City of Columbia

Engineering Standards and Specifications

Adopted September 12, 2024

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Amendments

Number	Date	Ordinance #
0	06/09/2024	4406
1	09/12/2024	4520

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Chapter 1: General Provisions

1.1 Title

These regulations shall hereinafter be known and cited as the Engineering Standards and Specifications (ESS) of Columbia, Tennessee. They may be referenced within this document as standards, specifications, or regulations.

1.1 Purpose

This document describes the technical design and construction requirements for land development within the City of Columbia, hereinafter referred to as "City". These standards and specifications utilize best practices and well-established standards to promote design that enhances the health, safety, and welfare of the general public, and to provide for the harmonious development of the City.

1.2 Applicability

These specifications shall apply to all entities, persons, developers, firms, or businesses interested in developing property within the City. These specifications are intended only to apply to new developments and streets within a development in the City, unless otherwise specified, or unless remedial work on existing infrastructure is required. The design and construction requirements in this document shall be sensitive to the character of the surrounding areas, impacts upon historic and environmental resources, and existing infrastructure.

1.3 Jurisdiction

Except as otherwise specified or required by law, these rules and regulations shall apply to all areas within the jurisdiction of the City of Columbia. Variations or exceptions to any of the standards of this Ordinance shall be approved by the City Engineer. Any appeals to the City Engineer's determination or these regulations shall be made to the Columbia Municipal Planning Commission (CMPC) as specified in **Section 1.10**.

1.4 Compliance Officer

It shall be the duty of the Columbia City Engineer (hereinafter referred to as the "Compliance Officer" or "City Engineer" or his/her designee to enforce these regulations and to bring to the attention of legal counsel any violations or lack of compliance herewith.

1.5 Relationship to Other Laws and Agreements

1.5.1 Conflict with Other Public Laws, Ordinances, Regulations, or Permits

Where provisions of this ordinance impose greater restrictions than those of any other City, State, or Federal regulation, statute, or ordinance the provisions of this ordinance shall be controlling. Where the provisions of any City, State, or Federal regulation, statute, or ordinance imposes greater restrictions than this ordinance, the provisions of such City, State, or Federal regulation, statute, or ordinance shall be controlling.

1.5.2 Conflict with Private Agreements

This Ordinance is not intended to revoke or repeal any easement, covenant, or other private agreement. However, where the regulations of this ordinance are more restrictive or impose higher standards or requirements than such easement, covenant, or other private agreement, then the requirements of this ordinance shall govern. Nothing in this Ordinance shall modify or repeal any private covenant or deed restriction, but such covenant or restriction shall not excuse any failure to comply with this Ordinance. The City shall not be obligated to enforce the provisions of any easements, covenants, or agreements between private third parties.

1.5.3 Vested Property Rights

In accordance with TCA 13-4-310, the following list specifies the types of plans approved, on or after January 1, 2015, that will cause a vested property right to be established. Vestment rights and periods shall be in accordance with TCA 13-4-310 and the Zoning Ordinance.

A. Approval by the CMPC, or Administratively by Staff, of a Development Plan as required by Zoning Ordinance;

B. Approval by the CMPC, or Administratively by Staff, of a Final Plat as required by the Subdivision Regulations;

C. Approval by the City Council of a Planned Unit Development as required by the Zoning Ordinance; or,

D. Approval by the CMPC of a Preliminary Plat, when not part of a PUD Development Plan, as required by the Subdivision Regulations.

1.5.4 Permits from other Government Agencies, Entities, and Departments

Prior to beginning any construction, the developer/contractor/property owner shall obtain all necessary permits as required by law. Such permits may include but are not limited to: those required by the State of Tennessee, Maury County, and City Departments, Commissions, or Boards.

1.6 Severability

It is hereby declared to be the intention of the City Council of Columbia, Tennessee, that the provisions of this Ordinance are separable. If any court of competent jurisdiction shall adjudge any provision of this Ordinance invalid, such judgment shall not affect any other provision of this ordinance not specifically included in said judgment; and if any court of competent jurisdiction shall adjudge invalid the application of any provision of this Ordinance to a particular property such judgment shall not affect the application of said provisions to any other property not specifically included in said judgment.

1.7 Saving Provision

These Engineering Standards and Specifications shall not be construed as abating any action now pending under or by virtue of previous applicable regulations or standards, or as discontinuing, abating, modifying, or altering any penalty accruing or about to accrue, or as affecting the liability of any person, or as waiving any right of the governing body under any section or provision existing at the time of

adoption of these regulations, or as vacating or annulling any rights obtained by any person by lawful action of the governing body, except as expressly shall be provided otherwise in these regulations.

1.8 Modifications

When the provisions of this ordinance are not appropriate or cannot be justified, modifications to these provisions shall be examined on a case-by-case basis by the City Engineer using the following criteria:

A. The proposed modifications do not negatively impact the health, safety, and welfare of the general public;

B. The proposed modifications adhere to best practices and well-established engineering standards; and

C. The proposed modification is necessary or meets and exceeds the standards of this document using alternative designs or methodologies.

Where a modification is desired, the developer, contractor, or design professional in responsible charge of the project shall submit the following information in writing to the City Engineer:

A. Identification of the specific provisions to be modified;

B. Identification of the alternative design or standards being proposed;

C. A thorough justification of the alternative design; and

D. A notarized affidavit attesting that all information in the request is true and complete, and the applicant has the authority over the development project to request such a modification.

1.9 Amendments

For the purpose of providing for the public health, safety, and general welfare the City Council may from time to time amend these regulations.

1.10 Appeals

A. The Planning Commission shall hear and decide appeals of orders, decisions, or determinations made by the City Engineering or designee relating to the application and interpretation of the technical provisions of the adopted Engineering Standards and Specifications.

B. The application for appeal shall be filed with the Development Services Department within ninety (90) calendar days after the ruling by the City Engineer was made, and shall be accompanied by a fee, as determined by the Development Services Department.

C. The Planning Commission may grant exceptions to the provisions of this ordinance only after finding that the life, safety, health, and general welfare of the City will not be impacted by such an exception.

D. Each item listed below shall be considered and deemed satisfied by the CMPC prior to the

approval of an exception:

1. The strict application of this ordinance would result in practical difficulties to or undue hardship on the owner of the property;

2. The situation is not self-created; and

3. The exception may be granted without substantial detriment to the public good and without sustainably impairing the intent and purpose of this ordinance.

E. The CMPC shall keep a record of all appeals.

1.11 Inspection

All developments shall be subject to inspection during and upon completion of construction by an authorized representative(s) of the City. Presence or absence of an inspector during construction does not relieve the Developer and/or Contractor from adherence to approved plans and material contained in these specifications or from liability. Materials and/or workmanship found not meeting requirements of approved plans and specifications shall be immediately brought into conformity with said plans and specifications.

The cost for inspections performed by the Development Services Department shall be calculated by the Department and paid by the Developer. Additional inspection fees will be required only when an inspection requiring City approval fails and requires subsequent re-inspections. Applicable fees and their fee schedules can be found in the City of Columbia Municipal Code and posted on the Development Services Department web page.

1.12 Testing

The City Engineer may require testing to verify construction materials and methodologies applicable to this ordinance. Testing shall be done by an independent testing laboratory, and results shall be submitted to and approved by the City Engineer. The Developer shall provide testing when requested by the City Engineer. Defects disclosed by the tests shall be corrected or rectified at no cost to the City.

Chapter 2: Construction Plans

2.1 General

In order to provide consistency and accuracy, the following standards shall apply to all construction plans, supplemental information, supporting calculations, and surveys submitted to the City for review. After receiving approval of a Preliminary Plat, Final Plat, Development Plan, Site Plan, or for any project requiring a Land Disturbance Permit, the Developer or Developer's engineer shall submit construction plans and all required documentation required for a full and complete review for approval by the City Engineer or his/her designee(s). Exemptions may be granted or additions required by the City Engineer based upon the project scope and special conditions. Construction plan review and any associated permits shall be accompanied by a fee as specified in Engineering Fee Schedule.

2.2 Expiration

Approval of construction plans shall be valid for one (1) year from the date of approval. If construction has not begun within that timeframe, the construction plans and applicable review fees shall be resubmitted and provided for approval.

2.3 Surveys

All construction plans shall be accompanied by a survey sealed by a professional land surveyor that contains all boundaries, angles, bearings, and calls. All surveys shall be tied to the TN State Plane Coordinate System.

2.4 Construction Plan Requirements

The construction plans shall consist of scaled drawings with specifications and all relevant and supporting data. The construction plans shall include all information related to street construction, grading, drainage, utilities, and all other information requested by the City Engineer to perform a full and complete review. The construction plans shall be neat and legible, such that all information contained within can be clearly and accurately ascertained.

The construction plans shall contain the following information, where applicable:

General

- Title sheet with project name, description, developer/owner contact information, and design professional contact information.
- Index of all pages contained within the plan set.
- North Arrow.
- Legend(s) for all symbology.
- Site vicinity map.
- Graphic Scale: between 1 inch =10ft and 1 inch =50ft.
- Sheet(s) showing existing conditions including but not limited to:
    - Natural features on-site including but not limited to wetlands, streams, ponds, springs, sinkholes, wells, rock outcroppings, slopes 10% and greater, forested areas, and trees over 6" caliper.
    - Existing structures.
    - Existing vehicular and pedestrian facilities.
- The approved Preliminary Plat, Final Plat, Site Plan, or Development Plan. Any deviations from the approved plan shall be clearly noted.
- The location, dimension, square footage of lot and lot numbers of all proposed lots or existing lots; denote critical lots.
- The location of all existing buildings and the proposed location of all commercial, mixed-use or condominium buildings within proposed development, if applicable.
- The location and width of all existing and proposed easements, alleys, public ways, and building setback lines.
- Name of property owners and zoning classification of subject and all adjoining properties.

Streets and Rights-of-Way

- Proposed right-of-way.
- Horizontal alignments showing all radii of all curves, lengths of tangents, and central angles on all streets.
- Vertical alignments showing existing and proposed elevations along center lines of all public and private streets.
- Plans and profiles indicating the locations and typical cross-section of public way pavements, including curbs and gutters, sidewalks, drainage easements, rights-of- way, public utilities, storm infrastructure, manholes, and catch basins.
- Existing and proposed sidewalks, trails, bicycle facilities, and other pedestrian elements.
- Proposed offsite roadway improvements and signalization plans, if warranted.
- Traffic signage and pavement markings.
- Proposed street names, and designation and public or private.

Grading

- Sheet(s) showing existing conditions with contours at a minimum vertical interval of two (2) feet.
- Limits of disturbance.
- Proposed contours at a minimum vertical interval of one (1) foot.
- Proposed erosion protection and sediment control (EPSC) plans.
- Retaining walls, culverts, and bridges.

Stormwater

- FEMA Special Flood Hazard Area (SFHA), 100-year Floodplain (F-P) and Floodway (F-W) boundaries with elevations and the exact location of the nearest benchmark. Indicate the Flood Insurance Rate Map (FIRM) panel number, its effective date, and flood insurance zones.
- Table showing all inverts, lengths, materials, and types of stormwater pipes and structures.
- Show detention and water quality calculations.
- Water Quality Riparian Buffer locations and widths and the location of top of bank for all water resources.
- Show drainage calculation and stormwater pipe calculations table.
- Show detention and water quality calculations.
- Amounts of pervious/impervious area in acres, pre and post-construction.
- All off-site drainage improvements.

Utilities

- The location, size, and invert elevations of existing and proposed sanitary sewers, stormwater drains, and fire hydrants, showing connection to any existing or proposed utility system.
- Exact location and size of all water, gas, or other underground utilities or structures.
- Location, size, elevation, and other appropriate description of any existing facilities or utilities, including but not limited to, existing public ways, sewers, drains, water mains, easements, water bodies, streams, and other pertinent features, such as swamps, railroads, buildings, and features noted on the land development plan or major street or road plan.

Details

- Roadway cross-sections.
- Drainage structures.
- Ditch cross-sections.
- Retaining wall(s).
- Pavement cross-sections.
- Traffic signage.
- EPSC details.
- Traffic signal items, equipment, phasing, and timings.

Other Requirements

- Indicate streetlights, proposed trees, and landscaping – avoid conflicts.
- Location of cluster box units for USPS mail delivery.
- Common or open space.
- ADA facilities including, cross walk, curb ramps, and accessible parking stalls.
- Fire protection system, including main sizes, location of hydrants, boxes, etc.

2.5 As-Built Plan

As construction is completed, an as-built plan must be submitted for all developments and sites with a Land Disturbance Permit. The as-built plan shall consist of a survey sealed by a professional land surveyor and a certification sealed by a registered professional engineer licensed to practice in Tennessee.

Subdivisions and developments with infrastructure dedicated to the City of Columbia shall provide the as-built plan with the final plat application, as well as a second and final certification prior to preliminary acceptance of the subdivision or infrastructure.

Developments without infrastructure dedicated to the City of Columbia shall provide the as-built plan prior to requesting a certificate of occupancy. Larger developments may require multiple as-built plans as portions of the site are completed.

A final inspection by the city is required before any performance security or performance bond will be released. The city shall have the discretion to adopt provisions for a partial pro-rata release of the performance security or performance bond on the completion of various stages of development. In addition, occupation permits shall not be granted until corrections to all BMP's have been made and accepted by the city.

2.5.1 Contents

The survey must show the contain the following:

- Rights-of-way, property boundaries, and easements.
- Invert of all storm structures and pipes
- Size and material of all storm pipes
- Casting or rim elevations of all storm structures
- Volumetric quantity and capacity of all SCMs.
- Location and contours of all ditches.
- Location and contours of a detention/retention ponds.
- Any other information required to determine the final

The licensed professional shall certify that: the stormwater facilities have been constructed as shown on the "as-built" survey, and the facilities are in conformance with approved construction plans and achieve the function for which they were designed.

Chapter 3: Streets

The purpose of this chapter is to establish the criteria and guidelines for the design of streets and other related elements in the rights-of-way. It is to be used in the design of public and private streets. Certain criteria and guidelines within this chapter may be determined to not be applicable to street design within certain districts and areas in order to preserve the existing character, address peculiarities, and preserve the public health, safety, and welfare, as determined by the City Engineer.

3.1 General

All design drawings and support data submitted to the City Engineer for approval must be sealed by a registered Professional Engineer, licensed to practice in the State of Tennessee.

The design criteria in this chapter are intended to aid in the preparation of plans and specifications and are considered the minimum. A complete design will usually require more information than is presented in this document. Designs of streets shall follow the best practices and standards, the design specifications of this document, and the approved details and roadway sections. Where conflicts exist or interpretations are required, the City Engineer shall make the final determination.

3.2 Location and Layout of New Streets

A. The location and layout of new streets shall be as identified in the Major Thoroughfare Plan of Connect Columbia, Access Management, Subdivision Regulations, and Zoning Ordinance. Streets not identified in the Major Thoroughfare Plan and the Access Management Ordinance shall meet the needs of the specific Development and satisfy all other specific requirements of this document. The City Engineer retains the authority to assign functional classification of streets as needed for circulation and emergency access and retains authority for approval of the overall street layout.

B. All streets shall have a logical relationship to the existing topography and the location of existing, platted, or planned streets within adjacent properties.

C. The street layout for all subdivisions shall be designed to ensure connectivity, enhance general circulation and provide secondary points for emergency access. They shall also provide safe, efficient, and convenient vehicular, bicycle, and pedestrian access within and between developments. Certain streets may need to be extended to property boundaries to provide for the future logical extension of the street through adjacent properties. If a street is located within or adjacent to a development, the development shall continue the street to a logical termination point as determined by the City Engineer.

D. All streets shall be properly integrated with the existing and proposed system of streets and dedicated rights-of-way as established in the Connect Columbia Comprehensive Plan, Transportation Master Plan, and Access Management Ordinance.

E. All streets shall be properly related to special traffic generators, such as industries, business districts, schools, churches, and shopping centers; to population densities; and to the pattern of existing and proposed land uses.

F. Minor local streets shall be laid out to conform as much as possible to the topography, to provide for the efficient dispersal of internal traffic, permit efficient drainage, and accommodate utility systems.

G. The use of an interconnected street system shall be used to broadly disperse internal traffic and provide maximum alternatives for access to the property for both public and private movement.

H. Street designs with connective streets are preferred instead of the use of cul-de-sacs. Cul-de-sacs are prohibited unless where topographic features or configuration of property boundaries prevent street connections, as approved by the CMPC.

3.2.1 Avenues and Boulevards

Where required by the Zoning Ordinance, a portion of the streets within a development shall be Avenues or Boulevards. Avenues and Boulevards shall be continuous in nature, where possible, and generally provide a continuous path from the entrance through the site.

3.3 Traffic Impact Study

When required, the applicant shall provide the City with a Traffic Impact Study (TIS) that shall adhere to the requirements of Ordinance #4106. When a TIS is required, the City shall not accept an application for development review until the TIS has been completed and is under review by the City. The TIS review by the City and resubmissions or responses by the applicant shall be completed and approved before an application for development review may be deemed complete.

3.4 Functional Classification

New connections, streets, and developments mean functional classification of streets is constantly evolving. The functional classification of any street in the jurisdiction and those adjacent to the jurisdiction shall be defined by the Connect Columbia Master Transportation Plan, or as amended by the City Engineer. Any amendments to the functional classification of streets by the City Engineer shall be updated regularly on a map and shall be readily available to the public.

For planning purposes, roads are often designated in terms of their functional classification, which is based on the character of the transportation service it is intended to provide. Categories typically include interstate, principal and minor arterials, collectors, and local roads. As one moves up the hierarchy from local to collector to arterial to interstate, speeds generally increase and there is a corresponding decrease in access provided to adjoining properties.

3.5 Public and Private Streets

Residential subdivisions should be served by public streets. Non-residential, multi-family, and mixed-use developments may be served by public streets or private streets. Where the development is not open to the public, such as in gated communities or access restricted areas, or the use of the proposed streets is not sufficiently public in nature, the streets shall be private.

Private streets serving more than one lot or more than one primary structure shall be built to the same standards as required for public streets and shall be located in a public utility drainage and access easement (PUDAE) the same width and dimensions of the required right-of-way.

All proposed streets shall be clearly identified as public or private on all development plans and platted in accordance with the Subdivision Regulations.

3.6 Rights-of-Way and Easements

3.6.1 Right-of-Way

Minimum right-of-way widths for each functional classification shall be as shown in **Table 1**. Topography, special design features, and other factors may require greater widths than these minimums. The City Engineer shall have the final review with the determination of any additional right-of-way (ROW) that is required for the design of a specific street segment.

Table 1: Minimum Standards for Functional Classifications

Street Classification	Minimum ROW (ft.)
Alley	20
Minor Local	50
Major Local	65
Collector	75
Arterial	90*
Principal Arterial	125*

**Arterial roadways shall at minimum provide the right-of-way in Table 1. Additional right-of-way May be required depending on the existing and/or proposed street section.*

Where a proposed public street intersects a collector roadway, a minimum of sixty-five (65) feet of right-of-way, two hundred (200) feet in length, shall be provided from the edge of the intersected street's right-of-way.

Where a proposed public street intersects an arterial roadway, a minimum of seventy-five (75) feet of right-of-way, two hundred fifty (250) feet in length, shall be provided from the edge of the intersected street's right-of-way.

The minimum radius of curvature for any new right-of-way line shall be twenty-five (25) feet. All radii of curvature at intersections shall be twenty-five (25) feet, except in developments of urban character, where approved by the City Engineer, right-of-way lines may intersect.

3.6.2 Easements

There are several types of easements the City of Columbia may require or permit relating to the construction of streets and the development of property.

A. Public Utility, Drainage, and Access Easement (PUDAE) approved for use by the City Engineer on a case-by-case basis.

B. Public Utility and Drainage Easement (PUDE).

C. Public Access Easement (PAE) for public access to a street, pedestrian facility, or internal drive.

D. Public Drainage Easement (PDE) for drainage purposes only.

E. Slope Easement (SE) for the construction of a slope between one property or the street right-of-way and adjacent property.

F. Temporary Construction Easement (TCE) to provide adequate construction area in the construction of a project.

G. Easements for storm and sanitary sewers shall be a minimum total width of twenty (20) feet. Where the depth of storm sewer exceeds 10 feet, two (2) additional feet of width for each foot of depth exceeding ten (10) feet shall be provided, rounded up in five (5) foot intervals.

H. Where the equivalent diameter of the storm sewer exceeds six (6) feet, two additional feet of width for each foot of diameter exceeding six (6) feet shall be provided, rounded up in five (5) foot intervals.

I. No permanent structures or appurtenances to structures shall encroach into utility easements including but not limited: accessory structures, sheds, pools, HVAC and mechanical units, refrigeration equipment, air handling equipment, or retaining walls over six (6) feet in height.

3.6.3 Improvements in Right-of-Way

All permanent public improvements including streets, lighting, sidewalks, traffic signage, traffic signals and equipment, and street-related features shall be located within a public right-of-way.

Permanent improvements not owned or maintained by the City may be permitted within the right-of-way if a license/maintenance agreement is approved by the City Council and all other appropriate City entities.

3.6.4 Additional Right-of-Way Required

Developments that adjoin existing streets shall dedicate or reserve additional right-of-way where necessary to meet the minimum requirements for the functional street classification of the existing street, see **Table 1**, or other dimensions as required by the City Engineer.

A. Major subdivisions, developments of ten (10) or more acres in size, and development requiring CMPC approval shall dedicate right-of-way, where required.

B. Minor subdivisions, developments under ten (10) acres in size, and developments not requiring CMPC approval shall reserve right-of-way, where required.

C. When the development is located on both side of the existing street, the entire right-of-way dedication or reservation shall be provided.

D. When the development is located on only one side of the existing street, half of the required width of the right-of-way, measured from the centerline of the existing roadway shall be dedicated or reserved.

E. Additional right-of-way may be required to accommodate future roadway improvements, at the discretion of the City Engineer.

3.6.5 Dedication of Right-of-Way

The dedication of rights-of-way, reservations, and easements shall normally occur through the platting process. When dedications are required outside the platting process, they shall be dedicated in a manner and format approved by the City Engineer and City Attorney.

3.6.6 Encroachments

A. Permanent dumpsters, including the pad and enclosure, shall not be located in a public right-of-way.

B. Permanent encroachments that may impede the use of the public right-of-way shall be prohibited, unless otherwise permitted by City Council.

C. Temporary encroachments of the right-of-way shall require a permit, including but not limited to:

    a. Dumpsters, roll-offs, or containers; and

    b. Scaffolding, construction fencing, or lifts;

D. Permanent encroachments of the right-of-way shall require City Council approval.

E. Encroachments shall not impede pedestrian facilities in a manner that prevents accessibility. If encroachment is within a pedestrian facility, an alternative route shall be provided that is complaint with OSHA, ADA, and other relevant codes/regulations.

F. Encroachments shall not create sight distance barriers for pedestrians, bicycles, and vehicles, and shall comply with city, state, and federal roadway standards.

G. Encroachments shall not impede or obstruct drainage facilities.

H. Encroachments shall not block Fire Department connections, fire hydrants, access, or pathways.

3.7 Geometry

The design criteria presented in this section apply to all roadways that are required to be designed and constructed to City standards and specifications. The design criteria presented below shall be used as minimum requirements for new developments and may be increased at the direction of the City Engineer if warranted by safety hazards or traffic operations.

All streets are to be designed in accordance with the design speeds specified for each street classification in this chapter, or as amended by the City Engineer, and as summarized in **Table 2.**

Table 2: Roadway Geometry Standards

Design Feature	Principal Arterial	Minor Arterial	Collector	Major Local	Minor Local	Alley
Design Speed	50	45	35	25	20	15
Min. Horizontal Centerline Radius	*	*	333	205	125	50
Superelevation	Yes	Yes	Yes	No	No	No
Maximum Grade %	6	7	8	10	14**	8
Min. K Values Crest	84	61	29	12	7	7
Min. K Values Sag	96	79	49	26	17	17
Curb and Gutter	Y	Y	Y	Y	Varies	N

* Min. Horizontal Centerline Radius for arterial streets shall be designed on a case-by-case basis.
**Preferred maximum grade is 10%. Shall not exceed 10% on streets with designated on-street parking lanes or stalls.

3.7.1 Horizontal Alignment

A. The minimum allowable horizontal centerline radii for horizontal curves shall be as designated in **Table 2**. Reverse and compound curves shall only be used where single radii curves cannot work. Where reverse and compound curves are used TDOT standards and specifications and AASHTO standards and procedures shall be used.

B. Whenever a proposed street intersects a street with an equal or greater classification, a tangent (measured from the edge of travelled way, or the right-of-way line when determined by the City Engineer, along the centerline of the intersecting street) shall be provided. The minimum tangent lengths shown in **Table 3** apply only to the intersecting street. The angle of departure of a tangent shall not exceed twenty (20) degrees measured from the intersection of the intersecting street and the intersected street's right-of-way line or ten (10) degrees where intersecting an arterial street.

C. Reverse curves shall be separated by minimum tangent length of fifty (50) feet for local streets, one-hundred (100) feet for collector streets, and one-hundred fifty (150) feet for arterial streets.

D. Curves under deflection angles of ten (10) degrees shall be avoided where possible.

E. Horizontal curves should avoid starting near the crest or sag of a vertical curve.

F. Connections with existing improvements or stub roads shall be made to match the existing grade alignment and continue the roadway in accordance with these standards.

G. Curves under deflection angles of ten (10) degrees shall be avoided where possible.

H. Horizontal curves should avoid starting near the crest or sag of a vertical curve.

Table 3: Tangent Length at Intersections

Street Classification of Intersected Street of Equal or Greater Classification	Minimum Tangent Length (ft.)
Alley	0
Minor Local Street	50
Major Local Street	50
Collector	100
Minor Arterial	150
Principal Arterial	150

3.7.2 Cross slopes

A. The normal crown for new streets shall be two (2.0) percent

B. Cul-de-sacs shall have no portion of pavement less than two (2.0) percent and no portion greater than five (5) percent.

3.7.3 Vertical Alignment

A. The maximum allowable grades for specific street classifications are shown in **Table 2**. The centerline grade of a cul-de-sac shall not exceed five (5.0) percent.

B. Single point grade breaks are permitted on local streets at the bottom of a sag curve where the maximum grade break is no more than one (2.0) percent within a sag curve to facilitate roadway drainage. All other single point grade breaks shall not exceed one (1.0) percent.

C. The minimum slope of the gutter line of all roadways shall be no less than one (1.0) percent, except within cul-de-sacs.

D. Connections with existing improvements or stub roads shall be made to match the existing grade alignment and continue the roadway in accordance with these standards. Single point grade breaks should be avoided where possible.

E. To ensure that future street improvements will meet these Standards, the grade and alignment of streets shall be continued. Where roadway construction may require future grading all necessary easements shall be included.

F. All vertical roadway profiles shall be capable of accommodating the City Fire and Rescue design apparatus and Sanitation Department collection vehicles.

3.7.4 Improvements in Floodable Areas

The finished elevation of proposed streets shall be a minimum of two (2) feet above the 1% annual flood risk, or 100-year flood elevation. Location of such streets shall conform to the requirements of the Stormwater Management Regulations as administered by the Engineering Department.

3.8 Turnarounds and Dead-End Streets

A. A permanent turnaround (cul-de-sac) shall be required on streets exceeding 150 feet in length from an intersection, cul-de-sac, or other approved turnaround.

B. Cul-de-sacs shall be located a minimum distance away from the connected roadway as to provide a right-of-way section a minimum of twenty-five (25) feet in length parallel to the centerline of the street between the intersected street and the expansion of the right-of-way for the cul-de-sac with a width matching the roadway cross-section.

C. No dead-end street shall be permitted to be longer than six hundred and fifty (650) feet.

D. Temporary turnarounds may be permitted for turnarounds within an overall development, where the overall approved development plan shows the removal of the turnaround. Temporary turnarounds shall be constructed within a dedicated right-of-way or a PUDAE where the temporary turnaround extends beyond the limits of the final intended right-of-way. The PUDAE shall be vacated when the temporary turnaround is removed.

E. Cul-de-sac medians may be permitted if it can be demonstrated that all service and emergency vehicles can be accommodated.

F. Cul-de-sac parking is prohibited.

G. Cul-de-sacs may be located where a future roadway connection is intended. When a connection is made by an adjoining development, the connecting development shall remove the cul-de-sac to provide a smooth continuous roadway transition between the existing and proposed development. The driveways of all affected lots shall be extended at the developer's expense.

H. Street designs such as loop streets are preferred to the use of a cul-de-sac design. Cul-de-sacs shall be permitted where topographic features or configuration of property boundaries prevent street connections. These alternatives shall support the turning movements of emergency and service vehicles.

I. Eyebrows or expansions of the roadway geometry shall not be permitted on Public or Private Streets.

3.10 Intersections

Intersections shall be designed to provide for the safety of motorists and pedestrians utilizing the facility. Intersections shall be designed using the standards in this document and those of the AASHTO Green Book, current edition, and the ITE Traffic Engineering Handbook.

3.10.1 Location

Intersection location shall be carefully planned and considered. Intersections shall be located to minimize conflict points, and maximize the safety of motorists and pedestrians. In no instance shall an intersection be used as a means to circumvent the standards for roadway geometry

3.10.2 Spacing of Intersections

Intersection spacing shall at a minimum adhere to the access spacing requirements outlined in the Access Management Ordinance. Streets, except alleys, shall in no case intersect another street within one hundred fifty (150) feet of a street intersection.

3.10.3 Alignments

A. All lanes shall be in alignment at an intersection. Special considerations may be granted to allow for up to a one-half lane width shift, subject to approval by the City Engineer.

   Vertical profiles on the legs of intersections shall be adjusted to provide a smooth junction, proper drainage, and adequate sight distance where streets intersect. Typically, the grade of the higher classified, or more majorly travelled leg of the intersection shall continue with the intersecting street's grade adjusted to meet it. It is desirable to provide near level intersection approach grades. Intersection approach grades shall be measured from the edge of travelled way of the intersected street along the centerline of the intersecting street. The maximum intersection approach grades are shown in **Table 4**.

Table 4: Intersection Approach Grades

Classification of Intersecting Street	Maximum Approach Grade	Minimum Length (ft.)
Alley	10%	N/A
Minor Local Street	5%	25
Major Local Street	5%	50
Collector	4%	75
Minor Arterial	4%	100
Major Arterial	3%	100

3.10.4 Curb Radius of Return

A. The curb radius shall be fifteen (15) feet for all streets unless otherwise mentioned below.

B. The minimum curb radius in industrial areas and areas where a significant portion of right turning traffic volumes are trucks or busses shall be twenty-five (25) feet minimum.

C. The minimum curb radius for minor and major local streets intersecting collector and arterial roads shall be twenty-five (25) feet minimum. Where private accesses and driveways connect to TDOT owned roadways, they shall adhere to TDOT Driveway Manual specifications.

D. The curb radius of intersections consisting of collector and arterial streets shall be designed to accommodate the appropriate design vehicles and traffic patterns on a case-by-case basis.

E. Where significant portions of right turning traffic volumes are trucks, busses, or other non-passenger type vehicles the designer shall use a larger radius to properly accommodate the appropriate design vehicle. Where the angle of street intersection is less than ninety (90) degrees, the City Engineer may require a larger radius of return. For streets and driveways intersecting TDOT rights-of-way, TDOT's radius of return requirements shall govern.

3.10.5 Left Turn Control Radius

The control radius refers to a radius that must be considered in establishing the location of a median or traffic separator ends on divided highways and the stop bar on undivided highways. The minimum control radius for left-turn movements is shown in **Table 5**.

Table 5: Minimum Control Radius

Design Vehicles Accommodated	Control Radius (ft.)			
	50 (40 min)	60 (50 min)	75	130
Predominant	P	SU-30	SU-40, WB-40	WB-62
Occasional	SU-30	SU-40, WB-40	WB-62	WB-67

3.10.4 Auxiliary Lanes

Auxiliary Lanes may be required at intersections of any street to address capacity or safety issues, at the determination of the City Engineer. Where required, the developer shall use TDOT standards for taper and transition lengths. A traffic study may be required to determine the sizing and specific requirements of the auxiliary lanes.

3.10.5 Roundabouts

Roundabouts offer a safer alternative, in almost all cases, to traditional stop controlled or signalized intersections. Roundabouts can be utilized to improve traffic flow at intersections while improving safety. Roundabouts designs shall be based on FHWA's, "Roundabouts: An Informational Guide," "TDOT Standard Specifications," requirements identified in a Traffic Study and requirements as determined by the City Engineer. Roundabouts shall be used primarily as a traffic control device.

3.10.6 Considerations for Block Length, Width, and Shape

The lengths, widths, and shapes of blocks shall be determined with due regard to: zoning requirements as to lot sizes, needs for convenient access, circulation, control, and safety of vehicular and pedestrian traffic, and limitations and opportunities of topography.

3.10.7 Sight Distance

Sight distance at intersections shall not be less than the minimum horizontal and vertical distances as specified in the AASHTO Design Guide Manual, current edition.

3.10.8 Traffic Signals

Where warranted, the City or developer of a project may install a traffic signal to provide a safe and orderly flow of vehicular and pedestrian traffic. Signal design and warrants shall conform to the requirements of the Manual of Uniform Traffic Control Devices (MUTCD), Public Works and Engineering Department Standards. Where a signal is proposed, a Traffic Impact Study may be required to determine appropriate intersection geometry, signal timing and phasing, and warrant analysis.

A. Signal design shall be approved by Public Works and the Engineering Division.

B. Signal equipment shall be from the City of Columbia's signal equipment list.

C. Signal supports shall be cantilever, mast-arm style supports constructed of clean steel and powder-coated black. Strain arm and wire signal supports shall be evaluated on a case-by-case basis only where mast arm style supports are impractical or unfeasible. Where new strain arm and wire signal supports are proposed, strain arms shall be constructed of clean steel and powder-coated black.

D. Where there is none or there is insufficient street lighting, lighting shall be provided on the signal supports. The lighting design, fixtures, and luminaires shall be approved by the power utility provider and the City Engineer.

E. When a signal is installed for the benefit of a new development, the developer shall provide streets, rights-of-way, or cross access to the adjacent properties.

F. Generally, split-phase timing shall be avoided unless specific conditions exist that would necessitate the usage. Lead-lag phasing shall also be considered where split phasing is proposed.

3.11 On-Street Parking

This section defines the parking criteria for on-street parking on new streets. Parking may be allowed on Local streets. Parking shall not be allowed on Alleys, Collector, and Arterial streets unless in marked or signed areas.

3.11.1 Parallel Parking

Parallel parking is permitted on certain streets as determined by the City Engineer.

3.11.2 Inset Parking

Where a dedicated parking lane is provided, parking inset from the curb line shall be required to provide safety and delineation of the parking aisle. Where inset parking is installed, islands shall be provided at all non-residential, multi-family and mixed-use driveways, intersections, and a minimum of every two hundred fifty (250) feet. Curb and gutter shall be required where inset parking is installed.

3.11.3 Diagonal and Perpendicular Parking

Diagonal and perpendicular parking shall not be allowed on public streets and shall not be allowed to utilize the public street for maneuvering. The City Engineer must approve any on-street parking areas that are not designed as parallel parking. All areas approved for diagonal parking shall be designed at an angle of thirty, forty-five, sixty, or ninety degrees as approved by the City Engineer.

3.12 Pedestrian Facilities

3.12.1 ADA Requirements

All pedestrian facilities provided within the City shall be designed to accommodate movement by the disabled as required by the “Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way.”

3.12.2 Sidewalk Location

On streets with curbing the sidewalk shall be:

A. A minimum of five (5) feet wide and constructed of concrete; and

B. Located a minimum of five (5) feet from the travel lane of the roadway.

On streets with roadside ditches instead of curbing, the sidewalk shall be:

A. A minimum of five (5) feet wide and constructed of concrete;

B. Located a minimum of twelve (12) feet from the travel lane of the roadway, separated from the travel lane by a grass buffer strip. Edge clearance requirements may dictate a larger buffer strip; and

C. Where the buffer strip contains the roadside ditch, drainage requirements may dictate an increased buffer width.

3.12.3 Intersections

All intersections where there is the assumption that pedestrians shall be present shall have curb ramps and crosswalks. A curb ramp shall be constructed for each crosswalk at each street corner.

Intersections with arterial, collector, and major local streets, shall have crosswalks that are clearly marked, and signalized intersections shall have pedestrian actuated signals. The signing and pavement markings at intersections shall clearly indicate how all street users should operate.

3.12.4 Detectable Warnings

The "Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way" requires detectable warnings for pedestrian street crossings. These surfaces feature a distinctive pattern of raised domes to provide a tactile cue detectable by cane or underfoot at the boundary between pedestrian and vehicular routes. Detectable warnings shall be used for all pedestrian street crossings, where applicable.

3.12.5 Pedestrian Guards

Safety rail shall be provided along pedestrian and multi-modal facilities in accordance with TDOT Standard Drawing: Bike and Pedestrian Safety Rail MM-BPR-1 or most current TDOT standards.

3.13 Bridges and Structures

Bridges must meet the latest version of the TDOT Standard Specifications for Road and Bridge Construction. All bridges, including bridges as part of a driveway serving a residential lot, shall meet necessary design and construction standards to provide access for emergency vehicles as determined by the City of Columbia Fire and Rescue Department. The City may require the review of bridges and structures by a third-party engineer selected by the City at the cost of the developer.

3.14 Signage

All signage shall conform to the requirements of the Manual of Uniform Traffic Control Devices (MUTCD) and Public Works and Engineering Department standards. Temporary signs may be installed and maintained in lieu of permanent signs until curbs are installed and backfilled or Final Plat. Such signs shall meet the same standards for mounting height, size, and legibility as permanent signs but may be mounted on temporary structures. The installation of temporary street name signs, including the signs required for temporary dead-end streets and for greenway easement signs in accordance with these standards, shall be verified by written developer/contractor certification to the Engineering Department before authorization for building permits may be granted.

A. The developer shall purchase and install appropriate signs. Written confirmation of this placement shall be required from the Engineering Department prior to the recording of a final plat.

B. The developer shall post a performance surety prior to the recording of the final plat. Street sign sureties shall be a part of the original surety covering streets, drainage, water, sewer, etc.

C. All street signage shall be installed and in accordance with MUTCD standards prior to the issuance of building permits.

3.15 Pavement Markings

All pavement markings shall conform to the requirements of the Manual of Uniform Traffic Control Devices (MUTCD). All pavement markings on streets not classified as minor local streets shall be retroreflective thermo-plastic pavement markings. Pavements markings for minor local streets, parking areas, and private lots may be painted pavement markings.

Where pavement markings are required to be removed or obliterated, the process shall not result in the degradation or scarring of the pavement surface, ghosting, or incomplete removal of pavement markings. Painting over existing pavement markings with black paint or spraying with asphalt shall not be accepted as a substitute for removal or obliteration. Where pavement markings cannot be removed or obliterated effectively, the pavement surface course shall be milled and overlaid.

3.16 Driveways

A. Access easements, a minimum of twenty-four (24) feet in width, shall be provided for accesses or driveways serving more than one lot/building site, use, or residence.

B. Driveways with two-way traffic serving more than one lot/building site, use, or residence shall be a minimum of sixteen (16) feet in width.

C. Driveways with one-way traffic serving more than one lot/building site, use, or residence shall be a minimum of ten (10) feet in width.

D. Driveways shall be constructed to allow for a typical passenger vehicle to safely pass.

E. Driveways shall be constructed to contain stormwater gutter flow within the curbed portion of the street section.

F. Maintenance for the portion of a driveway within the right-of-way shall be the responsibility of the property it serves.

G. In no circumstance shall parking or other uses on a driveway be permitted to block or restrict access to a sidewalk or pedestrian facility.

H. No commercial driveway shall be greater than ten (10) percent grade along any portion.

I. No residential driveway shall be greater than ten (10 percent) grade along any portion within the right-of-way, and no greater than twenty (20) percent grade along any other portion.

J. Driveways exceeding one hundred fifty (150) feet shall require Fire Marshal approval.

K. Driveway aprons, where streets have curb and sidewalk, shall be concrete pavement to the edge of right-of-way. Driveway aprons, where streets do not have sidewalk, shall be paved with asphalt or concrete pavement to the edge of right-of-way. Where the remainder of driveways are un-paved surfaces, the apron shall be a minimum of thirty (30) feet in length measured from

the edge of pavement of the roadway and be constructed in a manner to minimize the traction of gravel into the roadway.

3.17 Future Public Street Connections

Where possible, the City shall require the extensions of right-of-way and the construction of roadway to adjacent properties to facilitate roadway connectivity and the development of neighboring parcels. The City Engineer shall have discretion of the location and number of connections. Where future roadway connections are required, a sign must be provided noting that the street will be extended in the future.

3.18 Improvement of Streets before Acceptance

Private streets or streets accepted for maintenance by annexation into the City may be required to be improved to engineering standards before being accepted for maintenance as City streets. The City Engineer shall evaluate the streets to determine what, if any, improvements shall be required to meet engineering standards and the standards of public safety, heath, and welfare. The City Engineer may require the following:

A. A survey of the right-of-way and infrastructure;

B. Roadway core samples at least once every five hundred (500) feet in each travel lane;

C. Improvement of the road and pavement sections to meet a current City or State standard;

D. Maintenance of pavement under PCI condition rating of 70;

E. Installation of pavement markings, signage, and safety features; and

F. Installation of pedestrian facilities.

Any improvements shall be required to be completed by the Developer or the entity requesting acceptance of maintenance responsibilities by the City of Columbia.

3.19 Subgrade Preparation and Proof Roll

In addition to the “TDOT Standards Specifications for Road and Bridge Construction”, provisions for subgrade construction, it is required that immediately before placement of the crushed aggregate base, the street subgrade of any public or private street shall be proof-rolled using a pneumatic tire vehicle with a gross weight of not less than 30,000 (15 Tons) pounds per axle. The weigh ticket shall be provided. The contractor shall give 24 hours notification prior the request for a proof roll. Proof rolling must be witnessed and approved by authorized personnel of the Development Services Department. Any failures or areas of unsuitability shall be repaired in a manner approved by the City Engineer and may require a further proof roll. No aggregate base shall be applied until approval of the subgrade has been given.

3.20 Surface Course

3.20.1 Public Streets and Subdivisions

After all required inspections are completed, the final paving surface course may be applied when seventy-five (75) percent of the structures are completed within a subdivision. Under no circumstances shall final paving occur until all utility installations, including service lines to lots are complete. However, when an undue hardship is created by disallowing the final paving of a street prior to seventy-five (75) percent build-out, the City Engineer may permit final paving to occur. Once ninety (90) percent of all structures have be completed within a subdivision, no further certificates of occupancy shall be granted until the final surface course has been installed. Due to the phasing, or unique conditions of a development, it may be logical to defer the paving of the asphalt surface course until a later phase of construction.

3.20.2 Private Streets, Parking Areas, and Developments

After all required inspections are completed, the final paving surface course shall be applied prior to seventy-five (75) units or ninety (90) percent of the structures within a development are completed. In order to meet this requirement, paving may be required to be phased in portions of a development.

3.21 Street Lighting

The applicant shall bear the financial responsibility for the installation costs, including materials and labor, for street lighting. Street light layout, location, luminaire, and fixture type shall be approved by the City Engineer and the power utility district. All street lights shall be LED luminaires rated at 3000K luminance temperature.

3.22 Existing Streets and Rights-of-Way Prior to Development

3.22.1 Unimproved Rights-of-Way

Where a lot/building site's primary access is through an existing unimproved right-of-way, and the lot/building site is desired to be developed or subdivided, the right-of-way shall be improved with a roadway cross section and pavement schedule as determined by the CMPC and the City Engineer to the furthest extent of the lot/building site or a point determined by the City Engineer. The roadway dedication shall follow the requirements of the Subdivision Regulations.

3.22.2 Existing Streets

Where a lot/building site's primary access is through an existing street, and the lot/building site is desired to be developed in a manner that would require CMPC approval or subdivided, the street shall meet all of the following requirements:

A. A minimum pavement width of sixteen (16) feet;

B. A pavement section equivalent to the minimum parking lot pavement section or a concrete pavement section with suitability to be determined by the City Engineer; and

C. Capable of passing the City of Columbia Fire and Rescue design fire apparatus.

If the street does not meet the above requirements, the street shall be improved to a roadway cross section and pavement schedule as determined by the CMPC to the furthest extent of the lot/building site or a point determined by the CMPC. The roadway dedication shall follow the requirements of the Subdivision Regulations.

3.22.3 Improvements to Existing Streets

Where improvements are required along existing streets, the required pavement section, construction methods, and materials shall be determined by the City Engineer. All modifications to the existing pavement shall be repaired with a full lane-width surface course.

3.23 Secondary Access

Secondary access points may be required by the City Engineer for developments of seventy-five (75) units or greater or developments requiring a Traffic Impact Study. The feasibility and suitability of the site for a secondary access point shall be evaluated by the City Engineer and the Fire Marshal. Topography, natural features, access management regulations, shape of the property, and other constraints on the site may prevent the construction of a secondary access point. Where secondary access is not feasible, the geometry, cross section, or dimensions of the access may require modification at the discretion of the City Engineer.

3.24 Street Trees

Street trees shall be provided in accordance with the Zoning Ordinance. Street trees shall be located within planting strips, or when planting strips are not provided, tree wells or planters. Tree wells or planters shall be four (4) feet in width and thirty (30) square feet in area, minimum.

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Chapter 4 – Stormwater and Drainage Systems

4.1 General

The capacity of drainage systems shall be designed such it shall not:

A. Shall not increase flood hazard for an adjacent property;

B. Shall not impede City services, maintenance, and traffic along City streets; and

C. Shall not result in the degradation of water quality of downstream properties and water resources.

4.1.1 General Performance Standards

A. Public streets are not to be used to collect and convey stormwater runoff other than that which falls on a lot fronting that street.

B. Construction shall not aggravate upstream or downstream flooding. Existing downstream or upstream problems may be required to be corrected in conjunction with development.

C. The construction and financing of any required off-site drainage improvement necessitated by private development within the same watershed shall be the responsibility of the developer.

D. Under no circumstances shall a site be graded or drained in such a way as to increase the peak rate of stormwater runoff to sinkholes, dry wells, or drainage wells.

E. Flexible linings, “green” and other “soft” slope and stream bank stabilization methods shall receive preference over riprap, concrete and other hard armoring techniques. “Hard” alternatives shall only be permitted when their necessity can be demonstrated given site-specific conditions.

F. The City may require maintenance or modification of stormwater management practices that are not operating within the guidelines established by this Chapter, as determined by the City Engineer.

G. Drainage channels shall be trapezoidal and have a base a minimum of two (2.0) feet in width, a depth a minimum of one (1.0) foot, side slopes a maximum of three to one (3H:1V), a minimum slope of one (1.0) percent, and a maximum slope of seven and one half (7.5) percent.

H. Swales along property lines shall have a minimum depth of six (6) inches, side slopes a maximum of three to one (3H:1V), and a minimum slope of two (2.0) percent. Deviations from this standard may only be considered on a case-by-case basis, where adherence to this standard is not practicable and not feasible.

I. The minimum size for driveway culverts shall be fifteen (15) inches in diameter with headwalls and endwalls constructed of concrete or masonry.

J. All pipes and culverts under streets or within City rights-of-way or shall be eighteen (18) inches

in diameter at a minimum, excluding driveway culverts.

K. Pipes and culverts outside of city rights-of-way shall be a minimum of twelve (12) inches in diameter, excluding small drains such as roof drains, underdrain systems, and yard drains serving a single residential lot.

L. The minimum slope for pipes shall be one-half (0.5) percent for sizes greater than or equal to twenty-four (24) inches in diameter. All pipes smaller than twenty-four (24) inches in diameter shall have a minimum slope of one (1.0) percent.

M. Concentrated discharges shall be located to minimize the impact of downstream impacts.

4.2 Hydrologic and Hydraulic Calculations

All hydrologic and hydraulic computations utilized in the design of stormwater facilities must be prepared by a registered engineer proficient in the field of hydrology and hydraulics and licensed to practice engineering in the state.

4.2.1 Hydrology

A. Design storms shall be based on NOAA Atlas 14 Precipitation Frequency Estimates for Columbia, Tennessee.

B. The rational method shall be acceptable for estimating the peak flow rates for drainage basins under five (5) acres. However, the rational method shall not be used for the volumetric routing of storm events for the purposes of peak runoff control. Alternative methods and hydrographs utilizing the rational method such as the “Modified Rational Method” or the “Dekalb” hydrographs are acceptable for volumetric routing of storm events for the purposes of peak runoff control for catchments under five (5) acres. The City Engineer may require analysis by other methods

C. Drainage basins over five (5) acres shall use NRCS (formerly known as the SCS) unit hydrograph procedures using AMC II curve numbers and type II rainfall distribution, or other criteria that the City Engineer or Designee shall establish based on scientific and engineering information. Precipitation and runoff must be routed at appropriately small time intervals using either hand calculations or computer models that are widely accepted among engineering professionals.

D. In certain circumstances, the City Engineer may require analysis by other methods consistent with widely accepted industry standards and practice.

4.2.2 Hydraulics

All stormwater facilities shall be designed to adequately and safely carry the design flow.

A. All drainage systems at a minimum shall accommodate the ten (10) year storm

B. Drainage systems under a street or alley (public or private) shall accommodate the twenty-five (25) year storm

C. Drainage systems which would pass more than one hundred (100) cubic feet per second (cfs) for the ten (10) year storm shall be capable of accommodating a fifty (50) year storm

D. Drainage systems which would pass more than two hundred (200) cubic feet per second (cfs) for the ten (10) year storm shall be capable of accommodating a one hundred (100) year storm

E. Permanent stormwater controls and drainage systems shall be sized to prevent flooding of any new structures for the one hundred (100) year storm and have no additional adverse impact on existing structures.

All stormwater system design calculations shall include the design flow and the full capacity of the stormwater facility.

4.2.3 Manning's Coefficients

Values for Manning's roughness coefficient for Reinforced Concrete Pipe (RCP), Polypropylene Pipe (PP), High Density Polyethylene Pipe (HDPE), and Corrugated Metal Pipe (CMP) are given below:

A.	RCP	n = 0.013	(precast or cast-in-place)
B.	PP	n = 0.012	
C.	HDPE	n = 0.012	
D.	CMP	n = 0.024	(non-spiral flow, annular)

Manning's roughness coefficient for grass lined ditches shall follow the methodology in The Federal Highway Administration (FHWA) HEC-15. Generally, a Manning's coefficient of 0.03 may be used for ditches with flow capacities less than one hundred (100) cubic feet per second. Generally, a Manning's coefficient of 0.06 may be used for grass-lined swales with flow depths less than 0.7 feet and velocities less than five (5) feet per second.

4.2.4 Hydraulic Gradient

The hydraulic gradient and slopes for storm sewers should conform to the following criteria:

A. The maximum hydraulic gradient shall not produce a velocity that exceeds twenty (20) feet per second, ten (10) feet per second or less is desirable. Velocities in excess of ten (10) feet per second may require specialized anchoring systems and designs.

B. The minimum desirable slope of storm sewers should be that which will produce a velocity of two and one half (2.5) feet per second when the storm sewer is flowing full.

C. Storm sewer systems should be designed for non-pressure, gravity flow conditions.

D. The elevation of the hydraulic gradient for design conditions should be at least one half (0.5) foot below ground elevation.

4.2.5 Stormwater Management Plan

The design engineer shall submit a Stormwater Management Plan (SWMP) with the site construction plans. The SWMP shall include sufficient information to allow the City to evaluate the environmental characteristics of the project site, the potential impacts of all proposed development of the site, both present and future, on the water resources, and the effectiveness and acceptability of the stormwater control measures (SCMs). To accomplish this goal the SWMP shall include, at a minimum, the following:

A. Topographic base map: Topographic base map of the site which extends a minimum of 100 feet beyond the limits of the proposed development. Extents beyond the subject property may utilize LIDAR or other remote methods of survey. Topographical base map shall include:

    a. Existing surface water drainage including streams, ponds, culverts, ditches, sink holes, wetlands; and the type, size, elevation, etc., of nearest upstream and downstream drainage structures;

    b. Current land use including all existing structures, locations of utilities, roads, and easements;

    c. All other existing significant natural and artificial features.

B. Proposed land use with tabulation of the percentage of surface area to be adapted to various uses; drainage patterns; locations of utilities, roads and easements; the limits of clearing and grading.

C. Proposed SCMs;

D. A written description of the site plan and justification of proposed changes in natural conditions may also be required;

E. Calculations: Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storm(s). These calculations must show that the proposed SCMs are capable of controlling runoff from the site in compliance with this chapter and the Stormwater Ordinance. Such calculations shall include:

    a. A description of the design storms including: frequency, duration, and intensity where applicable;

    b. Time of concentration;

    c. Soil curve numbers or runoff coefficients;

    d. Peak runoff rates and total runoff volumes for each watershed area;

    e. Infiltration rates, where applicable;

    f. Culvert, stormwater sewer, ditch and/or other stormwater conveyance capacities;

    g. Flow velocities and/or rigid and flexible lining calculations for open channel design;

h. Comparison table for all watersheds and/or outfalls of pre and post-development rates of runoff.

i. Water Quality Treatment Volume (WQTV) calculations and figures.

j. Post-construction water quality SCM capacity sizing

k. Documentation of sources for all computation methods and field test results.

l. Soils information: If SCMs depend on the hydrologic properties of soils (e.g., infiltration basins), then a soils report shall be submitted. The soils report shall be based on on-site boring logs or soil pit profiles and soil survey reports. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the control measure.

4.3 Peak Runoff Control

Peak runoff control shall be required for all development required to obtain a Land Disturbance Permit.

4.3.1 Hydraulics and Hydrology

A. Peak runoff control shall be designed to address the rate at which flow is released over the entire runoff discharge period and the volume of discharge over the Critical Design-Storm Period. This shall be applied for 2, 5, 10, 25, 50, and 100 year 24-hour storms.

B. The post-development peak discharge rate shall not to exceed the pre-development peak discharge rate.

C. Other methods for evaluating and controlling peak runoff may be considered on a case-by-case basis.

4.3.2 Partial Development of a Parcel

On parcels greater than ten (10) acres, the entire parcel and the area within the limits of construction shall be analyzed for peak runoff control. The peak runoff control shall be sized to attenuate the more strenuous condition.

4.3.3 Redevelopment

If redevelopment alters greater than fifty (50) percent of the pre-development impervious surface area and the post-development impervious surface area is greater than 2 acres. Peak runoff control shall evaluate pre-development site conditions as having a maximum curve number of seventy (70).

4.3.4 Outfalls

Each individual outfall discharge directed off-site of the development shall be designed to control the peak rate of runoff in accordance with this section.

4.3.5 Existing Flooding Problems

When existing flooding problems are present, the City Engineer has authority to condition the approval of a permit upon the compliance with additional requirements, including but not limited to detention, conveyance facilities, or other stormwater management solutions required to reduce the adverse impact of the proposed development on other properties or on the subject development.

4.3.6 Waivers

Peak Runoff Control may be waived, with the approval of the City Engineer, if the development's stormwater discharges directly into a main stream.

4.3.7 Location of Facilities

Peak Runoff Control devices shall be located in common or open space lots in residential developments requiring plats. All other development shall be required to locate devices in an exclusive Public Utility and Drainage Easement (PUDE).

4.4 Water Quality

Post Construction Stormwater Quality shall be required for all development requiring a Land Disturbance Permit or development resulting in ten-thousand (10,000) square feet or more of additional impervious surface area. See Stormwater Ordinance for more detail.

4.5 Drainage Inlets

A. Drainage inlets shall be designed to minimize the spread of stormwater into the travel lanes by no more than half of a lane width. Bike lanes, shoulders, etc. May be fully utilized for spread.

B. Inlets or manholes shall be located a minimum of every three hundred (300) feet of storm pipe.

C. Inlets shall be located a minimum of every three hundred (300) feet of roadway for each side of the roadway, unless specific hydraulic analysis of spread is provided.

D. Inlets shall be located a minimum of every one hundred fifty (150) feet of alley.

E. Inlets shall be located at intersections to prevent drainage and spread from across travel lanes.

4.6 Subdivision and Lot Drainage

Subdivision and residential lot drainage shall be designed to minimize lot to lot drainage. Lot line swales shall be provided to direct and accommodate each lots drainage towards drainage infrastructure.

Surface drainage channels within a subdivision providing drainage for the following shall be located on a common or open space lot a minimum of ten (10) feet in width within a public drainage easement or public right-of-way.

1. Eight (8) or more lots, either in whole or a portion of;

2. Public infrastructure; or

3. A contributing drainage area of two (2.0) or more acres.

4.7 Detention/Retention Basins

A. A box or riser weir structure with a pipe culvert shall be used to attenuate basin outflows. Alternative primary structures may be evaluated on a case-by-case basis by the City Engineer.

B. Removable trash-rack or grates shall be installed on top of the box or riser weir.

C. "V" notch or other open multi-stage weirs are preferred as the primary flow regulation device.

D. The basin outlet culvert shall be a minimum of eighteen (18) inches in diameter. The basin outlet culvert shall not be the primary flow controlling device prior to the 50-year storm.

E. Slopes shall be no steeper than three-to-one (3H:1V).

F. A minimum freeboard of one (1.0) foot must be provided, from the water surface elevation for the 100-year storm, to the lowest point of the embankment, excluding the emergency spillway.

G. The emergency spillway must be capable of passing the entire 100-year storm without overtopping the embankment, in the event of the primary outlet structure clogging. The emergency spillway shall be located such that discharges do not come in contact with the outlet control structure and culvert.

H. The emergency spillway shall be located such that storm water will be directed to minimize risk to downstream structures and drainage facilities.

I. When adjacent to or in the vicinity of a stream, wetland, pond, or other aquatic resource, the invert elevation of the outlet control structure shall be no lower than one (1.0) foot above the top of bank.

J. In areas with a 100-year base flood elevation established, the invert elevation of the outlet control structure shall be no lower than the base flood elevation.

K. The minimum slope within the bottom of a detention pond shall be one (1.0) percent towards the outlet structure.

L. Pipes and channels discharging into a detention pond shall be located at or near the bottom of the detention pond.

4.8 Materials

A. Pipe materials and specifications shall adhere to the following standard specifications:
   1. Reinforced Concrete Pipe (RCP): Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe ASTM C76 – 20.

   2. Polypropylene Pipe (PP): Standard Specification for 12 to 60 in. [300 to 1500 mm]

Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications ASTM F2881 / F2881M – 21.

3. High Density Polyethylene Pipe (HDPE): Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications ASTM F2648 / F2648M – 20.

4. Corrugated Metal Pipe (CMP): Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains ASTM A760 / A760M - 15(2020).

B. All pipes must be bedded in a manufacturer approved bedding material.

C. All pipe joints and manhole joints must be sealed using a manufacturer approved method and material.

D. All backfill materials must be a manufacturer approved material and meet minimum cover requirements

E. All stormwater pipes must be installed correctly with adequate pipe bedding, backfill, and stormwater joint techniques in accordance with manufacturer specifications and appropriate ASTM standards or adopted standards herein.

F. Material for pipes used for conveyance of stormwater within the city shall be in accordance with the following:

1. Cross drains, and any other pipe under the pavement surfaces of streets shall be RCP or PP pipe.

2. Private stormwater facilities and those located outside of pavement surfaces of streets may be RCP, PP, and HDPE pipe.

3. RCP shall be required where a significant portion of the traffic is heavily loaded vehicles, on roadways with high traffic, or where the failure of the pipe would result in significant damage or loss of property.

4. Material for driveway culverts may be RCP, PP, HDPE, or CMP. RCP is required underneath any driveways or entrances that are heavily traveled or which would have the potential to flood areas within the public right-of-way or any structure

5. All detention pond outlet pipe culverts and pipes that drain through the berm of a detention pond shall be Reinforced Concrete Pipe (RCP).

4.9 Aquatic Buffers

4.7.1 Applicability and Authority

All Development and redevelopment projects are required to preserve aquatic buffers along the regulatory waterways and aquatic resources within the City of Columbia. Aquatic buffers are considered a Stormwater Control Measure (SCM) and are subject to the provisions of the Stormwater Ordinance.

4.7.2 Plan Requirements

The City Engineer may require the developer or applicant to perform a hydrologic determination to evaluate the regulatory authority of a suspected channel/watercourse.

All development plans and site construction plans shall:

A. Identify and label aquatic buffers;

B. Show top of bank location and elevations; and

C. Show buffer width.

4.7.3 Width Required

A. Aquatic buffers shall have widths as shown in **Table 6**, unless site-specific conditions necessitate alternative widths. The criteria for the width of the buffer zone can be established on an average width basis, as long as the minimum width of the buffer zone is more than the required minimum width at any measured location. Buffer average may be applied to both sides of a stream, but must be applied independently. Buffer averaging may not account for any portion of buffer greater than four (4) times the minimum buffer width.

B. Aquatic buffer widths shall be measured from the top of bank, or by a location as determined by the City Engineer, when the top of bank cannot be determined.

Table 6: Aquatic Buffer Widths

	Average Buffer Width (ft.)	Minimum Buffer Width (ft.)
Supporting*	30	15
Exceptional and Impaired **	60	30

** Waters with available parameters for siltation or habitat alteration, or unassessed waters.*

*** Waters with unavailable parameters for siltation or habitation alteration.*

4.7.4 Design and General Performance Standards

A. Stormwater discharges should enter the aquatic buffer as sheet flow, not as concentrated flow, where site conditions allow.

B. The predominant vegetation within the average buffer width area should be forested with native species. Where aquatic buffers are required to be sixty (60) feet, the minimum buffer width shall be predominantly forested with native species and the remaining buffer may be herbaceous ground cover.

C. Pedestrian, bicycle, and multi-modal paths may be permitted within the aquatic buffer when located outside the minimum buffer width. If constructed of impervious materials, the buffer width shall be increased by the width of the trail or runoff shall be directed to infiltration-based SCM's.

D. Aquatic buffers located within a subdivision shall be located on a common or open space lot within a PDE, PUDE, or PUDAE, or within a city right-of-way.

E. Aquatic buffers shall have reasonable access by City personnel through a PDE, PUDE, PUDAE, or City right-of-way. The number, location, and size of such accesses shall be determined by the City Engineer.

F. Road crossings and private accesses shall minimize impact upon the aquatic buffer. Crossings should be limited to one every one thousand (1,000) feet of stream length where possible. The angle of the crossing shall be perpendicular to the angle of the stream to minimize clearing and impacts upon the aquatic buffer.

G. Utilities, flood control structures, stormwater conveyances, and infrastructure shall minimize impact upon the aquatic buffer. Where possible, these facilities shall be located outside of the buffer.

4.7.5 Restoration Required

For developments receiving a Land Disturbance Permit and where existing vegetation is insufficient or the aquatic buffer areas are impacted by previous development and cannot reasonably be restored to a natural state without intervention, the buffers shall be actively restored in a manner consistent with best management practices and the Tennessee Urban Buffer Handbook provided by the Tennessee Department of Agriculture and the U.S. Forest Service.

4.7.6 Activities Permitted

A. Stream restoration projects, facilities, and activities approved by the City of Columbia Department of Development Services are permitted within the aquatic buffer.

B. Water quality monitoring and stream gauging are permitted within the aquatic buffer, as approved by the Development Services Department.

C. Individual trees within the aquatic buffer that are in danger of falling, causing damage to dwellings or other structures, or causing blockage of the stream may be removed. Non-native species may be selectively removed.

D. Other timber cutting techniques approved by the City of Columbia Department of Development Services may be undertaken within the aquatic buffer under the advice and guidance of Tennessee Department of Agriculture, Division of Forestry. The City of Columbia Development Services Department shall also be notified if timber cutting is to occur within the aquatic buffer

4.7.5 Maintenance

A. All aquatic buffer areas shall be maintained through a declaration of protective covenant, which is required to be submitted for approval by the City of Columbia Department of Development Services. The covenant shall be recorded in the land records and shall run with the land and continue in perpetuity.

B. All lease agreements must contain a notation regarding the presence and location of protective covenants for aquatic buffer areas and shall contain information on the management and maintenance requirements for the new property owner.

C. An offer of dedication of an aquatic buffer area to the City of Columbia shall not be interpreted to mean that this automatically conveys to the general public the right of access to this area.

D. Aquatic buffer areas may be allowed to grow into their vegetative target state naturally, but methods to enhance the successional process such as active reforestation may be used when deemed necessary by the Tennessee Department of Agriculture, Division of Forestry or the City of Columbia Department of Development Services to ensure the preservation and propagation of the buffer area. Aquatic buffer areas may also be enhanced through reforestation or other growth techniques as a form of mitigation for achieving buffer preservation requirements.

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Chapter 5: Grading and Site Development Standards

5.1 General Grading Standards

A. The City Engineer has the authority to adopt site grading standards.

B. Construction shall not aggravate upstream or downstream flooding. Existing downstream or upstream problems may be required to be corrected in conjunction with development or redevelopment.

C. All property lines and corners shall be clearly delineated in the field prior to commencement of any grading and construction.

D. During rough grading operations and prior to construction of permanent drainage structures, temporary drainage control should be provided to prevent ponding water and damage to adjacent properties.

E. No fill shall be placed on existing ground until the ground has been cleared of weeds, debris, topsoil, and other deleterious material.

F. Trash, debris, and waste shall be handled, disposed, and stored in a manner consistent with best practices and the TN ESPC Handbook.

G. The maximum slope of all cut and fill slopes shall not exceed three-to-one (3H:1V). The City Engineer may require geotechnical evaluation of the stability and suitability of any natural slopes exceeding three-to-one (3H:1V).

H. No obstruction of existing drainage courses shall be permitted.

I. Unless approved by the City Engineer, all fill areas shall be raised in lifts no more than eight (8) inches in thickness. The relative compaction of each layer shall be not less than ninety-five (95) percent of the standard proctor maximum dry density (ASTM D-698) in all areas of fill within open areas, and ninety-eight (98) percent for areas under roads, sidewalks, buildings, and structures.

J. Final grades shall provide proper drainage away from structures and prevent standing water, where possible.

K. Constructed slopes with an average grade of four-to-one (4H:1V) or steeper and an overall height of 20 feet or greater shall have a geotechnical design and certification.

L. Constructed fill slopes with an average grade of four-to-one (4H:1V) or steeper and an overall height of five (5) feet and up to ten (10) feet shall be set back from adjoining property line(s) a minimum of five (5) feet.

M. Constructed fill slopes with an average grade of four-to-one (4H:1V) or steeper and an overall height of ten (10) feet or greater shall be set back from adjoining property line(s) half of the height of the of the fill slope.

5.2 Mitigation of Flood Risk

A. Primary and accessory structures adjacent to or in the immediate vicinity of a river, stream, waterbody, aquatic buffer, or large drainage channel that do not have a base flood elevation

established shall have the lowest adjacent grade to the structure elevated a minimum of two (2.0) feet above the nearest top of bank.

B. Primary and accessory structures adjacent to or in the immediate vicinity of a river, stream, waterbody, aquatic buffer, or large drainage channel do have a 100-year base flood elevation established shall have the lowest adjacent grade to the structure elevated to the base flood elevation. The CMPC may grant exceptions to this requirement if no other practicable or feasible alternatives exist. All requests for waiver shall be submitted by an engineer clearly define the hardship with full compliance of this regulation, the proposed alternative, and demonstration of the minimization and mitigation of flood risk to the maximum extent practicable.

C. Primary and accessory structures adjacent to a sinkhole or depression shall have the lowest adjacent grade to the structure elevated a minimum of one (1.0) foot above the emergency bypass or reasonable filled elevation of the sinkhole or depression.

D. The City Engineer may require a flood study to be performed in areas with known flood hazard or indicative of hazardous terrain.

E. No net fill shall be permitted within a FEMA Special Flood Hazard Area or areas where flood studies have established a 100-year base flood elevation and corresponding floodplain. Compensatory cut areas, if provided, shall be located on-site. Fill material, or construction materials that elevate the grade only within the immediate building footprint shall not be considered in net fill calculations for compensatory flood storage. Standard procedures for evaluating and modeling FEMA Special Flood Hazard areas shall be followed for all alterations within the Special Flood Hazard Areas.

5.3 Grading Plans

Grading plans shall show with reasonable certainty the final and finish grades of all portions of the development site and building lot(s). Any deviations from these plans shall require approval by the City Engineer or designee.

A. Spot elevations may be required to provide a full and complete review.

B. Proposed grading contours shall be fully constructible as shown on the plans.

C. Where certain features may be less than the contour resolution of the plans, the plans shall indicate with clear intent the design and function goal.

D. Drainage infrastructure, detention/retention facilities, and preliminary lot grading shall be complete prior to any Final Plat being approved.

E. Deviations of grade greater than one (1.0) foot including the padding of lots from the approved construction plans is prohibited.

5.4 Sinkholes and Depressions

A. The City Engineer may require a geotechnical evaluation of all sinkholes and depressions prior to the approval of a development plan or construction plans.

B. The City Engineer shall have the authority to delineate the extents of sinkholes. Generally, the extents of a sinkhole is the highest closed contour.

C. Where feasible and practicable, sinkholes should remain in an undisturbed condition.

D. Sinkholes in subdivisions shall be located on common or open space lots.

E. Infrastructure, roadways, and structures shall not be located within the extents of a sinkhole, regardless of closure.

F. Any sinkholes functioning as part of the stormwater management system shall have reasonable access by City personnel with the access and the open space lot being contained within a public drainage easement.

G. Any sinkholes functioning as part of the stormwater management system shall have a constructed bypass system, such that if the sinkhole fails or ceases accepting stormwater runoff the excess may be diverted in a controlled manner.

5.5 Stabilization

Any area of land from which the natural vegetative cover has been either partially or wholly cleared by development activities shall be stabilized. Stabilization measures shall be initiated as soon as possible where construction activities have temporarily or permanently ceased. Temporary or permanent soil stabilization shall be installed where construction activity on a portion of the site is temporarily or permanently ceased within fourteen (14) days or less if other regulations or requirements require.

Permanent stabilization with perennial vegetation (using native herbaceous and woody plants where practicable) or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable. Unpacked gravel containing fines (silt and clay sized particles) or crusher runs will not be considered a non-eroding surface.

The following criteria shall apply to revegetation efforts:

A. Reseeding must be done with an annual or perennial cover crop accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion.

B. Revegetation with native woody and herbaceous vegetation must be accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion until the plantings are established and are capable of controlling erosion.

C. Any area of revegetation must exhibit survival of a minimum of seventy-five percent (75%) of the cover crop throughout the year immediately following revegetation. Revegetation must be repeated in successive years until the minimum seventy-five percent (75%) survival for one (1) year is achieved.

D. In addition to the above requirements, a landscaping plan must be submitted with the final design describing the vegetative stabilization and management techniques to be used at a site after construction is completed. This plan will explain not only how the site will be stabilized after construction, but who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved.

No Certificate of Occupancy, acceptance, or otherwise approval of completion shall be issued until final grading has been completed and the soil has been stabilized in accordance with this section and the approved construction plans.

Adequate topsoil shall be retained or reserved for residential developments, and shall be redistributed so as to provide a minimum of six (6) inches of cover on vegetated portions of the lots and between any sidewalks and curbs. All disturbed areas shall be stabilized with permanent vegetation.

5.6 Debris and Waste

No timber, debris, earth, rocks, soil, junk, rubbish, or other waste materials of any kind shall be buried in any land or left or deposited on any lot or street at the time of the issuance of a Certificate of Occupancy for any lot. Nor shall any such waste be left nor deposited in any area of the subdivision at the time of expiration of the performance surety and/or at the time of dedication of public improvements.

5.7 Fencing

Fences or pedestrian guards shall be required wherever the Development Services Department determines that a hazardous condition exists. Such fences shall be constructed according to standards established by the Engineering Department, as appropriate, and shall be noted on the construction plans as to height, specifications, and materials. No Certificate of Occupancy shall be issued for any affected lot until such fence improvements have been installed.

5.8 Construction Access

Construction accesses shall be located to provide the minimum possible impact to adjoining properties and to provide adequate safety. The City Engineer shall have final approval of the location and number of such access points. Where construction traffic may negatively impact existing roadways or infrastructure, the City Engineer may designate a route for all heavy construction equipment.

5.9 Suitability of the Land

Land, which the City Engineer finds to be unsuitable for subdivision or development due to flood risk as indicated by FEMA maps or engineering judgement, improper drainage, steep slopes as shown on topographical maps, rock formations, unsuitable soils, sinkholes, other adverse earth formations or topography, utility easements, or other features which may be harmful to the safety, health, and general welfare of inhabitants of the land and surrounding areas shall not be subdivided or developed unless adequate and protective methods to solve the problems created by the unsuitable land conditions are formulated by the developer and approved by the Planning Commission, upon recommendation of the City Engineer, to solve the problems created by the unsuitable land conditions. Such land shall be set aside for uses as shall not involve any danger to public health, safety, and welfare.

5.10 Critical Lots and Areas

A lot or area within shall be designated as critical if one or more of the following conditions are present:

A. Natural slopes exceeding three-to-one (3H:1V).

B. Adjacent to a sinkhole.

C. Adjacent to a 1% annual flood risk FEMA special flood hazard zone.

D. Slopes that exceed eight (8) feet in height with an average grade of four-to-one (4H:1V) or greater.

E. Retaining walls over six (6) feet in height.

F. Site specific conditions that may make development or construction difficult.

The City Engineer may require a Critical Lot Plan and supplementary information for each lot or area prior to development or construction. The Critical Lot Plan shall include at a minimum:

A. Existing and proposed grades at one (1) foot intervals;

B. Finished floor elevations;

C. Mechanical system locations and elevations;

D. EPSC measures; and

E. Any other information requested or required by the City Engineer to make a judgement on the suitability, constructability, and safety.

5.11 Parking

A. Parking shall conform to the Zoning Ordinance.

B. Parking aisles shall have minimum curb radii of fifteen (15) feet where intersecting other parking aisles.

C. Parking aisles that terminate shall stub five (5) feet beyond the last parking stall to facilitate backing movements for parked vehicles. This area shall be hatched with pavement markings.

D. Parking stalls adjacent to a curbed island shall be a minimum of one (1) foot wider than the standard stall width to allow safe exit from the vehicle.

E. Drainage grates shall be not located within a logically travelled pedestrian pathway, where possible.

F. Parking aisles that function as fire access lanes shall loop upon themselves, where possible.

G. The use of turnarounds should be avoided, where possible. Where turnarounds are provided or required, they shall meet the requirements of the Columbia Fire Marshal.

5.12 Sanitary Sewerage System

The construction standards and specifications for the sanitary sewerage system shall be in accordance with standards set forth by the City of Columbia Wastewater Department, the Tennessee Department of Environment and Conservation (TDEC).

5.12.1 Mandatory Connection to Public Sewer System

When public sanitary sewers are accessible to a development, as determined by the Columbia Wastewater Director, the developer shall provide such facilities to each lot therein and shall connect the facilities to the public system.

5.12.2 Individual Disposal System Requirements

If public sewer facilities are not available and individual disposal systems are proposed:

A. Lot areas shall be a minimum of one (1) acre;

B. The septic systems and other waste disposal methods must be permitted by the Tennessee State Department of Environment and Conservation (TDEC), the City of Columbia Wastewater Department, and all other relevant agencies; and

C. Subsurface disposal areas and relevant information shall be indicated on the final plat.

5.12.3 Manholes

A. Sanitary sewer manholes are preferred to be within a public right-of-way, where possible.

B. Sanitary sewer manholes located outside the roadway shall not extend above the surrounding grade by more than one (1) foot, unless approved by the Columbia Wastewater Director.

C. Sanitary sewer manholes located within a public right-of-way with a street shall be located along the centerline of the roadway, where possible. Manholes in the wheel path of travelling vehicles shall be avoided.

5.13 Gates

Guardhouses and gate structures shall be approved by the City Engineer and shall include a typical system, acceptable to the City of Columbia Fire and Rescue, for immediate emergency access to the development. At a minimum, gates shall meet the following requirements:

A. All gates shall be located a minimum of thirty (30) feet from the right-of-way and shall not open outward but shall open with the flow of traffic;

B. At least thirteen and one half (13.5) feet vertical clearance shall be provided and maintained over the full width of all means of access; and

C. The clear opening provided through gates shall be at least two (2) feet wider than the traveled way.

The Columbia Fire Marshal and the City Engineer may impose additional requirements for gated subdivisions as may be necessary to carry out the intent of these subdivision regulations. Under no circumstances shall the City or emergency service providers be responsible for the repair of any damage to the gates or structures associated with an emergency response into the subdivision.

5.14 Utility Services

All proposed primary and secondary utility service lines shall be placed underground. The City Engineer may waive this requirement upon recommendation by the power utility district or in minor subdivisions with existing overhead utilities.

5.15 Retaining Walls

A. Construction plans and supporting materials for retaining walls requiring a building permit (see Building Code) shall consist of scaled drawings with specifications and all relevant and supporting data and calculations and all other information requested by the City Engineer and Building Official to perform a full and complete review. The construction plans shall be neat and legible, such that all information contained within can be clearly and accurately ascertained.

B. Pedestrian guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, stairs, ramps, and landings that are located more than thirty (30) inches measured vertically to the floor or grade below at any point within thirty-six (36) inches horizontally to the edge of the open side.

C. Pedestrian guards shall be required on all walls exceeding six (6) feet in height or on walls that the department deems a reasonable hazard to health and human safety.

D. Retaining walls with pedestrian guards shall have a landing with maximum 10H:1V at the top of the wall extending forty-eight (48) inches perpendicular from the guard.

E. Maximum slopes adjacent to retaining walls shall be 3H:1V.

F. Retaining walls in single-family residential developments shall not exceed fifteen (15) feet in height. Walls may be terraced where walls are stepped back ten (10) feet from face of wall to face of wall where the walls are between ten (10) and fifteen (15) feet or stepped back six (6) feet where walls are less than (ten) feet in height.

G. Retaining walls not in single-family residential developments shall not exceed twenty (20) feet in height. Walls may be terraced where walls are stepped back ten (10) feet from face of wall to face of wall where the walls are between ten (10) and twenty (20) feet in height or stepped back six (6) feet where walls are less than (ten) feet in height. The City Engineer may grant exceptions to this requirement if no other practicable or feasible alternatives exist. All requests for waiver shall be submitted by an engineer clearly define the hardship with full compliance of this regulation, the proposed alternative, and demonstration of the minimization and mitigation of risk to the maximum extent practicable.

H. The maximum allowable height for retaining walls shall be reviewed and approved by the City Engineer. The City of Columbia may require walls over a certain height to be stepped or terraced.

I. The angle of repose shall be assumed to be 45 degrees or less steep, unless site specific soil testing and data is provided.

J. No geogrids or mechanically stabilized earth will be acceptable within a public right-of-way limit nor within any PUDE, unless approved by the City Engineer.

K. No retaining wall shall be constructed to support a public right-of-way or be within the angle of repose of the right-of-way, unless approved by the City Engineer. Where retaining walls are approved within the right-of-way, more stringent design standards may be required by the City Engineer.

L. Retaining walls six (6) feet or greater in height shall be a minimum of five (5) feet from the right-of-way.

M. Retaining walls six (6) feet or greater in height shall be a minimum of five (5) feet from adjacent property lines.

N. No retaining wall shall be constructed to support or be within the angle of repose of single-family structures, unless approved by the City Engineer.

O. Retaining walls or walls shall not be designed to primarily retain surface waters. Walls shall be designed in a manner to reinforce and support soils.

5.16 Pump Stations

Pump stations owned and operated by the City of Columbia shall have the following minimum requirements for site development standards. The operating entity shall have the authority to dictate greater requirements where the specific nature of the proposed pump station requires special consideration:

A. Shall be located within a common or open space lot

B. Shall be encompassed within an exclusive seventy-five (75) by seventy-five (75) foot easement. Slopes within the easement shall not exceed five (5) percent, two (2) percent is desired.

C. The exclusive easement shall be surrounded by fence consistent with the requirements of the operating entity.

D. An evergreen hedge screen shall be provided around the perimeter of the fence, consistent with the requirements of hedge screens in the Zoning Ordinance.

E. The exclusive easement shall be surrounded by a twenty-five (25) foot buffer along all sides.

F. The driveway/access to the pump station shall have the following minimum standards:

    a. A minimum of twelve (12) feet in width

    b. Constructed to the local road pavement section

    c. Encompassed in a twenty (20) foot access easement

    d. Ten (10) percent maximum grade

e. Shall intersect the fenced area perpendicularly at the location determined by the operating entity.

f. Shall be required to construct a turnaround, consistent with the standards of these standards if the driveway/access exceeds one hundred fifty (150) feet.

G. All structures and applicable equipment shall acquire a building permit prior to construction.

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Chapter 6: Definitions

AASHTO
American Association of State Highway and Transportation Officials which publishes documents including A Policy on Geometric Design (Green Book) and Roadway Design Guide.

Acceleration Lane
A speed-change lane, including tapered areas, for the purpose of enabling a vehicle entering the roadway to increase its speed to a rate at which it can more safely merge with through traffic. This also may be titled as an “accel lane."

Access
Entrance to or exit from land adjacent to a public road. May be a driveway, public street, private street, or alley.

Access Easement
A publicly owned area of land granted by adjacent landowners or reserved as part of a development plan and being part of the City right-of-way for the purpose of accessing public improvements for maintenance.

Access Management
The process of identifying, tracking, controlling, and managing authorized or specified users' access to a system.

Accessible Pedestrian Signal
A device that communicates information about pedestrian timing in non-visual format such as audible tones, verbal messages, and/or vibrating surfaces. (MUTCD)

Actuation
Initiation of a change in or extension of a traffic signal phase through the operation of any type of detector. (MUTCD)

Alley
A minor public or private way intended to be used primarily for vehicular access to the rear side of properties. Alleys shall connect between two streets or alleys and shall avoid having dead-ends.

Applicant
The owner of the property or the authorized representative of the owner who is applying for development approval.

Approach
The portion of an intersection leg which is used by traffic approaching the intersection.

Asphalt Binder
Course aggregate bound with bitumen between the foundation and the wearing course of an asphalt pavement section.

Asphalt Surface Course, Asphalt Topping
A mixture of bitumen and a range of graded aggregrates that constitute the wearing course of an asphalt pavement section.

Auxiliary Lane
The portion of the roadway turning, maneuvering of entering and leaving traffic, and other purposes supplementary to the through-traffic movement.

Avenue
A broad thoroughfare lined with planted strips and trees.

Average Annual Daily Traffic (AADT)
The total bi-directional volume of traffic passing through a given point during a given time period (in whole days), divided by the number of days in that time period, annualized.

Boulevard
A broad thoroughfare with lanes separated by a planted median.

Buffers
A protective barrier between two areas. Examples include landscaping buffers, aquatic buffers, and grass strip sidewalk buffers.

Building Site
See Zoning Ordinance.

City
The City of Columbia, TN.

City Engineer
A licensed professional engineer employed by the City or his duly authorized representative serving to direct and oversee engineering design, coordination and implementation of private and City capital improvements as well as public safety and welfare.

City Standards & Specifications
Those standards prescribed for the construction of streets, sidewalks, driveway access points, curb and gutter set out in this manual and the City Code.

Commercial Driveway Access
Any driveway access point that does not meet the definition of residential driveway access.

Connect Columbia
The comprehensive land use, transportation, and parks and recreation plan adopted by the City of Columbia.

Connective Street
A street within a development, other than a cul-de-sac street or loop street, which will allow vehicular and pedestrian circulation to adjoining developments; thereby providing for community-wide circulation.

Construction Plans
The maps or drawings showing the specific location and design of improvements to be installed in a subdivision or development.

Corner Clearance
At an intersecting street, the distance measured from the edge of pavement curb line or the intersection of right-of-way lines to the beginning of outside driveway radius.

Corner Clearance
The distance from an intersection of a public or private road to the nearest access along the highway system. This distance is measured from the closest edge of pavement of the intersecting road to the closest edge of pavement of the access measured along the traveled way (through lanes).

Critical Lot
Lots designated as critical during the concept plan review process, or final plat review process if no concept plan is required, based on soil conditions, degree of slope, flooding, or other lot features that could affect the feasibility of construction.

Crosswalk
That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the sidewalk at right angles to the centerline; or any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface. (MUTCD)

Curb Cut
An access or driveway providing ingress and/or egress to or from the highway system along a "curbed" section of highway.

Dead-End Street
A local access system street opened at one end only with special provisions for a vehicle to turn around.

Deceleration Lane
A speed-change lane, including tapered areas, for the purpose of enabling a vehicle that is making an exit turn from a roadway to slow to a safe turning speed after it has left the mainstream of faster-moving traffic. Also called a “decel lane"; it denotes a right turn lane or a left turn lane into a development.

Design Speed
Usually up to five miles per hour above the expected operating speed of the facility under design.

Design storm event
A hypothetical storm event, of a given frequency interval and duration, used in the analysis and design of a stormwater facility. The estimated design rainfall amounts, for any return period interval in terms of either 24-hour depths or intensities for any duration, can be found by accessing the following NOAA National Weather Service Atlas 14 data for the Columbia, Tennessee station ID: 40-1957.

Detectable Warning
A standardized surface feature built in or applied to walking surfaces or other elements to warn visually impaired people of hazards on a circulation path.

Developer
The person or entity responsible for the construction, maintenance, and completion of a development project.

Development Or Development Plan
See Zoning Ordinance

Development Services Department
The Department within the City of Columbia that regulates building, codes, land development, land use, zoning, and engineering.

Driveway Access Point
A point of ingress and egress, or both, which is considered a private driveway. It can be either a residential access point or a commercial driveway access point.

Easement
A grant by a landowner to another person, entity, or to the public for the right to occupy or use designated land for specific purposes such as access, drainage, conservation, the location of public improvements, or other specified purposes. An easement does not constitute fee simple ownership of the land.

Final Plat
A type of application to finalize a layout for subdividing land into two or more lots suitable for recording at the Maury County Office of Register of Deeds.

Floodplain
A land area adjoining a river, stream, watercourse, bay, or lake that is likely to be flooded.

Floodway
The channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

FEMA Special Flood Hazard Area (SFHA)
SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

Flow Line
The lowest point within a drainage conveyance.

Grade Break:
A single point at which grade changes instantaneously.

Grading Permit
See Land Disturbance Permit.

Grass Strip
A buffer between the sidewalk and curb for pedestrian safety, grading, and public infrastructure.

Impervious Surface
Areas which prevent or impede the infiltration of stormwater into the soil as it entered in natural conditions prior to development. Common impervious areas include, but are not limited to, rooftops, sidewalks, walkways, patio areas, driveways, parking lots, storage areas, compacted gravel, awnings and other fabric or plastic coverings.

Improvements
Any building, structure, landscaping, lighting, public ways, or other objects or improvement constituting a physical betterment of real property, or any part of such betterment.

International Fire Code
Regulations for fire prevention and fire protection systems that prevent hazardous conditions to life and property produced by the International Code Council and adopted by the City of Columbia.

ITE
Institute of Traffic Engineers

Land Disturbance Permit
Permit issued by the City of Columbia that allows for grading and land disturbing activities, see Stormwater Ordinance.

Level of Service
A measurement of the quality of service on transportation infrastructure. This is generally links to transportation trip time as it relates to speed.

Lot
A parcel of land occupied, by one main building or a group of main buildings, including open spaces as required by municipal regulations and ordinances.

Lot of Record
A lot or tract of land, described by deed and/or subdivision plat, filed in the Maury County Office of Register of Deeds.

Major Street
The street normally carrying the higher volume of vehicular traffic. (MUTCD)

Median
That portion of a divided roadway separating the traveled ways for traffic in opposite directions.

Minor Street
The street normally carrying the lower volume of vehicular traffic. (MUTCD)

NCHRP
National Cooperative Highway Research Program

Open Space, Common
Open space includes, but is not limited to, parks, plazas, courtyards, playing fields, trails, greenways, and golf courses.

Owner
Includes any person who is the holder of legal title as well as holders of any equitable interest, such as trust beneficiaries, contract purchasers, option holders, lessees under leases having an unexpired term of at least 10 years, and the like. Whenever a statement of ownership is required by this article, full disclosure of all legal and equitable interests in the property is required.

Pavement Markings
All lines, words or symbols, except signs officially placed within the roadway or parking area to regulate, warn or guide traffic.

PCC
Portland cement concrete

Peak-Hour Volume
Hourly traffic volume used for roadway design and capacity analysis, usually occurring during one or more peak travel hours during a 24 hour period.

Pedestrian
People who travel on foot or who use assistive devices, such as wheelchairs, for mobility.

Permissive Mode
A mode of traffic control signal operation in which, when a CIRCULAR GREEN signal indication is displayed, left or right turns may be made after yielding to pedestrians and/or oncoming traffic. (MUTCD)

Planning Commission
Appointed board of local citizens responsible for decision making related to growth and development within the City.

Preliminary Plat
A map of a proposed land subdivision showing the character and proposed layout of the tract in sufficient detail to indicate the suitability of the proposed subdivision of land.

Redevelopment:
See Zoning Ordinance.

Right-Of-Way, (ROW)
An interest in land to the City which provides for the perpetual right and privilege of the City and its agents, franchise holders, successors, and assigns to construct, install, improve, repair, maintain, and use a public street, including related and customary uses of street rights-of-way such as sidewalk, bike path, landscaping, traffic control devices and signage, sanitary sewer, stormwater drainage devices, water supply, cable television, electric power, gas, and telephone transmission and related purposes in, upon, over, below, and across the right-of-way. The City is authorized to remove, and keep removed from the rights-of-way all trees, vegetation, and other obstructions as is determined to be necessary by the City to maintain, repair, and protect facilities located in the right-of-way

Roadway
See definition of street.

Setback
See Zoning Ordinance.

Sidewalk
Any public or private pedestrian or bicycle walkway or path.

Signal Head
An assembly of one or more signal faces together with the associated signal housings. (MUTCD)

Signal Phase
The right-of-way, yellow change, and red clearance intervals in a cycle that are assigned to an independent traffic movement or combination of movements. (MUTCD)

Signal Timing
The amount of time allocated for the display of a signal indication. (MUTCD)

Signal Warrant
A threshold condition that, if found to be satisfied as part of an engineering study, shall result in analysis of other traffic conditions or factors to determine whether a traffic control signal or other Improvement is justified. (MUTCD)

State Route
An arterial highway designated and signed with a route number, which is primarily funded for construction and administered by TDOT. Improvements and maintenance of state routes is under the jurisdiction of TDOT.

Stormwater Facilities
Designed pipes, ditches, swales, filters, and ponds to convey storm runoff, remove pollutants, and control flow rates.

Stormwater Ordinance
Standards set forth about the management of stormwater runoff and protection of water resources.

Street
An existing or planned public or private right of way that is designed, dedicated, or used principally for vehicular and pedestrian circulation, which provides access for abutting properties.

Subdivision
See Subdivision Regulations

Subdivision Regulations
Documents establishing the guidelines and regulations for the subdivision of land within the City of Columbia.

TDEC
The Tennessee Department of Environment and Conservation.

TIS or TIA:
Traffic Impact Study or Analysis

Traffic Control Signal (Traffic Signal)
Any highway traffic signal by which traffic is alternately directed to stop and permitted to proceed. (MUTCD)

Traffic Sign
A device mounted on a fixed or movable support, conveying a message or symbol to regulate, warn or guide traffic.

United States Army Corps of Engineers (USACE)
Provides engineering services as a government agency as it relates to civil engineering projects.

Zoning Ordinance
Regulations that govern the land use, bulk standards, densities, and zoning districts within the City of Columbia.

Appendix A: Standard Drawings and Details

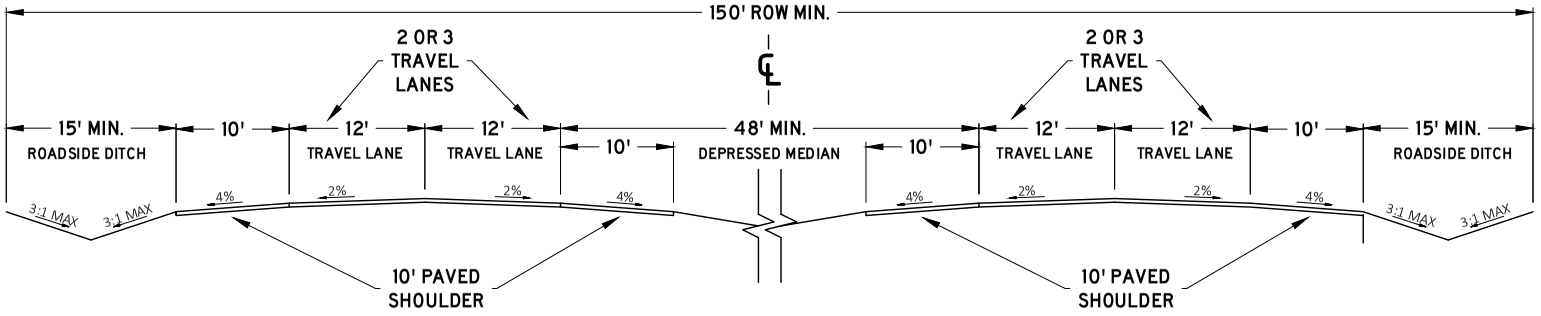
ROADWAY CLASSIFICATION STREET SECTIONS	
RD-01	MAJOR ARTERIAL ROADWAY
RD-02	MINOR ARTERIAL ROADWAY
RD-03	COLLECTOR ROADWAY
RD-04	MAJOR LOCAL / INDUSTRIAL ROADWAY
RD-05	MINOR LOCAL ROADWAY
RD-06	ALLEY
RD-07	RURAL ROADWAY (AADT < 1500)

CHARACTER DISTRICT STREET SECTIONS	
DS01	*BLANK*
DS02	RURAL NEIGHBORHOOD CURBED
DS03	*BLANK*
DS04	*BLANK*
DS05	*BLANK*
DS06	LARGE LOT NEIGHBORHOOD
DS07	*BLANK*
DS08	*BLANK*
DS09	*BLANK*
DS10	SUBURBAN NEIGHBORHOOD PARALLEL PARKING BOTH SIDES
DS11	SUBURBAN NEIGHBORHOOD PARALLEL PARKING ONE SIDE
DS12	SUBURBAN NEIGHBORHOOD NO PARALLEL PARKING
DS13	SUBURBAN BOULEVARD PARALLEL PARKING BOTH SIDES
DS14	SUBURBAN BOULEVARD NO PARALLEL PARKING
DS15	*BLANK*
DS16	*BLANK*
DS17	*BLANK*
DS18	URBAN NEIGHBORHOOD PARALLEL PARKING BOTH SIDES
DS19	URBAN NEIGHBORHOOD NO PARALLEL PARKING
DS20	URBAN CENTER PARALLEL PARKING BOTH SIDES
DS21	URBAN CENTER NO PARALLEL PARKING
DS22	URBAN BOULEVARD PARALLEL PARKING BOTH SIDES
DS23	URBAN BOULEVARD NO PARALLEL PARKING
DS24	URBAN BOULEVARD 4 LANE
DS25	URBAN AVENUE PARALLEL PARKING BOTH SIDES
DS26	URBAN AVENUE NO PARALLEL PARKING
DS27	URBAN AVENUE 4 LANE
DS28	*BLANK*
DS29	*BLANK*
DS30	*BLANK*
DS31	*BLANK*
DS32	*BLANK*
DS33	*BLANK*
DS34	INDUSTRIAL TWO LANE
DS35	*INDUSTRIAL THREE LANE*
DS36	*BLANK*
DS37	*BLANK*
DS38	*BLANK*
DS39	INTERNAL DRIVE COMMERCIAL AND MIXED-USE
DS40	INTERNAL DRIVE INDUSTRIAL

STANDARD DETAILS	
SD-01	CURB AND GUTTER AND POST CURB
SD-02	EXTRUDED MOUNTABLE CURB
SD-03	RIBBON CURB
SD-04	*BLANK*
SD-05	*BLANK*
SD-06	INSET PARALLEL PARKING ISLAND
SD-07	INTERSECTION CONFIGURATION AND GEOMETRY
SD-08	*BLANK*
SD-09	*BLANK*
SD-10	CONCRETE SIDEWALK
SD-11	SHARED USE PATH
SD-12	DRIVEWAY APRON
SD-13	*BLANK*
SD-14	*BLANK*
SD-15	CUL-DE-SAC
SD-16	TEMPORARY TURNAROUND
SD-17	*BLANK*
SD-18	*BLANK*
SD-19	STREET CONTINUATION SIGNAGE

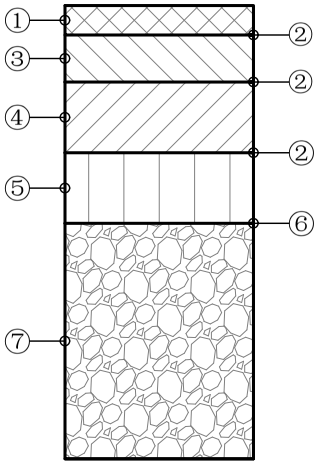
STANDARD DRAINAGE DETAILS	
DD-01	INLETS, CASTINGS, STRUCTURES, AND PIPES
DD-02	OUTLET CONTROL STRUCTURE
DD-03	TRAPEZOIDAL DITCH
DD-04	RESIDENTIAL LOT GRADING AND DRAINAGE

MISCELLANEOUS DETAILS	
MD-01	DUMPSTER PAD & ENCLOSURE
MD-02	PARKING LOT PAVEMENT SECTION
MD-03	CLUSTER BOX UNITS
MD-04	PROPERTY ADDRESSES



PAVEMENT SCHEDULE

①	BIT. SURFACE @ 1.25" THICK 411-02.10 ASPHALT CONCRETE MIX (PG70-22) (ACS) GRADING D (SURFACE)
②	TACK COAT (GENERAL USE) 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③	BIT. BINDER @ 2" THICK 307-03.08 ASPHALT CONCRETE MIX (PG76-22) (BPMB-HM) GRADING B-M2
④	BIT. BASE @ 3" THICK 307-03.01 ASPHALT CONCRETE MIX (PG76-22) (BPMB-HM) GRADING A
⑤	BIT. BASE @ 3" THICK 307-01.22 ASPHALT CONCRETE MIX (PG76-22) (BPMB-HM) GRADING A-S
⑥	PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑦	MINERAL AGGREGATE BASE @ 10" THICK 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
2. DIMENSIONS REFLECT A MINIMUM STANDARD
3. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

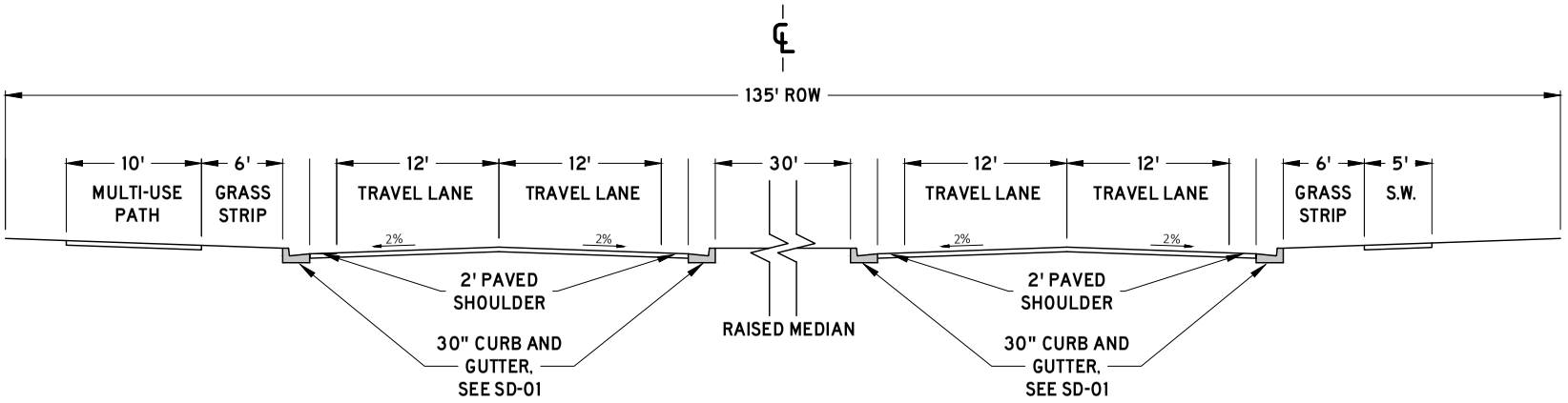
STANDARD DETAILS

MAJOR ARTERIAL ROADWAY

(NTS)

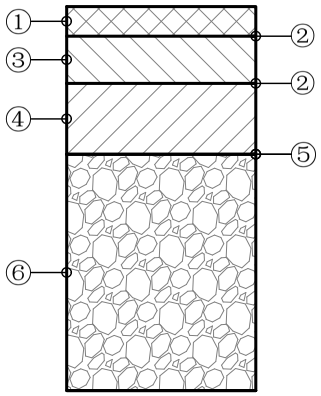
DATE
6/9/2022

RD-01



PAVEMENT SCHEDULE

①	BIT. SURFACE @ 1.25" THICK 411-02.10 ASPHALT CONCRETE MIX (PG70-22) (ACS) GRADING D (SURFACE)
②	TACK COAT (GENERAL USE) 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③	BIT. BINDER @ 2" THICK 307-03.08 ASPHALT CONCRETE MIX (PG76-22) (BPMB-HM) GRADING B-M2
④	BIT. BASE @ 3" THICK 307-03.01 ASPHALT CONCRETE MIX (PG76-22) (BPMB-HM) GRADING A
⑤	PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑥	MINERAL AGGREGATE BASE @ 10" THICK 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

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CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

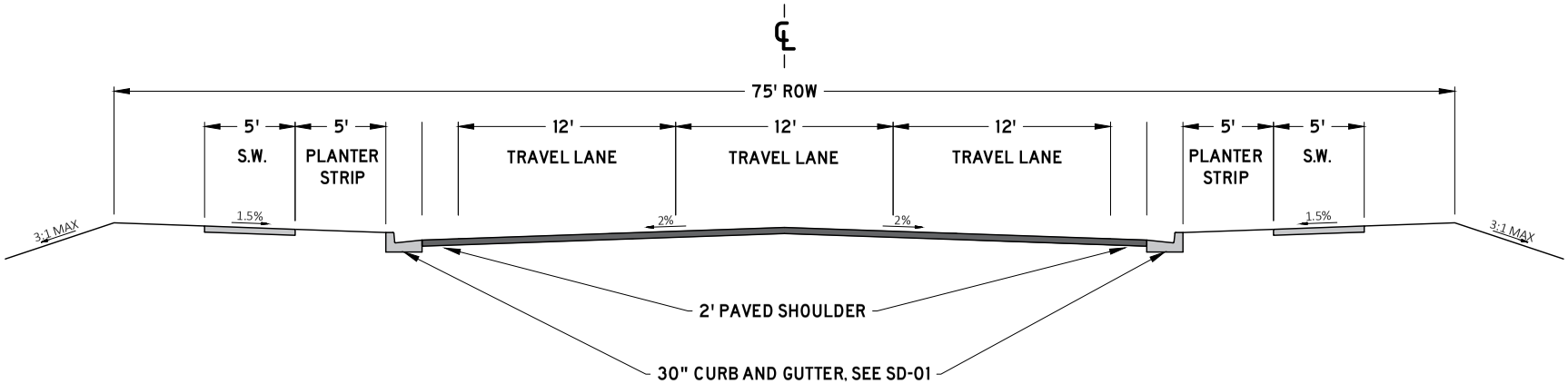
STANDARD DETAILS

MINOR ARTERIAL ROADWAY

(NTS)

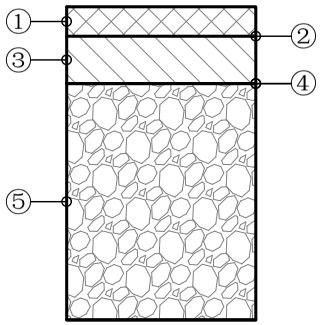
DATE
6/9/2022

RD-02



PAVEMENT SCHEDULE

①	SURFACE @ 1.5" THICK 411-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE)
②	TACK COAT (GENERAL USE) 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③	BIT. BINDER @ 3" THICK 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
④	PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑤	MINERAL AGGREGATE BASE @ 10" THICK 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
2. DIMENSIONS REFLECT A MINIMUM STANDARD
3. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

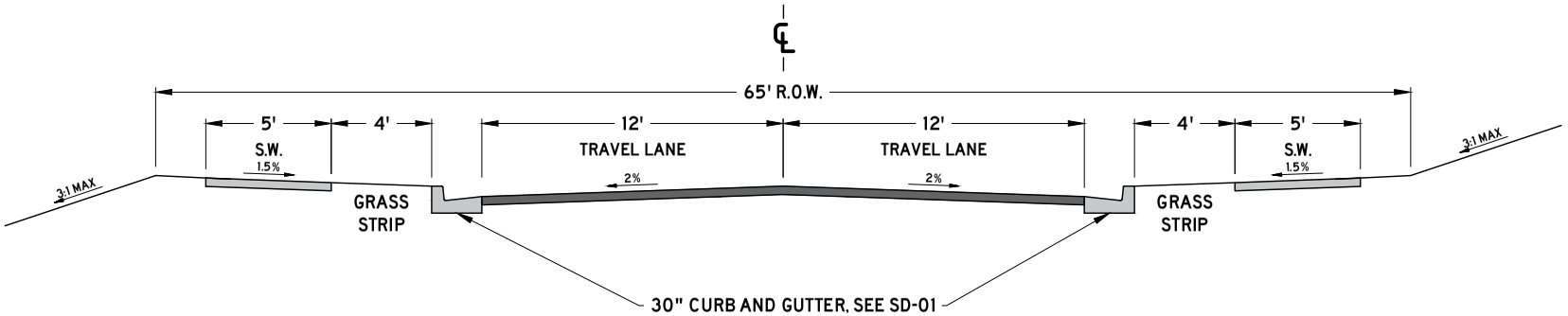
STANDARD DETAILS

COLLECTOR ROADWAY

(NTS)

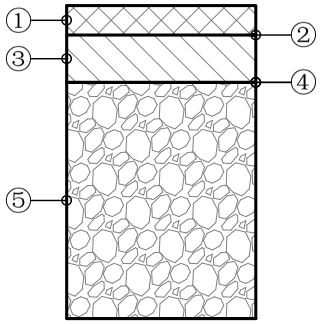
DATE
6/9/2022

RD-03



PAVEMENT SCHEDULE

①	**SURFACE @ 1.5" THICK** 411-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE), OR 307-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING C-W (SURFACE)
②	**TACK COAT (GENERAL USE)** 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③	**BIT. BINDER @ 3" THICK** 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
④	**PRIME COAT** 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑤	**MINERAL AGGREGATE BASE @ 10" THICK** 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
2. MAY INCLUDE A THIRD TRAVEL LANE 12 FEET IN WIDTH
3. DIMENSIONS REFLECT A MINIMUM STANDARD
4. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

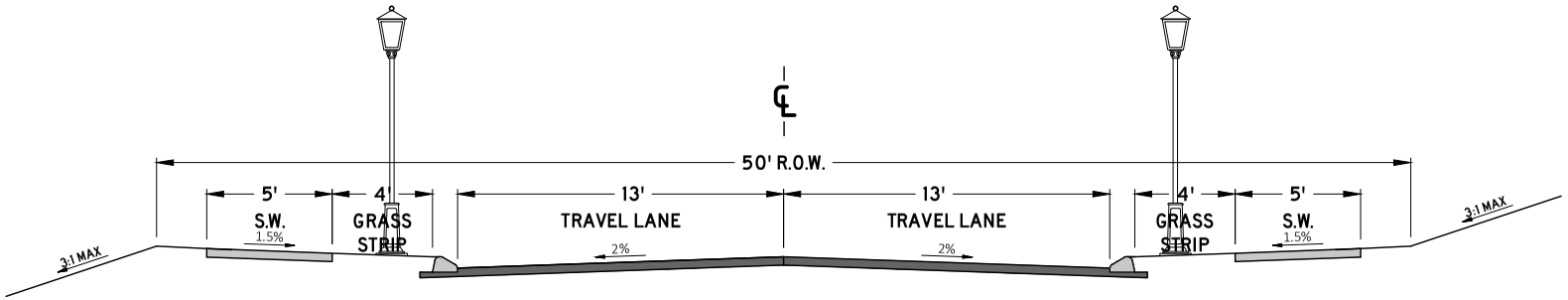
STANDARD DETAILS

MAJOR LOCAL / INDUSTRIAL ROADWAY

(NTS)

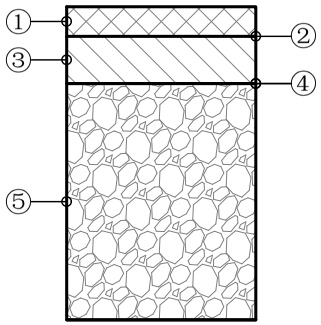
DATE
6/9/2022

RD-04



PAVEMENT SCHEDULE

①	**SURFACE @ 1.5" THICK** 411-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE), OR 307-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING C-W (SURFACE)
②	**TACK COAT (GENERAL USE)** 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③	**BIT. BINDER @ 2" THICK** 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
④	**PRIME COAT** 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑤	**MINERAL AGGREGATE BASE @ 8" THICK** 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
2. DIMENSIONS REFLECT A MINIMUM STANDARD
3. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

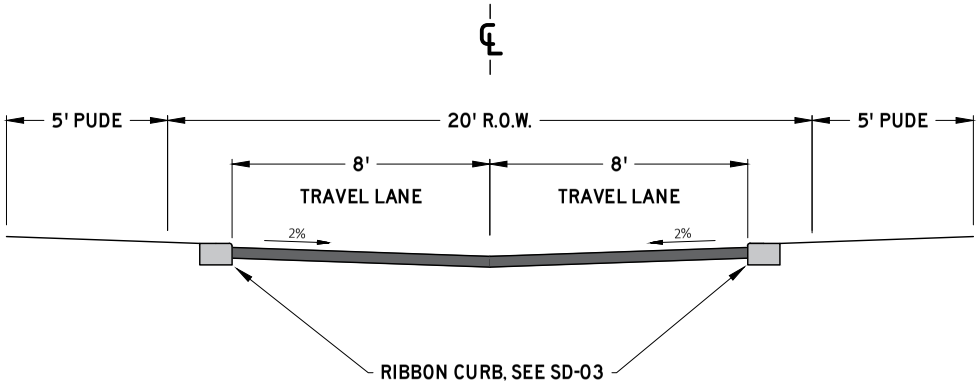
STANDARD DETAILS

MINOR LOCAL ROADWAY

(NTS)

DATE
6/9/2022

RD-05



PAVEMENT SCHEDULE

①	**SURFACE @ 1.5" THICK** 411-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE), OR 307-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING C-W (SURFACE)
②	**TACK COAT (GENERAL USE)** 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
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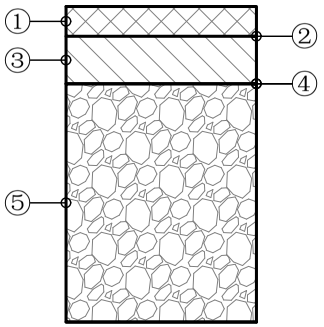
⑤	**MINERAL AGGREGATE BASE @ 8" THICK** 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
2. DIMENSIONS REFLECT A MINIMUM STANDARD
3. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

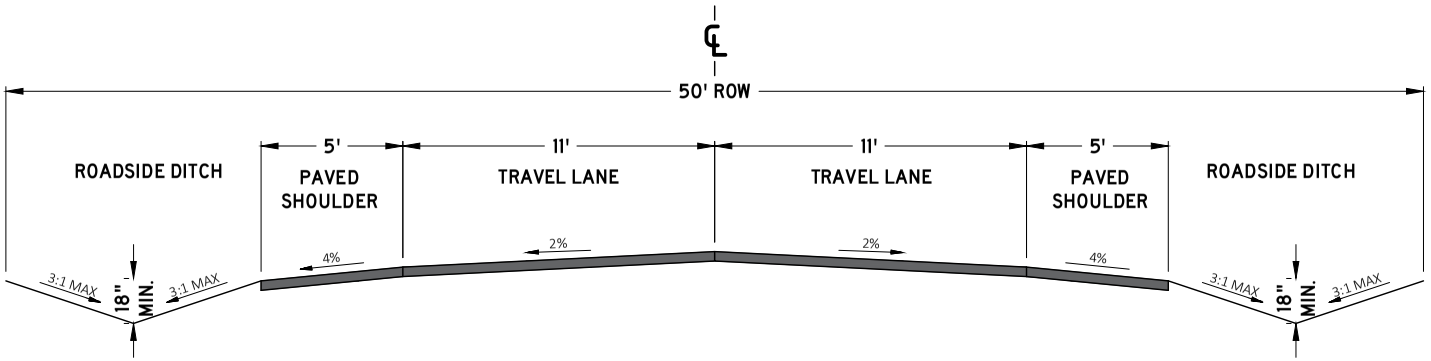
STANDARD DETAILS

ALLEY

(NTS)

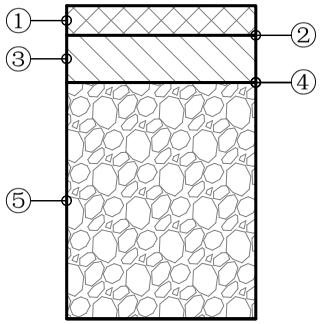
DATE
6/9/2022

RD-06



PAVEMENT SCHEDULE

①	**SURFACE @ 1.5" THICK** 411-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE), OR 307-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING C-W (SURFACE)
②	**TACK COAT (GENERAL USE)** 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③	**BIT. BINDER @ 3" THICK** 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
④	**PRIME COAT** 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑤	**MINERAL AGGREGATE BASE @ 10" THICK** 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. SUITABLE FOR RURAL ROADWAYS WITH LESS THAN 1500 AADT
2. ONLY PERMITTED WITHIN THE APPLICABLE ZONING DISTRICTS
3. ONLY PERMITTED ON MINOR LOCAL OR MAJOR LOCAL ROADWAY CLASSIFICATIONS
4. PAVEMENT SECTION SHALL FOLLOW MAJOR LOCAL ROADWAY
5. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
6. DIMENSIONS REFLECT A MINIMUM STANDARD
7. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

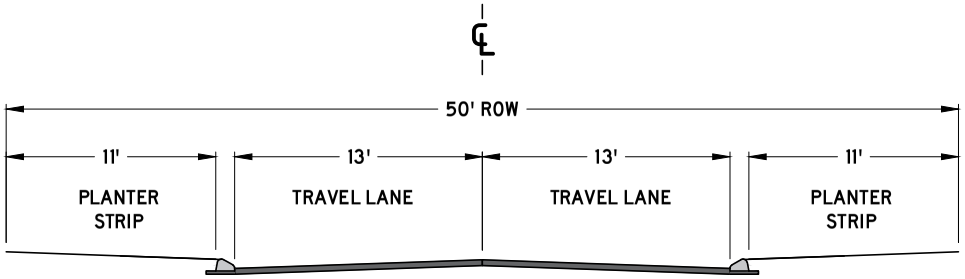
STANDARD DETAILS

RURAL ROADWAY (AADT < 1500)

(NTS)

DATE
6/9/2022

RD-07



NOTES:

1. ONLY PERMITTED WITHIN THE APPLICABLE ZONING DISTRICTS.
2. ONLY PERMITTED ON MINOR LOCAL ROADWAY CLASSIFICATIONS.
3. PAVEMENT SECTION SHALL FOLLOW MINOR LOCAL ROADWAY.
5. EXTRUDED CURB, SEE SD-02
6. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED.
7. DIMENSIONS REFLECT A MINIMUM STANDARD.
8. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER.

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

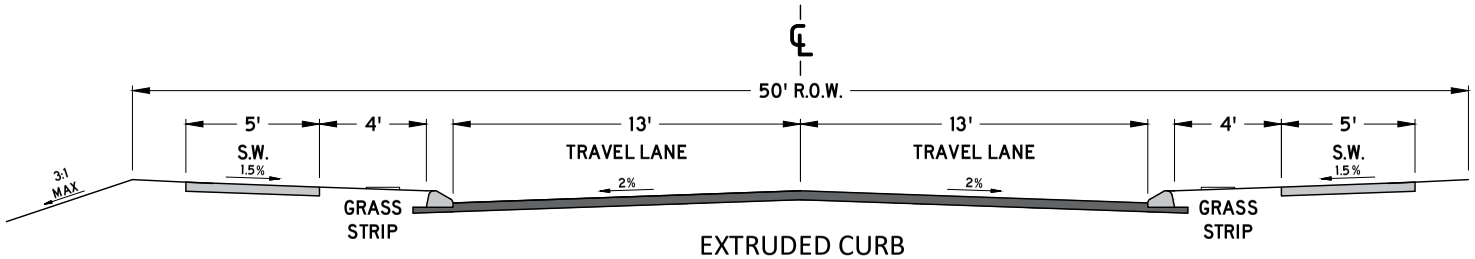
STANDARD DETAILS

CHARACTER DISTRICT STREET
RURAL NEIGHBORHOOD
CURBED

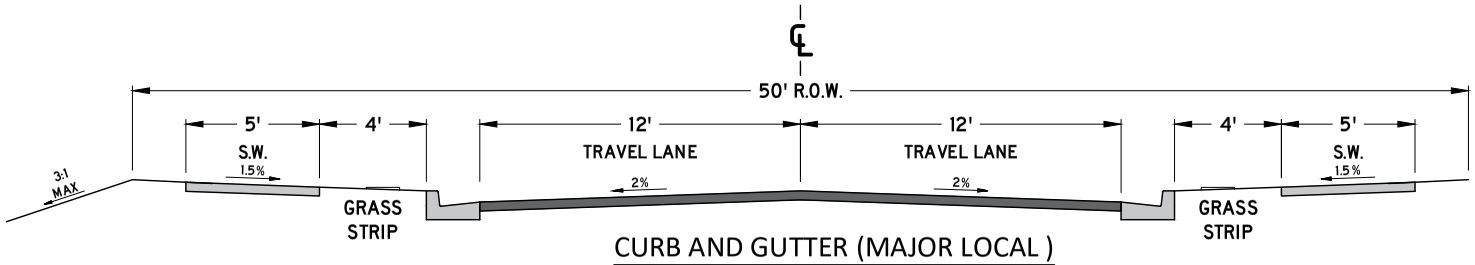
(NTS)

DATE
8/6/2024

DS-02



EXTRUDED CURB
(MINOR LOCAL)



CURB AND GUTTER (MAJOR LOCAL)

NOTES:

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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

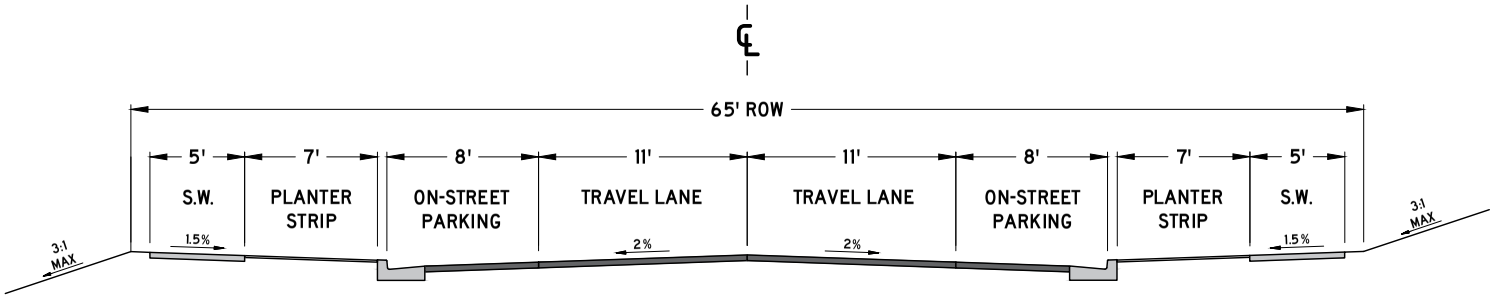
STANDARD DETAILS

CHARACTER DISTRICT STREET
LARGE LOT NEIGHBORHOOD

(NTS)

DATE
7/1/2024

DS-06



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

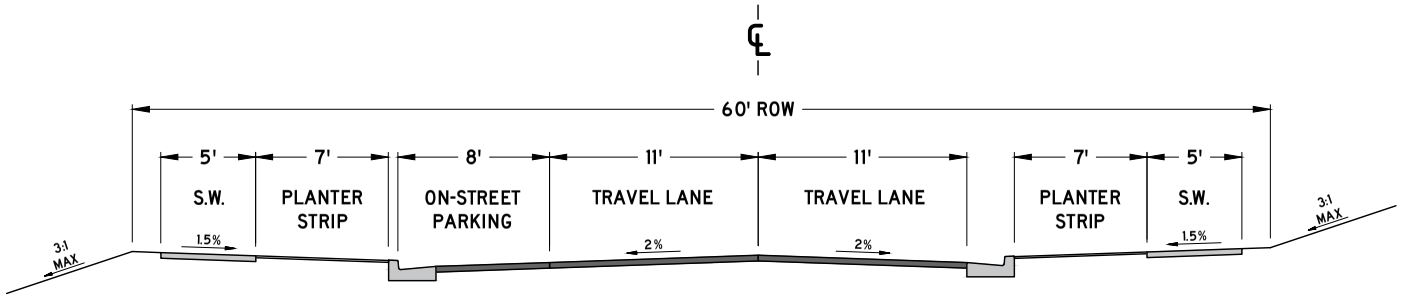
STANDARD DETAILS

CHARACTER DISTRICT STREET
SUBURBAN NEIGHBORHOOD
PARALLEL PARKING BOTH SIDES

(NTS)

DATE
7/1/2024

DS-10



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CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

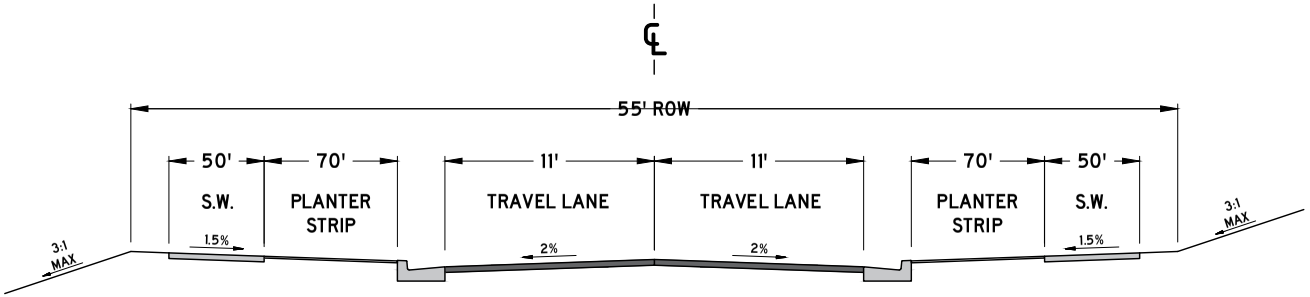
STANDARD DETAILS

CHARACTER DISTRICT STREET
SUBURBAN NEIGHBORHOOD STREET
PARALLEL PARKING ONE SIDE

(NTS)

DATE
7/1/2024

DS-11



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CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

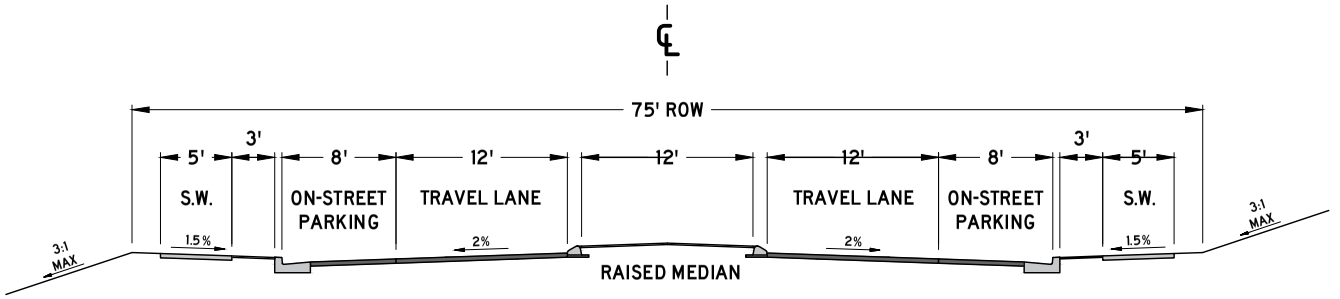
STANDARD DETAILS

CHARACTER DISTRICT STREET
SUBURBAN NEIGHBORHOOD
NO PARALLEL PARKING

(NTS)

DATE
7/1/2024

DS-12



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

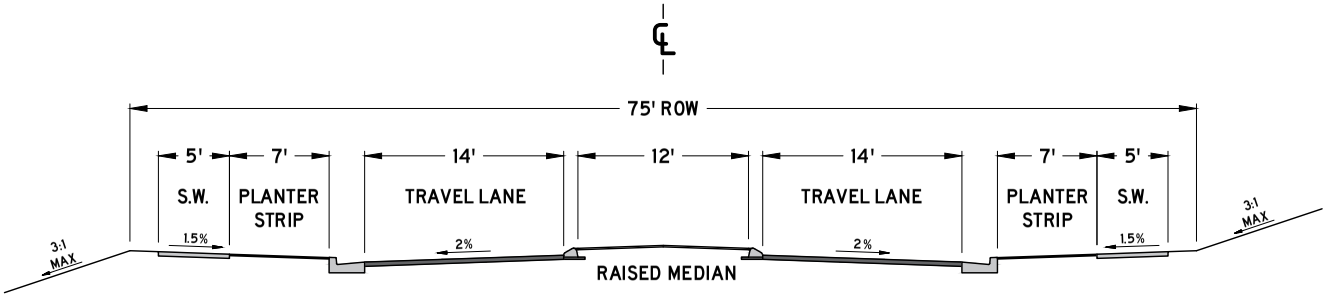
STANDARD DETAILS

CHARACTER DISTRICT STREET
SUBURBAN BOULEVARD
PARALLEL PARKING BOTH SIDES

(NTS)

DATE
7/1/2024

DS-13



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CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

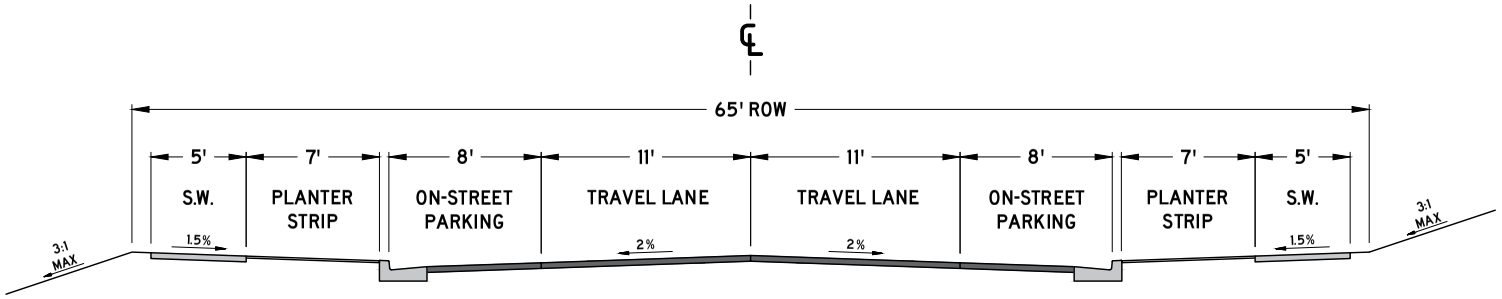
STANDARD DETAILS

CHARACTER DISTRICT STREET
SUBURBAN BOULEVARD
NO PARALLEL PARKING

(NTS)

DATE
7/1/2024

DS-14



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

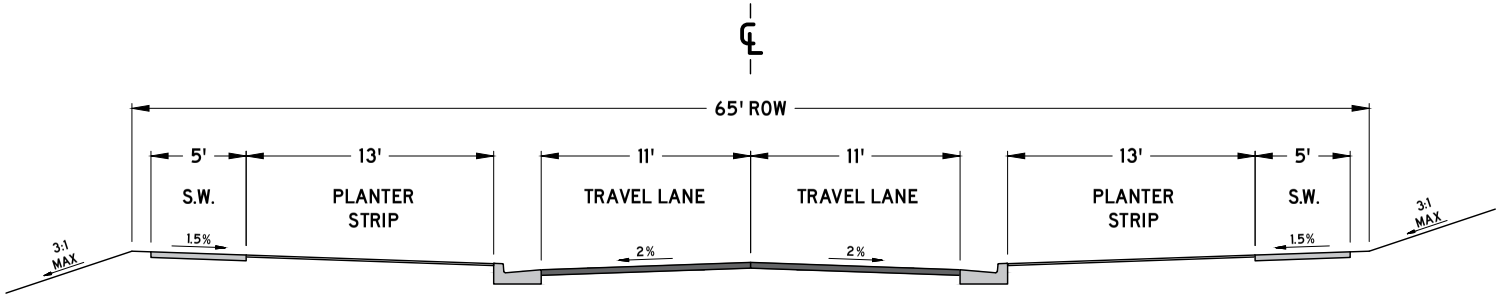
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN NEIGHBORHOOD
PARALLEL PARKING BOTH SIDES

(NTS)

DATE
7/1/2024

DS-18



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CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

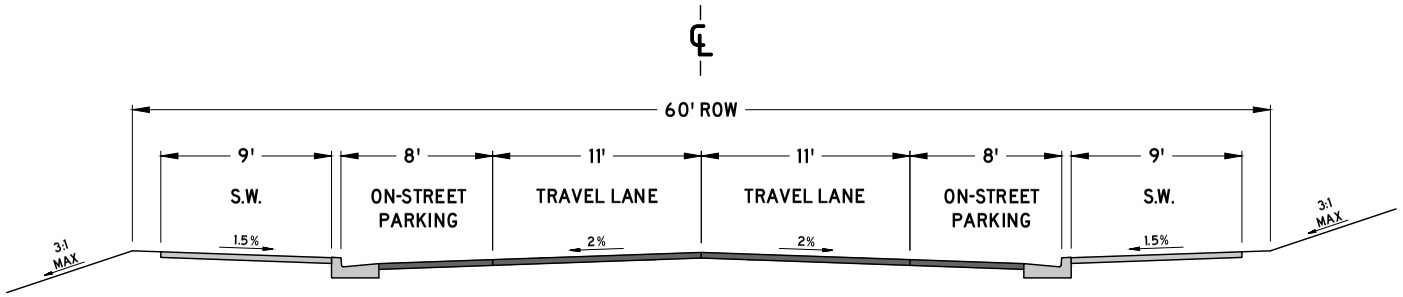
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN NEIGHBORHOOD
NO PARALLEL PARKING

(NTS)

DATE
7/1/2024

DS-19



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

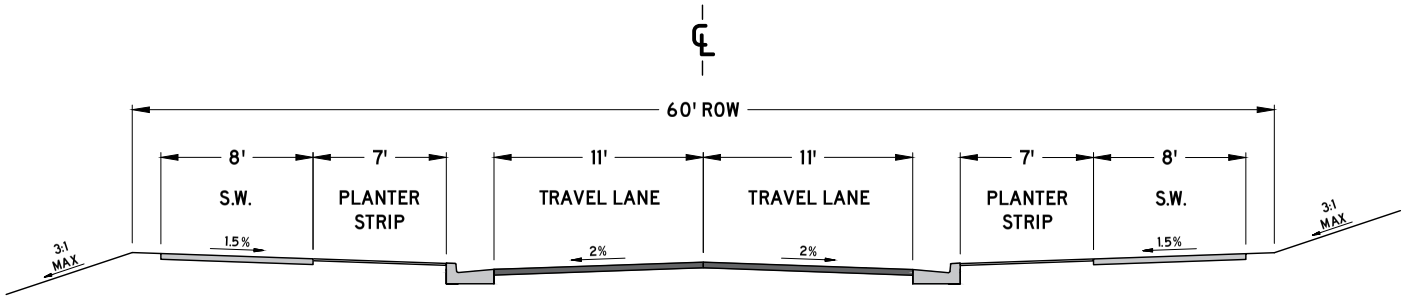
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN CENTER
PARALLEL PARKING BOTH SIDES

(NTS)

DATE
7/1/2024

DS-20



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

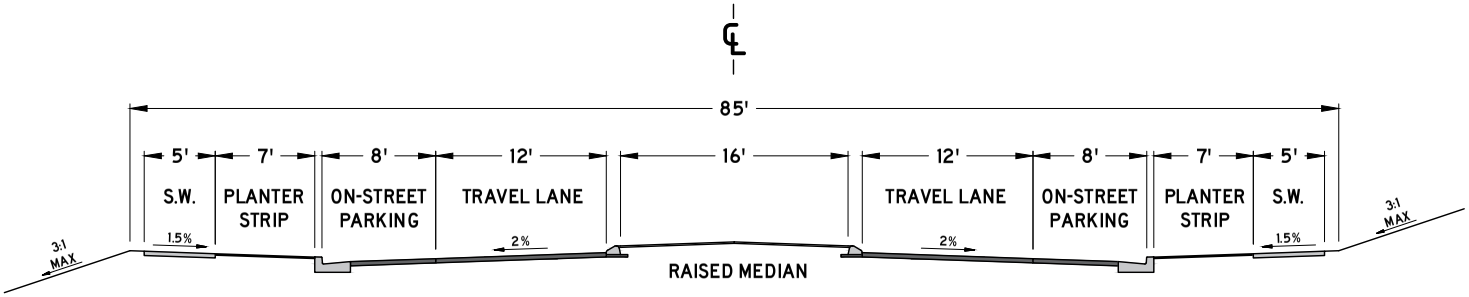
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN CENTER
NO PARALLEL PARKING

(NTS)

DATE
7/1/2024

DS-20



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CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

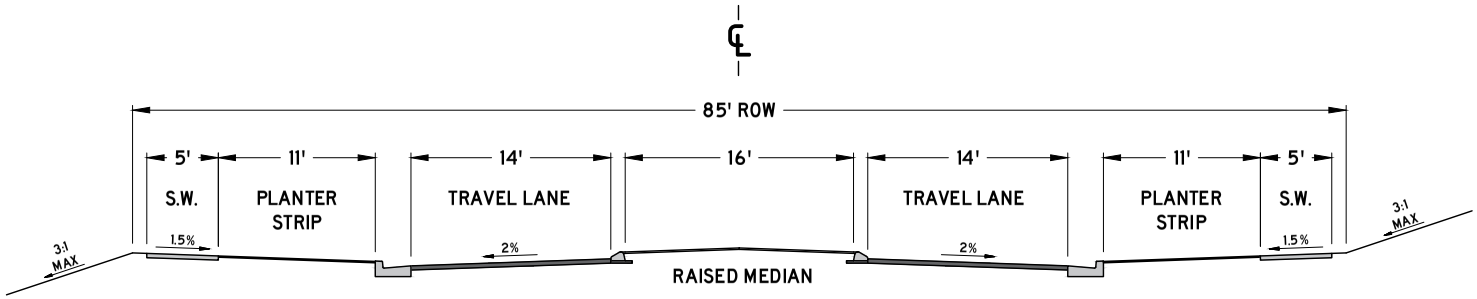
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN BOULEVARD
PARALLEL PARKING BOTH SIDES

(NTS)

DATE
7/1/2024

DS-22



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

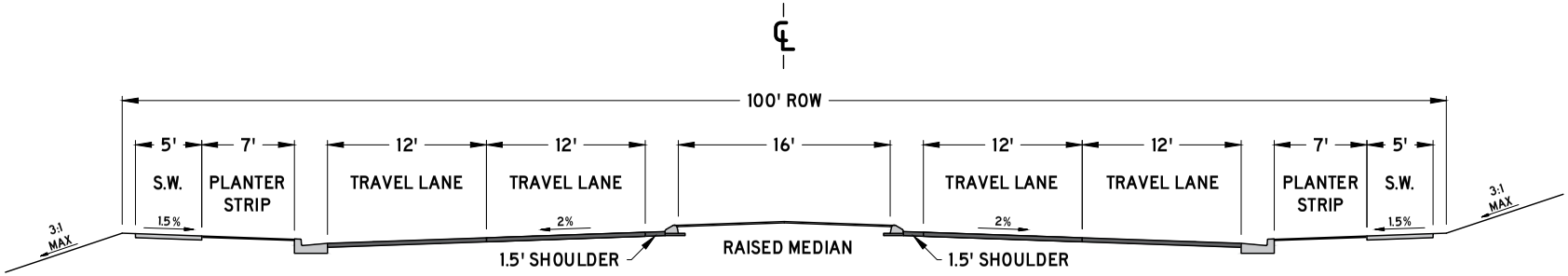
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN BOULEVARD
NO PARALLEL PARKING

(NTS)

DATE
7/1/2024

DS-23



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

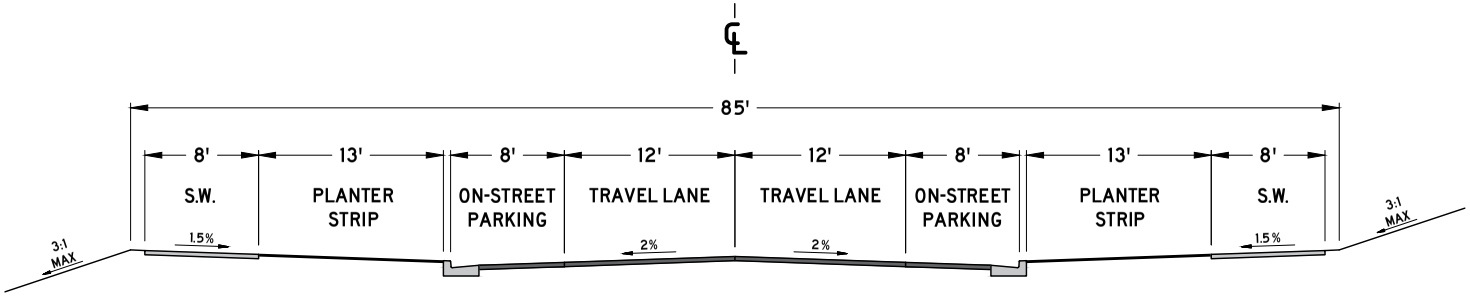
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN BOULEVARD
FOUR LANE

(NTS)

DATE
7/1/2024

DS-24



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

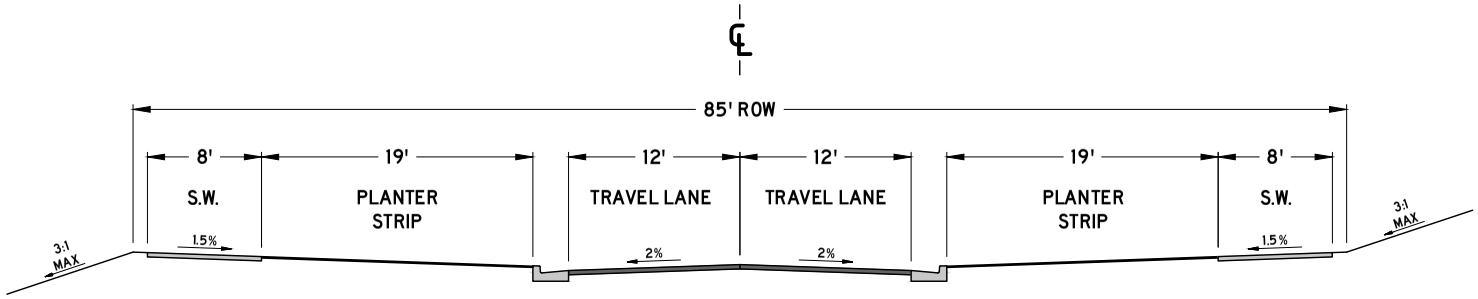
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN AVENUE
PARALLEL PARKING BOTH SIDES

(NTS)

DATE
7/1/2024

DS-25



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

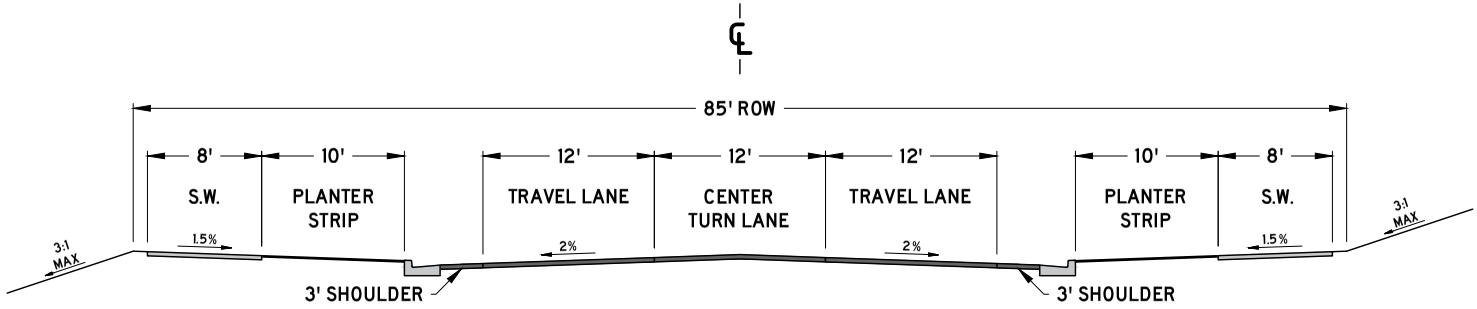
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN AVENUE
NO PARALLEL PARKING

(NTS)

DATE
7/1/2024

DS-26



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CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

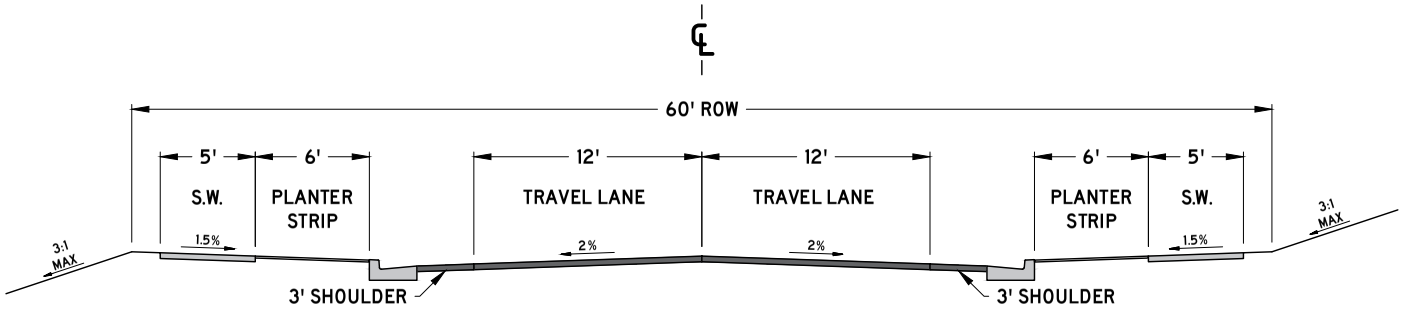
STANDARD DETAILS

CHARACTER DISTRICT STREET
URBAN AVENUE
THREE LANE

(NTS)

DATE
7/1/2024

DS-27



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TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

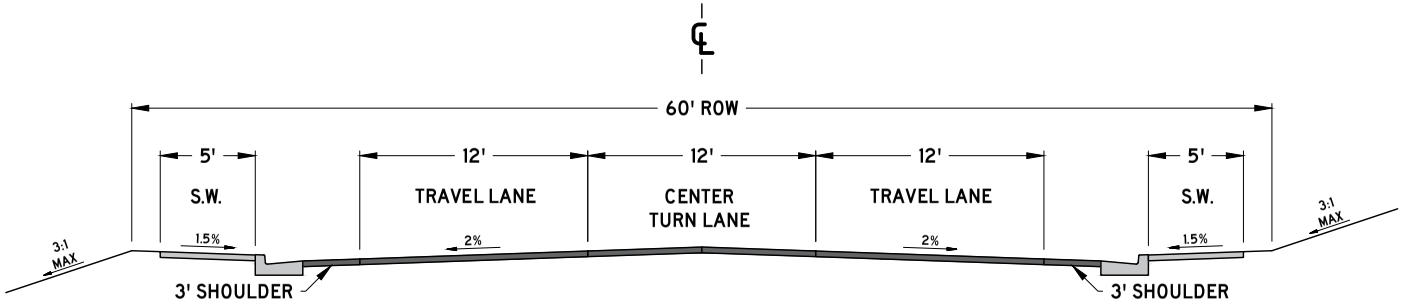
STANDARD DETAILS

CHARACTER DISTRICT STREET
INDUSTRIAL
TWO LANE

(NTS)

DATE
7/1/2024

DS-34



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TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

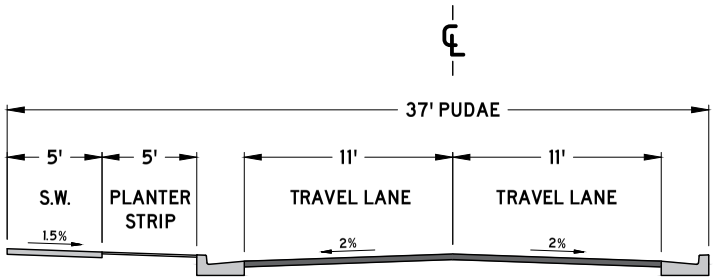
STANDARD DETAILS

CHARACTER DISTRICT STREET
INDUSTRIAL
THREE LANE

(NTS)

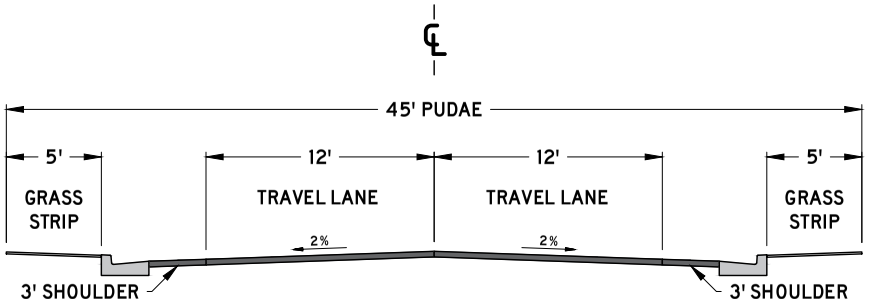
DATE
7/1/2024

DS-35



NOTES:

1. ONLY PERMITTED WITHIN THE APPLICABLE ZONING DISTRICTS
2. PAVEMENT SECTION SHALL FOLLOW THE MINOR LOCAL ROADWAY CLASSIFICATION'S STANDARD DETAIL
3. CURB AND GUTTER, SEE SD-01
4. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
5. DIMENSIONS REFLECT A MINIMUM STANDARD
6. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER
7. SHALL BE ENCOMPASSED IN A PUBLIC UTILITY, DRAINAGE, AND ACCESS EASEMENT (PUDAE). ADDITIONAL EASEMENTS MAY BE REQUIRED.
8. ADDITIONAL ELEMENTS SUCH AS PLANTER STRIPS, TREE WELLS, PLANTERS, DECORATIVE LIGHTING, AND ANGLE PARKING MAY BE PROVIDED. DIMENSIONS AND PLACEMENT OF SUCH ELEMENTS SHALL BE DETERMINED BY THE CITY ENGINEER.
9. PLANTER STRIPS MAY BE SUBSTITUTED WITH AN EQUIVALENT WIDTH OF SIDEWALK WITH TREE WELLS OR PLANTERS.
10. SIDEWALK AND PLANTER STRIPS SHALL BE PROVIDED ON AT LEAST ONE SIDE AND ON ALL SIDES WHERE BUILDING ENFRONT THE INTERNAL DRIVE



NOTES:

1. ONLY PERMITTED WITHIN THE APPLICABLE ZONING DISTRICTS
2. PAVEMENT SECTION SHALL FOLLOW THE MAJOR LOCAL / INDUSTRIAL ROADWAY CLASSIFICATION'S STANDARD DETAIL
3. CURB AND GUTTER, SEE SD-01
4. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED
5. DIMENSIONS REFLECT A MINIMUM STANDARD
6. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER
7. SHALL BE ENCOMPASSED IN A PUBLIC UTILITY, DRAINAGE, AND ACCESS EASEMENT (PUDAE). ADDITIONAL EASEMENTS MAY BE REQUIRED.
8. ADDITIONAL ELEMENTS SUCH AS PLANTER STRIPS, TREE WELLS, PLANTERS, DECORATIVE LIGHTING, AND ANGLE PARKING MAY BE PROVIDED. DIMENSIONS AND PLACEMENT OF SUCH ELEMENTS SHALL BE DETERMINED BY THE CITY ENGINEER.

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

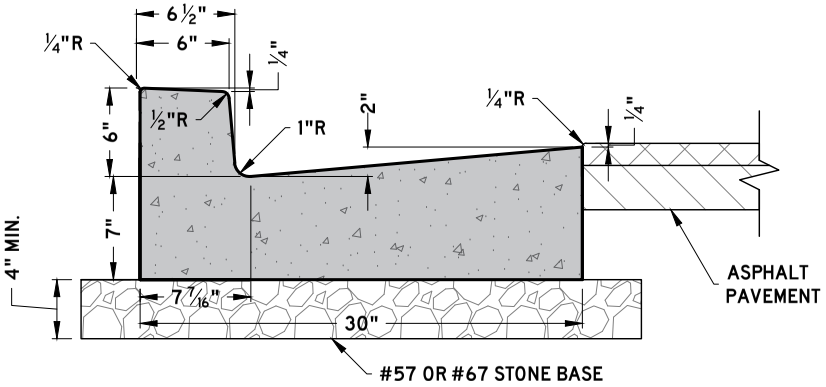
STANDARD DETAILS

INTERNAL DRIVE INDUSTRIAL ELEMENTS MAY VARY

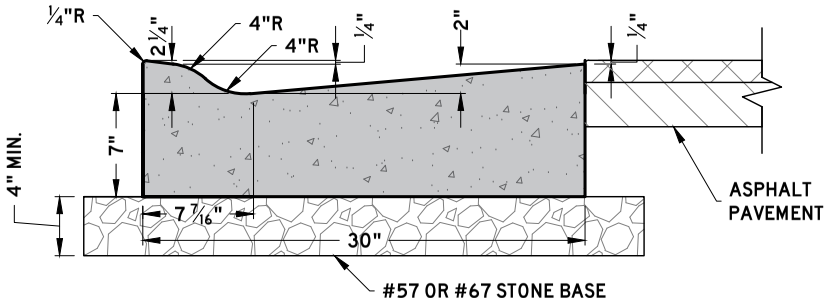
(NTS)

DATE
7/1/2024

DS-40



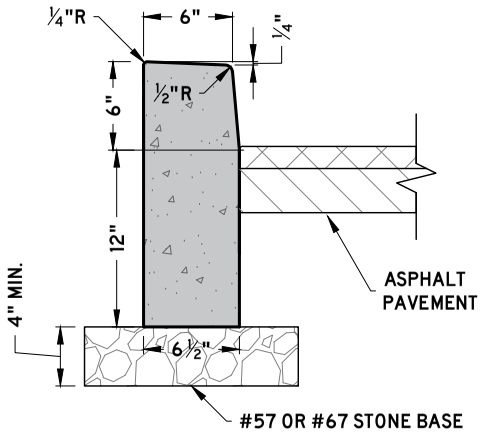
6-30 CONCRETE CURB AND GUTTER



LOWERED CONCRETE CURB AND GUTTER

NOTES:

1. BASED ON TDOT STANDARD DRAWING RP-VC-11
2. ONLY PERMITTED IN APPLICABLE ROADWAY SECTIONS
3. 4" MIN. THICK #57 OR # 67 STONE BASE
4. CLASS A 3000 PSI CONCRETE
5. EXPANSION JOINTS SHALL BE AS FOLLOWS:
   - 5.1. 1/2 INCH THICK
   - 5.2. A MAXIMUM SPACING OF 100 FEET
   - 5.3. AT TANGENTS OF ALL RADII OF CURVES
   - 5.4. BETWEEN CURBS AND ANY RIGID OBJECTS
   - 5.5. ALIGNED WITH ADJACENT EXPANSION JOINTS
   - 5.6. RUBBERIZED EXPANSION JOINT FILLER (AASHTO M153, TYPE 1)
   - 5.7. POLYPROPYLENE FOAM JOINT FILLER (ASTM D8139)
6. CONTRACTION JOINTS SHALL BE AS FOLLOWS:
   - 6.1. A MAXIMUM SPACING OF 10 FEET
   - 6.2. A MINIMUM SPACING OF 6 FEET
   - 6.3. 1/4 INCH DEPTH, EITHER SAWCUT OR HAND GROOVED.
7. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER



VERTICAL POST CURB

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

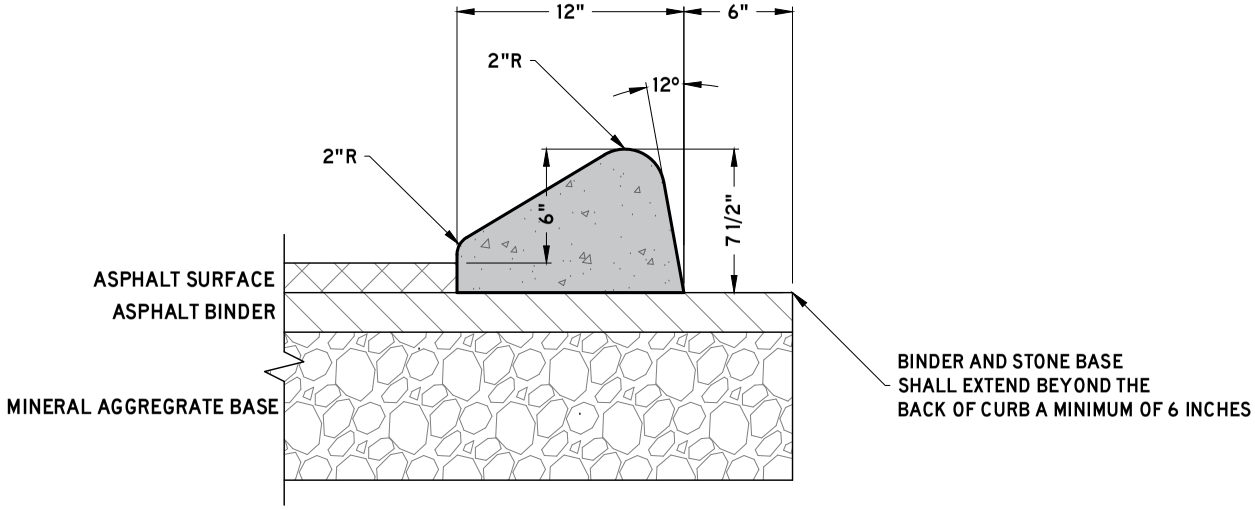
STANDARD DETAILS

CURB AND GUTTER AND POST CURB

(NTS)

DATE
6/9/2022

SD-01



NOTES:

1. BASED ON TDOT STANDARD DRAWING RP-SC-1
2. ONLY PERMITTED IN APPLICABLE ROADWAY SECTIONS
3. CLASS A 3000 PSI CONCRETE
4. CONTRACTION JOINTS SHALL BE AS FOLLOWS:
   - 4.1. A MAXIMUM SPACING OF 10 FEET
   - 4.2. A MINIMUM SPACING OF 6 FEET
   - 4.3. 1/4 INCH DEPTH, EITHER SAWCUT OR HAND GROOVED.
5. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
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CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

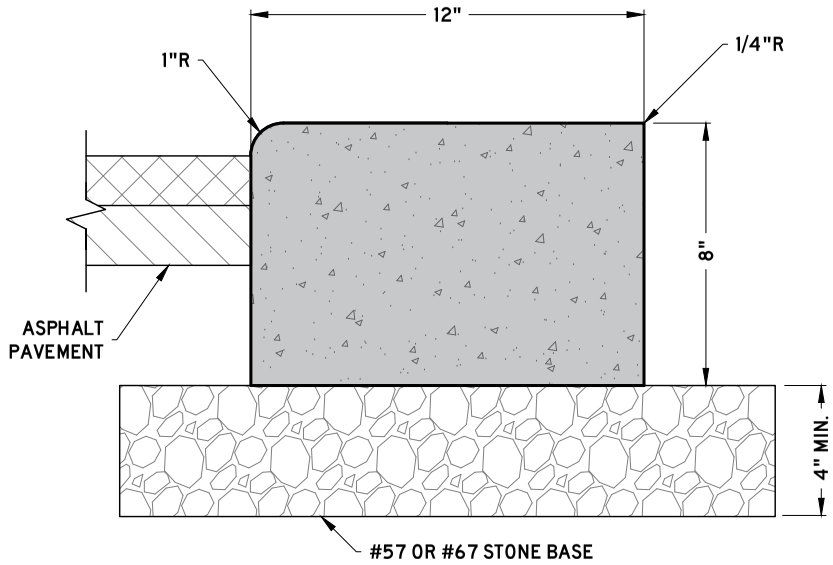
STANDARD DETAILS

EXTRUDED MOUNTABLE CURB

(NTS)

DATE
6/9/2022

SD-02



NOTES:

1. ONLY PERMITTED WITHIN THE APPLICABLE ZONING DISTRICTS
2. ONLY PERMITTED ON ALLEYS
3. CLASS A 3000 PSI CONCRETE
4. EXPANSION JOINTS SHALL BE AS FOLLOWS:
   - 4.1. 1/2 INCH THICK
   - 4.2. A MAXIMUM SPACING OF 100 FEET
   - 4.3. AT TANGENTS OF ALL RADII OF CURVES
   - 4.4. BETWEEN CURBS AND ANY RIGID OBJECTS
   - 4.5. ALIGNED WITH ADJACENT EXPANSION JOINTS
   - 4.6. RUBBERIZED EXPANSION JOINT FILLER (AASHTO M153, TYPE 1)
   - 4.7. POLYPROPYLENE FOAM JOINT FILLER (ASTM D8139)
5. CONTRACTION JOINTS SHALL BE AS FOLLOWS:
   - 5.1. A MAXIMUM SPACING OF 10 FEET
   - 5.2. A MINIMUM SPACING OF 6 FEET
   - 5.3. 1/4 INCH DEPTH, EITHER SAWCUT OR HAND GROOVED.
6. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

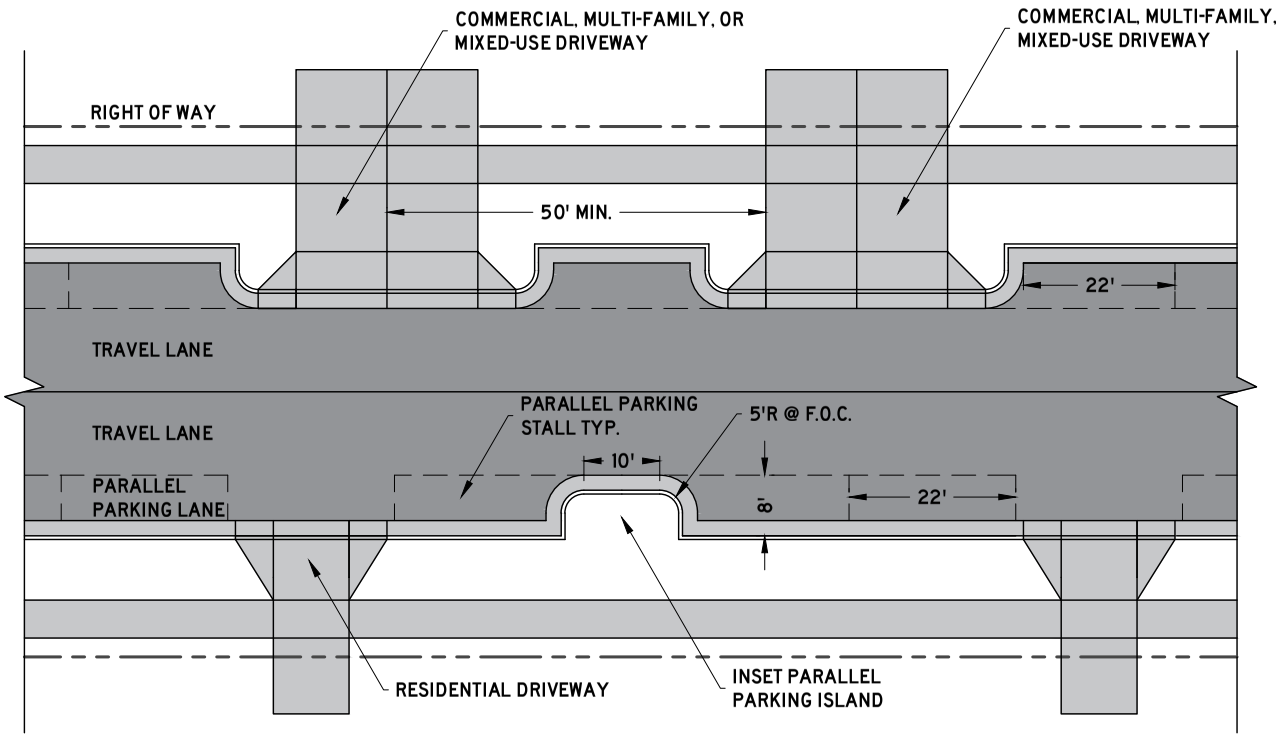
STANDARD DETAILS

RIBBON CURB

(NTS)

DATE
6/9/2022

SD-03



NOTES:

1. ONLY PERMITTED WITHIN THE APPLICABLE ZONING DISTRICTS
2. PARKING ISLANDS SHALL BE PROVIDED EVERY 220 FEET AT MINIMUM.
3. PARKING ISLANDS SHALL BE PROVIDED AT EVERY INTERSECTION.
4. COMMERCIAL, MULTI-FAMILY, AND MIXED-USE DRIVEWAYS SHALL REQUIRE PARKING ISLANDS ADJACENT TO THE DRIVEWAY.
5. RESIDENTIAL DRIVEWAYS SHALL NOT REQUIRE PARKING ISLANDS ADJACENT TO THE DRIVEWAY, BUT SHALL BE LOCATED BETWEEN PARKING STALLS WHERE PRACTICABLE.
6. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
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CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

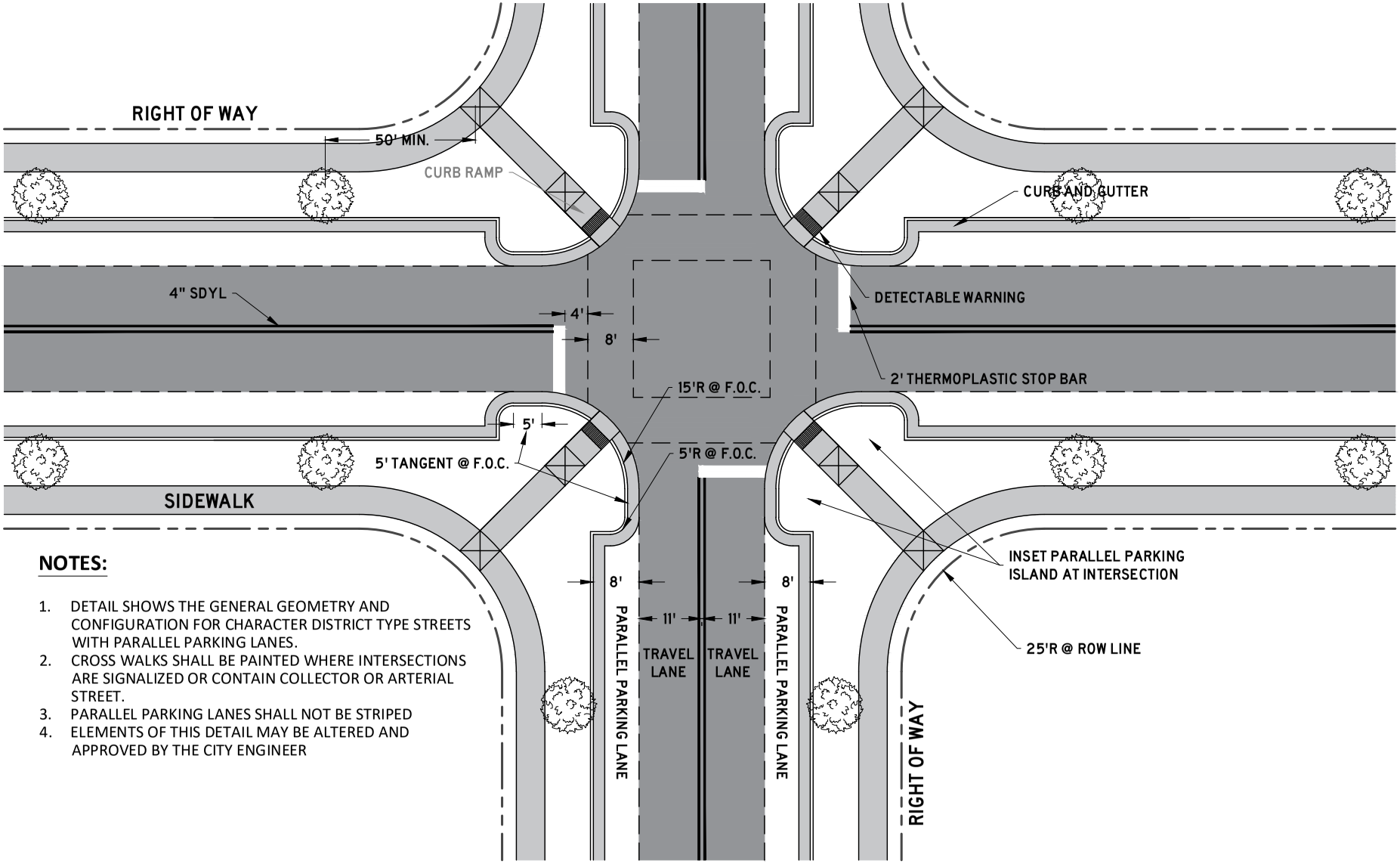
STANDARD DETAILS

INSET PARALLEL PARKING AND ISLANDS

(NTS)

DATE
6/9/2022

SD-06



NOTES:

1. DETAIL SHOWS THE GENERAL GEOMETRY AND CONFIGURATION FOR CHARACTER DISTRICT TYPE STREETS WITH PARALLEL PARKING LANES.
2. CROSS WALKS SHALL BE PAINTED WHERE INTERSECTIONS ARE SIGNALIZED OR CONTAIN COLLECTOR OR ARTERIAL STREET.
3. PARALLEL PARKING LANES SHALL NOT BE STRIPED
4. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

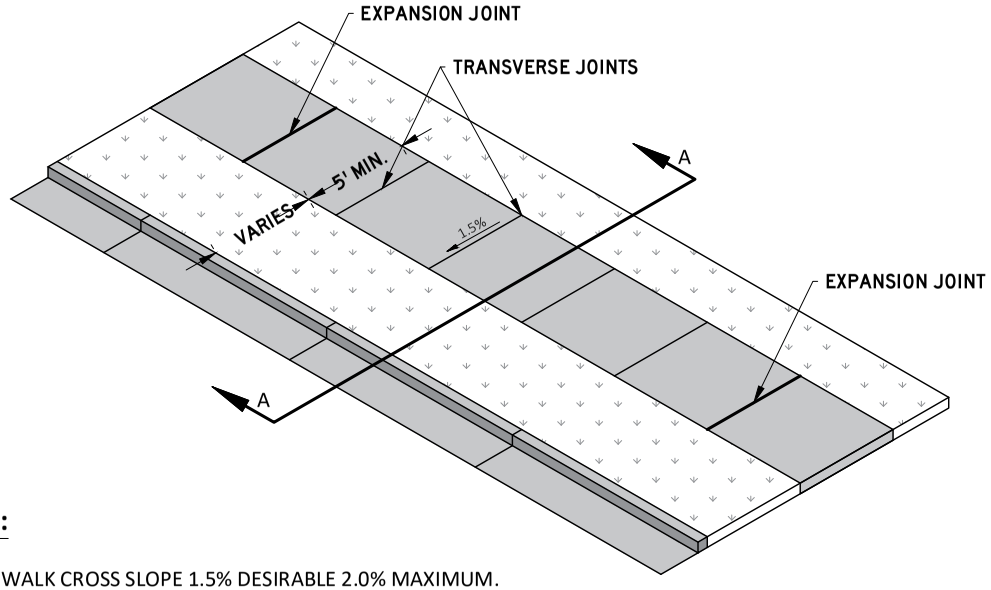
STANDARD DETAILS

INTERSECTION CONFIGURATION AND GEOMETRY

(NTS)

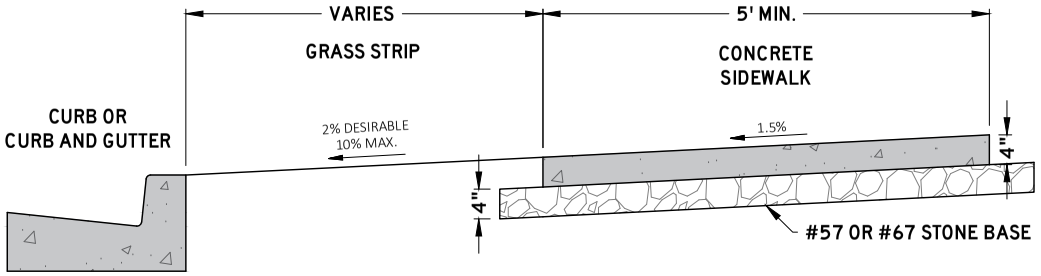
DATE
6/9/2022

SD-07



NOTES:

1. SIDEWALK CROSS SLOPE 1.5% DESIRABLE 2.0% MAXIMUM.
2. SIDEWALK GRADE SHALL FOLLOW THE ROAD GRADE WHERE POSSIBLE.
3. 4" MIN. THICK #57 OR # 67 STONE BASE
4. 4" MIN. THICKNESS CLASS A 3000 PSI CONCRETE WITH FIBER REINFORCEMENT, BROOM FINISHED.
5. EXPANSION JOINTS SHALL BE AS FOLLOWS:
   - 5.1. 1/2 INCH THICK
   - 5.2. A MAXIMUM SPACING OF 25 FEET
   - 5.3. AT TANGENTS OF ALL RADII OF CURVES
   - 5.4. BETWEEN CURBS AND ANY RIGID OBJECTS
   - 5.5. ALIGNED WITH ADJACENT EXPANSION JOINTS
   - 5.6. RUBBERIZED EXPANSION JOINT FILLER (AASHTO M153, TYPE 1)
   - 5.7. POLYPROPYLENE FOAM JOINT FILLER (ASTM D8139)
6. PROVIDE TRANSVERSE JOINTS AS NEARLY AS SQUARE AS PRACTICABLE. ON SIDEWALKS GREATER THAN 8 FEET IN WIDTH, PROVIDE A LONGITUDINAL JOINT ALONG THE CENTERLINE OF THE SIDEWALK.
7. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER



SECTION AA

CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

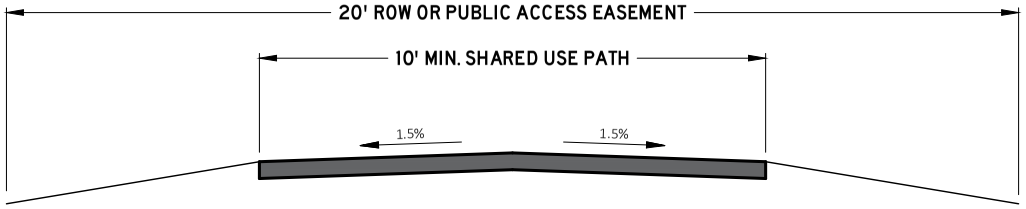
STANDARD DETAILS

CONCRETE SIDEWALK

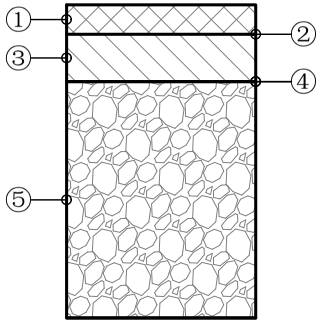
(NTS)

DATE
6/9/2022

SD-10



PAVEMENT SCHEDULE
① SURFACE @ 1.5" THICK 411-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE), OR 307-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING C-W (SURFACE)
② TACK COAT (GENERAL USE) 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③ BIT. BINDER @ 2" THICK 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
④ PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑤ MINERAL AGGREGATE BASE @ 6" THICK 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. CROSS SLOPE 1.5% DESIRABLE 2.0% MAXIMUM.
2. MAY BE GRADED TO DRAIN TO ONE DIRECTION, OR CROWNED AS SHOWN.
3. WHERE ADJACENT TO A ROADWAY, PATH SHALL BE GRADED TO DRAIN TOWARDS CURB LINE.
4. CONCRETE PAVEMENT ALLOWED, SEE SD-10 FOR CONSTRUCTION METHODS AND MATERIALS.
5. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

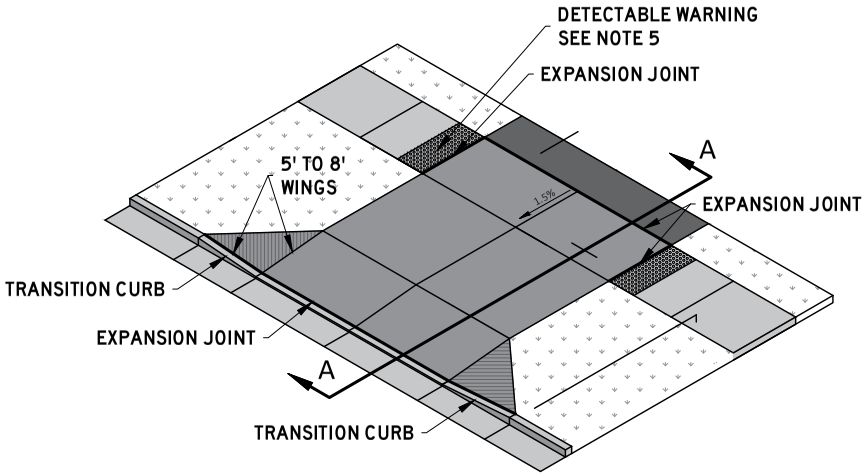
STANDARD DETAILS

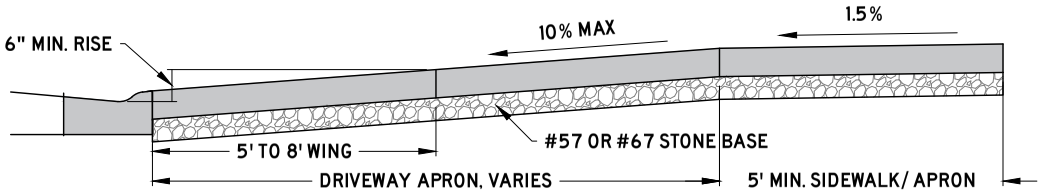
SHARED USE PATH

(NTS)

DATE
6/9/2022

SD-11





SECTION AA

NOTES:

1. SIDEWALK CROSS SLOPE 1.5% DESIRABLE 2.0% MAXIMUM.
2. APRON SLOPE 2.0% MIN. 10% MAX. MINIMUM OF 6" RISE ABOVE GUTTER LINE.
3. 4" MIN. THICK #57 OR # 67 STONE BASE
4. CLASS A 3000 PSI CONCRETE WITH FIBER REINFORCEMENT
   - 4.1. 6" MIN. THICKNESS RESIDENTIAL.
   - 4.2. 8" MIN. THICKNESS COMMERCIAL, MULTI-FAMILY, AND MIXED-USE.
5. EXPANSION JOINTS SHALL BE AS FOLLOWS:
   - 5.1. 1/2 INCH THICK.
   - 5.2. RUBBERIZED EXPANSION JOINT FILLER (AASHTO M153, TYPE 1).
   - 5.3. POLYPROPYLENE FOAM JOINT FILLER (ASTM D8139).
6. DETECTABLE WARNINGS WHERE DRIVEWAY IS STOP CONTROLLED.
7. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

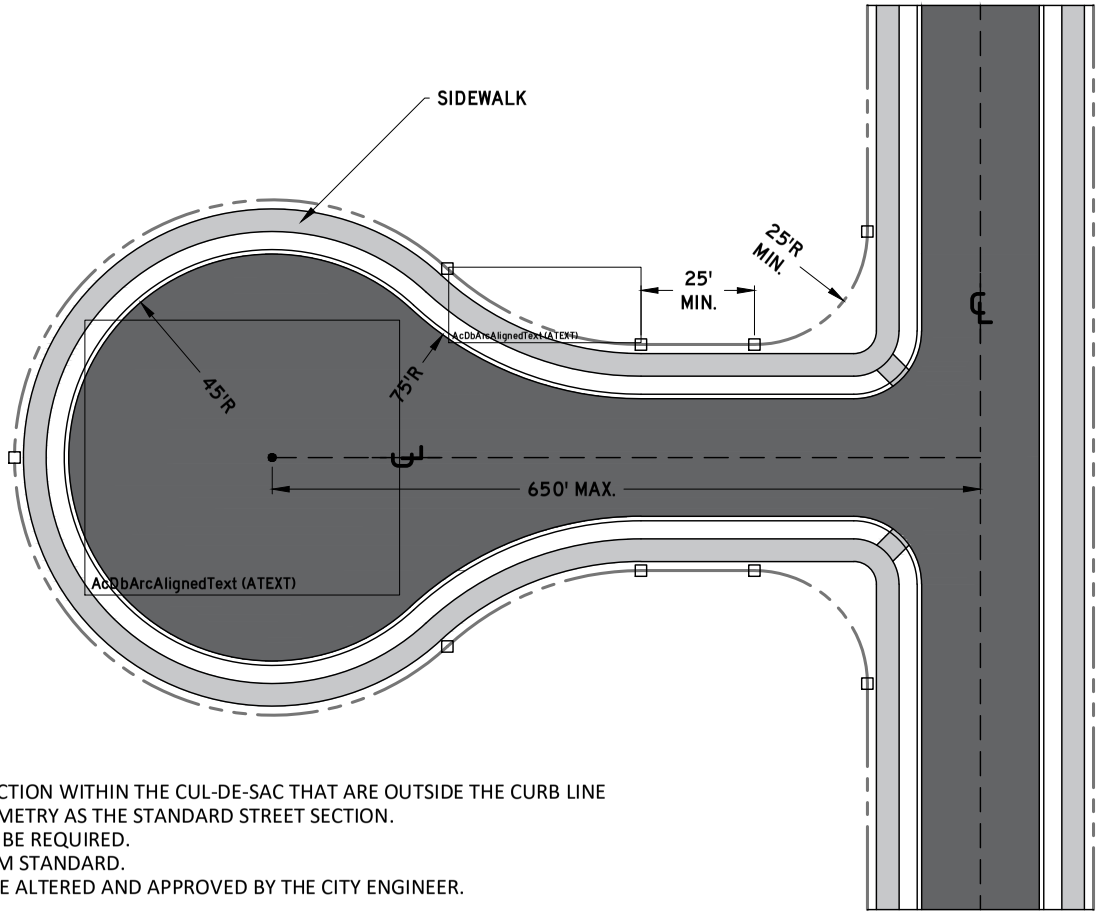
STANDARD DETAILS

DRIVEWAY APRON

(NTS)

DATE
6/9/2022

SD-12



NOTES:

1. ALL ELEMENTS OF THE STREET SECTION WITHIN THE CUL-DE-SAC THAT ARE OUTSIDE THE CURB LINE SHALL MAINTAIN THE SAME GEOMETRY AS THE STANDARD STREET SECTION.
2. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED.
3. DIMENSIONS REFLECT A MINIMUM STANDARD.
4. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER.

CITY OF COLUMBIA TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

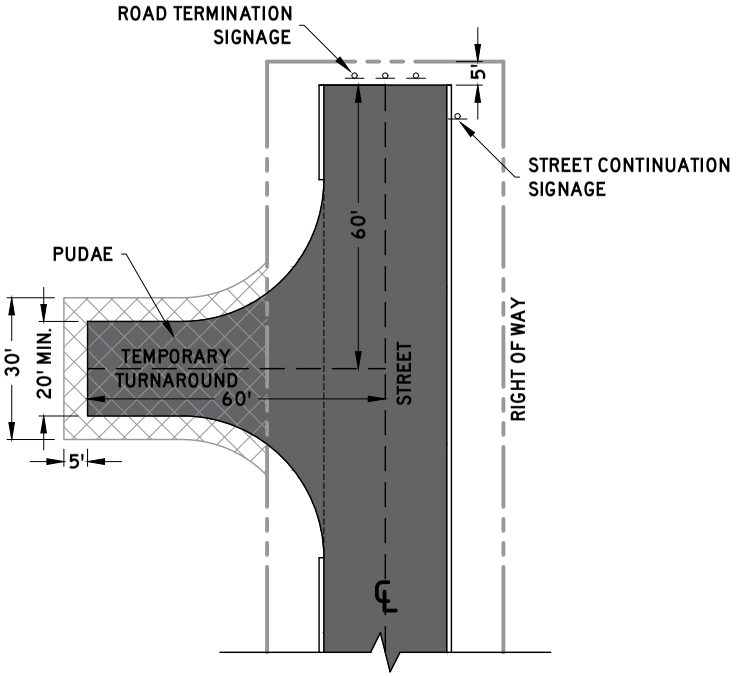
STANDARD DETAILS

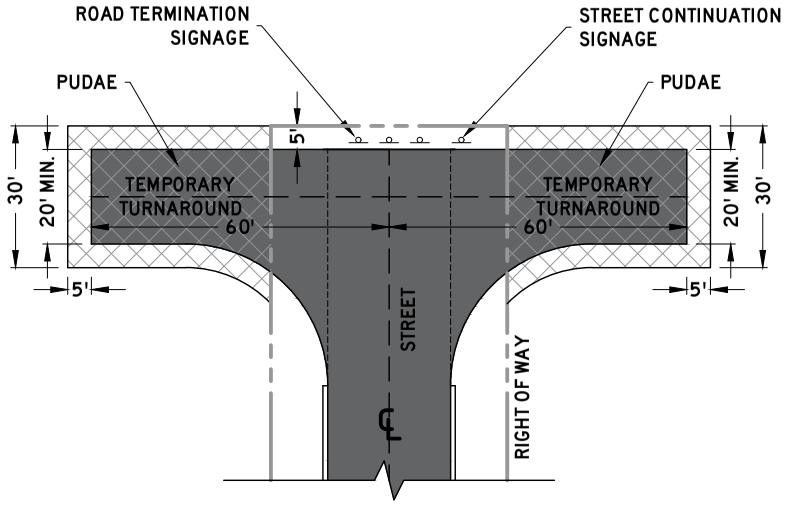
CUL-DE-SAC

(NTS)

DATE
6/9/2022

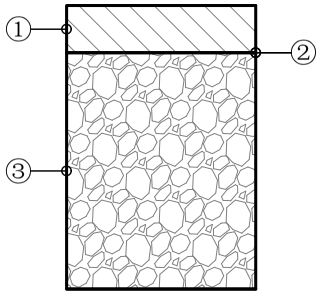
SD-15





PAVEMENT SCHEDULE

①	BIT. BINDER @ 2" THICK 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
②	PRIME COAT 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
③	MINERAL AGGREGATE BASE @ 8" THICK 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



NOTES:

1. TEMPORARY TURNAROUNDS SHALL BE SHOWN ON ALL FINAL PLATS AND DEVELOPMENT PLANS WHERE REQUIRED
2. TEMPORARY TURNAROUNDS SHALL BE CONSTRUCTED PRIOR TO FINAL PLAT APPROVAL
3. TERMINATION AND STREET CONTINUATION SIGNAGE SHALL BE INSTALLED PRIOR TO FINAL PLAT APPROVAL
4. TURNAROUNDS SHALL BE CONSTRUCTED TO DRAIN
5. IF A CONNECTION IS NOT MADE TO ALLOW FOR THE REMOVAL OF THE TURNAROUND PRIOR TO STREET FINAL SURFACING, THE TURNAROUND SHALL BE SURFACED, CURBED, AND STRIPED WITH NO PARKING HATCHING.
6. ONCE ROADWAY CONNECTION IS MADE TO ALLOW FOR REMOVAL, THE TURNAROUND SHALL BE REMOVED PRIOR TO ANY FINAL PLAT OR FURTHER PERMITS BEING ISSUED.
7. DIMENSIONS REFLECT A MINIMUM STANDARD
8. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

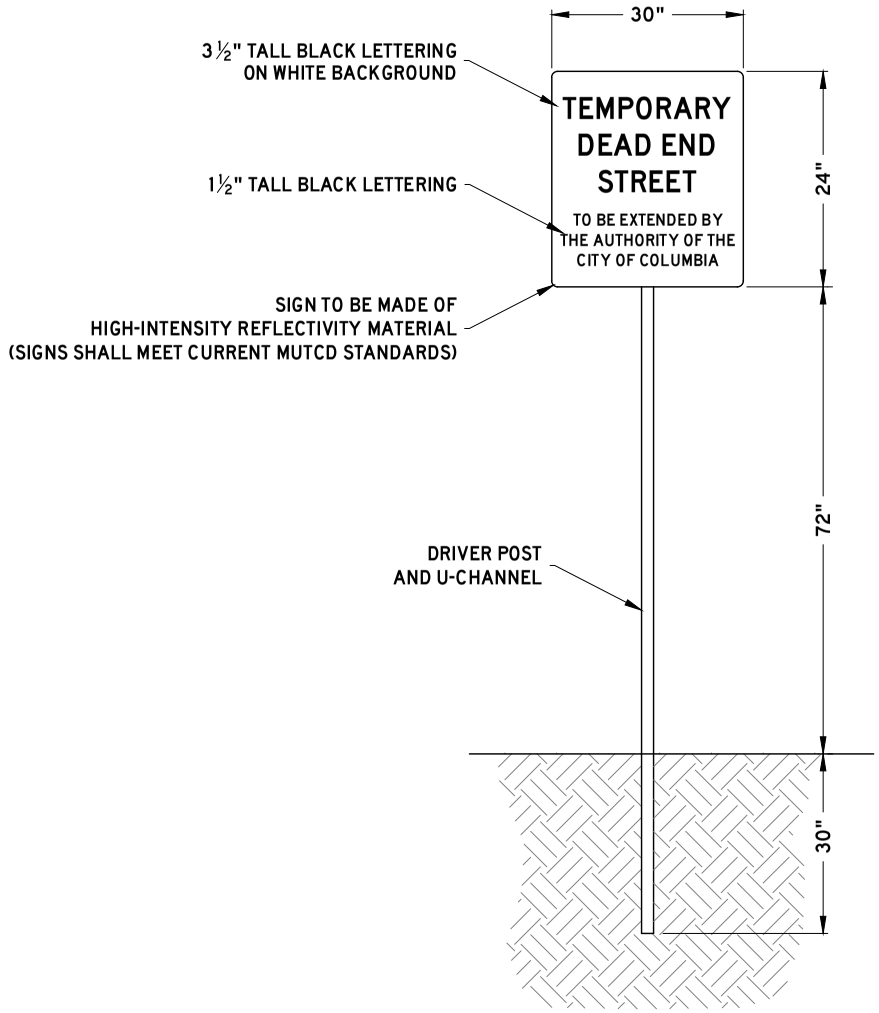
STANDARD DETAILS

TEMPORARY TURNAROUND

(NTS)

DATE
6/9/2022

SD-16



CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

STANDARD DETAILS

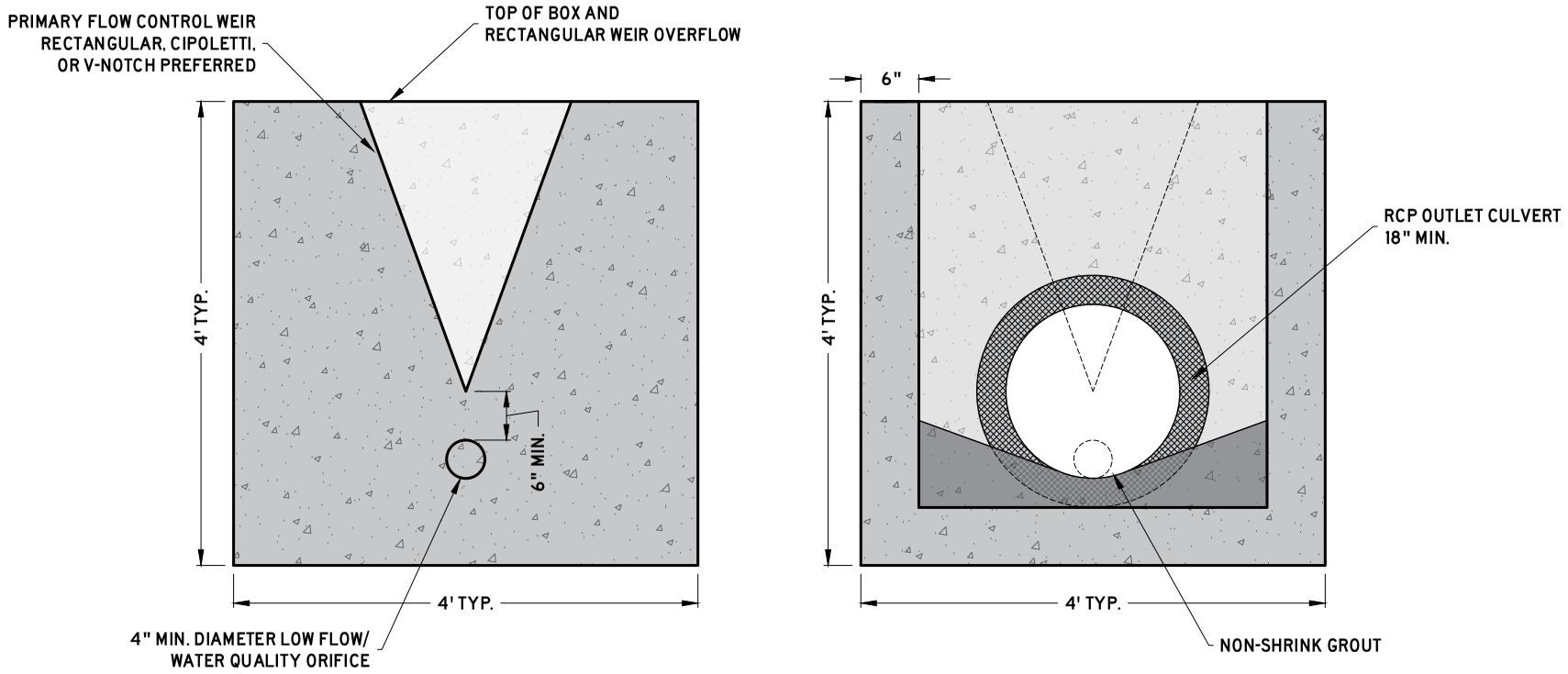
STREET CONTINUATION SIGNAGE

(NTS)

DATE
6/9/2022

SD-19

TYPE	TDOT STANDARD DRAWING OR CASTING MODEL
CURB INLET CATCH BASINS	TDOT CB SERIES NOS. 10, 11, 12, 13, 14, 16, 17
CURB AND GUTTER INLET CASTINGS	JB&S 3300
EXTRUDED CURB INLET CASTINGS	JB&S 3103
AREA DRAIN CATCH BASINS	TDOT CB SERIES NOS. 38, 39, 40, 42, 43
AREA DRAIN CASTINGS	TDOT CBB-42
JUNCTION BOXES	TDOT JBS SERIES NOS. 1, 2, 3, 4, AND 5
MANHOLES	TDOT MH SERIES NOS. 2, 3, 4, 5, 6, 7 AND TDOT RF-1
TRENCH DRAINS	TDOT TD-1
CONCRETE PIPE INSTALLATION	TDOT PB-1
FLEXIBLE PIPE INSTALLATION	TDOT PB-2
OVAL AND ARCH PIPES	TDOT PO-1
SAFETY CROSS DRAIN ENDWALLS	TDOT PE SERIES
SAFETY SIDE DRAIN ENDWALLS	TDOT SEW SERIES AND TDOT MSE-1
PROTECTED ENDWALLS	TDOT PE, PEW SERIES
FLUMES	TDOT FLU-1



NOTES:

1. OUTLET CONTROL STRUCTURES SHALL MEET STORMWATER REGULATIONS AND TDEC WATER QUALITY REQUIREMENTS FOR DETENTION/RETENTION PONDS.
2. WHERE A DIAMTER LESS THAN 4 INCHES FOR THE LOW FLOW/WATER QUALITY ORIFICE IS REQUIRED, A STANDPIPE SHALL BE ATTACHED TO PROVIDE THE NECESSARY FLOW RESTRICTION.
3. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER.

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

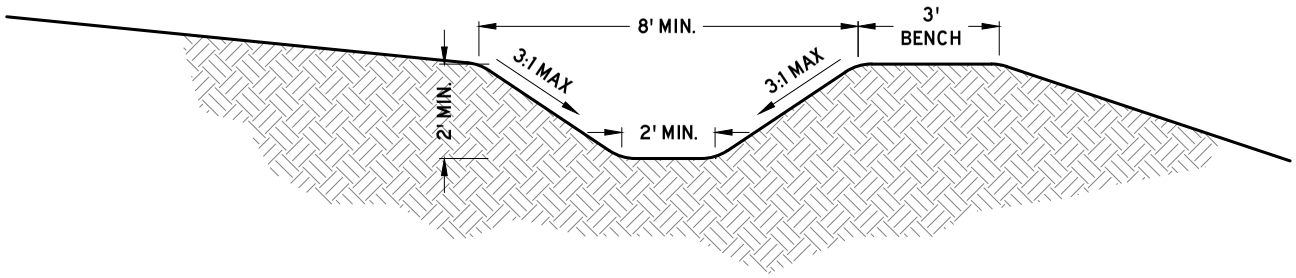
STANDARD DETAILS

OUTLET CONTROL STRUCTURE

(NTS)

DATE
6/9/2022

DD-02



NOTES:

1. DITCHES SHALL BE STABILIZED WITH APPROPRIATELY DESIGNED SOFT ARMORING.
2. RIP-RAP OR OTHER HARD ARMORING TECHNIQUES ARE DISCOURAGED AND SHALL ONLY BE APPROVED WHEN ALL OTHER MEANS OF STABILIZATION ARE EXHAUSTED.
3. FLOW LINE GRADE SHALL NOT BE LESS THAN 1.0%
4. FLOW LINE GRADE SHALL NOT BE MORE THAN 7.5%
5. WHERE PLACED ON A SLOPE, A BENCH OF MINIMUM WIDTH OF 3 FEET SHALL BE PROVIDED.
6. A MINIMUM OF 6 INCHES OF FREEBOARD ABOVE THE DESIGN FLOW DEPTH SHALL BE PROVIDED.
7. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER.

CITY OF COLUMBIA
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CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

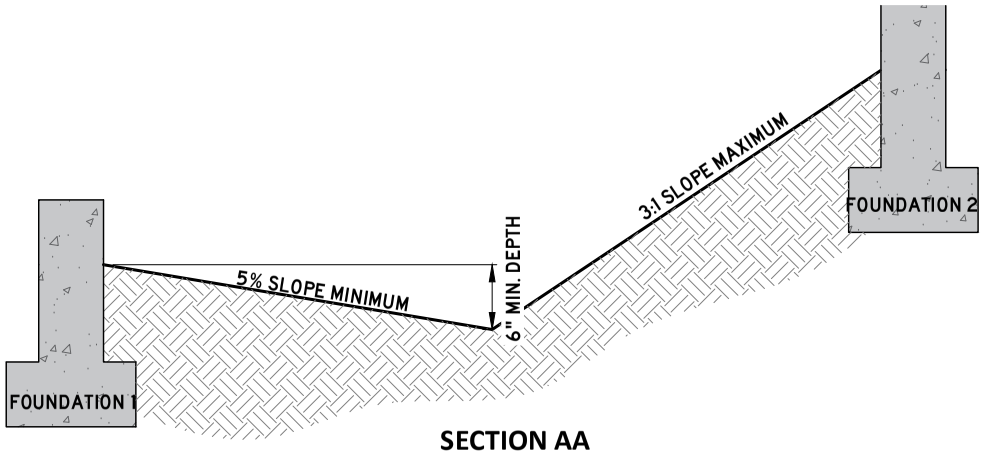
STANDARD DETAILS

TRAPEZOIDAL DITCH

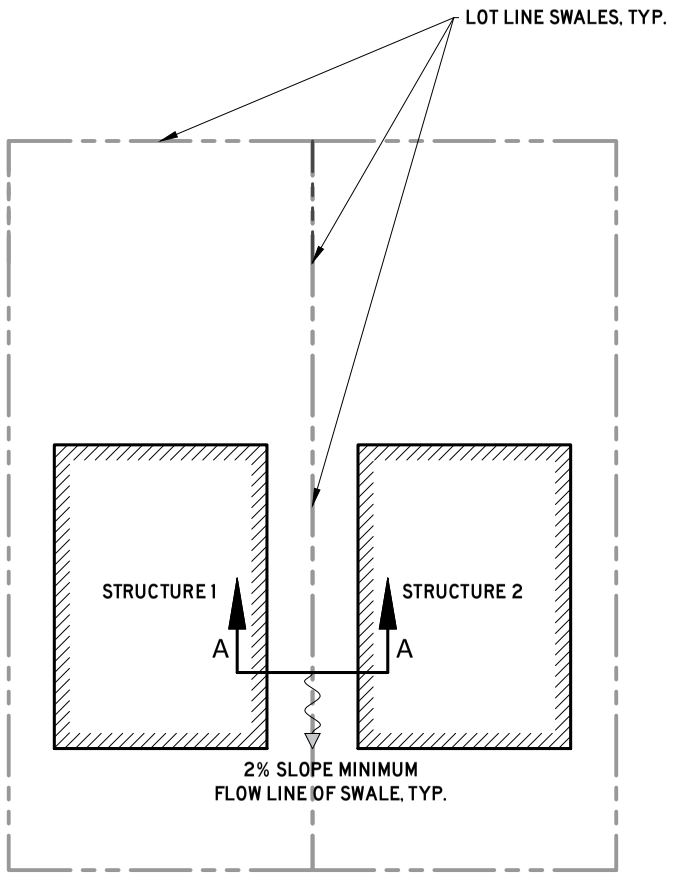
(NTS)

DATE
6/9/2022

DD-03



SECTION AA



PLAN

NOTES:

1. SURFACE DRAINAGE SHALL BE DIVERTED TO A STORM SEWER CONVEYANCE. ALL AREAS WITHIN A LOT SHALL BE GRADED TO DRAIN TO AN APPROVED STORMWATER CONVEYANCE.
2. LOTS SHALL BE GRADED TO DRAIN SURFACE WATER AWAY FROM FOUNDATIONS.
   - 2.1. LOTS SHALL BE GRADED TO PROVIDE A MINIMUM OF 6 INCHES OF FALL WITHIN THE FIRST 10 FEET OF THE STRUCTURE ALONG THE DIRECTION OF FLOW.
   - 2.2. LOTS SHALL BE GRADED TO PROVIDE A MINIMUM OF 1V:20H OF FALL PERPENDICULAR TO THE FACE OF THE FOUNDATION WALL WITHIN THE FIRST 5 FEET.
   - 2.3. IMPERVIOUS SURFACES SHALL BE SLOPED AT A MINIMUM OF 2% AWAY FROM THE STRUCTURE.
3. SWALES SHALL BE LOCATED ALONG LOT LINES TO REDUCE LOT TO LOT DRAINAGE, AND DIRECT STORMWATER RUNOFF TOWARDS APPROVED STORMWATER CONVEYANCES.
4. SWALES SHALL HAVE A MINIMUM SLOPE OF 2%.
5. FOUNDATIONS SHALL BE AT MINIMUM 12 INCHES ABOVE ANY THE RIM ELEVATION OR HIGHEST FLOW LINE OF ANY PUBLIC STORMWATER INFRASTRUCTURE THAT SURFACE DRAINAGE FROM THE LOT IS DIRECTED TO.
6. NON-PUBLIC STORMWATER INFRASTRUCTURE SHALL NOT SUCH AS YARD DRAINS SHALL NOT ALLEVIATE THE REQUIREMENTS OF NOTES 2 AND 3.
7. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

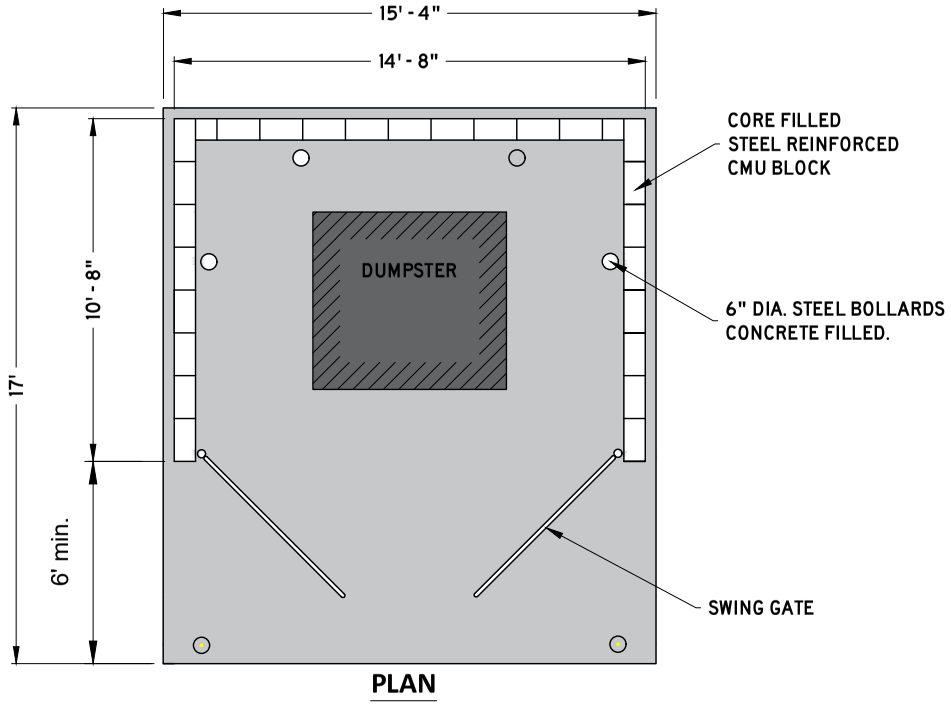
STANDARD DETAILS

RESIDENTIAL LOT GRADING AND DRAINAGE

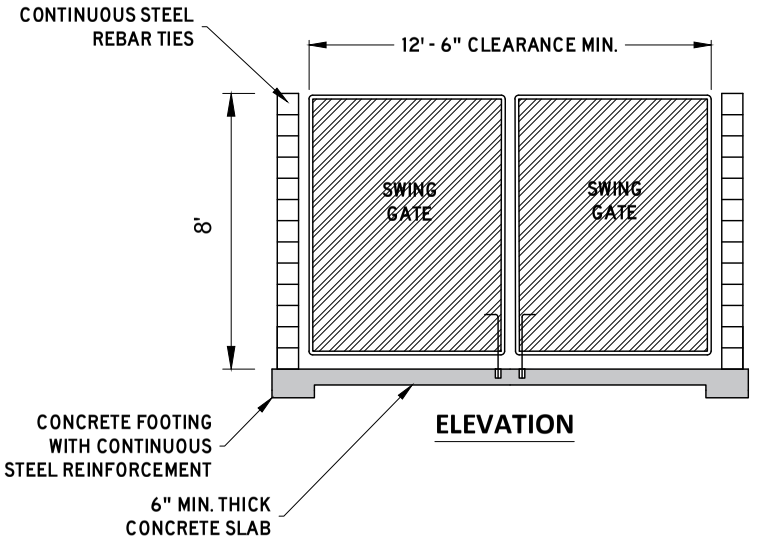
(NTS)

DATE
6/9/2022

DD-04



PLAN



ELEVATION

NOTES:

1. MATERIALS, CONSTRUCTION AND QUANTITY CONTROL OF MASONRY SHALL BE IN ACCORDANCE WITH INTERNATIONAL BUILDING CODE (IBC).
2. MATERIALS USED SHOULD BE CONSISTENT WITH THOSE USED IN THE CONSTRUCTION OF AND ARCHITECTURAL STYLE OF THE PRINCIPAL BUILDING. SHALL BE COMPLIANT WITH THE ZONING ORDINANCE AND ALL OTHER APPLICABLE REGULATIONS
3. CONCRETE SLAB: MONOLITHIC, MIN. 6" THICKNESS W/IMBEDDED 6"X6"/ 10X10 WELDED WIRE FABRIC (W.W.F.), CLASS A 3000 P.S.I. CONCRETE FILLED CELLS: WITH 1-#5 VERTICAL REBAR TIED TO FOOTER STEEL AT EACH CORNER AND EVERY 4' O.C.
4. BOLLARD: 3'-6" HIGH, 6" DIAMETER STEEL PIPE BOLLARD FILLED WITH CONCRETE, PAINTED TRAFFIC YELLOW
5. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER

CITY OF COLUMBIA
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DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

STANDARD DETAILS

DUMPSTER PAD AND ENCLOSURE

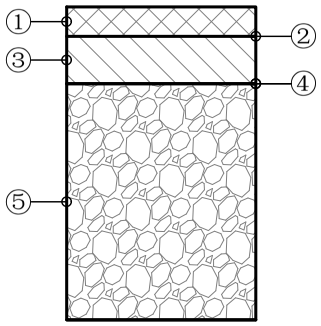
(NTS)

DATE
6/9/2022

MD-01

PAVEMENT SCHEDULE

①	**SURFACE @ 1.5" THICK** 411-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING D (SURFACE), OR 307-01.10 ASPHALT CONCRETE MIX (PG64-22) (ACS) GRADING C-W (SURFACE)
②	**TACK COAT (GENERAL USE)** 403-01 BITUMINOUS MATERIAL FOR TACK COAT (TC) (0.05 - 0.10 GAL/SY)
③	**BIT. BINDER @ 2" THICK** 307-01.08 ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2
④	**PRIME COAT** 402-01 BITUMINOUS MATERIAL FOR PRIME COAT (PC) (0.30-0.35 GAL/SY) 402-02 AGGREGATE FOR COVER MATERIAL (PC) (8-12 LB/SY)
⑤	**MINERAL AGGREGATE BASE @ 6" THICK** 303-01 MINERAL AGGREGATE, TYPE A BASE, GRADING D



CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

STANDARD DETAILS

PARKING LOT PAVEMENT SECTION

(NTS)

DATE
6/9/2022

MD-02

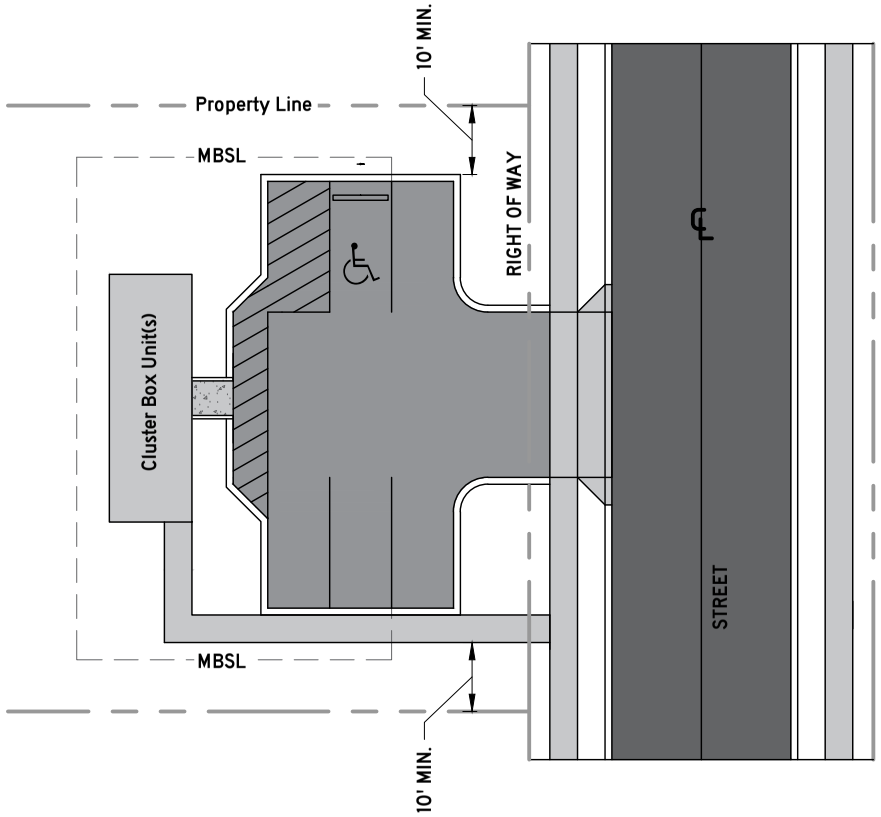
NOTES:

FOR 75 OR LESS CBU'S AT A SINGLE LOCATION

1. CLUSTER BOX UNITS (CBU'S) SHALL MEET USPS STANDARDS
2. CBU'S MAY BE LOCATED WITHIN THE RIGHT OF WAY
3. CBU'S SHALL NOT ENCROACH UPON THE ROADWAY OR SIDEWALK.
4. CBU'S SHOULD BE PLACED ALONG MINOR LOCAL ROADWAYS OR EQUIVALENT. FOR PLACEMENT ALONG COLLECTOR AND ARTERIAL ROADWAYS, FOLLOW THE STANDARDS BELOW, "FOR MORE THAN 75 CBU'S AT A SINGLE LOCATION".

FOR MORE THAN 75 CBU'S AT A SINGLE LOCATION

1. CBU'S SHALL MEET USPS STANDARDS
2. CBU'S SHALL BE LOCATED OUTSIDE OF THE RIGHT OF WAY WITHIN A COMMON OR OPEN SPACE LOT
3. CBU'S SHALL NOT BE PLACED WITHIN ANY EASEMENTS
4. CBU'S AND APPURTENANT BUILDING PAD(S) SHALL BE CONSIDERED A PRINCIPLE STRUCTURE AND SHALL ADHERE TO BUILDING SETBACKS
5. ACCESS AND DRIVEWAYS TO MEET ZONING CODE AND ACCESS MANAGEMENT
6. PARKING SHALL BE PROVIDED WITH A MINIMUM OF 2 PARKING STALLS PLUS 1 STALL PER 25 MAIL UNITS OR PORTION THEREOF ABOVE THE FIRST 25 MAIL UNITS, WITH A MAXIMUM OF TWICE THE MINIMUM
7. PARKING AND SIDEWALKS SHALL HAVE A 10 FT. MINIMUM BUFFER FROM ANY PROPERTY LINE
8. PARKING SHALL ADHERE TO LAYOUT AND INTERIOR LANDSCAPING REQUIREMENTS PER THE ZONING CODE
9. PARKING SHALL BE CLEARLY LABELED AS SHORT TERM PARKING AND CANNOT BE CONSIDERED REQUIRED PARKING FOR ANOTHER USE
10. WHEEL STOPS OR CURBING SHALL BE PROVIDED FOR ALL PARKING STALLS
11. ADEQUATE LIGHTING SHALL BE PROVIDED.
12. ELEMENTS OF THIS DETAIL MAY BE ALTERED AND APPROVED BY THE CITY ENGINEER



CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

STANDARD DETAILS

MAIL CLUSTER BOX UNITS

(NTS)

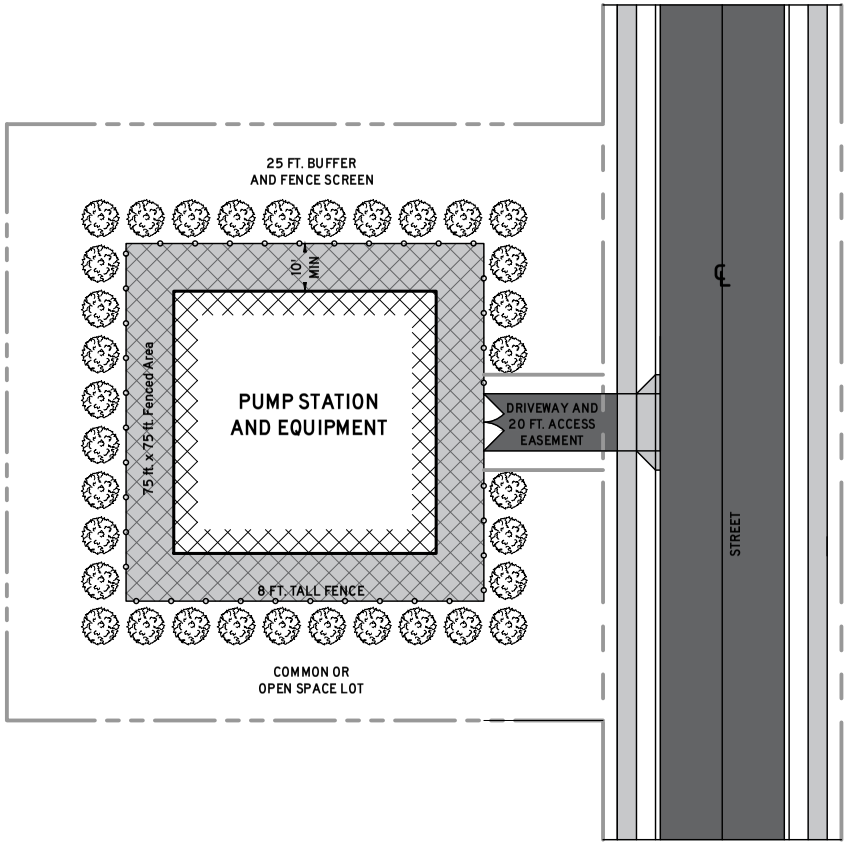
DATE
6/9/2022

MD-03

LETTER SIZE	DISTANCE FROM THE PUBLIC WAY
4"	115'
6"	150'
9"	300'
12"	400'
18"	560'
24"	750'
36"	1130'

NOTES:

1. PROPERTY ADDRESS SHALL BE ISSUED BY THE ENGINEERING DEPARTMENT AT THE TIME THE BUILDING PERMIT IS ISSUED.
2. NEW AND EXISTING BUILDINGS SHALL HAVE APPROVED ADDRESS NUMBERS, BUILDING NUMBERS, OR APPROVED BUILDING IDENTIFICATION PLACED IN A POSITION PLAINLY LEGIBLE AND VISIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY. THESE NUMBERS SHALL CONTRAST WITH THEIR BACKGROUND. ADDRESS NUMBERS SHALL BE ARABIC NUMERALS OR ALPHABET LETTERS. NUMBERS SHALL BE A MINIMUM OF 4 INCHES (102 M) HIGH WITH A MINIMUM STROKE WIDTH OF 0.5 INCH (12.7MM).
3. ALL COMMERCIAL STRUCTURES SHALL BE ADDRESSED IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE THAT IS ADOPTED BY THE CITY OF COLUMBIA.
4. ALL RESIDENTIAL STRUCTURES SHALL HAVE THE PROPERTY ADDRESS POSTED ON THE STRUCTURE AND BOTH SIDES OF THE MAIL BOX IF IT EXISTS.
5. UNDER EXTENUATING CIRCUMSTANCES THE CITY OF COLUMBIA MAY ALTER/CHANGE EXISTING ADDRESSES IN ORDER TO ENSURE THE SAFETY AND WELL BEING OF THE CITIZENS OF COLUMBIA.



CITY OF COLUMBIA
TENNESSEE

CITY OF COLUMBIA
DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION

STANDARD DETAILS

PUMP STATION

(NTS)

DATE
2/24/2023

MD-05