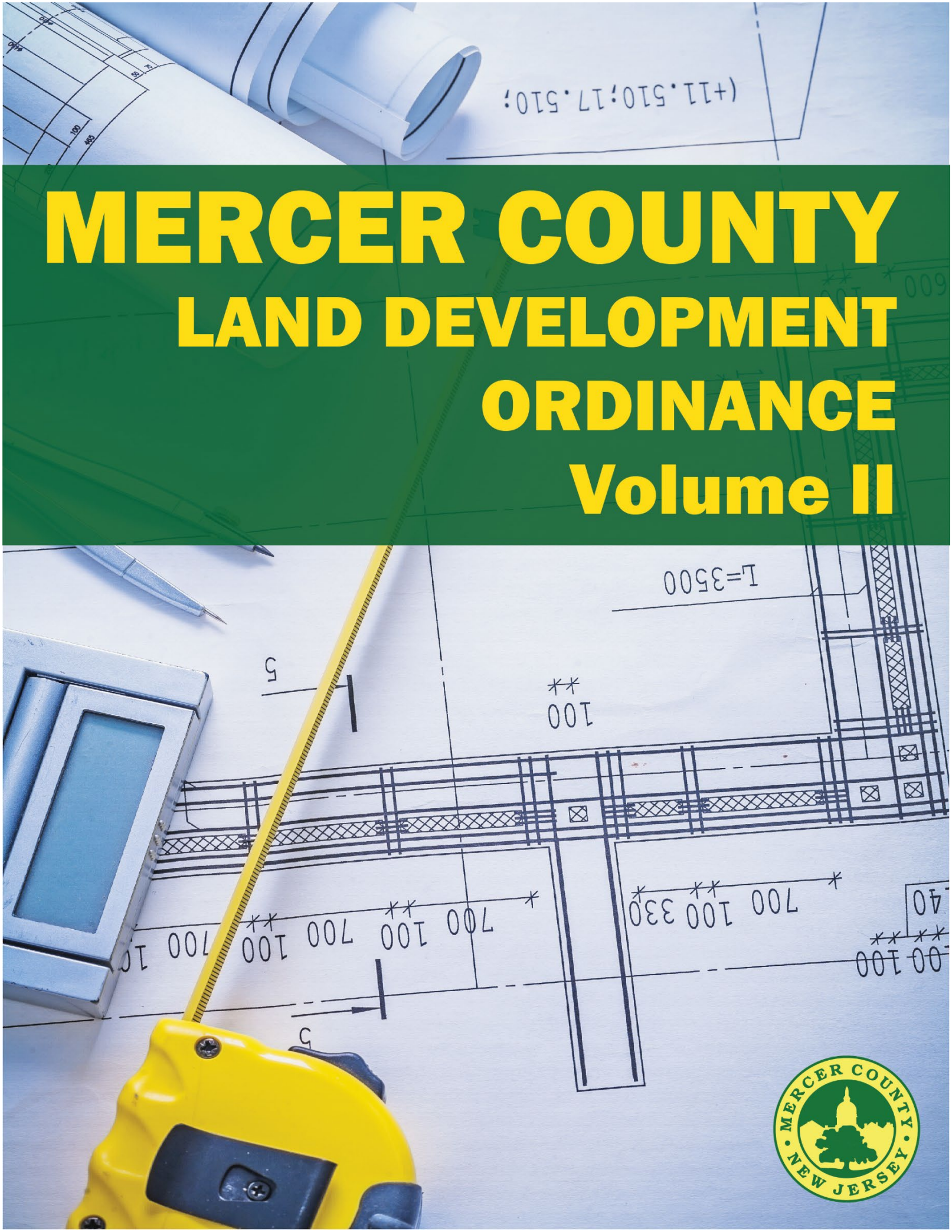
MERCER COUNTY
LAND DEVELOPMENT ORDINANCE
Volume II



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Mercer County Land Development Ordinance
Volume II: Development and Design Standards

Ordinance adopted by the Mercer County Board of Commissioners on May 23, 2024 and approved by County Executive May 24, 2024.

Ordinance effective as of June 12, 2024.

Prepared and Administered by the Mercer County Planning Board
&
Mercer County Department of Planning

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Volume II Table of Contents

Volume II
MERCER COUNTY DEVELOPMENT REGULATIONS & DESIGN STANDARDS

1. INTRODUCTION

To promote and maintain the health, safety, and general welfare of the public, Mercer County's Land Development Standards are intended to enable functional and attractive land development, to enhance safety and minimize adverse impacts to County roads and drainage facilities, and to protect shared natural resources.

With nearly 400,000 residents and thousands of local businesses located within Mercer County, it is crucial to work together to promote a more viable and livable area. Planning at the regional scale is critical to our economic vitality, fiscal management, environmental health, and community cohesion.

In the County Planning Act (N.J.S.A. 40:27-1 et seq.) the New Jersey Legislature gave Counties regulatory power over not just County facilities like its administrative buildings and parks, but also over the county highway system and surface water drainage system, which serve the region and not just municipalities. In most parts of New Jersey, and especially in Mercer County, longstanding municipal boundaries are no longer relevant to businesses' or residents' activities, especially with regard to air and water resources. As a result, to meaningfully influence environmental impacts associated with development, land use and transportation officials must act at a level where central cities and suburbs are considered together.

As part of this effort, the Mercer County Board of Commissioners endorsed a Complete Streets policy in 2012 to support safety and mobility for all modes of travel on County Highways, as per Resolution No. 2012-249, adopted April 26, 2012. Within this volume, several chapters address design considerations for complete streets. With complementary complete streets policies adopted by every Mercer municipality, it is essential for the County and its municipalities to collaborate on this and other actions and policies to promote the health, safety, and well-being of our region.

Other agencies and jurisdictions may have additional requirements applicable to development. The purpose of this document is to provide, in connection with subdivision and site plan applications requiring review and approval by the Development Review Committee of the Mercer County Planning Board, a comprehensive list of plan requirements, design standards, and guidelines for preparing engineering plans, studies and analyses.

A number of publications have been consulted and may be used for the purpose of developing design of traffic control devices, bridges, drainage facilities, culverts, roadways and roadside features. These include but are not limited to the following:

- A Policy on Geometric Design of Highways and Streets - American Association of State Highway and Transportation Officials (AASHTO)
- Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)
- New Jersey Department of Transportation Roadway Design Manual
- Mercer County Master Plan Mobility Element
- New Jersey's Stormwater Management rules (N.J.A.C. 7:8)
- Standards for Soil Erosion and Sediment Control in New Jersey

Several additional state and national guidance documents that provide design flexibility. These documents provide valuable Complete Streets guidance and recommendations when designing bicycle, pedestrian, and transit accommodations. They include the following:

- NJDOT Complete Streets Design Guide, 2017
- NACTO Designing for All Ages & Abilities: Contextual Guidance for High-Comfort Bicycle Facilities, 2017
- NJDOT Complete & Green Streets For All, 2019
- NACTO Urban Bikeway Design Guide, 2012
- AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, 2012
- NACTO Urban Street Design Guide, 2013
- FHWA Separated Bike Lane and Planning Design Guide, 2015
- NACTO Transit Street Design Guide, 2016
- FHWA Small Town and Rural Multimodal Networks, 2016
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004
- US Access Board Public Right-of-Way Accessibility Guidelines, 2023

1.1 APPLICABILITY

All developments subject to County jurisdiction pursuant to the County Planning Act, N.J.S.A. 40:27-1 et seq., which adjoin, include, or impact County Roads, County bridges or other structures, and/or County drainage facilities shall be designed in accordance with the standards and requirements set forth in this Ordinance.

1.2 SEVERABILITY

If any section, subsection, paragraph, clause, phrase or provision of this Ordinance should be adjudged invalid or held unconstitutional, such adjudication shall not affect the validity of the standards as a whole or any part or provision hereof other than the part so adjudged to be invalid or unconstitutional.

1.3 REQUIRED IMPROVEMENTS

The County Planning Board, upon recommendation by the County Engineer, shall require developments to include physical improvements for the safety and convenience of the traveling public. Improvements, where designated by the County Engineer, shall include but are not limited to: the dedication of additional Right-of-Way for roads or drainage-ways, adequate drainage facilities and easements, additional pavement widths, grading of Right-of-Way, curbs, sidewalks, crosswalks, bicycle facilities, shade trees, soil erosion and sediment control, stream protection, stormwater management, marginal access streets, reverse frontage, off-street parking facilities, and on or off tract highway and traffic safety improvements necessary to correct potential traffic and safety hazards which would be created by an increase in traffic volumes or impediments to traffic flows caused by the development

Off tract improvements or contributions to mitigate impacts for such improvements may be required by the County Planning Board to remediate any degradation of service or negative impact to County Roads or County drainage facilities resulting from the proposed development or subdivision.

2. REQUIRED SUBMISSION PLAN SHEETS & DETAILS

The plan and plat details listed below are generally considered to be the minimum details required to conduct a proper review of an application for development. The Mercer County Engineer may require additional details and information not listed based on the scope and characteristics of the application.

All plan and plat sheets shall include a title block containing the title of the plan, block and lot numbers and municipality in which the development is located, the scale of the plan and a north arrow. All sheets must also list the name, address, license number, signature and embossed seal of the person preparing the plan as well as include the date of original plan preparation and a list of all subsequent revision dates.

All submitted plan sheet shall be 24" x 36" (only) and shall be of an appropriate scale or as specified below. Larger plan sets will be rejected. *All subdivision plans shall be prepared in accordance with the New Jersey Map Filing Law (46:23-9.8) and signed and sealed accordingly by NJ Licensed Professional.*

County details are available on the County website or upon request from the Mercer County Engineering Division.

2.1 CONCEPTUAL SUBDIVISION OR SITE PLAN

Applicants are encouraged to submit conceptual plans and sketches to the County for early feedback. Conceptual plans are recommended to include but are not limited to the following items:

- The sketch plat/conceptual plan shall be based, at a minimum, on the municipal tax map or some similarly accurate representation. The sketch plat/conceptual plan must be drawn at a scale of at least 1" = 100' if the area to be developed contains 120 acres or less and at a scale of at least 1" = 200' if the area to be developed contains more than 120 acres.
- The portion of the lot being subdivided or developed and the remainder, if the entire tract is not proposed for development, and the area of each.
- The zoning district in which the proposed development is located and a schedule of zone requirements, e.g.; lot area, frontage, depth and set-back requirements, density, floor area ratio, percent of lot coverage, and parking requirements, with a comparison of zoning compliance relative to the proposed development.
- The location of existing structures within the area to be developed and within 200' of the site with an indication of which structures are to remain or to be razed.
- The location of existing roads and driveways within the area to be developed and within 200' of the site, and dimensions of the Right-of-Way widths of the existing and proposed roads.
- For frontages along County roads, all existing and proposed streets, roads, and driveways in both directions and both sides of the road, within 300 feet of the subdivision property line, and note the approximate distance in feet to the nearest signalized intersections
- The location of existing railroads within the area to be developed and within 200' of the site.
- The location of the proposed buildings, if the application is for a development other than a subdivision.
- The number of proposed lots or dwelling units as applicable.
- The total number of square feet of the proposed building(s) if the building(s) is for either non-residential development or for mid-rise or high-rise residential development.
- The location of proposed parking areas, proposed roads and/or driveways.
- The proposed lot lines and lot lines to be eliminated.
- The topography of the site and land within 200' of the site, shown at 2' contours.

- The location and direction of flow of existing streams, brooks, swales, ditches, lakes, ponds, drainage structures and drainage systems on the site to be developed and within 200' of the site.
- A delineation of the existing wood lines and clusters of trees within the area to be developed and along the existing road frontage.
- The location and width of all utility easements, drainage easements, access easements, etc., within the site to be developed and within 200' of the site.
- The location of any traffic signals along the site frontage or within 500' of the site.

2.2 MINOR SUBDIVISION REQUIREMENTS (PRELIMINARY AND FINAL)

Applicants submitting an application for a Minor Subdivision Plan shall submit a plan set that consists at a minimum of the following items:

- **Title Sheet**
- **Lot Layout Plan**
- **Survey Plat of Entire Tract**

Upon review and prior to deeming an application complete, the following sheets may also be required as part of the submission if applicable or deemed necessary by the Planning Board or County Engineer:

- Lot Yield Plan
- Topographic, Drainage and Utility Plan
- Landscape Plan
- Road Plan and Profiles and Cross Sections
- Stream Profiles and Cross Sections
- Traffic Control/ Detour Plan
- Traffic Signing and Striping Plan
- Tree Save Plan
- Site Drainage Area Maps
- Soil Erosion and Sedimentation Control Plan
- Final Minor Subdivision Plat
- County Facility Improvement Plan
- Construction Specifications for Traffic Signals on County Roads
- Lighting Plan
- Detail Sheets

Preliminary plans that combine the features listed above, such as a single plan showing drainage and utility features or a plan showing landscaping and lighting features, will be accepted for review provided the details of the individual features are shown clearly and are distinguishable without the plan being cluttered, confusing or difficult to interpret.

For detailed requirements of each plan sheet, please refer to Section 2.5 in this chapter.

2.3 MAJOR SUBDIVISION REQUIREMENTS (PRELIMINARY & FINAL)

Applicants submitting an application for a Major Subdivision Plan shall submit a plan set that consists at a minimum of the following items:

- **Title Sheet**
- **Survey Plat of Entire Tract**
- **Lot Layout Plan**
- **Topographic, Drainage and Utility Plan**

Upon review and prior to deeming an application complete, the following sheets may also be required as part of the submission if applicable or deemed necessary by the Planning Board or County Engineer:

- Lot Yield Plan
- Landscape Plan
- Road Plan and Profiles and Cross Sections
- Stream Profiles and Cross Sections
- Traffic Control/ Detour Plan
- Traffic Signing and Striping Plan
- Tree Save Plan
- Site Drainage Area Maps
- Soil Erosion and Sedimentation Control Plan
- Final Minor Subdivision Plat
- Final Major Subdivision Plat
- County Facility Improvement Plan
- Construction Specifications for Traffic Signals on County Roads
- Lighting Plan
- Detail Sheets

Preliminary plans that combine the features listed above, such as a single plan showing drainage and utility features or a plan showing landscaping and lighting features, will be accepted for review provided the details of the individual features are shown clearly and are distinguishable without the plan being cluttered, confusing or difficult to interpret.

For detailed requirements of each plan sheet, please refer to Section 2.5 in this chapter.

2.4 SITE PLAN REQUIREMENTS

Applicants submitting an application for a Site Plan shall submit a plan set that consists at a minimum of the following items:

- **Title Sheet**
- **Survey Plat of Entire Tract**
- **Lot Layout Plan**
- **Topographic, Drainage and Utility Plan**
- **Landscape Plan**
- **Detail Sheets**

Upon review and prior to deeming an application complete, the following sheets may also be required as part of the submission if applicable or deemed necessary by the Planning Board or County Engineer:

- Lot Yield Plan
- Road Plan and Profiles and Cross Sections
- Stream Profiles and Cross Sections
- Traffic Control/ Detour Plan
- Traffic Signing and Striping Plan
- Tree Save Plan
- Site Drainage Area Maps
- Soil Erosion and Sedimentation Control Plan
- Final Minor Subdivision Plat
- Final Major Subdivision Plat
- County Facility Improvement Plan
- Construction Specifications for Traffic Signals on County Roads
- Lighting Plan

Preliminary plans that combine the features listed above, such as a single plan showing drainage and utility features or a plan showing landscaping and lighting features, will be accepted for review provided the details of the individual features are shown clearly and are distinguishable without the plan being cluttered, confusing or difficult to interpret.

2.5 PLAN SHEET REQUIREMENTS

TITLE SHEET

All submitted subdivision and site plan sets are required to include the following items on the Title Page:

- Name and address of the owner of the property in question.
- Name and address of the applicant.
- A list of the names of the owners of property located within 200’ of the development by block and lot numbers.
- A listing of the titles of each sheet and sheet numbers contained in the preliminary set of plans.
- Existing major street names and County route numbers if applicable
- The zoning district in which the proposed development is located and a schedule of zone requirements, e.g.; lot area, density, lot frontage and depth, setbacks, and parking with a comparison of that provided relative to the proposed development.
- The portion of the lot being subdivided or developed and the remainder if the entire tract is not proposed for development and the area of each (if applicable).
- The number of proposed lots or dwelling units as applicable.
- The total number of square feet of the proposed building(s) if the building(s) is for either non-residential development or for mid-rise or high-rise residential development (if applicable).
- A table of the development standards required and/or permitted under the zone district within which the development is located and that which is provided under the proposed development plan.

LOT LAYOUT PLAN (SUBDIVISION ONLY)

The lot layout plan shall include but is not limited to the following:

- The existing and proposed lot lines and notes indicating which lot lines are to be removed, if applicable.
- The Right-of-Way lines of each proposed road.
- The easement boundary lines of all drainage easements, sight triangle easements, access easements, conservation easements, stream easements, bridge or culvert easements, etc.
- The existing and proposed Right-of-Way lines of all existing roads.
- The full width dimension of all existing and proposed road Right-of-Way, drainage easements, stream easements and access easements.
- The dimension of all Right-of-Way corner radii.
- The centerline of the Right-of-Way of all existing roads.
- The dimension of the existing and proposed Right-of-Way half width to the hundredths of a foot, as measured from the Right-of-Way centerline.
- The bearing and distance of each road Right-of-Way line and easement line.
- The bearing and distance of each lot line of each lot.
- The building setback lines of each lot in accordance with municipal zoning requirements.
- The area of each lot and the width of each road Right-of-Way.
- The phases or section boundaries of the development, if applicable.
- The proposed block and lot numbers
- The proposed street names

LOT YIELD PLAN (SUBDIVISION ONLY)

The lot yield plan shall be provided when a cluster design of the development is employed as permitted under municipal zoning regulations. The lot yield plan shall show the lot layout and road system as if a conventional subdivision design was employed in accordance with municipal zoning requirements.

- The lot yield plan shall include but is not limited to the following:
- The proposed lots and Right-of-Way of each proposed road.
- The dimension of each lot line of each lot.
- The building setback lines of each lot in accordance with municipal zoning requirements.
- The area of each lot and the width of each road Right-of-Way.

SURVEY PLAT

The survey of the property to be developed shall include but is not limited to the following:

- Existing lot lines with bearings and distances on the property being subdivided including any remainder.
- Existing survey monuments and markers on the property being subdivided including any remainder.
- Existing buildings and structures with type of use indicated on the property being subdivided including any remainder, and within 100’ of the property being subdivided.

- Existing roads, driveways, curbs, sidewalks, storm water and utility inlets and manholes on the property being subdivided including any remainder, and within 100' of the property being subdivided.
- Existing easements (e.g. utility, drainage, sight triangle and access) and road Right-of-Way on and abutting the property subdivided including any remainder.
- Existing road Right-of-Way centerline dimensions to the existing right- of-way lines on either side of the road on or abutting the property subdivided including any remainder.
- Existing road Right-of-Way centerline properly identified using the roadway name and County route number if applicable.
- Existing utilities with identification references as applicable (e.g., pole number and utility company) on the property being subdivided including any remainder, and within 100' of the property being subdivided.
- The location, size and direction of flow of all streams, brooks, drainage structures and drainage ditches on the property being subdivided including any remainder, and within 100' of the property being subdivided.
- The location and jurisdiction of existing traffic control devices within 100' of the property being subdivided including any remainder.

TOPOGRAPHIC, DRAINAGE AND UTILITY PLAN

A separate Utility Plan showing general drainage features and detailed stormwater and utility features will be required for review where such is necessary for clarity and ease of interpretation of the individual plan features.

The topographic, drainage and utility plan shall include but is not limited to the following:

- The plan shall include a survey baseline with stations and baseline offset dimensions at all points of curvature, points of tangency, angle points, beginning and end of work, manholes, storm sewer inlets, etc.
- A clear line demarcating the Proposed Limit of Disturbance (LOD) for the project.
- The existing and proposed fences within the development and within 100' of the development.
- The existing and proposed edges of road pavement along County Roads and along municipal roads that contain County drainage structures.
- The proposed edges of pavement for all new roads within the proposed subdivision.
- The location and width of existing and proposed roads and/or driveways within the development, on the opposite side of the existing road(s) that abut the development and within 300' of the development.
- The location and width of all existing and proposed depressed curb and vertical curb tapers.
- The location and dimension of existing and proposed driveway aprons.
- The location of existing and proposed handicap ramps.
- The location and width of sidewalks within the development and within 100' of the development.
- The existing and proposed curbs with notations indicating where existing curb is to be removed and/or replaced.
- The dimensions of all curb radii.
- The beginning and end of new curb and where new curb is to meet existing curb.

- The existing and proposed retaining walls within the development and within 100' of the development with top of wall and bottom of wall elevations.
- The beginning and end of portions of existing roads to be milled and resurfaced reconstructed or restored and a graphic representation of the areas to be milled and resurfaced, restored or reconstructed.
- The location of existing buildings with a note indicating which buildings are to remain and which buildings are to be removed.
- The location of each proposed building with first floor elevations indicated.
- The type of use of the existing and proposed buildings.
- The proposed lot lines and existing lot lines that are to be eliminated.
- The phases or section boundaries of the development, if applicable.
- The existing and proposed site topography and topography of land within 200' of the site shown at 2' contours.
- The high point of each road within the subdivision and within 350' of the subdivision.
- The location and width of all existing and proposed utility easements, drainage easements, access easements, landscape easements, conservation easements etc., within the site to be developed and within 200' of the site.
- The location, size, slope and type of material of existing and proposed underground utilities with invert and rim elevations at manholes
- The location of existing and proposed septic fields.
- The existing and proposed location of all utility poles and above ground utility equipment, including pumping stations and sanitary sewer treatment plants on and adjacent to the site and within 200' of the site and the identification number of all utility poles on and adjacent to the site and within 200' of the site.
- The location and direction of flow of existing and proposed stormwater assets ("Best Management Practices"), such as retention/detention facilities, permeable pavement, etc. as well as other surface water elements such as streams, brooks, swales, ditches and other water courses on the site to be developed and within 200' of the site. The direction of flow is to be designated with arrows.
- Soil Classifications within the property boundaries and where necessary to help illustrate the workings of a stormwater facility.
- The normal water surface elevation of all existing and proposed lakes and ponds within the site and within 200' of the site.
- The size, percent of slope, type, class of pipe and length of each segment of pipe of existing and proposed storm sewer systems on the site and within 200' of the site.
- The invert elevations of all storm sewer pipes at the beginning and end of each segment of pipe at storm sewer inlets, manholes, headwalls, flared end sections, detention and retention facility outlet structures, weirs, etc. At storm sewer inlets and manholes the invert elevations are to show which pipes are in-flowing and which are out-flowing.
- The elevations at the top and bottom of headwalls, weirs and outlet structure orifices.
- The existing and proposed grate elevation of all storm sewer inlets.
- The existing and proposed rim elevations of all storm sewer manholes.
- The location and type of existing and proposed storm sewer inlets and manholes.

- The existing and proposed top of curb and gutter elevations at 50' intervals except that additional elevations may be required at intersections to assure positive drainage or in areas where the minimum required slope cannot be achieved.
- The location and dimension of rip-rap aprons.
- Wetlands delineation
- New Jersey Flood Hazard Area delineations, using the latest NJ Design Flood Elevations delineated according to NJAC 7:13-3 [or most current iteration thereof].
- Riparian Buffers, delineated according to NJAC 7:13-4 [or most current iteration], and stream encroachment lines within the site and within 100' of the site.
- The percent of slope between each of the proposed gutter grades.
- The location of soil borings.
- The location of all existing and proposed guiderail and the type of guiderail end treatment.

LANDSCAPE PLAN

A Landscape Plan shall include but is not limited to the following:

- A delineation of the existing wood lines and clusters of trees within the area to be developed and along the existing road frontage.
- EXISTING LANDSCAPING: The diameter of trees measured at breast height (dbh), genus and species of trees, shrubs and other features and materials such as rocks, water, walls, fences and paving materials within 50' of the existing and proposed County Road Right-of-Way. Clusters of trees or shrubs within this area may be generally described.
- PROPOSED LANDCAPING: Identification of trees, shrubs, ground cover and perennials to be planted within the County Road Right-of-Way and within 50' of the proposed Right-of-Way and other materials such as rocks, water, walls, fences, and paving materials to be installed within the existing and proposed County Road Right-of-Way and within 50' of the existing and proposed County Road right-of- way.
- The number of trees, and shrubs to be planted along a tree line or within clusters grouped by genus and species and the number and identification of ground cover and perennials to be planted within the County Road Right-of-Way and within 50' of the proposed Right-of-Way.
- A legend of symbols used to identify the genus and species of all plant materials to be planted.
- A plant list of trees and shrubs identifying the genus, species and common name of proposed trees, shrubs and ground cover to be planted within the County Road Right-of-Way and within 50' of the proposed Right-of-Way. The list must include the size of all plant materials including trees, shrubs, ground cover and perennials to be planted and the average height of the planting at maturity.
- The location of existing and proposed sidewalks, fences, decorative walls, retaining walls and berms.
- Existing and proposed contour lines at 1' intervals.
- The location of all landmark trees (as defined below) within the project site and/or County Right-of-Way. Each tree shall be indicated on the landscape plan with an identification number, species name, diameter, elevation at plant base, and area of critical root zone or drip line. Landmark trees are those:
    - associated with a historic event or person;
    - having a direct impact on the development of an area;
    - associated with a scenic view or focal point; or

  - that has become noteworthy as a result of rarity or due to a peculiar, or rare, abnormality.

- The location of all Significant Trees, (defined as the largest known individual trees of each species in New Jersey as listed by the New Jersey Department of Environmental Protection (NJDEP) Bureau of Forestry; large trees approaching the diameter of the known largest tree; and/or species that are rare to that area or of particular horticultural or landscape value).
- A schedule of planting by optimum season. Schedule shall also include known time periods when specific plant material should not be installed.
- Details for the method of construction for all rock placements, water features, sculptures, monuments, art, fences, walls, and other building and paving materials located adjacent to the County Right-of-Way.
- Identification of areas to receive topsoil and seed or sod.
- Delineation of all easements including but not limited to: conservation easements, landscape buffer easements and sight triangle easements, drainage easements, utility easements, etc.
- Details of methods used to plant the trees and shrubs.
- Details of the rate of application of grass seed and method of planting.

ROAD PLAN, PROFILES AND CROSS SECTIONS

Road profiles and cross sections shall include but are not limited to the following:

- Baseline stations at 50’ intervals.
- Existing and proposed crown of the road.
- Existing and proposed top of curb and gutter of the road.
- Existing and proposed crown, gutter and top of curb elevations at 50’ intervals.
- Percent of the existing and proposed slope along the crown between stations.
- Percent of the existing and proposed slope along the gutter between stations.
- Percentage of the existing and proposed slope along the top of curb between stations.
- Location of existing and proposed underground utilities with slope of pipe and invert and manhole rim elevations.
- Location of existing and proposed storm sewers with slope of pipe, invert elevations and grate elevations at storm sewer inlets and invert and rim elevations at manholes.
- Location of existing and proposed drainage structures such as bridges, culverts and pipes that convey storm water flow across the road, with invert elevations.
- Elevations at the existing and/or proposed Right-of-Way line.
- Percent of proposed road cross slope between the crown and the existing edge of pavement and between the existing edge of pavement and proposed edge of pavement.
- Percent of slope between the existing and/or proposed Right-of-Way line and proposed edge of road pavement.
- Location of existing and proposed underground utilities with stations and pipe data such as size, type of pipe at road crossings and inverts and rim elevations at manholes.
- Location of existing and proposed storm sewers with stations and pipe data such as size, type of pipe at road crossings and inverts and grate elevations at inlets.

- Location of existing and proposed drainage structures such as bridges, culverts and pipes that convey storm water flow across the road, with type, size and invert elevations. Stream Profiles and Cross Sections

Stream profiles shall include but are not limited to the following:

- Station designations at 50' intervals along centerline of stream, or Thalweg.
- Normal water surface elevation
- Top of bank elevations
- Bottom of stream elevations
- Streambed invert (low point) elevations
- The 100-year storm-event and New Jersey Flood Hazard Area Design Flood (NJHADF) elevations.

TRAFFIC CONTROL PLAN/DETOUR PLAN

A Traffic Control Plan/Detour Plan shall be submitted where it is necessary to close a portion of or the entire County Road to accommodate road widening, road reconstruction, and/or utility work or where it is necessary to close a portion of or the entire municipal road for the extension of or reconstruction of a County drainage structure.

The Traffic Control Plan/Detour Plan shall include but is not limited to the following:

- All applicable Typical Application figures from the MUTCD (TA-1- TA 46) or NJDOT standard traffic control details should be provided on the plan.
- The type, size, and location of traffic control devices that shall be used during construction.
- If the County Road or municipal road at a County drainage structure is to be totally closed, a detour plan shall be submitted that indicates the route traffic will be diverted to during construction.
- The detour plan shall be approved by all other applicable bodies and agencies retaining jurisdiction (e.g. municipal police, municipal engineer, New Jersey Department of Transportation, etc.) of roads designated as part of the detour.

TRAFFIC SIGNING AND STRIPING PLAN

A Traffic Signing and Striping plan shall include but is not limited to the following:

- Existing painted centerlines, traffic islands, cross hatching, lane lines, shoulder lines/edge lines and stop bars, existing designated turn lanes, painted arrows, words and/or symbols, existing passing and no-passing zones, existing crosswalks, existing parking spaces and no-parking zones, existing loading zones and reflective pavement markers on the existing roads that border the development and are within 500' of the development.
- Proposed painted centerlines, traffic islands, cross hatching, lane lines, shoulder lines/edge lines and stop bars, proposed designated turn lanes, painted arrows, words and/or symbols, proposed passing and no-passing zones, proposed crosswalks, proposed parking spaces and no-parking zones, loading zones and proposed reflective pavement markers on the existing and proposed roads that border the development and are within 500' of the development and proposed road approaches to a County Road.
- Dimension of existing and proposed traffic lanes, shoulders and transitions.
- The location and length of existing traffic line striping to be removed by hydroblasting specified as the method used for removal.
- The width, color, and material of all proposed traffic line striping in accordance with Mercer County standards.

- All existing and proposed traffic signs with the *Manual of Uniform Traffic Control Devices* (MUTCD) designation and sizes, colors, and legends if custom designed.

Municipalities wishing to change signage and striping plans of a County Highway segment within their municipality should follow the directions outlined in appendix titled, "Mercer County Procedure for Municipalities Requesting Changes to Striping Plan on Mercer County Highways".

Signing and Striping plans shall be prepared at a scale of 1" = 20' or 1" = 30'. Signing and Striping plans shall indicate the following:

- Existing striping, including centerline, traffic islands and cross hatching, shoulder/edge line, lane markings, pavement marking symbols. Width and color of pavement markings must be indicated. Details, including width and color or pavement markings shall be provided.
- Limits of passing/no passing zones 1,000' from the termini of the lane transitions.
- Existing Traffic Signs by size and type with *Manual of Uniform Traffic Control Devices* (MUTCD Designation), to remain.
- Existing signs by size and type (MUTCD Designation) to be removed.
- Existing signs by size and type (MUTCD Designation) to be relocated and the location to which the sign will be relocated.
- Existing custom made signs by size, color, and legend to be removed, to remain or to be relocated
- Proposed signs by size and type (MUTCD Designation) to be installed.
- Proposed custom made signs by size, color, and legend.
- Sign and post installation details.
- Existing and proposed Right-of-Way.
- Utility poles, guiderail, mailboxes trees, and other roadside appurtenances which may impact the placement of signs.
- Existing raised pavement markers. Details including color and type of marking shall be included.
- Proposed raised pavement markers. Details including color and type of marking shall be included.
- Station and offset should be provided for all existing and proposed striping, pavement markings, signs.

Plans shall include a note stating that prior to the installation of traffic line striping and associated pavement markings, the proposed striping and pavement markings will be marked-out for inspection and approval by the Mercer County Engineer.

As-Built plans shall be provided as determined by the Mercer County Engineer.

TREE SAVE PLAN

A Tree Save Plan shall include but is not limited to the following:

- The limits of wooded areas within the County Road Right-of-Way and within 50' of the proposed County Road Right-of-Way if these areas are densely wooded.
- Identification of trees to be saved within densely wooded areas.
- Identification of trees to be removed within densely wooded areas.
- The diameter of the trunks of existing trees measured at breast height within the County Road Right-of-Way and within 50' of the proposed Right-of-Way for areas that are not densely wooded.

- The genus, species and common name of the existing trees within the County Road Right-of-Way and within 50' of the proposed Right-of-Way for areas that are not densely wooded.
- Identification of trees to be removed and trees to be saved within the County Road Right-of-Way and within 50' of the proposed Right-of-Way for areas that are not densely wooded.
- The method of protecting existing tree/s that is to be saved, during construction.

SITE DRAINAGE AREA MAPS

Drainage area maps must be submitted as part of the Stormwater Management Report for all applicable projects (see Chapter 9, Stormwater Management), and the County retains the right to require them any time it decides that they are necessary to properly review a proposal. In such cases, one pre-development drainage area map and one post-development drainage area map is required. Each of these maps shall highlight or otherwise call out all drainage areas tributary to any County Drainage Structure(s).

Pre-Development Drainage Area Map

Pre-Development Drainage Area Maps must include but are not limited to the following:

- Site topography with contours at 2' intervals.
- A delineation of the Proposed Limit of Disturbance (LOD).
- A delineation of each existing drainage area (DA) within the lot(s) in which the site is located, clearly showing the path(s) of shortest Time(s) of Concentration
- An identifying reference for each existing Best Management Practice [BMP] or other stormwater management asset depicted on the drainage area map.
- Inverts (points of lowest elevation) of all BMPs or other stormwater management assets. In the text of the report, or on a relevant worksheet, these inverts shall be compared to the Seasonal High Water Table (SHWT) elevations investigated within, or as close as possible to, the footprint of the BMP.
- A clear depiction and reference of each Point of Analysis used to compare pre- and post-development runoff. Points of analysis depict where runoff leaves the site. They can be for one drainage area, or more, where multiple drainage areas converge before leaving the site.
- When the proposed stormwater management control measures depend on the hydrologic properties of soils or require certain separation from the seasonal high water table, then a soils report shall be submitted. The soils report shall be based on on-site boring logs or soil pit profiles. 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 soils present at the location of the control measure.

Post Development Drainage Area Map

Post-Development Drainage Area Maps must include but are not limited to the following:

- Site topography with contours at 2' intervals.
- A delineation of the Proposed Limit of Disturbance (LOD)
- A delineation of each proposed drainage area (DA) within the lot(s) in which the site is located, clearly showing the path(s) of shortest Time(s) of Concentration
- An identifying reference for each BMP depicted on the drainage area map.

- A clear depiction and reference of each Point of Analysis used to compare pre- and post-development runoff. Points of analysis depict where runoff leaves the site. They can be for one drainage area, or more, where multiple drainage areas converge before leaving the site.
- The location and direction of flow of remaining and proposed retention and detention facilities , streams, brooks, swales, ditches and other water courses/runoff patterns on the site to be developed and within 200' of the site. The direction of flow is to be designated with arrows.
- The location of remaining and proposed retention and detention facilities, including recharge basins and dry wells, sub-surface retention or detention facilities, lakes and ponds.
- Seasonal high groundwater elevations at the point of lowest elevation for all remaining or proposed stormwater BMPs.
- The size, percent of slope, type, class of pipe and length of each segment of pipe for proposed storm sewer systems on the site and within 200' of the site.
- The invert elevations of all storm sewer pipes at the beginning and end of each segment of pipe at storm sewer inlets, manholes, headwalls, flared end sections, detention and retention facility outlet structures, weirs, etc.
- At storm sewer inlets and manholes the invert elevations are to show which pipes are in-flowing and which are out-flowing.
- The location and type of remaining and proposed storm sewer inlets and manholes.
- Wetlands delineations.
- NJ Flood Hazard Area delineations, using the latest NJ Design Flood Elevations delineated according to NJAC 7:13-3 [or the most current iteration thereof].
- Riparian Buffers, delineated according to NJAC 7:13-4 [or the most current iteration thereof].

SOIL EROSION AND SEDIMENTATION CONTROL PLAN

The Soil Erosion and Sedimentation Control Plan shall include all the appropriate measures, methods and techniques to control soil erosion and sedimentation as required by the Mercer County Soil Conservation District pursuant to the New Jersey Soil Erosion and Sedimentation Control Act (NJSA 4:24-39).

FINAL MINOR SUBDIVISION PLAT

Each final subdivision plat shall be 24" x 36" (only) and shall be of a scale of not less than 1"=50'.

The final subdivision plat shall be prepared in accordance with the New Jersey Map Filing Law (NJSA 46:23-9.8) and shall include but is not limited to the following:

- A key map at a scale of 1"=2,000' that clearly defines the area proposed for development, the location of the site and its relationship to the surrounding area.
- The block and lot numbers of all proposed lots within the subdivision.
- The name of streets within the subdivision and adjacent to the subdivision.
- The setback lines in accordance with municipal zoning requirements.
- The location of each proposed building.
- The proposed lot lines and existing lot lines that are to be eliminated.
- Bearings and distances of all lots lines within the subdivision.
- Mercer County Road Right-of-Way with dimensions from the centerline to the right-of- way line with bearings and distances along the boundary of the Right-of-Way.

- Sight triangle easements drainage easements, construction easements, access easements, conservation easements, easements for landscape buffers, utility easements, easements for maintenance and reconstruction of County drainage structures and drainage facilities with bearings and distances along the boundary of each easement.
- Notations indicating Right-of-Way, sight triangle, drainage easements, construction easements, access easements, easements for maintenance and reconstruction of County drainage structures and drainage facilities, granted and/or dedicated to the County of Mercer.
- The location of existing railroad Right-of-Way within and adjacent to the area to be subdivided.
- The number of proposed lots.

FINAL MAJOR SUBDIVISION PLAT

Each major subdivision plat shall be either 24" x 36" (only) and shall be of a scale of not less than 1"=50'.

The major subdivision plat shall be prepared in accordance with the New Jersey Map Filing Law (46:23-9.8) and shall include but is not limited to the following:

- A key map at a scale of 1"=2,000' that clearly defines the area proposed for development, the location of the site and its relationship to the surrounding area.
- The block and lot numbers of all proposed lots within the subdivision.
- The name of streets adjacent to and within the subdivision.
- The setback lines in accordance with municipal zoning requirements.
- A legend with municipal zoning requirements and a comparison of lot characteristics provided relative to the zoning requirements.
- Bearings and distances of all lot lines within the subdivision.
- The location of existing buildings with a note indicating which buildings are to remain and which buildings are to be removed.
- The location of each proposed building with first floor elevations indicated.
- The type of use of the existing and proposed buildings.
- The proposed lot lines and existing lot lines that are to be eliminated.
- Mercer County Road Right-of-Way with dimensions from the centerline to the right-of- way line with bearings and distances along the boundary of the Right-of-Way
- The location and width of existing and proposed roads and/or driveways within the development, on the opposite side of the existing road(s) that abut the development and within 300' of the development.
- Sight triangle easements, drainage easements, construction easements, access easements, conservation easements, easements for landscape buffers, utility easements, easements for maintenance and reconstruction of County drainage structures and drainage facilities with bearings and distances along the boundary of each easement.
- Notations indicating Right-of-Way, sight triangle easements, drainage easements, construction easements, access easements, easements for maintenance and reconstruction of County drainage structures and drainage facilities, granted and/or dedicated to the County of Mercer.
- The location of existing railroad Right-of-Way within and adjacent to the area to be subdivided.
- The number of proposed lots.
- Site topography with contours at 2' intervals.

- An indication of how access is to be provided (e.g., K-turn driveways).
- Notations indicating materials to be used to construct driveways.
- Identification of existing sidewalks
- The location, size, and material to be used for proposed sidewalks
- Wetlands delineation, limits of wetlands transition area, limits of the NJFHADF area, and limits of stream riparian zone within the site and within 300' of the site.
- The location, size, slope, and type of material of existing and proposed underground utilities with invert and rim elevations at manholes
- The location of existing and proposed septic fields.
- The existing and proposed location of all utility poles and above ground utility equipment, including pumping stations and sanitary sewer treatment plants on and adjacent to the site and the identification number of all utility poles on and adjacent to the site.
- The location and direction of flow of existing streams, brooks, swales, ditches, and other water courses on the site.
- The location of existing and proposed stormwater management facilities (BMPs), including areas of permeable pavement, dry wells, surface or sub-surface retention or detention facilities, lakes, and ponds.
- A delineation of the existing wood lines and clusters of trees within the area to be subdivided and along the existing road frontage.
- The diameter (measured at breast height for diameters 6" or greater), genus, and species of trees and shrubs within the existing and proposed County Road Right-of-Way and within 50' of the County Road Right-of-Way. Clusters of trees within this area may be generally described.
- Identification of trees and shrubs to be planted within the County Road Right-of-Way and within 50' of the proposed Right-of-Way.
- A legend of symbols used to identify the genus and species of trees and shrubs to be planted.
- A plant list of trees and shrubs identifying the genus, species and common name of proposed trees and shrubs to be planted within the County Road Right-of-Way and within 50' of the proposed Right-of-Way. The list must include the size of the trees and/or shrubs to be planted and the average height of the planting at maturity.
- The location of existing and proposed fences, decorative walls, retaining walls, and berms.
- Identification of areas to receive topsoil and seed or sod. (Note that minimum acceptable topsoil application is to a depth of 6 inches).
- Delineation of conservation easements, landscape buffer easements, and all other easements.
- Details of methods used to plant the trees.
- Details of pavement restoration as outlined on the Mercer County Website.

2.6 COUNTY FACILITY IMPROVEMENT PLAN

At the discretion of the County Engineer, plans for construction or reconstruction of County Roads, County Road intersections and/or County bridges and culverts may be required as submissions separate from the set of plans submitted for the associated subdivision or site plan. Where these plans are required for County facility improvements to be constructed adjacent to the proposed development, a limited amount of related on-site improvements shall be shown on the construction plans. Provide as applicable:

- Road and/or Bridge construction plans shall be signed and sealed by a professional engineer licensed in the State of New Jersey.
- Design package signed and sealed by a professional engineer licensed in the State of New Jersey. The design package shall include, but not be limited to the following:
- Survey field notes
- Right-of-Way/easement calculations
- Geometric calculations
- Drainage calculations
- Traffic report
- Structural calculations
- Provide project-specific Construction Specifications. Use the current NJDOT Specifications for Road and Bridge Construction as modified by the Mercer County Supplementary Specifications. Copies of these Supplementary Specifications are available on request from the Mercer County Engineering Department.

The design package must be sufficiently detailed to allow a thorough analysis and review of methods employed in the design of the project.

Plan Details for Improvements to County Roads

Plans for improvements to County Roads and the roadway plan sheets for County bridge improvements shall be provided in a separate plan set, on 24" x 36" sheets. Plans shall be on a scale of 1" = 30' and prepared in accordance with New Jersey Department of Transportation (NJDOT) requirements as demonstrated in the NJDOT Sample Plans and various design manuals, except a modified by County preference as indicated below. The following is a list of the minimum information which shall be included on typical roadway plans:

- Provide a baseline controlled field survey to be used to locate existing topographic features. The baseline shall be recreated, if available, from County records and clearly indicated on the construction plans. The beginning and end of the baseline, as well as all angle points shall have a minimum of three (3) ties each which shall also be indicated on the construction plans. The field survey shall be sufficient to include the probable project limits plus reasonable extensions to show matches to existing conditions. The minimum length of topographic survey along the roadway centerline shall be a minimum of:
- 500 feet from each end of each County bridge/culvert to be replaced/reconstructed;
- 300 feet from each end of each road segment improvement; and
- 300 feet along each leg of the intersection to be improved.
- In any case, survey shall be sufficient length to design and construct proper horizontal and vertical transitions and to encompass proposed restriping due to proposed traffic control measures such as lane shifts, etc.
- Provide Cross sections at a minimum of 50' intervals along the existing baseline. Cross sections shall, at a minimum, extend to the greater of:
- 50' on either side of the roadway centerline;
- 10' beyond proposed Right-of-Way; or
- 5' beyond the bottom (in fill conditions) or top (in cut conditions) of the roadway embankment.
- Provide enough additional survey to design proposed guiderail and attachments, if necessary.

Additional cross sections shall be provided at intersections, driveways, walkways, and other critical areas as appropriate that are affected by proposed improvements. Existing and proposed elevations shall be indicated at the top of curb, gutter, existing edge of pavement, at the centerline and change of proposed cross-slope. The cross section scale shall be either 1" = 5' or 1" = 10' for both the horizontal and vertical dimensions.

- Provide a roadway and gutter profile with a horizontal scale of 1" =30' and vertical scale of 1" = 3'.
- Provide a minimum of three (3) benchmarks tied to the North American Vertical Datum of 1988.
- Provide Baseline stations and offset dimensions (for curbs and edge of pavement) for all points of curvature (PC), points of tangency (PT), angle points (PI) and at beginning and end of work.
- Provide proposed roadway grade elevations by baseline station and offset if not clearly shown at 50' stations.
- Provide spot elevations at intersections as necessary. At a minimum, elevations shall be provided at PC's, PT's and the mid- point of each curve and at all observed high and low points, and at center of gutter line for all driveways and centerlines.
- Identify inlets and manholes by type and size and provide baseline station, offset, invert elevations, and elevations on the top of grate /rim. For inlets not in travel lanes, the gutter shall be depressed two inches at the grate and the gutter elevations on the calculated profile line indicated.
- Provide existing and proposed pipe diameters, slopes, material, and class. Drainage outfalls and end treatments such as flared end sections shall be located by baseline station and offset dimension. Inverts shall be provided for all existing and proposed pipes and outfalls. All Corrugated Metal Pipe identified located within County facility improvement limits must be replaced with Reinforced Concrete Pipe of similar size/capacity.
- Provide all necessary curve data including radii, tangent lengths, deflection angles and arc lengths.
- Provide existing and proposed Right-of-Way lines and property lines with bearings and distances. The length of all proposed Right-of-Way courses which begin or end at an existing Right-of-Way or property line shall be referenced using a dimension. All proposed Right-of-Way offsets shall be referenced by a set dimension from the survey baseline.
- Provide location of all existing and proposed utilities, both aerial and underground.
- Evidence of existing underground utilities shall be obtained. This shall include the location of any above ground markouts, when present, and all valves, manholes, sprinkler heads, hydrants, meter pits, etc. that can be detected.
- Existing above ground facilities: Telephone and Cable. Provide accurate locations for all poles, guy wires, and struts that may be present, and note the approximate size and number of cables, as well as their alignment.
- Existing above ground facilities: Electric. Provide accurate locations for all poles, guy wires, and struts that may be present, and note the approximate type and configuration of electrical facilities on the poles. For example, Transmission or distribution lines for type, and mast arm or spacer cable for configuration.
- Utility Poles: Whenever information is present, note the pole identification number. Also note the presence of street lights (with their orientation), risers (either electric or telephone), transformers, and any other pole mounted facility of significance. For poles supporting utility lines crossing intersections to be signalized, obtain elevations of street lights, and the elevations of electrical, telephone, and cable lines at the poles and at the sag points.
- The limits of Mercer County standard curb and pavement section at intersecting streets and driveways.

- The overall limits of work, as well as any limits of milling, leveling, overlay and/or limits of full pavement reconstruction. Record type of existing pavement (bituminous, concrete, gravel, etc.)
- Centerline and gutter line profiles, with grades and vertical curve data indicated.
- Driveway profiles with proposed improvements including grades and apron treatments.
- Signs: Record sign size, type, number of posts, stations and offsets.
- Provide NJDOT Standard Construction Details as modified by the Mercer County Engineering Department and/or Mercer County standard details required for improvements along County Roads. Only appropriate and applicable details shall be included with the construction plans.
- Show all centerline striping, shoulder lines, skip striping, pavement markings and gore striping.

Plan Details for Improvements to County Bridges & Culverts

Plans for improvements to County Bridge and culverts shall be provided in a separate plan set on 24" x 36" (only) sheets. Prepare plans in accordance with NJDOT requirements as demonstrated NJDOT Sample Plans and NJDOT Design Manual for Bridge and Structures, except a modified by County preference as indicated below.

- Provide a General Plan and Elevation of the Proposed Structure.
- Provide proposed Structure Section perpendicular to baseline.
- For Culverts, provide proposed Structure Section along roadway centerline.
- Provide a Working Point Layout Plan tying bridge construction to the construction baseline.
- Provide Footing and Pile Plans.
- Provide Abutment Plans including Elevation and Sections (not applicable for box culverts).
- Provide Pier Plans, including Elevations and Sections (no applicable for box culverts).
- Provide Wingwall Elevations and Sections.
- For Culverts, provide section layout plan and details for box/3-sided culverts.
- Provide superstructure framing plan.
- Provide bearing plan and details.
- Provide girder or beam details.
- Provide camber diagram and tables.
- Provide diaphragm details.
- Provide deck reinforcement and grading plan.
- Provide deck reinforcement section.
- Provide sidewalk plan and parapet elevation and sections.
- Provide all other details necessary to adequately construct the proposed structure.
- As determined by the County Engineer, the developer shall be required to provide as-built mylars (3 mil double matte) of the construction plans following completion of the improvements. If the developer fails to provide as-built mylars within 30 days of the completion of all punch list items, Mercer County may proceed against the bond to fund any necessary survey work.

Plan Details for Improvements to Traffic Signals on County Roads

Design shall comply with a Policy on Geometric Design of Highways and Streets by the American Association of State Highway and Transportation Officials (AASHTO), the Manual on Uniform Traffic Control Devices for Streets and Highways and current edition and the Mercer County Engineering Division Design Standards. Signal timing shall be derived utilizing accepted methodologies (i.e.: Synchro software). In addition, all timing and phase calculations shall be based on assuming fully or semi-actuated operation of the traffic signal.

The following are required prior to consideration of a Traffic Signal:

- A Gap Analysis
- A Traffic Signal Warrant Analysis
- Capacity Analysis with and without the proposed traffic signal including a comparison of levels of service, delay, available lane storage and 95th percentile que lengths.
- A summary of the most recent three-year crash history
- A comparison of existing and anticipated traffic volume with the criteria set forth in the Manual on Uniform Traffic Control Devices.

Design of traffic signals shall conform to the standards set forth herein, current Mercer County specifications, the NJDOT Standard Specifications for Road and Bridge Construction (Current Edition), *NJDOT Roadway Design Manual*, Mercer County Traffic Safety Engineering Division Design Standards and all other NJDOT manuals, guidelines and procedures with subsequent addenda.

A Traffic Signal Electrical Plan shall be prepared showing traffic signal hardware including controller, meter cabinet, junction boxes, phasing sequence, regulatory and street name signs mounted on signal standards and mast arms, conduit, block wiring diagram, signal heads and signs legend, construction notes including height of pole mounted signal heads, table of items to be constructed, existing and proposed Right-of-Way, utilities, guiderail and other roadside appurtenances affecting layout of traffic signal components. Pavement markings, excluding notes and labels, shall also be shown for informational purposes, but should be screened to minimize clutter. A note shall be placed on the electrical plan stating that the contractor shall obtain electrical service for the intersection in the name of the municipality within which the controller is located.

Construction details of hardware components must be included in the construction documents.

Traffic Signal Electrical, Signing/Striping and Traffic Signal Operational Plans shall be in 1”=20’ or 1” = 30’ scale. Prepared plans must be in accordance with NJDOT requirements as modified by County preferences.

2.7 DETAIL SHEETS

Detail sheets are to be placed at the end of the set of preliminary plans (subdivision construction plans). Generally details of Soil Erosion and Sedimentation Control measures should be placed on separate sheets. Any combination of details placed on single sheets for features such as: water and sewer utilities, storm water management facilities and drainage systems, pavement, sidewalk and curb construction, landscape, retaining walls, lighting, site identification signs and traffic signs, will be accepted for review provided the details of the individual features are shown clearly and are distinguishable without the plan being cluttered, confusing or difficult to interpret.

Detail sheets shall include but are not limited to the following:

- Typical cross section of a County Road in accordance with Mercer County Standards.
- Storm sewer inlet and manhole chamber details for each type to be constructed and for existing inlets or manholes to be modified.
- Storm sewer grate casting and manhole casting detail for each type to be constructed and for each existing inlet and manhole to be modified.

- Storm sewer flared end section, headwall and storm water retention and detention outlet structure details.
- Storm sewer weir/orifice and trash rack details for outlet structures.
- County storm sewer system pipe bedding detail.
- Detailed cross section of all Stormwater Facilities (BMPs) showing material layering and depths, underdrains (if present), invert elevation at lowest surface, and Seasonal High Water Table (SHWT) elevation.
- Soil Logs.
- County Road pavement cross section detail.
- County Road full faced curb detail.
- County Road depressed curb detail.
- County Road vertical curb taper detail.
- County Road pavement repair detail (with existing curb).
- County Road pavement repair detail (without existing curb).
- Concrete driveway apron detail.
- Sidewalk detail.
- Handicap ramp detail.
- Traffic sign details in accordance with the *Manual of Uniform Traffic Control Devices.*
- Traffic sign post and installation details.
- Reflective pavement marker detail.
- Traffic signal and foundation details.
- Guiderail details including end treatments in accordance with New Jersey Department of Transportation standards.
- Brick paver detail.
- Grass concrete paver detail.
- Ballard and bollard installation detail.
- Fence and fence installation detail.
- Deciduous tree planting detail.
- Evergreen tree planting detail.
- Deciduous and evergreen shrub planting detail.
- Guying and staking detail for tree.
- Tree protection detail.
- Stabilized construction entrance detail.
- Silt fence installation detail.
- Inlet filter detail.
- Sanitary sewer manhole detail.
- Water hydrant and valve installation detail.
- Water and sewer pipe bedding detail.
- Thrust block detail.
- Light pole and foundation details.

3. RIGHT-OF-WAY AND EASEMENTS

The Mercer County Planning Board may require dedications and/ or easements as outlined in the Mercer County Master Plan, Official County Map and this ordinance. All dedications and easements required by the Planning Board shall be submitted for review prior to receiving Final Approval. All necessary forms required to process such easements and dedications shall also be submitted to County staff which will then process and record the documents. Sample forms acceptable to the County are available on the Mercer County website or from the County Planning Department.

3.1 ROAD RIGHT-OF-WAY DEDICATION

Right-of-Way widths of County Roads that abut proposed subdivisions and site plans shall conform to the Right-of-Way widths on the Mercer County Mobility Element and Official County Map of which are an adopted element of the Mercer County Master Plan. If the existing Right-of-Way width of a County Road that abuts a proposed subdivision or site plan does not conform to the Right-of-Way width shown on the Mercer County Master Plan, a dedication of additional Right-of-Way shall be required.

If the subdivision or site plan is located on both sides of a County Road the full width of the Right-of-Way shown on the Mercer County Master Plan shall be dedicated to the County of Mercer. If the subdivision or site plan is along only one side of the County Road, one-half (1/2) of the required Right-of-Way width shall be dedicated, measured from the existing Right-of-Way centerline.

The subdivision or site plan shall include a notation showing the additional Right-of-Way. Bearings and distances shall be shown along the boundary of the easement/dedicated area on the subdivision or site plan. Please refer to the most recent version of the Mercer County Master Plan for up-to-date Right-of-Way requirements and Desired Typical Segments of County Roadways.

Where a County Road is intersected by an existing or proposed municipal road or state highway, or where two County Roads intersect, the Right-of-Way lines of the roads shall be connected at the intersection by a 35-foot corner radius, or as determined by the County Engineer.

The construction of and/or the conveyance of land to the County for left turn lanes, roundabouts, jughandles, and overpasses to a development may be required by the Planning Board.

Where by reason of special or unusual conditions, to conform to the adopted Mercer County Mobility Element, or to conform to a realignment plan or road widening plan determined to be necessary by the County Engineer, additional Right-of-Way in excess of the proposed Right-of-Way width shown on the Mercer County Mobility Element, may be required. If it is determined that the requirement for the additional Right-of-Way in excess of that shown on the Mercer County Mobility Element is not reasonably related to the anticipated impacts of the subdivision or site plan, the area of such additional Right-of-Way shall be reserved by way of a written Reservation of Lands for future acquisition and all building setbacks and site improvement setbacks shall be measured from the limits of the reserved area (see Right-of-Way Reservations).

The applicant shall be required to submit a legal description, a plan of metes and bounds signed by a Professional Land Surveyor and a title search, to the County of Mercer that describes the required Right-of-Way. Sample deeds can be found on the Mercer County Planning Department website.

In locations where a municipality desires on-street parking, an additional 8 to 16 feet of Right-of-Way is required to accommodate both parking and cyclists on shoulders. All required sidewalks and sidepaths shall be located within the County Right-of-Way so that the County is able to repair these facilities upon the property owner's failure to do so. If sidewalks and sidepaths fall outside the typical sections, an additional dedication may be required. In limited circumstances, sidewalks and sidepaths may be located within an easement area.

At intersections and high-volume access points, the County Engineer may require additional right of way for auxiliary lanes, relocated junction boxes and traffic masts, roundabouts, utility poles, lighting fixtures necessary for safety of the traveling public and/ or drainage improvements necessitated by improvements at high-volume access points. Where two roads classified as arterial or municipal collector in the adopted County Master Plan or Official County Map intersect an arterial or collector in the County Road System, the Right-of-Way requirement shall be increased by twenty (20) feet on both roads for a distance of two hundred and fifty (250) feet from the intersection of the centerlines.

Finally, like the State, Mercer County includes a Desirable Typical Segment that maintains the road in its current configuration (1A), applied where road widening would destroy the existing urban fabric. In such settings, the County will require Right-of-Way consistent with existing nearby parcels (also considering future operational and intersection improvements) and will work with municipalities on accommodating cyclists with strategies such as limiting parking to one side of the street.

3.2 RIGHT-OF-WAY RESERVATIONS

If the County Master Plan or the Official Map provides for the reservation of designated streets, ways, public drainageways, flood control basins, or public areas within the proposed development, before approving a subdivision or site plan, the County Planning Board may further require that such streets, ways, basins or areas be shown on the plat in locations and sizes suitable to their intended uses.

The County may reserve the location and extent of such streets, ways, basins or areas in perpetuity after the approval of the final plat or within such further time as may be agreed to by the County Planning Board.

The provisions of this section shall not apply to the streets and roads, flood control basins or public drainageways necessitated by the subdivision or land development and required for final approval. The developer shall be entitled to just compensation when the County purchases the reserved land not necessary as part of their development. In such instance, just compensation shall be deemed to be the fair market value of the land reserved.

Applicant is prohibited from constructing any permanent structures in the reserved area. Applicant shall not act to encumber the property and shall not allow anyone else to obtain any legal rights which affect the property without prior written consent from the County Planning Board.

3.3 SIGHT TRIANGLE EASEMENTS

Sight triangle easements shall be required at all existing and proposed road or street intersections with a County Road and at driveways as determined to be necessary by the County Engineer. Sight triangle easements should be in accordance with AASHTO standards and be shown on plans.

The applicant shall be required to submit a deed of sight triangle easement to the County of Mercer that describes the required easement area.

Where sight triangle easements are determined to be necessary at a proposed driveway on a County Road located in an urban area and where sight triangle easements are required at a new road or street on a County Road that is located in an urban area, the size of the easement may be adjusted when the strict application of sight triangle easement standards would result in a substantial reduction in existing on-street parking. Sight triangle easements at proposed road or street intersections shall be measured along the centerline of the existing and/or proposed road or street 90 feet from the point where the centerline of the proposed road or street intersects the centerline of the County Road and along the centerline of the County Road 300’ from the point where the centerline of the proposed road or street intersects the centerline of the County Road.

If it is determined by the County Engineer that the design of a subdivision does not allow for the standard sight triangle easements to be located entirely on property owned or controlled by the applicant, a modified sight triangle easement may be accepted, or County may require applicant to obtain necessary sight triangle from adjacent parcel. The minimum acceptable sight triangle easement area is described as follows:

- The area bounded by the Right-of-Way lines of the County Road and proposed road or street and a straight line connecting a point measured along the centerline of the proposed road or street 25 feet from the edge of pavement of the County Roadway and a point on the center of each lane of the County Road that approach the intersection a measured distance that equals 10 times the posted speed limit.
- Nothing shall be constructed, erected, placed, planted, or allowed to grow in a manner as to obstruct vision along the County Road from the road, street or driveway that approaches the County Road between a height of 30 inches and 10 feet above the centerline grade of either road whichever is lower.
- The height of objects within the sight triangle easement may be further restricted if the contour or grade of the land within the sight triangle easement is such that objects within the sight triangle easement would obstruct a driver's line of sight as described in these regulations.
- The plan shall show bearings and distances around the easement boundary and shall include the following notation: "Sight Triangle Easement granted to the County of Mercer".
- The applicant shall be required to submit a deed of sight triangle easement to the County of Mercer that describes the required easement area. Sample deeds can be found on the Mercer County Planning website.

3.4 DRAINAGE RIGHT-OF-WAY & EASEMENTS

Storm sewer systems that extend along a County Road that collect stormwater runoff from a County Road, storm sewer systems that convey storm water runoff from a County Road to a municipal, state, or private storm sewer system or storm sewer systems that convey stormwater runoff from a County Road to a waterway are under Mercer County jurisdiction.

Drainage easements to the County of Mercer shall be required for maintenance and reconstruction of the drainage systems described above. The size and extent of the drainage easements will be determined on a case-by-case basis as recommended by the County Engineer.

Developments traversed by a water course, drainage way channel or stream may be required to provide a storm-water drainage easement or drainage Right-of-Way of such width as may be deemed necessary and adequate for the purpose of maintaining and preserving the drainage facility. The existing natural drainage features shall be preserved in the design of the development.

Drainage easements shall be established for all existing and proposed open or enclosed storm drainage systems. The purpose of the drainage easement shall be to enter upon, operate and maintain the system. The easement shall be no less than 20 feet in width.

All stormwater detention and infiltration facilities shall provide easements to permit access for maintenance in accordance with minimum standards established by the County or Municipal Engineer. A minimum width of 20 feet for the entire perimeter of the facility should be provided.

Where a development by necessity, design, or both, must discharge storm drain runoff or alter the course of a stream to flow onto or across lands of the downstream property owner(s), for which there is no drainage easement of record, the developer shall secure the necessary easement and/or right-of-discharge agreement from the downstream property owner and submit a copy of the easement and/or right-of-discharge agreement to the County Planning Board.

The site plan or final development plat which is to be recorded with the Mercer County Clerk shall show all drainage easements and *"Dedicated to the County of Mercer" (Town, Township or Borough) for storm drainage purposes,"* whichever is appropriate. Bearings and distances shall be shown along the boundary of the easement on the subdivision or site plan.

The subdivision or site plan shall include the following notation: *"Easement granted to the County of Mercer for maintenance and reconstruction of the county drainage system."* Bearings and distances shall be shown

along the boundary of the easement on the subdivision or site plan. The applicant shall be required to submit a deed of easement to County of Mercer for maintenance and reconstruction of the county drainage system.

Other easements including but not limited to construction easements, slope easements, guiderail easements and other easements may be required as necessary to construct and maintain improvements to County drainage structures, County drainage systems and County drainage facilities associated with the development. The developer shall be responsible for the acquisition of any off-site easements and Right-of-Way that are necessary to construct improvements to County drainage structures, County drainage systems and County drainage facilities that are required in conjunction with approval of the development.

3.5 EASEMENTS FOR MAINTENANCE AND RECONSTRUCTION OF COUNTY DRAINAGE STRUCTURES

Easements for maintenance and reconstruction of the drainage structures (bridges, culverts, pipes, inlets, etc.) shall be required at all County drainage structures that abut a subdivision or site plan or those which are within 50 feet of a subdivision or site plan. The easements shall be 50 foot X 100 foot. The easement is to be measured 50 feet from and parallel to the centerline of the road in which the drainage structure is located and 50 feet from and parallel to the center of the waterway.

In special circumstances based on site conditions and road and/or stream alignment, the County Engineer may recommend easement dimensions that vary from the standard described above.

If replacement of the drainage structure involved is planned by the County and construction and/or temporary by-pass easements are proposed or anticipated by the County Engineer, additional easements and easement dimensions that vary from the standard described above may be required.

The required easement shall be shown on the subdivision or site plan at a scale of at least 1" =50. Bearings and distances shall be shown along the easement boundary. The plan shall include the following notation: *"Easement granted to the County of Mercer for Maintenance and Reconstruction of County Drainage Structure (insert County drainage structure reference number)".*

The applicant shall be required to submit a deed of easement to the County of Mercer for maintenance and reconstruction of the County drainage structure. Sample deeds can be on the Mercer County Planning Department website.

3.6 OTHER EASEMENTS AND RIGHT-OF-WAY

Other easements including but not limited to construction easements, slope easements, grading easements, roadway maintenance easements, guiderail easements, and traffic signal maintenance easements shall be required as necessary to construct and maintain improvements to County Roads, County drainage structures, County drainage systems and County drainage facilities associated with the development. The developer shall be responsible for the acquisition of any off-site easements and Right-of-Way that are necessary to construct improvements to County Roads, County drainage structures, County drainage systems and County drainage facilities that are required in conjunction with approval of the development.

The developer shall be required to attempt to acquire said off-site easements and Right-of-Way by making reasonable offers to the affected property owners. If the developer is unsuccessful in his/her attempts to acquire the necessary easements and Right-of-Way, proper documentation of same must be provided. The County Engineer on behalf of the Mercer County Development Review Committee, may recommend to the Board of Commissioners that the County undertake the acquisition of the required easements and Right-of-Way through negotiations and/or by instituting its of power of eminent domain.

The developer shall reimburse the County to cover all of the cost associated with the acquisition including but not limited to property parcel maps in accordance with County parcel map details, property appraisals,

legal fees, filing fees and the cost of the properties acquired. Sample construction easement deeds can be found on the Mercer County Planning Department website.

3.7 ENCROACHMENTS IN THE RIGHT-OF-WAY

Subdivisions and site plans shall be designed so that no part of the County Right-of-Way is used to conduct private business. The County Road Right-of-Way is to be kept clear of buildings, structures, any portion of a detention or retention basin, sales or merchandise displays, off-street vehicle parking areas, vehicles service areas, service equipment and appurtenances thereto, and fences, walls, advertising signs or business identification signs unless approved by the Mercer County Development Review Committee.

Commercial businesses located along a County Right-of-Way seeking to provide street furniture, decorative lighting, seasonal (non-permanent seating) seating, trash receptacles, benches, landscaping or other sidewalk amenity along sidewalks will have to sign an Indemnification Agreement for the use of seating/ temporary fixtures in any County Right-of-Way. A Maintenance Agreement may also be required depending on the improvement. County Engineer reserves to prohibit fixtures at any time and improvements may be removed at any time. If property owner wishes to remove landscaping or fixtures, they will be required to do so at their cost. A sample Indemnification & Maintenance Agreement can be found on the Mercer County website or provided by the Planning Department.

3.8 RECORDING RIGHT-OF-WAY AND EASEMENTS

Applicant shall submit all necessary documents including all Right-of-Way forms, exhibits, metes and bounds descriptions, and State of New Jersey forms for final recording to the Planning Board. Final documents need original signatures along with notarized signatures, seals and stamps as necessary. Three original copies are required as part of the final submission. County staff will process all documents for Commissioner approvals and record final documents with County Clerk.

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4. CONTROL OF ACCESS TO COUNTY ROADS AND ACCESS MANAGEMENT STANDARDS

Access management is the process limiting the number and spacing of intersections and driveways to improve roadway safety and capacity by reducing conflicts between through traffic and traffic entering and leaving the roadway. Safety for the travelling public is Mercer County's highest concern and responsibility.

Together, road classification and access point spacing criteria in the Mobility Element of the County Master Plan, with site circulation and design criteria in these Land Development Standards, constitute a County Access Management Code under NJSA 27:16-1.i and 27:7-91.c(1).

Because Mercer County is already extensively developed, with an advanced and continuing program of land conservation, most future development will be infill or the redevelopment of existing sites. The County's focus is on preserving sufficient access spacing, where it exists, and on encouraging shared access to commercial and multifamily development sites. Over time, this will reduce the number of conflicts at Access Points and increase safety for the travelling public.

4.1 ACCESS POINT SPACING

All (re)development projects along a County Highway are required to meet access spacing requirements set by the Mercer County Master Plan. The Mobility Element of the Mercer County Master Plan designates Access Levels for each segment of road under County jurisdiction. Mercer County Access Spacing Standards specified in the Mobility Element are, for the purposes of this Ordinance, designated as Critical Frontage values, which primarily impact the number of access points permitted on a site.

Access to a County Road may be prohibited if the site plan or subdivision also abuts a municipal road or adjacent parcel through which Reasonable Access may be provided.

4.2 HIGHWAY ACCESS AND SHARED ACCESS

Access to the County Road network is provided at the discretion of the County Engineer. This access may be modified by the County at any time in order promote the public health, safety, convenience and general welfare of the citizens of Mercer County. Existing Access Points may be restricted in movements, geometry, time of operations, or may be required to move or consolidate as needed. Before an existing driveway is required to be removed, the County will ensure that Reasonable Alternative Access shall be provided.

The intent of these provisions is to achieve no more than one Access Point for each contiguous County highway segment equal to the Critical Frontage for that segment. Where multiple contiguous sites with frontages less than the Critical Frontage for that roadway segment exist, accesses may be required to be combined until the Critical Frontage requirement is achieved. Consequently, it may be necessary to combine access for multiple sites to a single Access Point on the County Highway.

The beginning and ending of Critical Frontage segments must be decided case by case, considering environmental and geographic obstructions, roadway geometry and traffic patterns, adjacent land uses and lot size, and driveway and cross-access geometries.

Where necessary to achieve minimum Critical Frontage Access Point spacing, Reasonable Access to a proposed development site shall be through existing adjacent Access Points, whether those are on neighboring sites that have granted a cross-access easement, or on a lower-class road intersecting the County highway.

Alternatively, the proposed development site may be required to provide, at its cost, Reasonable Access for existing adjacent sites. If no connection can be made immediately, applicant shall build a stub drive to the property boundary.

Subdivisions creating two or more separate lots should be served by a single shared driveway or street. Flag lots are discouraged.

Cul-de-sacs, where proposed, shall extend to the boundary of the subdivision for later connection to neighboring subdivisions.

4.3 NUMBER OF ACCESS POINTS

Subdivisions and development sites with frontage on the County highway that exceeds the Critical Frontage may be permitted one driveway, access road, or ingress-egress pair.

Development sites with at least twice the Critical Frontage of the abutting County highway segment may, at the discretion of the County, be permitted additional Access Points that satisfy the Access Point spacing designated by the segment's Critical Frontage.

Development sites with frontage less than the Critical Frontage of the abutting County Highway may be permitted one driveway or ingress-egress pair. However, the final Subdivision or Site Plan approval letter shall state that the Access Point may be subject to closure if and when alternative Reasonable Access is provided.

4.4 CROSS ACCESS DECLARATIONS, EASEMENTS AND MAINTENANCE AGREEMENTS

To enable future access controls, Declarations of Cross Access shall be granted to all abutting parcels and recorded in the deed of a proposed development site. A sample Declaration of Cross Access may be found on the County website or provided upon request by the Planning Department.

When a proposed development site lacks Critical Frontage and alternative access is feasible via an abutting parcel with an existing Declaration of Cross Access, the developer of the proposed site shall negotiate and execute a shared maintenance agreement and bear the cost of improvements to a shared Access Point necessary to carry combined peak hour site traffic.

The shared Access Point may be on the proposed site or the abutting site, depending on topographic, traffic, and other conditions that impact feasibility and safety. In addition to Dedications of Cross Access for all abutting parcels, the developer shall also record with their deed, for this neighbor, a Cross Access Easement and Maintenance Agreement. A sample Cross Access Easement and Maintenance Agreement may be found on the County website or provided upon request by the Planning Department.

4.5 SITE CIRCULATION TO PROMOTE CROSS ACCESS

Site circulation shall be designed to facilitate cross access, including consideration of stub roads, frontage and backage drives, and through-access to rear lots, with the following exceptions:

- Incompatible uses or separation of vehicle types, for example, separating tractor trailers from passenger or micro-mobility vehicles.
- Geographic barriers such as streams, wetlands, or slopes greater than 8% with elevation difference greater than five (5) feet.
- Site and roadway safety concerns at the discretion of the County Engineer.

Cross access and through access drives shall be designed for a travel speed not greater than 20 MPH and for traffic operations in both directions unless dualized.

Stormwater facilities shall not be placed in alignments targeted for future cross-access.

Cross-site pedestrian and bicycle access shall be provided to complement vehicular access.

4.6 ACCESS POINT PLACEMENT

Vehicular Access Points shall be located as near as practicable to the outer boundary of the parcel's frontage on the County highway to facilitate future opportunities for cross access.

On corner parcels, Access Points, if permitted, shall be located as near as practicable the property boundary farthest from the intersecting roadway.

Access Point location may be refined based on safety factors, such as limits to stopping sight distance, alignment with an existing access adjacent or on the opposite side of the highway, or otherwise at the discretion of the County Engineer.

Turn restrictions, auxiliary lanes, corner radii, throat width and depth, and other design features may be specified, depending on highway and expected Access Point traffic volumes and speeds, at the discretion of the County Engineer.

Access Points may be permitted within a modern roundabout, at the discretion of the County Engineer.

Access Points are not permitted within a ramp, jughandle, or auxiliary lane.

Access Points are not permitted immediately adjacent to a County drainage structure or within the area protected by guiderail except upon approval by the County Engineer.

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5. SUBDIVISION AND SITE PLAN DESIGN STANDARDS

The following are Standards for the design of Site Plans and Subdivisions within Mercer County. Applicant shall adhere to the following design elements within site development:

5.1 ON-SITE VEHICLE TURN AROUND

Driveways on a County Road shall be designed so that vehicles are not forced to back out into the County Road. The on-site vehicle turn around must be designed in accordance with the appropriate design vehicle turning radii templates contained in the current edition of A Policy on Geometric Design of Highways and Streets published by American Association of State Highway and Transportation Officials (AASHTO) for the appropriate design vehicle.

Driveways on a County Road shall be designed so that vehicles do not maneuver into or out of on-site parking spaces within the portion of the driveway that is within 20 feet of a County Road.

5.2 DRIVE-THROUGH

Site circulation for drive-through commercial establishments shall be designed so vehicles do not stack through the site driveway and onto the County Roadway. The site plan shall provide a minimum distance of 50 feet from the rear of the maximum queue (or 95th-percentile queue) to a point where vehicles can freely maneuver into the site driveway circulation pattern.

Drive-through queueing shall not impede site circulation or parking.

5.3 DRIVEWAY WIDTH

SINGLE FAMILY OR TWO-FAMILY RESIDENTIAL

Single Family or Two-Family residential driveways shall be a minimum width of 12 feet, with a minimum apron flare of 1.5 feet on each side of the driveway or 10-foot radii provided at the terminus of the driveway at the County Road.

The maximum width of any single-family residential driveway is 22 feet.

Common or shared residential driveways shall be a minimum width of 20 feet, with a minimum apron flare of 1.5 feet on each side of the driveway.

NON-RESIDENTIAL & MULTI-FAMILY

The minimum width of a driveway for non-residential or multi-family residential use shall be 20 feet. In determining the width of the driveway, the types of vehicles that will use the driveway shall be considered. As a minimum, a new driveway must be designed to accommodate a single unit truck.

Driveway width above 50 feet for non-residential use and multi-family residential is at the discretion of the County Engineer. Median dividers at the intersection of the County Road shall not exceed 10 feet in width. The minimum corner radii where a new two-lane driveway intersects a County Road shall be 15 feet.

Where driveway aprons are permitted or required, the apron shall flare out a minimum of 3 feet on each side of the driveway at the terminus of the driveway at the County Road. Larger driveway flares may be required to ensure that vehicles turning into and out of the new driveway do not cross the centerline of the new driveway, cross the centerline of the County Road, or encroach on an adjacent traffic lane.

Wider lane widths and /or additional lanes may be required on driveways that intersect a County Road, based on traffic volumes, the types of vehicles that will use the driveway, and other traffic safety considerations, at the discretion of the County Engineer.

5.4 DRIVEWAY AND APRON MATERIAL

Driveways at a County Road shall be paved with bituminous concrete, reinforced concrete or other approved material for the full width of the driveway for a distance of at least 50 feet from the edge of pavement of the County Road.

Where concrete aprons are permitted or required, the aprons shall consist of Class "A" concrete with 28-day compressive strength of 4,500 PSI and 6% +/- 1.5% air entrained concrete (Portland cement), 6-inch thick and reinforced with welded wire fabric (6" X 6"– 8/8).

5.5 MAXIMUM DRIVEWAY SLOPE

The grade of a driveway approach to a County Road generally, shall be no greater than 3% for a minimum distance of 25 feet from the edge of pavement of the intersecting road. Based on site design constraints identified by the applicant's design professional, the maximum grade of the driveway approach may be exceeded. However, in no instance shall the driveway approach grade be more than 7%.

The vertical profile of the driveway approach to the County Road shall be designed to prevent impacting of the road or driveway by the front, rear or undercarriage of a vehicle.

Where concrete aprons are provided or required, the maximum grade differential between the slope of the driveway apron and the cross slope of the roadway shall be not more than 8%.

When a sidewalk is proposed across a driveway, ADA requirements shall be observed.

5.6 ANGLE OF DRIVEWAY

Driveways shall intersect the County Road at right angles (90° as measured at the centerlines of the intersecting driveway and the County Road). If it is not practical for the driveway to intersect the County Road at 90°, an additional angle of up to +/- 10° may be permitted at the discretion of the County Engineer.

5.7 DEPRESSED CURB AND APRON

Depressed curb shall be provided where curb is required, proposed, or exists along a County Road at a proposed driveway. The depressed curb shall extend to the points on either side of the driveway where the corner radius curb meets the curb along the County Road. Depressed curb is to consist of Class "A" 6% +/- 1.5% air entrained gray concrete (Portland cement) and measure 8-inch at the top, 9-inch at the base, 18 inches in height and have a 1 ½-inch reveal.

Reinforced concrete aprons shall be required at ALL driveways unless otherwise approved by the County Engineer. Aprons shall be class "A" air entrained concrete (Portland cement) 6 inch thick and reinforced with welded wire fabric (6" X 6"–8/8). Depressed curb must be provided where concrete aprons are required or provided.

Where new curb is required or provided along a County Road, the pavement must be saw cut for a 2-foot-wide trench and repaired in accordance with County requirements and standards contained in these regulations.

(1) Where a proposed driveway is to serve any land development providing 100 or more trips in any hour, 150 daily trips, or a SU or above design vehicle, curbed radii shall be provided.

(2) If the driveway serves a facility that requires sidewalk, a concrete apron and depressed curb shall be required. Concrete sidewalk shall be the width of the concrete apron.

(3) Where depressed curbs are used at driveways, the following specifications shall apply:

(a) Existing curb: To construct a depressed curb where curbing exists, the existing curb shall be modified in accordance with these standards.

(b) New depressed curb: New depressed curb shall be constructed in accordance with specifications as set forth by the County Engineer.

(4) Height of depressed curb above street pavement or shoulder: The top of the depressed curb shall be no greater than one and one half (1.5+) inches higher than the gutter grade.

(5) The horizontal transition from a depressed curb to a full height curb shall not exceed the length of the driveway flare.

5.8 SIGHT DISTANCES

INTERSECTION SIGHT DISTANCE

Proposed roads, streets and driveway access to a County Road shall be located to maximize sight distance along the County Road. New roads, streets and driveways shall be located so as to provide an unobstructed line of sight for Intersection Sight Distance as established by following the horizontal and vertical measurements outlined in the current edition of *A Policy on Geometric Design of Highways and Streets* published by American Association of State Highway and Transportation Officials (AASHTO).

Where the sight line criteria cannot be met and the applicant is unable to remove the line-of-sight obstruction, certain turning movements at the intersection may be prohibited. The applicant is responsible to ensure unobstructed lines of sight are maintained. Sight line easements are required when sight lines cross other properties.

5.9 LOADING AREAS

On-street loading areas within the County Right-of-Way or within sight lines or sight triangles are strongly discouraged. Loading areas must be designed and located so that vehicles can maneuver into and out of the loading areas without backing out onto the County Road.

5.10 PARKING

OFF STREET PARKING

Off-street parking spaces and parking isle lanes other than approved ingress and egress driveways shall not be permitted within the County Right-of-Way. Off-street parking areas shall be designed so that vehicles maneuvering into or out of parking spaces do not enter the path of vehicles entering the site. Off-street parking areas shall be designed to prevent the maneuvering of vehicles into or out of parking spaces within any portion of an entrance driveway that is within 20 feet of the edge of pavement of a County Road. Off-street parking areas shall be designed to permit all vehicles to turn around on the site to prevent vehicles from backing out onto the County Road.

Off-street parking shall not be permitted or placed in such a manner as to restrict intersection corner sight distance from the site driveway or an adjacent intersecting street or driveway.

The County of Mercer has no parking minimums and the number of parking spaces shall be determined by the municipality. Shared parking areas between neighboring sites and complementary site uses is encouraged as it reduces the amount of land devoted to parking and, in so doing, creates more opportunities for creative site planning and landscaping.

Off-Street parking areas shall accommodate both vehicle and pedestrian traffic traveling to and from the public Right-of-Way. Safe pedestrian crossings and walkways are encouraged as are traffic calming features such as speed tables. At least one safe, direct, and continuous pedestrian route shall be provided from the County Road Right-of-Way to main entrance of a development. Walkways shall be at least 4 to 6 feet wide depending on context, meet all ADA requirements and shall be well lit with appropriate scale lighting. Businesses with drive through windows shall separate pedestrian access from the drive-up areas to minimize conflicts.

For parking areas designed to accommodate 20 or more vehicles, a minimum of 10 percent of the parking surface area shall be planted as landscaped island areas. Landscaped islands shall be developed and reasonably distributed throughout the parking surface area so as to provide visual and climatic relief from broad expanses of pavement in accordance with the following standards:

- Tree islands and planting areas should be distributed throughout the parking lot to maximize tree canopy coverage over the entire parking lot. Large canopy trees shall be required to meet this requirement. Required planting areas may be consolidated into larger islands to provide greater soil volumes for plants or to accommodate stormwater BMPs.
- Each landscaped island that includes a tree shall have a soil volume of 800 cu. ft. per tree.
- Soil shall be excavated and amended to 30 inches depth with good quality loam soil.
- Shrubs or low, spreading plant materials may be planted within the required landscaped islands provided there is no impairment to the visibility of motorists or pedestrians.
- Plants tolerant of extreme heat, cold, salt and exhaust fumes are recommended.

ON-STREET PARKING

New on-street parking may be approved by the County Engineer and County Planning Board for new developments proposing to widen a County Highway for such a use, conditional that the posted speed limit of the County Road is 30 mph or less. Approved on-street parking shall not obstruct sight distance from the site driveway(s), pedestrian or cyclist crossings or an adjacent intersecting street or driveway. Approved on-street parking shall not contribute to municipal parking requirements.

For larger multi-family and commercial developments with significant traffic or turnover, a designated temporary parking area is encouraged to separate through traffic and drop off trips and deliveries. These temporary parking areas shall meet the requirements stated above for on-street parking.

5.11 ACCESS GEOMETRY AND ROAD, STREET, OR MAJOR DRIVEWAY INTERSECTION DESIGN

ACCESS POINT SPACING

See Chapter 4 for spacing and conditions on Access Points (commercial and multifamily driveways and stop-controlled street intersections)

Signalized intersection spacing is governed by the County Highway Access Class of a road segment as indicated in the Mercer County Master Plan Mobility Element, by safety considerations for stopping and entering sight distance, and by traffic progression patterns on the roadway. If driveway or street intersection signalization is considered, a pre-application meeting with the County Engineer is strongly encouraged.

ANGLE OF INTERSECTION

Roads, streets and major driveways shall intersect the County Road at right angles (90° as measured at the centerlines of the intersecting roads, streets or driveways and the centerline of the County Road). If conditions are not practical for the roads, streets or major driveways to intersect the County Road at 90°, an additional angle of up to +/- 10° may be permitted at the discretion of the County Engineer.

PROFILE OF A ROAD, STREET, OR MAJOR DRIVEWAY APPROACH TO A COUNTY ROAD

The grade of a road or street approach to a County Road generally, shall be no greater than 3% for a minimum distance of 25 feet from the edge of pavement of the intersecting County Road. Based on site design constraints identified by the applicant's design professional and accepted by the County Engineer,

the maximum grade of the major driveway approach may be exceeded. However, in no instance shall a road, street or driveway approach grade to a County Road be more than 7%.

The vertical profile of a road, street or major driveway approach to the County Road shall be designed to prevent impacting of the road, street or driveway by the front, rear or undercarriage of a vehicle.

A maximum grade differential between the slope of the new road, street or major driveway and the cross slope of the County Road shall not be more than 8%.

Where concrete aprons are permitted or required, the maximum grade differential between the slope of the driveway and the cross slope of the roadway shall not be more than 8%.

WIDTH OF ROADS, STREETS, OR MAJOR DRIVEWAYS THAT INTERSECT A COUNTY ROAD

Refer to the NJ Residential Site Improvement Standards (RSIS) for details on residential streets.

Non-residential streets may require wider lane widths and /or additional lanes on the new road or streets that intersect a County Road as is determined to be necessary by the Mercer County Engineer based on traffic volumes, the types of vehicles that will use the new road or street and other traffic safety considerations.

The minimum width of a new road or street at its intersection with a County Road shall be 34 feet. This minimum new road width shall consist of a 11-foot wide approach lane with a 6-foot wide shoulder and a 11-foot departure lane with a 6-foot wide shoulder.

Wider lane widths and /or additional lanes may be required on the new road or street that intersects a County Road as is determined to be necessary by the County Engineer based on traffic volumes, the types of vehicles that will use the new road or street and other traffic safety considerations.

5.12 CORNER RADII/CURB RETURN RADII

The minimum corner radii where a new two-lane driveway intersects a County Road shall be 15 feet. The minimum corner radii where a new road or street intersects a County Road shall be 25-feet. Larger corner radii may be required to ensure that vehicles turning into and out of the major driveway, road or street do not cross the centerline of the new road, street or major driveway, or cross the centerline of the County Road or encroach on an adjacent traffic lane.

The determination of the appropriate turning radii shall be based on turning radii of vehicle types that are anticipated to use the intersection. Required minimum turning radii for various vehicle types will be based on turning radii templates contained in the current edition of *A Policy on Geometric Design of Highways and Streets* published by American Association of State Highway and Transportation Officials (AASHTO).

5.13 AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS

All Road, Street and major driveway intersections shall be designed to satisfy ADA requirements. Where curb returns are provided or required at the intersection of a new road or street with a County Road, depressed curb must be provided in accordance with current ADA design requirements whether or not sidewalks are provided or the most recent Proposed Accessibility Guidelines for Pedestrians Facilities for Public Right-of-Way (PROWAG).

5.14 STOP SIGN AND STOP BAR

A stop sign and stop bar shall be provided at each road, street, or major driveway approach to a County Road. The stop bar and stop sign shall be designed, fabricated, located, and installed in accordance with the current edition of the *Manual of Uniform Traffic Control Devices*, in accordance with the design standards contained herein and as more specifically directed by the County Engineer.

5.15 LEFT TURN STORAGE LANES

A one-way or two-way left turn lane may be required on a County Road at the intersection of a new road or street. Left turn lanes shall be approved at the discretion of the County Engineer taking into consideration the physical conditions and safety of such movements.

Where a left turn lane is permitted or required by the County Engineer, traffic signs and traffic line striping must be installed in accordance with the current edition of the *Manual of Uniform Traffic Control Devices*, the current edition of *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO), in accordance with the design standards contained herein and as more specifically directed by the County Engineer.

5.16 BY-PASS AREAS

Where the left turning movements into the subject property from the County Road are not significant enough to warrant a formal left turn lane, the County engineer may require a traffic by-pass to allow through traffic to bypass a vehicle waiting to make a left turn into the subject site. This may require the acquisition of additional Right-of-Way, which is the responsibility of the developer. Traffic volumes and posted speed limits will be taken into consideration in determining the need for a by-pass area. Generally, a by-pass area will not be required on County Roads where the posted speed limit is less than 35 MPH, where through traffic volumes are low or moderate or where the proposed development is projected to generate fewer than 12 left turns from the County Road during the peak hour.

A by-pass area shall be a section of widened pavement along a portion of the County Road on the side opposite the new road that serves left turns into the development. The by-pass area shall extend to a distance of 100 feet in each direction along the County Road as measured from the extended curbline or edge of pavement of the new road. The widening for the by-pass shall extend to a distance not less than 20 feet from the painted centerline of the County Road and shall begin and end with pavement tapers designed in accordance with County design standards.

5.17 JUG HANDLE & OVERPASSES

Where left turns are prohibited from the County Road into a development based on high traffic volumes on the County Road and generated by the development, the construction of a jug handle or overpass may be required to provide for left turn ingress and/or egress. The installation of a traffic signal may be required in conjunction with a jug handle. Any property acquisitions necessary to construct the jug handle shall be the responsibility of the developer.

5.18 CENTERLINE AND LANE TRANSITIONS

Where the painted centerline of the County Road is shifted to provide for a left turn lane or to create a by-pass area on the opposite side of the development, the centerline and/or lane lines shall be re-painted with the appropriate transitions in accordance with the *Manual of Uniform Traffic Control Devices* and *NJDOT Roadway Design Standards.*

5.19 CENTER ISLANDS/TRAFFIC CONTROL ISLANDS

Where center islands are provided within a new road or street that intersects a County Road the minimum width of the new road or street approach to a County Road shall be a minimum of 17 feet which shall consist of a 12-foot lane and minimum 5-foot shoulders on each side of the lane. Required width will be upon approval by the County Engineer.

Where center islands are provided within a new road or street that intersects a County Road, the minimum width of the new road or street departure from the County Road shall consist of a 12-foot lane with a 1-foot (min.) shoulder between the lane line and the center island and a 3-foot (min.) shoulder on the right side of the lane line. Required width will be upon approval by the County Engineer.

Where center islands are provided in a new road or street at a County Road, no portion of the island shall be located within the County Road Right-of-Way unless a traffic control island is required by the County to prohibit turning movements into or out of the subdivision.

Center Islands to restrict turning movements shall be designed in accordance with design standards contained herein and as more specifically directed by the County Engineer.

A traffic control island may be required at the intersection of a new road or street and a County Road to prohibit turning movements, to separate traffic lanes, to create ramps for right turns into or right turns out of a subdivision and/or to create a refuge for pedestrians crossing the intersection, based on but not limited to, one or more of the following:

- Required intersection sight distance cannot be provided,
- A left turn lane cannot be provided on the County Road,
- Left turns into or out of the new road or street would require vehicles to cross more than one lane of traffic in each direction on the County Road, including a center left turn lane,
- There would be insufficient gaps within the flow of traffic on the County Road to safely permit left turns into and/or left turns out of the site,
- The new road or driveway would be in close proximity of an existing intersection,
- The new road or driveway would be located across from or within a merge lane, acceleration or deceleration lane, or entrance or exit to a ramp or jughandle,
- There are reasonable alternate access provisions, such as a jughandle(s) that provide for U-turns,
- The site has frontage on an adjacent municipal road or state highway,
- The existing road circulation patterns in proximity of the site permit vehicles to enter or exit the site from either direction of travel,
- Relatively high volumes of traffic will enter or exit the subdivision

Traffic control islands shall be designed in accordance with the current addition of the *Manual of Uniform Traffic Control Devices*, the current edition of *A Policy on Geometric Design of Highways and Streets* published by American Association of State Highway and Transportation Officials (AASHTO), in accordance with the design standards contained herein and as more specifically directed by the County traffic engineer.

5.20 ACCELERATION / DECELERATION LANE

Where deemed necessary by the County Engineer, acceleration and deceleration lanes shall be provided. The length of these lanes and associated lane transitions will be per the *Manual of Uniform Traffic Control Devices*, the current edition of *A Policy on Geometric Design of Highways and Streets* published by American Association of State Highway and Transportation Officials (AASHTO) and as determined by the County Engineer based on the traffic generated by the development and the existing and projected traffic on the abutting County Road.

5.21 EMERGENCY ACCESS

Emergency access shall be a maximum width of 24 feet and shall be designed so as not to be readily visible and not usable by the general motoring public. The emergency access should be gated and signed to allow access for emergency vehicles only. Emergency access drives shall be located to allow for the safe ingress and egress of the emergency vehicles.

The emergency access from the County Road to the development must consist of grass concrete pavers or equivalent and be designed in accordance with the latest version of the International Fire Code (IFC)

Use of the emergency access to accommodate pedestrians and/or bicycles shall be permitted and designed accordingly.

5.22 TEMPORARY CONSTRUCTION ACCESS

Temporary construction access on County Roads may be permitted at the discretion of the County Engineer. Any entrance must provide and ensure adequate sight distance for drivers of vehicles entering and exiting the driveway. In considering approving such access the County Engineer will take into consideration the acceleration and deceleration rates of the construction vehicles. Soil conservation methods in accordance with NJ Standards for Soil Erosion and Sediment Control must be employed to prevent the tracking of soils onto the County Road.

Paving of a portion of the driveway at the County Road may be required at the discretion of the County Engineer. A Mercer County Highway Department Road Opening permit must be obtained for any driveway to be used for construction access whether such driveway is temporary or is at the approved location for the site access.

6. COUNTY ROAD DESIGN STANDARDS

The design of roadway improvements shall be in accordance with the current editions of:

American Association of State Highway and Transportation Officials (AASHTO)

A Policy on Geometric Design of Highways and Streets

Roadside Design Guide

New Jersey Department of Transportation

Roadway Design Manual

Standard Specifications for Road and Bridge Construction

Standard Roadway Construction/ Traffic Control/ Bridge Construction Details and Electrical Details

Federal Highway Administration (FHWA)

Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)

Mercer County

*Design Standards and Details**

Mercer County Master Plan

Official County Map for County Roads and Drainage

(*) The design of any development shall conform to the proposals and standards contained in the adopted County Master Plan or Official County Map for County roads and drainage facilities and the standards and requirements contained in this resolution, as amended and supplemented.

6.1 COUNTY ROAD WIDTH

The minimum width of a County Road from edge-to-edge of pavement shall be 40 feet. The minimum half-width of a County Road that abuts a development shall be 20 feet. The 20-foot half-width shall be measured from the painted centerline of the road or the centerline of the County Right-of-Way, whichever results in the larger improvement. Final required road width will be determined by the County Engineer.

The Right-of-Way requirements for existing and proposed County roads shall conform with the classification of County roads contained in the adopted County Master Plan or Official Map and the improvements as defined on the diagram of "Cross Section Requirements". The Classification of County Road and Master Plan minimum Right-of-Way requirements are provided within the County Master Plan.

6.2 LANE WIDTHS

Other County Road design configurations may be required where additional lanes are necessary as determined by the County Engineer. The following lane widths shall be provided on County Roads. All lane widths are ultimately at the discretion of the County Engineer:

- Through lanes with shoulder or bike lane shall be 11 feet wide
- Through lanes without shoulders shall be 16 feet wide
- Left turn lanes shall be 12 feet wide
- Right turn lanes shall be 16 feet wide
- Two-Way Center Left Turn Lanes shall be a minimum of 12 feet wide.

- Shoulder Width – When required by the County Engineer, shoulder widths shall be a minimum of 5 feet wide and a maximum width of 14 feet wide in accordance with the County Master Plan.

6.3 ROAD CROSS-SLOPE

Where developments abut County Roads and marginal roads or reverse frontage are provided, widening of a County Road or new road construction shall be designed to obtain the best practical horizontal and vertical alignments. The cross slopes on a widened County Road shall be between 2%. Cross slopes on new roadways shall be 2%. The minimum cross slope for overlays of existing roadways shall be 2%. Careful consideration shall be given to impacts on existing intersections, driveways, and sidewalks.

6.4 SUPERELEVATION

Superelevation of a County Road is not permitted without the approval of the County Engineer. In those circumstances where Superelevation is permitted, the grade of the roadway cross section shall be broken a minimum of 3 feet from the outside curb line or edge of pavement to provide for a minimum 2% cross slope to the gutter.

6.5 CROWN AND GUTTER PROFILE

The minimum crown and gutter profiles shall be 0.5%. Careful consideration shall be given to impacts on existing intersections, driveways, and sidewalks. On sag curves, the gutter line profile grades may need to be broken to maintain the minimum 0.5% required. If permitted by the County Engineer, where the gutter profile is less than 0.5%, concrete curb and gutter and/or concrete swale must be provided.

6.6 PAVEMENT SECTION

The County pavement cross-section specifications are:

- Surface course – NJDOT HMA 9.5M64 Surface Course , 2” thick
- Base course - NJDOT HMA 12.5M64 Base Course, 8” thick
- Sub-base course - Dense-Graded Aggregate, 8” thick conforming to the standards of the current New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction (As required by County Engineer)

The minimum final pavement thickness for any roadwork shall be not less than 10-inches, or 18-inches including Dense-Graded Aggregate.

6.7 PAVEMENT JOINT FOR ROAD WIDENING

NO EXISTING CURB

The County Road shall be sawcut 2 feet from the edge of the existing pavement where curb does not exist. The standard County Road pavement section shall be installed between the sawcut and the new edge of pavement or new curb line.

EXISTING CURB

The County Road shall be sawcut 2 feet from the curb line. The standard County Road pavement section shall be installed between the sawcut and the new edge of pavement or new curb line.

6.8 PAVEMENT OVERLAY/RESURFACING

If determined to be necessary by the County Engineer, a 2-inch overlay shall be provided along the development frontage from the existing centerline to the new curb line. Milling will be required to key in the new pavement at the centerline.

Pavement restoration must be recorded on site or subdivision plans. Where the County Road is to be resurfaced/overlaid the area to be resurfaced/overlaid shall be milled for at least 50 feet from the limits of work at either end. Feathering into the adjacent pavement will not be permitted.

6.9 PAVEMENT MARKINGS

Pavement marking materials installed on a County Road shall be in accordance with the current NJDOT Standard Specifications for Road and Bridge Construction.

The removal of existing centerline markings across from the driveway of a large development may be required by the County Engineer. If required, the existing centerline shall be removed by hydroblasting method to a minimum of 25 feet on either side of the extended centerline of the new driveway. Where centerline markings are altered due to the installation of left turn lanes, the plans must indicate the limits of No Passing zones on the approach and departure sides of the proposed lane striping.

Where passing zones fall below the minimum criteria established by the MUTCD, the passing zones must be eliminated, and a no passing zone shall be installed.

Lane lines shall be used to delineate two separate travel lanes, where traffic moves in the same direction.

Edge lines shall be used to delineate the right edge of the travel lane. Existing edge lines shall be removed a minimum distance of 25 feet from the centerline of a new street that enters the County Road.

Cross-hatching shall be installed to delineate painted channelizing islands.

Stop bars shall be used at all new street and driveway locations. Stop bars must be located a minimum of 4 feet behind the extended edge of pavement of the County Road or a minimum of 4 feet behind an existing or proposed depressed curb for existing or future handicap ramps.

Pavement markings consisting of words and symbols shall be used to indicate mandatory lane use.

Painted crosswalks shall be required at locations where a new public street enters the County Road where sidewalks exist or are proposed. Crosswalk lines across municipal roads or County Roads shall be of a high visibility Continental or Ladder configuration.

Raised pavement markings (RPM's) shall be installed at locations where existing RPM's require removal as a result of modifying the centerline location. RPM materials, and installation shall conform to current New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction.

6.10 CURB

Curb must be provided along the development property that abuts a County Road. The curb line must be located no closer than 20 feet from the painted centerline of the County Road. The curbing shall be constructed of Class "A" gray air entrained concrete constructed following the Mercer County Standard Detail, unless otherwise specified by the County Engineer. Based on existing conditions in the area surrounding the site and where the site frontage is minimal, a reveal differing than the County Standard or Belgian Block Curb may be required as determined by the County Engineer.

Vertical curb tapers shall be required at the beginning and end of a new curb line where existing curb does not exist along the properties adjacent to the new curb line. Vertical curb tapers shall be 10-foot in length, 2-inches in height at the low end and meet the height of the new curb at the high end.

6.11 PAVEMENT REPAIR FOR REPLACEMENT OF EXISTING CURB

Where curb along a County Road is to be replaced, the existing curb shall be removed; the County Road pavement shall be sawcut 2 feet from the curb line through the surface course of pavement only. The surface course of pavement shall be removed and the new curb shall be face formed. The surface course of pavement shall be replaced with County Standard Surface Course between the sawcut and new curb.

6.12 TREATMENT OF THE COUNTY RIGHT-OF-WAY AND AREA IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY

The area behind the curb/edge of pavement and within the County Right-of-Way must be graded at either a 2% incline or decline. The area must be treated with 5-inches of topsoil hydro-seeded or fertilized and seeded in accordance with Mercer County Soil Conservation District standards. Grading from the Right-of-Way back into the development property must be at a maximum slope of 4 feet horizontal to one (1) foot vertical.

6.13 UTILITY POLES

The presence of new or relocated utility poles in the Right-of-Way shall be avoided where feasible. Underground installation shall replace overhead lines within the limits of the site frontage along the County right-of-way unless otherwise determined by the County Engineer.

Utility poles shall be located or relocated a minimum of 30 inches from the proposed front face of curb or edge of pavement to the front face of a utility pole on a County Road. A separation of 12-feet is preferred.

Utility Poles may not be relocated into an existing or proposed sidewalk or sidepath. The proposed location of utility poles shall be in consideration of the proposed sidewalk or sidepath and landscaping. The County Engineer may authorize adjustments to the strict adherence to this standard for relocations of three (3) poles or less. The applicant must provide a letter to the County stating that the utility company approves the location of the utility poles.

Refer to Chapter 13 of this volume for more information regarding Small Wireless Facilities.

6.14 SIDEWALKS

Concrete sidewalks are required along all County Roads. Sidewalks are to be installed 5 feet from the front face of curb unless otherwise directed. If a sidewalk is required as a condition of approval under this ordinance, such sidewalk shall be constructed in accordance with local specifications, Redevelopment/ Rehabilitation Area Plans or local design guidelines if applicable. Sidewalks within the County Right-of-Way, for developments abutting County roads, shall be constructed to meet the following standards:

Sidewalks shall be:

- 4 foot minimum wide in rural areas;
- 5 foot minimum wide in suburban areas;
- 6 foot minimum wide in any urbanized residential areas;
- 8 foot minimum in urbanized commercial areas;
- All sidewalks shall be at least 4 inches thick, except where automobile driveways cross the same, in which case the sidewalks shall be at least 6 inches in thickness for residential driveways and at least 8 inches in thickness for commercial and industrial driveways for that portion used as the driveway. Where sidewalk crosses a driveway, concrete must be reinforced with welded wire fabric (6" x 6").
- All concrete in the County Right-of-Way shall be Class A with 28-day compressive strength of 4500 psi.

- 6% +/- 1.5% air entrainment
- 2% cross slope.
- Expansion Joints - Construct ½-inch wide expansion joints, placed at intervals of approximately 12-15 feet, with preformed joint filler.
- Control/Contraction Joints - Construct transverse joints at equal intervals from expansion joint to expansion joint to provide uniform panel lengths not exceeding the width of the sidewalk. The joint should penetrate ¼ of the sidewalk thickness.
- All edges shall be neatly rounded to 1/4 inch radius.
- Where existing 4-foot-wide sidewalks exist and are allowed to remain, a passing area measuring a minimum of 5 foot x 5 foot must be provided at 200 foot intervals in accordance with ADA requirements.

6.15 CROSSWALKS

Marked crosswalks are an essential tool for channeling pedestrian movement in a predictable manner across roadways. Higher-visibility crosswalks have been shown to increase motorist yielding and channelization of pedestrians, leading the FHWA to conclude that high visibility pedestrian crosswalks have a positive effect on pedestrian and driver behavior.

- Crosswalks shall be provided in heavy pedestrian crossing areas. Additional crosswalks may be required at the discretion of the County Engineer.
- Crosswalks shall be planned, designed, and installed to conform to the specifications in the Manual on Uniform Traffic Control Devices (MUTCD).
- Detectable Pedestrian Warning Surfaces shall be provided in accordance with MUTCD requirements. Pedestrian countdown signals and call buttons must also be provided.
- Accessible Pedestrian Signals (APS) shall be provided in accordance with PROWAG and ADA standards.
- All crosswalks shall be marked with high visibility “ladder style” or “continental” thermoplastic striping.

6.16 BICYCLE FACILITIES

All new and reconstructed County Roads shall be planned and constructed to accommodate safe bicycle facilities. Each land development subject to County approval shall provide a bikeway within or alongside the County right-of-way if such is required by the Mercer County Master Plan and/or any applicable zoning, subdivision, site planning or other ordinance of the Municipality or County.

The appropriate facility for each County Road shall be recommended by the County Bicycle Master Plan Element and ultimately determined by the County Engineer. Current AASHTO, MUTCD, Mercer County Bike Plan, and NJDOT Complete Streets Guide standards should be followed in the development of bicycle facilities and within County Right-of-Way.

For residential or commercial developments which will generate 200 or more vehicle trips per day, and for all major non-residential developments, bicycle traffic shall be accommodated in one the following ways:

- For non-residential developments, bikeways shall be provided along any new collector or arterial road constructed as part of the development.
- For residential developments, bikeways shall be provided along any new minor collector, collector or arterial road constructed as part of the development.

Where a proposed development is within 300 feet of an existing bikeway or a proposed bikeway included in a municipal or County bikeway plan or official map, the development plan shall provide for connections to the existing or proposed bikeway.

SIDEPATH (MULTI-USE PATH)

A multi-use sidepath may be required as part of the County Bicycle Plan Element, an Element of the County Master Plan, or at the discretion of the County Planning Board and/or County Engineer. Per the Mercer County Complete Streets Policy, all roadway users are required to be accommodated, including bicyclists and pedestrians. If required, a multi-use sidepath shall replace the requirement for a sidewalk.

Multi-use sidepaths shall consist of a smooth hard surface of bituminous asphalt or concrete that is a minimum of 10-foot wide in developed areas and 8-foot wide in rural areas. A minimum 5-foot separation from the County Highway and trailside hazards or slopes is required. If a 5-foot separation cannot be provided, a barrier or safety rail shall be provided. A 2 foot graded area should be maintained adjacent to both sides of the path (small landscaping permitted within this area) and 3 feet of clear distance should be maintained between the edge of the trail and lateral obstructions.

Multi-use sidepaths must meet accessibility requirements of the Americans with Disabilities Act. Multi-use sidepaths shall meet the most current AASHTO standards for design elements including but not limited to design speed, cross slopes, horizontal alignments, grade, speed control, sight distances, signage, drainage, lighting, and street furniture.

Bituminous sidepath shall include a minimum of 4 inches bituminous surface course pavement and 6" compacted aggregate base course.

Concrete sidepaths shall include a minimum of 5 inches reinforced concrete pavement and 4 inches minimum of aggregate base course.

Concrete sidepath shall include 6"x6"xW1.4xW1.4 Welded Wire Fabric Reinforcement at a minimum, and greater per site loading conditions (i.e. maintenance trucks, gators, pedestrian, etc.). No control or expansion joints are to be placed parallel to the path of travel except where needed at intersections. Expansion joints are to be placed at regular intervals. Joints to be sealed.

BICYCLE COMPATIBLE INTERSECTION DESIGN

A bicycle lane passing through an intersection shall not be positioned to the right of a right turn only lane or to the left of a left turn only lane. A bicyclist continuing straight through an intersection from the right of a right-turn lane or from the left of a left-turn lane would be inconsistent with normal traffic behavior and would violate the expectations of right- or left-turning motorists.

When the right through lane is dropped to become a right turn only lane, the bicycle lane markings should stop at least 100 feet before the beginning of the right-turn lane. Through bicycle lane markings should resume to the left of the right turn only lane. All appropriate signage shall be placed at approaches.

6.17 PAVEMENT TAPERS

Pavement tapers shall be provided at the beginning and end of any portion of a County Road that is to be widened where the existing pavement at either end of the widening is not consistent with the width of the area being widened. The pavement taper at the beginning of the widening (approach side) is to be 50 feet in length. The pavement taper at the end of the widening (departure side) is to transition at 15:1 (15 feet of taper for every 1-foot of widening). Curb may be required along the pavement taper and will be determined based on site conditions.

6.18 GUIDERAIL

The County Engineer may require the applicant to install a steel beam guiderail pursuant to AASHTO *Roadside Design Guidelines* and New Jersey Department of Transportation Standards.

Length of need calculations, post spacing, fixed object treatment, guiderail materials and end treatments, etc. shall be in accordance with New Jersey Department of Transportation standards and as more specifically directed by the County Engineer.

6.19 MID-BLOCK CROSSINGS MEDIAN AND CROSSING ISLANDS

Where a subdivision or site plan is expected to generate a large amount of traffic or creates a traffic safety hazard, the County Engineer may require that the developer construct a traffic control island to facilitate the safe and expeditious movement of traffic exiting and entering the land development. Such islands may serve as pedestrian safety islands or traffic channelization islands. In all cases, the islands are to be designed, signed, illuminated, and marked in accordance with current editions of the *Manual of Uniform Traffic Control Devices* and *A Policy on Geometric Design of Highways*, *NJDOT Roadway Design Manual* and all subsequent amendments thereto, subject to the approval of the New Jersey Department of Transportation.

Mid-block crossings shall be fully compliant with the Americans with Disabilities Act (ADA) & PROWAG to accommodate persons with disabilities. Walking surfaces shall be smooth and a level landing should be provided at the top of each ramp, and a flush transition at street level. Curb ramps shall lead directly into the crosswalk and toward a ramp on the other side. If crossing islands are used, Detectable Warning Surfaces shall also be included.

Crosswalks leading to a Mid-Block Crossing shall be in a “Continental” or “Ladder” style of longitudinal white stripes, parallel to the travel lanes and the driver’s field of vision and made of retroreflective thermoplastic.

Raised medians shall extend beyond the crosswalk at intersections wherever possible, while accommodating vehicle turning movements. The “nose” of the median should be located in line with adjacent road cartways or be set back behind adjacent road cartways to reduce plow impediment. At times, crossings may be set back in order to accommodate the raised median nose.

6.20 RECTANGULAR RAPID FLASHING BEACONS

Rectangular Rapid Flashing Beacons (RRFBs) may be required to enhance a pedestrian crossing. The combination of signage and irregular flash pattern of the amber LED lights increases the visibility of a crossing, and studies show that they improve driver compliance with stopping for pedestrians at a marked crosswalk.

- Rectangular Rapid Flashing Beacons (RRFBs) shall be installed in accordance with current NJDOT and MUTCD standards. General Design Guidance:
- RRFBs should be used in conjunction with a marked crosswalk and curb ramps. They may be combined with other pedestrian crossing enhancements, such as curb extensions.
- RRFBs can be used on single-lane or multi-lane roadways. They may also be used at unsignalized locations with significant pedestrian activity, such as mid-block crossings near major destinations or trail crossings, or where high traffic volumes, speeds, and/or driver behavior make pedestrian crossings challenging.
- Designers should consider the surrounding context. Existing sign clutter or visual noise, particularly in an urban area, may decrease the visual impact of the RRFB.
- RRFBs can be installed with active or passive actuation.
- On divided roadways, RRFBs can be included in the median or center island to further increase visibility and driver yielding behavior.
- RRFBs are typically freestanding and powered by a solar panel unit. They are therefore easily implementable at trail crossings or other locations without easy access to a traditional power source.

6.21 PEDESTRIAN HYBRID BEACONS (HAWK)

A pedestrian hybrid beacon, also known as a High Intensity Actuated Crosswalk (HAWK), may be required for mid-block pedestrian crossing locations. They enable pedestrians to cross high-speed and high-volume

roadways while traffic is stopped. As the name implies, it is essentially a hybrid between a RRFB and a full traffic signal. It provides planners and engineers with an intermediary option for locations that do not meet requirements for a traffic signal warrant, but where traffic conditions exceed the limitations of an RRFB.

A pedestrian hybrid beacon consists of an overhead mast arm with two red lights and one yellow light, as well as pedestrian signal heads. When actuated by a pedestrian, the beacon goes through a sequence of flashing and steady yellow light intervals, followed by a steady red light to stop vehicular traffic, at which point a "walk" signal is indicated to pedestrians. At the conclusion of the "walk" phase, the pedestrian signal switches to a flashing orange hand, and the hybrid beacon switches to alternating flashing red lights. The beacon goes dark at the conclusion of the cycle, and traffic resumes as normal. Pedestrian hybrid beacons shall be installed in accordance with current NJDOT and MUTCD standards.

General Design Guidance:

- Marked crosswalk and curb ramps shall be used in conjunction with Pedestrian hybrid beacons They may also be combined with other pedestrian crossing enhancements, such as curb extensions.
- Pedestrian hybrid beacons are typically installed at mid-block locations and roadways with heavy traffic volumes, wide cross-sections, or high traffic speeds that create difficult pedestrian crossings. They are a useful tool where gaps in traffic are insufficient to allow pedestrian crossings or where there is excessive pedestrian delay.
- Due to the unfamiliarity of pedestrian hybrid beacons within Mercer County, appropriate education and outreach is required as part of implementation.

6.22 SIGNAGE

To facilitate the safe and efficient movement of traffic into and out of a site, the County may as a condition of the site plan or subdivision approval require the installation of specified directional, regulatory, or advisory signs or pavement markings at designated locations. The developer shall provide all signage required by the Municipality, County, and NJDOT in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD).

- For any proposed traffic signs in the County right-of-way, the developer shall coordinate with the County Engineering Department to get the required forms to be filled and submitted. All signage in the County right-of-way shall be included in the County's comprehensive signage inventory.
- All signs shall comply with the applicable provisions of the MUTCD and shall be maintained in good condition and retro reflectivity standards.
- Signs should be coordinated with other street amenities to unify areas with a distinct identity.
- All proposed signing must conform to the current edition of the MUTCD for size, legend and placement.

No advertising sign or device may be erected on or overhang a County Roadway.

No commercial signs may be placed in County right-of-way. Signs may be located within a County Right-of-Way easement at the discretion of the County Engineer and will require County approval and the signing of an Indemnification Agreement. No signage may be placed in a County Right-of-Way easement area without an indemnification agreement.

Advertising signs which revolve, move, flash, give the illusion of movement or resemble official traffic control devices shall be prohibited within 25 feet of the right-of-way line or any other location that would adversely impact the safe operation of a motor vehicle or cause confusion to pedestrians or bicyclists.

6.23 MAINTENANCE OF TRAFFIC CONTROL DEVICES

The County of Mercer is not responsible for maintaining traffic control signs, traffic striping, or pavement markings outside the County Right-of-Way or on a driveway or street approach to the County Roadway that is not under Mercer County jurisdiction.

6.24 SIGNAL TIMING OPTIONS

Refer to Chapter 8.3 “Pedestrian Signal Timing Options”

6.25 REDUCED CURB RADII

Curb radii should be designed to be as small as feasible and considering all intersection users, rather than designing for the largest possible vehicle. Smaller turning radii require vehicles to turn at lower speeds and decrease pedestrian crossing distance. Both factors improve pedestrian safety and comfort. This also improves sight distance between pedestrians and motorists.

6.26 LIGHTING

Darkness is a well-documented factor correlated with more severe crashes, especially those involving pedestrians. Lack of lighting reduces vehicle and pedestrian visibility to motorists, and hence reduces driver reaction time in a crash event. In general, lighting should always be provided wherever pedestrians are present during nighttime hours. Lighting falls into two categories: pedestrian crossings and corridor lighting.

Pedestrian Crossing Lighting should be provided at signalized, unsignalized, and midblock crossings, particularly at:

- Locations where the speed limit is equal to or greater than 35 mph and the roadway does not have adequate pedestrian conflict elimination.
- Intersections, access points, and decision points adjacent to changes in roadway alignment and cross section.
- Urban areas, connections to transit, pedestrian refuge islands, and areas adjacent to pedestrian generators and parking lots, such as shops, schools, parks, community centers, and places of worship.
- Locations where problems with nighttime visibility have resulted in more frequent vehicle-pedestrian conflicts.

Corridor Lighting shall be provided at the discretion of the County Engineer.

The following lighting requirements shall be enforced:

- Crossing lighting should be installed at least 10 feet ahead of the crosswalk rather than overhead. This design will light the side of the pedestrian facing the driver (i.e. front lit rather than back lit), increasing contrast, enhancing visibility, and facilitating facial communication between the pedestrian to the driver.
- Pedestrian scale lighting should be considered in shopping districts, downtowns, and urban areas with high pedestrian volumes. Streets that connect a community to major destination points, multimodal facilities, and areas with pedestrian safety or security concerns should also be considered.
- Pedestrian scale lighting should be designed to provide a continuous, uniform level of light along the corridor. Light fixtures are typically approximately 15 feet tall and have lower levels of illumination than street lights, but have closer spacing to avoid dark zones.
- All street and site light fixtures installed and thereafter maintained, shall be full cut-off fixtures as defined by the IESNA (Illuminating Engineering Society of North America) with an uplight rating of U0 in accordance with the B-U-G (Backlight, Uplight, Glare) rating system defined in the current

Model Lighting Ordinance (MLO) authored jointly by the IDA (International Dark-Sky Association) and IES. Full cut-off fixtures shall not have vertical swivel mounting capability.

- The use of mercury vapor lamps is prohibited. Flashing or strobing light installations are prohibited.
- Lights located at roadway curves shall be located on inside radius of curves wherever possible.

In addition to the categories discussed above, it is the preference of the County that these consideration be carried over into the design of vehicular and pedestrian lighting throughout each development where compliant with the lighting requirements of the municipality.

6.27 PUBLIC TRANSPORTATION & BUS INFRASTRUCTURE ON COUNTY ROADS

All roads should be designed to handle the needs of public transportation vehicles including weight and turning movement requirements in accordance with current NJDOT and NJ Transit Standards and Details.

The County Planning Board, with the advice of Transit providers, may require the applicant to provide transit facilities to support/encourage transit use, including the construction of bus turnouts/pullouts, bus lanes, bus shelters, and provisions for transit information.

- Where a proposed development is adjacent to or within 1,000 feet of collector or arterial roads where transit service is currently provided or may be provided in the future, the applicant shall consult with the transit authority regarding street design requirements for buses and passenger waiting areas and shelters.
- Where a development site is adjacent to or includes a rail transit facility or other exclusive transit Right-of-Way, the applicant shall consult with the transit authority to determine whether any special design features concerning the rail transit facilities will be required.
- Exclusive bus lanes, entrances, and exits should be provided when traffic volumes warrant such facilities. For more design standards, refer to the Bus Lane Section below.
- Bus turnouts and pullouts shall be designed in accordance with current NJDOT Standards and Details and current NJ Transit standards.
- Provisions for bus shelters along the County Road frontage contiguous with the proposed development site shall be required to accommodate existing and proposed bus or van services on the adjacent roadway.
- Sheltered bus stops shall be provided at major boarding points and spaced to minimize walking distances from building entrances.
- Bus shelters shall be built in accordance with current NJDOT and NJ Transit design specifications, and with appropriate amenities as specified by the County Engineer. Bus shelter amenities can include benches with back rests, attractive landscaping, trash and recycling containers with lids, information displays and guides, appropriate lighting, and public telephones for emergency communication. Shelters should be provided to protect riders from the weather and to buffer them from abutting streets. A sidewalk surface shall be proved between the bus shelter and the buildings, if applicable.
- Separate waiting places for transit patrons shall be provided out of the walking path of pedestrian circulation.
- Improvements at commuter rail stations proximate to the applicant's development may be required at the discretion of the County Engineer.
- Improvements to rail stations can include expanding or repaving parking areas, lengthening platforms, rail patron amenities, station access improvements or similar projects, and shall be built in accordance with the NJ Transit Station Design Guidelines.
- Station amenities and architectural treatments shall be consistent with the aesthetics and motif of the subject rail station.

DEDICATED CURBSIDE & OFFSET BUS LANES

Exclusive bus lanes, entrances and exits should be provided when traffic volumes warrant such facilities. In such cases, the County should be consulted and the following design standards should be followed:

- BUS ONLY pavement markings should be applied to emphasize the lane and to deter drivers from using it as per MUTCD 3D-01, or as determined by the County Engineer.
- Dedicated lanes should be separated from other traffic using solid single or double white stripes as per MUTCD 3B.04, or as determined by the County Engineer.
- It is recommended that bus lane width should be determined based on the available street space and the competing needs of bicyclists, pedestrians, and motorists. The minimum width of a curbside bus lane is 11 feet. The minimum width of an offset bus lane is 10 feet.
- Red colored paint should be applied to emphasize the lane and to deter drivers from using it. Red paint has higher installation and maintenance costs but has been shown to deter both unauthorized driving and parking in the bus lane.
- Dedicated bus lanes may be implemented on a 24-hour basis or managed for specific intervals of the day only.
- Dedicated bus lanes may be separated with soft barriers (i.e. rumble strips) or hard barriers (concrete curbs). If hard separation is used, bus lanes should be designed to allow passing at selected points.
- Signage marking the area as a “no stopping” or “no parking” location shall be provided as per MUTCD 2B.01, or as determined by the County Engineer.
- Typical curbside bus zone length is 90 feet for far-side stops, 100 feet for near-side stops, and 150 feet for midblock stops. An additional 20 feet should be provided for articulated buses, plus appropriate transition zones where traffic speeds are higher. Curbside stops accommodated into the normal flow of traffic, can be integrated easily within most street design schemes, and may be used on County Roads when traffic speeds are lower than 45 mph.

BUS BAY/ PULLOUT

The bus bay or pullout is a location off-line with respect to the travel lanes, with a special curbed pull-out for buses. A bus pullout’s primary function is to move buses out of travel lanes where they might impede traffic flow. Advantages in using this configuration are where an intersection presents a particular hazard or conflict with transit operations. It is most effectively used where traffic speeds are more than 35 mph, when long dwell times are common, or as a system layover stop. Mercer County will consider requiring bus pullouts under the following circumstances:

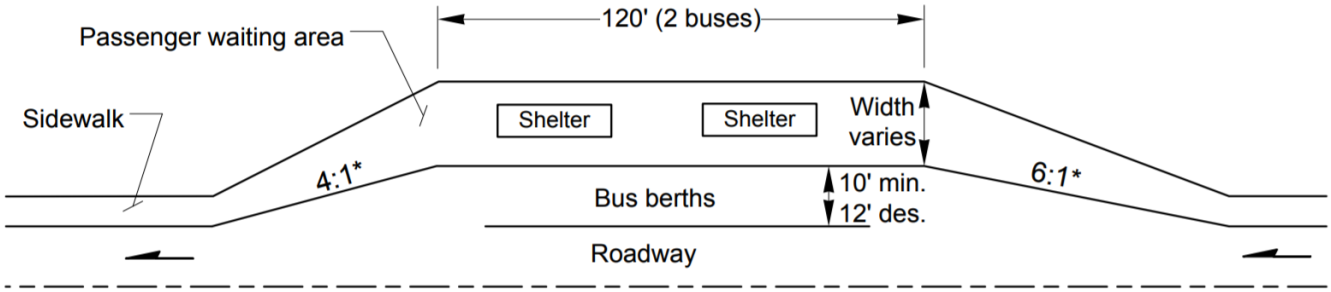
- At bus layovers (where buses park for several minutes)
- County Road’s posted speed limit is at or above 35 mph
- Bus ridership is above 35 daily boardings (or six (6) daily lift boardings)
- The bus bay or pullout is a location off-line with respect to the travel lanes, with a special curbed pull-out for buses. A bus pullout’s primary function is to move buses out of travel lanes where they might impede traffic flow. Although there are many scenarios where this is a valuable function, NJ Transit and Mercer County do not actively pursue the placement of bus pullouts at regular bus stops because it reduces the efficiency of transit service and require additional cartway.

Advantages in using this configuration are where an intersection presents a particular hazard or conflict with transit operations. It is most effectively used where traffic speeds are more than 35 mph, when long

dwell times are common, or as a system layover stop. Mercer County will consider requiring bus pullouts under the following circumstances:

- At bus layovers (where buses park for several minutes)
- County Road's posted speed limit is at or above 35 mph
- Bus ridership is above 35 daily boardings (or six (6) daily lift boardings)

Concrete bus pads are often incorporated in pullout designs but are also used at curbside bus stops. Bus pads are considered on a case-by-case basis but are generally found at stops with frequent service, significant ridership, or where heavy bus braking and acceleration is necessary.



*On higher-speed facilities, it may be necessary to provide a greater acceleration/deceleration transition. Suggested values shown; coordinate designs with the transit agency.

CURB EXTENSIONS

A curb extension (or "bus bulb") is a modification of the sidewalk to extend the bus loading/waiting area into the roadway. Because a curb extension can be as short as 15 feet, it can conserve curbside space for parking relative to a curbside stop with a bus zone. It is most effectively used when travel speeds are lower than 30 mph, where pedestrian volumes are high, or where the sidewalk is narrow and additional waiting space is required. The curb extension provides a larger waiting area for passengers (to accommodate a shelter, for example), with less interference with pedestrians on the sidewalk, and can also serve as a pedestrian amenity by shortening the crossing distance. Curb extensions are most appropriate for near-side stops where there are parking lanes or multiple travel lanes.

BUS STOP LOCATION

Where a proposed development is adjacent to or within 1,000 feet of collector or arterial roads where transit service is currently provided or may be provided in the future, the applicant shall consult with the transit authority regarding street design requirements for buses and passenger waiting areas and shelters.

Where a development site is adjacent to or includes a rail transit facility or other exclusive transit Right-of-Way, the applicant shall consult with the transit authority to determine whether any special design features concerning the rail transit facilities will be required.

Bus stops near major commercial nodes with large parking lots should place stops near entrances or congregation points or if not possible, provide a safe pedestrian crossing and promenade for persons walking from such bus stops.

BUS STOPS AND WAITING AREAS

County Engineer may require that an applicant is responsible for construction of bus shelter, bus stop or bus waiting area along their frontage. A bus stop waiting area should be sized to reflect expected passenger volumes and, at a minimum, be wide enough at the curbline to provide a safe place for passengers to wait

outside of the loading area. In locations where both pedestrian volumes and the number of transit passengers expected to use a stop are relatively low, the waiting area may overlap with the pedestrian path. Where pedestrian and/or passenger volumes are higher (such as in urban areas), care should be given to separate the waiting area and pedestrian path to the greatest extent practical.

The following guidelines should be followed:

- Bus shelters should be provided for stops on routes with high boarding numbers. Bus stops must have safe access via sidewalks and appropriate street crossing locations. Where possible, pedestrian crossings should be accommodated behind the departing transit vehicle. A minimum 5-foot-wide clear pedestrian path should be provided for access to the bus stop waiting area and loading area. The sidewalk or trail should provide a clear pedestrian path to and from the bus stop area, the bus stop loading pad, and the bus shelter or bench, when present.
- Bus stops are required to meet ADA standards, including the provision of landing pads and curb heights that allow for buses to load passengers in wheelchairs.
- Information provided to riders at a bus or transit stop should include an agency logo or visual marker, station name, route map, and schedule. Bus stops should include a system and/or route map and schedule on the bus shelter or other street furniture. The bus pad should be well marked with a double-sided sign, preferably on its own pole. Stop signage will be provided by NJ Transit. Real-time information systems may be added at bus stops to enhance the rider experience and create a predictable travel experience for riders.
- Clear and distinct signage differentiates the stop area from other roadside information and indicates locations to connect with other NJ Transit services. The sign location assists passengers in visually gauging the stopping point for the vehicle, and for those who are visually impaired, the signpost can provide a landmark in locating the bus loading pad with the aid of a cane.
- Adequate lighting should be installed around bus stops and shelters to ensure personal safety and security. Lighting may take several forms in any combination to provide an average level of 1.3 to 2.6 f.c. (horizontal foot candles) or 13 to 26 lux, which is roughly the typical light level around a building entrance. A nearby street light can also be used for stop-area lighting. The bus stop signage should be illuminated and, if present, shelter fixtures can provide added light levels. Wherever possible, energy saving devices, such as efficient lamps, solar power, and daylight sensing equipment, should be used.
- At major bus stops, municipalities should enhance the experience of passengers and passers-by through the addition of maps, plantings, vendors, or artworks.
- When present, a bench should be made of a durable material, resistant to vandalism and wear from exposure to weather. The bench should be ADA-compliant in dimension, with a recommended minimum length of 6.5 feet, or the equivalent of three seats. Arms are an important feature to assist seniors and the disabled.
- Anti-sleeping bars are recommended to prevent unintended use. Other forms of seating, such as a resting or leaning rail, can also be used as an alternative to benches. Options include a large diameter tube or ledge slightly higher than seat height, or about 2.5 feet high above the stop location surface. A low masonry wall also makes a convenient resting spot and can provide an opportunity for landscape integration of the bus stop area.
- Bicycle racks and storage shelters are increasingly used to accommodate commuters who use a bicycle to access transit but prefer not to use on-board bike racks. Supplying bicycle parking in a well-lighted, secure area will help to deter theft.

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7. TRAFFIC STUDIES AND ANALYSIS

7.1 SUBMISSION TRIGGER

Mercer County requires a Traffic Impact Study for any new proposed multiple unit housing development or commercial site along or affecting a County Road. Any project that meets one or more of the following criteria MUST submit a Traffic Impact Report (see Volume I: Section IV):

- Peak Hour Trips: 50 trips generated;
- Project Peak Hour Trips: 50 trips generated;
- Total Parking Spaces: 25 (new and/or existing);
- Tractor Trailer Vehicle Trips: 2 or more trips generated per day;
- Any Commercial Business with Drive-Thru.

The determination of the threshold value will be based upon the *Institute of Transportation Engineers (ITE) Trip Generation Manual* current edition at the time the development application is determined to be complete. Mercer County criteria deems trips generated as all pass-by and non-pass-by (new) trips combined. Seasonal high traffic volumes may be required to establish the threshold value. All traffic impact studies shall be signed and sealed by a New Jersey licensed professional engineer.

Additional information needed to satisfy the requirements of other jurisdictions, such as State Highway Access Management Code requirements as set forth in NJAC 16:47 (http://www.state.nj.us/transportation/business/accessmgt/NJHAMC/), may also be included.

7.2 SITE DESCRIPTION/PROPOSED ACCESS

The site description shall include the type of project; square footage by use (e.g., office, retail, medical, etc.) with appropriate ITE Land Use Code, number of dwelling units, or other appropriate units to indicate the size of the project; location map(s); construction staging; and the completion date(s) of the development. A brief description of major existing and proposed land developments within the study area (with anticipated dates of completion, where available) shall be included. The report shall also contain a description of the proposed internal transportation system. This includes internal vehicular, bicycle, and pedestrian circulation, all proposed ingress and egress locations, parking conditions, traffic channelization, and traffic control devices at intersections within the site.

Where appropriate, the site design shall encourage public transportation usage, such as by positioning the building proximately to the roadway, providing adequate turning radii at access points to allow a bus to enter the development, designating a bus shelter and signage along adjacent roadways, or reserving such areas for future use. A sight distance analysis shall be performed for all existing and proposed unsignalized intersections affected by the development. The level of detail for this analysis shall be resolved in discussions with the Office of the County Engineer.

7.3 ROADWAY INVENTORY

The study shall describe the external transportation system within the analysis area. All County intersections in the study area shall be identified and sketched. All existing and proposed public transportation services and facilities within a one-mile radius of the site shall be documented. All future highway improvements, including proposed construction and traffic signalization, shall be noted. High-accident areas, as determined by municipal and/or County officials, shall be described.

7.4 SCOPE OF STUDY

The area to be studied will vary with the quantity and quality of site-generated traffic and the excess capacity of the existing highway network. The impact analysis should extend as far as the site-generated traffic has a significant impact. Normally this would be limited to the points of access and adjacent intersections. However, for large developments, an analysis may extend a considerable distance from the site.

As a general rule, the study area should encompass all County Roads and intersections where traffic generated by the development is expected to increase existing traffic volumes by either 10 percent or 50 vehicles per hour. Where doubt exists, the transportation engineer should seek guidance from the County Planning Board or the Office of the County Engineer prior to submitting the traffic impact study report. The County will also identify those critical intersections and roadway sections which deserve special attention during the study.

7.5 TRAFFIC DATA

Traffic counts shall be conducted by the applicant. **All traffic counts must be taken within one year of submission of the Traffic Impact Study unless directed otherwise by the County Engineer.** Count data shall be summarized by 15-minute intervals over a peak two-hour period for both AM and PM peak periods, and for a weekday midday period and/or weekend peak periods if so directed by the County Engineer.

During the count period, there shall be no conditions such as detours, accidents or inclement weather that could affect traffic volumes. Traffic counts shall not be taken on or near holidays or other special events when traffic may not be representative of average daily traffic conditions. Any counts conducted during a period when school is not in regular session may, at the discretion of the County Engineer, be required to be repeated.

The assumed typical commuter peak hours are 7:00 to 9:00 AM and 4:00 to 6:00 PM, however for sites adjacent or in proximity to schools these hours should be extended to include arrival and dismissal. Intersection turning-movement counts shall be conducted during these hours OR otherwise to coincide with peak hours of the intersection. If necessary, additional counts shall be conducted to coincide with the expected peak hour of the site; for example, counts for a retail development shall also be conducted on a Saturday. The classification of vehicles must be sufficient to address the needs of the capacity analysis. All count sheets shall be included in the appendix to the report.

It is desirable to conduct automatic traffic recorded (ATR) counts at selected locations within the study area. This is especially important if the intersection turning-movement counts were conducted at several intersections on different days. The ATR counts shall be used to factor intersection counts to an average daily condition. Existing traffic volumes for each design hour shall be depicted in a traffic flow diagram.

Levels of service shall be determined for each study location. As described later in this section, the analysis procedures shall be consistent with the current version of the Highway Capacity Manual published by the Transportation Research Board.

Dependent on the application, the County may request a manual gap analysis of existing conditions be performed to determine the number of opportunities for vehicles to execute proposed turning movement(s) on the County roadway.

7.6 GENERATION RATES (ITE)

Site traffic should be determined using information contained in the current version of the *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). Any departure from ITE rates must be substantiated by actual data collected for similar land uses in the field. Desirably, such data should be obtained within Mercer County. The ITE land use category that most closely resembles the proposed use must be identified.

The application of pass-by trips reductions should be applied per ITE and NJDOT standards unless otherwise directed by the County Engineer. Pass-by trip percentages are applicable only to trips that enter or exit the adjacent street system. Internal trips are NOT pass-by trips.

Assumptions regarding the amount of transit use and carpooling/vanpooling shall also be documented with supporting evidence. Developers may be required to achieve such rates if the departure from ITE data is significant.

7.7 TRIP DISTRIBUTIONS

The geographic distribution of generated trips can be determined by one (1) of the following techniques:

- Market studies conducted by the developer;
- Experienced judgment and knowledge of local conditions (must be verified with local officials);
- ZIP Code address locations of employees, or of employees in similar industries in similar locations;
- Area-wide travel model results that include trip tables by trip purpose;
- Gravity Model (Quick Response System or National Cooperative Highway Research Program Report 187). The results shall be accompanied by a schematic diagram that shows the geographic distribution as a percentage of site-generated vehicle trips at the cordon boundary of the study area. An example of this diagram is shown in the Trip Distance detail.

7.8 TRIP ASSIGNMENTS

Site-generated trips shall be assigned to the roadway network based upon the trip distribution to the limits of the study area. If applicable, pedestrian volumes shall be derived and assigned to pedestrian crossings. Any unusual assignment characteristics, such as the effect of pass-by trips, shall be well-documented. The resulting trip assignments shall be shown on a schematic diagram. For each design hour, both inbound and outbound trips shall be depicted with all associated turning movements. An example of this diagram is shown in the Trip Assignment detail.

7.9 DESIGN YEAR

For analysis purposes, the design year shall correspond to the development's anticipated year of completion. For phased developments, multiple design years shall be utilized that include improvements in place each year. Background traffic growth shall be derived by extrapolating trend data which is available from municipal, County or state sources. Deviations from such trends will be accepted only if accompanied by satisfactory documentation. If specific development approvals have been obtained for nearby properties, the traffic from those developments shall be specifically included in the analysis in addition to background growth.

7.10 ANALYSIS (HCM SOFTWARE)

For each design hour, traffic volumes shall be derived as follows:

- "No-Build" volumes shall represent existing traffic plus background growth and other development traffic expected in the design year.
- “Build” volumes combine No-Build volumes and site-generated traffic volumes.

No-Build and Build volumes shall be depicted in traffic flow diagrams.

Traffic signal timings shall be based on the timing directives maintained on file by the County Engineer and shall account for any planned modifications to the timings.

Capacity analyses shall be performed using the methodology contained in the *Highway Capacity Manual*, latest edition. Preferably, all analyses will employ the latest version of the *Highway Capacity Software*. SYNCHRO or similar modeling software may be utilized with approval from the County Engineer. For signalized intersections, the operational analysis, rather than the planning analysis, technique shall be used. Any deviations from the default values shall be well-documented. All capacity analysis sheets shall be included in the appendix to the report, along with a Flash Drive that contains appropriate digital files.

7.11 INTERPRETATION OF RESULTS (L.O.S. DEFINITIONS)

Results of the capacity analyses shall be shown for all County Roadways and intersections impacted by the development for the Existing, No-Build, and Build conditions. All roadways and intersections that are projected to operate in the Build condition at a Level-of-Service (LOS) worse than "D" shall be considered deficient. For signalized intersections, level-of-service criteria are stated in terms of the average control delay per vehicle for a 15-minute analysis period. The upper limit of LOS "D" is defined as a control delay of 55.0 seconds.

7.12 MITIGATION TO NO-BUILD CONDITION

Mitigation measures must be proposed for all roads and intersections that are projected to operate in the Build condition at worse than LOS "D" and worse than the No-Build condition. Specific recommendations shall be included that will improve operations under the Build conditions to a level not worse than the No-Build conditions.

7.13 RECOMMENDATIONS

Specific recommendations that are proposed to mitigate deficiencies shall include, but are not limited to, the following elements:

- Internal circulation and external road design
- Traffic signal installation or phasing/timing changes
- Traffic system management techniques
- Traffic demand management

All proposed physical roadway improvements shall be shown in sketches.

Existing and future public transportation services shall also be addressed. If applicable, a listing of actions to be undertaken to encourage public transportation usage shall be included.

7.14 PHASED PROJECTS

In instances where a proposed development will be constructed in stages, the study must reflect the traffic impacts of the entire development as proposed for a given build-out year. Projects with an anticipated build-out beyond five years from the date of site plan approval (or the date of the traffic volume database) may require the applicant to submit one or more supplemental reports that include new traffic counts, the background traffic growth rate, and an updated list of major development projects located within the study area of the applicant's project.

7.15 DETERMINATION OF PRO-RATA SHARE CONTRIBUTION

After reviewing the traffic report, the County Planning Board will specify the road improvements that will be required as part of off-tract improvements. The probable construction cost of these improvements will be estimated by the County Engineer's Office.

8. TRAFFIC SIGNAL DESIGN STANDARDS

Where a subdivision or site plan is expected to generate an amount of traffic, or create a traffic safety hazard, which would warrant the installation of a traffic signal, the County Engineer may recommend that the land developer prepare plans, specifications, and construct a traffic signal to facilitate traffic entering and leaving the land development.

Where it is determined at the time of review of the land development that a traffic signal may be warranted in the near future, the land developer may be required to post a performance guarantee to cover the cost of designing and constructing a new traffic signal or improving an existing signal. This performance guarantee shall be separate from other performance guarantees posted by the land developer and shall remain in effect for five (5) years from the date of the first occupancy within the land development.

If and when the traffic signal becomes warranted during this five (5) year period, the land developer shall prepare plans, specifications, and construct the traffic signal. The Developer shall be responsible for providing As-Built plans within seven (7) days of the signal activation.

In all cases, no traffic signal shall be installed unless it meets the warrants as specified in the current edition of the *Manual of Uniform Traffic Control Devices.*

All traffic signal equipment, including signs, traffic signal foundations, controllers, junction boxes and conduit shall be placed within the road Right-of-Way. Design of traffic signals and related equipment shall conform to the current edition of the Manual on Uniform Traffic Control Devices and NJDOT standards and guidelines.

8.1 TRAFFIC SIGNAL RESTRICTIONS

New traffic signals shall not be permitted at locations where the following conditions exist:

- Where a roundabout can be designed with acceptable L.O.S. for predicted traffic volumes and sufficient Right-of-Way exists or can be acquired for its construction;
- Where the signal does not meet the installation criteria as outlined in this document;
- Adequate sight distance in advance of the traffic signal cannot be achieved;
- 95th percentile traffic queues anticipated for any time period would extend to an adjacent signal;
- 95th percentile traffic queues from an existing traffic signal would extend to the proposed access location;
- Access from an existing driveway or road adjacent to the new access could not be combined;
- The installation of a traffic signal would adversely affect the safety and efficient operation of a County Road.

8.2 VEHICLE DETECTION

Radar technology and video camera detection devices shall be utilized as the primary type of detection. Use of loop and microwave detectors are no longer acceptable. Design shall be in accordance with current NJDOT standards and guidelines.

- Vehicle detection accomplished with radar shall utilize the SmartSensor Matrix by Wavetronix with Click650 Controller interface, or improved technology based upon the requirements of the County Engineer.
- In scenarios where a large amount of pedestrian traffic exists, the County may request vehicle detection be accomplished with the use of a Video Image Vehicle Tracking and Detection

System (VIVTDS). The VIVTDS shall be the Gridsmart Fisheye Camera Detection system with GS2/GS3 processor and performance plus package, or improved technology based upon the requirements of the County Engineer.

The following guidelines are to be used in designing areas of presence detection on the approaches to a signalized intersection:

- Delay-call detection is to be provided on right-turn lanes where a "right turn on red" is permitted and where permitted left-turn lanes exist.
- The vehicle-extension interval is to be two (2) seconds.
- The area of detection must be at least 40 feet as measured back from the painted stop line and at least 10 feet as measured in front of the painted stop bar.
- In no case shall any portion of the detection extend beyond the projection of the curbline from the intersecting roadway into the intersection area.

8.3 SIGNAL TIMING OPTIONS FOR PEDESTRIANS

County Engineer may require that a developer be responsible for modifications to signal timing.

The following adjustments to signal timing may be acceptable to provide for increased pedestrian safety:

Pedestrian Signal Timing is designed to give pedestrians sufficient time to cross the roadway based on the width of the roadway and an assumed pedestrian walking speed. The MUTCD assumes a walking speed of 3.5 feet per second. However, for slower pedestrians, such as those in wheelchairs, elderly, school aged children or who are visually impaired, a slower walking speed of 3 feet per second may be assumed.

A Leading Pedestrian Interval (LPI) provides pedestrians an advanced walk signal, giving pedestrians several seconds to start and establish their place in the crosswalk before motor vehicles start their advance. Pedestrians are made more visible particularly to right-turning motorists who are thereby more likely to yield to pedestrians in the crosswalk.

A Pedestrian Scramble, also known as a diagonal crossing or a Barnes Dance, is a crossing system that stops all vehicular traffic allowing pedestrians an exclusive interval to cross an intersection in every direction, including diagonally, at the same time. The pedestrian scramble virtually eliminates pedestrian-vehicle conflicts and makes sense where large numbers of pedestrians are expected, and where there is enough space to enable pedestrians to gather on the sidewalks in larger numbers.

Pedestrian Countdown Timers are designed to enhance the effectiveness of pedestrian signals in clearing the crosswalk by showing the number of seconds remaining until the signal changes. Surveys show that most people misinterpret the meaning of the flashing hand of the traditional pedestrian signal. Providing the pedestrian countdown device helps pedestrians better interpret the pedestrian signals. Countdowns also enable pedestrians to stop on a median refuge, where provided, and wait for the next signal phase if they believe that there is insufficient time for them to complete their crossing. The use of pedestrian countdown timers are important when signal timing is complex (e.g., there is a dedicated left-turn signal for motorists), at established school zone crossings, when an exclusive pedestrian interval is provided, and where streets are wide.

8.4 MAINTENANCE AND PROTECTION OF TRAFFIC

The current NJDOT Standard Specifications for Road and Bridge Construction shall apply for the maintenance and protection of traffic.

Complete road closures are highly discouraged. Any roadway closures and/or detours need to be reviewed and approved by the Mercer County Engineer on a case by case basis.

The hours of construction operations at each site will be determined by the County.

Work which will interfere with traffic or restrict the width of travelled way available for traffic shall not be performed on Saturdays, Sundays, or legal holidays, unless otherwise directed or approved by the County.

8.5 DETOURS

Written approval of the County Engineer and consent of Local Authorities having jurisdiction shall first be obtained for rerouting traffic over detours, whether such detours are shown or not on the contract plans or in the specifications. All necessary arrangements shall be made with such authorities regarding the establishment, maintenance, and repair of such detours, the regulation and direction of traffic thereon, and signing. Adequate directional and detour signs in accordance with MUTCD and local police department and approved by the County Engineer, shall be furnished and erected at the location where such authorities may direct.

Any detours used exclusively for hauling materials and equipment shall be constructed and maintained at no cost to the County.

Wherever and whenever a detour may be established, the contractor shall obtain written approval from the County Engineer at least two weeks in advance and shall provide construction warning signs as necessary in accordance with the current edition of the *Manual of Uniform Traffic Control Devices*. The contractor will be responsible for signing and maintaining the detour and will assume all costs thereof.

8.6 MAINTENANCE OF TRAFFIC CONTROL DEVICES

The County of Mercer is not responsible for maintaining traffic control signs, traffic striping, or pavement markings outside the County Right-of-Way or on a driveway or street approach to the County Roadway that is not under Mercer County jurisdiction.

8.7 TRAFFIC SIGNALS & DEVICES

No traffic signal shall be installed unless it meets the warrants as specified in the *Manual of Uniform Traffic Control Devices.*

The County traffic engineer may permit the relocation of existing or installation of new County owned traffic signals and/or electrically illuminated signage provided an equally satisfactory and adequate site can be provided which is approved by the New Jersey Department of Transportation. This also applies to junction boxes, conduits, cabinets and other constituent parts of traffic signals and electrical sign installations.

8.8 TRAFFIC SIGNAL ANALYSIS

The methodology used to analyze the capacity of a signalized intersection shall be in accordance with that outlined in of the latest edition of the *Highway Capacity Manual* by the Transportation Research Board, National Research Council. Preferably, the analysis shall be performed using the latest version of the Highway Capacity Software developed by the US Department of Transportation, Federal Highway Administration, or similar software based on the same methodology. The analysis is to be submitted to the County Engineer for review and acceptance. The following conditions are to be utilized in the analysis:

- A saturation flow rate of no more than 1,900 vehicles per hour per lane.
- Clearance intervals of no less than 3 seconds “yellow” and no less than 2 seconds “all red.” (Timings will depend on the speed of approach and the distance required to “clear” conflicting movements.)

8.9 TRAFFIC SIGNAL GEOMETRY

Storage bays shall be of a sufficient length to accommodate 150% of the turning vehicles.

8-inch solid white lines shall be used to separate approach lanes at an intersection. The length of such lines shall be 66% of the length of the corresponding bay.

Curbs are to be provided at all intersection legs for a minimum distance of 100 feet beyond the point of curvature of the curb radii.

All centerlines (double yellow lines) are to be spaced so that there is a clear 4-inch space between the 4-inch lines.

8.10 TRAFFIC SIGNAL INDICATIONS

There shall be a minimum of (3) three vehicular indications per approach. Preferably (2) two as a minimum, (1) one of the indications are to be located within the "cone of vision" as per the MUTCD.

Independent traffic signal assemblies for the same approach are to be utilized where possible so that one indication will be visible in the event that any one traffic signal assembly is "knocked down" by an errant vehicle.

Five or Four section heads shall be used for protected/permitted indications (fiber optic lenses are not allowed).

All signal indications shall have LED lamps and are to be wired separately back to the controller.

Crosswalks and pedestrian indications are to be provided unless extenuating circumstances preclude their installation. Pedestrian indications are to be the "countdown" type.

8.11 TRAFFIC SIGNAL ASSEMBLIES AND CONTROL

Span wire-mounted indications shall be used for temporary installations only.

Aluminum poles (TSS Type "K" or "T") shall be located a minimum of 5 feet behind the face of curb.

Mast arms greater than 25 feet in length will require a steel pole (TSS Type "S"). Steel poles are to be located at least 10 feet behind the face of curb.

Controllers are to be located within the intersection so as not to interfere with the sight distance of right-turning vehicles on the minor street approach.

Rigid metallic conduits (RMC) 3-inch in diameter, shall be used throughout for all traffic signal cables. One spare 3-inch conduit shall be provided where conduit crosses the mainline and side streets. Conduit size for overhead electrical services and telephone services shall be 2-inch in diameter or as required by the utility company. Conduits under the road are to be installed by the open cut method.

Rigid nonmetallic conduits (RNMC) may be used for interconnect conduits between intersections or for conduits to control "Red Signal Ahead" signs. Install a ground wire if nonmetallic is installed.

Conduit under roadway (CUR) shall be installed a minimum of 2 feet below grade. Conduit underground (CUG) shall be installed a minimum of 3.5 feet below grade.

Per National Electrical Code (NEC) guidelines, a maximum of six (6) conduits are permitted in an 18-inch x 36-inch Junction Box.

9. STORMWATER MANAGEMENT

9.1 PURPOSE

The purpose of these regulations is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within this jurisdiction. These regulations seek to meet that purpose through the following objectives:

- Minimize increases in stormwater runoff from development in order to reduce flooding, siltation, increases in stream temperature, and streambank erosion and maintain the integrity of stream channels;
- Minimize increases in nonpoint source pollution caused by stormwater runoff from development which would otherwise degrade local water quality;
- Reduce the peak flow rate of surface water runoff which flows from any specific site during and following development, below that which was determined to exist in the predevelopment hydrologic regime to the extent required by State regulation and the County Engineer;
- Ensure that these stormwater management controls are properly maintained and pose no threat to public safety;
- Require the widespread use of stormwater best management practices (BMPs), Low Impact Development (LID) Techniques, and Green Infrastructure (GI) as primary techniques for stormwater management;
- Reduce or eliminate the number and frequency of Combined Sewer Overflow events.

Development approvals issued for subdivisions and site plans pursuant to these Regulations are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. As part of the development approval process, applicants often receive conditional approvals listing items that need to be addressed. In order to obtain Final County Approval, applicants shall submit documentation as necessary to provide evidence of having met stipulated conditions to the satisfaction of the County Engineer.

In order to help applicants and the County coordinate stormwater-related information, applicants shall submit, as part of the initial Land Development Application, a list of anticipated regulatory agencies from which the project will require permits or approvals. The applicant may be required to additionally provide copies of any such approval or permit upon request by the County. Any changes to a project that result from the finalization of outside permits or approvals shall be submitted to the County for review. Please see Volume I for the details regarding the submission of this information.

9.2 REGULATORY CONTEXT

In all such instances in which the provisions herein refer to New Jersey State Stormwater Regulations, such as NJAC 7:8, NJAC 7:9, NJAC 7:14, etc., either broadly or by specific citation, the relationship is a dynamic one – the relevant content referred to or cited at the time of this writing shall remain consistent with the most current version of the relevant regulation as updated or otherwise revised by the State.

In their interpretation and application, the provisions of these Regulations shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. These Regulations are not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of these Regulations impose restrictions different from those imposed by any other ordinance, rule, or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

9.3 APPLICABILITY

Site plans and subdivisions which meet the criteria found within N.J.S.A. 40:27-1 et seq., for County Planning Board review, shall be subject to County Stormwater Management Review. These applications will be held to the standards of this chapter, and, by reference, the New Jersey State Stormwater Regulations found at N.J.A.C. 7:8 and within the most current iteration of the New Jersey Best Management Practice [BMP] Manual.

Namely, the stormwater management aspects of those subdivisions and site plans which abut or are located along a County roadway will be reviewed. Projects which drain directly or indirectly through County drainage facilities, shall be referred to the County Planning Board which may disapprove, approve, or approve with conditions. Direct and indirect connections to County drainage facilities will be determined by the County Engineer. Site plan applications which include one or less acre of impervious surface, inclusive of existing and proposed development, and are not located along County roads, are exempt from County review and approval processes. Applications which require review and approval will have the Applicability criteria of N.J.A.C. 7:8 (as amended and updated) applied.

Residential developments which are covered under the Residential Site Improvement Standards (RSIS) found at NJAC 5:21, which propose five (5) or more units shall also be subject to County Stormwater Management Review.

Mercer County retains the right to require additional stormwater analyses and management measures as necessary to safeguard said facility and downstream stormwater conveyance infrastructure, and to achieve desired outcomes for water quantity and quality as determined by the County Engineer.

Property rights may be required to be dedicated as part of land development projects to accommodate proposed or future stormwater facilities along County roadways or in the vicinity of County stormwater facilities.

9.4 RELATION TO COUNTY STORMWATER DRAINAGE SYSTEMS

Consistent with the New Jersey County Planning Act (N.J.S.A 40:27-1 et seq.), the County may review site plans to discover whether or not they drain either directly or indirectly through any drainage facility maintained by Mercer County.

All subdivisions and site plans shall provide adequate drainage facilities in accordance with the standards established herein for the management of stormwater runoff that is generated by a development that now flows or will flow directly or indirectly to a County roadway or through a County drainage facility. It shall be the applicant's responsibility at its cost to provide adequate drainage facilities along County roadways as required by the County Engineer.

When a drainage system or any part thereof is proposed for a development which discharges to a County roadway, or through a County drainage facility, the additional capacity necessary to accommodate the anticipated increased stormwater runoff from the development, or of areas tributary to the drainage system, shall be determined in accordance with the following procedures:

1. The capacity and design of the drainage structure or system to accommodate stormwater runoff shall be designed by the applicant's engineer in accordance with these Standards and thereafter approved by the County Engineer. Storm drainage calculations and a storm drainage map shall be submitted by the applicant's engineer.

2. If a proposed project associated with a subdivision or site plan under County review would require the enlargement or other improvement of a County drainage structure or system, the applicant's engineer shall first prepare plans and designs that would reduce off site stormwater flow to a level which would eliminate the need to enlarge or improve the receiving County facility or system. If such efforts do not meet reductions acceptable to the County Engineer, the applicant's engineer shall be required to prepare plans and designs that would provide capacity for the anticipated increase in stormwater runoff to be received by County facilities downstream of the proposed

development, or which are tributary to the drainage system, subject to the approval of the County Engineer.

3. If determined by the County Engineer that required reductions cannot be met on site, and/or that a drainage structure or system cannot be enlarged by the applicant, the applicant shall make payment to the County in lieu of the installation or improvement of the additional measures or components of the drainage system. The County may also participate in the construction of improvements or assume responsibility for construction of the drainage system. Payment for all improvements shall be consistent with the provisions of these standards.

9.5 SUBMISSION REQUIREMENTS

In addition to the mapping/plan sheets described in Chapter 2, the following items shall accompany a major subdivision or site plan under County stormwater review:

Stormwater Management Report

Any proposal meeting the criteria set forth above, which is thereby under County Planning Board review, shall submit a Stormwater Management Report for County review. In addition to the information required below, the County Engineer may post, at their discretion, a summary sheet or form to be completed and submitted by the applicant's engineer. A Stormwater Management Report shall contain but not be limited to the following information:

1. Introduction
    a. Name of Project
    b. Name of Applicant, Owner, Property Developer and Engineer
    c. Description of Project
        i. Type of Current Land Use and Proposed Changes in Use
        ii. Overall Acreage of Property
        iii. Acreage within "Limit of Disturbance"
        iv. Acreage of Existing Impervious Surface (including rooftops)
        v. Acreage of New Impervious Surface (Total)
        vi. Acreage of New Motor Vehicle Surface
2. Location and Characteristics of Site
    a. Area Location Map
    b. Description of Site
        i. Land Characteristics, existing and proposed (physical description of the site)
        ii. Description of surface water bodies and/or wetlands on site, existing and proposed
        iii. Soils Map
    c. Impacts to County Right-of-Way and County Drainage Facilities
        i. Existing and proposed development site area that drains or will drain to an existing or proposed County drainage structure, County drainage system, and/or County drainage facility, including off-site County drainage structures, systems, and facilities (include drainage area map)

ii. Calculations which address the adequacy of any existing County drainage systems or facilities which will accept stormwater from the development.
iii. Summary : results of capacity analyses, and a determination of the adequacy of existing County-maintained stormwater facilities, with recommendations for improvements to existing storm water systems and facilities to address any deficiencies, or revisions to site designs that would reduce runoff to the point at which the need to improve County facilities would be precluded.

3. Separate pre- and post-development contoured Drainage Area Maps

    a. Maps shall illustrate area referenced in the study with acreage, curve numbers and time of concentration paths, areas detained and undetained, proposed drainage structures, BMPs, and Points of Analysis (POA), i.e. where runoff discharges offsite)

    b. Existing Drainage Patterns (description and map illustrating drainage areas and POAs)

    c. Proposed Drainage Patterns (description and map illustrating drainage areas and POAs)

4. A chart, for each Point of Analysis, summarizing the following:

    a. For each designated design storm (2, 10 and 100 year), a comparison of the volumes, and rates of flow (Q) in cubic feet per second, discharged from the POA, between the pre-development and post-development drainage for:

    b. "Current" conditions, with all applicable Mercer County multiplication factors applied to precipitation depths of the 2, 10, and 100-year storms, as per NJAC 7:8

    c. "Projected" conditions, with all applicable Mercer County multiplication factors applied to precipitation depths of the 2, 10, and 100-year storms, as per NJAC 7:8

5. Proposed Stormwater Best Management Practices (BMPs)

    a. For each proposed BMP, applicant shall provide height difference between lowest point (invert)of the BMP and the Seasonal High-Water Table (SHWT) elevation.

    b. Soil Testing results/analysis used to determine the SHWT, including date(s) of testing.

    c. In the instance of detention basins, inflow and outflow analysis, including routing computations by the Storage Indication (Modified PULS) Method or other appropriate procedure or method and justifications for heights and sizing of orifices and outlet structure design.

    d. Description of methods/BMPs by which applicant proposes to meet NJDEP Water Quality Standards.

    e. Description of methods/BMPs by which applicant proposes to meet NJDEP Groundwater Recharge Standards.

6. Hydraulic computations for the analysis, design and sizing of the Stormwater Management facilities. All calculations, assumptions and criteria used in the design analysis shall be based on Methods Approved by NJDEP, shall satisfy both "current" and "projected" rainfall amounts of the 2, 10 and 100 year storms, and shall be accepted by the County Engineer.

7. Appendix

    a. List or chart of BMPs and explanation of how they fulfill Quantity, Quality, and Groundwater Recharge requirements.

b. Pre and Post Runoff curve numbers, based on soil type(s) and land use per drainage area.

    i. As discussed in section 9.13, all "open space" lands within the Limit of Disturbance in the Post Development Condition shall be assumed to be in "Poor" Condition, and respective Curve Numbers applied.

c. Pre and Post-development Hydrographs per each Point of Analysis (where runoff discharges offsite) for designated storms in 'current' and 'projected' conditions, using the most current rainfall depth and distribution data, as determined by NJDEP (Currently NOAA Atlas 14, "Region C"), with all relevant adjustment factors applied, and use of the appropriate Dimensionless Unit Hydrograph consistent with the physiographic region in which the project is located.

Stormwater Maintenance Plan

A Stormwater Maintenance Plan providing for the immediate and long-term maintenance of Stormwater Management Facilities shall be provided using the guidance of the New Jersey Stormwater Best Management Practices Manual. The Maintenance Plan, and any subsequent revisions, shall be recorded with the deed in conformance with the procedures of the County Clerk's Office. Additionally, a copy of said plan shall be sent to the Mercer County Planning Department.

Final County Planning Board approvals will not be issued until proof of filing of Stormwater Maintenance Plan is submitted to the Department of Planning. The following Sections are required to be recorded with the County Clerk:

1. Cover Sheet
2. Table of Contents
3. Maintenance Plan:

    List of Stormwater Management Measures

    I. Location Map
    II. Description of Stormwater Management Measures
    III. Preventative and Corrective Maintenance Action Plan
    IV. Inspection and Logs of All Preventative and Corrective Maintenance
    V. Maintenance Personnel, Equipment, Tools, and Supplies
    VI. Disposal Plan

9.6 WAIVER FROM SUBMISSION REQUIREMENTS

The board reviewing an application, in consultation with the County Engineer, may waive the submission of any of the requirements when it can be demonstrated that the information requested is technically impractical to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process. In order to be technically impractical, the applicant must demonstrate that it cannot fully meet one or more of the design and performance standards on-site for engineering, environmental, or safety reasons. The demonstration of technical impracticability shall be for each drainage area on-site.

9.7 STORMWATER MANAGEMENT DESIGN CRITERIA AND STANDARDS

Stormwater Management Practices in each drainage area, individually or collectively, must be sized for all areas tributary to the drainage area for which they are designed, and satisfy the requirements for

management of both 'current' and 'projected' design storms. The County aligns its expectations for projects with those contained within the New Jersey state stormwater regulations [NJAC 7:8], which require the use of Green Infrastructure and Low Impact Development Methods for mitigating Stormwater Water within the proposed site. The design criteria and standards found below focus on the details most pertinent to a project as it relates to and impacts existing County drainage structures and systems.

Existing stormwater facilities (detention, retention, or bioretention basins, etc.) whose design was based upon previous development patterns, design standards, or regulations, are not automatically accepted under a 'legacy' approval. The County Engineer reserves the right to require that existing facilities be improved in order to comply with current design standards and regulations, and to function in a manner satisfactory to him/her in the context of current and future development in the relevant catchment area.

This pertains to development proposals that are accomplished through multiple 'phases,' whether the future development was considered at the earlier design stage or not. The point at which the runoff from a given area is assessed is that time in which the area in question is put before the Planning Board as a site plan or subdivision application. Existing facilities that are to receive runoff from new or modified proposed developments are required to meet the stormwater regulations in place when the most recent proposal has been determined to be complete.

9.8 GREEN INFRASTRUCTURE (GI)

GI Stormwater Management measures manage stormwater close to its source by:

- Treating stormwater runoff through infiltration into subsoil; and/or
- Treating stormwater runoff through filtration/evapotranspiration by vegetation or soil; and/or
- Storing stormwater runoff for reuse.

Green Infrastructure (GI) Best Management Practices (BMPs) are to be provided in accordance with NJAC 7:8 and the NJDEP Stormwater Best Management Practices Manual. A version of the BMP Manual may be obtained by contacting the Department or from the Department's website (currently at www.njstormwater.org.) It is incumbent upon the applicant to obtain and utilize the most current NJDEP Stormwater BMP Manual.

Pervious Pavement Systems

To the greatest extent possible, all new and reconstructed internal streets or alleyways are recommended to be designed and constructed to incorporate Green Infrastructure Stormwater Management practices, including but not limited to porous paving, permeable pavers, bio-retention, and tree trenches.

Due to the nature and structure of porous/permeable pavement as well as maintenance requirements, no porous/ permeable paving is permitted for County Roadways at this time. Only roads internal to a development site are permitted to be constructed of porous/ permeable pavement.

Permeable Pavement shall be designed in accordance with the *NJ Stormwater Best Management Practices Manual*.

Bioretention Facilities

Private property retention and detention stormwater facilities are not permitted to be placed within County Right-of-Way unless required by the County Engineer and are strongly discouraged along the County Road frontage. Facilities along frontage adjacent to County Right-of-Way will be evaluated on a case-by-case basis and will be permitted only by approval by the County Engineer.

Bioretention facilities may be placed within County Right-of-Way Easements on a case-by-case basis, upon approval by the County Engineer, and are required to be landscaped with a selection of plants appropriate for the conditions within the bioretention facility. Plantings and landscaping shall be developed in

accordance with these regulations and any applicable Municipal ordinances. Native plantings are recommended for all new developments.

Bottom of bioretention facilities must be located at least two feet above the seasonally high-water table (SHWT)

Bioretention with infiltration is not allowed in contaminated areas as defined by NJDEP.

Bioretention facilities shall be designed in accordance with the NJ Stormwater Best Management Practices Manual.

9.9 LOW IMPACT DEVELOPMENT TECHNIQUES (LID)

LID techniques are strategies and measures that manage stormwater runoff quantity and quality in the absence of structural stormwater measures, such as minimizing site disturbance, preserving natural vegetation and other important site features such as forests and especially core forests, reducing and disconnecting impervious cover, minimizing proposed ground slopes, utilizing native vegetation, minimizing turf grass lawns, revegetating areas, increasing time of concentration, and maintaining and enhancing natural drainage features and characteristics.

Nonstructural methods of stormwater management shall be used and explored before relying on structural BMPs, for the purpose of: flood control, minimizing stormwater volume and total suspended solid generation, maintaining natural filtration, groundwater recharge, simulating natural drainage systems and minimizing the discharge of pollutants to ground and surface waters. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater.

Stormwater Management measures shall be designed to take into account the existing site and surrounding area conditions, including, but not limited to, environmentally critical areas; areas of forests and core forests; wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability, and texture; and drainage area and drainage patterns.

Multiple Stormwater Management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge. Structural BMPs should be integrated with nonstructural Stormwater Management strategies and proper Stormwater Maintenance plans.

9.10 GROUNDWATER RECHARGE STANDARDS

The proposed project shall adhere to the groundwater recharge standards found at NJAC 7:8-5.4 and provide an illustration of such adherence within the Stormwater Management report, as stated above.

9.11 STORMWATER RUNOFF QUALITY STANDARDS

As stated above, the Stormwater Management Report shall illustrate how the project proposes to meet the NJDEP Stormwater Runoff Quality standards found in NJAC 7:8-5.5.

The Water Quality Design Storm must be consistent with NJAC 7:8.

In cases where stormwater runoff from a development discharges to rivers, creeks, wetlands, or other water bodies, the County may require special filtration and other water control measures in order to meet current permissible water quality standards and reduce the risk of contamination of the receiving water body from stormwater runoff. **The applicable water quality standards are contained in NJDEP rules cited as NJAC 7:8, 7:9, 7:14, and 8:9 et. seq.**

Stormwater Management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater generated from the Water Quality Design Storm in accordance with NJAC 7:8-5.5(b) as well as the following:

1. If the runoff from a project site will drain to County structures, systems, and/or facilities, and then drain directly or indirectly, into a water with a Total Maximum Daily Load (TMDL), then the TSS reduction shall be increased to be consistent with the reductions set forth in the TMDL.
2. If the runoff from a project site will drain to County structures, systems, and/or facilities, and then drain, directly or indirectly, into an impaired water that is listed under the most current "New Jersey Integrated Water Quality Assessment Report," then TSS shall be removed to the maximum extent practicable. The 2018/2020 report can be found at: https://www.state.nj.us/dep. Any update to this report takes precedence in the identifying of 'impaired waters.'
3. In accordance with the definitions of "FW1" and "Category One" at N.J.A.C. 7:9B-1.4, Stormwater Management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1 or Category One.
4. The Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-4.1(c)1 establish 300-foot riparian zones along Category One waters, as designated in the Surface Water Quality Standards at N.J.A.C. 7:9B, and certain upstream tributaries to Category One waters. An applicant shall not undertake a major development that is located within or discharges into a 300-foot riparian zone without prior authorization from the NJDEP under N.J.A.C. 7:13.
5. Pursuant to the Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-11.2(j)4, runoff from the Water Quality Design Storm that is discharged within a 300-foot riparian zone shall be treated in accordance with N.J.A.C 7:8 to reduce the post-construction load of total suspended solids by 95 percent of the anticipated load from the developed site, expressed as an annual average.

9.12 STEEP SLOPE DISTURBANCES

The development and disturbance of steep slopes is prohibited. Steep slopes include any slope equal or greater to 20%, as measured over a minimum run of ten (10) feet. Steep slopes are determined based on contour intervals of two (2) feet or less. Steep slopes are protected because, when disturbed, these areas contribute disproportionately to large loads of suspended solids, due to the velocity and erosive potential of runoff.

Disturbance of steep slopes results in accelerated erosion processes from stormwater runoff and the subsequent sedimentation of water bodies with the associated degradation of water quality and loss of aquatic life support. Related effects include soil loss, changes in natural topography and drainage patterns, increased flooding potential, further fragmentation of forest and habitat areas, and compromised aesthetic value. It has become widely recognized that disturbance of steep slopes should be restricted or prevented based on the impact on water quality and quantity and the environmental integrity of landscapes.

9.13 STORMWATER RUNOFF QUANTITY STANDARDS

The proposed development shall adhere to the most current State stormwater runoff quantity standards, currently found within NJAC 7:8, and the most current NJ Best Management Practice Manual, and submit supporting documentation within the stormwater management report, as stated above.

When calculating stormwater runoff volumes and rates for the respective design storms in the Post-Development Conditions, all "open space" lands within the Limit of Disturbance, including basin areas, shall be assumed to be in "poor" condition. If the land cover has changed from that which existed in the Pre-Development condition, such as a lawn area being converted to a basin with a top layer of sand or thick vegetation, a different set of Curve Numbers may apply, but in all cases the Curve Number corresponding to the "Poor" condition shall be applied.

Additionally, the County shall review details of the existing and proposed drainage structures, as they relate to County drainage systems, and shall apply the following criteria:

Runoff Collection and Conveyance Systems along County Roadways

Roadway runoff is collected in different ways based on the edge treatment, either curbed or uncurbed. Runoff collection and conveyance for a curbed roadway is typically provided by a system of inlets and pipe, respectively. Runoff from an uncurbed roadway, typically referred to as "an umbrella section", proceeds overland away from the roadway in fill sections or to roadside swales or ditches in roadway cut sections. The *NJDOT Roadway Design Manual* (Chapter 10) shall be used for the design of Runoff Collection and Conveyance along County Roadways except where in conflict with these standards, in which case these standards shall be held.

County Specific Design Criteria

Stormwater drainage collection systems must be designed to convey, at a minimum, the peak runoff from a 25-year storm under full flow conditions. If special circumstances are involved such as inadequate downstream stormwater facilities, lack of positive overland relief, or evidence of local flooding, the **County may require conveyance of full flow conditions from a 50- or 100-year storm under full flow conditions**. Minimum design velocity at flowing full conditions shall be three 3 ft/sec. Maximum design velocity shall not exceed 15ft/sec. Hydraulic losses at inlets, outlets, junctions, bends, etc., must be considered in the design.

Design Calculations

Stormwater runoff shall be calculated in accordance with the following:

9.13.1.1 Hydrologic Calculations

All stormwater calculations shall be provided in accordance with NJAC 7:8 and the *NJ Stormwater Best Management Practices Manual*, except that Hydrology calculations for run-off affecting County facilities must follow the USDA NCRS methodology in accordance with NJAC 7:8-5.7. Rational Method and Modified Rational Method are not permitted.

9.13.1.2 Hydraulic Calculations

While hydrology determines the rates and volumes of runoff, hydraulics determines the depth of flow in an open or closed conduit.

Open Channel Design (Manning's Equation)

Normal depth of flow, dN, is computed using Manning's equation by trial and error solution defines the channel cross section and provides a form for computing the normal depth. Values of the channel roughness coefficient "n" for use in the Manning's equation must be specified and are subject to approval by the County Engineer.

Closed Conduit Design

Storm sewer system must be designed to convey, at a minimum, the peak runoff from a 25-year storm under full flow conditions. Minimum design velocity at flowing full conditions shall be 3 ft/sec. Maximum design velocity shall not exceed 15 ft/sec. Hydraulic losses at inlets, outlets, junctions, bends, etc., must be considered in the design.

Storm pipe calculations for systems unconnected to Mercer County Facilities shall be provided using current NJ RSIS standards.

Storm pipe calculations for systems connected to Mercer County Roadway Drainage Facilities shall be provided in accordance with Chapter 10 of the *NJDOT Roadway Design Manual*.

Storm Drain Inlets

9.13.1.3 Spacing and Types of Inlets

On curbed roads, NJDOT Type B inlets shall be provided along County Roadways at 400-foot intervals.

On non-curbed County Roadways NJDOT Type B inlets with 10-foot curb transitions shall be provided set back 5-foot from the edge of pavement with additional pavement to the new inlet.

Where curb along a County Roadway is waived by the Mercer County Development Review Committee as recommended by the County Engineer, Type B inlets are to be installed with 10-foot long vertical curb tapers on each side of the inlet at a 400-foot interval.

Where the subdivision road intersects the County Roadway, gutter drainage along the County Roadway must be intercepted by storm drain inlets on the upstream side of a new road or driveway to prevent stormwater from crossing the intersection. Dished type gutters to carry drainage through an intersection will not be permitted.

9.13.1.4 Grate and Curb head Type

All storm drain inlets adjacent to properties under development, impacted by development, and/or new storm drain inlets must be provided with Type N Eco Curb heads and Bicycle Safe Grates.

Drainage Swales

In urban areas, as determined by the County Engineer, drainage swales along the sides of County Roadways shall be eliminated and replaced with storm drains of adequate capacity based upon the requirements of these standards.

Storm Drain Pipe

9.13.1.5 Types of Pipe

All subsurface storm drain pipes within the County Right-of-Way shall be made of reinforced concrete pipe (RCP) or ductile iron pipe (DIP).

Corrugated Metal Pipe (CMP), Vitrified Clay Pipe (VCP), and Terra Cotta Pipe (TCP) encountered on any affected drainage systems must be removed and replaced with RCP or DIP of same or greater capacity as determined by these standards.

9.13.1.6 Class of Pipe

The class of reinforced concrete pipe to be used within the County Right-of-Way shall be at a minimum of Class III. If conditions are such that cover over the pipe must be reduced below the acceptable values for Class III, higher classes of pipe (Class IV or Class V) shall be used as appropriate in accordance with specifications of the most current publication of the Concrete Pipe Association of New Jersey. Where ductile iron pipe is approved, CL 52 shall be used.

9.13.1.7 Diameter of Pipe

The minimum pipe diameter for pipe constructed within the County Right-of-Way shall be 15 inches. The pipe diameter must be properly sized to accommodate County design criteria for closed conduit system design.

Storm sewer systems must be designed to convey, at a minimum, the peak runoff from a 25-year storm under full flow conditions. If special circumstances are involved such as inadequate downstream stormwater facilities, lack of positive overland relief, or evidence of local flooding, the County Engineer may require conveyance of full flow conditions from a 50- or 100-year storm under full flow conditions.

Minimum design velocity at flowing full conditions shall be 3 ft/sec. Maximum design velocity shall not exceed 15 ft/sec. Hydraulic losses at inlets, outlets, junctions, bends, etc., must be considered in the design.

9.13.1.8 Depth of Cover

The depth of cover over a storm drainpipe within the County Right-of-Way shall be a minimum of 12 inches. Acceptable depths of cover for each class of pipe shall be based on specifications of the most current publication of the Concrete Pipe Association of New Jersey. The pipe cover shall be checked at the storm inlet grates to ensure that minimum separation is available between the casting and the storm pipe.

9.13.1.9 Pipe Transitions

Where pipe sizes are less than 48 inches in diameter, all transitions in slope, changes in horizontal direction, junctions of pipes and change in pipe sizes shall be confined to manholes, catch basins, or other accessible structures designed for such purposes. Where 48-inch pipes and larger are used, vertical and horizontal deflections may be accomplished using 100-foot radii curves, or greater if approved by the County Engineer.

9.13.1.10 Stormwater Pipes under Driveways

Where a drainage ditch exists within the County Right-of-Way, and where the proposed development is for a minor subdivision, and where driveway access is approved by the Mercer County Development Review Committee, the driveway may be carried over the ditch by the installation of concrete pipe or ductile iron pipe with adequate hydraulic capacity as approved by the County Engineer. Flared end pipe sections must be provided at the beginning and end of the pipe.

Where a drainage ditch exists within the County Right-of-Way and where a major subdivision or a development of multi-family homes, commercial, industrial, office, warehousing use is proposed, the drainage ditch shall be replaced with a sub-surface storm drain system approved by the County Engineer.

Storm Drain Outlet End Treatments

9.13.1.11 Headwall

Gravity headwalls shall not be used for pipes with diameters of 60-inches and greater. Cantilever walls consisting of cast-in-place reinforced concrete footings, headwalls, and wing walls shall be used. Headwalls shall be provided in accordance with applicable NJDOT Standards and the requirements of *The Standards for Soil Erosion and Sediment Control in New Jersey*.

9.13.1.12 Flared End Sections

Flared end sections are permitted at the outfall of County drainage systems for pipe diameters less than 60-inches. End Sections shall be provided in accordance with applicable NJDOT Standards and the requirements of *The Standards for Soil Erosion and Sediment Control in New Jersey*.

Conduit Outlet Protection

The purpose of conduit outlet protection is to provide a stable section of area in which the exit velocity from the pipe is reduced to a velocity consistent with the stable condition downstream. The need for conduit outlet protection shall be evaluated at any location where drainage discharges to the ground surface or a channel, ditch or stream. This may occur at the downstream end of culverts or other drainage systems.

The need for conduit outlet protection shall be determined by comparing the allowable velocity for the soil onto which the pipe discharges to the velocity exiting the pipe. The allowable velocity for the soil shall be

that given in *The Standards for Soil Erosion and Sediment Control Standards in New Jersey*. The velocity in the pipe shall be that which occurs during passage of the design storm or of the 25-year storm, whichever is greater. When the velocity in the pipe exceeds the allowable velocity for the soil, outlet protection will be required.

Conduit outlet protection including Riprap Stone Size and Apron Dimensions shall be designed in accordance with procedures in the *Standards for Soil Erosion and Sediment Control in New Jersey*.

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10. EXISTING COUNTY BRIDGES AND CULVERTS TO BE WIDENED

All modifications, including replacement, to existing Culvert and Bridge facilities shall be designed in accordance to the current *AASHTO LRFD Bridge Design Specifications* as modified by the current *NJDOT Design Manual for Bridges and Structures*. Construction shall be performed in accordance with the current NJDOT Standard Specifications for Road and Bridge Construction as modified by the County Special Provisions.

The minimum width of a County Road from edge-to-edge of pavement shall be 40 feet. Where it is determined necessary to widen the roadway and/or add adjacent ped/bike facilities, the developer shall widen, or replace, the bridges and culverts to the full width of the widened traveled way or future pavement width, whichever is greater, plus a sidewalk, multi-use path or embankment area, if such is required. In no instances, however, shall the structure roadway (curb-to-curb) be less the minimum required 40 feet.

Where these Standards require widening on both sides of the road, the culvert or bridge shall be extended, or replaced as specified by these Regulations.

Where an existing bridge or culvert is found to be structurally or hydraulically inadequate to serve the proposed development, then total replacement of the structure shall be required by the Planning Board and/or County Engineer.

When bridges and culverts are designated for replacement but immediate replacement is found to be impossible or impractical, then full payment of the total replacement cost shall be charged to the developer as provided in these standards.

10.1 BRIDGES AND CULVERTS DOWNSTREAM OF DEVELOPMENT

All developments, which drain to an existing County-owned Bridges or Culverts, will be considered to directly increase the hydraulic requirements of that structure. Residential subdivisions of 3 lots or less, not involving any other subdivision action within the prior three years, and not involving addition of impervious surfaces, may be exempted from this requirement, at the discretion of the County Engineer.

10.2 PROPORTIONATE SHARE COST

A developer shall be required to pay a proportionate share of the cost of correcting an adverse drainage condition when the County Engineer or Planning Board determines that a development situated in a drainage basin:

- Would create an immediate or potential impact on a County drainage structure, such as increased stream flows and discharges; or
- When the development lies in a drainage basin where drainage facilities have previously been installed, replaced, or altered under the provisions of these Standards.

The proportion of the cost of such facilities to be paid by a developer whose proposed development would drain into such facility will be equal to the proportion that the acreage of the proposed development bears to the acreage of the entire drainage basin. The developer's engineer shall perform all calculations of storm runoff based on consideration of the physical features of the basin and the future development of the area based on the future build out and existing local zoning ordinances. The County Engineer shall on behalf of the Planning Board review said calculations.

The proportionate cost of the drainage facility installation or alteration will be the estimated cost of installing the new facility as calculated by the County Engineer, plus 15% for contingencies. In cases where the payment is to be made toward the proportionate cost of facilities previously installed or the cost of

previously performed alterations, the actual cost of the work performed will be used in place of an estimated cost.

Regardless of any other provision in these Standards, the developer will not be financially responsible for any part of existing drainage facilities for which full payment has previously been made to the County by other developers in the same drainage basin.

10.3 BRIDGE AND CULVERT HYDRAULIC DESIGN

County bridges and culverts must be designed to convey the peak runoff from a 25-year storm under full flow conditions. One (1) foot of freeboard (1 foot above the water surface elevation of the 25-year storm to the bottom of the bridge superstructure or bottom side of the top of the culvert) is to be provided in determining the ultimate design of the County bridge or culvert. Minimum design velocity at flowing full conditions shall be 3 ft/sec. Maximum design velocity shall not exceed 15 ft/sec.

The hydraulic design of bridges and culverts shall be based on current New Jersey Department of Environmental Protection permit requirements. Therefore, all designs shall be sufficient to obtain all necessary permits. Hydraulic Design shall also accommodate all required stream stabilization Best Management Practices per the current New Jersey Soil Erosion Control Standards as well as the NJDEP Inland Flood Protection Rule in order to secure certification by the Mercer County Soil Conservation District.

10.4 WATER SURFACE PROFILES

At the discretion of the County Engineer, any bridge or culvert replacement, or modification, along a waterway must be accompanied by a hydraulic analysis of the upstream and downstream water surface elevation. The method for calculation of the water surface shall conform to methodology generally acceptable to NJDEP and shall evaluate 2, 5, 10, 25 , 50 , 100-year and the New Jersey Flood Hazard Act Design Storm Event.

10.5 BRIDGE AND CULVERT WIDTH

Bridges and Culverts shall be designed in such ways that take into account all future modes of transportation, including transit, bicycles, and pedestrians. Designs should also provide enough width to incorporate bicycle facilities whether they be bike lanes, buffered bike lanes, or separated bike facilities. Sidewalk shall also be provided at a minimum on one side of said bridge or culvert.

10.6 STANDARDS AND SPECIFICATIONS

Design specifications shall be the current edition of the *American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specification* as modified by the appropriate sections of the most current edition of the *New Jersey Department of Transportation Design Manual for Bridges and Structures*. Concrete classes shall conform to current Mercer County standards.

- For Bridge Reconstruction/Replacement, the Developer will propose three design alternatives demonstrating type, size, and location. (Prestressed beams/ girders will not be accepted.)
- All reinforcing steel shall be hot dip galvanized.
- The substructure shall consist of either cast-in-place or precast concrete, based upon approval by the County Engineer.
- Railings shall conform to current New Jersey Department of Transportation approved details or Federal Highway Administration (FHWA) approved details subject to review and approval by the County Engineer.
- Soil borings or other geotechnical services shall be required as necessary for the design of the proposed structure in accordance with *NJDOT Design Manual for Bridges and Structures*. A

minimum of two (2) borings per substructure is required. Borings will be of sufficient depth to design the proposed foundations.

- For precast concrete 3-sided rigid frames, or box culverts, only single cell structures will be permitted. If multiple cells are required, then a bridge structure must be used.
- The design of bridge railings, parapets, and other architectural treatments shall be compatible with the surrounding area. The use of special details, including textured concrete may be required. Structure Aesthetics will be at the approval of the County Engineer.
- Approach slabs shall be used for all structures and shall be designed in accordance with appropriate geotechnical parameters.
- Approach roadway transitions shall be designed to obtain the best achievable horizontal and vertical alignments. The minimum cross slope shall be 2%. The minimum centerline and gutter grades shall be 1%. Careful consideration shall be given to the impacts on existing intersections, driveways and sidewalks.
- Minimum concrete deck slab thickness for bridge-type structures shall be in accordance with the *NJDOT Design Manual for Bridges and Structures* and meet current AASHTO design guidelines.
- Minimum cover from the top of pavement (bituminous) to the top of the precast 3-sided rigid frame or box culvert shall be two (2) feet. A reinforced concrete deck slab shall be used if the cover is less than two (2) feet. Minimum slab thickness shall be 8 inches.
- Curb face on the proposed structure shall be 6 inches.

10.7 COUNTY RESPONSIBILITY FOR BRIDGES

The Mercer County Board of Commissioners may by resolution, assume jurisdiction and future maintenance of bridges and culverts on municipal roadways within developments when said structures will be for the purpose of spanning a waterway and will have a nominal four (4) foot clear span or greater and are subject to the following conditions:

- Said structures must further comply with the applicable standards for procedures, design, and construction as set forth in the Current *NJDOT Design Manual for Bridges and Culverts* and NJDOT Standard Specifications for Road and Bridge Construction
- Drainage Area
- The drainage basin upstream of proposed bridge or culvert exceeds one-half (1/2) square mile (320 acres) in areas and the bridge or culvert has a span greater than 20 feet.
- The structure has received all applicable approvals and certifications from governing regulatory agencies, including, but no limited to, NJDEP and Delaware and Raritan Canal Commission (as applicable).
- Structure Loading
- The structure is designed to carry AASHTO HL-93 loading and/or NJDOT Permit vehicle, whichever governs. Deck width meets or exceeds the following requirements:
- Culverts - Full width of road Right-of-Way.
- Bridges - Planned pavement width plus two (2) - 6-foot wide sidewalks.
- The construction plans and specifications for the structure have been approved by the County Engineer prior to construction.
- Construction Supervision Notification of commencement of construction is given so that periodic inspections can be made by County.

- Final inspection and certification of County Engineer stating that the new structure was constructed in accordance with the approved plans and specifications.
- The municipal governing body has adopted a resolution requesting that the County assume maintenance responsibility of the new structure.
- The structure has been designed in accordance to Mercer County Guidelines and can accommodate pedestrians, bicyclists, and transit vehicles.
- The structure has been designed with resiliency in mind to withstand future storm events.

11. LANDSCAPING ALONG COUNTY ROADS

Street trees are required to be planted along all County Roads in accordance with this ordinance. Street trees and landscaping are subject to review and approval by the Mercer County Land Development Review Committee. All shade trees shall be minimum of 2 ½ - 3 ½ inch caliper depending on species or minimum of 10-11 feet tall. Trees shall also be balled and burlapped and shall conform to the American Standard of Nursery Stock (current edition).

Landscaping must use species that are hardy to urban conditions with a preference to native species. Plant materials shall be planted so as not to interfere with utilities, roadways, sidewalks, sight easements or site lighting. The following sections shall describe the required landscaping standards. **Property owners shall be responsible for all trees and landscaping**. **New trees may be permitted in the County Right-of-Way only if an Indemnification & Maintenance Agreement is prepared, otherwise trees shall be planted outside of the County Right-of-Way.**

11.1 STREET TREE SPACING

Spacing of existing shade trees shall determine the spacing standards (see chart below) for new shade trees unless otherwise directed by the County. Proposed shade trees may be inter-planted between existing shade trees.

Shade trees shall be spaced evenly along the street, however, if a specific effect is desired, the trees may be massed at critical points or shall be a combination of both. If columnar trees are to be planted, the spacing may be closer. All tree spacing along County Roads shall be subject to review and approval by the Mercer County Development Review Committee.

All trees shall adhere to the following minimum planting distances for all utility or site infrastructure clearances:

- All trees shall be planted outside of existing or future sight triangle areas and easements.
- All trees shall be planted a minimum ten (10) feet from all drain inlets, catch basins, trench drains, utility poles and ground mounted transformers.
- All small sized trees shall be planted a minimum three (3) feet from any driveway aprons, curb, roadway pavement, sidewalk or sidepath.
- All medium and large sized trees shall be planted a minimum five (5) feet from any sidewalk or sidepath.
- All medium and large sized trees shall be planted a minimum ten (10) feet from any driveway aprons, curb and roadway pavement.
- All medium sized trees shall be planted a minimum fifteen (15) feet from extent of utility pole cross arm or power lines, whichever is greater.
- All large sized trees shall be planted a minimum of twenty-five (25) feet from extent of utility pole cross arm or power lines, whichever is greater.

Care should be taken to plant multiple tree species, with no less than 2 different species planted along the County Road to prevent widespread tree loss in case of future fungal and/or insect infestations. Where shade trees along a County Road include a variety of species, the general growth habit and scale of the trees should be similar so as to produce continuity.

The following table should be used for general guidance in the spacing of shade trees to be planted along County Roads. Specific situations or specific design requirements require review and approval of the modification of standards by the County planner.

Tree Size	Mature Height	Maximum Spacing
Large Trees	45+	50 feet
Medium trees	25 - 45	35 feet
Small Trees	Below 25	30 feet

Maximum spacing indicates maximum distance between street trees within the County Right-of-Way. **If no trees are planted within the County Right-of-Way, maximum spacing between trees shall be 50 feet.** More trees are permitted and encouraged as appropriate.

All deciduous trees shall be a minimum of (2 ½ – 3 ½) inches in caliper as measured at one (1) foot above the ground. The minimum height of all proposed deciduous trees shall be eleven (11) feet. The minimum height of all ornamental trees shall be allowed to vary depending on setting and type of tree.

The size of evergreens and shrubs shall be allowed to vary depending on setting and type of tree or shrub.

11.2 PLANTING SPECIFICATIONS

All trees shall have a minimum caliper as noted in the appropriate table in this section unless otherwise exempted. Street trees shall be substantially uniform in size and shape, and have straight trunks. Trees shall be properly planted and staked in accordance with the provisions of this section. Provision shall be made by the developer and/or property owner for regular watering and maintenance until they are established. **Trees shall be protected from deer until they are established. Dead or dying trees, for a period of three years, shall be replaced by the developer and/or property owner during the next suitable planting season.**

11.3 GUYING AND STAKING

All deciduous trees under three (3) inches in caliper shall be staked. All deciduous trees three (3) inches in caliper or greater shall be guyed. All evergreen trees under eight (8) feet shall be staked. All evergreen trees eight (8) feet or greater shall be guyed. Guying and staking detail shall be included on Landscape Plan. Guying and staking may be omitted if specific site conditions permit, subject to review and approval by the County Engineer.

All deciduous and evergreen trees requiring stakes shall have a minimum of three (3), six (6) to eight (8) foot cedar or oak stakes, no less than two (2) inches in diameter, installed in a triangular pattern to anchor the tree against the prevailing winds. Each stake shall be set two (2) feet into the ground parallel to the tree just beyond the root ball. Each tree shall be secured to the stakes with double strand twisted malleable #10 gauge annealed steel wire. The wire shall be looped through a two-ply fabric bearing rubber hose ½" minimum I.D. and secured approximately 2/3's up the tree or just at first branches. All stakes and wires shall be removed after two years.

All deciduous and evergreen trees requiring guy wires or cables shall have a minimum of three (3), three (3) foot long cedar or oak stakes, no less than three (3) inches in diameter, installed in a triangular pattern to anchor the tree against the prevailing winds. Each guying stake shall be installed at a 45° angle away from the tree. Each guy wire or cable shall be looped through a two-ply fabric bearing rubber hose ½" I.D. and secured approximately 2/3's up the tree or just at first branches. Each guy wire or cable shall have a turnbuckle to tension the wire or cable. All stakes and guy wires or cables shall be removed after two years.

Protective barriers shall be installed around each plant and/or group of plants that are to be retained within the County Right-of-Way and within 50 feet of the proposed County Right-of-Way. Barriers shall be self-supporting and shall not be attached to the vegetation being protected. Barriers shall be a minimum of four (4) feet high and constructed of highly visible orange plastic mesh that is durable and that will last until construction is completed. A silt fence shall be installed along the outside perimeter base of the plastic mesh fence to prevent siltation from occurring in areas where shrubs or trees are to be retained. All roots

shall be pruned one foot beyond the fence using a vibrating knife or narrow trencher. The trench shall be immediately backfilled and covered with a minimum of three (3) inches of mulch. All protected areas shall be signed to identify that tree preservation efforts are underway and to define the limit of construction.

All stakes and ties shall be removed not less than twelve (12) months nor more than eighteen (18) months from time of planting.

No construction equipment; construction material; or temporary soil deposits, shall be placed within five (5) feet of an existing shrub or within the crown spread of an existing tree designated to be retained on the Landscape Plan.

Protective tree wells or retaining walls shall be installed around each plant and/or groups of plants that are to be retained within the County Right-of-Way, or within fifty (50) feet of the County Right-of-Way, where the base of the trunk is to be lower than the surrounding finished grade by more than nine (9) inches. No tree well or retaining wall shall be installed within five (5) feet of an existing shrub, or within the drip line of an existing tree designated to be retained on the Landscape Plan.

11.4 PLANT & SHADE TREE SELECTION

All plant materials used shall be true to name and size in conformity with the American Standard of Nursery Stock (current edition) and shall be typical of their species and variety. All plants shall have normal, well-developed branches and vigorous root systems. Plants shall be sound, healthy, vigorous, and free from defects, disfiguring knots, and abrasions of the bark, sunscald injuries, plant diseases, insect eggs, borers and all other forms of infection. All plants shall be nursery grown, unless specifically approved by the County planner. All plants shall be grade "A" nursery stock.

All plant material shall be climatically suitable for that particular climatic zone in which the project is located. Plant material must be tagged at the source by the Landscape Architect or agent in charge. All plants (B&B or container) shall be clearly identified as to Genus, specie, variety, Common Name and size on weather-proof labels securely attached prior to delivery to the project site. **All plants shall be protected from wind and heat damage during transit to the job site by a tarpaulin. Once planted, all trees shall be watered accordingly as needed.**

All plant materials proposed on the Landscape Plan shall be subject to the review and approval of the County. All plant material shall be climatically suitable for that particular climatic zone in which the project is located. **Fruit bearing trees or shrubs may be permitted within the County Right-of-Way only with permission of County Engineer**. Property owners will be responsible for maintaining vegetation and debris. Developers shall ensure that any fruit bearing vegetation will not pose a safety or maintenance hazard.

The following tables show trees preferred by the County:

Table 1: Recommended Small Street Trees in County ROW

Botanical Name	Common Name	Minimum Planting Size
Acer buergeranum	Trident Maple	3" cal.
Acer campestre	Hedge Maple	3" cal.
Acer tataricum	Tatarian Maple	3" cal.
Amelanchier x grandiflora	Serviceberry	2.5" cal.
Amelanchier x hydrida 'Cumulus'	Shadblow 'Cumulus'	3" cal.
Cercis canadensis	Eastern Redbud	10'
Cornus florida	White Flowering Dogwood	11'
Cotinus obovatus	Smoketree	2.5" cal.
Crataegus crus-galli inermis"Cruzam"	Crusader Hawthorn	10'
Crataegus phaenopyrum x. 82errulate82	Washington Hawthorne	3" cal.
Crataegus viridis	Green Hawthorne	3" cal.
Magnolia Virginiana	Sweetbay Magnolia	10'

Magnolia x lobneri 'Merrill'	Merrill Magnolia	11'
Prunus cerasifera	Purpleleaf Plum	2.5" Cal.
Prunus padus	European Birdcherry	3" Cal.
Prunus sargentii	Sargent Cherry	3" Cal.
Prunus 83errulate 'Kwanzan'	Japanese Flowering Cherry	3" Cal.
Pyrus 'NCPX1'P Javelin	Javelin Pear	3" cal.

Table 2: Recommended Medium Street Trees in County ROW

Botanical Name	Common Name	Minimum Planting Size
Acer rubrum 'Scanlon'	Scanlon Red Maple	3" cal.
Acer rubrum 'Northwood'	Northwood Red Maple	3" cal.
Acer saccharum 'Goldspire'	Goldspire Sugar Maple	3" cal.
Acer truncatum	Purpleblow Maple	3" cal.
Amelanchier arborea	Serviceberry, Downy	3" cal.
Asimina triloba	Pawpaw	3" cal.
Carpinus betulus	European Hornbeam	3" cal.
Carpinus caroliniana	American Hornbeam	3" cal.
Celtis bungeana	Bunge Hackberry	3" cal.
Cercis canadensis	Eastern Redbud	3" cal.
Chionanthus virginicus	White Fringetree	3" cal.
Cladrastis kentukea	American Yellowwood	3" cal.
Cladratis lutea	Yellowwood	3" cal.
Cornus florida	Flowering Dogwood	3" cal.
Cornus 'Rutgan' STELLAR PINK	Stellar Pink Rutgers Dogwood	3" cal.
Ilex opaca	American Holly	3" cal.
Maackia amurensis	Amur Maackia	3" cal.
Nyssa sylvatica	Black Gum	3" cal.
Ostrya virginiana	Hop Hornbeam	3" cal.
Tilia cordata x. 'Whitehouse'	Whitehouse Linden	3" cal.
Viburnum prunifolium	Blackhaw Viburnum	3" cal.

Table 3: Recommended Large Street Trees in County ROW

Botanical Name	Common Name	Minimum Planting Size
Acer rubrum 'October Glory'	October Glory Red Maple	3" - 3½" cal.
Acer rubrum 'Red Sunset'	Red Sunset Red Maple	3" - 3½" cal.
Aesculus x carnea `Briotii'	Ruby Red Horsechestnut	3" - 3½" cal.
Carya glabra	Pignut Hickory	3" - 3½" cal.
Carya ovata	Shagbark Hickory	3" - 3½" cal.
Celtis occidentalis 'Magnifica'	Hackberry	3" - 3½" cal.
Cladrastis kentukea	American Yellowwood	3" - 3½" cal.
Corylus colurna	Turkish Filbert	3" - 3½" cal.
Diospyros virginiana	Persimmon	3" - 3½" cal.
Eucommia ulmoides	Hardy Rubber Tree	3" - 3½" cal.
Fagus grandifolia	American Beech	3" - 3½" cal.
Fraxinus americana 'Autumn Purple'	Autumn Purple Ash	3" - 3½" cal.
Ginkgo biloba (male only)	Ginkgo (male only)	3" - 3½" cal.
Gleditsia triacanthos	Honey Locust	3" - 3½" cal.
Ilex opaca	American Holly (Satyr Hill Cultivar)	3" - 3½" cal.
Juniperus virginiana	Eastern Red Cedar	3" - 3½" cal.

Liquidambar styraciflua	American Sweetgum	3” - 3½” cal.
Liriodendron tulipfera	Tulip Poplar	3” - 3½” cal.
Magnolia grandiflora	Southern Magnolia	3” - 3½” cal.
Metasequoia glyptostroboides	Dawn Redwood	3” - 3½” cal.
Nyssa sylvatica	Black Tupelo	3” - 3½” cal.
Oxydendrom arboretum	Sourwood	3” - 3½” cal.
Pinus strobus	Eastern White Pine	3” - 3½” cal.
Platanus acerifolia	London Planetree	3” - 3½” cal.
Platanus occidentalis	Sycamore	3” - 3½” cal.
Quercus alba	White Oak	3” - 3½” cal.
Quercus bicolor	Swamp White Oak	3” - 3½” cal.
Quercus coccinea	Scarlet Oak	3” - 3½” cal.
Quercus falcata	Southern Red Oak	3” - 3½” cal.
Quercus lyrata	Overcup Oak	3” - 3½” cal.
Quercus marcocarpa	Bur Oak	3” - 3½” cal.
Quercus muehlenbergii	Chinkapin Oak	3” - 3½” cal.
Quercus nuttalli	Nuttall Oak	3” - 3½” cal.
Quercus palustris	Pin Oak	3” - 3½” cal.
Quercus palustris "Pringreen"	Green Pillar Pin Oak	3” - 3½” cal.
Quercus phellos	Willow Oak	3” - 3½” cal.
Quercus phellos	Willow Oak	3” - 3½” cal.
Quercus robur	English Oak	3” - 3½” cal.
Quercus rubra	Northern Red Oak	3” - 3½” cal.
Quercus rubra	Red Oak	3” - 3½” cal.
Quercus shumardii	Shumard Oak	3” - 3½” cal.
Robinia psuedoacacia	Black Locust	3” - 3½” cal.
Taxodium distichum	Bald Cypress	3” - 3½” cal.
Tilia americana	American Linden	3” - 3½” cal.
Tilia tomentosa 'Green Mountain'	Silver Linden	3” - 3½” cal.
Tilia x euchlora	Crimean Linden	3” - 3½” cal.
Ulmus americana “Delaware”	Delaware American Elm	3” - 3½” cal.

Additional tree species may be considered on a case-by-case basis. Mercer County recommends that developers refer to the NJ Native Plant Society’s List of Acceptable Native Trees for identifying appropriate trees for our region.

11.5 PRUNING

All deciduous trees shall be pruned at time of planting to thin and shape the canopy. Branches extending below six (6) feet shall be pruned. All evergreen trees and shrubs shall only be pruned to remove damaged or broken branches. All deciduous shrubs shall be pruned to thin branch tips and foliage by 1/3 and to shape the plant. All cuts shall be made within ¼ inch of a lateral branch or bud.

Under no circumstances shall the central leader of any deciduous or evergreen tree be cut.

11.6 MULCHING

Trees shall be properly mulched to support healthy trees. Mulch shall be applied at a minimum depth of 2 inches and maximum depth of 4 inches. Proper mulching will leave root flare exposed and resemble a “donut” shape. **“Volcano Mulching” or “Mulch Volcanoes” are improper mulching methods and shall be avoided.** Mulch that is applied too deep can trap water in the root zone of plant material causing root rot. Over time, if mulch is applied too deep, it can compress, creating a barrier that doesn't allow water and nutrients to penetrate the soil, decreasing the health of the soil.

11.7 MINIMUM SOIL VOLUMES

Based on trees selected from the tables above, the following are the minimum soil volumes for tree rooting:

- Large Trees: 1,000 cubic feet of soil within 30 foot radius
- Medium Trees: 600 cubic feet of soil within 25 foot radius
- Small Trees: 200 cubic feet of soil within 18 foot radius
- Where soil volumes within the maximum allowable radii for adjacent trees overlap, up to 25% of the required soil volume per tree may be shared.
- Soil Volume calculation shall be calculated as:
    i. (Area of Open Soil x Depth of soil) plus (Area of Covered Soil x Depth of soil)
    ii. All soil types are calculated at full volume.
    iii. There may be multiple soil volume areas included in the calculation depending on design.

Reductions in tree planting space and soil volumes must be justified by physical constraints and approved by the County Engineer.

In order to provide adequate soil volume for street trees, horticulturally appropriate soils must often be placed beneath the adjacent paved surfaces. In commercial areas with wider sidewalks that extend to the curb, trees shall be placed in tree wells with root guard systems and soil systems. Acceptable soil systems include suspended pavements, structural cells, and several types of structural soils:

Suspended pavements include structural slabs that span between structural supports that allow uncompacted growing soil beneath the sidewalk, and commercially available structural systems. Manufacturer details and certification must be provided for commercial systems. Structural calculations and details must be provided for Suspended Pavement installations. Soil placed beneath Suspended Pavements shall be a minimum of 30 inches of Bioretention Soil or per manufacturer's specifications.

Structural cells are commercially-available structural systems placed subsurface that support the sidewalk and are filled with soil. Manufacturer details and certification must be provided for commercial systems. Soil placed within structural cells shall be a minimum of 30 inches of Bioretention Soil or per manufacturer's specifications.

Sand-Based Structural Soil System (SBSS) is a non-propriety soil system that typically includes a minimum of six inches of open graded crushed stone over a minimum of 30 inches of Sand-Based Structural Soil. Aeration of the overlying stone and a source of water are essential components.

CU Soil is a patented product and shall be obtained only from licensed facilities. CU Soil shall not be used in conjunction with stormwater infiltration.

Stalite Structural Soil is a proprietary product consisting of lightweight aggregate with a horticultural application.

11.8 GRASS AND TOPSOIL

Identification of all areas to receive topsoil and seed, sod or other approved vegetative cover. Topsoil removed during the course of construction within County Right-of-Way shall be stockpiled and redistributed on all re-graded surfaces within County Right-of-Way. **A minimum even cover of four (4) inches shall be redistributed to all disturbed areas of the affected Right-of-Way and shall be stabilized by seeding, application of sod, hydro seeding, use of other approved vegetative material and fertilizer.**

If excess topsoil remains, the thickness of cover shall be increased. **If additional topsoil is required, it shall be the responsibility of the developer to provide comparable topsoil.** Topsoil shall not be removed from

the site nor is topsoil to be used as spoil. Topsoil removed during the course of construction shall be stockpiled and redistributed so as to provide a nearly equal amount of cover to all disturbed areas of the affected Right-of-Way and shall be stabilized by seeding or planting on all slopes up to 10% as shown on the Final Grading Plan. All slopes and drainage swales over ten 10% shall be stabilized.

In cases where additional topsoil may be required, the imported material must be a friable, loamy soil, reasonably free of debris, objectionable weeds and stones; possess a natural pH of 5.0 to 7.5; have an organic content greater than 2%; and contain no toxic substances that may be harmful.

Please refer to the *NJ Department of Agriculture Standards for Permanent Vegetative Cover for Soil Stabilization* or the *NJDOT Standard Specifications for Road and Bridge Construction* for acceptable grass seed mixtures.

11.9 PLANTING NOTES/SOIL BACKFILL MIXTURE

All plant holes shall be backfilled with 1/3 subsoil and 2/3 soil mixture. The soil mixture shall be a combination of two (2) parts native loamy soil, one (1) part coarse sandy topsoil, and one (1) part peat humus or peat moss. A 10-6-4 fertilizer at a rate of ½ lb. per hole or liquid fertilizer as per label shall be mixed with the backfill soil mixture. The backfill soil mixture shall be free of all rocks and debris.

11.10 FENCES AND WALLS

All fences and/or walls shall be erected within property lines, and no fence or wall shall be erected so that it will encroach upon the County Right-of-Way. Fences shall be placed outside of any sight triangle easements and areas and placed a minimum 12 inches from edge of County Right-of-Way.

11.11 STREET FURNITURE

All street furniture including, but not limited to, trash receptacles, benches, planters, phone booths, etc., shall be reviewed and approved on a case by case basis by the County Planner and Engineer to be approved by the County Planning Board. **All "Street Furniture" within County Right-of-Way is subject to be moved by County staff at any time. If work is necessary within the County Right-of-Way, such as maintenance work or road widening, property owner shall move or remove all furniture at their own cost.** Restaurants or businesses seeking to place outdoor seating on sidewalk along the County Right-of-Way shall prepare an Indemnification Agreement for County review. A template of the Indemnification Agreement can be found in the appendix of these standards.

The placement of all street furniture including, but not limited to, trash receptacles, benches, tables, planters, phone booths, etc., in the County right-of-way, shall be encouraged subject to the signing of an indemnification agreement found in the appendix of these standards. The following shall be noted:

- Since much street furniture is functional in nature, it should be located where needed. Benches should be placed at street corners, in plazas, or where people congregate; bollards should be placed where desired to prevent vehicle access while still allowing access for pedestrians and cyclists; bus shelters should be required at major intersections or where there is heavy bus usage; bike racks should be located at schools, in shopping areas, and at playgrounds; kiosks, drinking fountains, game tables, and notice boards might be located in public plazas, in parks, or in other recreational areas.
- Restaurants seeking to place outdoor seating on sidewalk along the County Right-of-Way should review the Indemnification Agreement in the appendix of these standards.
- The street furniture shall be appropriately affixed or of sufficient weight to preclude its accidental rearrangement by persons, vehicles or natural forces. Items should be durable. Street furniture must be designed to withstand the effects of the elements, including sun expansion-contraction, wind stress, moisture, and in some cases, salt spray, frost, or ice.

- The placement of street furniture shall not impede pedestrian access to, from and through the area unless the purpose of such placement is to direct or redirect pedestrian access in an appropriate manner.
- Street furniture shall not obstruct sight lines at any intersection.
- Street furniture shall not be utilized as or for signage.
- Street furniture for bicyclists, such as bike racks and bike shelters, is encouraged in areas of high bicycle use, and may be required at the discretion of the County Engineer.
- Street amenities should be located in a zone along or near the curb as a barrier to automobile traffic, especially lighting, parking meters, street trees, trash receptacles, news racks and heavy planters.

11.12 LANDSCAPING ON CHANNELIZED ISLANDS OR TRAFFIC ISLANDS

All channelized islands or traffic islands with less than two hundred fifty (250) square feet of area shall be paved. Decorative paving material, such as brick, Belgian block, or similar paving material may be permitted on channelized islands or traffic islands. Bricks and small pavers are not allowed along any pedestrian travel path within islands and are not a permitted detectable warning surface.

All channelized islands or traffic islands with greater than two hundred fifty (250) square feet of area shall be planted with turf, groundcovers, annuals, perennials, or shrubs and shall not exceed twenty (20) inches in height as measured above the centerline grade of the intersecting street or driveway.

Deciduous ornamental and/or shade trees may be permitted on channelized islands or traffic islands of five thousand (5,000) square feet or greater. All trees shall be planted a minimum eight (8) feet from edge of pavement. Tree canopies shall be maintained at no lower than ten (10) feet above the centerline grade of the intersecting street or driveway.

11.13 LANDSCAPING ON MEDIANS

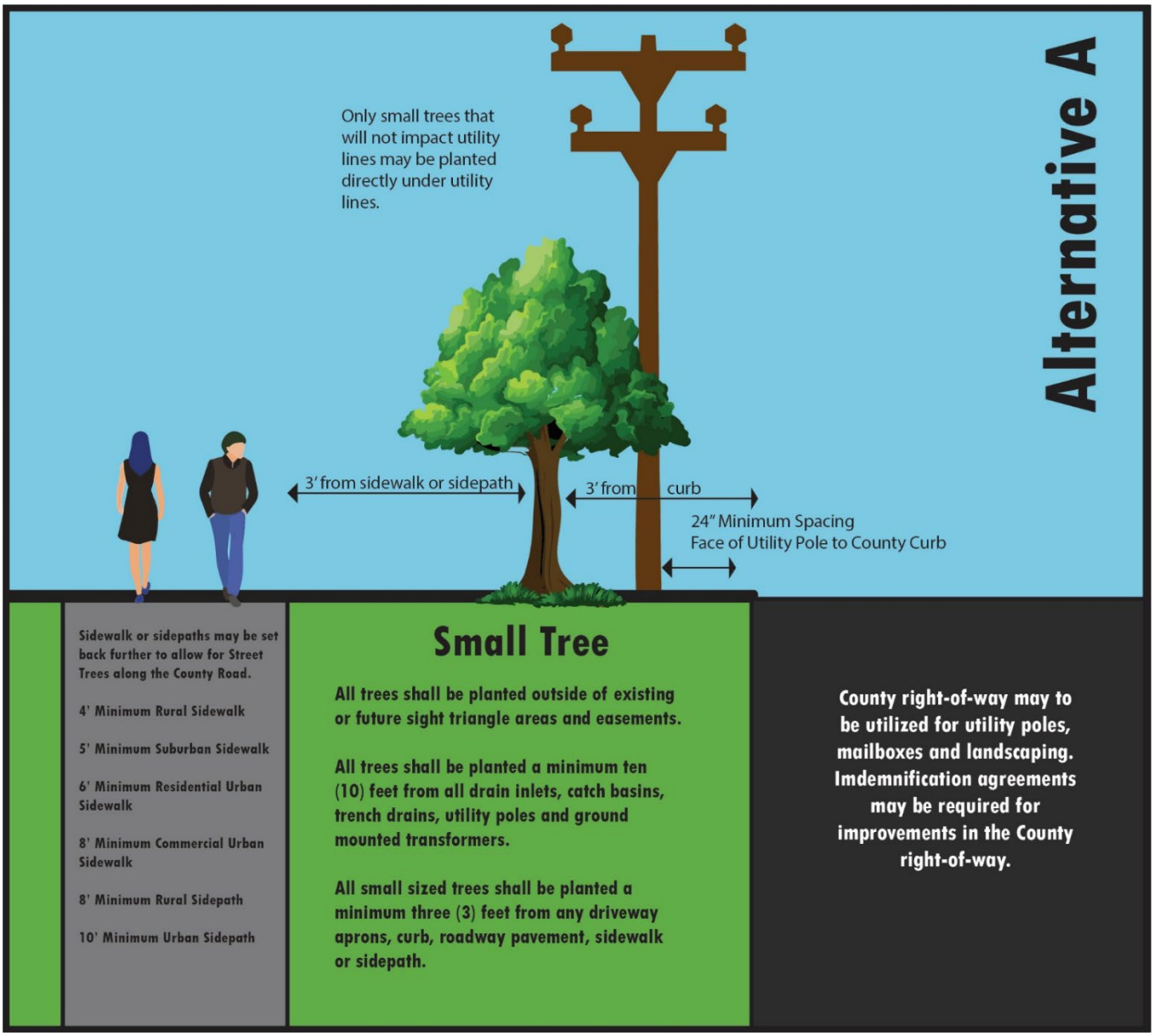
Medians and islands shall be landscaped unless otherwise directed by the County Engineer. All medians fifteen (15) feet in width or less, that are not required to be paved, shall be planted with turf, groundcovers, annuals, perennials, or shrubs and shall be maintained to a height of thirty (30) inches as measured from the centerline grade of the adjacent street or driveway.

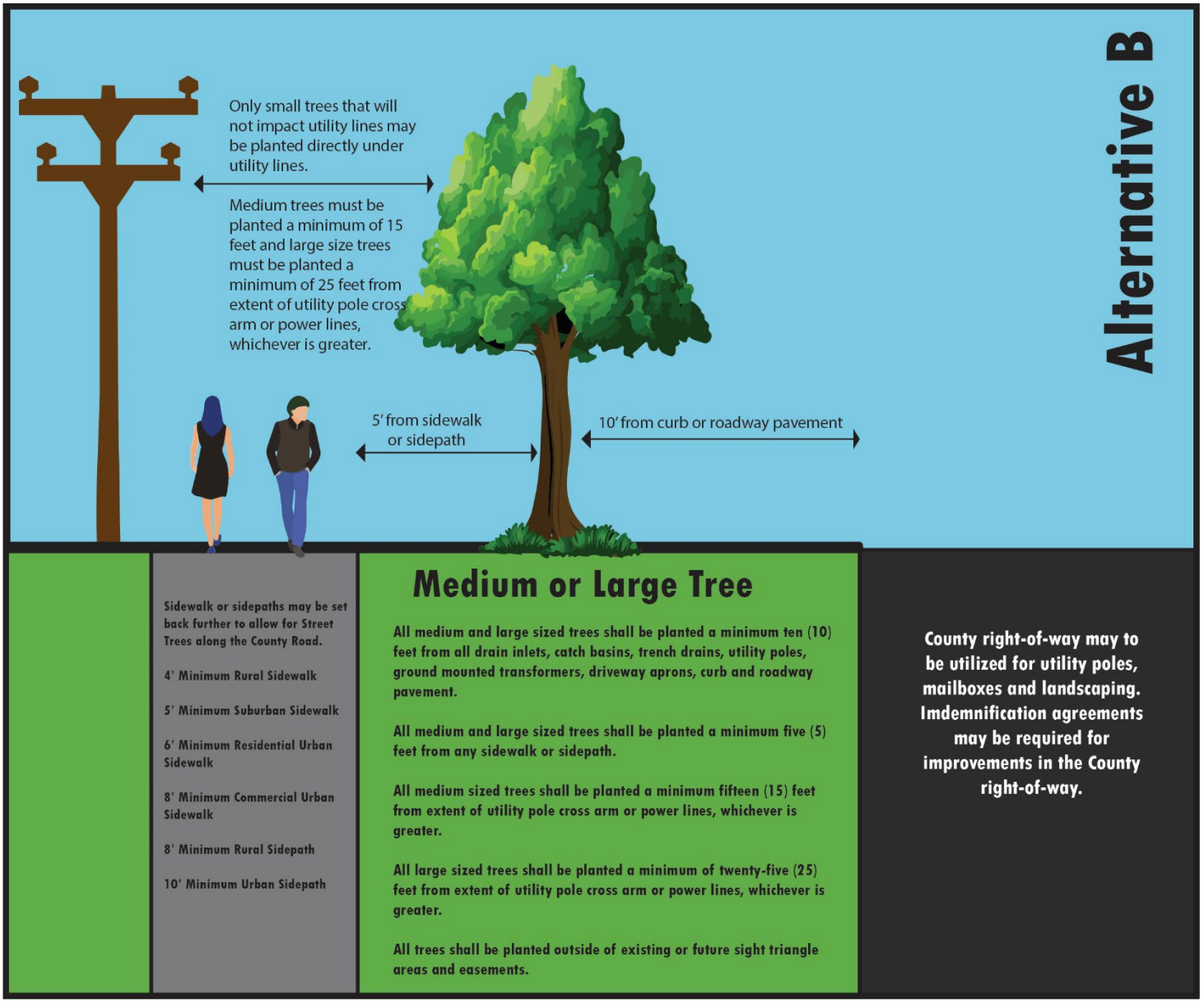
Deciduous ornamental and shade trees may be permitted on medians sixteen (16) feet in width. All trees shall be planted a minimum eight (8) feet from edge of pavement. Tree canopies shall be maintained at no lower than ten (10) feet above the centerline grade of the intersecting street or driveway.

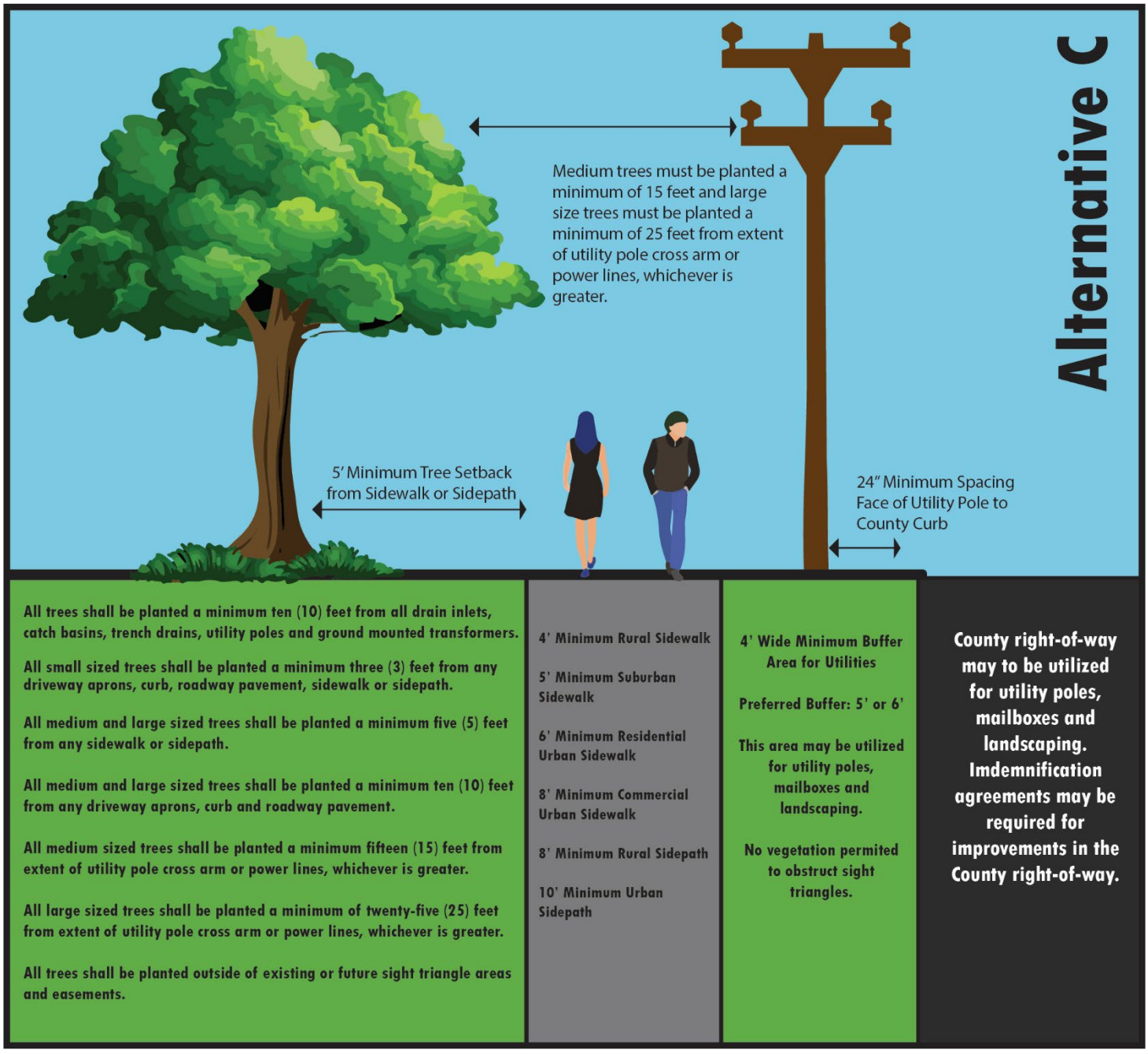
Landscaped medians and islands shall be a minimum width of 4 feet, as measured from the back of the curb. If large trees are to be planted in landscaped medians or islands, these medians or islands shall be a minimum of 10 feet in width measured from the back of curb and include a minimum of 200 square feet of soil surface area per large tree.

All landscaped islands and medians shall receive a minimum of 5 inches of topsoil over finished subgrade and shall be graded to provide adequate drainage. Subsurface drainage may be recommended for landscaped medians and islands at the discretion of the County Engineer.

The following graphics are for illustrative purposes only. Final landscaping, utility pole and sidewalk/sidepath placement shall be coordinated with Mercer County:


Alternative A
Only small trees that will not impact utility lines may be planted directly under utility lines.
3' from sidewalk or sidepath
3' from curb
24" Minimum Spacing
Face of Utility Pole to County Curb
Sidewalk or sidepaths may be set back further to allow for Street Trees along the County Road.
4' Minimum Rural Sidewalk
5' Minimum Suburban Sidewalk
6' Minimum Residential Urban Sidewalk
8' Minimum Commercial Urban Sidewalk
8' Minimum Rural Sidepath
10' Minimum Urban Sidepath
Small Tree
All trees shall be planted outside of existing or future sight triangle areas and easements.
All trees shall be planted a minimum ten (10) feet from all drain inlets, catch basins, trench drains, utility poles and ground mounted transformers.
All small sized trees shall be planted a minimum three (3) feet from any driveway aprons, curb, roadway pavement, sidewalk or sidepath.
County right-of-way may to be utilized for utility poles, mailboxes and landscaping. Imdemnification agreements may be required for improvements in the County right-of-way.


Alternative B
Only small trees that will not impact utility lines may be planted directly under utility lines.
Medium trees must be planted a minimum of 15 feet and large size trees must be planted a minimum of 25 feet from extent of utility pole cross arm or power lines, whichever is greater.
5' from sidewalk or sidepath
10' from curb or roadway pavement
Sidewalk or sidepaths may be set back further to allow for Street Trees along the County Road.
4' Minimum Rural Sidewalk
5' Minimum Suburban Sidewalk
6' Minimum Residential Urban Sidewalk
8' Minimum Commercial Urban Sidewalk
8' Minimum Rural Sidepath
10' Minimum Urban Sidepath
Medium or Large Tree
All medium and large sized trees shall be planted a minimum ten (10) feet from all drain inlets, catch basins, trench drains, utility poles, ground mounted transformers, driveway aprons, curb and roadway pavement.
All medium and large sized trees shall be planted a minimum five (5) feet from any sidewalk or sidepath.
All medium sized trees shall be planted a minimum fifteen (15) feet from extent of utility pole cross arm or power lines, whichever is greater.
All large sized trees shall be planted a minimum of twenty-five (25) feet from extent of utility pole cross arm or power lines, whichever is greater.
All trees shall be planted outside of existing or future sight triangle areas and easements.
County right-of-way may to be utilized for utility poles, mailboxes and landscaping. Imdemnification agreements may be required for improvements in the County right-of-way.


Alternative C
Medium trees must be planted a minimum of 15 feet and large size trees must be planted a minimum of 25 feet from extent of utility pole cross arm or power lines, whichever is greater.
5' Minimum Tree Setback from Sidewalk or Sidepath
24" Minimum Spacing Face of Utility Pole to County Curb
All trees shall be planted a minimum ten (10) feet from all drain inlets, catch basins, trench drains, utility poles and ground mounted transformers.
All small sized trees shall be planted a minimum three (3) feet from any driveway aprons, curb, roadway pavement, sidewalk or sidepath.
All medium and large sized trees shall be planted a minimum five (5) feet from any sidewalk or sidepath.
All medium and large sized trees shall be planted a minimum ten (10) feet from any driveway aprons, curb and roadway pavement.
All medium sized trees shall be planted a minimum fifteen (15) feet from extent of utility pole cross arm or power lines, whichever is greater.
All large sized trees shall be planted a minimum of twenty-five (25) feet from extent of utility pole cross arm or power lines, whichever is greater.
All trees shall be planted outside of existing or future sight triangle areas and easements.
4' Minimum Rural Sidewalk
5' Minimum Suburban Sidewalk
6' Minimum Residential Urban Sidewalk
8' Minimum Commercial Urban Sidewalk
8' Minimum Rural Sidepath
10' Minimum Urban Sidepath
4' Wide Minimum Buffer Area for Utilities
Preferred Buffer: 5' or 6'
This area may be utilized for utility poles, mailboxes and landscaping.
No vegetation permited to obstruct sight triangles.
County right-of-way may to be utilized for utility poles, mailboxes and landscaping. Imdemnification agreements may be required for improvements in the County right-of-way.

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12. AS-BUILT PLANS

As-built construction plans are to be submitted to the County Engineer after the work under County jurisdiction has been completed, with the exception of traffic signals. As-built plans of all traffic signal installations shall be provided within seven (7) days of the activation of the traffic signal. Only permanent features in the County jurisdiction will require as-built including road, drainage, utility, signals, signage, striping, and structures. Changes to proposed traffic control utilized during construction will not be required for the final as-builts.

Prints of the as-built construction plans will be sufficient for final inspection purposes. However, prior to acceptance of the improvements, the as-builts must be submitted in the form of bond paper sheets (24" x 36" only), PDF and AutoCAD drawings in digital format as directed by the County Engineer.

12.1 AS-BUILT ROAD CONSTRUCTION PLANS

1. With a bold black marker or red ink, write or stamp "As-Built Plans" and the date the as-builts were developed on the cover (key) sheet of the construction plans.
2. Enter all as-built quantities in the appropriate spaces on the Estimate of Quantities sheet and on individual sheets as required.
3. Revise all callouts and notes appropriately so as to reflect the "as-built" condition of the road and associated structure(s). Here are a few typical examples:
    (i) If an item included in the original contract was eliminated from the project, then all callouts, details and appropriate notes require revisions.
    (ii) If an item was omitted from the original contract but was still constructed, then callouts, details and appropriate notes are to be added that reflect its proper location, dimensions and configuration.
    (iii) All sheets that pertain to the construction of the road—including, but not limited to, the road plans, road profiles/cross sections, drainage structures and associated details—should be revised as required.
4. All road cross sections are to be "as-built" at every 50-foot station on the straight portions of the project and at every 25-foot station on curves. All such sections should extend 10 feet past the appropriate Right-of-Way lines.
5. All intersection grading plans are to reflect the as-built grades.
6. All as-built grades are to be shown on the plans for the tops of manholes, catch basin grates, and catch basin and pipe inverts (in and out).
7. All as-built pipe lengths, sizes and materials are to be shown on the plans.
8. All as-built driveway profiles, dimensions and locations are to be shown.
9. All as-built pavement limits, dimensions and elevations are to be shown.
10. All as-built headwall dimensions and elevations are to be shown.
11. All utilities identified, test pitted, installed, and/or relocated within County Jurisdiction.
12. Any road details that were added or revised are to be shown in the as-built configuration.
13. Any and all plan revisions that pertain to any portion of the project should be incorporated in the final set of as-built plans.
14. The as-built plans are to be signed and sealed by a licensed New Jersey Professional Engineer and/or a licensed New Jersey Land Surveyor, as required, certifying that all construction was

executed in accordance with the approved design calculations, approved plans, and Standard Specifications for Road and Bridge Construction and all supplements thereto.

15. As-built drawings of all construction plans for improvements under County jurisdiction must be submitted to the County. An electronic version of the as-built plans are to be submitted as directed by the County Engineering Division.

12.2 AS-BUILT BRIDGE CONSTRUCTION PLANS

1. With a bold black marker or red ink, write or stamp “As-Built Plans” and the date the as-builts were developed on the cover (key) sheet of the construction plans.
2. Enter all as-built quantities in the appropriate spaces on the Estimate of Quantities sheet and on individual sheets as required.
3. Revise all callouts and notes appropriately so as to reflect the “as-built” condition of the structure(s). Here are a few typical examples:
4. If an item included in the original contract was eliminated from the project, then all callouts, details and appropriate notes require revisions.
5. If an item was omitted from the original contract but was still constructed, then callouts, details and appropriate notes are to be added that reflect its proper location, dimensions and configuration.
6. All sheets that pertain to the construction of the bridge—including, but not limited to, the road plan, road and stream profiles/cross sections and bridge construction plans— should be revised as required.
7. Each dimension and elevation for an abutment, wingwall, deck, parapet and pylon, as constructed, is to be circled and crosshatched and the as-built dimension or elevation is to be entered alongside it.
8. Any details (joints, corners, rebars, etc.) that were added or revised are to be shown in the as-built configuration.
9. All utilities identified, test pitted, installed, and/or relocated within County Jurisdiction.
10. Any and all plan revisions that pertain to any portion of the project should be incorporated in the final set of as-built plans.
11. The structural as-built plans are to be signed and sealed by a licensed New Jersey Professional Engineer certifying that all construction was executed in accordance with the approved design calculations, approved plans, and Standard Specifications for Road and Bridge Construction and all supplements thereto. An electronic version of the as-built plans are to be submitted as directed by the County Engineering Division.

13. SMALL WIRELESS FACILITIES IN COUNTY ROW

The purpose of this chapter is to establish a process for managing, and uniform standards for acting upon, requests for the placement of small wireless facilities and conduit within the public rights-of-way of the County consistent with the County's duty to manage the public rights-of-way and any incursions into the public rights-of-way, which are intended for public use for transportation for pedestrians, bicycles and vehicles.

The County recognizes the importance of wireless facilities to provide high-quality communications service to the residents and businesses within the County, and the County also recognizes its obligation to comply with applicable federal and state law regarding the placement of personal wireless services facilities in its public rights-of-way. This ordinance shall be interpreted consistent with those provisions.

Notwithstanding any franchise or right-of-way agreement to the contrary, all wireless facilities proposed to be placed within the County right-of-way by a utility regulated by the Board of Public Utilities, or any other entity lawfully within the County right-of-way, shall be subject to the standards and procedures set forth in this article and shall require right-of-way permits for the siting of poles, antennas and cabinets in the County right-of-way.

All corporations, firms and persons to whom permission has been or may be granted for running or laying underground conduits, tubes or pipes for electrical conductors or cables or wires shall conform to the requirements and regulations of this Ordinance.

All corporations, firms and persons to whom permission has been or may hereafter be granted for the erection of poles, fixtures, cables, wires and conductors in or over the streets or housetops in the County shall conform to the requirements and regulations of this Ordinance.

13.1 NONDISCRIMINATION

In establishing the rights, obligations and conditions set forth in this chapter, it is the intent of the County to treat each applicant or public right-of-way user in a competitively neutral and nondiscriminatory manner, to the extent required by law, and with considerations that may be unique to the technologies, situation and legal status of each particular applicant or request for use of the public rights-of-way.

13.2 APPLICATION REVIEW FEES AND CHARGES

All Application Review Fees and Fee related items can be found in the Appendix.

13.3 RIGHT-OF-WAY PERMIT FEES AND CHARGES

This section to be revised under a future Ordinance Amendment and/or Appendix.

13.4 SITING STANDARDS FOR POLES, ANTENNAS AND CABINETS IN COUNTY ROW

Mercer County shall have the sole authority for the design, development and location standards for wireless facilities in the County's public rights-of-way.

No pole, antenna or cabinet shall be installed within the County right-of-way without the issuance of a Right-of-Way Occupancy Permit and/or a Road Construction Permit. Applicant shall submit a structural analysis for both new collocations on existing poles and for new poles. The following standards apply for poles, antennas and cabinets within the County right-of-way.

Pole Siting Standards:

The County has established an order of preference for Wireless Facility installation configuration. The most preferred types are those that have the lowest incremental impact and use existing resources. The County’s three acceptable wireless facility design configurations in order of preference are as follows:

1. Collocating on an existing or replacement utility pole or streetlight. Applicants shall collocate on existing Poles when feasible. To the maximum extent practical, Applicant shall make its poles available to subsequent and additional Applicants who desire to utilize the Right-of-Way to provide Wireless Services. If collocating on an existing pole, applicants shall submit a structural analysis, otherwise, applicants shall be required to replace and existing pole with a new or upgraded pole.
2. Installing a new small wireless pole in private right-of-way.
3. Installing a new small wireless steel pole in the public right-of-way.
    a. New poles in the County right-of-way may not be erected within 500 linear feet from any other existing pole or proposed pole, which is used to support a Small Wireless Facility by the Applicant.

        New poles shall be at least 250 feet from any Small Wireless Facility by any other Communications Service Provider, unless Applicant can reasonably demonstrate that such minimum spacing requirements constitute a prohibition of service. Burden of proof shall rest with Applicant.

    b. New poles in the public right-of-way shall be made of steel. Wooden poles may be permitted on a case-by-case basis by the County Engineer. If constructing a new pole, applicants shall submit a structural analysis.

    c. Height. No pole shall be taller than (50) fifty feet or 110% of the height of poles in the surrounding streetscape, whichever is taller. Poles taller than this limit may only be permitted on a case-by-case basis by the County Engineer after careful consideration.

    d. Utility Poles may not be relocated into an existing or proposed sidewalk or sidepath. Poles shall be located in buffer area between sidewalk and roadway or placed a minimum of 5-feet behind sidewalk. A separation of 10-feet is preferred.

    e. In no case shall a pole be located closer than (30) thirty inches from the curb line.

    f. Location, safety and aesthetics. No pole shall be erected in the right-of-way unless it:

        I. Is used to bring utility service across the right-of-way to an existing or proposed development from an existing pole; or

        II. Is replacing an existing pole; or

        III. Is located on the opposite side of the street from the electric distribution system; and

        IV. For sites in any residential zone, is two hundred linear feet from any other existing pole or proposed pole along the same side of the street, or for sites in any other zone, is at least one hundred linear feet from any other existing pole or proposed pole along the same side of the street; and

        V. Poles shall be made of galvanized steel unless otherwise permitted by County Engineer. The materials used shall be nonreflective and nonflammable; and

        VI. Is not located in an area with underground utilities; and

        VII. Does not interfere with any existing sight triangles or sight distance; and

        VIII. Allows adequate room so as not to impede the public's or County's use of the right-of-way; and

        IX. Is finished and otherwise camouflaged, in conformance with best available stealth technology methods, so as to blend in compatibly with its background and so as to minimize its visual impact on surrounding properties; and

X. If in a historic district of the municipality, has been reviewed and approved by the historic preservation committee.

Ground Level Cabinet Site Standards:

1. Ground level cabinets are discouraged and permitted only if placement on a pole is not possible or feasible. County Engineer shall determine if a pole is not feasible.
2. Cabinets may not be relocated into an existing or proposed sidewalk or sidepath. Cabinets shall be placed a minimum 10' behind sidewalk.
3. No ground level cabinet shall be installed unless it:
   I. Is less than twenty-eight cubic feet in volume; and
   II. Is finished so as to blend in compatibly with its background and so as to minimize its visual impact on surrounding properties; and
   III. The materials used shall be nonreflective and nonflammable; and
   IV. Does not interfere with any existing sight triangles or sight distance; and
   V. Allows adequate room so as not to impede the public's or County's use of the right-of-way.
4. Pole mounted antenna and pole mounted cabinet siting standards:
   I. Pole mounted antennas are permitted on existing poles, provided that each pole mounted antenna:
      - Does not exceed three cubic feet in volume; and
      - Is finished and otherwise camouflaged, in conformance with best available stealth technology methods, so as to blend in compatibly with its background and so as to minimize its visual impact on surrounding properties; and
      - The materials used shall be nonreflective and nonflammable; and
      - Does not interfere with any sight triangles or sight distance; and
      - Allows adequate room so as not to impede the public's or County's use of the right-of-way.
   II. Pole mounted cabinets are permitted on existing poles, provided that each pole mounted cabinet:
      - Does not exceed sixteen cubic feet; and
      - Is finished and otherwise camouflaged, in conformance with best available stealth technology methods, so as to blend in compatibly with its background and so as to minimize its visual impact on surrounding properties; and
      - The materials used shall be nonreflective and nonflammable; and
      - Does not interfere with any sight triangles or sight distance; and
      - Allows adequate room so as not to impede the public's or County's use of the right-of-way.
      - The County may in its discretion require that a permittee provide a certification from a licensed engineer attesting to the structural integrity of any pole mounted antenna or pole mounted cabinet.

13.5 ADDITIONAL FACILITY PLACEMENT CONSIDERATIONS

The following additional considerations shall apply to Small Wireless Facilities within the County right-of-way:

1. Electric service: The County strongly encourages site operators to use flat-rate electric service when it would eliminate the need for a meter. Where meters are required, use the narrowest electric meter and disconnect available.

2. Security: All equipment and facilities shall be installed in a manner to avoid being an attractive nuisance and to prevent unauthorized access, climbing, and graffiti.

3. Safety: All Small Wireless Facilities in the right-of-way, including each piece of equipment, shall be located and placed in a manner so as to not interfere with the use of the right-of-way; impede the flow of vehicular or pedestrian traffic; impair the primary use and purpose of poles/signs/traffic signals or other infrastructure; interfere with outdoor dining areas or emergency facilities; or otherwise obstruct the accessibility of the right-of-way. Further, all wireless facilities and associated equipment in the right-of-way shall comply with Americans with Disabilities Act (ADA) requirements.

4. Noise: Small Wireless Facilities and all accessory equipment and transmission equipment must comply with all noise regulations and shall not exceed, either individually or cumulatively, 65 dBA.

5. Lighting: No facility shall be illuminated unless specially required by the Federal Aviation Administration (FAA) or other government agency. Any required lighting shall be shielded to eliminate, to the maximum extent possible, impacts on the surrounding area property.

6. Signs: Every facility shall at all times display signage that accurately identifies the facility owner and provides the owner's unique site number and a local or toll-free telephone number to contact the facility owner's operations center. Required RF Emissions and Safety Signage shall also be posted as required by the FCC or required by law or permit condition.

   No facility may display any other signage or advertisement unless it is expressly allowed by the County in a written approval, recommended under FCC regulations, or required by law or permit condition.

7. Landscaping: In addition to any landscaping used for concealment or screening purposes, the applicant shall propose and install additional landscaping to replace any existing landscaping displaced during construction or installation of the applicant's facility in the right-of-way. The applicant's landscaping plan shall be subject to the County's review and approval but shall, at a minimum, match the existing landscaping and foliage surrounding the installation site.

   Landscaping proposed by applicant shall be maintained by applicant. County may require an Indemnification and Maintenance Agreement for any and all landscaping improvements.

8. Modifications: Any modifications to existing facilities or equipment or collocations shall not defeat the concealment elements of the existing structure/facility.

9. Surety Bond & Removals. Poles which are no longer in use shall be removed at the applicant’s expense. Applicant shall submit a Surety Removal Bond as part of their ROW Agreement to cover costs of removing poles, cabinets, electrical connections and/or any concrete boxes as part of the removal.

13.6 SIZE & TIME LIMIT OF STREET OPENING

During the construction or laying of said underground conduits, tubes, pipes, conductors, cables and wires, no street shall be opened or the paving broken into for a greater distance than 100 feet at any one time, and the opening or trench shall not be of greater width than two feet. No such one-hundred-foot section shall be kept open for a longer period than five days, and, as the work progresses, the paving shall be promptly repaved and the street put in good condition.

If applicant is making utility cuts within County pavement, applicant is required to repave the full width of the County Road extending 30' on either side of the last cut.

13.7 PERMITS TO INSTALL UNDERGROUND CONDUITS

Prior to making an opening in any street for the laying of conduits, tubes or pipes for electrical conductors, cables or wires, the corporation, firm or person desiring to lay the same shall make application, in writing, to the County Highway Division and shall file plans and specifications with said Division showing the location and route and length of the proposed conduits, pipes or tubes and shall file duplicates of such application and plans and specifications with the County Engineer's office.

If the County Engineer or their designee approves the proposed route or routes and plans and specifications and finds that they otherwise comply with the provisions of this Volume, they shall issue a certificate to that effect. Upon issuance of the certificate, the County Highway Division shall have the authority to issue a permit for the proposed opening of the street.

13.8 MISCELLANEOUS PROVISIONS

This section to be revised under a future Ordinance Amendment.

13.9 AS-BUILTS

Upon completion of construction, provider shall submit as-built drawings and a map showing the location of the facility and equipment.

13.10 RIGHT OF COUNTY TO USE POLES

This section to be revised under a future Ordinance Amendment.

13.11 NONDISCRIMINATION

In establishing the rights, obligations and conditions set forth in this chapter, it is the intent of the County to treat each applicant or public right-of-way user in a competitively neutral and nondiscriminatory manner, to the extent required by law, and with considerations that may be unique to the technologies, situation and legal status of each particular applicant or request for use of the public rights-of-way.

13.12 REMOVAL, RELOCATION AND ABANDONMENT

Within 30 days following written notice from the County, the Provider shall, at its own expense, protect, support, temporarily or permanently disconnect, remove, relocate, change or alter the position of any of its communications facilities, poles, support structures or towers within the public Right-of-Way, including relocation of above-ground communications facilities underground (consistent with the provisions of this chapter), whenever the County has determined, in its sole discretion, that such removal, relocation, change or alteration is necessary for the construction, repair, maintenance or installation of any County improvement, the operations of the County in, under or upon the public Right-of-Way, or otherwise is in the public interest. The Provider shall be responsible to the County for any damages or penalties it may incur as a result of the Provider's failure to remove or relocate communications facilities, poles, support structures or towers as required in this section.

1. The County retains the right and privilege to cut or move any communications facility, pole, support structure or tower located within the public Right-of-Way of the County, as the County may determine, in its sole discretion, to be necessary, appropriate or useful in response to a public emergency or hazardous situation. If circumstances permit, the County shall notify the Provider and give the Provider an opportunity to move its own facilities prior to cutting or removing the communications facility, pole, support structure or tower. In all cases, the County shall notify the

Provider after cutting or removing the communications facility, pole, support structure or tower as promptly as reasonably possible.

2. A Provider shall notify the County, by certified mail, of abandonment of any communications facility, pole, support structure or tower at the time the decision to abandon is made, however, in no case shall such notification be made later than 30 days prior to abandonment. Following receipt of such notice, the Provider shall remove its communications facility, pole, support structure or tower at the Provider's own expense, unless the County determines, in its sole discretion, that the communications facility, pole, support structure or tower may be abandoned in place. The Provider shall remain solely responsible and liable for all of its communications facilities, poles, support structures and towers until they are removed from the public Right-of-Way unless the County agrees in writing to take ownership of the abandoned communications facilities, poles, support structures or towers.
3. A Surety Removal Bond may be required. Removal Bond means a bond posted to ensure the availability of sufficient funds to properly remove a Provider's Facilities upon abandonment, disuse, or discontinuance of a Provider's use or occupation of the Rights-of-Way. See Appendix for more information about applicable fees and bond requirements.
4. If the Provider fails to timely protect, support, temporarily or permanently disconnect, remove, relocate, change or alter any of its communications facilities, poles, support structures or towers or remove any of its abandoned communications facilities, poles, support structures or towers as required in this section, the County or its contractor may do so and the Provider shall pay all costs and expenses related to such work, including any delay damages or other damages the County incurs arising from the delay. At the County's sole discretion, said facilities shall then be considered the property of the County.
5. All relocated and replaced Communications Facilities shall be of similar design and of similar or smaller dimensions than the existing facilities to be replaced or relocated.