City of Coral Springs

Development Services Department

Engineering Division

Minimum Engineering Design Standards for Public Rights-of-Way (Non-Utility)

Prepared by
Chen Moore and Associates
Civil and Environmental Engineers
500 West Cypress Creek Road Suite 630
Fort Lauderdale, FL 33309

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FOREWORD

The purpose of this manual is to set standards for the construction of public improvements to serve new and future developments and for the reconstruction of existing facilities to upgrade existing infrastructure not related to utility services. In all cases where the Florida Department of Transportation Design Standards or the Minimum Standards Applicable to Public Right-of-Way under Broward County Jurisdiction apply, the more stringent standard shall govern. These standards shall apply to all infrastructure improvements within the public right-of-way, to all improvements required within the proposed public right-of-way of new subdivisions, for all improvements intended for maintenance by the City, and for all other improvements for which the City Land Development Code of Ordinances requires approval of the City Engineer. These improvements include street, bikeway, drainage, water, and sanitary sewer improvements as required by the development review process, City Ordinance, and other City policies adopted. Standards for site grading, erosion control, parking lot, and driveway construction on private property are also contained in this manual.

The standards contained in this manual are established by the City as rules governing the quality of workmanship to which designers, developers, and others shall adhere in preparing plans for public improvements, in preparing plans for private utility facilities in public rights-of-way, and in constructing said improvements and facilities, and to which City staff shall adhere in reviewing plans and inspecting said construction. Where minimum values are stated, greater values should be used whenever practical and consistent with County and State law; where maximum values are stated, lesser values should be used where practical. In some locations, due to existing development or unusual topography, conformance to these standards may impose a substantial hardship. In such locations, the City may approve modifications to the standards or a variance from a Development Code standard that is directly related to an Engineering Design Manual standard, as allowed by law.

The City has adopted standard construction specifications, including standard details. The standard specifications and standard details shall be used in the design, construction and reconstruction of improvements intended for public use and maintenance in the City. Where the design standards, standard specifications, or standard details do not cover improvements, the City Engineer shall establish appropriate standards.

Standards on potable water system, wastewater collection system, lift stations, force main systems, miscellaneous utilities, flushing testing and disinfection were authored by Eckler Engineering and the Department of Public Works; and are located in a separate publication.

The Engineering Standards will undergo continuous review and amendment as needed in response to changes in engineering best-practice and feedback from the field. As details and specifications are revised and new drawings added, the appropriate index sheets will also be revised. Public inquiries will be managed by the Development Services Department. Written comments on the standards should be directed to:

Development Services Department
2730 University Drive
Coral Springs, FL 33065
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DEFINITIONS

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General Rules of Construction

For the purpose of these Zoning and Land Development Regulations, certain terms used herein are herewith defined. The following general rules of construction shall apply to the regulations of this Code:

A. The singular number includes the plural and the plural the singular, unless the context clearly indicates the contrary.

B. Words used in the present tense include the past and future tenses, and the future the present tense.

C. The word “shall” is mandatory; the word “may” is permissive.

D. The word “Building” or “Structure” includes any part thereof, and the word “Building” includes the word “Structure.”

E. The word “Lot” includes the word “Plot” or “parcel” or “tract” or “Site.”

F. The words “used” or “occupied” include the words “intended,” “designed” or “arranged” to be used or occupied.

G. The words “required yards” or “minimum required yards” and “minimum yards” includes the word “setback.”

H. When this Code refers to other ordinances, codes or statutes the reference shall imply the most up-to-date ordinance, code or statutes, as amended.

I. Words and terms not defined herein shall be interpreted in accord with their normal dictionary meaning and customary usage.

J. When not inconsistent with the context, words used in the present tense include the future tense.

K. The word “land” shall include water surface and land under water.

L. If a Use is not listed as a Main Permitted Use, Special Exception or Accessory Use, said Use is automatically considered as a Prohibited Use.

M. If a Use is specifically enumerated, then it takes preference over general applications or interpretations of these regulations. If a Use is specifically enumerated as a permitted Use in a district then to be considered as a permitted use in another district, it must also be specifically listed.

N. When these standards refer to a “Director,” the referral shall automatically include the Director’s “designee” unless specifically otherwise stated.

O. Words of any gender shall be deemed and construed to include correlative words of the other gender.
Terms Defined

**Abutting or Adjacent Property:** Plots shall be considered to abut, or be abutting, when the plots border upon, adjoin, or are across from plots of dissimilar land use or zoning without a roadway of a minimum classification or without a separator of a minimum distance between dissimilar plots. Dissimilar plots separated by a water body are considered to abut, or be abutting, regardless of the placement of the zoning line unless the zoning district’s regulations only require a separator of a minimum distance between the dissimilar plots. The zoning district’s regulations include the minimum distance of any separator and the minimum classifications of the roadways for the more intensive zoning districts.

**Access:** The principal means of ingress and egress to a lot from a publicly dedicated right-of-way.

**Access Waterways:** A waterway which is developed or constructed in conjunction with the development of real estate for the purpose of providing access by water to lots within a subdivision.

**Alley:** A public thoroughfare or way, not more than twenty (20) feet in width except for necessary turnarounds and which normally provides a secondary means of access to abutting property. This does not apply to those alleys already permitted.

**Availability or Available:** Means that at a minimum the facilities and services will be provided in accordance with the standards set forth in Rule 9J-5.0055(2), Florida Administrative Code. (Definition used for Concurrency determinations.)

**Block:** A parcel of land entirely surrounded by streets, streams, railroad rights-of-way, parks or other public space or combination thereof.

**Building:** means any structure that encloses space and is used or built for the shelter or enclosure of persons, businesses, chattel or property.

**Certificate of Appropriateness:** A certificate issued by the Community Development Director indicating that the new construction, alteration, or demolition of a Historic Building within a Local Historic District is in accordance with the Historic Preservation regulations contained in these regulations.

**Change of Occupancy:** A discontinuance of existing use and the substitution of a use of a different kind or class. Change of occupancy is not intended to include a change of tenants or proprietors unless accompanied by a change in the type of use.

**Code Enforcement Officer:** Includes any City employee working under the authority and direction of the Chief Building Official or Chief Code Enforcement Officer.

**City:** The City of Coral Springs.

**City Engineer:** The City Engineer of the City of Coral Springs or his duly authorized representative.

**Commercial Uses:** Any activity where there is an exchange of goods or services for monetary gain. Such activities include but are not limited to retail sales, offices, eating and drinking facilities, theaters and similar uses.

**Commission or City Commission:** The City Commission of the City of Coral Springs.
**Community Development Director:** That individual appointed by the City Manager as the Director of the Community Development Division.

**Concurrency:** The requirement that necessary public facilities and services to maintain the City's adopted level of service standards are available when the impacts of development occur.

**Copy:** The wording on a sign surface either in permanent or removable letter form, including trademark emblems or reproductions.

**Dedication:** A grant for designated public use.

**Density:** Is the maximum number of units which can be developed on parcel of land (including to the center line of streets, easements and rights of way). Credit towards density is given to bodies of water, excluding canals, and lakes.

**Department of Transportation:** Includes the term STATE STANDARDS and as used herein shall refer to the Florida State Department of Transportation's (FDOT) Standard Specifications for Road and Bridge Construction as currently adopted and in use.

**Developer:** Any individual, firm, association, syndicate, co-partnership, corporation, trust or any other legal entity commencing proceedings under these regulations. The term DEVELOPER is intended to include the term SUBDIVIDER, even though the persons involved in successive stages of the project may vary.

**Development:** That meaning given in Section 380.04 of the Florida Statutes.

**Development Permit:** Any building or land permit, use approval, subdivision or plat approval, site plan approval, Development Review Committee Order, rezoning, special exception, or other official action.

**Development Review Committee (DRC):** shall consist of but not be limited to, the following or their designees:

- Zoning Division
- Transportation Representative
- Community Development Division
- Engineering Division
- Public Works Department
- Building Division
- Fire Department
- Police Department
- Landscaping Representative
- ADA Representative

**Dwelling:** Any building or part thereof, occupied in whole or in part, as the residence or living quarters of one or more persons, permanently or temporarily, continuously or transiently.

**Easement:** An interest in land granted for limited use purpose, but which does not convey title to real property.

**Enforcing Official:** The officers and employees of the City to whom duty of enforcing the terms of these regulations are assigned.
**Essential Services**: Any structure, or facility required by a utility owned by the City or franchised to operate within the City limits, which by its nature, is customarily required to be located in a specific proximity to the area it serves, as determined by the City Engineer.

**Grade, Established**: The average elevation of the public sidewalks around or abutting a plot, or in the absence of sidewalks, the average elevation of the public streets abutting the plot as measured at the crown of the road.

**Historic Building**: A building which is listed in the Historic Properties Database and which is at least 45 years old or meets the National Register of Historic Properties as defined by the U.S. Department of Interior's Standards or a building that was present during a period of historical significance and possesses historic integrity reflecting its character at that time or is capable of yielding important information about the period. (Note: A building is historic even if it has been altered if the alteration is reversible and the building's key historic architectural elements are intact and repairable).

**Lot**: A parcel or tract of land designated and identified as a single unit of area in a subdivision plat officially recorded in the public record of Broward County, Florida. This definition includes the terms site, platted lot, plot, tract or parcel and land described by metes and bounds.

**Master Plan**: An approved drawing which shows the intended division and improvement of real property meeting the requirements of these regulations.

**N/A**: Not applicable

**Nonconforming Structure**: A structure or portion thereof, existing at the effective date of this chapter or any amendment thereto, which was occupied, designed, erected, intended or structurally altered so that it does not conform to all of the regulations applicable to the zoning district in which it is located.

**Person**: Includes an individual, association, firm, co-partnership, or corporation.

**Plat**: A map depicting the division or subdivision of land into lots, blocks, parcels, tracts, or other portions thereof. The map same may be designated, prepared in accordance with the provisions of these regulations and those of any applicable law and/or local ordinance, and be designated to be placed on record in the office of the Clerk of the Circuit Court of Broward County. Plat of Record is a plat which conforms to the requirements of the applicable laws of the state and ordinances of the county, which has been accepted by the City Commission and placed in the official records of Broward County.

**Plot**: Land occupied or to be occupied by a building or use, and its accessory buildings and accessory uses, together with such yards and open spaces as are required by this chapter. A plot may consist of one, or more and/or portions of a platted lot or lots and/or unplatted land.

**Public Utility**: Includes every person, corporation, partnership or association or other legal entity, their lessees, trustees or receivers now or hereafter, either owning, operating, managing or controlling a system or proposing construction of a system that is provided or proposes to provide water or sewer service, electricity, natural or manufactured gas, or any similar gaseous substance, telephone or telegraph service to the public for compensation.
**Regulation or Regulatory Control**: A rule or order published by the City, or other authority with jurisdiction, controlling the use and/or development of land, water or structures within the City. This may include provisions for the administration and enforcement of regulations.

**Right-of-Way**: Is a strip of land dedicated or deeded to the perpetual use of the public.

**Setback**: The minimum required distance between any property line and the location of a building or structure.

**Stormwater runoff**: That part of precipitation that travels over natural, altered or improved surfaces to any stream, channel, canal, river, impoundment area or City owned and maintained rights-of-way.

**Street**: A public or private thoroughfare twenty (20) feet or more in width which affords principal means of access to abutting property.

**Structure**: Anything constructed or erected, on the ground or attached to something having a location on the ground, such as buildings, trailers, fences, signs, swimming pools, patios, terraces and poles. However, the definition of structure does not include sidewalks, pathways, driveways, parking areas and mail boxes.

**Structural Alteration**: Any change, except for repair or replacement, in supporting members of a building or structure, such as bearing walls, columns, beams or girders.

**Subdivision**: Any division or re-subdivision of a lot, tract or parcel of land, regardless of how it is to be used, either by platting or by metes and bounds into two or more lots, building sites or other divisions of one acre or less, for the purpose, whether for the immediate or future transfer of ownership, lease, legacy, or building development, including any division of land involving a dedication, change or abandonment of a public street, site, easement or other right-of-way for any public use of facility.

**Surface Waters**: All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.)

**Surveyor**: A land surveyor registered in the State of Florida.

**Use**: The purpose for which land or a structure thereon is occupied, utilized or maintained.

**Waterway**: A stream, canal or body of water, dedicated to public use, publicly owned, or used and available for public travel by boats, not including privately owned bodies of water or drainage ditches.

**Work**: Shall include all required construction as shown on approved plans and specifications for all facilities and features of any kind which are required, related to the process of subdivision or land under these regulations.

**Yard**: A space on the same plot with a structure or use, open and unobstructed from the ground to the sky except by encroachments specifically permitted in this chapter. Yard measurements shall be the minimum horizontal distances. Yards shall extend and be measured inward from the respective plot lines.
Zoning Code: The Zoning and Land Development Regulations of the City.

Abbreviations

AASHTO American Association of State Highway and Transportation Officials
BCDH Broward County Department of Health
BCED Broward County Engineering Division
BCTED Broward County Traffic Engineering Division
CO Certificate of Occupancy
COE Army Corps of Engineers
City City of Coral Springs
Code Code of Ordinances
Commission City Commission
County Broward County
CSID Coral Springs Improvement District
DEP Department of Environmental Protection, State of Florida
BCEPBM Broward County Environmental Protection and Growth Management Department
DRC Development Review Committee
Department Department of Development Services
Developer Developer of a Project
ERU Equivalent Residential Unit
FDOT Florida Department of Transportation
NSID North Springs Improvement District
P & Z Planning and Zoning Board
PTWCD Pine Tree Water Control District
SFWMD South Florida Water Management District
SWCD Sunshine Water Control District
TRCDD Turtle Run Community Development District
## GEN - GENERAL PROVISIONS

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GEN.01 Engineering Plans

All final engineering plans for public and private improvements, including but not limited to canal or lake excavation, dredging, bulkheads, bridges, culverts, headwalls, end walls, earthwork (cut or fill), grading, paving (including sub grade preparation, base and surface), sidewalks, curbs and gutters, median crossings, guardrails, street signs, storm drainage, utilities, cable, shall be submitted to the Building Department for review and approval prior to any construction.

A. Submittals

Application for an engineering permit and any other work to be performed in the public right-of-way shall include the following:

1. Three (3) complete sets signed and sealed plans by a registered professional engineer in the State of Florida.

2. Plans shall be submitted on 24" X 36" sheets except that for small projects, plans may be submitted on smaller sheets, if all the required information fits on one (1) sheet.

3. Plans shall clearly indicate how proposed work and existing and new conditions are being integrated to meet the requirements of all applicable codes.

4. Detailed certified cost estimate sealed by a registered professional engineer in the State of Florida on the approved City form, referred to as the cost estimate, copies of which form are available in the City Engineer's office.

5. All required development permits and staff reports from the South Florida Water Management District (SFWMD), State of Florida Department of Environmental Regulation (FDER), Florida Department of Transportation (FDOT), Broward County Engineering Department (BCED), Broward County Environmental Protection and Growth Management Department (BCEPGMD), North Springs Improvement District (NSID), Coral Springs Improvement District (CSID), Sunshine Water Control District (SWCD), Pine Tree Water Control District (PTWCD), Turtle Run Community Development District (TRCDD) etc., that have jurisdiction.

6. Copies of the contractor's certificate of competency and insurance

7. One (1) copy of the final plat with the plat report

B. Public Improvement Bonds

Prior to the issuance of any permit, other than for clearing and grubbing, submittal and approval of the public improvement bond is required. A letter of credit will be required to his general contractor with the City in the amount of one hundred (100) percent of the itemized estimated cost, prepared and certified by a professional engineer registered in the State of Florida for all required public improvements. This bond shall be cash, irrevocable bank letter of credit, a cashier's check or other negotiable instrument, or a surety bond written by a company listed in the latest revision of Circular 470 standards Surety Companies Acceptable on Federal Bonds. Also acceptable is a letter from a savings and loan or commercial bank stating that:
1. It has committed funds in an amount equal to the cost of the project.

2. Moneys will be disbursed as work is done but only after inspection and approval by the design engineers and approval of the bank’s representatives;

3. The work will be completed in accordance with the approved engineering drawings and specifications as well as all applicable City ordinances;

4. The bank or savings and loan guarantees completion if the developer does not complete;

5. It is holding a separate collateral account in an amount equal to twenty-five (25) percent of the cost of the improvements, which moneys are to remain available one (1) year after formal approval and acceptance of subdivision improvement by the City, together with any needed corrections or insufficiencies in design, workmanship and/or materials which are found within one (1) year of the date of formal acceptance; and

6. The moneys held will be released to the City upon demand if the City certifies that the work is not being done in accordance with specifications and drawings.

7. The person, developer, owner, contractor or subcontractor who shall apply for street cut permits shall furnish to the City a good and sufficient bond, in the full amount of the cost of the required restoration of the street improvements.

8. All bonds shall be approved by the City attorney (as to form) and the City Engineer (as to dollar amount). Either may require such terms and/or conditions as they deem necessary for the protection of the City. The bond shall guarantee the completion of all stipulated improvements in accordance with the approved engineering plans and within a specified time period, approved by the City Engineer and the City commission, ensure payment of City fees and guarantee completion of improvements. The bond shall be posted by the developer or contractor.

C. Permits

Following administrative approval of the final site plan, posting of all required public improvement bonds, payment of required fees and obtaining permits from all agencies having jurisdiction for the proposed work, the owner of the land being developed, or his bona fide agent, is required to obtain permits from the City for all land improvements occurring on public or private property. No improvement or alteration of any existing public or private property or utility shall be allowed without a City permit issued for such specific improvement. The permit shall be visibly displayed at all times during construction. As a condition of the permit, a copy of the approved record drawings furnished by the City Engineer shall be on the project site at all times.

1. No person shall open any streets or median or alter or cut any curb adjacent to any street or thoroughfare without first obtaining an engineering permit from the City authorizing said work.

2. Permits issued pursuant to this article shall be deemed in full force and effect until such time as the work covered is complete. However, if work covered by a permit has not
commenced within three (3) months from the date of issuance of the permit, or has been commenced and then suspended or abandoned for a period of sixty (60) days from the date of the most recent inspection, the permit automatically is terminated and shall become null and void unless special exception is granted by the City commission. Work shall be considered to have commenced and be in active progress when, in the opinion of the City Engineer, a full complement of workers and equipment is present at the site to diligently incorporate materials and improvements into the project. When a permit has been terminated, all fees paid shall be forfeited and any work started by someone else after such termination shall be subject to all applicable City ordinances in effect at the time a subsequent permit is issued, and submittal of new cost estimates for all remaining incomplete improvements and fees paid for a new permit at the time of resumption of the work, and bond adjusted accordingly.

D. Elevations and Bench Marks

A minimum of two (2) bench marks shall be established by a registered land surveyor in the State of Florida on or adjacent to any project for which elevations are shown on the submitted drawings, which shall clearly show the following:

1. The datum being used.
2. The location, description and elevation of the bench marks on or adjacent to the project, to be used for vertical control.

Bench marks shall be placed on permanent reference monuments or equally stable objects that are easily recognized, easily found and not likely to move.

Bench marks as described above shall be equivalent to third-order and be established in conformance with the Standards of Practice by The Florida Society of Professional Land Surveyors.

E. Engineer Final Certification

After all required improvements have been installed, the owner shall have the Engineer of record submit certification to the City that the improvements have been constructed according to the City Code and standard details, ADA requirements, approved plans specifications and all other requirements set forth by agencies having jurisdiction, based on inspections of the site and review of as-built drawings.

F. As-Built Record Drawings

The developer shall engage the services of a registered professional land surveyor in the State of Florida to prepare record drawings of the improvements. All record drawings shall be signed, sealed and dated by the responsible licensed surveyor. In addition, plans are to be submitted in a digital format in AutoCAD latest version. Digital File shall be compatible with the City's GIS system. Record Drawings submitted to the City as part of the project acceptance shall comply with the following requirements:

1. Storm drainage record drawings:
Length of pipe runs from center of structure to center of next structure, including the size and type of pipe used.

Type and size of each structure and its location with reference to property lines and/or the street centerline.

Top of rim elevations of grate lid elevations of manholes and invert elevations of all pipes.

Inverts of swales shown at fifty-foot intervals coinciding with pavement interval elevations.

Cross-section drawings of the lakes and canals within and adjacent to the development at two-hundred-foot intervals.

The above-noted record drawings shall be submitted to the City Engineer, and his approval thereof must be obtained prior to placement of lime rock base course adjacent thereto. If the City Engineer finds any or all of the work to be unacceptable, it developer shall correct the unacceptable work and provide new record drawings for that portion of the work as provided above.

When a geotechnical report is required for the project design, a final letter of certification prepared by the soils engineer or engineering geologist stating to the best of their knowledge, the work within their area of responsibility is in accordance with the approved engineering geotechnical report.

2. Asphalt Pavement Record:

Finish grades at the edge of finished rock and centerline at longitudinal intervals of not more than fifty (50) feet, street intersections and/or all changes in gradient.

Top of rim elevations of all sanitary sewer and storm manholes as well as storm inlets within areas to be paved.

The above-noted record drawings shall be provided to the City Engineer and his approval must be obtained prior to the placement of the pavement surface course. If the City Engineer finds any or all of the work to be unacceptable, then developer shall correct the unacceptable work and provide new record drawings for that portion of the work as provided above.

**GEN.02 Easements**

Easements recorded in the Broward County Public Records shall be provided for the installation of all underground utilities facilities, in conformance with such size and location of easements as may be determined by the City Engineer to be compatible with the requirements of all utility companies involved with respect to a particular utility service.

**A. Utility Easements**

Easements across lots or centered on rear or side lot lines shall be provided for public utilities where necessary and shall meet the requirements of the water and wastewater systems and their specifications and details.

**B. Right of Way Easements**

Where a subdivision is traversed by a watercourse, drainage way, canal or stream, there shall be provided a drainage easement or right-of-way, conforming substantially to the lines...
of such watercourses. Parallel streets or maintenance easements may be required where necessary for service or maintenance

C. Drainage Easements

Easements of such size and location as may be may be required for drainage purposes, determined by the Engineering Division, or by a drainage district if the plat lies within its jurisdiction. Such shall be required if necessary to tie into the City drainage plan or any drainage district plan by the City Engineer or the drainage district engineer

D. Canal Maintenance Easements

All canal maintenance easements shall be a minimum of twenty (20) feet in width. No above ground construction or usage of this maintenance easement will be allowed.

GEN.03 Site Restoration

Pavement restorations shall conform to requirements of all applicable agencies having jurisdiction and also the City's Code and standard details.

A. Relocation of Landscape

All natural foliage removed as a result of street cuts, median cuts, sidewalks or thoroughfare cuts shall be approved by the City Engineer and replaced or relocated at the expense of the applicant.

B. Soil Compaction

Laboratory and field tests which are necessary in the opinion of the City Engineer to establish compliance with the compaction requirements of this section shall be conducted at the applicant's expense.

C. Temporary Restoration

Temporary restoration shall be provided within the same day for the cutting of the pavement, street, curb or median. Such temporary restoration shall be approved by the City Engineer and constructed in a manner to provide a safety for the general public.

D. Roadway Restoration

During the course of cutting and restoring any thoroughfare or street which consists of more than one (1) lane in either direction, not more than one (1) lane in either direction may be rendered impassable by traffic at any given time. Where practical, steel plates shall be used to facilitate through traffic during the construction period.

E. Asphalt Restoration

Wherever pavement is damaged by adjacent construction activities, installation of new work or installation of equipment, it shall be repaired to the full width of the lane.
GEN.04 General Traffic Maintenance and Detour

Traffic safety and traffic control devices shall be employed on all private and public construction work within the public right of way. Such measures shall be established and provided in conformance with these regulations.

All private and public agencies, their contractors or representatives shall submit to the City Engineer three (3) sets of plans for construction work within the public right of way, for review by the Department.

A. Provisions of Traffic Maintenance or Detour Plans and Specifications

1. Upon such review, the Engineering Division may, at its discretion, specify use of applicable traffic maintenance. Review of projects requiring traffic detours shall include the selection of a suitable route plus a sketch showing the plan and specifications to be used.

2. Traffic maintenance and detour plans, specifications and provisions for extensive construction projects involving arterial streets rights-of-ways, may be supplied on a site to site basis to the Engineering Division.

3. The Engineering Division may specify special traffic maintenance or detour plans, specifications and provisions if, in its opinion, such plans, specifications and provisions set by the City are not applicable to a given project.

B. MOT Requirements

Providing, installing and maintaining traffic control and warning devices (MOT) shall be the responsibility of the contractor. Contractor shall submit MOT plans for review and approval by Broward County for projects involving paving, striping, or improvements impacting the clear and recovery zone unless said projects are determined by the Engineering Division to be outside of the requirements for MOT review and approval by Broward County. All traffic control and warning devices shall, unless otherwise specified by the Engineering Division, be furnished, installed, and maintained by the agency or contractor involved.

C. MOT for Emergency Construction Projects

Traffic maintenance or detour measures shall be employed during emergency work on or within a roadway. Such measures shall be based, as possible, upon the applicable plans and specifications shown.

D. Limitation on Beginning Construction Work

Construction on all projects, or the portions thereof, requiring traffic maintenance or detour provisions shall not begin without implementation of such plans and specifications authorized by the City Engineer.

E. Permits Required by Other Governmental Agencies
The procedures or requirement, stated in this section shall not be construed as relieving any agency or contractor of responsibility in obtaining required traffic permits issued by other governmental agencies. Such additional permits, when their stipulated regulations are more restrictive than those herein contained, shall have precedence, except that traffic may not be detoured without authorization by the City Engineer.
1.0 STREETS

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1.01 Functional Street Classification

Street classifications are used to indicate the primary purpose of the streets within the transportation system. The basic street classification used in The City is consistent with both Broward County and the FDOT. The three functional street classifications within the City of Coral Springs are arterials, collectors, and local streets, as defined below:

A. Arterial

Arterials are intended to provide a high degree of mobility and serve longer trips. Therefore, they should provide for high operating speeds and levels of service. Because movement, not access, is their principal function, access management is essential to preserve capacity. Arterials provide continuity for the intercity and cross-county trips. This class of street will typically include US and State numbered routes.

B. Collector

A street that serves as a connecting link between local and arterial streets is a collector street. These facilities provide both land access and movement within residential, commercial, and industrial areas. Traffic volumes are usually lower than on arterial streets (moderate average traffic volumes). Other operational characteristics such as speed are also lower on collector streets than arterial streets. A higher level of direct access to abutting properties is generally allowed from collector streets.

C. Local

Local streets are those that directly serve abutting properties including residential areas (serve to provide land access). Traffic volumes and operating speeds are generally lower on this class of street than on other street classifications. Local streets should be designed to discourage traffic from passing through a neighborhood (cut-through traffic) in order to gain access to collector streets. The movement on local streets involves traveling to or from a collector facility.

1.02 Need for Traffic Studies

The impact of any development, large or small, on the City’s transportation system depends on the number of trips generated by the development and the routes taken to and from the site. This impact is qualified by conducting a traffic study. The traffic study projects future transportation conditions and recommends methods to offset both the impacts of the increase in traffic volumes and the changes in traffic operations due to land development. Its purpose is to evaluate the transportation elements of proposed developments and help the City and private developers meet the complex needs of balancing efficient traffic movement with necessary land access.

Traffic studies may be required by the City in order to adequately assess the impacts of certain developments on the existing and/or planned street system. The primary responsibility for assessing traffic impacts associated with a proposed development rests with the developer, with the City serving in a review capacity. If a developer feels that the traffic impacts associated with a proposed development have been addressed in a prior study, they should submit documentation to that effect to the City.
A Traffic Study Requirements

Required traffic studies will be the responsibility of the applicant and must be prepared by a registered professional engineer in the State of Florida. It is recommended that concurrence be obtained from the City regarding study details prior to completion of any required analyses. Items to be reviewed with the City at the beginning of the study would include proposed data sources, assumptions to be utilized, analysis methodology, and method of reporting. Depending on the type and size of development, the traffic study can range from a cursory review and letter of opinion from a qualified professional to a comprehensive analysis and report that includes the detailed study of the development, the area-wide transportation system and other approved or planned developments in the vicinity of the proposed development.

1.03 Geometric Design

Minimum design criteria used of roadway and street construction in Broward County must conform to the latest edition of the Manual of Minimum Standards for Design, Construction and Maintenance for Streets and Highways, and the Utility Accommodation Guide as published by the State of Florida; and the provisions of the Broward County Land Development Code. Streets and roadways to be constructed in the City must also be in conformance with these criteria. The designer is encouraged to use of a higher standard, when practical, and consider cost-benefits as well as consistency with adjacent facilities.

In restricted or unusual conditions, it may not be possible to meet the minimum standards. In such cases, the designer must obtain a design exception from the City of Coral Springs. However, every effort should be made to obtain the best possible alignment, grade, sight distance, and drainage consistent with the terrain, the development, safety, and fund availability.

Specific other requirements are included in this section together with excerpts form the state’s Manual of Minimum Standards.

A Typical Sections

Basic element characteristics for the three public roadway classifications are indicated below:

<table>
<thead>
<tr>
<th>Classification of Lanes</th>
<th>Typical No. of Lanes</th>
<th>Minimum Right of Way Width (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>2</td>
<td>50*</td>
</tr>
<tr>
<td>Collector</td>
<td>2-4</td>
<td>80**</td>
</tr>
<tr>
<td>Arterial</td>
<td>4-6</td>
<td>106-120</td>
</tr>
</tbody>
</table>

* In certain cases, consideration may be given to private roadways with an overall right-of-way width of less than 50 feet. This consideration will be based on the nature of the proposed development, anticipated traffic volumes and other relevant factors.
** A minimum right-of-way of 60 feet may be allowed, subject to approval by the City Engineer, for collectors within or adjacent to residential areas. In cases where this exception is granted, additional right-of-way for turning lanes must be provided at intersections with other collectors or arterials.

These characteristics are based on the anticipated function of the street together with the additional width needed to accommodate curbs, sidewalks, and utilities. Additional width may be required where swale drainage or added lanes are necessary due to specific traffic conditions. Where other specific documents indicate conflicting dimensions, the larger of dimensions should be used.

All roadway design shall adhere to FDOT’s *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways*.

B. Horizontal Alignment

Horizontal alignment and rights-of-way for streets must conform with the pattern of thoroughfares as indicated in the Broward County Trafficways Plan and the City’s Comprehensive Plan. Proposed streets must be in continuous alignment with existing, planned or platted streets, which they are to connect.

Arterial, collector, and local streets, which do not end in a cul-de-sac, must extend to the boundary lines of the property being developed. Proposed streets with widths different from existing streets to which they are being connected must be transitioned properly. Acceptable transition treatments are contained in a subsequent section of this chapter.

Minimum horizontal curve design parameters are contained in Table 3.3.2-1. These standards are for City-maintained streets only and are in conformance with data contained in the state’s *Manual of Uniform Minimum Standards for Design, Construction, and Maintenance For Streets and Highways* for lower speed urban streets.

<table>
<thead>
<tr>
<th>Design Criteria</th>
<th>Local</th>
<th>Collector</th>
<th>Arterial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Operating Speeds (MPH)</td>
<td>30 or less</td>
<td>30-45</td>
<td>35-55</td>
</tr>
<tr>
<td>Minimum Centerline Radius (Feet)</td>
<td>300</td>
<td>800-1000</td>
<td>1300-2400</td>
</tr>
<tr>
<td>Minimum Sight Distance (Feet)</td>
<td>200</td>
<td>200-325</td>
<td>225-450</td>
</tr>
</tbody>
</table>

These criteria are based on using a normal crown section for all roadways. Unless specifically approved by the City Engineer, the use of superelevation on City-maintained streets is not permitted. In addition, pavement widening of two feet is required on the outside edge of arterial and collector roadways where lane widths are less than twelve feet. The transition back to the normal roadway width shall be not less than 100 feet.

C. Vertical Alignment

Vertical alignment of roadways is generally not applicable to the street system of the City. However, should questions arise, the Florida Department of Transportation’s *Manual of*
Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways should be used for determining the appropriate design standards.

D. Intersections

An intersection is defined as the general area where two or more streets join or cross, including the roadway and roadside facilities for traffic movements within the area. Each street radiating from an intersection and forming part of it is an intersection leg. The most common intersection at which two street cross on another has four legs. It is not recommended that an intersection have more than four legs.

1. Angles – Regardless of the type of intersection, for safety purposes intersecting streets should intersect one another at a 90 degree angle or as close to 90 degrees as practical. An intersection angle of less than 70 degrees will not be allowed unless specifically approved by the City Engineer.

2. Spacing – Standards for the spacing of intersections are contained in the Broward County Land Development Code, Section 5-195 (b) (3) a). Unless otherwise approved by the City Engineer, these spacing values should be used for roadway in the City, as documented below:
   a. A collector street may intersect an arterial roadway if spaced at a minimum distance of 1,320 feet from a nearby arterial/collector intersection. If the nearby intersection is formed by two arterial roadways, the minimum spacing should be 1,420 feet.
   b. A collector street may intersect another collector facility if spaced at a minimum distance of 660 feet from any other intersection.
   c. A local street may intersect a collector roadway if spaced at a minimum distance of 660 feet from any other intersection.
   d. A local street may not intersect an arterial unless unavoidable in which case the minimum spacing distance from any other intersection should be 660 feet, except at a minimum distance of 760 feet from the intersection of two arterials.
   e. Spacing between signalized intersections should not be less than 1,320 feet.
   f. The minimum spacing requirements of this Section may be reduced upon a finding by the City Engineer that, given the particular conditions of the proposed development, such reduction will not compromise operational and safety standards.

3. Turning Radii – The Manual on Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways relates some general criteria for the design of corner radii. Designs in conformance with this manual should be generally sufficient to accommodate the anticipated design vehicle without encroaching on the shoulder/curb of the roadway. A set of minimum radii are outlined in Table 3.3.4-1 for various intersection configurations. These typical dimensions do not preclude the City Engineer from requiring different radii values for specific conditions.
### Table 3.3.4-1 - Minimum Intersection Radii

<table>
<thead>
<tr>
<th>Type of Intersection</th>
<th>Edge-of-Pavement Radius (feet)</th>
<th>Right-of-Way Line Radius ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local - Local</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Local - Collector</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Collector - Collector</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Collector - Arterial</td>
<td>35</td>
<td>Independently Designed</td>
</tr>
<tr>
<td>Arterial - Arterial</td>
<td>40</td>
<td>Independently Designed</td>
</tr>
</tbody>
</table>

4. Design Vehicles – Geometric design elements should be selected based on the operating characteristics of the vehicles expected to use the facilities. The *Manual of Uniform Minimum Standards For Design, Construction, and Maintenance For Streets and Highways* outlines some typical dimensions of ten classes of design vehicles. It also establishes a procedure for selecting an appropriate design vehicle. The Broward County Land Development Code requires that buildings be accessible to certain design vehicles as contained in Table 3.5.

All intersections must be designed with adequate pavement to provide a minimum 45-foot inside turning radius for access by emergency vehicles.

#### Table 3.5 - Design Vehicle Requirements

<table>
<thead>
<tr>
<th>Roadway Use</th>
<th>Design Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>Single Unit Truck (SU)</td>
</tr>
<tr>
<td>Commercial</td>
<td>SU and Semi Trailer (WB-40)</td>
</tr>
<tr>
<td>Industrial</td>
<td>SU and WB-40 and Full Trailer (WB-60)</td>
</tr>
</tbody>
</table>

E. **Through-Lane Transition Tapers**

Standards for providing a smooth transition between roadway segments with a different cross-sectional dimension vary between different governing agencies. The *Manual of Minimum Standards* states that transitions should be gradual and preferably avoided. The Broward County Land Development Code does not specifically address the issue.

It has been found through research of other documents including FDOT Standard Index No. 526 that a transition determined through the use of appropriate formula produces a generally acceptable transition length. For appropriate transition dimensions, refer to Florida Department of Transportation Standard Index 526.

F. **Left-Turn Lane Storage Lengths**

The principle purpose of storage lanes, together with their associated tapers, is to provide for deceleration, storage, and protection for turning vehicles from through traffic.

FDOT standards indicate that, for un-signalized intersections, storage requirements can be established based on the volume of turning traffic by the formula:

\[
S = 0.84 \times V \text{ (rounded to a multiple of 25)}
\]
Where:  
\[ S = \text{Storage length} \]  
\[ V = \text{Volume in vehicles per hour (vph)} \]

The use of this formula produces results as indicated in Table 3.6. Left-turn storage lanes for un-signalized intersections in The City should conform to this procedure.

Table 3.6 - Left-Turn Storage for Un-signalized Intersections

<table>
<thead>
<tr>
<th>Volume (vph)</th>
<th>30</th>
<th>60</th>
<th>100</th>
<th>200</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage (ft.)</td>
<td>50*</td>
<td>50*</td>
<td>100</td>
<td>175</td>
<td>250</td>
</tr>
</tbody>
</table>

* Minimum storage length is 50 feet.

Storage requirements for signalized intersections should be determined through a traffic study. Discussions should be held with the City in order to establish the methodology that will be used to determine the storage needs of turn lanes at signalized intersections.

Design for roadways under the jurisdiction of the City shall provide for both left- and right-turn storage lanes that are in conformance with either The Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways or other appropriate DOT or AASHTO standards. Storage lengths, however, shall be a minimum of 50 feet long. Dimensions greater than 50 feet shall be in increments of 25 feet and calculations shall be rounded upward to the nearest increment.

G. Turn Lane Transitions

For both right- and left-turn storage lanes on streets under City jurisdiction, minimum transition rates should be used as follows:

Table 3.7 – Taper Rate for Turning Lanes

<table>
<thead>
<tr>
<th>Design Speed:</th>
<th>Taper Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 MPH or less</td>
<td>8:1</td>
</tr>
<tr>
<td>35 MPH</td>
<td>10:1</td>
</tr>
<tr>
<td>40 MPH</td>
<td>12:1</td>
</tr>
<tr>
<td>45 MPH or greater</td>
<td>15:1</td>
</tr>
</tbody>
</table>

The above taper rates will provide adequate transition lengths for normal conditions. However, an increase in taper rates resulting in longer transition lengths may be required for conditions involving special traffic operations and/or safety considerations. Modifications to the above taper rates must be approved on a case-by-case basis, based upon an engineering analysis and report by a qualified professional traffic engineer registered in the State of Florida.

H. Sight Distance

Sight distance on intersection approaches is critical from several viewpoints as outlined below:
Stopping sight distance
  - Approach to stops
Sight Distance for Intersection Maneuvers

The Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways and the Florida Department of Transportation Plans Preparation Manual contain procedures for computing sight distances developed from these manuals for various conditions. Table 3.8 establishes minimum sight distances for an approach to a stop condition.

<table>
<thead>
<tr>
<th>Design Speed (MPH)</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
<th>45</th>
<th>50</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sight Distance (feet)</td>
<td>115</td>
<td>155</td>
<td>200</td>
<td>250</td>
<td>305</td>
<td>360</td>
<td>425</td>
<td>495</td>
</tr>
</tbody>
</table>


I. Medians

1. Medians are to have sufficient width to fully shelter a left-turning vehicle from the through traffic lanes. Specific requirements may be found in FDOT’s Manual on Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways. The median width is defined as the horizontal distance between the inside pavement edges of the opposing roadways.

2. Raised curbed medians shall be provided on all divided roadways with a median width less than 22 feet. All designs are subject to review and approval by the City Engineer and subject to the design standards provided in FDOT’s Manual on Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways.

3. Fixed objects will normally not be permitted in medians. Plantings must be located so as not to violate applicable sight distance standards and/or clear zone requirements.

4. Median openings will normally be spaced at intervals that would result in minimal impacts to traffic operations. The spacing of median openings will be subject to review and approval by the City Engineer.

J. Roadside Clear Zone Width

The roadside clear zone is that area outside the traveled way available for use by errant vehicles. Vehicles frequently leave the traveled way during avoidance maneuvers, due to loss of control by the driver or due to collisions with other vehicles. The primary function of the clear zone is to allow space and time for the driver to retain control of his/her vehicle.

The clear zone width is defined as follows:

1. Urban (with curbing) Sections – measured from the face of the curb
2. Rural (without curbing) Sections – measured from the edge of the outside motor-vehicle travel way

The minimum permitted widths are provided in Table 3-12 of FDOT’s *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways*. These are minimum values only and should be increased wherever practical.

K. Vertical Clearance

A minimum vertical clearance of sixteen feet six inches (16’-6”) must be provided for all overhead structures measured from the highest elevation of the street to the lowest portion of the structure. This includes traffic signs and signals that are mounted over the roadway.

L. Dead-End Streets

It is desirable to minimize the length of dead-end streets, whether they are terminated by a cul-de-sac or dead-end condition. The length of such roadways should generally be limited to 1,000 feet (preferably, no longer than 700 feet). Dead-end streets must be established on a case-by-case basis. Since conditions surrounding the design of such facilities vary, both the length of roadways and the specific design of the turn-around area must be approved by the City Engineer prior to construction.

M. Guardrails

The following standards have been previously adopted by the City and should be used for both new development and improvements to existing development.

1. Vehicular Facilities – The following is the policy concerning the City’s standards for vehicular guardrail installation adjacent to roadways at canals and/or bridges within the City.

Where roadside canals are not sufficiently removed from the travel way, they shall be guarded by a longitudinal barrier to prevent vehicles from going into the canal. For the purpose of this policy, the following definitions apply:

a. Urban – Roads with curbs of a minimum 6-inch height located at the outside edges of pavement.
b. Rural – All other roads, including roads with mountable curbs.
c. Canal – A canal is considered to be an open-top ditch with a side slope of 4:1 of steeper located adjacent to the road and/or with an average water depth in excess of three feet for periods of twenty-four hours or more.

The following table outlines the minimum acceptable distance from the outside edge of the through travel lane to the top of the canal side slope nearest the roadway, where a longitudinal barrier is not required:

<table>
<thead>
<tr>
<th>Posted Speed Limit</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
</table>

STREETS - 25
When the above minimum distances cannot be attained, the canal should be guarded by a longitudinal barrier. For a placement of longitudinal barriers adjacent to roadways, guidelines for offsets are as follows:

a. For a shoulder width of less than twelve feet outside the edge of pavement with a curb height of six inches or more, the barrier face should be at the face of the curb.
b. For a shoulder width of more than twelve feet outside the edge of pavement with a curb height of six inches or more or with a sidewalk adjacent to the curb, the longitudinal barrier should be placed at the edge of the shoulder.
c. For roadways with valley gutters or curbs less than six inches in height, the longitudinal barrier should be placed a minimum of six feet from the edge of pavement.
d. For roadways without curbs, the longitudinal barrier should be placed as far as practical from the edge of pavement.

With regards to vehicular approaches to bridges, FDOT standards for need and placement of longitudinal barriers shall be applicable in accordance with individual site conditions.

2. Playgrounds – The following is the policy concerning the City’s standards for vehicular guardrail installation adjacent to playgrounds within the City.

Where playgrounds are located adjacent to roadways, they shall be guarded by a longitudinal barrier to prevent vehicles from entering the play area.

For the purpose of this policy, the following definitions apply:

a. Urban – Roads with curbs of a minimum 6-inch height located at the outside edges of pavement.
b. Rural – All other roads, including roads with mountable curbs.

For placement of longitudinal barriers adjacent to roadways, guidelines for offsets are as follows:

a. For a right-of-way width of less than sixteen feet outside the edge of pavement with a curb height of six inches or more, the barrier face should be at the face of the curb.
b. For a right-of-way width of more than sixteen feet outside the edge of pavement with a curb height of six inches or more or with a sidewalk adjacent to the curb, the longitudinal barrier should be placed at the right-of-way line.
c. For a right-of-way width of less than sixteen feet outside the edge of pavement for roadways with valley gutters, curbs less than six inches in height, or no curb, the longitudinal barrier should be placed a minimum of six feet from the edge of pavement.
d. For a right-of-way width of more than sixteen feet outside the edge of pavement for roadways without curbs, the longitudinal barrier should be placed at the right-of-way line.
N. Protective Barriers Adjacent to Bicycle and Pedestrian Facilities

This standard is intended for the protection of bicyclists and pedestrians in areas adjacent to canals.

In the design of pedestrian and bicycle facilities, every effort should be made to provide a safe recovery area between these facilities and canals to eliminate the need for protective barriers.

1. Bicycle Facilities - This standard is based upon State guidelines. These guidelines call for provision of an adequate barrier (such as dense shrubs and/or chain link fence) when a bike path is located within seven feet of a canal.

New paths should be installed according to current design standards including provisions of appropriate barriers. When protective barriers are installed, they should be placed a minimum of two feet from the bicycle path.

In many cases, bicycles travel on the roadway or on a paved shoulder. At these facilities, the motor vehicle recovery area would be greater than the bicycle recovery area and, thus, provision for motor vehicles will also provide for bicycles. However, where guardrail is required within the bicycle recovery area discussed above, care should be taken to assure that barriers are provided to safely protect motorists and bicyclists.

2. Pedestrian Facilities - At pedestrian facilities, where bicycles are prohibited or very little bicycle activity is anticipated, physical barriers should be provided when a canal or culvert is within five feet of the pedestrian path.

1.04 Site Access Control and Design – State Roadways

Site access control and design will be determined by the appropriate government agency with jurisdiction over the roadway to which connections are to be made. The control of access is one of the most effective and efficient methods for improving the capacity and safety characteristics of streets and highways. The reduction of the frequency of access points and the restriction of turning and crossing maneuvers should be considered in order to minimize the impacts to traffic flow on the adjacent roadways. Specific requirements for each of the agencies are contained in the following sections.

1. Connections with roadways under the jurisdiction of the Florida Department of Transportation (FDOT) should be made in accordance with the FDOT’s Rules of the Department of Transportation, Chapter 14-97, Access Management Classification System and Standards. This document is published under the responsibility of the Department’s Maintenance Division. Included in the publication are procedures for application for a connection permit. Design and construction details are also contained in this document.

Developments that require connections with a State roadway should follow the procedures outlined in the above-referenced manual and the development’s
representatives should meet with FDOT to discuss the access connections to the State highway system.

A. Site Access Control and Design - County Roadways

Connections to the County roadway system must be in conformance with the guidelines contained in Section 5-198 of the Broward County Land Development Code. Developments that anticipate connections with and/or modifications to county roadways should follow the applicable County permit procedures.

B. Site Access Control and Design - City Roadways

Access connections onto City streets shall be reviewed and approved by the City Engineer. Driveway spacing and design criteria should be based on the guidelines contained in FDOT’s *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways*, and a *Policy on Design of Urban Highways and Arterial Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO).

C. New Roadways

New roadway facilities must be in conformance with the Transportation Element of the Coral Springs Comprehensive Plan or as otherwise approved by the City. Such roadways must meet the design criteria as established by the City Engineer.

D. Turn Lanes

1. The provision of turn lanes which allow turning vehicles to leave the traffic stream and not interfere with through traffic is an important element to be considered during the period of site access approval. Separate lanes for either right or left turns are beneficial with respect to both overall traffic operations and to traffic safety.

2. For uniformity in roadway design and access treatments to proposed developments, the same criteria for provision of left- and right-turn lanes that are applicable to roadways under County jurisdiction will be applicable to roadways under City jurisdiction.

3. Left-turn lanes must be provided whenever the street’s speed limit equals or exceed 35 MPH or if the proposed development will generate 25 or more left turns during the peak hour.

4. Similarly, right-turn lanes will be required whenever the street’s speed limit equals or exceeds 35 MPH or the proposed development will generate 100 or more right turns during the peak hour.

5. Required turn-lane storage lengths should be determined in accordance with the criteria outlines in the previous section on geometric design.

E. Driveway Access Designs

Connections to the existing roadway network will be through the use of driveways. Driveway access will generally be either via a standard drop curb arrangement or through
the use of a street-type entrance. Drop curbs should be used where curb-and-gutter exists and the volume of traffic using the access is less than 50 vehicles during the peak hour. Street-type entrances should be used where no curb-and-gutter exists and/or traffic volumes during the peak hour are expected to be greater than 50 vehicles.

1.05 Site Circulation and Parking

On-site traffic circulation and parking is an essential element of the development review and approval process. It is essential that traffic approaching and leaving a specific development be able to do so in a safe and efficient manner. The requirements of this section are generally directed at developments other than single-family and duplex dwellings.

The Broward County Development Code Section 5-195(a) outlines specific requirements relating to both site circulation and parking. Unless specifically indicated otherwise, these criteria should be followed for all developments proposed within the City. Site plans shall be submitted to the City and must receive approval from the City prior to final approval of development plans.

A. Circulation of On-Site Traffic

Site plan must be designed such that all site-related traffic circulation, including service vehicles, can occur within the site. On-site circulation patterns must allow for vehicles to leave the street system efficiently without affecting traffic flows on adjacent roadways. Access to parking areas from the street must be uninterrupted by competing circulation routes for a sufficient distance to preclude interference with adjacent roadway traffic.

Loading, unloading, refuse collection, and other related service activities must take place entirely within the confines of the site unless otherwise approved by the City Engineer. Parking for any such service vehicles (while waiting to load or unload) must be provided entirely on-site. Refuse collection facilities must be located such that other service-related activities do not interfere with or prohibit the correction of refuse from receptacles.

B. Design Vehicle Requirements

Access to parking and circulation areas shall generally be designed to accommodate passenger vehicles. Where conditions warrant, however, the design vehicles shall be appropriate for the mix of vehicles expected to use the facility.

Access to fire lanes from the street network shall be sufficient to accommodate equipment used by the Coral Springs Fire Department. However, the minimum outside turn radius must equal 50 feet, unless otherwise specified by the Coral Springs Fire Department. In addition, circulation through the site shall be designed to accommodate this design vehicle in a manner acceptable to the Fire Marshal.

Aisles for parking areas adjacent to a building shall have sufficient dimension to allow for ladder truck operation from the aisle, as determined by the Coral Springs Fire Department.

C. General Parking Requirements
The Coral Springs Land Development Code specified the requirements for provision and location of off-street parking facilities. In addition, the requirements of off-street loading facilities are included in this section of the Land Development Code. These provisions and requirements shall be the basis for parking and loading facilities for developments in the City unless otherwise approved by the City Engineer.

D. Vehicular Reservoir Areas

Adequate reservoir capacity for vehicles to enter and/or leave a development safely and efficiently must be provided in accordance with Section 250819 of the Municipal Code.

Note that the minimum reservoir length does not include the length of the vehicle being served. Also, each reservoir space is twenty-two feet long.

E. Typical Dimensions

The standard parking space size for facilities constructed in The City will be nine feet wide by eighteen feet deep. A handicap space shall be twelve feet in width by eighteen feet in length.

1.06 Traffic Control Devices

Traffic control devices consist of traffic signals, traffic signs and pavement marking. The national standard for uniformity of such devices is the Manual on Uniform Traffic Control Devices – Millennium Edition (MUTCD). Local and state standards typically supplement this national standard. The authority of the installation and maintenance of these devices rests with either the local, county or state government.

Chapter 20, Section 50, of the Minimum Standards Applicable to Public Rights-of-way Under Broward County Jurisdiction contains standards for pavement markings, signing, and signalization. These standards should be used for developments within the City. The standards are repeated here for convenience.

A. Pavement Markings

The installation of pavement markings on streets and roadways under the jurisdiction of the City shall be in conformance with the following requirements:

1. All pavement markings shall be installed utilizing thermoplastic materials meeting current standards adopted by the Florida Department of Transportation (FDOT) and/or the Broward County Traffic Engineering Division. Preformed markings may be used in lieu of thermoplastic if they are acceptable to FDOT as a substitute for thermoplastic.

2. For some lower volume collector roads, consideration may be given to allowing standard reflectorized traffic paint instead of thermoplastic for edge line markings. The composition of such paint must conform to FDOT requirements.

3. All pavement markings shall conform to the standards and requirements contained in the latest edition of the Manual on Uniform Traffic Control Devices for Streets and
Centerlines, lane lines, edge lines, stop bars, crosswalks, arrows and other pavement messages shall be required on all arterial and collector roadways. Standard reflectorized traffic paint is allowed if the median is not curbed. Any exception to the standard use of thermoplastic must be approved by the City Engineer.

5. Stop bars shall be required on local roadways at their intersection with collector and arterial roads. One hundreds (100 feet of double yellow centerline shall also be required on all local streets at approaches to stop bars).

6. In addition to thermoplastic pavement markings, raised reflective markers shall be required to supplement longitudinal markings on all arterial roadways. On collector roadways, raised reflective markings shall be used on all center lines, lane lines, and edge lines where there is a change in the alignment of the road or at the approach of some other potential hazard such as a canal, bridge, or guardrail.

7. If bike paths or sidewalks exist at an intersection requiring pavement markings, crosswalks shall be installed as part of the intersection pavement markings. Special consideration regarding stop bars and crosswalks should be given to established school zones.

8. Local roads with 25 MPH speed limits or less are exempt from requirements to install pavement markings unless required by the City Engineer.

9. Any exceptions or variations from these requirements must be specifically approved in writing by the City Engineer.

10. Where roadways fall under the jurisdiction of Broward County, County standards must be met.

B. Signs

The design and construction of traffic signs shall be in accordance with the following standards:

- Florida DOT Standard Specifications
- Florida Roadway and Traffic Design Standards
- Manual on Uniform Traffic Control Devices
- Broward County Traffic Engineering Division - Sign Specifications
- Broward County Traffic Engineering Division - Standard School Crossing Application

1. Signing Plan

Signing plans shall be submitted to the City Engineer for review and approval, as part of the total paving and drainage submittal. The plan shall show all new signs and all existing signs to be removed. Where appropriate, existing signs to remain shall be shown.

2. Materials
All "STOP", "YIELD", "DO NOT ENTER", and "WRONG WAY" signs and street name signs shall be fabricated entirely with High Intensity reflective sheeting. Other signs shall be fabricated using engineering grade materials. Post-mounted signs shall be mounted on single or double steel U-channel posts. Tubular posts shall not be used.

3. Maintenance of Signs During Construction
   "STOP" and "YIELD" signs shall be maintained during construction. All temporary signs shall conform to the same specifications as permanent signs.

4. Traffic Signals
   All traffic signals within the City are maintained by and under an agreement with Broward County. For details regarding installation requirements the Broward County Traffic Engineering Division should be contacted.

1.07 Installation of Street Lighting

1. Street lighting can be generally grouped into three categories. These are,
   - Continuous roadway lighting
   - Point lighting of specific areas
   - Neighborhood security lighting

2. Continuous roadway lighting consists of placing luminaries at regular intervals along roadways to provide a consistent level of illumination throughout the roadway section. This type of lighting is usually provided on high volume arterial roadways where the task of driving at night needs added visibility. It is not generally considered cost effective or feasible to provide such lighting for local and residential roadways. Standard practices for lighting levels and luminaries spacing can be found in FDOT standards.

3. Point lighting of specific areas is generally used in residential areas or other areas where traffic volumes are relatively low and a continuous lighting scheme is not either needed or desirable. Intersections, for instance, may be lighted with a single luminaries and provide a sufficient level of light for low traffic volumes to have adequate visibility of potential hazards. Likewise, curves in the roadway may be lighted with one or more luminaries for the same purpose. Other roadway features that may not be readily identifiable with ordinary automobile headlights could be lighted to a level adequate for needed visibility. In some instances, a single light at intersections and on curves constitutes the lighting scheme for a neighborhood. Such installations provide visibility of necessary roadway features but provide only background lighting between luminaries' locations.

4. Neighborhood security lighting may be provided through the use of low output lighting fixtures located near the right-of-way lines. Such lines provide a level of illumination that is below levels generally considered measurable for street lighting purposes. These lights do provide a visible measure of illumination, however, and provide a higher feeling of security within a residential area. Care should be taken when installing such lights to avoid creating glare problems for drivers at night. These types of lights should generally have lamps of less than 100-watt output and should have a frosted or other diffusing type of envelope. Mounting heights and distances from the edge of the roadway would vary depending on the type and wattage of light used.
5. Because street lighting requirements can vary significantly from project to project, the City Engineer should be consulted during the project planning phase in order to determine what provisions need to be compiled for the project.

1.08 Structures and Lateral Clearances

Street lighting and utility poles should be placed in a manner so as not to be a hazard to out-of-control vehicles. Poles should be placed as far removed from the travel lane as possible in conformance with roadside recovery areas as discussed in previous sections. Poles should be placed on the inside of curves whenever possible. Foundations and other rigid structures should be flush with or below ground level.

1.09 Construction Area Traffic Control

Construction, maintenance and utility operations can produce potentially serious roadway safety problems in addition to reductions in level of service for roadway sections. Roadways under state or county jurisdiction must follow the appropriate standards from the agency under whose jurisdiction the roadway falls.

Such activities within The City must be in conformance with the procedures outlined in the latest version of the Florida Department of Transportation Standard Indexes, 600 Series, and the latest version of the Manual on Uniform Traffic Control Devices (MUTCD).

The Traffic Control Devices Handbook (published by the Institute of Transportation Engineers) provides an excellent overview of traffic control requirements during construction. Selected excerpts and illustrations from this publication are included here for convenience. These excerpts provide the basic requirements for construction area traffic control but the individuals responsible for these activities are cautioned that it is necessary to comply with all requirements contained in the current FDOT Standard Indexes.

1.10 General Requirements – Manual on Traffic Control and Safe Practices

1. All traffic control devices used on road or street construction, maintenance, and utility work shall conform to the applicable specifications of the Florida Department of Transportation Standard Indexes, 600 Series, the Manual on Uniform Traffic Control Devices, and the Traffic Control Devices Handbook, whichever provides the greatest safety for motorists, bicyclists, pedestrians and workers. They shall be installed prior to the start of construction, maintenance, or utility operations, and shall be properly maintained and operated during the time such special conditions exist. They shall remain in place only as long as they are needed and shall be removed immediately thereafter.

2. Where operations are performed in stages, there shall be in place only those devices that apply to the conditions present. Signs that do not apply to existing conditions shall be removed or covered so as not to be readable by oncoming traffic (see Florida Department of Transportation Standard Indexes, 600 Series for types of covering allowed).
3. Many daylight operations requiring traffic control are discontinued at night, leaving the highway totally unobstructed. However, other operations are of such nature that they cannot be completed in daylight hours and must remain overnight. In view of this, it is mandatory that all warning signs, barricades, and other warning devices (for nighttime operations) be reflectorized with material meeting FDOT Specifications.

4. The work area is defined as the limit of the area within which all construction, maintenance, and utility operations are being conducted, except for the flagmen activities. If the work being performed is a moving operation, such as surveying or mowing, the work area shall be defined as that area within which the workmen and any equipment involved remain at all times. In all cases, the vehicles, equipment, men and their activities involved in the construction, maintenance, and utility operations shall be restricted to one side of the pavement unless otherwise authorized by an agent of the responsible highway authority. Due to specific field conditions that may arise at some locations, the longitudinal dimensions may have to be adjusted in order to provide the amount of protection intended. When operations encroach on the roadway surface, a full lane shall be closed and appropriate traffic control established. This condition may be waived when the remaining portion of the lane encroached upon has a usable width of ten feet or more.

5. An operation that utilizes a slow moving vehicle on or near the pavement creates a special hazard since a series of warning signs cannot be maintained at a specific distance in advance of the operation. Consequently, a special plan of protection must be employed.

6. The distance between the actual work area and the advance warning signs shall in no case exceed the distance covered by one-half day's operation or two miles, whichever is less. In case the limits of the work area are reached by the crew in less than one-half day, the work area and sign placement shall be moved ahead immediately and in all cases before starting to work in the afternoon. Due to terrain, location of work area or traffic conditions, it may be necessary to move the signs more often to provide effective protection. All temporary signs must be removed from the roadway when the crew is absent from the work area.

7. If the work being performed is a daytime operation only, then the temporary signs and other warning devices shall be removed or properly covered at the close of the day's work. If the work area is to remain in the roadway through the night, then all the vehicles and equipment shall be removed from the pavement and the area shall be clearly delineated by adequate signing and warning devices.

8. Barricades and sign supports shall be constructed and erected in the most effective manner. Weeds, shrubbery, construction materials, and equipment, spoil, etc., shall not be allowed to obscure any traffic control device.

9. In order to function most efficiently and retain their effectiveness, traffic control devices must be well maintained. Deteriorated traffic control devices or inoperative devices command little respect and may constitute a safety hazard. Signs shall be kept properly positioned, legible, and clean at all times. Signs that do not apply to existing conditions shall be removed. Damaged, defaced, or dirty signs shall be replaced, repaired, or cleaned. Highway traffic regulations are prohibitions or restrictions imposed upon the
choice of action of the roadway users. Traffic regulations may be established only to the extent and in the manner prescribed by State Laws.

10. Where parked vehicles may contribute to hazardous road conditions and restrict traffic flow, parking restrictions should be established within construction and maintenance areas. Local authorities may establish parking restrictions by the exercise of police power or by the direct intervention of the City Engineer on applicable City owned and maintained roads. Parking restrictions may be established on the state highway system by the Florida Department of Transportation.

11. The establishment of STOP controls, ONE WAY traffic movements, restrictions on lane usage, prohibition of passing, turn restrictions, and any other prohibition or restriction of traffic movement and motorists' rights shall be done only by the public authority.

A. Design of Signs – Manual on Traffic Control and Safe Practices

1. Street or roadway construction and maintenance signs fall into the same three major categories as do other traffic signs; namely, Regulatory Signs, Warning Signs, and Guide Signs. Many signs normally used elsewhere will also find application of signing construction, utility, and maintenance operations. The shape of special construction and maintenance signs follows the basic standard for all highway signs. Warning signs in construction areas shall have a black legend on an orange background. Existing permanent yellow warning signs already in place within these areas may remain in use. Color for other signs shall follow the standard for all highway signs.

2. The use of stripes (other than the standard border) or other geometric patterns or contrasting colors on or around any sign, in an attempt to make it more conspicuous, distracts attention from the message and defeats the purpose of maintaining uniformity and simplicity of design. Such practice is contrary to standards and is prohibited. However, the use of standard orange flag or yellow flashing warning lights in conjunction with signs is permitted, so long as they do not interfere with a clear view of the sign face and conform to the Florida Department of Transportation Standard Indexes, 600 Series, the Manual on Uniform Traffic Control Devices and the Traffic Control Devices Handbook.

B. Warning and Channelizing Devices – Manual on Traffic Control and Safe Practices

1. Function - Properly used warning and channelizing devices such as barricades, cones, drums, etc., are essential to the safety of workmen and of the traveling public in areas of road work operation. It is imperative, however, that these devices provide a smooth and gradual transition in reducing the width of the traveled way and they shall be fabricated so they will not inflict severe damage to a vehicle that inadvertently strikes them.

2. Barricades and channelizing devices are elements in a total system of traffic control devices for use in construction, utility, and maintenance operations, and these elements shall be preceded by other warning devices that are adequate in size, number, and placement for the type of road on which the work is to take place.

3. It is imperative that nothing be placed on, or suspended from, the warning devices and their panels, legs, supports, and members, such as sand bags, rocks, concrete, water,
and other weights above a passenger car bumper line elevation (approximately 13”) nor
that such weights and method of attachment (if any) be of such substance that will likely
inflict more damage to vehicle and occupants than the warning device alone, if struck by
such vehicle. This will also require that nothing block the reflective area of the signs or
device. More direction on sign placement in construction zones is provided in the
Florida Department of Transportation's Standard Indexes, 600 Series.

4. Construction and maintenance zones often encroach into sidewalks or crosswalks
necessitating provisions for alternate routing of pedestrians. Where it is not possible to
close a path and divert the pedestrians to other walkways, barricades may be used to
define the path. Flashers should be used on sidewalk barricades except where high
levels of illumination exist for sidewalk areas and the use of flashers on barricades may
not be needed.

5. Channelization - Within the system of traffic control devices in use within construction or
maintenance areas where a reduction in pavement width is involved, the single most
important element is the taper that is provided for the channelization. An inadequate
taper will almost always produce undesirable traffic operations with resulting congestion
and possible accidents through the area.

6. The taper length shall be determined by the following formula:

\[
L \text{ (min)} = \frac{WS}{2} \text{ for speeds } \geq 45 \text{ mph}
\]

\[
L = \frac{WS^2}{120} \text{ for speeds } \leq 40 \text{ mph}
\]

Where:

- \( L \) = Taper length
- \( W \) = Width of lateral transition in feet
- \( S \) = Posted speed limit (mph)

7. The real test concerning adequate length of taper is the operation of vehicles through
transitions. It should be long enough so drivers of vehicles approaching side by side
have sufficient distance in which to adjust their respective speeds and merge into a
single lane before the end of the transition. A brief period of observing driver
performance will generally provide some clear indications of the adequacy of the taper
length. For example, if severe brake applications are observed, an increase in the
length of the taper is indicated. On construction projects, channelization often remains
in the same place for long periods of time. During such a long interval, some of the
devices, barricades, drums, etc., are moved out of their original alignment, due to being
struck, moved due to construction activities, etc. It is necessary to patrol the
channelization at regular intervals to assure its proper functioning as a traffic control
system. Replacement or shifting of the devices into original alignment can best be done
if the original positions of the element were indicated on the pavement. This technique
assures good alignment and proper vehicle performance over a long period of time with
minimum expenditure of men and materials.

8. Sometimes, work at one site will extend over several days, thereby requiring that
channelization be set up each morning and removed each evening. Under these
circumstances the locations of the cones, drums, etc., should be marked at the time of the original setup to facilitate the rapid, orderly resetting of the devices on each succeeding day.


1. Function - The primary function of temporary traffic control plans is to describe temporary traffic control measures to be used to move road users through a work zone. The control of traffic through work areas is an essential part of utility, construction, and maintenance operations. Temporary traffic control plans most commonly involve a strategy for the channelization of traffic through the work zone and the selection, placement and sequences of traffic control devices. The following considerations must be taken when preparing a traffic control plan (TCP): work duration, highway classification, work proximity to traffic, and type of work.

2. The work duration affects the amount of traffic control devices that will be required to carry out the TCP and the complexity of the traffic control techniques that will be implemented. There are five categories into which work duration is divided. They are as follows: Long-Term Stationary (more than three days), Intermediate-Term Stationary (Overnight to three days), Short-Term Stationary (Daytime 1 to 12 hours), Short Duration (less than or equal to 1 Hour), and Mobile (less than or equal to 15 minutes). Of all these five categories, the one that requires the most traffic control devices and the most complex traffic control techniques is the Long-Term Stationary, whereas the others require progressively less traffic control devices and less complex traffic control techniques.

3. The classification of the highway has a major effect on the TCP that is implemented. The three major highway classifications that produce changes in the TCP are as follows: Freeways and Expressways, Arterial Highways, and Local Streets. Of the three classifications, Freeways and Expressways will require a more complex TCP due to the high-operating speed of the roadway and the high traffic volumes they carry. Although arterial highways carry less traffic and have lower operating speeds, the TCP is not much less complicated than that for the freeways and expressways, since there are more points of conflict between vehicles and the roadway design is more complex. Local streets require the least complicated TCP although special consideration should be taken for pedestrian and bicycle traffic in the area. It is also worthwhile to note that local streets have a significant number of points of conflict along the roadway and it is important to minimize the impact of construction on these locations.

4. It is important to consider, when developing a TCP, how close to traffic the work will take place. Depending on the location on the roadway that the work takes place, the TCP must be modified to protect both workers and motorists. The TCP must be well structured, but also flexible enough to accommodate changes that would maximize worker and motorist safety.

5. Since there is a large variability in the type of work that is done on a roadway, the TCP must cater specifically to the work that is being done.

6. Maintaining good public relations is necessary. The cooperation of the various news media in publicizing the existence of work sites and reasons therefore can be of great assistance in keeping the motoring public well informed.
7. Any traffic control plan submitted to the City for review and approval will require plans signed and sealed by a Professional Engineer registered in the State of Florida and certified as a Work Zone Specialist.

8. Hand Signaling Devices - A number of hand signaling devices, such as flags, Stop/Slow paddles, and lights are used in controlling traffic through the roadwork areas. The hand signaling device to be used shall be the flagman traffic control sign (the Stop/Slow paddle). Red flags will be acceptable in emergency situations only.

9. The sign paddle shall display a 24-inch STOP sign with a SLOW sign on the opposite face. If the paddle is circular in shape it shall have a minimum diameter of 26 inches. This combination sign may be fabricated from sheet metal or other light semi-rigid material. The background color of the STOP face shall be red with white legend and border. The background color of the SLOW face shall be orange with black legend and border. The sign paddle shall be mounted on a rigid handle.

10. Flagmen - Since flagmen are responsible for human safety and make the greatest number of public contacts of all construction personnel, it is important that qualified personnel be selected. A flagman should possess the following minimum qualifications:
   - Good physical condition, including sight and hearing.
   - Mental Alertness
   - Courteous but firm manner.
   - Neat appearance.
   - Sense of responsibility for safety of public and crew.

   In addition to the preceding qualifications, flagmen should be trained in flagging procedures and work zone safety.

11. The use of orange clothing such as a vest, shirt, or jacket shall be required for flagmen. Reflectorization will be required for nighttime use. More direction on flagging operations is given in the Florida Department of Transportation Standard Indexes, 600 Series.

12. Flagging Procedures - The following method of signaling with the sign paddle shall be used:

   a. To Stop Traffic - The flagman shall face traffic and hold the mounted sign paddle in a stationary position with his arm extended horizontally away from the body. The STOP face should be visible to the approaching motorists. For greater emphasis, the free arm may be raised with the palm toward the traffic.

   b. When it is Safe for Traffic to Proceed - The flagman shall face traffic with the SLOW face of the sign paddle visible. If further restraint is needed, the flagman may move his free arm with palm outstretched in an up-and down motion.

13. Urban Characteristics - There is already congestion in urban traffic movement and further congestion due to construction, utility, and maintenance operations should be kept to a minimum. The density of traffic on these facilities requires that traffic control procedures be designed and implemented only after detailed study of existing traffic conditions and the operation that is to be performed. Considerations must be given to allowing critical merging maneuvers to occur in advance of work areas in a manner
designed to create minimum disturbance in the traffic stream. These situations may require a much more sophisticated group of devices than specified for normal rural use. The same important basic considerations of uniformity and standardization of control devices and their use in accordance with the general principles set forth herein should apply for all facilities. On arterial streets such work should, if possible, be restricted to hours other than those of maximum traffic flow.

14. The amount of street space occupied by road work operations should be no more than is absolutely necessary, although this does not justify any failure to use signs, warning devices and channelization as may be required in the roadway for public protection and guidance. Partial lane closures shall be avoided.

15. Changes in operation may be necessary to maintain traffic movement, through an area where a major street is closed or partially obstructed. Additional regulatory signs, such as "ONE WAY" signs, "DO NOT ENTER" signs, and "NO PARKING" signs will be needed to control traffic under these conditions. The messages of most of the standard warning signs described previously are applicable.

16. The sign layout should provide the driver with specific information on the lane closed, type of activity, speed guidance, and special directions for passing around or through the work site. The reasonableness of all restrictions must be carefully evaluated to obtain maximum driver observance. Where a street must be closed to through traffic but where access to adjacent property can be maintained, a special sign with the message "LOCAL TRAFFIC ONLY" should be used in conjunction with any detour signs or barricades that are present at the points of closure.

17. Regulatory, guide, and information signs can usually be erected at the curbs, although it may sometimes be more advantageous to place them on barricades, pedestals, or other temporary supports on the roadway. When these signs are erected at the curbs, they shall be posted at a height of 7' from the bottom of the sign to the ground.
2.0 SOIL EROSION AND SEDIMENTATION CONTROL

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2.01 General Provisions

All procedures and permits shall comply with the Florida Stormwater, Erosion and Sedimentation Control Manual, issued by the Florida Department of Environmental Protection (FDEP). Florida’s stormwater regulatory program requires the use of Best Management Practices (BMPs) listed in Table 4.1 during and after construction to minimize erosion and sedimentation and to properly manage runoff for both stormwater quantity and quality.

<table>
<thead>
<tr>
<th>Name</th>
<th>Application</th>
<th>Max Drainage Area</th>
<th>Useful Life</th>
<th>Comment</th>
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<tbody>
<tr>
<td>Block &amp; Gravel</td>
<td>Inlet Protection</td>
<td>&lt; 1 Acre</td>
<td>3-6 Months</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Brush Barrier</td>
<td>Perimeter Control</td>
<td>Unspecified</td>
<td>3-6 Months</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Check Dam / Hay Bale (Gravel)</td>
<td>Perimeter Control</td>
<td>10 Acres</td>
<td>&lt; 3 Months</td>
<td>Replace as Needed</td>
</tr>
<tr>
<td>Check Dam / Rock (Gravel)</td>
<td>Control Water Velocity</td>
<td>10 Acres</td>
<td>18 Months</td>
<td>Max Height 2 feet</td>
</tr>
<tr>
<td>Check Dam / Silt Fence</td>
<td>Control Water Velocity</td>
<td>10 Acres</td>
<td>6 Months</td>
<td>Replace as Needed</td>
</tr>
<tr>
<td>Construction Road Stabilization</td>
<td>Road Stabilization</td>
<td>Unspecified</td>
<td>Project Life</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Curb &amp; Gutter Sediment Barrier</td>
<td>Inlet Protection</td>
<td>&lt; 1 Acre</td>
<td>&gt; 6 Months</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Drainfield Pipe Inlet Protection</td>
<td>Inlet Protection</td>
<td>&lt; 1 Acre</td>
<td>&gt; 6 Months</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Floating Turbidity Barrier</td>
<td>Sediment Containment</td>
<td>Unspecified</td>
<td>&gt; 18 Months</td>
<td>Use in Low Flow Water Body</td>
</tr>
<tr>
<td>GeoHay Curb Inlet Protection</td>
<td>Containment</td>
<td>&lt; 1 Acre</td>
<td>&gt; 6 Months</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Gravel &amp; Wire Mesh</td>
<td>Inlet Protection</td>
<td>&lt; 1 Acre</td>
<td>3-6 Months</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Hay Bale (Straw Bale)</td>
<td>Inlet Protection</td>
<td>&lt; 1 Acre</td>
<td>3 Months</td>
<td>Routine Maintenance</td>
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<tr>
<td>Silt Fence</td>
<td>Perimeter Control</td>
<td>&lt; 1/4 Acre per 100</td>
<td>6 Months</td>
<td>Trench In &amp; Compact</td>
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<tr>
<td>Sod</td>
<td>Inlet Protection</td>
<td>&lt; 1 Acre</td>
<td>&gt; 6 Months</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Temporary Diversion Dike</td>
<td>Slope Protection</td>
<td>5 Acres</td>
<td>&gt; 18 Months</td>
<td>Compact/Stabilize Slopes</td>
</tr>
<tr>
<td>Temporary Fill Diversion</td>
<td>Slope Protection</td>
<td>5 Acres</td>
<td>1-7 Days</td>
<td>Rebuild As Needed</td>
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<tr>
<td>Temporary Gravel Construction Entrance</td>
<td>Entrance</td>
<td>Unspecified</td>
<td>Project Life</td>
<td>Routine Maintenance</td>
</tr>
<tr>
<td>Temporary Sediment Basin</td>
<td>Sediment Removal</td>
<td>&gt; 5 Acres</td>
<td>18 Months</td>
<td>Engineer Must Design</td>
</tr>
<tr>
<td>Temporary Sediment Trap</td>
<td>Sediment Removal</td>
<td>5 Acres</td>
<td>18 Months</td>
<td>Stabilize Interior/ Exterior</td>
</tr>
<tr>
<td>Temporary Slope Drain</td>
<td>Slope Protection</td>
<td>5 Acres</td>
<td>3-6 Months</td>
<td>Stabilize Outfall</td>
</tr>
<tr>
<td>Temporary Right of Way Diversion</td>
<td>Shorten Flow Length</td>
<td>&lt; 5 Acres</td>
<td>3-6 Months</td>
<td>Inspect Weekly or After Rain</td>
</tr>
</tbody>
</table>
2.02 Scheduling

Temporary and permanent erosion control measures shall be provided for all land disturbing work in accordance with an erosion control plan approved by the City. A grading permit shall be obtained from the Engineering Division prior to beginning site work. Temporary measures shall be installed and inspected by the City for compliance prior to any land disturbing activity. All permanent erosion control measures shall be incorporated into the work at the earliest practical time. All temporary measures shall be maintained until the permanent measures have taken effect. Temporary and permanent measures shall be coordinated to provide effective and continuous erosion control throughout the construction and post-construction period to minimize siltation of streams, lakes, reservoirs, and other impoundments, ground surfaces, and other property. These measures shall remain in effect until Final Approval is given by the City Engineer.

2.03 Temporary Measures

1. Temporary sediment barrier is required to be installed as directed by the Engineering Division. Temporary sediment barrier shall be erected in accordance with standard details.

2. Diversion berms shall be installed at the top of cut and fill slopes and any other necessary locations as directed by the Engineering Division. Diversion berms shall be installed in accordance with standard details.

3. Construction entrances shall be installed at all points of access to construction sites. Any access point which does not have a construction entrance shall be barricaded to prevent its use. The contractor shall be responsible for maintaining cleanliness of existing streets and routes impacted by construction activities.

4. Sediment pits or filter basins shall be installed at all points where accumulated runoff is released to natural drainage channels as directed by the Engineering Division.

5. Sod and mulching shall be done immediately behind construction. Sod species will be depending on the availability of irrigation. Where no irrigation is available, only bahia sod is allowed.

6. If active construction ceases in any area for more than 30 days all disturbed areas must be sodded, mulched, and tacked unless written approval is granted by the Engineering Division.

2.04 Permanent Measures

A. Ground Cover

1. After construction is complete, all disturbed areas shall receive a permanent ground cover with sod and mulching.
2. Permanent Ground Cover is the establishment of perennial vegetation cover for periods longer than twelve (12) months.

3. Plant Selection: Select plants appropriate to the season, region, and site conditions. Consult with Broward Agricultural Extension agent, Broward County, FDEP, SFWMD, FDOT offices, or Table 1.65a of the Florida Development Manual.

B. Riprap Dissipation Pads and Riprap Protection

1. After construction is complete, all points of stormwater release shall be protected by riprap dissipation pads designed to reduce discharge velocities to non-erosive levels.

2. The dissipation pads shall be designed and constructed with either an engineering fabric or washed stone barrier between the dissipation pad and the natural ground. Calculations shall be furnished to indicate the sufficiency of the dissipation pads specified. Riprap pad design shall be in accordance with FDEP and MS4 manuals. Filter fabric, or a washed stone liner shall be used on all sediment basins, riprap dissipators, or channel designs.

2.05 Computations

1. All computations and assumptions used to formulate an erosion control plan shall be reviewed by the Engineering Division and in compliance with Broward County and the City’s Stormwater Ordinance and Soil Erosion and Sedimentation Control Ordinances to verify their sufficiency.

2. Erosion and sedimentation control measures, structures, and devices shall be planned, designed, and constructed to control the calculated peak runoff from a 10-year frequency storm. Runoff rates shall be calculated using the USDA Soil Conservation Service Method, the Rational Method, or other acceptable calculation procedures. Runoff computations shall be based on rainfall data published by the National Weather Service or information in SFWMD Environmental Resource Permit Information Manual Volume IV, latest edition for this area.

2.06 Construction Sequence

The construction sequence on projects shall be as follows:

1. Submit MS-4 plans to City Engineer for review; and process permits with Building Division

2. Install all erosion control measures as shown;

3. Obtain grading permit;

4. Obtain certificate of compliance through on-site inspection by the City Engineer;

5. Proceed with grading;

6. Clean sediment basins when one-half full;
7. Repair or replace all erosion control measures as needed;

8. Sod, mulch and/or non-seeded ground cover are to be installed within thirty (30) days after finished grades are established;

9. Maintain soil erosion control measures until permanent ground cover established;

10. Request final approval by the City Engineer;

11. Remove all temporary soil erosion control measures and stabilize these areas.
3.0 STORM DRAINAGE

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3.05 Canals and Lakes ..........................................................................................................50
3.1 **Submittals**

**A. Site Plans**

Site Plans shall include the following drainage features and submittals:

1. Drainage boundaries, including all adjacent off site areas draining into and off the proposed project site.

2. Sufficient proposed topographic information with elevations at a minimum of one-foot contours to verify the locations of all grade changes, including the location of edge of water. When overall elevation changes are less than one foot, spot elevations of slope changes are required to be shown.

3. Existing drainage features and topographical information, including but not limited to canals, ditches, ponds, catch basins, manholes, pipes, curbs, gutters, edges of water and pavement, easements, etc.

4. All proposed drainage features, including location of inlets, manholes, pipes, swales, roof drainage, canals, gutters, exfiltration trenches, etc.

5. Delineation of sub-basin areas and retention/detention areas.

6. Preliminary drainage calculations showing the amount of storage areas provided will be sufficient to serve the proposed development. These shall include required and provided water quality, pretreatment and additional retention storage volumes and estimated length of exfiltration trench based on typical soil permeability rates for the area.

**B. Final Engineering Plans**

In addition to the requirements for site plans (above), Final Engineering Plans shall include the following drainage features and submittals:

1. Pipe sizes, materials, lengths and invert elevations.

2. Structure types and sizes, including casting numbers for inlet grates and manhole lids.

3. A certified soil report prepared by a licensed professional engineer in the State of Florida specialized in geotechnical engineering shall be provided showing the water table elevation, soil permeability rate, and cross section of the soil strata. A minimum of one boring per acre of development shall be performed.

4. Final drainage calculations, including revised required and provided retention storage volumes, stage storage calculations, design storm elevations, pipe sizing and exact length of trench based on soil permeability tests performed on site.

5. Conform to all requirements of Development Review Committee’s (DRC’s) checklist items related to drainage.
3.02 Retention Requirements

A. Water Quality Pretreatment

1. Water Quality and Pretreatment storage shall be designed in accordance with the South Florida Water Management District’s (SFWMD) Permit Information Manual “Management and Storage of Surface Waters”, latest edition.

2. Water quality storage shall be provided for no less than one (1) inch of rainfall over the entire site.

3. In addition to water quality storage, pretreatment storage shall be provided for all commercial and industrial development and shall be no less than one-half (1/2) inch of the rainfall over the entire site.

4. Storage volumes credited towards water quality and pretreatment shall conform to requirements of NSID, CSID, or SWCD.


6. All water quality and pretreatment storage must be provided on site.

B. Exfiltration Systems

1. Exfiltration systems may be used for supplement retention areas for the purpose of water quality, pretreatment and additional retention storage.

2. Exfiltration trenches shall be designed in accordance with the South Florida Water Management District’s (SFWMD) Permit Information Manual “Management and Storage of Surface Waters”, latest edition.

3. Final calculations for dimensioning exfiltration trenches shall be based on actual soil permeability tests performed on site.

4. Exfiltration systems shall not be used in public right-of-ways or for any public facility.

5. Maintenance access shall be provided on both sides of exfiltration trenches in the form of approved manholes or catch basins. The maximum distance between such access structures shall not exceed three hundred (300) feet.


3.03 Flood Protection

A. Method of Discharge

1. Connection to Public System
All development shall drain via positive outlets to a public system of adequate capacity. Such system may consist of an existing pipe of adequate capacity to accept the additional discharge generated from the project, a public canal or lake. If a connection to an existing system is proposed, calculations shall be submitted to prove that it can accept the proposed discharge in addition to existing areas. The connection to a public system shall be approved by the receiving drainage district, i.e., NSID, CSID, or SWCD.

2. Stand-Alone System

Land locked developments that do not have an adequate discharge point will have the option to build a system connected to an existing lake or canal, or to design a stand alone drainage system by detaining the runoff volume from the 100-Year/1-Day storm event on site with no impact to adjacent roadways or developments.

Calculations shall be submitted to show that the proposed development will retain water on site up to the 100-Year/1-Day storm elevation with no impact to adjacent roadways or developments. Such calculations shall also show that the detained water will be drawn down to the design water elevation within 10 days.

B. Design Storm Stage Elevations

1. Drainage calculations shall show that the 10-Year/1-Day storm stage elevation is equal to, or lower than the lowest catch basin rim elevation within the roadway or parking area.

2. Drainage calculations shall show that the 25-Year/3-Day storm stage elevation is equal to, or lower than the site perimeter elevation.

3. Drainage calculations shall show that the minimum finished floor elevation is at or above the 100-Year/3-Day storm stage elevation.

3.04 Design Parameters

A. Drainage Pipes and Culverts

1. Materials. All drainage pipe installed within the public rights of way shall be reinforced concrete.

Acceptable pipe materials for use on private property are: reinforced concrete (RCP), corrugated aluminum (CAP) and high density polyethylene (HDPE).

2. Roughness Coefficients. Manning’s “n” values used in all drainage calculations submitted to the City for review shall be as follows:

- Reinforced Concrete: 0.013
- Corrugated aluminum pipe: 0.024
- High density polyethylene: 0.011
- Cast iron: 0.013
3. Minimum Cover. Minimum cover for all drainage pipes shall be designed in accordance with FDOT “Roadway Traffic Design Standards”, latest edition, Index no. 205, but shall never be less than eighteen (18) inches.

4. Pipe and culvert ends shall have concrete headwalls to protect from undermining and provide a readily maintainable entrance/exit for stormwater flow. Concrete headwalls designed in accordance with FDOT roadway and traffic design standards, latest edition, Index no. 250 through 255 end sections.

B. Drainage Structures

1. Materials. All drainage structures, including inlets, manholes and end walls shall be pre-cast reinforced concrete.

2. Minimum thickness of walls, base and slabs shall be eight (8) inches.

3. Maintenance access. The maximum pipe lengths between access points consisting of an approved manhole or inlet, shall be designed in accordance with the FDOT drainage manual, latest edition, but shall not exceed the distances shown below:
   
   - For 15" through 18" pipe: 300 feet
   - For 24" through 36" pipe: 400 feet
   - For pipes larger than 36": 500 feet

4. Minimum Sump. A minimum sump of eighteen (18) inches shall be provided below the invert of the lowest pipe in all inlet and manhole structures to prevent sediment from reaching the discharge point.

5. Aprons. All structures having a lid or grate in a grassy area shall have a two (2) foot concrete apron all around to prevent the grass from covering the top.

6. Sediment Control. All inlets shall be protected from sediment laden storm runoff until completion of all construction operations that may contribute sediment to the inlet. See Chapter 4.

C. Coefficients of Runoff

1. Used in all drainage calculations provided to the City for review shall be as follows 0.50 for grassed or other pervious areas.

2. Used in all drainage calculations provided to the City for review shall be as follows 0.95 for paved or other impervious areas.

B. Design Water Elevations

1. For the C-14 drainage basin shall be 7.0 MSL

2. For the Hillsboro drainage basin shall be 6.0 MSL

C. Time of Concentration
1. The minimum time of concentration shall be ten (10) minutes.

2. The maximum time of concentration shall be thirty (30) minutes.

D. Retention Areas

1. The maximum slope for the banks of dry retention areas shall not exceed three (3) to one (1) horizontal to vertical, except for areas within five (5) feet from a sidewalk in which the slope shall not exceed four (4) to one (1) horizontal to vertical.

2. The minimum width of the bottom of dry retention areas shall not be less than three (3) feet.

3. The banks and bottom of retention areas shall be covered with sod.

4. All drainage retention areas shall be connected to the on-site drainage system with a drainage inlet/outlet.

3.05 Canals and Lakes

1. Canals dedicated to the public shall have a minimum right-of-way width of eighty (80) feet as measured at the design water elevation. Lakes dedicated to the public shall have a minimum surface water width of one hundred fifty (150) feet. A maintenance easement twenty (20) feet in width shall be provided adjacent to the entire boundary of a lake or canal.

2. The elevation of the bottom at the center of the canal or lake shall be a minimum of twelve (12) feet below design water elevation. The side slopes of the canal or lake shall be designed in accordance with the City Code and Standard Details.

3. All canals and lakes shall connect directly or indirectly to the secondary canal system permitted by the South Florida Water Management District.
APPENDICES

Appendix A – Standard Detail Drawings
I. **General Details (GEN) – Engineering**

- GEN-1 Datum Plane Relationships
- GEN-2 Permanent Reference Monument
- GEN-3 Utility Placement within Public R.O.W.
- GEN-4 Utility Placement within Rear Lot Easement
- GEN-5 Utility Placement at Road Crossing of Canal
- GEN-6 Standard Drafting Details Road Symbols
- GEN-7 Utility Symbols
- GEN-8 Standard Symbols
- GEN-9 Surveyor Symbols
- GEN-10 Underground Utilities – Identifying Color Code
- GEN-11 Abbreviations
- GEN-12 Fences within Canal Maintenance Easements
- GEN-13 Standard General Details Chain-link Fence
0.00 NATIONAL GEODETIC VERTICAL DATUM

0.00 CITY OF MIAMI MLW BAY

0.00 U.S.C.E. MLW BAY

0.00 U.S.C.E. MLW OCEAN

*Same Elevation and Datum previously called:
U.S.C. & G.S. 1929 MEAN SEA LEVEL
SEA LEVEL DATUM OF 1929
INSTALLATION IN ROCK

NOTE:
FOR SOIL OTHER THAN ROCK
THE CONCRETE ENCASEMENT
SHALL BE EXTENDED TO FIRM
MATERIAL BUT NO LESS THAN
18 INCHES

INSTALLATION IN SOIL
(OTHER THAN ROCK)

* ALL DIMENSIONS ARE CONSIDER MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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</tr>
<tr>
<td>GEN-2</td>
<td>SHEET 1 OF 1</td>
</tr>
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</table>
NOTES:
1. ALL MAIN VALVES AT INTERSECTIONS SHALL BE LOCATED AT THE INTERSECTION OF THE MAIN WITH THE PROJECTION OF THE R/W LINE.
2. ALL SANITARY SEWER MANHOLES AT INTERSECTIONS SHALL BE LOCATED AT THE CENTERLINE OF THE INTERSECTING STREETS.
3. FIRE HYDRANTS AT INTERSECTIONS SHALL BE LOCATED OPPOSITE THE P.C. OF THE R/W LINE.
4. ALL UNDERGROUND UTILITIES SHALL BE PLACED PARALLEL OR PERPENDICULAR TO THE CENTERLINE OF RIGHT OF WAY.

* ALL DIMENSIONS ARE CONSIDER MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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SECTION A-A

MINIMUM COVER FOR LATERAL NOT CROSSING CENTERLINE.

MINIMUM COVER FOR SANITARY SEWER
1.) 36" FOR PVC
2.) 24" FOR DIP

WATER METER SHALL BE PLACED AT OUTER EDGE OF SIDEWALK WHEN SIDEWALK ALREADY EXISTS, WHEN CONDITIONS PERMIT.

R/W Widths | Sewer and Water Main OFFSETS
--- | ---
50' | 12'
60' | 15'

NOTES:
1. ALL CONSTRUCTION OR ADJUSTMENT OF UNDERGROUND UTILITIES MUST BE COMPLETED BEFORE FINAL ASHALTIC CONCRETE SURFACE MAY BE PLACED.
2. ON ALL STREETS, PLACE UTILITY POLES AT THE R/W LINE, AND FIRE HYDRANTS 1'-0" FROM R/W LINE. (SEE G2.1, SHEETS 1, 3.)
3. WHERE UTILITY Crosses ARTERIAL, USE MINIMUM 36" COVER THROUGH ARTERIAL.
NOTES:
1. ALL MAIN VALVES AT INTERSECTIONS SHALL BE LOCATED AT THE INTERSECTION OF THE MAIN WITH THE PROJECTION OF THE R/W LINE.
2. FIRE HYDRANTS AT INTERSECTIONS SHALL BE LOCATED OPPOSITE THE P.C. OF THE R/W LINE.
3. ALL UNDERGROUND UTILITIES SHALL BE PLACED PARALLEL OR PERPENDICULAR TO THE CENTERLINE OF THE RIGHT-OF-WAY.
4. ACCESS MANHOLES SHALL NOT BE PLACED IN TRAFFIC LANE UNLESS SPECIAL APPROVAL IS OBTAINED. MEDIAN AND SIDEWALK AREAS SHALL BE USED.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
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<td>SHEET 3 OF 4</td>
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</table>
*All dimensions are center min. design conditions unless otherwise approved by the city engineer for special exception areas.

**SECTION B-B**

**NOTES:**

1. PROVIDE MINIMUM 36" COVER ON ALL UTILITIES. GREATER COVER MAY BE REQUIRED ON UTILITIES LARGER THAN 24" AT INTERSECTION ARTERIALS.

2. NO UTILITY POLES TO BE PLACED ON ARTERIALS EXCEPT BY SPECIAL APPROVAL.

3. PLACE FIRE HYDRANTS 1'-0" FROM BACK OF SIDEWALK (R/W LINE), EXCEPT IN AREAS W/CURB & GUTTER, FIRE HYDRANTS SHALL NOT BE MORE THAN 8 FEET FROM FACE OF CURB.

4. PLACE WATER METER AT OUTER EDGE OF SIDEWALK WHEN SIDEWALK ALREADY EXISTS, WHEN CONDITIONS PERMIT.

5. ROADWAY LIGHTING POWER LINE COVER 12" TO 36", AS REQUIRED BY EXISTING CONDITIONS.
NOTES:
1. ALL UNDERGROUND UTILITY LINES SHALL HAVE
   A MINIMUM 24" VERTICAL CLEARANCE BELOW
   FINISHED GRADE. VERTICAL CLEARANCE BETWEEN
   LINES TO BE DECIDED BY UTILITY COMPANIES INVOLVED.
2. WATER AND SEWER LINES LOCATED IN STREET
   RIGHT-OF-WAY. (SEE 2.03)

* ALL DIMENSIONS ARE CONSIDER MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY
ENGINEER FOR SPECIAL EXCEPTION AREAS.
NOTES:
1. ELEVATED UTILITY CROSSING SHALL BE ON THE DOWN STREAM SIDE OF BRIDGE.
2. HORIZONTAL CLEARANCE BETWEEN PILING SHALL EQUAL EXISTING BRIDGE PILING OR BE APPROVED BY THE CITY ENGINEER.
3. ALL UTILITIES (WHERE PRACTICABLE), SHOULD UTILIZE THE SAME SUPPORTING STRUCTURE.
4. UTILITY COMPANY SHALL RELOCATE AT THEIR EXPENSE, ANY UTILITY CROSSING (BOTH ELEVATED AND/OR BURIED), WHICH WOULD INTERFERE WITH FUTURE DEEPENING OR WIDENING OF CANALS, OR WIDENING OF BRIDGES.
5. WATER AND SEWER MAINS TO BE LOCATED IN ACCORDANCE WITH THE FLORIDA STATE STATUTES.

* ALL DIMENSIONS ARE CONSIDER MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS
ROAD SYMBOLS – ETC.

EXISTING

PROFILE LINE
ROAD PAVEMENT
SIDEWALK
CURB
CURB AND GUTTER
DRIVEWAY OR TURNOUT
PROFILE LINE (∅)

CONSTRUCT

GROUND ELEVATION (To 0.1 Ft.)

IMPROVEMENT OR STRUCTURE
ELEVATION (To 0.01 Ft.)

CONTOUR LINE

CENTER LINE

RIGHT-OF-WAY LINE

BASE LINE

NOTE: * — SHADING VARIES

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<th>STANDARD DRAFTING DETAILS ROAD SYMBOLS</th>
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<td>----------------</td>
<td>----------</td>
</tr>
<tr>
<td>Utility Pole</td>
<td>↝</td>
</tr>
<tr>
<td>Utility Pole with Guy Anchor</td>
<td>⚠️ ←→ ⚠️</td>
</tr>
<tr>
<td>Pole with Light</td>
<td>⚡️</td>
</tr>
<tr>
<td>Concrete Pole with Light</td>
<td>⚡️</td>
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<tr>
<td>Transmission Line Pole</td>
<td>↝</td>
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<tr>
<td>Water Valve</td>
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<tr>
<td>Gas Valve</td>
<td>⚠️</td>
</tr>
<tr>
<td>Force Main Valve (Plug, Gate)</td>
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<tr>
<td>Air Valve (FM)</td>
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<tr>
<td>Manhole (Sanitary)</td>
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</tr>
<tr>
<td>Manhole (Storm)</td>
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</tr>
<tr>
<td>Manhole (Telephone)</td>
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<tr>
<td>Manhole (Electric)</td>
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**Standard Details**

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**Utility Symbols**

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# Utility Symbols

<table>
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<th>Proposed</th>
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<tr>
<td><strong>Water Main</strong></td>
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</tr>
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<td>6&quot;</td>
<td>6&quot; WATER</td>
</tr>
<tr>
<td>24&quot; WATER</td>
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</tr>
<tr>
<td>10&quot; SAN</td>
<td>12&quot; RCP</td>
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<tr>
<td><strong>Sanitary Sewer</strong></td>
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<td>12&quot;</td>
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<td><strong>Force Main</strong></td>
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<tr>
<td>48&quot;</td>
<td>48&quot;</td>
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<tr>
<td><strong>Gas Main</strong></td>
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<tr>
<td>4&quot;</td>
<td>PROPOSED 4&quot; GAS</td>
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<tr>
<td><strong>Buried Telephone Cable</strong></td>
<td><strong>Buried Telephone Cable</strong></td>
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<td>150 PR</td>
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<td><strong>Telephone Duct</strong></td>
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<tr>
<td>PROPOSED TEL. DUCT</td>
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<td><strong>Electrical Duct</strong></td>
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<td>4 DUCT</td>
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<td><strong>Lateral (Sanitary Sewer)</strong></td>
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<td><strong>Water Meter</strong></td>
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<td><strong>Fire Hydrant</strong></td>
<td><strong>Fire Hydrant</strong></td>
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<tr>
<td><strong>Inlet (Catch Basin)</strong></td>
<td><strong>Inlet (Catch Basin)</strong></td>
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<tr>
<td><strong>Sprinkler</strong></td>
<td><strong>Sprinkler</strong></td>
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**Note:**

- *48" FM OR 48" FM OR 48" FM*
- Shading also varies.

## Standard Details

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**Coral Springs**

*Everything Under the Sun*
SURVEYORS SYMBOLS

BENCH MARK B.M.  ☒ B.M.#......
PERMANENT REFERENCE MONUMENT  ☐ P.R.M.
IRON ROD  ☐ I.R.  ☐ I.P.
IRON PIPE
SECTION CORNER
QUARTER CORNER
LIMITED ACCESS R/W LINE, R/W LINE
COUNTY LINE
TOWNSHIP SECTION LINE
BARBED WIRE FENCE  ☒ ☒ ☒ ☒ ☒
CHAIN LINK FENCE  ☐ ☐ ☐ ☐
WOOD FENCE  ☐ ☐ ☐ ☐ ☐
RAILROAD TRACK  —SINGLE  ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑
—DOUBLE  ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑
NATURAL FEATURES

PALM TREE

PINE TREE

TREE (ALL OTHERS)

HEDGE

MARSH

PATH

BUSHES

SHORELINE – OCEAN

SHORELINE – LAKE

CANAL

RIVER

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**STANDARD *COLOR CODE FOR IDENTIFYING UNDERGROUND UTILITIES**

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<tr>
<th>UTILITY &amp; PRODUCT TYPE</th>
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<td>MUNICIPAL &amp; ELECTRIC SYSTEMS</td>
<td>SAFETY RED</td>
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<tr>
<td>GAS DISTRIBUTION AND TRANSMISSION</td>
<td>HIGH VISIBILITY SAFETY YEL</td>
</tr>
<tr>
<td>OIL DISTRIBUTION AND TRANSMISSION</td>
<td>HIGH VISIBILITY SAFETY YEL</td>
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<tr>
<td>DANGEROUS MATERIALS, PRODUCT LINES</td>
<td>HIGH VISIBILITY SAFETY YEL</td>
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<tr>
<td>TELEPHONE AND TELEGRAPH SYSTEMS</td>
<td>SAFETY ALERT ORANGE</td>
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<td>CABLE TELEVISION</td>
<td>SAFETY ALERT ORANGE</td>
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<td>POLICE AND FIRE COMMUNICATIONS</td>
<td>SAFETY ALERT ORANGE</td>
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<tr>
<td>WATER SYSTEMS, SLURRY PIPELINES</td>
<td>SAFETY PRECAUTION BLUE</td>
</tr>
<tr>
<td>SEWER SYSTEMS</td>
<td>SAFETY GREEN</td>
</tr>
<tr>
<td>TREATED WASTE WATER PIPE LINES</td>
<td>SAFETY BROWN</td>
</tr>
</tbody>
</table>

**NOTE:** UTILITY LOCATION TO BE MARKED PRIOR TO ANY INTENDED TRENCHING OR EXCAVATION.

* AMERICAN PUBLIC WORKS ASSOCIATION IDENTIFYING COLOR CODING SPECIFICATION

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<th>STANDARD DETAILS</th>
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<tr>
<td>FLOW LINE</td>
<td>F/L</td>
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<tr>
<td>RIGHT-OF-WAY</td>
<td>R/W</td>
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<tr>
<td>CENTER LINE</td>
<td>C</td>
</tr>
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<td>BASE LINE</td>
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<td>BENCH MARK</td>
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<td>EDGE OF PAVEMENT</td>
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<td>TOP OF CURB</td>
<td>T.O.C.</td>
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<tr>
<td>SIDEWALK</td>
<td>S/W</td>
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<tr>
<td>JUNCTION BOX</td>
<td>J.B.</td>
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<td>CATCH BASIN</td>
<td>C.B.</td>
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<td>MANHOLE</td>
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<td>INVERT</td>
<td>INV.</td>
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<td>F.H.</td>
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<td>GATE VALVE</td>
<td>G.V.</td>
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<tr>
<td>BUTTERFLY VALVE</td>
<td>B.V.</td>
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</tr>
<tr>
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<td>P.T.</td>
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<td>POINT OF CURVATURE</td>
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<td>POINT OF REVERSE CURVATURE</td>
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<td>POINT OF COMPOUND CURVATURE</td>
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<tr>
<td>MEAN HIGH WATER</td>
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<td>MEAN LOW WATER</td>
<td>M.L.W.</td>
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<td>MEAN SEA LEVEL</td>
<td>M.S.L.</td>
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<td>CAST IRON LEVEL</td>
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<td>DUCTILE IRON PIPE</td>
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</table>
NOTES:

1. EACH SECTION SHALL HAVE (2) END POINTS. (1) TOP RAIL, (1) BOTTOM RAIL AND WIRE MESH.

2. ALL END POSTS TO BE SET IN SLEEVE OR SOCKET FOR EASY REMOVAL AND REPLACEMENT.

3. POSTS AND RAILS SHALL BE GALVANIZED STEEL OR ALUMINUM.

4. WIRE MESH SHALL BE GALVANIZED, AS WELL AS ALL OR ALUMINUM.

5. PERMIT REQUIRED FROM THE BUILDING AND ZONING DEPARTMENT FOR INSTALLATION.
* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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VII. Streets Details (S)

S-1  Concrete Sidewalks & Meter Posts in Parking lots
S-2  Concrete Swale Detail Valley Gutter Curb
S-3  Typical Street Type Access Class I, II, & III
S-4  Typical Curb Cross Sections
S-5  Typical Exfiltration Trench
S-6  Concrete Flume
S-7  Guard at Pipe Ends
S-8  Interlocking Concrete Block Pavers
S-9  Paving Header & Brick Paver Details
S-10 Street & Driveway Repl. for Concrete and Asphaltic Concrete Surfaces
S-11 Section through Boat Ramp
S-12 Standard Driveway Location at Intersections
S-13 Standard Concrete & Asphalt Driveway
S-14 Typical Sidewalk Construction
S-15 Typical Bus Stop Pad Detail
S-16 Minimum Space Requirements for Self-Parking Facilities
S-17 Typical Handicapped Stall
S-18 Handicapped Sign Detail
S-19 Typical Sidewalk Curb Cut Ramps
S-20 Typical Street Sections
S-21 Wheel Stops Reinforced Concrete
S-22 Standard Dumpster Enclosure
S-23 Typical Turn Lane Geometrics
S-24 Speed Hump
S-25 Speed Cushion
S-26 Speed Table
S-27 Bus Shelter
S-28 Pavement Markings
S-29 Sidewalk Path
S-30 Alley Typical Section
S-31 Location of Mailboxes within Public R.O.W.
S-32 Visibility Triangles & No Planting Areas
S-33 Sight Restrictions for Access to Arterial Roads
SECTION A-A

CONSTRUCTION JOINT PERMITTED (Typ)

LIMITS OF CONCRETE SWALE
LIMITS OF PAY QUANTITY

SECTION B-B

NORMAL VALLEY GUTTER CURB
SECTION – SEE DETAIL 3.04

NOTE:
SUBJECT TO CITY ENGINEER’S APPROVAL
TO BE USED ONLY IN UNIQUE SITUATIONS.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

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SHEET 1 OF 1
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<tr>
<th>CLASS OF ACCESS</th>
<th>WIDTH (W) (feet)</th>
<th>CORNER CLEARANCE (C) (feet)</th>
<th>FLARE* (F) (feet)</th>
<th>ANGLE (Y) (degrees)</th>
<th>ADJOINING PROPERTY CLEARANCE (E) (feet)</th>
<th>DISTANCE BETWEEN MULTIPLE ACCESSES (D) (feet)</th>
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<tbody>
<tr>
<td>I</td>
<td>15 - 30</td>
<td>10</td>
<td>10 - 15</td>
<td>90</td>
<td>0*</td>
<td>50</td>
</tr>
<tr>
<td>II One way</td>
<td>15 - 30</td>
<td>10</td>
<td>25</td>
<td>90</td>
<td>10</td>
<td>50</td>
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<tr>
<td>II Two way</td>
<td>26 - 50</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>III Restricted Turns</td>
<td>26 - 30</td>
<td>10</td>
<td>35</td>
<td>90</td>
<td>10</td>
<td>200</td>
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<td>III Non-Restricted Turn</td>
<td>39 - 60</td>
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* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS
NOTE: “D” Curb is to be used in unique situations. Use of “D” curb is subject to City Engineer’s approval. See Detail 3.02

TYPE “D” CURB

3’ TRANSITION AT DRIVES

NOTE: When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement and the thickness of the lip shall be 6”, unless otherwise shown on plans.

TYPE “F” CURB

NOTES:
1. There shall be a 1/2” seal joint between back of curb and driveway.
2. Concrete in curbs shall be 3000 psi, with fiber mesh reinforcing.

VALLEY GUTTER

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
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<td>07/2014</td>
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ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

NOTES:
1. HALF ROUND PLATE TO BE WELDED TO TOP FOR POLLUTION RETARDANT BASIN.
2. THE HALF ROUND PIPE SHALL BE ONE SIZE LARGER THAN DISCHARGE PIPE.
3. FOR STRUCTURE'S CONSTRUCTION DIMENSIONS AND SPEC'S., SEE PRECAST CATCH BASIN DETAIL.
4. WEEP HOLES ARE NOT PERMITTED IN WELLFIELD AREAS.

LONGITUDINAL SECTION
\[ L = \frac{V}{K(H_z * W + 2*H_2 * D_u - D_2^2 + H_2 * D_s) + (K) * W * D_u} \]

- \( L \): LENGTH OF TRENCH REQUIRED (FEET)
- \( V \): VOLUME TREATED (ACRE - INCHES)
- \( W \): TRENCH WIDTH (FEET)
- \( K \): HYDRAULIC CONDUCTIVITY (CFS/FT² - FT. HEAD)
- \( H_z \): DEPTH TO WATER TABLE (FEET)
- \( D_u \): NON-SATURATED TRENCH DEPTH (FEET)
- \( D_s \): SATURATED TRENCH DEPTH (FEET)

**CROSS SECTION**

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

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* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

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<td>S–6</td>
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sheet 1 of 2
4' CONCRETE APRON  
1'-3" TO CENTER OF INLET  

EDGE OF ASPHALT PAVEMENT  
8'-6" CURB, 6" HIGH  

TRANSITION TO ZERO CURB HEIGHT  
TYPE "D" OR "F" CURB  

NOTE:  
WHEN SURFACE FLOW IS TOWARDS INLET  
FROM BOTH SIDES, CONSTRUCT 10' RADIUS CURB ON EACH SIDE OF INLET.  

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS
**NOTE:**
1. GUARDS TO BE CONSTRUCTED ONLY AT LOCATIONS SPECIFICALLY CALLED FOR IN PLANS.
2. FOR OTHER SIZES CHECK FOOT INDEX NO. 280

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

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<th>PIPE DIA</th>
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<th>30&quot;</th>
<th>36&quot;</th>
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<tr>
<td>GRADE (Lbs)</td>
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<td>74</td>
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**STANDARD DETAILS**

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<td>REVISIONS</td>
<td>SHEET 1 OF 1</td>
<td></td>
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</table>
NOTE:
1. All pavers to be installed flush with top of curb.
2. Interlocking paving units shall generally be installed in accordance with manufacturer's requirements.
3. Paver thickness: 2 3/8" residential, light duty traffic; 3 1/8" commercial, heavy duty traffic.
4. Concrete pavers to conform to ASTM C936–82.
5. Course granular base shall be in accordance with manufacturer's requirements (4" min. for 2 3/8" pavers and 6" min. for 3 1/8" pavers), granular base shall be crushed concrete or other material approved by city engineer. Concrete base required for continuous vehicle loading or as required by city engineer (6" min. concrete 3000 psi with fiber mesh).
6. Coloring or dye shall be uniform throughout each concrete paver unit. Dipped or externally colored paver units are unacceptable.
7. Pavers shall be installed with edge restraint and confined with cemented paver units, curbs, poured concrete or other suitable method.
8. Final finished surface shall be of uniform elevation or slope.
9. Subgrade shall be free of clay, organics, or other materials which will allow future settlement and compacted to 98% AASHTO T-180–57.

* All dimensions are considered minimum design conditions unless otherwise approved by city engineer for special exception areas.
4"x8" INTERLOCKING CONCRETE PAVERS, WASH SAND/CEMENT MIX INTO JOINTS

1/2" - 3/4" SAND SETTING COARSE

6" (MIN) CONCRETE 3000 PSI WITH FIBER MESH

SAW CUT EXIST. ASPH.

EXISTING ASPHALT

12"

12"

EX. BASE

1/2" EXPANSION JOINT

STABILIZED SUBGRADE

*ALL EXPOSED CONCRETE EDGES TO BE HAND TOOLED.

NOTE:
CONCRETE BASE REQUIRED FOR CONTINUOUS VEHICLE LOADING OR AS REQUIRED BY CITY ENGINEER
SUBGRADE SHALL BE FREE OF CLAY, ORGANICS, OR OTHER MATERIALS WHICH WILL ALLOW FUTURE SETTLEMENT AND COMPACTED TO 98% AASHTO T-180-57.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
<th>PAVING HEADER &amp; BRICK PAVER DETAIL</th>
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<td>LAST MODIFIED 07/2014</td>
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<tr>
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<td>DETAIL NUMBER S-9</td>
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<td>REVISIONS</td>
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</tbody>
</table>
ASPHALT STREET AND DRIVEWAY REPLACEMENT REQUIRED FOR
UTILITY CONSTRUCTION

CONCRETE REPLACEMENT REQUIRED FOR UTILITY CONSTRUCTION

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
<th>STREET AND DRIVEWAY REPLACEMENT FOR CONCRETE &amp; ASPHALTIC CONCRETE SURFACES</th>
</tr>
</thead>
<tbody>
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<tr>
<td>S-10</td>
<td>SHEET 1 OF 1</td>
</tr>
</tbody>
</table>
1. LOCATION OF BOAT RAMP(S) MUST BE IDENTIFIED, INSPECTED AND APPROVED BY SBOD PRIOR TO CONSTRUCTION.
2. SLOPE DETAILS AS OUTLINED ABOVE MUST BE INSPECTED AND APPROVED BY THE DISTRICT PRIOR TO INSTALLATION OF EROSION CONTROL MAT.
3. UPON COMPLETION OF BOAT RAMP, DISTRICT MUST BE NOTIFIED FOR FINAL APPROVAL.
4. BOAT RAMP MUST INTERSECT ADJACENT ROAD AND WATER BODY AT 90° ANGLE UNLESS OTHERWISE APPROVED.
5. THE BOAT RAMP(S) MUST BE MINIMUM 12' WIDE.
6. PROVIDE DROP CURB AT PAVEMENT WHERE APPLICABLE.
7. FOR BOAT RAMP CONSTRUCTED ON AN SBOD CANAL A SLOPE OF 3:1 CAN BE USED FROM EDGE OF WATER UP TO TOP OF BANK.
8. BOAT RAMPS SHALL BE CONSTRUCTED OF LIMEROCK OR EROSION CONTROL MAT, AT THE DISCRETION OF THE DISTRICT.
9. IF SBOD OPTS FOR AN EROSION CONTROL MAT, THE MAT SHALL BE FILLED WITH AT LEAST 4" OF 3/4" ROCK.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
<th>SECTION THROUGH BOAT RAMP</th>
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<tbody>
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<td>MARCH 2008</td>
<td>LAST MODIFIED 07/2014</td>
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</tbody>
</table>
| NO. DATE         | DETAIL NUMBER S-11 SHEET 1 OF 1

DIAGRAM:

- 8" MINIMUM COMPACTED LIMEROCK BASE SODDED WITH ST. AUGUSTINE IN RESIDENTIAL AREAS AND BAHIA IN NON-RESIDENTIAL AREAS.
- LAKE MAINTENANCE EASEMENT.
- 20" ELEVATION.
- 12" ELEVATION.
- BASIN CONTROL.
- ANGLE OF REPOSE.
- 8" LIMEROCK BASE OR EROSION CONTROL MAT (GEO-MAT OR APPROVED EQUAL).
- 1" ELEVATION.
* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

NOTE: DRIVeways TO BEGIN A MINIMUM OF 40' MEASURED FROM CURB LINE EXTENDED OR 10' FROM PROPERTY LINE, WHICHEVER IS GREATER.

- TRANSITION AREA

---

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
<th>STANDARD DRIVEWAY LOCATION AT INTERSECTIONS</th>
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<tr>
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<tr>
<td>NO.</td>
<td>DETAIL NUMBER S-12</td>
</tr>
<tr>
<td>DATE</td>
<td>SHEET 1 OF 2</td>
</tr>
</tbody>
</table>
1. Form over well compacted soil 4" thick, with last 3'-0" at road being 6" thick. Fiber mesh concrete.

2. Concrete to be a minimum 3,000 PSI at 28 days.

3. Nail section of 1x lumber on asphalt to insure finished drive will be 3/4" above roadway.

4. Call city engineer for inspection after formed and before pouring concrete.

5. Joints, if and when necessary, shall be designed by the engineer of record.

6. All roots, sprinkler lines, etc. shall be removed from the concrete slab area before pouring.

PRIVATE CONCRETE DRIVEWAYS

1. Place (1") one inch of asphaltic concrete surface on a compacted (8") eight inch limber rock base.

2. Nail section of 1x lumber on roadway asphalt to insure finished drive will be above roadway.

3. All roots, sprinkler lines, etc. shall be removed from the concrete slab area before pouring.

PRIVATE ASPHALT DRIVEWAYS

*All dimensions are considered minimum design conditions unless otherwise approved by city engineer for special exception areas.
**TABLE OF SIDEWALK JOINTS**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A&quot;</td>
<td>JOINT SHALL BE PLACED AT P.C. AND P.T. OF CURVES, JUNCTION OF EXISTING SIDEWALKS, EVERY 60' ON NEW SIDEWALKS AND WHERE SIDEWALKS ABUT CONCRETE CURBS, DRIVEWAYS AND SIMILAR STRUCTURES.</td>
</tr>
<tr>
<td>&quot;B&quot;</td>
<td>JOINT SHALL BE PLACED 5'-0&quot; CENTER</td>
</tr>
<tr>
<td>&quot;C&quot;</td>
<td>JOINT SHALL BE PLACED AT 20' INTERVALS</td>
</tr>
</tbody>
</table>

---

**NOTE:** SIDEWALK SHALL BE 4" THICK EXCEPT IN DRIVEWAYS WHERE THE THICKNESS SHALL BE 6".

---

**TYPICAL SIDEWALK SECTION**

**PLAN**

**TYPICAL SIDEWALK CONSTRUCTION**

<table>
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<tr>
<th>STANDARD DETAILS</th>
<th>TYPICAL SIDEWALK CONSTRUCTION</th>
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</thead>
<tbody>
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<td>NO. DATE</td>
<td>REVISIONS</td>
</tr>
<tr>
<td></td>
<td>S-14</td>
</tr>
</tbody>
</table>
NOTES:

1. BUS STOP PAD MAY EXTEND FROM EXISTING CURB TO OR THROUGH THE ALIGNMENT OF EXISTING SIDEWALK.

2. THE BUS STOP PAD WILL FOLLOW THE SAME SLOPE AND WILL BE FLUSH WITH THE BACK OF CURB.


4. PAVED ACCESS TO THE BUS STOP PAD FROM THE SIDEWALK MUST MEET CITY OF CORAL SPRINGS SIDEWALK STANDARDS AND ADA STANDARDS WITH A MAXIMUM SLOPE OF 1:12 AND LEVEL REST. STOPS NO MORE THAN 30 FEET APART. LOCATION OF ACCESS WILL BE FIELD DETERMINED. SLOPE OF PARKWAY AREA ADJACENT TO BUS STOP PAD WILL BE FIELD DETERMINED.

5. BUS STOP PAD SHALL BE A MINIMUM OF 6" REINFORCED CONCRETE THE SAME AS CONCRETE DRIVEWAYS.

6. BUS STOP PAD SHALL BE CENTERED AS CLOSE TO LOT LINES AS POSSIBLE. EXISTING BUS STOP SIGNS MAY NEED TO BE RELOCATED ACCORDINGLY.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS
PARALLEL PARKING

FACE OF CURB (TYPE D) OR EDGE OF CONCRETE GUTTER (TYPE F)

6" WHITE STRIPING

45° BUMP OUT

25.0' 20.0' 10.0'

ANGLED PARKING

"A" "B" "C" "D" "E" "F"

PARKING ANGLE PARKING STALL STALL WIDTH AISLE WIDTH CURB WIDTH OVERALL WIDTH

30° 9' 16.80' 12.00' 18.00' 44.60'
45° 9' 19.10' 13.00' 12.73' 51.20'
60° 9' 20.10' 18.00' 10.40' 58.20'
90° 9' 18.00' 24.00' 9.00' 60.00'

NOTE:

EACH STALL SHALL BE PROVIDED WITH WHEEL STOPS IF NO ADJACENT CURBING IS PRESENT
NOTE:
All pavement markings to be thermoplastic.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS
**NOTE:**
All pavement markings to be thermoplastic.

---

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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<td><strong>MARCH 2008</strong></td>
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<tr>
<td></td>
<td></td>
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</tbody>
</table>
WHITE BORDER
& SYMBOL
BLUE BACKGROUND

BLACK BORDER
& LETTERS
WHITE BACKGROUND

BLACK BORDER
& LETTERS
WHITE BACKGROUND

ALL LETTERS
1" SERIES "C"

1'-0"

1.5"

6"

1.5"

1.5"

PARKING BY
DISABLED
PERMIT
ONLY

$257 FINE
F.S. 318.14

2" GREEN PAINTED
STANDARD "U" CHANNEL STEEL

2" HOT DIPPED GALVANIZED
STANDARD WEIGHT STEEL PIPE

3/8" RIVET (TYP.)

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

STANDARD DETAILS

MARCH 2008

HANDICAPPED SIGN DETAIL

LAST MODIFIED
07/2014

NO. DATE REVISIONS

S-18 SHEET 1 OF 1
WHERE CURB RAMPS ARE CONSTRUCTED IN EXISTING SIDEWALKS WITH SIDEWALK OR UTILITY STRIP SLOPES GREATER THAN 0.02, THE SIDEWALK SHALL BE RECONSTRUCTED TO REDUCE THE SLOPES TO 0.02 AT THE FLARE POINT.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

**STANDARD DETAILS**

<table>
<thead>
<tr>
<th>TYPICAL SIDEWALK CURB CUT RAMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARCH 2008</td>
</tr>
</tbody>
</table>

DETAIL NUMBER S-19 SHEET 1 OF 2
NOTES:

* USE DETECTABLE WARNING SURFACES ONLY FOR DRIVEWAYS 24' OR WIDER.
** 4' FLARED RADIUS OPTIONAL
1. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF CORAL SPRINGS STANDARDS AND SPECIFICATIONS.
2. SIDEWALKS ADJOINING 24' DRIVES, ALLEYWAYS, OR STREETS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH OF THE SIDEWALK IN THE DIRECTION OF TRAVEL. THE MINIMUM LENGTH OF THE DETECTABLE WARNING SURFACE SHALL BE 24" FROM THE EDGE OF DRIVEWAYS, EDGE OF SIDE ROADS, OR STREETS.
3. SIDEWALKS SHALL BE CONTINUOUS THROUGH ALL DRIVEWAYS REGARDLESS OF DRIVEWAY WIDTH.

GENERAL NOTES:

1. PUBLIC SIDEWALK CURB RAMPS SHALL BE CONSTRUCTED IN THE PUBLIC RIGHT OF WAY AT LOCATIONS THAT WILL PROVIDE CONTINUOUS UNOBSERVED PEDESTRIAN AREAS, ELEMENTS, AND FACILITIES IN THE PUBLIC RIGHT OF WAY AND TO ACCESSIBLE PEDESTRIAN ROUTES ON ADJACENT SITES.
2. CURB RAMPS ARE TO HAVE CURB RAMPS CONSTRUCTED AT ALL STREET INTERSECTIONS AND AT TURNOUTS THAT HAVE CURBED RETURNS. RAMPS CONSTRUCTED AT LOCATIONS WITHOUT SIDEWALKS SHALL HAVE A LANDING CONSTRUCTED AT THE TOP OF EACH RAMP.
3. THE LOCATION AND ORIENTATION OF CURB RAMPS SHALL BE AS SHOWN IN THE PLANS.
4. CURB RAMPS RUNNING SLOPES AT UNRESTRAINED SITES SHALL NOT BE STEEPER THAN 1:12 AND CROSS SLOPE SHALL BE 0.02 OR FLATTER. TRANSITION SLOPES SHALL NOT BE STEEPER THAN 1:12. WHEN ALTERING PEDESTRIAN FACILITIES WHERE EXISTING SITE DEVELOPMENT PRECLUDES THE ACCOMMODATION OF A RAMP SLOPE OF 1:12, A RUNNING SLOPE BETWEEN 1:12 AND 1:10 IS PERMITTED FOR A RISE OF 6" MAXIMUM AND A RUNNING SLOPE BETWEEN 1:10 AND 1:8 IS PERMITTED FOR A RISE OF 3" MAXIMUM, WHERE COMPLIANCE WITH THE REQUIREMENTS FOR A CROSS SLOPE CANNOT BE FULLY MET, THE MINIMUM FEASIBLE CROSS SLOPE SHALL BE PROVIDED. RAMP RUNNING SLOPE IS NOT REQUIRED TO EXCEED 8' IN LENGTH, EXCEPT AT SITES WHERE THE PLANS SPECIFY A GREATER LENGTH.
5. IF A CURB RAMP IS LOCATED WHERE PEDESTRIANS MUST WALK ACROSS THE RAMP, THEN THE WALK SHALL HAVE TRANSITION SLOPES TO THE RAMP; THE MAXIMUM SLOPE OF THE TRANSITIONS SHALL BE 1:12. RAMPS WITH CURB RETURNS MAY BE USED AT LOCATIONS WHERE OTHER IMPROVEMENTS PROVIDE GUIDANCE AWAY FROM THAT PORTION OF THE CURB PERPENDICULAR TO THE SIDEWALK; IMPROVEMENTS FOR GUIDANCE ARE NOT REQUIRED AT CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC.
6. CURB RAMPS DETECTABLE WARNING SURFACE SHALL EXTEND THE FULL WIDTH OF THE RAMP AND IN THE DIRECTION OF TRAVEL 24" FROM THE BACK OF THE CURB. DETECTABLE WARNING SURFACES SHALL BE VANGUARD, ARMOR TILE, OR APPROVED EQUAL.
7. Where a ramp is constructed within existing curbing, curb and gutter, and or sidewalk, the existing curb or curb and gutter shall be removed to the nearest joint beyond the curb transitions or to the extent that no remaining section of curb or curb and gutter is less than 5' long. The existing sidewalk shall be removed to the nearest joint beyond the transition slope or walk around or to the extent that no remaining section of sidewalk is less than 5' long.
8. DETECTABLE WARNING SURFACE COLOR SHALL CONTRAST WITH SURROUNDING SURFACE AS DIRECTED BY CITY ENGINEER (DEFAULT COLOR IS YELLOW).

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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<tr>
<td>March 2008</td>
<td>Last Modified 07/2014</td>
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<tr>
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<td>Revisions</td>
</tr>
<tr>
<td>Detail Number</td>
<td>Sheet 2 of 2</td>
</tr>
</tbody>
</table>

Coral Springs
City of Coral Springs, Florida
2 AND 3 LANE ROAD

3 AND 4 LANE ROAD

NOTES:
1. PAVEMENT MATERIALS AND THICKNESS, AND BASE MATERIALS AND THICKNESS WILL BE STATED IN CONSTRUCTION DRAWINGS AND SCOPE OF THE WORK.
2. SEE CONSTRUCTION DRAWINGS FOR CURB TYPE AND LANE WIDTHS.
   * REFER TO FOOT INDEX 700 FOR CLEAR ZONE WIDTH

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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<td>S-20</td>
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<td>S-20</td>
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<tr>
<td>SHEET 2 OF 2</td>
<td></td>
</tr>
</tbody>
</table>
NOTE: Concrete to be 3,000 psi, with fiber mesh reinforcing.
NOTE:

THE DUMPSTER ENCLOSURE SLAB MUST BE A MINIMUM OF 6 INCHES THICK OVER A 6 INCH LIMEROCK BASE AND 12 INCH STABILIZED SUBGRADE. THE SLAB SHALL EXTEND OUT IN FRONT OF THE ENCLOSURE AT LEAST AS WIDE AS THE WIDEST GATE BUT NOT LESS THAN 6 FEET.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS
<table>
<thead>
<tr>
<th>SPEED</th>
<th>STORAGE L1</th>
<th>TAPER RATE L2</th>
<th><strong>TAPER L3</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>≤30 MPH</td>
<td>* MIN. 75'</td>
<td>8:1</td>
<td>L3.WS²/60</td>
</tr>
<tr>
<td>35 MPH</td>
<td>* MIN. 75'</td>
<td>10:1</td>
<td>L3.WS²/60</td>
</tr>
<tr>
<td>40 MPH</td>
<td>* MIN. 75'</td>
<td>12:1</td>
<td>L3.WS²/60</td>
</tr>
<tr>
<td>≥45 MPH</td>
<td>* MIN. 75'</td>
<td>15:1</td>
<td>L3.WS</td>
</tr>
</tbody>
</table>

* FROM TABLE 6, PAGE 9. STORAGE LENGTHS SHOULD BE DETERMINED BY \( L_{1,2} (V/C) 25 \) WHERE V/C IS THE NUMBER OF VEHICLES PER CYCLE DURING THE PEAK HOUR.

** W. AMOUNT OF OFFSET IN THRU MOVEMENT
S. DESIGN SPEED PER PAGE 10
\* 100-FOOT MINIMUM LENGTH FOR 12’ LANES
AND 80’ MINIMUM LENGTH FOR 10’ LANES

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
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<td>MARCH 2008</td>
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<td>07/2014</td>
<td>S-23</td>
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</table>
NOTE: PRIOR TO INSTALLATION OF SPEED HUMP AND NEW CURB AND GUTTER, DRAINAGE FEATURES SHALL BE INVESTIGATED.

SECTION A-A

DETAIL OF SPEED HUMP AT CURB LOCATION

EXISTING CURB & GUTTER

ROADWAY SYMMETRICAL ABOUT 1'

MATCH EXISTING GRADE

2' ASPHALT

2' SOD

24' OR WIDTH OF ROADWAY

TRANSITION

DETAIL OF SPEED HUMP WITHOUT CURB

3' SLOPE 12:1

3' 8'

EXISTING ASPHALT TO BE SAWCUT IN ORDER TO KEY IN TRANSITION (TYP.)

PROFILE VIEW

CONSTRUCTION MATERIALS
THE CONSTRUCTION OF THE HUMP CAN BE A PRECAST CONCRETE SECTIONS, CONCRETE CAST ON SITE, ASPHALT, OR BRICK/CONCRETE PAVING.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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</tr>
<tr>
<td>S-24</td>
<td>SHEET 1 OF 1</td>
</tr>
</tbody>
</table>
**NOTES**

1. Position speed cushions on straight sections of roadway.
2. Use on streets less or equal to 40' wide.
3. Not appropriate on streets less than 36' wide.
4. Requires parking restrictions 50' on each side.
5. Centerline stripe may not be in the center of roadway, but if not striped, position cushions symmetrical to center of roadway.
6. Use additional pavement marking on streets with bike lanes.

---

### SECTION A-A

**PARABOLIC SECTION**

<table>
<thead>
<tr>
<th>STREET CENTERLINE</th>
<th>DOUBLE YELLOW CENTERLINE MARKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>14'</td>
<td></td>
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</tbody>
</table>

**EXISTING OR PROPOSED CURB**

**EXISTING ASPHALT SURFACE**

**CONCRETE SIDEWALK**

**SECTION A-A**

### SECTION B-B

**PARABOLIC SECTION**

<table>
<thead>
<tr>
<th>STREET CENTERLINE</th>
<th>DOUBLE YELLOW CENTERLINE MARKING</th>
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</thead>
<tbody>
<tr>
<td>14'</td>
<td></td>
</tr>
</tbody>
</table>

**EXISTING OR PROPOSED CURB**

**EXISTING ASPHALT SURFACE**

**CONCRETE SIDEWALK**

**SECTION B-B**

---

*All dimensions are considered minimum design conditions unless otherwise approved by City Engineer for special exception areas.*

---

**STANDARD DETAILS**

<table>
<thead>
<tr>
<th>SPEED CUSHION</th>
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<tbody>
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<td>MARCH 2008</td>
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**LAST MODIFIED**

| 07/2014 |

**DETAIL NUMBER**

| S-25 |

**NO. DATE REVISIONS SHEET 1 OF 1**
NOTE: PRIOR TO INSTALLATION OF SPEED TABLE AND NEW CURB AND GUTTER, DRAINAGE FEATURES SHALL BE INVESTIGATED.

ROADWAY SYMMETRICAL ABOUT

SECTION A-A

24' OR WIDTH OF ROADWAY

EXISTING CURB & GUTTER

DETAIL OF SPEED TABLE AT CURB LOCATION

10' FLAT ASPHALT

EXISTING PAVEMENT

1' TRANSITION

MATCH EXISTING GRADE

DETAIL OF SPEED TABLE WITHOUT CURB

2' SOD

PROFILE VIEW

EXISTING PAVEMENT

SLOPE 24:1

EXISTING ASPHALT TO BE SAWCUT IN ORDER TO KEY IN TRANSITION (TYP.)

CONSTRUCTION MATERIALS
THE CONSTRUCTION OF THE SPEED TABLE CAN BE A PRECAST CONCRETE SECTIONS. CONCRETE CAST ON SITE ASPHALT OR BRICK/CONCRETE PAVERS.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
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<td>REVISIONS</td>
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LAST MODIFIED: 07/2014

DETAIL NUMBER: S-26

SHEET 1 OF 1
TYPICAL PLAN

EDGE OF PAVEMENT

STREET NAME

R/W LINE

SHOW ROUTE OF ELECTRICAL SERVICE
SHOW SERVICE POINT

R/W LINE

SIDEWALK

CLEAR SIGHT LINE

BUS STOP POST AND SIGN

PER ADA

BUS SHELTER

40' BUS

NOTE:
1. SHEET PLAN SHALL SHOW ACTUAL SITE CONDITIONS.
2. ALL DIMENSIONS SHOWN ARE INDICATIVE ONLY.
3. ALL DIMENSIONS INDICATED ABOVE ARE MINIMUMS.
4. SIDEWALK WIDTH SHALL BE 5 FEET MINIMUM.
5. ACCESS WALK Width shall not exceed 3 FEET.

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS
NOTE:
1. FOR TRAFFIC AND PEDESTRIAN SIGNAL INSTALLATION REFER TO FOOT INDEXES No. 17721 THROUGH 17890
2. FOR PUBLIC SIDEWALK CURB RAMPS, REFER TO CITY OF CORAL SPRINGS DETAIL 3.19
3. FOR PAVEMENT MARKING AND SIGN INSTALLATION REFER TO FOOT INDEXES 9535 THROUGH 17358
4. CROSSWALK MINIMUM WIDTHS: INTERSECTION CROSSWALK 6', MID BLOCK CROSSWALK 10'

SPECIAL EMPHASIS CROSSWALK
MID BLOCK SIGNALIZED

<table>
<thead>
<tr>
<th>APPROXIMATE SPEED LIMIT</th>
<th>SEEN ADDED COMMENT</th>
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<tr>
<td>35 TO 40</td>
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<td>60 TO 70</td>
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* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

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<td>REVISIONS S-30</td>
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<td>SHEET 1 OF 1</td>
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</table>
MAILBOXES MAY NOT BE INSTALLED WITHIN CURVE LIMITS AT INTERSECTIONS

**NOTES:**

1. NO OBSTRUCTIONS ARE PERMITTED WITHIN THE RIGHT OF WAY THAT WOULD PRECLUDE A MAIL CARRIER FROM PULLING OFF TRAFFIC LINES TO MAKE DOOR DELIVERIES.

2. THE MAILBOX SHOULD BE SET 3 1/2 TO 4' ABOVE THE ROADWAY.

3. THE MAILBOX MUST BE LOCATED SO THAT THE MAIL CARRIER DOES NOT HAVE TO LEAVE HIS VEHICLE IN ORDER TO PLACE MAIL IN BOX.

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<th>DIMENSIONS</th>
<th>ARTERIAL</th>
<th>RESIDENTIAL</th>
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<td>B</td>
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NOTE:
1. TREES PLANTED WITHIN R/W MUST BE APPROVED BY CITY ENGINEER

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

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<td>SHEET 1 OF 1</td>
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</tr>
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</table>
NO PLANTING OR OTHER OBJECT ALLOWED IN MEDIAN WHERE ‘W’ IS 4’ OR LESS.

NO SIGHT OBSTRUCTION BETWEEN 30” AND 8’ HIGH ALLOWED IN THIS AREA (TYPICAL BOTH SIDES)

R/W LINE

NO SIGHT OBSTRUCTION ALLOWED IN THIS AREA

ARTERIAL ROAD

PAVEMENT EDGE

PLAN

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
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IX. Erosion and Sedimentation Control (MS4)

- **MS4-1** Temporary Erosion Control Gravel Interceptor Bed
- **MS4-2** Temporary Erosion Control Diversion Berm
- **MS4-3** Single Family Home Straw Bale Sediment Barrier/Silt Fence Installation
- **MS4-4** Temporary Sediment Trap at Curb Inlet
- **MS4-5** Temporary Sediment Trap at Storm Drain Inlet
- **MS4-6** Temporary Erosion Control Sediment Basin
- **MS4-7** Temporary Sediment Barrier at Drop Inlet
- **MS4-8** Floating Turbidity Barriers
- **MS4-9** Canal and Lake Side Slopes
* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

CROSS SECTION

TOP ISOMETRIC VIEW
REFER TO FLORIDA EROSION AND SEDIMENTATION CONTROL INSPECTOR'S MANUAL

DIVERSION RIDGE REQUIRED WHERE GRADE EXCEEDS 2%

SECTION A - A

SPILLWAY

SEDIMENT BARRIER

SUPPLY WATER TO WASH WHEELS IF NECESSARY

FLOW

EXISTING PAVED ROADWAY

2"-3" COURSE AGGREGATE MIN. 6" THICK

DIVERSION RIDGE

50' MIN.

NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

REFER TO PLATE 4.03a IN THE FLORIDA EROSION AND SEDIMENT CONTROL INSPECTOR'S MANUAL

STANDARD DETAILS

MARCH 2008

TEMPORARY EROSION CONTROL DIVERSION BERM

LAST MODIFIED 07/2014

DETAIL NUMBER MS4-2

NO. DATE REVISIONS

Sheet 2 of 2
* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

NOTE:

SLT FENCE IS PREFERRED, IF SIGNIFICANT GRADE EXISTS, STRAW BALES MAY BE REQUIRED TO BE PLACED ON THE DOWNSTREAM SIDE OF THE SILT FENCE.

---

REFER TO FLORIDA EROSION AND SEDIMENTATION CONTROL INSPECTOR’S MANUAL
1. SET STAKES 6' MAX.
2. EXCAVATE A 4" X 4" TRENCH UPSCALE ALONG THE LINE OF STAKES
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH
4. BACKFILL AND COMPACT THE EXCAVATED SOIL

SHEET FLOW INSTALLATION (PERSPECTIVE VIEW)

POINTS A SHOULD BE HIGHER THAN POINT B DRAINAGE INSTALLATION (FRONT ELEVATION)
EXTRA STRENGTH FILTER FABRIC
NEEDED WITHOUT WIRE MESH SUPPORT

STEEL OR
WOOD POST

FLOW

FLOW

10' MAX. SPACING WITH
WIRE SUPPORT FENCE

6' MAX. SPACING WITHOUT
WIRE SUPPORT FENCE

STEEL OR
WOOD POST
36" HIGH MAX.

FLOW

FLOW

4" x 6" TRENCH
WITH COMPACTED
BACKFILL

RUNOFF

12" MIN.

RUNOFF

9" MAX.
(RECOMMENDED)
STORAGE HT.

12" MIN.

NOTES:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT
   WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT
   CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING
   EFFICIENCY.

STANDARD DETAIL:
TRENCH WITH NATIVE BACKFILL

ALTERNATE DETAIL:
TRENCH WITH GRAVEL
* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

BUILDING BLOCK LAID 6" FROM THROAT WEB HORIZONTAL.

ROLL OF 12 1/2" GUAGE WELDED FENCE, 2"X2" MESH, 8"-10" DIAMETER FILLED WITH 3" STONE.

NOTES:

1. FIBEROUS FILLER MATERIAL IN FRONT OF BLOCK PREVENTS GRAVEL FROM WASHING INTO STRUCTURE.

2. 2"X4" BEHIND BLOCK AND ACROSS THROAT HELPS KEEP BLOCK IN PLACE. PLACE IN OUTER HOLE OF SPACER BLOCK.

3. BALES OF HAY AND SOD, SIMILARLY PLACED, MAY ALSO BE USED.

REFER TO FLORIDA EROSION AND SEDIMENTATION CONTROL INSPECTOR'S MANUAL
* All dimensions are considered minimum design conditions unless otherwise approved by the city engineer for special exception areas

MAX SLOPE 1:1
1' BELOW THROAT MIN
2' BELOW THROAT MAX

CLEAN OUT WHEN SEDIMENT IS 6" BELOW THROAT.

LEAVE OUT BLOCK TEMPORARILY, INSERT TILE WITH WIRE SCREEN AND GRAVEL FILTER.

CROSS SECTION

CIRCULAR SHAPE IS NOT ESSENTIAL – VARY SHAPE TO FIT DRAINAGE AREA AND TERRAIN. OBSERVE TO CHECK TRAP EFFICIENCY AND MODIFY AS NECESSARY TO INSURE SATISFACTORY TRAPPING OF SEDIMENT.

PLAN VIEW

Refer to Florida Erosion and Sedimentation Control Inspector's Manual
* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

**Plan View**

- Sediment Trap
- Stabilize outermost bank with sod or other suitable material
- Earth Berm

**Cross Section**

- Water level during storm
- Bales of straw staked down
- 8" min.
- 2' min
- Overflow pipe
- Min. 2:1 slide slope
- Stabilized slope
- Splash pad and/or stabilization required if pipe empties into other than body of water.

Refer to Florida Erosion and Sedimentation Control Inspector's Manual
Straw bales are to be placed 4 inches in the soil tightly abutting with no gap, staked and backfilled around the entire outside perimeter.

Silt fence is to be installed around straw bales.

Area inlet with grate

Plan view

Staked straw bale

Runoff water with sediment

Filtered water

Section A-A

Silt fence

Backfill

This method of inlet protection is applicable where the inlet drains a relatively flat area (slopes no greater than 2%) where sheet or overland flows (not exceeding 0.5 CFS) are typical. The method shall not apply to inlets receiving concentrated flows, such as street or highway medians.
1. Excavate the trench

2. Place and stake straw bales
   - Angle first stake toward previously laid bale
   - Wedge loose straw between bales
   - Bales must be tightly abutting with no gaps

3. Backfill and compact the excavated soil

PROPERLY INSTALLED STRAW BALE (CROSS-SECTION)

BINDING WIRE OR TMNE
FILTERED RUNOFF
1" X 2" STAKE
STAKED AND ENTRENCHED
50 LB (APPROX.) STRAW BALE
COMPACTED SOIL TO PREVENT PIPING
SEDIMENT LADEN RUNOFF
1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS.
   (LESS THAN 5%)  
2. USE 2" X 4" WOOD OR EQUIVALENT METAL STAKES. (3 FT. MIN. LENGTH)  
3. INSTALL 2" X 4" WOOD TOP FRAME TO INSURE STABILITY.  
4. THE TOP OF THE FRAME (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION  
   DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE  
   NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.
Refer to Florida Erosion and Sedimentation Control Inspector’s Manual

Specific Application:
This method of inlet protection is applicable where the inlet drains in a relatively flat area (slope no greater than 5%) where the inlet sheet of overland flows (not exceeding 1 c.f.s.) are typical. The method shall not apply to inlets receiving concentrated flows, such as in street or highway medians.

Standard Details

Temporary Sediment Barrier at Drop Inlet

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<th>Temporary Sediment Barrier at Drop Inlet</th>
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<td>Detail Number MS4-8</td>
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<tr>
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<td>Revisions Sheet 2 of 2</td>
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</table>
TYPES I & II

STRESS BAND

STRESS PLATE

5/16 IN. CHAIN  BALLAST & LOAD LINE

FOLDS EVERY 8 FEET

DEPTH ACCORDING TO NEED

100 FT. STANDARD LENGTH

STRESS PLATE (TO REMOVE PRESSURE FROM FLOATS)

FLOATATION

WATER SEAL

PVC SLOT-CONNECTOR

18 (OR 22) OZ. VINYL COVERED NYLON

GALVANIZED #24 SAFETY HOOK

TYPE II

TOP LOAD LINE

5/16 VINYL COATED CABLE

FLOATATION

STRESS PLATE

1/4 IN. CHAIN

ALL SEAMS HEAT SEALED

(BLOW-UP OF SHACKLE CONNECTION)

ECONOMY FABRICS AVAILABLE
16 OZ. 300 LB/IN. STANDARD

FLOATATION

5/8 IN. POLYPROPYLENE ROPE

FOLDS FOR COMPACT STORAGE

1/4 IN. TIE ROPE

NYLON REINFORCED VINYL

DEPTH ACCORDING TO NEED

REVIEWER:

MARCH 2008

LAST MODIFIED

07/2014

NO. DATE REVISIONS

MS4-9 SHEET 1 OF 3
Refer to Florida Erosion and Sedimentation Control Inspector’s Manual

**Type III**

- 22 oz nylon reinforced vinyl
- PVC slot - connector
- Floation

**Stress Band**

- Stress plate
- Lap link
- 5/16 in. chain

- Depth according to need

- 5/16 vinyl coating cable (on both sides of curtain to reduce strain)

**Orientation when installed (tidal situation - type III)**

- Note: Anchoring with buoys, as shown, removes all vertical forces from the curtain, hence, the curtain will not sink from wind or current loads.

- Buoy
- Attach lines to shackle
- Automatic flashing light (on at dusk – off at dawn) 100’ on center shall be used in navigable channels only

- Standard containment systems light buoy
- Anchor (as recommended by the manufacturer)

- Water surface
- Min. 2

- Curtain
- Min. 12

- Riverbed

---

**Standard Details**

- Floating Turbidity Barriers Type III

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</table>
* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

NOTES
1. IF SLOPE IS FLATTER THAN 1 TO 4 THE SLOPE MUST BE CONTINUED TO A DEPTH 4" BELOW DESIGN WATER ELEVATION.
2. ALL FILL MATERIAL USED TO CONSTRUCT CANAL/LAKE SLOPES SHALL BE FREE OF DEBRIS.

REFER TO FLORIDA EROSION AND SEDIMENTATION CONTROL INSPECTOR’S MANUAL
X. **Storm Drainage (STM)**

- STM-1  36" Round Drainage Structure
- STM-2  Concrete and Asphalt Aprons
- STM-3  Conflict Manhole
- STM-4  Curb & Gutter Inlet
- STM-5  Precast Drainage Manhole
- STM-6  Standard Frames and Grates
- STM-7  F.D.O.T. Type Straight Endwall
- STM-8  F.D.O.T. Type Endwall with Wings
- STM-9  Concrete Endwall with 45° Wings
- STM-10 Typical Trench Detail
- STM-11 Water Rated Slotted Drain
- STM-12 Yard Inlet Detail
US FOUNDRY FRAME & GRATE #4105

1 LAYER 4 X 4 X W4 X W4 TO MEET ASTM A185 AND EXCEED ASTM C478 (STEEL AREA OF 0.12 SQ.IN./FT.)

VARIES

36" Ø

2"

6"

4"

12" Ø

LIFTING HOOKS (3)

#4 AT 12" C.C.E.W.

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MARCH 2008

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DETAIL NUMBER STM-1

SHEET 1 OF 1
TYPICAL ASPHALT APRON

CROSS-SECTION ASPHALT APRON

TYPICAL USF #4155 GRATE & APRON

TYPICAL USF #6631 GRATE & APRON

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"CASCADE" PIPE SUPPORT

GROUT SEAL AROUND ALL PIPES

DIP SLEEVE

FILL WITH NON-SETTING CAULKING (TYPICAL)

1 LENGTH OF D.I.P. CENTERED IN STRUCTURE

18" (MIN)

AREA UNDER DIP CASING SHALL EQUAL TWICE THE AREA OF THE DRAINAGE PIPE

COMPRESSIBLE BACKING ROD (TYPICAL)

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STANDARD DETAILS | CURB & GUTTER INLET
--- | ---
NO. | MARCH 2008
DATE | LAST MODIFIED 07/2014
REVISIONS | DETAIL NUMBER STM-4

EDGE OF PAVEMENT
GUTTER LINE
TOP OF CURB
BACK OF CURB
USF No. 5130-616B CURB & GUTTER INLET

4-7/8" ANCHOR HOLES
33 7/8" 38"
24 5/16" 31"
17 3/4" 5 7/8"
2 1/4" 2"
6 6 1/4" 6 3/8"
PLAN

U.S. FOUNDRY FRAME & GRATE
DRAWING NO. 420-6
LABELED "STORM SEWER"
(OR APPROVED EQUAL)

IN GRASS AREAS, ALL GRATES
SHALL HAVE A 2" CONCRETE
APRON ALL AROUND.

SECTION

22-3/4"

20-5/8"

36"

MANHOLE FRAME & LID
USP# 420 C

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY
ENGINEER FOR SPECIAL EXCEPTION AREAS

STANDARD DETAILS

PRECAST DRAINAGE MANHOLE

MARCH 2008

LAST MODIFIED

07/2014

NO. DATE REVISIONS

STM-5 SHEET 1 OF 1
**USF # 4105 FRAME & GRATE**

**USF #5125 CURB FRAME, GRATE & HOOD**

**USF # 4155 FRAME & GRATE**

**USF # 5130 CURB FRAME, GRATE & HOOD**

*All dimensions are considered minimum design conditions unless otherwise approved by city engineer for special exception areas.*

**Standard Details**

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<th>L THREE PIPES</th>
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**STRAIGHT END & BEVEL END**

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<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>8'-6&quot;</td>
<td>19'-9&quot;</td>
<td>28'-3&quot;</td>
<td>36'-9&quot;</td>
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<td>84&quot;</td>
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<td>2'-0&quot;</td>
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<td>19'-9&quot;</td>
<td>28'-3&quot;</td>
<td>36'-9&quot;</td>
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<tr>
<td>96&quot;</td>
<td>11'-11&quot;</td>
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<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
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<td>2'-0&quot;</td>
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<td>19'-9&quot;</td>
<td>28'-3&quot;</td>
<td>36'-9&quot;</td>
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**BEVEL END ONLY**

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>H</th>
<th>T</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>X</th>
<th>L ONE PIPE</th>
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<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>28'-6&quot;</td>
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<tr>
<td>120&quot;</td>
<td>14'-7&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>30'-6&quot;</td>
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<tr>
<td>132&quot;</td>
<td>15'-11&quot;</td>
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<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>32'-6&quot;</td>
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<tr>
<td>144&quot;</td>
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<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
<td>34'-6&quot;</td>
</tr>
</tbody>
</table>

**NOTE:**

Bevel slope shall not be greater than 1:1 for single tier construction. When the pipe bevel is greater than 1:1, headwalls shall be constructed as required for straight end pipes.

*All dimensions are considered minimum design conditions unless otherwise approved by city engineer for special exception areas.*

---

**STANDARD DETAILS**

<table>
<thead>
<tr>
<th>F.D.O.T. TYPE STRAIGHT ENDBALL</th>
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<tbody>
<tr>
<td><strong>DATE</strong></td>
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**CORAL SPRINGS**

*Everything under the sun*
<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tr>
<td>15&quot;</td>
<td>1'-11&quot;</td>
<td>1'-2&quot;</td>
<td>4'-0&quot;</td>
<td>1'-10&quot;</td>
<td>1'-2&quot;</td>
<td>0'-6&quot;</td>
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<tr>
<td>18&quot;</td>
<td>2'-3&quot;</td>
<td>1'-3&quot;</td>
<td>4'-6&quot;</td>
<td>1'-11&quot;</td>
<td>1'-3&quot;</td>
<td>1'-0&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>2'-8&quot;</td>
<td>1'-4&quot;</td>
<td>5'-0&quot;</td>
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<td>1'-4&quot;</td>
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*All dimensions are considered minimum design conditions unless otherwise approved by City Engineer for special exception areas.*

**STANDARD DETAILS**

<table>
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<tr>
<th>STD.</th>
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<td>STM-7</td>
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* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS*

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
<th>F.D.O.T. TYPE ENDWALL WITH WINGS</th>
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<tr>
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<td>STM-8</td>
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TABLE OF DIMENSIONS AND ESTIMATE QUANTITIES
PIPE CULVERT ENDCARDS WITH 45° WINGS

<table>
<thead>
<tr>
<th>OPENING</th>
<th>WALL</th>
<th>FOOTING</th>
<th>CONCRETE, CLASS I</th>
<th>STEEL TIE BARS</th>
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<tr>
<td></td>
<td>D</td>
<td>H</td>
<td>G</td>
<td>L</td>
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<td>1.2</td>
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<td>3'-7&quot;</td>
<td>1'-0&quot;</td>
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<tr>
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<td>1'-9&quot;</td>
</tr>
<tr>
<td>36&quot;</td>
<td>7.1</td>
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<td>5'-4&quot;</td>
<td>2'-0&quot;</td>
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<tr>
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<td>48&quot;</td>
<td>12.6</td>
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<td>2'-6&quot;</td>
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* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

STANDARD DETAILS | CONCRETE ENDCARD WITH 45° WINGS

LAST MODIFIED | 07/2014

MARCH 2008 | DETAIL NUMBER

NO. | DATE | REVISIONS | STM-9 | SHEET 1 OF 1
BACKFILL, NOT LARGER THAN 3", PLACED IN 6" LAYERS COMPACTED WITH MECHANICAL VIBRATION TO 98% OF MAXIMUM DENSITY PER AASHTO T-180

BACKFILL, NOT LARGER THAN 1", PLACED IN 6" LAYERS & THOROUGHLY TAMPERED TO 98% OF MAXIMUM DENSITY PER AASHTO T-180

3/4" WASHED ROCK CRADLE MANUALLY EXCAVATE 6" MIN.

UNDISTURBED STABLE ROCK OR MATERIAL

MAX. WATER LEVEL PERMITTED DURING CONSTRUCTION

12" O.D. 12"

FINISHED PAVEMENT GRADE

18" MIN. (DIP)

24" MIN. (PVC)

* ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
<th>TYPICAL TRENCH DETAIL</th>
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<tr>
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*ALL DIMENSIONS ARE CONSIDERED MINIMUM DESIGN CONDITIONS UNLESS OTHERWISE APPROVED BY CITY ENGINEER FOR SPECIAL EXCEPTION AREAS*

<table>
<thead>
<tr>
<th>STANDARD DETAILS</th>
<th>WATER RATED SLOTTED DRAIN</th>
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LAST MODIFIED: 07/2014

DETAIL NUMBER: STM-11

SHEET 1 OF 1
NOTE: YARD DRAINS SHALL BE HIGH DENSITY POLYETHYLENE (HDPE) N-12 (ADVANCED DRAINAGE SYSTEMS) OR EQUAL.

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