CITY OF PORT ST LUCIE

ENGINEERING STANDARDS FOR LAND DEVELOPMENT

COMMERCIAL, RESIDENTIAL SUBDIVISIONS AND CAPITAL IMPROVEMENT PROJECTS

List of Revisions

1st Edition – December 2020

2nd Edition – Month Adopted 2025

Table of Contents

List of Figures

List of Tables

1. Introduction

1.1 - Purpose

The City of Port St Lucie's *Engineering Standards for Land Development: Commercial, Residential Subdivision and Capital Improvement Projects* provides standards for the design and construction of transportation and drainage facilities as well as the use of easements and rights-of-way for development projects within the City of Port St. Lucie.

The standards within this document shall ~~are applicable~~apply to all new development. Limitations imposed by existing conditions may make it infeasible to apply these standards to redevelopment projects; however, in that event, these standards shall apply to the extent that safety, legal, economic, and environmental considerations allow.

The terms "shall" and "must" are used when the requirement is mandatory. Other terms such as, "recommended" and "preferred" indicate desirable procedures or methods. The requirements of this document do not provide relief from standards imposed by federal, state, or other agencies. In the event of conflicts with federal, state, or other regulations, the more stringent regulation shall prevail. In case of a disagreement in the interpretation of any of these standards, the written decision of the City Manager shall prevail.

1.2 - Acronyms and Abbreviations

Acronyms and abbreviations used in this document shall have the meanings listed in Table 1-1~~Table 1-1~~~~Table 1-1~~.

Table 1-1 Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADAAG	American Disabilities Act Accessibility Guidelines
AKA	Also Known As
APL	Approved Product List
APS	Accessible Pedestrian Signal
ASIC	American Society of Irrigation Consultants
BMAP	Basin Management Action Plan
BMP	Best Management Practice – Stormwater Erosion and Sediment Controls
CCU	Central Control Unit
CFS	Cubic Feet per Second
CSM	Cubic Feet per Second per Square Mile
~~CD~~	~~Compact Disc~~
CDD	Community Development District
CIP	Capital Improvement Program
CO	Certificate of Completion

Table 1-1 Acronyms and Abbreviations

DR	Dimension Ratio
DRI	Development of Regional Impact
EOP	Edge of Pavement
EOR	Engineer of Record
EPA	United States Environmental Protection Agency
ERP	Environmental Resource Permit (SFWMD)
ERU	Equivalent Residential Unit
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FFE	Finished Floor Elevation
FFWCC	Florida Fish and Wildlife Conservation Commission
FHWA	United States Department of Transportation, Federal Highway Administration
FIRM	Flood Insurance Rate Map
FP&L	Florida Power and Light Company
FS	Florida Statutes
GDC	General Development Corporation
HDPE	High Density Polyethylene
ICE	Intersection Control Evaluation
IPS	Iron Pipe Size
ITE	Institute of Traffic Engineers
LBR	Limerock Bearing Ratio
LED	Light Emitting Diodes
MB	Megabyte
Mg/l	Miligrams per liter
MPUD	Master Planned Unit Development
MS4	Municipal Separate Stormwater System
MUTCD	*Manual on Uniform Traffic Control Devices for Streets and Highways* – FHWA
NAVD	North American Vertical Datum of 1988
NCHRP	National Cooperative Highway Research Program
NGVD	National Geodetic Vertical Datum
NEC	National Electric Code
NESC	National Electric Safety Code
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSLRWCD	North St Lucie River Water Control District

Table 1-1 Acronyms and Abbreviations

NTU	Nephelometric Turbidity Units
PDF	Portable Data Format (electronic file)
POA	Property Owner Association
PSM	Professional Surveyor and Mapper
PTZ	Pan/ Tilt/ Zoom
PUD	Planned Unit Development
PVC	Polyvinyl Chloride
QPL	Qualified Product List
RCV	Remote Control Valve
ROW	Right-of-way
SAD	Special Assessment District
SEU	Special Exception Use
SFWMD	South Florida Water Management District
SPRC	Site Plan Review Committee
SWPPP	Stormwater Pollution Prevention Plan
TIS	Traffic Impact Study
TMDL	Total Maximum Daily Load
TPO	Transportation Planning Organization
UPS	Uninterrupted Power Supply
USACE	United States Army Corps of Engineers
USGS	United States Geological Society
USPS	United States Postal Service

1.3 - Reference Manuals

Standards and guidelines which are referenced in the following technical publications, latest edition, shall be considered part of this document and are adopted by reference for use in the City of Port St Lucie.

- *A Policy on Geometric Design of Highways and Streets* – AASHTO
- *Access Management Guidebook – FDOT*
- *Access Management in the Vicinity of Intersections* – FHWA
- *Corridor Access Management* – Intersection Proven Safety Countermeasure - FHWA
- *American Disabilities Act Accessibility Guidelines* – Federal Agencies
- American Society of Irrigation Consultants
- *Color Specifications for Retro-reflective Sign and Pavement Marking* Materials – Code of Federal Regulations, Appendix to Subpart F of Part 655 of Title 23.
- *Complete Streets Implementation Plan* – FDOT and Smart Growth America

- *Design Manual* – FDOT
- *Drainage Manuals* – FDOT
- *Driveway Information Guide - FDOT*
- *Environmental Resource Permit Applicant's Handbook, Volume I, SFWMD and FDEP*
- *Environmental Resource Permit Applicant's Handbook, Volume II, SFWMD*
- *Environmental Resource Permit Information Manual Volume IV*, SFWMD
- *Erosion and Sediment Control Manual (FDOT and FDEP)*
- *Flexible Pavement Design Manual* – FDOT
- *Florida Bridge Scour Manual (FDOT)*
- *Florida Building Code* – Florida Statutes
- *Florida Building Code*, Plumbing, Appendix 'F'
- Florida Department of Environmental Protection Regulations
- Florida Fish and Wildlife Conservation Commission Regulations
- ~~*Florida Intersection Design Guide* – FDOT~~
- Florida Irrigation Society Irrigation Design Standards
- ~~*Florida Roundabout Guide* - FDOT~~
- Florida Statutes
- *Guide for the Development of Bicycle Facilities* - AASHTO
- *Guide for the Planning, Design, and operation of Pedestrian Facilities* - AASHTO
- *Highway Capacity Manual* – Transportation Research Board
- *Maintenance of Signs and Sign Supports* – FHWA
- *Manual of Uniform Minimum Standards for Design, Construction and Maintenance For Streets and Highways* – FDOT. Reference is made as the Florida Greenbook.
- *Manual on Uniform Traffic Control Devices for Streets and Highways* – FHWA
- *Manual on Uniform Traffic Studies* – FDOT
- *Median Handbook* – FDOT
- *Parking Generation* - ITE
- *Parking Standards* – Urban Land Institute
- ~~*Plans Preparation Manual* – FDOT~~
- *Report 420, Impacts of Access Management Techniques* - NCHRP
- *Report 672, Roundabouts: An Informational Guide (TRB 2010*) - NCHRP
- *Rigid Pavement Design Manual* - FDOT
- *Roadside Design Guide* - AASHTO

- *Soil Survey of St Lucie County* – United States Department of Agriculture, Soil Conservation Service
- South Florida Water Management District Regulations
- St Lucie County Fire District Regulations
- *Standard Plans for Road ~~and Bridge~~ Construction* – FDOT. Reference is made as the FDOT Standard Plans Index #.
- *Standard Specifications for Road and Bridge* Construction – FDOT. Reference is made as the FDOT Standard Specifications Section XXX.
- *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals* - AASHTO
- *Storm Drain Handbook* – FDOT
- *The Dimensions of Parking* – Urban Land Institute
- *The Standard Highways Signs and Markings* ~~–~~ – FHWA
- *Traditional Neighborhood Communities Handbook (FDOT)*
- *Traffic Engineering Manual* - FDOT
- *Traffic Signing Handbook* - ITE
- *Transportation and Traffic Engineering Handbook* – ITE
- *Trip Generation* – ITE
- United States Environmental Protection Agency Regulations
- *Utility Accommodations Manual* - FDOT
- *Vegetation Control For Safety* - FHWA

1.4 - Amendment

The City Engineer shall review this document annually and recommend amendments to reflect updates in local, ~~state~~state, or federal legislation, updated policy, clarifications, or other such reason with due cause.

1.5 - Fees

The fees for review ~~and,~~ permitting, and/or inspection ~~fees~~ for commercial and subdivision developments are provided in City Code Section 57.01.

2. Drainage Right-of-Way

2.1 - Purpose

The City's stormwater management system exists for the benefit of all residents. To ~~accomplish this responsibility~~this end, the City has designated certain land as drainage right~~s~~-of-way ("DROW"). ~~Drainage rights-of-way (DROW),~~DROW owned and maintained by the City~~,~~ are used for the collection, treatment, and/or conveyance of stormwater within canals, ditches, swales, culverts, ponds, and/or drainage control structures. The requirements for City-owned DROW~~drainage rights-of-way~~ are provided in this chapter.

2.2 - Protection and Use

(a) No work within a ~~drainage right-of-way~~DROW shall occur without the prior approval of the City Engineer. No one may use, construct, excavate or alter the DROW or install any structure or equipment to enable the discharge of water, water withdrawal or other water use by anyone without receiving a right-of-way permit from the City.

~~(a)~~(b) Any work within a right-of-way requires and shall be subject to the requirements of the right-of-way permit and City Code, Chapter 54, ~~Article II,~~ Right~~s~~-of-Way ~~Permit~~. ~~T~~that details the requirements, exemptions and emergency situations. Prior to any excavation within a right-of-way, a utility locate shall be completed~~. In the case of an emergency, authorization (written is practical) may be given by the City Engineer or Public Works Director.~~

(c) Aerial utility lines shall have a minimum clearance of forty (40) feet from the utility line to the top of a canal bank or perimeter berm, whichever is higher. Aerial utility lines shall not be located above drainage structures.

(d) Underground crossings of canals shall provide a minimum of ten (10) feet vertical clearance for all major canal crossings and five (5) feet for minor canal crossings. Vertical clearance shall be measured from top of pipe to the canals design bottom elevation at the crossing.

(e) When access to a private property crosses a ~~drainage right-of-way~~DROW, the maintenance responsibility of the drainage pipe and driveway shall be the responsibility of the private property owner and shall include, but not be limited to:

a. Maintenance and replacement as necessary of the drainage pipe beneath any driveway crossing a ~~the~~ swale or ~~drainage right-of-way~~DROW in a manner such as not to impede or interfere with the stormwater drainage function of the swale or ~~drainage right-of-way~~DROW. Provided, however, that the cost of culvert replacement as a result of a drainage improvement or driveway modification initiated by the City shall be the City's expense.

~~(b)~~b. Properly mowing the grassed area to maintain a neat appearance, including the removal of grass, weeds, bushes, sand, silt and debris at both ends of, or within, any driveway culvert pipe to effectively maintain flow through the culvert.

2.3 - Abandonment

(a) Abandonment of a ~~drainage right-of-way~~DROW is rare and shall only be used for special circumstances. Requests to abandon ~~drainage rights-of-way~~DROW shall be submitted to the City Engineer and shall include, at a minimum, all of the following items:

(1) Completed Abandonment of Right-of-Way Application (Appendix A).

(2) Payment of ~~R~~review fee, ~~a fee schedule is~~as provided in City Code Section 57.01.

(3) Letter of request which clearly demonstrates, to the reasonable satisfaction of the City, that the abandonment:

a. Does not hinder the current or future location of any drainage or stormwater management facility,

b. Is not detrimental to the public interest, and

c. Provides a positive benefit to the City.

(4) Aerial and site photographs showing location and current conditions of site.

(5) Signed and sealed legal description and sketch of the right-of-way to be abandoned.

(6) Concept plan showing proposed use, if applicable.

(7) ~~No objection letters~~Letters of no objection from utility companies (phone, electric, cable, gas, etc.).

(b) The City Engineer will review the application, and if satisfied of its sufficiency, shall obtain the City Utility Systems Department recommendation, obtain a draft ordinance of abandonment from the City ~~Legal Department~~~~City~~ Attorney's Office, prepare a summary/recommendation memorandum, and forward the complete package to the City Manager requesting review and consideration by the City Council.

(c) The applicant shall be responsible for all costs relating to the abandonment, including the costs associated with the preparation and recording of plats, warranty deeds, legal and sketch, or other such instruments required to accomplish the abandonment.

~~(c)~~(d) (d) The ~~e~~City reserves the right to require additional requirements in a given application or may reject the request at its discretion.

3. Road Right-of-Way

3.1 - General

Road rights-of-way are provided for the benefit of all City residents. ~~The intent of road right-of-way standards~~Road right-of-way standards are intended ~~is~~ to create uniformity in design, engineering, and use practices to promote safety and sustainability. This chapter presents ~~I~~information about the classification, minimum width, protection, use, and abandonment of City-owned and maintained road rights-of-way ~~is presented in this chapter~~. Requirements and standards for the design, permitting, and construction are provided in chapters 5 ~~-~~through 8, 16, and 17 respectively.

3.2 - Classification

All roadways within the City have an urban designation. The following roadway functional classifications are provided in the City's Comprehensive Plan:

(a) *Principal arterial*. Primarily focuses on carrying through traffic. Principal arterials provide service that is relatively continuous, long in trip length, and high operative speeds.

(b) *Minor arterial*. Provides service for through traffic movement similar to a principal arterial but provides greater land access and distributes traffic to smaller geographical areas than the principal arterial.

(c) *Collector*. Provides both land access and traffic circulation between local roads and/or arterial roads. A collector provides service that is relatively moderate in volume, of moderate trip length, and moderate speed.

(d) *Local*. Permits direct access to abutting property and connections to a higher order roadway. A local street provides service that is relatively low in volume and short average trip length or minimal through traffic movements.

3.3 - Required Widths

Unless approved otherwise, the minimum mid-block right-of-way widths for newly constructed private roadways are provided in City Code Section 156.093(C). The minimum mid-block right-of-way widths for newly constructed public roadways are provided in section 8.6. Additional width may be necessary to accommodate turn lanes and the adjacent facilities within the right-of-way. The required components of the right-of-way are discussed in section 0~~8.6~~.

3.4 - Protection and Use

3.4.1 - General

(a) Prior to any excavation within a road right-of-way, a utility locate shall be completed. With the exception of the initial construction of the road, any work within the road right-of-way requires and shall be subject to the requirements of the right-of-way permit and the provisions of City Code, Chapter 54, ~~Article II,~~ Right~~s~~-of-Way ~~Permit~~. Work within the right-of-way shall use measures to protect adjacent properties from temporary or permanent impacts. Encroachment onto adjacent properties is not allowed unless the applicable easement or agreement is obtained. All placement of signage shall meet MUTCD and FDOT Standards.

(b) Approved US Postal Service mailboxes or newspaper delivery boxes and newspaper vending machines are exempt from the right-of-way permit.

(1) Mailboxes or newspaper delivery boxes within the road right-of-way shall be in accordance with the US Postal Service requirements and FDOT roadside safe zone requirements.

(2) Newspaper vending machines shall be in accordance with City Code, Chapter 54, Article V, Newspaper Vending Machines.

3.4.2 - Memorial Markers

(a) As a public service and to increase awareness of highway safety, it is a City policy to fabricate and install highway safety memorial markers within the City rights-of-way to memorialize people who have died as a result of a vehicle related crash and to remind motorists to protect human life by driving safely.

(b) Requests for markers shall be made to the City Engineer or their designee in accordance with City Code Chapter 54, Article VI, Signage, Section 545.62, Memorial Markers. The markers will be made and installed by the City Public Works Department. The markers will remain in place for twelve (12) months and the department reserves the right to have them removed due to construction or other maintenance needs. No other objects are to be placed on or around memorial markers. Any items that are placed around City-approved Memorial Markers that are deemed a distraction to motorists will be removed.

(c) The markers may not necessarily be placed at the exact location where the fatality occurred due to restricted space, safety concerns, property owner complaints, or other constraints. The Public Works Department only installs markers on City-owned roads and does not have the authority to install markers on Private, County or State roadways. Memorial markers will not be erected where they are prohibited by other governmental entities.

3.4.3 - Location Signs - Private Facility

The City does not have a program for the location of directional signage for private facilities within the City's road right-of-way.

3.4.4 - Temporary Signage

Temporary signage is not permitted within the City's right-of-way unless approved by the City Council in accordance with City Code Chapter 155, Sign Code.

3.4.5 - Utilities

(a) The placement of utilities within the road right-of-way shall be in accordance with all applicable codes, the right-of-way permit, and City Code Chapter 54, Article IV, Utilities. Additionally, the following requirements shall apply:

(1) Above ground utility appurtenances shall be located beyond the clear and recovery zone, use frangible designs (where appropriate), and shall not impede sight distance.

(2) Underground utilities parallel and perpendicular to roadways shall maintain a minimum vertical clearance of thirty-six (36) inches below grade.

(3) Underground utilities, with the exception of City-owned and maintained utilities shall be located, at a minimum, five (5) feet from the edge of pavement unless a dedicated utility

easement is otherwise provided. ~~it~~If so, the private ~~non-city~~ underground utility will be required to be within the utility easement.

(4) Underground crossings of the road pavement shall be perpendicular unless approved otherwise.

(5) Aerial crossings shall be in accordance with the National Electrical Code.

(6) All utility construction and maintenance shall be performed with proper slopes, shoring, stabilization, safety gear, and trained personnel.

(7) All excavated material in excess of the quantity required for backfill and unusable material shall be disposed of at the right-of-way permittee's expense, and not placed within the limits of the right-of-way unless so directed by the City.

(8) Imported material shall be at the expense of the right-of-way permittee.

(9) Trees and/or shrubs harmed or destroyed shall be replaced by the right-of-way permittee.

(10) All debris shall be removed at the expense of the right-of-way permittee.

(11) Bore casings shall extend past the pit by a minimum of five (5) feet. The backfill in the bore pit shall be compacted to ~~a stabilized and non-yielding condition.~~restore the right-of-way to its original condition or better at the expense of the right-of-way permittee. Jack and bore or directional bore casings shall be a minimum depth of thirty-six (36) inches below the subgrade of any road unless approved otherwise. Missile Bore shall not be permitted within the City right-of-way.

(12) ~~In the analysis of~~When considering a request for open cutting, primary consideration shall be given to the safety and convenience of the public. Open cutting shall not be allowed on recently paved or resurfaced roadways. Where open cutting is permitted, restoration shall be in accordance with the Standard Pavement Restoration Detail provided in chapter 20. Open cutting of pavement shall generally not be allowed, but may, in the City's sole discretion, be permitted~~considered~~ under one or more of the following conditions:

a. Subsurface obstructions

b. Limited space for jacking pits

c. Condition of roadway surface, including imminent resurfacing and rebuilding

d. Prohibited by facility design

(13) Stabilization/restoration shall begin as soon as possible and in accordance with applicable permit conditions. Replacement sod shall be of the same type as the original grass.

(14) Attachments to bridges shall be carefully reviewed and may be considered provided the attachment will not:

a. Create a potential hazard

b. Affect the integrity of the structure

c. Adversely affect aesthetics of the structure

d. Hinder maintenance operations

e. Block the view of traffic control devices

(15) Where attachments to bridges are permitted, the following criteria shall be followed:

a. Where possible, the utility line should be in conduit so that maintenance can be accomplished from the ends of the structure.

b. Materials used for casing and attachments shall be such that it will not require routine maintenance such as painting.

c. Flammable fluid pressure lines shall not be attached to structures.

d. Attachments shall be effectively isolated from the structure so as not to induce corrosion of the structure.

3.5 - Abandonment

(a) Abandonments of road rights-of-way are reserved for unusual or special circumstances. Generally, requests of this nature are completed as part of a development and are addressed in the Site Plan Review process. For requests outside the Site Plan Review process, applications to abandon a road right-of-way shall be submitted to the City Engineer in accordance with City Code Section 54.04. The request shall include a completed Abandonment of Right-of-Way Application (Appendix A), payment of the applicable review fee, and the required supporting documentation.

(b) The City Engineer will review the application, obtain the Utility Systems Department and Information Technology (IT) recommendation, obtain a draft ordinance of abandonment from the ~~Legal Department~~City Attorney's Office, prepare a summary/recommendation memorandum, and forward the complete package to the City Manager requesting review and consideration by the City Council.

(c) The applicant shall be responsible for all costs for the preparation and recording of plats, warranty deeds, legal and sketch, or other such instrument(s) as required to accomplish the abandonment.

4. Easements

4.1 - General

Easements generally allow specific non-property owners to cross or otherwise use a private property for a specified purpose. The property owner's use of an easement is regulated to preserve the intended use of the easement. The City has reserved the right to use and/or cross land owned by others for stormwater/drainage facilities, water, sewer and reclaim facilities, access maintenance, or other such purposes in the form of ~~e~~City-owned easements. Typical uses of easements include, but are not limited to utilities, stormwater facilities, sidewalks, flowage of stormwater, crossing property owned by others, access for emergency vehicles, or the preservation of land such as a conservation easement. The purpose of this chapter is to provide information on the easements provided on the original or subdivided GDC lots within the City.

4.2 - Vacating Internal Easements on GDC Lots

Plats for lots created by GDC state that when more than one lot is developed as a single site, the outside boundaries of the site carry the side easements. In other words, where more than one lot or parts or one or more lots is intended as a building site, the outside boundaries or the building site shall carry the side easements. ~~tThe internal easements are "removed" when several lots are developed as a single parcel.~~ Therefore, within the GDC areas, abandonment of the internal easements is not required when lots are combined by ~~replatting~~replating ~~the abandonment of the internal easements is not required~~. This condition does not apply to a unity of title. All easements remain if two or more lots are combined through a unity of title. If a single parcel is divided into two or more parcels, then the original internal easements are returned to the original condition prior to the joining of lots.

4.3 - Use of GDC Lot Easements

The property owner's use of an easement within a GDC lot shall be as provided below in Table 4-1~~Table 4-1Table 4-1~~.

Table 4-1 Use of Easements on GDC Lots

Description	Six (6) - or Ten (10) - Foot Easement	Twenty (20) - Foot Easement
Accessory Pad Moveable Accessory Building Dumpster Pad Lighting Parking Lot Signage	Prohibited because the setback requirement will not be met.	As allowed by the Revocable Encroachment Permit – In S~~s~~ection 0~~16.6~~ and City Code Section. 55.30.
Detention Area	Prohibited because the setback requirement will not be met.~~Allowed, provided the detention area will not affect access or hinder or impeded the existing or future use of the~~	Allowed for commercial properties only, ten (10) foot encroachment into easement allowed.

Table 4-1 Use of Easements on GDC Lots		
Description	Six (6) - or Ten (10) - Foot Easement	Twenty (20) - Foot Easement
	~~easement as determined during the plan review process.~~	
Landscaping/Irrigation (Refer to City Code Section 154.03(I) for listing of allowable plants near utilities.)	Allowed, provided it is easily removable, does not hinder, impede, or effect the use of the easement.	As allowed by the Revocable Encroachment Permit – section 0~~16.6~~ and City Code Section. 55.30.
Masonry/Stone Wall	As allowed by ~~the~~ City Code Section 158.216~~Revocable Encroachment Permit – section 16.6.~~ Masonry/stone walls are permitted through the Building Department.	As allowed by the Revocable Encroachment Permit – S~~s~~ection 0~~16.6~~. and City Code Section 158.216. Masonry/stone walls are permitted through the Building Department.
Metal/Wood/Plastic Fence	As allowed by City Code Section 158.216~~, provided it is easily removable and does not hinder or impede the use of easement~~. **Not Allowed within an easement that contains existing drainage culverts or infrastructure.** Fences are permitted through the Building Department.	
Structure	Prohibited because the setback requirement will not be met.	

4.4 - Abandonment of Easement on GDC Lot

(a) Due to the existing use or potential future use, the City rarely abandons easements. Of particular concern to the City are the twenty (20) -foot wide easements along drainage rights-of-way which are of critical importance and, for that reason, are not abandoned. However, encroachments into easements for certain limited uses are allowed pursuant to the revocable encroachment permit as described in section 0~~16.6~~.

(b) In those instances, where an abandonment of easement is appropriate, applications for abandonment of easement shall be submitted to the City Engineer in accordance with City Code Chapter 55, Article II.

(c) The City Engineer will review the application, obtain the Utility Systems Department recommendation, obtain a draft ordinance of abandonment from the ~~Legal Department~~City Attorney's Office, prepare a summary/recommendation memorandum, and forward the complete package to the City Manager requesting review and consideration by the City Council.

(d) The applicant shall be responsible for all costs for the preparation and recording of plats, warranty deeds, legal and sketch, or other such instrument(s) as required to accomplish the abandonment.

5. Stormwater Management

5.1 - General

Numerous individual and master stormwater management systems discharge into City and/or SFWMD systems and ultimately into the St. Lucie River Estuary. ~~This city-wide system~~These combined systems protect~~s~~, maintain~~s~~, and enhance~~s~~ the safety and general welfare of the residents and provide~~s~~ a benefit to all properties within the City. This chapter addresses ~~D~~design requirements for all stormwater management systems within the City ~~are discussed in this chapter~~.

5.2 - System Information Sources

The following sources include ~~I~~information regarding the stormwater management system within the City ~~includes the following sources~~:

(a) City's Infrastructure Map – the general flow direction, culvert sizes, culvert inverts, flow line elevations, control elevations, identification number, and structure information for the City's swale and canal systems.

(b) City's Control Structure Inventory System – the identifications, locations, sizes, inverts of the control structures located within the City.

(c) City's Stormwater Master Plan

~~(b)~~(d) City's Culvert Master Plan

~~(c)~~(e) SFWMD - permit data-base.

5.3 - Stormwater Fee

The City's stormwater fee provides ~~F~~funding for the operation, maintenance and construction of the stormwater management system ~~is provided through the City's stormwater fee~~. The annual stormwater fee rate ~~(dollars per ERU)~~ is approved by City Council as part of the City's Annual Budget. The ERU calculation is based upon the impervious area of a property as outlined in City Code Chapter 51 Stormwater Utility System. The fee is assessed and collected as a non-ad valorem fee on the annual property tax bill.

5.4 - Permitting

Before beginning any activity that could affect wetlands, alter surface water flows, or contribute to water pollution, appropriate state and federal permits are required. The SFWMD Environmental Resource Permit (ERP) covers activities such as dredging and filling in wetlands, constructing flood protection facilities, providing stormwater containment and treatment, site grading, building dams or reservoirs and other activities affecting state waters.

(a) Preliminary stormwater reports with conceptual designs will be needed as stated in City Code Section 158.185~~5~~9 for MPUD and/or DRI requirements.

(b) ~~With the exception of the items~~Except as identified below, permitting of stormwater management systems within the City shall follow the requirements set forth by SFWMD.

(1) Exfiltration systems may be used. ~~however~~However,~~;~~ such a~~the~~ system shall be sized to provide the 0.5-inch dry pretreatment volume plus up to 3.2 inches in the trench and void spaces. The remainder of the water quality volume shall be treated in an open retention or detention basin prior to discharge from the site.

(2) Development that is up to ten acres in size and eligible for the SFWMD General Permit pursuant to Section 403.81~~3~~4(12), Florida Statutes known as the "10/2 General Permit" is limited to a discharge rate of 0.5 cfs per acre. A slightly higher discharge rate may be approved provided that drainage calculations show that the:

a. Proposed site elevations are compatible with adjacent properties;

b. Proposed discharge does not adversely impact downstream systems;

c. The smallest size bleeder of six-square inches is the only discharge device being used; ~~and~~

d. The post-development discharge is equal to or less than the pre-development discharge.

(3) Total retention systems are highly discouraged and allowed only if the applicant clearly demonstrates that:

a. There is no legal positive outfall for the project; and

b. The project strictly follows the SFWMD guidelines for a retention system.

(c) Information regarding the SFWMD permit requirements can be found on the SFWMD website: http://www.sfwmd.gov

5.5 - System Requirements

Stormwater management systems shall comply with applicable federal and state regulations as well as the following:

(a) Surface water shall not be channeled or directed into a sanitary sewer system. All roof drains, yard drains and the like shall be shown on c~~C~~onstruction plans as connecting to the stormwater system.

(b) Existing surface water flow patterns shall not be adversely affected by the construction or operation of a stormwater management system.

(c) The passage of drainage from offsite areas through the site shall be maintained and accommodated by the proposed development.

(d) Runoff shall be treated and attenuated in a retention/detention facility prior to discharge into the City's stormwater management system.

(e) Natural areas and existing waterbodies may be used for stormwater treatment facilities provided the use does not conflict with environmental, water quality, or public use considerations.

(f) Access to all stormwater water management facilities for operation and maintenance activities shall be legally and physically available.

(g) Stormwater treatment facilities shall not be located within one-hundred (100) feet of a public drinking water well (62-555.312(3), F.A.C.).

(h) Stormwater treatment facilities shall not be located within seventy-five (75) feet of a private drinking water well (62-555.312(3), F.A.C.).

(i) Stormwater management areas and swales shall be a minimum of fifteen (15) feet from a septic system (64E-6.005(1)(f), FAC).

(j) Stormwater pipes shall be a minimum of ten (10) feet from septic systems (64E-6.005(1)(e), F.A.C.).

(k) A dry retention/detention area shall not be located within one-hundred (100) feet of a sewage treatment percolation pond. (SFWMD, *ERP Applicant's Handbook, Volume II*, Section 4.5)

(l) A wet detention area shall not be located within two-hundred (200) feet of a sewage treatment percolation pond. (SFWMD, *ERP Applicant's Handbook, Volume II*, Section 4.5).

(m) Wet detention areas shall be a minimum of seventy-five (75) feet from septic stabilization facilities (64E-6.0~~0~~05, FAC).

(n) Wet detention areas shall be separated from wetland preservation, creation, or restoration areas as required by SFWMD. (*ERP Applicant's Handbook, Volume II*, Section 3.12).

5.6 - Flood Protection

(a) The following minimum flood protection criterion shall be used in the design and development of all projects within the City.

(1) Finished Floor Elevation (FFE)

a. The FFE for all buildings subject to special flood hazards within the City shall comply with Chapter 152 - ~~,~~ Floodplain Management, of the City Code.

b. The FFE for buildings located within a development with a permitted master stormwater management system shall be at or greater than the minimum grade established in the SFWMD permit. The SFWMD criteria is the one-hundred-year three-day event with zero discharge and the one-hundred-year flood elevation per FEMA FIRMs.

c. The FFE for buildings on a site without a permitted master stormwater management system shall be a minimum of twenty-four (24) inches above the crown of the road in front of the property. Corner lots shall use the nearest intersection elevation.

d. The deviation from FFE established by this chapter and shown in the permit documents shall be limited to plus three (+3) inches; in no circumstance shall the FFE be less. A deviation greater than plus three (+3) inches requires the review and approval of the City Engineer.

e. In no case shall the FFE of a building adversely impact the drainage of adjacent buildings or property.

f. The slab elevation of accessory use structures constructed on lots zoned for single family dwellings shall be compatible with the site drainage plan for the dwellings.

(2) Parking Lot Elevation

a. Equal to or greater than the stage of the ten-year one-day event.

b. A minimum of two feet higher than the average wet season water table.

(3) Road Crown Elevation

a. A minimum of two feet higher than the average wet season water table.

b. Local Roads. Ten-year one-day stage.

c. Collector Roads. Twenty-five-year one-day stage.

d. Arterial Roads. Twenty-five-year three-day stage.

e. Bridges. Fifty-year three-day stage.

(4) Perimeter Elevation

a. Perimeter elevations of the site shall meet or exceed the twenty-five-year, three-day design storm stage.

~~a.~~b. Berms shall be~~.~~ a ~~M~~minimum of five (5) feet wide at top,~~.~~ with ~~S~~side slopes not to exceed a three:one (3:1) ratio.

(b) The EOR is responsible for determining if additional criteria such as, but not limited to, fluctuating receiving water stages, historic data, or flood insurance map information needs to be included in the evaluation of flood protection stages. In no circumstance shall the flood protection criteria be reduced to accommodate site specific conditions.

(c) Any portion of the system storage that is not recovered within twelve (12) days of the design storm event shall be removed from the flood routing analysis to determine the minimum elevation for flood protection.

5.7 - Water Quality Treatment Volume

(a) Water quality treatment is provided by detaining or retaining stormwater in a system prior to discharge. The total water quality volume in a system shall be provided by one or a combination of the following:

(1) Wet Detention – Volume shall be provided for the first inch of runoff from the developed project or the total runoff of 2.5 inches times the percent impervious, whichever is greater.

(2) Dry Detention – Volume shall be equal to seventy-five percent (75%) of the wet detention volume.

(3) Retention (if approved) – Volume shall be equal to fifty percent (50%) of the amount computed for a wet detention system.

(4) ~~The City~~The following items apply to stormwater management systems that are within and contribute stormwater to the St. Lucie River Basin/Estuary~~.~~, including but not limited to the North Fork, the SFWMD C-23 canal, and the SFWMD C-24 canal.

a. The St. Lucie River Basin is an impaired water body that does not meet state water quality standards for nutrients nitrogen and phosphorus.

b. The St. Lucie River Basin has an adopted TMDL to achieve 0.081 mg/l total Phosphorus and 0.72 mg/l total nitrogen at the Roosevelt Bridge pursuant to 62-304.705, FAC.

c. A BMAP has been adopted to achieve the goals of the St. Lucie River Basin TMDL.

d. Proposed projects may need to provide nutrient analysis and additional treatment to provide reasonable assurance of compliance with the TMDL and BMAP goals in accordance with ~~SFWMD~~ FDEP requirements.

e. Applicants are encouraged to have a pre-application meeting with SFWMD prior to submitting construction applications to the City.

(b) As part of the required water quality volume, at least 0.5 inch of dry pretreatment, as required by SFWMD, shall be provided for:

(1) Commercial projects

(2) Industrial projects

(3) Projects that discharge into the Savannas which have greater than forty percent (40%) impervious area.

(4) Systems that contribute stormwater either directly or indirectly to the North Fork of the St. Lucie River, an impaired waterbody / Outstanding Florida Water, shall be designed in accordance with the requirements of the SFWMD *Environmental Resource Permit Applicant's Handbook Volume II, Appendix E*.

5.8 - Discharge

(a) The stormwater management system shall be designed to provide the required water quality treatment and attenuation for the design storm event (twenty-five-year three-day event unless indicated otherwise) prior to discharge.

(b) The discharge from a development shall cause no adverse impacts to off-site properties. The discharge rate may be determined by one or more of the following:

(1) Historic discharges (*i.e.*, pre = post).

(2) Discharge permitted by an existing SFWMD permit prior to development.

(3) Discharge specified in SFWMD criteria (e.g., 31.50 cfs per square mile for the C-23 Canal, 30.25 cfs per square mile for the C-24 Canal).

(4) Capacity of the downstream system.

(5) Discharge imposed by drainage basin studies conducted by the City.

(6) Approximately 0.5 cfs per acre (twenty-five-year three-day event) for projects that are less than ten acres in size and eligible for the "10/2 General Permit."

5.9 - Commercial or Industrial Phased Developments

Commercial or industrial projects that will be subdivided and/or where the entire system is not constructed initially shall provide, at a minimum the more stringent of the below criteria or those~~as~~ approved by state regulatory agencies:

(a) A water quality system for one inch of runoff detention in the master system for the total developed site.

(b) The master system shall be located in a legally defined common area and shall not utilize exfiltration trench.

(c) The individual sites shall provide the remainder of the water quality volume (2.5-inch x percent impervious – 1 inch) on site.

(d) The individual sites may use a properly designed and maintained exfiltration trench.

(e) A collection and conveyance system, within a recorded easement, that interconnects the detention system with the outfall and access points available to each individual parcel.

(f) Deed restrictions on the undeveloped parcel(s) identifying:

(1) The flood protection requirements.

(2) Additional detention required for water quality.

(3) The assumed impervious area used in the design calculations.

5.10 - System Calculations

(a) Stormwater management system calculations include, but are not limited to, the generation of pre- and post-development runoff hydrographs, routing the post-development hydrograph through a detention system, sizing the outfall structure to control post development discharges, sizing pipes, and checking to ensure the downstream drainage facilities are adequate.

(b) Calculations shall demonstrate that the proposed stormwater management system meets flood protection criteria, meets allowable offsite discharge, and that the system will not adversely affect other properties. Calculations shall be prepared and certified (signed and sealed) by the EOR and submitted for review by the City and/or SFWMD, as appropriate.

(c) The SFWMD *Environmental Resource Applicant's Handbook, Volume II* ~~(Latest Edition)~~ provides references and example calculations to assist in preparing and reviewing stormwater system calculations. When using the SFWMD examples or data, be aware that the City requirements for exfiltration volume, discharge rate for a development less than ten (10) acres, and the use of retention basins is more stringent than SFWMD requirements.

5.11 -

Design Requirements

Design requirements for the components of a stormwater management system including, but not limited to the exfiltration trench, detention areas, discharge structure, and control device, are provided ~~in following sections.~~ 5.11.1 through 5.11.6.

5.11.1 - Design Storm

Unless indicated otherwise by an existing permit, ~~Unless indicated otherwise by an existing permit, Tt~~the twenty-five-year three-day storm event shall be used as the design storm.

5.11.2 - Exfiltration Trench

(a) In an exfiltration system, stormwater passes through a perforated pipe and infiltrates into the surrounding rock trench and ground. When an exfiltration trench is utilized, soil permeability and water table conditions must be such that the trench system can percolate the required stormwater volume within a specified time following a storm event and then return to a dry condition when the drawdown of the treatment volume is completed. Appropriate design and regular maintenance are key to maximizing the useful life of an exfiltration system.

(b) Soils within the City tend to be classified as poorly to very poorly draining with a relatively high water table. Over the years, these conditions coupled with a lack of regular maintenance have shown that systems relying on an exfiltration system alone have a short useful life (~~possibly~~ between five (5) to ten (10) years). Sediment accumulation and clogging of exfiltration system by particles ~~by fines~~ can reduce the life of an exfiltration trench. Total replacement of the trench is often the only means of restoring the treatment capacity of the system. Periodic replacement of the trench should be considered routine operational maintenance when selecting this management practice. Because of the short useful life and the long-term costs to maintain and replace exfiltration systems, the City's allowable use of exfiltration trench is different from that of SFWMD.

(c) Within the City, exfiltration trench may be used to achieve the 0.5 inch of dry pretreatment; however, the remainder of the water quality volume shall be provided within an above ground detention area.

The detention area will provide storage and help to minimize flooding ~~in the event that~~if the trench system deteriorates or fails.

(d) Exfiltration trenches used within the City shall meet the following requirements:

(1) Maximum credit – 0.5-inch dry pretreatment plus up to 3.2 inches (trench and void spaces)

(2) Design calculations shall follow the examples and requirements presented in the SFWMD Applicant's Handbook, Volume II.

(3) A soils report prepared and signed and sealed by a Geotechnical Engineer shall be provided with the design calculation. The soils report shall identify the average wet season water table elevation and the hydraulic conductivity of the soil.

(4) Design of the exfiltration trench shall be in accordance with SFWMD Applicant's Handbook, Volume II.

~~(4)~~(5) Maintenance shall occur at the owner's expense and according to the manufacturer's recommendation.

5.11.3 - On-Site Retention

A retention system does not have a control structure that allows the release of water from the system. Because of this, it is ~~extremely important to ensure~~imperative that retention~~the~~ systems ~~is~~are designed and maintained properly to prevent overflow. A retention system shall only be allowed in cases where positive legal outfall is not possible and the system strictly complies with the SFWMD requirements for a dry retention system. Additionally, the system shall operate such that ~~the~~ it allows percolation and returns the basin to a dry condition within twelve (12) days of the design storm event.

5.11.4 - On-Site Detention

Detention systems allow the release of stormwater through a control structure. This system requires that the soil permeability, water table conditions, and discharge system be such that the system percolates and releases the desired runoff volume within a specified time following a storm event. The requirements for wet detention (lakes) and dry detention are provided below in 5.11.4.1 and 5.11.4.2.

~~5.11.1.1~~ ~~–~~5.11.4.1 - Wet Detention

Wet detention areas are generally incorporated into larger projects which require permitting by SFWMD. For this reason, only general siting and dimensional requirements for wet detention areas are identified below.

(a) Inlet structures shall be designed to dissipate the energy of water entering the pond.

(b) The flow path of water from the inlets to the outlet of the pond must be maximized to promote good mixing with no dead spots, minimize short circuiting, and maximize pollutant removal efficiency and mixing.

(c) If short flow paths are unavoidable, the effective flow path can be increased by adding diversion barriers such as islands, peninsulas, or baffles to the pond.

(d) A minimum twenty (20) ~~-~~foot maintenance and access easement with slopes no steeper than 4:1 (horizontal: vertical) shall be provided around the perimeter of all wet detention areas at the control elevation. These easements~~,~~ shall be legally reserved to the operati~~o~~ng entity and for that purpose

by dedication on the plat, deed restrictions, easements or other such recorded document so that the intended use is maintained by subsequent owners.

(e) Area. One-half acre minimum.

(f) Width. One-hundred (100) feet minimum for linear areas in excess of two-hundred (200) feet length. Irregular shaped areas may have narrower reaches but shall average at least one-hundred (100) feet.

(g) Side slopes. No steeper than 4:1 (horizontal: vertical) from top of bank out to a minimum depth of two feet below the control elevation, or an equivalent substitute. Constructed side slopes steeper than 3.5:1 (horizontal: vertical) shall be considered a substantial deviation. Side slopes shall be top soiled and stabilized through seeding or planting from two feet below to one foot above the control elevation.

(h) Alternative side slope criteria for golf course detention areas adjacent to tee areas, bunkers, and greens.

(1) The design and final constructed side slopes adjacent to tee areas, bunkers, and greens contiguous to golf course wet detention areas shall be no steeper than 2:1 (horizontal: vertical) for the area above the permitted control elevation. For purposes of this rule, the tee area is limited to an area specifically constructed and designated as the location from which a golfer makes his/her first shot toward a designated hole. The green is the area of shortest grass around the hole. Bunkers (sand traps) consist of a prepared area of ground, often a hollow, from which turf or soil has been removed and replaced with sand-like material.

(2) For those portions of the wet detention areas adjacent to tee areas, bunkers, and greens with final constructed side slopes steeper than 3.5:1 (horizontal: vertical), the final constructed side slopes below the control elevation shall not be steeper than 8:1 (horizontal: vertical) to a depth of two feet below the control elevation or equivalent substitute.

(i) Bulkheads - Bulkheads shall be allowed for no more than forty percent (40%) of the shoreline ~~length, but~~length but compensating littoral zone must be provided based on a 4:1 (horizontal: vertical) side slope.

~~5.11.1.2~~ 5.11.4.2 - Dry Detention

Dry detention areas shall have:

(a) Well-draining sands;~~.~~

(b) A pond bottom elevation that is, at a minimum, one foot above the wet season water table or project control elevation, whichever is higher~~.~~;

(c) Side slopes that are as flat as possible with a maximum of 4:1 (horizontal to vertical)~~.~~;

(d) Mosquito control ditches or other appropriate features for such purpose~~.~~; and

(e) Mechanisms for returning the groundwater level in the area to the wet season water table elevation.

5.11.5 - Discharge Structure

All stormwater discharges from a development shall be made through a structural facility. Earth berms are not considered a structural facility. These discharge or control structures shall:

(a) Be non-operable unless otherwise approved by SFWMD.

(b) Meet FDOT Standard Specifications Section 425 and FDOT Standard Plans Index Series 425-~~XXX~~.

(c) Include a baffle skimmer in accordance with FDOT Standard Plans Index 425-070.

(d) Directly flow into existing storm systems, manmade ditches, swales, or canals that are easily able to absorb concentrated discharges.

(e) Flow into a spreader swale prior to discharge into a receiving water or adjacent ecosystem that may be degraded by a direct discharge. The spreader swale shall be of a length that reduces the discharge velocity to historic rates or rates less than two feet per second.

5.11.6 - Control Device/Bleed Down Mechanism

Gravity control devices that allow the discharge of stormwater from the system and provide a means to remove water from the bottom of the system shall meet the following requirements:

(a) Sized to allow a maximum discharge of 0.5 inch in twenty -four (24) hours.

(b) Projects shall have the ability to recover the system to the pond bottom or control elevation within twelve (12) days or less.

(c) Underdrains/side drains can be used and are encouraged within large dry detention ponds. Underdrains/side drains can be used to assist with system recovery by conveyance of water to the control device but shall not bypass the water quality bleeder or system control weirs. Underdrain/ side drain designs should not discharge ground water below the wet season water table.

(d) ~~In order to~~To provide a dry detention system, the control device/bleed down orifice shall be located one foot below the bottom of the detention area.

(e) The gravity control orifice minimum size shall be either a:

(1) "V" notch with a minimum dimension of two inches and twenty degrees; or

(2) Circular orifice with a minimum three-inch (3") diameter.

(f) Systems that discharge only through a minimum size bleed down device are presumed to meet the maximum discharge quantity criteria except for projects where zero discharge is required.

(g) Control elevations shall be established such that they are consistent with and maintain surrounding land control and average wet season water table elevations, consistent with water use permits, wetlands, and have a maximum depth of six (6) feet below natural ground.

(h) Control structure design should consider access to the structure and the removal of debris from the structure during a storm event. Baffles and debris skimmers shall be over sized such that they do not become the hydraulic control of the flow and will provide for debris removal both upstream and downstream with common hand tools.

(i) The location of the structure should be such that i~~s~~t can be easily accessed during the peak stage of the design storm event by pedestrian or ~~non-commercial~~service vehicle.

(j) If the system is not able to recover to the control elevation or bottom of a dry pond, then the retained volume shall be excluded from the design storm flood protection analysis.

5.12 - Illicit Discharge

It shall be considered unlawful to dump or drain any illicit discharge to the stormwater system or in any freshwater lake, canal, river, stream, tidal, or coastal water of the City. The following fluids are not considered illicit discharges:

(a) Air conditioner condensation

(b) De-chlorinated pool water (less than one part per million)

(c) Discharge from a potable water source

(d) Diverted stream flows

(e) Flow from wetlands

(f) Individual car washing

(g) Landscape irrigation

(h) Lawn watering

(i) Residential building wash water (without detergents)

(j) Rising ground water

(k) Street wash water

(l) Uncontaminated ground water

(m) Water line flushing

5.13 - Inspection and Maintenance

(a) Applications for development approval that include a storm water management system shall include a maintenance plan for the system to include but not limited to inspection schedules, sedimentation removal depths, pre- and post-storm inspections, construction plans, maps, and technical data as necessary for the effective operation and maintenance of the system in perpetuity. As part of the final certification, the maintenance plan shall be amended to include record drawings of the storm water management system.

(b) The City may conduct periodic inspections to ensure that the project is constructed and operating in compliance with the approved plans and in a manner that protects the public health and safety and resources of the state. No person shall refuse immediate entry or access to any authorized person of the City who requests entry for purposes of such inspection. Special attention shall be made during inspection to ensure that:

(1) Soil is stabilized to prevent sediment discharge to waters in the state;

(2) The system is kept free of debris, trash, garbage, oils and greases, and other refuse;

(3) Oil and grease separators, skimmers, or collection devices are working properly and do not allow the discharge of oils or greases. Oils and greases or other materials removed from such a device shall be disposed of at a sanitary landfill or other lawful means; and

(4) All structures are operable and have not become damaged, or clogged with vegetation, trash, or sediment.

(c) ~~In the event that~~If the stormwater management system is found to be inoperable, in poor working order, or disrepair, the City Engineer shall give the property owner written notice. Failure to take corrective action within thirty (30) days of the date of the notice shall constitute a violation and the

City will address the issue through its Code Compliance processes or take immediate action and back charge the owner should it be determined that the inoperable nature of the system threatens life, safety, welfare, or property.

6. Drainage

6.1 - General

Design requirements for drainage system components located within the City are provided in this chapter.

6.2 - Parking Lot Slopes

The minimum slope to promote positive drainage within a parking lot is 0.005 feet per feet or 0.50 percent, a greater slope should be considered when possible. In no circumstance shall an accessible route within the pavement or curb area exceed ADA slope requirements.

6.3 - Curb and Gutter

Curb and gutter or gutters shall meet the requirements of FDOT Standard Specifications Section 520 and FDOT Standard Plans Index Series 520-~~XXX~~001. Slopes shall not be less than 0.003 feet per feet or 0.3 percent.

6.4 - Roadway Spread

The allowable stormwater spread from a rainfall intensity of four (4) inches per hour shall be as provided in Table 6-1~~Table 6-1~~~~Table 6-1~~. The spread calculations shall be submitted to the City along with the construction plans.

Table 6-1 Roadway Spread

Road Classification	Allowable Spread
Local	Below the crown of the road
Collector	1/2 travel lane width of outside travel lane
Arterial	Leaves eight (8) feet ~~of lane clear~~ of outside travel lane clear
Evacuation Route	1/3 travel lane width of outside travel lane

6.5 - Manholes and Inlets

(a) Manholes, inlets (curb or ditch bottom), and gratings shall meet the requirements of FDOT Standard Specifications Section 425, ~~and~~ FDOT Standard Plans Index Series 425-XXX and FDOT Drainage Design Guide. Tops for the structures shall be designed to withstand traffic loading, bicycle traffic, or pedestrians, as appropriate. Open bottom inlets are encouraged in effective recharge areas. Manhole spacing shall be as located outside the wheel path of vehicles and as provided in Table 6-2~~Table 6-2~~~~Table 6-2~~.

Table 6-2 Structure Spacing	
Pipe Size – Round or Equivalent (inches)	Maximum Spacing (feet)
15	200
18	300
24-36	400
>42	500

(b) For roadways, curb inlets shall be spaced so that the inlets intercept one- hundred percent (100%) of the design flow without exceeding the allowable spread of water onto the travel lanes as provided in section 06.4. Inlets shall not be located in radius returns or within drop curb locations.

6.6 - Roadway Underdrains

In cases where soils exhibit adverse water table characteristics, underdrains and/or fill or other acceptable alternative that will provide necessary measures to maintain the structural integrity of the road will be required. Underdrains shall be required whether they are provided as part of the design or if conditions during construction reveal the need. Requirements for underdrains are as follow:

(a) Underdrains shall be used where the seasonal ~~high water~~high-water table cannot be maintained at a level two feet below the base of the roadway.

(b) The use of ~~limerock~~lime rock base in conjunction with an underdrain system is prohibited.

(c) Underdrains shall be designed with free gravity outlet at carefully selected discharge points.

(d) Erosion control measures shall be provided, as needed at, all discharge points.

(e) Provisions to clean the underdrain system shall be provided.

(f) Filtering media shall consist of stone, gravel or slag, and shall contain no friable materials.

(g) The design of the underdrain shall be by a geotechnical engineer based upon the results of field testing.

6.7 - Drainage Pipes

Drain pipes connecting structures or a structure to an outfall shall meet the following requirements:

(a) Design shall be based upon a three (3) -year frequency for new work.

(b) Design for a pipe that is replacing a swale shall be based upon a ten (10) -year frequency.

(c) Pipe design calculations shall:

(1) Be based on the Rational Method. Storm drains associated with drain systems (exfiltration trench, french drains, underdrains, etc.) or detention systems (ditches/swales, etc.) may be performed using hydrographs to account for storage.

(2) The minimum time of concentration shall be ten (10) minutes.

(3) Calculations for pipe size shall be based on open channel or pressure flow, as appropriate using the Manning's equation. Calculations shall indicate the source of the roughness coefficient, "n".

(4) With the exception of exfiltration trench, french drains, underdrains, etc., the minimum physical slope of the pipe ~~shall~~ must produce positive flow and a ~~with a desired~~ minimum velocity of two feet per second at full flow.

(5) Hydraulic grade calculations:

a. Tailwater elevation shall be based on the design storm event.

b. Hydraulic grade may exceed the top of a ditch bottom inlet.

c. Systems with greater than two-thousand (2000) feet shall consider major and minor losses in the calculation.

d. For velocities greater than 7.5 feet per second, the calculation shall consider all losses.

e. For systems only considering ~~minor~~ major losses, the hydraulic grade shall be one foot below the elevation of the structure gutter.

f. For systems considering major and minor losses, the hydraulic grade shall be equal to the elevation of the structure gutter.

(6) Be documented and submitted to the City along with the construction plans.

(d) The minimum pipe size installed within road rights-of-way, or under hardened surfaces shall be fifteen~~-~~ (15) inch round or equivalent.

~~(d)~~(e) A minimum of five (5) feet clearance shall be provided from drainage structures and pipes to trees.

~~(e)~~(f) Pipes installed under roadways or within road rights-of-way shall be reinforced concrete pipe (Class III) with rubber gaskets~~,~~ or~~, with prior~~by approval of the Public Works Department and on a ~~case by case~~case-by-case ~~basis,~~ corrugated profile wall polypropylene pipe (Class II, 100-year design service life).

~~(f)~~(g) All pipe joints shall be wrapped with filter fabric that is centered on the joint with a minimum total length of two feet. Filter fabric shall meet the requirements of FDOT Standard Specifications Section 985.

~~(g)~~(h) The selection of the pipe material is subject to the use, location, soil type, ground water conditions and available cover. The following pipe materials are generally acceptable:

(1) Reinforced concrete pipe conforming to FDOT Standard Specifications Section 430, ~~which are required.~~ - Required~~ Required~~ within road rights-of-way.

(2) Corrugated aluminum pipe conforming to FDOT Standard Specifications Section 945.

(3) Corrugated polyethylene pipe conforming to FDOT Standard Specifications Section 948.

(4) Corrugated profile wall polypropylene pipe conforming to FDOT Standard Specifications Section 948-7.2 (Class II, 100-year design service life). – Required within road rights-or-way

(5) Polyvinyl chloride pipe conforming to FDOT Standard Specifications Section 948 (but note that use of this material for installation under roadways or within road rights-of-way requires prior approval of the Public Works Department).

~~(h)~~(i) End treatments for pipes are subject to the specific hydraulic, structural, and safety requirements for the site. End treatments shall meet the requirements of FDOT Design Standard Plans Index Series 430-XXX, unless otherwise approved by the City Engineer.

6.8 - Roadway Culverts

Roadway culverts convey stormwater under the road between two open systems such as swales. The design of the culverts:

(a) Shall have sufficient capacity to convey the ten-year storm event without damage to the end treatments, approaches, ~~road~~road, or adjacent areas.

(b) The backwater elevation shall be maintained at or below the travel lane elevation.

(c) The highest tail water elevation that can be reasonably expected to occur with the storm event shall be used.

(d) The minimum pipe size installed within road rights-of-way shall be fifteen-inch round or equivalent.

(e) Pipes installed under roadways shall be reinforced concrete pipe (Class III) with rubber gaskets, or ~~by approval of the Public Works Department and on a case by case~~case-by-case basis corrugated profile wall polypropylene pipe (Class II, 100-year Design Service Life).

(f) All pipe joints shall be wrapped with filter fabric that is centered on the joint with a minimum total length of two feet. Filter fabric shall meet the requirements of FDOT Standard Specifications Section 985.

(g) The selection of the pipe material is subject to the use, location, soil type, ground water conditions and available cover. The following pipe materials are acceptable:

(1) Reinforced concrete pipe conforming to FDOT Standard Specifications Section 430.

(2) Corrugated profile wall polypropylene pipe conforming to FDOT Standard Specifications Section 948-7.2 (Class II, 100-year design service life).

(h) End treatments for pipes are subject to the specific hydraulic, structural, and safety requirements for the site. End treatments shall meet the requirements of FDOT Standard Plans Index Series 430-XXX, unless otherwise approved by the City Engineer.

6.9 - Bridge-Culverts and Bridges

The hydraulic design of bridge-culverts and bridges shall be done in accordance with good engineering practices and comply with FDOT guidelines. ~~Design~~The design of these facilities shall be completed and documented in a permanent record file. The file shall address all design standards in sufficient detail so that an independent engineer with expertise in bridge hydraulics can fully interpret and understand ~~development~~the development of the final design. The design may include, but is not limited to, the following items:

(a) Backwater Analysis.

(b) Tailwater Analysis.

(c) Completed Bridge Hydraulics Recommendations Sheet provided in the FDOT Plans Preparation Manual.

(d) Bridge Hydraulics Report.

(e) Evidence of Field Review.

(f) Hydrologic analysis including sources of data and methodology.

(g) Alternative analysis or evaluation of structure sizes (length and vertical height/clearance). This evaluation shall be done consistent with FDOT policy for bridge hydraulic design.

(h) Deck drainage analysis.

(i) Supporting hydraulic computations.~~.~~

(j) Applicable regulatory agency (SFWMD, FDEP, USACOE, Coast Guard, etc.) documents that affect the final design.

~~(j)~~

6.10 - Driveway Culverts

(a) The roadside swale system within the City is a critical component of the City's stormwater management system. Driveways that ~~crossescross~~ a roadside swale shall have a driveway culvert. The following shall apply to driveway culverts located within the City road right-of-way:

(1) Driveway culverts for ~~C~~commercial driveways shall be reinforced concrete pipe (RCP) conforming to FDOT Standard Specifications Section 430.

(2) Driveway culverts for ~~R~~residential driveways shall be corrugated aluminum~~metal~~ pipe conforming to FDOT Standard Specifications Section 945, reinforced concrete pipe conforming to FDOT Standard Specifications Section 449 or, with prior ~~by~~ approval of the Public Works Department and on a case by case basis, corrugated profile wall polypropylene pipe conforming to FDOT Standard Specifications Section 948. Polypropylene pipes will require end treatments, such as mitered end sections or end walls.

(3) Shall extend a minimum of four (4) feet beyond both sides of driveway.

(4) Shall have mitered ends or headwalls in accordance with FDOT Standard Plans Index Series 430-XXX.

(5) The ends of the culvert shall be a minimum of ten (10) feet from inlets, side lot pipes, or cross drains.

(6) Driveway culvert inverts, sizes and lengths shall be provided by the Public Works Department.

(7) The design of the driveway culvert is based upon the ten-year frequency storm.

(8) If any alternate method of drainage is necessary, it shall be reviewed and approved by the City Engineer.

(9) The installation of any drainage pipe across the entire front of any lot in the ~~city~~ City is prohibited unless roadway improvements require the piping of the swale.

(10) The contractor shall obtain a site work permit to install a new driveway as provided in section 0~~16.3~~.

(11) The contractor shall obtain a driveway/culvert permit to modify an existing driveway culvert as provided in section 0~~16.4~~.

(12) Property owners shall be responsible for the maintenance of the road ROW from the edge of the pavement to the owner's property line including the driveway, driveway culvert, and swale as specified in City Code Section 41.08(g).

~~(12)~~

(b) The construction plans shall show the driveway culvert and mitered end sections with a label that indicates: *"The culvert material, size, inverts and lengths shall be supplied by the City of Port St. Lucie Public Works Department after the completion of the driveway stakeout inspection."*

6.11 - Clearances

The following minimum clearances shall be provided for stormwater drain pipes and structures:

(a) Crown of pipe and gutter of structure – per FDOT Standard Plans Index.

(b) Pipe cover (minimum and maximum) – per manufacturer.

(c) Horizontal clearance of ~~five~~ten (10) feet.

(d) Vertical clearance of eighteen (18) inches.

(e) In no circumstance shall an electrical or gas facility come into direct contact with a storm drain or structure.

(f) Utility conflict structures shall be in accordance with FDOT Standard Plans Index 125-001.

6.12 -

Open Channel Systems (Swales and Canals)

(a) Hydrologic data used for the design of open channel systems shall be based on one of the following methods, as appropriate for the ~~, for the particular~~ site:

(1) Frequency analysis of observed gage data;

(2) Regional or local regression equation developed by the USGS calibrated with available observed data for the basin or nearby basins;

(3) Rational equation for basins up to six-hundred (600) acres calibrated with available observed data for the basin or nearby basins;

(4) For outfalls from stormwater management facilities, the method used for the design of the facility may be used and calibrated with available observed data for the basin or nearby basins; or

(5) For regulated or controlled canals, verified hydrologic data.

(b) The design of the open channel system shall:

(1) Be based on the Manning's Equation.

(2) Include the source of the roughness coefficient, "n".

(3) Minimize the use of linings.

(4) Include the design velocity for the canal.

(5) Include the recommended maximum velocity for the type of surface.

(6) Be documented and the calculations (hydrologic analysis, hydraulic analysis, and analysis of channel lining requirements) submitted to the City along with the construction plans.

6.12.1 - Swales

Any rework or new swales installed in City road right-of-way shall comply with the following standards. Variations in the requirements may be approved by the City Engineer ~~in the event that~~if limited right-of-way or existing conditions prohibit the achievement of these standards.

(a) Swales and ditches shall be accessible for maintenance.

(b) Shall be sized to accommodate stormwater flows from contributing drainage areas for the ten-year one-day frequency.

(c) The flow line elevations shall be in accordance with the City's drainage program.

(d) The minimum allowable swale grade shall be 0.05 percent (0.0005 foot per foot) with positive slope or as approved by the City Engineer.

(e) Maximum side slope will be 4:1 (horizontal to vertical).

(f) Shall be sodded.

(g) The rework of roadway swales within the originally platted City lots shall include the installation of a plastic swale liner in accordance with Standard Swale Liner Detail provide in chapter 20. The plastic swale liner is provided by the Public Works Department.

(h) Property owners shall be responsible for the maintenance of the road ROW from the edge of the pavement to the owner's property line including the driveway, driveway culvert, and swale as specified in City Code Section 41.08(g).

6.12.2 - Canals

Canals within the City are under the jurisdiction of either the City, SFWMD (C-24 and C-23), the NSLRWCD (northwestern area), or St. Lucie County. Design requirements for an outfall to a canal ~~depends~~depend upon site specific conditions such as location in relation to a control structure, slope of the banks, and the control elevation of the canal. The type of end treatment, energy dissipation, and slope stabilization, as appropriate, will be reviewed and addressed on a ~~case by case~~case-by-case basis by the appropriate agency with jurisdiction. New canals, unless approved otherwise by City Council, shall be designed, at a minimum, to the following standards:

(a) Canals shall be sized to accommodate stormwater flows from contributing drainage areas for the twenty-five-year frequency.

(b) The minimum allowable grade shall be 0.05 percent (0.0005 foot per foot) or as approved by the City Engineer.

(c) ~~With the exception of~~Except for areas with continuous standing or flowing water or areas that will be lined, canals shall be sodded.

(d) Lining material shall be reviewed and approved by the City Engineer.

(e) Side slopes shall be designed in accordance with the lining manufacturer recommendations and soil conditions.

(f) The maximum side slope for an unlined canal shall be 4:1 (horizontal to vertical) from the top of bank out to a minimum depth of two feet below the control elevation.

(g) Side slopes stabilized with sod or plantings extending from two feet below to one foot above the control elevation.

(h) The minimum canal bottom width shall be five (5) feet to accommodate mitered end sections and maintenance mowers.

(i) V-bottom canal sections are not permitted due to siltation and maintenance issues.

(j) For dry canals, the bottom elevation shall be one foot above the estimated seasonal high groundwater elevation to enable mowing.

(k) A minimum of one foot of freeboard above the design stage shall be provided in the canal.

(l) Shall be accessible for maintenance.

7. Erosion and Sediment Control

7.1 - General

(a) Land clearing activities, including the construction of stormwater management systems, shall be designed, constructed, and ~~maintained at all times~~always maintained so that erosion and sedimentation from the system, including the areas served by the system, do not cause violations of applicable state water quality standards in receiving waters.

(b) Further, because sedimentation of offsite lands can lead to public safety concerns, erosion and sediment controls shall be designed and implemented to retain sediment on-site as required by Section 62-40.432(2), FAC. In particular, the erosion and sediment control requirements described in the SFWMD *Environmental Resource Permit Applicant's Handbook Volume I, Part IV*, shall be followed during construction of the system.

7.2 - Requirements

The operator of any construction project that disturbs one acre or ~~more, or~~more or is part of the larger common plan of development or sale which disturbs one acre or more, is required to obtain the proper stormwater permit from the FDEP and to comply with all the terms and conditions of the permit.

7.3 - Best Management Practices (BMPs)/Stormwater Pollution Prevention Plan (SWPPP)

(a) BMPs are methods that have been determined to be the most effective, practical means of preventing or reducing pollution of non-point sources from ~~entering into~~entering a stormwater system and/or surface waters. BMPs for a development shall be as specified in the approved SWPPP. Requirements for the SWPPP are provided in section 0~~14.7~~.

(b) If it is found upon site inspection that the approved BMPs are insufficient, BMP's must be adjusted to correct the sediment and erosion problem. Additionally, the City Engineer is authorized to issue stop work orders on any site that has not obtained or is not in compliance with the applicable stormwater permit. Upon issue of such stop work order all site work affected thereby shall immediately cease until such time the City Engineer authorizes the work to resume.

8. Roadways

8.1 - General

All roadways within the City shall be designed pursuant to the requirements contained in this chapter unless approved otherwise by City Council.

8.2 - Access Management

(a) Access management considers the appropriate number of access points, appropriate type of access (~~i~~*i.e.g.*, full, right-in and right-out, etc.), spacing of the access points, modifications to medians, modifications to intersections, need for turn lanes, and cross access with adjacent properties. Because of the many potential scenarios, access management shall be reviewed and considered on a ~~case by case~~case-by-case basis using the guidelines contained within this section, knowledge of the roadway system, FDOT and 2FHWA guidelines, and accepted engineering practices.

(b) Successful access management in the vicinity of an intersection is a critical component of maintaining the safety and capacity of a roadway system. FHWA's *Access Management in the Vicinity of Intersections* recommends the following access management considerations:

(1) Locating driveways on the appropriate roadway functional classification;

(2) Limiting driveways within the functional area of an intersection improves safety;

(3) Reducing the number and types of conflict points created by a driveway may reduce crashes;

(4) Eliminating left-turn movements at driveways is beneficial from a safety perspective;

(5) Median treatments can impact safety;

(6) Reducing driveway density reduces crashes; and

(7) Properly designed driveways influence safety and mobility at the driveway.

(c) The document also provides the following guidelines for the location of which may be applicable considerations for developments within the City.

(1) Suburban Areas:

a. Locate driveways upstream of the vehicle queue caused when the downstream traffic signal is red.

b. Prohibit median openings that allow movements across the left turn lane(s) of an intersection.

c. In the case of a traversable median, align the driveways on opposite sides of the road with an offset that allows vehicles to ~~making~~make opposing left turns without creating a conflict point for the two vehicles in the traversable median.

d. In the case of a traversable median, if it is not possible to align driveways on opposite sides of the road without creating a conflict point for the two vehicles in the traversable median, locate the driveways directly across the street from one another.

e. Raised medians on the major roadways that prohibit left-turn movements will improve pedestrian and bicycle safety by reducing the number of potential conflict points.

f. A channelized island between the in-bound and out-bound movements of a right-turn-only driveway will provide a pedestrian and bicyclist refuge area.

g. Minimization of the driveway width will help to reduce pedestrian and bicyclist crossing distance and exposure.

h. Locate pedestrian and bicyclist travel ways at driveways so that the driver is visible to the pedestrian and bicyclist and vice versa. Do not block the sight line with landscaping or signage.

i. Provide appropriate signage at driveways for the pedestrian, ~~bicyclist~~bicyclist, and driver.

(2) Urban Areas:

a. Development of a right-turn lane for the driveway on the through road may require the removal of on-street parking.

b. Avoid locating on-site parking stalls within the driveway throat.

c. Replace gated parking entries with alternate options to decrease the entrance time and reduce queues on the main roadway.

d. Locate bus bays and stops on the far side of the driveway to maximize sight distance for motorists exiting a driveway.

e. Locate driveways on lower volume roadways, where possible.

f. Sign and stripe driveways for right-turn, outbound movements only, where possible.

g. Locate driveways on one-way streets, where possible.

h. Locate driveways that serve left-turning inbound vehicles near the center of the block to reduce interaction with upstream and downstream intersections.

i. Locate driveways upstream from an intersection and to provide motorists sufficient room to maneuver and make necessary lane changes in anticipation of the downstream intersection.

j. Use colored pavement across driveways in combination with crosswalk markings, audio/visual treatments for drivers and pedestrians and bicyclists where exiting vehicles have limited sight distance.

k. Restrict inbound driveway speeds by designing the driveway access with appropriate radii.

l. Smaller driveway radii of twenty-five (25) to thirty-five (35) feet are more sensitive to pedestrian movements because motorists ~~have to~~must slow down to complete the turn. However, on-street parking and bike lanes increase the radius, so care should be taken to balance vehicle and pedestrian safety.

(3) Rural Areas:

a. Provide adequate throat depth and on-site circulation for vehicles to easily exit a major roadway and minimize the speed differential.

b. Pave the shoulders near driveways to provide additional entry and exit width and thus higher entry and exit speeds to help minimize the speed differential.

c. Frontage roads that parallel the major roadways may be employed ~~as a means to~~to provide access to each of the adjacent properties.

d. Paved shoulders that are at least four (4) feet wide can provide benefits to bicyclists and pedestrians.

8.3 - Network Requirements

The road network establishes traffic flow patterns and conflicts and is the basis of the roadway safety and efficiency criteria. The layout of the road network shall consider and implement the following criteria:

(a) The roadway layout shall be logical and easily understood by the user.

(b) Circulation patterns created by the network shall be compatible with adjacent areas.

(c) Flow patterns shall be designed to interconnect neighborhoods while discouraging through motorized traffic on local streets.

(d) The road network shall be compatible with mass transit, ~~pedestrian~~pedestrian, and bicycle traffic.

(e) The road network shall reduce conflicts and eliminate substantial speed differentials and hazardous turning and crossing maneuvers.

~~(f) The number of intersections shall be kept to a minimum but should meet land use needs and flow requirements.~~

(f) As the land surrounding the roadway is developed, the intent and purpose of the network and road classification shall be maintained through the implementation of access management practices and policies for driveways and medians.

(g) New roads shall extend to development or parcel boundaries, perpendicular to the adjacent right-of-way, to allow for connection and extension of the road network by either the City or adjacent development.

~~(g)~~(h) New development shall connect to existing road connections and stub outs provided from adjacent parcels.

8.4 - Subdivision Roadways

In the development of a subdivision, roadway cross-section requirements shall be based on Section 8.6. ~~the r~~Roadway layout shall meet the requirements of ~~City Code~~ Chapter 156, Article VI of the City Code,~~. These requirements include~~including, but are not limited to, the allowed length of residential blocks, maximum length of dead-end streets, requirements for temporary ~~turn arounds~~turnarounds, etc.

8.5 - Entry Gates

Gates are allowed on private roadways or property unless the development order or other such agreement specifically prohibits the use of gates. Gates are prohibited on public roads owned and maintained by the City. As allowed, gates on private roadways or property shall demonstrate the following minimum standards:

(a) Access shall be provided at all times for police, fire, city inspection, mail delivery, garbage pickup, utility, school buses, and other health and safety-related vehicles. Access must not require drivers to exit their vehicles.

(b) Access for pedestrians and bicycles must be provided along the perimeter of the gate.

(c) Turn around areas for vehicles that are denied access shall be provided. The turnaround area shall be of sufficient size to accommodate a bus or commercial truck, as appropriate.

(d) The minimum distance from the road right-of-way to the beginning of the queuing for the gate shall be ~~one hundred~~one hundred (100) feet for residential development. For commercial driveways, the

minimum distance shall be no less than one and one-half (1 ½) times the length of the typical vehicle/truck that is expected to access the property for regular business. The City Engineer may request a greater length in cases where a large number of units will be served by the gate, the development will have a large volume of long vehicles, the operation for opening the gate is a lengthy process, or the entry is located on a major roadway.

(e) The gated area shall provide a minimum unobstructed vertical clearance meeting the requirements of the Fire District.

(f) Gates may be either a swinging or sliding type.

(g) Manual operation of the gate shall be possible with one person.

(h) For the purposes of emergency vehicles, the gate must have the ability to be opened with a Knox Key Box, siren, or a breakaway design in accordance with the requirements of the St. Lucie County Fire District.

8.6 - Roadway Section

~~The required minimum section for all newly constructed private roadways, are presented in City Code Section 156.093(C).~~ The required minimum section for all ~~newly constructed public~~ roadways ~~are~~ is detailed in Table 8-1 and 8-2, based on existing or projected average daily traffic.~~graphically shown in the Standard Roadway Details for 6-, 4- and 2-Lane sections provided in Chapter 2020.~~ The configuration of the intermediate phasing of roadways (for example, the construction of the first two lanes of a four-lane roadway) shall be subject to the approval~~ed~~ of~~by~~ the City Engineer.

~~Table 8-1 Roadway Section Requirements~~

~~Road Type/ Ultimate Number of Lanes~~	~~Midblock ROW Width (feet)[5]~~	~~Travel Lane Width (feet)[1]~~	~~Median Width (feet)[2]~~	~~Bike Lane Width (feet) and Location~~	~~Sidewalk Width (feet) and Location[3]~~	~~Utility Easement Width (feet) and Location[4]~~
~~Arterial 6 Lanes~~	~~160~~	~~11~~	~~22-30~~	~~7 Both Sides~~	~~8-10 Both Sides~~	~~10 Both Sides~~
~~Arterial or Collector 4 Lanes~~	~~135~~	~~11~~	~~22-30~~	~~7 Both Sides~~	~~8-10 Both Sides~~	~~10 Both Sides~~
~~Collector or Local 2 Lanes Undivided~~	~~85~~	~~12~~	~~0~~	~~7 Both Sides~~	~~6 One Side~~	~~10 Both Sides~~
~~Collector or Local 2 Lanes Divided~~	~~85~~	~~12~~	~~16~~	~~7 Both Sides~~	~~6 Both Sides~~	~~10 Both Sides~~

Table 8-1 Roadway Section Requirements						
Road Type/ Ultimate Number of Lanes	Daily Traffic (ADT)	Design Speed (MPH)	Curb and Gutter[1]	Access Management[2]	Median Width (feet)[3]	Midblock ROW Width (feet)[4,5]
Arterial 6 Lanes	>25,000	30 to 50	required	restricted	22 to 48	160
Arterial or Major Collector 4 Lanes	12,500 to 25,000	30 to 50	required	restricted	22 to 32	135
Arterial or Major Collector 2 to 4 Lane[6]	7,500 to 12,499	30 to 40	required	restricted	22 to 32	130
Minor Collector 4 Lanes	5,000 to 7,499`	30 to 40	required	restricted	22 to 30	120
Minor Collector 2 Lane	2,500 to 4,999	25 to 40	required	restricted	22 to 30	100
Subdivision Collector 2 Lane	1,500 to 2,499	25 to 35	required	shared <14 DU	16 to 22	100
Major Local 2 Lane	1,000 to 1,499	20 to 30	optional	shared <7 DU	10 to 16 (optional)	80
Local	500 to 999	15 to 25	optional	direct	none	70

Table 8-1 Roadway Section Requirements						
Road Type/ Ultimate Number of Lanes	Daily Traffic (ADT)	Design Speed (MPH)	Curb and Gutter[1]	Access Management[2]	Median Width (feet)[3]	Midblock ROW Width (feet)[4,5]
Local	<500	15 to 25	optional	direct	none	60
Local	<250	15 to 25	optional	direct	none	50

[1] Curb and gutter required along outside edge of pavement for all new arterial and collector roads and the widening of existing roads to multi-lane roads.

[2] Direct access from an individual residential parcel are prohibited for all new arterial and collector roads. Access connections shall be per access management requirements. New subdivision collector and major local roads shall have shared access driveways serving multiple residential parcels with no more than one connection for four parcels and no more than two connections total.

[3] Median width includes curb and gutters (two feet each side), expect along median dividers less than six (6) feet in width.

[4] Midblock ROW to increase by 20 feet for rural (swale) sections and an additional 10 feet when adjacent to a canal.

[5] Ten (10) foot-wide utility easements are required along both sides of the right-of-way.

[6] The configuration of the intermediate phasing of roadways are too be designed as divided roadways (for example, the construction of the first two lanes of a four-lane roadway), unless otherwise approved by the ~~shall be subject to the approval of the~~ City Engineer.

~~[1]Outside curb and gutters are required.~~

~~[2]Median width includes curb and gutters (two feet each side).~~

~~[3]Six feet sidewalks minimum. Where site characteristics allow & on a case by case basis eight feet or wider sidewalks shall be required.~~

~~[4]Located outside the ROW.~~

~~[5]ROW widths are a minimum for new City roadways unless approved otherwise by City Council.~~

~~[6]5Street and/or pedestrian lighting within subdivisions shall be as required in City Code Section 156.117.~~

Table 8-2 Roadway Section Multimodal Requirements						
Road Type/ Ultimate Number of Lanes	Travel Lane Width (feet)[1]	Sidewalk Width (feet)[2]	Bike Lane Width (feet) [3]	Alternative Shared-Use Path Width (feet)[4]	Alternative Multimodal Way Width (feet)[5]	Buffers, Landscape and Street Lights[6]
Arterial 6 Lanes	11 to 12	8 to 10 Both Sides	7 to 8 Both Sides	10-12	12-14	required
Arterial or Major Collector	11 to 12	8 to 10 Both Sides	7 to 8 Both Sides	10-12	12-14	required

Table 8-2 Roadway Section Multimodal Requirements						
Road Type/ Ultimate Number of Lanes	Travel Lane Width (feet)[1]	Sidewalk Width (feet)[2]	Bike Lane Width (feet) [3]	Alternative Shared-Use Path Width (feet)[4]	Alternative Multimodal Way Width (feet)[5]	Buffers, Landscape and Street Lights[6]
4 Lanes						
Minor Collector 4 Lanes	11	8 to 10 Both Sides	6 to 7 Both Sides	8-12	10-12	required
Arterial or Major Collector 2 to 4 Lane[6]	11 to 12	8 to 10 Both Sides	7 to 8 Both Sides	8-12	12-14	required
Arterial or Major Collector 2 Lane	11	8 to 10 Both Sides	6 to 7 Both Sides	8	10-12	required
Minor Collector 2 Lane	11	6 to 8 Both Sides	5 to 6 Both Sides	8	10-12	required
Subdivision Collector 2 Lane	11	6 to 8 Both Sides	4 to 5 Both Sides	8 to 10	10-12	required
Major Local 2 Lane	11	5 to 6 Both Sides	none	8 to 10 One Side	none	required
Local	10	5 to 6 Both Sides	none	8 to 10 One Side	none	required
Local	18 to 20	5 to 6 One Side	none	none	none	required
Local	18 to 20	5 to 6 One Side	none	none	none	required

[1] Travel Lane widths shall reflect roadway design speed. Approval of travel lane widths above or below the minimum shall be based on cross-section design and subject to approval by City Engineer.
[2] Sidewalks shall be placed a minimum of five (5) feet behind the edge of curb or pavement. The City engineer may approve sidewalks adjacent to curb or edge of pavement where a buffer cannot be provided due to physical constraints. Sidewalks shall be at least six (6) feet in width when adjacent to back of curb or edge of pavement, or the minimum allowable width where sidewalks greater than six (6) feet are required.
[3] Bicycle lanes six (6) feet in width shall include a buffer at least one (1) foot in width. Where bicycle lanes are seven (7) or more feet in width, a buffer at least two (2) feet in width shall be provided. Protected bicycle lanes may require additional width. Protected or separated bicycle lanes are permitted and shall be designed on a case-by-case basis, subject to City Engineer Approval.
[4] Shared-use paths may be provided as alternatives to sidewalks and / or on-street bicycle lanes so long as an equivalent total width of multimodal facilities is being provided. Any proposal for a shared-use path on one side of a ROW and a sidewalk and on-street bicycle lane on the other side of the ROW is subject to approval by the City Engineer.
[5] Multimodal Ways may be provided in-lieu of sidewalks and / or on-street bicycle lanes so long as an equivalent total width of multimodal facilities is being provided. Any proposal for a shared-use path on one side of a ROW and a sidewalk and on-street bicycle lane on the other side of the ROW is subject to approval by the City Engineer.
[6] Buffers, landscape, including street trees, and street lighting are subject to the requirements of sections XXXX of the Land Development Code.

(a) The widening of existing roadway shall be based on existing traffic and projected traffic based on historic growth rates or travel demand model growth rates, along with design traffic analysis, where appropriate, subject to approval by the City Engineer.

(b) Construction of new streets by the City shall be based on projected average daily traffic volumes (ADT) utilizing the latest ITE Trip Generation Manual rates from adjacent development, travel demand volumes, or corridor studies conducted to validate the need for the new roadways.

(c) Roadway designs for development shall be based on projected average daily traffic volumes (ADT) utilizing the latest ITE Trip Generation Manual rates or trip generation rates subject to approval by the City Engineer.

(1) An internal site related trip generation analysis shall be provided with development order applications where street design approvals are requested or required street.

(2) The trip generation shall be calculated per street, cul-de-sac, or drive aisle based on adjacent land uses with access to the street, cul-de-sac, or drive aisle. The trip generation rates shall be provided cumulatively along streets from the furthest most development boundary to the closest access connection with an existing external arterial road access connection.

(3) The trip generation analysis is to address internal site related circulation. Thus, there shall be no adjustments for factors such as internal capture, pass-by trips, or mode share. Further, credits shall not be provided for existing or previous development.

(4) The development trip generation analysis is not required to address future traffic from adjacent development as part of the internal trip generation analysis.

(5) The trip generation for non-residential land uses shall be based on the most intensive land use permitted and the maximum square footage allowed, unless the development agrees to development order conditions that limit the amount and type of development to reflect its intended market. The development order conditions shall include requirements to address site-related improvements by the development should future amendments to the amount and type of development result in an increase in trip generation.

(6) If development is relying on existing collector or local roads to provide direct access to the development to such an extent that the roads function as site related access, then the trip generation analysis will need to include existing ADT on those roads.

(7) If the City is to consider land use or zoning approvals for development applications intending to utilize an existing arterial or collector road that is either adjacent to the development boundary or traverses the development to such an extent that the arterial or collector will function as site related access to the development, then the City will evaluate needed improvements for the arterial or collector and determine what share of those improvements is related to providing site access and what share of travel would accommodate community level travel beyond the development.

(d) Traffic calming or neotraditional street designs may be incorporated into developments with approval of the City Council. Developments shall base design on City approved technical reports and FDOT guides and manuals related to traffic calming and traditional neighborhood development. Applicants may propose innovate street designs, site circulations, and dynamic parking management where travel by people walking, bicycling, and where applicable, transit, are prioritized over motor vehicle travel.

(e) Roadway Cross-Sections are provided in Chapter 20.

8.7 - Pavement Design

(a) The minimum roadway pavement design standards are presented in Table 8-3~~Table 8-32~~~~Table 8-2~~. All pavement designs shall be prepared and signed and sealed by a professional engineer. The recommended pavement design shall include supporting geotechnical investigations. The inclusion of edge, strip, trench, or underdrains where seasonal high groundwater levels are within two feet of any base layer or irrigated medians are planned shall also be included in the design.

(b) Designs shall consider future traffic loadings as well as construction traffic. Roadways with higher traffic volumes, significant truck traffic, emergency routes, or such reason, as determined by the City Engineer, shall exceed the minimum standards to ensure that the facility will reach a full term service life. FDOT's *Flexible Pavement Design Manual* shall be used as a basis of reference for pavement designs greater than the minimum standards.

~~(b)~~

(c) Alternate types of pavement, base and subgrade which are equal to or superior to those specified may be approved by the City Engineer. Application for such approval shall be accompanied by written data, calculations and analysis which show, by accepted engineering principles, that the alternate types are equal or superior to those specified.

Table 8-32 Flexible Pavement Design Standards				
Description	Pavement Type			
	Arterial	Collector	Local	Parking Lot
Structural Number (minimum)*	4.0	3.5	3.0	2.18**
Portland Cement Concrete (minimum thickness is 6 inches)	-	-	-	FDOT approved Class 1 Concrete.
Asphalt Thickness (inches) (minimum.)	3.0	2.5	1.5	1
Optional Base Group (FDOT Standard Spec. Section 285 With 8-inch minimum thickness)	99	6	66	4
Subgrade Thickness (inches) (minimum.)	12	12	12	12
Subgrade Compacted or Stabilized	LBR 40	LBR 40	LBR 40	LBR 40

*To meet required minimum Structural Number – Asphalt, Base and Subgrade thickness may be adjusted.

**For Temporary, Non-required Parking Lots, in which its removal is bonded, the Minimum Structural shall =1.6 minimum (i.e.1" Asphalt +6.5" Rock +Compacted Subgrade = 1.61

8.8 - Geometric Elements of Roadway Design

The geometric design shall provide the simplest geometry and promote interconnectivity and facilitate the movement of all drivers, bicyclists, and pedestrians. The horizontal and vertical alignment of the roadway shall be designed in accordance with the FDOT *Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways* and the FDOT Design Manual. (Latest Edition)

8.9 - Medians

Requirements for roadway medians:

(a) All roads with four or more travel lanes and design speed of 4035 mph or greater shall include require a median.

(b) Median design shall be in accordanceaccordance with the FDOT Greenbook. (Latest Edition)

(c) Landscaped medians shall have a two-foot paver concrete band, adjacent to the back of curb, for all public rights-of-way with a width of eighty (80) feet or more. Concrete band shall be brick red in color with Herringbone pattern unless approved otherwise byin writing by the Public Works Director.

(d) Left turn channelization shall provide storage space for left-turn entry and for left-turn exiting vehicle refuge.

(e) The preferred end treatment for a median opening is the bullet-nose design.

(f) Minimum spacing between median openings is provided in Table 8-4Table 8-43Table 8-3. Distances may be greater if the median opening falls within the operational area of an intersection, if required by the City Engineer, or if a posted speed greater than forty-five (45) mph is used.

Table 8-~~4~~3 Median Spacing[1]	
Median Type	Minimum Spacing (feet)
Full Access	660
Restricted Access	330

[1]Source: Florida Administrative Code, Section~~Statue~~ 14-97.003 for Access Class 7

8.10 - Intersections

Roadway intersections shall:

(a) Be designed in accordance with FDOT standards. ~~(Latest Edition)~~

(b) Involve the junction of only two roadways.

(c) Create an angle that is near ninety (90) degrees. Angles less than seventy-five (75) degrees are not acceptable.

(d) Provide centerline offsets of three-hundred (300) feet or more with adjacent intersections.

(e) Provide a minimum radius of thirty (30) feet for a local or collector road and forty (40) feet for an arterial.

(f) Include appropriate turn lanes per Sections 8.12.7 and 8.12.8 of this document.

~~(f)~~(g) - Design criteria and guidance for alternative intersection and intersection control evaluation (ICE) must follow FDOT Design Manual Chapter 212.

8.11 - Modern Roundabouts

Roundabout design is highly dependent upon site specific conditions as well as experience of the designer and sound engineering judgement. The use of a roundabout shall be documented and ~~justified~~ evaluated using the ~~standard justification report outlined in the *Florida Roundabout Guide* by~~Intersection Control Evaluation (ICE) Manual per FDOT Design Manual Chapter 213. Lane widths, turning radii, super elevation, grades, horizontal clearance, clear zone, border width shall follow the FDOT ~~*Plans Preparation*~~*Design* ~~*Manua.l*~~*Manual* ~~or the AASHTO *Policy on Geometric Deign for Streets and Highways*.~~and NCHRP Report 672, Roundabouts:- An Informational Guide (TRB 2010)~~ NCHRP~~.

8.12 - Driveways

Driveway design shall follow FDOT Standard Plans ~~Indexes 000-515 and 000-516~~Index 522-003, and the ~~*Driveway Information Guide*~~*Access Management Guidebook*. A driveway shall provide sufficient lanes to produce efficient traffic flow while providing a safe environment for all users (vehicles, pedestrians, bicyclist, disabled users, bus patrons, etc.). Efficient traffic flow means that the difference in speed between the turning vehicle and through traffic are minimized, encroachment of the turning vehicle into adjacent lanes is minimized, adequate sight distance is provided and there is sufficient operational area to prevent spill back into the public road. Driveways shall meet the following general standards:

(a) Approved by the entity owning the connecting roadway.

(b) Recommended for approval by the Site Plan Review Committee, if applicable.

(c) Permitted through the driveway permitting process, if applicable.

(d) Shared driveways with cross access and interconnected parking lots shall be used where possible.

(e) When there is a choice, driveways shall be located on the street with the lowest classification and least traffic volume.

(f) Street lighting is required when a driveway is connecting to a collector or arterial roadway. Pole could be located and maintained on the private property to illuminate the driveway connection.

~~(e)~~(g) All driveways with public right-of-way irrigation crossings shall provide a sleeve for the irrigation main that meets the City of Port St. Lucie Irrigation Standards. See Appendix F.

8.12.1 - Driveway Geometry

Driveways shall meet the following geometric standards:

(a) Turnouts are located within the extended property line.

(b) Located outside acceleration or deceleration lanes and tapers.

(c) Coordinated with median openings.

(d) For undivided roadways, driveways shall align with those across the street if possible. Otherwise, driveway shall be offset to minimize jog maneuvers, overlapping left turns or other unsafe conditions.

(e) As close as possible to ninety degrees with the roadway. In accordance with FDOT Standard Plans Index ~~000-515~~330-001 and 522-003, angles ranging from ninety- to sixty-degrees will be considered and may be allowed depending upon the circumstances of the use.

(f) Widths shall meet City Code Section 158.222(B)(2).

(g) Transverse joints shall be tooled, not saw cut.

(h) Sidewalk joints shall continue through driveways.

~~(f)~~(i) For residential driveways, concrete shall be formed ½ inch higher than the existing roadway asphalt pavement. Saw cut the existing edge of asphalt at a minimum of 12 inches into the roadway for the entire width of the driveway. Form boards must be used for the entire width of the driveway when pouring the front face of the driveway and in line with the existing roadway edge of pavement. A minimum 12 inch wide strip of hot mix asphalt shall be used to replace the asphalt removed from forming the driveway.

~~(g)~~(j) Grades shall follow the guidelines of FDOT Standard Plans Index ~~000-515~~522-003 which indicates the maximum grade for a non-residential driveway is ten percent and twenty-eight percent for a residential driveway; however, grades less than these are desirable and recommended. The maximum difference in grade should be no more than the recommend twelve percent. Additionally, the grade of the proposed driveway will need to consider visibility so that a sight distance problem is not caused (e.g., downgrade of a driveway at a point of super-elevation on the roadway).

~~(h)~~(k) Channelization with divisional islands to serve as pedestrian refuges, traffic separation, and/or to direct traffic should be considered where there is a large pavement area, to channelize right-in and right-out movements, for high traffic volumes, for high volumes of larger vehicles, where a traffic signal is located or will be located in the future, and/or where there are two or more entrance lanes.

~~(i)~~(l) Length shall be sufficient so that queuing, stacking, maneuvering, standing, and parking is completed beyond the right-of-way line. The driveway throat length is measured from the ultimate edge of pavement to the first internal drive aisle or parking space as shown in Figure 8-1~~Figure 8-1~~Figure 8-1.

~~(j)~~(m) Recommended minimum throat lengths are provided in Table 8-5~~Table 8-54~~Table 8-4. Careful consideration of future road widening shall be made when determining the required driveway length. Where a site is being redeveloped or the site is on a small property with no reasonable alternative access, it may be difficult to obtain the lengths presented in Table 8-5~~Table 8-54~~Table 8-4. In these cases, the driveway and site layout shall maximize the available length.

Table 8-54 Driveway Throat Length

Description	Minimum Length (feet)
Major Development - four or more lanes	300
Regional Shopping Center over 150,000 square feet	250
Community Shopping Center 100,000 to 150,000 square	150
Small Strip Shopping Center	50
Small Single Commercial Development	30

Source: Driveway Information Guide: Exhibit 36 - Recommended Minimum Driveway Length for Major Entrances, FDOT.

Figure 8-1 Driveway Throat Length

8.12.2 - Number of Driveways

Driveways shall be limited to the number provide in City Code Section 158.222(B)(3). The number of driveways shall be the minimum number necessary to provide reasonable access to the overall site and not the maximum available for that frontage.

8.12.3 - Number of Access Points for Residential Subdivisions

The minimum number of external vehicular access points for residential subdivisions shall adequately serve the subdivision and as recommended for approval by the Site Plan Review Committee. See City

Code Sections 156.094, 158.172, 158.187 and 158.222 for the minimum requirements.~~49or a traffic study 50paved stablestabilized paved , (which may be resident only)~~

8.12.4 - Separation from Intersections

City Code Section 158.222(B)(4) provides the minimum standards for the spacing required between a driveway and intersection.

8.12.5 - Spacing between Driveways

Spacing between driveways shall be measured from the midpoint of each driveway and have the minimum distances provided in City Code Section 158.222(B)(5).

8.12.6 - Movement Restrictions

Movement restrictions at driveways shall be required whenever one of the following conditions occurs:

(a) A warranted left turn lane is not feasible.

(b) Exiting vehicle would be required to drive through the queue or cross a left turn lane of a signalized intersection.

(c) Provision of a median with two-way channelization providing storage for left-turn entry and refuge for left-turn existing vehicles meeting FDOT design criteria is not possible.

(d) The location of the driveway will unnecessarily increase conflicts, or negatively impact the safety of the traveling public, or the function of the adjacent roadway.

8.12.7 - Right Turn Lanes

(a) The use of a continuous right turn lane shall be avoided. Exclusive right turn lanes for driveways are required when the operational aspects of the driveway meet the volume and speed criteria presented in Table 8-6~~Table 8-65Table 8-5~~, where a traffic study indicates that the LOS is degraded by the proposed development, or where required for safety reasons even though the peak hour turn volumes may be lower than specified in Table 8-6~~Table 8-65Table 8-5~~.

Table 8-~~6~~5 Unsignalized Driveway Right Turn Lanes[1, 4, 5]

Roadway Posted Speed Limit	Number of Right Turns Per Hour
45 mph or less	80-125 [2]
Over 45 mph	35-55 [3]

[1]Source: FDOT Access Management Guidebook, Table 27

[2]The lower threshold of eighty right turn vehicles per hour would be most used for higher volume (greater than 600 vehicles per hour, per lane in one direction on the major roadway) or two-lane roads where lateral movement is restricted. The 125 right turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with a large entry radius (fifty feet or greater).

[3]The lower threshold of thirty-five right turn vehicles per hour would be most appropriately used on higher volume two lane roadways where lateral movement is restricted. The fifty-five right turn vehicles per hour upper threshold would be most appropriate on lower volume roadways, multilane highways, or driveways with large entry radius (fifty feet or greater).

[4]A posted speed limit of over forty-five mph may be used if the operating speeds are known to be over forty-five mph during the time of peak right turn demand.

[5]Projecting turning volumes is, at best, a knowledgeable estimate. Keep this in mind especially if the projections of right turns are close to meeting the guidelines. In that case, consider requiring the turn lane.

(b) An exclusive right turn lane shall be required, even if the speed and volume criteria is not met, when one of the following conditions exist:

(1) Developments that have a high volume of buses, trucks, or trailers.

(2) Poor internal circulation that may cause backups onto the roadway.

(3) Heavier than normal peak flows on the roadway.

(4) Very high operating speeds on the roadway.

(5) Areas where turns are not expected.

(6) Roadways with curves, hills, or other sight distance restrictions.

(7) Gated entrances.

(8) An area with a history of crashes, especially rear end collisions.

(9) Intersections or driveways just after a signalized intersection where acceleration typically occurs.

(10) A driveway with a severe skewered angle.

(11) Areas of heightened safety concern.

8.12.8 - Left Turn Lanes

A left turn lane for driveways shall be provided:

(a) Whenever a driveway is served by a median opening.

(b) On a two-lane road, on curves, or whenever speeds are forty-five mph and greater.

(c) Where a traffic study shows that the LOS is degraded by the proposed traffic.

(d) When warranted by ~~the~~ NCHRP *Report 745 Development of Left Turn Lane Warrants for Unsignalized Intersections* and NCHRP *Report 279 Intersection Channelization Design Guide*~~Report 745 analysis and Report 279~~.

8.13 - Clear Visibility Triangle

In order to provide a clear view of intersecting streets and driveway entrances, a triangular area of clear visibility shall meet the following standards.

(a) Nothing shall be located, erected, placed, planted, or allowed to grow in such a manner as to impede vision between a height of three feet and eight feet within the triangular area.

(b) Road Intersections: The clear visibility triangle shall be formed by drawing a line twenty-five (25) feet along each property line abutting the right-of-way starting at the point where the two property lines intersect or their projections intersect, then connecting the two end points with a straight line as shown in Figure 8-2~~Figure 8-2~~~~Figure 8-2~~.

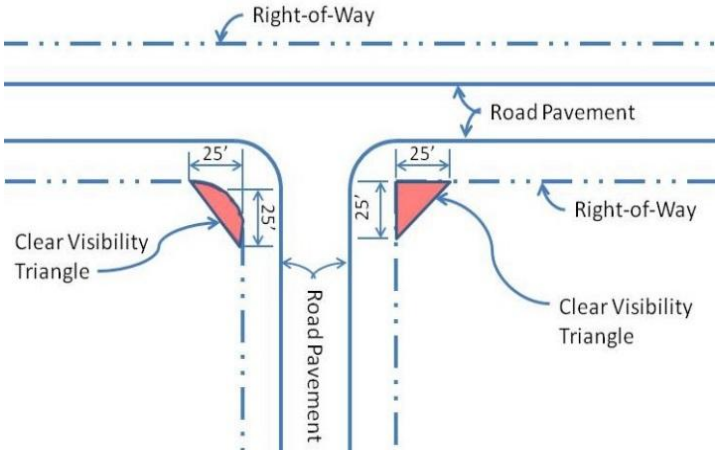


Figure 8-2 Clear Visibility Triangle at Intersection

(c) Driveways: A clear visibility triangle shall be formed as shown in Figure 8-3~~Figure 8-3~~~~Figure 8-3~~. Beginning at the intersection of the driveway with the road right-of-way, then along the right-of-way for a distance of twenty-five (25) feet, then in a straight line across the property to a point on the edge of the driveway twenty-five (25) feet from the point of beginning. Where driveways are curved or intersect with the street at other than right angles, the visibility triangle shall be measured from the point of the curve most projecting into the driveway.

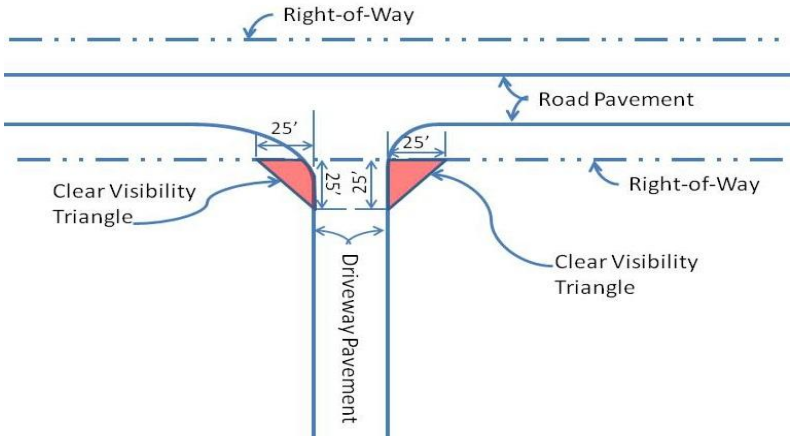


Figure 8-3 Clear Visibility Triangle at Driveway

Sight–Distance

Sight distance applies to all intersections and driveways and is intended for the purpose of clear sight development and maintenance. Design~~s~~ and maintenance of intersections and driveways within the City

shall meet the requirements of FDOT Design Manual. ~~(Latest Edition)~~

8.14 - Roadside Clear Zone

The roadside clear zone provides space and time for the driver to retain control of the vehicle and avoid or reduce collision with roadside objects. Roadside clear zone width shall be in accordance with the FDOT Design Manual. ~~(Latest Edition)~~

8.15 - Sidewalks

Sidewalks shall meet the following ~~requirements, and~~requirements ~~and~~. Should there be any conflicts between the two documents, the more stringent will apply:

(a) Designed and constructed in accordance with the FDOT Greenbook and ADA standards. ~~(Latest Edition)~~

(b) Minimum width of five (5) feet when separated from the back of curb. ~~Sidewalks constructed as part of a road improvement project shall have a minimum width of six~~ (6) ~~feet as provided in~~ Table ~~8-1Table 8-1.~~

(c) Minimum width of six (6) feet when located adjacent to the back of curb or edge of pavement.

(d) Maximum cross slope of 1.5 percent.

(e) Grades less than 8.33 percent.

(f) Curb ramps at all intersections.

(g) Sidewalks shall be constructed with three-thousand (3000) psi concrete.

(h) A minimum sidewalk thickness of six (6) inches is required for the following cases:
(1) Located within a concrete driveway;
(2) Within five (5) feet of an intersection or driveway;
(3) Within easements and drainage rights-of-way; ~~or~~
~~(3)~~(4) Access crossings to utilities or stormwater management facilities;
~~(4)~~(5) Areas of special concern as requested by the City Engineer.

(i) If a sidewalk thickness of six (6) inches is not required, a four (4)-inch-thick sidewalk is acceptable.

~~(i)~~ JA 4' minimum width for curb ramps, curb ramp landings, and sidewalk crossings at driveways.

(j)

Transverse joints shall be tooled, not saw cut.

(k) ~~I~~Prior to sidewalk and detectable warning mat installation the existing asphalt must be saw cut at a minimum 12 inches in width by a minimum width of the sidewalk. A form board the width of the sidewalk must be used at the front face of sidewalk between the asphalt radius. A minimum 12 inch wide strip of hot mix asphalt must be used to replace the asphalt removed for sidewalk tie in installation.

~~(j)~~

8.16 - On Street Parking

~~On-street~~On-street parking shall be allowed within Traditional Neighborhood Developments or in designated Community Redevelopment Areas as approved by the City Council on local or collector

streets. On--street parking shall be located so that it is outside the radius of the intersection and does not hinder the intersection sight distance. On-street parking shall be designed on a case-by-case basis and subject to approval by the City Engineer.

8.17 - Traffic Calming

The City's neighborhood traffic calming policy is provided in Appendix B.

8.18 - Beautification Policy

The City's beautification policy is provided in Appendix C.

8.19 - Mobility Plan

The City's Mobility Plan is found on City of Port St Lucie website under Planning & Zoning Department: https://www.cityofpsl.com/Government/Your-City-Government/Departments/Planning-Zoning/Mobility-Plan

9. Traffic Control Devices, Signalizations and ~~Lights~~ Lighting

9.1 - Traffic Control Devices

(a) Traffic control devices include pavement markings, signs, and other devices used to regulate, warn, or guide traffic, which are placed on, over, or adjacent to a street, highway, pedestrian facility, bikeway, or private road open to public travel. The purpose of traffic control devices~~s~~ is to provide for the orderly and predictable movement of traffic. Therefore, the standardization of use is of utmost importance.

(b) The determination of need, warrant, and placement of traffic control devices shall be as determined by the design documents or as revised later due to a systematic engineering judgment and/or study. Traffic control devices added, removed, or relocated shall only be completed with the approval of the owner of the right-of-way. The design and installation of all traffic control devices shall be in accordance with the ~~latest edition of~~ FDOT Standard Plans, MUTCD, and NEC.

9.1.1 - Pavement Markings

Pavement markings include, but are not limited to, pavement markings, raised pavement markers (RPM's), curb markings, delineators, and colored pavements. In some instances, markings supplement other traffic control devices. The following standards relating to pavement markings shall be used in the City:

(a) Temporary paint markings may be used on a construction project for the first lift of asphalt as allowed by FDOT guidelines. Temporary paint may also be used as ~~interim~~an interim measure prior to the placement of thermoplastic on the final lift of asphalt at the discretion of the City's project manager.

~~(a)~~(b) All new striping on public roads shall follow all FDOT Specifications for method and material.

~~(b)~~(c) The final lift of asphalt shall be provided with thermoplastic pavement markings after an acceptable curing time. Curing time is typically thirty (30) days.

~~(c)~~(d) Contrasting color, permanent tape shall be applied to all concrete surfaces, specifically bridge decks.

~~(d)~~(e) Striping removal shall follow FDOT specifications. ~~(Latest Edition).~~ Preferred Method is Mill and Overlay per FDOT Specifications. Method must be pre-approved by Public Works Department for each project.

~~(e)~~(f) Hydroblasting to remove pavement markings from the final lift ~~shall not be permitted~~is prohibited.

(g) Black paint to remove or cover up pavement markings ~~shall not be permitted~~is prohibited.

(h) Retro-reflectivity standards shall be in accordance ~~per~~with MUTCD

~~(f)~~(i) Marked crosswalks shall be Special Emphasis per FDOT Standard Plans ~~(Latest Edition).~~

9.1.2 - Signage

The determination of need, design requirements, and vertical and horizontal placement of traffic control signs within the road right-of-way shall be in accordance with MUTCD, and the FDOT Standard Plans ~~(Latest Edition)~~. Memorial markers are discussed in ~~s~~Section 0~~3~~.4.2, signs for private facilities are discussed in S~~s~~ection 0~~3~~.4.3 and temporary signage is discussed in ~~s~~Section 0~~3~~.4.4

(a) All signs shall be diamond grade.
(b) Sign blanks shall be aluminum and 0.8" thickness.

9.1.2.1 Driver Feedback Signs

a. Radar speed display signs shall be Traffic Logix EV11EYL-SOL or latest version as approved by the City. Model EV 11" Digital Solar including Strobe, BT, Data-modem with 12-month network access to cloud-4 cell backup.

9.2 - Signalizations

All traffic signal installations or modifications shall require a signalization plan that is signed and sealed by a professional engineer licensed to practice in the state of Florida. The signalization plan shall be reviewed and approved by the City and permitted prior to starting any work. Upon completion of the work, one set of signed and sealed record drawings along with electronic versions (PDF and DWG formats) shall be submitted to the City.

9.2.1 - Traffic Signals

Traffic signals shall meet the requirements for the following: MUTCD; FDOT *Standard Plans*, *Standard Specifications for Road and Bridge Construction*, *Traffic Engineering Manual*, *Minimum Specifications for Traffic Control Signals and Devices*, *Intersection Design Guide*, *District 4 Signal Design Guidelines*, and the Fiber Optic Specifications (Appendix D). Specific traffic signal requirements are listed below:

(a) General

(1) Equipment and materials shall be listed on the FDOT APL.

(2) The City shall be supplied with one Honda EU 3000i portable invertor generator (or equivalent) upon completion of a traffic signal that will be owned and maintained by the City.

(3) Span wire assemblies shall not be permitted within the City, unless otherwise approved for temporary installations.

(4) Span wire assemblies, where approved, shall be perpendicular, box and dropped-box span assemblies. Diagonal spans may only be used for flashing beacon assemblies or where approved by the City Engineer. Pre-stressed concrete or steel poles shall be used.

(5) Annual power and maintenance costs of traffic signals on private roads are the sole responsibility of the owner of the road, unless a signed agreement has been executed.

(6) Upon completion of the work, one set of signed and sealed record drawings along with electronic versions (PDF and DWG formats) shall be submitted to the City.

(7) For projects that will be owned and maintained by the City, shop drawings for the materials including, but limited to, controller assemblies, mast arms, luminaires, internally illuminated street name signs, optical vehicle detector systems, signal heads, traffic monitoring cameras, fiber

optic materials, pull boxes, cable, conduit, etc. shall be provided to the City for review and approval prior to installation.

(8) For projects that will be owned and maintained by the City, warranty information and transfers shall be submitted to the City prior to ~~the final~~final acceptance by the City.

(b) Design/Operation

(1) For programed flash operation, the major street is to flash yellow and the minor street is to flash red.

(2) The controller shall operate an approved FDOT Signal Operating Plan.

(3) Signal timing displayed for local operation shall be suggested timings based on the St. Lucie TPO volume counts. Actual timing and coordination plans are to be determined by the City.

(c) Controller Assembly

(1) The controller assembly shall be a ~~Naztec TS2 Type 1 Cabinet with a Number 7 key.~~Econolite Colbalt ATC or most recent version of controller approved by the City.

(2) The top of the foundation shall be twelve (12) inches above the sidewalk or the edge of pavement if there is no sidewalk.

(3) A disconnect switch shall be mounted on a separate concrete pole ~~on controller~~on the controller cabinet corner.

(4) ~~Controller~~The controller base shall have four conduits: ~~-~~two for communication cable and two for power. The conduits shall be terminated in the communication pull box.

~~(4)~~(5) Cabinet shall be FDOT State contract Econolite TS2T1 77" with generator panel.

~~(5)~~(6) The controller cabinet shall be oriented with the door opening away from the roadway so that the technician can view the entire intersection while working in the cabinet.

~~(6)~~(7) A concrete pad that measures forty-eight- by thirty- (48 x 30) inches, ~~preferable,~~ shall be constructed adjacent to the controller cabinet. The pad elevation shall match the elevation of the sidewalk. In the absence of sidewalk, the concrete pad elevation shall match the elevation of the edge of pavement. The pad shall have a six (6) -inch eyebolt, protruding from the concrete at the hinge side of the cabinet, that can be used to secure a generator.

(d) Mast Arms

(1) Mast arm assemblies shall follow FDOT Design Guidelines and Design Standards ~~(Latest Edition)~~.

(2) Mast arm foundations shall be in accordance with FDOT Standard Plans. ~~(Latest Edition).~~

(3) Mast arm shop drawings shall be reviewed and approved by the City prior to procurement of mast arms.

(4) Top of mast arm foundations within a sidewalk shall match the finish contour and elevation of the sidewalk.

(5) Final location of mast arm is to be field determined and approved by the City.

(b) Luminaires

(1) Luminaires on mast arm uprights shall be 120 Volt, LED ~~and 250 watt HPS equivalent~~.

(2) Luminaires shall be wired on a separate breaker in the disconnect box.

(c) Street Name Signs

(1) Internally i~~I~~lluminated street name signs shall have 10-inch series "C" Letters.

(2) Signs shall be rigidly mounted to the mast arm.

(3) Signs shall be wired to a single photo cell located in the controller cabinet.

(d) Optical Vehicle Detectors

(1) Inductive loop technology and microwave technology shall not be permitted for vehicular detection, unless otherwise approved by the City Engineer. Video detection is preferred. In instances where video detection is not feasible, inductive loops will be considered as an alternative.

(2) All video power cables, processors, and equipment shall be provided for a complete and operational video detection system that complies with the City's existing video system.

(3) Processors shall be Iteris Edge II, with Iteris Edge connect and Iteris TS2-IM module and shall be capable of multi zone detection.

(4) Cameras shall be Iteris RZ4-WDR or most recent version of optical detector approved by the City.

(5) Cameras shall be mounted above the mast arm using astro bracket hardware at a height that allows the required detection and as recommended by the system manufacturer.

(6) All detection camera brackets shall be drilled and tapped for 1/4-20 set screw after installation to prevent camera from laying over in high winds.

(7) Anti-seize shall be used on all mounting hardware for the camera brackets.

(8) The detection system shall be equipped with an LCD monitor for configuration of the detector loops.

(9) Manufacturers shall be present at turn on for programming and setup.

(e) Signal Heads

(1) Five (5) -section signal heads shall have an additional terminal strip installed in the red ball signal head with a red and neutral jumper wire attached for the ease of replacing the red ball LED signal.

(2) All signal heads shall be poly-construction and have back plates with retroreflective borders installed in accordance with FDOT standards. ~~(Latest Edition).~~

(3) Signal heads shall be vertically and rigidly mounted to the mast arms.

(4) Anti-seize shall be used on all mounting hardware for the camera brackets.

(5) Weep holes shall be drilled in all signal heads/pedestrian signals.

~~(5)~~(6) Four (4) ~~-~~-section Flashing Yellow Arrow signal heads shall be used for protected/permissive left turn indications.

(f) Traffic Monitoring Camera

(1) New and modified traffic signals shall include the installation of a pan-tilt zoom traffic monitoring camera.

(2) Traffic monitoring camera shall be Bosch Autodome IP Starlight 700HD Pan Tilt Zoom or most recent version of PTZ camera approved by the City.

(3) The camera shall have surge and lighting protection and shall be mounted with mast-o-bracket and neoprene wrap.

(4) The mounting location shall be determined by the City.

(5) Anti-seize shall be used on all mounting hardware for the camera brackets.

(g) Electrical

(1) Electrical work shall meet the requirements of the NEC, NESC, and the FDOT Specifications for Road and Bridge Construction.

(2) Components shall be properly grounded and bonded per NEC requirements.

(3) Conductor and/or wire connections shall be butt spliced and waterproof. Wire nuts will not be accepted.

(4) An UPS, Novus FXM 2000 with a network interface card installed and configured, shall be provided for the signals.

(5) The UPS shall be located in a Novus Fortex FX 200 cabinet that is mounted on a concrete pad alongside the controller foundation.

(6) Signal conductor within the cabinet shall completely encircle inside of cabinet before termination to allow slack for knock downs.

(7) Signal conductor shall pass through hole in the mounting bracket into signal mounting pipe and into signal head so cable is not exposed to the elements.

(8) Wire nuts shall not be used within the controller cabinet, street light circuit or signal circuit. Approved connections are terminal strips, ~~water tight~~watertight butt splices (rubber tape electrical tape, scotch cote), and split bolts.

(9) All signal upright hand holes shall have terminal strips installed for the termination of signal conductor from the controller cabinet to the signal heads/pedestrian signals.

(10) All ground wiring within pull boxes requiring termination to ground rod shall be attached using cad weld ignitors.

(11) All spare signal conductor within controller cabinet shall be terminated directly to ground/neutral bars.

(12) All signal conductor within the upright hand hole and controller cabinet shall be properly labeled using flag tie wraps.

(13) The electrical feed source shall be coordinated with FP&L.

(h) Fiber Optics

(1) New and modified traffic signals shall be interconnected to the City's ITS network via fiber optic. This requirement may be waived by the City Engineer if the new or modified traffic signal is not located within a reasonable distance of an existing fiber optic trunk line.

(2) Fiber optic ethernet switch shall be Siemens/Ruggedcom RS-900G-HI-D-2SC10-XX, and shall be fully configured for operation, including assigned IP Address determined by the City.

(3) Pull box (Fiber Optic) - Tier 15 (~~minimium~~minimum)

a. Box: Quazite – PG1730BB18 – 17L x 30W x 18H (inches), Cover: Quazite – PG1730CA00

b. Box: Synertech - S1730B18FA –17L x 30W x 18H (inches), Cover: Synertech - S1730HBBOA

(4) Splice Box (Fiber Optic) - Tier 15 (~~minimium~~minimum)

a. Box: Quazite – PG3048BB – 30L x 48W x 36H (inches), Cover: Quazite – PG3048HC00

b. Box: Oldcastle – 3048-36 - 30L x 48W x 36H (inches), Cover- Oldcastle - Uni-half 3048

(5) Splice Closures (Fiber Optic): Tyco FOSC-450-C6-6-NT-0-C6V

a. Enclosure Splice Tray: FOSC-ACC-C-Tray-24

b. Basket: FOSC-ACC-C-Basket

(6) Fiber Optic Cable

a. Corning/Siecor – 096EU4-T4701D20 - 96 Fiber ALTOS® Gel-Free Cable Non-Armored SMFE 1.4/0.4/0.3 dB/km 12f/tube. Print in feet.

b. Corning/Siecor – 012EU4-T4701D20 - 12 Fiber ALTOS® Gel-Free Cable Non-Armored SMFE 1.4/0.4/0.3 dB/km 12f/tube. Print in feet.

(7) The following pay items (shown using the FDOT item number, quantity and format) shall be incorporated into the signalization plans for each intersection:

a. Closed Circuit Television Items

i. 686-101-2 Video Data Serial Converter (Furnish and Install) - 1 Each

ii. 686-101-3 Copper Data Patch Cables 5 (Furnish & Install) - 1 Each

iii. 686-101-4 Camera Assembly, Bosch 36XG5, Smoked Lens w/ Composite Cable & Gasket (Furnish & Install) - 1 Each

iv. 686-101-5 Mount, Mastobrac and Neoprene Wrap (Furnish & Install) - 1 Each

v. 686-101-6 Video Coax Patch Cables w/ Splitter (Furnish & Install) - 1 Each

vi. 686-101-8 Maintenance Unit -Surge Arrestor Panel for Power, Data, Video w/ Interface (Furnish & Install) - 1 Each

vii. 686-101-7C Multi-Voltage Power Supply Module (Furnish & Install) - 1 Each

b. Electronics

i. 686-101-1 FO Ethernet Switch 1000BaseF, 2opt-8cu (Furnish & Install) - 1 Each

ii. 686-101-1B FO Ethernet Switch 1000BaseF, 2opt-8cu POE (Furnish & Install)

iii. 686-101-1C Cisco Industrial 4000 8GT8GP4G-E FO Ethernet

c. Fiber Optic Cable – Outside Plant Installation

iv. 101-1 Mobilization and Documentation – Lump Sum

v. 633-TW Tracer Wire w/ Radio Detection System Balancing for Citywide Locate System (Furnish & Install) – Linear Feet

vi. 633-113-123 FO Cable 96F, SM, LT, UG (Furnish & Install) - Linear Feet

vii. 633-113-DM ROW Delineator Marker Post Orange 6-feet (Furnish & Install) - 1 Each

viii. 633-1-121 FO Cable 12F, SM, Drop Cable (Furnish & Install) - Linear Feet LF

ix. 633-2-31 FO Connection (Install) Splice - 1 Each

x. 633-2-31 FO Connection (Install) Termination - 1 Each

xi. 633-7-12 FO Splice-Term. Cabinet, 12F, Wall/Rack (Furnish & Install) - 1 Each

xii. 633-9-A FO Jumper, Duplex ST-ST, SM, 10-Feet (Furnish & Install) - 1 Each

xiii. 633-9-B FO Jumper, Duplex SC-ST, SM, 10-Feet (Furnish & Install) - 1 Each

xiv. 633-9-C FO Jumper, Duplex LC-ST, SM, 10-Feet (Furnish & Install) - 1 Each

xv. 633-9-12 FO Splice Closure 12F, Aerial/UG (Furnish & Install) - 1 Each

xvi. 633-9-96 FO Splice Closure 96F, Aerial/UG (Furnish & Install) - 1 Each

xvii. 635-1-15 FO Pullbox (Furnish & Install) - 1 Each

xviii. 635-1-15A FO Splicebox (Furnish & Install) - 1 Each

(8) For additional information on the City's fiber optic network, refer to Appendix D, City of Port St Lucie Fiber Optic Network Minimum Design Standards and Details

~~Traffic Signal Coordination~~

~~(8)~~

9.2.2 - Traffic Signal Spacing

Traffic signal spacing shall be in accordance with Florida Administrative Code Rule 14-97, Table 2 – Access Management Standards for Controlled Access Facilities. The majority of roads in the City are Class 7, which has a minimum spacing of 1,320 feet between signals. The roadway access class shall be approved by the City Engineer.

9.2.3 - ~~Beacons and Midblock Treatments~~

Pedestrian Signals

Pedestrian signals shall meet the following requirements as well as the applicable requirements presented for traffic signals in Section 0~~9.2.1~~9.2.1 - Traffic Signals~~Traffic Signals~~~~Traffic Signals~~:

(a) Equipment and materials shall be listed on the FDOT APL.

(b) Pedestrian signal design and placement shall follow FDOT guidelines and ADAAG.

(c) ~~All new and modified~~Accessible pedestrian signals ~~shall be~~ (APS) type with audible indications will be evaluated on a ~~case by case~~case-by-case basis.

(d) All new and modified Pedestrian Signals shall countdown during pedestrian change interval.

(e) Shop drawings of new and modified pedestrian signals and appurtenances shall be submitted to the City and approved prior to procurement.

(f) All signal heads shall be poly-construction.

(g) Leading Pedestrian Interval (LPI) will be evaluated on a ~~case by case~~case-by-case basis.

~~(e)~~(h) Treatments for pedestrian crosswalks at midblock and unsignalized intersections shall be in accordance with Section 5.2 of the FDOT Traffic Engineering Manual.

9.3 - Roadway and Pedestrian Lighting

All roadway and pedestrian lighting installations or modifications shall require a lighting plan that is signed and sealed by a professional engineer ~~registered~~ licensed to practice in the state of~~in~~ Florida. The lighting plan shall be reviewed and approved by the City prior to starting any work. Lighting for roadways and pedestrians shall meet the following requirements:

(a) General

(1) Alternative energy-efficient lighting technologies, such as LED shall be required for all new construction and modification of existing facilities, unless otherwise approved by the City Engineer.

(2) Annual power and maintenance costs for roadway and pedestrian lighting on private roads are the sole responsibility of the owner of the road, unless a signed agreement has been executed.

(3) Upon completion of the work, one set of signed and sealed record drawings along with electronic versions (PDF and DWG formats) shall be submitted to the City.

(4) For projects that will be owned and maintained by the City, shop drawings for the materials including, but limited to, pull boxes, cable, conduit, poles, transformer bases, etc. shall be provided to the City for review and approval.

(5) For projects that will be owned and maintained by the City, warranty information and transfers shall be submitted to the City prior to ~~the final~~final acceptance by the City.

(b) Design

(1) All roadway lighting design, including but not limited to spacing and placement, shall meet or exceed minimum criteria established by FDOT design guidelines and the ITE Traffic Engineering Handbook. ~~(Latest Edition).~~

(2) Illumination levels shall meet criteria set forth in FDOT's ~~Plans Preparation~~Design Manual, ~~Volume 1~~Part 2.

(c) Pull Boxes

(1) Armorcast Products #A6001946TAPXX12 polymer concrete box or equivalent.

(2) Box dimension is 13W x 24L x 12H (inches) with an open bottom.

(3) Load rating of box shall be a minimum of twenty thousand (20,000) pounds.

(4) Lid shall be non-metallic, have a non-skid surface, stamped "street lighting", and be secured to the box.

(5) Where possible, pull boxes shall not be located within a sidewalk. Approval from the City shall be obtained prior to installation within a sidewalk.

(6) Pull boxes shall never be placed within sidewalk ramps or a road.

(7) A pull box shall be located two feet, maximum, from each pole.

(8) Each pull box shall be supplied with a grounding rod and shall be properly grounded in accordance with FDOT specifications.

(d) Conductor, Cable, Conduit

(1) Conductor and/or cable shall be housed in ~~two~~a two-inch schedule forty conduit.

(2) One spare conduit shall be provided for conduit run, including roadway crossings.

(3) Each spare conduit shall be supplied with a pull string.

(4) Conductor at the pole hand holes and pull boxes shall be looped in the pole and/or pull box with sufficient length (about three (3) feet) to completely remove connectors and splices one foot outside the hand hole and pull box to make connections and splices accessible for changing fuses and troubleshooting the system.

(e) Poles

(1) Hand holes for poles and transformer bases shall be located opposite approaching traffic.

(2) Each pole shall be equipped with an accessible fuse and fuse holder with protective boots.

(3) Each pole shall be equipped with a lightening arrestor that is properly grounded.

(f) Construction

(1) All workmanship and materials shall be in accordance with the FDOT Standard Plans ~~(Latest Edition)~~ and FDOT Specifications for Road and Bridge Construction. ~~(Latest Edition).~~

(2) Equipment and materials shall be listed on the FDOT QPL/APL.

(3) Poles, luminaires and bases shall be fabricated in accordance with AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals,* and shall have been tested by FHWA approved methods. Certification for tests shall be submitted to the City with the shop drawings.

(4) Pulling Cable

a. Pulling device shall be connected to the copper wire, not the jacket.

b. Pulling stress shall be as specified by the manufacturer.

c. Pulling compound shall be used in accordance with the manufacturer's requirements.

d. Bends shall meet the manufacturer's requirements.

(5) Electrical Work

a. Electrical work shall meet the requirements of the NEC, NESC, and the FDOT Specifications for Road and Bridge Construction.

b. Components shall be properly grounded and bonded per NEC requirements.

c. Conductor and/or wire connections shall be butt spliced and waterproof. Wire nuts will not be accepted.

d. The electrical feed source shall be coordinated with FP&L.

Specifications for Roadway Lighting

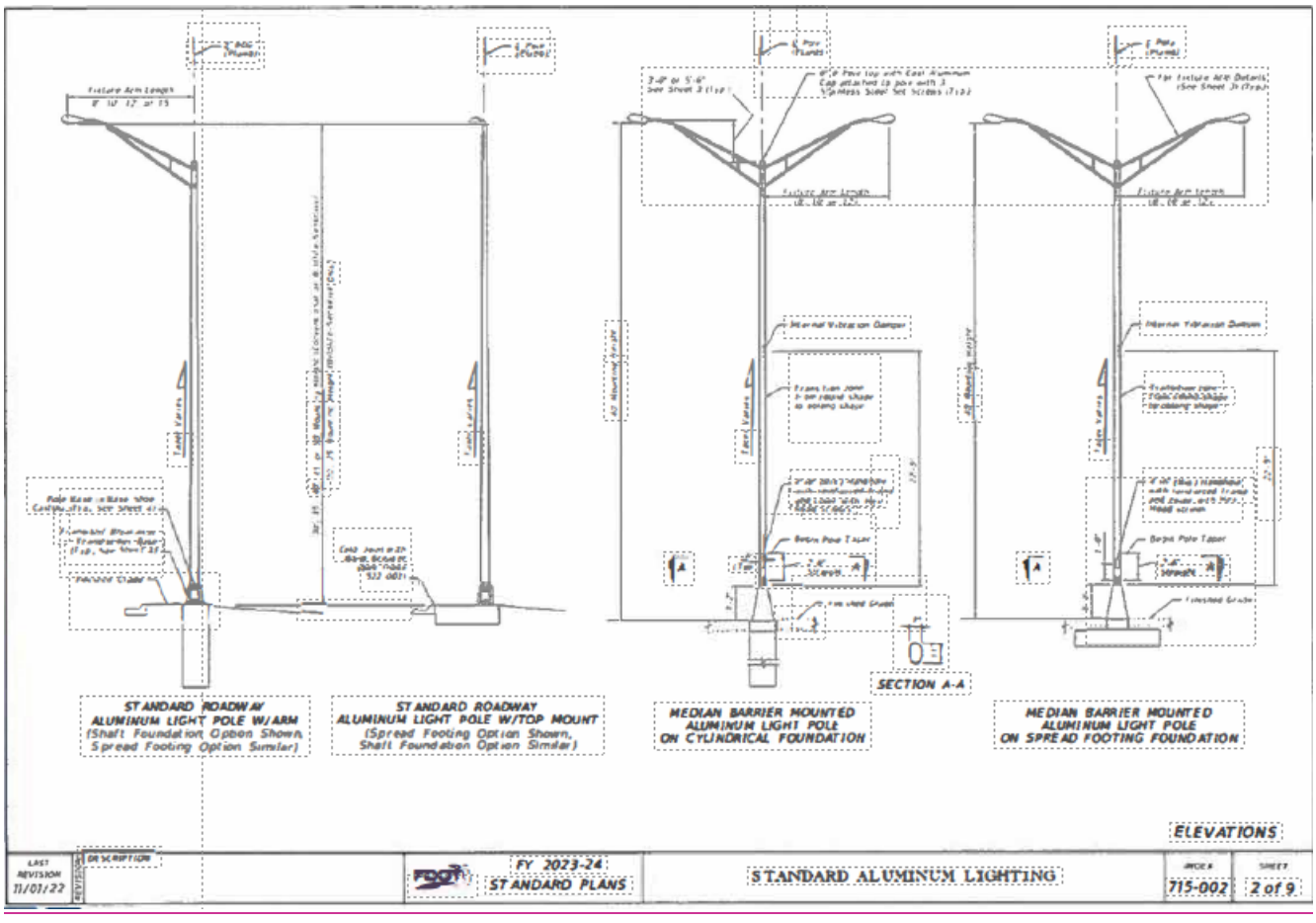
1. Roadway lighting is required for all newly constructed roadways that are intended to be owned and maintained by the City.
2. Roadway lighting shall meet the most current FOOT standard plans, FOOT standard specifications and FOOT Design manual and be on the FOOT Approved Products List (APL).
3. Roadway illumination shall be provided for all midblock (uncontrolled) pedestrian crossings.
4. All roundabouts and traffic circles must be designed with roadway illumination and meet applicable illumination standards.
5. All fixtures shall be light emitting diode (LED) technology with the light-cone and lumen output able to meet FOOT standards for roadway illumination and be on the FOOT APL.
6. LED fixtures shall have the ability to be shielded to prevent light intrusion into adjacent properties, should this become necessary.
7. All light poles shall be equipped with a festoon box including GFCI 110v outlet and in-use cover.
8. Height of pole, length of arm and pole spacing shall be determined by a qualified engineer and meet FOOT illumination standards.
9. Conductor and/or cable shall be housed in 2" schedule 40 conduit and provide one spare conduit for each conduit run. Each spare conduit shall be supplied with pull string.
10. Polymer concrete pull boxes shall be installed at each pole location and be 13W X 24L X12H 20K. Lid must be fastened to box and be stamped "streetlighting".
11. Photometric plans, Lighting Plans and Shop Drawings shall be approved by the City's Public Works Traffic Operations Division prior to construction.
12. • The City's Roadway and Pedestrian Lighting General Notes shall be provided with all lighting design plans. Please contact 772-344-4360 to obtain the most recent version of these notes.

Specifications for Pedestrian Lighting

1. Pedestrian illumination, if provided, shall meet the most current Florida Department of Transportation (FOOT) Design manual.
2. Light pole wiring and installation shall meet FOOT standard plans.
3. Poles shall be ornamental flute tapered aluminum monotube with a maximum of height of 16' including luminaire.
4. Poles shall meet current wind speed requirements and have a 25yr design life.

5. Poles shall be mounted to a concrete foundation utilizing breakaway couplings and a modified cast aluminum base with twin doors separated 180 degrees.
6. Pole color is specific to project and subject to City approval.
7. All fixtures shall be light emitting diode (LED) technology with the light-cone and lumen output able to meet FOOT standards for pedestrian facility illumination.
8. LED color temperature shall be no greater than 3000K.
9. LED fixtures shall have the ability to be shielded to prevent light intrusion into adjacent properties, should this become necessary.
10. All light poles shall be equipped with a festoon box including GFCI 110v outlet and in-use cover.
11. Height of pole and pole spacing shall be determined by a qualified engineer and meet FOOT illumination standards.
12. Conductor and/or cable shall be housed in 2· schedule 40 conduit and provide one spare conduit for each conduit run. Each spare conduit shall be supplied with pull string.
13. Polymer concrete pull boxes shall be installed at each pole location and be 13W X 24L X12H 20K. Lid must be fastened to box and be stamped "streetlighting".
14. Photometric plans, Lighting Plans and Shop Drawings shall be approved by the City's Public Works Traffic Operations Division prior to construction.
15. The City's Roadway and Pedestrian Lighting General Notes shall be provided with all lighting design plans. Please contact 772-344-4360 to obtain the most recent version of these notes.
16. • See reference sketch next page (FOOT Index 715-002 pg. 2 of 9) ...

~~(g)~~



10. Landscaping and Irrigation

10.1 - General

All landscaping and irrigation shall be placed and maintained in accordance with applicable codes, approved construction plans, the Right-of-Way Permit,– SFWMD Water Use Permit, ~~and~~ the Beautification Policy Guidelines set forth in Appendix C, and the Irrigation Standards set forth in Appendix F.

10.2 - Privately Owned Property

(a) Landscaping and irrigation within private property shall be in accordance with City Code Chapter 154.

(b) Landscape materials within private developments shall be maintained in a manner that ensures public safety. Landscaping shall meet the requirements for the clear visibility triangle (Section 0~~8.13~~), sight distance for intersections and driveways (Section 8.15), and not overhang so that the use of sidewalks or roadways is hindered.

(c) Sprinkler heads and irrigation systems installed adjacent to public roadways and sidewalks shall be designed to ensure public safety and shall not spray water over or on the roadway or sidewalk area. Irrigation systems shall not be operated during high pedestrian or vehicular travel times.

10.3 - City-Owned Property

(a) Any landscaping or irrigation located within City-owned property, including rights-of-way, which causes or contributes to the deterioration of the road shoulder; swale; roadway systems; drainage pipes; drainage structures; drainage systems; creates a hazard for drivers, pedestrians, or bike users; or interferes/hinders the operation and/or maintenance of roadway or drainage systems shall be subject to removal at the discretion of the City.

(b) The installation and/or maintenance of landscaping within a City-owned property or right-of-way by entities other than the City requires an agreement, approved by City Council, between the entity and the City, and installed in accordance with the Beautification Policy Guidelines set forth in Appendix C.

(c) All landscaping provided on City-owned property shall include an irrigation system that meets the requirements set forth in Appendix F.

10.4 - Tree Root Barriers

Any tree locations less than five (5) feet to City-owned or maintained curbs, pavement, or sidewalks shall have a root barrier that is at least twenty-four (24) inches deep and fifteen (15) feet long (centered) parallel to the pavement, curb or sidewalk. Larger trees may require deeper and/or longer barriers.

11. Bicycle and Pedestrian Facilities

11.1 - General

Opportunities for bicycle and pedestrian mobility should be enhanced through site design strategies that seek to shorten walking distances and increase accessibility between neighborhoods, schools, recreation areas, community centers, shopping areas or employment centers. Development shall be designed to support bicycle and pedestrian mobility in accordance with the following:

(a) Accessible routes that meet the requirements of the ADA.

(b) Connecting the development to the adjacent roadway sidewalk system.

(c) Providing easements that connect the development to schools, parks, playgrounds, roads or other facilities.

(d) Pedestrian ways between parking areas, the building entrance, surrounding street sidewalks, external sidewalks, outparcels, and abutting properties.

(e) Pedestrian circulation shall be provided between abutting commercial properties ~~through the use of~~using walkways and similar pedestrian-oriented facilities.

(f) Pedestrian facilities may be incorporated into the required landscape buffer.

(g) Bicycle and pedestrian amenities, such as benches, water fountains, or bicycle racks, should be provided for developments where possible and appropriate as required in the City of Port St. Lucie Citywide Design Standards.

~~(g)~~(h) Safe bicycle and pedestrian access to bus stops, parks, public facilities, shared use paths, sidewalks and trails. Connections and crossings at intersections and midblock locations must be evaluated to provide safety and mobility per the City's adopted ~~Mobilty~~Mobility and Multimodal Plans.

11.2 - Sidewalks

All new roadways shall have sidewalks as provided in section 0~~8.6~~. New development and revisions to existing development shall provide sidewalks along adjacent existing roadways in accordance with City Code Section 158.222(E).

12. Parking Areas

12.1 - General

(a) Parking requirements shall be in accordance with the City Code Section 158.221. The design of the parking lot should provide a continuous flow of traffic, allow for the safe movement of pedestrians, and create obvious and simple circulation patterns.

(b) Driveways for parking areas areis discussed in section 08.12. Parking spaces shall be located outside the throat of the driveway as discussed in section 08.12.1

12.2 - Number of Parking Spaces

(a) The number of standard paved parking spaces required for the particular land use and zoning is provided in City Code Section 158.221(C). In addition to the standard parking spaces, the appropriate number of accessible parking spaces for disabled persons shall be provided in accordance with Section 553.5041, Florida Statutes.

(b) For developments with unpaved parking areas, pursuant to City Code Section 158.221(H); the required number of accessible parking spaces shall be based on the total number of parking spaces provided (sum of the paved and unpaved parking spaces). Additionally, the unpaved spaces shall be considered impervious area in stormwater calculations.

12.3 - Parking Spaces

(a) Off-street parking spaces shall be designed in accordance with City Code Section 158.221(B).

(b) On-street standard parallel parking, where permitted, shall have the following characteristics:

(1) Stall Length – twenty-two (22) feet

(2) Stall Width – twelve (12) feet

(3) Allowable distance of the space to an intersection - Per FDOT Standard Plans Index 711-001.

(c) Accessible parking spaces shall be dimensioned, stripped and signed, and constructed in accordance with FDOT Standard Plans Index 711-001.

12.4 - Stacking

(a) The locations and lengths of vehicular stacking areas for facilities including, but not limited to, schools, day care, car washes, and drive-up windows, shall be provided in accordance with standards that promote the general safety and welfare of the public.

(b) Stacking shall meet requirementsthe requirements of City Code Section 158.221(I). At a minimum, a commercial drive-through shall provide the stacking capacity provided in Table 12-1Table 12-1Table 12-1, unless the queuing analysis indicates a greater length is required.

(b)(c) A queuing analysis shall be submitted to confirm the proposed site has sufficient on-site vehicle stacking that complies with City Code Section 158.221(I). The queuing analysis shall be prepared by observing and documenting the peak hour queuing of at least three (3) When a proposed development has other similar type existing establishments within a similar demographic, we will require an analysis must be provided of the needed stacking based on the actual Peak hour queuing data from 3 other similar existing usesbuilding types, sizes and urban locations.

Table 12-1 Drive Thru Stacking Requirements			
Facility/Use	Measured From	Minimum Vehicle Stacking (1 Vehicle = 20 feet)	
		Spaces per Approach	Length (Feet)
Bank	Window	6	120
	Pneumatic Tube	3	60
	ATM	3	60
Car Wash (automatic)	Entry	3	60
Car Wash (self-serve)	Entry	1	20
Drug Store	Window	3	60
	Pneumatic Tube	3	60
Restaurant	Window (last service)	8	160

12.5 - Cross Access

As required below, adjacent developments shall provide ~~a cross~~cross access and an easement for vehicles and pedestrians to allow circulation between sites. This requirement also applies to a site that abuts an existing developed property unless the SPRC deems it to be impractical.

(a) Cross access shall be provided for developments fronting an arterial and may be required for developments fronting a collector.

(b) ~~At a minimum, t~~The cross access connection shall consist of a paved ~~twenty-foot-wide (minimum)~~ connection at least twenty (20) feet wide ~~to~~ between both neighboring properties.

(c) A cross access agreement between each side neighboring property shall be executed by both parties and recorded in the public records of St. Lucie County. If unable to obtain a cross access agreement and connection with an existing development, the proposed development shall provide the cross access on its site.

12.6 - Lighting

Lighting within parking lots shall meet the requirements of City Code Section 158.221(B)(7).

12.7 - Maintenance

All parking areas shall be maintained free of ~~pot holes~~potholes, debris, weeds, broken curb, broken wheel stops and shall be clearly striped with signs and posts in good condition and functioning lights.

13. Waste and Recycling Facilities

13.1 - General

Waste and recycling areas shall meet the requirements set forth in City Code Section 158.232. Additionally, the following should be considered:

(a) It is the City's preference that the waste and recycling facilities are located outside drainage easements. However, if there is no other alternative, they may be located within the drainage easement provided that the setback requirements are met, the design ensures sheet flow drainage is directed internal to the site, and a revocable encroachment permit is obtained.

(b) Pads shall be of the appropriate thickness and have sufficient reinforcement to accommodate the anticipated loading.

(c) Access areas should be of sufficient area to accommodate the collection vehicle.

(d) The approach to the waste/recycling area should facilitate a looping or circle ingress/egress path that reduces the need for the collection vehicle to back up.

14. Submittals

14.1 - General

(a) The general format and content of submittals are provided in the following subsections. Submittals are generally made as part of the site plan review or permitting process for commercial developments. All submittals shall include a transmittal summary with the following information:

(1) Contact information for the applicant, engineer of record and owner.

(2) Project identification including, if appropriate, the site plan review project "P" number assigned by the Planning and Zoning Department.

(3) List of items included in the submittal.

(4) Reason for the submittal.

(5) Action requested of staff.

(b) In addition to the items listed above, resubmittals shall include a list of the revisions in the transmittal summary, revisions on drawings shall be shown in the revision block with a number to identify the revision, and revisions to documents shall be shown by an underline and strikeout format for all documents not generated by CAD, CAD generated documents shall have their revisions clouded.

(c) Electronic file submittals shall be done such that each pdf is named according to the convention provided in Table 14-1~~Table 14-1~~Table 14-1. If a submittal includes a document that is not on the list, the file name shall clearly reflect the content of the submittal.

Table 14-1 Electronic Submittal File Names

Document	File Name
Aerial	Aerial.pdf
Annexation	Annexation.pdf
Application	Application.pdf
As-Builts	AsBuilts.pdf and .dwg
Boundary Survey	BoundarySurvey.pdf and .dwg
Citywide Design Standards	CitywideDesignStandards.pdf
Clearing Plan	Clearing.pdf
Conceptual Building Elevations	ConceptualBuildingElevations.pdf
Conceptual Floor Plan	ConceptualFloor.pdf
Conceptual Site Plan	ConceptualSite.pdf
Construction Plan	Construction.pdf
Cover Letter	CoverLetter.pdf
Development of Regional Impact (DRI)	DRI.pdf
DRI Notice of Proposed Change	DRINOPC.pdf
DRI Substantial Deviation	DRISD.pdf
Drainage/Stormwater Plan	Drainage.pdf
Final Plat	Plat.dwg and .pdf

Table 14-1 Electronic Submittal File Names	
Document	File Name
Irrigation Plan	Irrigation.pdf
Landscape Plan	Landscape.pdf
Legal Description	Legal.pdf
Legal Description and Sketch	LegalAndSketch.pdf
Limited Mixed District Rezoning	LMDRezoning.pdf
Listed Species Survey	ListedSpeciesSurvey.pdf
Mass Grading Plan	MassGrading.pdf
Master Planned Urban Development	MPUD.pdf
Owner Authorization	OwnerAuthorization.pdf
Paving and Drainage Plan	Paving.pdf
Permit (FDOT, SFWMD, USACOE,etc.)	Permit*Agency*.pdf [1]
Planned Urban Development	PUD.pdf
Preliminary Plat	PreliminaryPlat.pdf
Proof of Ownership	ProofOfOwnership.pdf
Public Art Checklist	PublicArtChecklist.pdf
Record Drawings	RecordDrawings.pdf & .dwg
Response to Comments	ResponseToComments*X*.pdf [2]
Site Plan	SitePlan.pdf or dwg
Special Exception Use	SEU.pdf
Stormwater Pollution Prevention Plan (SWPPP)	SWPPP.pdf
Street Lighting Plan	StreetLighting.pdf
Topographic Survey	TopographicSurvey.pdf
Traffic Report/Study/Analysis	Traffic.pdf
Tree Survey	Tree.pdf
Water and Sewer Plan	Utility.pdf

[1]Name should include the permitting agency, for example the SFWMD permit would be named PermitSFWMD.pdf.

[2]X is the response number: first response=1, second response=2, etc.

14.2 - Plats

Plats submitted for review prior to recording shall meet the requirements of City Code Section 156.056. All applicable items shall be provided as listed on the Plat Review Checklist included in Appendix A.

14.3 - Topographic and Boundary Surveys

A boundary survey is used to establish the perimeter of a property as it relates to the legal description. Topographic surveys are a mapping of the physical features of the property. A topographic survey may or may not be combined with a boundary survey. The following items shall be included on a topographic or boundary survey, as applicable.

(a) Prepared and certified by a ~~registered~~ professional surveyor and mapper registered in the State of Florida.

(b) Be of the form and format specified by Chapter 5J-17, F.A.C.~~)~~.

(c) Formatted for standardized sheet size of 24-inch by 36-inch.

(d) Scale greater than or equal to ~~one inch~~one-inch equals 50 feet.

(e) Date of survey shall be within one year of the submittal.

(f) Show and label the location of existing streets within and adjacent to the property.

(g) Revisions are clearly noted in revision block as well as shown and labeled on survey.

(h) Show and label benchmark and control points.

(i) Boundary, limits, nature and extent of wooded areas, specimen trees, and other significant physical features.

(j) Topographic surveys shall also include:

(1) Dimensions, size, finished floor elevations, and setbacks from property line for existing structures on the site.

(2) Features (*e.g.*, lakes, marshes, wetlands, canals, waterways, ~~soil types~~, wooded areas, specimen trees, contours or spot elevations, structures, finished floor elevations, etc.) within two hundred (200) feet of the site.

(3) Features of the subject property (*e.g.*, lakes, marshes, wetlands, canals, waterways, ~~soil types~~, wooded areas, specimen trees, contours or spot elevations, etc.) shall be shown and labeled.

(k) The vertical datum shall reference NAVD of 1988 unless prior arrangements have been made. The reason for this is that in rare circumstances, such as the development of a new phase under a previously permitted project using the NGVD, the use of the NGVD may be warranted and accepted by the City.

14.4 - Concept Plan

The concept plan is for the purpose of demonstration and discussion. The plan provides the basic parameters of a development without the details or expenses associated with preparing a site or construction plan. The content and detail of the concept plan varies depending upon the project. Items typically of interest to the Public Works Department include, but are not limited, to the following:

(a) Recent aerial showing location of site and adjacent properties.

(b) Overall plan view on one sheet.

(c) Traffic access points and type of access requested (*i.e.*, full access, right-in and right-out, in only, exit only).

(d) General location of Stormwater detention area and discharge location.

(e) Preliminary traffic information – peak hour trips using the latest version of the ITE Manual with reference to the ITE version and code number and a trip distribution map for each driveway.

(f) Preliminary drainage information – Identification of the applicable SFWMD permit, the method of collection, treatment, and discharge, the general location of the detention area, and discharge. If known, identify the flood protection stages for the roadway, finished floor and twenty -five- (25) year, three (3)- day event.

(g) Project phasing, if applicable.

(h) Offsite roadway or drainage improvements needed to support the proposed development.

(i) Proposed roadway sections.

14.5 - Clearing Plan

Any project that disturbs an area of one or more acres is required to obtain a clearing permit. An approved clearing plan and SWPPP (section 0~~14.7~~) is required to obtain a clearing permit. Additionally, for projects that disturb one acre or more, submit a copy of the NOI submitted to the FDEP. A clearing plan shall include the items specified in City Code Section 154.23.

14.6 - Mass Grading Plan

An approved mass grading plan and SWPPP (section 0~~14.7~~) allows the construction of lakes, detention areas, canals/ditches shown on the approved PUD or DRI master plan prior to approval of the subdivision or construction plans. The mass grading plan shows areas to be cleared, filled, or excavated, rough contours, stockpile areas, and haul routes. The mass grading plan shall include the items specified in City Code Section 154.23.

14.7 - Stormwater Pollution Prevention Plans (SWPPP)

A SWPPP (aka erosion and sediment control plan) provides details for the reduction/prevention of stormwater runoff pollution from the proposed development. Approval of the SWPPP is required for the issuance of a clearing permit, mass grading permit, or site work permit. The SWPPP shall include the items specified in City Code Section 154.23.

14.8 - Site Plans

Site plans shall be prepared and signed and sealed by a professional engineer, architect, or landscape architect ~~registered~~ licensed to practice in the State of Florida. An approved site and construction plan is required for the issuance of a site work permit. The site plan shall include sufficient information and be consistent with practices of plans preparation within the industry. The plans shall include the items specified in City Code Section 158.238.

14.9 - Construction Plans

Construction plans shall be prepared and signed and sealed by a Professional Engineer ~~registered in~~licensed to practice in the State of Florida. In addition to the information provided on the site plan, the construction plans shall include sufficient information and be consistent with practices of plans preparation within the industry. The following items, as applicable~~appropriate~~, ~~should~~ must be included in the construction plans.

(a) Cover sheet with name of project, site map, sheet index, key map.

(b) Standard Road Design and Construction Notes, if applicable, provided in chapter 20, shall be included in the plan notes.

(c) Demolition plan, if applicable.

(d) Stormwater Management Plan: Existing and proposed drainage patterns, drainage area map, design, specifications, and calculations for onsite and offsite improvements. Identify the flood protection stages for the roadway, finished floor and perimeter berm. Along with the signed and sealed drainage calculations, the EOR shall provide a maintenance schedule for the proposed on-site stormwater management system.

(e) Signed and sealed geotechnical test results and a location map representative of conditions for swales, retention areas, detention areas, or exfiltration trenches.

(f) An erosion and sedimentation control plan or SWPPP (section 0~~14.7~~) that describes the type and location of control measures, the stage of development at which they will be put into place or used, and maintenance provisions.

(g) Paving and road design: appropriate horizontal and vertical controls, pavement section, cross-sections, profiles, signs, sight distance, pavement markings, traffic signals, pedestrian signals, street lights, pedestrian lights, sidewalks, and specifications for onsite and offsite improvements.

(h) Grading and excavation details and elevations including the interface of the proposed development with abutting properties.

(i) Proposed utility infrastructure plans, including sanitary sewer, water, stormwater management, telephone, electric, cable television, etc. (cross sections and profiles).

(j) Spot and finished elevations at all property corners, corners of all structures or dwellings, existing or proposed first floor elevations within two hundred (200) feet of the site.

14.10 - Opinion of Probable Cost

(a) An opinion of probable cost isshall be submitted by the EOR to the Public Works Department. The estimate may be the basis of a performance guarantee, permit fee for a new development, maintenance guarantee, or for a capital improvement project.

(b) The estimate shall be prepared and certified by a Professional Engineer ~~registered~~ licensed to practice in the State of Florida. The estimate shall include a line item along with the unit of measure, estimated quantity (based upon a set of signed and sealed construction plans), estimated unit cost (based upon current market conditions) and extended line item cost.

14.11 - Site Work Estimates

A certified cost estimate from the EOR or the contractor's itemized contract for the work shall be submitted to the Public Works Department. This estimate will be used as the basis of the inspection portion of the Public Works Department permit fee. The permit fee is provided in the fee schedule provided in City Code Section 57.01. The site work costs shall include all site work needed to provide the paving and drainage components of the work which includes:

(a) Earthwork

(b) Grading

(c) Embankment

(d) Stormwater collection, conveyance, treatment, storage, and discharge facilities

(e) Roadway and parking area subgrade, base, and asphalt or concrete

(f) Concrete work: curb/gutter, sidewalks

(g) Stabilized surfaces and sod

14.12 - Drainage Calculations

Stormwater and drainage calculations shall demonstrate the project meets the minimum design guidelines presented in chapters 5 and 6. Calculations shall be signed and sealed by a Professional Engineer licensed to practice in the state of Florida. The number of copies and content will be as specified in the contract documents, as agreed upon for the specific project or as required for the site plan review process.

14.13 - Equivalent Residential Unit (ERU) Stormwater Calculations

Newly platted parcels, rezoned parcels, and construction plans shall include a calculation for the stormwater equivalent residential units for the proposed development. The calculation shall be completed on a worksheet, provided to the Public Works Department, by the EOR and then signed by the EOR and the property owner. This calculation will be used to determine the stormwater fee for the rezoned, developed, or renovated property.

14.14 - Geotechnical Reports

Geotechnical reports shall be signed and sealed by a Professional Engineer licensed to practice in the State of Florida. The number of copies and content will be as specified in the contract documents, as agreed upon for the specific project, or as required for the site plan review process.

14.15 - Traffic Studies

(a) For projects reviewed as part of the site plan review ~~project~~process, a traffic study shall be completed in accordance with the *St. Lucie TPO Standardized Traffic Impact Studies (TIS) Methodology and Procedures for St. Lucie County, City of Fort Pierce and the City of Port St. Lucie*. This document is provided in Appendix E.

(b) Traffic studies completed for a specific purpose or use outside of the site plan review process shall be completed as specified in the contract documents for the specific project.

14.16 - Shop Drawings

Shop drawings shall be submitted for capital improvement projects ~~or~~and for private development projects that will ~~eventually~~ be turned over to the City for ownership and maintenance responsibilities. Shop drawings, as specified in the standards, such as drainage structures, pipes, reinforcing steel, cement mix for sidewalks, asphalt mix for pavement, pedestrian or street lighting components, traffic signal components, etc. shall be reviewed and approved by the EOR prior to submittal to the Public Works Department. The number of copies and the submittal requirements are project specific and shall be included in the specifications for the work and as agreed upon at the preconstruction meeting.

14.17 - Completion Certification

Certification of completion shall be on company ~~letter head~~letterhead and signed and sealed by the EOR. The certification letter shall clearly indicate:

(a) Date of construction completion.

(b) That the work was observed by the certifying engineer or his/her representative.

(c) Certification statement - all facilities have been constructed in substantial conformance with the approved plans and specifications.

14.18 - Operation and Maintenance Manuals

Developer and/or contractor shall provide the City with operation and maintenance manuals for any mechanical, electrical, or specialized components of systems that will be owned and/or maintained by the City. These documents will be requested through contract documents and/or requested by the City at the preconstruction meeting. Failure of the City to request the documents does not eliminate the developer's/contractor's obligation to provide the documentation. ~~Operation and maintenance manuals, as specified in the contract documents or as requested, in writing, at the preconstruction meeting by the City shall be provided by the developer or contractor. These manuals are generally required for mechanical, electrical, or specialized components of systems that will be owned and maintained by the City.~~

14.19 - Record Drawings

(a) Newly completed construction for roadways, sidewalks, street/pedestrian lighting, traffic signals, landscaping, irrigation or stormwater management facilities that will be owned and maintained by the City requires a record drawing survey and completion certifications prior to final inspection and acceptance. Signed and sealed record drawings shall be provided to the City in both .dwg and .pdf formats.

(b) Record drawing surveys shall be prepared by a professional surveyor and mapper licensed in the State of Florida in accordance with 5J-17.052(1), F.A.C. At a minimum, the record drawings shall include the following and the minimum technical requirements for record drawings shall include:

(1) Horizontal Control Plan.

a. Accuracy certification of the horizontal control plan.

b. Survey monuments - installation and accuracy certifications.

(2) Paving Plans. Top of curb, gutter, and pavement centerline elevations at all grade breaks, curb returns, valley gutters, plus any other location necessary to adequately show drainage.

(3) Drainage

a. State Plan Coordinates (northing and easting), size, material, top elevation, and invert of all pipes at all changes in alignment.

b. State Plan Coordinates (northing and easting), top elevation, invert, and description of headwalls, structures, detention ponds and lakes.

c. Elevation of all drainage control points (e.g., weir, bleeder, top of berm, etc.)

d. Finished floor elevation.

(4) Signing & Striping Plans

a. State Plan Coordinates (northing and easting) and identification of each sign.

b. Plan showing pavement markings: arrows, wording, and symbols, and raised pavement markers.

(5) Traffic and Pedestrian Signal Plans. State Plan Coordinates (northing and easting) of all fixture poles, cabinets, boxes, or other signal related furniture.

(6) Street and Pedestrian Light Plans. State Plan Coordinates (northing and easting) and identification number of each light.

(7) Landscape Plans (Professional surveyor and mapper license not required). Confirmation of the material, types, general location, and number installed.

(8) Irrigation Plans

a. State Plan Coordinates (northing and easting) of all controllers, timers, and electrical boxes.

b. Confirmation of the location, size and type of pipe and heads.

c. Zoning and electrical diagrams.

15. Improvement Guarantees

15.1 - General

The requirements and procedures for performance and maintenance guarantees for public improvements are provided in City Code Chapter 156, Article VII, Improvement Guarantees.

15.2 - Performance Guarantees

Prior to the Planning and Zoning Department releasing a final plat for recording, public improvements that support the development must be either accepted as final by the City or ensured by a performance guarantee in the appropriate amount and form. The performance guarantee ensures the timely completion of the work and that the work is completed in accordance with the approved plans. The requirements for a performance guarantee are provided in City Code Chapter 156, Article VII, Improvement Guarantees.

Performance Guarantees shall be required for all work that will be performed within the City right-of-way and shall be provided in accordance with City Code Chapter 156, Article VII, Improvement Guarantees. In the event a surety has already been approved and provided for a final plat that includes the proposed work, the existing surety will satisfy this requirement, provided the value of the surety is sufficient to cover the required amount of the plat infrastructure and the work that is proposed within the City right-of-way.

15.3 - Maintenance Guarantees

A maintenance guarantee is required for all improvements, constructed by an owner/developer, that are turned over to the City prior to the completion of a one-year, minimum, warranty period. This would also apply to ~~or are~~ construct~~ed~~ion by an owner/developer within the City right-of-way as off-site improvements to support site development. The maintenance guarantee protects the City against defects and faults in the materials or workmanship that may occur after the work is completed. The requirements for a maintenance guarantee are provided in City Code Chapter 156, Article VII, Improvement Guarantees.

15.4 - Partial Release of Guarantees

The partial release of performance guarantees for work that will be owned and maintained by others shall be completed in accordance with City Code Chapter 156, Article VII, Improvement Guarantees.

15.5 - Final Paving Course and Pavement Markings

The required schedule for the completion of the final paving course and pavement markings held under a performance guarantee shall be in accordance with City Code Chapter 156, Article VII, Improvement Guarantees.

16.1 - Clearing & Mass Grading Permit

A project that disturbs one acre or more is required to have approval prior to clearing the property. Requirements for a land clearing permit are provided in City Code Chapter 154 Landscaping and Land Clearing Code, Article III Land Clearing. The process for completing a clearing permit application is as follows:

(a) Submit the following information via upload to Fusion at https://fusion.cityofpsl.com/ ~~to the Planning and Zoning Department:~~ for review and sign off by all departments:

(1) A completed ~~Planning and Zoning Department compliance form requesting a clearing permit~~online application for Clearing Plan.

(2) The approved land clearing and mass grading plan with SWPPP that is signed and sealed by an engineer licensed to practice in the State of Florida ~~Registered Engineer~~.

(3) Completed tree removal permit application and payment of the permit application fee, as required. The tree removal permit application and current fee may be obtained from the Planning and Zoning Department.

(4) Upland mitigation fee, if required—for current fee amount, refer to the Planning and Zoning Department.

(b) The Planning and Zoning Department will ~~review the compliance package and once it is found to be sufficient and in compliance with the approved plans, the Planning and Zoning Department will forward the packet to the Public Works Department.~~notify the applicant and other reviewing departments when the item is scheduled for a Site Plan Review Committee (SPRC) meeting.

(c) Submit the following items, electronically, ~~as one application package,~~ to the Public Works Department. ~~If submitted electronically, P~~please upload to ~~Project~~ Fusion at https://fusion.cityofpsl.com/ or via email sent~~d~~ to the Public Works Department at engpw@cityofpsl.com in PDF format and include "Clearing ~~Permit Application~~Plan" along with the project name and City's project number in the subject line. If files are larger than ten (10) MB please ~~upload files to the FTP site https://submit.cityofpsl.com/~~contact the Public Works Department via email at engpw@cityofpsl.com for access to our Sharepoint site.

(1) A completed Construction Permit Application found in Appendix A.

~~(2) The approved land clearing plan signed and sealed by an engineer licensed to practice in the State of Florida Registered Engineer.~~

~~(3) The approved SWPPP signed and sealed by an engineer licensed to practice in the State of Florida Registered Engineer.~~

~~(4)~~(2) Documentation of plan approval from the Community Development District, ~~(~~if applicable~~)~~.

~~(5)~~(3) A copy of the approved SFWMD permit, if applicable.

~~(6)~~(4) For projects that disturb one acre or more, submit a copy of the NOI submitted to the FDEP.

~~(7)~~(5) A copy of the approved USACE permit, if applicable.

~~(8) Electronic PDF files of the items listed above on a CD; or submitted via Project Fusion or email to engpw@cityofpsl.com.~~

(d) Install perimeter sediment and erosion and turbidity controls.

(e) Request an onsite meeting by completing the Preconstruction Meeting Request Form (Appendix A) and submitting to engpw@cityofpsl.com. The responsible authority (per NOI), the general contractor, and the EOR will need to attend the meeting. An SFWMD representative, Community Development District representative, and Florida Fish and Wildlife Conservation representative should ~~-~~attend the meeting if available.

(f) After completion of a satisfactory inspection of the perimeter sediment and turbidity controls (occurs along with the preconstruction meeting), satisfactory onsite meeting, and review of the complete application package, a ~~clearing~~ construction permit will be issued to the applicant by the Public Works Department for the proposed clearing.

~~(g) The total time to process the clearing permit application varies with an average of ten working days for both departments to review the information, hold the site meeting and issue the permit. Applicants are cautioned that the actual time frame may be different than the average. A better project specific estimate for the time to receive a clearing permit may be obtained by calling the project reviewer.~~

~~(h)~~(g) Once issued, the applicant ~~shall~~ must have the clearing permit available at the location of the work during working hours. The work shall be completed in accordance with the approved clearing permit, specifications, and sediment and erosion control plan.

~~(i)~~(h) A clearing permit is void if inspections have not occurred within ~~six months~~ one year of the permit issuance or inspections have not occurred within a period of ~~six months~~ one year. A new permit and payment of the review fee is required if a permit is voided.

~~16.2 Mass Grading Permit~~

~~An active development order (such as an approved site plan, plat or building permit) in the construction phase of development or an approved PUD or DRI that desires to create lakes, detention areas, swales, ditches, or other such rough grading as shown on the approved master plan may obtain approvals for clearing and mass grading. The process for completing a clearing and mass grading permit application follows:~~

~~(a) Submit the following information to the Planning and Zoning Department:~~

~~(1) A completed Planning and Zoning Department compliance form requesting a clearing and mass grading permit.~~

~~(2) The approved land clearing plan that is signed and sealed by an engineer licensed to practice in the State of Florida registered engineer.~~

~~(3) The approved mass grading plan that is signed and sealed by an engineer licensed to practice in the State of Florida registered engineer.~~

~~(4) Completed tree removal permit application and payment of the permit application fee, as required. The tree removal permit application and current fee may be obtained from the Planning and Zoning Department.~~

~~(5) Upland mitigation fee, if required – for current fee amount, refer to the Planning and Zoning Department.~~

(b) The Planning and Zoning Department will review the compliance package and once it is found to be sufficient and in compliance with the approved plans, the Planning and Zoning Department will forward the packet to the Public Works Department.

(c) Submit the following items, as one application package, to the Public Works Department. If submitted electronically, please upload to Project Fusion at https://fusion.cityofpsl.com/ or send via email sent to the Public Works Department at engpw@cityofpsl.com in PDF format and include "Clearing Permit Application" along with the project name and City's project number in the subject line. If files are larger than ten (10) MB, please upload files to the FTP site

(1) A completed Construction Permit Application found in Appendix A.

(2) The approved land clearing plan signed and sealed by an engineer licensed to practice in the State of Florida registered engineer.

(3) The approved SWPPP signed and sealed by an engineer licensed to practice in the State of Florida registered engineer.

(4) The approved mass grading plan that is signed and sealed by an engineer licensed to practice in the State of Florida registered engineer.

(5) Documentation of plan approval from the Community Development District (if applicable).

(6) A copy of the approved SFWMD permit, if applicable.

(7) For projects that disturb one acre or more, submit a copy of the NOI submitted to the FDEP.

(8) A copy of the approved USACE permit, if applicable.

(9) Electronic PDF files of the items listed above on a CD or submitted via email to engpw@cityofpsl.com.

(d) Install perimeter sediment and erosion and turbidity controls.

(e) Request an onsite meeting by completing the Preconstruction Meeting Request Form (Appendix A) and submitting to engpw@cityofpsl.com. The responsible authority (per NOI) the general contractor, and the EOR will need to attend the meeting. An SFWMD representative, Community Development District representative, and Florida Fish and Wildlife Conservation Commission representative should attend the meeting if available.

(f) After completion of a satisfactory inspection of the perimeter sediment and turbidity controls (occurs along with the preconstruction meeting), satisfactory onsite meeting, and review of the complete application package, a clearing and mass grading permit will be issued to the applicant by the Public Works Department.

(g) The total time to process the clearing and mass grading permit application varies with an average of ten working days for both departments to review the information, hold the site meeting and issue the permit. Applicants are cautioned that the actual time frame may be different than the average. A better project specific estimate for the time to receive a clearing permit may be obtained by calling the project reviewer.

(h) Once issued, the applicant shall have the clearing and mass grading permit available at the location of the work during working hours. The work shall be completed in accordance with the approved clearing permit, specifications, mass grading plans, and sediment and erosion control plan.

(i)(a) A clearing and mass grading permit is void if inspections have not occurred within six months of the permit issuance or inspections have not occurred within a period of six months. A new permit and payment of the review fee is required if a permit is voided.

16.3 - Site Work Permit

The site work permit is required for the construction of site work associated with new development or improvements to existing developments. Site work includes the work necessary to construct drainage, stormwater, roadway, parking lots, sidewalks, etc. The process for completing a site work permit application follows:

(a) Submit the following information to the Planning and Zoning Department via upload to Fusion at https://fusion.cityofpsl.com/:

(1) A completed Planning and Zoning Department compliance ~~form~~ review requesting a site work permit.

(2) One set ~~(folded)~~ 24- x 36-inch signed and sealed Civil/Site plans (paving, grading, drainage, SWPPP, and landscaping/irrigation, as appropriate).

(3) One approved site plan 24 x 36-inch.

~~(4) One CD or USB flash drive containing all items submitted.~~

(b) The Planning and Zoning Department will review the compliance ~~package~~ submittal through Fusion and once it is found to be sufficient and in compliance with the approved plans, the Planning and Zoning Department will notify the Utility Department that it is ready to be reviewed. The Utility Department will then notify the ~~forward the packet to the~~ Public Works Department when they are complete with their review.

(c) Submit the following items, as one package, to the Public Works Department. If submitted electronically, please upload to ~~Project~~ Fusion at https://fusion.cityofpsl.com/ or via email sent to engpw@cityofpsl.com in PDF format and include "Site Work Permit Application" along with the project name and City's project number in the subject line. If files are larger than ten (10) MB please ~~upload files to the FTP site https://submit.cityofpsl.com/.~~email the Public Works Department for access to the City's Sharepoint site.

(1) ~~Three~~ Two sets (folded) 24- x 36-inch signed and sealed Civil/Site plans (paving, grading, drainage, SWPPP, and landscaping/irrigation, as appropriate).

(2) A completed Construction Permit Application found in Appendix A.

(3) Calculation of the Stormwater ERU (Appendix A) with signature of the engineer and owner.

(4) An itemized cost estimate for the total site work signed and sealed by the EOR, or a copy of the contractor's bid with a letter from the EOR certifying that the bid is acceptable for the project.

(5) Documentation of plan approval from the Community Development District (if applicable).

(6) A copy of the approved SFWMD Permit for this project (if applicable).

(7) For projects that disturb one acre or more, a copy of the NOI submitted to the FDEP.

(8) For projects that disturb one acre or more, a SWPPP.

(9) A copy of the approved USACE permit, if applicable.

(10) A copy of approved driveway permit from FDOT, County, or other Agency, as appropriate.

(d) Install perimeter sediment and erosion and turbidity controls.

(e) Request an onsite meeting by completing the Preconstruction Meeting Request Form (Appendix A) and submitting to engpw@cityofpsl.com. The responsible authority (per NOI), if possible, the

general contractor, and the EOR will need to attend the meeting. An SFWMD representative, Community Development District representative, and Florida Fish and Wildlife Conservation Commission representative should attend the meeting if available.

(f) The Public Works Department will review the package, calculate the site work permit fee, and forward the fee amount to the applicant. Site work permit fees are based upon a percentage of the total site work cost plus the fees for culverts, traffic signals, or pedestrian lights, or street lights as provided in the fee schedule found in City Code Section 57.01.

(g) The applicant shall remit the site work permit fee. The fee may be paid with ~~cash,~~ check, or credit card. The fee is nonrefundable.

(h) After completion of a satisfactory inspection of the perimeter sediment and turbidity controls (occurs along with the preconstruction meeting), satisfactory onsite meeting, review of the complete application package, and payment of the fee, the Public Works Department will issue the site work permit~~applicant will be notified by the~~provided ~~the Public Works Department to pick up the site work~~ Construction ~~permit and the compliance form~~.

~~(i) The total time to process the site permit application varies with an average of ten working days for both departments to review the information, hold the site meeting and issue the permit. Applicants are cautioned that the actual time frame may be different than the average. A better project specific estimate for the time to receive a site work permit may be obtained by calling the Public Works Department prior to submittal.~~

~~(j)~~(i) Once issued, the applicant ~~shall~~ must have the site work permit available at the location of the work during working hours. The work shall be completed in accordance with the approved construction plans.

~~(k)~~(j) A site work permit is void if inspections have not occurred within ~~six months~~one year of the permit issuance or inspections have not occurred within a period of ~~six months~~one year. A new permit and payment of the review fee is required if a permit is voided.

16.4 - Driveway/Culvert Permit

Developments that obtain a site work permit do not require a separate driveway/culvert permit. For projects where the modification of a driveway/culvert is the only work to be completed, a driveway/culvert permit is required. Requirements for a driveway permit are provided in City Code Chapter 54 Rights-of-Way, Article III. - Driveway Permit. The process for completing a driveway/culvert permit application is as follows:

(a) Submit the following information to the Public Works Department online through Cobra Public at www.CobraPublicWeb.cityofpsl.com ~~. If submitted via email, please send to engpw@cityofpsl.com in PDF format and include "Driveway/Culvert Permit Application" along with the project name in the subject line. If files are larger than ten MB please upload files to the FTP site https://submit.cityofpsl.com/~~ If you are unable to submit online, you may deliver in person to the Public Works Department.

(1) A ~~completed~~ driveway/culvert permit application ~~found~~ filled out on above website under Residential > My Permits > Create New Lot Permit or utilize a hard copy in Appendix A.

(2) One 11- by 17-inch signed and sealed Civil/Site plans. All surveys uploaded are required to have the 3rd party verification for authenticity of the signature.

(b) Payment of the driveway/culvert permit fee as provided in the fee schedule found in City Code Section 57.01. The fee may be paid with cash, check, or~~,~~ credit card (credit card only online). The fee is nonrefundable.

(c) After satisfactory review of the complete application package and payment of the fee, a driveway/culvert permit will be issued to the applicant by the Public Works Department.

(d) The total time to process the driveway/culvert permit application varies with an average of five (5) working days to review the information and issue the permit. Applicants are cautioned that the actual time frame may be different than the average. A better project specific estimate for the time to receive a driveway/culvert permit may be obtained by calling the Public Works Department prior to submittal.

(e) Once issued, the driveway/culvert permit must ~~shall~~ be available at the location of the work during working hours. The work shall be completed in accordance with the approved construction plans.

~~(e)~~ A minimum twelve (12) inch~~12"~~ diameter temporary pipe must be installed in the City ~~R~~right-of-way. A rejection fee will be incurred if the pipe is not installed.

(f) Satisfactory form board and final inspections are required to close out the permit.

(g) A driveway permit is void if inspections have not occurred within ~~six months~~one year of the permit issuance or inspections have not occurred within a period of ~~six months~~one year. A new permit and payment of the review fee is required if a permit is voided.

16.5 - Right-of-Way Permit

A right-of-way permit is required for any excavation or work within the City's right-of-way as provided by City Code Chapter 54 Rights-of-Way, Article II. - Right-of-Way Permit. Please note that the construction of driveways within the city right-of-way is covered under a driveway/culvert permit or commercial site work permit rather than a right-of-way permit. The process to complete a right-of-way permit application is as follows:

(a) Submit the ~~following information~~application to the Public Works Department~~.~~ ~~If submitted~~ electronically via ~~upload to~~ Cobra Public at https://cobrapublicweb.cityofpsl.com/ ~~.in PDF format and include "Right-of-Way Permit Application" along with the project name in the subject line. If files are larger than ten MB please upload files to the FTP site https://submit.cityofpsl.com/~~.Upload the following items with the application submittal:

~~A completed right-of-way permit application found in Appendix A.~~

~~Vicinity map.~~

~~application found in Appendix A.~~

~~(1)~~ ~~Vicinity map.~~

~~(2)~~(1) Excavation plan.

~~(3)~~(2) Certificate of insurance in accordance with City Code Chapter 54 Rights-of-Way, Article II. - Right-of-Way Permit.

~~(4)~~(3) Construction Surety in accordance with City Code Chapter 54 Rights-of-Way, Article II. - Right-of-Way Permit.

~~(5)~~(4) Maintenance of traffic plan in accordance with FDOT guidelines if traffic is interrupted or if any roads or sidewalks will be closed. A separate Road/Lane Closure Request (Section 16.7) must be submitted for any roadway or sidewalk closure a minimum of forty-eight (48) hours prior to the closure.

(b) After a satisfactory review of the complete application package, the Public Works Department will issue a right-of-way permit ~~will be issued to the applicant by the Public Works Department~~ via email. ~~Typically, the permit is ready within five working days; however, the time to process the permit is highly dependent upon staffing levels and work load and the time will fluctuate~~.

(c) A right-of-way permit is void if inspections have not occurred within twelve (12) months. ~~of the permit issuance or inspections have not occurred within a period of twelve (12) months.~~

16.6 - Revocable Encroachment Permit

The Revocable Encroachment Permit allows encroachments into the twenty (20) -foot -wide easements along drainage rights-of-way for certain limited uses. These uses are limited to removable structures which meet the required zoning setbacks as provided in Table 4-1~~Table 4-1Table 4-1~~. The requirements of a revocable encroachment permit are provided in City Code Chapter 55. - Easements, Article III. - Revocable Encroachment Permits. The process to complete a revocable encroachment permit application is as follows:

(a) Obtain and complete a Revocable Encroachment Permit Application (Appendix A) and gather the required submittal documentation noted on the application.

(b) Submit the application and supporting documentation to the Public Works Department.

(c) If submitted via email, please send to engpw@cityofpsl.com in PDF format and include "Revocable Encroachment Permit Application" along with the project name and City's project "P~~p~~" number, if applicable, in the subject line. If files are larger than ten (10) MB please ~~upload files to the FTP site https://submit.cityofpsl.com/.~~contact the Public Works Department for access to the City's Sharepoint site.

(d) The Public Works Department will process and review the application. If approved by the City Engineer, the application and all exhibits will be recorded in the St. Lucie County Public Records at the applicants cost.

16.7 - Road/Lane Closure Request

A road/lane closure request is required for work that will interrupt the flow of traffic on City-owned and maintained streets or sidewalks. Requirements for a road/lane closure request are provided in City Code Chapter 54. - Rights-of-Way, Article VII. - Road, Lane and Sidewalk Closure ~~Permits .~~Permits. Additionally, the request may be extended by sending an email request or calling to advise of the reason and time for the extension. The process to complete a road/lane closure request is as follows:

(a) Submit the following information to the Public Works Department via email or in person. If submitted via email, please send to rdclosure@cityofpsl.com in PDF format and include "Road/Lane Closure Request" along with the project name in the subject line. If files are larger than ten (10) MB please ~~upload files to the FTP site https://submit.cityofpsl.com/~~contact the Public Works department to receive access to our Sharepoint site.

(1) A completed road/lane closure request form found in Appendix A or https://www.cityofpsl.com/Government/Your-City-Government/Departments/Public-Works/Commercial-Residential-Review-Permitting/Public-Works-Forms-

Documentshttps://www.cityofpsl.com/government/departments/public-works/commercial-residential-review-permitting/commercial-residential-forms.

(2) Vicinity map.

(3) Detour plan, if appropriate.

(4) Maintenance of traffic plan in accordance with FDOT guidelines.

(b) After a satisfactory review of the application package, the road/lane closure request will be processed by the Public Works Department. Notification will only be provided to the requestor if additional information is needed or if the request is denied.

17. Construction Standards

17.1 - General

Construction activities are highly visible and have the potential to significantly impact the public. It is very important that the site is maintained in a safe and orderly manner and that the work is conducted ~~in a manner to~~in a way which minimizes impacts to residents. This chapter provides information on construction standards for projects within the City.

17.2 - Utility Locates

At least two days prior to work, contact Sunshine One Call of Florida at 811 or sunshine811.com for the location of utilities within rights-of-ways and/or easements.

17.3 - Work Hours

Work hours shall be from 7:00 am to sundown in accordance with City Code Chapter 94, unless a permit authorizing work to extend beyond this time is approved. A permit allowing the extension of work hours is issued by the Port St Lucie Police Department.

17.4 - Site Maintenance

The work area shall be maintained to ensure that the site and surrounding area is maintained in a neat and orderly manner by removing litter, managing stockpiles and equipment, mowing regularly, maintaining roadways that access the site, and using dust and noise control measures.

17.5 - Vertical Datum

Unless otherwise approved, the vertical datum shall reference NAVD of 1988. The reason for this is that in rare circumstances, such as the development of a new phase under a previously permitted project using the NGVD, the use of the NGVD may be warranted and accepted by the City. The datum shall be clearly designated on the cover and note sheet of the survey, plans, calculations, etc.

17.6 - Maintenance of Traffic

(a) The contractor shall~~, at all times,~~ maintain traffic as specified in this chapter at all times. When deemed necessary in the interest of public safety, the City Engineer, Chief of Police, Public Works Director or their designee, has the right to require that the work be~~is~~ stopped and traffic operations are resumed.

(b) Maintaining traffic flow during construction or maintenance activities in or adjacent to roadways requires the following:

(1) Work shall be scheduled to keep traffic delays to a minimum.

(2) Unless otherwise provided in the road closure permit, all roads and sidewalks shall be kept open to all traffic by the permittee. If a sidewalk is approved for temporary closure, a continuous ADA compliant pathway shall be required to allow safe passage around the work area.

(3) The provision and maintenance of barricades, temporary approaches, warning signs, delineators, flagmen, pilot cars, or other such traffic maintenance devices shall be in accordance with FDOT and the MUTCD.

(4) All expenses for preparing, implementing, and maintaining the MOT plan shall be borne by the permittee.

(5) Materials or equipment at the work site shall not be located within clear zones or impede the sight or passage of vehicular or pedestrian traffic.

(6) Pedestrians shall be given adequate warning of hazardous areas in and about the construction project.

a. Where pedestrian activity is low, it is desirable to direct pedestrians to the opposite side of the street in advance of the work area. Signs shall be used in conjunction with barricades/longitudinal control devices for this purpose.

b. In areas where the pedestrian volume is high and the normal passage area becomes part of the work area, the contractor shall provide an alternate or temporary ADA compliant pathway.

(7) Excavations and/or trenches which cannot be properly restored, including the placement of the final surface course of asphalt, prior to opening to traffic by the end of the work period, shall be bridged to provide for unobstructed traffic flow.

(8) Steel Plates used to bridge excavations or trenches shall be subject to the approval of the City Engineer:

a. Contractor shall submit a plan designed and signed/sealed by a professional structural engineer licensed to practice in the Sstate of Florida.

b. Steel plates shall be pinned to the roadway.

c. Trench or excavation walls shall have proper shoring to prevent cave-ins and to adequately support the steel plates and traffic loads and shall be included as part of the structural engineer's design.

d. Contractor shall install "Steel Plate Ahead" signs in advance of work area. These signs shall be maintained for the entire duration.

e. The use of steel plates shall not exceed fourteen (14) days, unless approved otherwise by the City Engineer.

17.7 - Abatement of Erosion and Water Pollution

(a) Sediment is solid, small particle material that may include organic and non-organic substances and debris. Erosion is the process of transporting sediment from one location to another location by air or water. Erosion during and immediately following construction is a major contributor to siltation and the conveyance of organic debris and nutrients to water bodies. Siltation reduces the flowage and holding capacity of stormwater facilities (pipes, structures, swales, canals, detention areas, etc.) and organic debris and nutrients reduces the water quality of lakes and the river.

(b) Stormwater control measures to minimize the impact of this erosion sedimentation shall be incorporated on all projects in the City. For projects that disturb one acre or more, a detailed description of these measures shall be included in the SWPPP which is submitted as part of the construction plans. Erosion and sediment controls shall be provided, used and maintained in

accordance with the NOI, approved construction plans, SWPPP, and NPDES requirements. Additionally, the following requirements shall be met:

(1) The "operator" of any construction project that disturbs one acre or more, or is part of the larger common plan of development or sale which disturbs one acre or more, is required to obtain the proper stormwater permit from the FDEP and to comply with all the terms and conditions of the permit.

(2) The City Engineer, or their designee, is authorized to issue stop work orders on any site that is not in compliance with the applicable stormwater permits for SFWMD, FDEP NPDES, etc. or that has failed to obtain said permit and upon issue of such stop work order all site work affected thereby shall immediately cease until authorized by the City Engineer.

(3) No land-disturbing activity shall occur in, adjacent to, or near wetlands, or the shoreline of the North Fork of the St. Lucie River unless a buffer zone, as described in City Code Section 157.05 is provided along the margin of the watercourse.

(4) BMPs shall be properly used and maintained.

a. Perimeter sediment and erosion control devices shall be installed around the perimeter of the site to prevent sediment from leaving the site boundary.

b. A construction entrance shall be installed and maintained to prevent sediment from entering public roadways. The construction entrance must be located on the most minor roadway when options are available.

c. Inlet protection is required to prevent sediment from entering any storm system.

d. Turbidity barriers or other such sediment and control devices shall be used adjacent to wetlands or other surface waters.

(5) The angle for graded slopes and fills shall not be greater than the angle which can be retained by vegetative cover, or other adequate erosion-control, devices or structures.

(6) Groundcover sufficient to restrain erosion must be planted or otherwise provided within seven (7) calendar days on portions of cleared land upon which further construction activity is not being undertaken.

(7) Temporary seeding or sodding, adequate covering, or chemical application, on exposed soils, including stockpiles of topsoil, sand, or other construction fill, shall be used where delays in construction of more than seven calendar days are anticipated.

(8) Stabilize newly created slopes in or adjacent to wetlands or other surface waters to prevent erosion and turbidity.

(9) Maintain construction equipment to minimize the amount of oils, grease, antifreeze, gasoline or other such vehicle fluids ~~from~~ release into the environment.

(10) Control the release or discharge from stockpile areas.

(11) Inspections as per the SWPPP, shall be once every seven (7) days and within twenty-four (24) hours of a 1/2" of rain. Any necessary remedies shall be performed within a reasonable time depending upon the severity of the issue.

(12) Dewatering operations shall meet the following requirements:

a. Dewatering permits from SFWMD shall be obtained prior to dewatering.

b. Turbid water, water greater than twenty-nine (29) NTU above natural background conditions, shall not be discharged from the project site.

~~b.~~

17.8 - Clearing and Grubbing

Requirements for clearing and grubbing and the removal of the resultant products and debris within construction areas are identified below.

(a) Dust control is mandatory.

(b) All appropriate permits and approvals shall be obtained prior to the start of the activity.

(c) Existing trees, vegetation, and sensitive areas that are designated to remain shall be protected in accordance with Chapters 154 and 157 of the City Code.

(d) Sediment and erosion controls shall be installed and inspected prior to clearing and grubbing operations.

(e) Clearing and grubbing shall consist of the removal and disposal of all timber, brush, stumps, roots, grass, weeds, sawdust, rubbish, buildings, septic tanks, pipe, foundations and all other deleterious material resting on or protruding through the surface.

(f) All clearing and grubbing shall be in accordance with FDOT Standard Specifications.

(g) Wells to be abandoned shall be done so in accordance with FDEP and SFWMD requirements.

(h) In all areas of roadway construction and embankment, trees, stumps, roots, and other deleterious materials shall be removed to a depth of not less than one foot below the subgrade.

(i) Materials from clearing and grubbing operations shall be disposed of in accordance with current City, County, State and Federal rules, regulations, ordinances, and laws.~~Regulations.~~

17.9 - Earthwork

Earthwork shall include all excavation, removal of unsuitable material, provision of suitable material, shaping, filling, sloping and finishing necessary for the construction, preparation and completion of all embankments, subgrades, shoulders, ditches, slopes, gutters, intersections, approaches, private entrances, driveways, parking lots and other works all in accordance with the required alignment, grade and cross sections shown on the plans or as directed by the City Engineer. All earthwork shall comply with approved plans and FDOT *Standard Specifications*.

17.10 - Roadway

(a) Preparation, materials, construction and testing of roadway subgrade, base, bituminous treatments, surface courses, geonet, geofabric, and concrete pavement shall meet the requirements of FDOT S*tandard Specifications for Road and Bridge Construction*.

(b) ~~With the exception of~~Except in limited applications, the use of concrete pavement on City-owned and maintained facilities is not routinely approved.

(c) The use of graded, crushed concrete base material is acceptable on privately owned and maintained parking areas with a certification from the EOR that the materials are of a satisfactory gradation, free of deleterious materials, and will achieve a fine to coarse aggregate mixture that will support the

intended use. The use of graded, crushed concrete base material is not acceptable on City-owned or maintained roadways or projects.

17.11 - Sidewalks

Sidewalks, unless otherwise approved by City Council, shall be constructed to the following standards:

(a) Designed and constructed to conform to ADA standards, Section 522 of the FDOT Standard Specifications, FDOT Standard Plans Index Series 522-XXX. A tooled joint is the only acceptable method of constructing an expansion joint. Saw cutting expansion joints is not permitted.

(b) Shall be designed with a maximum cross slope of ~~1.5~~two (2) percent.

(c) Shall meet FDOT Specifications which call for three thousand (3,000) psi. with a minimum thickness of four (4) inches, except across driveways, maintenance areas, curb ramps or within five (5) feet of roadways where the minimum thickness is six inches.

(d) Sidewalks and accessible pathways shall not be constructed using brick.

(e) Sidewalk repairs shall be a minimum of four (4) feet in length.

~~(e)~~(f)

17.12 - Restoration and Stabilization

(a) All areas disturbed by construction shall be restored and stabilized to a condition as good as or better than the original condition in accordance with the approved plans, applicable permits, and NPDES requirements.

(b) For construction that involves the crossing or disturbance of a swale the contractor shall be responsible for restoration of all disturbed swale areas. Furthermore, a new or replacement plastic swale liner shall be installed as specified by approved plans.

(c) The following areas shall be properly sodded with a satisfactory performance turf (sod) and shall be the same kind as the existing sod:

(1) All retention/detention basins.

(2) All exposed areas within ~~pubic~~public rights-of-way.

(3) Areas with slopes steeper than 4:1 (horizontal: vertical).

(4) A three (3)- foot- wide strip of sod (three (3) rows), unless otherwise approved, shall be placed adjacent to all curbs, walks and pavements.

(5) A ten (10) -foot- wide strip of sod shall be placed adjacent to any drainage right-of-way.

(6) Swales.

17.13 - Irrigation

(a) The City uses a central control system for monitoring and controlling irrigation systems within road rights-of-way. For that reason, components of the irrigation system installed within ~~e~~City-maintained road rights-of-way shall be compatible with this system and meet the requirements set forth in this chapter and Appendix F.

(b) For situations not specifically addressed by these specifications, the design, materials, and installation shall meet or exceed the Florida Building Code, Plumbing, Appendix 'F', Florida

Irrigation Society Irrigation Design Standards, and the American Society of Irrigation Consultants requirements. In the event there is a conflict among these standards, the most conservative and restrictive shall govern.

(c) The supply source of irrigation quality water may be from lakes, canals, reuse water facilities, or designated groundwater wells.

18. Project Inspection

18.1 - General

This chapter presents the required inspections for permits issued by the City. All other inspection requirements, types, frequency, and standards shall be in accordance with the governing specifications.

18.2 - Pavement Inspections

Testing for the roadway section shall be in accordance with FDOT and conducted by a Florida certified laboratory. The following are minimum testing requirements; however, the City reserves the right to request additional testing for due cause.

(a) Subgrade – Testing for the thickness, bearing value and density shall be randomly selected locations within each ~~five-hundred~~five hundred (500) ~~-~~foot interval (maximum) for density or ~~one-thousand~~one thousand (1000) feet per LBRs along the length of the roadway or every six-thousand (6000) square feet of parking area. Satisfactory passing test results shall be provided to the City, City's CEI, or EOR for the project prior to proceeding with the base course.

(b) Base - Testing for the thickness and density shall be randomly selected locations within each ~~five-hundred~~five hundred~~-~~ (500) foot interval (maximum) along the length of the roadway or every ~~six-thousand~~six thousand (6000) square feet of parking area. There shall be no less than one test per roadway or parking area. Satisfactory base test results shall be provided to the City, City's CEI, or EOR for the project prior to proceeding with the asphalt or concrete wearing surface.

(c) Asphalt – Roadway and parking area asphalt shall be tested to meet a minimum of ninety-four (94) percent of the maximum laboratory density for the asphalt mix design. Testing may be done by core sampling. Testing shall be at randomly selected locations within each ~~three-hundred~~three hundred~~-~~ (300) foot interval (maximum) along the length of the roadway or every ~~six-thousand~~six thousand (6000) square feet of parking area.

18.3 - Site Work Inspections

Inspectors will make scheduled and unscheduled site visits to determine how the work is proceeding. The EOR or a representative ~~is required to~~must schedule required inspections and shall be on site during the following site work inspections:

(a) Drainage: Observation of the pipe and pipe joints, prior to the pipe being backfilled. The City Inspector also observes backfill operations and structure tie-ins.

~~(a)~~(b) Right-of-Way Irrigation: ~~D~~driveway sleeves, ~~I~~irrigation components, and ~~F~~final ~~T~~testing will be inspected by the City Irrigation Inspector.

~~(b)~~(c) Concrete: The City Inspector will inspect the overall line/grade of the forms for concrete work outside the limits of the building including sidewalks, pavement, curb and gutter. The City Inspector may also observe the placement of concrete.

~~(c)~~(d) Pavement Subgrade: Visual inspection of the compaction and materials and a string line to visually inspect the grade, proof roll, as needed, to ensure that the material is not yielding.

~~(d)~~(e) Pavement Base: Visual inspection of the compaction and materials and a string line to visually inspect the grade, proof roll, as needed, to ensure that the material is not yielding.

~~(e)~~(f) Asphalt: The City Inspector will observe paving operations and may test the temperature of the asphalt mix.

~~(f)~~(g) Final: The site work will be inspected for overall condition and conformance to the construction plans. The following items, will be inspected, including but not limited to~~, will be inspected~~: retention/detention areas, control structures, drainage structures, pavement surface, pavement markings, signage, sidewalks, site grading, and other specifications shown on the plans.

18.4 - Traffic Signals and Lighting Inspections

Traffic signal and lighting inspections shall be conducted by ~~the~~ Traffic Operations staff and/or CEI representatives contracted by the City for all new or modified facilities prior to acceptance.

18.5 - Driveway Culvert and/or Swale Inspections

Driveway culvert and/or swale inspections are required for areas that have roadway swale drainage. The swales within the City serve as the collection and conveyance system for the City's drainage system and, for this reason,~~;~~ the City controls modifications to this system. For projects that require a driveway and culvert pipe that crosses a swale and/or modifications to the swale, there are three (3) inspections. They are as follows:

(a) Stakeout Inspection. For this inspection, the City surveys the swale surrounding the development and specifies the horizontal and vertical location of the swale and driveway culvert(s) as well as the culvert size on a cut-sheet. The day after the stakeout is ~~completed;~~completed, the cut sheet will be available from the Public Works Department. The Contractor shall use this cut sheet to establish the location and grades of the swale and the driveway culvert as well as the size of the driveway culvert.

(b) Driveway Culvert Inspection. Inspection of the driveway culvert prior to ~~backfill,~~backfill is optional,~~;~~ however, it is strongly recommended as there are minimal tolerances. The driveway culvert tolerances are as follow:

(1) No tolerance is allowed for culverts that are set too high.

(2) A one-inch tolerance is allowed for inverts that are set too low.

(c) Final Swale Inspection. City ~~confirms that~~will determine whether the following requirements have been met.

(1) The swale, driveway and culvert(s) are constructed in accordance with the cut sheet.

(2) Culvert(s) is/are clear of debris.

(3) The swale and right-of-way are clear of debris.

(4) Swale liner installed (where appropriate).

(5) Ground stabilized, sodded and graded to promote proper drainage.

(6) Adjacent properties and swales (including the lot(s) directly across the street) are restored to ~~original~~their original condition or better.

18.6 - NPDES Inspections

Inspections are performed on commercial projects to verify that the project ~~is in compliance~~complies with the approved SWPPP and state water quality standards. The frequency of inspections shall occur as stated in the approved FDEP Phase II MS4 Permit for the City.

19. Project Acceptance

19.1 - Privately Owned Development Projects

The EOR shall provide the following information prior to the Public Works Department accepting the project and recommending Certification of Occupancy (CO) issuance to the Building Department ~~issuing a CO~~. The following documents shall be submitted via email in PDF format to engpw@cityofpsl.com and the email shall include the Project Name and Project # in the subject line. If files are larger than ten (10) MB, please ~~upload files to the FTP site https://submit.cityofpsl.com/.~~contact the Public Works department for access to our Sharefile site.

(a) Satisfactory final inspection report from Public Works Department.

(b) Satisfactory final swale and driveway culvert inspection, if applicable, from Public Works Department.

(c) Letter from SFWMD accepting the Engineer's Construction Completion Certification, if applicable.

(d) Letter of certification from the EOR (signed and sealed).

(e) Electronic copy of the record drawing (both PDF and DWG format).

(f) Inspection test results (density and compaction tests for work within City's right-of-way).

19.2 - City-Owned Development Projects

For a capital improvement project, the project closeout documentation shall be in accordance with the requirements of the contract documents. At a minimum, the close out documentation for development projects that will be City-owned shall include:

(a) Deposit of the appropriate maintenance guarantee, if required, in accordance with City Code Chapter 54, Article II, Right-of-Way Permit or City Code Chapter 156, Article VII, Improvement Guarantees.

(b) Satisfactory final inspection report from Public Works Department.

(c) Satisfactory final swale and driveway culvert inspection, if applicable, from Public Works Department.

(d) Letter from SFWMD accepting the Engineer's Construction Completion Certification, if applicable.

(e) Letter of certification from the EOR (signed and sealed).

(f) Electronic copy of the record drawing (both PDF and DWG format).

(g) Inspection test results.

(h) Releases of liens from subcontractors.

19.3 - Roadway Turnover

(a) A request to turn over the ownership and maintenance responsibilities of a roadway that were previously owned and maintained by others may be submitted to the City Engineer. The City Engineer will review the request and prepare a recommendation memo that identifies the reasons for the acceptance, rejection, or need for further information regarding the turnover request. The request, recommendation of the City Engineer, and a draft resolution will be submitted to City Council for review and consideration.

(b) The turnover of roadways, constructed by others, to the City shall follow the procedures outlined in the City Code Section 156.150. Submitting all documents for review/approval prior to submitting the official request for Roadway Turnover is highly recommended.

- Pavement Restoration
- Swale Liner
- Roadway Section - 2 Lanes Divided and Undivided
- Roadway Section - 4 Lanes
- Roadway Section - 6 Lanes
- Road Construction Plan Notes

Appendix A: Applications, Forms, Worksheets

- Abandonment of Easement Application
- Abandonment of Right-of-Way Application
- Commercial Development Review of Traffic Patterns (Policy 19-01)
- Construction Permit Application (clearing and/or mass grading and/or site work)
- Driveway/Swale Permit Application
- Preconstruction Meeting Request Form
- Revocable Encroachment Permit Application
- Right-of-Way and Easement Permit Application
- Road/Lane Closure Request
- Stormwater ERU Calculation Worksheet
- Traffic Calming Request and Petition Form

PLEASE CHECK WITH THE DEPARTMENT, PRIOR TO USING APPLICATION,

TO MAKE SURE THAT THE APPLICATION IS THE MOST RECENT VERSION.

THE MOST RECENT VERSIONS CAN BE FOUND HERE
HTTP://WWW.CITYOFPSL.COM/GOVERNMENT/DEPARTMENTS/PUBLIC-WORKS/COMMERCIAL-RESIDENTIAL-REVIEW-PERMITTING/COMMERCIAL-RESIDENTIAL-FORMS

Appendix B: Traffic Calming Policy and Guidelines

Appendix C: Beautification Policy Guidelines

Appendix D: Fiber Optic Network Minimum Design Standards and Details

Appendix E: St Lucie TPO Standardized Traffic Impact Studies (TIS) Methodology and Procedures for St Lucie County, City of Fort Pierce and the City of Port St Lucie

Appendix F: Irrigation System Standards

Appendix G: Mobility Plan