

# TABLE OF CONTENTS

## PART 1

1.1	General	2
1.2	Engineer of Record/Duties & Responsibilities	2-3
1.3	Roadway Design and Construction Criteria	3-4
1.4	Standard Details & Typical Roadway Sections	4
1.5	Public Right-of-Way and Utility/Drainage Easements	5
1.6	Clearing and Grubbing	5
1.7	Subsoil Investigation for Roadways	5
1.8	Design Criteria for Roadway Subgrade	5-6
1.9	Base Courses for Flexible Pavements	6-7
1.10	Surface Course for Flexible Pavements	7-9
1.11	Concrete Pavement	9
1.12	Intersection Corner Radii	9
1.13	Traffic Control Devices	9-11
1.14	Traffic Calming Zones	11
1.15	Driveways	11
1.16	Sidewalks	12
1.17	Acceleration – Deceleration Lanes	12
1.18	Bridges	12
1.19	Roadway Alignment	13
1.20	Roadside Clear Zone Width	13
1.21	Sight Distance Criteria	13
1.22	Medians, Islands and Parkways	14
1.23	Other Structural Improvements Within Public Right-of-Ways	14
1.24	Sodding or Grassing and Mulching	14
1.25	Bicycle Facilities	14-15
1.26	Erosion Control	15-16
1.27	Utility Installations Within Public Right-of-Ways	16-17
1.28	City, County, State and Federal Permits	17
1.29	Construction Plans/Public and Private Streets	18-19
1.30	Approval of Engineering Plans	19
1.31	Inspections of Projects	19-20
1.32	Enforcement of Code Violations	20
1.33	Certified “As-Built” Construction Plans	20
1.34	Public Acceptance and Maintenance of Facilities	20
1.35	Warranty Period for City-Maintained Improvements	20

# CITY OF LAKE WALES

## ROADWAY DESIGN STANDARDS

### 1.1 General

Florida Statutes (the Florida Transportation Code) establishes the responsibilities of the State, Counties, and Municipalities for the planning and development of the transportation systems serving the public. The Code's purpose is to protect the safety and welfare of the public. The State of Florida Department of Transportation (FDOT) has developed and adopted uniform minimum standards and criteria for the design, construction, maintenance and operation of public roads. The City of Lake Wales has adopted the FDOT – Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook) as a manual that provides the basic guidelines for developing street and highway facilities with reasonable operating characteristics with a minimum number of hazards.

The purpose of this section of the City of Lake Wales Engineering Standards Manual is to provide uniform minimum standards and criteria for design, specifications and construction of public and private streets, highways, bridges, sidewalks, driveways, curbs, curb ramps, bicycle paths, drainage and stormwater management facilities, water, electric and wastewater utilities. These standards provide basic guidelines for developing these facilities in order to maintain uniform and reasonable operating characteristics and shall be applied to all new construction projects and on all reconstruction projects to the extent that economic and environmental considerations and existing development will allow. Where this Manual refers to guidelines and design standards given by reference in other manuals, those guidelines and standards shall be considered as minimum criteria and are to be considered as the requirements within the authority of this Manual. In those instances where a design criteria, specification or method of testing or construction is not specifically addressed in this manual, then the governing authority will be that contained in these other manuals cited and referenced in this Manual. The City or Public Works Department shall mean the Public Works Director or his designated representative with respect to this Manual.

### 1.2 Engineer of Record/Duties and Responsibilities

#### Design Stage

The Engineer of Record for a project is responsible for the design of the construction plans and specifications for those roadways, drainage and utility facilities, and other structures, as they may apply. The Engineer of Record is responsible for the conformance with the minimum requirements set forth in this Manual and with other applicable statutory rules, regulations or policies that would affect the design and operation of the constructed project. Construction plans and specifications submitted to the City shall include design data and calculations necessary for the City to provide adequate review of the submittal. These plans, specifications and calculations shall be certified by the Engineer of Record.

Construction and Inspection Stage

The Engineer of Record for a project shall make periodical reviews and inspections from time to time, as required, in order that he can be reasonably assured that the project is substantially constructed in accordance with the plans and specifications that have received approval by the City. The Engineer of Record shall not solely rely on project inspection from individuals who are not directly under his responsible charge unless the Certification of the “As-Built” or “As-Built/Record Drawing” is to be made by another Registered Engineer who shall accept responsibility for project review and inspection.

“As-Built” or “As-Built/Record Drawing”

The Engineer of Record, or other such Registered Engineer as may apply, shall submit to the City the required number of certified “As-Built” or “As-Built/Record Drawings” on the media required by the particular Department or Departments within the City of Lake Wales, or as required by other governmental regulatory or permitting agencies requiring such drawings. This “As-Built/Record Drawing” shall contain a certification from the Engineer of Record registered in the State of Florida that indicates that the project has been substantially completed in accordance with the approved plans and specifications, or that the deviations noted on the Record Drawings will not prevent the project from complying with the design function of the project.

In order to effectively comply with this requirement, it would be necessary for the certifying Engineer to have provided periodic review and inspection of the installation of those facilities within the project. The Engineer may supplement his review and inspection of the project by utilizing information taken from a valid survey. The “As-Built/Record Drawing” shall provide information on project facilities that indicates sufficient horizontal and vertical dimensional data so that the constructed improvements may be located and delineated. All dimensions both horizontal and vertical that differ from the approved plans shall be placed on the “As-Built/Record Drawing” and certified by a Professional Surveyor and Mapper and Professional Engineer before submitting to the City.

“As-Built/Record Drawings” that contain disclaimers that essentially render the Professional Engineer’s certification meaningless will not be accepted.

**1.3 Roadway Design and Construction Criteria**

Roadway design and construction criteria shall conform to the criteria contained within this Manual and, as referenced in criteria contained in the following publications and other applicable publications:

- FDOT – Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition.
- FDOT – Roadway Plans Preparation Manual, latest edition.
- FDOT – Standard Specifications for Road and Bridge Construction, latest edition.
- FDOT – Procedures Manual for Flexible Pavement Design, latest edition.
- FDOT – Utility Accommodation Guide, latest edition.
- FDOT – Roadway and Traffic Design Standards, latest edition.
- FDOT – Drainage Manual, latest edition.
- FDOT – Bicycle Facilities Planning & Design Manual, latest edition.

AASHTO – A Policy on Geometric Design of Highways and Streets, latest edition.  
AASHTO – Standard Specifications for Highway Bridges, latest edition.  
AASHTO – Guide for Development of New Bicycle Facilities, latest edition.  
Transportation Research Board, Special Report 209, Highway Capacity Manual.  
ITE - Traffic Calming reference  
OSHA-All OSHA Safety Regulations, current edition  
USDOT, FHWA – Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition (MUTCD).

Publications listed above shall be considered as an integral part of this Manual.

## 1.4 Standard Details & Typical Roadway Sections

### Standard Details

Construction shall conform to the Standard Details and Specifications contained in Section 6 of this Manual or as otherwise approved by the Public Works Director. These Standard Details and Specifications may be updated from time to time. They are intended to serve as uniform standards, which represent minimum requirements and are supplemented by the standard details, design criteria and specifications contained in the other manuals and texts that were referenced in Section 1.3 of this Manual.

### Typical Roadway Sections

The roadway typical sections for both public and private streets proposed for construction within the City of Lake Wales shall conform to the minimum criteria, guidelines and standards set forth in this Manual. These may be updated from time to time. These typical roadway sections are intended to serve as uniform standards which represent minimum requirements and may be supplemented by more stringent criteria, guidelines and standards that may be contained in the referenced manuals, as specific conditions may dictate.

### Typical Roadway Sections Local Streets

The minimum pavement width shall be twenty-four (24) feet and the minimum right of way width shall be **fifty (50) feet**. In those instances where a Developer proposes to develop a local public or private street that does not conform to the adopted typical sections, the proposed typical section will require the approval of the Public Works Director and the minimum standards and criteria prescribed in the aforementioned FDOT Manuals shall apply.

### Collector Streets

The geometric design and roadway typical section of a collector road will be determined by the design operating conditions of the facility pursuant to criteria contained in other Manuals referenced in Section 1.3.

The minimum pavement width for collector streets shall be twenty-four (24) feet. The roadway sections and geometric design features required at a site shall be dependent on the operating conditions of the facility. The Public Works Director shall determine the minimum design criteria of the proposed collector street or modifications required to an existing collector street that is impacted by a development.

## 1.5 Public Right-of-Way and Utility/Drainage Easements

Minimum right-of-way widths are listed below. Additional right-of-way may be required to provide for adequate drainage facilities and to accommodate public drainage and utilities. Public utility and/or drainage easements may be substituted in lieu of actual dedicated right-of-way where the minimum right-of-way widths are consistent with the requirements contained in this manual, or as approved by the Public Works Director.

<u>Roadway Classification</u>	<u>Urban Section</u>	<u>Rural Section</u>
Alleys	10' min.	Not applicable
Local Street	60' min.	As required
Minor Collector	66' min.	As required
Major Collector	84' min.	As required
Arterial Streets & Highway	120-300'	As required

## 1.6 Clearing and Grubbing

Before clearing and grubbing can be started, erosion and sediment control measures must be implemented.

All roadway rights-of-way shall be cleared and grubbed in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. Selective clearing and grubbing is prohibited unless approved by the Public Works Director.

## 1.7 Subsoil Investigation for Roadway

A subsoil investigation report shall be submitted with road, drainage and utility plans and shall include:

- (a) Seasonal high and existing groundwater elevation data.
- (b) Borings to a minimum of 5.0 feet below the profile grade at no more than five hundred (500) foot intervals to determine the soil classification in accordance with AASHTO M 145-73. Additional borings may be made as necessary to determine limits of unsuitable material. Depth and horizontal extent of muck, or other unsuitable materials shall be determined. The Engineer of Record shall determine handling of unsuitable material, subject to the approval of the Public Works Director.

## 1.8 Design Criteria for Roadway Subgrade

### Requirements

Roadway sub-grade shall not have a thickness, bearing ratio, or density less than the following:

Type of Roadway	Compacted Stabilized Sub-grade Thickness	Limerick Bearing Ratio	Minimum Density AASHTO T-180
Local	12"	40	98% Proctor
Collector	12"	40	98% Proctor

Construction

The construction of the stabilized sub-grade shall conform to the FDOT Standard Specifications for Road and Bridge Construction, latest edition. The use of a reinforcing geo-fabric may be considered for application below the sub-grade to help obtain the required compaction, subject to the approval of the Public Works Director. The fabric shall meet the specifications of FDOT, Standard Specifications for Road and Bridge Construction.

Testing

Test points for the sub-grade bearing capacity and compaction shall be located no more than four hundred (400) feet apart and shall be staggered to the left, right, and on the centerline of the roadway. The test results shall be submitted by the Engineer of Record to the Public Works Department. When, in the judgment of the Public Works Director, conditions warrant additional testing, the Engineer of Record will be advised that additional tests will be required and the extent of such additional tests. Such tests shall be in accordance with the provisions of the FDOT Standard Specifications for Road and Bridge Construction or other applicable testing requirements.

**1.9 Base Courses for Flexible Pavements**

- (a) Base course material normally used is lime-rock. Other alternate base course materials may be considered for use for special design conditions with the approval of the Public Works Director. These alternate materials include any FDOT approved base course. All materials and construction shall conform to FDOT Standard Specifications for Road and Bridge Construction, latest edition. If lime-rock base material is approved for construction, the thickness and density shall not be less than the following:

<u>Type of Development</u>	<u>Compacted Base Depth</u>	<u>Minimum Density AASHTO T-180</u>
Local	6"	98% Proctor
Collector	8"	98% Proctor

- (b) If an alternate base material is approved for use, equivalent minimum densities must be achieved.
- (c) Base materials and plant mixes including plant, methods & equipment shall be certified in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. Base materials and plant mix certifications shall be submitted to the Public Works Department by the Engineer of Record for review.

- (d) Soil cement base shall have a seven (7) day compressive strength of a minimum of 150 psi. In no case shall soil cement base thickness be less than six (6) inches for residential development and eight (8) inches for industrial development. Test cores shall be taken at twenty-one (21) days, have a strength of a minimum of 300 psi, and be taken at locations of high groundwater and other locations as deemed necessary by the Engineer of Record. Only a plant mixed soil cement base will be allowed; mixed in place soil cement base will not be allowed. Soil cement base shall have a seven (7) day minimum curing time prior to paving.
- (e) Testing  
Tests for base thickness and density shall be located no more than four hundred (400) feet apart and shall be staggered to the left, right, and on the centerline of the roadway. Test reports for thickness and density shall be submitted to the Public Works Department by the Engineer of Record. When, in the judgment of the Public Works Director, conditions warrant additional testing, the Engineer of Record will be advised in writing that additional tests will be required and the extent of such additional tests.
- (f) Prime and Tack Coats  
All bases shall be primed in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. Tack coats shall not be required on primed bases, except on areas, which have become excessively dirty and cannot be cleaned or in areas where the prime has cured and lost all bonding effect. Tack coat material and construction methods shall conform to the FDOT Standard Specifications for Road and Bridge Construction, latest edition.

## 1.10 Surface Course for Flexible Pavements

### Requirements

Hot bituminous mixtures – plant, methods, & equipment shall conform to FDOT Standard Specifications for Road & Bridge Construction. Surface courses for flexible pavements shall be Asphaltic Concrete Type S and shall meet the following minimum thickness requirements.

<u>Roadway Classification</u>	<u>Asphaltic Concrete Surface Course</u>
Local Street	1 ¼”
Collector Street	1 ½”

### Materials and Construction

Asphaltic Concrete Type S, including prime and tack coats, shall conform to the FDOT Standard Specifications for Road and Bridge Construction, latest edition, for materials and method of construction.

The method of determining the roadway sub-base and pavement thickness has been calculated by the structural number criterion as set forth in the “Flexible Pavement Design Manual” prepared by FDOT. An example of the structural layer coefficients defined in that manual are provided in TABLE 1 in this section. These structural layer coefficients are then extended in one-inch equivalent layers in the calculations of the structural number of the combined structural layers of the roadway section.

The minimum structural number allowable for any roadway section design for Local Street shall be 2.59. This structural number considers a roadway with a Type S asphaltic pavement of 1 ¼” thickness, a lime-rock base of 6” thickness and a stabilized sub-grade of 12” thickness. The minimum structural number of a collector street shall be 3.06. This structural number considers a roadway with a Type S asphaltic pavement of 1 ½” thickness, a lime-rock base of 8” thickness and a stabilized sub-grade of 12” thickness.

Where the Developer desires to present an alternate combination of roadway sub-grade, base and pavement design typical section, the structural number of the alternate roadway section shall meet the structural number criteria established above. The Public Works Director reserves the right to either approve or disapprove such alternate roadway typical section.

**TABLE 1  
STRUCTURAL COEFFICIENTS FOR DIFFERENT PAVEMENT LAYERS**

<u>Specification Section</u>	<u>Layer Coefficient</u>	<u>Layer</u>
337	0.20	FC-1 or FC-4
331	0.44	Type S
333	0.30	Type III
332	0.20	Type II
280	0.30	ABC-3 (Marshall – 1000)
280	0.25	ABC-2 (Marshall - 750)
280	0.20	ABC-1 (Marshall - 500)
272	0.25	Econocrete (1100 psi)
272	0.22	Econocrete ( 800 psi)
270	0.20	Soil Cement (500 psi)
270	0.15	Soil Cement (300 psi)
335	0.15	SAHM (Marshall – 300)
204	0.15	Graded Aggregate (LBR-100)
250	0.18	Cemented Coquina Shell (LBR-100)
200	0.18	Limerock (LBR-100)
250	0.16	Bank Run Shell (LBR-100)
230	0.12	Limerock Stab. (LBR-75)
240	0.12	Sand Clay (LBR-70)
250	0.12	Shell (LBR-70)
260	0.10	Shell Stab. (LBR-70)
290	0.18	Limerock Sub-base*
160-3	0.10	Stabilized Sub-base
180	0.08	Stabilized Sub-base
160-5,6	0.08	Type A, B Stabilization (LBR-40)
160-5,6	0.06	Type A, B Stabilization (LBR-30)
160-7	0.06	Type C Stabilization
170	0.12	Cement Treated Subgrade (300 psi)
165	0.08	Lime Treated Subgrade
165	0.08	Hydrate Lime Treated Subgrade

\* See Optional Base and Pavement Chart in FDOT Flexible Pavement Manual for thickness



limitations. Updated layer coefficients as specified by the current FDOT Flexible Pavement Manual may be used for determining layer thickness. Friction courses will be approved on a case by case basis.

Plant mix design certification and/or coring tests of base and pavement will be required on all public and private streets. The frequency of coring tests will be, at a minimum, as established in the FDOT Specifications, for Road and Bridge Construction, latest edition, or as specified by the Public Works Department. The expense of all required tests shall be that of the developer.

Control strip testing may be required in accordance with FDOT Standards for Road and Bridge Construction, latest edition, or as specified by the Public Works Department.

## **1.11 Concrete Pavement**

Concrete pavement may only be used with the specific approval of the Public Works Department. Concrete pavement must conform to the FDOT Standards for Road and Bridge Construction, latest edition, the requirements of the American Concrete Paving Association Guide Specifications and Design Standards contained in the “Municipal Concrete Paving Manual”, or an equivalent specification approved by the Public Works Department.

## **1.12 Intersection Corner Radii**

For commercial and industrial development the minimum radii shall be 50 feet where large trucks are expected to use the intersection.

## **1.13 Traffic Control Devices**

All traffic control devices including those signs and pavement markings on private property when the public is invited must conform to standards adopted by the Florida Department of Transportation pursuant to Florida Statute, Section 316.0747.

Any nonconforming traffic control device in use by a nongovernmental entity prior to January 1, 1980 may be used for the remainder of its useful life, but no longer than January 1, 1992 after which any replacement device shall conform to the uniform system of traffic control devices adopted by the Department of Transportation.

The “Manual on Uniform Traffic Control Devices” (MUTCD) published by the U.S. Department of Transportation is the national standard for Traffic Control Devices. The Florida Department of Transportation has adopted the MUTCD as the State standard by Rule 14-15.10.

The City of Lake Wales has adopted Section 316 of the Florida Statutes, the Florida Uniform Traffic Control Law, relating to the use and regulations of streets and highways within the territorial limits of the City of Lake Wales, Florida (Ord. No. 1791).

The MUTCD states that:

- Parking space striping must be white (Sec. 3B-19)
- Lane Lines between traffic in the same direction, must be white (Sec. 3B-2).
- Centerlines between traffic in opposing directions, must be yellow (Sec. 3B-1).
- Arrows on the pavement must be white (Sec. 3B-20)
- Crosswalks must be white (Sec. 3B-18)
- Stop lines must be white (Sec. 3B-17).
- Street Name Signs should have 4" high lettering (Sec. 2D-39).

#### SIGN INSTALLATION:

In business, commercial or residential districts where parking and/or pedestrian movement is likely, the clearance to the bottom of a sign shall be at least seven 7 feet. (Sec. 2A-23).

Lateral clearance for regulatory and warning signs or small directional signs should be 6 to 12 feet from the edge of the pavement or traveled way in rural areas; signs are generally mounted alongside the roadway in the space between the curb and the sidewalk. Although 2 feet is recommended as a working urban minimum, a clearance of 1 foot from the curb face is permissible where sidewalk width is limited (Sec. 2A-24).

#### STANDARD SIZES OF SIGNS:

STOP: 30" (OCTAGON)

YIELD: 36" (EQUILATERAL TRIANGLE)

NO TURN (SYMBOL):24" X 24" (SQUARE)

DO NOT ENTER: 30" X 30" (SQUARE)

REGULATORY (SPEED LIMIT, KEEP RIGHT):24" X 30" (RECTANGLE)

WARNING (RIGHT OR LEFT CURVE, NO OUTLET...):30"X 30" OR 36" X 36" (DIAMOND)

STREET NAME: 6" HIGH WITH 4" HIGH LETTERING (RECTANGLE)

HANDICAPPED PARKING: 12" X 18"

ONE WAY: 36" X 12" OR 18" X 24" (RECTANGLE)

STREET NAME SIGNS – STREETS SHALL BE NAMED IN ACCORDANCE WITH THE METHOD SET FORTH IN STANDARD

- (a) Signalization – During the review of the development plan, the Public Works Department Traffic Operations Division will review the need for signalization. The developer shall be responsible for submitting any traffic studies required to determine signalization requirements, or requests for additional traffic controls. This determination will be based upon traffic warrants as identified in the "Manual of Uniform Traffic Control Devices".
- (b) Costs – All costs for the design and installation of required traffic control devices and street name signage's including but not limited to design, permitting, construction and installation of signalization shall be borne by the developer.
- (c) Temporary Road Closures – The temporary closure of public streets located within the City of Lake Wales for the purposes of a special event, roadway or utility construction, reconstruction, maintenance, or emergency purposes may be authorized through the issuance of a Permit by the Public Works Department. An additional permit will be required on those roads within the City of Lake Wales maintained by Polk County or the Florida Department of Transportation.

- (d) Traffic Control and Work Safety – Construction, maintenance and utility operations within public right-of-ways shall require that a plan be submitted to the Public Works Department for traffic control around and through the work site. This work site safety and traffic control plan shall conform to the FDOT Manual on Traffic Controls and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations and the FDOT Roadway and Traffic Design Standards.

## 1.14 Traffic Calming Zones

Traffic calming and traffic calming zones are strategies to regulate the excessive speed of “pass through” vehicular traffic on certain local residential streets where traffic volumes, speed, and high accident rates have been determined by the City to be disruptive to the quality of life within the neighborhood. Generally, traffic calming measures consist of the introduction of structural features or special street design features that discourage vehicles from traveling of speeds higher than posted speed limits. Traffic calming zones have limited application and any proposed location must be first recommended for consideration by the Public Works Department, then approved for funding and implementation by the City Commission.

## 1.15 Driveways

Driveways installed within the public right-of-way within the City of Lake Wales shall be constructed in accordance with the provisions of this Manual, and no driveway shall be constructed until a Right of Way Use Permit has been obtained from the City for such construction.

The materials and specifications for commercial and industrial driveways will be according to intersection design standards and be approved on a site-specific case that provides for moving traffic off the road as quickly as possible without impeding traffic on the main road. This class of driveway shall typically include a wide radius capable of handling vehicles that will be utilizing the entrance and be either flexible pavement or concrete. Typically, the minimum radius for semi trucks will be 50 feet. The FDOT Roadway and Traffic Design Standards, latest edition and FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition shall be used as a minimum for driveway design when intersection criteria is required.

The property owner shall maintain private driveways. The City will only maintain public access roads and intersections.

Driveways that connect to the State Highway System or County Road System must obtain a driveway permit from the governing agency prior to receiving approval of the site plan by the City.

Driveways installed within private property may be of any material that provides a “dust-free” surface and are to be constructed in accordance with the specifications deemed appropriate for the type of construction proposed.

## 1.16 Sidewalks

Sidewalks installed within the public right-of-way within the City of Lake Wales shall be constructed in accordance with the provisions of the Lake Wales City Code and no sidewalk therein shall be constructed until a permit has been obtained for such construction. In an urban design road, sidewalks shall be located a minimum distance of thirty (30) inches behind the back of curb and the sidewalk shall have a minimum width of five (5) feet. When constructed along the back of the curb, sidewalks shall have a minimum width of six (6) feet wide. Sidewalks constructed along the road with no curb shall have a minimum distance of six (6) feet from the driving lane or outside the roadside clear zone whichever is greater.

The material and specifications for the installation of standard sidewalk are shown on the details contained in FDOT Standard Details 304 and 515. Refer to FDOT Index 304 for handicap ramps.

Any request to vary from the criteria for sidewalk construction set forth in the Lake Wales City Code will be considered on a case by case basis by the Public Works Director. Such requests may be granted provided the Public Works Director determines that specific restrictive conditions preclude conformance to approved standards and the proposed sidewalk construction is warranted.

## 1.17 Acceleration – Deceleration Lanes

Acceleration-deceleration lanes shall be provided, if warranted, under the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition and the FDOT Road and Traffic Design Standards, or as required by the Public Works Director due to special conditions.

## 1.18 Bridges

- (a) Bridges shall be constructed of precast concrete, prestressed concrete or cast in place concrete, unless otherwise approved by the Public Works Director.
- (b) Bridge design shall conform to the design criteria of the AASHTO Standard Specifications for Highway Bridges, latest edition, FDOT Standard Specifications for Road and Bridge Construction, latest edition and other applicable design standard specifications relevant to the approved construction material and construction practices.
- (c) The design truck loading shall be HS 20-44. Four (4) sets of signed, sealed, and dated bridge design calculations shall be submitted by the Engineer of Record to the Public Works Department.
- (d) Foundation investigation and design reports and testing are required and shall be in accordance with FDOT and AASHTO Standard practices, and shall be submitted to the Public Works Department by the Engineer of Record for review.
- (e) All Engineering design revisions shall be reviewed and approved by the Public Works Director prior to construction.

## 1.19 Roadway Alignment

### Vertical Alignment

A minimum grade of 0.30% is required for all urban design sections. The grade of a rural design section will be dependent upon the specific topographic features of the area. Vertical curves shall be provided where appropriate. The roadway grade in both urban and rural design sections shall conform to the criteria set forth in the FDOT Manual of Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition. Refer to the following table for maximum change in grade without using vertical curve.

DESIGN SPEED (MPH)	20	30	40	50	60	65	70
Maximum Change in grade in percent	1.20	1.00	0.80	0.60	0.40	0.30	0.20

### Horizontal Alignment

The standard alignment of a particular section of road should extend throughout the entire section. “Broken back” arrangements of curves should be avoided. Horizontal curvature shall conform to the criteria set forth in the FDOT Manual of Minimum Standards for Design, Construction and Maintenance for Streets and Highways.

### Alignment Coordination

Horizontal and Vertical alignment should not be designed independently. Curvature and grades should be in proper balance and stopping sight distance should also be included in the design decision. All alignment consideration should be in conformance with the FDOT Manual of Standards for Design, Construction and Maintenance for Streets and Highways.

## 1.20 Roadway Clear Zone Width

The width of the clear zone should be as wide as practical. The minimum permitted widths as shown in the following table, are minimum values and should be increased whenever feasible.

DESIGN SPEED (MPH)	30 and below	35	40	45	50 and above
Rural (ft)	6	8	11	14	30
Urban (ft)	4	4	4	4	14

Guardrails may be utilized in lieu of the clearance with minimum requirements under certain circumstances. Refer to FDOT Roadway and Traffic Design Standards for minimum installation details.

## 1.21 Sight Distance Criteria

The design of street and highway vertical and horizontal alignments and intersection design shall consider stopping sight distance and obstructions to sight distance. Refer to the criteria set forth in the FDOT Manual of Uniform Minimum Standards for Design Construction and Maintenance for Streets and Highways.

## **1.22 Medians, Islands and Parkways**

Medians, islands, and parkways may be authorized and in some cases required within the public right-of-way by the Public Works Department. The plat dedication or other legal authority must clearly stipulate that the maintenance, including vegetative maintenance of the area is to be the sole responsibility of a private individual, group or association and that proof is provided that the maintenance of the improvements will be perpetual. The maintenance of the median, islands and parkways must insure that their presence does not become a site obstruction.

Medians shall be curbed and conform to requirements of the FDOT Standards. All median turn lanes shall be developed in accordance with the applicable Florida Department of Transportation's Standard Indexes for Roadway and Traffic Design Standards and shall provide sufficient clear unobstructed sight distance consistent with the requirements contained herein.

## **1.23 Other Structural Improvements Within Public Right-of-Way**

No private structural improvements, including but not limited to walls, posts, fences, gate houses, private identification signs, or other encroachments shall be constructed or placed within the public right-of-way unless approved by the City Commission. Public or quasi-public improvements such as utilities, bus shelters, telephone booths, newspaper racks, or benches will be considered, providing they do not create a traffic or pedestrian hazard and do not limit site distance at intersections. Mailboxes are exempt from permitting and may be placed in the right of way providing they meet all United States Postal Service requirements and comply with the FDOT Roadway and Traffic Design Standards, latest edition. Typically mailboxes should be mounted on a breakaway type post. When constructing congregate or multiple mailboxes, or a mailbox on a non break away pedestal they shall be constructed in conformance with FDOT roadway safety requirements including maintaining a roadside clear zone as specified in this manual. A building permit may be required for the installation of certain structural improvements. This permit must be obtained from the Building Department.

## **1.24 Sodding or Grassing and Mulching**

All right-of-way other than the roadway area shall be sodded or seeded and mulched in order to prevent erosion within the project limits. All sodding or seeding and mulching shall be in accordance with the materials and construction practices set forth in the FDOT Standard Specifications for Road and Bridge Construction, latest edition. The final decision as to the requirement for sodding versus seeding and mulching will be that of the Public Works Director.

## **1.25 Bicycle Facilities**

Transportation facilities and recreational trails for bicycles shall be developed in accordance with the criteria set forth in the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, The FDOT Bicycle Facilities Planning and Design Manual and as adopted by the American Association of State Highway and Transportation Officials (AASHTO) in the Guide for Development of New Bicycle Facilities, latest edition.

In the development of new streets and highways and in the reconstruction of existing streets and highways, bicycle facilities in the form of either of the following shall be considered and evaluated as to the applicability of incorporating such features into the design of the street and highway.

1. Rural design sections – five (5) foot width paved shoulders
2. Urban design sections – fifteen (15) foot width curb lanes  
(alternate) – five (5) foot width exclusive dedicated bicycle lane

## **1.26 Erosion Control**

The developer shall take all practicable and necessary effort to control and prevent erosion and sediment transport during the construction of a project to surface waters of the State or to adjoining properties. The design of erosion control systems applies common sense planning, scheduling and control actions that will minimize the adverse impacts of soil erosion, transport and deposition. The design and maintenance of erosion and sediment control shall utilize Best Management Practices (BMP) in accordance with the required NPDES permit.

Installation of Controls – No clearing, grading, cutting or filling shall commence until erosion and sedimentation control devices have been properly installed, in accordance with an approved plan between the area to be disturbed and adjacent property, water bodies, water courses and wetlands. Clearing and excavation required for installation of erosion and sedimentation control devices is allowed provided no activity occurs beyond five feet of the control devices as specified on the approved plan.

Method of Control – Erosion shall be minimized and sediment retained on the site through application of Best Management Practices (BMP) approved as part of the NPDES permit. Methods of control shall be suitable for site size, vegetative cover, soil type, slope, design features and proposed construction sequence and activities.

### Methods:

Limiting amount of clearing.

Staging clearing activities to minimize the length of time and area is left unstabilized and to minimize the total area cleared at any one time.

Temporary gravel construction entrances.

Silt fences.

Storm drain inlet protection.

Temporary diversion dikes.

Temporary sediment traps.

Temporary sediment basins.

Temporary stream crossing.

Seeding to establish an appropriate vegetative ground cover.

Sodding.

Erosion control and seeding mats.

Other suitable methods.

Maintenance of Controls – once properly installed, erosion and sediment controls must be maintained until a permanent vegetative ground cover is established. Any site or portion thereof where work is not being performed as part of the current phase of development and which remains cleared for over thirty (30) days, shall be stabilized. All disturbed areas shall be

permanently stabilized through the establishment of appropriate vegetative ground cover upon completion of development activities on the site.

#### Erosion & Sediment Control Notes

1. All practicable and necessary efforts will be taken during construction to control and prevent erosion and transport of sediment to surface drains, surface waters, or on to adjoining properties.
2. All site grading shall direct stormwater runoff to the detention and/or retention areas.
3. Revegetation and stabilization of disturbed ground surfaces will be accomplished as rapidly as possible to prevent erosion from occurring and reduce the sediment load into the discharge waters of the State or USA. All areas disturbed during construction shall be grassed and mulched, or sodded.
4. All areas subject to erosion shall be regraded and properly maintained with protective measures such as vegetation, turfing, mulch, stabilizing, fibrous materials riprap, etc. to control erosion with a minimum maintenance and to reduce dust conditions.
5. Filter fabric will be installed around the construction site perimeter to prevent siltation of adjacent properties and any such materials shall be removed from off-site. The filter fabric will remain in place until all exposed surfaces are stabilized.
6. The downstream turbidity screening will remain in place for the duration of the project construction.

#### Drainage Facilities Operations & Maintenance

Bank side slopes shall be maintained against wash and erosion.

All silt and other materials that accumulate in the pond bottom, underdrains, exfiltration beds, swales, ditches, pipes, etc. shall be removed.

All retention areas and adjacent areas shall be mowed and kept clean of all trash and debris. All grass cuttings; trimmings and other organic sediment shall be raked and removed.

Retention area bottoms and side slopes are to be cleaned and regraded by the Owner as required to maintain the effective depth and volume and rate of percolation.

### **1.27 Utility Installation With-in Public Right-of-Ways**

In addition to obtaining a Right of Way Use Permit, anyone working within the right of way shall maintain traffic, and use BMP's as needed to provide erosion control.

#### General (City-Maintained Streets)

Where it is necessary for utilities to be placed or relocated within the public right-of-way, the placement and location shall not be inconsistent with the requirements of this the Manual. Utility poles and above ground utility structures are not generally permitted in medians or within roadside recovery areas. Underground utilities should not be buried under the



pavement when other space is available within the right-of-way. Unavoidable crossings of the street should be designed to allow for repairs and modifications without unnecessary disruption or hazard to traffic. Work site safety shall conform to Part VI of the MUTCD and to the criteria set forth in the FDOT Roadway and Traffic Design Standards.

### Installations Crossing Under Streets

Underground utility crossing of paved City-maintained streets are to be by the “Jack and Bore or Directional Bore methods. No other methods will be allowed. Where extraordinary circumstances preclude the use of the “Jack and Bore” or Directional Bore methods of utility crossing, the Public Works Department may authorize an open cut trench across the paved street. The casing of the underground utility shall maintain a minimum of thirty-six (36) inches of cover from the crown of the roadway pavement to the outside diameter of the casing. The casing shall extend three (3) feet past the back of curb in an urban design section and a minimum of three (3) feet past the edge of pavement in a rural design section. All methods of installation are subject to the review, approval and inspection by the City of Lake Wales. Traffic control at the project site shall be maintained during all stages of the operation and such traffic control shall conform to the criteria set forth in this section.

### Utility Installations (County and State Maintained Right-of-Way)

Utility installations within County and State maintained right-of-way requires that the City of Lake Wales file a permit with those agencies for the installation and maintenance of that utility installation. It will also require that the Contractor performing the actual installation of the utility file with the City of Lake Wales proof of insurance that sufficiently protects the City, as determined by the City’s Public Works Department. The Contractor shall be responsible for maintaining traffic control and work site safety during the entire installation.

## **1.28 City, County, State, and Federal Permits**

The developer, his agent or assign, prior to the development of a site, shall obtain all necessary City, County, State, and Federal permits for the construction of the project. The Engineer of Record shall submit copies of the approved permits to the Public Works Department at the time development plans are submitted to construct road, bridge, utility and/or drainage facilities. In certain circumstances, conditional approval of the construction plans may be granted upon receipt of satisfactory evidence that applications for permit have been furnished to the City. This conditional approval shall be subject to the actual issuance of the required permit. Conditional approval does not grant authorization to start construction unless specifically authorized by the Public Works Director.

Polk County and Florida Department of Transportation issue permits for driveway connections to their roadways, utility installations and other general uses of their right-of-ways. Florida Department of Environmental Protection (FDEP) issues permits for construction activity in or affecting the water quality of waters of the State and potable water systems and wastewater systems. Southwest Florida Water Management District (SWFWMD) issues permits for stormwater management systems. The Florida Department of Environmental Protection issues NPDES exemptions and permits for development, which require erosion control measures. Other permit applications may also be issued by the afore-referenced agencies.

## 1.29 Construction Plans/Public and Private Streets

Construction plans and specifications prepared by and certified by a professional engineer registered in the State of Florida must be submitted to the City of Lake Wales Public Works Department for approval by the Public Works Department and other departments for all proposed public and private street construction. These plans and specifications shall include the minimum information:

- (a) Topographic map of the site with elevations based on NGVD elevations, contour lines and other features that would influence the drainage pattern (existing or modified) of the site.
- (b) A layout plan of the proposed development, showing all necessary existing and proposed elevations, grades and treatment of intersections.
- (c) Typical roadway sections showing all necessary elevations, grades and intersection treatment, including special profiles are required to define design requirements of site specific locations.
- (d) Drainage map, including the entire area to be developed and adjacent areas affecting or affected by the development.
- (e) Plan and profile sheets for all public and private streets that are proposed for construction. These plans shall include existing topography and proposed elevations of roadway sections and method of connection to existing roads, which may include special profiles of intersections.
- (f) If variable width right-of-ways are proposed, roadway and ditch cross sections shall be shown to describe site conditions. In any instance, the maximum interval of cross-sections shall be one hundred (100) feet.
- (g) The construction plans shall include the location of all existing and proposed utilities and, where applicable, a utility relocation plan. Existing and proposed drainage facilities shall also be included in the plans. All afore-referenced facilities shall be located in plan and profile view and in most instances, be shown in cross-sectional views.
- (h) Benchmarks shall be shown on the construction plans at an interval not to exceed five hundred (500) feet. These bench mark elevations are to be established at NGVD elevations.
- (i) Soil survey data indicating all soil classifications and seasonal high water table elevations shall be provided. Soil classifications shall be in accordance with AASHTO soil classifications. Soil classifications shall be prepared and certified by a qualified engineer registered in the State of Florida.
- (j) The construction plans shall also include the minimum requirements:

The location of all existing and proposed development lot lines; if applicable.

The location and width of all utility and drainage easements. If easements are to accommodate both drainage and utilities, sufficient separation or width should be provided to avoid conflict.

Title of the proposed subdivision or site development and address, where applicable.

Location and width of proposed outfall ditch easements or right-of-way, where applicable. This requirement shall include details of typical section and their relationship to cross-sections. Special details may be required that would provide adequate depiction of a proposed facility.

Identification of adjoining development, including: right-of-way, roadway widths, and names of roads impacted by the proposed development.

All plans shall contain a note, requiring conformance with the guidelines and criteria set forth in this Manual and with current FDOT Specifications for Road and Bridge Construction. Compliance with the guidelines and criteria set forth in other applicable manuals referenced in Section 1.3 of this Manual may be applicable. In any instance the plans and specifications shall conform to acceptable engineering practice. All engineering construction plans and specifications shall be prepared under the supervision of and shall be certified by an engineer registered in the State of Florida.

### 1.30 Approval of Engineering Plans

Prior to the start of construction, engineering plans must be approved by the Public Works Director. Prior to the Public Works Director authorizing construction to begin, approval of utility work must be received from the Public Works Department. **Approval of such plans shall expire twelve (12) months after the date of original written approval by the City of Lake Wales's authorized representative unless substantial construction has been achieved**, or a developer furnished construction schedule has been received prior, to extend the construction completion date. The determination of completion of substantial construction shall be made by the Public Works Department prior to the expiration of the twelve-month approval period. If construction has not commenced within the initial twelve (12) month time period, the plans must be resubmitted and must comply with current criteria. After construction has commenced, work shall be continuous until complete. If the developer suspends the construction for a period of six (6) months or more, plans shall be resubmitted and construction may not continue until the plans are reapproved. Approval by the Public Works Department of engineering plans or the plat of a subdivision or minor variances does not constitute approval of anything at variance with the Subdivision Regulations, unless a variance has been granted by the City's Planning and Zoning Board.

Any deviance from the City's Subdivision Regulation must receive a variance from the City's Planning and Zoning Board. If the deviance from the Subdivision Regulations results in a change in roadway design criteria, neither approval of the construction plans nor authorization to commence construction will be given until the variance is received from the City's Planning and Zoning Board.

### 1.31 Inspection of Project

The Public Works Department shall inspect all permitted projects to assure the construction of infrastructure to be maintained by the City is in compliance with the approved plans. When actual field conditions differ from the approved plans the Engineer of Record shall notify the City so that a determination can be made if modifications to the plans are necessary. If substantial changes are to be made the Engineer of Record shall submit plans reflecting the changes and receive approval of the modifications from the Public Works Department before

proceeding with work at variance to the previously approved construction plans.

### **1.32 Enforcement of Code Violations**

In the case where Lake Wales City Codes are being violated, enforcement actions may be taken to bring the violation into compliance. Typically the infraction shall be identified, and the contractor verbally notified and/or a written Notice of Deficiency provided. If the violation is significant or the infraction is not corrected in a “specified” amount of time after the contractor has been notified of the violation a **Stop Work Order may be issued by the Public Works Director.**

### **1.33 Certified “As-Built” Construction Plans**

Two sets of certified “As-Built/Record Drawing” (Blueprint), one mylar and one set on electronic media compatible with City systems shall be provided to the Public Works Department for all roadway, drainage and all underground utilities within the development upon completion of the project. The “As Built/Record Drawing” shall be certified by a Professional Engineer based upon information provided by a Professional Surveyor & Mapper as described in Section 1.2 of this Manual.

### **1.34 Public Acceptance and Maintenance of Facilities**

The City of Lake Wales shall accept for maintenance only those public streets and drainage facilities which are constructed in accordance with the requirements referenced in this Manual and which have been approved for acceptance by the City.

### **1.35 Warranty Period for City Maintained Improvements**

Prior to the acceptance by the City of City-maintained street or drainage, the City shall inspect the construction improvement and if the improvements have been determined by the City to have been satisfactorily completed in accordance with the approved plans and specifications the City shall accept the improvements with a 1-year warranty period.