



**City of Gainesville
Department of Sustainable Development
Planning Division**

PO Box 490, Station 11
Gainesville, FL 32627-0490
306 NE 6th Avenue
P: (352) 334-5022
F: (352) 334-2648

CITY COMMISSION STAFF REPORT

PUBLIC HEARING DATE: October 28, 2021

ITEM NO: Need Legistar Number: - 210572

PROJECT NUMBER AND NAME: **Petition PB-21-167 TCH. City of Gainesville Public Works.**
Requests to amend and update the City of Gainesville Engineering Design & Construction Manual, as well as, amend the City of Gainesville Land Development Code to allow future updates of the Engineering Design & Construction Manual to be adopted by resolution instead of by ordinance.

APPLICATION TYPE: Quasi-Judicial.

CITY PROJECT CONTACT: Lawrence Calderon, Planner III

APPLICATION INFORMATION:

Agent/Applicant: City of Gainesville, Public Works.

Property Owner(s): N/A

Related Petition(s): None

Legislative History: None

Neighborhood Workshop: March 23, and April 29, 2021 Community Review and Comments.

BACKGROUND AND EXPLANATION:

Background and Explanation:

The Engineering Design & Construction Manual (EDCM), establishes engineering design standards and specifications for the construction of physical improvements in the City. It complements goals/objectives identified in the Comprehensive Plan and the requirements under the Land Development Code, Chapters 23, 26 and 30. The actual content of the document is not included in the referenced chapters of the Code but the EDCM is referenced throughout Chapters 23, 26 and 30.

Section 30-1.6 of the LDC, specifically references adoption of the EDCM, by ordinance. Staff has determined that the more appropriate, convenient, and efficient procedure of adoption, should be by resolution.

Public Works, in cooperation with other City departments, has been working with the development community over the last year and a half to update the 2015 Engineering Design & Construction Manual (EDCM). Key goals were to make the 2021 EDCM clearer, more concise and briefer, as well as, resolve conflicts with the land development code. Because the edits were significant, provided are the original EDCM 2015 edition, the proposed EDCM 2021 edition, and a comparison table.

Proposed modification

After several internal reviews and consultation with the development community, staff proposes the following modification to Section 30-1.6 of the Land Development Code.

Sec. 30-1.6. Engineering Design and Construction Manual.

The City of Gainesville Engineering Design and Construction Manual, which may be cited as the design manual, is intended to provide detailed design guidelines and specifications for the construction of physical improvements in the city. The design manual shall be adopted by resolution ~~ordinance~~ of the city commission and kept on file in the public works department. The design manual shall address the following:

- A. Selection of environmentally sound practices for the management of stormwater and control of erosion and sedimentation;
- B. Construction specifications for stormwater management facilities, streets, bridges, bikeways, sidewalks, and other physical improvements;
- C. Design criteria for wet and dry detention basins; and
- D. Local rainfall information.

Staff's recommendation to the City Plan Board

Approve Petition PB-21-00167 TCH and forward a recommendation to the City Commission to approve Resolution.

DRAFT MOTION FOR CONSIDERATION

Move that a recommendation be forwarded to the City Commission, approving Petition PB-21-00167 TCH as presented by staff.

POST-APPROVAL REQUIREMENTS:

Following the City Plan Board's recommendation, the petition shall be presented to the City Commission for final action.

LIST OF ATTACHMENTS:

- Attachment A.** Application and Other Supporting Documents
- Attachment B.** City of Gainesville Public Works Department Engineering Design & Construction Manual 2021.
- Attachment C.** Engineering Design and Construction Manual Comments/Responses
- Attachment D.** City of Gainesville Engineering Design & Construction Manual 2015
- Attachment E.** Proposed 2021 Engineering Design and Construction Manual Summary Table Showing 2015 EDCM location to 2021 EDCM location



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ATTACHMENT “A”, “B”, “C”, “D” and “E”

Petition PB-21-00167 TCH

October 28, 2021

Attachment A. Application and Other Supporting Documents

Attachment B. City of Gainesville Public Works Department Engineering Design & Construction Manual 2021.

Attachment C. Engineering Design and Construction Manual Comments/Responses

Attachment D. City of Gainesville Engineering Design & Construction Manual

Attachment E. Proposed 2021 Engineering Design and Construction Manual Summary Table Showing 2015 EDCM location to 2021 EDCM location.



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ATTACHMENT "A"

Petition PB-21-00167 TCH

October 28, 2021

Attachment A. Application and Other Supporting Documents

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Attachment C. Engineering Design and Construction Manual Comments/Responses

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APPLICATION—CITY PLAN BOARD
Planning & Development Services

OFFICE USE ONLY

Petition No. _____ Fee: \$ _____
 1st Step Mtg Date: _____ EZ Fee: \$ _____
 Tax Map No. _____ Receipt No. _____
Account No. 001-660-6680-3401 []
Account No. 001-660-6680-1124 (Enterprise Zone) []
Account No. 001-660-6680-1125 (Enterprise Zone Credit []

Owner(s) of Record (please print)
Name: City of Gainesville Public Works
Address: 405 NW 39th Avenue
Gainesville, FL 32609
Point of Contact: Gail Mowry, PE
Phone: 352-334-5070 Alt: 352-393-8421
(Additional owners may be listed at end of applic.)

Applicant(s)/Agent(s), if different
Name: Same as owner
Address:
Phone: Fax:

Note: It is recommended that anyone intending to file a petition for amendments to the future land use map or zoning map atlas, meet with the Department of Community Development prior to filing the petition in order to discuss the proposed amendment and petition process. Failure to answer all questions will result in the application being returned to the applicant.

REQUEST

Check applicable request(s) below:

Future Land Use Map []	Zoning Map []	Master Flood Control Map []
Present designation:	Present designation:	Other [X] Specify:
Requested designation:	Requested designation:	2021 Engineering Design & Construction Manual

INFORMATION ON PROPERTY

1. Street address: City-wide
2. Map no(s): N/A
3. Tax parcel no(s): N/A
4. Size of property: N/A acre(s)
<i>All requests for a land use or zoning change for property of less than 3 acres are encouraged to submit a market analysis or assessment, at a minimum, justifying the need for the use and the population to be served. All proposals for property of 3 acres or more must be accompanied by a market analysis report.</i>

Certified Cashier's Receipt:

See Attachment A for details.

5. Legal description (attach as separate document, using the following guidelines):

- a. Submit on 8 ½ x 11 in. sheet of paper, separate from any other information.
- b. May not be included as part of a Purchase Agreement, Contract for Sale, Lease Agreement, Transfer of Title, Warranty Deed, Notice of Ad Valorem Taxes, Print-outs from Property Appraiser's Office, etc.
- c. Must correctly describe the property being submitted for the petition.
- d. Must fully describe directions, distances and angles. Examples are: North 20 deg. West 340 feet (not abbreviated as N 20 deg. W 340'); Right-of-Way (not abbreviated as R/W); Plat Book (not abbreviated as PB); Official Records Book 1, page 32 (not abbreviated as OR 1/32); Section 1, Township 9 South, Range 20 East (not abbreviated as S1-T9S-R20E).

6. **INFORMATION CONCERNING ALL REQUESTS FOR LAND USE AND/OR ZONING CHANGES** (NOTE: *All development associated with rezonings and/or land use changes must meet adopted level of service standards and is subject to applicable concurrency requirements.*)

N/A A. What are the existing surrounding land uses?

North

South

East

West

N/A B. Are there other properties or vacant buildings within ½ mile of the site that have the proper land use and/or zoning for your intended use of this site?

NO ____

YES ____ If yes, please explain why the other properties cannot accommodate the proposed use?

- N/A C. If the request involves nonresidential development adjacent to existing or future residential, what are the impacts of the proposed use of the property on the following:

Residential streets

Noise and lighting

- N/A D. Will the proposed use of the property be impacted by any creeks, lakes, wetlands, native vegetation, greenways, floodplains, or other environmental factors or by property adjacent to the subject property?

NO ☐

YES ☐

(If yes, please explain below)

- E. Does this request involve either or both of the following?

- a. Property in a historic district or property containing historic structures?

NO ☒

YES ☐

- b. Property with archaeological resources deemed significant by the State?

NO ☒

YES ☐

- N/A F. Which of the following best describes the type of development pattern your development will promote? (please explain the impact of the proposed change on the community):

Redevelopment ☐

Urban Infill ☐

Activity Center ☐

Urban Fringe ☐

Strip Commercial ☐

Traditional Neighborhood ☐

Explanation of how the proposed development will contribute to the community.

N/A G. What are the potential long-term economic benefits (wages, jobs & tax base)?

N/A H. What impact will the proposed change have on level of service standards?

Roadways

Recreation

Water and Wastewater

Solid Waste

Mass Transit

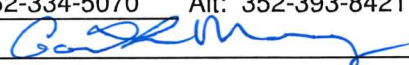
N/A I. Is the location of the proposed site accessible by transit, bikeways or pedestrian facilities?

NO ____

YES ____ (please explain)

CERTIFICATION

The undersigned has read the above application and is familiar with the information submitted. It is agreed and understood that the undersigned will be held responsible for its accuracy. The undersigned hereby attests to the fact that the parcel number(s) and legal description(s) shown in questions 3 and 5 is/are the true and proper identification of the area for which the petition is being submitted. Signatures of all owners or their agent are required on this form. Signatures by other than the owner(s) will be accepted only with notarized proof of authorization by the owner(s).

Owner of Record	
Name:	City of Gainesville Public Works
Address:	405 NW 39th Avenue
	Gainesville, FL 32609
	Point of Contact: Gail Mowry, PE
Phone:	352-334-5070 Alt: 352-393-8421
Signature:	


Owner of Record	
Name:	
Address:	
Phone:	Fax:
Signature:	

Owner of Record	
Name:	
Address:	
Phone:	Fax:
Signature:	

Owner of Record	
Name:	
Address:	
Phone:	Fax:
Signature:	

No person submitting an application may rely upon any comment concerning a proposed amendment, or any expression of any nature about the proposal made by any participant, at the pre-application conference as a representation or implication that the proposal will be ultimately approved or rejected in any form.

To meet with staff to discuss the proposal, please call (352) 334-5022 or 334-5023 for an appointment.


 Owner/Agent Signature

8/27/2021
 Date

STATE OF FLORIDA
 COUNTY OF _____

Sworn to and subscribed before me this _____ day of _____ 20____, by (Name)

_____.

 Signature – Notary Public

Personally Known ____ OR Produced Identification ____ (Type) _____

ATTACHMENT A
CITY OF GAINESVILLE PUBLIC WORKS
APPLICATION - PLAN BOARD

ENGINEERING DESIGN & CONSTRUCTION MANUAL
2021 EDITION

Public Works, in cooperation with other City departments, has been working with the development community over the last year and a half to update the 2015 Engineering Design & Construction Manual (EDCM). Key goals were to make the 2021 EDCM clearer, more concise and briefer, as well as, resolve conflicts with the land development code. Because the edits were significant, provided for Plan Board review are the original EDCM 2015 edition, the proposed EDCM 2021 edition, and a comparison table. Also attached, is a copy of the responses to comments provided by the development community.

Public Works is also proposing to modify Section 30-1.6 of the LDC to allow adoption by resolution instead of by ordinance. See below for proposed revision.

The City of Gainesville Engineering Design and Construction Manual, which may be cited as the design manual, is intended to provide detailed design guidelines and specifications for the construction of physical improvements in the city. The design manual shall be adopted by ~~ordinance~~ resolution of the city commission and kept on file in the public works department. The design manual shall address the following:

- A. Selection of environmentally sound practices for the management of stormwater and control of erosion and sedimentation;
- B. Construction specifications for stormwater management facilities, streets, bridges, bikeways, sidewalks, and other physical improvements;
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ATTACHMENT “B”

Petition PB-21-00167 TCH

October 28, 2021

Attachment A. Application and Other Supporting Documents

Attachment B. City of Gainesville Public Works Department Engineering Design & Construction Manual 2021.

Attachment C. Engineering Design and Construction Manual Comments/Responses

Attachment D. City of Gainesville Engineering Design & Construction Manual

Attachment E. Proposed 2021 Engineering Design and Construction Manual Summary Table Showing 2015 EDCM location to 2021 EDCM location.

City of Gainesville
Public Works Department
Engineering Design & Construction Manual
2021 Edition



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1. Introduction

1.1 Purpose and Applicability

The City of Gainesville Engineering Design & Construction Manual (hereafter referred to as the EDCM or this manual) is approved and adopted by Ordinance Number ##### on ##### ##, 2021, pursuant to the authority granted by the City of Gainesville Comprehensive Plan. The EDCM further complements the requirements of the Land Development Code, Chapters 23, 26 and 30, City of Gainesville Code of Ordinances.

The EDCM is intended to implement City policy as outlined in the City's Comprehensive Plan for the provision of transportation facilities that serve the needs of all users and promote a well-connected, integrated transportation system that reduces dependency on automobile use.

The EDCM establishes engineering design standards and specifications for the development of site plans, subdivisions, redevelopment projects, permits and capital projects within the City of Gainesville as part of the City's responsibility to provide for the health, safety and welfare of the public.

When real property within the City of Gainesville is developed and/or redeveloped or any work is proposed within the City's right-of-way (ROW) or easement, the infrastructure facilities contained within said property, serving said property or activities within the City's ROW or easement shall comply with the requirements set forth in this manual and the City of Gainesville Code of Ordinances.

1.2 Enforcement

The Public Works Department, through their designated representatives, shall have the right to inspect the land and constructed facilities addressed by this manual and to issue "Notices to Comply" for violations of the Code of Ordinances or of approved plans reviewed under this manual, an extension of the Code of Ordinance.

1.3 Conflicts with Governing Documents

Where more stringent standards are imposed by federal, state and other local agencies, the more stringent standards having jurisdiction shall apply. Where the standards and specifications included in the City of Gainesville Code of Ordinances and this manual conflict, the City of Gainesville Code of Ordinances shall prevail. Where the Code of Ordinances conflict with the Comprehensive Plan, the Comprehensive Plan shall prevail.

All construction must comply with the EDCM / land development code unless a design variance or exception is approved in accordance with Chapter 1.6 by Public Works.

1.4 Definitions and Terms

The definitions of the terms used in this manual have the meanings respectively ascribed to them by common usage or specifically defined in those publications identified by reference, except in those instances where the text clearly indicates a different meaning. The definitions or terms contained herein are not intended to alter definitions expressly specified in any other City of Gainesville ordinance, policy, regulation or code, but are provided for the purpose of making clear and distinct the intention of the language used in a specific section of this document.

1.5 Amendments

The City of Gainesville shall amend the contents of this manual as may be required by resolution adopted by the City Commission.

1.6 Design Exceptions or Variances

Design Exceptions or Variances from the standards contained in this manual may be approved when such exceptions or variances are not contrary to the public interest where, owing to special conditions, a literal enforcement of the provisions of this manual would result in unnecessary hardship in order to allow for implementation of an innovative design practice.

Design Exceptions are required when the Controlling Design Elements as specified in Chapter 14 of the Manual of Uniform Standards for Design, Construction and Maintenance for Streets and Highways (aka "Florida Greenbook") cannot be met.

Design Exceptions shall be submitted in writing by the Professional Engineer responsible for the design and justified as described in Chapter 14 of the Florida Greenbook. The FDOT's Utility Accommodation Manual provides guidance on exceptions with respect to utilities. The City Engineer has the authority to approve Design Exceptions that meet the requirements of this section.

When proposed design elements other than the Controlling Elements do not meet the requirements contained in this manual, sufficient detail and justification of such deviations must be documented by the Responsible Professional Engineer as a Design Variation and shall be submitted to the City. Design Variation shall include the following:

1. Design Criteria versus the proposed criteria
2. Reason the design criteria are not appropriate
3. Justification for the proposed criteria.
4. Review and evaluation of the most recent 5-years of crash history where appropriate
5. Background information which documents or justifies the request
6. Demonstration that the proposed design variations would be in harmony with the general intent and purpose of the Land Development Code, Comprehensive Plan, EDCM and the Manual for Uniform Minimum Standards for Design, Construction and Maintenance (Florida Greenbook), would not be injurious to surrounding properties, and would not otherwise be detrimental to the interest, safety, health, and welfare of the public.

7. Demonstration that the proposed alternative treatment will meet the intent of the City's specifications and not pose an undue or significant burden upon the City or any other party.

The City Engineer has authority to approve Design Variances that meet the requirements of this section.

1.7 Interpretation

The Public Works Director, if the incumbent is a registered Professional Engineer, shall provide the final interpretation of the contents of this manual; otherwise, the City Engineer shall provide the final interpretation of the contents of this manual.

As interpretations or corrections of this manual are made by the Public Works Director or City Engineer, the development community will be informed through the use of a Design Memo. The Design Memos will be posted on the Public Works Development Review webpage. The tracking of all design memos will be shown in a Revision Log, which will also be provided on the aforementioned webpage.

1.8 Omissions

Logical, accountable, and generally accepted design standards and engineering judgment shall apply where not specifically addressed in this manual.

2. Technical References

Standards and guidelines that are referenced in most recent version of the following technical publications shall be considered part of this manual including subsequent updates or revisions to these publications. In the event of a conflicting standard imposed by the City, federal, state or other local agencies, the more stringent jurisdictional standard shall apply.

American Association of State Highway and Transportation Officials (AASHTO) – A Policy on Geometric Design of Highways and Streets

Americans with Disabilities Act (ADA) – Uniform Federal Accessibility Standards (UFAS); ADA Standards for Accessible Design (ADAAG); Public Rights of Way Accessibility Guidelines (PROWAG)

ASCE - ASCE 24 Flood Resistant Design and Construction

Florida Department of Environmental Protection (FDEP) – Chapter 62-302, F.A.C., Surface Water Quality Standards

FDEP – Chapter 62-621, F.A.C., Generic Permits

FDEP – Chapter 62-624, F.A.C., Municipal Separate Storm Sewer Systems

FDEP – Chapter 62-330, F.A.C., Environmental Resource Permitting

FDEP – The Florida Stormwater Erosion and Sedimentation Control Inspector’s Manual

FDEP and Water Management Districts Environmental Resource Permit (ERP) Applicant’s Handbook Volume I (General and Environmental)

Florida Department of Transportation (FDOT) – “Accessing Transit: Designing Handbook for Florida Bus Passenger Facilities”.

FDOT Standard Specifications for Road and Bridge Construction

FDOT Standard Plans for Road Construction

FDOT Procedures Manual for Flexible Pavement Design

FDOT Drainage Manual

FDOT Drainage Design Guide

FDOT Utility Accommodations Manual

FDOT Florida Erosion and Sediment Control Designer and Reviewer Manual

Federal Highway Administration (FHWA) – Manual on Uniform Traffic Control Devices (MUTCD)

Chapter 2 - Technical References

Florida Greenbook – also known as the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways

Gainesville Regional Utilities (GRU) Approved Electric System Materials Manual

GRI Lighting Catalog

Institute of Transportation Engineers (ITE) – Curbside Management: Practitioners Guide

ITE – Context Sensitive Solutions in Designing Major Walkable Urban Thoroughfares: A Context Sensitive Approach Major Urban Thoroughfares for Walkable Communities

National Association of City Transportation Officials (NACTO) – Urban Bikeway Design Guide

NACTO – Urban Street Design Guide

National Cooperative Highway Research Program (NCHRP) Report 672

SJRWMD – Permit Information Manual (includes Applicant’s Handbook Volume II)

SRWMD – ERP Applicant’s Handbook Volume II

United States Department of Agriculture/National Resource Conservation Service (USDA/NRCS) – Technical Release 55 (TR-55) Urban Hydrology for Small Watersheds

3. Stormwater Management

3.1 Objective

The objective of this section of the EDCM is to provide the design and performance standards necessary for the conservation and improvement of the quality of the surface waters, as well as, the control of stormwater runoff volume and rate and floodplain elevations in the City of Gainesville.

3.2 Evaluation Criteria

Applicants must provide reasonable assurance that the construction, alteration, operation, or maintenance of a project, or removal or abandonment of an existing stormwater management system, will not cause adverse water quality impacts, water quantity impacts, or flooding impacts to on-site or off-site property.

Key documents to be utilized as reference for this section are the FDOT Drainage Manual, the FDOT Drainage Design Guide, the SJRWMD Permit Information Manual (includes Applicant's Handbook Volume II), and the SRWMD ERP Applicant's Handbook Volume II.

3.3 Permitting Thresholds

3.3.1. Cumulative Development

All development of a particular lot or site governed by final approved development plans shall be cumulative from October 1, 2013. For example, a site adding 850 sf of new impervious would not trip the New Development Threshold of 1,000 sf. If the site then added additional 150 sf or greater the following year, stormwater requirements would be triggered for the cumulative area.

3.3.2. Definition of Redevelopment of Vehicular Use Area or Building

For the purposes of applying permitting thresholds and exemption criteria, redevelopment is any demolition or reconstruction of the vehicular use area (excluding maintenance of pavement such as resurfacing and restriping) or building.

3.3.3. Exemptions

1. New development < 1,000 sf of impervious area; or
2. Redevelopment < 4,000 sf of impervious area on an existing improved site.
3. Maintenance of Pavement
 - a. Activities such as milling, resurfacing, surface overlay, and minor (as determined by Public Works) limerock base replacement are potentially exempt from stormwater requirements.
 - b. Exemption status will be determined on a site-by-site basis.
 - c. A sketch or narrative must be provided to describe the proposed activity. Plan(s) may be necessary for review to confirm changes to existing grades and drainage patterns are not proposed, as well as, to demonstrate no impact to adjacent or downstream properties.

4. Accessible parking space improvements associated with Building Permits for ADA compliance.
 - a. Exemption status will be determined on a site-by-site basis.
 - b. A sketch or narrative must be provided to describe the proposed activity. Plan(s) may be necessary for review to confirm changes to existing grades and drainage patterns are not proposed, as well as, to demonstrate no impact to adjacent or downstream properties.

3.3.4. Water Quality Required

1. New development between 1,000 sf and 1,999 sf of net new impervious area.
 - a. Demonstrate the project is not impacting adjacent properties by ensuring discharge is not directed onto a neighboring property but to a city street, landscaped area or stormwater retention area.

3.3.5. Water Quality and Quantity Required

1. New development of 2,000 sf and greater of net new impervious area; or
2. Redevelopment of 4,000 sf and greater of impervious area on an existing improved site.

3.4 Minimum Requirements

3.4.1 Drainage Narrative

See Section 7.1.2 for detailed information on what is required to be included in the drainage report.

3.4.2 General Design Standards

1. All drainage facilities shall provide a positive outfall to existing watercourses, water bodies, wetlands or storm sewer systems unless it can be proven that it is a closed system or acting as a closed basin.
2. Stormwater management facilities shall be designed to minimize the need for maintenance in accordance with this manual.
3. All stormwater management facilities shall be landscaped in such a manner as to promote safety and to integrate with the overall design of the site as required by the LDC.
4. Insofar as possible, the contour of stormwater management facilities should promote aesthetically pleasing site design and increased wildlife habitat.
5. The design and operation of stormwater management facilities shall discourage the breeding of mosquitoes.
6. The design of stormwater management facilities shall promote joint uses for habitat, open space, passive recreation, and the establishment and integration of trails.
7. Features that are identified as "Design by Others" shall demonstrate support of the overall stormwater management system and conformance with its design. A review of the features identified as designed by others during the development review process must submit for Public Works Stormwater and Constructability review prior to construction.
8. Underground utilities within the footprint of a stormwater basin are to be reviewed and approved on a case-by-case basis by the City Engineer. Underground utilities are

prohibited within underground stormwater facilities. Underground utilities are discouraged from being located within a stormwater basin. Where there are existing utilities within the footprint of a stormwater basin, relocation is encouraged.

3.4.3 Technical Standards

1. The area of the top elevation of all proposed stormwater management facilities shall be considered to have a $CN = 100$ or $C = 0.95$ for applicable stormwater calculations. The top elevation is set at the control elevation of a wet pond and the design high for a dry pond.
2. Stormwater Basins
 - a. Fill Material.
 - i. Fill material used for undercut or backfill within the stormwater basin must not exceed 10% passing of 200 sieve.
 - b. Dry Retention Ponds.
 - i. Initial basin excavation should be within one foot of the final elevation of the basin floor.
 - ii. Final excavation should be deferred until all contributing areas of the drainage basins have been stabilized.
 - iii. Light equipment should be used to remove accumulated sediments and achieve final grade without compacting the basin bottom. The bottom of the pond shall be tested in the field using a double-ring infiltrometer test to demonstrate that it is not less than the design infiltration.
 - c. Underground/ Exfiltration Systems
 - i. Design permeability data collected in appropriate flow zones.
 - ii. The underground facilities must be designed so that the invert elevation of the system is at least two feet above the seasonal high ground water table elevation unless the engineer of record or geotechnical engineer affirmatively demonstrates based on geotechnical information that an alternative design is appropriate for the specific site conditions.
 - iii. Provide location of building support beams and footers in relation to the underground facility.
 - iv. Provide percolation link perimeters on a scaled map. Applicable when using ICPR stormwater modeling software. Basins with shared boundaries and modeled in Ponds are to be consistent with technical memorandums supplied by Devo Engineering.
 - v. Provide mounding analysis.
 - vi. Freeboard demonstrated as identified in Section 3.4.3 paragraph 6.
 - vii. Provide location of roof drain connections. Underground facilities that are individually identified with a drainage basin delineated will have to provide documentation that justifies the design assumptions made.
 - viii. Provide location of cleanout ports.
 - ix. An isolation row or chamber that effectively filters sediment and other contaminants, which can be systematically removed using cleanout ports, shall be incorporated into designs that are not open vault style systems.
 - x. For underground facilities utilizing a geotextile, specify and provide specifications that demonstrate the proposed geotextile will not be a limiting factor in infiltration.

- xi. The insitu material under proposed underground facilities shall be tested in the field after preparation but prior to placement of bedding material using a double-ring infiltrometer test to demonstrate that it is not less than the design infiltration.
 - xii. If utilizing a compacted backfill material, it too must be tested in the field after placement to demonstrate that it is not a limiting factor in infiltration.
 - xiii. Provide a visual “failure” indicator that would provide the O&M entity some indication that the system is not functioning as intended and requires maintenance or repair.
 - xiv. The design shall incorporate a way to perform a full visual inspection of the underground facility.
 - xv. Operation and maintenance guidance document provided.
- 3. Slope Stability Analysis
 - a. A slope stability analysis shall be performed for berms, dams, or embankments that provide any storage above surrounding grade. Underground facilities that have the potential to daylight onto an embankment or side slope are included. Documentation of the slope stability factor shall be provided with the stability analysis. Seepage and piping through the berm or dam and erosion should be of major concern when specifying fill/soil type, placement methods, and compaction.
 - i. The City Engineer or designee shall require field density tests and these tests shall be made in accordance with FDOT standards and reported in writing to the City Engineer or designee.
 - ii. Avoid planting woody species with developed root structures on embankment berms, as this can cause piping and geotechnical failures.
- 4. Freeboard
 - a. A minimum freeboard of 6 inches shall be provided for all retention/detention areas.
 - b. Underground stormwater facilities can utilize areas within the project watershed to accommodate the 6 inches of required freeboard if this freeboard area is at least 5 feet from the property boundary.
 - i. If freeboard is being provided within the project watershed, identify where the storage will occur on a scaled plan, the volume of that storage, and the maximum depth of staged water that will occur in those areas.
 - ii. The freeboard area depicted must include enough grade information to demonstrate that the area of storage is occurring at a distance of at least 5 feet from the property line. In addition, the plans must provide enough grading detail to show where discharge would occur in the event freeboard is exceeded.
- 5. Finished Floor Elevation

Finished floor elevations of structures adjacent to or that could potentially be impacted by the stormwater management facility as determined by the City Engineer shall be elevated at least one foot above the design high water elevation or base flood elevation (whichever is higher) so that the structure is adequately protected from a basin overtopping event. All stormwater management systems shall be evaluated for the 100-year critical storm event to establish the minimum finished floor elevation.

6. Sumps
 - a. Sumps within stormwater management facilities are discouraged. Sumps within stormwater management facilities will only be allowed due to cover issues and minimum pipe slope/velocities. The bottom elevation of the sump shall be a minimum of 12 inches above the seasonal high-water table. When sumps are utilized for dry detention facilities, the bottom elevation of the sump shall be placed up to one foot below the control elevation.
 - i. Sumps within stormwater management facilities intended to be dedicated to the City for any type of maintenance will not be accepted.
7. Retaining Walls
 - a. The following requirements apply to retaining walls or near-vertical soil retaining structures used to form stormwater management facilities or portions of stormwater management facilities:
 - i. Fencing or protective barriers may be required as determined by the City Engineer or designee.
 - ii. The wall shall be designed with materials that prevent sediment seepage into the stormwater management facility and that do not require regular maintenance to function properly.
 - iii. Railroad ties, wooded planks, and other similar materials should not be used within stormwater management facilities.
 - iv. Sufficient access for maintenance equipment is required in accordance with the requirements of this chapter.
 - b. For “Designs by Others”, retaining walls constructed with a drain shall ensure that the drain is at minimum two (2) feet away from stormwater basins to ensure water quality criteria is met.
8. Stabilization

All sloped areas within stormwater basins and swales/ditches, 3:1 or greater, shall be sodded.
9. Pre-Treatment Best Management Practice (BMP)

Oil/water separator or comparable BMP technology is required for pre-treating runoff from vehicular traffic areas associated with the following practices:

 - a. Car washes;
 - b. Auto or marine paint and body shops;
 - c. Auto, recreational vehicle, commercial truck, tractor-trailer, farm tractor, heavy machinery, or small engine parts, service and repair operations;
 - d. Automotive fleet operations;
 - e. Junkyards and salvage yards; and
 - f. Gas stations, including convenience stores with gas pumps.
10. Chlorinated Pool Discharges

Chlorinated pool water is not allowed to be discharged into stormwater management systems connected to the City’s storm sewer system.

3.5 Water Quality Standards

Developments within the City of Gainesville shall follow the water quality treatment volume criteria in Table 3-1.

3.5.1 Water Quality Treatment Volume

Table 3-1. Water Quality Treatment Volume Criteria		
Facility	Off-line	On-line
Dry Retention, Underground, Exfiltration Systems)	Greater of 0.5" of runoff from Drainage Area or 1.25" of runoff from impervious area	Off-line + 0.5" of runoff from Drainage Area
Dry Detention	Greater of 1" of runoff from Drainage Area or 2.5" of runoff from impervious area	N/A
Wet Detention	Greater of 1" of runoff from Drainage Area or 2.5" of runoff from impervious area.	

3.5.2 Water Quality Recovery

1. The water quality treatment volume shall be recovered within 72 hours for dry systems and one-half of the volume shall be drawn down within 24 to 30 hours for wet systems.
2. All percolation rates shall have a Factor of Safety of 2 applied for all stormwater calculations and modeling.
3. A mounding analysis of the 100-year critical events must be provided for all systems using infiltration to demonstrate recovery.

3.6 Stormwater Quantity Criteria

3.6.1 Design Storm Events

Developments within the City of Gainesville shall use the design rainfall in Table 3-2 in the design of stormwater management systems. The FDOT Zone 5 rainfall curves shall be used to determine the rainfall distribution.

Table 3-2. Design Storm Events										
Return Period (Years)	Design Rainfall (inches)									
	10 min	15 min	30 min	60 min*	2 hr*	4 hr*	6 hr	8 hr*	12 hr	24 hr*
3	1.05	1.33	1.93	2.6	3.2	3.8	4	4.48	4.68	6
10	1.19	1.54	2.31	3.2	4	4.8	5.1	5.84	6.24	7.92
25	1.34	1.74	2.66	3.6	4.4	5.28	5.76	6.56	6.96	8.64
50	1.43	1.88	2.9	3.95	4.8	5.92	6.48	6.96	7.92	9.6
100*	1.53	2.03	3.11	4.4	5.4	6.72	7.2	8	8.76	11.04

*Storms required for critical event analysis for proposed stormwater basins.

3.6.2 Levels of Service for Stormwater Quantity

Developments within the City of Gainesville shall use Design Discharge Conditions Table 3-3 in the 100-year critical events to demonstrate post < pre criteria for rates in open watersheds and rates and volumes in closed watersheds.

Table 3-3. Design Discharge Conditions			
Basins	Frequency Duration	Discharge Rate	Discharge Volume
Open Basin	100-year critical events	Post less than or equal to Pre	N/A
Closed Basin	100-year critical events	Post less than or equal to Pre	Post less than or equal to Pre

3.6.3 Volume Requirements – Closed Basin Criteria

Within a closed basin, systems must be designed to retain any increase in volume of runoff over the predevelopment volume for a 72-hour period under all 100-year storm events.

3.6.4 Tailwater

Tailwater condition for the design of the storm drain systems and for stormwater basin outfalls shall be evaluated as part of the design process.

1. Utilize the FDOT Drainage Manual for guidance on accounting for tailwater impacts.

3.6.5 Lane Spread

Lane spread shall be calculated using FDOT criteria considering the 4 inch per hour or 10-year frequency storm as noted in Chapter 3.9.1 of the FDOT Drainage Manual. Spread criteria shall be consistent with the FDOT Drainage Manual except for:

1. Minor/Major Local Roads (Table 4-1).
 - a. The allowable lane spread can potentially be to the crown of the road on a case by case basis if approved by the City Engineer.

3.6.6 System Recovery

1. Where systems are designed for reducing post-development peak rate discharge and volume, the outlet and regulation schedule should be designed to provide necessary design detention and retention storage within the times specified by the applicable water management district for its design storm events and 30 days following the City's 100-year critical events.
2. All percolation rates shall have a Factor of Safety of 2 applied for all stormwater calculations and modeling.
3. A mounding analysis must be provided for all systems using infiltration to demonstrate recovery and horizontal extent of mounding. Mounding analysis must account for other adjacent or nearby systems or properties. See previous reference to mounding analysis in Chapter 3.4.3 2. c. iv.

3.7 Floodplains and Floodways

3.7.1 100-year Floodplain

In general, a loss of onsite floodplain storage will result in an increase in the offsite floodplain. As such, developments that encroach into a 100-year floodplain as designated by FEMA and the City of Gainesville, or any other determination by a jurisdictional authority shall demonstrate that the loss of onsite storage will not cause adverse offsite impacts to the floodplain. Additionally, the base flood elevation and the finished floor elevations for existing and proposed structures must be identified for projects located within the floodplain. Any development within a 100-year floodplain shall not increase the base flood elevation.

3.7.2 10-year Flood Channel

No permanent structures or fills shall be allowed in the 10-year flood channel except structures and fills designed for flood prevention and control, streets, bridges and sanitary sewer lift stations and utility lines. Structures that are permitted in the 10-year flood channel shall demonstrate that no adverse impacts result from placing the structure within the 10-year flood channel (i.e., there is no increase in the elevation and limits of the 10-year flood channel or floodplain and no changes to the upstream or downstream 10-year flood channel or floodplain).

3.7.3 Critical Facilities

New Class III and IV critical facilities, as defined by the Florida Building Code, shall be located outside of areas with a floodplain subject to a 0.2% or greater chance of flooding (or 500 year flood).

3.7.4 Compensating Storage

Land use activities that do not meet the thresholds for a stormwater analysis shall minimally be required to demonstrate one-for-one compensating storage, to be reviewed and approved by the City Engineer.

3.7.5 Letter of Map Change

When proposed improvements associated with site development encroach into a flood hazard zone, it shall be necessary for the applicant to file a letter of map amendment or revision with FEMA. Provide proof of application prior to final site acceptance by Public Works.

3.8 Stormwater Conveyance

All conveyance systems shall conform to the FDOT Drainage Manual and the Level of Service (LOS) Criteria in Table 3-4.

Table 3-4. LOS Criteria	
Type of Storm	Frequency
Storm Sewer Systems (Internal to Development)	3-year
Minor/Major Local Street Minor Local Collector	10-year
Side Drain / Driveway Culvert	10-year
Major Local Collector	50-year
Minor / Principal Arterials	100-year
Bridge Culverts & Bridges	100-year
Open Channel	FDOT Drainage Manual

1. Wet piping systems are not allowed in public rights-of-way and discouraged in private systems. The City Engineer must approve wet piping systems.
2. The rainfall intensity will be determined from the IDF curve for Zone 5 at the calculated time of concentration.
3. Hydraulic Grade Line (HGL) Standard: The HGL must be 12" below inlet top of grate or 12" below theoretical gutter elevation as applicable. For Type E or F structures, this is 13.5".
4. Tailwater condition for the design of the storm drain systems shall be evaluated as part of the design process. Utilize the FDOT Drainage Manual for guidance on accounting for tailwater impacts.

3.8.1 Subdivisions – Rear lot Drainage

Any subdivision proposed for City maintenance, whether road/storm sewer or road/storm sewer/stormwater pond maintenance, cannot incorporate rear lot drainage. If rear lot drainage is incorporated, the system will be a privately maintained system, including for functionality.

3.8.2 Closed Conveyance Systems

1. Inlets
 - a. All inlets with grates shall be per FDOT standards.
 - b. Provide documentation that the inlets selected can receive the calculated flow estimated.
 - c. Curb inlets are not allowed at pedestrian crossings or within the radius of intersections.
 - d. A new structure shall be provided at any change in alignment and elevation of pipe.
 - e. Elliptical pipes are permitted.
 - f. Ram-neck connections are not permitted.
 - g. No sumps are allowed on wet piping systems in public rights-of-way.

- h. The maximum spacing of manholes and inlets on pipe runs are shown in Table 3-5 based on operations and maintenance requirements. Spacing of inlets shall be based on spread calculations.
- i. Pre-cast structures are preferred. All structures that are delivered in sections shall have gaskets and interlocking sections to minimize seepage.

Table 3-5. Maximum Manhole and Inlet Spacing	
Pipe Size	Maximum Spacing
15 to 18 inches	300 feet
Greater than 18 inches to 60 inches	400 feet
Greater than 60 inches	500 feet

- 2. Pipes
 - a. The minimum pipe size shall be 15 inches or equivalent in all roadways public or private.
 - b. All pipes within City right-of-way shall be reinforced concrete or polypropylene meeting FDOT specifications (latest edition), have a 100-year design service life, and be from an FDOT-approved production facility.
 - c. Stormwater pipes shall have a minimum separation of 3 inches from outside of the pipe to any other utility pipe or structure.

3.8.3 Open Conveyance Systems

- 1. Roadside swales may be provided in lieu of curb and gutter as long as all the specific requirements this manual can be met.
- 2. Minimum allowable ditch and swale grades shall be in accordance with the FDOT Drainage Manual.
- 3. Maximum side slopes on all ditches are 4:1(H:V). Front and back slopes shall also be in compliance with the Florida Greenbook. Steeper slopes may be reviewed and approved on a case-by-case basis by the City Engineer.
- 4. To prevent erosion in ditches all swales shall be sodded to one foot past the top of bank in addition to meeting the requirements in the FDOT Drainage Manual.
- 5. Roadway spread within gutter and travel lane shall conform to the FDOT Drainage Manual and the LOS criteria in Table 3-4.
- 6. Drainage easements in addition to ROW width shall be sufficient to accommodate all portions of the public stormwater management system facilities and to provide access for the facility maintenance. Such easements shall be dedicated to the City of Gainesville or to a recognized entity that shall be responsible for the maintenance of the easement. Where drainage facilities serve private streets, the easement or designated area reserved for stormwater management facilities shall be sufficient in width to accommodate all portions of the stormwater management system facility and to provide for access to maintain the facility. Such easements shall be dedicated to a responsible private maintenance entity.
- 7. Open drainageways (ditches) will not be permitted in or within 100 feet of any land designated as a residential district as defined in the Land Development Code, Sections 30-2.1 and 30-4.1, and any land in actual use or zoned for use as a school, unless it can be established to the satisfaction of the City Engineer that the open drainage way

will appear and function as a natural watercourse and will not require significant maintenance. Any permitted open drainageways shall be designed to present no unreasonable hazard to life, the health of the public and nearby property residents, and to be protected against scour and erosion.

3.9 Geotechnical Criteria

All basins shall require geotechnical borings. Documentation of the geotechnical parameters shall be submitted to the City by a licensed geotechnical engineer. Methods of testing should be done in accordance with the appropriate water management district standards (SJRWMD Permit Information Manual or the SRWMD Applicant's Handbook Volume II). The number of borings required shall be in accordance with Section 26.4 of the SJRWMD Applicant's Handbook: Regulation of Stormwater Management Systems Chapter 40C-42 F.A.C.

If a basin's percolation occurs over different soil layers, each layer must be tested for permeability.

A soil cross section must be provided that shows the stormwater basin top, bottom modeled seasonal high groundwater table and modeled base of aquifer.

See Section 8.7 for additional geotechnical criteria during construction.

3.10 Water Management District Criteria

All stormwater basins shall be designed in accordance with the criteria of the appropriate water management district. See SJRWMD Permit Information Manual or SRWMD Applicant's Handbook Volume II. Applications must include demonstration the criteria are met.

3.11 Stormwater Pollution Prevention Plan

An erosion and control plan shall be developed and submitted in accordance with the Florida Department of Environmental Protection's requirements of Rule 62-621.300(4) National Pollution Discharge Elimination System (NPDES) Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

3.12 Erosion and Sedimentation Control

3.12.1 Key Criteria

Construction plans shall provide notes for the Contractor to outline key criteria including but not limited to:

1. Best Management Practices (BMPs) to be utilized,
2. Timing of BMP Installation,
3. Installation Details for BMPs,
4. Permanent and Temporary Stabilization Measures,
5. Inspection of BMPs,
6. Maintenance of BMPs,
7. Final Site Stabilization and BMP removal.

3.12.1 Additional Requirements

1. Erosion and perimeter controls shall be used to prevent runoff, and/or disposition of sediment from the site and shall be regularly inspected and maintained during construction.
2. Sites are required to control waste such as building materials, concrete truck washouts, chemicals, litter, and sanitary waste.
3. Failure to install or maintain erosion, perimeter, and waste controls shall result in enforcement, up to and including an order to stop all work until site is in compliance.

3.13 Karst Areas and High Aquifer Vulnerability Areas

All stormwater management facilities and systems shall be designed and constructed to ensure that adequate treatment of stormwater runoff is provided prior to this runoff being discharged to the aquifer. The stormwater management facility and system shall be designed to prevent the formation of sinkholes. A map of the most recent Sensitive Karst Area can be obtained from the water management district. SJRWMD provides a map in its Permitting Information Manual (Figure 13.0-3). Section 5.9 of the SRWMD Environmental Resource Permit Applicants Handbook Volume II provides guidance on its Sensitive Karst Area Design Criteria.

Stormwater management facilities and systems located in sensitive karst areas as delineated by the appropriate water management district shall adhere to the minimum following design standards:

1. A minimum of 3 feet of unconsolidated soil material is required between the surface of the limestone bedrock and the bottom and sides of the stormwater management facility. The City Engineer shall approve the type of excavation and backfill material that will be used to meet these criteria.
2. Stormwater management facilities shall be designed to be as shallow as possible with horizontal bottoms. Deeper areas shall not be allowed in the bottom of the facility unless approved by the City Engineer.
3. To prevent the formation of sinkholes, the maximum facility depth shall be ten (10) feet.
4. The stormwater management facility side slopes, bottoms and areas adjacent to the facility that were disturbed or altered during construction shall be fully vegetated and stabilized.
5. All fill material used onsite shall be free of phosphatic Hawthorn Group sediments or other phosphorous rich materials that may leach phosphorus causing surface water quality degradation and lake eutrophication.
6. Any excavation that would lead to exposure of Hawthorn Group sediments or other phosphorus rich materials that could leach and adversely impact groundwater or surface water shall be mitigated by covering, backfilling or using other techniques to prevent phosphorus leaching.
7. Utility lines shall not be installed beneath stormwater basins in karst sensitive areas unless approved by the City Engineer or designee and GRU. Any lines for temporary irrigation of vegetation in and around stormwater management systems shall be installed to minimize excavation in karst sensitive areas.

3.14 Stormwater Management Utility

All development plans shall include on the cover sheet the following information under the heading "Stormwater Management Utility Data":

1. Total Project Impervious Area
 - a. All project impervious located within the project parcel(s) and in the right-of-way (sidewalks, driveways, etc.).
2. Total Site Impervious Area for SMU Determination
 - a. Includes all the impervious proposed on the project parcel(s) plus the driveway impervious in the right-of-way.
3. Total Semi-Impervious Area (i.e., grass parking)
4. Table containing the following information for each stormwater management facility:
 - a. SMF ID
 - b. Lowest Discharge Elevation (ft)
 - c. Retention Volume Below Lowest Discharge Elevation (cf)
 - d. Retention Area at Lowest Discharge Elevation (ft)

3.15 Operation and Maintenance

3.15.1 Accessibility

1. Reasonable maintenance access to all stormwater management facilities shall be provided.
2. The maintenance path shall have a minimum cleared width of 5 feet, a maximum slope of 8H: 1V, and be stabilized with grass.
3. A driveway apron to access into stormwater management facilities for maintenance/larger equipment is required for ponds intended to be maintained by the City for functionality.
4. The sidewalk in maintenance access ways to stormwater basins or facilities shall be a minimum of 6 inches thick.
5. Stormwater management facilities within subdivisions or that are maintained by the City shall provide a minimum cleared maintenance path width of 15 feet.
 - a. This includes facilities in subdivisions that are intended to be maintained by the City for functionality.

3.15.2 Operation & Maintenance Overview / Manual

1. Maintenance Entity

The entity responsible for all maintenance on the stormwater structures and facilities shall clearly be identified with the following information through a letter to the Public Works Department Director, the subdivision plat or the approved site plan.

 - a. Name of the entity.
 - b. Point of contact for the entity. A position title can be used.
 - c. Address of the entity.
 - d. Phone number of the entity.
2. Operation & Maintenance Overview / Manual

An Operation & Maintenance (O&M) Overview / Manual is to be provided that outline the following:

 - a. Facility Description
 - i. Brief description of the stormwater management system.

- b. Description of maintenance required for major components of the stormwater management system. Describe routine maintenance for:
 - i. Stormwater Basins
 - ii. Erosion Control
 - iii. Swale/Ditch
 - iv. Culverts, Pipes and Structures
 - c. Outline frequency of inspections for major components of the stormwater management system.
 - d. Provide guidance for sinkhole repairs.
 - e. Illicit Discharges
 - i. Outline best management practices (BMPs) for activities on the operational site that could potentially impact the stormwater system or affect downstream water quality. This would include items such as on-site pools, pet waste management, sidewalk or pavement washing activities, a dumpster in disrepair, etc. A reference to the Clean Water Partnership of Gainesville brochures on BMPs can be utilized.
3. Long Term Operation & Maintenance
- a. The O&M entity shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.
 - b. The O&M entity shall inspect the stormwater or surface water management system after the completion of construction per the Water Management District Requirements and copy the inspection reports to Public Works Stormwater.
 - c. Once a system has been constructed and is in its O&M phase, City staff shall be granted access to inspect stormwater management systems to ensure compliance with permitted conditions.

4. Roadway Design

4.1 Objective

These roadway design standards demonstrate the City’s commitment to the provision and maintenance of a safe, accessible, and integrated transportation system. Road design shall prioritize the implementation of Vision Zero principles to maximize safety and prevent incidence of severe crashes, while balancing the needs of all users including drivers of vehicles, bicyclists, pedestrians, and transit riders. Designs shall be based on functional classification, context classification and design speed. Other mitigating factors such as demand, existing conditions, land use, environment and costs, must also be considered.

4.2 Governing Standards

Roadways shall be designed and constructed in accordance with the applicable sections of the Florida Greenbook, the FDOT Design Manual, FDOT Standard Plans, the MUTCD, the Americans with Disabilities Act and the Public Right-of-Way Accessibility Guidelines “PROWAG” except as modified herein. In the event it is necessary to deviate from the standards referenced in this chapter, a design variance or exception is required.

4.3 Roadway Classification

All streets shall be designed in accordance with the Street Types listed in the Subdivision section of the City’s Land Development Code. For the purposes of this manual, utilize Table 4-1 to correlate Street Types to Functional Classifications listed in the Florida Greenbook. Classifications and Street Types referenced in this manual are defined in accordance with the Florida Greenbook.

Table 4-1. Roadway Classifications		
Land Development Code Street Type	ADT	Regulating Florida Greenbook Classification
Minor local street	Less than 800	Local
Major local street	800 to 1,200	Local
Minor local collector	1,201 to 3,200	Local
Major local collector	3,201 to 7,000	Collector
Minor arterial	7,001 to 12,000	Collector
Principal arterial	Over 12,000	Arterial

4.4 Drainage

Stormwater design related to roadways shall adhere to the design criteria established in Chapter 3 Stormwater Management.

4.5 Intersection Design

4.5.1 Type Selection

Roundabouts are the preferred method of intersection control and shall be utilized as opposed to signal control. When new traffic signal is warranted or reconstruction of a traffic signal is necessary, a roundabout shall be constructed unless study is provided in accordance with Chapter 6.

4.5.2 Roundabouts

Roundabouts may be installed in all areas; mini-roundabouts (as defined by NCHRP Report 672) may be installed within roadways projected to carry less than 1,200 ADT. Roundabouts and mini-roundabout design shall be designed in accordance with NCHRP Report 672 and meet the following criteria; in the event of a conflict, the criteria herein shall prevail:

1. Roundabouts:
 - a. Roundabouts on arterials and collectors shall be designed to accommodate WB-50 class vehicle in the travel lane.
 - b. Local roadways shall be designed to accommodate a WB-40. Truck aprons shall be provided to accommodate the next highest-class vehicle.
 - c. Mini-roundabout shall be designed to accommodate an S-BUS-36 within the travel lane. A fully traversable central island may be used to accommodate larger vehicles.
 - d. Raised splitter islands shall be provided on all approaches to a roundabout.
 - e. A six-by-six foot pedestrian refuge shall be provided in the splitter island.
 - f. Pedestrian crossing shall be located at least 20 feet back from the yield line to provide storage room for vehicles.
 - g. On roads with an on-street bike line, a ramp shall be provided ahead of the roundabout to allow bicyclists access to the sidewalk.
 - h. Lighting in accordance with NCHRP Report 672 or the Greenbook, whichever is greater, shall be provided to light all approaches and the center island.
2. Mini-roundabouts
 - a. Mini-roundabout shall be designed to accommodate an S-BUS-36 within the travel lane. A fully traversable central island may be used to accommodate larger vehicles
 - b. Raised splitter islands should be provided on all approaches.
 - c. A six-by-six foot pedestrian refuge should be provided in splitter islands.
 - d. Lighting in accordance with NCHRP Report 672 or the Greenbook, whichever is greater, shall be provided to light all approaches and the center island.

4.5.3. Traffic Signals

Design a new traffic signal or a modification or reconstruction of an existing traffic signal shall meet the following criteria:

1. All signal plans are to be signed and sealed by a professional engineer licensed in Florida.
2. Signed and seal traffic signal timings to accommodate timing changes. For new signals and reconstruction of signals, provide basic controller timings, clearance interval calculations, coordination plans and base day plans. If significant changes are implemented, new coordination plans for the entire corridor will be required.

3. All signal and pedestrian heads shall be LED.
4. Countdown pedestrian signal heads shall be utilized.
5. All new construction shall be mast arms, painted black, with horizontally mounted traffic signal heads.
6. Traffic signal heads shall be mounted on articulating astro-brackets with terminal compartments.
7. All signal equipment shall be compatible with the existing Gainesville Traffic Management System.
8. When providing protected/permissive left turn phasing a four-section horizontal flashing yellow arrow shall be utilized.
9. Furnish and install video detection for vehicle and bicycle detection on all approaches.
10. Traffic signals within or adjacent to existing traffic signal systems shall be interconnected with a minimum 2" underground conduit and 72-count fiber optic cable. The interconnect communications equipment shall be provided.
11. If the intersection being modified or reconstructed, any existing functionalities related to intersection detection, video monitoring, and communications shall be preserved during the duration of the construction project. The use of infrared temporary vehicle detection is prohibited. If any traffic control detection or communication devices are to be replaced, offline or downtime shall be less than 48 hours.

4.6 Pavement Designs

4.6.1 Flexible Pavement

Flexible pavements shall be designed in accordance with applicable standards referenced in this EDCM and the FDOT Procedures Manual for Flexible Pavement Design. Minimum City standards for the design of flexible pavements are as follows:

1. Roadway pavement materials shall be FDOT approved and from FDOT approved sources.
2. Pavement designs shall be FDOT approved asphalt mixes.
3. Asphalt Concrete shall be Superpave only.
4. Limerock bases require roadway underdrains in all areas of subgrade where ground water may rise to within 12 inches of the bottom of the base material or in undercut areas where ground water may infiltrate or accumulate in the stabilized subgrade.
5. Subgrade materials shall be Type B Stabilization (LBR 40).
6. The minimum thicknesses shown in Table 4-2 shall be provided. The City Engineer has the authority to approve alternate designs provided the professional engineer demonstrates that the proposed design meets objectives and minimum requirements of that particular scenario.

Table 4-2. Minimum Pavement Thickness				
Facility	Type B Stabilization	Base	Structural Course	Friction Course
Trails & Multi-use Paths	12 inches	6 inches	1.5 inches	Optional
Local Roadways	12 inches	6 inches	2 inches (two lifts)	Optional
Local Roadways (Design Speed >30 MPH OR ADT >3,000)	12 inches	8 inches	1.5 inches	1.5 inches
Arterials & Collectors	12 inches	8 inches	2 inches	1.5 inches

4.6.2 Concrete Pavement

Concrete pavement may be used in lieu of flexible pavement if its structural capacity meets or exceeds the values for the minimum flexible pavement sections.

1. Concrete pavements shall be designed in accordance with the FDOT Procedures Manual for Rigid Pavement Design.
2. FDOT Design Manual with Draincrete edgedrains and shall be a minimum of 6 inch thick.
3. Design shall provide all steel reinforcement, doweling and joint requirements.

4.6.3 Brick Pavement

Brick Pavement may be used in lieu of flexible pavement.

1. Brick pavement cross section shall include a 6" concrete pavement with Draincrete edgedrains under-layer in accordance with the FDOT Rigid Pavement Design Manual.
2. Brick pavers shall be 4"x8", 2-3/4" thick, mortarless with joints width of 1/16" to 1/8" and 3/4" concrete bedding fines. See Appendix B for details.

4.6.4 Geotechnical for Public Roadways

Roadways intended to be dedicated to the Public must provide the following geotechnical and boring information:

1. Geotechnical recommendations for roadway signed and sealed by a Professional Geotechnical Engineer.
2. Borings will be collected within the proposed roadway every 500 feet or a minimum of one per roadway segment.
3. The depth of the borings must be to a depth of the proposed roadway template plus 3 feet.

4.7 Driveways

Driveways must be designed as follows:

1. Refer to the City's Land Development Code for specific requirements regarding dimensions, types, locations, number and permitting of driveways.
2. Unless permitted by Code or by the City Engineer, ramp style (FDOT concrete flared) driveways shall be utilized at all locations.
3. Unless permitted by the City Engineer, all driveways shall be 6 inch thick concrete with 6x6 WWM or 1.5 lbs. polypropylene fiber mesh per CY.

4.8 Bicycle Facilities

Bicycle facilities shall be provided on all new roadway projects. The NACTO Urban Bikeway Design Guide also provides design solutions to help accommodate bicyclists and achieve complete streets in roadway design.

1. Shared lane markings may be required at the City Engineer's discretion. Dedicated in-street bicycle lanes shall be provided for all roadways projected to carry an ADT greater than 2,500 vehicle trips per day.
2. The minimum bicycle lane width shall be 5' to face of curb. A minimum of 4' width is required for roadways without curb.
3. Bicycle lanes along corridors with vehicular speeds posted above 35 mph shall be buffered in accordance with FDOT Standard Plans.
4. Bicycle lanes adjacent to on-street parallel parking should have a minimum width of 6' (preferably 7') and a buffer to allow for door swing from parked cars.

4.9 Sidewalks and Shared-use Paths

Pedestrian facilities shall be provided on all new roadway projects. The NACTO Urban Design Guide also provides design solutions to help achieve complete streets in roadway design.

1. Sidewalks shall be a minimum of 5' wide and all sidewalks shared used paths shall be designed with a 1.5% cross slope.
2. Sidewalks and shared-use paths may be designed as asphalt, concrete or brick pavers.
3. Asphalt pavement cross-sections shall meet the requirements of Table 4-2;
4. Asphalt pavement section with expected vehicle loads shall be designed as a local roadway. Asphalt may be placed in a single lift.
5. Concrete areas with expected vehicle loads shall be 6 inch-thick concrete with 6x6 WWM or 1.5 lbs. polypropylene fiber mesh per CY; otherwise, 4 inch thick concrete is permissible.
6. Brick pavers shall be 4"x 8", 2-1/4" thick, mortarless with joints width of 1/16" to 1/8" and 3/4" concrete bedding fines; areas with expected vehicle load shall include a 6 inch thick concrete underlayer; otherwise, a 4 inch thick concrete underlayer is permissible.
7. See Appendix B for details for brick paver details.

4.10 Curb Ramps and Sidewalk Connections

Curb ramps and sidewalk connections shall meet the following criteria:

1. All curb ramps and sidewalk connections shall be 6 inch thick concrete with 6x6 WWM or 1.5 lbs. polypropylene fiber mesh per CY.
2. Detectable warning areas shall be clay fired or concrete brick with truncated domes, red in color only.
3. The City brick detectable warning area details are shown in Appendix B.

4.11 Signage

All signs designs shall be approved by the City prior to fabrication. All street signs placed in the Public right-of-way shall meet the following requirements:

1. Sheeting: Use Type XI sheeting for all signage.
2. Street name signs:
 - a. Blanks: 0.080-gauge 30 inch by 9 inch aluminum (4 per intersection).
 - b. Public street color scheme: white on green.
 - c. Private street color scheme: green on white.
 - d. Border: One-half inch around the perimeter of the sign.
 - e. Standard Lettering: 6 inch – series “B”.
 - f. Superscript letters: 2 ¾ inch letters – series “C”
3. Historic Street Name Signs:
 - a. Blanks: 0.080-gauge 30 inch by 9 inch aluminum (4 per intersection).
 - b. Color scheme: white on black.
 - c. Border: one-quarter inch, one-quarter inch off the perimeter of the sign, leaving a one-quarter inch black border on the perimeter of the sign.
 - d. Standard Lettering: 4 ½ inch – series “B”.
 - e. Superscript letters: 2 inch letters – series “C”.
4. Mast arm overhead street signs:
 - a. Blanks: 0.080-gauge aluminum, 18 inches by 54 inches minimum, 18 inches by 72 inches maximum. The size of the sign shall be increased in 6 inch increments only.
 - b. Placement: Attached to the right of the outside most traffic signal head to the maximum extent possible.
5. Posts:
 - a. Street name signs shall be mounted on a uni-strut square post, 2 lb/ft (or equivalent as approved by the Public Works Department).
 - b. Combination stop signs and street name signs shall be mounted on a uni-strut square post, 2 lb/ft (or equivalent as approved by the Public Works Department).
 - c. All other traffic signs shall use a U-channel post, 2 lb/ft (or equivalent as approved by the Public Works Department).
 - d. If the signpost is to be painted, it shall be powder coated and painted black.
6. Abbreviations:

Full street type names are preferred. If necessary, abbreviations shall be as follows: Avenue – AVE; Boulevard – BLVD; Place – PL; Street – ST; Road – RD; Terrace – TERR; Lane – LN; and Drive – DR.
7. Specialty or decorative signs & posts may be approved at the discretion of the City Engineer; any specialty or decorative signs & posts shall require a maintenance

agreement and all cost associated with furnishing, installing, replacing & maintenance shall be the responsibility of the permittee.

4.12 Pavement Markings

Pavement markings shall meet the following criteria:

1. Pavement markings shall not be placed on local roadways unless required by the MUTCD. Other exceptions include vertical deflection of traffic calming markings, at intersections with collector/arterial roadways, and as directed by the City Engineer.
2. Collector and arterial roadways shall include all standard markings and RPMS.
3. All final pavement markings shall be thermoplastic.

4.13 Traffic Calming

Traffic calming measures shall be utilized at the direction of the City Engineer where roadway alignments may encourage high vehicle speeds or cut through traffic on local roadways.

4.13.1 Horizontal Traffic Calming Measures

Horizontal traffic calming measures, such as bulb-outs, chicanes or roundabouts are the preferred treatment to minimize impacts to emergency response vehicles.

4.13.2 Vertical Traffic Calming Measures

If vertical traffic-calming measures are utilized, they shall be designed as raised intersections or speed tables.

Examples of traffic calming devices are illustrated in Appendix B.

4.14 On-Street Parking

4.14.1 On-Street Parking

1. When on-street parking is proposed, curb extensions are required to reduce crossing distance for pedestrians.

4.14.2 Angle parking

1. When angle parking is proposed, back in angle parking is preferred if technically feasible.

4.15 Lighting

Lighting shall meet the following criteria:

1. Lighting shall be LED and designed in accordance with the Florida Greenbook.
2. GRU and the Public Works Department shall approve all lighting designs, including photometrics.
3. All publicly-maintained lighting facilities, including but not limited to poles, arms, boxes and fixtures shall be approved by GRU.

4. All publicly-maintained lighting materials shall be selected from the current GRU Lighting Catalog and GRU Approved Electric System Materials Manual.
 - a. If a developer chooses to install roadway lighting that is not approved by GRU and the Public Works Department, an agreement acceptable to the City shall be submitted stating that the developer/home owners association is responsible for 100% of the capital, maintenance, electricity, replacement costs of the roadway lighting facilities, registration with Florida One Sunshine, and provision of utility locates in perpetuity.
5. New lighting shall be aesthetically compatible with any existing adjacent lighting.
6. Existing highway lighting is to remain in service during all phases of construction or until new lighting is installed and placed in service.

4.16 Utilities

Utilities shall meet the following criteria:

1. Utilities shall be designed to minimize impacts and conflicts with roadway elements in the right-of-way. Utilities shall be placed in accordance with the current FDOT Utility Accommodations Manual and the City's Code of Ordinances.
2. Roadway, trail and sidewalk surfaces newer than 5-years old shall not be open cut.
 - a. Exceptions may be approved by the City Engineer.
3. Any allowable open cut shall be repaired in accordance with FDOT Standard Plans, flowable fill option only.
 - b. Open cut restoration shall encompass a full lane minimum width and a minimum of 50 feet in length.
 - c. Multiple open cuts on the same block may require resurfacing of the entire block, at the City Engineer's sole discretion.
4. Utility work within the City right-of-way will require a permit from the Public Works Department (Utility and/or Obstruction permits) in accordance with the City's Code of Ordinances.
5. All utility services, including but not limited to those of franchised utilities, electric power and light, telephone, cable services, water, sewer and gas, shall be installed beneath the surface of the ground, unless the City Manager or designee determines that the soil, topography or other compelling condition makes it unreasonable or impractical.
6. The subsurface mounting of incidental appurtenances, including but not limited to transformers, switchgear boxes or pedestal-mounted boxes for the provision of utilities, electric meters, back flow preventers and fire hydrants, is not required.

4.17 Landscaping

When planning for the street tree requirements under Section 30 of the Code of Ordinances, Public Works will consider the use of innovative design elements and other BMPs to promote trees and other landscaping within the ROW. Design elements should protect all infrastructure within the ROW and promote the reduction of stormwater runoff from the existing storm sewer system. As an example, use of a tree well that utilizes a barrier along the side adjacent to a linear utility would be considered a valid design element. Designs that propose innovative alternatives will be reviewed for the following:

1. Structural Integrity;
2. Functionality;
3. Constructability;
4. Maintainability;
5. Safety; and
6. Aesthetics.

4.18 Transit

Transit facilities shall meet the following criteria:

1. Transit facilities shall be designed in accordance with standards referenced in this manual and the Americans with Disabilities Act. The FDOT Transit Design Handbook provides technical guidelines in the design of transit facilities. The design of transit facilities shall be coordinated with and approved by the Gainesville Regional Transit System (RTS).
2. ADA compliant bus stops shall be considered in the design of all new roadway projects. At a minimum, boarding and alighting areas shall be designed to include a firm surface measuring 8' perpendicular to the roadway and 5' measured parallel to roadway.
3. Bus bays and shelters should also be considered and provided if feasible.

4.19 Mailboxes

Community and group mailboxes shall be placed in locations that will not encourage the congregation of pedestrians or parked vehicles on high volume or high-speed roadways. Placement of such mailboxes shall be contemplated during the design plat process and shall be prohibited on or adjacent to arterial and collector roadways unless approved by the City Engineer.

4.20 Temporary Traffic Control

Obstructions such as road closures, lane closures and sidewalk closures shall be minimized. If required, the impacts on the public and time duration shall be minimized. The City Engineer, at its discretion, may limit the days of week, times of day, or duration of closures. Obstruction permitting shall be in accordance with Chapter 8-Construction of this manual.

5. Site Design

The criteria listed under this heading apply to site development, which typically includes projects that are primarily outside of the Public ROW and that do not have elements of a typical residential subdivision. The requirements listed in this section may be applied to all other types of development at the discretion of the City Engineer.

5.1 Driveways

Driveways shall be designed in accordance with Chapter 4.7 of this manual.

5.2 Utility Service

Utilities shall be designed in accordance with Chapter 4.16 of this manual.

5.3 Refuse Collection and Dumpster Pads

Refuse Collection and dumpster pads shall be designed as follows:

1. A minimum of 6 inch thick 3,000-psi concrete shall be used for dumpster pads.
2. Refuse collection areas shall be situated so that collection vehicles are not required to back out into the Public right-of-way.
3. Temporary dumpsters and roll-offs are prohibited in the Public right-of-way and temporary permits will not be issued.
4. Sites should be designed so that all refuse needs can be accommodated on-site.

5.4 Parking (off street)

5.4.1 Dimensions

Minimum dimensional standards are provided in Appendix B of this manual.

5.4.2 Grading

Parking lots shall be graded to provide safe pedestrian and vehicle conditions while maintaining positive drainage into inlets and minimizing surface ponding. As a guideline, 8% maximum and 0.5% minimum slope should be used in all areas where ADA requirements do not overrule local requirements.

5.4.3 Site Striping

Site striping on hard surfaces shall be a minimum of 4 inch wide on private sites. All striping shall comply with the MUTCD.

5.4.4 Inlets

Inlets shall be located away from areas frequently traversed by pedestrians. Grates shall be safely traversable by all anticipated traffic including pedestrian, bicycle, wheelchair and vehicle.

5.4.5 Vehicle Parking

A physical barrier shall be provided to ensure vehicle overhang does not obstruct a pedestrian route. A minimum of 5 feet of open travel pedestrian area shall be maintained.

5.4.6 Bicycle Parking

Bicycle parking shall be located in areas convenient to building entrances and in areas that require minimal effort to access. The type and number of bicycle parking spaces shall be in accordance with the Land Development Code.

5.4.7 Motorcycle Parking

Motorcycle parking shall be 4.25 feet wide and 8 feet deep and be located in areas convenient to the building entrances. The parking surface shall be concrete.

5.4.8 Scooter Parking

Scooter parking shall be 3 feet wide and 6 feet deep and be located in areas convenient to the building entrances. Each scooter-parking stall shall be accessible from a minimum 3 feet wide aisle. The parking surface shall be concrete.

5.5 Public Right-of-Way and Maintenance

Private amenities or infrastructure, such as bike racks, on-site landscaping requirements, etc., proposed for construction in the public right-of-way shall be approved by the City Engineer and shall require a perpetual Maintenance Agreement.

5.6 Public Sidewalks

Public sidewalks shall be constructed in accordance with Chapter 4. A sidewalk easement is required for that portion of a public sidewalk proposed on private property.

6. Traffic Study Guidelines

The City of Gainesville has adopted transportation policies that promote infill, urban redevelopment and transportation choices. It is the intent of these guidelines to provide information that ensures the maintenance of adequate traffic safety and operating conditions of the transportation system within City limits. Traffic studies shall be signed and sealed by a professional engineer licensed in Florida.

6.1 Study Thresholds

6.1.1 Traffic Statement

1. Projects that generate less than 100 gross net new peak hour trips. For purposes this threshold, gross net new peak hour trips is defined as the gross trips from the development with a reduction of trips from any existing uses on the site. No reductions for pass-by or multimodal trips are applied for 100 gross net new trip threshold.
2. A Traffic Statement shall document driveway volumes, site trips per mode (based on the latest edition of ITE Trip Generation and local multiuse rates as available), and roadway characteristics that may affect site access and/or safety.
3. A Traffic Statement may be included on the site plan and no other documentation is needed.
4. Location specific conditions may dictate the need for site access and intersection analysis or traffic study. The City retains the sole discretion to determine the scope of additional analyses or studies; such analyses or studies shall be communicated to the applicant no later than the conclusion of the First Step meeting.

6.1.2 Traffic Study

Projects that generate that generate 100 or more gross net new peak hour trips.

6.2 Methodology Letter

Prior to the preparation of a traffic study, the project's Traffic Engineer in coordination with the City of Gainesville must develop and agree on the study methodology. For projects impacting County or State roads or within one-quarter mile of the unincorporated area, coordination with the appropriate jurisdiction is required. Final approval of the methodology by the City and other agencies is required prior to commencing the study and should be documented in the final study.

6.3 Required Information

The standard required information to be included in the traffic study is listed below. City reserves the right to request additional information or further evaluation based on site location and conditions.

1. Project Description

1. Type of development (e.g., standard subdivision, commercial/retail, office, mixed use, etc.), size (acres, etc.) and number of units as appropriate for the project (dwelling

units, square feet, etc.). For student-oriented multi-family developments, the analysis should be performed based on the number of bedrooms.

2. Expected build-out year.
3. Access
 - a. Identify vehicular, transit, bicycle, and pedestrian access to the development from the public roadway system.
 - b. Identify proposed connections (including cross-access or joint driveways) to existing and future adjacent developments.
 - c. Provide location map and figure illustrating the adjacent roadway network and all site access points.
4. Trip generation
 - a. Calculate average daily, AM and PM peak hour trip generation according to the latest version of the ITE Trip Generation Manual;
 - b. If appropriate, document any unique trip generation characteristics of the project;
 - c. Document calculation of internal capture, pass-by trips, and multimodal trip reductions including assumptions and methodology used.
5. Trip Assignment
 - a. Calculate directional distribution of project traffic and state methodology used (GUATS, observation of traffic at nearby developments, based on directional distribution of existing traffic, etc.) and provide projected ADTs for all new roadway segments. Data obtained from other developments should be based on an average using a minimum of 1 day of manual counts (Tuesday, Wednesday and Thursday only).

2. Study Area

1. The City will specify the boundary of the Study Area and any intersections that shall be analyzed as part of the study. At a minimum this shall extend one-quarter mile from the project site and include main intersections and project driveways. Extent may vary depending on site conditions and intensity.
2. Acceptable dates for traffic counts will be approved as part of the study methodology letter. Counts may not be taken on Mondays, Fridays, holidays, significant events (e.g., Gatornationals or holiday shopping season) or during school breaks (UF, Santa Fe College, and/or the public schools).
3. Turning movement counts should be collected for a minimum of one day at locations and time-periods specified in the methodology.
4. The Study may require a Highway Capacity Manual operational analysis using the most recent version of Synchro or the Highway Capacity Software as applicable.

3. Analysis of Conditions

1. Transportation System Serving the Project Site
 - a. Identify all arterial and collector streets within one-half mile of project, as defined by the City's Comprehensive Plan and list the governmental jurisdiction(s) responsible for maintenance.
 - b. Identify Regional Transit System routes serving project and locate bus stops (indicate whether a bus shelter(s) exist at the stop) within one-quarter mile of the project.
 - c. Identify streets with sidewalks (one-side/both sides) within one-quarter mile of the project.

- d. Identify any bicycle facilities (bike lanes, rail trails, wide curb lanes, etc.) within one-quarter mile of the project.
 - e. Identify any gaps in sidewalk and/or bicycle facilities within one-quarter mile of the project.
- 2. Programmed Transportation Modifications
 - a. List proposed transportation system modifications in the study area as stated in the adopted 5-year Transportation Improvement Plan (TIP) and the City's or Alachua County's Capital Improvement Element (as appropriate).
 - b. List any proposed and/or scheduled transportation system modifications that will impact the project that are not in the TIP.
- 3. Background Growth Rates
 - a. Use the City of Gainesville, Alachua County and Florida Department of Transportation (FDOT) counts to determine growth trends. For instances where there is no data available to establish the growth rate, a standard 2% growth rate shall be used. For roadways having a negative growth rate, a 1% growth rate shall be used.
- 4. Analysis Scenarios
 - a. The study shall document the following conditions: existing, future with background growth projects, future with project traffic, future with project traffic and proposed improvements.
 - b. Provide figures that illustrate existing and future turning movement counts including traffic associated with nearby developments that have received development plan approval, as identified in the study methodology.
 - c. Calculate level-of-service at affected intersections for all scenarios.
 - d. If required, perform warrant analysis for traffic control devices at affected unsignalized intersections. All intersection warrant analysis for signal control and signal reconstruction shall include a roundabout evaluation and operation analysis. If there are no site constraints (environmental or land rights needs outside the control of the applicant) and a roundabout operates at an acceptable level of service in the design year, a roundabout shall be selected as the appropriate intersection control type.
- 5. Summary of Transportation System Impacts
 - a. Provide summary of the project impacts on the public roadway system.
 - b. Provide summary of the project's impacts on the transit, pedestrian and bicycle system.
 - c. Identify any needed roadway modifications which may be required (i.e., turn lanes, medians, traffic separators, or traffic control devices).
 - d. Any additional information requested in the methodology letter.
- 6. Supporting Documentation
 - a. All supporting documentation shall be provided in the Appendix, including but not limited to:
 - i. Copy of the signed methodology letter.
 - ii. Copies of required traffic counts.
 - iii. Copies of all analysis performed utilizing various engineering software programs (such as Highway Capacity Software, Synchro, etc.).
 - iv. Warrant studies.
 - v. Growth trends.
 - vi. Site plan

Chapter 6 – Traffic Study Guidelines

- vii. Signal timings
- viii. Volume calculations
- ix. Distribution calculations / model plots
- x. TMPA district information

7 Submittal Requirements

The following is a list of components that may be included for various submittals. Requirements are deemed by type of project and stage of submittal. It is the engineer of record's responsibility to provide all documentation for a stand-alone permit application.

7.1 Site Plans

7.1.1 Conceptual Review

1. Approximate topographic map (USGS or Regional Planning Council maps may be used) showing:
 - a. Existing creeks.
 - b. Ditches.
 - c. Above ground utilities.
2. A statement identifying the location and elevation of any flood zones.
3. A statement as to whether the project will be affected by the creek setback regulations.
4. A general description of how the drainage will be handled, including an initial identification of soils (information from NRCS acceptable), and the general area of the site to be used for stormwater management facilities.
5. Conceptual review submittals shall meet applicable requirements in the City of Gainesville Code of Ordinances Sec. 30-3.50 – Conceptual Review.

7.1.2 Development Plan Review

1. The coordinate system shall be Florida State Plane Coordinates, NAD 83 Zone North US Survey feet. Vertical coordinates shall be referenced to the NAVD 88 datum with elevations given in US Survey feet unless otherwise approved by the City Surveyor.
2. Grading and paving plan, including horizontal control, elevations, complete notes and specifications covering construction (this can be combined with the drainage plan).
3. Provide turning templates for driveways and intersections as requested by the City Engineer.
4. Incorporate projected ADTs of new roadway segments into plan set submittal.
5. Erosion and sediment control plan must be submitted, if appropriate, or a statement must be on the plans that one is not required.
6. A statement outlining the status of State environmental permits.
7. Final review shall meet applicable requirements in the City of Gainesville Code of Ordinances Sec. 30-3.46 - Submittal Requirements and Sec. 30-3.47 - Contents of Final Development Orders.
8. Drainage narrative shall minimally include:
 - a. A complete description of the stormwater management plan, including, but not limited to:
 - i. Information for all affected drainage areas;
 - ii. Existing, proposed, and previously permitted and future impervious areas;
 - iii. Water quality treatment criteria;
 - iv. Structural analysis for dams and berms;

- v. Explanation of all assumptions;
 - vi. Supporting electronic stormwater modeling files;
 - vii. All pre-development and post-development basins that contribute runoff to the area proposed for development, including all off-site contributions, and areas that may be impacted by the development fully delineated and quantified.
 - viii. Hydrologic and hydraulic stormwater model analysis including all input parameters, supporting calculations, assumptions, documentation for design and results.
 - ix. Calculations pipe and lane spread calculations.
 - x. Demonstration that freeboard is met, see Section 3.4 for criteria.
 - xi. Recovery analysis based on drawdown of the total required volume.
 - xii. A slope stability analysis if required. See Section 3.4 for criteria.
 - xiii. Calculations must be consistent with the plan sheets and other supporting details.
 - xiv. Calculations shall use standard methodology recognized in the State of Florida, including hand and/or computerized calculations.
 - xv. Calculations must be provided for drainage features identified as “Design by Others” (for example but not limited to, roof drains, drainage for retaining walls, underground stormwater facilities).
 - xvi. Signed and sealed by a professional engineer.
9. Geotechnical investigation report shall minimally include:
- a. A summary of all subsurface exploration data and subsurface soil profiles.
 - b. Exploration logs, laboratory or in situ test results, groundwater information, the interpretation and analysis of the subsurface data.
 - c. Recommendations for design, discussion of conditions for solution of anticipated problems, and recommended geotechnical special provisions.
 - d. Signed and sealed by a professional engineer.

7.1.3 Drainage plan sheets shall minimally show:

- 1. The location and design parameters for all retention/detention areas including:
 - a. Dimensions or coordinates for constructability.
 - b. Cross sections, to scale, along the width and length of each pond, showing the design high water elevation, estimated seasonal high-water elevation, pond top elevation, pond bottom elevation, side slope steepness, maintenance berm width, sod stabilization of the pond side slopes, and appropriate vegetative cover on the pond bottom.
 - i. A typical cross section can be used instead when sufficient information is shown on the plan view, which minimally includes pond width and length call outs as measured at the pond's top and bottom elevations.
- 2. Soil boring location with labels and ground elevation at time of collection.
- 3. All stormwater features or connective elements located and identified that may have an impact on the existing or proposed system, including but not limited to cross-drains, natural weirs, water line of lakes, wetlands, rivers, springs, streams, canals and other manmade or natural features.

4. All existing and proposed stormwater structures located and identified including labels and design parameters such as, references to a detail or source, widths, depths, heights and pertinent elevations.
5. A structure table that presents existing and proposed inlets, inlet type per FDOT index, and inverts of pipes.
6. All existing and proposed stormwater pipes located and identified including labels and design parameters such as, sizes, materials, lengths, slopes, references to a detail or source, and invert elevations.
7. All existing and proposed swales located and identified including labels and design parameters such as, side slope steepness, widths, dimensions, ditch block locations and details, stabilization, and material used to stabilize.
8. Identification of finished-floor elevations of structures. See Section 3.4.3 for criteria to be met.
9. Site access accounting for stormwater conveyance within the right-of-way.
10. Site grading, using spot grades at all corners and other critical or transitional locations, with directional flow arrows, details, cross sections, or general grading depictions.
11. Erosion control measures, including:
 - a. The construction entrance location and controls;
 - b. Limits of silt fence, turbidity barrier, and other perimeter or intermediate controls; and
 - c. References to a detail or source.
12. Details, cross-sections, or references clearly describing the construction intent. It is acceptable to reference standard details, such as FDOT's, when used instead of reproducing them.
13. Signed and sealed by a professional engineer.

7.1.4 Road Construction / Improvements Associated with Site Plans

If roadways are part of a site plan and are to be dedicated to the City, the submittal shall provide standard sheets containing information identified under Section 7.2.

7.1.5 Required Notes on Plans

The following notes shall be added to the plans if work is required to be done within the City, County or State ROW:

1. City Right-of-Way
 - a. "The method and manner of performing the work and the qualities of material for construction within the ROW shall conform to the requirements specified by the Public Works Department."
 - b. "No work shall be done nor materials used in the ROW, without inspection by the Public Works Department (352-334-5070), and the Contractor/Developer shall furnish the Department with every reasonable facility for ascertaining whether the work performed and materials used are in accordance with the requirements and intent of the plans and specifications."
 - c. "The Public Works Department reserves the right to modify the proposed work within the ROW to ensure compatibility with existing improvements. Such modification costs shall be borne by the Developer."
 - d. "All required backfill within the ROW shall be documented within a FDOT type density log book, compiled and maintained by the contractor, and shall be

available for review by the Public Works inspector at all times and immediately upon request. The log book will be reviewed for compliance to specifications by City Staff prior to any earthwork starting. The log book shall contain proctors, LBRs, soil classifications, etc. as required by specification. The log book shall be signed and sealed by the professional engineer responsible for materials testing and provided to the Public Works Department for review and TCO acceptance as part of the closeout documents.”

- e. “Post installation video inspections in accordance with FDOT Specifications shall be required for all pipe in the City right-of-way and the cost shall be borne by the contractor.”
 - f. “Exact limits of roadway and sidewalk to be removed will be determined by City Public Works Inspection staff. Any non-compliant or damaged areas due to construction within the right-of-way shall be removed and replaced prior to final acceptance.”
2. County Right-of-Way
- a. “The method and manner of performing the work and the qualities of material for construction within the County ROW shall conform to the requirements specified by the Alachua County Public Works Department.”
 - b. “No work shall be done nor materials used in the ROW, without inspection by the Alachua County Public Works Department (352-462-2147), the Contractor/Developer shall furnish the Alachua County Public Works Department with every reasonable facility for ascertaining whether the work performed, and materials used are in accordance with the requirements and intent of the plans and specifications.”
3. State Right-of-Way
- a. “The method and manner of performing the work and the qualities of material for construction within the ROW shall conform to the requirements specified by the Public Works Department and the Florida Department of Transportation (FDOT).”
 - b. ““No work shall be done nor materials used in the State ROW, without inspection by FDOT and the Public Works Department (352-334-5070) per its maintenance agreement with FDOT. The Contractor/Developer shall furnish each Department with every reasonable facility for ascertaining whether the work performed, and materials used are in accordance with the requirements and intent of the plans and specifications.”
4. Stormwater Basins
- a. “If a geotextile is proposed, the Engineer of Record will provide specifications to Public Works prior to installation to demonstrate the geotextile is not be a limiting factor in infiltration.”
 - b. “The insitu material for all dry retention ponds will be tested by a geotechnical engineer using appropriate methodologies such as onsite testing with a double-ring infiltrometer or trench test, or collection of an undisturbed sample for testing such as a Shelby tube to demonstrate that it is not less than the design infiltration. Test results shall be submitted to the City for approval. The cost shall be borne by the contractor.”
 - c. “The insitu material under all proposed underground stormwater systems will be tested by a geotechnical engineer in the field after preparation but prior to

placement of bedding stone using a double-ring infiltrometer test to demonstrate that it is not a limiting factor in the design infiltration. If utilizing a compacted backfill material, it too must be tested in the field after placement to demonstrate that it is not a limiting factor in infiltration. Test results shall be submitted to the City for approval. The cost shall be borne by the contractor.”

- d. “Stormwater basins utilizing underground storage facilities must remain off-line until it is demonstrated that all sediment within the stormwater conveyance has been removed and will not be flushed into the basin.”
 - e. “Final excavation of dry retention ponds to within one foot must be deferred until all contributing areas of the drainage basin are stabilized. Light equipment should be used to remove accumulated sediments and achieve final grade without compacting the basin floor.”
5. General
- a. “On slopes of 3:1 or greater, or wherever erosion may be a problem, sod shall be laid with staggered joints and secured by pegging or other approved methods.”

7.1.6 Electronic File Submittals

Electronic copies of all reports, calculations, and plans shall be provided to the Public Works Department in .pdf format for all requested reviews.

7.2 Subdivision Development

In addition to the requirements identified for Site Plans under Section 7.1, the following is a list of standardized sheets required for Plans Submittal. Sheets may be omitted if those elements are not present in the project.

7.2.1 Plat Map / Right-of-Way Map.

Construction Plans shall be consistent with the approved design plan plat. The final plat shall conform to the design plat as approved by the City Commission.

7.2.2 Construction Plans.

Sheets referenced below shall meet all applicable requirements stated in the current version of the FDOT Design Manual.

- 1. Key sheet.

Any elements of the key sheet mentioned in the manual specific to the FDOT, shall be replaced with the corresponding element specific to the City of Gainesville.
- 2. Subdivision plat.

Final Plat must identify the allowed impervious per lot. The allowed impervious can be specified as a percentage or by square footage.
- 3. General notes.
 - a. Identify the benchmark datum.
 - b. Specify the source in which construction shall be in accordance
 - c. List stakeholder contacts the contractor shall coordinate with including utilities and other government agencies.
 - d. Include any other notes specific to the project to ensure successful completion by the contractor.
- 4. Certified topographic and boundary survey.

Chapter 7 – Submittal Requirements

- a. Surveys shall meet the minimum technical standards of the current version of the Florida Administrative Code.
 - b. The coordinate system for all drawings shall be Florida State Plane Coordinates, NAD 83 Zone North US Survey feet. Vertical Coordinates shall be referenced to the NAVD 88 datum with elevations given in US Survey feet.
5. Summary of drainage structures.
6. Master drainage map / Sub-division or roadway map.
7. Roadway typical sections.
8. Roadway soil survey and auger borings.
Boring information shall be shown on the roadway cross sections.
9. Special details.
10. Plan and profile sheets.
Where appropriate, the horizontal scale shall be 1 inch = 20 feet and the vertical scale shall be 1 inch = 2 feet.
11. Utility plans.
Provide sufficient information to clarify potential conflict locations, including pipe slopes, elevations, required separation, etc., based upon the FDOT Utility Accommodation Manual or applicable state & federal statutes.
12. Roadway cross sections.
 - a. Where appropriate, the horizontal scale shall be 1 inch = 10 feet and the vertical scale shall be 1 inch = 5 feet.
 - b. Boring information shall be shown on the roadway cross sections.
13. Signing and marking plans.
 - a. The horizontal scale shall be the same as the scale chosen for the plan and profile sheets.
14. Drainage details.
 - a. Shall include details of major roadway connections, urban and rural turnouts, stormwater management facilities, and concrete structures such as box culverts and retaining walls.
 - b. Shall include details of special drainage structures, which include the rebar, formwork design, and specials construction specifications such as joints and connections.
 - c. Include any other details not covered in other sheets that contribute to successful drainage in the project.
15. Stormwater pond plans.
Include all stormwater basins and details including control structures, slopes, outfalls, underdrain systems, and stabilization information.
16. Stormwater pond cross sections.
 - a. Include cross sections at spacing sufficient to determine pond performance.
 - b. Where appropriate, the horizontal scale shall be 1 inch = 10 feet and the vertical scale shall be 1 inch = 5 feet.
17. Temporary Traffic Control (TTC) plans.
 - a. EOR to provide note to the Contractor that informs them that TTC plans are required for the ROW Permit. See Chapter 8.2 ROW Permits for additional information on City ROW Permit requirements.
18. Landscaping and streetscaping plans.
19. Stormwater pollution prevention plan.
20. Lighting plans.

- a. The horizontal scale shall be the same as the scale chosen for the plan and profile sheets.
 - b. Include a table that shows the photometric calculations, including average maintained luminance and uniformity ratio compared to the chosen design standard values.
21. Irrigation plans.
- a. Irrigation plan sheets shall show the location and type of irrigation equipment to be installed to support the landscaping and streetscaping plans.
 - b. The horizontal scale shall be the same as the scale chosen for the plan and profile sheets.
 - c. Include a summary of quantities table specific to irrigation items.
 - d. Private subdivisions do not require a summary of quantities.

7.2.3 Submittal Format

Electronic copies of all reports, calculations, and plans shall be provided to the Public Works Department in pdf format for all requested reviews.

7.3 Interim Stormwater As-built Survey

The Contractor shall provide the City with an interim as-built survey of the retention/detention basin(s) and associated control structures that must be prepared by a registered land surveyor. The survey shall provide vertical and horizontal extents of the stormwater basins and elevation of control structures and confirm the stormwater system is in conformance with approved plans prior to permanently covering or burying the basins. The survey shall be in accordance with standards identified in Section 7.4.

7.4 As-built Survey

All work within or on City owned and maintained facilities, ROW or easements, as well as all stormwater infrastructure, whether on private or public property, shall require as-built plans. As-built Surveys must meet the following criteria:

1. As-built plans must show the constructed conditions of the City owned or maintained area and be performed by a Florida Licensed Professional Surveyor and Mapper.
2. The as-built survey data must be overlaid on the construction plan set that was approved for the project.
3. Construction Plan information must be shown in grayscale with the plan information untouched or unaltered.
4. The as-built survey must be to scale match the plan scale information.
5. The as-built survey data will be shown in bold print that is easily discernible from the grayscale plan information. When appropriate, use of strikethroughs, asterisks and clouds should be used to ensure it is clear what changes have occurred.
6. The coordinate system shall be Florida State Plane Coordinates, NAD 83 Zone North US Survey feet. Vertical Coordinates shall be referenced to the NAVD 88 datum with elevations given in US Survey feet.
7. The as-built shall be certified as meeting the Minimum Technical Standards set forth by the Florida Board of Land Surveyors pursuant to Chapter 472, Florida Statutes and Chapter 5J-17, Florida Administrative Code.

8. As-built plans shall be submitted to the Public Works Department for review and acceptance prior to TCO of any buildings or phase of the site as signed and sealed plans and an electronic drawing file.
9. One final as-built survey compiling all phased surveys shall be submitted to the Public Works Department for review and acceptance prior to CO or final acceptance.
10. As-built plans for driveway permits may be required on a case-by-case basis.
11. The engineer of record shall file the as-built survey with the Public Works Department upon completion of constructed improvements.
12. The final as-built cover sheet at minimum shall be produced from the approved construction drawing. The as-built shall include, but not be limited to:
 - a. Transportation infrastructure
 - b. Traffic control infrastructure
 - c. Signage
 - d. Stormwater infrastructure
 - e. Pedestrian infrastructure
 - f. Street furnishings
13. All changes to final utility locations including horizontal and vertical locations shall be clearly shown and referenced to permanent surface improvements and include all manholes, hydrants, valves, valve boxes, and structures.
14. As-built surveys shall also document actual installed pipe materials.
15. As-built surveys shall clearly show and document all field changes of dimension and detail.
16. As-built surveys shall include all details not on the original drawings, but constructed.
17. As-built Digital Submittal Requirements:
 - a. Must be prepared by a FL licensed professional surveyor.
 - b. Must have coordinate systems assigned.
 - i. Horizontal: State Plane NAD 83
 - ii. Vertical: NAVD 88
 - iii. Submittal must be in digital file format. A paper copy can accompany the digital file(s) but is optional.
 - iv. Both paper and digital copies must be signed and sealed.
 - c. Digital file submittal shall be in the following formats:
 - i. Adobe PDF file.
 - a) Minimum 300 DPI.
 - b) PDF must be saved in the native page size.
 - c) Submit one pdf file that includes all pages of the as-built.
 - d) Files must be clear and legible.
 - ii. AutoCAD or ArcGIS files.
 - a) AutoCAD DWG file (2013 and above).
 - 1) Includes XREF files.
 - (a) Utilize relative path for XREF files.
 - 2) Must be drawn in Model Space.
 - b) ArcGIS Geodatabase file.
 - 1) Provide data using the CityWorks schema.
 - c) Utilize the Public Works Digital Geographic Information System and CADD Standards and Requirements for as-built.

8 Construction

8.1 Objective

The purpose of this Chapter is to describe the requirements for construction improvements within City ROW, easements or any other City-maintained properties or properties intended to be turned over to the City for maintenance in the future.

All work within the aforementioned areas shall be constructed in accordance with the FDOT Standard Specifications (Division II and Division III) and the FDOT Standard Plans except as modified herein; if the provisions contained herein conflict with any FDOT requirements, the provisions herein shall prevail. Whenever, in the Florida Department of Transportation's Standard Specifications for Road and Bridge Construction, the following terms or their pronouns occur, they shall be defined as follows:

Department of Transportation: City of Gainesville, Florida, or its duly authorized representative.

State Highway Engineer, State Transportation Engineer, District Engineer, Engineer of Materials and Tests, Engineer, Inspector: The City of Gainesville City Engineer.

8.2 ROW Permits

All construction work in the City ROW, easements or City maintained properties would require permit(s) prior to beginning work. A permit is required whether the construction work is temporary or permanent.

8.2.1 City ROW Use Permits

City ROW Use Permits in the form of an Obstruction of Right-of-Way Permit or a Utilities in Right-of-Way Permit are issued by the Public Works Department.

1. Obstruction of Rights-of-Way: City of Gainesville Code of Ordinances, Chapter 23, Article V. - Public Rights-of-Way Obstructions requires any person or entity wanting to obstruct a City Right-of-Way (including temporarily obstructing the general movement of vehicular or pedestrian traffic, as well as any digging or excavation) must first obtain a permit from the Public Works Department.
2. Utilities in Rights-of-Way: Code of Ordinances - Chapter 23, Article VI. - Public Rights-of-Way Use by Utilities requires that any person, entity, or communications services provider wanting to install or maintain a communications facility in a city right-of-way be required to Register prior to applying for a permit. Upon an effective registration, a Utilities in Rights-of-Way Permit must be obtained prior to performing any work in a city right-of-way.

8.2.2 City Building Permits

City Building Permits are required for the installation or replacement of driveway aprons, curbs, sidewalks, and stormwater systems are issued by the Building Department.

8.2.3 Other Permits

Permits from federal, state and local regulatory agencies may also be required. These may include City of Gainesville, FDEP, Water Management District, FDOT, Alachua County, Florida Division of Forestry, etc. Permits must be approved prior to beginning work in the City ROW, easements and City maintained properties.

8.3 Construction Activities

8.3.1 Preconstruction Meeting

All work in City ROW shall require a preconstruction meeting or conference between the Owner, Contractor, Design Engineer and City Engineer or designee prior to beginning work. A less formal onsite meeting may be allowed for minor projects.

8.3.2 Inspections

1. Gainesville Public Works Department Inspectors and staff must be granted access to all City of Gainesville permitted sites.
2. Regular hours for inspections are Monday through Friday from 7:00 AM through 3:30 PM.
3. Inspections outside of normal work hours will be by appointment only. Inspections are to be scheduled one business day (24 hours) in advance of the required inspection. Inspection staff contact information is provided on the permit.

8.3.3 Site Housekeeping

1. Stockpiles of materials shall not be placed within the ROW or easements without a ROW obstruction permit.
2. Stockpiles of excavated topsoil or fill material shall be located such that site drainage or waterways are not obstructed.

8.3.4 Traffic Control

1. A detailed traffic control plan is required for all work impacting roadways, trails or sidewalks. The plan shall be submitted with the ROW Permit and approved by the Public Works Department prior to the start of work.
2. The Contractor is to provide a Certified Worksite Traffic Supervisor in accordance with FDOT Standard Specifications (Section 102 and 105). The Contractor shall provide the Engineer with a copy of the certification(s) prior to the beginning of the work. No work shall begin until the traffic control is set up and satisfactorily inspected by the Worksite Traffic Supervisor.
3. The Contractor shall provide a written request to the City for all traffic control initial set ups or subsequent plan changes. Allow a minimum of 14 days for approval of major set ups or plan changes and 7 days for minor set ups or plan changes. No closures will be set up without approval from City of Gainesville project staff.
4. Those certified in MOT shall design Traffic Control Plans (TCP). TCP shall include configuration traffic control devices, detour routes, notifications, schedules, responsible field contact, etc. FDOT Standard Plans 102 and MUTCD may be utilized as applicable.

8.4 Stormwater

8.4.1 Erosion Control

1. A stormwater pollution prevention plan shall be submitted in accordance with the Florida Department of Environmental Protection's requirements of Rule 62-621.300(4) F.A.C. National Pollution Discharge Elimination System (NPDES) Generic Permit for Stormwater Discharge from Large and Small Construction Activities. See Sections 3.11 and 3.12 for additional requirements.
2. The NPDES generic permit for construction activity must be posted on site at all times.

8.4.2 Dewatering Activities

A detailed dewatering plan is required for all dewatering activities on the project. The plan is to be submitted with the ROW Permit and approved by the Public Works Department prior to the start of work.

1. The dewatering plan shall include the following:
 - a. A Site Map identifying the site location and the proposed discharge location.
 - b. Type of dewatering proposed (i.e., well point, sump pump, etc.)
 - c. Rate and duration of the activity.
 - d. Hours of operation and decibel levels must comply with City Noise Ordinance.
 - e. Identification of any contamination or pollution on site.
 - f. Types of control technologies proposed (i.e., sediment traps or basins, filters, chemical treatments, etc.)
 - g. Types of monitoring to be implemented.

8.4.3 Drainage Structures and Pipe

1. Storm sewer piping and structures shall be manufactured and installed in accordance with the FDOT Standard Specifications for Roadway and Bridge Construction, the FDOT Design Standards (Roadway Index), and the FDOT Drainage Manual.
2. A copy of the engineer approved shop drawings shall be submitted to Public Works for all pipes and structures to be maintained by the City. Submit shop drawings upon EOR approval to Public Works to confirm conformance with approved plans.
3. The manufacturer shall stamp all structures and pipes. City staff shall inspect the condition of all structures and pipes at time of delivery.
4. Storm sewer piping materials other than concrete and polypropylene will be considered in special circumstances only and their use in City ROW will be on a case-by-case basis.
5. As such, if PP pipe is proposed to be utilized, independent calculations shall not be required if the proposed application meets the general notes and cover requirements in the FDOT Drainage Manual. If the application does not meet the general notes and cover requirements, then independent calculations shall be provided.
6. Post installation video inspections shall be required for all pipe in the City right-of-way and the cost shall be borne by the contractor. A general note to this effect must be included in all plan sets.
7. City staff shall inspect all structures and pipes prior to backfilling to ensure proper line, grade and joint tolerances.

8. The Contractor shall provide a proctor density for all backfill materials. If on site material is to be used in the backfill operation, City inspection staff shall decide where proctor density samples are to be taken.
9. Backfill compaction shall be density tested per FDOT specifications by the Contractor, and all proctor and density reports shall be submitted to the City.
10. City staff shall inspect structures before and after the pouring of inverts.

8.4.4 Stormwater Basins

1. Inspection
 - a. City staff shall inspect all basins before sodding and/or seeding or before covered such as in the case of underground systems.

8.4.5 Underdrain

Roadway underdrain design once approved or required by City Engineer, shall be installed per FDOT Standard Plans 440-001 Type II.

8.5 Stormwater As-built Survey

The survey shall be in accordance with standards identified in Section 7.4.

8.6 Utility Work

Utility work shall comply with FDOT's Utility Accommodation Manual (UAM) and this manual. Below are some City utility requirements including some clarifications and exceptions to the UAM and other referenced FDOT standards.

1. Cutting of the asphalt surface of an existing City maintained roadway is discouraged and will only be allowed after the pavement is 5-years old without extenuating circumstances.
2. Pavement cuts that are allowed shall have the asphalt surface replaced within 24 hours, with open cut restoration performed in accordance with most current edition of FDOT Standard Plans utilizing the flowable fill option.
3. The dimensions of replacement asphalt pavement sections will be at the discretion of the Public Works Department. Small and oddly shaped patches are strongly discouraged.
4. Underground installations placed parallel to and within the roadway may constitute complete reconstruction of the roadway and more extensive design and coordination requirements. The City Engineer will make this determination.
5. All underground utilities installed within City ROW will be installed to a depth meeting the minimum requirements of this manual; however, never less than the minimum depth of 36 inches below finished grade when installed beneath the pavement and 30 inches below finish grade when installed outside the limits of the pavement.
6. Underground crossings of existing roads by jacking, boring, or directional bore are encouraged and open cut trenching will only be allowed on a case-by-case basis and as approved by the City Engineer. No missile bores, stitch boring, or similar shall be permitted.

7. All crossings installed either by direct bury or by boring shall have the ends of the casing no closer than 8 feet from the edge of the pavement on rural roads with paved shoulders, 13 feet on rural roads without a paved shoulder, and no closer than 5 feet from the back of the curb on a curb and gutter roadway. Casing lengths may be required to be longer in order to facilitate known future widening or reconstruction. All jacked, bored, or directional bored crossings are subject to require pressure testing to a minimum of 20 psi for 24-hours, prior to the installation of the utility line, if there are any concerns about the integrity of the casing after installation.
8. Per Section 3.16.6 Casing Requirements of the UAM, the UAO shall provide casing for underground utilities (whether longitudinal or crossing) within toes of the front slopes when any the following conditions exist:
 - a. The underground utility does not meet the requirements in UAM Section 3.16.3 or UAM Section 3.16.4.
 - b. The underground utility contains flammable gases or fluids and does not meet the requirements of 49 CFR, Part 192, or 49 CFR, Part 195.
 - c. When venting is necessary, the UAO shall vent the casing at or outside the R/W line.
9. City of Gainesville Public Works Department shall be notified 24-hours prior to the start of a roadway crossing by directional bore or by jack and bore. The assigned inspector and the utility contractor making the crossing shall meet on site prior to the excavation of any bore pits. The area shall be evaluated to prevent damage to any underground drainage structures, underdrain, sidewalk, or any other structural portion of the roadway.

8.7 Earthwork

1. Earthwork shall conform to FDOT specification section 120 Earthwork and Related Operations for LAP (Off-System) (REV 1-8-18) (FA 1-9-18) as modified herein.
2. All delivery tickets shall contain the approved pit/source information and be available for review on site and submitted to the City.
3. Subgrade, curb pad and base inspections shall be performed to ensure proper grade, finish and densities. If two lifts are required, each lift shall be inspected separately.
4. A-4 material is prohibited in soil envelope.
5. Compaction under wet conditions: Backfill without compaction shall only be allowed after normal dewatering methods have been attempted and failed, and with written authorization from the City Engineer.
6. The Contractor shall perform all sampling and testing required by the specification (City and Contractor requirements). All costs shall be borne by Contractor or Developer.
7. All required fill and embankment within the ROW shall be documented within a FDOT type density Log book, compiled and maintained by the contractor, and available for review by the Public Works inspector at all times and immediately upon request. The log book shall be prepared and reviewed for compliance to specifications by City Staff prior to any earthwork starting. It shall contain proctors, LBRs, soil classifications, etc. as required by specification. The log book shall be signed and sealed by the Engineer in responsible charge of Contractor Testing and provided to the Public Works Department for review and TCO / Acceptance as part of the closeout documents.

8. The Contractor shall perform all sampling and testing required by the specification (City and Contractor requirements). All costs shall be borne by Contractor or Developer.
9. If City funding from any source is used, embankment will be paid at the plan quantity. Where payment for embankment is not to be included in the payment for the excavation, and is to be paid for on a cubic yard basis for the item of embankment, the plan quantities to be paid for will be calculated by the method of average end areas unless the Engineer determines that another method of calculation will provide a more accurate result. The measurement will include only material actually placed above the original ground line, within the lines and grades indicated in the Plans or directed by the Engineer. The length used in the computations will be the station-to-station length actually constructed. The original ground line used in the computations will be as determined prior to placing of embankment and no allowance will be made for subsidence of material below the surface of the original ground.

8.8 Asphaltic Concrete

1. Asphalt work shall conform to FDOT specification section 334 Hot Mix Asphalt for LAP (Off-System) (Rev 1-26-15) (FA 1-29-15) as modified herein.
2. All asphalt shall be produced using a currently approved FDOT mix design.
3. The Contractor shall perform all sampling and testing required by the specification (City and Contractor requirements). All costs shall be borne by Contractor or Developer.
4. Prior to application of surface course, all drainage construction shall be complete to include:
 - a. Inlet inverts, inlet tops, storm drainpipes and outfalls, basins (to include grass-stabilized slopes) and swales.
 - b. Swale sections parallel to roadways may be left rough graded until installation of utilities in accordance with these specifications.
 - c. Fill required behind curbs must be in place and shoulder stabilization must be completed to the depth and LBR specified by design.

8.9 Concrete

1. Concrete shall be per FDOT specification section 344 Concrete for LAP (Off-System) (REV 12-20-11) (FA 2-27-12) as modified herein.
2. The City Engineer will randomly select a sample from each 200 cubic yards or one day's production for testing by the Developers / Contractors Quality Control Engineer to determine plastic properties and to make three 4 x 8 inch cylinders at 28 days to ensure that the design compressive strength has been met for the class of concrete as specified.
3. Maximum allowable transit time for concrete in Category 1 & 3 is 90 minutes.
4. The Contractor shall perform all sampling and testing required by the specification (City and Contractor requirements).
5. All costs shall be borne by Contractor or Developer.

8.10 Signals

1. All work shall be inspected and formally accepted by City staff.
2. An FDOT approved/certified traffic signal contractor shall perform traffic signal construction.
3. All materials provided shall be on the FDOT Approved Products List (APL).
4. All new construction shall be mast arms with horizontally mounted traffic signal heads.
5. Traffic signal heads shall be mounted on articulating astro-brackets with terminal compartments.
6. If the intersection being modified or rebuilt, existing functionalities related to intersection detection, video monitoring, and communications shall be preserved during the duration of the construction project. The use of infrared vehicle detection is prohibited. If any traffic control detection or communication devices are to be replaced, offline or downtime shall be less than 48 hours.
7. Any Traffic Control equipment, devices, and materials removed from service shall be maintained in good working condition. The return or disposal of any traffic control equipment, devices, and materials shall be at the discretion of the City.
8. All overhead sign messages must be approved by the City of Gainesville prior to fabricating overhead street name signs. Shop drawings shall be required.

8.11 Signs & Markings

1. All materials provided shall be on the FDOT's Approved Products List (APL).
2. Traffic signs shall be mounted on a uni-strut square post for combination Stop Sign and Street Name Signs (or equivalent as approved by the Public Works Department); all other signs shall use U-channel post.
3. All signs shall be bolted to the uni-strut post with stainless steel bolts and vandal proof stainless steel nuts.
4. Any specialized street name signs shall have a maintenance agreement or a license agreement. All cost associated with furnishing, installing and replacing shall be the responsibility of the permittee.
5. Signs installed in concrete:
 - a. A 6 inch long, 8 inch round, schedule 40 PVC pipe is to be buried so it is thru the entire concrete pour and each end is open and accessible.
 - b. The top opening of the sign tube is to be flush with the surface of the sidewalk and empty of debris for the entire length.
 - c. Where applicable, a cap shall be applied over the top prior to a post being installed so debris cannot enter the opening.
 - d. The pipe shall be buried not driven into the ground.
 - e. The pipe shall be installed before the concrete pour and the concrete poured around the pipe, leaving the top of the pipe exposed for sign installation.
 - f. The party installing the pipe is responsible for getting utility locates prior to installation of the pipe and maintaining clearances to any buried utilities.
6. Signs installed in bricks:
 - a. A 6 inch long, 8 inch round, schedule 40 PVC pipe is to be buried.

- b. The top opening of the sign tube is to be flush with the surface of the brick sidewalk and empty of debris for the entire length.
- c. Duct tape shall be applied over the top prior to a post being installed so debris cannot enter the opening.
- d. If a concrete base is poured for the bricks the PVC tube is to go the length of the bricks and the concrete so there is an opening of the tube at the top and one at the bottom below the concrete.
- e. The pipe shall be installed before the concrete pour and the concrete poured around the pipe, leaving the top of the pipe exposed for sign installation.
- f. Thermoplastic pavement markings and reflective pavement markers shall not be installed until the pavement has cured for a minimum of 14 days. Traffic paint in compliance with FDOT standards shall be installed in the interim.

8.12 Landscaping

- 1. Landscaping shall be per FDOT specification Section 580 Landscape Installation for LAP (Off-System) (REV 4-5-11) (FA 4-15-11) as modified herein.
- 2. Plant material maintenance period shall extend 180 days after certification of acceptability by the City. Maintenance shall include watering fertilizing and general care to establishment of landscaping materials.
- 3. Plant material guarantee (warranty) period shall extend 1-year after certification of acceptability by the City.
- 4. All work, including clearing and grubbing activities, shall be completed in accordance with ANSI A300 and Z133 standards.

8.13 Lighting

- 1. All lighting facilities in the Public right-of-way, including but not limited to poles, arms, boxes, conduit and fixtures shall be selected using the latest GRU Lighting Catalog and GRU Approved Electric System Materials Manual.
- 2. Lighting facilities shall be inspected by GRU and Public Works.
- 3. Existing Illumination levels shall be maintained during the duration of construction.

Definitions and Terms

Brush Barrier: A temporary sediment barrier composed of limbs, weeds, vines, root mat, soil, rock and other cleared materials pushed together to form a berm, located across a slope to intercept and detain sediment and decrease flow velocities.

Check Dams: Small, temporary dams constructed across shallow swales to reduce the velocity of concentrated flows, reducing erosion of the swale or ditch.

A “Closed Basin” means a watershed in which the runoff does not have a surface outfall up to and including the 100-year flood level.

Dust Control: Reducing surface and air movement of dust during land disturbance, demolition or construction activities in areas subject to dust problems in order to prevent soil loss and reduce the potentially harmful airborne substances.

Impervious Area: For purposes of applying permitting thresholds and exemption criteria, impervious area means surfaces that do not allow, or minimally allow, the penetration of water, including semi-impervious areas. Semi-impervious means land surfaces that partially restrict the penetration of water, such as porous concrete and asphalt pavements, gravel, limerock, and certain compacted soils.

Inlet Protection: The installation of various kinds of sediment trapping measures in or around drop inlet or curb inlet structures prior to permanent stabilization of the disturbed area.

Level Spreader: An outlet consisting of an excavated depression constructed at zero grade across a slope to convert concentrated, sediment-free runoff to sheet flow and release it onto areas of undisturbed soil stabilized by existing vegetation.

Mulching: Application of plant residues or other suitable materials to disturbed surfaces to prevent erosion and reduce overland flow velocities. Applicable to all seeding operations, other plant materials, which do not provide adequate soil protection by themselves, and bare areas, which cannot be seeded due to the season but which still, need soil protection.

Outlet Protection: The installation of paved and/or riprap sections and/or stilling basins below drain outlets to reduce erosion from scouring at outlets and to reduce flow velocities.

Permanent Seeding: Establishment of perennial vegetative cover by planting seed on rough-graded areas that will not be brought to final grade for a year or more or where permanent, long-lived vegetative cover is needed on fine-graded areas.

Redevelopment: Any demolition and/or reconstruction of the vehicular use area (excluding resurfacing and restriping) or building.

Riprap: A permanent, erosion-resistant ground cover of large, loose, angular stone installed wherever soil conditions, water turbulence and velocity, expected vegetative cover, etc., are such that soil may erode under design flow conditions.

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Silt Fence: A temporary sediment barrier constructed of posts, filter fabric and, in some cases, a wire support fence, placed across or at the toe of a slope to intercept and detain sediment and decrease flow velocities from drainage areas of limited size; applicable where sheet and rill erosion or small concentrated flows may be a real problem. Installation shall be in accordance with the FDEP "Florida Stormwater Erosion and Sedimentation Control Inspector's Manual" and FDOT/FDEP "State of Florida Erosion and Sediment Control Designer and Reviewer Manual."

Sodding: Stabilizing fine-graded areas by establishing permanent grass stands with sod. Provides immediate protection against erosion, and is especially effective in grassed swales and waterways or in areas where an immediate aesthetic effect is desirable. In some cases where slopes dictate, pinning of sod will be required.

Sprigging: The establishment of vegetative cover by planting springs, stolons or plugs used to stabilize fine-graded areas where establishment with sod is not preferred.

Subsurface Drain: A perforated conduit installed beneath the ground to intercept and convey groundwater preventing sloping soils from becoming excessively wet and subject to sloughing.

Temporary Diversion Dike: A ridge of compacted soil located across a sloping disturbed area to divert off-site runoff away from unprotected slopes and to a stabilized outlet, or to divert sediment-laden runoff to a sediment trapping structure. Maximum effective life is 18 months.

Temporary Gravel Construction Entrance: A stabilized pad located at points where vehicles enter and leave a construction site to reduce the amount of sediment transported onto public roads by motor vehicles or runoff.

Temporary Sediment Trap: A small ponding area, formed by constructing an earthen embankment to detain sediment-laden runoff from small-disturbed areas for enough time to allow most of the sediment to settle out. Maximum effective life is 18 months.

Temporary Seeding: Establishment of temporary vegetative cover on disturbed areas by seeding with appropriate rapidly growing plants on sites that will not be brought to final grade for periods of 30 days to 1-year.

Temporary Slope Drain: A flexible tubing or conduit, used before permanent drainage structures are installed, intended to conduct concentrated runoff safely from the top to the bottom of a disturbed slope without causing erosion on or below the slope.

Top Soiling: Preserving and using topsoil to provide a suitable growth medium for vegetation used to stabilize disturbed areas. This would be applicable where preservation or importation of topsoil is most cost-effective method of providing a suitable growth medium. Not recommended for slopes steeper than 2:1.

Tree Preservation and Protection: Protecting existing trees from mechanical and other injury during land disturbing and construction activity to insure the survival of desirable trees where they will be effective for erosion and sediment control and provide other environmental and aesthetic benefit.

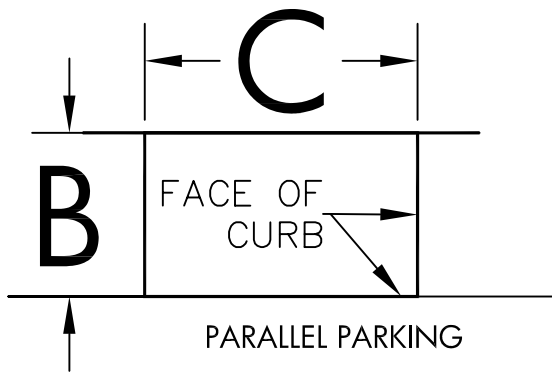
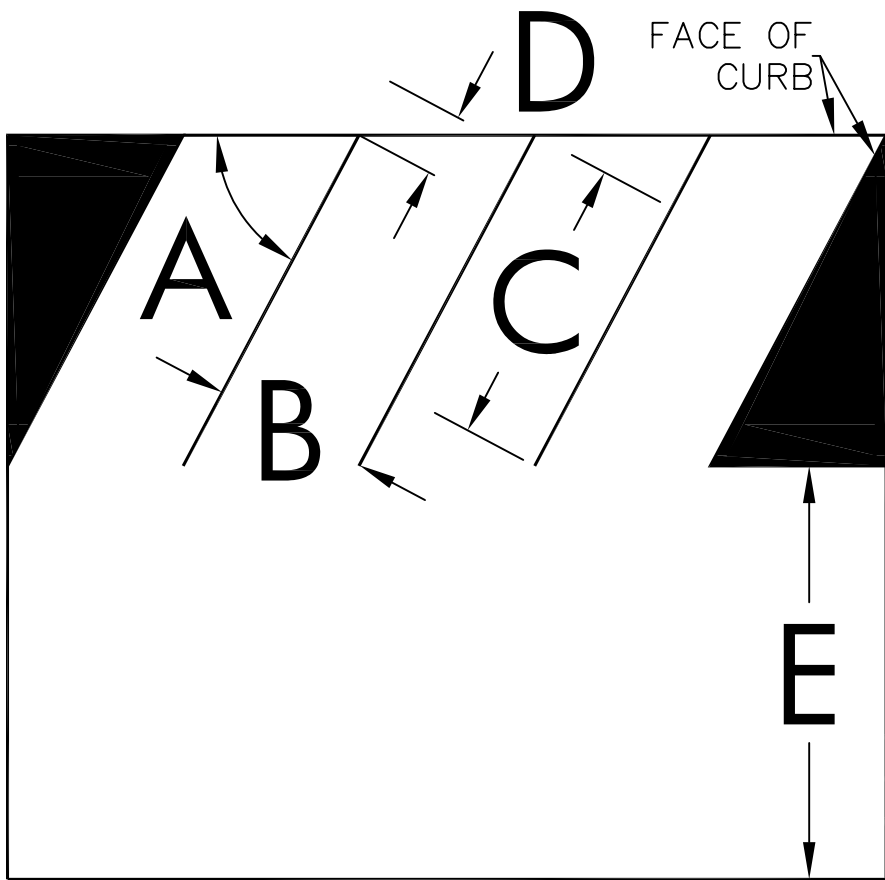
APPENDIX A

Trees, Shrubs, Vines, and Ground Covers: Stabilizing disturbed areas by planting trees, shrubs, vines and ground covers where turf is not preferred. These plant materials also provide food and shelter for wildlife as well as many other environmental benefits. Especially effective where plants are desirable and turf maintenance is difficult.

Vegetative Streambank Stabilization: The establishment of appropriate vegetation to protect the banks from erosion.

APPENDIX B

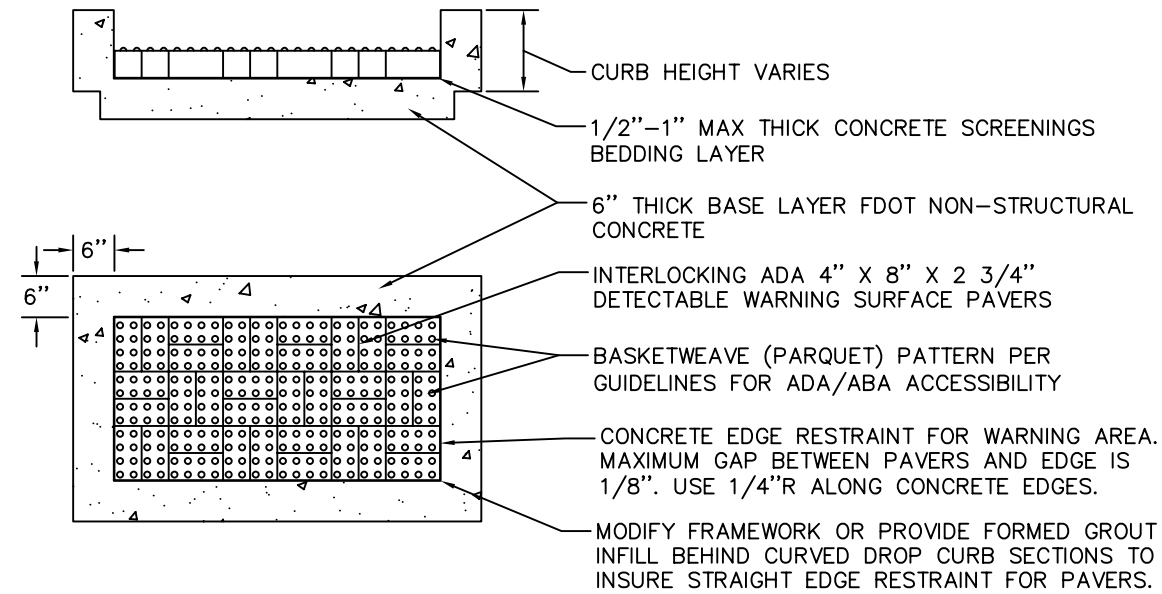
Standard Details



MINIMUM DIMENSIONAL STANDARDS FOR PARKING SPACES

A	B	C	D	E	
ANGLE	MIN. WIDTH	PAVED DEPTH	OVERHANG DEPTH	AISLE WIDTH	TRAFFIC CIRCULATION
90°	8'-6"	16'-0"	3'-0"	24'-0"	TWO-WAY
60°				13'-6"	ONE-WAY
45°				11'-10"	ONE-WAY
30°				11'-0"	ONE-WAY
0°	8'-0"	20'-0"	0'-0"	N/A	N/A

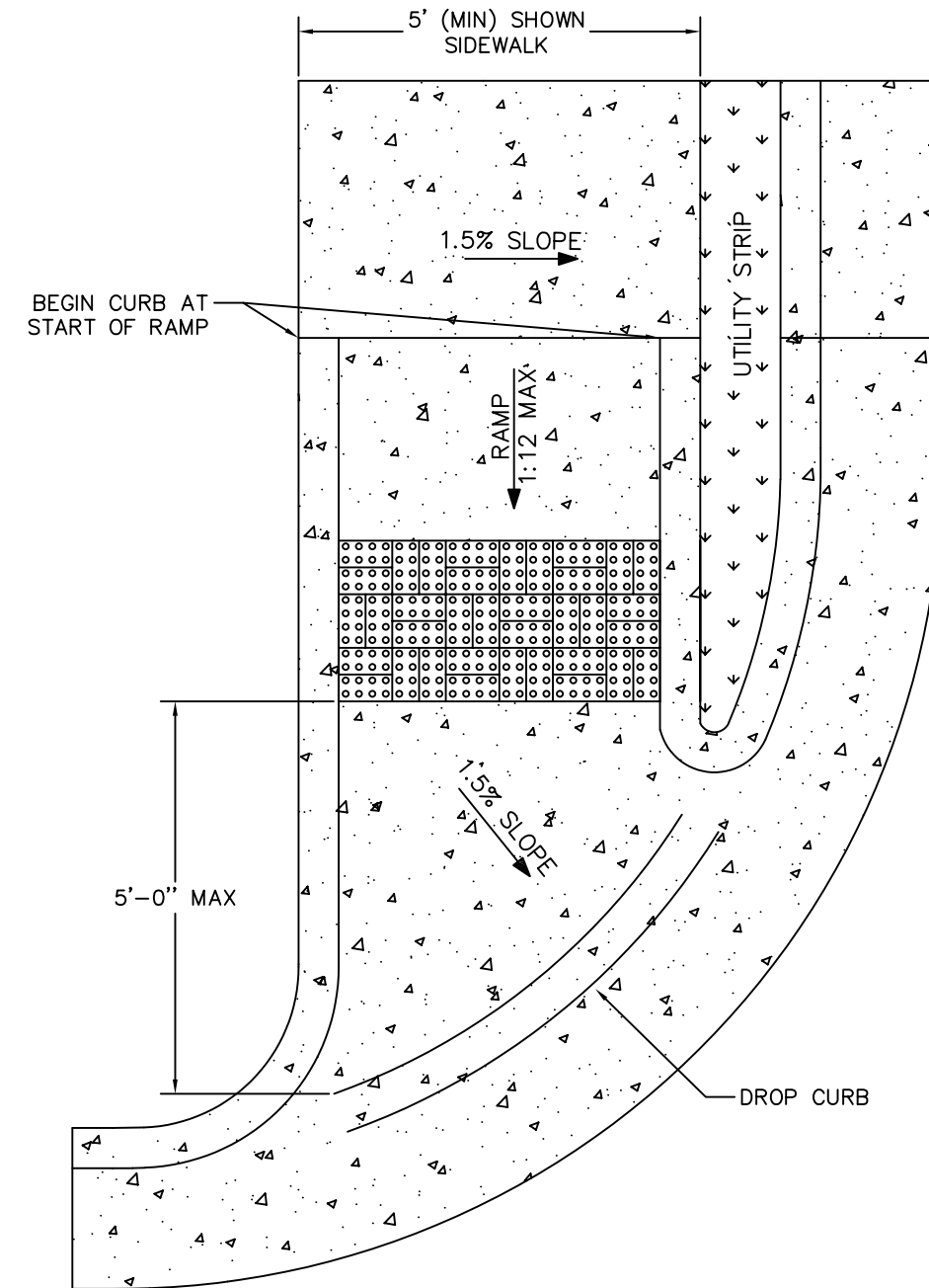
- GENERAL NOTES:
1. AISLE WIDTHS MAY BE REDUCED OR ENLARGED WITH AUTHORIZATION FROM THE CITY ENGINEER.
 2. BACK-IN ANGLED PARKING SHALL UTILIZE 45° ANGLE DIMENSIONS



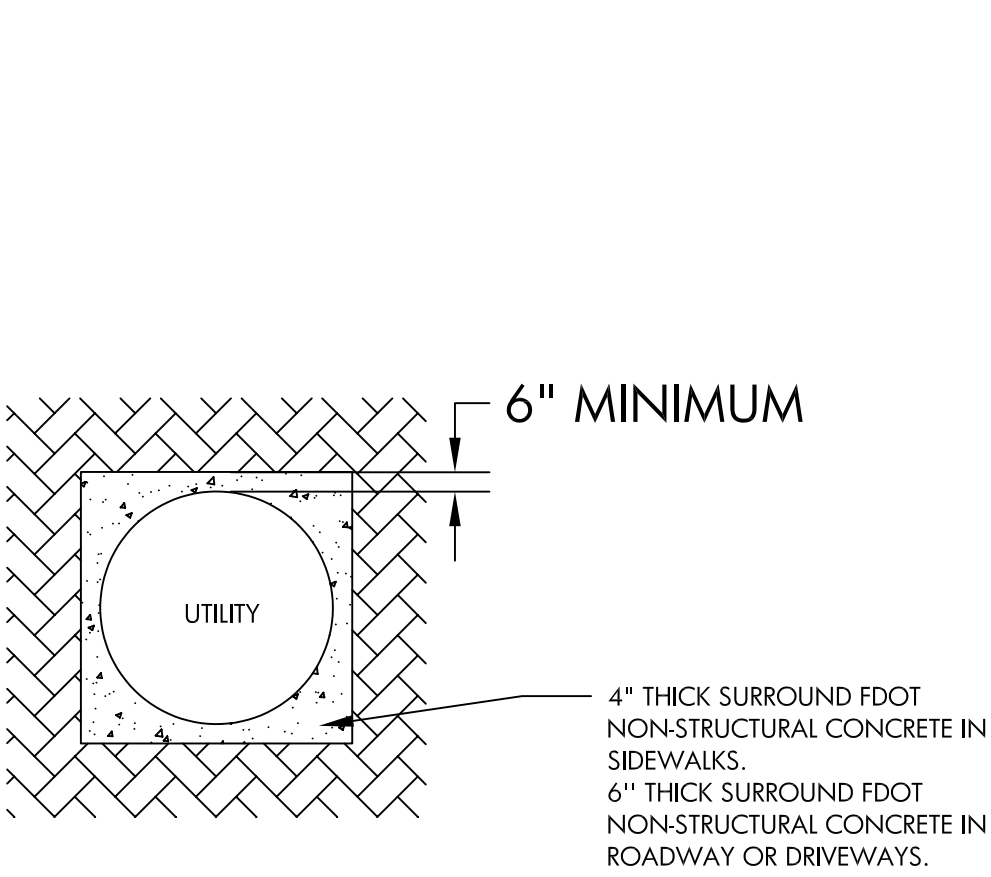
DETECTABLE WARNING DETAIL

DETECTABLE WARNING NOTES:

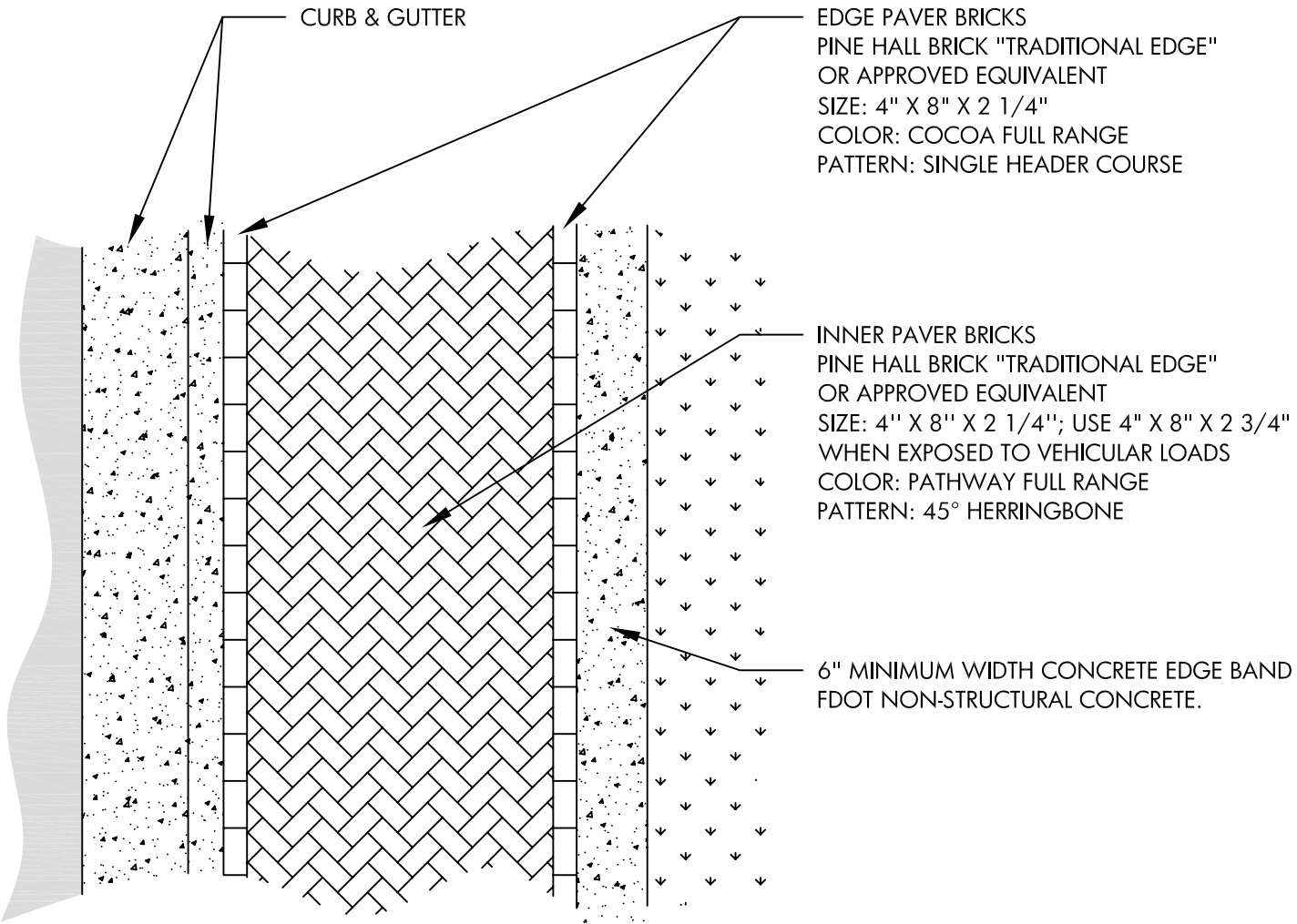
1. DETECTABLE WARNING SURFACE FOR THE RAMPS SHALL CONSIST OF INTERLOCKING 4"x8"x2 $\frac{3}{4}$ " ADA DETECTABLE WARNING SURFACE PAVERS HAVING A MINIMUM DEPTH OF 2" WITH RAISED TRUNCATED DOMES WITH A DIAMETER OF NOMINAL 0.9 INCHES, A HEIGHT OF NOMINAL 0.2 INCHES, AND CENTER-TO-CENTER SPACING OF NOMINAL 2.35 INCHES. CONCRETE PAVERS ARE TO MEET ASTM C902, CLASS SX, TYPE I AND THE COLOR OF THE BRICK SHALL BE BRICK RED. ALL OTHER COLOR SCHEMES SHALL BE APPROVED BY THE CITY ENGINEER.
2. ALL UNITS SHALL BE SOUND AND FREE OF DEFECTS THAT WOULD INTERFERE WITH THE APPEARANCE OR PROPER PLACEMENT OF THE UNIT OR IMPAIR THE STRENGTH OR LONGEVITY OF THE FINAL STRUCTURE. ANY UNITS THAT ARE STRUCTURALLY DAMAGED DURING THE WORK SHALL BE IMMEDIATELY REMOVED AND REPLACED. THE PAVERS ARE TO BE LAID IN A TWO BY TWO BASKETWEAVE PATTERN, FLUSH WITH THE FINISH GRADE OF THE DOME SURFACE AND HAVE GAPS BETWEEN 1/16" AND 1/8". CUT PAVERS (MASONRY SAW ONLY) SHALL BE NO SMALLER THAN ONE-THIRD OF A WHOLE PAVER.



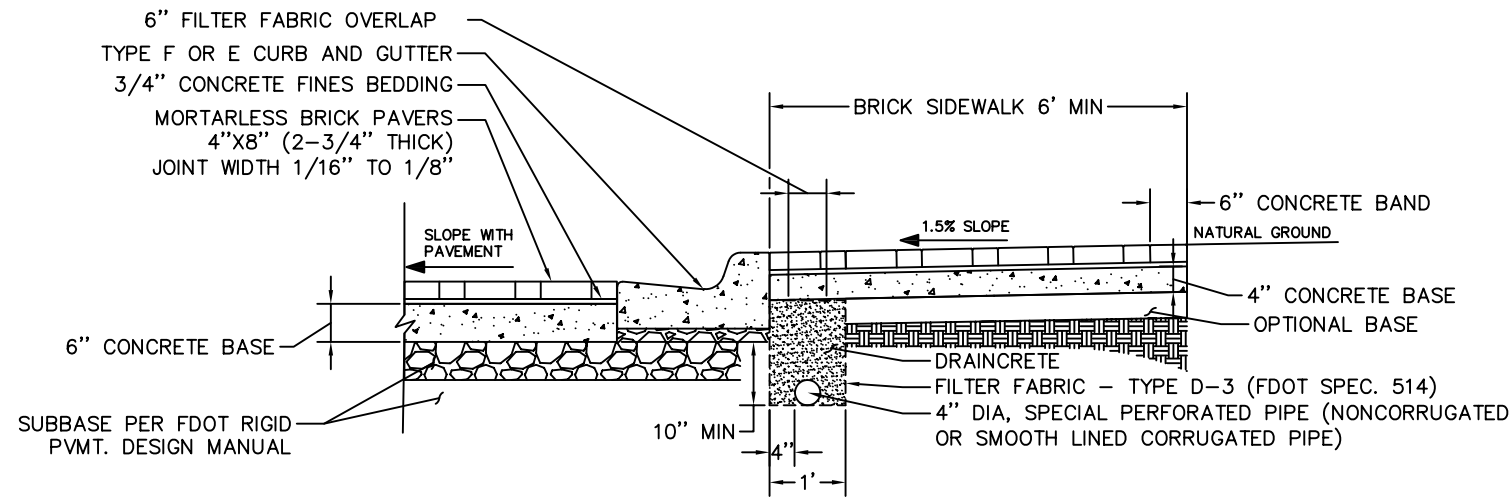
CURB RAMP DETAIL



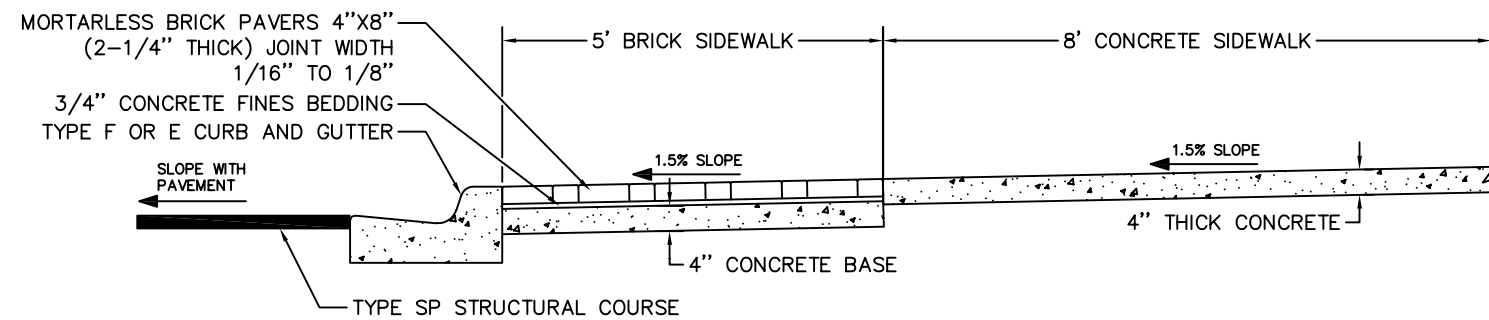
UTILITY STRUCTURE CONCRETE SURROUND DETAILS



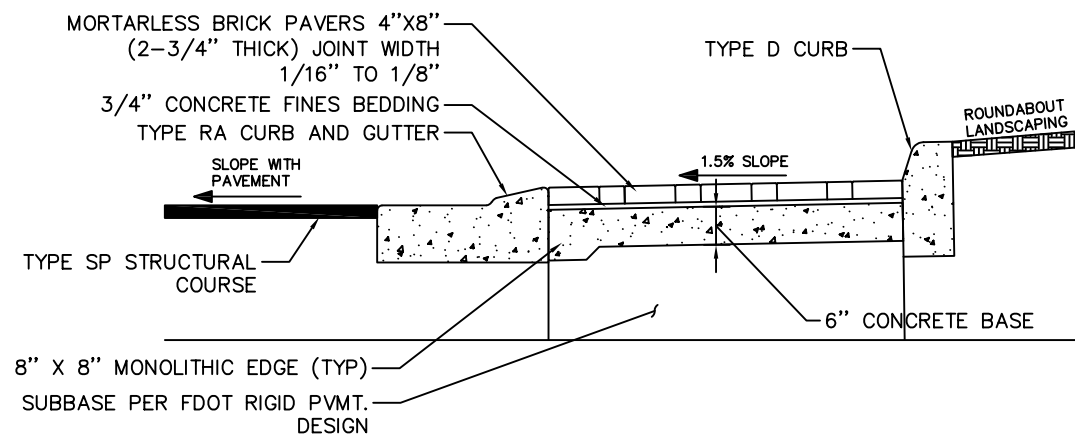
BRICK SIDEWALK DETAILS



BRICK ROADWAY SECTION

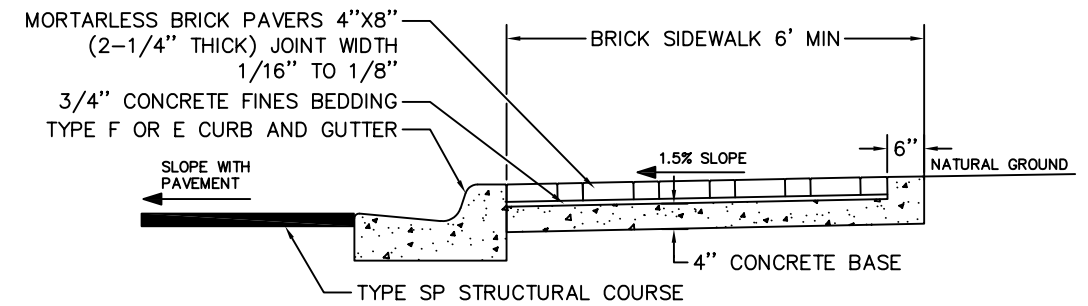


BRICK & CONCRETE SIDEWALK SECTION

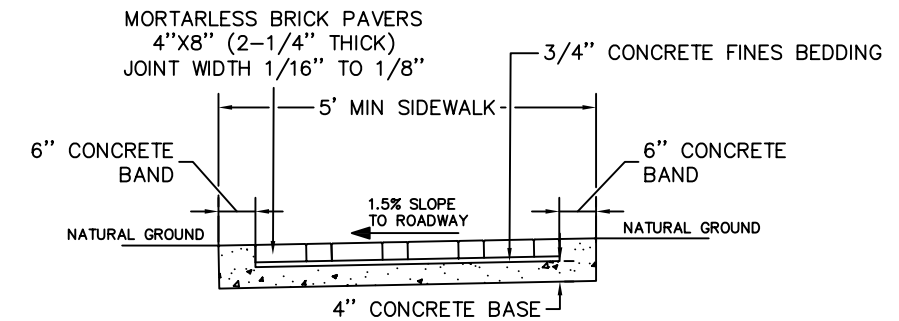


TRUCK APRON SECTION

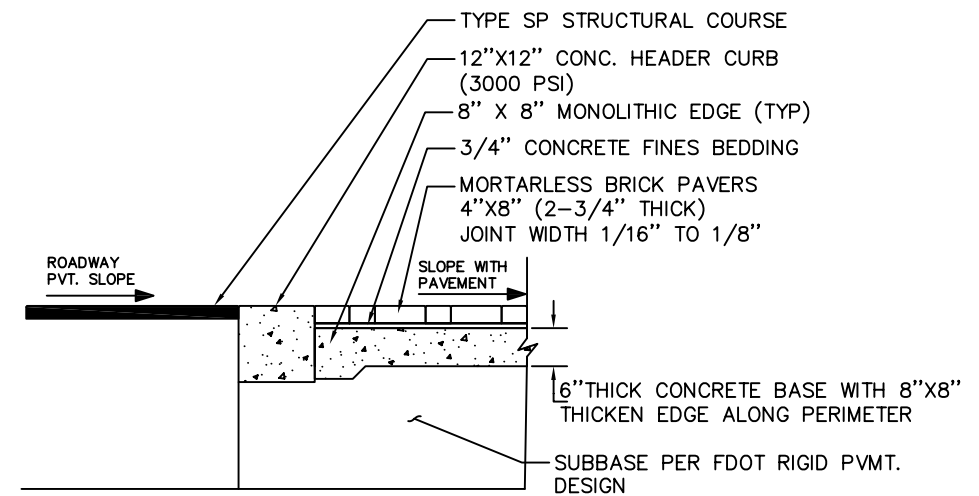
PROVIDE 1/8" JOINTS (TOOL ONLY) AT LANE LINES AND 1/2" EXPANSION JOINTS AT GUTTERS



BRICK SIDEWALK SECTION



BRICK & SIDEWALK SECTION
NOT ADJACENT TO CURBING

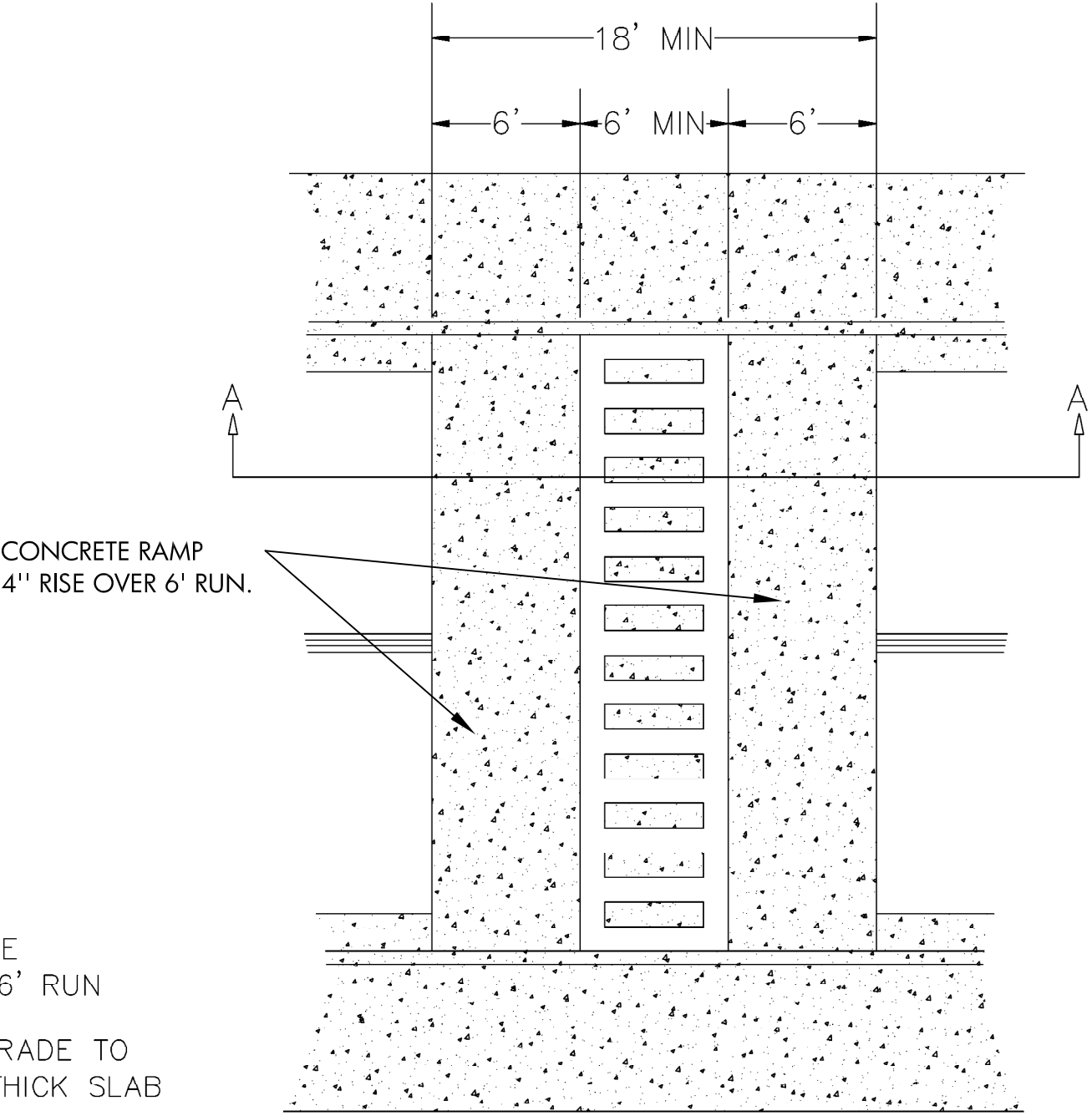
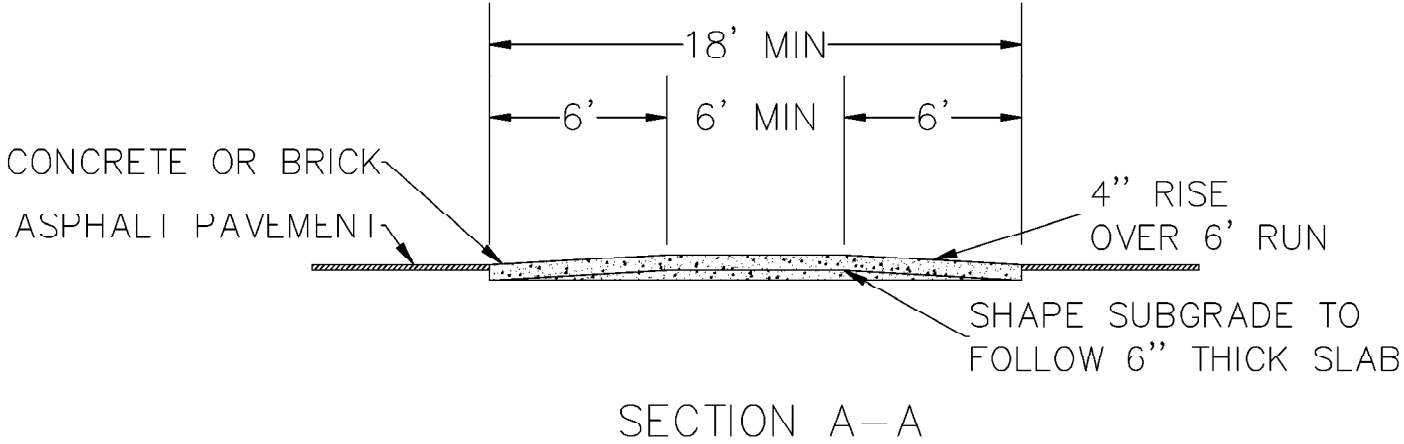


CROSSWALK SECTION

EDGEDRAIN REQUIRED

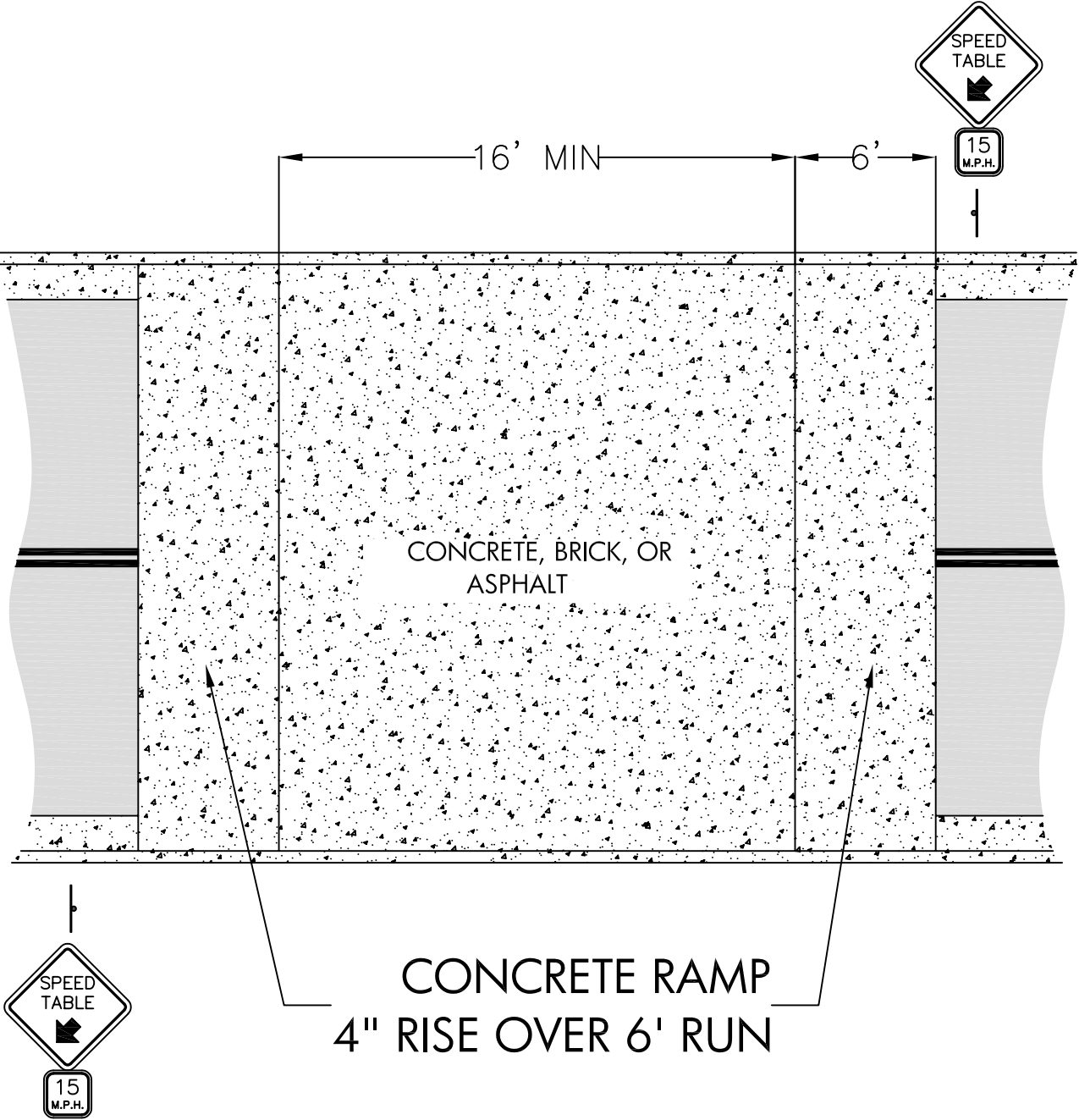
GENERAL NOTES:

- 1. IF SIDEWALK AT BACK OF CURB, CROSSWALK MUST MEET AT TOPS OF CURBS OR PROVIDE CURB CUTS TO TIE INTO SIDEWALKS.
- 2. ALL GRADES SHALL BE ADA COMPLIANT.
- 3. FLAT TABLE SURFACE MAY BE CONCRETE, BRICK, OR ASPHALT DESIGNED IN ACCORDANCE WITH CHAPTER 4. BRICK FLAT TABLE SURFACE SHALL BE PINE HALL BRICK "TRADITIONAL EDGE" OR APPROVED EQUIVALENT. SIZE: 4" X 8' 'X 2 3/4 ". COLOR: PATHWAY FULL RANGE. PATTERN: 45° HERRINGBONE
- 4. UNLESS PERMITTED BY THE CITY ENGINEER, ALL CONCRETE SHALL BE 6" THICK CONCRETE WITH 6X6 WWM OR 1.5 LB POLYPROPYLENE FIBER MESH PER CY.
- 5. SIGNING AND MARKING SHALL ADHERE TO FDOT STANDARDS.
- 6. SIDEWALKS SHALL BE ADJACENT TO BOTH ENDS OF THE CROSSWALK.
- 7. ASPHALT RAMPS ARE PROHIBITED. RAMPS SHALL BE CONCRETE OR BRICK DESIGNED IN ACCORDANCE WITH CHAPTER 4.
- 8. ALL VERTICAL DEFLECTIONS SHALL NOT EXCEED A FOUR INCH RISE OVER A SIX FOOT RUN.



GENERAL NOTES:

- 1. SPEED TABLE SHOWN. EXTRAPOLATE FOR RAISED INTERSECTIONS.
- 2. IF USED FOR INTERSECTIONS, PEDESTRIAN CROSSINGS SHALL BE IN THE RAISED PORTION OF THE INTERSECTION.
- 3. IF SIDEWALK AT BACK OF CURB, CROSSWALK MUST MEET AT TOPS OF CURBS OR PROVIDE CURB CUTS TO TIE INTO SIDEWALKS.
- 4. ALL GRADES SHALL BE ADA COMPLIANT.
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**City of Gainesville
Department of Sustainable Development
Planning Division**

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ATTACHMENT “C”

Petition PB-21-00167 TCH

October 28, 2021

Attachment A. Application and Other Supporting Documents

Attachment B. City of Gainesville Public Works Department Engineering Design & Construction Manual 2021.

Attachment C. Engineering Design and Construction Manual Comments/Responses

Attachment D. City of Gainesville Engineering Design & Construction Manual

Attachment E. Proposed 2021 Engineering Design and Construction Manual Summary Table Showing 2015 EDCM location to 2021 EDCM location.

Engineering Design and Construction Manual Comments/Responses

Chapter 1 – Introduction

1.1 Purpose and Applicability

Comment 1: In paragraph 1, line 3, should it specify the City of Gainesville Comprehensive Plan “or ULDC”? (Travis Hastay – CHW)

March 23, 2021 Meeting note: 1st P – reference to the Comprehensive Plan: Does the comp plan give authority or the land development code?

- Action Item: COG to investigate and confirm.

Per internal discussion, the Comp Plan supports the LDC which subsequently references specifically the EDCM. EDCM language is created to support and implement both. No changes proposed.

1.2 Policy (deleted in revised version)

Comment 1: Suggest combining this section with the paragraph in 1.1. (Travis Hastay – CHW)
&

March 23, 2021 Meeting note

- This section is really describing applicability. Recommend combining with 1.1.
 - Action Item: COG to modify.

Deleted heading 1.2 Policy.

1.3 Enforcement (now 1.2)

Comment 1: Public Works Department does not have police power. This is a code enforcement issue? (Travis Hastay – CHW)

&

March 23, 2021 Meeting note

- Does PW have the ability to enforce?

As discussed during the meeting, yes, in regards to approved plans. Violations of code are referred to Code Enforcement citing the code violated. PW act as technical advisory staff for code enforcement officers as needed. No changes proposed.

1.4 Conflicts with Governing Documents (now 1.3)

No comments.

March 23, 2021 Meeting note

- Meeting comment: Chris Towne had a comment in Section 2 that may apply here regarding the phrase “more stringent standard”.

Discussed further internally. What is the hierarchy? If approved plans, what happens if the approved plans do not meet LDC or EDCM? Modified to ensure that it is clear that “All

construction must comply with the EDCM / land development code unless a design variance or exception is approved in accordance with Chapter 1.6 by Public Works”.

1.5 Definitions and Terms (now 1.4)

Comment 1: Code needs to be observed when a code definition exists. (Travis Hastay – CHW) &

March 23, 2021 Meeting note

- If definitions are in the code, use that. Don’t redefine and don’t introduce a modified version of a definition in the manual.
 - Action Item: COG to review for this issue. It would be helpful if an example or two could be provided by the development community.

If there are specific definitions and terms that are a concern, we would be happy to discuss. No changes proposed at this time.

1.6 Amendments (now 1.5)

No comments.

March 23, 2021 Meeting note

- CHW had provided a comment in a 2020 document to COG that discussed tracking of changes within sections. COG agrees that this would be helpful. In addition, as interpretations are made, this should be tracked and added to the manual. Upon updates to the manual, these interpretations can be worked into the revised document.
- Discussion on how often the EDCM should be updated: @ 2 years

Discussed a log during this section of the meeting, but this really applies to the Interpretation and Omissions sections. No changes to Amendments is proposed.

1.7 Design Exceptions or Variances (now 1.6)

Comment 1: At the end of paragraph 1, add “or unique site conditions.” (Travis Hastay – CHW)

Discussed internally. The text already phrases “special conditions”, which could be inclusive of “unique site conditions”. No change proposed.

Comment 2: In paragraph 2, this needs to be clear that this is for roadway design only. (Travis Hastay – CHW)

Discussed internally. The reference to chapter 14 controlling design elements are only roadway design. No change proposed.

Comment 3: In paragraph 4, line 3, “by documented” should say “be documented.” (Travis Hastay – CHW)

Correction made.

Comment 4: In paragraph 4, line 4, it says “submitted to the City.” It should specify who it needs to be submitted to. (Travis Hastay – CHW)

As part of the permitting process...reviewers would move to city engineer as needed. No changes made to the document.

Comment 5: Regarding paragraph 4 and the list under it, what is the process for stormwater, lighting, sidewalks, etc? (Travis Hastay – CHW)

Paragraph 4 is inclusive of other items such as stormwater. “...elements other than...”. No changes made.

March 23, 2021 Meeting notes

- 1st P: This section seems to be exclusive to roadways (Greenbook Exceptions) does not necessarily apply to site development.
- Exceptions are per Greenbook and apply to roadway design, but the chapter section allows for variance to other design criteria.
- Comment regarding intent on who is authorized to approve Exceptions and Variances?:
 - As discussed during the meeting, this is a Public Works document and intended for PW to determine and approve variance/exceptions.
 - EDCM states City Engineer. As discussed with Brian, if there is a conflict from another City department, communicate that conflict to Brian and the Development Review Engineer as soon as possible so they can get involved.
- Robert suggested we keep a log to document interpretations/approvals so we remain consistent over time.
 - Same comment also provided in the written comments. COG agrees and has drafted a design memo prototype and a revision log prototype to be used for this purpose. These documents will be placed on the PW webpage.

1.8 Interpretation (now 1.7)

Comment 1: Interpretations should be documented and issued as addendum to this manual (Travis Hastay – CHW).

COG agrees. Proposed a design memo and revision log procedure.

1.9 Omissions (now 1.8)

Comment 1: Addendums should be issued. Don't go 6 years without updating. (Travis Hastay – CHW)

COG agrees. The goal is to update every 2 years.

Chapter 2 – Technical References

2. Technical References

Comment 1: At the end of paragraph 1, it specifies “more stringent standard shall apply.” The City Engineer decides what is more stringent? This is not always clear when it comes to stormwater. GRU and WMD standards are references. Are there specific pieces of these manuals/standards that should be references to avoid confusion? (Travis Hastay – CHW & Jay Brown - JBPro)

Changed to “...more stringent jurisdictional standard shall apply.”

Comment 2: Why are both the Florida Greenbook and FDOT annual of Uniform Minimum Design Standards or Design, Construction, and Maintenance for Streets and Highways – commonly known as the “Florida Greenbook” listed? (Jay Brown – JBPro)

Deleted the extra reference.

Comment 3: Does the FDOT Drainage Manual (FDM) exist? (Jay Brown – JBPro)

Yes.

Comment 4: It is not appropriate to reference GRU Design Standards here. Often there are conflicts. (Travis Hastay – CHW)

Deleted the GRU referenced. Did add a reference to the GRU lighting standards.

Comment 5: For references SJRWMD Chapter 40C, F.A.C. and SRWMD Chapter 40B, F.A.C., why is the entire chapter called out? Also, most ERP permitting has been repealed. (Travis Hastay – CHW)

Agree we can delete. The statewide ERP manual Volume 1 and the 62-330 FAC cover any reference to 40C and 40B. The remaining 40C and 40B FAC do have existing criteria, typically dewatering and karst related. The WMD PIM Volumes II reference other applicable standards such as the Technical Publication 85-5 A guide to stormwater runoff procedures.

Comment 6: For references SJRWMD Permit Information Manual and SRWMD ERP Applicant’s Handbook II, these conflict. They have different requirements relative to each district and are different than the City. Why adopt them? (Travis Hastay – CHW)

The EDCM requires that the WMD criteria are met, therefore, they are applicable and serve as a reference (not adopted).

Comment 7: For reference Urban Land Institute and National Parking Association (2000), this is a 21-year-old document. Parking has probably changed since. (Travis Hastay – CHW)

Deleted.

Comment 8: We would recommend removing unused references while specifying what information the document is pertinent to avoid confusion on which standards are to be applied. (Travis Hastay – CHW)

Received additional information from Travis.

- GRU Design Standards
- Urban Land Institute and National Parking Association (2000).

Both of these, in addition to others, have been deleted.

Comment 9: When does TR-55 apply? (Jay Brown – JBPro)

Primary usage is to calculate the time of concentration and runoff curve number.

Chapter 3 – Stormwater Management

3.1 Objective

No comments.

April 13, 2021 Meeting notes

- Travis – Be more specific in terms of how it relates to LDC / Comp Plan.
 - Action Item: COG to address.
 - In reviewing the Stormwater Elements under the Comp Plan and the LDC, the EDCM is supported by both. There are a couple minor tweaks that will occur in the LDC at some point after the EDCM is done.

3.2 Evaluation Criteria

No comments.

April 13, 2021 Meeting notes

- Ch. 3.2 Claudia – what is the criteria for abandonment of a project? Please clarify what that means. Do they have to get a permit for that?
 - Jay – intent is to address existing stormwater management systems to ensure they don't get cut off - abandonment of an existing storm.
 - Action Item: COG to clarify.
 - Edits have been made to this paragraph to clarify.

3.3 Permitting Thresholds

3.3.1 Cumulative Development

No comments.

April 13, 2021 Meeting notes

- Travis - Comment about development order...language not used anymore. Suggest approved development plans.
 - Modified the language.

3.3.2 Definition of Redevelopment of Vehicular Use Area or Building

Comment 1: "Maintenance" should include replacing limerock base. (Jay Brown – JBPro)

Incorporated minor limerock base replacement (as determined by Public Works). We may need to discuss specifics on what "minor" would be considered to be.

3.3.3 Exemptions

Comment 1: Under 2., change surface area to "impervious area." (Jay Brown – JBPro)

Modified the language.

April 13, 2021 Meeting notes

- Travis – What would the process be to get an exemption? Project docs? Email? Paragraph c. Plans “must” be. Can this be “may”. Tweak the language to allow for sketch, narrative, etc.
 - Action Item: COG to review and revise language.
 - Modified the language to allow for a sketch or narrative, but noted that plans may be necessary.
- Matt brought up an issue with a potential exemption being needed for when a building permit trips ADA. Added potential exemption for accessible parking space improvements (ADA) associated with Building Permits.

3.3.4. Water Quality Required

Comment 1: Under 1., define “worsening condition” and how to demonstrate it. (Jay Brown – JBPro) (Also discussed during the 4/13/21 meeting.)

Modified the text to clarify.

3.3.5 Water Quality and Quantity Required

Comment 1: Change surface area to “impervious area.” (Jay Brown – JBPro) (Also discussed during the 4/13/21 meeting.)

Modified the language.

3.4 Minimum Requirements

3.4.1 Drainage Narrative

No comments.

3.4.2 General design standards

Comment 1: In the title, Design Standards should be capitalized and the period removed. (JBPro)

Corrected.

Comment 2: Under 8., rather than saying utilities must not be located within a stormwater basin say that utilities “shall be discouraged from being located” within a stormwater basin. Is a variance required? (Jay Brown – JBPro) (Also discussed during the 4/13/21 meeting.)

Modified the text to discourage utilities within a basin but to allow flexibility on a site by site basis.

3.4.3 Technical Standards

April 13, 2021 Meeting note

- 3.4.3, #1 & #2 – do we really need? Statewide standard practice.

- Deleted during meeting.

April 13, 2021 Meeting note

- 3.4.3, #3 CN for pond (now #1)
 - Action Item: COG to modify per notes made in meeting.
 - Modified as discussed during meeting.

Moved Item from Chapter 8.4.4 to 3.4.3 #2 Stormwater Basins

- Paragraph a. Fill Material.

Moved Item from Chapter 8.4.4 to 3.4.3 #2 Stormwater Basins

- Paragraph b. Dry Retention Pond write-up (3 sub paragraphs i-iii).

April 13, 2021 Meeting note

- 3.4.3, #4, Paragraph b: Confining layer – Doesn't support testing the confining layer. Doesn't believe it is necessary. This was the recommendation by the geotechnical engineering group.
 - Consensus to delete. See note in doc.
 - Deleted.

April 13, 2021 Meeting note

- 3.4.3, #4, Paragraph c (now 3.4.3 #2.c.ii.): Discussion about the 2' separation per WMD criteria, which does allow for geotechnical support to use something less.
 - Action Item: COG to modify per notes made in meeting.
 - Modified as discussed.

April 13, 2021 Meeting note

- Paragraph e (now 3.4.3 #2.c.iv.) – Perc Link Perimeters - qualify that this is per ICPR.
 - Action Item: COG to modify per notes made in meeting.
 - Modified including with language for Ponds methodology.

April 13, 2021 Meeting note

- Paragraph j (now 3.4.3 #2.c.ix.) – isolator row" is actually proprietary term.
 - Action Item: COG to modify language per notes made in meeting.
 - Modified paragraph.

Comment 1: Under 4.k., change to say specifications "that" a geotextile will not be a limiting factor in infiltration. (Jay Brown – JBPro) (now 3.4.3 #2.c.x.)

Modified.

April 13, 2021 Meeting note

- Paragraph k – geotextile – woven or non-woven. (now 3.4.3 #2.c.x.)
 - Potentially both can be utilized in underground systems. It depends on where the usage is.

Comment 2: Under 4.m., how do we incorporate a way to perform a full visual inspection of underground systems in the design? (Jay Brown – JBPro) (Also discussed during the 4/13/21 meeting.) (now 3.4.3 #2.c.ixiv.)

No changes are shown for this section. An action item had been identified to set up a meeting to discuss this item further. This still needs to be done.

Comment 3: Under 5., what is considered a dam/embankment? How high? (Jay Brown – JBPro) (now 3.4.3 #3)

The height criteria has been removed so that evaluation would occur for ponds that are providing above surrounding grade.

April 13, 2021 Meeting note

- #6 Freeboard - Discussion about the need for 6". Is it really needed? If showing where the flow is being directed, couldn't that be enough. (now #4)
 - Action Item: COG to clarify.

In general, most entities require freeboard. FDOT requires one foot within their ponds. We've removed the 12" freeboard requirement, but are keeping the 6". The volume is to help address various factors that could affect the system's performance. Additional language has been added.

April 13, 2021 Meeting note

- #7 FFE: How to address stair stepped systems. Current language uses "adjacent to". Example of recent project where internal area was a hallway, not "living" space or office.
 - Alice – The language is trying to match up with the City's FEMA and floodplain management requirements.
 - Action Item: COG to clarify / incorporate FEMA terms / floodplain management ordinance language.

Based on discussion with Andy Renshaw and per ASCE/SEI 24-05, the hallway is a finished enclosed area within the structure and is considered part of a building's lowest floor. No changes proposed.

Comment 4: Under 10., stabilization, steeper than 4:1? 4:1 no grassing? Suggest flatter than 4:1. (Jay Brown – JBPro) (Also discussed during the 4/13/21 meeting.)

Modified to specify a 3:1 slope. Consistent with changes made in chapter 7.1.5.

3.5 Water Quality Standards

3.5.1 Water Quality Volume

Comment 1: Why are the requirements for exfiltration more than retention? (Jay Brown – JBPro) (Also discussed during the 4/13/21 meeting.)

After discussing further, the City is proposing to change the WQTV for exfiltration/underground systems to match the WMD.

April 13, 2021 Meeting note

- Ch. 3.5.2 Recovery - Mounding analysis for which storms?

Modified to add in the events.

3.6 Stormwater Quantity Criteria

April 13, 2021 Meeting note

- Ch. 3.6.2 Table 3-3 – Question about the Closed Basin w/downstream flooding scenario
 - Modified table to change “Hogtown” criteria to Closed Basin criteria. A definition of closed basin has been added to the appendix.

April 13, 2021 Meeting note

- Ch. 3.6.5 Lane Spread
 - Indicates 4” or 10-year frequency as appropriate. Discussion over what applies and when.
 - Modified to reference the FDOT Drainage Manual which discusses the applicability of 4” and 10yr.
 - In looking at the allowable lane spread under #1, is this for 2 lane roads only? What about 4 lane roads? In discussing this, we are pretty certain that the City doesn’t have any minor / major local roads with 4 lanes. COG to look at how we define our road classifications.
 - Modified text. Minor/major local roads as identified under Table 4-1.
 - Evaluate wording.
 - Section has been reworded.
 - Take out the reference to Table 3.6. If they change the table, the reference is lost.
 - Modified to reference the FDOT Drainage Manual section.

April 13, 2021 Meeting note

- Ch. 3.6.6 System Recovery
 - #1 – can the recovery happen in 30 days...similar to FDOT criteria.
 - WMD recovery applies now for mean and 25yr.
 - Modified to treat the 100 yr critical events similarly to FDOT. The applicable WMD events remain at 14 days per their requirements.

April 13, 2021 Meeting note

- #3: Mounding Analysis – “no impact” verbiage is concerning. Can we rephrase to say must account for...would be difficult to demonstrate no impact.
 - Modified the language to “account for other adjacent” systems.

3.7 Floodplains and Floodways

April 13, 2021 Meeting note

- Ch. 3.7.5 LOMC - What is the timing?
 - Added language to “Provide proof of application prior to final site acceptance by Public Works.”

3.6 Stormwater Conveyance

April 13, 2021 Meeting notes

- Table 3-4: Look at definition of road classifications used.
 - Modified the language to reflect City road classifications.
- #1 Wet piping systems:
 - Modified the language to separate public rows vs private.
- #3 HGL Standard
 - Travis – Is this applicable internal to the private site? Some sites are using their parking areas for surcharge from the system.
 - Gail – Storm calcs for onsite collection systems are required; however, it is noted that underground units are allowed to surcharge into the parking areas for freeboard demonstration purposes.
 - Matt W. – Roads whether private or public should meet same criteria as we never know when something may get turned over to the city.
 - Gail – The HGL criteria is applicable to all roads.
 - Alice – Discharging (or the potential to discharge) into the ROW during storm events should be evaluated.
 - Action Item: COG to further discuss options and potentially modify language.
 - Not proposing a change at this time. We understand that private sites are using the parking areas for potential freeboard demonstration, but the storm conveyance itself should be sized to move the water to the stormwater basins.

3.8.2 Closed Conveyance:

April 13, 2021 Meeting note

- #1. g. Change “required” to “allowed”. Discussed that private sector routinely utilizes sumps. Can this be modified to allow for private sites/maintenance
 - Modified the language to so that no sumps in wet piping systems are allowed in public rows.
- #2 Travis & Claudia: 15” pipe diameter requirement: can this be clarified further...use less than 15 on many private sites? This is a routine occurrence, and while the city has

not been commenting on internal pipe sizes in general, there is concern about potentially having to routinely ask for a variance/exception.

- Modified the language to require minimum pipe size for all roadways public or private since, theoretically, a private road could become a public road in the future.

Revised #2.b.

- Adding that the pipes must have a 100-year design service life and be from an FDOT-approved production facility.

3.13 Karst Areas

April 13, 2021 Meeting note

- Ch. 3.13 Karst: #7 – how does this fit into the context of the chapter 8 discussion?
 - The text regarding underground utilities within the footprint of a stormwater basin (in chapter 3) got updated was modified as discussed. This language doesn't directly conflict with the Utility Work section in Chapter 8.6.

3.15 Operation and Maintenance

April 13, 2021 Meeting note

- Ch. 3.15.2 – 3.15.4 O&M - Recommends merging these three sections.
 - Sections merged.

Chapter 4 – Roadway Design

4. Roadway Design

4.1 Objective

Comment 1: In paragraph 2 it is not recommended to include the FDOT Design Manual as the list of manuals to design and construct in accordance with. Rather it should be used as a guide. (Ali & Brian – Kimley Horn)

PW is using the phrase of “applicable sections” which would include from the FDOT Design Manual. No further change proposed.

Comment 2: Make paragraph 2 the start of section 4.2 and call it “4.2 Governing Standards.” (Travis Hastay – CHW) (Also discussed during the 3/30/21 meeting.)

Agreed. Modified.

Comment 3: In paragraph 2, sentence 1, what sections specifically are the “applicable sections” of the references? (Travis Hastay – CHW)

PW is using the phrase of “applicable sections”. No further change proposed.

March 30, 2021 Meeting note

- Sergio – first paragraph – question about the Vision Zero resolution. It doesn’t really tell you anything from the standpoint of the standards. Does the City want to refer to this? Not sure it presents any guidance.
 - Action Item: COG to take a closer look at that.
 - The COG Commissioners have discussed Vision Zero initiatives, which are intended to improve roadway design and education efforts to eliminate traffic fatalities and severe injuries. Debbie has modified paragraph 4.1 to further explain within the EDCM.

4.2 Roadway Classification (now 4.3)

Comment 1: Eliminate the callout “4.2.” (Travis Hastay – CHW)

This is in reference to the second paragraph and creation of a Governing Standards section. This has been modified as requested.

Comment 2: In sentence 1, eliminate “within or outside of a subdivision.” “Design” should say “designed” and continue to say in accordance with the Street Types listed in “the” Subdivision section.... (Travis Hastay – CHW & Jay Brown - JBPro)

Agreed. Modified.

Comment 3: Eliminate the last sentence, it is a repeat sentence. (Travis Hastay – CHW)

PW reviewed and doesn't believe it has quite the same meaning. Not proposing a change at this time.

Comment 4: A general comment for the entire first paragraph: this is not an objective, it's the standard. (Travis Hastay – CHW)

This is in reference to the second paragraph and creation of a Governing Standards section. This has been modified as requested.

Comment 5: Under Table 4-1., the table calls out "less than 800" and the next starts at "801." What if it is exactly 800? (Travis Hastay – CHW)

Agreed. Modified.

4.3 Drainage (now 4.4)

Comment 1: Eliminate the callout "4.3." (Travis Hastay – CHW)

Drainage is part of roadway design. A reference to Chapter 3 is warranted.

4.4 Intersection Design (now 4.5)

4.4.1 Type Selection (now 4.5.1)

Comment 1: The end of the paragraph references Chapter 6. ICE analysis should be standard? (Travis Hastay – CHW) (Also discussed during the 3/30/21 meeting.)

The City is expecting the old 3 step process. See revised changes, which include a reference to chapter 6.

4.4.2 Roundabouts (now 4.5.2)

Comment 1: In the first sentence, mini-roundabouts are mentioned. Include a definition and criteria for mini-roundabouts. (Ali & Brian – Kimley Horn)

Rewritten to provide additional definition and criteria for mini-roundabouts.

Comment 2: Under 4., is this applicable to a mini? (Travis Hastay – CHW) (Also discussed during the 3/30/21 meeting.)

No, not applicable to a mini. Clarified to further state "to a roundabout."

Comment 3: Under 7., what is this in accordance with? (Travis Hastay – CHW) (Also discussed in 3/30/21 meeting.)

Updated the reference to be in accordance with NCHRP Report 672.

4.4.3 Traffic Signals (now 4.5.3)

Comment 1: Under 2., specify all “signed and sealed” signal plans....(Ali & Brian – Kimley Horn & Jay Brown - JBPro)

Created a new #1 that required signed and sealed signal plans.

Comment 2: Under 4., Add a provision for strain poles in certain circumstances providing COG approval. Also add a provision for pedestal mounted vehicular signs in certain circumstances providing COG approval. (Ali & Brian – Kimley Horn) (Also discussed during the 3/30 meeting.)

This can be handled as a variance. No change made.

Comment 3: Under 4., we believe that is a current agreement between COG and FDOT that COG maintains painted black mast arms. COG to confirm. (Ali & Brian – Kimley Horn) (Also discussed during the 3/30 meeting.)

The initial painting is on the developer or whoever installs it. The City will repaint them as needed.

Comment 4: Under 8., does this apply to minor project modifications?

No, can't require developer to install or upgrade if not one of their impacts. A meeting or First Step can be scheduled by the developer or design engineer if unsure for a specific project.

4.5 Pavement Designs (now 4.6)

4.5.1 Flexible Pavement (now 4.6.1)

Comment 1: Under 2., this statement doesn't make sense. Asphalt shall be FDOT approved mixes only. (Travis Hastay – CHW & Jay Brown – JBPro) (Also a comment in the 3/30 meeting.)

Correction made.

Comment 2: Under Table 4-2, row 3 (Local Roadways Design Speed>35 MPH or ADT>2,500), FPM states 35 or more, 3000 ADT. (Ali & Brian – Kimley Horn & Jay Brown - JBPro) (Also a comment in the 3/30 meeting.)

Further researched and adjusted Table 4-2.

4.5.2 Concrete Pavement (now 4.6.2)

Comment 1: Under 1., reference Rigid Pavement Design Manual. (Ali & Brian – Kimley Horn, Travis Hastay – CHW, & Jay Brown - JBPro) (Also a comment in the 3/30 meeting.)

Correction made.

4.5.3 Brick Pavement (now 4.6.3)

No comments.

4.5.4 Geotechnical for Public Roadways (now 4.6.4)

Comment 1: Should this specify “new” roadways rather than just “roadways”? (Ali & Brian – Kimley Horn & Jay Brown - JBPro) (Also a comment in the 3/30 meeting.)

Discussed internally. This is intended to address new roadways in general as they come through development such as for a subdivision. Existing roads would most likely not be included in such a discussion depending on what work is done. However, there may be times where existing roads are being significantly impacted or altered. The City reserves the right to require certain information if determined appropriate to its intent to take over maintenance.

Comment 2: This section includes subdivisions. (Travis Hastay – CHW)

Yes.

March 30, 2021 Meeting note:

There was an action item for Jay and the local geotechs to further modify this section verbiage.

The City is still open to seeing changes in this section.

4.6 Driveways (now 4.7)

No comments.

4.7 Bicycle Facilities (now 4.8)

Comment 1: In the first sentence, “all new roadway projects” should specify not subdivision roads. (Travis Hastay – CHW)

PW staff discussed further. The important thing to note is that we do have to accommodate bicycle traffic on subdivision roads. Not proposing a change.

Comment 2: Number 4., a buffer is not required for angled parking. Only required for parallel. (Jay Brown – JBPro) (Also a comment during the 3/30 meeting.)

Agree. Added “parallel” to #4.

4.8 Sidewalks and Shared-Use Paths (now 4.9)

Comment 1: Subdivision sidewalk with aprons? 4” vs 6”? (Travis Hastay – CHW)

#5: 6” in areas with expected vehicle loads. No change made.

Comment 2: Under 2., change “design” to “designed.” (Jay Brown – JBPro) (Also discussed in 3/30/21 meeting. Change made in document at the time.)

Corrected.

Comment 3: Under 3., remove the word “shall.” (Travis Hastay – CHW)

Confirmed there was an extra “shall” and deleted it.

Comment 4: Under 6., pavers should be 2-3/4” with vehicular load? (Travis Hastay – CHW)

Is correct as shown in text and consistent with detail. No changes made.

4.9 ADA Ramps (now 4.10 and called Curb Ramps and Sidewalk Connections)

Comment 1: Should it be titled ADA Curb Cut Ramps? (Jay Brown – JBPro)

Changed to Curb Ramps and Sidewalk Connections.

Comment 2: City/County Roads? (Travis Hastay – CHW)

City roads. No jurisdiction over ACo.

Comment 3: Why is this subsection (ADA Ramps) in the roadway section? (Jay Brown – JBPro)

Renamed the section to Curb Ramps and Sidewalk Connections to provide clarity.

4.10 Signage (now 4.11)

Comment 1: Under 3. (Historic Street Signs), when is it considered historic? Who decides? Who pays? Shop drawings? (Jay Brown – JBPro)

Streets that exist now with historic name and signing are historic.

Who pays? This doesn’t necessarily need to be identified in the manual. Will get clarification from Archie Harris. (GLM to do.)

There are already templates/standards for traffic/street name signs. Maybe need shop drawings for specialty signs? (GLM to further research.)

Comment 2: Under 5. (Posts), street name signs Unistrut. Need clarification for all other signs. (Ali & Brian – Kimley Horn) (Also discussed during the 3/30/21 meeting.)

Modified per Emmanuel’s original notes and additional information from Archie Harris. These change bring back the u-channel text that went missing.

4.11 Pavement Markings (now 4.12)

Comment 1: Under 2., should “standard markings” specify “per MUTCD”? (Travis Hastay – CHW)

No.

4.12 Traffic Calming (now 4.13)

No comments.

4.13 On-Street Parking (now 4.14)

No comments.

4.14 Lighting (now 4.15)

Comment 1: Under 2., for photometrics there are standards for different roadway classifications. Who maintains? Metered or not? (Jay Brown – JBPro)

Further expanded the Lighting section. This should provide clarity.

Comment 2: Specify if the lighting applies to private roadways. (Jay Brown – JBPro) (Also discussed during the 3/30/21 meeting.)

Private roadways do have to be designed the same as public roads. Further expanded the Lighting section. This should provide clarity.

4.15 Utilities (now 4.16)

Comment 1: What about GRU requirements? GRU generally dictates where these utilities go under roadways. (Travis Hastay – CHW) (Also discussed during the 3/30/21 meeting.)

PW will help if GRU is requiring something not in the LDC/EDCM.

Comment 2: Under 1., sentence 2 change “utility” to “utilities.” (Jay Brown – JBPro)

Corrected.

Comment 3: Under 2., if the proposed development needs an open cut, is there a specific amount of milling and resurfacing that can be completed to allow for it? Or does this fall under exceptions? (Travis Hastay – CHW)

It would be 50 feet per corrected 3.a.

Comment 4: Under 3.b., specify that this can be less as directed by PW inspector. (Travis Hastay – CHW)

Corrected to 3.a. The minimum is 50 feet. Something less would have to be approved by the City Engineer. No change to the text proposed.

Comment 5: Under 4., the last word “ordinances” is spelled incorrectly. (Jay Brown – JBPro)

Corrected.

Comment 6: Under 5., line 4, specify that the “existing conditions soil, topography, or other compelling conditions make it unreasonable” (Jay Brown – JBPro)

Modified the “and” to “or”.

4.16 Transit (now 4.17)

No comments.

4.17 Landscaping (new section)

4.17 Mailboxes (now 4.19)

Comment 1: Line 3 should specify that placement of such mailboxes shall be contemplated during the design plat process “of subdivisions.” (Travis Hastay – CHW)

There are other types of submittals that have community mailboxes that PW may want to review. No change proposed.

4.18 Temporary Traffic Control (now 4.20)

No comments.

Chapter 5 – Site Design

5. Site Design

No comments.

March 30, 2021 Meeting notes:

- 1st paragraph – Last sentence was asked about during the meeting. Question by Jay. What other type of development would there be that doesn't fall under site design? If any of these issues apply on another site or development such as a park or SF clubhouse....they apply to site design. There's roadways and site design.
 - Action Item: COG to look at last sentence.
 - After discussing further internally, not proposing to make a change. The City is not looking to making any changes to how site design requirements are applied.

5.1 Driveways

No comments.

5.2 Utility Service

No comments.

5.3 Refuse Collection and Dumpster Pads

No comments.

5.4 Parking (off street)

5.4.1 Dimensions

No comments.

5.4.2 Grading

Comment 1: Recommend a maximum slope of 10% rather than 8% and a minimum slope of 0.30% rather than 0.50%. (Jay Brown – JBPro) (Also discussed during the 3/30/21 meeting.)

Kept the 8% and 0.5% but compromised to say "should be used".

5.4.3 Site Striping

No comments.

5.4.4 Inlets

No comments.

5.4.5 Vehicle Parking

Comment 1: What is overhang? (Jay Brown – JBPro) (Jay Brown – JBPro) (Also discussed during the 3/30/21 meeting.)

Per discussion during the meeting, the City would prefer to be leave as is to allow flexibility. No change proposed.

Comment 2: ADA requires a minimum of 3' of open travel pedestrian area to be maintained. Suggest decreasing the 5' to 4'. (Jay Brown – JBPro) (Also discussed during the 3/30/21 meeting.)

Per discussion during the meeting, Public Works is willing to help with how Planning is interpreting this item. No change proposed.

5.4.6 Bicycle Parking

No comments.

5.4.7 Motorcycle Parking

Comment 1: LDC says 3' minimum for motorcycle space. LDC also does not require motorcycle specifically. Scooter and/or motorcycles are allowed to meet current code. Is it the intent that motorcycle spaces are separately signed? Or is it at the developer discretion what size space they provide? (Travis Hastay – CHW) (Also discussed during the 3/30/21 meeting.) (Also discussed during the 3/30/21 meeting.)

Based on research, motorcycle parking is 4.5 feet wide and scooters are different at 3' wide.

Still need to get clarification on the separate signage. (GLM to do.)

Comment 2: Motorcycle parking should be 4' wide. (Jay Brown – JBPro) (Also discussed during the 3/30/21 meeting.)

Per the notes 4.25 feet was discussed and Brian indicated he could support. Additionally, Mobility said they could support 4.25 if that is what is desired. Modified the text with this change.

Comment 3: Why does motorcycle parking have to be located in areas convenient to the building entrances? (Jay Brown – JBPro)

The thought about the convenience of the spaces is to make sure that they are visible and encourage use so the scooters/motorcycles don't take available vehicular spaces. The intent is to avoid what happens at the Standard where the moped/motorcycle spaces are inconveniently located in the upper level of the garage and no one uses it preferring instead to park on-street or other spaces.

5.4.8 Scooter Parking

Comment 1: Why does the parking surface have to be concrete? Why can't it be asphalt? (Jay Brown – JBPro) (Also discussed during the 3/30/21 meeting.)

As discussed during the meeting, if just doing maintenance paving, maybe, but if the project is already doing concrete work, why wouldn't this be modified too.

5.5 Public Right-of-Way and Maintenance

No comments.

5.6 Public Sidewalks

Comment 1: What about hardscape zones in transect? Sidewalk is in R.O.W. but public will use these shared spaces. (Travis Hastay – CHW)

This section is addressing sidewalks and what would happen if a public sidewalk were proposed on private property. No change proposed.

Chapter 6 – Traffic Study Guidelines

6. Traffic Study Guidelines

Comment 1: Traffic Statements and Traffic Studies should be prepared by and signed and sealed by a Florida registered professional engineer experienced in traffic impact analysis. (Ali & Brian – Kimley Horn)

Added text.

6.1 Study Thresholds

6.1.1 Traffic Statement

Comment 1: Change “6.1.1” to “1.” Change “1., 2., and 3.” To “a.,b. and c.” Change “6.1.2” to “2.” (Jay Brown – JBPro)

The numbering schema is consistent with the other sections. Not proposing to change.

Comment 2: Under 1., specify less than or equal to 100 gross net new peak hour trips. (Jay Brown – JBPro)

Modifying the traffic study to be 100 or more.

Comment 3: Under 1., specify less than 100 peak hour total vehicle trips (after credit for existing uses). (Ali & Brian – Kimley Horn)

Modifying the traffic study to be 100 or more.

Comment 4: Under 1., recommend 100 gross peak hour trips instead. A coffee shop or gas station could have a major impact on the adjacent intersections but have less than 100 net new peak hour trips due to their high pass-by rate. (Travis Hastay – CHW) (Also discussed during 3/23/21 meeting.)

After discussion between Debbie and Scott with Mobility and Ali/KHA and Brian/CHW, leaving as net new. (Going to refer to this group in following responses as the Traffic Collaborative Group, which includes Brian S. as well.)

Comment 5: Under 2., remove “roadway information,” or need clarification on what roadway information is. (Also discussed during 3/23/21 meeting.)

Text has been amended to add clarification.

Comment 6: Under 3., add in “a Traffic Statement should be summarized in a letter including the ITE Land Use Codes utilized and”continue the rest of the statement. (Ali & Brian – Kimley Horn)

While the specific text in #3 has remained, other text in this section has been amended to add clarification.

6.1.2 Traffic Study

Comment 1: What happens if you generate exactly 100 peak hour trips? (Travis Hastay –_CHW)

Traffic study required. Modified text.

6.2 Comment 7: Under 6.1.2, specify 100 “net or gross” peak hour trips. (Jay Brown – JBPro)
(Also discussed during 3/23/21 meeting.)

Specified net new.

6.2 Methodology Letter

Comment 1: At the beginning of sentence 1, change prior to the preparation of the traffic study to “a traffic study.” (Jay Brown – JBPro)

Modified.

Comment 2: At the end of sentence 1, change the last word from “letter” to “for the study.” The methodology must be documented in writing by the traffic consultant and be approved by the City. (Jay Brown – JBPro)

The sentence has been modified by the Traffic Collaborative Group. It does appear that this is a good compromise.

Comment 3: In sentence 2, specify that the City “or consultant” will coordinate with the appropriate jurisdiction. (Jay Brown – JBPro) (Also discussed during 3/23/21 meeting.)

Per discussion in the meeting, The City may share or direct information to another agency, but it is not facilitating the coordination with other agencies. The text has been modified to require that coordination does happen. The coordination would be incumbent on the developer or its consultant to facilitate. The City would participate as needed.

Comment 4: After sentence 2, note that if a permit is required from the County or FDOT, the engineer should coordinate with them. (Ali & Brian – Kimley Horn).

See response to Comment #3.

Comment 5: In sentence 3, it mentioned the methodology letter will outline key components. Should the key components be listed out? (trip generation, study area intersections, analysis time periods, build out year, phasing, committed development). (Ali & Brian – Kimley Horn)

The paragraph has been modified and the first sentence now provides that the Traffic Engineer in coordination with the City would develop and agree on study methodology. This process would include identification of the key components needed.

Additional March 23, 2021 Meeting notes:

Fix 6.3 numbering.

Done.

6.3 Required Information

1. Project Description

Comment 1: Under 1., if ITE LUC only has “resident” variable assume “resident”= “bedroom” (Ali & Brian – Kimley Horn)

Traffic Collaborative Group modified to add “student-oriented” multi-family.

Comment 2: Under 4.c., include multimodal trip reductions (Ali & Brian – Kimley Horn)

Traffic Collaborative Group modified.

Comment 3: Under 5.a., eliminate the last sentence. It is covered in Study Area item 3. (Ali & Brian – Kimley Horn)

Traffic Collaborative Group modified last sentence.

Comment 4: Under 5.a., traffic volumes should vary little from Tuesday through Thursday and the cost of the counts double. Recommend permitting a single day of counts. (Travis Hastay – CHW) (Also discussed during 3/23/21 meeting.)

Traffic Collaborative Group modified to 1 day.

Comment 5: If blackout dates are going to remain while UF is in regular session, this should be clearly articulated at the outset of this section. (Travis Hastay – CHW) (Also discussed during 3/23/21 meeting.)

Traffic Collaborative Group modified.

2. Study Area

Comment 1: Under 1., define “study area” requirements better. (Ali & Brian – Kimley Horn and Jay Brown – JBPro) (Also discussed during 3/23/21 meeting.)

Traffic Collaborative Group modified.

Comment 2: Under 2., replace “specify” with “confirm.” (Ali & Brian – Kimley Horn)

Traffic Collaborative Group modified.

Comment 3: Under 3., eliminate “for a minimum of two consecutive days.” In the meeting, Brian Singleton did not think 2 days was necessary. (Ali & Brian – Kimley Horn and Jay Brown – JBPro) (Also discussed during 3/23/21 meeting.)

Traffic Collaborative Group modified.

Comment 4: Under 3., traffic volumes should vary little from Tuesday through Thursday and the cost of the counts double. Recommend permitting a single day of counts. (Travis Hastay – CHW)

Traffic Collaborative Group modified.

3. Analysis of Conditions

Comment 1: Change number 3. Growth Rate to “Background Growth.” (Ali & Brian – Kimley Horn)

Text modified.

Comment 2: In the first sentence of 3.a. change Alachua County and FDOT to Alachua County “and/or” FDOT. (Ali & Brian – Kimley Horn and Jay Brown - JBPro) (Also discussed during 3/23/21 meeting.)

Text modified.

Comment 3: Add a 3.b. Include trips from committed developments (developments which traffic studies were completed and are already approved by the City, but that have not yet been built or occupied at the time the traffic data was collected). The City will provide the traffic studies for any committed developments to be included in the study during the methodology correspondence. (Ali & Brian – Kimley Horn)

Traffic Collaborative Group modified.

Comment 4: What is the purpose of roadway segment analysis since the City of Gainesville required mobility fees and not transportation concurrency? (Travis Hastay – CHW)

The reference to roadway segments has been removed.

Comment 5: Under 4.a, specify background “growth/” projects. At the end of the paragraph, remove the period and continue the sentence to read “, if necessary.” (Ali & Brian – Kimley Horn and Jay Brown - JBPro)

Added “growth”.

Comment 6: Under 4.b., remove all of 4.b. During the meeting, Brian Singleton questioned why roadway segment analysis was needed.

Traffic Collaborative Group has significantly modified 4.b.

Comment 7: Under 4.c., change sentence to read provide figures that illustrate existing “, future background, and future with project” and future turning movements counts. (Ali & Brian – Kimley Horn)

[Traffic Collaborative Group deleted original 4.c.](#)

Comment 8: Under 4.d., remove the words “roadway segments and.” In the meeting, Brian Singleton questioned why roadway segment analysis is needed. (Ai & Brian – Kimley Horn).

[Now 4.c., Traffic Collaborative Group revised and has removed that reference.](#)

Comment 9: Under 4.d., how are the affected roadways determined? (Travis Hastay – CHW)

[Now 4.c., Traffic Collaborative Group revised and has removed that reference.](#)

Comment 10: Under 4.e., in sentence 2 remove the words “in accordance with current FDOT practices.” ICE now replaces previous FDOT roundabout evaluation process. The 3-step roundabout forms are still available to be downloaded from the FDOT website, but Section 116 of FDM says ICE is current practice. It might be beneficial for the City to take these forms and make them their own and have the bulleted list follow the 3-step process. (Ali & Brian – Kimley Horn)

[Now 4.d., Traffic Collaborative Group revised and has removed that reference.](#)

Comment 11: 4.e.iii., change Level or Service to Level “of” Service. (Jay Brown – JBPro)

[Now 4.d., this has been corrected.](#)

Comment 11: Add additional sections to item 6. (vi. Site Plan, vii. Signal timings, viii. Volume calculations, ix. Distribution calculations/model plots, x. TMPA district information. (Ali & Brian – Kimley Horn)

[Additional documentation identified and inserted by Traffic Collaborative Group.](#)

Chapter 7 – Submittal Requirements

7.1.2. Traffic Study Guidelines

April 29, 2021 Meeting notes:

- #9 & #11-19 under drainage narrative. Currently under “plans” when it is applicable to drainage narrative.
 - Action Item: COG agrees this is appropriate and will do.
 - Moved all under Drainage Narrative section.
- #10 Cross section
 - Action Item: Move to design drawings. Not for geotech to do.
 - Moved language to geotechnical section in Chapter 3 Stormwater
- Chapter 7.1.5 #1.f.
 - Added text during the meeting.
 - Further discussed internally and removed the language “for the length of the project”. The developer would be responsible for any damages incurred relating to the project. For example damage associated with a haul route.
- Chapter 7.1.5 #2.b. Travis: Add Alachua County Public Works. Done during meeting.
 - Done.
- Chapter 7.1.5 #3.b. Travis: Rewrite to be directed for state only. See notes in word doc.
 - Action Item: COG to rewrite as discussed.
 - Done.
- Chapter 7.1.5 #4.a. Travis: Question about who and when. The contractor to provide any time prior to installation of the geotextile.
 - Rewrote. The EOR will provide specifications prior to installation.
- Chapter 7.1.5 #4.b. Broaden test options to include Shelby tube and trench test.
 - Action Item: COG to amend as discussed.
 - Done.
- Chapter 7.1.5 #5 Question by Claudia about the 4:1 versus 3:1 which is when DOT recommends pinning or pegging of sod. This includes private systems, which private clients would prefer not to do.
 - Action Item: COG to research further.
 - Rewrote to match the FLESCI book.
- Chapter 7.2.1 - Discussed that is a bit odd to have identified with no text. It was part of a list in the previous manual and the renumbering sets it up to be more of a section.
 - Action Item: COG to add minor text describing.
 - Added text consistent with the Section 30-3.37 D in the LDC.
- Chapter 7.2.2 #19 Temporary Traffic Controls Plans

- Action Item: Discuss further with Matt.
 - Discussed internally and agreed that it makes the most sense for the TTC Plans to be provided when the Contractor's gets their ROW permit. Modified text to:

“EOR to provide note to the Contractor that informs them that TTC plans are required for the ROW Permit. See Chapter 8.2 ROW Permits for additional information on City ROW Permit requirements.”
- Chapter 7.2.2 #5 Summary of Quantities
 - Action Item: City to discuss further why we're requiring.
 - Agreed during 6/1/21 staff meeting to delete.
- Chapter 7.2.2 #15 Drainage Structures
 - Discussed in meeting that this appeared to be a duplicate. Agreed and deleted.
- Chapter 7.2.2 #18.c.
 - Discussed further whether this was really. Agreed and deleted.
- Chapter 7.3 #10
 - Travis – Question about the * and exactly what needs to be flagged.
 - Gail – Typically the * is intended to flag changes to elevation in general. Clouds are another way to denote changes.
 - Action Item: COG to modify text to further clarify.
 - Amended text. Added #'s 2-5 and deleted the original #10.
- Chapter 7.3 #11 Utility Locations
 - Discussed this section during the meeting. This is not new language but was reworded. Travis suggested moving #1 into the introduction text to help make it clearer.
 - Amended text during the meeting. See notes in document.

Chapter 8 – Construction

- Chapter 8
 - 8.1 Travis – Has a couple of items they think might need to be moved to Chapter 5.
 - Moved the stormwater items as noted later in this meeting.
- Chapter 8.3.3 Site Housekeeping
 - Travis – Suggests some of this language be put in Chapter 5 as well. Nothing in Chapter 5 that expresses similar concerns.
 - COG discussed further. Stockpiles are already addressed as part of the NPDES CGP compliance, which is referenced in chapters 3 and 8. We don't believe additional language is needed there.
 - #3 & 4 should be in chapter 5.
Action Item: COG to review and add as appropriate language in chapter 5.
 - Discussed #3 & 4 and propose deletion. #1 and #2 cover all that COG needs.
- 8.4.3 #2 Shop Drawings
 - Claudia – We are just to provide after EOR approves? Is the City wanting to approve them?
 - COG just wants a copy.
 - Timing of Submittal – Send to COG upon approval. The City doesn't want to delay the process.
 - Claudia – Can the EDCM be clearer about when these should be submitted.
 - Action Item: Modify document to be clearer. See notes in document.
 - Added language.
- 8.4.3 Pipe Materials
 - Manual allows only RCP and polypropylene.
 - Discussed video requirement.
 - Mentioned July 2020 memo regarding use of PE. If using PE pipe, video required.
 - Gail: Anything in-house for review right now, please know PP pipe required. Need to change.
 - Brian: Per the memo, only the black pipe (PE) requires video. Once the new manual is adopted, all pipe would require video per FDOT criteria.
 - Claudia – Should this be in the design section?
 - Gail – Chapter 3 does qualify the pipe material allowed, but we haven't covered that yet.
 - Action Item: Gail to send out July 2020 memo from Brian regarding.
 - Action Item: Include reference to allowed pipe.
 - Action items done.
- 8.4.4 Action Item: Move to Chapter 3.

- Done. Left inspection item as it is the construction phase.
- 8.4.6 Action Item: Move most of paragraph to Chapter 3.
 - Moved to as-built survey section in chapter 7 (new 7.3). Left the last sentence.
- 8.5 Utility Work
 - #2 Is this written differently in other chapters?
 - Action Item: COG staff to look at.
 - #2: Staff searched for multiple references but really could only find one other reference to a cut. Chapter 4.16 Utilities calls it “open cuts” versus 8.5 #2 that calls out “Pavement cuts” and in #1 says “cutting of the asphalt surface”. The way the text is written doesn’t seem to be contradictory. Not proposing any changes.
 - #4 Same question
 - Action Item: COG staff to look at.
 - #4: Staff searched for multiple references but really could only find 5 items that referenced underground “installations” or “utility”.
 - 8.5 #4 “underground installations”
 - 8.5 #5 “underground utilities”
 - 8.5 #6 “underground crossings”
 - 8.5 #8 uses “underground utility” and “underground utilities”
 - 8.5 #9 refers to “damage to any underground drainage structures, underdrain, sidewalk or any other structural portion of the roadway”

The way the text is written seems to be appropriate for the context they’ve been written and doesn’t seem to be contradictory. Not proposing any changes.
- 8.12 Lighting
 - Lighting needing to be maintained for construction? Temporary lighting plan?
 - Action Item: Discussed that language for temporary lighting is needed.
 - Revised language in 8.12 and 4.15.
 - #2 All fixtures along 4th Avenue (example) would not be allowed as they are not GRU approved. May want to open it up so that more options are available. GRU selections are very limited.
 - Action item: Add language about City accepting only GRU standard lighting fixtures, maintenance agreement required if not.
 - Revised language but put in Chapter 4.15.

Appendix A Definitions and Terms

Some minor changes made here including the requested change to the definition of redevelopment.

Appendix B Details

- B-1 – Column F has been removed.
- B-2 through B-6: No comments.



**City of Gainesville
Department of Sustainable Development
Planning Division**

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ATTACHMENT “D”

Petition PB-21-00167 TCH

October 28, 2021

Attachment A. Application and Other Supporting Documents

Attachment B. City of Gainesville Public Works Department Engineering Design & Construction Manual 2021.

Attachment C. Engineering Design and Construction Manual Comments/Responses

Attachment D. City of Gainesville Engineering Design & Construction Manual 2015

Attachment E. Proposed 2021 Engineering Design and Construction Manual Summary Table Showing 2015 EDCM location to 2021 EDCM location.

CITY OF GAINESVILLE ENGINEERING DESIGN & CONSTRUCTION MANUAL

2015



CITY OF
GAINESVILLE
every path starts with passion
FLORIDA

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APPENDIX A Definitions and Terms

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Chapter 1 INTRODUCTION

1.1 Purpose and Applicability

The City of Gainesville Engineering Design and Construction Manual is approved and adopted by Ordinance Number 140661 on April 16, 2015, pursuant to the authority granted by the City of Gainesville Comprehensive Plan. This manual further complements the requirements of the Land Development Code, Chapter 30, City of Gainesville Code of Ordinances.

This manual seeks to implement City policy as outlined in the City's Comprehensive Plan for the provision of transportation facilities that serve the needs of all users and promote a well-connected, integrated transportation system that reduces dependency on automobile use.

This manual establishes engineering design standards and specifications for the development of site plans, subdivisions, redevelopment projects, permits and capital projects within the City of Gainesville as part of the City's responsibility to provide for the health, safety and welfare of the public.

1.2 Jurisdiction

This manual establishes engineering design standards and specifications for the development of site plans, subdivisions, redevelopment projects, permits and capital projects within the City of Gainesville. Where more stringent standards are imposed by federal, state and other local agencies, the more stringent standards having jurisdiction shall apply.

1.3 Policy

When real property within the City of Gainesville is developed and/or redeveloped or any work is proposed within the City's right-of-way (ROW) or easement, the infrastructure facilities contained within said property, serving said property or activities within the City ROW or easement shall comply with the requirements set forth in this manual and the Land Development Code.

1.4 Enforcement

The Public Works Department, through their designated representatives, shall have the right to inspect the land and constructed facilities addressed by this manual and to issue "Notices to Comply" for violations or through a Site Plan Violation.

1.5 Conflicts with City of Gainesville Code of Ordinances

When the standards and specifications included in the City of Gainesville Code of Ordinances and the manual conflict, the City of Gainesville Code of Ordinances shall apply.

1.6 Definitions and Terms

The definitions of the terms used in this manual have the meanings respectively ascribed to them by common usage or specifically defined in those publications identified by reference, except in those instances where the text clearly indicates a different meaning. The definitions or terms contained herein are not intended to alter definitions expressly specified in any other City of Gainesville ordinance, policy, regulation or code, but are provided for the purpose of making clear and distinct the intention of the language used in a specific section of this document. Following the Metropolitan Transportation Planning Organization (MTPO) Transportation Language Policy, objective language will be used avoiding biased terms. A list of commonly used terms and acronyms can be seen in Appendix I – Definitions and Terms.

1.7 Amendments

The City of Gainesville shall amend the contents of this manual as may be required by ordinance adopted by the City Commission.

1.8 Design Exceptions or Variances from the Terms in this Manual

Design Exceptions or Variances from the terms of the design manual may be approved when such exceptions or variances are not contrary to the public interest; where, owing to special conditions, a literal enforcement of the provisions of the design manual would result in unnecessary hardship; or in order to allow for implementation of an innovative design practice.

Design Exceptions are required when the 13 Controlling Design Elements specified in Chapter 14 of the Manual of Uniform Standards for Design, Construction and Maintenance for Streets and Highways (a.k.a “Florida Greenbook”) cannot be met. The 13 controlling design elements are:

- | | |
|-----------------------|---------------------------|
| ▪ Design Speed | ▪ Cross Slopes |
| ▪ Lane Widths | ▪ Superelevation |
| ▪ Shoulder Widths | ▪ Horizontal Alignment |
| ▪ Bridge Widths | ▪ Vertical Alignment |
| ▪ Structural Capacity | ▪ Stopping Sight Distance |
| ▪ Vertical Clearance | ▪ Horizontal Clearance |
| ▪ Grades | |

The FDOT’s Utility Accommodation Manual provides guidance on exceptions with respect to utilities. Design Exceptions shall be submitted in writing by the Professional Engineer responsible for the design and justified as described in Chapter 14 of the Florida Greenbook. Approvals must be made by the Public Works Director or designee.

Design Variances are required when proposed design elements are below the City’s criteria as specified in this Manual and where a Design Exception is not required. Design Variances shall be submitted in writing and signed and sealed by the Professional Engineer responsible for the project and include the following:

- Project description
- Description of variance and need
- Demonstration that the proposed design variations would be in harmony with the general intent and purpose of the Land Development Code and the Comprehensive Plan, would not be injurious to surrounding properties, and would not otherwise be detrimental to the interest, safety, health, and welfare of the public.
- Demonstration that the proposed alternative treatment will meet the intent of the City's specifications and not pose an undue or significant burden upon the City or any other party.

Approval shall be based upon a finding by the Public Works Director or designee that the Design Exception or Variance meets the requirements of this section.

1.9 Interpretation

The Public Works Director or designee shall provide the final interpretation of the contents of this manual.

1.10 Omissions

Logical, accountable, and generally accepted design standards and engineering judgment shall apply where not specifically addressed in this manual.

Chapter 2

TECHNICAL REFERENCES

Standards and guidelines which are referenced in most recent version of the following technical publications shall be considered part of this manual including subsequent updates or revisions to these publications. In the event of a conflicting standard imposed by the City, federal, state or other local agencies, the more stringent standard shall apply.

AASHTO – A Policy on Geometric Design of Highways and Streets

ADA – Uniform Federal Accessibility Standards (UFAS); ADA Standards for Accessible Design (ADAAG); Public Rights of Way Accessibility Guidelines (PROWAG)

Alachua County Low Impact Development Manual - DRAFT

ASCE and WPCF – Design and Construction of Sanitary & Storm Sewers

City of Gainesville – Standard Practice for Roadway Lighting

City of Gainesville – Streetscape Design and Technical Standards for City of Gainesville CRA Districts

DEP – Chapter 62-4, F.A.C., Permits

DEP – Chapter 62-25, F.A.C., Regulation of Stormwater Discharge

DEP – Chapter 62-302, F.A.C., Surface Water Quality Standards

DEP – Chapter 62-621, F.A.C., Generic Permits

DEP – Chapter 62-624, F.A.C., Municipal Separate Storm Sewer Systems

DEP – The Florida Stormwater Erosion and Sedimentation Control Inspector's Manual

Department of Environmental Protection and Water Management Districts Environmental Resource Permit Applicant's Handbook Volume I (General and Environmental)

Department of Environmental Protection and Water Management Districts ERP Stormwater Quality Handbook – March 2010 DRAFT

FDOT – “Accessing Transit: Designing Handbook for Florida Bus Passenger Facilities” Version III, 2013

FDOT – Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Commonly known as the “Florida Greenbook”)

Chapter 2 - Technical References

FDOT – Standard Specifications for Road and Bridge Construction

FDOT – Procedures Manual for Flexible Pavement Design

FDOT – Roadway and Traffic Design Standards (FDOT Index)

FDOT – Florida Roundabout Guide

FDOT – Drainage Manual

FDOT – Utility Accommodations Guide

FDOT – Plans Preparation Manual

FDOT – Office of Construction Preparation and Documentation Manual

FDOT & FDEP – State of Florida Erosion and Sediment Control Designer and Reviewer Manual

FHWA – Manual on Uniform Traffic Control Devices (MUTCD)

GRU – Design Standards and Construction Details for Potable Water, Reclaimed Water, and Wastewater (GRU Manual)

ITE – Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities

ITE – Trip Generation Manual

MTPO – Urban Design Policy Manual, prepared for the Metropolitan Planning Organization for the Gainesville Urbanized Area by the North Central Florida Regional Planning Council

NACTO – Urban Bikeway Design Guide

NACTO – Urban Street Design Guide

SJRWMD – Technical Publication 85-5

SJRWMD – Permit Information Manual

SJRWMD – Chapter 40C, F.A.C.

SRWMD – Applicant's Handbook Volume II

SRWMD – Chapter 40B, F.A.C.

Urban Land Institute and National Parking Association. (2000). *The dimensions of parking*, 4th

Chapter 2 - Technical References

Edition. Washington, D.C.: Urban Land Institute.

USDA/NRCS – Technical Release 55 (TR-55)

Chapter 3 PERMITS

3.1 Maintenance of Traffic

All permitting activities related to Maintenance of Traffic shall adhere to the City of Gainesville Code of Ordinances, Part II, Chapter 23 – Streets, Sidewalks and Other Public Places.

Obtaining a Maintenance of Traffic Permit does not alleviate the requirements for other applicable permits, including but not limited to Driveway Permits and Right-of-Way Permits.

3.2 Driveway

All permitting activities related to driveways shall adhere to the City of Gainesville Code of Ordinances, Part II, Chapter 23 – Streets, Sidewalks and Other Public Places, specifically Article V Construction and Removal of Driveways.

Obtaining a Driveway Permit does not alleviate the requirements for other applicable permits, including but not limited to Maintenance of Traffic Permits and Right-of-Way Permits.

3.3 Right-of-Way Use

All permitting activities related to work in the public ROW shall adhere to the City of Gainesville Code of Ordinances, Part II, Chapter 23 – Streets, sidewalks and other public places.

Obtaining a Right of Way Permit does not alleviate the requirements for other applicable permits, including but not limited to Driveway Permits and Maintenance of Traffic Permits.

The applicant must move or remove facilities located in the public ROW, regardless of permit status, in accordance with the approved schedule provided to the City.

Work in the public ROW which qualifies for a permit exemption under Section 23-40 and is emergent in nature, shall provide the City with the information required in a permit application once the situation has been stabilized.

Chapter 4

STORMWATER MANAGEMENT

The objective of this section of the manual is to provide the design standards necessary for the conservation and improvement of the quality of the surface waters and the control of stormwater runoff volume and rate and floodplain elevations in the City of Gainesville.

4.1 Application

No person shall change, or allow to be changed, the contour, topography, use, or vegetation cover of land unless the stormwater runoff and sedimentation generated thereby are controlled in accordance with this manual, except as follows:

- Property in actual agricultural use, excluding silviculture
- Accessory home gardening and customary routine landscape maintenance
- Removal of individual trees in accordance with the landscape and tree management sections of the Land Development Code and this manual

For the purposes of evaluating stormwater threshold criteria, redevelopment is any demolition and/or reconstruction of the vehicular use area (excluding resurfacing and restriping) or building. Any proposal for a site on which the proposed redevelopment of building(s) or vehicular use area involves the demolition and reconstruction of more than 80 percent of the area devoted to existing building and vehicular use shall be considered new development, and shall be required to meet the stormwater quality and quantity requirements. The minimum amount of disturbance to asphalt outside of public roadways to be considered reconstruction will be the complete removal of the asphalt course. New development may utilize the existing impervious surfaces during the pre-developed analysis for the establishment of discharge rates and/or volume amounts.

- New development of less than 1,000 SF or redevelopment of less than 4,000 SF are exempt from stormwater management requirements.
- New development between 1,000 SF and 1,999 SF net new impervious area are required to meet stormwater quality requirements in Section 4.6.
- Redevelopment of 4,000 SF and greater, but less than 80% as described above, are required to meet stormwater quality requirements of Section 4.6.
- New development with 2,000 SF or more net new impervious area is required to meet stormwater quality and quantity requirements.

No person shall discharge or alter the discharge of stormwater runoff or sedimentation from development activity into creeks, watercourse, or water bodies without the consent of the applicable governmental authority.

4.2 General Design Standards

All drainage facilities shall provide a positive outfall to existing watercourses, water bodies, wetlands, or storm sewer systems unless it can be proven that it is a closed system.

The property owner is fully responsible for compliance with all rules, regulations, and requirements of the county, the applicable water management district, the state department of environmental protection, the U.S. Army Corps of Engineers, and United States Environmental Protection Agency.

The type, intensity, and structural design of any development proposed for a site shall be appropriate to the existing natural topographic characteristics of the site, while recognizing that minimal grade changes are essential to site development. Avoid disturbing steep slopes. Terracing and diversions shall be used when disturbance of slopes is unavoidable. Slopes created by fill for other than landscape or buffering purposes shall be not steeper than three to one (horizontal to vertical) and must be stabilized by vegetation or other approved methods. Excessive erosion of any cut or fill slope shall require remediation by the property owner.

4.3 Design Storm Events

Developments within the City of Gainesville shall use the design rainfall in Table 4-1 in the design of stormwater management systems. The FDOT Zone 5 rainfall curves shall be used to determine the rainfall distribution.

Table 4-1. Design Storm Events

Return Period (Years)	Design Rainfall (inches)									
	10 min	15 min	30 min	60 min*	2 hr*	4 hr*	6 hr	8 hr*	12 hr	24 hr*
3	1.05	1.33	1.93	2.60	3.20	3.80	4.00	4.48	4.68	6.00
10	1.19	1.54	2.31	3.20	4.00	4.80	5.10	5.84	6.24	7.92
25	1.34	1.74	2.66	3.60	4.40	5.28	5.76	6.56	6.96	8.64
50	1.43	1.88	2.90	3.95	4.80	5.92	6.48	6.96	7.92	9.6
100	1.53	2.03	3.11	4.40	5.40	6.72	7.20	8.00	8.76	11.04

*Storms required for critical event analysis

4.4 Levels of Service for Stormwater Quantity

Developments within the City of Gainesville shall use the Level of Service (LOS) criteria in Table 4-2.

Table 4-2. LOS Criteria

Facility	Description	Storm Frequency	Physical Reference
Roadway Culverts - Cross Drains and Bridges	Evacuation Routes and Primary Arterials (including exclusive residential access roads)	100 year (open systems)	Flood stage 12" below EOP
		50 year (closed systems)	HGL 12" below GE
	Collector Road (non-exclusive residential access roads only)	50 year / 10 to 60 minute (open systems)	Flood stage 12" below EOP
		25 year / 10 to 60 minute (closed systems)	HGL 12" below GE
	Local Road (non-exclusive residential access roads only)	25 year / 10 to 60 minute (open systems)	Flood stage 12" below EOP
		10 year / 10 to 60 minute (closed systems)	HGL 12" below GE
Side Drains (driveway culverts)	Arterial and Collector Roads (external to development)	10 year / 10 to 60 minute	Flood stage 12" below EOP
	Local Roads (internal to development)	10 year / 20 minute (5.4 inches per hour)	Flood stage 12" below EOP
Storm Sewer Systems	External to Development (non-cross drain)	10 year / 10 to 60 minute	HGL 12" below GE
	Internal to Development	10 year / 10 to 60 minute (for private roadways designed to public roadway standards only)	HGL 12" below GE
Swales (roadside)	Arterial and Collector Roads (external to development)	10 year / 10 to 60 minute	Flood stage 12" below EOP
	Local Roads (internal to development)	10 year / 20 minute (5.4 inches per hour)	Flood stage 12" below EOP
Outfall Ditches	Roadway or Development	25 year / 10 to 60 minute	Flood stage 12" below TOB
Open or Closed Watershed Systems	Positive outfall to external drainage facility or receiving stream or open lake watershed	100 year critical (post < pre criteria for rates (open watersheds) and rates and volumes (closed watersheds))	Flood stage 6" below TOB

GE: Gutter Elevation

TOB: Top of Bank

EOP: Edge of Pavement

Open systems: Swales and drainage ditches

Closed systems: Pipes and culverts

Within the Hogtown Creek Basin, systems must be designed to retain any increase in volume of runoff over the predevelopment volume for a 72-hour period under all 100 year storm events.

All stormwater systems shall be evaluated for the 100 year critical storm events to establish the minimum finished floor elevations of surrounding structures (to 1' above the 100 year elevation).

Underground stormwater treatment systems can utilize areas within the project watershed to accommodate the 0.5' of required freeboard if this freeboard area is at least 5 feet from the property boundary.

Sumps within stormwater management facilities are discouraged. Sumps within stormwater management facilities will only be allowed due to cover issues and minimum pipe slope/velocities. When sumps are utilized for dry retention facilities, the bottom elevation of the sump shall be a minimum of 12 inches above the seasonal high water table. When sumps are utilized for dry detention facilities, the bottom elevation of the sump shall be placed up to one foot below the control elevation.

The requirements for stormwater quality and quantity as listed within this manual may be satisfied by a master stormwater plan serving several properties. An easement must be provided between participating landowners. The easement shall be recorded in the public records of the county and submitted to the Planning and Development Services Department and to the Public Works Department prior to the issuance of any development order or permit. Any development proposed for consideration utilizing an existing or planned master stormwater facility shall provide the calculations and documentation necessary to establish the right to use the facility and that the contribution of stormwater runoff of the proposed development will be within the design parameters of the master system. A maintenance agreement among all of the property owners that conforms to the provisions of this manual shall be executed subject to the approval of the City Attorney as to form and legality and recorded in the public records of Alachua County.

A development may use an off-site stormwater management facility to meet the applicable stormwater quality and/or quantity standards required by this manual.

4.5 Water Quality Standards

Developments within the City of Gainesville shall follow the water quality treatment volume criteria in Table 4-3.

Table 4-3. Water Quality Treatment Volume Criteria

Facility	Off-line	On-line
Retention	Greater of 0.5" of runoff from Drainage Area or 1.25" of runoff from impervious area	Off-line + 0.5" of runoff from Drainage Area
Dry Detention	Greater of 1" of runoff from Drainage Area or 2.5" of runoff from impervious area	N/A
Wet Detention	Greater of 1" of runoff from Drainage Area or 2.5" of runoff from impervious area	N/A
Exfiltration Systems	Greater of 1" of runoff from Drainage Area or 1.25" of runoff from impervious area	Off-line + 0.5" of runoff from Drainage Area

The water quality treatment volume shall be recovered within 72 hours for dry systems and one-half of the volume shall be drawn down within 24 to 30 hours for wet systems.

4.6 Open Conveyance Systems

Roadside swales may be provided in lieu of curb and gutter as long as all the specific requirements the Engineering Design and Construction Manual can be met.

All open conveyance systems shall conform to the FDOT Drainage Manual and the LOS standards in Table 4-2.

Minimum allowable ditch and swale grades shall be in accordance with the FDOT Drainage Manual.

Maximum side slopes on all ditches are 4(H) to 1(V). Front and back slopes shall also be in compliance with the Florida Greenbook. Steeper slopes may be reviewed and approved on a case by case basis by the Public Works Director or designee.

To prevent erosion in ditches all swales shall be sodded to one foot past the top of bank in addition to meeting the requirements in the FDOT Drainage Manual.

Roadway spread within gutter and travel lane shall conform to the FDOT Drainage Manual and the LOS standards in Table 4-2.

Drainage easements in addition to ROW width shall be sufficient to accommodate all portions of the public stormwater management system facilities and to provide access for the facility maintenance. Such easements shall be dedicated to the City of Gainesville or to a recognized entity that shall be responsible for the maintenance of the easement. Where drainage facilities serve private streets, the easement or designated area reserved for stormwater management facilities shall be sufficient in width to accommodate all portions of the stormwater management system facility and to provide for access to maintain the facility. Such easements shall be dedicated to a responsible private maintenance entity.

Open drainageways (ditches) will not be permitted in or within 100 feet of any land designated as a residential district as defined in the Land Development Code, Section 30-41 and any land in actual use or zoned for use as a school, unless it can be established to the satisfaction of the City Commission that the open drainageway will appear and function as a natural watercourse and will not require significant maintenance. Any permitted open drainageway shall be designed so as to present no unreasonable hazard to life, the health of the public and nearby property residents, and so as to be protected against scour and erosion.

4.7 Closed Conveyance Systems

All closed conveyance systems shall conform to the FDOT Drainage Manual and the LOS standards in Table 4-2. Wet piping systems are discouraged and should not be used when feasible.

4.7.1 Inlets

- All inlets with grates shall be per FDOT standards.
- Curb inlets are not allowed at pedestrian crossings or within curb returns at intersections.
- The last inlet or manhole with a removable top prior to discharging to stormwater management facilities and that are to be maintained by the Public Works Department shall have 2 foot sumps, minimum. Weep holes shall be installed in the bottom of the structures when the Seasonal High Water Table is greater than 12 inches from the structure bottom.
- A new structure shall be provided at any change in alignment and elevation of pipe.
- Elliptical pipes are permitted.
- Ram-neck connections are not permitted.
- All junction structures shall have the tops of the intersecting pipes at the same elevation for all pipes entering or exiting the structure. The two foot sump requirement shall be measured from the lowest invert of the pipe in the structure. No sumps are required on wet piping systems.
- The maximum spacing of manholes and inlets on pipe runs are shown in Table 4-4 based on operations and maintenance requirements. Spacing of inlets shall be based on spread calculations.
- Pre-cast structures are preferred. All structures that are delivered in sections shall have gaskets and interlocking sections to minimize seepage.

Table 4-4. Maximum Manhole and Inlet Spacing

Pipe Size	Maximum Spacing
15 to 18 inches	300 feet
Greater than 18 inches to 60 inches	400 feet
Greater than 60 inches	500 feet

4.7.2 Pipes

- The minimum pipe size shall be 15 inches or equivalent.
- All pipes within City right-of-way shall be reinforced concrete pipes. Exceptions may be approved by the Public Works Director or designee per section 10.8.1.
- The Modified Rational Method shall be used to calculate the hydraulic capacity of pipes.
- Stormwater pipes shall meet the hydraulic capacity requirements specified in Table 4-2.
- Stormwater pipes shall have a minimum velocity of 2.5 feet per second at full flow.
- All outfall structures shall have energy dissipating blocks or equivalent energy dissipating mechanisms to prevent these areas from eroding.
- All pipes shall be joined with approved gaskets to minimize seepage.
- Stormwater pipes shall have a minimum separation of three inches from outside of the pipe to any other utility pipe or structure.

4.8 Stormwater Pollution Prevention Plan

All Stormwater Pollution Prevention Plans shall be developed in accordance with the FDEP requirements of Rule 62-621.300 Generic Permits.

4.9 Erosion and Sedimentation Control

Development shall provide temporary and/or permanent erosion and sedimentation control best management practices prior to any clearing or alteration of land. Areas of application include but are not limited to perimeter, inlet, outlet, slope, and ditch protection measures. The protective measures shall remain installed and be regularly maintained for the duration of the project or until the site is properly stabilized with permanent protective measures.

4.9.1 Stabilization of Denuded Areas and Soil Stockpiles

Permanent or temporary soil stabilization shall be applied to denuded areas within 15 days after final grade is reached on any portion of the site. Soil stabilization shall be applied within 15 days to denuded areas which may not be at final grade but will remain dormant (undisturbed) for longer than 30 days. A phasing plan will be required for activities longer than 30 days. A phasing plan will also be required for denuded areas over 1 acre regardless of the dormant time period. Soil stockpiles that will be dormant for more than 7 days shall be surrounded with silt fencing to prevent off site sediment tracking.

4.9.2 Establishment Of Permanent Vegetation

Permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved which is mature enough to control soil erosion.

4.9.3 Timing and Stabilization of Sediment Trapping Measures

Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment on-site shall be constructed as a first step in grading and be

made functional before upslope land disturbances takes place. Earthen structures such as dams, dikes and diversions shall be seeded and mulched within 15 days of installation.

4.9.4 Cut and Fill Slopes

Cut and fill slopes shall be designed and constructed in a manner which will minimize erosion. Consideration must be given to the length and steepness of the slope, the soil type, upslope drainage area, groundwater conditions and other applicable factors. Slopes which are found to be eroding excessively within one year of construction shall be provided with additional slope stabilizing measures until the problem is corrected.

4.9.5 Storm Pipe Inlet Protection

All storm pipe inlets which are made operable during construction shall be protected so that sediment-laden water will not enter the conveyance system without first being filtered or otherwise treated to remove sediment.

4.9.6 Construction Access Routes

Wherever construction vehicle access routes intersect paved public roads, provisions shall be made to minimize the transport of sediment (mud), concrete, and other construction materials by runoff or vehicle tracking onto the paved surface. Where sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each work day. Sediment shall be removed from roads by shoveling or sweeping and be transported to a controlled sediment disposal area. Street washing shall be allowed only after sediment is removed in this manner.

4.9.7 Removal of Temporary Measures

All temporary erosion and sediment control measures shall be removed of within 30 days after final site stabilization is achieved or after the temporary measures are no longer needed, unless otherwise authorized. Trapped sediment and other disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.

4.9.8 Maintenance

All temporary and permanent erosion and sediment control practices shall be maintained and repaired as needed to assure continued performance of their intended function.

4.10 Karst Areas and High Aquifer Vulnerability Areas

All stormwater management facilities and systems shall be designed and constructed to ensure that adequate treatment of stormwater runoff is provided prior to this runoff being discharged to the aquifer. The stormwater management facility and system shall be designed to prevent the formation of sinkholes. A map of the most recent Aquifer Vulnerability Zones can be obtained from the water management district.

In an effort to prevent untreated stormwater runoff discharging into the aquifer, stormwater management facilities and systems located in sensitive karst areas and areas of High Aquifer Vulnerability as delineated by the appropriate water management district shall adhere to the minimum following design standards:

- A minimum of 3 feet of unconsolidated soil material is required between the surface of the limestone bedrock and the bottom and sides of the stormwater management facility. The Public Works Director or designee shall approve the type of excavation and backfill material that will be used to meet these criteria.
- Stormwater management facilities shall be designed to be as shallow as possible with horizontal bottoms. Deeper areas shall not be allowed in the bottom of the facility unless approved by the Public Works Director or designee.
- To prevent the formation of sinkholes, the maximum facility depth shall be ten (10) feet.
- The stormwater management facility side slopes, bottoms and areas adjacent to the facility that were disturbed or altered during construction shall be fully vegetated and stabilized.
- All fill material used onsite shall be free of phosphatic Hawthorn Group sediments or other phosphorous rich materials that may leach phosphorus causing surface water quality degradation and lake eutrophication.
- Any excavation that would lead to exposure of Hawthorn Group sediments or other phosphorus rich materials that could leach and adversely impact groundwater or surface water shall be mitigated by covering, backfilling or using other techniques to prevent phosphorus leaching.
- Utility lines shall not be installed beneath stormwater basins in karst sensitive areas unless approved by the Public Works Director or designee and GRU. Any lines for temporary irrigation of vegetation in and around stormwater management systems shall be installed to minimize excavation in karst sensitive areas.

4.11 Floodplains and Floodways

In general, a loss of onsite floodplain storage will result in an increase in the offsite floodplain. As such, developments that encroach into a 100 year floodplain as designated by FEMA and the City of Gainesville, or any other determination by a jurisdictional authority shall demonstrate that the loss of onsite storage will not cause adverse offsite impacts to the floodplain. Additionally, the base flood elevation and the finished floor elevations for existing and proposed structures must be identified for projects located within the floodplain. Any development within a 100 year floodplain shall not increase the base flood elevation. No permanent structures or fills shall be allowed in the 10-year flood channel except structures and fills designed for flood prevention and control, streets, bridges and sanitary sewer lift stations and utility lines. Structures that are permitted in the 10-year flood channel shall demonstrate that no adverse impacts result from placing the structure within the 10-year flood channel (i.e., there is no increase in the elevation and limits of the 10-year flood channel or floodplain and no changes to the upstream or downstream 10-year flood channel or floodplain).

4.12 Finished Floor Elevations

Finished-floor elevations of structures adjacent to or that could potentially be impacted by the stormwater management facility shall be elevated at least one foot above the design high water elevation or base flood elevation (whichever is higher) so that the structure is adequately protected from a basin overtopping event. All stormwater

management systems shall be evaluated for the 100 year critical storm event to establish the minimum finished floor elevation.

4.13 Berms and Dams

All stormwater basins that are created by damming or berming shall be designed with a minimum of 12 inches freeboard.

A slope stability analysis shall be performed by a registered Professional Engineer on embankments which may pose a threat to public safety. A stability analysis shall also be performed on embankments greater than 6 feet tall or embankments that are directly upstream from a structure, public facility or other floodwater sensitive facilities. Documentation of the slope stability factor shall be provided with the stability analysis. Seepage through the berm or dam and erosion should be of major concern when specifying fill soil type, placement methods, and compaction. Field density tests shall be required by the Public Works Director or designee and these tests shall be made in accordance with FDOT standards and reported in writing to the Public Works Director or designee.

4.14 Maintenance Access and Responsibility

Reasonable maintenance access to all stormwater management facilities shall be provided. The maintenance path shall have a minimum cleared width of 5 feet, a maximum slope of 8H:1V, and be stabilized with grass. Stormwater management facilities within subdivisions or that are maintained by the City shall provide a minimum cleared maintenance path width of 15 feet.

The entity responsible for all maintenance on the stormwater structures and facilities shall clearly be identified through a letter to the Public Works Department Director, the subdivision plat or the approved site plan.

4.15 Slopes

All sloped areas within stormwater basin and swales/ditches shall be sodded or planted. Slopes steeper than 4:1 shall be pinned. Basins are encouraged to be constructed with no parallel sides.

4.16 Retaining Walls

The following requirements apply to retaining walls or near-vertical soil retaining structures used to form stormwater management facilities or portions of stormwater management facilities:

- Fencing or protective barriers may be required as determined by the Public Works Director or designee.
- The wall shall be designed with materials that prevent sediment seepage into the stormwater management facility and that do not require regular maintenance to properly function. Railroad ties, wooded planks, and other similar materials should not be used within stormwater management facilities.

- Sufficient access for maintenance equipment is required in accordance with the requirements of this chapter.

4.17 Tailwater Conditions

Tailwater impacts to outfall/outlet structures shall be evaluated as part of the design process. Guidance on accounting for tailwater impacts can be found in the FDOT Drainage manual.

4.18 Geotechnical Requirements

All basins shall require geotechnical borings. Documentation of the geotechnical parameters should be submitted to the City by a licensed geotechnical engineer. Methods of testing should be done in accordance with the appropriate water management district standards (SJRWMD Permit Information Manual or the SRWMD Applicant's Handbook Volume II). The number of borings required shall be in accordance with Section 26.4 of the SJRWMD Applicant's Handbook: Regulation of Stormwater Management Systems Chapter 40C-42 F.A.C.

4.19 Dry Stormwater Basins

All dry (retention and detention) stormwater basins shall be designed in accordance with the LOS criteria of the appropriate water management district (Table 4-2 and SJRWMD Permit Information Manual or SRWMD Applicant's Handbook Volume II).

4.20 Wet Detention Basins

All wet detention basins shall be designed in accordance with the LOS criteria of the appropriate water management district (Table 4-2 and SJRWMD Permit Information Manual or SRWMD Applicant's Handbook Volume II). Wet detention basins shall be sodded to the normal high water level in the basin at the time of construction.

4.21 Underdrain Systems

All underdrain systems shall be designed in accordance with the appropriate water management district standards (SJRWMD Permit Information Manual or SRWMD Applicant's Handbook Volume II).

4.22 Exfiltration Systems

All exfiltration systems shall be designed in accordance with the appropriate water management district standards (SJRWMD Permit Information Manual or SRWMD Applicant's Handbook Volume II).

4.23 Swales

All swale systems shall be designed in accordance with the LOS criteria of the appropriate water management in Table 4-2 and the SJRWMD Permit Information Manual or SRWMD Applicant's Handbook Volume II.

4.24 Wetland Treatment Systems

All wetland treatment systems shall be designed in accordance with the LOS criteria of the appropriate water management district (Table 4-2 and the SJRWMD Permit Information Manual or SRWMD Applicant's Handbook Volume II).

4.25 Technical Standards

The minimum Time of Concentration to be used in stormwater calculations shall be 6 minutes.

The maximum length for overland flow shall be 100 feet, per FDOT Drainage Handbook Hydrology 2.2.2.1.A.

The area of the top elevation of all proposed stormwater management facilities shall be considered to have a $CN = 100$ or $C = 0.95$ for applicable stormwater calculations.

All percolation rates shall have a Factor of Safety of 2 applied for all stormwater calculations and modeling.

4.26 Additional Construction Design Requirements

All stormwater management facilities shall be landscaped in such a manner as to promote safety and to integrate with the overall design of the site.

Insofar as possible, the contour of stormwater management facilities should promote aesthetically pleasing site design and increased wildlife habitat.

The design and operation of stormwater management facilities shall discourage the breeding of mosquitoes.

The design of stormwater management facilities shall promote joint uses for habitat, open space, passive recreation, and the establishment and integration of trails.

Stormwater management facilities shall be designed to minimize the need for maintenance in accordance with this manual.

4.27 Stormwater Management Utility

All development plans shall include on the cover sheet or by separate letter to the Public Works Department the following information under the heading "Stormwater Management Utility Data":

- Total Impervious Area
- Total Semi-Impervious Area (i.e. grass parking)
- Table containing the following information for each stormwater management facility:
 - SMF ID
 - Lowest Discharge Elevation (ft)
 - Retention Volume Below Lowest Discharge Elevation (cf)
 - Retention Area at Lowest Discharge Elevation (ft)

Chapter 5 ROADWAY DESIGN

5.1 Geometrics

The geometric design of a roadway shall consider the needs of drivers, bicyclists, and pedestrians implementing ‘complete streets’ elements. Opportunities shall be maximized to promote interconnectivity of modes. Where feasible, particularly in conjunction with land development or redevelopment, the design shall incorporate pedestrian scale blocks to create a gridded transportation network and facilitate the movement of all users. Geometrics shall be designed in accordance with the Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways “*Florida Greenbook*,” the guidance of the Institute of Transportation Engineers “*Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*,” and other provisions contained herein. In the event that it is necessary to deviate from these standards, a design variance or exception is required.

5.2 Intersections

Intersection design shall provide:

- Safe and convenient operation for all road users, including cyclists and pedestrians
- Proper accessibility for pedestrians with special needs
- Adequate maneuvering for design vehicles
- Resolution of conflicts between competing movements
- Reasonable delineation of vehicle paths
- Adequate visibility of conflicting traffic
- Storage for normal queue of vehicles
- Appropriate access management application
- Necessary regulatory, warning and informational messages for all road users
- Uniformity of treatment with similar locations

The Florida Greenbook shall provide the minimum standards for different types of intersections. Additional provisions for the design of intersections may apply depending upon the context.

5.2.1 Roundabouts

Roundabouts shall be designed in accordance with the Florida Roundabout Guide. A roundabout shall consist of a circulating roadway around a raised central island. Other components shall include:

- Landscaped area in central island
- Non-mountable curb (i.e. Type D) around perimeter of landscaped area
- Mountable curb & gutter (i.e. Type E) around perimeter of central island
- Raised splitter islands
- Streetscape elements including clay bricks
- Landscaping meeting scale of roundabout

- Safe accommodations for bicyclists and pedestrians. This can be accomplished with bike access ramps that can provide an alternative for bicyclists to get off the bike lanes and onto the sidewalk or multi-use paths before going through the roundabout. An example of this can be seen in Appendix B.

See Appendix B for a typical roundabout detail. This detail should be used for guidance on the types of curb permitted in the roundabout, types of pavement and material allowed in the roundabout and recommended pedestrian and bicycle facilities through the roundabout. Dimensions and radii of the roundabout shall be in accordance with the Florida Roundabout Guide.

5.3 Pavements

5.3.1 Flexible Pavement

Flexible pavements are to be evaluated and designed in accordance with the FDOT Flexible Pavement Design Manual and FDOT Design Standards index 514. Additional provisions for the design of flexible pavements are as follows:

- A typical flexible pavement design consists of stabilized subgrade, base, and asphalt pavement. Roadway pavement materials shall be FDOT approved and from FDOT approved sources.
- Asphalt Concrete shall be Superpave only.
- Graded aggregate or crushed concrete base materials are strongly encouraged.
- Limerock bases will require roadway underdrains in all areas of subgrade where ground water may rise to within 12 inches of the bottom of the base material or in undercut areas where ground water may infiltrate or accumulate in the stabilized subgrade. Underdrains shall meet the requirements of Section 10.8.4.
- Subgrade materials shall be Type B Stabilization (LBR 30 or 40).
- Friction courses should be used to improve skid resistance on roads having an ADT of 3,200 or more and a Design Speed greater than 35 MPH. Friction courses may be required in areas of steep vertical slopes.
- The minimum flexible pavement design should include: 2" SP 9.5 Asphalt; 6" base and 12" stabilized subgrade.
- Asphalt trails and multi-use paths shall be constructed to the following specifications: 1.5" of SP 9.5, 6" Limerock Base (LBR100) and 12" Stabilized Subgrade.

5.3.2 Rigid Pavement

The use of concrete (rigid) pavement may be used in lieu of flexible pavement if its structural capacity meets or exceeds the values for the minimum flexible pavement sections. Like flexible pavement, concrete pavement will require an increase of its structural capacity if warranted by the type and amount of vehicular traffic loading. The design of rigid pavement shall conform to the requirements of AASHTO Interim Guide for Design of Pavement Structures 1972, Chapter III (Revised 1981).

5.3.3 Alternative Design

Alternative pavement designs such as brick shall conform to the same structural standards as the minimum flexible pavement design. A 6" concrete base constructed beneath the brick ensures the structural standards are met.

5.3.4 Additional Criteria

More stringent structural standards shall apply when warranted by the type and amount of vehicular loading.

5.4 Utilities

Utilities shall be designed in accordance with the FDOT Utility Accommodation Manual (with City of Gainesville Public Works Department substituted for FDOT and as modified by the Public Works Department in conjunction with the utilities), GRU specifications and the Florida Greenbook.

Any utility work within the ROW will require the necessary permits from the Public Works Department (Right-of-Way use and/or Maintenance of Traffic permits). Utility work will be coordinated with any ongoing or future roadway and drainage projects to the extent possible. Some exceptions will apply for emergency work. Approved Utility Work Schedules (UWS) will be required for all utility work proposed in conjunction with any roadway project. Utility owners will be responsible for maintaining as-builts on all utility work in the public ROW.

Road, trail and sidewalk surfaces newer than 5 years old shall not be open cut. Any allowable open cut shall be repaired with in kind materials or better. The repair method and size of the patch will be at the discretion of the Public Works Director or designee. Open cuts will be allowed for emergency situations. Exemptions to this may be approved by the Public Works Director or designee.

5.5 Drainage

All roadway projects must adhere to the design criteria established in Chapter 4 – Stormwater Management. Inverted crowned roads are not permitted except in special cases, such as alleyways, as approved by the Public Works Director or designee.

5.6 Sidewalks, Bicycle Lanes, Trails, Shared Paths and ADA Ramps

5.6.1 Sidewalks, Bicycle Lanes, Trails and Shared Use Paths

Sidewalks, bicycle lanes, trails and shared use paths shall be designed in accordance with the Florida Greenbook, FDOT Indices and CRA streetscape standards when applicable. All markings and signage shall be in accordance with the MUTCD.

In areas of high pedestrian traffic the sidewalk width should be maximized to provide adequate accommodation to all users.

The minimum sidewalk width to avoid point obstacles is 42 inches. The sidewalk should have a 5 foot long taper down to 42 inches, be at 42 inches for 5 feet and then taper back to sidewalk width in 5 feet.

5.6.2 ADA Ramps

ADA ramps and detectable warnings shall be designed in accordance with the ADA Standards for Accessible Design, the Florida Building Code, Florida Greenbook, FDOT Indices, and CRA streetscape standards (when applicable) except for the following provisions:

- Detectable warning surfaces shall contrast visually with adjacent walking surfaces either light-on-dark or dark-on-light.
- Detectable warning surface for the ramps shall consist of interlocking 4x8 inch ADA detectable warning surface bricks having a minimum depth of 2 inch with raised truncated domes with a diameter of 0.9 inch (23 mm) minimum and 1.4 inches (36 mm) maximum, a top diameter of 50 percent of the base diameter minimum to 65 percent of the base diameter maximum, and a height of 0.2 inch (5 mm). The truncated domes shall have a center-to-center spacing of 1.6 inches (41 mm) minimum and 2.4 inches (61 mm) maximum, and a base-to-base spacing of 0.65 inch (17 mm) minimum, measured between the most adjacent domes in a square grid.
- Bricks are to meet "ADA Standards for Accessible Design" Section 705.1 and contract requirements.
- Brick are to be laid in a 2x2 basket weave pattern, flush with the finish grade of the ramp surface, and have gaps between 1/16 and 1/8 inch.
- Brick shall be cut with a masonry saw only and used in pieces no smaller than 1/3 of a whole brick without City approval.
- FDOT Index 304, ADA Curb Ramp Type "CR-L" shall be used only if absolutely necessary and require approval from the Public Works Director or designee.

Typical brick details are shown in Appendix B.

5.7 Traffic Signals

Traffic Signals shall be installed in accordance with appropriate MUTCD, FDOT, and MTPO Standards. The Developer shall be responsible for all costs associated with the installation of new or modification of existing traffic signal(s). All materials provided shall be on the FDOT Approved Products List (APL). If any proposed streets are to be dedicated to the city for maintenance, the Public Works Department will assume maintenance of the pavement markings at final acceptance.

New traffic signalization or modification of an existing traffic signal shall include, but not be limited to:

- Signed and sealed engineering drawings of the proposed modifications or new signal(s).
- Actual construction, modification or installation of said improvements. These improvements shall be made by an FDOT approved/certified traffic signal contractor.
- Signed and sealed traffic signal timings to accommodate the changes or new signals. This shall include, but not be limited to, basic controller timings, clearance interval calculations, coordination plans and base day plans. If significant changes are

implemented, the developer may be required to provide new coordination plans for the entire corridor. This would be limited to the signal system that the new or modified signal(s) is part of.

- Permitting by the appropriate authority(ies) including the City, Alachua County Public Works Department and FDOT.
- Final inspection and acceptance by the City.

5.7.1 Additional City Standards

The following local standards will be implemented above and beyond MUTCD and FDOT standards:

- All supplied traffic signal and pedestrian heads shall be all LED (light emitting diode).
- Countdown pedestrian signal heads shall be utilized.
- All new construction shall be mast arms with horizontally mounted traffic signal heads.
- The mast arms shall be painted to meet federal standard 595B utilizing color # 27038 – black semi-gloss.
- Traffic signal heads shall be mounted on articulating astro-brackets with terminal compartments.
- Emergency vehicle pre-emption shall be installed for each approach direction. 3M Opticom 700 series with a detector for each approach shall be provided to meet this requirement.
- The traffic signal equipment supplied shall be compatible with the existing Gainesville Traffic Management System. The controller and cabinet shall be 100% compatible with the Naztec Streetwise System.
- When providing protected/permissive left turn phasing a 4 section horizontal flashing yellow arrow head shall be centered in the left turn lane..
- When one of the approach directions is to be a privately maintained roadway/access point, the developer shall utilize video detection for vehicle detection on all approaches.
- Traffic signals within or adjacent to existing traffic signal systems shall be interconnected with a minimum 2” underground conduit and 72-count fiber optic cable. The interconnect communications equipment shall be considered part of the traffic signal controller and cabinet equipment and will be provided by the developer at the developer’s expense.
- If traffic signal interconnect is to be provided, fiber optic traffic signal interconnect shall be provided. The developer shall be responsible for providing the interconnect via GRUComm. The terms and agreement shall be the same as the interconnect that GRUComm provides the Public Works Department via FDOT.
- If the intersection being modified or rebuilt is the intersection of 2 state highways or a state highway and a county road, a traffic signal video-monitoring camera shall be installed. This camera shall be a pan-tilt-zoom camera that matches the existing traffic monitoring cameras that the city currently has installed and shall be 100% compatible with our existing system.

5.7.2 Mast Arm Overhead Street Name Signs

These notes pertain to overhead street name signs installed on traffic signal projects:

- Sign sizes shall be a minimum of 18 inches by 54 inches to a maximum of 18 inches by 72 inches. The size of the sign shall be increased in 6 inch increments only.
- The desired letter size shall be 10.67 inch upper case and 8 inch lower case. Type “E” modified should be subject to street name using this size. When the street name consists of ordinal numbers, the suffix shall be Series D and one-half the height of the number, mounted along the upper extreme of the number.
- Sheeting for overhead street names shall be Type III retro reflective for legends, border and background.
- Avoid abbreviation. If absolutely necessary, use the following (with approval of the city):
 - Avenue – AVE
 - Place – PL
 - Road – RD
 - Lane – LN
 - Boulevard – BLVD
 - Street – ST
 - Terrace – TERR
 - Drive – DR
- To the extent possible, sign panels will be attached to the right of the outside most traffic signal head.
- The developer shall be responsible for verifying the messages with the City of Gainesville prior to fabricating overhead street name signs. Shop drawings shall be required.

5.8 Traffic Signs

Traffic Signs shall be fabricated and installed in accordance with appropriate MUTCD and FDOT Standards. All materials provided shall be on the FDOT’s Approved Products List (APL). The developer shall be responsible for all costs associated with the fabrication and installation of all traffic control signs. If any proposed streets are to be dedicated to the city for maintenance, the Public Works Department will assume maintenance of the traffic control signs at final acceptance.

The Contractor or Developer shall be responsible for all costs associated with the installation of all pavement markings.

5.8.1 Additional City Standards

The following additional specifications shall apply:

- Reflective sheeting shall be of high intensity or greater reflectivity materials with the exception of regulatory and warning signs. Regulatory and warning signs shall be of prismatic reflectivity or greater.
- Traffic signs shall be mounted on a uni-strut square post (or equivalent as approved by the Public Works Department). If the signpost is to be painted, it shall be powder coated and painted black.
- Street name signs shall adhere to the following minimum standards:
 - The sign blank shall be a 0.080 gauge 30 inch by 9 inch aluminum blank (4 blanks per intersection).

- The background color for public street name signs is green.
- There shall be a one-half inch white border around the perimeter of the sign.
- The letters shall be 6 inch white letters – series “B”.
- Superscript letters shall be 2 ¾ inch white letters – series “C” (e.g. – N.W. 4TH Street – the “TH” would use the 2 ¾ inch letters – series “C” and all other lettering would be 6 inch series “B”). The top of all capital and superscript letters shall be aligned.
- Street name signs shall be centered and bolted to the uni-strut square post. The signs will be back to back with the post between them. The signs shall be riveted together on either end. The rivet shall be in the center of the sign and one-half inch in from the outer end.
- Street name signs shall be attached to the post, both above the stop sign but with the primary street sign on top of the post and the cross (secondary) street sign attached below the primary street sign.
- Street name signs for private streets shall meet the same design criteria with the exception of color scheme. The color scheme for private streets shall be the reversal of public streets. Private street name signs shall have a white background with a green border and green letters.
- Special circumstances or unusual layout may dictate additional street name direction signs at the expense of the developer.
- All signs shall be bolted to the uni-strut post with stainless steel bolts and vandal proof stainless steel nuts.
- Additional warning or directional signs may be required. These signs will be identified during the permitting process.
- Historic street name signs shall adhere to the following minimum standards:
 - The sign blank shall be a 0.080 gauge 30 inch by 9 inch aluminum blank (4 blanks per intersection).
 - The background color for historic street name signs is black.
 - The letters shall be 4 ½ inch white letters – series “B”.
 - There shall be a one-quarter inch white border, or outline, one-quarter inch off the perimeter of the sign, leaving a one-quarter inch black border on the perimeter of the sign.
 - Superscript letters shall be 2 inch white letters – series “C” (e.g. – N.W. 4TH Street – the “TH” would use the 2 inch letters – series “C” and all other lettering would be 4 ½ inch series “B”). The top of all capital and superscript letters shall be aligned.
 - The historic street name shall be centered on the bottom of the sign, three-quarters of an inch under the new street name and one-quarter inch above the sign’s white border and shall be 2 inch letters – series “C”.
- To the extent possible, traffic control signs shall be installed to minimize the number of sign posts utilized. Street name signs shall be combined with stop signs or other traffic control signs at intersections.
- Sign post sleeve/tube installation requirements
 - For signs installed in concrete:*
 - A 6 inch long, 8 inch round, schedule 40 PVC pipe is to be buried so it is thru the entire concrete pour and each end is open and accessible.

- The top opening of the sign tube is to be flush with the surface of the sidewalk and empty of debris for the entire length.
- Duct tape shall be applied over the top prior to a post being installed so debris cannot enter the opening.
- The pipe shall be buried not driven into the ground.
- The pipe shall be installed before the concrete pour and the concrete poured around the pipe, leaving the top of the pipe exposed for sign installation.
- The party installing the pipe is responsible for getting utility locates prior to installation of the pipe and maintaining clearances to any buried utilities.

For signs installed in bricks:

- A 6 inch long, 8 inch round, schedule 40 PVC pipe is to be buried.
- The top opening of the sign tube is to be flush with the surface of the brick sidewalk and empty of debris for the entire length.
- Duct tape shall be applied over the top prior to a post being installed so debris cannot enter the opening.
- If a concrete base is poured for the bricks the PVC tube is to go the length of the bricks and the concrete so there is an opening of the tube at the top and one at the bottom below the concrete.
- The pipe shall be installed before the concrete pour and the concrete poured around the pipe, leaving the top of the pipe exposed for sign installation.
- The party installing the pipe is responsible for getting utility locates prior to installation of the pipe and maintaining clearances to any buried utilities.

5.9 Pavement Markings and Striping

Pavement Markings shall be installed in accordance with appropriate MUTCD and FDOT Standards. The developer shall be responsible for all costs associated with the installation of all pavement markings. All materials provided shall be on the FDOT's Approved Products List (APL). If any proposed streets are to be dedicated to the city for maintenance, the Public Works Department will assume maintenance of the pavement markings at final acceptance.

On streets classified as collector streets or higher, the developer shall provide thermoplastic pavement markings with reflective pavement markers. The thermoplastic pavement markings and reflective pavement markers shall not be installed until the pavement has cured for 30 days. The developer shall utilize traffic paint in the interim. Additionally, any street requiring centerline or edge line striping shall utilize thermoplastic pavement markings and reflective pavement markers.

Special pavement markings may be required in certain situations. Any special pavement markings shall be identified during the permit process.

The contractor or developer shall be responsible for all costs associated with the installation of all pavement markings.

5.10 Bridges and Other Structures

Structures shall be in accordance with the Florida Greenbook and FDOT Indices.

5.11 Transit Improvements

All transit improvements shall be built in accordance with the FDOT “Accessing Transit: Designing Handbook for Florida Bus Passenger Facilities” Version III, 2013.

5.12 Traffic Control

Traffic control shall be designed in accordance with the Florida Greenbook, FDOT Indices and MUTCD. All work including utility relocations shall be coordinated with the proposed roadway improvements and be included in the traffic control plan for the project. Safe accommodations for vehicles, bicyclists and pedestrians shall be provided at all times. Temporary pavement, detours, variable messaging, etc. shall be utilized to help maintain safety and connectivity in and around roadway projects. Permitting shall be in accordance with the requirements of Chapter 3 in this manual.

5.13 Landscape and Streetscape

Landscape and streetscape standards shall be in accordance with FDOT Indices, Florida Highway Landscaping Guide, Land Development Code and CRA standards where applicable. Landscaping and streetscaping designs shall be coordinated with utility separation requirements for the project.

In most cases, landscaping including trees shall be required or strongly encouraged on all roadway projects. Trees shall be selected as appropriate for the project and be approved by the City Arborist.

Streetscaping is also included in many of the City’s urban projects especially in the downtown area. Bricks shall be full size (4 inch by 8 inch by 2 ¾ inch) and made of clay materials. All brick pavements shall have a 6 inch concrete base and leveled on a one-half to one inch thick concrete finesbedding material. Acceptable brick colors, patterns and manufacturers are noted in Appendix B or as approved by the City.

5.14 Lighting

Lighting shall be designed in accordance with the Florida Greenbook, AASHTO Roadway Lighting Design Guide and City of Gainesville Lighting Standards. Light poles and fixtures in CRA Districts shall be provided in accordance with CRA standards. Lighting designs, including photometrics, shall be coordinated with GRU, Public Works Department and CRA where applicable and meet City standards.

5.15 Traffic Calming

Traffic calming devices shall comply with appropriate FDOT and MUTCD standards.

5.15.1 Speed Tables

Speed tables shall be designed in accordance with the Florida Greenbook and City of Gainesville standards as detailed in Appendix B.

5.15.2 Raised Intersections

Raised intersections shall be designed in accordance with the Florida Greenbook and City standards as detailed in Appendix B.

5.15.3 Other

Other traffic calming devices can be approved by the Public Works Director or designee on a case-by-case basis. Devices should calm traffic, be self-enforcing, be accessible by emergency vehicles, and should not create liability issues for the City.

5.16 Street Classification

Streets shall be classified based upon average daily traffic as follows:

Table 5-1. Street Classification

Class	ADT
Local	$\leq 1,200$
Minor Collector	$\leq 3,200$
Major Collector	$\leq 7,000$
Minor Arterial	$\leq 12,000$
Major Arterial	$> 12,000$

5.17 Parking (on-street)

Minimum dimensional standards are provided in Appendix B.

Chapter 6 SITE DESIGN

The criteria listed under this heading apply to site development which typically includes projects that are primarily outside of the public ROW and that do not have elements of a typical residential subdivision. The requirements listed in this section may be applied to all other types of development at the discretion of the Public Works Director or designee.

6.1 Driveways

Driveways shall be designed in accordance with the most recent FDOT Index and City standards. Driveways with sidewalk crossings shall meet current ADA standards for the length of the sidewalk crossing. Concrete sidewalk crossing shall be a minimum of 6 inches thick and have a 3,000 psi compressive strength. See Appendix B for a brick driveway ramp detail. All driveways shall be designed in accordance with the FDOT index.

6.2 Dumpster Pads

A minimum of 6 inch thick - 3,000 psi concrete shall be used for dumpster pads.

6.3 Parking (off street)

6.3.1 Dimensions

Minimum dimensional standards are provided in Appendix B.

6.3.2 Grading

Parking lots shall be graded to provide safe pedestrian and vehicle conditions while maintaining positive drainage into inlets and minimizing surface ponding. As a guideline, 8% maximum and 0.5% minimum slope shall be used in all areas where ADA requirements do not overrule local requirements.

6.3.3 Parking Lot Striping

Parking lot striping on hard surfaces shall be a minimum of 6 inches wide within the ROW and 4 inches wide on private sites. Striping color shall be white where ADA requirements do not apply.

6.3.4 Inlets

Inlets shall be located away from areas frequently traversed by pedestrians. Grates shall be safely traversable by all anticipated traffic including pedestrian, bicycle, wheelchair and vehicle.

6.3.5 Pipes

Pipe material specifications should conform to the requirements of the FDOT Standard Specifications for Road and Bridge Construction or, if not specified therein, to applicable ASTM standards. Utility pipes shall conform to GRU Material Standards.

6.3.6 Sidewalk/Curb Stops

All vehicular parking stalls shall be headed by a minimum 6 inch tall sidewalk or curb. Wheel stops or other similar structures are not allowed, but may be approved on a case by

case basis. The vehicle overhang should not obstruct a pedestrian route. The pedestrian access shall be in compliance with ADA standards. A minimum of 5 feet of open travel pedestrian area is encouraged.

6.3.7 Bicycle Parking

Bicycle parking shall be located in areas convenient to the primary building and in areas that require minimal effort to access. Dimensions of bicycles parking and types of material shall be in accordance with the Land Development Code.

6.3.8 Motorcycle Parking

Motorcycle parking shall be 4.5 feet wide and 8-ft deep and be located in areas convenient to the primary building. The surface shall consist of a hard material capable of withstanding the kickstand point load. Soft mix/low aggregate asphalt is not allowed in motorcycle parking areas.

6.3.9 Scooter Parking

Scooter parking shall be 3 feet wide and 6-ft deep and be located in areas convenient to the primary building. Each scooter parking stall shall be accessible from a minimum 3 foot wide aisle. The surface shall consist of a hard material capable of withstanding the kickstand point load. Soft mix/low aggregate asphalt is not allowed in scooter parking areas.

6.4 Public Sidewalks

Public sidewalks shall be constructed of a minimum 4 inch thick - class NS per FDOT Spec 347 for non-driveway areas and 6 inch thick - 3,000 psi concrete at driveway crossings. Brick pavers and other alternative materials used within the ROW shall include a 4 inch thick minimum concrete subgrade. ADA standards apply to all public sidewalks. See Appendix B for a brick detectable warning detail. Ramps at public sidewalks shall be in accordance with FDOT standards.

Chapter 7

TRAFFIC STUDY GUIDELINES

The City of Gainesville has adopted transportation policies that promote infill, urban redevelopment and transportation choices. It is the intent of these guidelines to provide information that ensures the maintenance of adequate traffic safety and operating conditions of the transportation system within City limits.

7.1 Study Thresholds

- Traffic Statement: Projects that generate less than 50 net new peak hour trips.
A Traffic Statement shall document driveway volumes, site trips per ITE Trip Generation and roadway information. A Traffic Statement may be included on the site plan and no other documentation is needed.
- Minor Traffic Study: projects generating between 50 and 99 peak hour trips.
- Major Traffic Study: projects generating 100 or more peak hour trips.

7.2 Required Information

The required information to be included in the traffic study is listed below. For Minor Traffic Studies the intersection analysis requirement is waived, unless required by the Public Works Department due to special circumstances in the area.

7.2.1 Project Description

- Type of development (e.g., standard subdivision, commercial/retail, office, TND, mixed use, etc.), size (acres, etc.) and number of units as appropriate for the project (dwelling units, square feet, etc.).
- Expected build-out year.
- Access
 - Identify vehicular, transit, bicycle, and pedestrian access to the development from the public roadway system.
 - Identify proposed connections (including cross-access or joint driveways) to existing and future adjacent developments.
 - Provide location map and figure illustrating the adjacent roadway network and all site access points.
- Trip generation
 - Calculate average daily, AM and PM peak hour trip generation according to the latest version of the ITE Trip Generation Manual;
 - If appropriate, document any unique trip generation characteristics of the project;
 - Document calculation of internal capture and pass-by trips, including assumptions and methodology used (if using TIPS software, provide print outs of worksheets).
- Trip Assignment
 - Calculate directional distribution of project traffic and state methodology used (GUATS, observation of traffic at nearby developments, based on directional distribution of existing traffic, etc.). Data obtained from other developments should be based on an average using a minimum of 2 days of manual counts (Tuesday, Wednesday and Thursday only).

- Assign peak hour project traffic to connection points and determine build out peak hour enter/exit traffic.
- Assign peak hour project traffic to the roadway system.

7.2.2 Study Area

- The City (Public Works and Planning and Development Services Departments) will specify the boundary of the Study Area. In general, for Minor Traffic Studies the study area shall include roadway segments wholly or partially within one-half mile of project access points, or to the nearest intersecting major street, whichever is greater. For Major Traffic Studies the study area shall include all roadway segments where the project traffic is 5% or greater than the adopted Maximum Service Volume (MSV) as reported on the latest MTPD Multimodal LOS Report; at a minimum, the one-half mile requirement applies. For projects within one-quarter mile of the unincorporated area, or on or within one-quarter mile of a County maintained roadway, the Alachua County Public Works Department may offer input on the study area boundaries.
- Provide listing of average daily, AM peak hour and PM peak hour traffic, determination of peak hour traffic with directional counts and any other unique traffic volume traffic parameters that impact the project. The City will specify acceptable dates for traffic counts and how many days of the week the counts must be performed. Counts may not be taken on Mondays, Fridays, holidays, significant events (e.g. Gatornationals or holiday shopping season) or during school breaks (UF, Santa Fe College, and/or the public schools).
- Identify any signalized intersections(s) to be studied. The Study may require a Highway Capacity Manual level of service analysis (operational analysis).
- Prepare condition diagram for each signalized intersection showing major features. The 8 ½ inch signal drawings available in the Public Works Department are satisfactory for this use.

7.2.3 Analysis of Conditions

- Significant Land Uses/Activities within one-half mile of Project Site
 - Identify all public and private schools; significant commercial and/or mixed use areas; recreational facilities and any other significant land uses/activities; and,
 - Identify any approved, but unbuilt projects, which may impact traffic conditions in the area. Projects to be included as background or reserved traffic shall be obtained from the Planning and Development Services Department and, as needed, Alachua County Public Works Department.
- Transportation System Serving the Project Site
 - Identify all arterial and collector streets within one-half mile of project, as defined by the City's Comprehensive Plan and list the governmental jurisdiction(s) responsible for maintenance.
 - Identify Regional Transit System routes serving project and locate bus stops (indicate whether a bus shelter(s) exist at the stop) within one-quarter mile of the project.
 - Identify streets with sidewalks (one-side/both sides) within one-quarter mile of the project.

- Identify any bicycle facilities (bike lanes, rail trails, wide curb lanes, etc.) within one-quarter mile of the project.
- Identify any gaps in sidewalk and/or bicycle facilities within one-quarter mile of the project.
- Programmed Transportation Modifications
 - List proposed transportation system modifications in the study area as stated in the adopted 5-Year Transportation Improvement Plan (TIP) and the City's or Alachua County's Capital Improvement Element (as appropriate).
 - List any proposed and/or scheduled transportation system modifications that will impact the project that are not in the TIP.
- Growth Rates
 - Use the City of Gainesville, Alachua County and Florida Department of Transportation (FDOT) counts to determine growth trends. For instances where there is no data available to establish the growth rate, a standard 2% growth rate shall be used. For roadways having a negative growth rate, a 1% growth rate shall be used.
- Impacts on Roadway Segments and Intersections
 - Calculate existing and future (with development) traffic volumes on roadway segments and at connections to the public roadway system expressed in average daily traffic and peak hour traffic. Roadway segments shall be consistent with the MTPO Multimodal LOS Report segmentation.
 - Provide figures that illustrate existing and future turning movement counts (future shall include background, project and total traffic)
 - Calculate future level of service at affected roadway segments and intersections.
 - If required, perform warrant analysis for traffic control devices at affected unsignalized intersections.
- Summary of Transportation System Impacts
 - Provide summary of the project impacts on the public roadway system.
 - Provide summary of the project's impacts on the transit, pedestrian and bicycle system.
 - Identify any needed roadway modifications which may be required (i.e., turn lanes, medians, traffic separators, or traffic control devices).
 - Any additional information requested in the methodology letter.
- Coordination with other Agencies and Local Governments
 - Four (4) signed and sealed (by a Florida P.E.) original copies of the report must be submitted to the City of Gainesville. If the development is on a County-maintained road or within one-quarter mile of either a County-maintained road or the unincorporated area, one additional copy of the traffic study report must be submitted to the Alachua County Public Works Department (or submit an extra copy to the City for distribution to the County). One additional copy is required for State Roads.
 - All supporting documentation shall be provided in the Appendix, including but not limited to: copy of the signed methodology letter, copies of required traffic counts, copies of all analysis performed utilizing various engineering software programs (such as Highway Capacity Software, Synchro, TIPS, etc), warrant studies, growth trends.

- All pages (including maps, diagrams, figures, and appendices) shall be numbered.

7.3 Methodology Letter

Prior to the preparation of the traffic study, the project's Traffic Engineer and the City of Gainesville must agree to a methodology letter. For projects impacting County roads or within one-quarter mile of the unincorporated area, the City will consult with the Alachua County Public Works Department concerning the required methodology. For projects impacting State Roads, the City will coordinate with FDOT. The methodology letter will outline key components of the traffic study (roadway segments and intersections to be studied, and unusual and/or unique conditions the study must address, etc.) A key component of the methodology letter will be a statement addressing the type and duration of field data (machine traffic counts, manual traffic counts, directional distribution counts, etc.) the project's traffic engineer must obtain. This includes stating the time of year and days of the week that are appropriate for obtaining the traffic data.

The project's Traffic Engineer and representatives from the City's Public Works and Planning and Development Services Departments must sign the methodology letter prior to commencement of the traffic study.

Chapter 8

SUBMITTAL REQUIREMENTS

The following is a list of components that may be included for various submittals. Requirements are deemed by type of project and stage of submittal.

8.1 Site Plans

8.1.1 Conceptual Review

- Approximate topographic map (USGS or Regional Planning Council maps may be used) showing:
 - Existing creeks
 - Ditches
 - Above ground utilities
- A statement identifying the location and elevation of any flood zones.
- A statement as to whether the project will be affected by the creek setback regulations.
- A general description of how the drainage will be handled, including a soils statement (SCS acceptable) and the general area of the site to be used for stormwater management facilities.
- Conceptual review submittals shall meet applicable requirements in the City of Gainesville Code of Ordinances Sec. 30-160 - Submittal Requirements.

8.1.2 Development Plan Review

- The coordinate system for all record drawings shall be Florida State Plane Coordinates, NAD 83 Zone North US Survey feet. Vertical coordinates shall be referenced to the NAVD 88 datum with elevations given in US Survey feet unless otherwise approved by the City Surveyor.
- Drainage narrative including the following:
 - Explanation of all assumptions.
 - Method of analysis with calculations.
 - Soil boring results, if necessary.
 - Stormwater Management Utility summary sheet.
 - Signed and sealed by a professional engineer.
- Drainage plan including the following:
 - Typical sections and details of all drainage facilities.
 - Specifications of construction.
 - Complete construction notes.
 - Signed and sealed by a professional engineer.
- Grading and paving plan, including horizontal control, elevations, complete notes and specifications covering construction (this can be combined with the drainage plan).
- Sedimentation control plan must be submitted, if appropriate, or a statement must be on the plans that one is not required.
- A statement outlining the status of State environmental permits.
- Final review shall meet applicable requirements in the City of Gainesville Code of Ordinances Sec. 30-160 - Submittal Requirements and Sec. 30-166 - Contents of Final Development Orders.

- The following notes should be added to the plans if work is required to be done within the City, County or State ROW:
 - City Right-of-Way:

“The method and manner of performing the work and the qualities of material for construction within the ROW shall conform to the requirements specified by the Public Works Department.”

“No work shall be done nor materials used in the ROW, without inspection by the Public Works Department (334-5070), and the Contractor/Developer shall furnish the Department with every reasonable facility for ascertaining whether the work performed and materials used are in accordance with the requirements and intent of the plans and specifications.”

“The Public Works Department reserves the right to modify the proposed work within the ROW to ensure compatibility with existing improvements. Such modification costs shall be borne by the Developer.”
 - County Right-of-Way

“The method and manner of performing the work and the qualities of material for construction within the County ROW shall conform to the requirements specified by the Alachua County Public Works Department.”

“No work shall be done nor materials used in the ROW , without inspection by the Alachua County Public Works Department (462-2147), and the Contractor/Developer shall furnish the Department with every reasonable facility for ascertaining whether the work performed and materials used are in accordance with the requirements and intent of the plans and specifications.”
 - State Right-of-Way

“The method and manner of performing the work and the qualities of material for construction within the ROW shall conform to the requirements specified by the Public Works Department and the Florida Department of Transportation (FDOT).”

“No work shall be done nor materials used in the City and State ROW, without inspection by the Public Works Department (334-5070), and FDOT respectively, and the Contractor/Developer shall furnish each Department with every reasonable facility for ascertaining whether the work performed and materials used are in accordance with the requirements and intent of the plans and specifications.”
- Electronic copies of all reports, calculations, and plans shall be provided to the Public Works Department in .pdf format for all requested reviews.

8.2 Subdivision Developments and Capital Improvement Plan (CIP) Roadway Projects

The following is a list of standardized sheets required for Plans Submittal. Sheets may be omitted if those elements are not present in the project.

- Plat map / Right-of-Way map
- Construction plans

- Key sheet

The key sheet shall meet all applicable requirements stated in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 3 – Key Sheet. Any elements of the key sheet mentioned in the manual specific to the FDOT, shall be replaced with the corresponding element specific to the City of Gainesville.
- Subdivision plat
- General notes
 - Identify the benchmark datum.
 - Specify the source in which construction shall be in accordance with.
 - List stakeholder contacts the contractor shall coordinate with including utilities and other government agencies.
 - Include any other notes specific to the project to ensure successful completion by the contractor.
- Certified topographic and boundary survey
 - Surveys shall meet the minimum technical standards of the current version of the Florida Administrative Code Chapter 5J-17.
 - The coordinate system for all record drawings shall be Florida State Plane Coordinates, NAD 83 Zone North US Survey feet. Vertical Coordinates shall be referenced to the NAVD 88 datum with elevations given in US Survey feet.
 - Survey approval shall follow the procedure set forth in the City of Gainesville Code of Ordinances, Sec. 30-185 - Procedure for Approval of Final Plat.
- Summary of quantities
 - Summary of quantities sheet shall meet all applicable requirements stated in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 7 Summary of Quantities. A summary of quantities will not be required for a private subdivision.
- Summary of drainage structures
 - Summary of drainage structures sheet shall meet all applicable requirements stated in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 8 Summary of Drainage Structures and Optional Materials Tabulation.
- Master drainage map / Sub-division or roadway map
 - Master drainage map sheet shall meet all applicable requirements stated in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 5 Drainage Map and Bridge Hydraulic Recommendation Sheet.
- Roadway typical sections
 - Roadway typical sections sheets shall meet all applicable requirements stated in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 6 Typical Sections.
- Roadway soil survey and auger borings
 - Roadway soil survey and auger borings sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 17 Soil Survey.
- Special details

- Special details sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 16 Special Details.
- Plan and profile sheets
 - Plan and profile sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 10 Roadway Plan and Roadway Plan-Profile.
 - Where appropriate, the horizontal scale shall be 1 inch = 20 feet and the vertical scale shall be 1 inch = 2 feet.
- Utility plans
 - Utility plans sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 20 Utility Adjustments.
 - Symbols used shall be consistent with the current version of the FDOT Design Standards Index No. 002 Standard Symbols.
 - Provide sufficient information to clarify potential conflict locations, including pipe slopes, elevations, etc.
- Roadway cross sections
 - Roadway cross section sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 18 Roadway Cross Sections.
 - Where appropriate, the horizontal scale shall be 1 inch = 10 feet and the vertical scale shall be 1 inch = 5 feet.
 - Include volumes and end areas for cut and fill.
- Signing and marking plans
 - Signing and marking plan sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 23 Signing and Pavement Marking Plans.
 - The horizontal scale shall be the same as the scale chosen for the plan and profile sheets.
- Drainage structures
 - Drainage structures sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 14 Drainage Structures.
- Drainage details
 - Shall include details of major roadway connections, urban and rural turnouts, stormwater management facilities, and concrete structures such as box culverts and retaining walls.
 - Shall include details of special drainage structures which include the rebar, form work design, and specials construction specifications such as joints and connections.
 - Include any other details not covered in other sheets that contribute to successful drainage in the project.
- Stormwater pond plans
 - Include dry and wet stormwater basins and details including control structures, slopes, outfalls, underdrain systems, and stabilization information.

- Stormwater pond cross sections
 - Include cross sections at spacing sufficient to determine pond performance.
 - Where appropriate, the horizontal scale shall be 1 inch = 10 feet and the vertical scale shall be 1 inch = 5 feet.
 - Include volumes and end areas for cut and fill.
- Traffic control plans
 - Traffic control plan sheets shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 19 Temporary Traffic Control Plan.
- Landscaping and streetscaping plans
 - Landscaping and streetscaping plans shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 26 Landscape Plans.
- Stormwater pollution prevention plan
 - Shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 28 Stormwater Pollution Prevention Plan.
- Lighting plans
 - Shall meet all applicable requirements in the current version of the FDOT Plans Preparation Manual, Volume 2, Chapter 25 Lighting Plans.
 - The horizontal scale shall be the same as the scale chosen for the plan and profile sheets.
 - Include a table that shows the photometric calculations, including average maintained luminance and uniformity ratio compared to the chosen design standard values.
- Irrigation plans
 - Irrigation plan sheets shall show the location and type of irrigation equipment to be installed to support the landscaping and streetscaping plans.
 - The horizontal scale shall be the same as the scale chosen for the plan and profile sheets.
 - Include a summary of quantities table specific to irrigation items.
 - Private subdivisions do not require a summary of quantities.
- Electronic copies of all reports, calculations, and plans shall be provided to the Public Works Department in .pdf format for all requested reviews.

8.3 As-built Plans and Record Drawings

All work within or on City owned and maintained facilities, ROW or easements will require as-built plans. As-built plans should show the constructed conditions of the City owned or maintained area and be performed by a Florida Licensed Professional Surveyor and Mapper. The coordinate system shall be Florida State Plane Coordinates, NAD 83 Zone North US Survey feet. Vertical Coordinates shall be referenced to the NAVD 88 datum with elevations given in US Survey feet.

As-built plans shall be submitted to the Public Works Department as signed and sealed plans and an electronic drawing file. Guidance on preparation of As-Built Plans can be

found in Chapter 4 of the FDOT Office of Construction, Preparation and Documentation Manual. As-built plans for driveway permits may be required on a case by case basis.

The engineer of record shall file as-built plans or record drawings with the Public Works Department upon completion of any improvements for which changes have been approved during the construction process. The requirement for an as-built plan or record drawing will be determined on a case by case basis, depending on the scope of the changes.

Record drawings shall be legibly marked to document actual construction. All changes to final utility locations including horizontal and vertical locations shall be clearly shown and referenced to permanent surface improvements and include all manholes, hydrants, valves, valve boxes, and structures. Record drawings shall also document actual installed pipe materials. Record drawings shall clearly show and document all field changes of dimension and detail. Record drawings shall include all details not on the original drawings, but constructed.

Chapter 9

INSPECTION REQUIREMENTS

9.1 Permits

- 9.1.1 Any construction in the City of Gainesville Public ROW will require permits from the Public Works Department prior to beginning work.
- 9.1.2 A MOT Permit is required for any activity in the ROW that either directly or indirectly affects vehicular or pedestrian traffic.
- 9.1.3 A ROW Use Permit is required for any temporary or permanent work being performed within City ROW.
- 9.1.4 A Building Permit is required for the installation or replacement of driveway aprons, curbs, sidewalks, and stormwater systems.

9.2 Inspections

Inspections for ROW improvements or stormwater systems installation may be scheduled through the Building Department or Public Works Department at (352) 334-5070.

Regular hours for inspections are Monday through Friday from 7:00 AM through 3:30 PM. Inspections outside of normal work hours will be by appointment only. Inspections are to be scheduled one business day (24 hours) in advance of the required inspection.

The City shall periodically inspect stormwater control facilities and shall inspect upon complaint to determine that such facilities are operating and being maintained as designed.

9.3 Project Accessibility

Public Works Inspectors and/or their associates must be granted access to all City of Gainesville permitted sites during regular working hours.

Chapter 10

CONSTRUCTION SPECIFICATIONS

10.1 Purpose

The purpose of this Chapter is to establish minimum standards for road and highway construction within City of Gainesville ROW, easement or any other City maintained facility. This document is to be used in conjunction with the FDOT Standard Specifications and Design Standards. If these specifications conflict with any FDOT standards, these specifications will govern.

10.2 Preconstruction Meeting

All work in City ROW shall require a preconstruction meeting or conference between the Owner, Contractor, Design Engineer and Public Works Director or designee prior to beginning work. A less formal onsite meeting may be sufficient for smaller projects.

10.3 Permits

Prior to start of work all applicable federal, state and local permits shall be obtained by the permittee from the appropriate governing agency. These include City of Gainesville, Florida Department of Environmental Protection, Water Management District, Florida Department of Transportation, Alachua County, Florida Division of Forestry, etc.

10.4 Clearing and Grubbing

Areas within the ROW and easements shall be cleared of all trees, roots, vegetation and debris as indicated on the plans, or discovered onsite to be obstructing work or the intent of work. Areas of exclusion such as protected trees or designated buffers shall be adequately marked for protection.

Take all reasonable precautions to prevent damage outside project ROW. Clearing and grubbing shall be strictly limited to areas designated in the plans. Construction fencing shall be utilized at property lines as necessary to ensure work is confined to areas designated for the work.

Prior to clearing, demolition, or other construction activities, protective barriers shall be constructed, as necessary, and inspected by the City to prevent the destruction or damaging of regulated trees that are located as indicated in the plans or within 15 feet of any construction activity or storage of equipment and materials.

Protective barriers shall be plainly visible and shall create a continuous boundary around trees or vegetation clusters in order to prevent encroachment by machinery, vehicles or stored materials.

Barricades must be at least three feet tall and must be constructed of either wooden corner posts at least two by four inches buried at least one foot deep, with at least two courses of wooden side slats at least one by four inches with colored flagging or colored mesh attached, or constructed of one-inch angle iron corner posts with brightly colored mesh construction fencing attached.

Protective barriers shall be placed as follows:

- At or outside the dripline for all Heritage and Champion trees and all regulated pine and palm trees.
- At a minimum of two-thirds of the area of the dripline for all other regulated species.
- Where roots greater than one inch in diameter are damaged or exposed, they shall be cut cleanly and re-covered with soil by the end of the work day.

Protective barriers shall remain in place and intact until such time as landscape operations begin or construction needs dictate a temporary removal that will not harm the tree.

No building materials, machinery or harmful chemicals shall be placed within protective barriers defined in this section, except short-duration placements of clean fill soil that will not harm the tree. Such short-duration placements shall not exceed 30 days. The original soil grade that existed within the protected areas prior to the placement of such fill shall be restored.

Attachments to trees are prohibited. No attachments or wires other than those of a protective and non-damaging nature shall be attached to any tree.

The City shall conduct periodic inspections of the site before work begins and/or during clearing, construction and/or post-construction phases in order to ensure compliance with City regulations and the intent of this section.

Contractor must take ownership of and dispose of all removed materials.

Approval from the City is required for any deviations to this section.

10.4.1 Disposal of Debris

Stockpiles of debris and waste material shall not remain within the ROW or easements and be removed from the site prior to inspection of subgrade.

Stockpiles of excavated topsoil or fill material shall be located such that site drainage or waterways are not obstructed.

Stockpiles of excess suitable material must be removed from the site prior to final inspection unless approved by the Public Works Director or designee.

Stockpiling of material on any permitted site with the intention of using it on another project is prohibited unless approved by the Public Works Director or designee.

10.4.2 Erosion Control

Erosion and sedimentation control measures shall be in accordance with FDEP “Florida Stormwater Erosion and Sedimentation Control Inspector’s Manual” and FDOT/FDEP “State of Florida Erosion and Sediment Control Designer and Reviewer Manual.” These methods shall be in place prior to exposing erodible earth on such grades as erosion may

be detrimental to adjoining properties, ROW, waterways, or stormwater management facilities.

The Contractor is responsible for erosion, sediment, and water turbidity control practices during construction to control on-site erosion/sedimentation and to protect against damage to off-site property. This includes preventing the placement of sediment and the discharge of turbid waters into natural surface waters via stormwater sewer systems or overland flow.

The Contractor shall, at a minimum, employ the following practices:

- Erosion and sediment control devices shall be installed and inspected by the Contractor, and approved by City staff, before any clearing and grubbing, demolition and/or grading activities commence. Copies of the Contractor's inspection reports and Stormwater Pollution Prevention Plan (SWPPP) shall be available for review on-site at all times.
- Erosion, sediment, and turbidity control are the responsibility of the Contractor. These delineated measures are the minimum required, with additional controls to be utilized as needed, dependent upon actual site conditions and construction operation.
- The Contractor shall secure the services of Certified Florida Stormwater Erosion and Sedimentation Control Inspector(s) to supervise erosion, sediment, and turbidity control plans to ensure compliance with the Clean Water Act requirements. The Contractor shall provide the Engineer with a copy of the certification(s) prior to the beginning of the work.
- All erosion, sediment and turbidity control measures shall be maintained in working order throughout the construction phase. The Contractor shall inspect and repair as necessary the erosion/sedimentation protection at the end of each working day. The Contractor will alter or increase the control measure as necessary to meet the control requirements.
- Erosion, sediment and turbidity control shall be placed by the Contractor prior to site excavation and shall remain in place until site vegetation, landscaping and construction is complete. All areas to be covered with hydroseed or sod shall have the hydroseed or sod placed as soon as is reasonably possible.
- Disturbed areas graded either directly or indirectly toward the stormwater system, natural waterways or offsite shall be protected by covering the exposed area with an impervious fabric, hydroseed, or sod. The protection will be left in place when work is not directly required in that area.
- Sediments, whether caused by rainfall, wind, or the construction processes, which lay on sidewalks, driveways, or roadways within the limits of this project, must be immediately removed, through mechanical means, manual means or a combination thereof.
- All stormwater sewer system inlets shall have sediment inflow prevention facilities in place as per FDOT standards throughout the construction phase.
- The discharge of sediment-laden water from newly graded areas directly into waterways is strictly prohibited.

10.5 Earthwork

10.5.1 Excavation

Excavation shall include removal of all materials and structures necessary to construct roadway and drainage facilities to the appropriate line and grade.

Roadway excavation shall be maintained and well drained at all times. Appropriate erosion control measures shall prevent loss of materials due to action of wind or water.

Material removed shall be disposed of off-site or stockpiled as appropriate in accordance with these specifications.

10.5.2 Subsoil Excavation

Subsoil excavation shall include removal of all muck, rock, clay or unsuitable materials within the roadway.

Clay and other unsuitable materials within 24 inches of the top of the subgrade shall be removed and replaced with select fill material. Select and unsuitable materials are as defined in FDOT Design Standards Index Number 505. Undercut profile shall be in accordance with FDOT Design Specifications Index Number 500 or as approved by the Public Works Director or designee. Underdrain, as required, shall be installed in compliance with these specifications. The final surface of the undercut area shall be compacted to the maximum extent possible, with a sheepsfoot roller, in accordance with FDOT Specification 120-9.

Removal of muck (AASHTO M-145 Classification A-8) should be performed until a suitable bearing foundation is encountered or sufficient select fill may be placed to provide adequate bearing for subgrade construction, or as otherwise directed by the Public Works Director or designee.

Materials used for replacement of unsuitable materials shall be placed in accordance with these specifications.

Where paved swale sections are utilized adjacent to undercut areas, swale section grades shall be adjusted so that the undercut line intersects the swale no lower than the swale bottom or top of ditch paving as applicable, in accordance with FDOT Design Specifications, Index No. 500.

Extreme care shall be exercised in the excavation and grading of swale sections in clay materials to avoid over-excavation, requiring replacement of material to match line and grade.

10.5.3 Fill Materials

The Contractor shall provide a proctor density for all backfill materials. If on-site material is to be used in a backfill operation, City inspection staff shall decide where (and how many) proctor density samples will be taken.

Backfill compaction shall be density-tested per FDOT specifications by the Contractor, and all proctor and density reports shall be submitted to the City. City inspection staff shall be notified in advance of when density tests will be taken.

Material used for embankment shall not contain muck, stumps, roots, brush, vegetable matter, rubbish or other material that does not compact into a suitable roadbed.

Compaction of fill materials shall be in 6 inch lifts unless the Contractor can successfully demonstrate compacting thicker lifts. Where thick lifts are demonstrated and approved, maximum lift thickness may not exceed 12 inches compacted thickness.

Fill placed for roadway embankment or replacement of sub soil excavation shall be placed in a maximum of 12 inch lifts, and compacted to minimum density specified on the design drawings. Fill placed in excess of four feet in total depth may be placed at a minimum compaction of 95% of maximum as determined by AASHTO Method T-180, except that the top four-foot of fill shall meet the specified compaction requirements for subgrade.

Materials placed under the roadway must be select fill of AASHTO M-145 Classification A-1, A-3, or A-2-4. Plastic materials may be used in deep fills under the roadway at depths greater than four feet only with prior approval from the Public Works Director or designee. Plastic materials may be used in sanitary sewer or storm sewer excavations performed in undercut areas once above soil envelope. Density requirements will still apply.

Materials placed in storm sewers, sanitary sewers and other utility excavations under the roadway, shall conform to compaction requirements for embankment fill for the full depth of the excavation. Lift thickness of fill material may be reduced as necessary due to type of compaction equipment and material classification in order to obtain the required compaction.

Placement and compaction of fill sections shall be constructed to full width required, in sections not less than 300 feet in length or full length of the embankment. Density will be verified in accordance with these specifications.

Fill material placed outside of roadway embankment (outside of 2:1 slope downward from shoulder edge or back of curb) shall be compacted to density approximately equal to undisturbed soil adjacent to the fill area.

Materials placed for stormwater management basin embankments shall be placed in maximum 12 inch lifts and compacted to a minimum of 95% of maximum density as determined by AASHTO Method T-99.

10.6 Subgrade

10.6.1 Materials

Contractor shall provide material from FDOT approved sources and obtain the engineer's approval of the source of supply.

10.6.2 Placement and Mixing

All soft and yielding material that will not compact readily shall be removed and replaced with suitable material.

All stumps, roots and organic matter shall be removed to a depth of 2 feet minimum below the bottom of the base material. All rocks larger than 6 inches shall be removed and all rock larger than 3 ½ inches, which cannot be readily broken by mixing operations, shall be removed to a depth of 2 feet.

Subgrade materials, to a minimum depth of 12 inches, must meet the bearing value requirements of the roadway design for Type B stabilization, determined by the FDOT Limerock Bearing Ratio Method (LBR).

Full limits of the subgrade will be mixed by rotary tiller or other equipment approved by the Public Works Director or designee, regardless of the existing soil LBR. Prior to mixing, subgrade shall be brought to an elevation such that after mixing, subgrade will conform to the required line and grade.

Subgrade materials known not to meet specified LBR value will require introduction of an additive material. Materials used to increase LBR value shall conform to Section 914 of the FDOT Standard Specifications. Amount of additive required will be determined by the Contractor and spread uniformly over the area to be stabilized such that after mixing subgrade will conform to specified line and grade.

Upon completion of mixing, subgrade shall be compacted, checked for line and grade and sampled to a depth of 12 inches for LBR determination. After acceptable LBR value is determined, the subgrade shall be density tested for conformance with plans. Frequency of testing will be in accordance with these specifications.

Underdrain required for subgrade drainage shall be installed in accordance with these specifications and functional prior to subgrade acceptance for placement of base.

The Contractor shall maintain required density and line and grade until placement of base. Rework requiring addition of materials will require re-stabilization and retesting for bearing and density requirements.

10.6.3 Inspection

Subgrade shall be inspected by City staff to determine LBR sample locations and to ensure proper depth and uniformity of mix.

All earthwork, subgrade, etc. shall be inspected for proper grade and densities. Certified LBR and density reports shall be submitted to the City.

10.7 Base Course

10.7.1 Materials

Contractor shall provide material from FDOT approved sources and obtain the engineer's approval of the source of supply.

Base course shall be constructed of limerock or graded aggregate materials. Limerock base shall be from the Ocala formation, conforming to requirements of Section 911 of the FDOT Standard Specifications. Material must be from a quarry currently approved by FDOT for use on FDOT projects or qualifying test results by an independent testing laboratory and an adequate quality control program must be supplied to the Public Works Director or designee and approved prior to use. Graded aggregate base shall be in conformance with Section 204 of the FDOT Standard specifications. Crushed concrete may be substituted for graded aggregate if approved by the Public Works Director or designee.

10.7.2 Placement of Materials

Delivery of base to the placement location shall be conducted in a manner that will not damage the accepted roadway subgrade. Delivery shall be across previously placed base whenever possible.

When compacted thickness of base course is greater than 6 inches, material shall be placed in two courses. Thickness of the first course shall be approximately one-half of the total thickness, but thick enough to bear the weight of equipment without damaging the subgrade. Final course of base material shall be a minimum of 3 inches thick.

For materials placed in more than one course, each course shall be compacted to 98% of maximum density as determined by AASHTO T-180.

Placement of each course of material shall be parallel to specified line and grade.

Addition of water or drying of materials shall be conducted for full depth of the course being placed.

10.7.3 Final Grading and Compaction

Finished surface shall be checked for conformance to line and grade and to a profile template or string line used perpendicular to centerline. A 15 foot straight edge shall also be used parallel to centerline in the center of each lane. Irregularities exceeding one-quarter inch require material to be scarified, regraded and recompacted. Final density testing will be performed after acceptance of template and grade to assure compaction to 98% of maximum density as determined by AASHTO Method T-180.

10.7.4 Priming and Maintaining

Prior to application of prime coat, moisture content of upper portion of the base shall not exceed 90% of optimum moisture for the material.

Prime coat applied to base shall conform to Section 300 of FDOT Standard Specifications.

Prior to application of prime coat, all loose or foreign material shall be removed from the base material.

Prime coat applications shall be uniformly covered with sand-bituminous hot mix, screenings or non-plastic sand (bare or hot-asphalt coated) with a mechanical spreader. All surface coatings shall be rolled with a traffic roller as required to produce a dense mass.

Crown and template of the finished base shall be maintained with no rutting or distortion until application of asphalt surface course.

Areas where prime coat has cured to the extent that it has lost all bonding effect shall have a tack coat applied in compliance with Section 300 of the FDOT Standard Specifications prior to application of asphaltic concrete.

10.7.5 Required Construction

Prior to application of surface course, all drainage construction shall be complete to include: Inlet inverts, inlet tops, storm drainpipes and outfalls, basins (to include grass stabilized slopes) and swales. Swale sections parallel to roadways may be left rough graded until installation of utilities in accordance with these specifications. Fill required behind curbs must be in place and shoulder stabilization must be completed to the depth and LBR specified by design.

10.7.6 Inspections

All base delivery tickets shall contain the approved pit/source information and be available for review on site and submitted to the City.

Base inspections shall be performed to ensure proper grade, finish and densities. If 2 lifts are required each lift shall be inspected separately.

Compaction shall be density tested by the Contractor and all density reports shall be submitted to the City.

The base shall be inspected once final grade has been established but prior to paving.

The Contractor shall provide a written paving schedule a minimum of 2 weeks prior to the start of paving operations.

10.8 Drainage

Storm sewer piping and structures shall be manufactured and installed in accordance with the FDOT Standard Specifications for Roadway and Bridge Construction, the FDOT Design Standards (Roadway Index), and the FDOT Drainage Manual.

A copy of the engineer approved shop drawings shall be submitted to Public Works for all pipes and structures.

All structures and pipes shall be stamped by the manufacturer. City staff shall inspect the condition of all structures and pipes at time of delivery.

10.8.1 Storm Sewer Materials

Storm sewer piping materials other than concrete will be considered in special circumstances only and their use in City ROW will be on a case by case basis. See the FDOT Standard Specifications for Roadway and Bridge Construction, the FDOT Design Standards (Topic No. 625-010-003), and the FDOT Drainage Manual (Topic No. 625-040-002) for corrugated steel, corrugated polyethylene and polypropylene, as applicable.

When corrugated metal pipe is proposed, environmental considerations, abrasion, use and flow characteristics and respective calculations shall be submitted with each request. When corrugated polyethylene or polypropylene pipe is proposed, deflection, buckling, bending stress, bending strain, and wall stress calculations shall be submitted with each request. Refer to FDOT Drainage Handbook – Optional Pipe Materials.

10.8.2 Inlets

All structures shall be constructed and installed in accordance with the FDOT Standard Specifications for Roadway and Bridge Construction, the FDOT Design Standards (Roadway Index), and the FDOT Drainage Manual.

Design and construction of pre-cast inlet structures shall be certified as meeting all FDOT designs and specifications by the supplier.

All drainage structure covers shall read “City of Gainesville Storm Sewer”.

10.8.3 Swales and Basins

All swales and basins shall be constructed to line and grade prior to approval of subgrade construction.

All slopes of 3:1 or greater shall be sodded.

Erosion control per FDOT Index No. 102 and 103, and in accordance with the Stormwater Pollution Prevention Plan provided for the project, shall be installed upon completion of excavation and grading.

Swale sections in conjunction with subsoil excavation shall be constructed in accordance with FDOT Index No. 500, in order to facilitate subgrade drainage.

Embankment fill for basins shall be constructed in accordance with these specifications.

All swales and basins shall be grassed upon completion of final grading and erosion control shall remain in place until all slopes have stabilized.

Special ditch sections requiring concrete ditch paving shall be graded and constructed in accordance with design plans. Construction of ditch paving shall be in conformance with FDOT Index No. 281, with contraction joints at 10' intervals. Concrete shall have a float finish, lightly broomed.

Expansion joints in ditch paving shall be constructed at intervals not to exceed 200 feet. Joint materials shall be one-half inch preformed material conforming to Section 932 of the FDOT Standard Specifications. Paving constructed on clay bottom swales shall have weep holes constructed on 10 foot centers. Weep holes shall be constructed with gravel (#6 aggregate) sumps, with galvanized wire mesh between the aggregate and concrete, per FDOT Standard Index No. 281.

10.8.4 Underdrain

Roadway underdrain shall be installed in all areas of subgrade where ground water may rise to within 12 inches of the bottom of base material or in undercut areas where ground water may infiltrate or accumulate in the stabilized subgrade.

Underdrain shall be installed with the flow line a minimum of 42 inches below the top of the curb line, centered 2 feet behind the curb.

Required subgrade underdrain shall be installed prior to stabilization of subgrade materials and in conjunction with inlet and storm sewer construction. Underdrain required in basin construction shall be in accordance with Design Specifications.

10.8.5 Curb and Gutter

Curb and gutter construction shall begin only after approval of subgrade preparation for LBR requirements. Subgrade upon which curb will be placed shall be compacted to design requirements for subgrade prior to curb placement.

Curb and gutter shall be constructed of FDOT Class I (3000 psi) concrete, produced in accordance with FDOT Specification, Section 346.

Location of curb and gutter shall be verified for density, line and grade prior to placement. Washouts, fill or regrading, subsequent to approval, may require re-verification of subgrade.

Contraction joints shall be sawed at 10 foot intervals as soon as concrete has hardened. Damage or uncontrolled cracking between sawed joints shall be cause for removal of curb sections.

Expansion joints shall be constructed at all inlets and radius points. Expansion joints shall also be located at intervals not to exceed 500 feet and shall be constructed of one-half inch preformed material conforming to Section 932 of the FDOT Standard Specifications.

A brush finish will be applied while concrete is still plastic. Membrane curing compound shall be applied in accordance with Section 520-8.3 of the FDOT Standard Specifications, immediately after application of the finish.

10.8.6 Inspections

City staff shall inspect all structures and pipes prior to backfilling to ensure proper line, grade and joint tolerances.

The Contractor shall provide a proctor density for all backfill materials. If on site material is to be used in the backfill operation, City inspection staff shall decide where proctor density samples are to be taken.

Backfill compaction shall be density tested per FDOT specifications by the Contractor, and all proctor and density reports shall be submitted to the City.

City staff shall inspect structures before and after inverts are poured.

City staff shall inspect all retention/detention basins before sodding and/or seeding.

10.8.7 As-builts

The Contractor shall provide the City with an as-built survey of the retention/detention basin and associated structures, prepared by a registered land surveyor. The survey shall be submitted on paper copy and electronically (.pdf and Autodesk CAD).

10.9 Asphaltic Concrete

10.9.1 Asphaltic Concrete Materials

Type S Marshall mixes are prohibited. Superpave mixes shall be used.

All materials shall comply with the most current edition of the FDOT Standard Specifications, Sections 320 and 330. Type of asphaltic concrete shall be specified on the approved design drawings or contract documents. Batch plants shall have current FDOT certification rating.

Asphalt mixes designs shall be FDOT approved and from an FDOT approved supplier. Documentation shall be approved for use on the project by the City at least 7 days prior to placement.

10.9.2 Surface Preparation

Prior to placement of asphaltic concrete, the base surface shall be swept clean of all loose and deleterious material by use of power brooms or blowers. Areas of excessive separation of prime coat during power brooming shall require re-application of prime coat prior to application of surface course. If material is to be placed on another asphaltic concrete surface, a tack coat conforming to Section 300 of the FDOT Standard Specifications shall be applied. Asphaltic concrete materials shall be placed after tack coat has adequately cured, but prior to loss of adhesiveness.

10.9.3 Asphaltic Concrete Placement

Material shall be placed on clean, dry surfaces with air and surface temperature above the minimum specified for the type of mix being placed. All necessary equipment shall be on hand and operational prior to start of placement. Placement, compaction and equipment shall be as specified in Section 330 of the FDOT Standard Specifications, except as noted herein.

10.9.4 Inspections

A pre-paving meeting or conference shall be conducted prior to beginning all paving operations.

All asphalt delivery tickets shall contain the approved mix number and copies provided to the City.

During the paving operation, the asphalt shall be checked by the Contractor and City staff for proper temperature, compaction and surface texture. Deficiencies may result in rejection of the pavement.

10.10 Signing and Marking

10.10.1 Materials

Signs and marking materials shall be in strict accordance with FDOT standards, MUTCD and these specifications.

Reflective sheeting for traffic signs shall be of High Intensity or greater reflectivity with the exception of STOP Signs. STOP signs shall be of “diamond grade” equivalent prismatic reflectivity or greater.

10.10.2 Placement

Traffic signs shall be mounted on a uni-strut square post (or equivalent as approved by the Public Works Director or designee). The sign posts are to be painted; sign posts shall be powder coated and painted black to meet federal standard 595B utilizing color # 27038 – black semi-gloss.

10.10.3 Placement of Signs and Markings

Signs and markings shall be installed by the Contractor in accordance with appropriate Manual on Uniform Traffic Control Devices (MUTCD) and FDOT Standards, Section 711 and 713; and City of Gainesville requirements.

10.10.4 Inspections

Verify all signing and marking materials are FDOT approved and placement is per plans and specifications prior to opening roadways to traffic.

10.11 Landscaping

10.11.1 Materials

Plant materials shall comply with the Landscape Specifications & Notes as noted in the Construction Drawings.

10.11.2 Placement and Maintenance

All landscape shall be installed by the Contractor in accordance with plans and specifications.

Plant material maintenance period shall extend 180 days after certification of acceptability by the owner. Maintenance shall include watering fertilizing and general care to establishment of landscaping materials.

Plant material guarantee (warranty) period shall extend 1 year after certification of acceptability by the owner.

10.12 Sampling and Testing Requirements

10.12.1 General

A reputable, recognized independent laboratory shall perform all sampling and testing on the project. A certified copy of all test results shall be forwarded to the Public Works Director or designee.

Frequencies specified herein are considered minimums. Materials may be subject to additional testing at any time they appear to deviate from the required standards.

10.12.2 Testing Requirements

All sampling and testing shall comply with FDOT Specifications with the following exceptions:

- Embankment/ Fill
 - Classification and/or Gradation
 - Where specific soil classification or gradation is required, material shall be pre-qualified prior to use.
 - Density
 - Embankment fill under pavement – test every lift (12” max) for 98% of maximum as determined by AASHTO T-180. No less than one density verification for each 500 linear feet of a tested lift. (Reference FDOT Specifications Section 120)
 - Embankment fill outside of pavement: – test every lift (12” max) for 95% of maximum density as determined by AASHTO T-180. No less than one density verification for each 500 linear feet of a tested lift. (Reference FDOT Specifications Section 120)

- Fill for sewer, storm drain or utility trenches: test every lift (12” max) for 98% of maximum density as determined by AASHTO T-180. No less than one density verification for each 500 linear feet of a tested lift. (Reference FDOT Specifications Section 125)
- Subgrade
 - Material Qualification
 - Subgrade materials shall comply with FDOT Specifications, Section 160.
 - Contractor shall identify source of mixing materials and obtain approval prior to use.
 - Type "B" Stabilization (Limerock Bearing Ratio Method)
 - After stabilization and mixing, sample up to a depth of 12" minimum for each change of subgrade material, or each section of subgrade with differing amounts of added stabilizing material.
 - Minimum of 2 tests per roadway section. No less than 2 determinations shall be made per project.
 - Bearing value shall be determined in accordance with FDOT limerock bearing ratio method, FM5-515.
 - Verify width and depth of stabilization every 200 foot.
- Vertical Grade and Horizontal Alignment
 - Verify vertical grade a minimum of every 50 feet in typical crown sections.
 - Verify vertical grade every 25 feet in super elevations or transition sections.
 - Grades shall be within no more than one-quarter inch high and one-half inch below design grade.
 - Verify subgrade alignment in the ROW a minimum of every 100 feet.
- Density
 - 98% of maximum as determined by AASHTO T-180
 - No less than one density determination per 500 feet of subgrade or one per each section of roadway if work is divided in smaller and separate operations. Density shall be as specified in these specifications or as shown on design plans, utilizing the proctor sample as modified for the LBR testing.
 - Subgrade densities performed solely for placement of curb shall not satisfy requirements for subgrade density verification prior to base material placement. Curb densities shall be performed at the same frequency as subgrade densities.
 - Portions of subgrade not worked as a part of overall compactive effort or sections replaced as rework or repair shall be tested for density and bearing value prior to placement of base rock.
- Base
 - Material Qualification
 - Material for limerock base shall be from a FDOT approved source, or pre-qualification tests shall be provided indicating conformance to Section 911 of FDOT Standard Specifications.
 - Graded aggregate (or crushed concrete) shall be from a FDOT approved source, or pre-qualification tests shall be provided indicating conformance to Section 204 of FDOT Standard Specifications.
- Vertical Grade and Horizontal Alignment

- Verify profile grade every 50 feet minimum on typical crown sections utilizing a string line or a template laid perpendicular to centerline, and a 15 foot straight edge laid parallel to centerline.
- Verify profile grades every 25 feet between the P.C. and P.T in super elevated sections.
- Grades shall be within one-quarter inch of design profile.
- Verify alignment in ROW and width of roadway a minimum of every 100 feet.
- Density
 - Each course - 98% of maximum as determined by AASHTO T-180.
 - No less than one density determination per 500 linear feet of base or one per each section of roadway if work is divided in smaller and separate operations.
 - A minimum of 2 densities per project shall be performed.
- Asphaltic Concrete
 - Material Qualification
 - Superpave asphaltic concrete shall be produced, inspected and tested in accordance FDOT Specification Sections 330, 334 and 337.
 - Temperature
 - Verify first five trucks for within 25° F of target batch temperature. Verify a minimum of every fifth truckload if temperatures remain within range. If outside range, the Contractor must perform corrective action and each truck shall be verified until within established temperature range.
 - Asphalt not within 30° F of target temperature for the mix design shall be rejected for use on the project.
 - Thickness and Profile
 - Thickness and cross slope each layer shall be checked 25 feet maximum and adjustments made as needed to stay within tolerance. Material thickness behind the screed shall be manually checked every.
 - Look for surface texture defects before rolling. If mixture is still hot, scarify and add fresh asphalt to correct irregularities.
 - All longitudinal joints shall be checked with a straight edge. The number of start and stop locations will be kept to a minimum by maintaining uniform supply of asphalt to the paver and adjustment of paver speed.
 - Use a 15 foot rolling straightedge to check joints and for any surface irregularities. Correct any intermediate layer deficiencies in excess of three-sixteenths inch before placing the next course. Irregularities greater than three-sixteenths inch shall be corrected either by overlay or removal, as appropriate, if they cannot be removed by increased rolling effort.
 - Final rolling shall be completed prior to pavement temperature dropping below 175° F.
- Density
 - Provide densities per FDOT standards for asphalt when specified in the contract documents.
- Concrete
- Material Qualification

- All concrete produced in accordance with FDOT Specifications, Section 346 and 347. Verify that all concrete on the project has a mix design approved by FDOT and the City of Gainesville.
- Verify all concrete on project is provided by a FDOT approved supplier and delivery is made with a certification ticket as per Section 346.
- Placement
 - All formwork shall be approved by City staff prior to ordering concrete for placement.
 - Truck transit time shall be tracked and documented for each load delivered to the site.
 - Contractor shall perform slump tests before any water is added at the site and document conformance to FDOT Specifications Section 346.
 - Perform slump, air and strength testing for structural concrete as per FDOT Section 346.

10.13 Maintenance of Traffic

- The Maintenance of Traffic (MOT) shall conform to the requirements of the Florida Department of Transportation (FDOT). It shall be the duty of the Contractor to ensure that the MOT meets the requirements of the FDOT Standard Index, 600 Series.
- The Contractor is to implement the Traffic Control Plan specifically designed for the project (or an approved Alternate Plan as described in the FDOT Standard Specifications). It is the Contractor's responsibility to account for any additional traffic control that may be required to meet the standards of safe practices.
- The Contractor shall supply whatever MOT is necessary to provide protection to both the workers on the job site and the public utilizing the adjacent public facilities. When the Contractor is working adjacent to the travel lanes, the Contractor shall provide an adequate buffer zone between workers and motor vehicles.
- The Contractor shall furnish and set up all MOT equipment and devices. The Contractor shall also be responsible for the maintenance and daily inspection of the MOT. Inspection documentation shall be maintained through duration of the project.
- The Contractor is to provide a Certified Worksite Traffic Supervisor in accordance with FDOT Standard Specifications (Section 102 and 105). The Contractor shall provide the Engineer with a copy of the certification(s) prior to the beginning of the work. No work shall begin until the MOT is set up and satisfactorily inspected by the Worksite Traffic Supervisor.
- The Contractor shall provide a written request to the City for all traffic control initial set ups or plan changes. Allow a minimum of 14 days for approval of major set ups or plan changes and 7 days for minor set ups or plan changes. No closures will be set up without approval from City of Gainesville project staff.

10.14 Utility Accommodation Manual

The City intends to utilize the FDOT's Utility Accommodation Manual for utility installations and maintenance within the City of Gainesville, to the extent possible.

Below are some City utility requirements including some clarifications and exceptions to the Utility Accommodation Manual and other referenced FDOT standards.

10.14.1 Permitting

- Permits are required for all utility work performed in the City ROW.
- Applications shall be submitted on a City of Gainesville Right of Way Use Permit form, Maintenance of Traffic (MOT) form with any supporting documentation. (i.e. plans & details, maps, and narrative).
- Permit applications shall be accompanied by a fee (communications only) as established by resolution of the City Commission.
- All reference to the Local Maintenance Engineer, the District Maintenance Engineer, or the District Permit Engineer shall be understood to mean the Public Works Director or designee.
- Permit applications may be submitted either hard copy or electronically (.pdf).
- Emergency repair, initiated to protect life and property, may be initiated immediately and the Public Works Director or designee, or his designee, shall be notified immediately. A permit application shall be initiated within 3 business days.

10.14.2 Maintenance of Traffic

A MOT or Traffic Control Plan shall be included with all permits identifying all facilities impacted (i.e. roadway, trail or sidewalk) and a plan to complete the work safely and efficiently. Traffic Control Plans shall be designed by those certified in MOT and shall include the configuration traffic control devices, detour routes, notifications, schedules, responsible field contact, etc. FDOT 600 Series Indexes and MUTCD may be utilized as applicable.

10.14.3 Accommodation Standards

Clear recovery zone dimensions shall be governed by the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Green Book) when dimensions reflected in the Accommodation Manual are less restrictive.

10.14.4 Pavement Cutting

- Cutting of the asphalt surface of an existing City maintained roadway is discouraged and will only be allowed after the pavement is 5 years old without extenuating circumstances.
- Pavement cuts that are allowed shall have the asphalt surface replaced within 24 hours, with open cut restoration performed in accordance with most current edition of FDOT Index No. 307 using the flowable fill option.
- The dimensions of replacement asphalt pavement sections will be at the discretion of the Public Works Department. Small and oddly-shaped patches are strongly discouraged.
- The City of Gainesville Public Works Department will be notified by calling 352-334-5070 prior to start of excavation.

10.14.5 Location Criteria

- Underground installations placed parallel to the roadway may constitute complete reconstruction of the roadway and more extensive design and coordination requirements.
- All underground utilities installed within City ROW will be installed to a depth meeting the minimum requirements of this manual however; never less than the minimum depth of 36 inches below finished grade when installed beneath the pavement and 30 inches below finish grade when installed outside the limits of the pavement.

10.14.6 Underground Crossings

- Underground crossings of existing roads by jacking, boring, or directional bore are encouraged. Crossing of existing roadways with any pressurized line will require that the utility line be placed in a casing. On new construction, all service lines of any utility will be in a casing; however, water mains may be installed without a casing when the main is constructed of ductile iron pipe (DIP).
- All crossings installed either by direct bury or by boring will have the ends of the casing no closer than 8 feet from the edge of the pavement on rural roads with paved shoulders, 13 feet on rural roads without a paved shoulder, and no closer than 5 feet from the back of the curb on a curb and gutter roadway. Casing lengths may be required to be longer in order to facilitate known future widening or reconstruction. All jacked, bored, or directional bored crossings are subject to require pressure testing to a minimum of 20 psi for 24 hours, prior to the installation of the utility line, if there are any concerns about the integrity of the casing after installation.
- City of Gainesville Public Works Department shall be notified 24 hours prior to the start of a roadway crossing by directional bore or by jack and bore. The assigned inspector and the utility Contractor making the crossing shall meet on site prior to the excavation of any bore pits. The area shall be evaluated to prevent damage to any underground drainage structures, underdrain, sidewalk, or any other structural portion of the roadway.

10.14.7 Field Coordination

City of Gainesville Public Works Department shall be notified 24 hours prior to the start of a roadway crossing. The assigned inspector and the utility Contractor performing the work shall meet on site prior to beginning work. The area shall be evaluated to prevent damage to any other utility, drainage structures, sidewalk, adjacent property or any portion of the roadway.

APPENDIX A

Definitions and Terms

Brush Barrier: A temporary sediment barrier composed of limbs, weeds, vines, root mat, soil, rock and other cleared materials pushed together to form a berm, located across a slope to intercept and detain sediment and decrease flow velocities.

Check Dams: Small, temporary dams constructed across shallow swales to reduce the velocity of concentrated flows, reducing erosion of the swale or ditch.

Dust Control: Reducing surface and air movement of dust during land disturbance, demolition or construction activities in areas subject to dust problems in order to prevent soil loss and reduce the potentially harmful airborne substances.

EOP: Edge of Pavement

GE: Gutter Elevation

HGL: Hydraulic Grade Line

Inlet Protection: The installation of various kinds of sediment trapping measures in or around drop inlet or curb inlet structures prior to permanent stabilization of the disturbed area.

Level Spreader: An outlet consisting of an excavated depression constructed at zero grade across a slope to convert concentrated, sediment-free runoff to sheet flow and release it onto areas of undisturbed soil stabilized by existing vegetation.

Mulching: Application of plant residues or other suitable materials to disturbed surfaces to prevent erosion and reduce overland flow velocities. Applicable to all seeding operations, other plant materials which do not provide adequate soil protection by themselves, and bare areas which cannot be seeded due to the season but which still need soil protection.

Outlet Protection: The installation of paved and/or riprap sections and/or stilling basins below drain outlets to reduce erosion from scouring at outlets and to reduce flow velocities.

Permanent Seeding: Establishment of perennial vegetative cover by planting seed on rough-graded areas that will not be brought to final grade for a year or more or where permanent, long-lived vegetative cover is needed on fine-graded areas.

Redevelopment: Any demolition and/or reconstruction of the vehicular use area (excluding resurfacing and restriping) or building. A site is also classified as a redeveloped site if less than 80% of the entire site is modified at the time of redevelopment.

Riprap: A permanent, erosion-resistant ground cover of large, loose, angular stone installed wherever soil conditions, water turbulence and velocity, expected vegetative cover, etc., are such that soil may erode under design flow conditions.

Silt Fence: A temporary sediment barrier constructed of posts, filter fabric and, in some cases, a wire support fence, placed across or at the toe of a slope to intercept and detain sediment and decrease flow velocities from drainage areas of limited size; applicable where sheet and rill erosion or small concentrated flows may be a real problem. Installation shall be in accordance with the FDEP "Florida Stormwater Erosion and Sedimentation Control Inspector's Manual" and FDOT/FDEP "State of Florida Erosion and Sediment Control Designer and Reviewer Manual."

Sodding: Stabilizing fine-graded areas by establishing permanent grass stands with sod. Provides immediate protection against erosion, and is especially effective in grassed swales and waterways or in areas where an immediate aesthetic effect is desirable. In some cases where slopes dictate, pinning of sod will be required.

Sprigging: Establishment of vegetative cover by planting springs, stolons or plugs to stabilize fine-graded areas where establishment with sod is not preferred.

Subsurface Drain: A perforated conduit installed beneath the ground to intercept and convey groundwater. Prevents sloping soils from becoming excessively wet and subject to sloughing.

Temporary Diversion Dike: A ridge of compacted soil located across a sloping disturbed area to divert off-site runoff away from unprotected slopes and to a stabilized outlet, or to divert sediment-laden runoff to a sediment trapping structure. Maximum effective life is 18 months.

Temporary Gravel Construction Entrance: A stabilized pad located at points where vehicles enter and leave a construction site to reduce the amount of sediment transported onto public roads by motor vehicles or runoff.

Temporary Sediment Trap: A small ponding area, formed by constructing an earthen embankment to detain sediment-laden runoff from small disturbed areas for enough time to allow most of the sediment to settle out. Maximum effective life is 18 months.

Temporary Seeding: Establishment of temporary vegetative cover on disturbed areas by seeding with appropriate rapidly growing plants on sites that will not be brought to final grade for periods of 30 days to one year.

Temporary Slope Drain: A flexible tubing or conduit, used before permanent drainage structures are installed, intended to conduct concentrated runoff safely from the top to the bottom of a disturbed slope without causing erosion on or below the slope.

TMDL: Total Maximum Daily Load

TOB: Top of Bank

Top Soiling: Preserving and using topsoil to provide a suitable growth medium for vegetation used to stabilize disturbed areas. Applicable where preservation or importation of topsoil is most

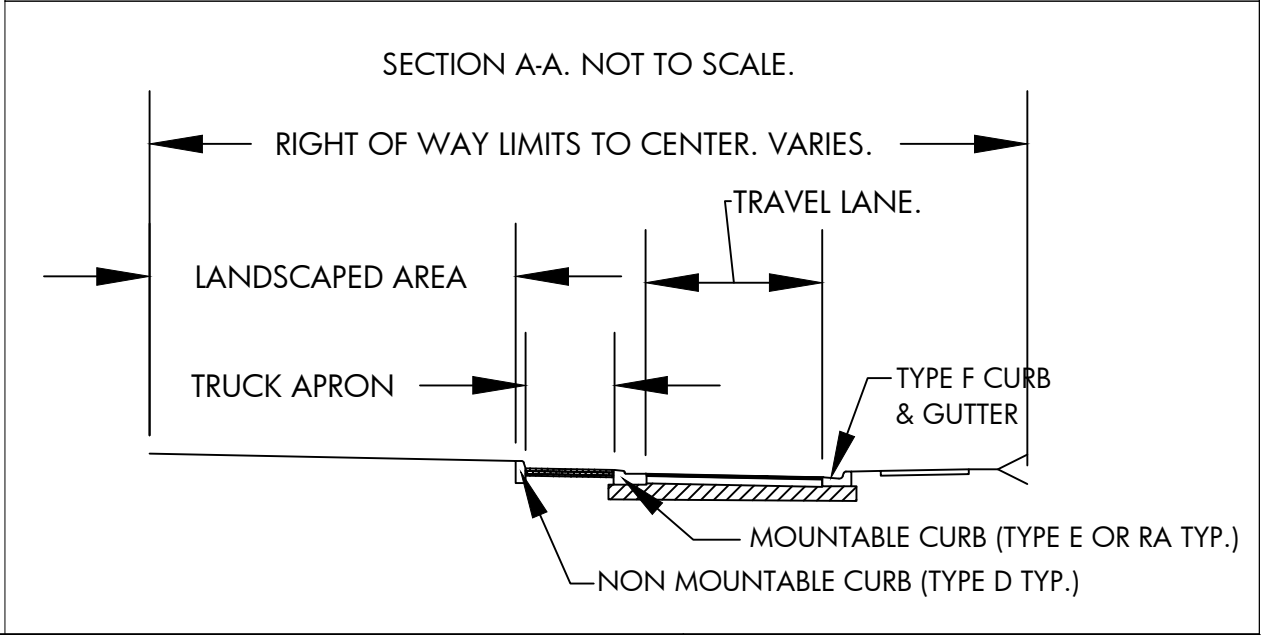
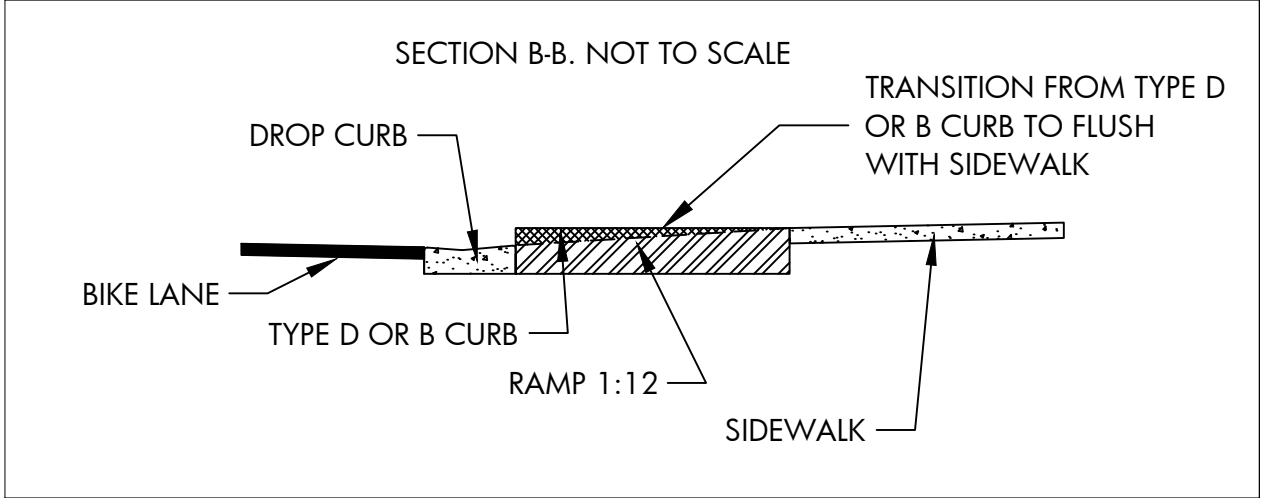
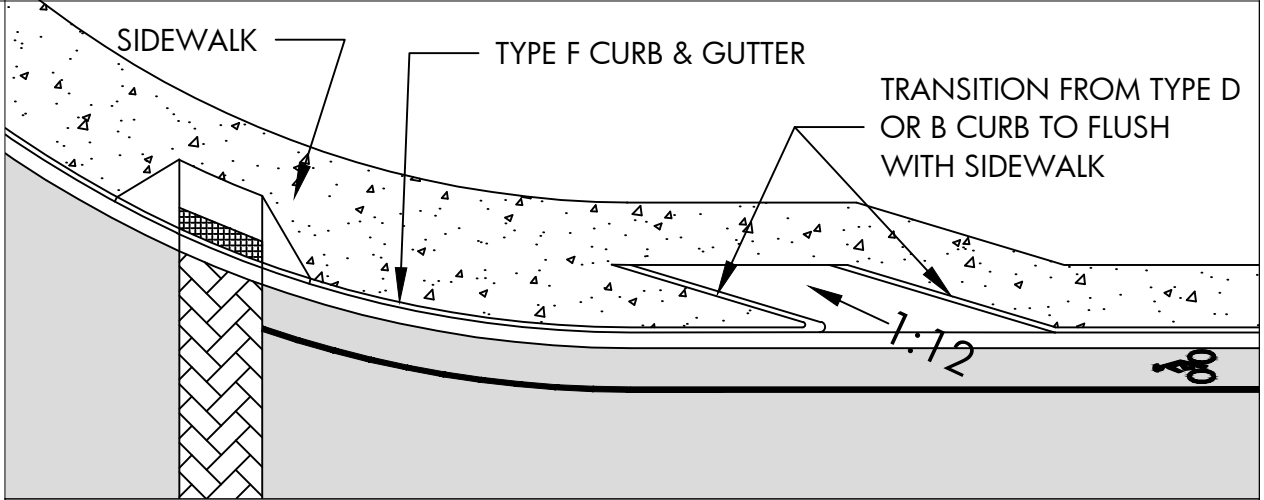
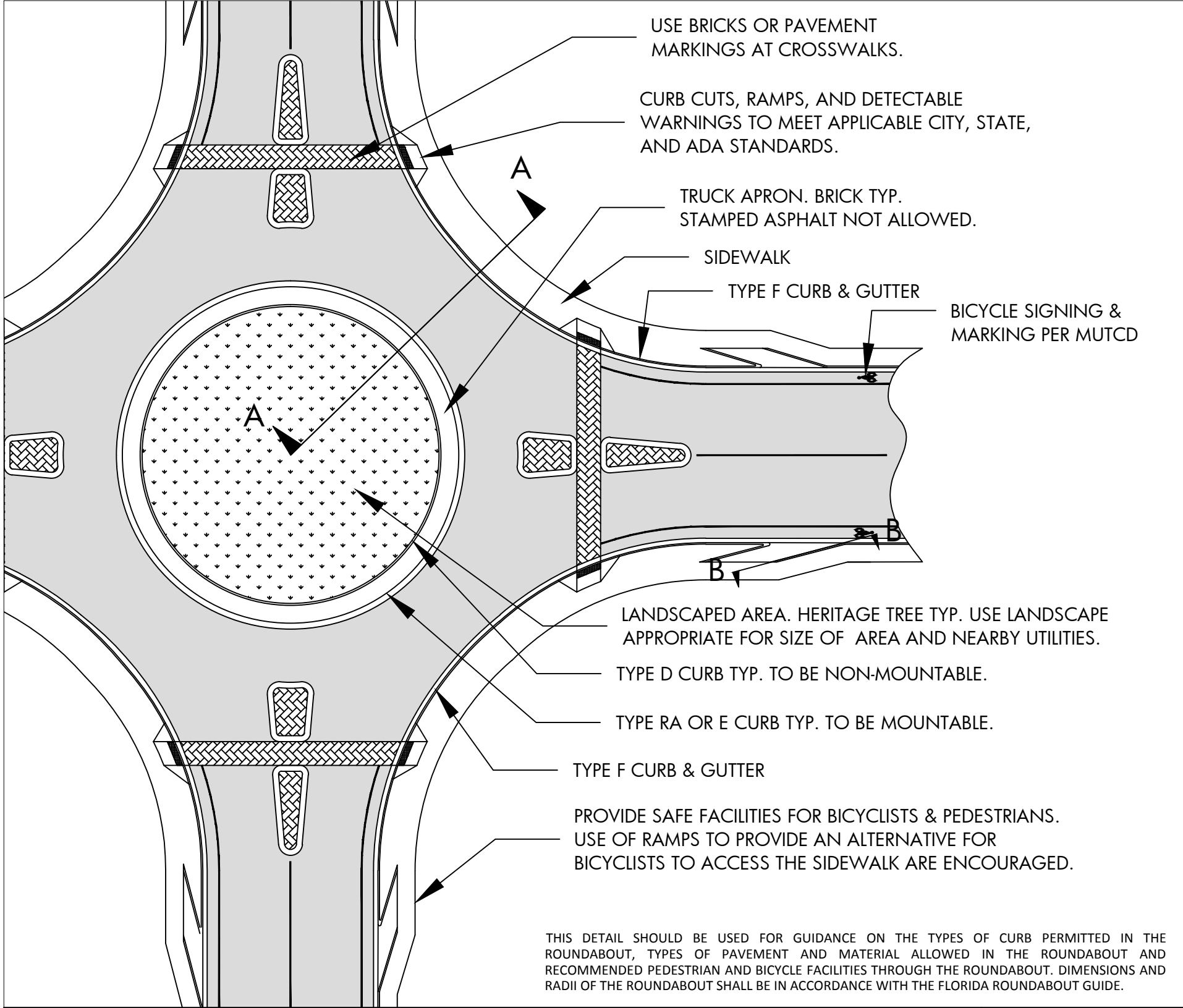
cost-effective method of providing a suitable growth medium. Not recommended for slopes steeper than 2:1.

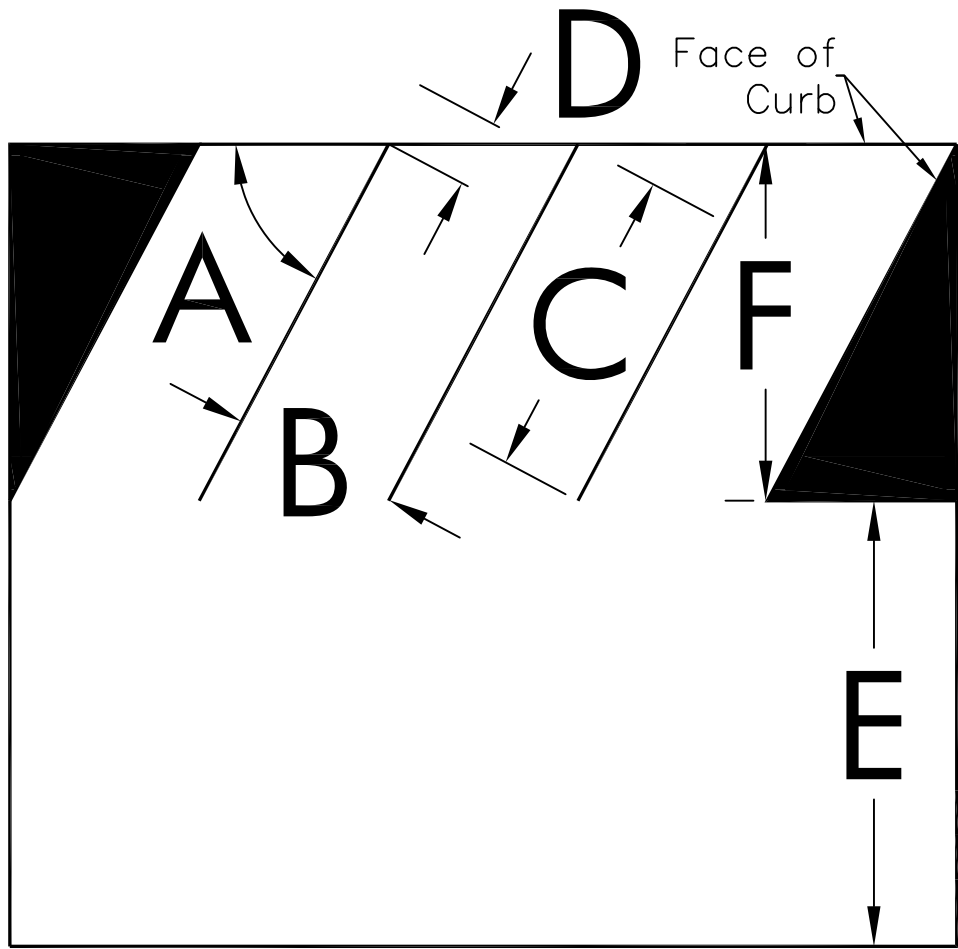
Tree Preservation and Protection: Protecting existing trees from mechanical and other injury during land disturbing and construction activity to insure the survival of desirable trees where they will be effective for erosion and sediment control and provide other environmental and aesthetic benefit.

Trees, Shrubs, Vines, and Ground Covers: Stabilizing disturbed areas by planting trees, shrubs, vines and ground covers where turf is not preferred. These plant materials also provide food and shelter for wildlife as well as many other environmental benefits. Especially effective where plants are desirable and turf maintenance is difficult.

Vegetative Streambank Stabilization: The establishment of appropriate vegetation to protect the banks from erosion.

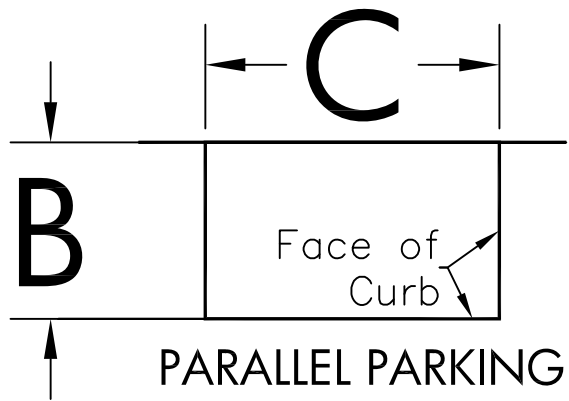
APPENDIX B
Standard Details



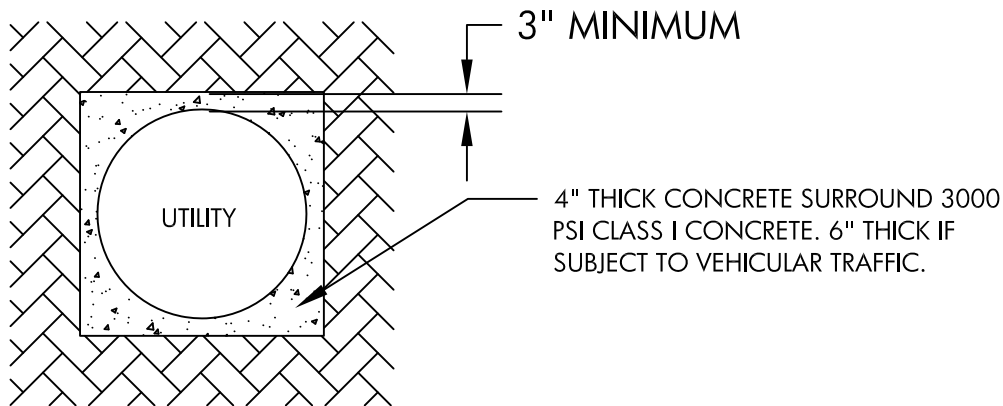


MINIMUM DIMENSIONAL STANDARDS FOR PARKING SPACES

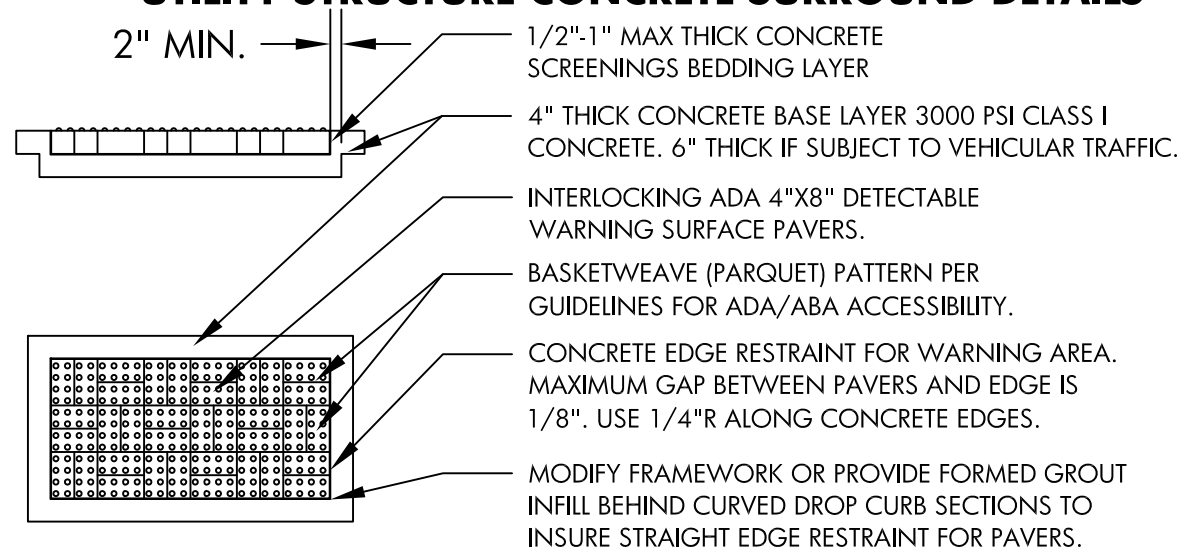
A	B	C	D	E		F	F	F
ANGLE	MIN. WIDTH	PAVED DEPTH	OVER-H ANG DEPTH	AISLE WIDTH	TRAFFIC CIRCULATION	B = 8'-6" (MIN. WIDTH)	B = 9'-0" (WIDTH)	B = 12'-0" (HANDICAP WIDTH)
90°	8'-6"	16'-0"	3'-0"	24'-0"	TWO-WAY	16'-0"	16'-0"	16'-0"
60°				13'-6"	ONE-WAY	18'-3"	18'-6"	20'-0"
45°				11'-10"	ONE-WAY	17'-3"	17'-9"	20'-0"
30°				11'-0"	ONE-WAY	15'-6"	15'-9"	18'-6"
0°	8'-0"	20'-0"	0'-0"	N/A	N/A	N/A	N/A	N/A



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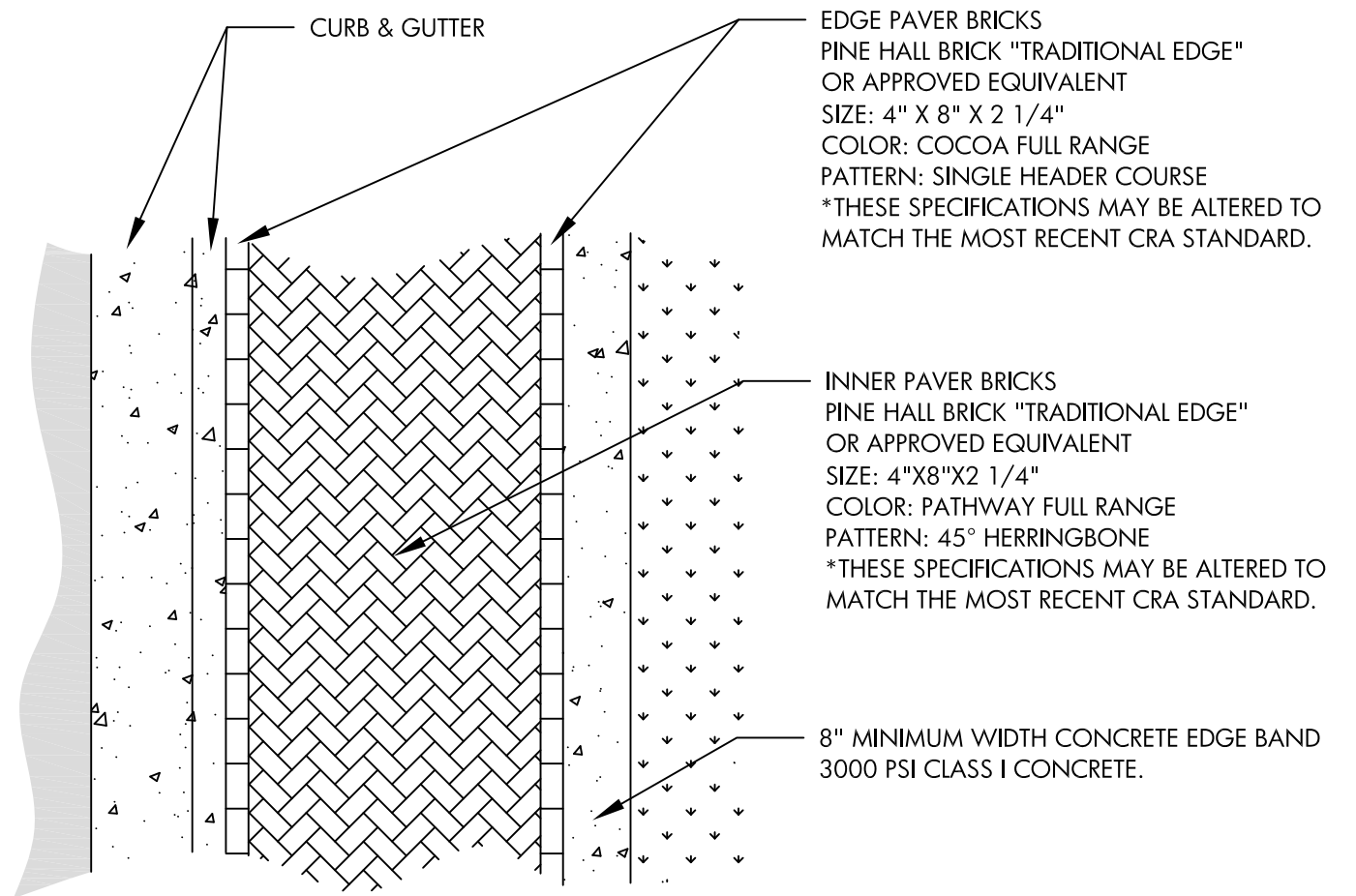
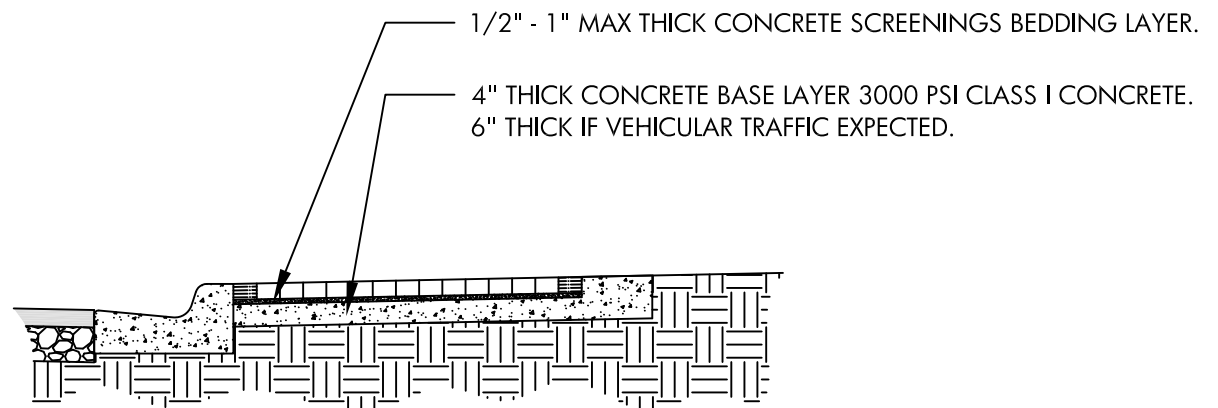
UTILITY STRUCTURE CONCRETE SURROUND DETAILS



DETECTABLE WARNING NOTES:

1. DETECTABLE WARNING COLOR TO PROVIDE LIGHT/DARK CONTRAST OF 70% OF ADJACENT SIDEWALK.
2. DETECTABLE WARNING SURFACE FOR THE RAMPS SHALL CONSIST OF INTERLOCKING 4"X8" ADA DETECTABLE WARNING SURFACE PAVERS HAVING A MINIMUM DEPTH OF 2" WITH RAISED TRUNCATED DOMES WITH A BASE DIAMETER OF 0.9 INCH (23 MM) MINIMUM AND 1.4 INCHES (36 MM) MAXIMUM, A TOP DIAMETER OF 50 PERCENT OF THE BASE DIAMETER MINIMUM TO 65 PERCENT OF THE BASE DIAMETER MAXIMUM, AND A HEIGHT OF 0.2 INCHES (5.1 MM). THE TRUNCATED DOMES SHALL HAVE A CENTER-TO-CENTER SPACING OF 1.6 INCHES (41 MM) MINIMUM AND 2.4 INCHES (61 MM) MAXIMUM, AND A BASE-TO-BASE SPACING OF 0.64 INCH (17 MM) MINIMUM, MEASURED BETWEEN THE MOST ADJACENT DOMES IN A SQUARE GRID. CONCRETE PAVERS ARE TO MEET ASTM C902, CLASS SX, TYPE I AND BRICK PAVERS ARE TO BE TARMAC AMERICA'S RED HOLLANDSTONE CONCRETE PAVERS OR APPROVED EQUIVALENT.
3. ALL UNITS SHALL BE SOUND AND FREE OF DEFECTS THAT WOULD INTERFERE WITH THE APPEARANCE OR PROPER PLACEMENT OF THE UNIT OR IMPAIR THE STRENGTH OR LONGEVITY OF THE FINAL STRUCTURE. ANY UNITS THAT ARE STRUCTURALLY DAMAGED DURING THE WORK SHALL BE IMMEDIATELY REMOVED AND REPLACED. THE PAVERS ARE TO BE LAID IN A TWO BY TWO BASKETWEAVE PATTERN, FLUSH WITH THE FINISH GRADE OF THE DOME SURFACE AND HAVE GAPS BETWEEN 1/16" AND 1/8". CUT PAVERS (MASONRY SAW ONLY) SHALL BE NO SMALLER THAN ONE-THIRD OF A WHOLE PAVER.

BRICK DETECTABLE WARNINGS DETAILS



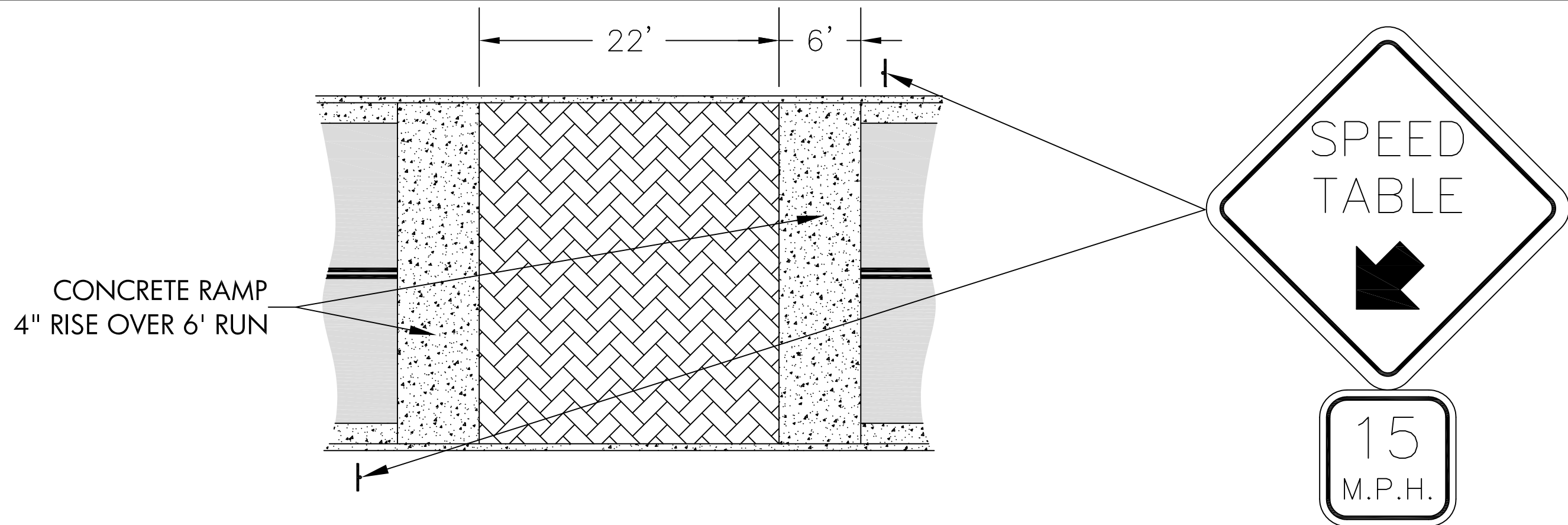
BRICK SIDEWALK DETAILS

CITY OF GAINESVILLE
PUBLIC WORKS DEPARTMENT
405 NW 39TH AVE. GAINESVILLE, FLORIDA 32627
TELEPHONE: (352) 334-5070 FAX: (352) 393-7987

CITY OF GAINESVILLE
ENGINEERING DESIGN & CONSTRUCTION MANUAL

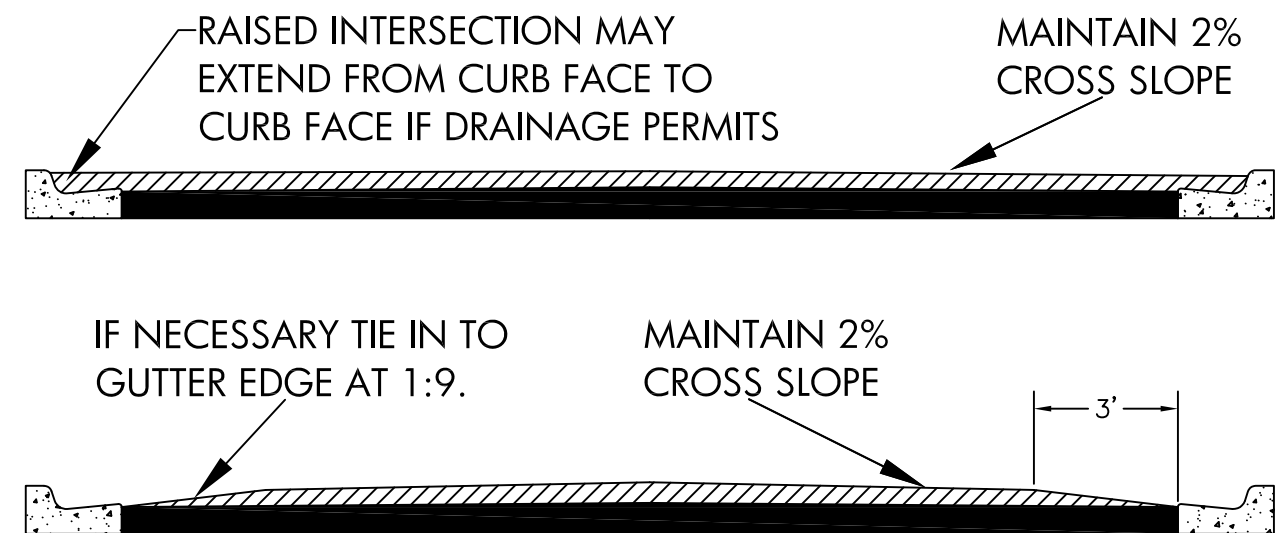
BRICK DETAILS

APPENDIX B-3



GENERAL NOTES:

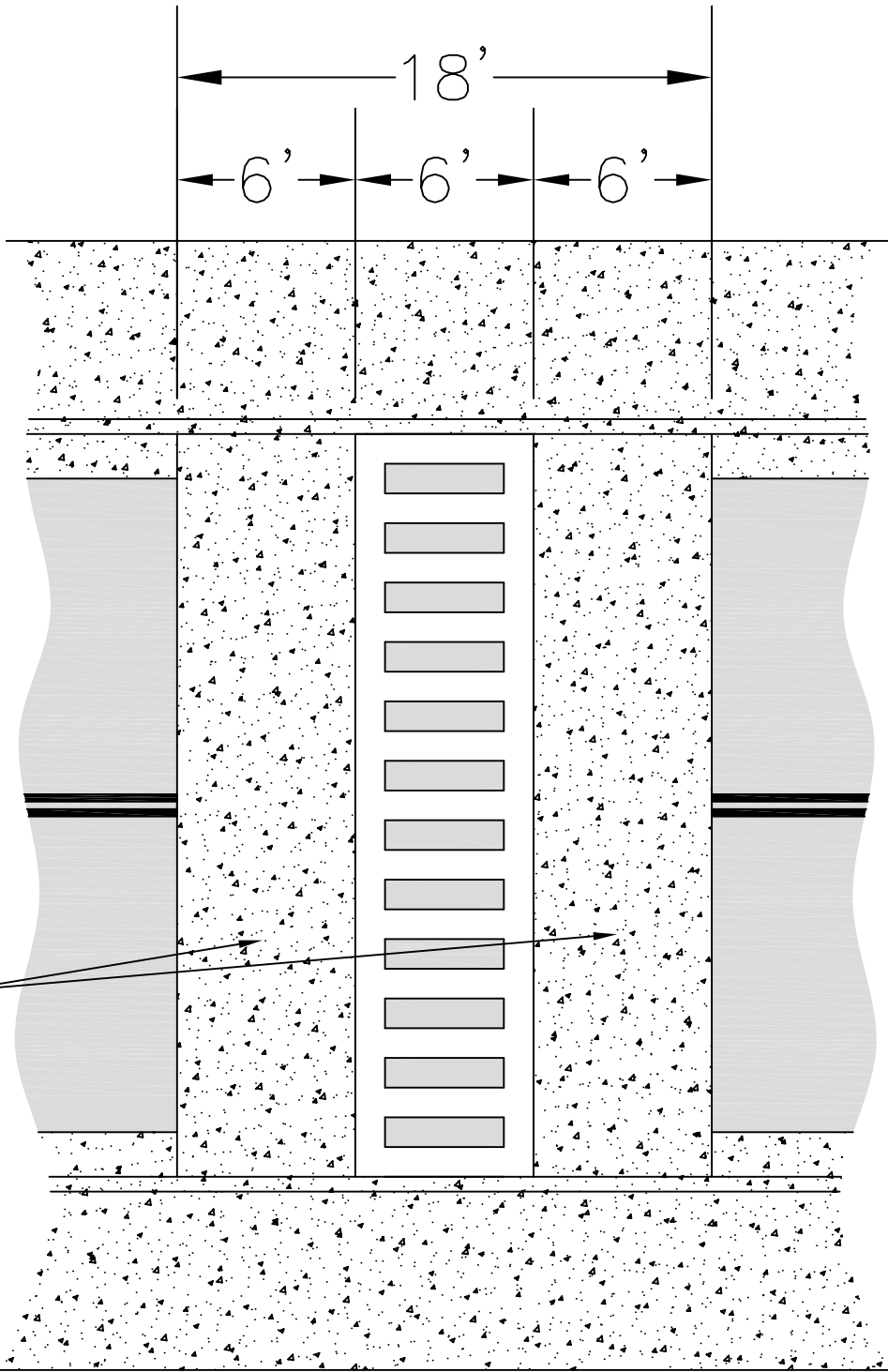
1. FLAT TABLE SURFACE MAY BE ASPHALT, CONCRETE, BRICK, OR OTHER APPROVED PAVING SURFACE.
2. SIGNING AND MARKING SHALL ADHERE TO THE LATEST VERSION OF THE MUTCD SECTION 3B.25 SPEED HUMP MARKINGS.
3. SHALL MEET SPEED TABLE REQUIREMENTS AS LISTED IN THE LATEST VERSION OF THE FDOT GREEN BOOK TABLE 15-1 VERTICAL TREATMENTS.
4. ALL VERTICAL DEFLECTIONS SHALL NOT EXCEED A FOUR INCH RISE OVER A SIX FOOT RUN.
5. RAMPS SHALL NOT BE ASPHALT. RAMPS SHALL BE CONCRETE, BRICK, OR OTHER APPROVED PAVING SURFACE.



CROSS SECTION

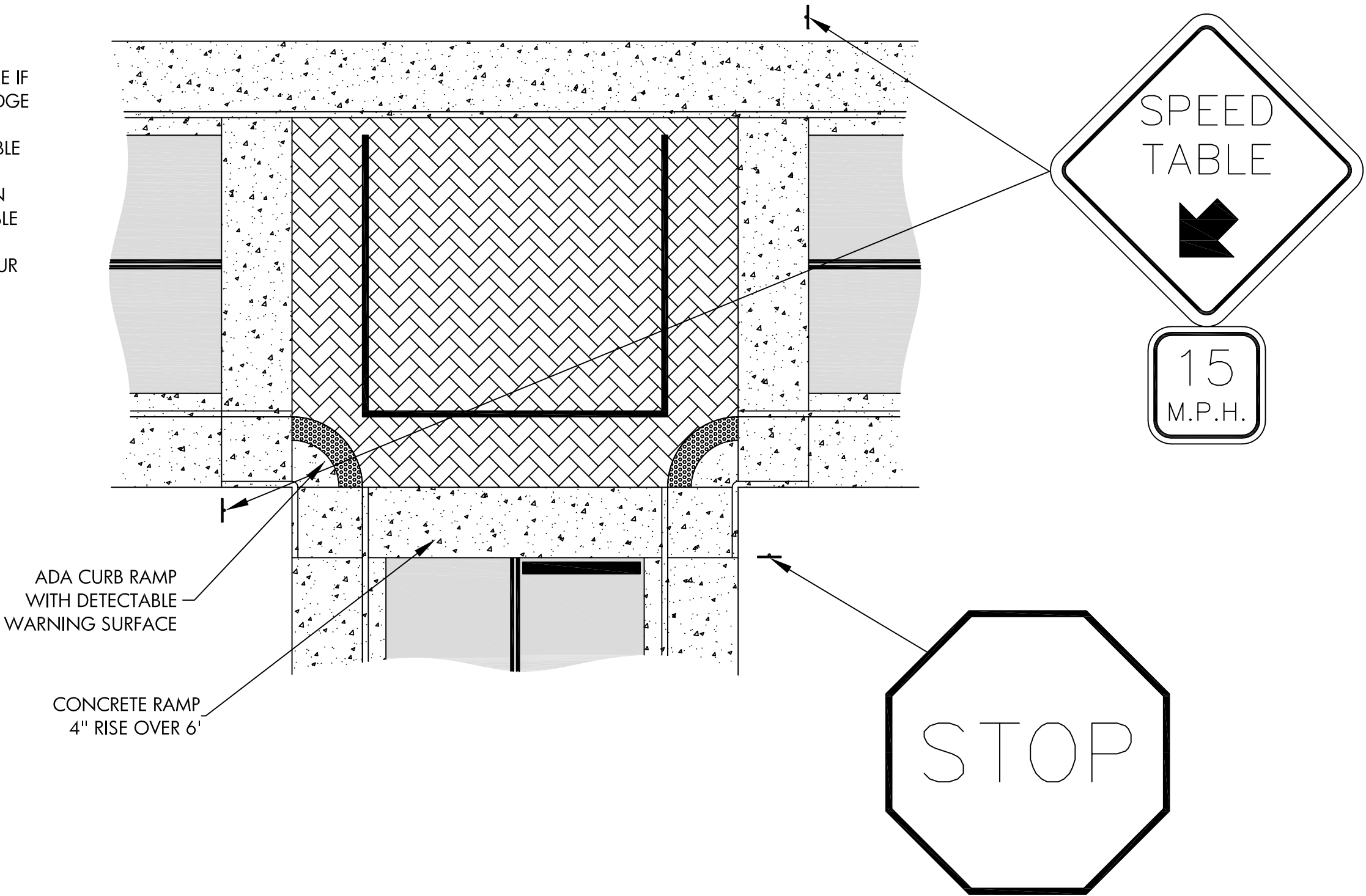
- GENERAL NOTES:
- 1. IF SIDEWALK AT BACK OF CURB, CROSSWALK MUST MEET AT TOPS OF CURBS OR PROVIDE CURB CUTS TO TIE INTO SIDEWALKS.
 - 2. ALL GRADES MUST BE ADA COMPLIANT.
 - 3. FLAT TABLE SURFACE MAY BE ASPHALT, CONCRETE, OR BRICK.
 - 4. SIGNING AND MARKING SHALL ADHERE TO THE LATEST VERSION OF THE MUTCD SECTION 3B.18 CROSSWALK MARKINGS.
 - 5. SIDEWALKS MUST BE ADJACENT TO BOTH ENDS OF THE CROSSWALK.
 - 6. SHALL MEET RAISED CROSSWALK AND SPEED TABLE REQUIREMENTS AS LISTED IN THE LATEST VERSION OF THE FDOT GREEN BOOK TABLE 15-1 VERTICAL TREATMENTS.
 - 6. SEE APPENDIX B-4 SPEED TABLE DETAILS FOR TYPICAL SECTION.
 - 7. RAMPS SHALL NOT BE ASPHALT. RAMPS SHALL BE CONCRETE, BRICK, OR OTHER APPROVED PAVING SURFACE.

CONCRETE RAMP.
4" RISE OVER 6' RUN.



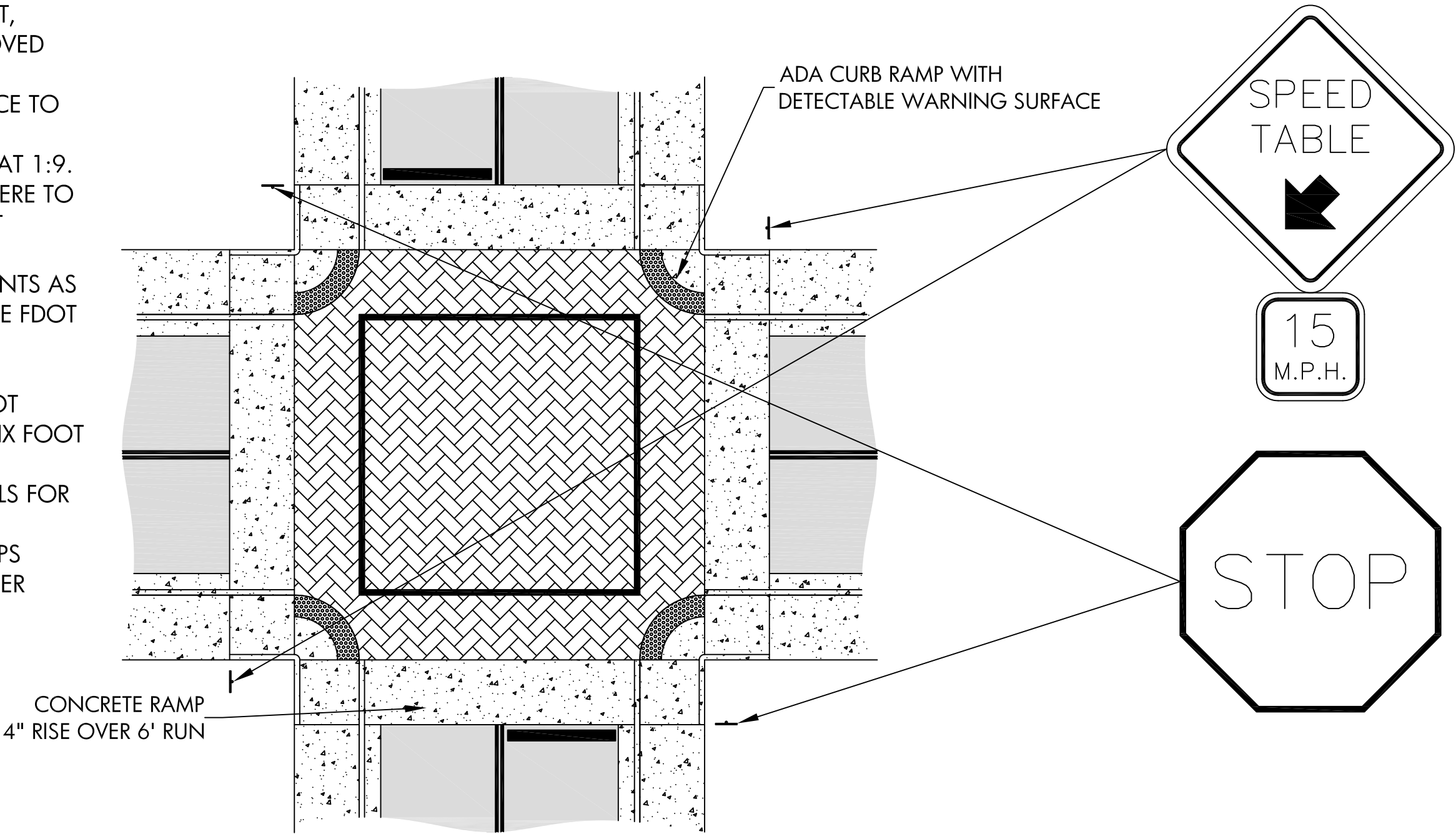
GENERAL NOTES:

- 1. FLAT TABLE SURFACE MAY BE ASPHALT, CONCRETE, BRICK, OR OTHER APPROVED PAVING SURFACE.
- 2. RAMPS MAY EXTEND FROM CURB FACE TO CURB FACE IF DRAINAGE PERMITS. OTHERWISE, TIE INTO GUTTER EDGE AT 1:9.
- 3. SIGNING AND MARKING SHALL ADHERE TO APPLICABLE SECTIONS OF THE LATEST VERSION OF THE MUTCD
- 4. SHALL MEET SPEED TABLE REQUIREMENTS AS LISTED IN THE LATEST VERSION OF THE FDOT GREEN BOOK TABLE 15-1 VERTICAL TREATMENTS.
- 5. ALL VERTICAL DEFLECTIONS SHALL NOT EXCEED A FOUR INCH RISE OVER A SIX FOOT RUN.
- 6. SEE APPENDIX B-4 SPEED TABLE DETAILS FOR TYPICAL SECTION.
- 7. RAMPS SHALL NOT BE ASPHALT. RAMPS SHALL BE CONCRETE, BRICK, OR OTHER APPROVED PAVING SURFACE.

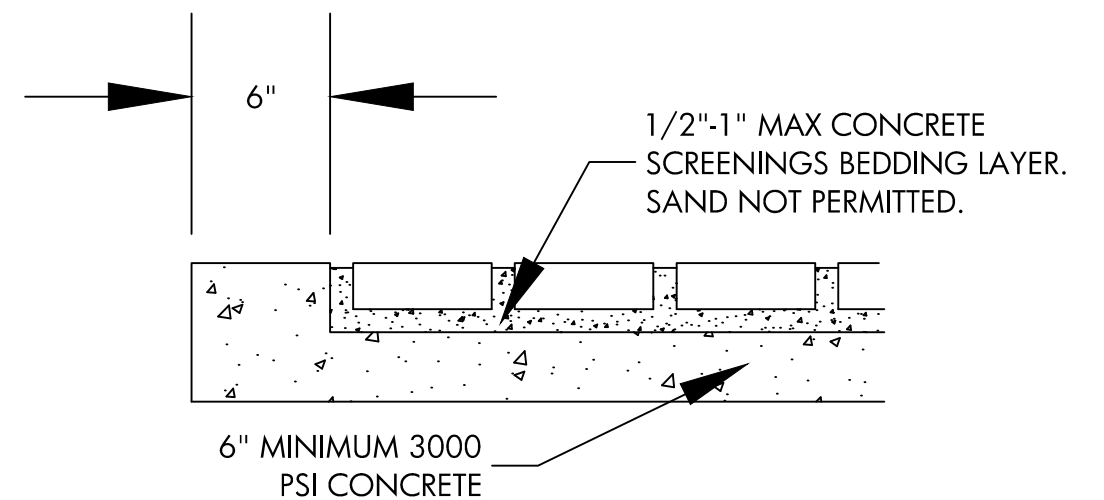
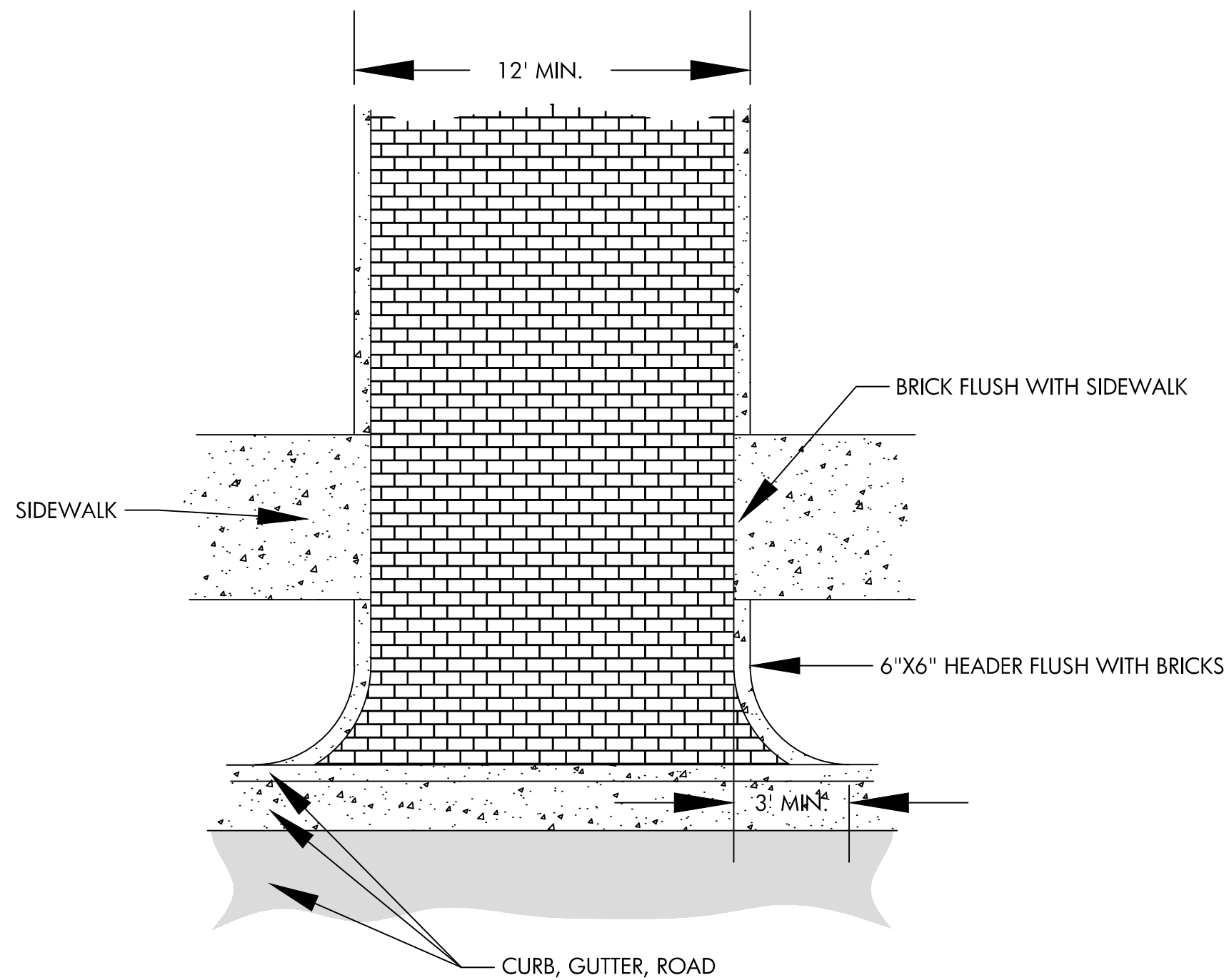


GENERAL NOTES:

- 1. FLAT TABLE SURFACE MAY BE ASPHALT, CONCRETE, BRICK, OR OTHER APPROVED PAVING SURFACE.
- 2. RAMPS MAY EXTEND FROM CURB FACE TO CURB FACE IF DRAINAGE PERMITS. OTHERWISE, TIE INTO GUTTER EDGE AT 1:9.
- 3. SIGNING AND MARKING SHALL ADHERE TO APPLICABLE SECTIONS OF THE LATEST VERSION OF THE MUTCD
- 4. SHALL MEET SPEED TABLE REQUIREMENTS AS LISTED IN THE LATEST VERSION OF THE FDOT GREEN BOOK TABLE 15-1 VERTICAL TREATMENTS.
- 5. ALL VERTICAL DEFLECTIONS SHALL NOT EXCEED A FOUR INCH RISE OVER A SIX FOOT RUN.
- 6. SEE APPENDIX B-4 SPEED TABLE DETAILS FOR TYPICAL SECTION.
- 7. RAMPS SHALL NOT BE ASPHALT. RAMPS SHALL BE CONCRETE, BRICK, OR OTHER APPROVED PAVING SURFACE.



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**City of Gainesville
Department of Sustainable Development
Planning Division**

PO Box 490, Station 11
Gainesville, FL 32627-0490
306 NE 6th Avenue
P: (352) 334-5022
F: (352) 334-2648

ATTACHMENT “E”

Petition PB-21-00167 TCH

October 28, 2021

Attachment A. Application and Other Supporting Documents

Attachment B. City of Gainesville Public Works Department Engineering Design & Construction Manual 2021.

Attachment C. Engineering Design and Construction Manual Comments/Responses

Attachment D. City of Gainesville Engineering Design & Construction Manual 2015

Attachment E. Proposed 2021 Engineering Design and Construction Manual Summary Table Showing 2015 EDCM location to 2021 EDCM location.

PROPOSED 2021 Engineering Design and Construction Manual
Summary table showing 2015 EDCM location to 2021 EDCM location.

Original Section #	Section Title	New Section #	New Section Title
CH 1	Introduction	CH 1	Introduction
1.1	Purpose and Applicability	1.1	Purpose and Applicability
1.2	Jurisdiction	N/A	Deleted
1.3	Policy	1.1	Moved to Purpose and Applicability
1.4	Enforcement	1.2	Enforcement
1.5	Conflicts with City of Gainesville Code of Ordinances	1.3	Conflicts with Governing Documents
1.6	Definitions and Terms	1.4	Definitions and Terms
1.7	Amendments	1.5	Amendments
1.8	Design Exceptions or Variances from the Terms in this Manual	1.6	Design Exceptions or Variances
1.9	Interpretation	1.7	Interpretation
1.10	Omissions	1.8	Omissions
CH 2	Technical References	CH 2	Technical References
CH 3	Permits	N/A	Deleted
CH 4	Stormwater Management	CH 3	Stormwater Management
		3.1	Objective
		3.2	Evaluation Criteria
4.1	Application	3.3	Permitting Thresholds
		3.3.1	Cumulative Development
		3.3.2	Definition of Redevelopment of Vehicular Use area or Building
		3.3.3	Exemptions
		3.3.4	Water Quality Required
		3.3.5	Water Quality and Quantity Required
4.2	General Design Standards	3.4	Minimum Requirements
		3.4.1	Drainage Narrative
		3.4.2	General Design Standards
		3.4.3	Technical Standards
4.5	Water Quality Standards	3.5	Water Quality Standards
		3.5.1	Water Quality Treatment Volume
		3.5.2	Water Quality Recovery
4.3	Design Storm Events	3.6	Stormwater Quantity Criteria
		3.6.1	Design Storm Events
4.4	Levels of Service for Stormwater Quantity	3.6.2	LOS Criteria for Stormwater Quantity
		3.8	Stormwater Conveyance
		3.6.3	Volume Requirements – Hogtown Creek Basin Criteria
		3.6.4	Tailwater

PROPOSED 2021 Engineering Design and Construction Manual
Summary table showing 2015 EDCM location to 2021 EDCM location.

Original Section #	Section Title	New Section #	New Section Title
		3.6.5	Lane Spread
		3.6.6	System Recovery
4.5	Water Quality Standards	3.5	Stormwater Quality Criteria
4.11	Floodplains and Floodways	3.7	Floodplains and Floodways
		3.7.1	100-year Floodplain
		3.7.2	10-year Flood Channel
		3.7.3	Critical Facilities
		3.7.4	Compensating Storage
		3.7.5	Letter of Map Change
4.4	Levels of Service for Stormwater Quantity	3.8	Stormwater Conveyance
		3.8.1	Subdivisions – Rear Lot Drainage
4.6	Open Conveyance Systems	3.8.2	Closed Conveyance Systems
4.7	Closed Conveyance Systems	3.8.3	Open Conveyance Systems
4.18	Geotechnical Requirements	3.9	Geotechnical Criteria
4.19 – 4.24	(see below for list)	3.10	Water Management District Criteria
4.8	Stormwater Pollution Prevention Plan	3.11	Stormwater Pollution Prevention
4.9	Erosion and Sedimentation Control	3.12	Erosion and Sedimentation Control
4.10	Karst Areas and High Aquifer Vulnerability Areas	3.13	Karst Areas and High Aquifer Vulnerability Areas
4.11	Floodplains and Floodways	3.7	Floodplains and Floodways
4.12	Finished Floor Elevations	3.4.3	Minimum Requirements #5
4.13	Berms and Dams	3.4.3	Minimum Requirements #3
4.14	Maintenance Access and Responsibility	3.15	Operation and Maintenance
4.15	Slopes	7.1.5	Required Notes on Plans
4.16	Retaining Walls	3.4.3	Minimum Requirements #7
4.17	Tailwater Conditions	3.6.4 3.8	Tailwater Stormwater Conveyance
4.18	Geotechnical Requirements	3.9	Geotechnical Criteria
4.19	Dry Stormwater Basins	3.10	Water Management District Criteria
4.20	Wet Detention Basins	3.10	Water Management District Criteria
4.21	Underdrain Systems	3.10	Water Management District Criteria
4.22	Exfiltration Systems	3.10	Water Management District Criteria
4.23	Swales	3.10	Water Management District Criteria
4.24	Wetland Treatment Systems	3.10	Water Management District Criteria
4.25	Technical Standards	3.4.3	Technical Standards
4.26	Additional Construction Design Requirements	3.4.2	General Design Standards
4.27	Stormwater Management Utility	3.14	Stormwater Management Utility

PROPOSED 2021 Engineering Design and Construction Manual
Summary table showing 2015 EDCM location to 2021 EDCM location.

Original Section #	Section Title	New Section #	New Section Title
4.14	Maintenance Access and Responsibility	3.15	Operation and Maintenance
		3.15.1	Accessibility
		3.15.2	Maintenance Entity
		3.15.3	Operation & Maintenance Overview or Manual
		3.15.4	Long Term Operation & Maintenance
CH 5	Roadway Design	4	Roadway Design
5.1	Geometrics	4.1	Objective
		4.2	Governing Standards
5.16	Street Classification	4.3	Roadway Classification
5.5	Drainage	4.4	Drainage
5.2	Intersections	4.5	Intersection Design
		4.5.1	Type Selection
5.2.1	Roundabouts	4.5.2	Roundabouts
		4.5.3	Traffic Signals
5.3	Pavements	4.6	Pavement Designs
5.3.1	Flexible Pavement	4.6.1	Flexible Pavement
5.3.2	Rigid pavement	4.6.2	Concrete Pavement
5.3.3	Alternative Design	4.6.3	Brick pavement
		4.6.4	Geotechnical for Public Roadways
5.3.4	Additional Criteria	N/A	Deleted
		4.7	Driveways
		4.7	Bicycle Facilities
5.4	Utilities	4.16	Utilities
5.5	Drainage	4.4	Drainage
5.6	Sidewalks, Bicycle Lanes, Trails, Shared Paths and ADA Ramps	4.8 4.9 4.10	Bicycle Facilities Sidewalks and Shared-use paths ADA Ramp
5.6.1	Sidewalks, Bicycle Lanes, Trails, Shared Paths	4.8	Bicycle Facilities
5.6.1	Sidewalks, Bicycle Lanes, Trails, Shared Paths	4.8	Sidewalks and Shared-use paths
5.6.2	ADA Ramps	4.10	ADA Ramps
5.7	Traffic Signals	4.5.3	Traffic Signals
5.7.1	Additional City Standards	4.5.3	Traffic Signals
5.7.2	Mast Arm Overhead Street name signs	4.11	Signage
5.8	Traffic Signs	4.11	Signage
5.8.1	Additional City Standards	4.11	Signage
5.9	Pavement Markings and Striping	4.12	Pavement Markings
5.10	Bridges and Other Structures	N/A	Deleted

PROPOSED 2021 Engineering Design and Construction Manual
Summary table showing 2015 EDCM location to 2021 EDCM location.

Original Section #	Section Title	New Section #	New Section Title
5.11	Transit Improvements	4.18	Transit
5.12	Traffic Control	4.20	Temporary Traffic Control
5.13	Landscape and Streetscape	8.12	Landscaping
5.14	Lighting	4.15	Lighting
5.15	Traffic Calming	4.13	Traffic Calming
		4.13.1	Horizontal Traffic Calming Measures
5.15.1	Speed Tables	4.13.2	Vertical Traffic Calming Measures
5.15.2	Raised Intersections	4.13.2	Vertical Traffic Calming Measures
5.15.3	Other	4.13	Traffic Calming
5.16	Street Classification	4.3	Roadway Classification
5.17	Parking (on-street)	4.14	On-Street Parking
		4.14.1	On-Street Parking
		4.14.2	Angle parking
		4.15	Lighting
		4.16	Utilities
5.13	Landscape and Streetscape	4.17	Landscaping
5.11	Transit Improvements	4.18	Transit
		4.19	Mailboxes
5.12	Traffic Control	4.20	Temporary Traffic Control
CH 6	Site Design	5	Site Design
6.1	Driveways	5.1	Driveways
		5.2	Utility Services
6.2	Dumpster pads	5.3	Refuse Collection and Dumpster Pads
6.3	Parking (off-street)	5.4	Parking (off-street)
6.3.1	Dimensions	5.4.1	Dimensions
6.3.2	Grading	5.4.2	Grading
6.3.3	Parking Lot Striping	5.4.3	Site Striping
6.3.4	Inlets	5.4.4	Inlets
6.3.5	Pipes	N/A	Deleted
6.3.6	Sidewalk/Curb Stops	4.9	Sidewalks and Shared-use Paths
		5.4.5	Vehicle Parking
		5.4.5	Vehicle Parking
6.3.7	Bicycle Parking	5.4.6	Bicycle Parking
6.3.8	Motorcycle Parking	5.4.7	Motorcycle Parking
6.3.9	Scooter Parking	5.4.8	Scooter Parking
		5.5	Public Right-of-Way and Maintenance
6.4	Public Sidewalks	5.6	Public Sidewalks
CH 7	Traffic Study Guidelines	6	Traffic Study Guidelines
7.1	Study Thresholds	6.1	Study Thresholds
		6.1.1	Traffic Statement

PROPOSED 2021 Engineering Design and Construction Manual
Summary table showing 2015 EDCM location to 2021 EDCM location.

Original Section #	Section Title	New Section #	New Section Title
		6.1.2	Traffic Study
		6.2	Methodology Letter
7.2	Required Information	6.3	Required Information
7.2.1	Project Description	6.3 #1	Project Description
7.2.2	Study Area	6.3 #2	Study Area
7.2.3	Analysis of Conditions	6.3 #3	Analysis of Conditions
7.3	Methodology Letter	6.2	Methodology Letter
CH 8	Submittal Requirements	7	Submittal Requirements
8.1	Site Plans	7.1	Site Plans
8.1.1	Conceptual Review	7.1.1	Conceptual Review
8.1.2	Development Plan Review	7.1.2	Development Plan Review
		7.1.3	Drainage Plan Sheets Shall Minimally Show
		7.1.4	Road Construction / Improvements Associated with Site Plans
		7.1.5	Required Notes on Plans
		7.1.6	Electronic File Submittals
8.2	Subdivision Developments and Capital Improvement Plan (CIP) Roadway Projects	7.2	Subdivision Development
		7.2.1	Plat Map / Right-of-Way Map
		7.2.2	Construction Plans.
		7.2.3	Submittal Format
		7.3	Interim Stormwater As-built Survey
8.3	As-built Plans and Record Drawings	7.4	As-built Survey
9	Permits	N/A	Deleted
9.2	Inspections	8.3.2	Inspections
9.3	Project Accessibility	8.3.2	Inspections
10	Construction Specifications	8	Construction
10.1	Purpose	8.1	Objective
10.2	Preconstruction Meeting	8.3.1	Preconstruction Meeting
10.3	Permits	8.2	ROW permits
9.1.3	ROW Use Permit	8.2.1	City ROW Use Permits
9.1.4	Building Permit	8.2.2	City Building Permits
		8.2.3	Other Permits
		8.3	Construction Activities
10.2	Preconstruction Meeting	8.3.1	Preconstruction Meeting
9.2	Inspections	8.3.2	Inspections
		8.3.3	Site Housekeeping
		8.3.4	Traffic Control

PROPOSED 2021 Engineering Design and Construction Manual
Summary table showing 2015 EDCM location to 2021 EDCM location.

Original Section #	Section Title	New Section #	New Section Title
10.8	Drainage	8.4	Stormwater
10.4.2	Erosion Control	8.4.1	Erosion Control
		8.4.2	Dewatering Activities
10.8.2	Inlets	8.4.3	Drainage Structures and Pipe
10.8.3	Swales and Basins	8.4.4	Stormwater Basins
10.8.4	Underdrain	8.4.5	Underdrain
10.8.7	As-builts	8.5	Stormwater As-built Survey
10.14	Utility Accommodation Manual	8.6	Utility Work
10.5	Earthwork	8.7	Earthwork
10.9	Asphaltic Concrete	8.8	Asphaltic Concrete
		8.9	Concrete
10.4	Clearing and Grubbing	N/A	Deleted
10.4.1	Disposal of Debris	N/A	Deleted
10.4.2	Erosion Control	3.11 3.12	Stormwater Pollution Prevention Erosion and Sedimentation Control
10.5	Earthwork	8.7	Earthwork
10.5.1	Excavation	8.7	Earthwork
10.5.2	Subsoil Excavation	8.7	Earthwork
10.5.3	Fill Materials	8.7	Earthwork
10.6	Subgrade	N/A	Deleted
10.6.1	Materials	N/A	Deleted
10.6.2	Placement and Mixing	N/A	Deleted
10.6.3	Inspection	N/A	Deleted
10.7	Base Course	N/A	Deleted
10.7.1	Materials	N/A	Deleted
10.7.2	Placement and Mixing	N/A	Deleted
10.7.3	Final Grading and Compaction	N/A	Deleted
10.7.4	Priming and Maintaining	N/A	Deleted
10.7.5	Required Construction	N/A	Deleted
10.7.6	Inspections	N/A	Deleted
10.9	Asphaltic Concrete	8.8	Asphaltic Concrete
5.7.1	Additional City Standards	8.10	Signals
5.8.1	Additional City Standards	8.11	Signs & Markings
10.8	Drainage	8.4	Stormwater
10.8.1	Storm Sewer Materials	8.4.3	Drainage Structures and Pipe
10.8.2	Inlets	8.4.3	Drainage Structures and Pipe
10.8.3	Swales and Basins	8.4.4	Stormwater Basins
10.8.4	Underdrain	8.4.5	Underdrain
10.8.5	Curb and Gutter	N/A	Deleted
10.8.6	Inspections	8.4.3	Drainage Structures and Pipe

PROPOSED 2021 Engineering Design and Construction Manual
Summary table showing 2015 EDCM location to 2021 EDCM location.

Original Section #	Section Title	New Section #	New Section Title
10.8.7	As-builts	8.5	Stormwater As-built Survey
10.9	Asphaltic Concrete	8.7	Asphaltic Concrete
10.9.1	Asphaltic Concrete Materials	8.7	Asphaltic Concrete
10.9.2	Surface Preparation	N/A	Deleted
10.9.3	Asphaltic Concrete Placement	N/A	Deleted
10.9.4	Inspections	N/A	Deleted
10.10	Signing and Marking	8.11	Signs & Markings
10.10.1	Materials	8.11	Signs & Markings
10.10.2	Placement	8.11	Signs & Markings
10.10.3	Placement of Signs and Markings	8.11	Signs & Markings
10.10.4	Inspections	8.11	Signs & Markings
10.11	Landscaping	8.12	Landscaping
10.11.1	Materials	8.12	Landscaping
10.11.2	Placement and Maintenance	8.12	Landscaping
		8.13	Lighting
10.12	Sampling and Testing Requirements	N/A	Deleted
10.12.1	General	N/A	Deleted
10.12.2	Testing Requirements	N/A	Deleted
10.13	Maintenance of Traffic	N/A	Deleted
10.14	Utility Accommodation Manual	8.6	Utility Work
10.14.1	Permitting	8.2	ROW Permits
10.14.2	Maintenance of Traffic	N/A	Deleted
10.14.3	Accommodation Standards	8.6	Utility Work
10.14.4	Pavement Cutting	8.6	Utility Work
10.14.5	Location Criteria	N/A	Deleted
10.14.6	Underground Crossings	8.6	Utility Work
10.14.7	Field Coordination	N/A	Deleted