Florida Department of Transportation

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ANANTH PRASAD
SECRETARY

ROADWAY DESIGN BULLETIN 14-17

(FHWA Approved: November 18, 2014)

DATE: November 18, 2014

TO: District Directors of Transportation Development, District Directors of Operations, District Design Engineers, District Consultant Project Management Engineers, District Construction Engineers, District Structures Design Engineers, District Traffic Operations Engineers, District Planning and Environmental Managers, Program Management Engineers

FROM: Michael Shepard, P. E., State Roadway Design Engineer
Marjorie Kirby, Manager, Environmental Management Office

COPIES: Brian Blanchard, Tom Byron, Duane Brautigam, David Sadler, Tim Lattner, Mark Wilson, Bruce Dana, John Krause, Greg Schiess, Nicholas Finch (FHWA), Chad Thompson (FHWA) and Phillip Bello (FHWA)

SUBJECT: Urban Arterial Lane Width and Bicycle Lane Options

This bulletin modifies the criteria for Urban Arterial Travel Lane Width, Bicycle Lane Facilities and related Bicycle Lane Markings. Specifically, this bulletin establishes eleven foot travel lanes for roadways with a divided typical section in or within one mile of an urban area and with a Design Speed of 45 mph or less. This bulletin also establishes seven foot Buffered Bicycle Lanes as the standard for marked bike lanes.

REQUIREMENTS

Plans Preparation Manual (PPM) Revisions:

1. **Replace PPM, Volume 1, Sections 2.1.1 and 2.1.2** with the following:

2.1.1 Travel Lanes and Auxiliary Lanes

Standard practice is to provide lane widths that are consistent with AASHTO Guidelines. See ***Table 2.1.1***. Auxiliary lanes for speed change, turning and storage, and other purposes supplementary to through-traffic movement should be of the same width as the through lanes.

Table 2.1.1 Lane Widths

LANE WIDTHS (FEET)					
FACILITY		**TRAVEL LANES**	**AUXILIARY LANES**		
TYPE	**AREA**		**SPEED CHANGE**	**TURNING (LT/RT/MED)**	**PASSING**
FREEWAY	Rural	12	12	----	----
	Urban	12	12	----	----
ARTERIAL	Rural	12 [6]	12 [6]	12 [6]	12 [6]
	Urban	11 [1]	11 [1]	11 [1,3]	11 [1]
COLLECTOR	Rural	12 [5,6]	11 [2]	11 [2,3]	11 [2,4]
	Urban	11	11	11 [3]	11

1. 12 ft. for Design Speeds > 45 mph and for all undivided roadways
2. 12 ft.for 2-lane roadways
3. With severe R/W controls, 10 ft. turning lanes may be used where design speeds are 40 mph or less and the intersection is controlled by traffic signals. Median turn lanes shall not exceed 15 ft.
4. 12 ft. when truck volume exceeds 10%.
5. 11 ft. for low volume AADT.
6. 11 ft. for divided roadways with Design Speeds ≤ 45 mph within one mile of an urban area.

Modification for Non-Conventional Projects:
Delete footnote 3 in ***PPM*** Table 2.1.1 above and see RFP for requirements.

2.1.2 Other Lane Widths

Lane widths for special lanes are given in ***Table 2.1.2***.

Table 2.1.2 Lane Widths - Special

LANE WIDTHS (FEET)					
FACILITY		**SPECIAL LANE TYPE**			
TYPE	**AREA**	**HOV[1]**	**BICYCLE**	**OFF SYSTEM DETOUR**	**URBAN MULTI-PURPOSE [3]**
FREEWAY	Rural	12	----	11 [2]	----
	Urban	12	----	11 [2]	----
ARTERIAL	Rural	12	5 [5]	11	----
	Urban	12	7	11	8 [4]
COLLECTOR	Rural	----	5 [5]	11	----
	Urban	----	7	11	8 [4]

1. Separated or concurrent flow.
2. For Freeway detours, at least one 12 ft. lane must be provided in each direction.
3. Urban multi-purpose lanes are usually used as refuge lanes but may be used for loading zones, bus stops, emergency access and other purposes. Parking that adversely impacts capacity or safety is to be eliminated whenever practical. Standard parking width is measured from face of curb, with a minimum width of 8 ft.
4. 10 ft. to 12 ft. lanes for commercial and transit vehicles.
5. 7 ft. buffered bicycle lane within one mile of an urban area.

Modification for Non-Conventional Projects:
Delete the second sentence in footnote 3 and delete footnote 4 in ***PPM*** Table 2.1.2 above and see RFP for requirements.

2. Revise PPM, Volume 1, Table 2.3.2, Shoulder Widths and Cross Slopes – Arterials Divided, add the following note:

7. 7 feet in or within one mile of an urban area.

This applies to the outside paved shoulder width, without shoulder gutter. Add subscript 7 to the column header "Outside" under "PAVED WIDTH", "WITHOUT SHOULDER GUTTER"

3. Revise PPM, Volume 1, Table 2.3.4, Shoulder Widths and Cross Slopes – Collectors Divided and Undivided, add the following note:

7. 7 feet for divided roadways in or within one mile of an urban area.

This applies to the outside paved shoulder width, without shoulder gutter. Add subscript 7 to the column header "Outside" under "PAVED WIDTH", "WITHOUT SHOULDER GUTTER"

4. Replace PPM, Volume 1, Table 8.1.1 with the following:

Table 8.1.1 On-Street Bicycle Facilities

Location	Condition	Type of Work		
		New Construction and Reconstruction	**Resurfacing, Restoration, Rehabilitation (RRR) [1, 2, 3]**	**Traffic Operations, Intersection Improvements**
In or within one mile of an urban area	All	Buffered Bicycle Lane	Buffered Bicycle Lane, Bicycle Lane, Wide Curb Lane, or Shared Lane with Shared Lane Markings (acceptable for posted speed 35 mph or less).	Buffered Bicycle Lane, Bicycle Lane, Wide Curb Lane, or Shared Lane with Shared Lane Markings (acceptable for posted speed 35 mph or less).
Beyond one mile of an urban area	Curb and Gutter	Buffered Bicycle Lane	Buffered Bicycle Lane, Bicycle Lane, Wide Curb Lane, or Shared Lane with Shared Lane Markings (acceptable for posted speed 35 mph or less).	Buffered Bicycle Lane, Bicycle Lane, Wide Curb Lane, or Shared Lane with Shared Lane Markings (acceptable for posted speed 35 mph or less).
	Flush Shoulder	Paved Shoulder	Paved Shoulder	Paved Shoulder

1. When no bicycle facilities exist, the widening of curbed sections for the project length to provide bicycle facilities may disproportionally affect the scope and cost of a RRR project, especially if reconstruction of the curb, sidewalk, and/or drainage system is required, additional right of way is needed, or utilities are impacted. No Design Variation is required, however, a statement similar to the following shall be included in the project file:

   "Bicycle facilities have been considered for this project but will not be provided, due to insufficient width between existing curb lines to provide bicycle facilities without substantial reconstruction of the roadway, drainage system and sidewalk (and/or requires additional right of way). Reconstruction (and/or right of way acquisition) is outside the scope of this project."

2. Substantial widening of an existing curbed section is outside the scope of a RRR project and is considered reconstruction.

3. See ***Section 25.4.19*** for options that shall be considered on RRR projects with existing roadways where no widening is planned.

5. Replace PPM, Volume 1, Sections 8.4, 8.4.1, 8.4.2.1, 8.4.3 and 8.4.4 with the following:

8.4 Bicycle Facilities

Appropriately designed and located bicycle facilities play an important role in supporting safe bicycle travel. Bicycle facilities include buffered bicycle lanes, conventional bicycle lanes, paved shoulders, wide curb lanes, low speed shared lanes (posted speed 35 mph or less), shared use paths, traffic control devices and bicycle parking facilities.

Measures that can considerably enhance a corridor's safety and capacity for bicycle travel are:

1. Providing bicycle facilities.

2. Maintaining a smooth, clean riding surface, free of obstructions. This includes ensuring drainage inlets and utility covers that cannot be moved out of the travel way are flush with grade, well seated, and use bicycle-compatible inlets, grates and covers.

3. Responsive and appropriate traffic control devices, consistent with guidance in the ***MUTCD***, including providing bicycle oriented directional signage.

8.4.1 Bicycle Lanes

Where required by ***Table 8.1.1,*** a bicycle lane shall be provided for each direction of travel on the roadway. On flush shoulder roadways, the paved shoulder described in ***Section 8.4.3*** shall be marked as a bicycle lane in or within 1 mile of an urban area. Bicycle lanes shall be marked in accordance with ***Design Standards, Index 17347*** and the ***MUTCD.*** Shared use paths do not meet the requirement for bicycle lanes.

On divided roadways in or within one mile of an urban area and a Design Speed of ≤ 45 mph,

travel lanes shall be 11 feet with a 7 foot Buffered Bicycle Lane. The bicycle lane is defined as the area between the edge of travel lane and the edge of pavement. For RRR projects, the distribution of available roadway width may require a bicycle lane other than the 7 foot buffered bicycle lane (See ***Volume 1, Section 25.4.19.2*** for further information). When providing a bicycle lane on a RRR project, the options in the order of priority are:

1. 7 foot buffered bicycle lane
2. 6 foot buffered bicycle lane
3. 5 foot conventional bicycle lane
4. 4 foot conventional bicycle lane

The minimum width of the buffer zone for the 6 foot and 7 foot buffered bicycle lane is depicted in ***Design Standards, Index 17347.*** A Buffered Bicycle Lane should not exceed 7 feet in width. For RRR projects, any additional pavement width that results from restricting the Buffered Bicycle Lane to 7 feet should be applied to the outside travel lane.

At an intersection approach, the buffer striping will transition to a double 6 inch wide stripe using a 2/4 skip pattern. The transition will begin 150 feet in advance of an intersection to provide sufficient distance for an automobile or truck to merge into the bicycle lane before turning right. The buffer striping will not be broken at low-volume or residential driveways.

When a guardrail or other barrier exists and the roadway pavement is continuous to the face of the barrier, the bicycle lane width shall not be less than 5 feet. When the bicycle lane is adjacent to a right-turn lane or bus bay, refer to ***Section 8.4.2*** of this chapter. On high speed urban and suburban arterial highways with design speeds of 50 mph or more and curb and gutter on the outside, a 6.5 foot bicycle lane adjacent to the curb and gutter is required. See ***Volume 1, Section 2.16*** for further information.

Bicycle lanes shall be one-way facilities and carry bicycle traffic in the same direction as adjacent motor vehicle traffic. On one-way streets, bicycle lanes should generally be placed on the right side of the street. A bicycle lane on the left side of the street can be considered if it will substantially reduce the number of potential conflicts, such as those caused by frequent bus traffic, heavy right-turn movements, high-turnover parking lanes, or if there is a significant number of left-turning bicyclists.

8.4.2.1 Keyhole Locations

In new construction, reconstruction and traffic operations projects, at locations with right turn lanes, bus bays or parking lanes, a bicycle lane, known as a keyhole lane, shall be provided between the through lane and the right turn lane, bus bay or parking lane. When provided in conjunction with the buffered bicycle lane, the width of the keyhole lane should be the same as the buffered bicycle lane and the buffer should be included in the keyhole lane. For 6 foot or smaller bicycle lanes, the minimum width of the keyhole lane is 5 feet.

For bicycle lanes adjacent to parking lanes, a 7 foot wide buffered bicycle lane shall be provided

using a 3 foot buffer adjacent to the parking lane hatched with 10 foot diagonal spacing. Shared lane markings should be used if width is inadequate for the 7 foot buffered bicycle lane.

When a RRR project includes the addition or modification of a right turn lane or bus bay, a 5-foot minimum width bicycle lane shall be provided between the through lane and the right turn lane or bus bay, if existing right of way is adequate.

When a RRR project has an existing right turn lane without a bicycle lane between the through lane and right turn lane, bus bay or parking lane, a bicycle lane should be provided. Factors to be considered include the opportunity to provide a continuous alignment, reduce the potential for conflicts with turning vehicles, and availability of right of way.

8.4.3 Paved Shoulders

A paved shoulder is a portion of a roadway which has been delineated by edge line striping, and may include bicycle lane pavement markings or signing. In or within 1 mile of an urban area, the paved shoulder shall be marked as a bicycle lane. Beyond one mile of an urban area, paved shoulders shall be 5 feet in width for new construction and reconstruction projects. Existing 4-foot paved shoulders on RRR projects should be widened to 5 feet where practical. A paved shoulder of at least 4 feet in width is considered to be a bicycle facility; however a minimum 5 foot clear width between the traveled way and the face of curb, guardrail or other roadside barrier is required.

8.4.4 Wide Curb Lanes

Wide curb lanes are through lanes which provide a minimum of 14 feet in width, which allows most motor vehicles to pass cyclists safely within the travel lane. Wide curb lanes do not meet Department requirements for bicycle facilities on new construction or reconstruction projects. However, in some conditions, such as RRR projects, they may be the only practical option for a bicycle facility.

6. Replace PPM, Volume 1, Section 21.5.3, note 3 with the following:

3. 7 feet adjacent to on-street parking.

7. Replace PPM, Volume 1, Section 25.4.5, Table 25.4.5.1 with the following:

Table 25.4.5.1 Lane and Shoulder Widths - Rural Multilane

Design Year AADT	Design Speed (mph)	Minimum Lane Width (ft.)	Minimum Shoulder Width (ft.)
ALL	ALL	12 [1]	6

1. 11 ft. for divided roadways with a Design Speed of 45 mph or less within one mile of an urban area.

8. Replace PPM, Volume 1, Section 25.4.19.2 note 1 with the following:

25.4.19.2 Bicyclist Needs

1. Buffered Bicycle Lanes, Bicycle Lanes, Paved Shoulders, Wide Outside Lanes and Shared Lanes

The available roadway width will be distributed, when practical, to provide for bicycle facilities. Bicycle facilities shall meet the criteria provided in ***Chapter 8***. The type of bicycle facility considered for implementation shall be in the following order of priority: buffered bike lanes, bike lanes, wide outside lanes, and shared lanes. Travel lane widths on urban multilane roadways and two-lane curb and gutter roadways shall not be reduced to less than 11 feet for design speeds ≥ 40 mph, and to no less than 10 feet for design speeds ≤ 35 mph. See ***Section 25.4.5*** for additional information on lane widths. Coordinate with the District Public Transportation (Modal Development) Office and local transit agency when considering the reduction of lane widths on roadways where public transit routes are present. Existing bicycle facilities not in accordance with ***Chapter 8*** require a Design Variation to remain.

9. Replace PPM, Volume 2, Chapter 6 Exhibits - Typical Sections TYP-3, TYP-4, TYP-5, TYP-6 and TYP-6A attached.

10. Add PPM, Volume 2, Chapter 6 Exhibit Typical Sections TYP-6b attached.

Design Standards Revisions:
The following Design Standards Revision (DSR) is released:
Revised Index 17347 (Bicycle Markings)

COMMENTARY

Eleven foot wide travel lanes on urban arterials are supported by AASHTO Guidance and the Highway Safety Manual. The 2001 AASHTO Greenbook states that for interrupted-flow operating conditions 11 foot wide lanes are normally adequate for design speeds of 45 mph or less, and even have some advantages over wider lanes. The AASHTO Guide to Bicycle Facilities states that, in some cases, the width needed for bicycle lanes can be obtained by narrowing travel lanes. The AASHTO Guide to Bicycle Facilities also cites the Highway Safety Manual and states that evaluation of the effects of travel lane widths of 10 to 12 feet on crashes for urban arterial roadways has found no general indication that the use of narrower widths within this range increases crash rates.

The Highway Safety Manual applies crash modification factors to base conditions, such as lane width, which can be statistically correlated to crash performance. For all roadway types, except Urban and Suburban Arterials, lane width is a factor in safety performance. In the case of urban arterials it was determined, through an expert panel review process, that lane widths between 10 and 12 feet are acceptable on urban arterials and do not cause safety problems. There is no significant correlation between lane width and safety performance for the range of facilities studied. However, neither high truck traffic nor bus traffic was quantified in this research; therefore, it is not known if lanes as narrow as 10 feet have the same safety performance as 11 or 12 feet wide lanes where high truck or bus traffic

exists. It has been concluded, though, based on FDOT Central Transit Office research titled "Integrating Transit into Traditional Neighborhood Design Policies – The Influence of Lane Width on Bus Safety" that the minimum acceptable lane widths for transit operations to avoid crashes and perform turning maneuvers safely is 11 feet.

Research addressing bicycle lane widths on roadways other than very low speed roadways is limited. Current AASHTO guidance notes the following:

1. The current bicycle lane standard of 4 feet is the AASHTO minimum operating width for cyclists.
2. AASHTO recommends wider bicycle lanes for roadways with operating speeds and traffic volumes such as exists on the State Highway System.

The limited width of a 4 foot bicycle lane tends to lead the cyclist to ride close to the curb to maintain a safe offset distance from passing vehicles, reducing maneuverability and visibility at intersections and driveways.

A 7 foot bicycle lane provides the legal passing offset distance of 3 feet and adequate distance from the curb for the cyclist to avoid debris and be more visible to motorists at side streets and driveways.

BACKGROUND

The practice of using 11 foot wide travel lanes on urban arterials under interrupted-flow operating conditions has become more accepted nationally. Safety research suggests that there is no safety benefit to using 12 foot wide lanes over 11 foot wide lanes and AASHTO publications support the use of 11 foot wide travel lanes under these conditions. In addition, Department initiatives related to reducing bicycle crashes have resulted in the need to implement new criteria for bicycle lane widths and associated pavement marking treatments. As a result, the opportunity exists to jointly implement new urban arterial lane width criteria for both travel and bicycle lanes that complement each other.

IMPLEMENTATION

The Requirements of this bulletin are effective immediately on all Project Development and Environment (PD&E) projects that have not held a Public Hearing. These requirements may be implemented immediately subsequent to the Public Hearing, at the discretion of the District. If the typical section for a PD&E recommended alternative changes due to this change in criteria, a Design Change Reevaluation will be required.

The Requirements of this bulletin are effective immediately on all design-bid-build projects in Phase I or Phase II design development (less than 60% complete). These requirements may be implemented immediately on all design-bid-build projects either in Phase III or Phase IV at the discretion of the District Design Engineer.

All of the Requirements of this bulletin are effective immediately on all design-build projects for which the final RFP has not been released. Design build projects for which the final RFP has been released are exempt from these requirements unless otherwise directed by the District.

CONTACT

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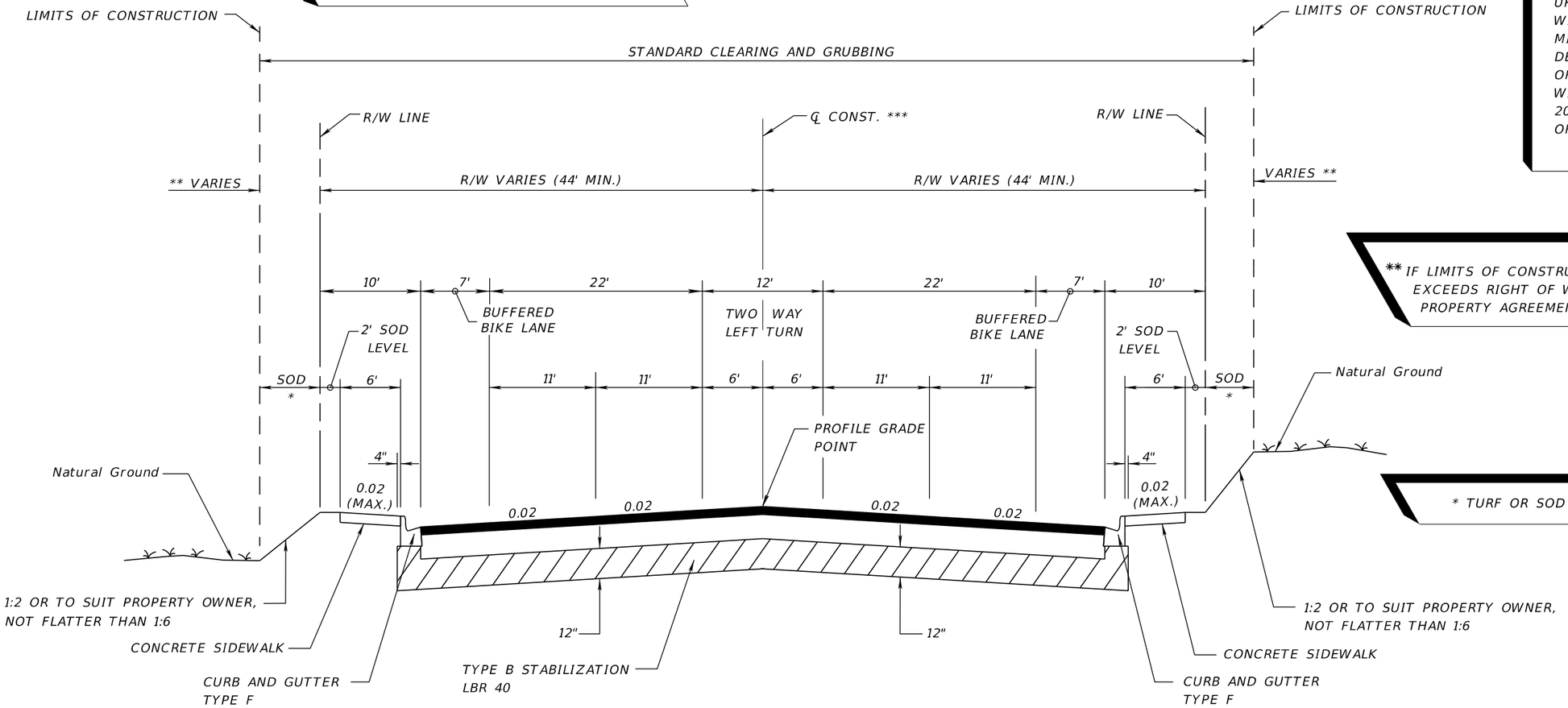
DC/SF

Link to Design Standards Revisions: http://www.dot.state.fl.us/rddesign/DS/15/Rev.shtm

5-LANE SECTIONS ARE TO INCLUDE SECTIONS OF RAISED OR RESTRICTIVE MEDIAN. SEE PPM TABLE 2.2.1.

*** ℄ SURVEY AND/OR ℄ CONSTRUCTION, AS APPLICABLE.

5-LANE
ARTERIAL/COLLECTOR
NEW CONSTRUCTION
UNDIVIDED
URBAN
WITH BICYCLE LANES
MINIMUM RIGHT OF WAY
DESIGN SPEED 40 MPH
OR LESS
WITH PROJECTED
20 YR. AADT OF 1500
OR GREATER



** IF LIMITS OF CONSTRUCTION EXCEEDS RIGHT OF WAY, A PROPERTY AGREEMENT IS REQUIRED.

* TURF OR SOD

TYPICAL SECTION
SR 00 (DUVAL STREET)
STA. 252+12.00 TO STA. 323+19.42

TRAFFIC DATA

CURRENT YEAR = 1998 AADT = 9900
ESTIMATED OPENING YEAR = 2000 AADT = 10600
ESTIMATED DESIGN YEAR = 2020 AADT = 14000
K = 6% D = 55% T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 40 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR. POSTED SPEED (MPH) IS OPTIONAL.

NEW CONSTRUCTION

OPTIONAL BASE GROUP 8 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1 ½")
AND FRICTION COURSE FC-12.5 (TRAFFIC B) (1 ½") (PG 76-22)

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

EXHIBIT TYP-3
Date: 1/1/15

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
10	LEON	123456-1-52-01

TYPICAL SECTION

SHEET NO.

10/30/2014 1:11:35 PM

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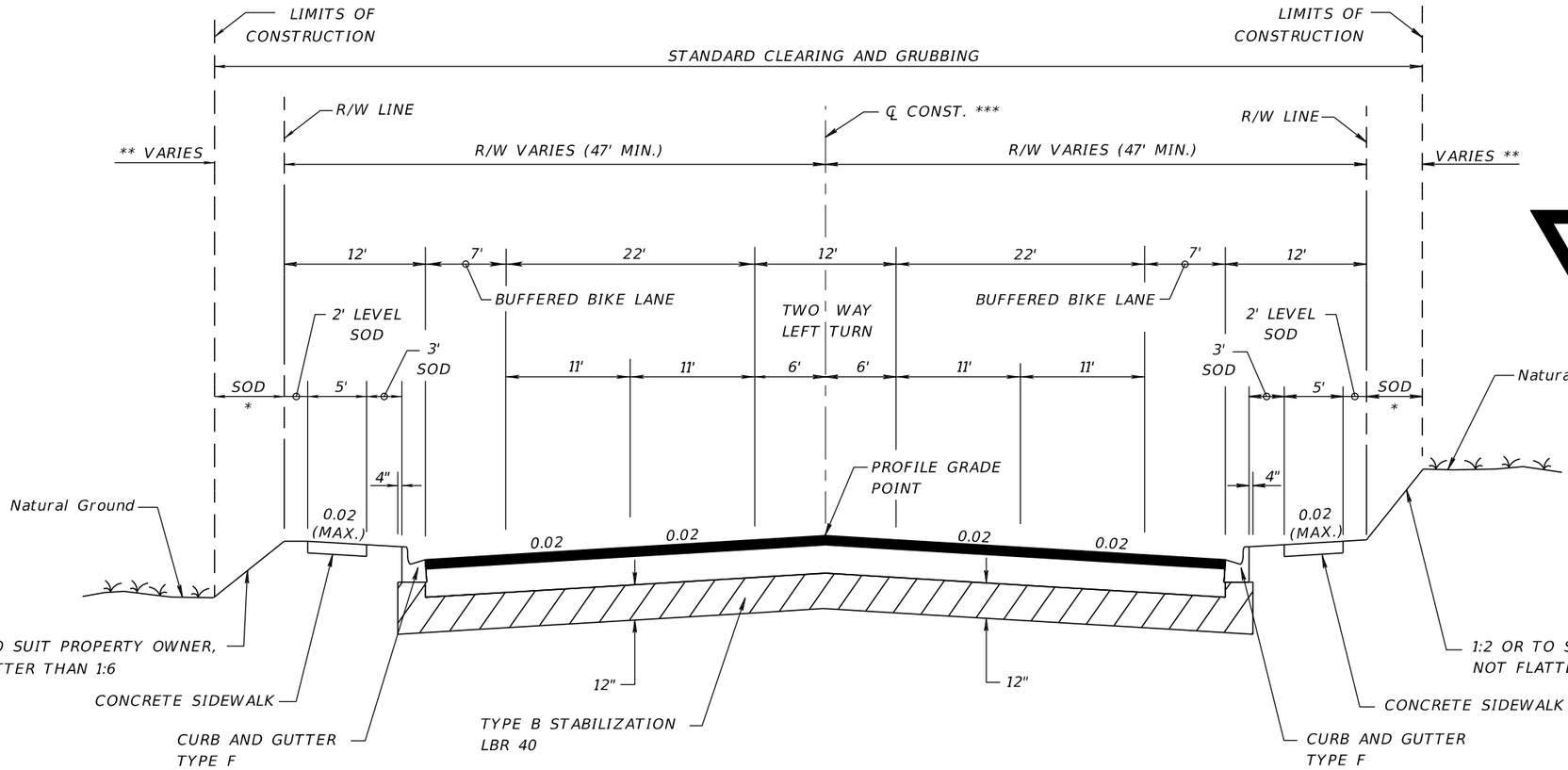
5-LANE SECTIONS ARE TO INCLUDE SECTIONS OF RAISED OR RESTRICTIVE MEDIAN. SEE PPM TABLE 2.2.1.

*** ℄ SURVEY AND/OR ℄ CONSTRUCTION, AS APPLICABLE.

5-LANE
ARTERIAL/COLLECTOR
NEW CONSTRUCTION
UNDIVIDED
URBAN
WITH BICYCLE LANES
DESIGN SPEED 40 MPH
OR LESS
WITH PROJECTED
20 YR. AADT OF 1500
OR GREATER



** IF LIMITS OF CONSTRUCTION EXCEEDS RIGHT OF WAY, A PROPERTY AGREEMENT IS REQUIRED.

* TURF OR SOD

TRAFFIC DATA

CURRENT YEAR = 1998 AADT = 20819
ESTIMATED OPENING YEAR = 2003 AADT = 24100
ESTIMATED DESIGN YEAR = 2023 AADT = 24900
K = 9% D = 60% T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 40 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR. POSTED SPEED (MPH) IS OPTIONAL.

TYPICAL SECTION
SR 00 (MATTHEWS STREET)
STA. 202+42.00 TO STA. 263+29.68

NEW CONSTRUCTION

OPTIONAL BASE GROUP 8 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1 ½")
AND FRICTION COURSE FC-12.5 (TRAFFIC B) (1 ½") (PG 76-22)

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

EXHIBIT TYP-4
Date: 1/1/15

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
10	LEON	123456-1-52-01

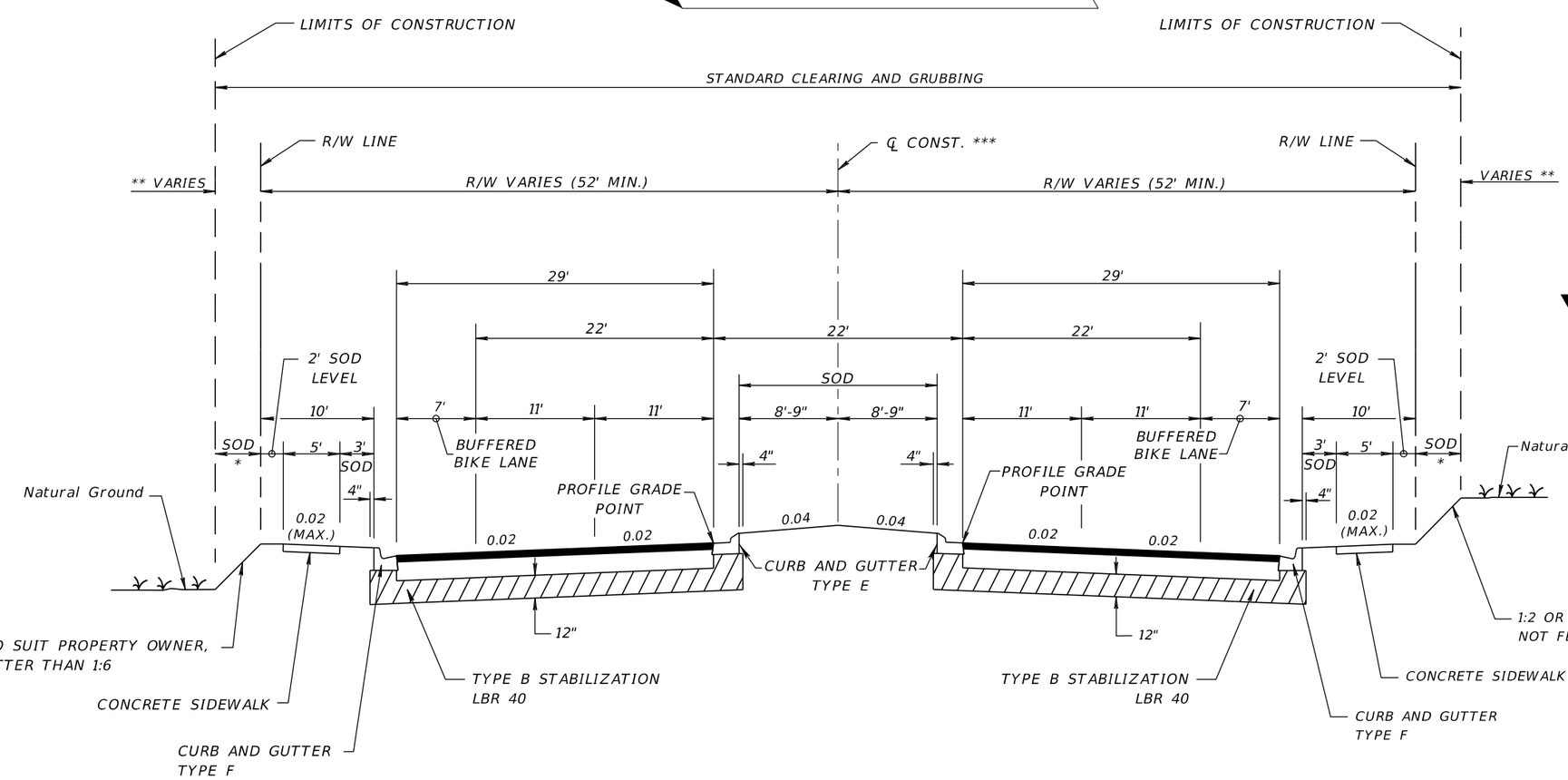
TYPICAL SECTION

SHEET NO.

10/30/2014 1:14:16 PM

*** ℄ SURVEY AND/OR
℄ CONSTRUCTION, AS APPLICABLE.

4-LANE
ARTERIAL
NEW CONSTRUCTION
DIVIDED
URBAN
WITH BIKE LANES
DESIGN SPEED 45 MPH OR LESS



** IF LIMITS OF CONSTRUCTION EXCEED RIGHT OF WAY, A PROPERTY AGREEMENT IS REQUIRED.

TRAFFIC DATA

CURRENT YEAR = 1998 AADT = 22800
ESTIMATED OPENING YEAR = 2000 AADT = 25800
ESTIMATED DESIGN YEAR = 2020 AADT = 30600
K = 6% D = 55% T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 45 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR. POSTED SPEED (MPH) IS OPTIONAL.

TYPICAL SECTION
SR 00 (WILSON STREET)
STA. 98+40.00 TO STA. 202+33.00

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC B) (1 ½")
AND FRICTION COURSE FC-12.5 (TRAFFIC B) (1 ½") (PG 76-22)

* TURF OR SOD

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

EXHIBIT TYP-5
Date: 1/1/15

REVISIONS					STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TYPICAL SECTION	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					10	LEON	123456-1-42-01		

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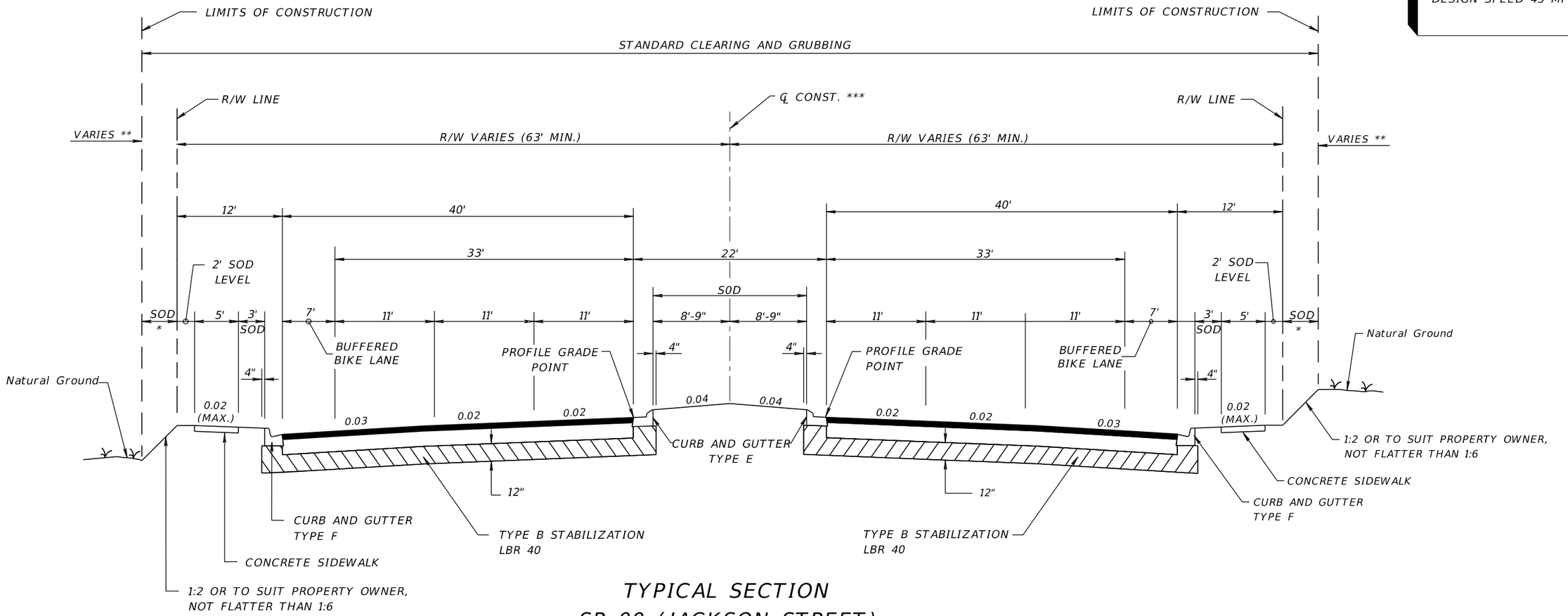
*** ℄ SURVEY AND/OR ℄ CONSTRUCTION, AS APPLICABLE.

** IF LIMITS OF CONSTRUCTION EXCEED RIGHT OF WAY, A PROPERTY AGREEMENT IS REQUIRED.

6-LANE
ARTERIAL
NEW CONSTRUCTION
DIVIDED
URBAN
WITH BIKE LANES
DESIGN SPEED 45 MPH OR LESS



TYPICAL SECTION
SR 00 (JACKSON STREET)
STA. 101+21.00 TO STA. 221+44.00

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2")
AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

TRAFFIC DATA

CURRENT YEAR = 1998 AADT = 22800
ESTIMATED OPENING YEAR = 2000 AADT = 25800
ESTIMATED DESIGN YEAR = 2020 AADT = 30600
K = 6% D = 55% T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 45 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

* TURF OR SOD

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

EXHIBIT TYP-6
Date: 1/1/15

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
10	LEON	123456-5-20-1

TYPICAL SECTION

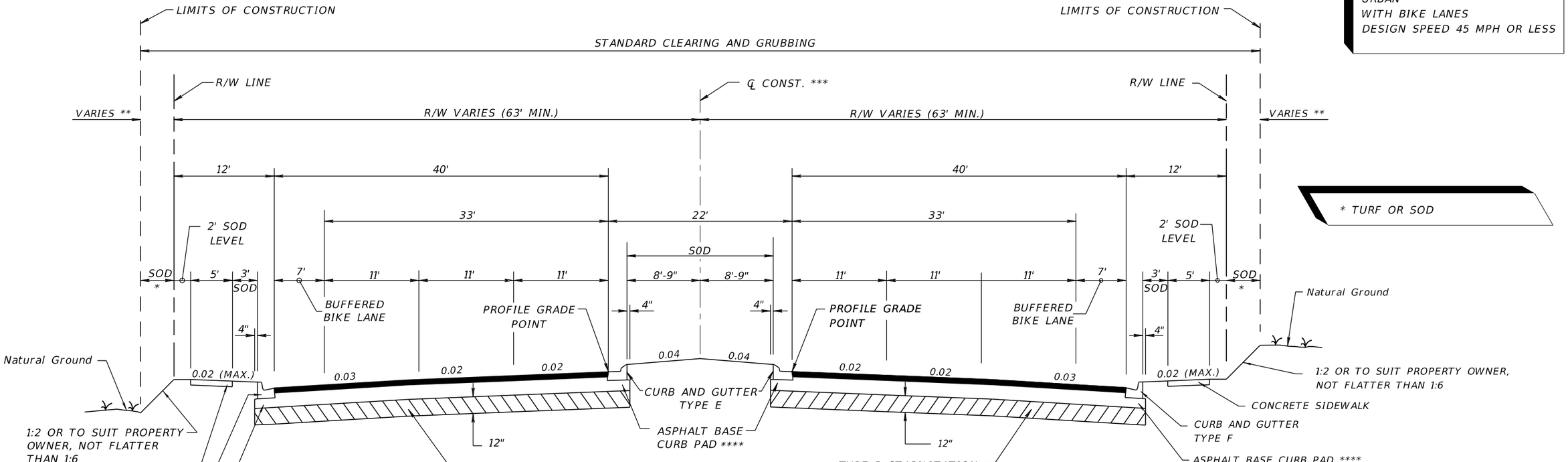
SHEET NO.

10/30/2014 1:18:20 PM

*** ℄ SURVEY AND/OR ℄ CONSTRUCTION, AS APPLICABLE.

** IF LIMITS OF CONSTRUCTION EXCEED RIGHT OF WAY, A PROPERTY AGREEMENT IS REQUIRED.

6-LANE
ARTERIAL
NEW CONSTRUCTION
DIVIDED
URBAN
WITH BIKE LANES
DESIGN SPEED 45 MPH OR LESS



* TURF OR SOD

TRAFFIC DATA

CURRENT YEAR = 1998 AADT = 22800
ESTIMATED OPENING YEAR = 2000 AADT = 25800
ESTIMATED DESIGN YEAR = 2020 AADT = 30600
K = 6% D = 55% T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 45 MPH

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER

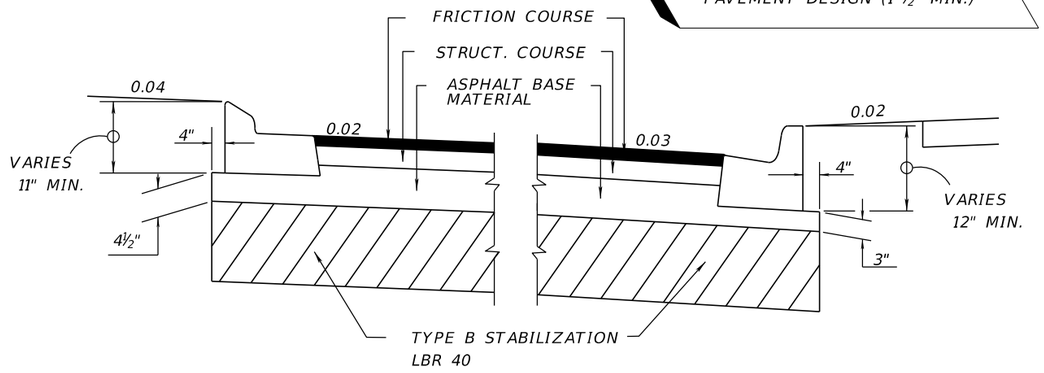
TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

TYPICAL SECTION
SR 00 (JACKSON STREET)
STA. 101+21.00 TO STA. 221+44.00

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 (TYPE B-12.5 ONLY), WITH TYPE SP STRUCTURAL COURSE (TRAFFIC C) (3") AND FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

**** THICKNESS VARIES BASED ON PAVEMENT DESIGN (1 ½" MIN.)



DETAIL OF ASPHALT BASE CURB PAD

EXHIBIT TYP-6A
Date: 1/1/13

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
10	LEON	123456-1-52-01

TYPICAL SECTION

SHEET NO.

10/30/2014 1:21:10 PM

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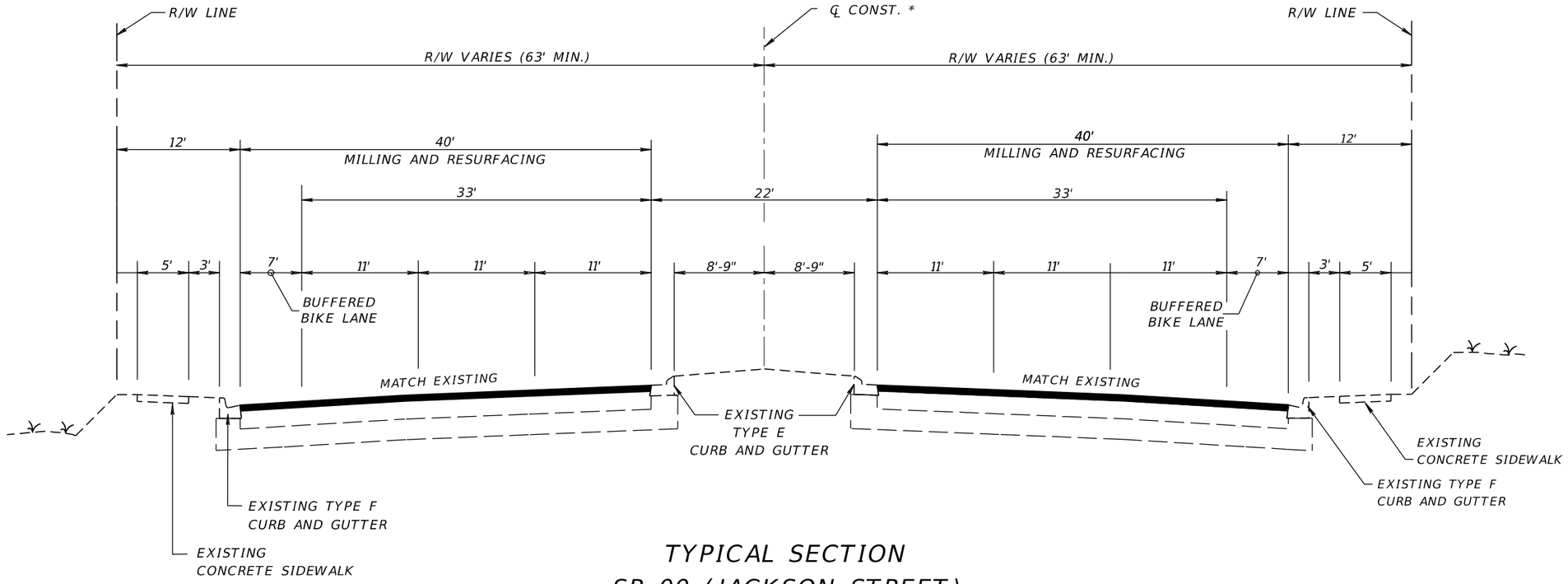
* ℄ SURVEY AND/OR
℄ CONSTRUCTION, AS APPLICABLE.

6-LANE
ARTERIAL
MILLING AND RESURFACING
DIVIDED
URBAN
WITH BIKE LANES
DESIGN SPEED 45 MPH OR LESS



TYPICAL SECTION
SR 00 (JACKSON STREET)

CONSTANT DEPTH MILLING AND RESURFACING
STA. 101+21.00 TO STA. 221+44.00

MILLING

MILL EXISTING ASPHALT PAVEMENT (1 ½" AVG. DEPTH)

RESURFACING

FRICTION COURSE FC-12.5 (TRAFFIC C) (1 ½") (PG 76-22)

TRAFFIC DATA

CURRENT YEAR = 1998 AADT = 22800
ESTIMATED OPENING YEAR = 2000 AADT = 25800
ESTIMATED DESIGN YEAR = 2020 AADT = 30600
K = 6% D = 55% T = 2% (24 HOUR)
DESIGN HOUR T = 1%
DESIGN SPEED = 45 MPH

TRAFFIC DATA IS REQUIRED TO BE NOTED FOR CURRENT YEAR, OPENING YEAR AND DESIGN YEAR.

FOR STANDARD TYPICAL SECTION NOTES REFER TO EXHIBIT 6-1, THIS CHAPTER.

EXHIBIT TYP-6b
Date: 1/1/15

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
10	LEON	123456-5-20-1

TYPICAL SECTION

SHEET NO.

11/13/2014 2:28:55 PM