

## PREFACE - APPENDIX B

*This Appendix B contains certain Indexes from the Department's January 2006 Design Standards for Design, Construction, Maintenance, and Utility Operations on the State Highway System that supplement the requirements found in this UAM for utility restoration and certain other utility operations deemed necessary to preserve the condition of the R/W. Should the particular conditions in the field indicate that the standards contained in this Appendix B are insufficient to restore FDOT R/W to the condition existing prior to utility work and that a standard not contained within this Appendix B is absolutely necessary to restore FDOT R/W to the condition existing prior to utility work, such standard shown in the Department's January 2006 Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System (excluding the 600 series indexes) will be prescribed by FDOT. To the extent it is possible to do, so such standard shall be identified on the permit, so adjustments to the utility work can be made by the utility. The January 2006 Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System can be found on FDOT's website at <http://www.dot.state.fl.us/rddesign/DesignStandards/Standards.htm>.*

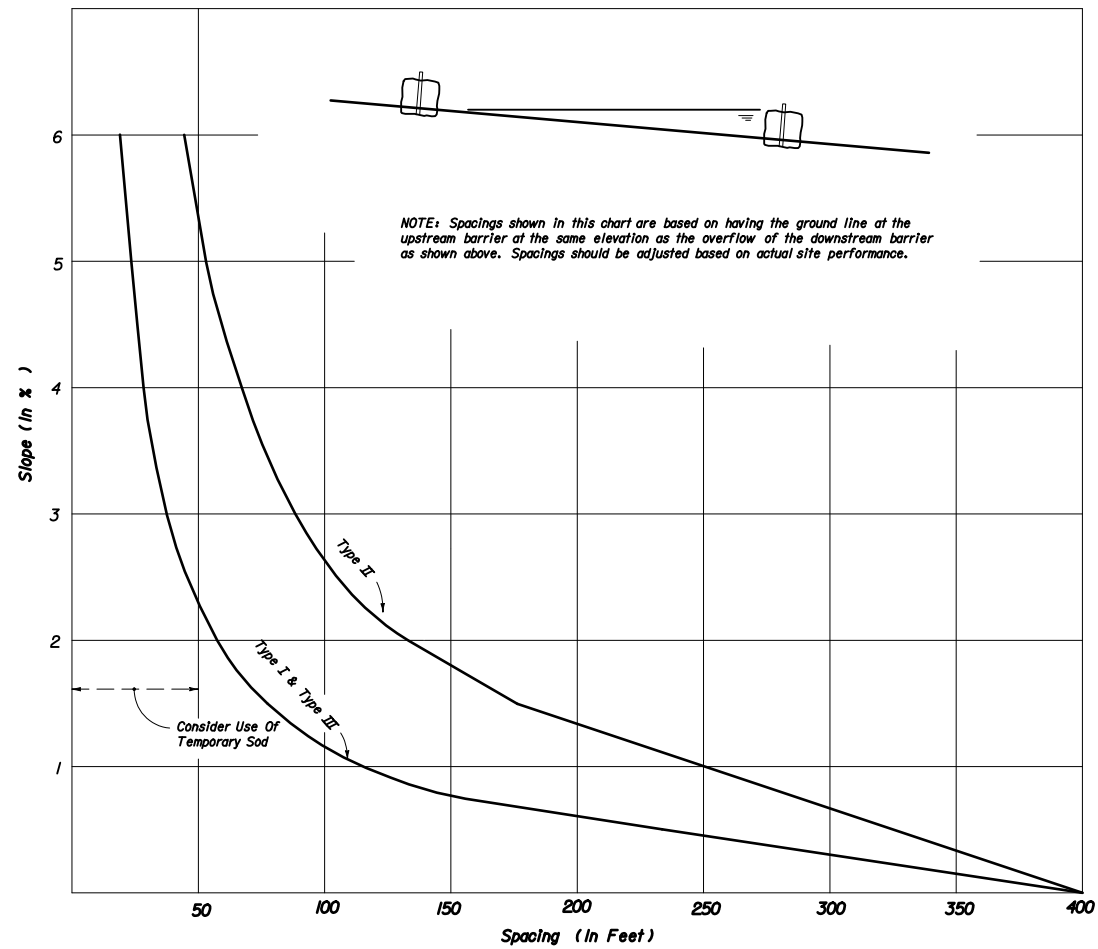
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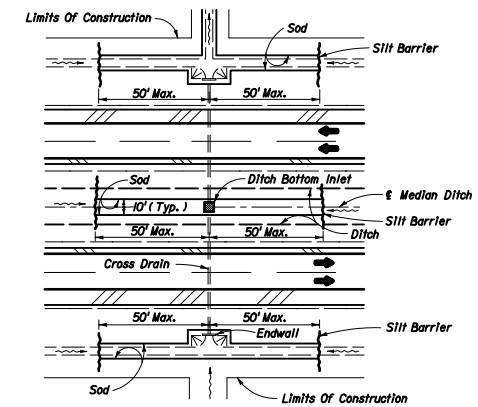
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

*Appendix B*

DATE	UTILITY ACCOMMODATION MANUAL REVISIONS



**CHART I**  
**RECOMMENDED SPACING FOR BALED HAY BARRIERS AND TYPE III SILT FENCE**



**DITCH INSTALLATIONS AT DRAINAGE STRUCTURES**



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**TEMPORARY EROSION AND SEDIMENT CONTROL**

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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS
01/01/07	"CHART I", delete the title and substitute "RECOMMENDED SPACING FOR SYNTHETIC BALES AND BALE TYPE BARRIERS AND TYPE III SILT FENCE"

**PROTECTION AROUND INLETS OR SIMILAR STRUCTURES**

**BARRIER FOR PAVED DITCH**

**SECTION AA**

*Note:* Where the slope length exceeds 25 feet, construct one row of bale barriers at 0% longitudinal grade midway up the slope. Construct two rows of bale barriers where the slope length exceeds 50 feet.

**ALONG FILL SLOPE**

**BARRIERS FOR UNPAVED DITCHES**

**BARRIERS FOR FILL SLOPES**

**NOTES FOR BALED HAY OR STRAW BARRIERS**

- Type I and II Barriers should be spaced in accordance with Chart 1, Sheet 1.
- Hay bales shall be trenched 3" to 4" and anchored with 2 - 1" x 2" (or 1" dia.) x 4" wood stakes. Stakes of other material or shape providing equivalent strength may be used if approved by the Engineer. Stakes other than wood shall be removed upon completion of the project.
- Rails and posts shall be 2" x 4" wood. Other materials providing equivalent strength may be used if approved by the Engineer.
- Adjacent bales shall be butted firmly together. Unavoidable gaps shall be plugged with hay or straw to prevent silt from passing.
- Where used in conjunction with silt fence, hay bales shall be placed on the upstream side of the fence.
- Bales to be paid for under the contract unit price for Baled Hay or Straw, EA. The unit price shall include the cost of filter fabric for Type I and II Barriers. Sand bags shall be paid for under the unit price for Sandbagging, CY. Rock bags to be paid for under the contract unit price for Rock Bags, EA.

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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS	
01/01/07	<p>"BARRIER FOR PAVED DITCH " is deleted and "SYNTHETIC BALE AND BALE TYPE BARRIER FOR PAVED DITCH " substituted.</p> <p>"BARRIERS FOR UNPAVED DITCHES" is deleted and "SYNTHETIC BALES OR BALE TYPE BARRIERS FOR UNPAVED DITCHES" is substituted.</p> <p>"NOTES FOR BALED HAY OR STRAW BARRIERS" is deleted and "NOTES FOR SYNTHETIC BALES AND BALE TYPE BARRIERS" is substituted.</p> <p>Note 1 is deleted and the following substituted: " 1. Type I synthetic barrier should be spaced in accordance with Chart 1 on Sheet 1. "</p>	<p>Note 2, delete the word "Hay" .</p> <p>Note 4, delete the second sentence.</p> <p>Note 5 is deleted and the following substituted: " 5. Where used in conjunction with silt fence, bales shall be placed on the upstream side of the fence. "</p> <p>Note 6 is deleted and the following substituted: " 6. Bales to be paid for under the contract unit price for Synthetic Bales, LF. The unit price shall include the cost of filter fabric for Type I Barrier. Sand bags shall be paid for under the contract unit price for Sandbagging, CY. Rock bags to be paid for under the contract unit price for Rock Bags, EA. "</p>

**TYPE III SILT FENCE**

Post Options: Softwood 2 1/2" Dia., Softwood 2" x 4", Hardwood 1 1/2" x 1 1/2", Steel 1.33lbs/ft

Filter Fabric (In Conformance With Sec. 985 FDOT Spec.)

Optional Post Positions

Principle Post Position (Canted 20° Toward Flow)

**TYPE IV SILT FENCE**

Post Options: Softwood 4" Dia., Softwood 4" x 4", Hardwood 3" Dia., Steel 1.33lbs/ft Min.

Poultry Mesh (20 Ga. Min.) Or Type A Fence Fabric (Index No. 801 & Section 550 FDOT Spec.)

Filter Fabric (In Conformance With Sec. 985 FDOT Spec.)

Optional Post Positions

Principle Post Position (Canted 20° Toward Flow)

**SILT FENCE APPLICATIONS**

Silt Fence Protection In Ditches with Intermittent Flow

Silt Fence Protection Around Ditch Bottom Inlets.

**JOINING TWO SILT FENCES**

Place the end post of one fence behind the end post of the other fence as shown.

Rotate both posts at least 180 degrees in a clockwise direction to create a tight seal with the fabric material.

Drive both posts into the ground and bury flap.

**NOTES FOR SILT FENCES**

- Type III Silt Fence to be used at most locations. Where used in ditches, the spacing for Type III Silt fence shall be in accordance with Chart I, Sheet I.
- Type IV Silt Fence to be used where large sediment loads are anticipated. Suggested use is where fill slope is 1:2 or steeper and length of slope exceeds 25 feet. Avoid use where the detained water may back into travel lanes or off the right of way.
- Do not construct silt fences across permanent flowing watercourses. Silt fences are to be at upland locations and turbidity barriers used at permanent bodies of water.
- Where used as slope protection, Silt Fence is to be constructed on 0% longitudinal grade to avoid channelizing runoff along the length of the fence.
- Silt Fence to be paid for under the contract unit price for Staked Silt Fence, (LF).

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**TYPE II**

$D_1$  = 5' Std. (Single Panel For Depths 5' or Less).  
 $D_2$  = 5' Std. (Additional Panel For Depths > 5').  
Curtain To Reach Bottom Up To Depths Of 10 Feet.  
Two (2) Panels To Be Used For Depths Greater Than 10 Feet Unless Special Depth Curtains Specifically Call For In The Plans Or As Determined By The Engineer.

**TYPE I**

**STAKED TURBIDITY BARRIER**

**NOTICE:** COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.

### FLOATING TURBIDITY BARRIERS

**LEGEND**

- Pile Locations
- ▨ Dredge Or Fill Area
- Mooring Buoy w/Anchor
- ⊙ Anchor
- Barrier Movement Due To Current Action

**GENERAL NOTES**

- Floating turbidity barriers are to be paid for under the contract unit price for Floating Turbidity Barrier, LF.
- Staked turbidity barriers are to be paid for under the contract unit price for Staked Turbidity Barrier, LF.

**NOTES:**

- Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
- Number and spacing of anchors dependent on current velocities.
- Deployment of barrier around pile locations may vary to accommodate construction operations.
- Navigation may require segmenting barrier during construction operations.
- For additional information see Section 104 of the Standard Specifications.

**Note:** Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractor's option unless otherwise specified in the plans, however payment will be under the pay item(s) established in the plans for Floating Turbidity Barrier and/or Staked Turbidity Barrier. Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

### TURBIDITY BARRIER APPLICATIONS

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**TURBIDITY BARRIERS**

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**LEGEND**

- 1 Wildflower Group #1
- 2 Wildflower Group #2
- G Grass-Seed/Seed & Mulch (To Limit of Construction)
- SC Selective Clearing And Grubbing
- LC Limits Of Construction
- S Seed, Seed And Mulch, Sod Or Seed, Sod

GRASS SEEDING RATES ( Lbs/Ac )								
TYPE OF SEED	ZONE I				ZONE II			
	COASTAL*		INLAND		COASTAL*		INLAND	
	Mar. to Nov.	Nov. to Mar.	Mar. to Nov.	Nov. to Mar.	Feb. to Dec.	Dec. to Feb.	Feb. to Dec.	Dec. to Feb.
<b>PERMANENT GRASSES</b>								
Unhulled Bermuda**		90		20		90		20
Hulled Bermuda**	60		15		60		15	
Bahia ( Argentine Or Pensacola )			180	180			180	180
<b>QUICK GROWING GRASS</b>								
Annual Rye Grass		90		90		90		90
<b>TOTAL POUNDS PER ACRE</b>	<b>60</b>	<b>180</b>	<b>195</b>	<b>290</b>	<b>60</b>	<b>180</b>	<b>195</b>	<b>290</b>

**SEEDING RATE ZONES**

WILDFLOWER SEEDING RATES	
Common Name ( Botanical Name )	lbs/ao
<b>#1 Group</b>	
Black-Eyed Susan ( Rudbeckia hirta )	2
Lance-Leaf Tickseed ( Coreopsis lanceolata )	10
Goldenmane Tickseed ( Coreopsis basalis )	10
Leavenworth's Tickseed ( Coreopsis leavenworthii )	10
Fire Wheel ( Galliardia pulchella )	10
Softhair Coneflower ( Rudbeckia mollis )	2
Crimson Clover ( Trifolium incarnatum )	15
<b>#2 Group</b>	
Annual Phlox ( Phlox drummondii )	10
Moss Verbena ( Verbena tenuisecta )	6
Leavenworth's Tickseed ( Coreopsis leavenworthii )	10
Fire Wheel ( Galliardia pulchella )	10
Crimson Clover ( Trifolium incarnatum )	15

**GENERAL NOTE**  
Confirm compatibility of wildflower with Grass Rate Zones.

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	Index No. <b>104</b>			

**GENERAL NOTE**  
Activities such as clearing, grading, and excavating that will disturb one or more acres of land require coverage under the General Permit for Stormwater Discharge from Large and Small Construction Activities from the Florida Department of Environmental Protection, and implementation of appropriate pollution prevention measures to minimize erosion and sedimentation and properly manage stormwater.

DATE	UTILITY ACCOMMODATION MANUAL REVISIONS	
01/01/07	Under the "WILDFLOWER SEEDING RATES" chart add the following footnote: "Wildflower seeding rates are for restoring impacted wildflower areas."  Under the "LEGEND", by symbol "G", delete " Grass Seed / Seed & Mulch " and insert "Turf " .  By symbol "S", delete "Seed, Seed and Mulch, Sod or Seed, Sod " and insert "Turf " .  Delete the "GRASS SEEDING RATES" table.	Above the "GENERAL NOTE" insert the following: "NOTE: All turf establishment shall be performed meeting the requirements of Section 570 of the Standard Specifications" .

**SECTION AA (Symmetrical About  $\epsilon$ )**

**SECTION BB (Symmetrical About  $\epsilon$ )**

**OVERLAPPED SOD FLUME**

**TRANSVERSE SECTION**

**LONGITUDINAL SECTION**

**RURAL UNDIVIDED**

**RURAL DIVIDED**

CRITERIA FOR PAVING SHOULDER ON DIVIDED AND UNDIVIDED FACILITIES		
Design Speed (mph)	Degree Of Curve	Note:
30	7° Or Greater	Shoulder Pavement is required on all curves meeting the criteria tabulated. For curves not meeting the criteria, shoulders are to be paved where erosion of the shoulder is evident or anticipated.
40	5° Or Greater	
50	4° Or Greater	
60	3° Or Greater	
65	3° Or Greater	
70	2° Or Greater	

**NOTES**

- These treatments are applicable to new construction, reconstruction and RRR projects. Project requirements for shoulder pavement and sodding that exceed the limits of this standard take precedence.
- For sodding adjacent to ditches and at headwalls, see Index No. 281.
- All front slopes steeper than 1:3 are to be sodded.

**SHOULDER AND SLOPE TREATMENT FOR SUPERELEVATED ROADWAYS**

**SHOULDER AND SLOPE TREATMENT IN SAG VERTICAL CURVES**

**TREATMENTS FOR PROTECTION FROM CONCENTRATED ROADWAY RUNOFF EROSION AND SHOULDER RAVELING**



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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS
01/01/07	On the left side of "SECTION BB" delete the notation "Conventional Grassing" and insert "Turf".

### TREATMENT I

**COMPLETED SHOULDER**

CRITERIA FOR USING TREATMENT I

Project \_\_\_\_\_

- is resurfacing, widening and resurfacing or construction of shoulder pavement
- is rural or is urban without curb and gutter
- resurfacing build-up is 3" or less

#### PATTERN DETAIL

**PLAN VIEW**

### GENERAL NOTES

- Treatment I:**
  - If trenching under sod is necessary to achieve the required 1" drop off, excavated turf and topsoil are to be used for filling voids and low areas at the edge of pavement or for flushing along the edge of sod. Excess material to be uniformly distributed over the shoulder.
  - Payment for excavation of turf and topsoil and for back fill of this material under Treatment I is to be included in the contract unit price for Sodding, SY.
- Treatment II:**
  - All borrow shall meet requirements for a "Select" material in accordance with Index 505 and Section 120 of the Standard Specifications.
  - Borrow may be used in lieu of excavated turf and topsoil when economically feasible, however the upper 6" shall meet the requirements of Section 162 "Finished Soil Layer". There will be no additional payment for substituting borrow for excavated turf and topsoil.
  - When existing turf and topsoil do not meet the requirements of Section 162 "Finished Soil Layer", provide additive materials as necessary in the upper 6" to meet the requirements of Section 162. There will be no additional payment for additives.
  - Payment for Treatment II will be under Finished Soil Layer. Seed, mulch fertilizer, water, sodding and borrow shall be paid for as separate items.
- Special attention is to be directed to the construction of the required 1" drop-off at the edge of pavement.
- Activities such as clearing, grading, and excavating that will disturb one or more acres of land require coverage under the Generic Permit for Stormwater Discharge from Large and Small Construction Activities from the Florida Department of Environmental Protection, and implementation of appropriate pollution prevention measures to minimize erosion and sedimentation and properly manage stormwater.
- Seeding:**
  - Wildflowers destroyed by shoulder sodding and turf operations are to be reestablished under the seeding rates prescribed for permanent wildflower #2 Group shown by table on Index 104.
  - Refer to Index 104 for Grass Seeding Rates and Seeding Rate Zones. Use seeding rates provided in Index 104 unless otherwise specified in the Contract Plans.
  - All seeding shall be performed meeting the requirements of Section 570 of the Standard Specifications.

### TREATMENT II

**SHOULDER OPTION 1**

**SHOULDER OPTION 2**

CRITERIA FOR USING TREATMENT II

Project \_\_\_\_\_

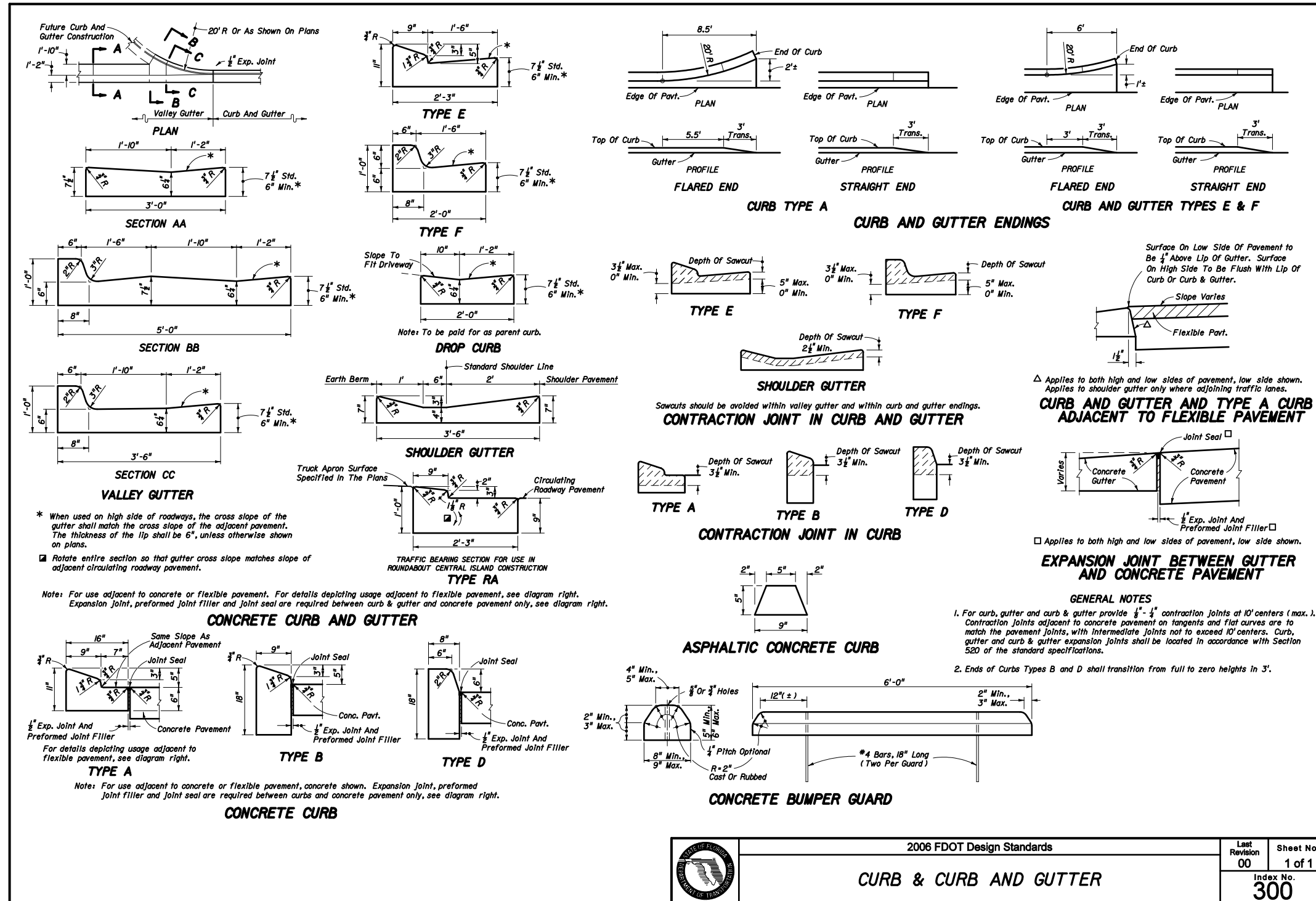
- is resurfacing or construction of shoulder pavement
- is rural or is urban without curb and gutter
- resurfacing build-up is 3" or more

A SIMILAR TREATMENT MAY BE USED FOR PROJECTS THAT REQUIRE SHOULDER WIDENING. DETAILS ARE TO BE SHOWN IN THE PLANS.

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	<b>SHOULDER SODDING AND TURF ON EXISTING FACILITIES</b>			Index No. <b>105</b>

DATE	UTILITY ACCOMMODATION MANUAL REVISIONS	REVISIONS
01/01/07	<p>"TREATMENT I", add width dimension of the sod strip as "2 5/32 -8" " and the note "See Pattern Detail".</p> <p>"TREATMENT II", "SHOULDER OPTION I" and "SHOULDER OPTION II", delete notations "Seed And Mulch" and insert "Turf".</p> <p>"GENERAL NOTES", note "1 B", delete the text of the note and substitute the following: "Payment for the sod, excavation of turf and topsoil and for back fill of this material under Treatment I is to be included in the contract unit price for Performance Turf, SY."</p> <p>Note "2 D", delete the second sentence and insert the following: "Sod and other materials for turf establishment shall be paid for as Performance Turf, SY".</p>	<p>Note "5", delete "Seeding" and insert "Turf Establishment".</p> <p>Note "5 B", delete the note.</p> <p>Note "5 C", renumber as "5 B". Also delete "seeding" and insert "turf establishment".</p>





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**CURB & CURB AND GUTTER**

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**GENERAL NOTES**

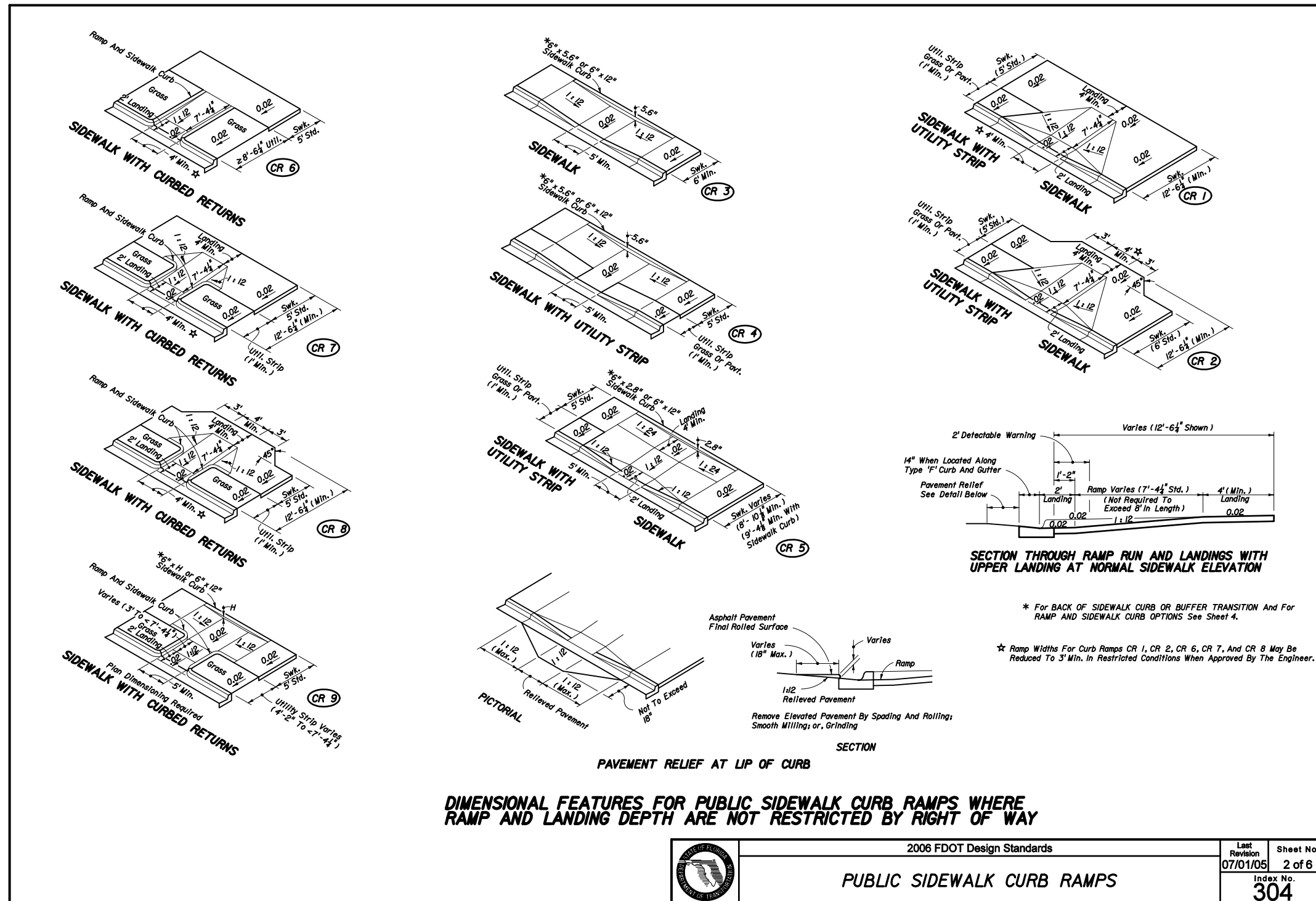
- Public sidewalk curb ramps shall be constructed in the public right of way at locations that will provide continuous unobstructed pedestrian circulation paths to pedestrian areas, elements and facilities in the public right of way and to accessible pedestrian routes on adjacent sites. Curbed facilities with sidewalks and those without sidewalks are to have curb ramps constructed at all street intersections and at turnouts that have curbed returns. Partial curb returns shall extend to the limit prescribed by Index No. 515 to accommodate curb ramps. Ramps constructed at locations without sidewalks shall have a landing constructed at the top of each ramp, see Sheet 5.
- The location and orientation of curb ramps shall be as shown in the plans.
- Curb ramp running slopes at unrestrained sites shall not be steeper than 1:12 and cross slope shall be 0.02 or flatter. Transition slopes shall not be steeper than 1:12.  
  
When altering existing pedestrian facilities where existing site development precludes the accommodation of a ramp slope of 1:12, a running slope between 1:12 and 1:10 is permitted for a rise of 6" maximum and a running slope of between 1:10 and 1:8 is permitted for a rise of 3" maximum. Where compliance with the requirements for cross slope cannot be fully met, the minimum feasible cross slope shall be provided.  
  
Ramp running slope is not required to exceed 8' in length, except at sites where the plans specify a greater length.
- If a curb ramp is located where pedestrians must walk across the ramp, then the walk shall have transition slopes to the ramp; the maximum slope of the transitions shall be 1:12. Ramps with curb returns may be used at locations where other improvements provide guidance away from that portion of curb perpendicular to the sidewalk; improvements for guidance are not required at curb ramps for linear pedestrian traffic.
- Curb ramp detectable warning surfaces shall extend the full width of the ramp and in the direction of travel 24" from the back of curb. Detectable warning surfaces shall be constructed in accordance with Specification 527. See Sheet 6 of 6 for detectable warning layouts. Transition slopes are not to have detectable warnings.
- Where a curb ramp is constructed within existing curb, curb and gutter and/or sidewalk, the existing curb or curb and gutter shall be removed to the nearest joint beyond the curb transitions or to the extent that no remaining section of curb or curb and gutter is less than 5' long. The existing sidewalk shall be removed to the nearest joint beyond the transition slope or walk around or to the extent that no remaining section of sidewalk is less than 5' long. For details of Concrete Sidewalk See Index 310.
- Alpha-numeric identifications are for reference (plans, permits, etc.).
- Public sidewalk curb ramps are to be paid for as follows:  
Ramps, reconstructed sidewalks, walk around sidewalks, sidewalk landings and sidewalk curbs are to be paid for under the contract unit price for Sidewalk Concrete, (Type ---) Thick).  
ST. Curb transitions and reconstructed curbs are to be paid for under the contract unit price for the parent curb, i.e., Curb Conc., (Type ---), LF or Curb and Gutter Conc., (Type ---), LF.  
  
When a separate pay item for the removal and disposal of existing curb, curb and gutter, and/or sidewalk is not provided in the plans, the cost of removal and disposal of these features shall be included in the contract unit price for new curb, curb and gutter and/or sidewalk respectively.
- Acceptance Criteria for Detectable Warnings:  
(a) The ramp detectable warning surface shall be complete and uniform in color and texture  
(b) 90% of the individual truncated domes must comply with the design criteria  
(c) There may be no more than 4 non-complying domes in any one square foot of surface  
(d) No two adjacent domes may be non-compliant  
(e) Surface may not deviate more than 0.10" from a true plane
- All sidewalk surfaces, ramp surfaces, and landings with a cross slope shown in this Index to be 0.02 shall be 0.02 maximum. All ramp surfaces and ramp transition slopes with a slope shown in this Index to be 1:12 shall be 1:12 maximum.

**TYPICAL PLACEMENT OF PUBLIC SIDEWALK CURB RAMPS AT CURBED RETURNS**

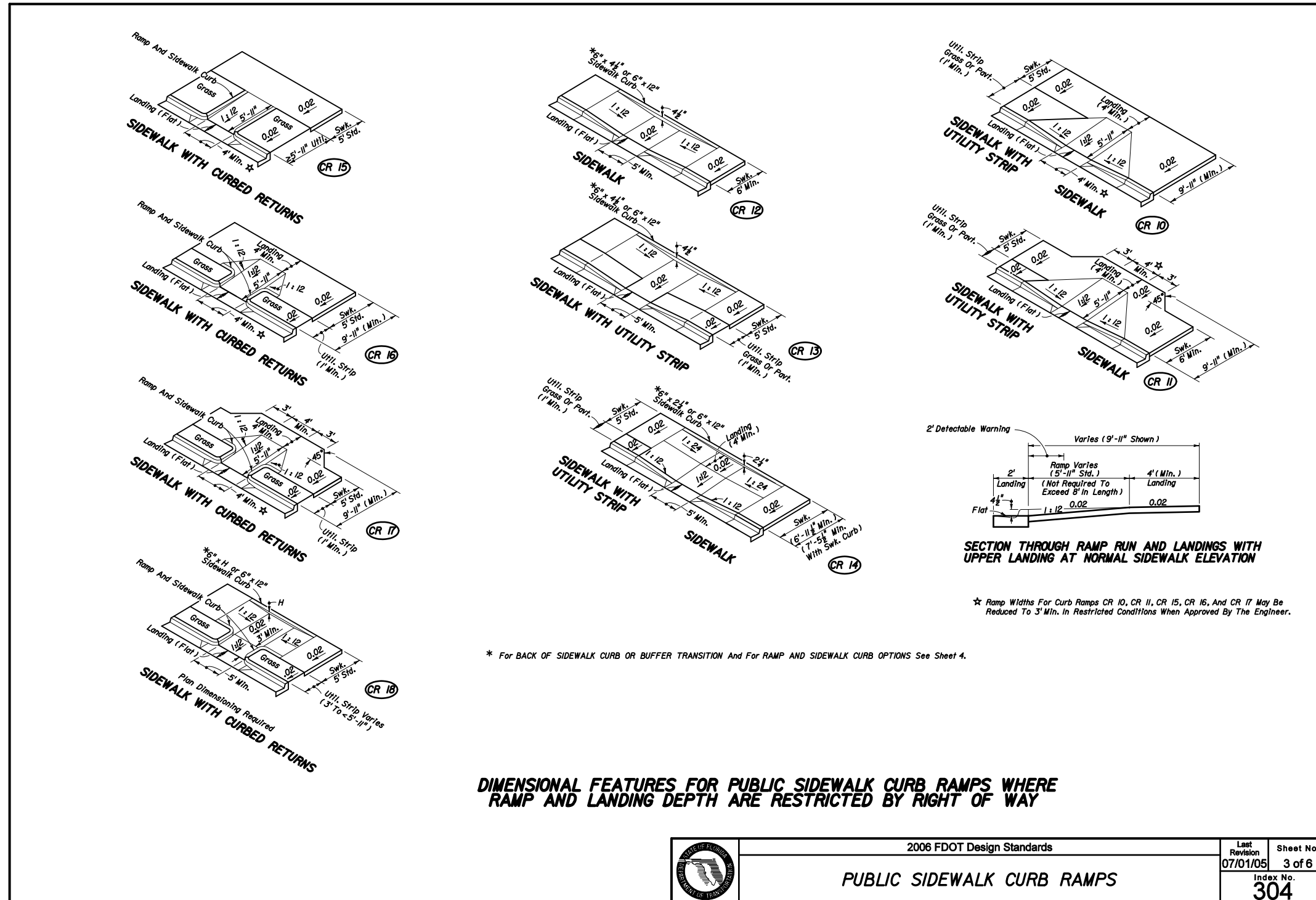
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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS
01/01/07	Detail in lower left corner, the note "When crosswalk markings - - " is deleted and the following note substituted: "When crosswalk markings are required, ramp runs must fall within crosswalk limits and where practical, be parallel with the projected crosswalk alignment. The bottom of the ramp beyond the curb line shall have a clear space 48" minimum within the markings of a marked crosswalk. If no crosswalk markings are present, the bottom of the ramp beyond the curb ramp shall have a clear space 48" minimum outside active traffic lanes."



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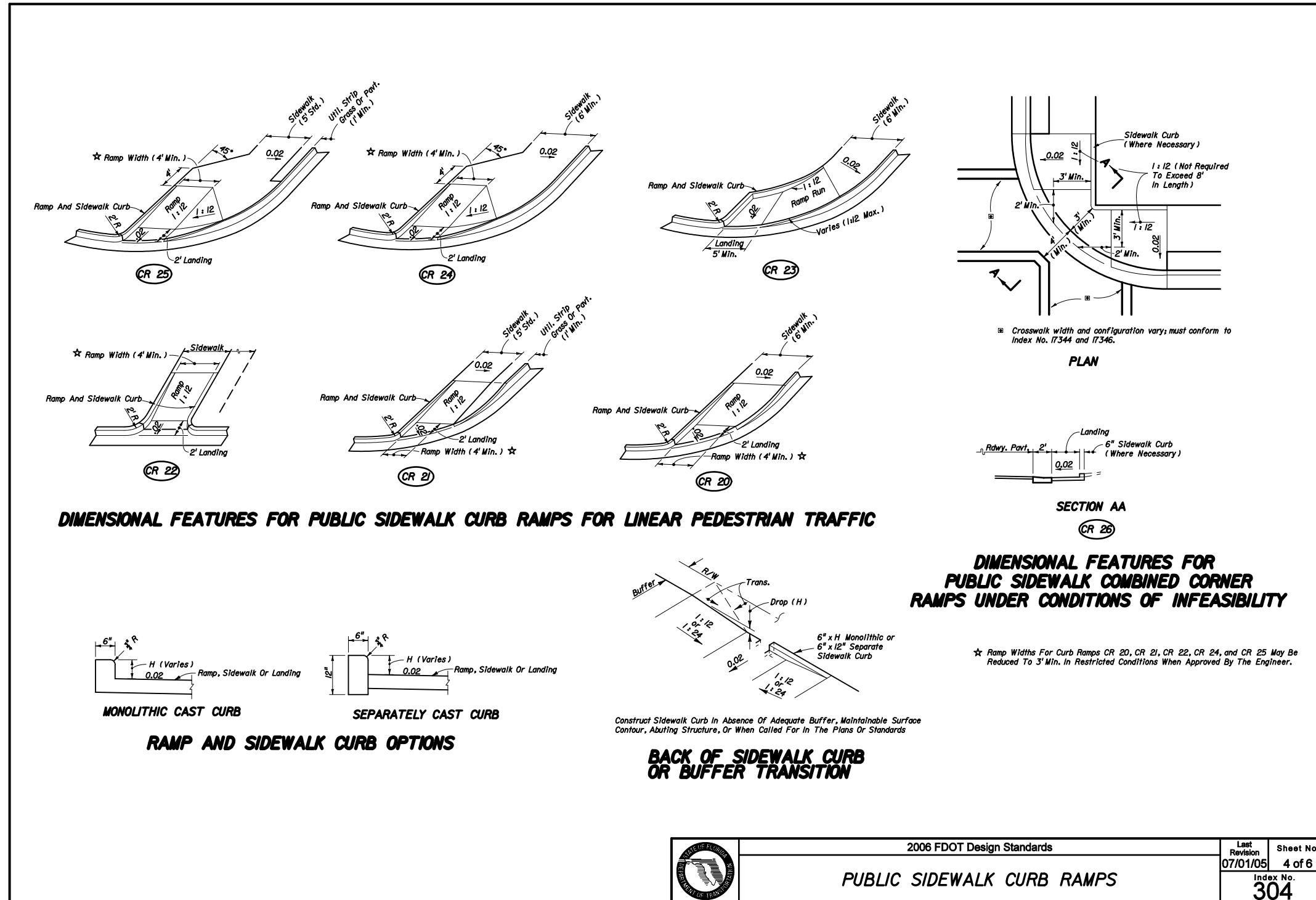


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**PUBLIC SIDEWALK CURB RAMPS**

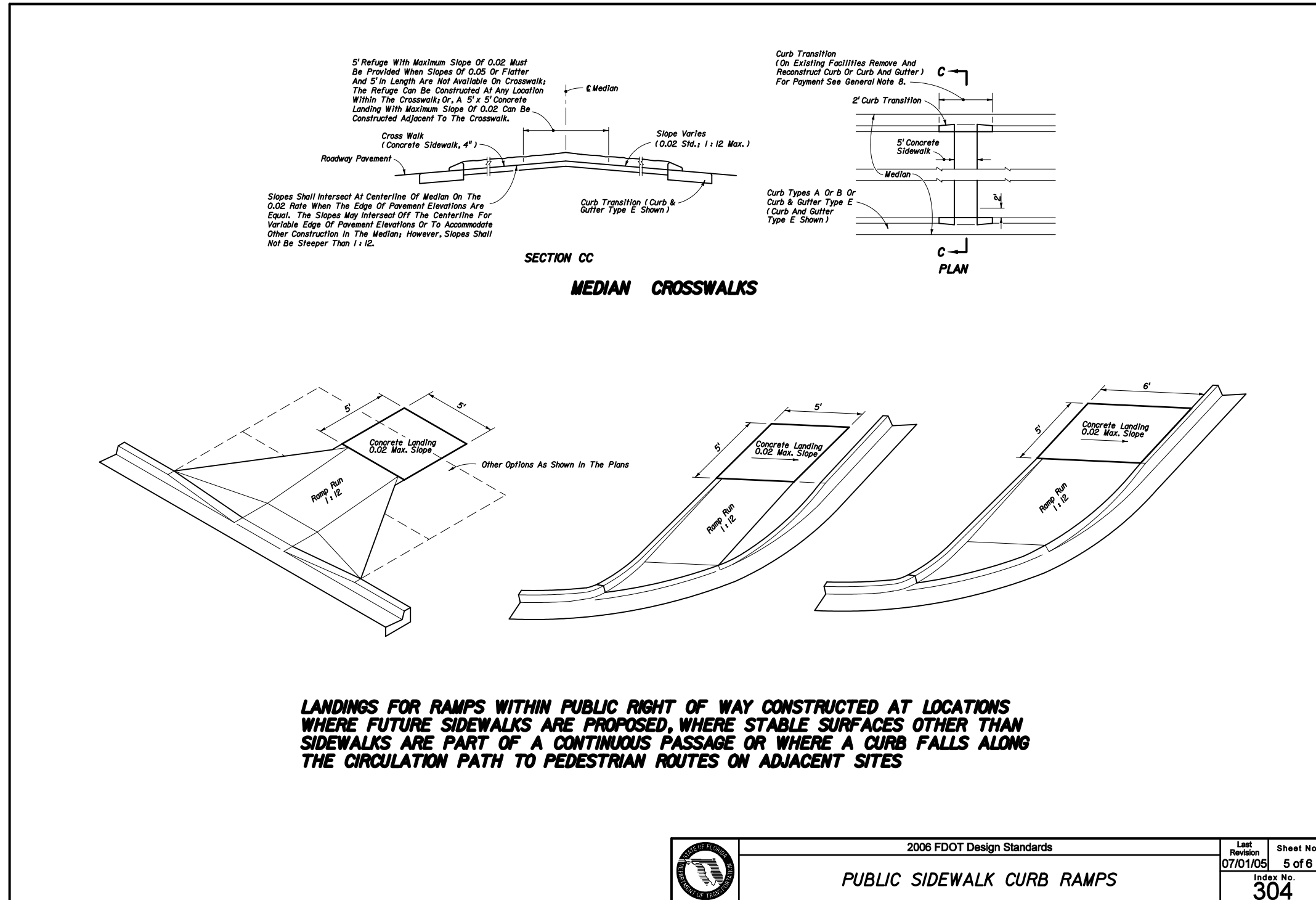
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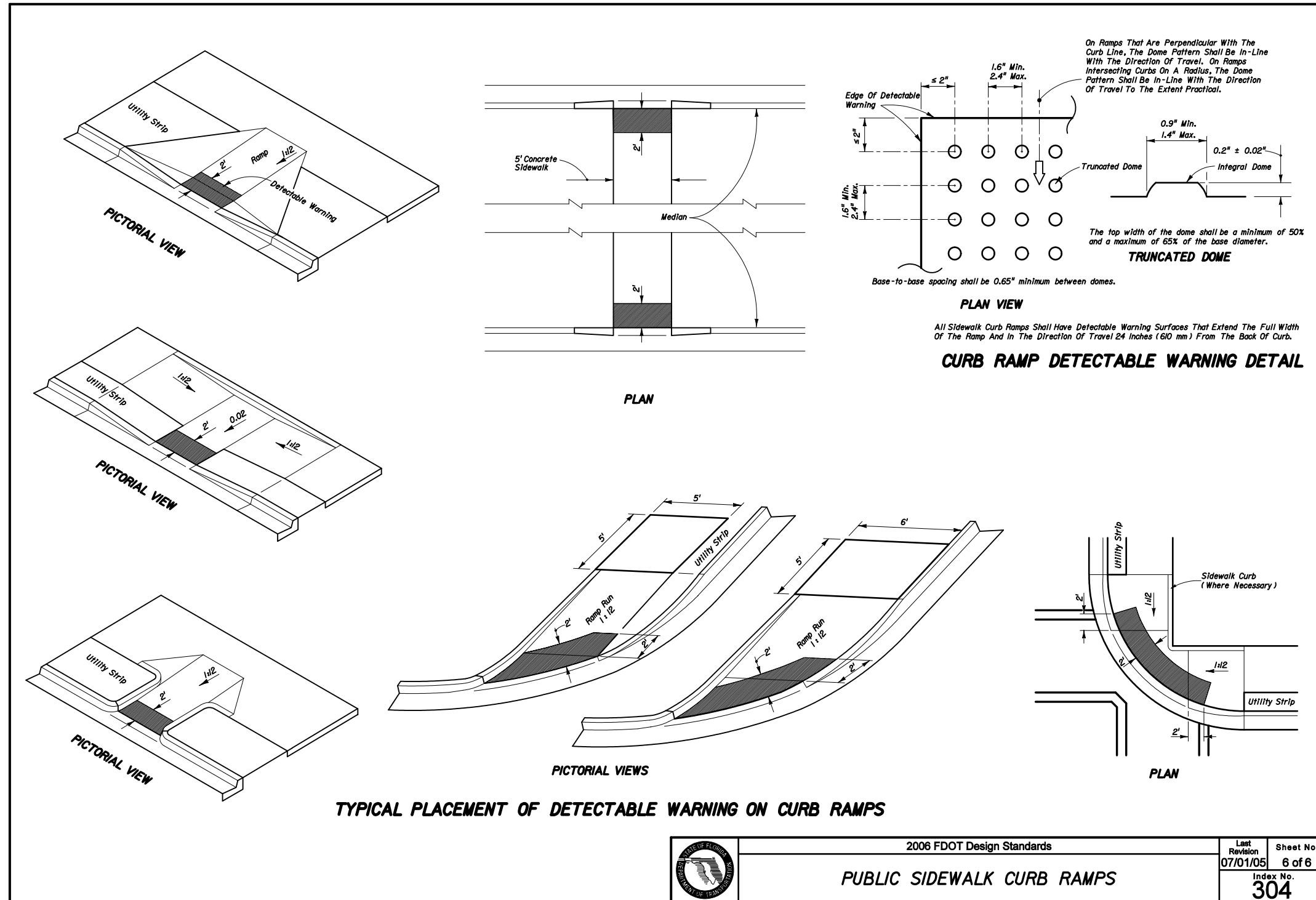
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	<b>PUBLIC SIDEWALK CURB RAMPS</b>			Index No. <b>304</b>

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	<b>PUBLIC SIDEWALK CURB RAMPS</b>		Index No. <b>304</b>	

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DATE	
01/01/07	"MEDIAN CROSSWALKS", "PLAN", As an alternative to the curb transitions shown, the designer may detail the curb to extend along the crosswalk in similar manner to a CR 6 Curb Ramp.



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**PUBLIC SIDEWALK CURB RAMPS**

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**FLEXIBLE PAVEMENT NOTES**

**PAVEMENT REMOVAL AND REPLACEMENT**

Pavement shall be mechanically sawed.

The replacement asphalt shall match the existing structural and friction courses for type and thickness.

The new base materials shall be either of the same type and composition as the materials removed or of equal or greater structural adequacy (See Index No. 514).

**BACKFILL**

**COMPACTED AND STABILIZED FILL OPTION**

Backfill material shall be placed in accordance with Section 125 of the Standard Specifications.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct compacted fill along the sides of the pipe and up to the bottom of the base, with the upper 12" receiving Type B Stabilization. In lieu of Type B Stabilization, the Contractor may construct using Optional Base Group 3.

**\* FLOWABLE FILL OPTION**

If compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the existing base course.

**RIGID PAVEMENT NOTES**

**PAVEMENT REMOVAL AND REPLACEMENT**

High early strength cement concrete (3000 psi) meeting the requirements of Standard Specification 346 shall be used for rigid pavement replacement.

Pavement shall be mechanically sawed and restored to conform with existing pavement joints within 12 hours. (See Index No. 305)

**GRANULAR BACKFILL**

Any edgeline system that is removed shall be replaced with the same type materials. Any edgeline system that is damaged shall be repaired with methods approved by the Engineer.

Fill material shall be placed in accordance with the Standard Specifications. Fill material shall be special select soil in accordance with Index No. 505.

In Stage #1, construct compacted fill beneath the haunches of the pipe, using mechanical tamps suitable for this purpose. This compaction applies to the material placed beneath the haunches of the pipe and above any bedding.

In Stage #2, construct fill along the sides of the pipe and up to the bottom of replacement pavement.

**\* FLOWABLE FILL OPTION**

If mechanical compaction can not be achieved through normal mechanical methods then flowable fill may be used.

Flowable fill is to be placed in accordance with Section 121 of the Specifications, as approved by the Engineer.

Do not allow the utility being installed to float. If a method is provided to prevent flotation from occurring, Stages #1 and #2 can be combined, if approved by the Engineer.

In Stage #1, place flowable fill midway up on both sides of the utility. Allow to harden before placing Stage #2.

In Stage #2, place flowable fill to the bottom of the stone layer.

**TRENCH CUTS AND RESTORATIONS ACROSS ROADWAYS**

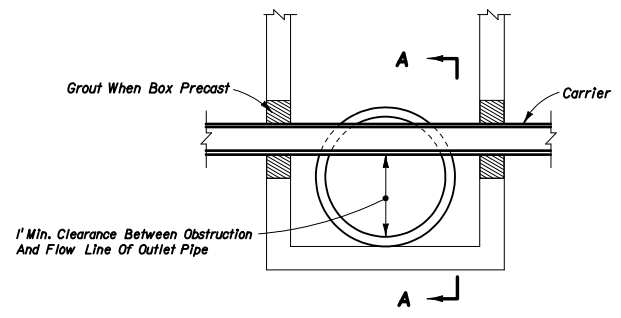
**GENERAL NOTES**

- The details provided in this standard index apply to cases in which Jack and bore or directional boring methods are not required by the Engineer.
- Flowable fill shall not be placed directly over loose, or high plastic, or muck material (see Index 505) which will cause settlement due to fill weight. Where highly compressible material exists, the amount, shape and depth of flowable fill must be engineered to prevent pavement settlement.
- These details do not apply to utility cuts longitudinal to the centerline of the roadway which may require the additional use of geotextiles, special bedding and backfill, or other special requirements.
- Method of construction must be approved by the Engineer.
- Some pipe may require special granular backfill up to 6" above top of pipe. Geotextiles may be required to encapsulate the special granular material.
- Where asphalt concrete overlays exist over full slab concrete pavement, the replacement pavement shall have an overlay constructed over the replacement slab. The overlay shall match the existing asphalt pavement thickness. The replacement friction course shall match the existing friction course, except structural course may be used in lieu of dense graded friction course.
- Existing broken and seated pavements shall be treated as flexible pavements.
- All shoulder pavement, curb, curb and gutter, and their substructure disturbed by utility trench cut construction shall be restored in kind.
- The use of flowable fill to reduce the time traffic is taken off a facility is acceptable but must have prior approval by the Engineer. Flowable fill use is allowed only when properly engineered for pavement crossings, whether straight or diagonal, and shall not be installed for significant depths or lengths. The maximum length shall be fifty (50) feet and a maximum depth of six (6) feet unless supported by an engineering document prepared by a registered professional engineer that specializes in soils engineering. The engineering document shall address the evaluation of local groundwater flow interruption and settlement potential.
- Excavatable flowable fill is to be used when the flowable fill option is selected.
- When approved by the Engineer, in lieu of the pavement and base, non-excavatable flowable fill may be used for manhole stabilization and ring and cover adjustments. Excavatable flowable fill shall not be used within the limits of the pavement and base.

DATE	UTILITY ACCOMMODATION MANUAL REVISIONS

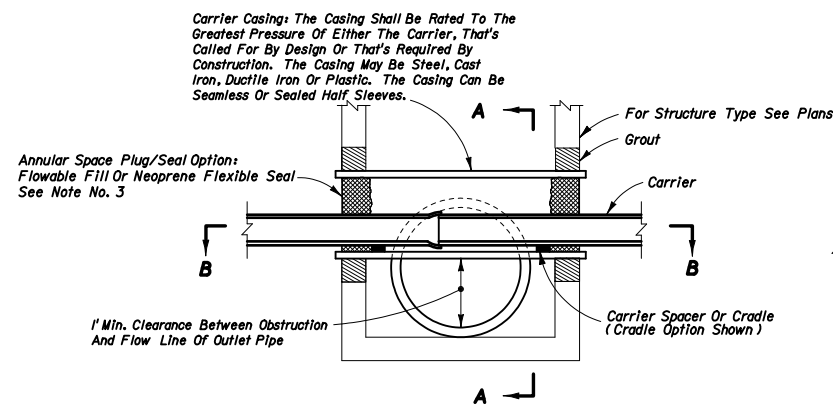
	2006 FDOT Design Standards	Last Revision 04	Sheet No. 1 of 3
	MISCELLANEOUS UTILITY DETAILS		Index No. 307



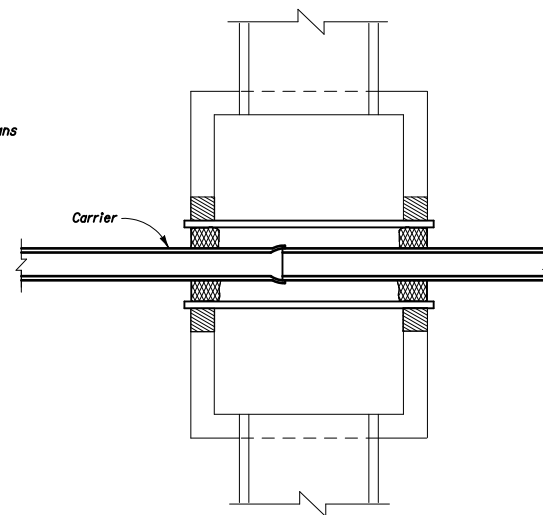


**SECTION LONGITUDINAL TO CARRIER PIPE**  
No Joints Allowed Within Structure  
(Non-Pressure Or Non-Fluid Carrier Installations)

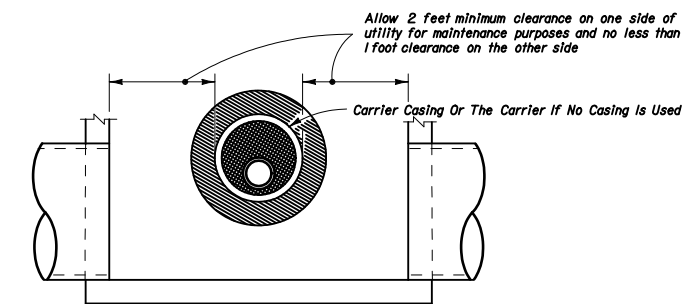
**UTILITY CONFLICT CONDITION I**



**SECTION LONGITUDINAL TO CARRIER PIPE**  
(Pressure Or Fluid Carrier Installations)  
**UTILITY CONFLICT CONDITION II**



**SECTION BB**



**DESIGNERS NOTE**

"Sumped" Conflict Manholes Shall Not Be Used Unless The System Is Hydraulically Designed To Account For The Headloss Generated If The Sump Is Completely Blocked

**SECTION AA**

**NOTES FOR UTILITY CONFLICT PIPE**

1. These details are for construction field expediency to resolve utility conflicts that cannot be remedied by relocation. For conflicts determined during design, use the construction shop drawings for structure details.
2. Concrete used in conflict structures shall be as specified in ASTM C478. 4000 psi may be used in lieu of Class I concrete.
3. Maximum opening for pipe shall be the pipe OD plus 6". Mortar used to seal the pipe into the opening will be of such mix that shrinkage will not cause leakage into or out of the structure.
4. If the conflict structure is round or there are multiple inlet or outlet pipes, then the wall section should be reviewed for strength.
5. If during the plans design or construction process it is determined that a domestic water supply line must pass through a storm drain structure, it must be shown on the design or construction plans and submitted to the Florida Department of Environmental Protection (FDEP) Administrator For Drinking Water in Tallahassee for review and comment. This index provides accepted methods for addressing conflicts when and where they cannot be reasonably avoided. To be submitted along with the plans shall be a justification describing inordinate cost and the impracticality of avoidance. If identified, properly justified, and accomplished in accordance with this index, approval is granted. Upon request, the Utility Agency Owner (UAO) must provide support data on the cost of relocation or adjustment to the FDOT for submittal to the FDEP. Failure to comply may result in work stoppage by FDEP.

**UTILITY CONFLICT PIPES THRU STORM SEWER STRUCTURES**

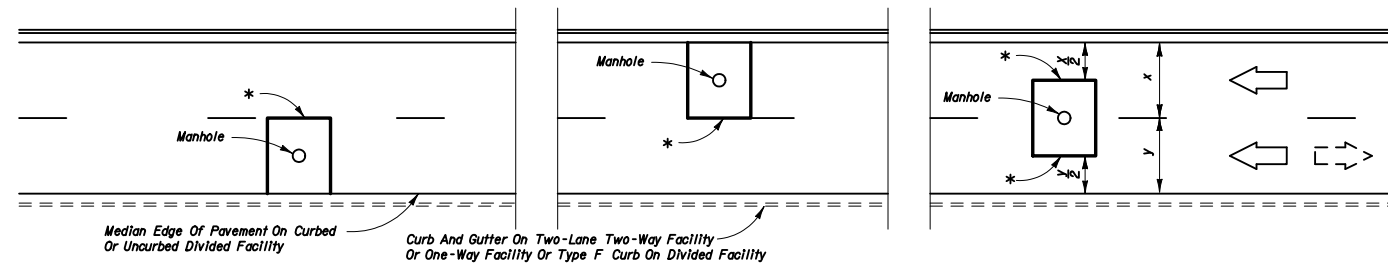


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MISCELLANEOUS UTILITY DETAILS

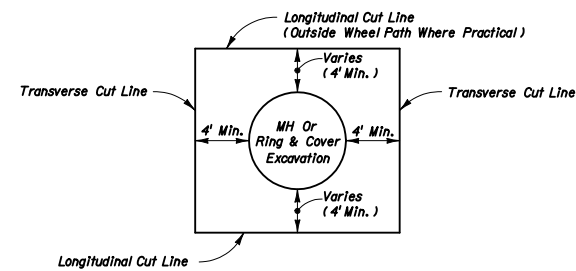
Last Revision	Sheet No.
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Index No.	
307	

DATE	UTILITY ACCOMMODATION MANUAL REVISIONS
01/01/07	"NOTES FOR UTILITY CONFLICT PIPE", Note 5, delete the last sentence.



\* Longitudinal Cut Lines For Both Curbed And Uncurbed Facilities Must Coincide With A Regular Seam Or Mid-Lane Point In Order To Be Outside The Wheel Path

**PLAN VIEW  
FOR TWO OR MORE LANES (TWO LANES SHOWN)**



**PARTIAL CUTS FOR RING AND COVER ADJUSTMENTS**

**NOTES**

1. No irregular seams are permitted. All seams must be clean sawed.
2. Pavement cut seams for underground utility structures in rigid pavement are the same longitudinally, but the transverse seams shall extend to the nearest existing joint.
3. See Sheet I for replacement pavement.

**NON-TRENCH PAVEMENT CUTS FOR UNDERGROUND UTILITY STRUCTURES IN PAVEMENT**



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MISCELLANEOUS UTILITY DETAILS

Index No.  
**307**

DATE	UTILITY ACCOMMODATION MANUAL REVISIONS

**SIDEWALK WITH EDGE BEAM FOR SURFACE MOUNTED RAILINGS**

(Cost Of Edge Beam To Be Included In Price Of Sidewalk)

**SIDEWALK WITH UTILITY STRIP**

**SIDEWALK WITHOUT UTILITY STRIP**

**JOINT LEGEND**

- A -  $\frac{1}{2}$ " Expansion Joints (Preformed Joint Filler)
- B -  $\frac{1}{2}$ " Dummy Joints, Tooled
- C -  $\frac{1}{2}$ " Formed Open Joints
- D -  $\frac{1}{8}$ " Saw Cut Joints,  $\frac{1}{2}$ " Deep (96 Hour) Max. 5' Centers
- E -  $\frac{1}{8}$ " Saw Cut Joints,  $\frac{1}{2}$ " Deep (12 Hour) Max. 30' Centers
- F -  $\frac{1}{2}$ " Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.
- G - Cold Joint With Bond Breaker, Tooled

**NOTES FOR CONCRETE SIDEWALK ON CURBED ROADWAYS**

- Sidewalks shall be constructed in accordance with Section 522 of the FDOT Standard Specifications except for public sidewalk curb ramp runs which shall be finished in accordance with Index No. 304.
- Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils nor more than  $\frac{1}{8}$ ".
- For public sidewalk curb ramps see Index No. 304.
- For turnouts see Index No. 515.
- Construct sidewalks with 1" thick Edge Beam through the limits of any surface mounted Aluminum Pedestrian/Bicycle Picket Railing or Pipe Guiderail shown in the plans.
- Sidewalk shall be paid for under the contract unit price for Sidewalk Concrete (\_\_\_ Thick), S.Y.

**CONCRETE SIDEWALK FOR CURBED ROADWAYS**

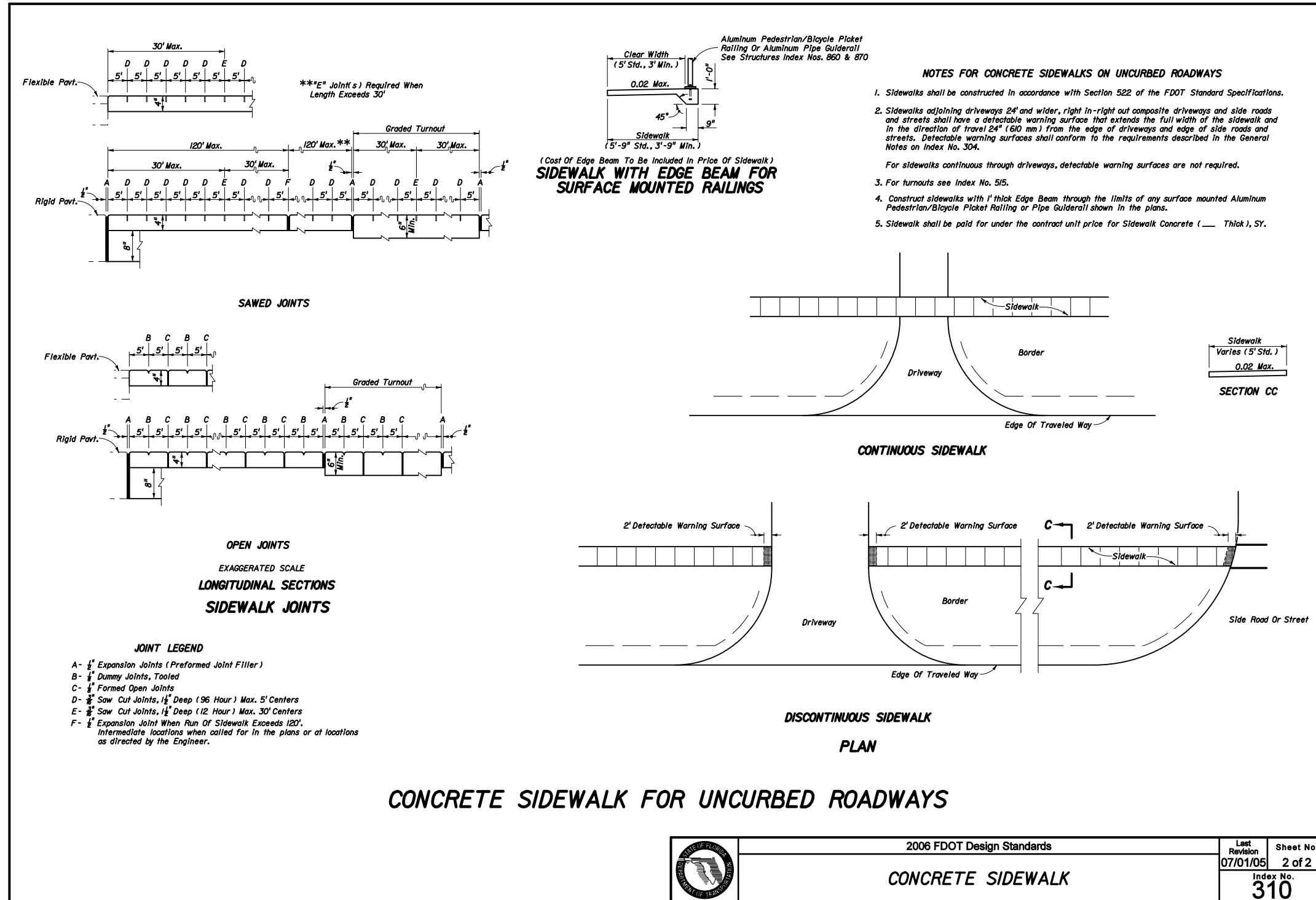
2006 FDOT Design Standards

Last Revision: 07/01/05

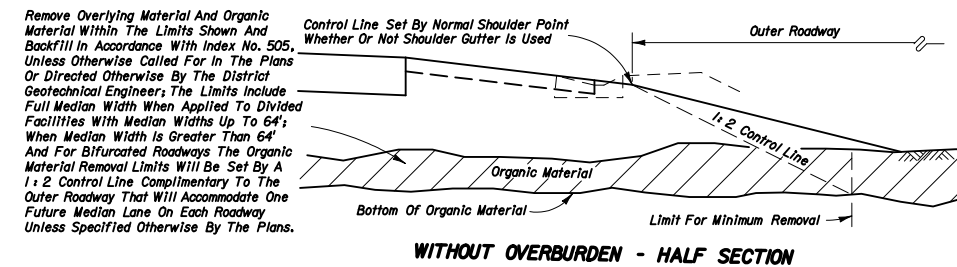
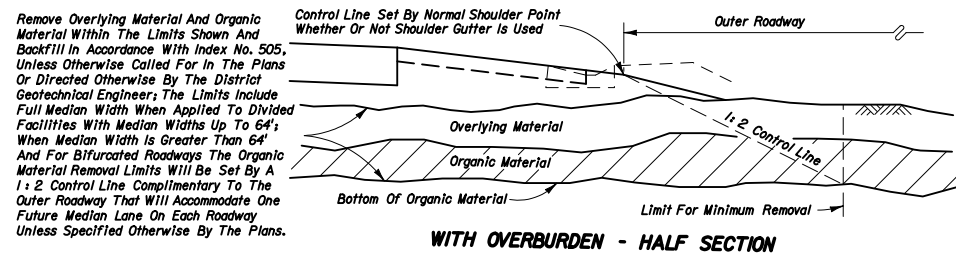
Sheet No.: 1 of 2

Index No.: 310

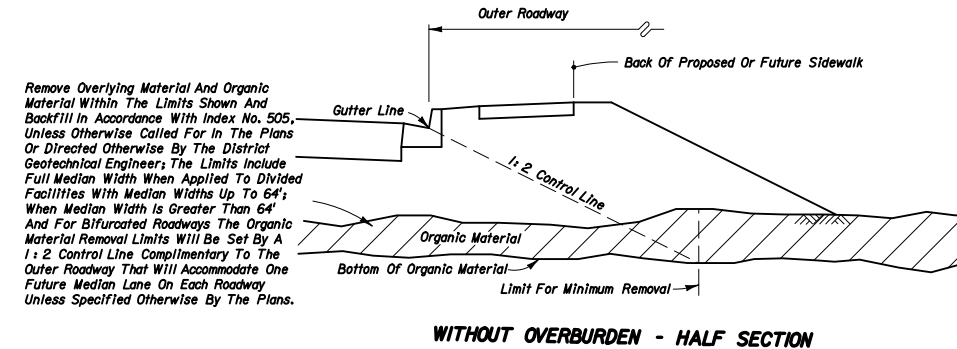
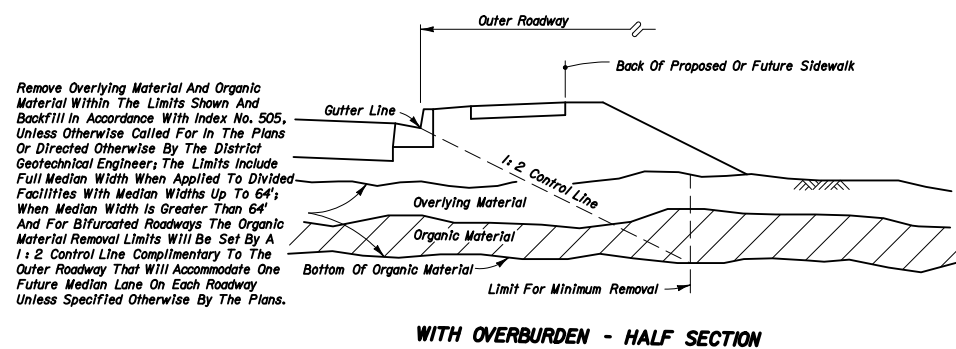
DATE	UTILITY ACCOMMODATION MANUAL REVISIONS
01/01/07	"SIDEWALK WITH UTILITY STRIP" and "SIDEWALK WITHOUT UTILITY STRIP", width of the sidewalk walkarounds at driveways delete " 4" " and insert " 4' ".



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**IN RURAL CONSTRUCTION**



**IN URBAN CONSTRUCTION**

**REMOVAL OF ORGANIC MATERIAL**

**GENERAL NOTES**

- All details shown on this index for removal of organic and plastic materials apply unless otherwise shown on the plans.
- Utilization of excavated materials shall be in accordance with Index No. 505.
- Where organic or plastic material is undercut, backfill shall be made of suitable material in accordance with Index No. 505, unless otherwise shown on the plans.
- The term "Plastic Material" used in this index in conjunction with removal of plastic soil is as defined under soil classifications for Plastic (P) and High Plastic (H) on Index No. 505.
- The term "Organic Material" as used on this index is defined as any soil which has an average organic content greater than five (5.0) percent, or an individual organic content test result which exceeds seven (7.0) percent. Organic material shall be removed as shown on this index and the plans unless directed otherwise by the District Geotechnical Engineer.
- Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum. Tests shall be performed in accordance with AASHTO T 267 on the portion of a sample passing the No. 4 sieve.
- The normal depth of side ditches shall be 3.5' below the shoulder point except in special cases.
- In municipal areas, where underdrain is to be constructed beneath the proposed pavement, the grade of the underdrain filter material will not extend above the bottom of the stabilized section of the subgrade. Gradation of the filter material shall conform to FDOT specifications. Minimum grade on underdrain pipe shall be 0.2%.
- See Index No. 506 for miscellaneous earthwork details.

**DESIGN NOTES**

- At locations where organic material or other soft soil deposits persists to such depth that removal is impractical, the construction of a geosynthetic foundation over those soils should be considered. The Engineer of Record should request guidance from the District Geotechnical Engineer and make a geosynthetic foundation design in accordance with Index No. 501 when pursuing geosynthetic alternatives.
- The designer shall take into consideration the expectancy of roadway widening to the outside, and where widening is anticipated specify in the plans the limits of removal of organic and plastic materials necessary to accommodate anticipated widening.



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**REMOVAL OF ORGANIC AND PLASTIC MATERIAL**

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**HALF SECTION**

Remove Plastic Material To This Line. See Note\*.

Inner And Outer Cut Limit For Preferable Removal Of Plastic Material. Where Preferable Method Of Removal Governs And It Is Impossible To Place The Underdrain At The Outer Cut Limit Due To Conflict With Storm Sewer Mains, Remove To Inner Limit And Place Underdrain At Location Shown For Minimum Removal.

Extended Underdrain Slope When Underdrain Located At Outer Control Line Limit

0.02 Underdrain Backslope When Underdrain Located At Back Of Curb Underdrain. See Index No. 286  
Minimum Grade On Underdrain Pipe Shall Be 0.2%.

NOTE: Refer to roadway cross sections to determine whether minimum or preferable removal is used.

\*Where frequency of median breaks indicates that it is impractical to leave plastic material in the median, the designer may elect to indicate total removal of this material. If during construction it becomes apparent, due to normal required construction procedures, that it is impractical to leave the plastic material in the median, total removal of this material shall be approved by the Engineer.

**REMOVAL OF PLASTIC MATERIAL AND LOCATION OF UNDERDRAIN IN URBAN CONSTRUCTION**

**MISCELLANEOUS DETAILS**

At locations where plastic material is being removed, the side ditches must be at least as deep as the undercut plane.

Where paved side ditches are used in areas of removal of plastic material, the top of the ditch pavement must be no higher than the undercut plane.

**TYPICAL CUT SECTION**

Note: When this detail is applied to minor collectors and local facilities, the undercut may be reduced to 18".

**REMOVAL OF PLASTIC MATERIAL ON DIVIDED FREEWAYS, ARTERIALS AND MAJOR COLLECTORS HAVING FLUSH MEDIANS, AND, ON UNDIVIDED ARTERIALS AND MAJOR COLLECTORS**

**TYPICAL CUT SECTION ON TANGENT**

**TYPICAL CUT SECTION ON SUPERELEVATION**

**REMOVAL OF PLASTIC MATERIAL ON INTERSTATE FACILITIES, FREEWAYS, DIVIDED ARTERIALS AND MAJOR COLLECTORS HAVING DEPRESSED MEDIANS**

**REMOVAL OF PLASTIC MATERIAL**

Note: For GENERAL NOTES see Sheet 1.



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**REMOVAL OF ORGANIC AND PLASTIC MATERIAL**

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**DIVIDED ROADWAYS**

**UNDIVIDED ROADWAY**

**GENERAL NOTES**

- Roadway dimensions are representative. Subgrade dimensions and control lines are standard. The details shown on this Index do not supersede the details shown in the plans or on Index Nos. 500 or 506.
- Plastic (P) soils may be placed above the existing water level (at the time of construction) to within 4 feet of the proposed base. It should be placed uniformly in the lower portion of the embankment for some distance along the project rather than full depth for short distances.
- High Plastic (H) soils excavated within the project limits may be used in embankment construction as indicated on this Index. High Plastic soils are not to be used for embankment construction when obtained from outside the project limits.
- Select (S) soils having an average organic content of more than two and one-half (2.5) percent, or having an individual test value which exceeds four (4) percent, shall not be used in the subgrade portion of the roadbed.

Select (S), Plastic (P), or High Plastic (H) soils having an average organic content of more than five (5) percent, or an organic content individual test result which exceeds seven (7) percent, shall not be used in the portion of embankment inside the control line, unless written authorization is provided by the District Geotechnical Engineer; these soils may be used for embankment construction outside the control line, unless restricted by the plans or otherwise specified in the plans, provided they can be compacted sufficiently to sustain a drivable surface for operational vehicles as approved by the Engineer.

Average organic content shall be determined from the test results from a minimum of three randomly selected samples from each stratum or stockpile of a particular material. Tests shall be performed in accordance with AASHTO T 267 on the portion of a sample passing the No. 4 sieve.
- Highly organic soils, composed primarily of partially decayed organic matter, often dark brown or black in color with an odor of decay, and sometimes fibrous, shall be designated as muck. Further, any stratum or stockpile of soil which contains pockets of highly organic material may be designated as Muck (M).

Highly organic soils shall not be used within the subgrade or embankment portion of the roadbed, with the exception of muck used as a supplement to construct a finish soil layer as described in Section 162 of the FDOT Standard Specifications.

**DESIGN NOTES**

- The designer shall take into consideration the expectancy of roadway widening to the outside, and where widening is anticipated, specify in the plans the location of the future widening control line for utilization of High Plastic (H) soils and/or soils classified as organic material in the embankment.
- The designer shall take into consideration the position of the drainage swales in the portion of the embankment where Plastic (P) soils, High Plastic (H) soils, or soils classified as organic material would be allowed. The designer shall limit the use of Plastic (P) soils, High Plastic (H) soils, and/or soils classified as organic material to locations that will not inhibit the infiltration of stormwater from the swales.

SYMBOL	SOIL	CLASSIFICATION (AASHTO M 145)
S	Select	A-1, A-3, A-2-4 **
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.

See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.

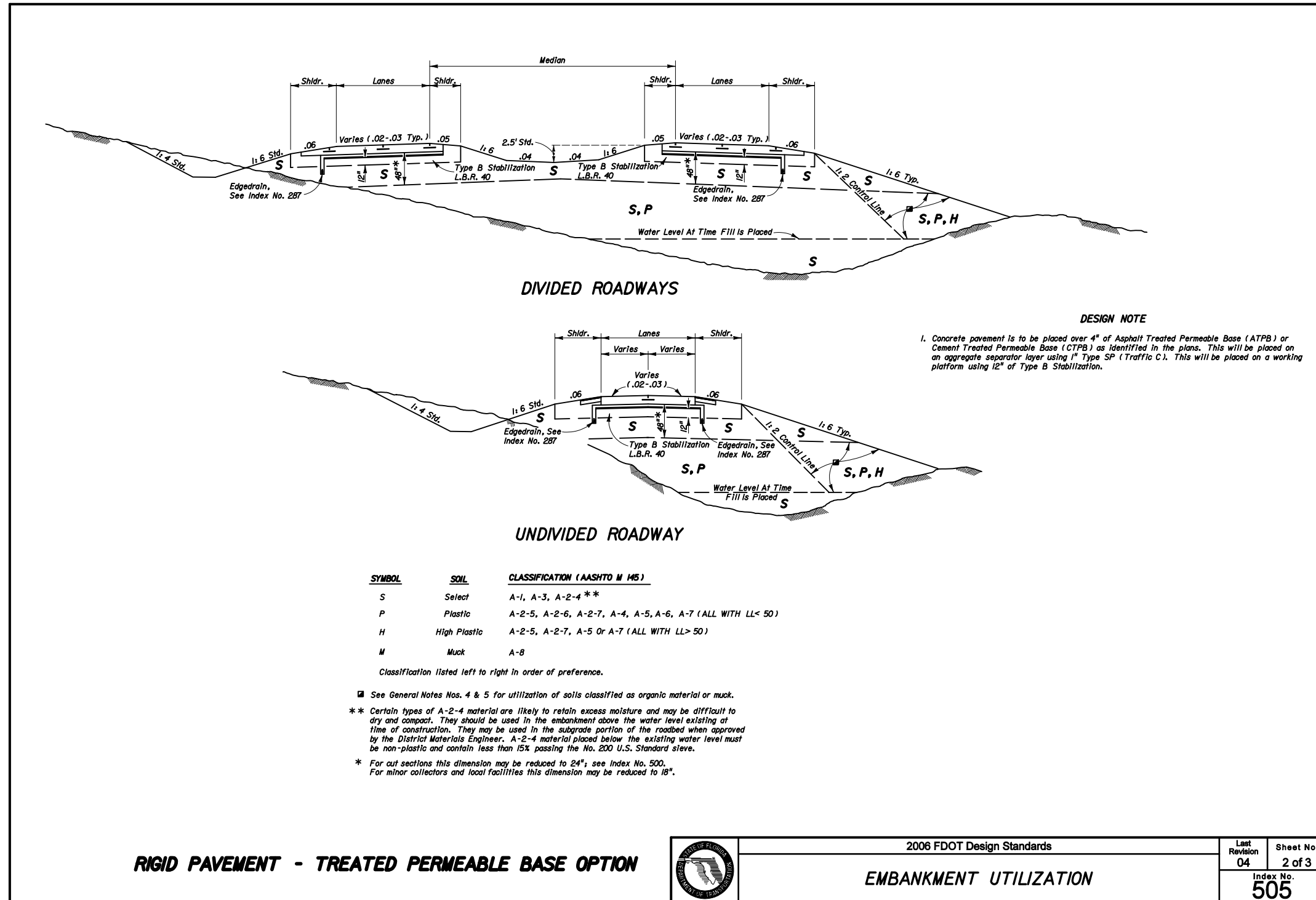
\*\* Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. They may be used in the subgrade portion of the roadbed when approved by the District Materials Engineer. A-2-4 material placed below the existing water level must be non-plastic and contain less than 15% passing the No. 200 U.S. Standard sieve.

\* For cut sections this dimension may be reduced to 24"; see Index No. 500.  
For minor collectors and local facilities this dimension may be reduced to 18".

**FLEXIBLE PAVEMENT**

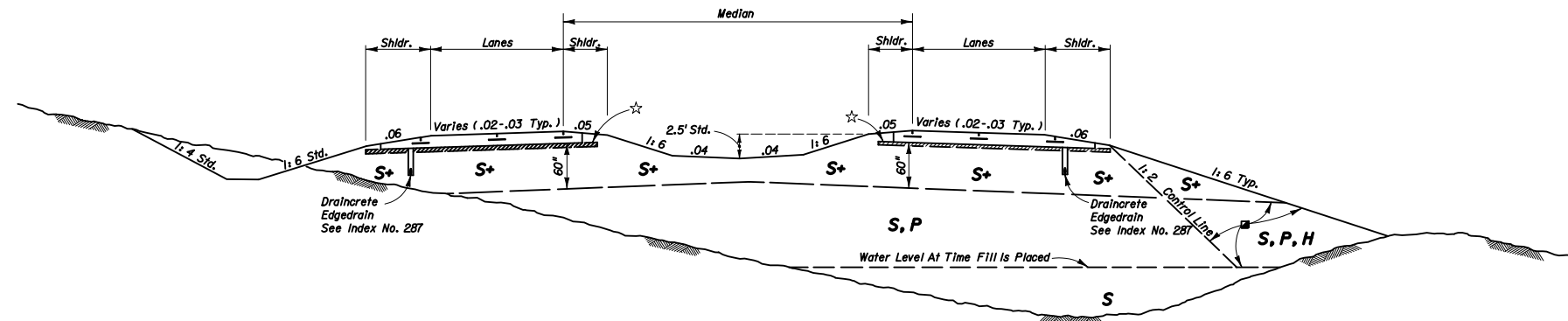
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<b>EMBANKMENT UTILIZATION</b>		Index No. <b>505</b>	

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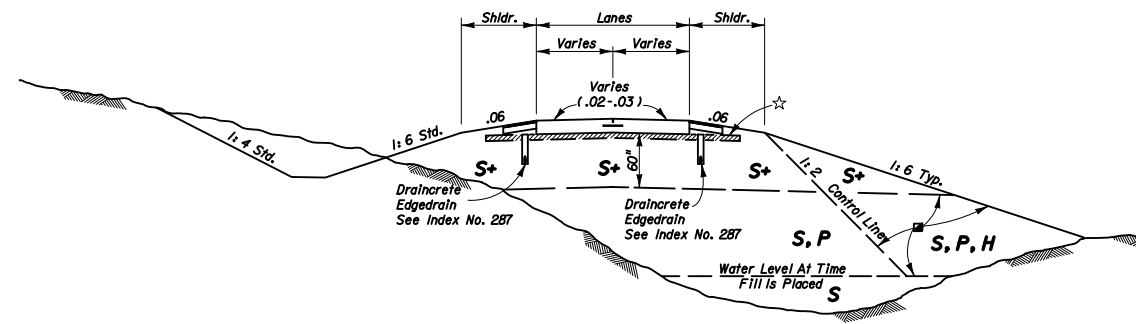


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**DIVIDED ROADWAYS**



**UNDIVIDED ROADWAY**

SYMBOL	SOIL	CLASSIFICATION (AASHTO M H5)
S	Select	A-1, A-3, A-2-4 **
S+	Special Select	A-3 *** With Minimum Average Lab Permeability of $5 \times 10^{-5}$ cm/sec (0.14 ft./day) as per FM 1-T215
P	Plastic	A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7 (ALL WITH LL < 50)
H	High Plastic	A-2-5, A-2-7, A-5 Or A-7 (ALL WITH LL > 50)
M	Muck	A-8

Classification listed left to right in order of preference.

See General Notes Nos. 4 & 5 for utilization of soils classified as organic material or muck.

\*\*\* When allowed by the plans, some types of A-2-4 material may be approved in writing by the District Materials Engineer. This material must meet the minimum lab permeability requirement, be non-plastic, and not exceed 12% passing the No. 200 U.S. Standard sieve.

\*\* Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. They should be used in the embankment above the water level existing at time of construction. A-2-4 material placed below the existing water level must be non-plastic and contain less than 15% passing the No. 200 U.S. Standard sieve.

\* 3" of #57 or #89 Coarse Aggregate Mixed Into Top 6".

Note: SPECIAL SELECT SOIL OPTION may be used only when approved in writing by the District Materials Engineer and shown in the plans.

**RIGID PAVEMENT - SPECIAL SELECT SOIL OPTION**



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**EMBANKMENT UTILIZATION**

Index No.  
**505**

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BASE THICKNESS AND OPTION CODES										
Base Group	Structural Range	Base Group Pay Item Number	Base Options							
			Limerock LBR 100	Cemented Coquina LBR 100	Shell Rock LBR 100	Bank Run Shell LBR 100	Graded Aggregate Base LBR 100	Type B-12.5	B-12.5 And 4" Granular Subbase, LBR 100 *	RAP Base
			Structural Number (Per. in.)							
			(.18)	(.18)	(.18)	(.18)	(.15)	(.30)	(.30 & .15)	(NA)
1	.65-.75	701	4"	4"	4"	4"	4 1/2"	Δ 4"		□ 5"
2	.80-.90	702	5"	5"	5"	5"	5 1/2"	Δ 4"		
3	.95-1.05	703	5 1/2"	5 1/2"	5 1/2"	5 1/2"	6 1/2"	Δ 4"		
4	1.05-1.15	704	6"	6"	6"	6"	7 1/2"	Δ 4"		
5	1.25-1.35	705	7"	7"	7"	7"	8 1/2"	4 1/2"		
6	1.35-1.50	706	8"	8"	8"	8"	9"	5"		
7	1.50-1.65	707	8 1/2"	8 1/2"	8 1/2"	8 1/2"	10"	5 1/2"		
8	1.65-1.75	708	9 1/2"	9 1/2"	9 1/2"	9 1/2"	11"	5 1/2"		
9	1.75-1.85	709	10"	10"	10"	10"	12"	6"	4"	
10	1.90-2.00	710	11"	11"	11"	11"	∅ 13"	6 1/2"	4 1/2"	
11	2.05-2.15	711	12"	12"	12"	12"	∅ 14"	7"	5"	
12	2.20-2.30	712	12 1/2"	12 1/2"	12 1/2"	12 1/2"		7 1/2"	5 1/2"	
13	2.35-2.45	713	∅ 13 1/2"	∅ 13 1/2"	∅ 13 1/2"	∅ 13 1/2"		8"	6"	
14	2.45-2.55	714	∅ 14"	∅ 14"	∅ 14"	∅ 14"		8 1/2"	6 1/2"	
15	2.60-2.70	715						9"	7"	

**GENERAL NOTES**

1. On new construction and complete reconstruction projects where an entirely new base is to be built, the design engineer may specify just the Base Group and any of the unrestricted General Use Optional Bases shown in that base group may be used. Note, however, that some thick granular bases are limited to widening which prevents their general use.
2. Where base options are specified in the plans, only those options may be bid and used.
3. The designer may require the use of a single base option, for instance Type B-12.5 in a high water condition. This will still be bid as Optional Base.

\* For granular subbase, the construction of both the subbase and Type B-12.5 will be paid for under the contract unit price for Optional Base. Granular subbases include Limerock, Cemented Coquina, Shell Rock, Bank Run Shell and Graded Aggregate Base at LBR 100. The base thickness shown is Type B-12.5. All subbase thicknesses are 4".

∅ To be used for widening only, three feet or less.

Δ Based on minimum practical thicknesses.

□ Restricted to non-limited access shoulder base construction.

**GENERAL USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS**



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OPTIONAL BASE GROUP AND STRUCTURAL NUMBERS

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BASE THICKNESS AND OPTION CODES									
Base Group	Structural Range	Base Group Pay Item Number	Base Options						
			Limerock Stabilized LBR 70	Shell LBR 70	Shell Stabilized LBR 70	Sand-Clay LBR 75	Soil Cement (300 psi) (Plant Mixed)	Soil Cement (300 psi) (Road Mixed)	Soil Cement (500 psi) (Plant Mixed)
			Structural Number (Per. in.)						
			(.12)	(.12)	(.10)	(.12)	(.15)	(.15)	(.20)
1	.60-.75	701	5"	5"	7"	5"	5"	5"	4"*
2	.75-.90	702	6½"	6½"	8½"	6½"	5½"	5½"	4"
3	.95-1.05	703	8"	8"	9½"	8"	6½"	6½"	5"
4	1.05-1.15	704	9"	9"	10½"	9"	7½"	7½"	5½"
5	1.20-1.35	705	10"	10"	12"	10"	8½"	8½"	6"
6	1.30-1.45	706	11"	11"		11"	9"		7"
7	1.45-1.60	707	12½"	12½"		12½"	10"		7½"
8	1.65-1.75	708					11"		8½"

Not Recommended For 20 Year Design  
Accumulated 18 kip Equivalent Single  
Axle (ESAL) Loads Greater  
Than 1,000,000

**Note:**  
These base materials may be used on FDOT projects when approved in writing by the District Materials Engineer and shown in the plans.  
\* Based On Minimum Practical Thickness

**LIMITED USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS**



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OPTIONAL BASE GROUP AND STRUCTURAL NUMBERS

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For Additional Information Refer To FDOT Rules Chapters 14-96 And 14-97.  
**SKETCH ILLUSTRATING DEFINITIONS**

**LEGEND**

- Return Radius Point Or Flare Point
- Buffer Areas
- F.B. Line Frontage Boundary Line
- W Driveway Width
- Y Driveway Angle
- C Corner Clearance
- G Setback
- R Outside Radius
- U Inside Radius
- D Distance Between Connections
- F Flare

**GENERAL NOTES**

1. For definitions and descriptions of access connection "Categories" and access "Classifications" of highway segments, and for other detailed information on access to the State Highway System, refer to FDOT Rule Chapter 14-96, "State Highway Connection Permits Administrative Process" and Rule Chapter 14-97, "State Highway System Access Management Classification System And Standards."
2. For this index the term "turnout" applies to that portion of driveways, roads or streets adjoining the outer roadway. For this index the term "connection" encompasses a driveway, street or road and their appurtenant islands, separators, transition tapers, auxiliary lanes, travelway flares, drainage pipes and structures, crossovers, sidewalks, curb cut ramps, signing, pavement marking, required signalization, maintenance of traffic or other means of access to or from controlled access facilities. The turnout requirements set forth in this index do not provide complete intersection design, construction or maintenance requirements.
3. The location, positioning, orientation, spacing and number of connections and median openings shall be in conformance with FDOT Rule Chapter 14-97.
4. On Department construction projects all driveways not shown on the plans are to be reconstructed at their existing location in conformance to these standards, or, in conformance to permits issued during the construction project.
5. Driveways shall have sufficient length and size for all vehicular queuing, stacking, maneuvering, standing and parking to be carried out completely beyond the right of way line. Except for vehicles stopping to enter the highway, the turnout areas and drives within the right of way shall be used only for moving vehicles entering or leaving the highway.
6. Connections with expected daily traffic over 4000 vpd are to be constructed as intersecting streets or roads. The design requirement of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.  
*For connections with expected daily traffic less than 4000 vpd, the Department will determine if drop curbs or radius returns are required in accordance with existing or planned connections. Where radius returns apply, the design requirements of this index and that of the local government will be used to select appropriate connection widths, radii and intersection design, subject to the approval of the Department.*  
*For connections that are intended to daily accommodate either multi-unit vehicles or single unit vehicles exceeding 30' in length, returns with 50' radii are to be used, unless otherwise called for in the plans or otherwise stipulated by permit. Where large numbers of multi-unit vehicles will use the connection, the connection width and radii are to be increased and auxiliary lanes, tapers, lane flares, separators and/or islands constructed, as determined by the Department to be necessary for safe turning movements.*
7. Any connection on a highway having a posted or operating speed over 45 mph shall have radial returns. Any connection requiring or having a specified median opening with left turn storage and served directly by that opening shall have radial returns.
8. Where a connection is intended to align with a connection across the highway, the through lanes are to align directly with the corresponding through lanes.
9. For new connections and for connections on all new construction and reconstruction projects, pavement materials and thicknesses shall meet the requirements applicable to either that detailed for "Urban Flared Turnouts", or, that described in "Table 515-1" for connections with radial returns and/or auxiliary lanes.
10. The responsibility for the cost of construction or alteration to an access connection shall be in accordance with FDOT Rule Chapter 14-96.

**DESIGN NOTES**

1. Prior to the adoption of FDOT Rules Chapters 14-96 and 14-97, connections to the State Highway System were defined and permitted by Classes. Connections have been redefined by Categories under Rule 14-96; and, the term "Class" has been applied to highway segments of the State Highway System as defined under Rule 14-97.

ELEMENT DESCRIPTION	URBAN (CURB & GUTTER)			RURAL		
	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day <sup>■</sup> or 61-400 Trips/Hour	1-20 Trips/Day or 1-5 Trips/Hour	21-600 Trips/Day or 6-60 Trips/Hour	601-4000 Trips/Day <sup>■</sup> or 61-400 Trips/Hour
CONNECTION WIDTH W	12' Min. 24' Max.	24' Min. 36' Max. ★	24' Min. 36' Max. ★	12' Min. 24' Max.	24' Min. 36' Max. ★	24' Min. 36' Max. ★
FLARE (Drop Curb) F	10' Min.	10' Min.	N/A	N/A	N/A	N/A
RETURNS (Radius) R & U	N/A	△	25' Min. 50' Std. 75' Max.	15' Min. 25' Std. 50' Max.	25' Min. 50' Std. 75' Max.	25' Min. 50' Std. (Or 3-Centered Curves)
ANGLE OF DRIVE Y		60°-90°	60°-90°		60°-90°	60°-90°
DIVISIONAL ISLAND (Throat Median)		4'-22' Wide	4'-22' Wide		4'-22' Wide	4'-22' Wide
SETBACK G	12' Min., All categories. See General Note No. 5.					

■ Street or road intersection design, with possible auxiliary lanes and channelization, may be necessary. Intersection design, with possible auxiliary lanes and channelization, should be considered for connections with more than 4000 trips/days.  
 □ "2-Way" refers to one "in" movement and one "out" movement i.e. not exclusive left or right turn lanes on the connection.  
 ★ When more than 2 lanes in the turnout connection are required, the 36' max. width may be increased to relieve interference between entering and exiting traffic which adversely affects traffic flow. These cases require documented site specific study and design.  
 △ Small radii may be used in lieu of flares as approved by the Department.  
 DESIGN NOTE: 1-Way connections will be designed to effectively eliminate unpermitted movements.

NOT INTENDED FOR FULL INTERSECTION DESIGN

**SUMMARY OF GEOMETRIC REQUIREMENTS FOR TURNOUTS**

2006 FDOT Design Standards

TURNOUTS

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01/01/07	"GENERAL NOTES", Note 7, delete the first sentence.

**PLAN C**  
TURNOUT WITHOUT SIDEWALK

**PLAN B**  
TURNOUT WITH SIDEWALK AND UTILITY STRIP (10' OR GREATER)

**PLAN A**  
TURNOUT WITH SIDEWALK AND UTILITY STRIP (LESS THAN 10')

**JOINT PATTERN WHEN CONCRETE DRIVE CONSTRUCTED**  
INSET

**Footnotes:**

- All  $\frac{1}{2}$ " joints shall be constructed with preformed joint filler.
- \*  $\frac{1}{2}$ " Open Joints placed at equal (20' max.) intervals for driveways over 20' wide. Joints in curb and gutter to match joints in driveways.
- △ When connecting to sidewalk curb and gutter sections, the no drop curb limits should extend back to the sidewalk radius point. With or without curb and gutter, no driveway should encroach on the corner radius.
- ◇ Driveways (6" concrete) shall be of a uniform width (W) to the right of way line.
- ☆ 4' Min., May be reduced to 3' Min. in restricted conditions when approved by the Engineer.
- Alpha-numeric identification of a flared driveway type specifically called for in the plans, see sheets 3 and 4.

**SPECIAL NOTES FOR URBAN FLARED TURNOUTS**

1. Driveway 6" concrete pavement and drop curb shall meet the material and construction requirements of Sections 522 and 520 respectively of the FDOT Standard Specifications. The driveway foundation shall meet the requirement of Subarticle 522-4.
2. For details of drop curb and public sidewalk curb ramps refer to Indexes Nos. 300 and 304 respectively.
3. Where turnouts are constructed within existing curb and gutter, the existing curb and gutter shall be removed either to the nearest joint beyond the flare point or to the extent that no remaining section is less than 5' long and, drop curb constructed in accordance with Notes Nos. 1 and 2.
4. Cost for preformed joint filler shall be included in the cost for the concrete pavement (concrete sidewalk, 6" thick).
5. For turnouts with radial returns see the requirements under the "Summary of Geometric Requirements For Turnouts", the "General Notes", the details of "Rural Turnout Construction" and the detail of "Limits Of Clearing & Grubbing, Stabilization And Base At Intersections".
6. Department maintenance of pavement shall extend out to the right of way or 2' back of sidewalk, whichever distance is less.
7. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.
8. All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.
9. All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.
10. Turnouts will be paid for under the contract unit price for Concrete Sidewalk (6" Thick), SY.
11. All sidewalk surfaces crossing driveways with a cross slope shown in this Index to be 0.02 shall be 0.02 Maximum.

**DESIGN NOTES FOR URBAN FLARED TURNOUTS**

1. Driveways indicated as 'Adverse Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions, or those with slopes that can cause drivers who are leaving the roadway to slow or pause to the extent that traffic demand volumes will be impeded.
2. The standard flared driveways on this Index may not accommodate vehicles with low beds, low undercarriage or low appendage features. Where such vehicles are design vehicles driveways are to have site specific flare designs or Category III designs.
3. When specific flare type driveways are to be constructed, the type shall be designated in the plans using the assigned alpha-numeric designation.

Driveways indicated as 'Marginal Applications' are those with slopes that can cause overhang drag for representative standard passenger vehicles under fully loaded conditions when the driveway is located on the low side of fully super-elevated roadways.

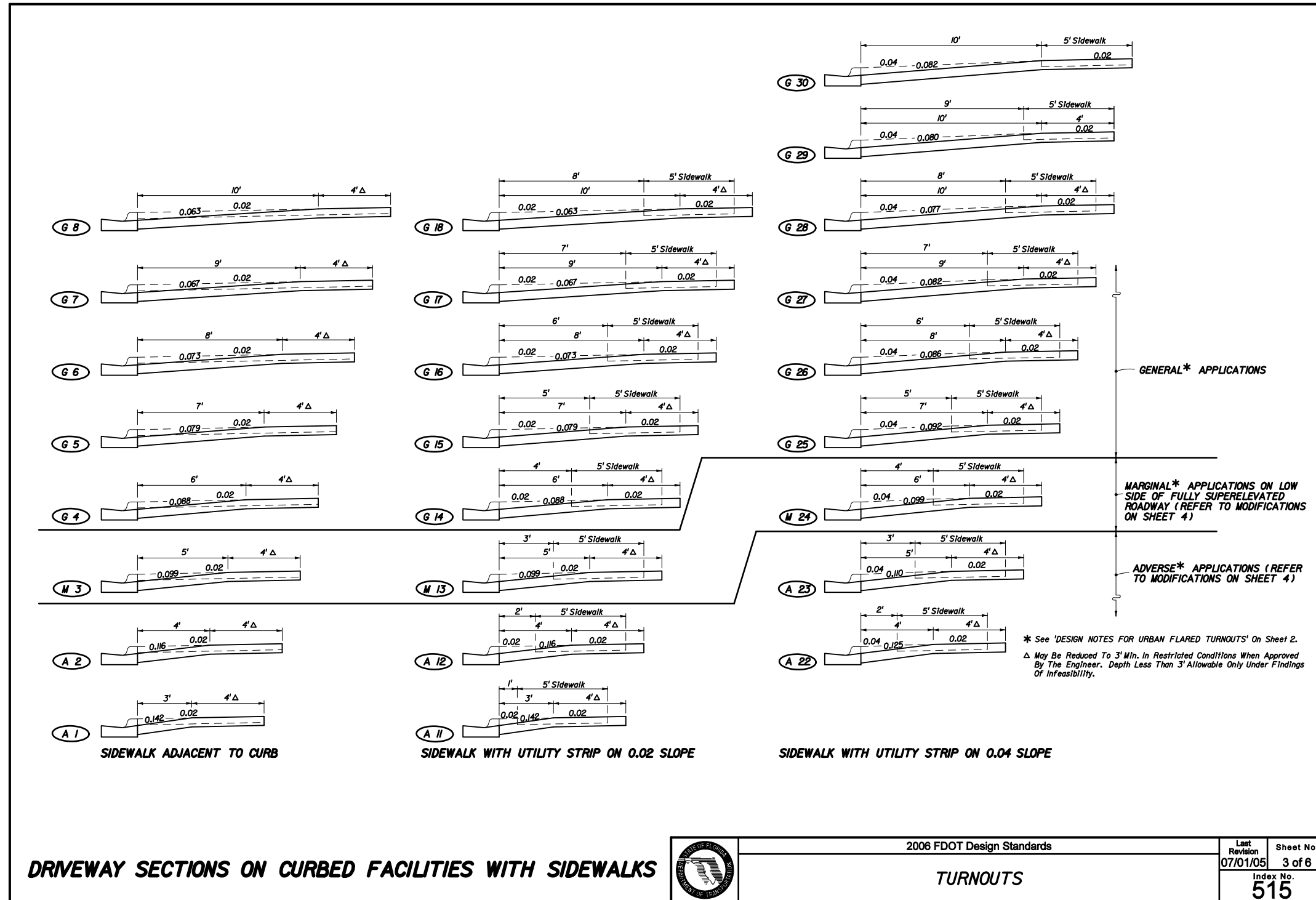
Driveways indicated as 'General Applications' are those with slopes that can readily accommodate representative standard passenger vehicles and those that can accommodate representative standard trucks, vans, buses and recreational vehicles operating under normal crown and super-elevation conditions.

Notes: See sheet 1 for 'GENERAL NOTES'

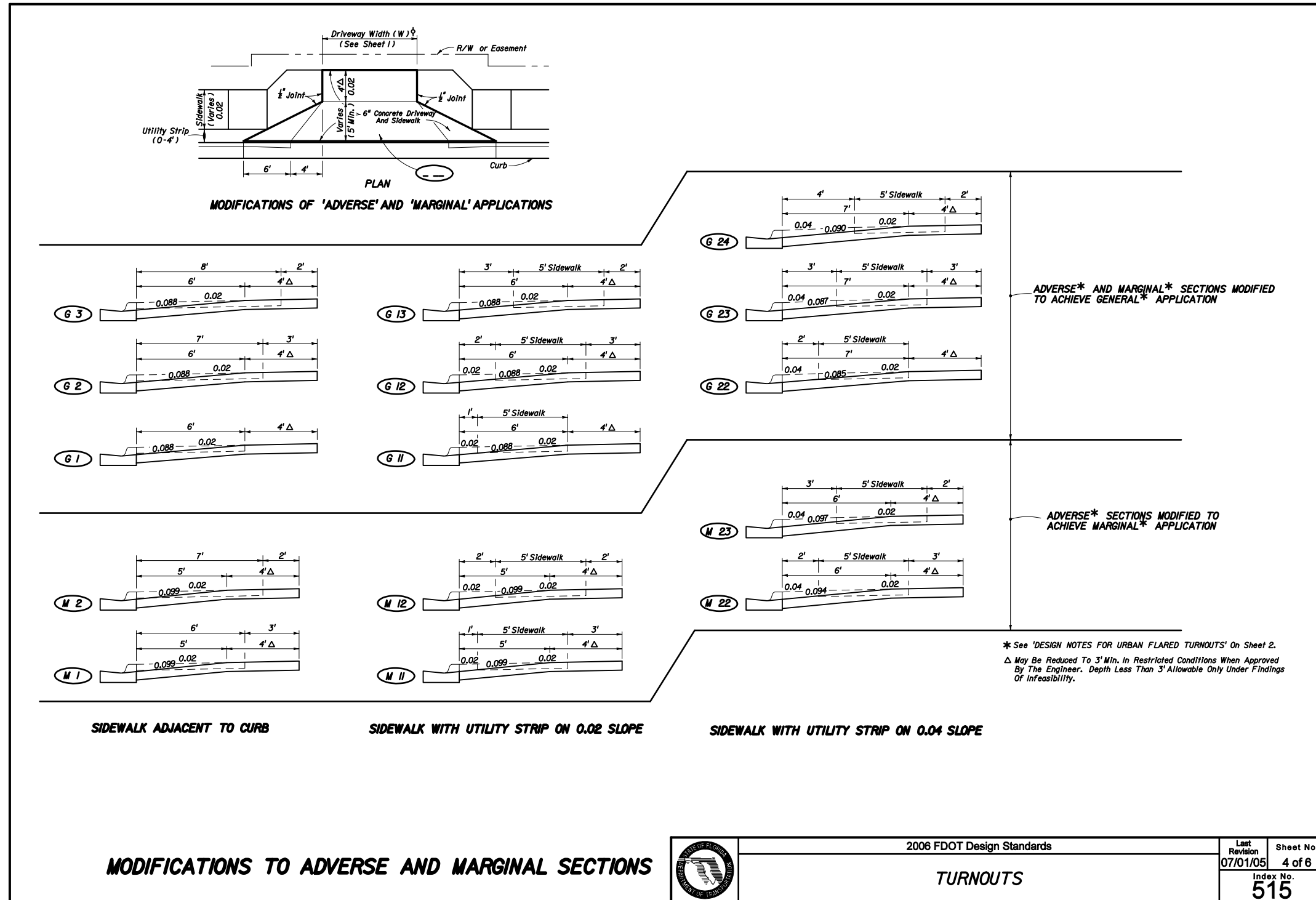
**URBAN FLARED TURNOUTS**

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### Typical Half Section For Low Volume/Residential Connections

### Typical Half Section For Higher Volume Connections

### PLAN

### LONGITUDINAL SECTION

### PROFILE AND END VIEW

★ Drainage pipe size and length shall be that shown on the plans, or as stipulated by permit, or, as determined by the Engineer during construction. The size shall be at least that established by the FDOT District, but not less than 15" diameter or equivalent. For minimum cover over drainage pipe see Index No. 205. Pipe arch or elliptical pipe may be required to obtain necessary cover. At minimal cover applications a modified pavement apron is permitted. See "PERMISSIBLE PAVEMENT MODIFICATION" Index No. 273. For spacing between adjacent pipe and treatments see Index No. 273.

▢ Stable material may be required for graded turnouts to private property as directed by the Engineer in accordance with Section 102-6 of the Standard Specifications.

▣ The 5' pavement at graded connections is not required where there is paved shoulder 4' or more in width. The 5' pavement requirement may be waived for connections serving one or two homes or field entrances with less than 20 trips per day, or 5 trips per hour as approved by permit or by the Engineer, or when not itemized in the plans.

Paved turnouts are to be constructed for all paved connecting facilities. The connecting point will be determined by the Engineer.

Paved turnouts are to be constructed for all business, commercial, industrial or high volume residential graded connecting facilities. The connecting point shall be 30' from edge of roadway pavement or at R/W line, whichever is less.

Paved turnouts are to be constructed for all connecting facilities over 4000 vehicles per day. The connecting point shall be at the R/W line.

▣ See "Summary Of Geometric Requirements For Turnouts" chart for return radii lengths and supplemental information.

## RURAL TURNOUT CONSTRUCTION

### LIMITS OF CLEARING & GRUBBING, STABILIZING AND BASE AT INTERSECTIONS

### MATERIAL TYPES AND THICKNESSES IN DRIVING AREAS FOR RURAL AND URBAN CONNECTIONS

Course	Materials ②	Thickness (in.) ①	
		Connections ③	Roadway ④
Structural	Asphaltic Concrete	1"	1½"
Bases	Optional Base (See Index No. 514)	O.B.G. 1	O.B.G. 3

① Minimum thickness.  
② All materials shall be approved by the Department prior to being placed.  
③ Connection structure other than traffic lanes. See Notes 1 and 2 below.  
④ Travel way flares (bypass lanes), auxiliary lanes serving more than a single connection, and all median crossovers including their auxiliary lanes and/or transition tapers. See Notes 1 and 2 below.

### NOTES

- The pavement should be structurally adequate to meet the expected traffic loads and should not be less than that shown above, except as approved by the Department for graded connections. Other Department approved pavement equivalences may be used at the discretion of the Engineer. For additional information see Index No. 514.
- Auxiliary lanes and their transition tapers shall be the same structure as the abutting roadway pavement or any of the roadway structures tabulated above, whichever is thicker.
- If an asphalt base course is used for a turnout, its thickness may be increased to match the edge of roadway pavement in lieu of a separate structural course. 6" of Portland cement concrete will be acceptable in lieu of the asphalt base and structural courses. See Notes 4 and 5 below.
- A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.
- Connections paved with Portland cement concrete shall be Class I concrete at least 6" thick. The Department may require greater thickness when called for in the plans or stipulated by permit. Materials and construction are to conform with FDOT Standard Specifications Sections 346, 350 and 522.
- The Department may require other pavement criteria where local conditions warrant.

### PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY LANES TABLE 515-1

### LIMITS OF CLEARING & GRUBBING, STABILIZING AND BASE AT INTERSECTIONS

### LIMITS OF CONSTRUCTION AND MAINTENANCE FOR RURAL CONNECTIONS

**LEGEND**

- Graded Or Paved
- Required Paving
- Limits Of Department Maintenance

**NOTES**

- Auxiliary lane pavements and crossover pavements shall be maintained by the Department.
- Department maintenance of turnout pavement shall extend out to 5' from edge of the travel way or limits of paved shoulders, and extend to include auxiliary lanes. The remainder of any turnout paved area on the right of way shall be maintained by the owner or his authorized agent. As a function of routinely reworking shoulders, the Department may grade and shape existing material on non-paved areas beyond the maintained pavement.
- Control and maintenance of drainage facilities within the right of way shall be solely the responsibility of the Department, unless specified differently by Department permit.
- The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of a public agency.
- All pavement markings on the State highways, including acceleration and deceleration lane markings, and signing installed for the operation of the State highway shall be maintained by the Department.
- All signing and marking installed for the operation of the connection (such as stop bars and stop signs for the connection) shall be the responsibility of the permittee.

DATE

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**TURNOUTS**

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**RURAL TURNOUT PROFILES**

**Definitions**  
 G- Grade (%)  
 A- Algebraic Difference In Grades (%)  
 L- Transition (See Tabulated Lengths):  
 A ≤ 14% - Transition Not Required  
 A > 14% - Straight Or Rounded Transition Required

A	LENGTHS (L) (FT.)							
	CRESTS				SAGS			
	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable	Minimum
6-13%	3	0	5	0	3	0	5	0
14%	3	0	10	0	3	0	10	0
15%	3	2.5	10	3	5	3	10	5
16%	5	3	10	4	6	4	10	6
17%	6	3.5	10	5	8	5	10	7
18%	6	4	10	6	9	6	10	8
19%	7	4.5	10	7	11	7	12	9
20%	8	5	11	8	12	8	13	10
21%	9	5.5	12	9	13	8.5	14	11
22%	10	6	13	10	14	9	16	12
23%	10	6.5	14	10.5	14	9.5	16	12.5
24%	11	7	15	11	15	10	17	13
25%	12	7.5	15	11.5	16	10.5	18	13.5
26%	12	8	16	12	17	11	18	14
27%	13	8.5	17	12.5	17	11.5	19	14.5
28%	14	9	17	13	18	12	20	15
29%	NA	NA	22	14	NA	NA	21	17
30-31%	NA	NA	23	15	NA	NA	22	18
32-33%	NA	NA	24	16	NA	NA	23	20
34-36%	NA	NA	26	17	NA	NA	25	21
37-38%	NA	NA	27	18	NA	NA	26	22
39-41%	NA	NA	29	19	NA	NA	28	24
42-43%	NA	NA	30	20	NA	NA	29	25
44-46%	NA	NA	32	21	NA	NA	31	26
47-49%	NA	NA	33	22	NA	NA	32	27
49-51%	NA	NA	34	23	NA	NA	34	28
52-54%	NA	NA	36	24	NA	NA	35	30
55-56%	NA	NA	37	25	NA	NA	36	31

**RECOMMENDED TURNOUT PROFILE TRANSITION LENGTHS (L) (FT)**

**STORMWATER RUNOFF AND PROFILE OPTION NOTES**

- Turnouts shall neither cause water to flow on or across the roadway pavement, nor cause water ponding or erosion within the State right of way. On all rural turnouts the transition (L) nearest the roadway shall be sloped or crowned to direct stormwater runoff to the roadside ditch. Inlets, flumes or other appropriate runoff control devices shall be constructed when runoff volumes are sufficient to cause erosion of the shoulder. Similar runoff control devices shall be constructed as necessary to properly direct and control the stormwater runoff on urban turnouts.
- The Option 1 profile is intended for locations where roadway, turnout taper and auxiliary lane stormwater runoff volumes are relatively large. The Option 2 profile is intended for locations where runoff volumes are relatively small and/or where there is no roadside ditch.

**URBAN TURNOUT PROFILES**

**Definitions**  
 G- Grade (%)  
 A- Algebraic Difference In Grades (%)  
 L- Transition (See Tabulated Lengths):  
 A ≤ 14% - Transition Not Required  
 A > 14% - Straight Or Rounded Transition Required

**TURNOUT PROFILES**

**ROADWAY PAVEMENT SLOPES AND SLOPES OF ABUTTING RURAL TURNOUT SURFACES (G<sub>2</sub>) SUPERELEVATION SECTIONS**

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**GENERAL NOTES**

1. Details apply to both rural and urban intersections under stop sign control or flashing beacon control. For full signal controlled intersections see Design Note No. 4.
2. Sight distance (*d*) applies to normal and skewed intersections (intersecting angles between 60° and 120°), and where vertical and/or horizontal curves are present. Sight distance (*d*) is measured along the major roadway from the center of the entrance lane of the minor roadway to the center of the near approach lane (right or left) of the major roadway. Distances *d<sub>L</sub>* and *d<sub>R</sub>* are measured from the centerline of the entrance lane of the minor roadway to a point on the edge of the near side outer traffic lane on the major roadway. Distance *d<sub>m</sub>* is measured from the centerline of the entrance lane of the minor roadway to a point on the median clear zone limit or horizontal clearance limit for the far side roadway of the major roadway.
3. a. The limits of clear sight define a corridor throughout which a clear sight window must be preserved. See WINDOW DETAIL, Sheet 6.  
b. Clear sight must be provided between vehicles at intersection stop locations, and vehicles on the major roadway within dimension 'd'.  
c. Since observations are made in both directions along the line of sight, the reference datum between roadways is 3'-6" above respective pavements.
4. Barrier systems within intersection sight corridors, where penetration into the sight window might occur, shall be located to provide the least adverse affect practical.
5. The corridor defined by the limits of clear sight is a restricted planting area. Drivers of vehicles on the intersecting roadway and vehicles on the major roadway must be able to see each other clearly throughout the limits of 'd' and 'd<sub>s</sub>'. If in the Engineers judgement, landscaping interferes with the line of sight corridor prescribed by these standards the Engineer may rearrange, relocate or eliminate plantings. Plants within the restricted areas are limited to selections as follows:

**Ground Cover & Trunked Plants (Separate or Combined):**

**Ground Covers** - Plant selection of low growing vegetation which at maturity does not attain a height greater than 18" below the sight line datum.  
For ground cover in combination with trees and palms; the following heights below the sight line datum will apply: 24" for trees and palms ≤ 11" dia.; and, 18" for sabal palms > 11" ≤ 18" dia. (dia. - within Sight Window).

**Trunked Plants** - Plant selection of a mature trunk diameter 4" or less measured at 6" above the ground. Canopy or high borne foliage shall never be lower than 5' above the sight line datum. These selections shall be spaced no closer than 20'.

**Trees:**

Trees can be used with lawn; pavers; pavement; gravel, bark or wood chip beds; ground covers or other Department approved material. The clear sight window must be in conformance with the 'WINDOW DETAIL' modified to attain the height requirements listed in 'Ground Covers' above. Tree size and spacing shall conform to the following tabular values:

Description	Speed (mph)													
	30	35	40	45	50	55	60	30	35	40	45	50	55	60
Diameter (Within Limits Of Sight Window)	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18	>4≤11	>11≤18
	(Inches)													
Minimum Spacing (c. to c. Of Trunk)	22	91	27	108	33	126	40	146	45	165	52	173	60	193
	(Feet)													
<p>Sizes and spacings are based on the following conditions:</p> <p>(a) A single line of trees in the median parallel to but not necessarily collinear with the centerline.</p> <p>(b) A straight approaching mainline, within skew limits as described in No. 2 above.</p> <p>(c) 1. Trees and palms ≤ 11" in diameter casting a vertical 6' wide shadow band on a vehicle entering at stop bar location when viewed by mainline driver beginning at distance 'd'; see SHADOW DIAGRAM, Sheet 6. 2. Sabal palms with diameters &gt; 11" to ≤ 18" spaced at intervals providing a 2 second full view of entering vehicle at stop bar location when viewed by mainline driver beginning at distance 'd'; see PERCEPTION DIAGRAM, Sheet 6. (d) Trees with diameters ≤ 11" intermixed with trees with diameters &gt; 11" ≤ 18" are to be spaced based on trees with diameters &gt; 11" ≤ 18".</p> <p>For any other conditions the tree sizes, spacings and locations shall be detailed in the plans; see Design Note No. 5.</p>														

**DESIGN NOTES**

1. The information shown on this Index is intended solely for the purpose of clear sight development and maintenance at intersecting highways, roads and streets, and is not intended to be used to establish roadway and roadside safety except as related to clear sight corridors. An analysis of sight distance shall be documented for all intersections.
2. Details are based on the AASHTO 'A Policy On Geometric Design Of Highways And Streets, 2001', CHAPTER 9, INTERSECTION SIGHT DISTANCE, CASES B and F, and Department practices for channelized median openings (left turns from major roadways).
3. The minimum driver eye setback of 14.5' from the edge of the traveled way may be adjusted on any intersection leg only when justified by a documented, site specific field study of vehicle stopping position and driver eye position.
4. For SIGNALIZED INTERSECTIONS sight distances should be developed based on AASHTO 'Case D - Intersections With Traffic Signal Control'. 'At signalized intersections, the first vehicle stopped on one approach should be visible to the driver of the first vehicle stopped on each of the other approaches. Left-turning vehicles should have sufficient sight distance to select gaps in oncoming traffic and complete left turns. Apart from these sight conditions, there are generally no other approach or departure sight triangles needed for signalized intersections. However, if the traffic signal is to be placed on two-way flashing operation (i.e. flashing yellow on the major-road approaches and flashing red on the minor-road approaches) under off-peak or nighttime conditions, then the appropriate departure sight triangles for Case B, both to the left and to the right, should be provided for the minor-road approaches. In addition, if right turns on a red signal are to be permitted from any approach, then the appropriate departure sight triangle to the left for Case B2 should be provided to accommodate right turns from that approach.'
5. Where curvature, superelevation, adverse split profiles or other conditions preclude the use of standard tree sizes and spacing, proof of view and shadowing restraints must be documented and the size and location of trees in medians detailed in the plans.
6. Intersection sight distance values are provided for Passenger Vehicles, SU Vehicles and Combination Vehicles. Intersection sight distance based on the Passenger Vehicle is suitable for most intersections. Where substantial volumes of heavy vehicles enter the major-road, such as from ramp terminals with stop control or roadways serving truck terminals, the use of tabulated values for SU Vehicles or Combination Vehicles should be considered.



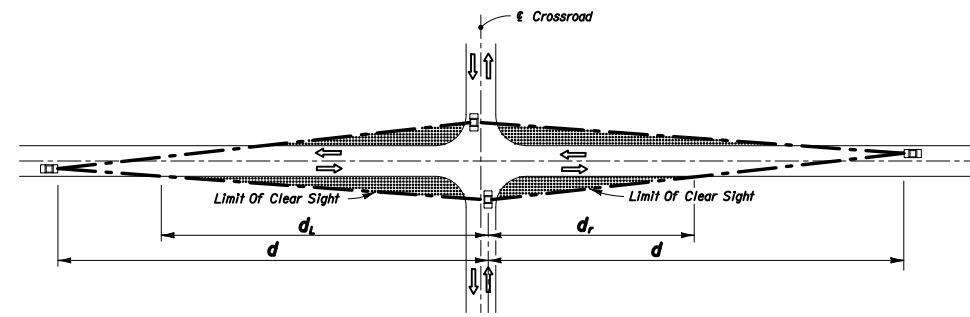
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**SIGHT DISTANCE AT INTERSECTIONS**

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Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	335	240	150
35	390	275	175
40	445	315	200
45	500	355	225
50	555	390	250
55	610	430	275
60	665	470	300
65	720	510	325

Passenger Vehicle

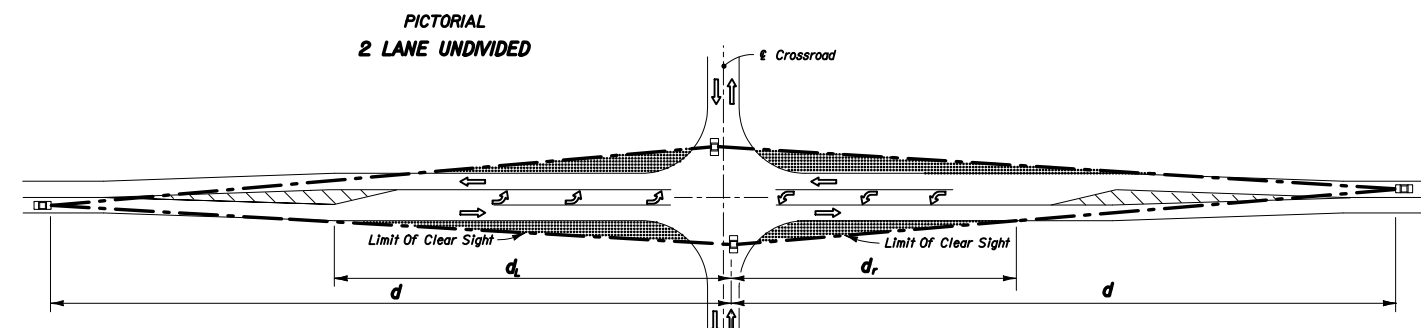
Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	420	295	190
35	490	345	220
40	560	395	250
45	630	445	280
50	700	495	310
55	770	545	345
60	840	595	375
65	910	645	405

SU Vehicle

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	510	360	225
35	595	420	265
40	680	480	305
45	765	540	340
50	845	600	375
55	930	660	415
60	1015	720	450
65	1100	780	490

Combination Vehicle

SIGHT DISTANCE (d) AND RELATED DISTANCES (d<sub>L</sub>, d<sub>R</sub>) (FEET)  
2 LANE UNDIVIDED



Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	355	195	135
35	415	225	155
40	475	260	180
45	530	290	200
50	590	325	220
55	650	355	245
60	710	390	265
65	765	420	290

Passenger Vehicle

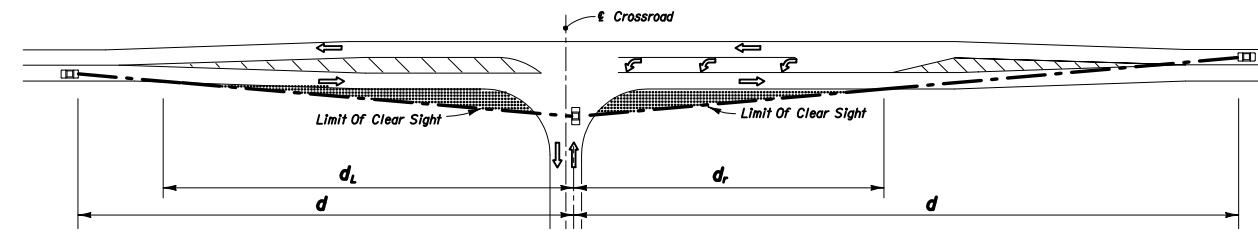
Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	450	250	170
35	525	290	200
40	600	330	225
45	675	370	255
50	750	410	285
55	825	450	310
60	900	490	340
65	975	530	370

SU Vehicle

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	540	295	205
35	630	345	240
40	720	395	270
45	810	445	305
50	900	495	340
55	990	540	375
60	1080	590	405
65	1170	640	440

Combination Vehicle

SIGHT DISTANCE (d) AND RELATED DISTANCES (d<sub>L</sub>, d<sub>R</sub>) (FEET)  
2 LANE 2 WAY • FLARED FOR LEFT TURNS



2 LANE 2 WAY • FLARED FOR SINGLE SIDE LEFT TURN CENTERED ON ALIGNMENT

**LEGEND**  
Areas Free Of Sight Obstructions

NOTE: See Sheet 6 for intersecting roadway origin of clear sight and quadrant corner clips.



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**SIGHT DISTANCE AT INTERSECTIONS**

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**PICTORIAL  
4 LANE UNDIVIDED**

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	355	250	115
35	415	295	135
40	475	335	155
45	530	375	175
50	590	415	195
55	650	460	210
60	705	500	230
65	765	540	250

Passenger Vehicle      SU Vehicle      Combination Vehicle

**SIGHT DISTANCE (d) AND RELATED DISTANCES (d<sub>L</sub>, d<sub>R</sub>) (FEET)  
4 LANE UNDIVIDED**

**PICTORIAL  
4 LANE UNDIVIDED FLARED - SYMMETRICAL**

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	375	205	120
35	440	240	145
40	500	275	165
45	565	310	185
50	625	340	205
55	690	375	225
60	750	410	245
65	815	445	265

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	480	220	155
35	560	255	180
40	640	290	210
45	720	330	235
50	800	365	260
55	880	400	285
60	960	440	310
65	1040	480	340

Passenger Vehicle      SU Vehicle      Combination Vehicle

**SIGHT DISTANCE (d) AND RELATED DISTANCES (d<sub>L</sub>, d<sub>R</sub>) (FEET)  
4 LANE UNDIVIDED FLARED - SYMMETRICAL**

**PICTORIAL  
4 LANE UNDIVIDED WITH OPTIONAL LANE**

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	375	265	95
35	440	310	115
40	500	355	130
45	565	400	145
50	625	440	160
55	690	490	172
60	750	530	195
65	815	575	210

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	480	340	125
35	560	395	145
40	640	450	165
45	720	510	185
50	800	565	205
55	880	620	225
60	960	680	245
65	1040	735	265

Design Speed	d	d <sub>L</sub>	d <sub>R</sub>
30	570	405	145
35	665	470	170
40	760	540	195
45	855	605	220
50	950	670	245
55	1045	740	270
60	1140	805	295
65	1235	875	320

Passenger Vehicle      SU Vehicle      Combination Vehicle

**SIGHT DISTANCE (d) AND RELATED DISTANCES (d<sub>L</sub>, d<sub>R</sub>) (FEET)  
4 LANE UNDIVIDED WITH OPTIONAL LANE**

**LEGEND**  
Areas Free Of Sight Obstructions

NOTE: See Sheet 6 for intersecting roadway origin of clear sight and quadrant corner clips.

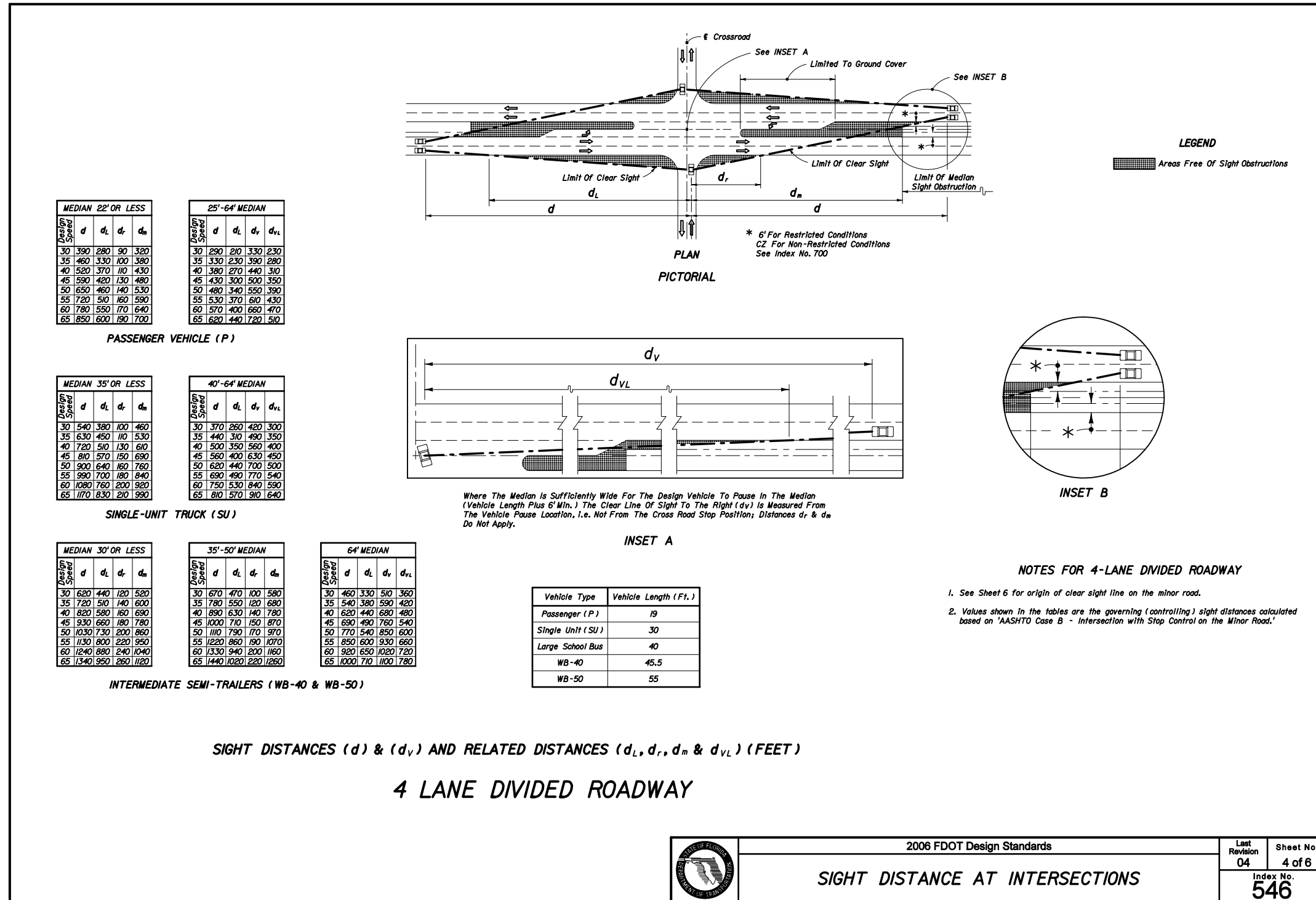


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**SIGHT DISTANCE AT INTERSECTIONS**

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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS

MEDIAN 22' OR LESS				
Design Speed	$d_x$	$d_L$	$d_r$	$d_m$
30	410	290	80	350
35	480	340	90	410
40	550	390	100	470
45	620	440	110	530
50	690	490	130	590
55	760	540	140	640
60	830	590	150	700
65	900	640	170	760

PASSENGER VEHICLE ( P )

25'-64' MEDIAN				
Design Speed	$d$	$d_L$	$d_v$	$d_{vL}$
30	310	220	330	230
35	360	250	390	280
40	410	290	440	310
45	460	330	500	350
50	510	360	550	390
55	570	400	610	430
60	620	440	660	470
65	670	470	720	510

SINGLE-UNIT TRUCK ( SU )

MEDIAN 35' OR LESS				
Design Speed	$d_x$	$d_L$	$d_r$	$d_m$
30	590	420	90	510
35	690	490	110	600
40	780	550	120	680
45	880	620	140	760
50	980	690	160	850
55	1080	760	170	940
60	1170	830	190	1020
65	1270	900	200	1100

INTERMEDIATE SEMI-TRAILERS ( WB-40 & WB-50 )

40'-64' MEDIAN				
Design Speed	$d$	$d_L$	$d_v$	$d_{vL}$
30	410	290	420	300
35	470	330	490	350
40	540	380	560	400
45	610	430	630	450
50	680	480	700	500
55	740	520	770	540
60	810	570	840	590
65	880	620	910	640

MEDIAN 30' OR LESS				
Design Speed	$d_x$	$d_L$	$d_r$	$d_m$
30	670	470	110	590
35	780	550	130	670
40	890	630	150	770
45	1000	710	170	860
50	1110	790	190	960
55	1220	860	200	1050
60	1330	940	220	1150
65	1440	1020	240	1240

35'-50' MEDIAN				
Design Speed	$d_x$	$d_L$	$d_r$	$d_m$
30	720	510	100	640
35	830	590	110	740
40	950	670	130	840
45	1070	750	150	950
50	1190	840	160	1060
55	1310	930	180	1160
60	1430	1010	190	1270
65	1550	1100	210	1380

64' MEDIAN				
Design Speed	$d$	$d_L$	$d_v$	$d_{vL}$
30	490	350	510	360
35	580	410	590	420
40	660	470	680	480
45	740	520	760	540
50	820	580	850	600
55	910	640	930	660
60	990	700	1020	720
65	1070	760	1100	780

**PICTORIAL PLAN**

\* 6' For Restricted Conditions  
CZ For Non-Restricted Conditions  
See Index No. 700

**INSET A**

**INSET B**

**LEGEND**  
Areas Free Of Sight Obstructions

**NOTES FOR 4-LANE DIVIDED ROADWAY**

1. See Sheet 6 for origin of clear sight line on the minor road.
2. Values shown in the tables are the governing (controlling) sight distances calculated based on 'AASHTO Case B - Intersection with Stop Control on the Minor Road.'

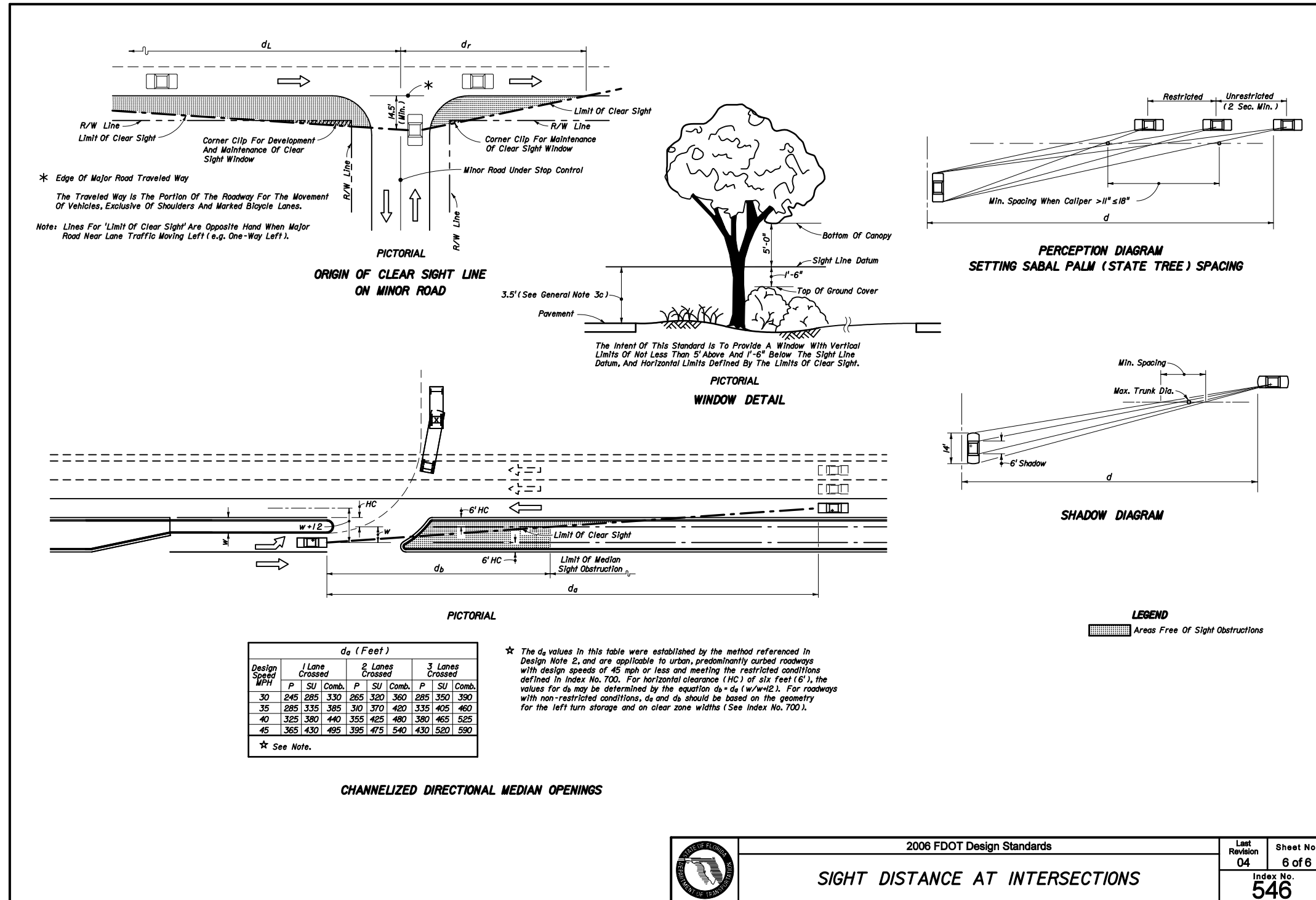
Where The Median Is Sufficiently Wide For The Design Vehicle To Pause In The Median (Vehicle Length Plus 6' Min.) The Clear Line Of Sight To The Right ( $d_v$ ) Is Measured From The Vehicle Pause Location, I.e. Not From The Cross Road Stop Position; Distances  $d_r$  &  $d_m$  Do Not Apply.

SIGHT DISTANCES ( $d$ ), ( $d_v$ ) & ( $d_x$ ) AND RELATED DISTANCES ( $d_L$ ,  $d_r$ ,  $d_m$  &  $d_{vL}$ ) (FEET)

6 LANE DIVIDED

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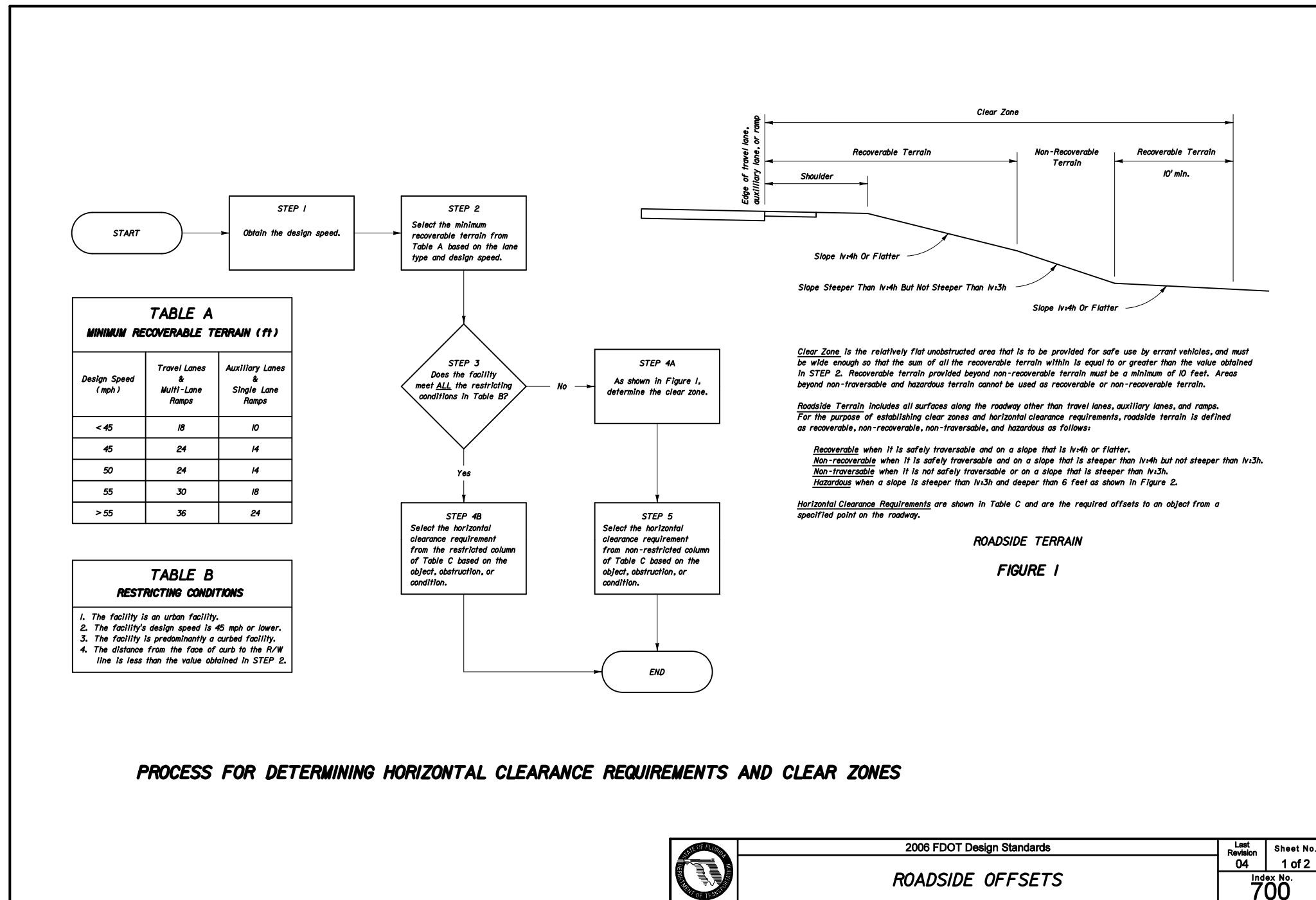
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SIGHT DISTANCE AT INTERSECTIONS

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**PROCESS FOR DETERMINING HORIZONTAL CLEARANCE REQUIREMENTS AND CLEAR ZONES**



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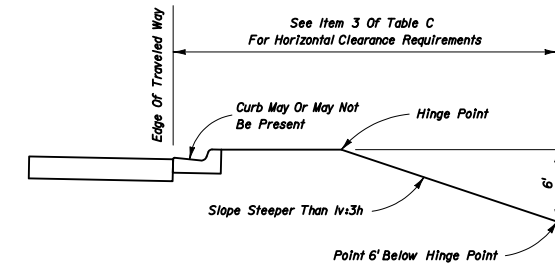
ROADSIDE OFFSETS

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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS
2007 UAM	Should the provisions of this Index conflict with any other section of this UAM, the provisions of this Index will be superseded by the requirements found within the other sections of this UAM.



TABLE C				
	Item No.	OBJECTS, OBSTRUCTIONS OR CONDITIONS	HORIZONTAL CLEARANCE REQUIREMENTS	
			Restricted	Non-Restricted
GENERAL	1	Above ground fixed hazards: All roadside objects, obstructions or conditions other than those listed below that exceed 4 inches in height and pose a hazard to errant vehicles and vehicle occupants.	Locate as close to the Right Of Way as practical and not less than 4 feet from face of curb.	Locate outside the clear zone as close to the Right Of Way as practical.
	2	All FDOT approved guardrails, crash cushions, permanent or temporary concrete barriers, and guardrail end terminals.	Locate as shown in the Design Standards.	Locate as shown in the Design Standards.
ROADWAY	3	Drop-off hazards: Any point along a roadside slope steeper than 1v:3h that is deeper than 6 feet below the hinge point. See Figure 2.	Locate the point that is 6 feet below the hinge point no less than 22 feet from the traveled way.	Treat as roadside slopes in accordance with Design Standard 400.
	4	Mailboxes not shown in Design Standard 532.	Not to be used.	Not to be used.
	5	Mailboxes shown in Design Standard 532.	Locate in accordance with Design Standard 532.	Locate in accordance with Design Standard 532.
	6	Trees expected to become greater than 4 inches in diameter measured 6 inches above the ground.	Outside roadways: Locate no less than 4 feet from face of curb in accordance with Design Standard 546. Inside medians: Locate no less than 6 feet from the edge of traffic lane and in accordance with Design Standard 546.	Locate outside the clear zone as close to the Right Of Way as practical and in accordance with Design Standard 546.
	7	Trees not expected to become greater than 4 inches in diameter measured 6 inches above the ground.	Locate in accordance with Design Standard 546.	Locate in accordance with Design Standard 546.
	8	Canals behind guardrail.	Locate no less than 5 feet from the back of the guardrail post.	Locate no less than 5 feet from the back of the guardrail post.
	9	Canals without guardrail.	Locate as close to the Right Of Way as practical and not less than 40 feet from the traveled way.	Design speeds of 50 mph and greater: Locate as close to the Right Of Way as practical and not less than 60 feet from the traveled way. Design speeds less than 50 mph: Locate as close to the Right Of Way as practical and not less than 50 feet from the traveled way.
DRAINAGE	10	Culvert wing wall, endwall, retaining walls and flared end sections less than 6 feet deep.	Locate no less than 4 feet from face of curb.	Locate outside the clear zone.
	11	Culvert wing wall, endwall, retaining walls and flared end sections 6 feet and greater in depth.	Treat as drop-off hazard; See Item No. 3.	Treat as drop-off hazard; See Item No. 3.
	12	Mitered end sections.	Locate as shown in Design Standards 272 and 273.	Locate as shown in Design Standards.
TRAFFIC CONTROL DEVICES	13	Frangible sign supports.	Locate no less than 4 feet from face of curb and in accordance with Design Standard 1730Z.	Locate in accordance with Design Standard 1730Z.
	14	Overhead sign supports and other non-frangible signs.	Locate no less than 4 feet from face of curb.	Locate outside the clear zone.
	15	Signal controller cabinets, signal poles, strain poles and mast arms.	Locate no less than 4 feet from face of curb and not in medians.	Locate outside the clear zone and not in medians.
LIGHTING	16	Conventional lighting (frangible and non-frangible).	Locate no less than 4 feet from face of curb and not in medians.	Locate 20 feet from travel lanes or 14 feet from auxiliary lanes. Not in medians. May be clear zone width when the clear zone is less than 20 feet.
	17	Highmast lighting.	Not applicable.	Locate outside the clear zone.
STRUCTURES	18	Bridge piers and abutments: Above ground vertical structures.	Locate not less than 16 feet from edge of travel lane.	Locate outside the clear zone.
UTILITIES	19	Fire hydrants with bases no higher than 4 inches above the ground.	Locate not less than 2 feet from face of curb.	Locate as close to the Right Of Way as practical.
	20	Utility installations: All above ground fixed objects.	Locate as close to the Right Of Way as practical and not less than 4 feet from face of curb and not in medians.	Locate outside the clear zone as close to the Right Of Way as practical and not in medians and not within limited access facilities. May be placed 4 feet behind the back of shields that have been justified for other reasons.
RAILROADS	21	Railroad crossing traffic control devices.	Locate in accordance with Design Standard 1788Z.	Locate in accordance with Design Standard 1788Z.



DROP-OFF HAZARDS  
FIGURE 2

GENERAL NOTES

- When sidewalks are present, an unobstructed sidewalk width of at least 4 feet must be provided.
- When site specific conditions prohibit meeting the horizontal clearance requirements in TABLE C, the object, obstruction or condition must be mitigated, possibly by shielding. Otherwise, the Plans Preparation Manual, Volume 1, Chapters 2, 4, 21 and 25, or Chapters 5 and 9 of the Utility Accommodation Manual must be researched to determine viable alternatives. The minimum requirements in these manuals can only be reduced when a Design Variation or Design Exception has been approved in accordance with Chapter 23 of the Plans Preparation Manual, Volume 1 or a Utility Exception has been approved in accordance with Chapter 13 of the Utility Accommodation Manual.

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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS
2007 UAM	Should the provisions of this Index conflict with any other section of this UAM, the provisions of this Index will be superseded by the requirements found within the other sections of this UAM.