Whether or not shoulder gutter is used, control line set by normal shoulder point. Limit for minimum removal of bottom of organic material.

*Remove overlying material and organic material within the limits shown and backfill in accordance with Index 505, unless approved otherwise by the District Geotechnical Engineer. The limits include full median width when applied to divided facilities with median widths up to 64'. When median width is greater than 64' and for bifurcated roadways, the organic material removal limits will be set by a 1:2 control line complimentary to the outer roadway that will accommodate one future median lane on each roadway unless specified otherwise by the plans.

GENERAL NOTES:
1. All details shown on this Index for removal of organic and plastic materials apply unless otherwise shown on the plans.
2. Utilize excavated materials in accordance with Index 505.
3. Where organic or plastic material is undercut, backfill with suitable material in accordance with Index 505, unless otherwise shown on the plans.
4. 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 505.
5. See Index 506 for miscellaneous earthwork details.
6. 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. Remove organic material as shown on this Index and the plans unless directed otherwise by the District Geotechnical Engineer. Determine the average organic content from the test results from a minimum of three randomly selected samples from each stratum. Perform tests in accordance with AASHTO T267 on the portion of a sample passing the No. 4 sieve.
7. In areas of curbed roadway, 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 must conform to Standard Specifications. The minimum grade of underdrain pipe is 0.02.

GENERAL NOTES AND REMOVAL OF ORGANIC MATERIAL

INDEX NO. 500

REMOVAL OF ORGANIC AND PLASTIC MATERIAL
DIVIDED FREeways, ARTERIALS, MAJOR COLLECTORS HAVING FLUSH MEdIANS, ON UNDIVIDED ARTERIALS AND MAJOR COLLECTORS

INTERSTATE FACILITIES, FREEWAYS, DIVIDED ARTERIALS AND MAJOR COLLECTORS HAVING DEPRESSED MEdIANS

NOTES:
1. See Sheet 1 for the GENERAL NOTES.
2. When the typical cut details are applied to minor collectors and local facilities, the underdrain may be reduced from 24" to 18".
3. 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.
4. Refer to roadway cross sections to determine whether minimum or preferable removal is used.
5. Where the Preferable Removal method is shown in the plans and it is impossible to place the underdrain at the Outer Cut Limit due to conflict with storm drain trunk lines, remove to Inner Cut Limit and place underdrain at location shown for Minimum Removal. (See Special Removal Details)
6. Cross slopes of 0.02 shown above are minimums. Follow the cross slope of the pavement to the extent possible.

CONSTRUCTION AND LOCATION OF UNDERDRAIN IN CURBED ROADWAY

(See Note #4)

REMOVAL OF ORGANIC AND PLASTIC MATERIAL

INDEX NO. SHEET NO.
500 2 of 2

REMOVAL OF PLASTIC MATERIAL

FY 2017-18 DESIGN STANDARDS
GENERAL NOTES

1. 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.

2. Plastic (P) soils may be placed above the existing water level (at the time of construction) to within 4 feet of the proposed base. A-2 soil excavated within the project limits may be used in embankment construction as indicated on this Index. Certain types of A-2 soil will be allowed. The designer shall limit the use of Plastic (P) soils, High Plastic (H) soils, and/or soils classified as organic material in the subgrade portion of the roadbed. High Plastic soils are not to be used for embankment construction when obtained from outside the project limits.

3. High Plastic (M) 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.

4. 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. 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.

5. 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

1. 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.

2. 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.
DIVIDED ROADWAYS

UNDIVIDED ROADWAY

SYMBOL  SOIL  CLASSIFICATION (AASHTO M 145)

S  Select  A-1, A-2, A-2-4**
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.

** 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 roadway when approved by the District Materials Engineer. A-2-4 material placed below the existing water level must be nonplastic 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 collector and local facilities this dimension may be reduced to 18'.

RIGID PAVEMENT - TREATED PERMEABLE BASE OPTION

F O O T N O T E

1. Concrete pavement is to be placed over 4" of Asphalt Treated Permeable Base (ATPB) or Cement Treated Permeable Base (CTPB) as identified in the plans. This will be placed on a separator layer using 2" Type SP. This will be placed on a working platform using 12" of Type B Stabilization.

DESIGN NOTE

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'.
DIVIDED ROADWAYS

DESIGN NOTE

1. Concrete pavement is to be placed over Optional Base Group 1 Type B-12.5 only Asphalt Base as identified in the plans. This will be placed on a working platform using 12" of Type B Stabilization.

UNDIVIDED ROADWAY

RIGID PAVEMENT - ASPHALT BASE OPTION

**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 roadway when approved by the District Materials Engineer. A-2-4 material placed below the existing water level must be nonplastic and contain less than 15% passing the No. 200 U.S. Standard sieve.

* For cut sections this dimension may be reduced to 18". For minor collectors and local facilities this dimension may be reduced to 18".
**DIVIDED ROADWAYS**

**UNDIVIDED ROADWAY**

**SYMBOL**
- S: Select
- S+: Special Select
- P: Plastic
- H: High Plastic
- M: Muck

**CLASSIFICATION (AASHTO M 145)**
- S Select: A-1, A-3, A-2-4 **
- S+: Special Select: A-3 *** With Minimum Average Lab Permeability of 5x10^-6 cm/sec (0.14 ft./day) as per AASHTO T 215
- M Muck: A-8

Classification listed left to right in order of preference.

Note:
- **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 nonplastic, and not exceed 15% passing the No. 200 U.S. Standard sieve.

**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**

- 3' of #57 or #89 Coarse Aggregate Mixed Into Top 6'.

- Water Level At Time Fill Is Placed

- **DIVIDED ROADWAYS**

- **UNDIVIDED ROADWAY**

- **SYMBOL**
  - S: Select
  - S+: Special Select
  - P: Plastic
  - H: High Plastic
  - M: Muck

- **CLASSIFICATION (AASHTO M 145)**
  - S Select: A-1, A-3, A-2-4 **
  - S+: Special Select: A-3 *** With Minimum Average Lab Permeability of 5x10^-6 cm/sec (0.14 ft./day) as per AASHTO T 215
  - M Muck: A-8

Classification listed left to right in order of preference.

**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**

- 3' of #57 or #89 Coarse Aggregate Mixed Into Top 6'.
NOTES

1. All material in the shaded area is excess base to be removed.
2. The cost for removal of excess base material shall be included in the contract unit price for base.
3. Payment for base shall be calculated using normal width.

REMOVAL OF EXCESS BASE MATERIAL

MEDIAN STABILIZING DETAILS

1. When the median has curb or curb and gutter, stabilize 4" back of curb.
2. When the median has shoulder with no curb or curb and gutter, stabilize to normal shoulder width.
3. See the details above for stabilizing requirements at crossroads.
4. Stabilize entire area under all paved traffic islands.
5. Stabilize full width under all traffic separators.
6. Select material as defined on Index No. 505. For minor collectors and local facilities the depth of select material thickness may be reduced from 24" to 18".
**SHOULDER CONSTRUCTION WITH SUPERELEVATION**

**NORMAL CROWN SECTION AA**

- **2-LANE, 4-LANE OR 6-LANE PAVEMENT, NO MEDIANS**
- **Pavement Width**
- **Profile Grade Point**
- **Profile Grade Line**
- **Normal Crown Slope**

**REVOLUTE CROWN SECTION BB**

- **FULLY SUPERELEVATED SECTION CC**
  - **Pavement Width**
  - **Profile Grade Point**
  - **Profile Grade Line**
  - **Normal Crown Slope**

**FULLY SUPERELEVATED SECTION CC**

SHOULDER ON HIGH SIDE: A shoulder slope of 0.06 downward from the edge of travel way will be maintained until a 0.08 break in slope at the pavement edge is reached due to superelevation of the pavement. As the pavement superelevation increases, the 0.08 break in slope will be maintained and the shoulder flattened until the shoulder slope reaches the minimum of 0.02 downward from the edge of travel way. Any further increase in pavement super elevation will necessitate sloping the inside half of the shoulder toward the travel way and the outer half outward, both at 0.02 for super elevations 0.06-0.09 and both at 0.03 for super elevation 0.10. For shoulders with paved widths 5 feet or less see Special Shoulder Break Over Details on Sheet 2 of 2.

SHOULDER ON LOW SIDE: Maintain 0.06 drop across inside shoulder until pavement cross slope reaches 0.06. For pavement cross slopes greater than 0.06, shoulder to have same slope as pavement. These slopes are the same as those shown pictorially on Sheet 2 of 2.

NOTE: These details apply to both paved and grassed shoulders. For median shoulders use 0.05 in lieu of 0.06.

**DESIGN SUPERELEVATION RATES FOR RURAL HIGHWAYS, URBAN FREEWAYS AND HIGH SPEED URBAN HIGHWAYS**

<table>
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<th>Design Speed</th>
<th>Pavement Width</th>
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<td>80-85</td>
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**DEGREE OF CURVE**

- **SUPER ELEVATION TRANSITIONS**
- **Inside Pavement Edges**
- **Outside Pavement Edges**

**SUPER ELEVATION TRANSITIONS**

- **Straight Line Transition**
- **On Inside Edge Of Pavement**
- **Pavement Width**
- **Profile Grade**
- **Normal Crown Slope**
- **Transition L (Varies, 100' Min.)**

**DIRECT LINE SUPER ELEVATION TRANSITION**

- **On Inside Edge Of Pavement**
- **Pavement Width**
- **Profile Grade**
- **Normal Crown Slope**
- **Transition L (Varies, 100' Min.)**

**SUPER ELEVATION TRANSITIONS**

- **Inside Pavement Edges**
- **Outside Pavement Edges**
- **Profile Grade Points**
- **Median**
- **Normal Section**
- **FULLY SUPER ELEVATED**
- **SECTION AA**
- **SECTION BB**

**RADIUS OF CURVE - FEET**

- **SUPER ELEVATION RATE**
- **(0.05 For Medians)**
- **Shovel Slope Not Steeper Than 0.06 Not Steeper Than 0.06**

**GENERAL NOTES:**

1. For curves in Urban Highways and High speed Urban Streets, see Index No. 511.
Super elevation Transition L₁ (Varies 100' Min.)

Profile Grade

Superelevation Transition L₁ (Varies 100' Min.)

Full Superelevation

Curves

Tangent

Outside Part Edge

Outer Roadway

Full Superelevation

Outer Roadway

Profile Grade

Crown Point

Inner Roadway

Crown Point

Outside Pav't Edge

Inner Roadway

Outside Pav't Edge

Profile Grade

Crown Point

Both Roadways

Outside Part

Edges-Both

Roadways

Normal Crowned Section

SECTION A-A

SUPERELEVATION SECTION LT. & RT.

SECTION B-B

SUPERELEVATION SECTION LT. & RT.

SECTION C-C

SUPERELEVATION SECTION LT. & RT.

SECTION D-D

SUPERELEVATION TRANSITION LT. & RT.

SECTION E-E

SUPERELEVATION TRANSITION LT. & RT.

SECTION F-F

SUPERELEVATION LT. & RT.

8-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN

8-LANE PAVEMENT WITH ONE LANE SLOPED TO MEDIAN

Shoulder SLOPES ON SUPERELEVATION SECTIONS

a) 12 AND 10 FULL WIDTH SHOULDERS WITH 5 OR LESS PAVED WIDTHS,

b) IF FULL WIDTH SHOULDERS WITH 4 OR LESS PAVED WIDTHS,

SPECIAL SHOULDER BREAK OVER DETAILS

FOR SHOULDERS WITH PAVED WIDTHS 5 FEET OR LESS SEE SPECIAL SHOULDER BREAK OVER DETAILS

SPECIAL SHOULDER BREAK OVER DETAILS

SHOULDER SLOPES ON SUPERELEVATION SECTIONS

SPECIAL SHOULDER BREAK OVER DETAILS
### General Notes

1. Maximum rate of superelevation for urban highways and high speed urban streets shall be 0.05.

2. Superelevation shall be obtained by rotating the plane successively about the break points of the section until the plane has attained a slope equal to that required by the chart. Should the rotation traverse the entire section and further superelevation be required, the remaining rotation of the plane shall be about the low edge of the inside travel lane. Crown is to be removed in the auxiliary lane to the outside of the curve only when the adjoining travel lanes require positive superelevation.

3. When positive superelevation is required, the slope of the gutter on the high side shall be a continuation of the slope of the superelevated pavement.

4. In construction, short vertical curves shall be placed at all angular profile breaks within the limits of the superelevation transition.

5. The variable superelevation transition length \( L \) shall have a minimum value of 50 feet for design speeds under 40 MPH and 75 feet for design speeds of 40 MPH or greater.

6. Roadway sections having lane arrangements different from those shown, but composed of a series of planes, shall be superelevated in a similar manner.

7. For superelevation of lower speed urban streets, see the FDOT Manual of Uniform Minimum Standards For Design, Construction And Maintenance For Streets And Highways. For superelevation of curves on rural highways, urban freeways and high speed urban highways, see Index No. 510.

### Tabulated Values

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<th>Degree Of Curve (D)</th>
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<th>Radius (R) (Ft.)</th>
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</table>

### Charted Values

- **a:** When the speed curves and the degree of curve or radius lines intersect above this line, the pavement is to be superelevated (positive slope) at the rates indicated at the lines intersecting points.

- **b:** When the speed curves and the degree of curve or radius lines intersect between these limits, the pavement is to be superelevated at the rate of 0.02 (positive slope).

- **c:** When the speed curves and the degree of curve or radius lines intersect below this line, the pavement is to have normal crown (typically 0.02 and 0.03 downward slopes).

### Chart of Values

- **Degree Of Curve (D):**
  - 0° 00'
  - 2° 00'
  - 4° 00'
  - 6° 00'
  - 8° 00'
  - 10° 00'
  - 12° 00'
  - 14° 00'
  - 16° 00'
  - 18° 00'
  - 20° 00'

- **Design Speed (mph):**
  - 20 MPH
  - 30 MPH
  - 40 MPH
  - 50 MPH

- **Radius (R) (Ft.):**
  - 30
  - 50
  - 100
  - 150
  - 200

- **Superelevation Rates (e):**
  - 0.05
  - 0.02
  - 0.01
  - 0.00

### Maximum Rate

- **Max. Rate of Superelevation (Dmax):**
  - 0.05 (negative slope)
  - 0.02 (positive slope)

### Notes

- When positive superelevation is required, the slope of the gutter on the high side shall be a continuation of the slope of the superelevated pavement.

- In construction, short vertical curves shall be placed at all angular profile breaks within the limits of the superelevation transition.

- The variable superelevation transition length \( L \) shall have a minimum value of 50 feet for design speeds under 40 MPH and 75 feet for design speeds of 40 MPH or greater.

- Roadway sections having lane arrangements different from those shown, but composed of a series of planes, shall be superelevated in a similar manner.

- For superelevation of lower speed urban streets, see the FDOT Manual of Uniform Minimum Standards For Design, Construction And Maintenance For Streets And Highways. For superelevation of curves on rural highways, urban freeways and high speed urban highways, see Index No. 510.

### Superelevation Rates for Urban Highways and High Speed Urban Streets

- **\( e_{max} = 0.05 \)**

### Description

- **Superlevation for Urban Highways and High Speed Urban Streets**

- **Design Standards**

- **INDEX NO:** 511

- **Sheet No:** 1 of 3

- **FY 2017-18**

- **Revision:** 07/01/00

- **Date:** 10/12/2016
Superelevation Transition Sections
For Urban Highways and High Speed Urban Streets

Superelevation rates obtained from the chart or table on Sheet 1 are also applicable to a parabolic crown section. When this section is used, superelevation is established by rotating a tangent about the arc of the parabolic crown until the desired slope is attained (points A & B on sketch). The normal parabolic crown will be maintained outside the limits of the plane thus formed.
EXAMPLE SUPERELEVATION SECTIONS AND PROFILES
FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

Note:
The sections and profiles shown are examples of superelevation transitions.
Similar schemes should be used for roadways having other sections.
SUMMARY OF GEOMETRIC REQUIREMENTS FOR DRIVEWAY TURNOUTS

- **ELEMENT DESCRIPTION**
  - **1-20 Trips/Day**
    - **2-Way**: 12' Min., 24' Max.
    - **2-Way**: 10' Min., 20' Max.
  - **21-600 Trips/Day**
    - **2-Way**: 15' Min., 25' Max.
    - **2-Way**: 15' Min., 25' Max.
  - **601-4000 Trips/Hour**
    - **2-Way**: 17' Min., 28' Max.
    - **2-Way**: 17' Min., 28' Max.

- **CONNECTION WIDTH**
  - **W**
    - 10' Min., 20' Max.

- **FLARE (Drop Curb)**
  - **F**
    - 10' Min., N/A

- **RETURNS (Radius) R & U**
  - **10' Min., N/A

- **ANGLE OF DRIVE Y**
  - 60°-90°

- **DIVISIONAL ISLAND (Throat Median)**
  - 4'-22' Wide

- **SETBACK G**
  - 12' Min., All categories

**NOT INTENDED FOR FULL INTERSECTION DESIGN**

**DESIGN STANDARDS**

**INDEX**

**NO.** 515

**SHEET** 1 of 7

**FY 2017-18**

**REVISION** 01/01/16
CURBED ROADWAY - 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 will be impeded.

2. Driveways indicated as "Marginal Applications" are those with slopes that can barely 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. When the driveway is located on the low side of fully superfaced roadways.

3. 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 shall have site specific flare designs or Category III designs.

Footnotes:
1. All 1/8" joints shall be constructed with preformed joint filler.
2. Open joints placed at equal (20') intervals for driveways over 20' wide. Joints in curb and gutter to match joints in driveways.
3. When connecting to side road curb and gutter sections, the no drop curb limits should extend back to the side road radius point. With or without curb and gutter, no driveway should encroach on the corner radius.
4. Driveways (6" concrete) shall be of a uniform width (W) to the right of way line.

Alpha-numeric identification of a flared driveway type specifically called for in the plans, see sheets 3 and 4.

SPECIAL NOTES FOR CURBED ROADWAYS - FLARED TURNOUTS

1. Drop curb, concrete sidewalks (6" thick) and driveways (6" thick) shall meet Specification Sections S20 and S22. The driveway foundation shall meet the requirements of Subarticle S32-A.
2. For details of drop curb and sidewalk curb ramps refer to Indexes 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. For turnouts with radial returns see the requirements under the "Summary Of Geometric Requirements For Turnouts", the "General Notes", the details of "Flush Shoulder Roadway-Turnout Construction" and the detail of "Limits Of Clearing & Geometric Requirements For Turnouts", the "General Notes", the details of "Flush Shoulder Roadway-Turnout Construction" and the detail of "Limits Of Clearing & Geometric Requirements For Turnouts".

5. Maintenance of pavement shall extend out to the right of way or 2' beyond the back of sidewalk, whichever distance is less.
6. The maintenance and operation of highway lighting, traffic signals, associated equipment, and other necessary devices shall be the responsibility of the public agency.
7. 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.
8. 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.
9. All sidewalk surfaces crossing driveways with a cross slope shown in this Index to be 0.02 shall be 0.02 Maximum.
* See "DESIGN NOTES FOR CURBED ROADWAY - FLARED TURNOUTS"

**DRIVEWAY SECTIONS ON CURBED FACILITIES WITH SIDEWALKS**

**SIDEWALK ADJACENT TO CURB**

**SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE**

**SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE**

**GENERAL APPLICATIONS**

**MARGINAL APPLICATIONS ON LOW SIDE OF FULLY SUPERELEVATED ROADWAY (REFER TO MODIFICATIONS ON SHEET 4)**

**ADVERSE APPLICATIONS (REFER TO MODIFICATIONS ON SHEET 4)**

**SIDEWALK ADJACENT TO CURB**

**SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE**

**SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE**

**GENERAL APPLICATIONS**

**MARGINAL APPLICATIONS ON LOW SIDE OF FULLY SUPERELEVATED ROADWAY (REFER TO MODIFICATIONS ON SHEET 4)**

**ADVERSE APPLICATIONS (REFER TO MODIFICATIONS ON SHEET 4)**
MODIFICATIONS OF 'ADVERSE' AND 'MARGINAL' APPLICATIONS

SIDEWALK ADJACENT TO CURB

SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE

MODIFICATIONS TO ADVERSE AND MARGINAL SECTIONS

ADVERSE* AND MARGINAL* SECTIONS MODIFIED TO ACHIEVE GENERAL* APPLICATION

ADVERSE* SECTIONS MODIFIED TO ACHIEVE MARGINAL* APPLICATION

SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE

* See 'DESIGN NOTES FOR CURBED ROADWAY - FLARED TURNOUTS'
DRIVE ENTRANCES NOTES:

- 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 Specification Section 125. 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 273. For spacing between adjacent pipe end treatments see Index 273.

- Stable material may be required for graded turnouts to private property as directed by the Engineer in accordance with Section 102-8 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 shall be constructed for all paved connecting facilities. The connecting point will be determined by the Engineer.

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

- Paved turnouts shall 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 radius lengths and supplemental information.

- Return Radius Point or Flare Point.
<table>
<thead>
<tr>
<th>Course</th>
<th>Materials</th>
<th>Connections (in)</th>
<th>Roadway (in)</th>
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<tr>
<td>Bases</td>
<td>Optional Base (see Spec Section 285)</td>
<td>0.860.1</td>
<td>0.860.3</td>
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</table>

1. Minimum thickness
2. All materials shall be approved by the Department prior to being placed.
3. Structural course 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**

1. 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 equivalent pavements may be used at the discretion of the Engineer.

2. Auxiliary lanes and their transition tapers shall be the same structure as the adjoining travel way pavement thickness or any of the roadway structures tabulated above, whichever is thinner.

3. If an asphalt base course is used for a turnout, its thickness may be increased to match the edge of travel way pavement thickness 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.

4. A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.

5. Connections paved with Portland cement concrete shall be Class NS concrete at least 6" thick. The Department may require greater thickness when called for in the plans or stipulated by permit. Materials and construction shall conform with FDOT Standard Specifications Sections 347, 335, and 522.

6. The Department may require other pavement criteria where local conditions warrant.

**PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY Lanes**

**TABLE 515-1**
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 

FLUSH SHOULDER ROADWAY - TURNOUT PROFILES

CURVED ROADWAY - TURNOUT PROFILES
- When restoring or reconstructing existing commercial turnout connections on new construction and reconstruction projects, the maximum 10% commercial grade may be exceeded provided this does not create adverse roadway operational or safety impacts. This shall be approved by the District Design Engineer and supported by documented site specific findings.

STORMWATER RUNOFF AND PROFILE OPTION NOTES
1. 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 Flush Shoulder Roadways the turnout 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 Curbed Roadway turnouts.
2. 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. The Option 1 profile is recommended 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.

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

STORMWATER RUNOFF AND PROFILE OPTION NOTES
1. 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 Flush Shoulder Roadways the turnout 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 Curbed Roadway turnouts.
2. 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.
**GENERAL NOTES**

1. Turnouts are to be constructed or resurfaced for low volume (single family, duplex, farm, etc.) residential connections as directed by the Engineer.

2. Turnout construction is not required for low volume residential connections where roadway shoulders are paved.

3. Connections outside the 5' limit are to be constructed as directed by the Engineer.

4. The contract unit price for Turnout Construction includes the cost for excavation and base.

5. Payment for structural course is to be included in the roadway resurfacing pay item.

6. Payment for feathering friction course is to be included in the unit price for Asphaltic Concrete Friction Course placed on the roadway. Feathered areas will not be included in measured quantities. Feathering is not required for FC-5 friction course.

**AREAS FOR ONE 5' DEEP TURNOUT (SY)**

<table>
<thead>
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<th>Drive Width (ft.)</th>
<th>Intersection</th>
<th>Type I</th>
<th>Type II</th>
<th>Type I</th>
<th>Type II</th>
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</table>

**PAVEMENT STRUCTURE FOR 5' DEEP TURNOUTS**

- **Course**: Structural
- **Material**: Asphaltic Concrete
- **Minimum Thickness**: 1'
- **Base**: Optional Base (See Spec. Section 285) O.B.G. 1

**Notes**:

1. Turnout structural course to be the same material as roadway leveling or structure course. Structural course not required if asphalt base course and its thickness increased to match edge of roadway pavement.

2. Additional structural strength may be required if heavy truck loads are anticipated.

3. Turnout construction is not required for low volume residential connections where roadway shoulders are paved.
RAISED RUMBLE STRIPS AT INTERSECTIONS

THERMOPLASTIC SET

ASPHALT SET

SECTION AA FOR THERMOPLASTIC AND ASPHALT RUMBLE STRIP SETS

** May be decreased in urban areas with low operating speeds.

NOTE:
Raised rumble strips are to be constructed in accordance with Section 546 of the Specifications.
SHOULDER GROUND-IN RUMBLE STRIP PLACEMENT

GENERAL NOTES FOR SHOULDER GROUND-IN RUMBLE STRIPS

1. Shoulder ground-in rumble strips shall be constructed on limited access facilities.

2. The skip array is the standard array. The continuous array shall be constructed in advance of bridge ends for a distance of 1000', or back to the gore recovery area for mainline interchange bridges; and constructed at other specific locations as called for in the plans.

3. Ground-in rumble strips are to be constructed in accordance with Section 546 of the Specifications.

4. When friction course extends more than 8' beyond the edge of the travel lane, the extended friction course shall be bladed off back to the 8' line, prior to rumble strip grinding.

Note:
- Arrows indicate direction of travel and not the number of lanes nor width of median shoulder pavement.
- See General Note No. 4
SHOULDER RUMBLE STRIPS

NTS
RIGID PAVEMENT WITH FLEXIBLE PAVEMENT SHOULDER

Ground-in Rumble Strips For Flexible Pavement

NTS
RIGID PAVEMENT WITH RIGID PAVEMENT SHOULDER

Profiled Thermoplastic Markings

Flexible Shoulder Pavement

Concrete Shoulder Pavement

ISOMETRIC - LONGITUDINAL CUT
INSET A

ISOMETRIC - LONGITUDINAL CUT (RIGID PAVEMENT)
INSET B
**NOTES:**

1. Do not use this Index for suspended (structural) steps or stairways.
2. Construct steps in accordance with Section 522 of the FDOT Standard Specifications.
3. Concrete: Class NS, Specification 347.
4. Tread Finish: Broom finish parallel to steps unless otherwise shown in Plans.
5. Pedestrian Railing: See Index Nos. 852, 862, 870, 880 or Project Specific Design.
6. Cost of concrete steps, landings and cheekwalls shall be paid for under the contract unit price for Class NS Concrete (Concrete Steps), CY. Cost of reinforcing steel shall be paid for under the contract unit price for Reinforcing Steel (Miscellaneous), LB.

**PLAN AT JUNCTION OF STEPS & LANDING**

(Bottom Landing shown, Top Landing similar)

**STAIR TREAD AND-RISER DETAILS**

*The greatest riser height within the flight of steps shall not exceed the smallest by more than 1/8.**

**The greatest tread depth within the flight of steps shall not exceed the smallest by more than 1/8.**

**TREAD**

17" Min.
16" Max.
1/4" Pitch

**R** = 1/8" Max.

**RISER**

9 1/2" Min.
12" Max.
1 1/2" Min.

**EXPANSION JOINT**

2" Min. Cover

**NOTE:** Provide a maximum of 12 risers between landings.
GENERAL NOTES:

1. Taper-Type exit and entrance terminals as detailed shall not be used on ramps for which a speed of 50 MPH or greater cannot be maintained. For such ramps, parallel deceleration and acceleration lanes shall be used in place of tapers with lengths set according to AASHTO.

2. Shoulder Pavement:
   A. Concrete Pavement Projects: Where shoulder pavement adjacent to shoulder gutter is less than 6' wide, it shall be identical to the adjacent roadway pavement beginning with the transverse joint nearest the point of 6' width.
   B. Flexible Pavement Projects: Where shoulder pavement used in conjunction with shoulder gutter is less than 6' uniform width, it shall be identical to the adjacent roadway pavement.

3. For concrete pavement joint details and layouts at entrance and exit ramp terminals, see Index 305.
TAPER - TYPE ENTRANCE

PARALLEL - TYPE ENTRANCE

LEGEND:

Shoulder Pavement
4-LANE WITH TWO-WAY LEFT-TURN LANES

4-LANE UNDIVIDED FLARED - SYMMETRICAL

GENERAL NOTE
1. For pavement markings refer to Index No. 37346.

DECCELERATION LENGTH (L) See Index No. 301 For Queue Length

MINIMUM TAPER RATES FOR LANE DROP (T_a) will be 1:20.
LEFT SIDE WIDENING

CENTERED WIDENING

RIGHT SIDE WIDENING

FLARED & PAINTED LEFT TURNS FOR 2-LANE 2-WAY ROADWAYS

<table>
<thead>
<tr>
<th>DESIGN SPEED (mph)</th>
<th>L_d (ft.)</th>
<th>MINIMUM UNDER CONSTRAINTS</th>
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</table>

See Index No. 301 Queue Length

For Deceleration Length (L_d)

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<td>60</td>
<td>360</td>
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<tr>
<td>70</td>
<td>480</td>
</tr>
</tbody>
</table>
**4-LANE DIVIDED TO 4-LANE UNDIVIDED**

\[ L = \frac{S}{5} \geq 45 \text{ mph} \]

\[ L = \frac{S}{120} < 45 \text{ mph} \]

**4-LANE DIVIDED TO 2-LANE UNDIVIDED**

\[ L = 125 \times 45 \text{ mph} \]

\[ L = \frac{S}{5} \geq 45 \text{ mph} \]

\[ L = \frac{S}{3} < 45 \text{ mph} \]

**4-LANE UNDIVIDED TO 2-LANE UNDIVIDED**

LANE DIVERGENCE AND CONVERGENCE FOR CENTERED ROADWAYS

\[ 2L \]

5 = Design speed (mph)
CONNECTING FLARE WITH PAVED SHOULDERS TO EXISTING ROADWAY WITHOUT PAVED SHOULDERS

CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING SYMMETRICAL FLARE WITHOUT PAVED SHOULDERS

CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING ASYMMETRICAL FLARE WITHOUT PAVED SHOULDERS

PAVED SHOULDER TREATMENT AT TRANSITIONS AND CONNECTIONS

S=Design speed (mph)
LEFT ROADWAY CENTERED ON APPROACH ROADWAY

TWO LANE TO FOUR LANE TRANSITION

NOTES FOR SHEETS 5 THRU 8

1. The transition details as represented on sheets 5 thru 8 are intended as guidelines only. The transition lengths, curve data, nose radii and offsets are valid only for tangent alignment, design speeds ≤ 45 mph, the median widths and lane widths shown.

2. Approach lane departures (Δ = 5°) are suitable for design speeds up to 60 mph. Interior curves (D = 1°) are suitable for normal crown for design speeds up to 50 mph. Merging curves (D ≥ 5°) will require superelevation.

3. The geometrics of these schemes are associated with the standard subsectional spacing for side roads, but in any case will require modification to accommodate side road location, multilane and/or divided side roads, oblique side roads, crossover widths, storage and speed change lane requirements, and, other related features.
### Left Roadway Centered on Thru Roadway

#### Four Lane to Two Lane Transition

**Description:**

- **L:** Weight for speeds = 45 mph
- **W:** Weight for speeds = 40 mph

Where:

- **W:** Width of lateral transition in feet
- **S:** Design speed

**Design Standards for FY 2017-18**

**Roadway Transitions**

<table>
<thead>
<tr>
<th>Section</th>
<th>Design Speed</th>
<th>Width</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>22' MEDIAN</td>
<td>45 mph</td>
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<td>1:15 Taper</td>
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<tr>
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<tr>
<td>64' MEDIAN</td>
<td>45 mph</td>
<td>90'</td>
<td>1:15 Taper</td>
</tr>
</tbody>
</table>

**Example Data:**

- **T = 50.03'**
- **L = 100'**
- **Δ = 5°**
- **D = 4'**
- **T = 50.03'**

**Additional Notes:**

- (1/4 Min., But Not Less Than 50')
- 1:15 Taper
- (1/4 Min., But Not Less Than 50')
- 1:15 Taper
- (1/4 Min., But Not Less Than 50')
- 1:15 Taper
RIGHT ROADWAY CENTERED ON APPROACH ROADWAY

TWO LANE TO FOUR LANE TRANSITION

\( T = \text{Width of lateral transition in feet} \)
\( L = \text{WS for speeds} = 45 \text{ mph} \)
\( L = \text{WS for speeds} \leq 40 \text{ mph} \)
\( S = \text{Design speed} \)

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<thead>
<tr>
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<th>Width</th>
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<th>Angle</th>
<th>Taper</th>
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<tr>
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<td>100'</td>
<td>4°</td>
<td>0'</td>
</tr>
<tr>
<td>60' Min.</td>
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<tr>
<td>80' Min.</td>
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<td>160'</td>
<td>6°</td>
<td>0'</td>
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</table>

 FY 2017-18
DESIGN STANDARDS
ROADWAY TRANSITIONS

REVISED 07/01/00
DESCRIPTION:

REV NO.
SHEET NO.
INDEX NO.

(1:4 Min., But
Not Less Than 50')
RIGHT ROADWAY CENTERED ON THRU ROADWAY

FOUR LANE TO TWO LANE TRANSITION
NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking and to ensure minimum clearance between trucks making opposing movement. The depicted design only applies where roads and streets intersect at 90° to the mainline and have centerlines common with the opposing road or street. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 SU and WB-40 tractor-semitrailer.

RETURN NO. 1

RETURN NO. 2

RETURN NO. 3

RETURN NO. 4

NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking and to ensure minimum clearance between trucks making opposing movement. The depicted design only applies where roads and streets intersect at 90° to the mainline and have centerlines common with the opposing road or street. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 SU and WB-40 tractor-semitrailer.
NOTE: Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking and for minimum clearance between trucks making opposing movement. The depicted design only applies where roads and streets intersect at 90° to the mainline and have centerlines common with the opposing road or street. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 WB-50 tractor-semitrailer.

RETURNS:

Returns Depicted:
- Simple Curve With Tapers For Returns Nos. 1, 2 & 4 (Best Configuration)
- 70° Radius; 1:15 And 1:12 Tapers
- 2 And 6' Offsets
- Three Centered Compound Curves For Return No. 3:
  - 120'-60'-200' Radii; 2' And 13' Offsets

NOTE:

40' MEDIAN  4-LANE DIVIDED  •  PARALLEL TURN BAY  •  2001 AASHTO WB-50

RETURN NO. 1
RETURN NO. 2
RETURN NO. 3
RETURN NO. 4
Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking and for 4' minimum clearance between trucks making opposing movement. The depicted design only applies where roads and streets intersect at 90° to the mainline and have centerlines common with the opposing road or street. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 SU and WB-40 tractor-semitrailer.

NOTE:

Return configurations for each quadrant must be analyzed independently to assure adequate return pavement for semi-trailer inside tracking and for 4' minimum clearance between trucks making opposing movement. The depicted design only applies where roads and streets intersect at 90° to the mainline and have centerlines common with the opposing road or street. Swept paths are by AutoTURN 4.0 for the AASHTO 2001 SU and WB-40 tractor-semitrailer.
**DESCRIPTION:**

**REVISED DESIGN STANDARDS**

**FY 2017-18**

**REST AREA PAVILION**

**INDEX NO. 530**

**SHEET NO. 1 of 3**

NOTE: 

**FLOOR**

- 6" reinf. concrete slab
- w/ WWR 6x6-W1.4xW1.4
- Drop footing at slab
- perimeter & interior posts see keynotes.
- Harden & broom finish slab surface.

**STRUCTURE**

- Posts: 8 x 8 PT
- Beams: 4 x 6 PT
- Framing: 4x PT as described.
- Misc members: 1x and 2x as described.

**ROOF**

- 3"x6" T&G wood decking.
- 30# asphalt Impregnated fiberglass felt underlayment.
- Standing seam metal roof (24 GA Steel or 0.032 Alum.) w/ Kynar 500 finish.
- Structure, decking and roofing shall be designed to withstand 130 mph wind load.

**BUILDING CODE**

- Picnic pavilions shall be constructed according to the requirements of the appropriate sections of the "Florida Building Code", current, adopted edition.

**PICNIC TABLES**

- Picnic tables and benches shall be 8x8 w/heavy galvanized pipe frames and recycled plastic wood seats and table tops.
- All tables shall be of walk thru design suitable for exterior locations. Pavilions shall meet the requirements of the Americans With Disabilities Act (ADA) accessibility guidelines. A minimum of 20% of picnic tables to meet ADA.
**KEYNOTES**

- **03300-A**: Class II 6" conc slab
- **03300-B**: 6"x6"x1.4 ft @ E of slab
- **03300-C**: 6 mil vapor barrier
- **03300-D**: #5 rebar cont. (2 required)
- **03300-E**: 24" cont. drop footing
- **03300-F**: 18"x18" drop footing
- **03300-G**: 6" min comp sand fill
- **03300-H**: #5x18" rebar (4 required)

- **05500-A**: 1/2" galv. steel plate
- **05500-B**: 1/2" galv. steel plate
- **05500-C**: post base.
- **05500-D**: 1/2" Ø bolt, washer & nut (typ.)
- **05500-E**: 1/2" Ø eyebolt, washer & nut for cross brace bar
- **05500-F**: 1/2" Ø steel rod w/turbuckle

- **06130-A**: 1x10" PT wood fascia
- **06130-B**: 2x6" PT wood sub fascia
- **06130-C**: 8x8" PT wood post
- **06130-D**: 3x6" T&G wood decking
- **06130-E**: 3x8" T&G wood frame
- **06130-F**: 3/8" wood shim

- **07411-A**: Standing seam metal roof
- **07411-B**: Felt underlayment

Alternate Material Note: These structures are shown with timber frames and decking. Alternate materials (i.e., aluminum, steel, etc.) may be used when submittals are signed and sealed by a specially engineer as per Section 5 of the Standard Specifications and when approved by the Engineer.
**SPECIFICATIONS**

**Concrete**
- Concrete: FDOT Class II.
- Reinforcing Bars: ASTM A615, Grade 60.
- Vapor Barrier: Black 6-Mil Polyethylene.

**Steel**
- Galvanized Steel Plate. Steel Plate ASTM A36 or A709, in accordance with the requirements of ASTM A123.
- Galvanized Fasteners. High-Strength bolts and nuts, in accordance with Specification Section 962.
- Make field repairs to galvanizing in accordance with Specification 562.

**Wood**
- Comply with American Institute For Timber Construction AITC 108, "Standard For Heavy Timber Construction."
- Preservation Treatment: Pressure treat fabricated members with waterborne solution for above ground use, complying with AWPA U1, category UC3B above ground exposed.
- Wood Decking: Predrill decking at 30" centers for lateral spiking to adjacent units. Spikes to be 8" spikes galvanized common.
- Species: Douglas Fir, Hem-fir, or Southern Pine, at fabricator's option.

**Details**
- Accommodate Steel Plates Notch 06130-C To Accommodate Steel Plates
- DRIP EDGE
- Similar At Roof Rake

**Drawings**
- Side Elevation
- End Elevation
- Section

**Keynotes On Sheet 2.**
GENERAL NOTES

1. The location and construction of mailboxes shall conform to the rules and regulations of the United States Postal Service as modified by this design standard.

2. Mailboxes will not be permitted on Interstate highways, freeways, or other highways where prohibited by law or regulation.

3. The contractor shall give the Postmaster of the delivery route(s) written notice of project construction 7 days prior to the beginning of work, with Saturdays, Sundays and Holidays excluded.

4. Mailboxes shall be light sheet metal or plastic construction, in traditional style only, and only in Size 1 as prescribed by the Domestic Mail Manual of the U. S. Postal Service.

5. Mailboxes shall be located on the right-hand side of the roadway in the direction of the delivery route, except on one-way roads and streets where they may be placed on the left-hand side.

6. Mailboxes on rural highways shall be set with the roadside face of the box offset from the edge of the traveled way a minimum distance of the greater of the following:
   a. Shoulder width plus 8” to 12”.
   b. 10’ for ADT over 10,000 vdp.
   c. 6’ for ADT under 10,000 vdp.
   d. 2’-6” for speed and ADT under 100 vdp.

7. When a mailbox is installed within the limits of guardrail it should be placed behind the guardrail whenever practical.

8. Lightweight newspaper receptacles may be mounted below the mailbox on the support post in conformance with the USPS Domestic Mail Manual. Support posts shall not be fitted nor installed with surface mount base plates.

9. Wood and steel support posts for both single and double mailbox mountings shall be embedded no more than 2’ into the ground.

10. At driveway entrances mailboxes shall be placed on the far side of the driveway in the direction of the delivery route. At intersecting roads mailboxes shall be located 100’ or more from the centerline of the intersecting road on the far side in the direction of the delivery route, with the distance increased to 200’ when the route volume exceeds 400 vehicles per day.

11. Wood support posts shall be in conformance with the material and dimensional requirements of Section 9.92 and the treatment requirements of Section 9.95 of the Standard Specifications.

Steel support posts shall have an external finish equal to or better than two coats of weather resistant, air dried or baked, paint or enamel. Surface(s) shall be cleaned of all loose scale prior to finishing. The Postal Service prefers that posts be painted white, but other colors may be used when approved by the Engineer. When galvanized posts are used painting is not required.

12. Mailboxes shall be paid for under the contract unit price for Mailboxes. Each. Payment shall be full compensation for boxes, posts and accessory items required.

13. Mailboxes shall be located 100’ or more from the centerline of the intersecting road on the far side in the direction of the delivery route, with the distance increased to 200’ when the route volume exceeds 400 vehicles per day.

14. Wood and steel support posts for both single and double mailbox mountings shall be embedded no more than 2’ into the ground.

Concrete, block, brick, stone or other rigid foundation structure or encasement, either above or below the shoulder groundline, will not be permitted for mailboxes on rural highways. On urban roads and streets where mailboxes support posts are set within rigid pavement back of curb, the support posts shall be separated from the pavement by a minimum of 1” of expansion material.

Support posts shall not be fitted nor installed with surface mount base plates.

Payment shall be limited to one mailbox per patron address whether the mailbox is new, reused, salvaged, reset or relocated. Payment shall be per mailbox regardless of the number of mailboxes per support or grouping arrangement.

The above compensation shall include any work and cost incurred by the contractor for removal and disposal of existing mailboxes.

There shall be no payment participation for NDCBU furnishing, assembly, installation, resetting or relocation.

MAILBOXES

INDEX NO. 532

SHEET NO. 1 of 3

REV. DESCRIPTION:

FY 2017-18 DESIGN STANDARDS

REV.

01/01/16

11/03/16

11/01/16

REVISION
Note: See General Notes for finish requirements.

FLANGED CHANNEL

STEEL PLATFORM

STEEL ADAPTER PLATE

STEEL SPACER

STEEL FLANGED CHANNEL SUPPORT POSTS
**Mailboxes**

**Steel Shelf**

- Front View
- Side View
- Top View
- End View

**Steel Bracket**

- Side View
- End View

**Steel Platform**

- Side View

**Steel Pipe and Wood Support Posts**

Note: See General Notes for finish requirements.
**DESCRIPTION:**

REVISION NO.

INDEX NO.

SYMMETRICAL ABOUT $a$

One Row Of 1" x 18" Long Dowels @ 12" Centers (In Center Of Slab)

1/2 Traveled Way Width

Shoulder Width

4 Std

Const. Joints

Dowels

1/2" Bolts With Heads, Washers and Nuts Countersunk

Note: Class I concrete is to be used unless otherwise noted in plans or special provisions.

REINFORCED CONCRETE

TYPE A

GENERAL NOTES

1. Tractor crossing shall be paid for under the contract unit price for Tractor Crossing, EA.

TRACTOR CROSSINGS
NOTES:

1. Crown Dripline Protection Zone: Extends in all directions from trunk of tree to a distance equal to one foot per inch of trunk diameter at breast height.

2. Staging, storage, dumping, washing and operation of equipment is not permitted within the limits of the tree protection barrier, including during barrier installation.

3. Install all tree protection prior to commencement of construction and remove when directed by the engineer. Maintain protection at all times.

4. For closely spaced groups of trees, place the tree protection barrier around the entire group.

5. Inspect trunk protection and tree quarterly to prevent girdling. Adjust bands to allow tree growth as needed.

6. See plans for any additional requirements or modifications within the tree protection area.

7. Place weather resistant sign every 50' along the barrier, with 6" minimum text height and provide text in English and Spanish. Sign should read "Keep Out Tree Protection Area".

8. Alternate tree protection systems approved by the Engineer may be used in lieu of the tree protection barrier detailed on this Index.

1. Install trunk protection when Tree Protection Barrier can not be reasonably erected.

2. See Selective Clearing and Grubbing Plan for location of trunk protection.

3. Adjust bands to allow tree growth (inspect quarterly to prevent girdling).

4. For closely spaced groups of trees, place the tree protection barrier around the entire group.

5. Inspect trunk protection and tree quarterly to prevent girdling. Adjust bands to allow tree growth as needed.

6. See plans for any additional requirements or modifications within the tree protection area.

7. Place weather resistant sign every 50' along the barrier, with 6" minimum text height and provide text in English and Spanish. Sign should read "Keep Out Tree Protection Area".

8. Alternate tree protection systems approved by the Engineer may be used in lieu of the tree protection barrier detailed on this Index.
UNDER 4" CALIPER TREE PLANTING

1. All dimensions 8" and less are exaggerated for illustrative purposes only.

2. Plant containers shall be removed prior to planting. If plants are not container grown, remove a minimum of the top ½ of burlap, fabric, or wire mesh. Never lift or handle the tree by the trunk.

3. The uppermost root on all trees shall be covered by less than 1" of soil. Use hand tools to carefully remove all excess soil. The top of root ball shall be set 1"-2" above finish grade after setting and set plumb to the horizon. If planting pit is too deep, remove the tree and firmly pack additional soil in the bottom of the planting pit to raise the rootball. After positioning the tree in the planting pit, slice through rootballs with 3 or 4 vertical slices (top to bottom) equally distributed around the tree.

4. Backfill shall be loosened existing soil. Remove rocks, sticks, or other deleterious materials. Use hand tools to carefully remove all excess soil. The top of root ball shall be set 1"-2" above finish grade after setting and set plumb to the horizon. If planting pit is too deep, remove the tree and firmly pack additional soil in the bottom of the planting pit to raise the rootball. After positioning the tree in the planting pit, slice through rootballs with 3 or 4 vertical slices (top to bottom) equally distributed around the tree.

5. Soil rings shall be constructed of existing soil at the outer edge of the planting pit, with a height of 3" and gently sloping sides. Do not pile soil on top of rootball.

6. Mulch shall be a 3" deep layer placed 2" off the edge of the trunk flare, around the base of shrub, or solidly around groundcover. Never pile mulch against the tree trunk.

7. Straps shall be minimum 1" wide nylon or polypropylene. Check straps monthly and adjust as required to eliminate girdling of tree. All wood stakes or anchors shall be located beyond the edge of the rootball in undisturbed soil and located below finished grade, unless otherwise specified.

8. Sabal Palms may be hurricane cut. All other palms must have fronds tied with biodegradable twine. Palm trunks shall have no burn marks, scars, or sanding.

9. All dimensions provided for wood materials are nominal.

10. When a permanent, subsurface, or drip irrigation system is provided, a soil ring is not required. Mulch to edge of planting pit.

11. Alternate tree bracing and guying systems specified or approved by the Engineer may be used in lieu of the tree bracing and guying methods detailed on the Index.

12. Remove above ground guying systems at the end of the establishment period.

GENERAL NOTES:

UNDER 4" CALIPER TREE PLANTING WITH UNDERGROUND BRACING

4" AND LARGER CALIPER TREE PLANTING
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, streets, and driveways, 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. For the purpose of this Index, Minor Road is defined as an intersecting highway, roads, streets, and driveways.

3. 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 roads).

4. 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.

5. 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 distances needed for signalized intersections. However, if the traffic signal is to be placed on a two-way flashing operation (i.e., flashing yellow on the major road approaches and flashing red on the minor road approaches) under peak or nighttime conditions, then the appropriate departure sight triangles for Case B2, 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.

6. Where curvature, superelevation, adverse sight profiles or other conditions preclude the use of standard two to three times and spacing, predicted view and shadowing constraints must be documented and the size and location of trees in medians detailed in the plans.

7. Intersection sight distance values are provided for Passenger Vehicles, SUV 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 SUV vehicles or Combination vehicles should be considered.

TREES AND MEDIAN PLANTS

A. Size and spacing shall conform to the Tree Spacing Table.

B. Requirements for placement within medians at median openings and at unsignalized intersections:

1. Where left turns from the major road are permitted, no trees shall be located within the distance 'd 1' from the edge of the near side of the major road. Distances 'd 1' and 'd 2' are measured from the centerline of the entrance lane of the major road to the center of the near approach lane (right or left) of the major road. Distance 'd 1' is measured from the centerline of the entrance lane of the major road to a point on the edge of the near side outer traffic lane on the major road.

C. Since observations are made in both directions along the line of sight, the reference datum between roadways is 3'-4" 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 road and vehicles on the major road must be able to see each other clearly throughout the limits of 'd' and 'd 1'. If in the Engineer's judgement, landscaping interfere 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:

6. Where curvature, superelevation, adverse sight profiles or other conditions preclude the use of standard two to three times and spacing, predicted view and shadowing constraints must be documented and the size and location of trees in medians detailed in the plans.

7. Intersection sight distance values are provided for Passenger Vehicles, SUV 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 SUV vehicles or Combination vehicles should be considered.

TREE SPACING TABLE

<table>
<thead>
<tr>
<th>Description</th>
<th>Design Speed (mph)</th>
</tr>
</thead>
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<td>10</td>
</tr>
<tr>
<td>Diameter (Within limits of Sight Window)</td>
<td>100'</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>20</td>
<td>22</td>
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<tr>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>&gt;30</td>
<td>&gt;35</td>
</tr>
</tbody>
</table>

** Sizes and spacings are based on the following conditions:

a. A single line of trees in the median parallel to but not necessarily canted with the centerline.

b. A straight approach, and the maximum skew limits as described in No. 2 above.

c. 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 entering at distance 'd'; see SHADOW DIAMON, Sheet 2.

d. Trees with diameters > 11' ≤ 18' spaced at intervals providing a 20 second full view of entering vehicle at stop bar location when viewed by the mainline driver entering at distance 'd'; see PERCEPTION DIAMON, Sheet 2.

e. Trees with diameters > 11' ≤ 18' spaced at intervals providing a 20 second full view of entering vehicle at stop bar location when viewed by the mainline driver entering at distance 'd'; see PERCEPTION DIAMON, Sheet 2.

f. Trees with diameters > 11' ≤ 18' spaced at intervals providing a 20 second full view of entering vehicle at stop bar location when viewed by the mainline driver entering at distance 'd'; see PERCEPTION DIAMON, Sheet 2.

For any other conditions, the tree sizes, spacings and locations shall be detailed in the plans; see Design Note 5.

GENERAL NOTES

Sight Distance at Intersections

- The information shown on this index is intended solely for the purpose of clear sight development and maintenance at intersecting highways, roads, streets, and driveways, 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.
- For the purpose of this Index, Minor Road is defined as an intersecting highway, roads, streets, and driveways.
- 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 roads).
- 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.
- 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 distances needed for signalized intersections. However, if the traffic signal is to be placed on a two-way flashing operation (i.e., flashing yellow on the major road approaches and flashing red on the minor road approaches) under peak or nighttime conditions, then the appropriate departure sight triangles for Case B2, 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.
- Where curvature, superelevation, adverse sight profiles or other conditions preclude the use of standard two to three times and spacing, predicted view and shadowing constraints must be documented and the size and location of trees in medians detailed in the plans.
- Intersection sight distance values are provided for Passenger Vehicles, SUV 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 SUV vehicles or Combination vehicles should be considered.

TREES AND MEDIAN PLANTS

A. Size and spacing shall conform to the Tree Spacing Table.

B. Requirements for placement within medians at median openings and at unsignalized intersections:

1. The lateral offset of the mature specimen must be maintained as specified in the RPP, Vol. 1, Chapter 4. Specimens whose mature trunk diameter is greater than 18" shall not be permitted.

C. For safety, these additional setbacks are required:

1. Where no left turn lane is present, size and spacing shall conform to the Tree Spacing Table. No trees shall be permitted within 100' of the restricted median nose (measured from the edge of pavement).

2. Where left turn lanes are present, the following requirements apply:

- For low speed facilities (design speed less than 50 mph), size and spacing shall conform to the Tree Spacing Table. No trees shall be permitted within 100' of the restricted median nose (measured from the edge of pavement).

- For high speed facilities (design speed 50 mph or greater), no trees shall be permitted within 200' of the restricted median nose. Beyond this limit, size and spacing shall conform to the Tree Spacing Table.

SITE DISTANCE AT INTERSECTIONS

DESIGN STANDARDS

L A S T REV I S I O N 0 1 / 0 1 / 0 6

D E S I G N STANDARDS

SIGHT DISTANCE AT INTERSECTIONS

I N D E X N O . 5 4 6

S H E E T N O . 1

1 6
### SIGHT DISTANCE AT INTERSECTIONS

#### LEGEND

- **Areas Free Of Sight Obstructions**

#### SIGHT DISTANCE (d) AND RELATED DISTANCES (d₁, d₂, d₃) (FEET)

##### 2 LANE UNDIVIDED

<table>
<thead>
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<th>Speed Limit (MPH)</th>
<th>d₁ (FT)</th>
<th>d₂ (FT)</th>
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<td>305</td>
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<tr>
<td>50</td>
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<td>365</td>
<td>385</td>
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</table>

#### 2 LANE 2 WAY · FLARED FOR OPPOSING LEFT TURN CENTERED ON ALIGNMENT

<table>
<thead>
<tr>
<th>Speed Limit (MPH)</th>
<th>d₁ (FT)</th>
<th>d₂ (FT)</th>
<th>d₃ (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>300</td>
<td>320</td>
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<td>35</td>
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<td>50</td>
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<td>360</td>
<td>380</td>
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#### 2 LANE 2 WAY · FLARED FOR LEFT TURNS

<table>
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<th>d₁ (FT)</th>
<th>d₂ (FT)</th>
<th>d₃ (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
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</tr>
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<td>50</td>
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<td>385</td>
</tr>
</tbody>
</table>

#### NOTE:

- See Sheet 2 for intersecting roadway origin of clear sight and quadrant corner clips.
SIGHT DISTANCE AT INTERSECTIONS

PICTORIAL
4 LANE UNDIVIDED

PICTORIAL
4 LANE UNDIVIDED - SYMMETRICAL

PICTORIAL
4 LANE UNDIVIDED WITH OPTIONAL LANE

LEGEND

Areas Free Of Sight Obstructions

NOTE: See Sheet 2 for intersecting roadway origin of clear sight and quadrant corner clips.
### SIGHT DISTANCES (d) & (d_l) AND RELATED DISTANCES (d_l, d_r, d_m & d_vL) (FEET)

#### 4 LANE DIVIDED ROADWAY

**NOTES FOR 4-LANE DIVIDED ROADWAY**

1. See Sheet 2 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.

**LEGEND**

- **Areas Free Of Sight Obstructions**
- **Areas With Sight Obstructions**

**PLAN**

**PICTORIAL**

**INDEX NO.**

**REVISION NO.**

**DESCRIPTION:**

**REV.**

**DATE**

**FY 2017-18 DESIGN STANDARDS**

**SIGHT DISTANCE AT INTERSECTIONS**

**Sheet No.**

**5 of 6**

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Vehicle Length (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger (P)</td>
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</tr>
<tr>
<td>Single Unit (SU)</td>
<td>30</td>
</tr>
<tr>
<td>Large School Bus</td>
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</tr>
<tr>
<td>WB-40</td>
<td>45.5</td>
</tr>
<tr>
<td>WB-50</td>
<td>55</td>
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**INSET A**

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_r) is Measured From the Vehicle Pause Location, i.e., Not From the Cross Road Stop Position. Distances d_r & d_vL Do Not Apply.

**Limit Of Median Sight Obstruction**

**Limit Of Clear Sight**

**Median 22' OR LESS**

<table>
<thead>
<tr>
<th>Design Speed (d)</th>
<th>d</th>
<th>d_l</th>
<th>d_r</th>
<th>d_m</th>
<th>d_vL</th>
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<tbody>
<tr>
<td>30</td>
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<td>220</td>
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<td>325</td>
<td>240</td>
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<td>270</td>
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**Median 25' - 64'**

<table>
<thead>
<tr>
<th>Design Speed (d)</th>
<th>d</th>
<th>d_l</th>
<th>d_r</th>
<th>d_m</th>
<th>d_vL</th>
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<tr>
<td>22</td>
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**Median 30' OR LESS**

<table>
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<th>Design Speed (d)</th>
<th>d</th>
<th>d_l</th>
<th>d_r</th>
<th>d_m</th>
<th>d_vL</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
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<td>325</td>
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<td>350</td>
<td>270</td>
<td>360</td>
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</table>

**Median 35' - 64'**

<table>
<thead>
<tr>
<th>Design Speed (d)</th>
<th>d</th>
<th>d_l</th>
<th>d_r</th>
<th>d_m</th>
<th>d_vL</th>
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</thead>
<tbody>
<tr>
<td>30</td>
<td>355</td>
<td>220</td>
<td>330</td>
<td>240</td>
<td>325</td>
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<td>270</td>
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**Median 64'**

<table>
<thead>
<tr>
<th>Design Speed (d)</th>
<th>d</th>
<th>d_l</th>
<th>d_r</th>
<th>d_m</th>
<th>d_vL</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>355</td>
<td>220</td>
<td>330</td>
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</tr>
<tr>
<td>45</td>
<td>325</td>
<td>240</td>
<td>350</td>
<td>270</td>
<td>360</td>
</tr>
</tbody>
</table>

**SIGHT DISTANCES AT INTERSECTIONS**

- **MEDIAN 22' OR LESS**
  - Design Speed (d) = 22
  - Design Speed (d_l) = 25
  - Design Speed (d_r) = 33
  - Design Speed (d_m) = 24
  - Design Speed (d_vL) = 30

- **MEDIAN 25' - 64'**
  - Design Speed (d) = 30
  - Design Speed (d_l) = 32
  - Design Speed (d_r) = 34
  - Design Speed (d_m) = 25
  - Design Speed (d_vL) = 30

- **MEDIAN 30' OR LESS**
  - Design Speed (d) = 30
  - Design Speed (d_l) = 31
  - Design Speed (d_r) = 33
  - Design Speed (d_m) = 22
  - Design Speed (d_vL) = 30

- **MEDIAN 35' - 64'**
  - Design Speed (d) = 35
  - Design Speed (d_l) = 34
  - Design Speed (d_r) = 36
  - Design Speed (d_m) = 25
  - Design Speed (d_vL) = 30

- **MEDIAN 64'**
  - Design Speed (d) = 64
  - Design Speed (d_l) = 67
  - Design Speed (d_r) = 70
  - Design Speed (d_m) = 40
  - Design Speed (d_vL) = 55

**PASSENGER VEHICLE (P)**

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Vehicle Length (Ft.)</th>
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<tbody>
<tr>
<td>Single Unit (SU)</td>
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</table>

**SINGLE-UNIT TRUCK (SU)**

<table>
<thead>
<tr>
<th>Vehicle Type</th>
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<tr>
<td>Intermediate Semi Trailers (WB-40 &amp; WB-50)</td>
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**INTERMEDIATE SEMI-TRAILERS (WB-40 & WB-50)**

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<th>d</th>
<th>d_vL</th>
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</thead>
<tbody>
<tr>
<td>30</td>
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<td>225</td>
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<tr>
<td>40</td>
<td>335</td>
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**MEDIAN 35' OR LESS**

<table>
<thead>
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<th>Design Speed (d)</th>
<th>d</th>
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<tr>
<td>30</td>
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<td>225</td>
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<tr>
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<td>335</td>
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**MEDIAN 40' - 64'**

<table>
<thead>
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<th>Design Speed (d)</th>
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<tbody>
<tr>
<td>30</td>
<td>355</td>
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<tr>
<td>35</td>
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<td>225</td>
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**MEDIAN 64'**

<table>
<thead>
<tr>
<th>Design Speed (d)</th>
<th>d</th>
<th>d_vL</th>
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</thead>
<tbody>
<tr>
<td>30</td>
<td>355</td>
<td>220</td>
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<tr>
<td>35</td>
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<td>40</td>
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11/01/16

SIGHT DISTANCE AT INTERSECTIONS

MEDIAN 22' OR LESS

<table>
<thead>
<tr>
<th>Design Speed</th>
<th>d1</th>
<th>d2</th>
<th>d3</th>
<th>d4</th>
<th>dL</th>
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<tbody>
<tr>
<td>30</td>
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<td>90</td>
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<td>45</td>
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<td>445</td>
<td>115</td>
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<td>185</td>
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<td>1040</td>
<td>760</td>
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<td>840</td>
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MEDIAN 30' OR LESS

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<thead>
<tr>
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<th>d1</th>
<th>d2</th>
<th>d3</th>
<th>d4</th>
<th>dL</th>
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</thead>
<tbody>
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<td>30</td>
<td>570</td>
<td>405</td>
<td>90</td>
<td>495</td>
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<td>855</td>
<td>555</td>
<td>140</td>
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MEDIAN 35'-50'

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<th>d3</th>
<th>d4</th>
<th>dL</th>
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<tr>
<td>30</td>
<td>370</td>
<td>265</td>
<td>90</td>
<td>240</td>
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<td>615</td>
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<td>835</td>
<td>520</td>
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</tbody>
</table>

SIGHT DISTANCES (d), (dL) & (dX) AND RELATED DISTANCES (dL, dL, dL, & dL) (FEET)

NOTES FOR 6-LANE DIVIDED ROADWAY

1. See Sheet 2 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.

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

INSET A

INSET B

LEGEND

Areas Free Of Sight Obstructions

SIGHT DISTANCE AT INTERSECTIONS
null
### GENERAL NOTES

1. The Railroad Company will furnish and install all track bed (ballast), crossties, rails, crossing surface panels and accessory components. All pavement material, including that through the crossing, will be furnished and installed by the Department or its Contractor, unless negotiated otherwise.

2. When a railroad grade crossing is located within the limits of a highway construction project, a transition pavement will be maintained at the approaches of the crossing to reduce vehicular impacts to the crossing. The transition pavement will be maintained as appropriate to protect the crossing from low clearance vehicles and vehicular impacts until the construction project is completed and the final highway surface is constructed.

3. The Central Rail Office will maintain a list of currently used Railroad Crossing Products and will periodically distribute the current list to the District Offices as the list is updated.

4. The Railroad Company shall submit engineering drawings for the proposed crossing surface type to the Construction Project Engineer and/or the District Rail Office for concurrence along with the list of Railroad Crossing Products. The approved engineering drawings of the crossing surface type shall be made a part of the installation agreement.

5. Sidewalks shall be constructed through the crossing between approach sidewalks of the crossing. Sidewalks shall be constructed with appropriate material to allow unobstructed travel through the crossing in accordance with ADA requirements.

6. Install pavement in accordance with the Specifications.

7. The Department will participate in crossing work, that requires adjustments to rail outside of the crossing, no more than 50 feet from the edge of the travel way.

### CROSSING SURFACES

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
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<tr>
<td>C</td>
<td>Concrete</td>
</tr>
<tr>
<td>R</td>
<td>Rubber</td>
</tr>
<tr>
<td>RA</td>
<td>Rubber/Asphalt</td>
</tr>
<tr>
<td>TA</td>
<td>Timber/Asphalt</td>
</tr>
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### STOP ZONE FOR RUBBER CROSSING

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Zone Length (Distance From Stop)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 or Less</td>
<td>250'</td>
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<tr>
<td>50 - 55</td>
<td>350'</td>
</tr>
<tr>
<td>60 - 65</td>
<td>500'</td>
</tr>
<tr>
<td>70</td>
<td>600'</td>
</tr>
</tbody>
</table>

Notes:
1. Type R Crossings are NOT to be used for multiple track crossings within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.

2. Single track Type R Crossings within the zones on the chart may be used unless engineering or safety considerations dictate otherwise.
**Crossing Shoulder Pavement**  
(Except Area Occupied By Crossing Surfacing Material):  
a. To Shoulder Line For Outside Shoulders Less Than 8' Wide.  
b. To 8' Maximum Width For Outside Shoulders 8' Or Wider (Regardless Of Approach Shoulder Pavement Width).  
c. 4' For Median Shoulders.

* Where the existing shoulder is substandard for the facility type, the shoulder width is to be widened to accommodate crossing shoulder pavement.

**Section View**  
- Beveled Edge (1:4 Slope)  
- Shoulder Line  
- Shoulder Pavement  
- Edge Of Travel Way  
- Shoulder Pavement In Lieu Of Curb

**Half Plan**  
ROADWAYS WITH FLUSH SHOULDERS

**Typical Crossing Material Replacement At RR Crossings**

**Vertical Roadway Alignment Through A Railroad Crossing**

**railroad crossing**

**Design Standards**

**INDEX NO. 560**

**Sheet No. 2 of 2**

**REVISION NO.**

**Revision Date:** 01/01/10

**Description:**

**FY 2017-18**

**Railroad Crossing**

**Note:** For location of railroad signals, gates or signals and gates see Index No. 17882

**Filter Fabric (Optional When Required By Crossing Type)**

**Overbuild**

**Type SP Asphalt (500 lb/SY)**

**Ballast**

**Crosstie**

**Concrete Curb And Gutter**

**Utility Strip**

**Sidewalk**

**Shoulder Pavement When Crossing Materials Do Not Extend Beyond Lip Of Gutter**

**Beveled Edge (1:4 Slope)**

**Note:** Pavement

**Pavement**

**Shoulder Pavement**

**Edge Of Travel Way**

**Shoulder Line**

**Pavement**

**Pavement Above See ‘Crossing Shoulder Pavement’ Above**

**10/11/16 11:08:55 AM**