MISCELLANEOUS EARTHWORK DETAILS

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 120-001. For minor collectors and local facilities the depth of select material thickness may be reduced from 24" to 18".
SHOULDER CONSTRUCTION WITH SUPERELEVATION

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

RADIUS OF CURVE - FEET

SUPERELEVATION TRANSITIONS

SUPERELEVATION - HIGH SPEED ROADWAYS

INDEX 000-510

SYMBOLS

1. For curves in Urban Highways and high speed Urban Streets, see Index 000-511.

GENERAL NOTES:

1. For curves in Urban Highways and high speed Urban Streets, see Index 000-511.

NOTE:

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

SHOULDER ON HIGH SIDE: A shoulder slope of 0.06 downward from the edge of travel way will be maintained until a 0.07 break in slope at the pavement edge is reached due to super-elevation of the pavement. As the pavement super-elevation increases, the 0.07 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 in Sheet 3 of 2.

NOTE:

These details apply to both paved and grassed shoulders. For median shoulders use 0.05 in lieu of 0.06.
### SUPERELEVATION RATES (e) FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS  

**e** \(_{\text{max}}\) = 0.05

#### TABULATED VALUES

<table>
<thead>
<tr>
<th>Degree Of Curve (D)</th>
<th>Radius (R) (Ft.)</th>
<th>Design Speed (mph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2° 00'</td>
<td>2,865</td>
<td>30 35 40 45 50</td>
</tr>
<tr>
<td>2° 15'</td>
<td>2,546</td>
<td>NC</td>
</tr>
<tr>
<td>2° 45'</td>
<td>2,083</td>
<td>NC</td>
</tr>
<tr>
<td>3° 00'</td>
<td>1,910</td>
<td>NC</td>
</tr>
<tr>
<td>3° 45'</td>
<td>1,528</td>
<td>NC</td>
</tr>
<tr>
<td>4° 00'</td>
<td>1,432</td>
<td>NC</td>
</tr>
<tr>
<td>4° 45'</td>
<td>1,206</td>
<td>NC</td>
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<tr>
<td>5° 00'</td>
<td>1,146</td>
<td>0.023</td>
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<td>5° 15'</td>
<td>1,091</td>
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<td>5° 30'</td>
<td>1,042</td>
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<tr>
<td>5° 45'</td>
<td>996</td>
<td>0.035</td>
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<tr>
<td>6° 00'</td>
<td>955</td>
<td>0.040</td>
</tr>
<tr>
<td>6° 15'</td>
<td>917</td>
<td>0.045</td>
</tr>
<tr>
<td>6° 30'</td>
<td>883</td>
<td>0.050</td>
</tr>
<tr>
<td>6° 45'</td>
<td>849</td>
<td>0.062 (Dmax= +0.05)</td>
</tr>
<tr>
<td>7° 00'</td>
<td>819</td>
<td>0.070</td>
</tr>
<tr>
<td>7° 15'</td>
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<td>7° 45'</td>
<td>739</td>
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<td>8° 00'</td>
<td>716</td>
<td>0.084</td>
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<tr>
<td>8° 15'</td>
<td>694</td>
<td>0.086</td>
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<td>8° 30'</td>
<td>674</td>
<td>0.090</td>
</tr>
<tr>
<td>8° 45'</td>
<td>655</td>
<td>0.095 (Dmax= +0.05)</td>
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<tr>
<td>9° 00'</td>
<td>637</td>
<td>0.100</td>
</tr>
<tr>
<td>9° 15'</td>
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<tr>
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<td>593</td>
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</tr>
<tr>
<td>10° 00'</td>
<td>574</td>
<td>0.110</td>
</tr>
<tr>
<td>10° 30'</td>
<td>546</td>
<td>0.047</td>
</tr>
<tr>
<td>11° 00'</td>
<td>523</td>
<td>0.023 (Dmax= +0.05)</td>
</tr>
<tr>
<td>11° 30'</td>
<td>498</td>
<td>0.026 (Dmax= +0.05)</td>
</tr>
<tr>
<td>12° 00'</td>
<td>477</td>
<td>0.030</td>
</tr>
<tr>
<td>13° 00'</td>
<td>441</td>
<td>0.036</td>
</tr>
<tr>
<td>14° 00'</td>
<td>409</td>
<td>0.045</td>
</tr>
<tr>
<td>15° 00'</td>
<td>382</td>
<td>0.048 (Dmax= +0.05)</td>
</tr>
<tr>
<td>16° 00'</td>
<td>358</td>
<td>0.027 (Dmax= +0.05)</td>
</tr>
<tr>
<td>17° 00'</td>
<td>337</td>
<td>0.027</td>
</tr>
<tr>
<td>18° 00'</td>
<td>318</td>
<td>0.028</td>
</tr>
<tr>
<td>19° 00'</td>
<td>297</td>
<td>0.035</td>
</tr>
<tr>
<td>20° 00'</td>
<td>276</td>
<td>0.035 (Dmax= +0.05)</td>
</tr>
</tbody>
</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).

### 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 000-510.
SUPERELEVATION TRANSITION SECTIONS
FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

UNDIVIDED FACILITIES

TWO TRAVEL LANES EACH DIRECTION

TWO TRAVEL LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANES

THREE TRAVEL LANES EACH DIRECTION WITH MEDIAN

DIVIDED FACILITIES

SUPERELEVATION TRANSITION SECTIONS
FOR URBAN HIGHWAYS AND HIGH SPEED URBAN STREETS

SUPERELEVATION - LOW SPEED HIGHWAYS

INDEX
000-511

FY 2018-19
STANDARD PLANS

Revised: 01/01/17

Description:

Revision

Last Revision: 01/01/17

Sheet: 2 of 3
**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.

**SUPERELEVATION TRANSITION "L"**
(Varies, See Note Below)

Normal Section

Superelevated Section

*Tangent of Curve*

PC or PT of Curve

Profile Grade

Line D

Line B & F

Line A & G

Theoretical Grade Line

PC or PT of Curve

Line G

Line F

Line D

Line B

Line A

Note: Runoff rate "d" is to be applied to the outside edge of travel lane.

**LINE DESCRIPTION**

- A Inside Travel Lane
- B Inside Lane Line
- C Inside Median Edge Pavement
- D Outside Construction
- E Outside Median Edge Pavement
- F Outside Lane Line
- G Outside Travel Lane

Inside and Outside Are Relative To Curve Center

**d (Slope Ratio)**

- 30 NPM: 1:100
- 40 NPM: 1:125
- 45-50 NPM: 1:150

* 1:125 may be used for 45 NPM under Restricted Conditions.

**SECTION 0-A to 0-D**

**SECTION 0-A to 0-E**

**TWO LANES EACH DIRECTION**

**TWO LANES EACH DIRECTION WITH MEDIAN AND AUXILIARY LANE**

**STANDARD PLANS**

**INDEX**

000-511

**REVISION**

11/01/17

**DESCRIPTION:**

**REVISION**

10/27/17

**AM**

**SUPERELEVATION - LOW SPEED HIGHWAYS**

**SHEET**

3 of 3
### General Notes
1. For descriptions and definitions 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 or side roads adjoining the outer roadway. For this index the term 'connection' encompasses a driveway or side road and their appurtenant islands, separators, transition tapers, auxiliary lanes, driveway 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 shall 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, manoeuvering, 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 drive 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 shall be constructed as an intersecting side 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 a drop curb or radius returns are required in accordance with existing or planned connections. Where return radii 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.

7. 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 shall align directly with the corresponding through lanes.

9. For new connections and for connections on all new construction and reconstruction projects, pavement materials and thickness shall meet the requirements applicable to either that detailed for "Curbed Roadway-Flush Turned" or, that described in "Table S15-2" 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.

### Summary of Geometric Requirements for Driveway Turnouts

#### Curbed Roadways

<table>
<thead>
<tr>
<th>ELEMENT DESCRIPTION</th>
<th>1-20 Trips/Day or 601-4000 Trips/Day</th>
<th>1-60 Trips/Hour or 600-4000 Trips/Hour</th>
<th>1-20 Trips/Day or 601-4000 Trips/Day</th>
<th>1-60 Trips/Hour or 600-4000 Trips/Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONNECTION WIDTH W</td>
<td>12 Min. 24 Max. 36 Max.</td>
<td>N/A</td>
<td>12 Min. 24 Max. 36 Max.</td>
<td>N/A</td>
</tr>
<tr>
<td>FLARE (Drop Curb) F</td>
<td>10 Min. 10 Min. N/A</td>
<td>N/A</td>
<td>10 Min. 10 Min. N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>RETURNS (Radius) R &amp; U</td>
<td>N/A</td>
<td>15 Min. 25 Max. 50 Max.</td>
<td>25 Min. 50 Max. 50 Max.</td>
<td>25 Min. 50 Max. 50 Max. (Or 3-Centered Curves)</td>
</tr>
<tr>
<td>ANGLE OF DRIVE Y</td>
<td>60°-90°</td>
<td>60°-90°</td>
<td>60°-90°</td>
<td>60°-90°</td>
</tr>
<tr>
<td>DIVISIONAL ISLAND (Throat Median)</td>
<td>4'-22 Wide</td>
<td>4'-22 Wide</td>
<td>4'-22 Wide</td>
<td>4'-22 Wide</td>
</tr>
</tbody>
</table>

| SETBACK G           | 12 Min. All Categories. See General Note No. 5. | N/A                                    | N/A                                    | N/A                                    |

**Notes:**
- Side 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/day.
- "2-Way" refers to one "in" movement and one "out" movement, i.e., not exclusive left or right turn lanes on the connection.
- 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 unauthorized movements.

---

**Sketch Illustrating Definitions:**

- **Legend:**
  - Return Radius Point
  - Driveway Angle
  - Flare
  - Structure
  - Frontage
  - Property Line
  - Buffer Areas
  - Frontage Boundary Line

**Not Intended for Full Intersection Design**

**Index:**

**Turnouts and Driveways**

**Standard Plans:**

**FY 2018-19**

**Index:** 000-515

**Sheet:** 1 of 7
TURNOUTS AND DRIVEWAYS

CURBED ROADWAY - FLARED TURNOUTS

1. Driveways indicated as 'Adverse Applications' are those with slopes that can cause overhang drive 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. Driveways indicated as 'Marginal 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 and superelevated conditions.

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.

4. When connecting to side road curb and gutter sections, no drop curb limits shall extend back to the side road radius point. With or without curb and gutter, no driveway should encroach on the corner radius.

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 a 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 sidewalk (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.

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STANDARD PLANS

TURNOUTS AND DRIVEWAYS

CURBED ROADWAY - FLARED TURNOUTS

1. Drop curb, concrete sidewalks (6" thick) and driveways (6" thick) shall meet Specification Sections 520 and 522. The driveway foundation shall meet the requirements of Subarticle 522.4.

2. For details of drop curb and sidewalk curb ramps refer to Indexes 520-001 and 522-002 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 7' 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 & Grubbing, Stabilization And Base At Intersections".

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 a 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.
**DESCRIPTION:**

**REVISION**

**LAST REVISION**

**STANDARD PLANS**

**INDEX**

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**FY 2018-19**

**TURNOUTS AND DRIVEWAYS**

* See 'DESIGN NOTES FOR CURBED ROADWAY - FLARED TURNOUTS'*

### Turnouts and Driveways

**SIDEWALK ADJACENT TO CURB**

**SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE**

**SIDEWALK WITH UTILITY STRIP ON 0.04 SLOPE**

**DRIVEWAY SECTIONS ON CURBED FACILITIES WITH SIDEWALKS**
MODIFICATIONS OF 'ADVERSE' AND 'MARGINAL' APPLICATIONS

SIDEWALK ADJACENT TO CURB
SIDEWALK WITH UTILITY STRIP ON 0.02 SLOPE

MODIFICATIONS TO ADVERSE AND MARGINAL SECTIONS

* See 'DESIGN NOTES FOR CURVED ROADWAY - FLARED TURNOUTS'
**INTERSECTIONS NOTES:**

- **Return Radius Point or Transition Point.**

**DRIVE ENTRANCES NOTES:**

- Drainage pipe size and length shall be as 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 430-022. For spacing between adjacent pipe end treatments see index 430-022.

- 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.

- Elevated turnouts at graded connections 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 radii lengths and supplemental information.

- Return Radius Point or Plane Point.
Determined By The Engineer

(See Note #1)

Auxiliary Lane Width

(See Note #1)

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 abutting
   travel way pavement thickness or any of the roadway structures tabulated above,
   whichever is thicker.

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, 350 and 522.

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

PAVEMENT STRUCTURE FOR TURNOUTS AND AUXILIARY LANES

TABLE 515-1

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Materials</th>
<th>Thickness (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural</td>
<td>Asphaltic Concrete</td>
<td>1''</td>
</tr>
<tr>
<td>Bases</td>
<td>Optional Base (See Spec. Section 285)</td>
<td>0.8 B. 1</td>
</tr>
</tbody>
</table>

NOTES
1. All materials shall be approved by the Department prior to being placed.
2. Connection structure other than traffic lanes. See Notes 1 and 2 below.
3. Auxiliary lane serving more than a single connection, and all median crossovers including their auxiliary lanes and/or transition tapers. See Notes 1 and 2 below.
Definitions

G-Grade (N)
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

Maximum Grades

G=0.01
G=0.09
G=0.07
G=0.08
G=0.03
G=0.04
G=0.05
G=0.06
G=0.07
G=0.08
G=0.10

DROP CURVE

UTILITY STRIP

SIDEWALK

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.

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 Roadway 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 Curved 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.

ROADWAY PAVEMENT SLOPES AND SLOPES OF ABUTTING FLUSH SHOULDER ROADWAY TURNOUT SURFACES (G)

SUPERELEVATION SECTIONS

M - Minimum
 NA - Not Applicable
 R - Recommended
 D - Desirable
 S - Satisfactory

SYMBOLS

สายตรง  (STRAIGHT)
ผ่าตัด  (CUT)
แนวขนาน  (PARALLEL)
แนวตั้งตรง  (VERTICAL)
แนวฯ  (ANGLE)
เส้นโค้ง  (CURVE)
เส้นทางที่มีความเรียบ  (SMOOTH)
เส้นทางที่มีความโค้ง  (CURVED)
เส้นทางที่มีทางพาน  (PARAPET)
เส้นทางที่มีทางพานข้าง  (PARAPET SIDE)
เส้นทางที่มีทางพานข้างฝั่งหน้า  (PARAPET SIDE FRONT)
เส้นทางที่มีทางพานข้างฝั่งหลัง  (PARAPET SIDE BACK)
เส้นทางที่มีทางพานข้างฝั่งข้าง  (PARAPET SIDE SIDE)
เส้นทางที่มีทางพานข้างฝั่งข้างชั้น  (PARAPET SIDE CHILL)
เส้นทางที่มีทางพานข้างฝั่งข้างชั้นบน  (PARAPET SIDE CHILL UP)
เส้นทางที่มีทางพานข้างฝั่งข้างชั้นล่าง  (PARAPET SIDE CHILL DOWN)
เส้นทางที่มีทางพานข้างฝั่งข้างชั้นด้านใน  (PARAPET SIDE CHILL IN)
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เส้นทางที่มีทางพานข้างฝั่งข้างช้
**Description:**

Revisions of standard plans FY 2018-19

**Index:** 000-516

**Sheet:** 1 of 1

**Areas for one 5' deep Turnout (SY):**

**Types of Turnouts:**

- **Type I Turnout**
  - Typical Half-Section
  - For Automobile Traffic
- **Type II Turnout**
  - Typical Half-Section
  - For Truck-Trailer Traffic

**Pavement Structure for 5' Deep Turnouts:**

<table>
<thead>
<tr>
<th>Drive Width (ft)</th>
<th>Intersection</th>
<th>Normal</th>
<th>Skewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Type I</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>14</td>
<td>Type II</td>
<td>27</td>
<td>29</td>
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<tr>
<td>16</td>
<td>Type I</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>18</td>
<td>Type II</td>
<td>29</td>
<td>35</td>
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<tr>
<td>20</td>
<td>Type I</td>
<td>31</td>
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<tr>
<td>22</td>
<td>Type II</td>
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<td>24</td>
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<td>33</td>
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<tr>
<td>26</td>
<td>Type II</td>
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<td>Type I</td>
<td>38</td>
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</tr>
<tr>
<td>32</td>
<td>Type II</td>
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<td>64</td>
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<tr>
<td>34</td>
<td>Type I</td>
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<td>36</td>
<td>Type II</td>
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<tr>
<td>38</td>
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<td>50</td>
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<td>Type II</td>
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<td>Type I</td>
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<td>103</td>
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<tr>
<td>60</td>
<td>Type II</td>
<td>83</td>
<td>106</td>
</tr>
</tbody>
</table>

**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. Any Department-approved pavement structure equivalence may be used at the discretion of the Engineer.
3. Additional structural strength may be required if heavy truck loads are anticipated.

**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. Match existing paved shoulder widths = 4'. For all other shoulders conditions, construct at 5' wide.
4. Connections beyond the shoulder width are to be constructed as directed by the Engineer.
5. The contract unit price for Turnout Construction includes the cost for excavation and base.
6. Payment for structural course is to be included in roadway resurfacing pay item.
7. 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.

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**For Drainage Pipe and Mitered End Section Requirements See Index 000-515.**

Existing turnouts to be paved in accordance with Index 000-515. Existing paved connections to be paved with a structural course to the limits specified for "flush shoulder roadway turnout construction" index 000-515, unless otherwise called for in the plans or directed by Engineer.

See "Summary of Geometric Requirements for Turnouts" Index 000-515 for return radii lengths.

Construction limits (see Note 3) are anticipated.

Additional structural strength may be required if heavy truck loads are anticipated.
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 350-001.

LEGEND:

- Shoulder Pavement

SINGLE LANE RAMPS - EXIT TERMINALS

REVISION 01/01/17

DESCRIPTION:

FY 2018-19

STANDARD PLANS

RAMP TERMINALS

INDEX 000-525

SHEET 1 of 5
DESCRIPTION:

EXIT TERMINALS - FRICTION COURSE LOCATION (FOR FLEXIBLE PAVEMENT)

LEGEND:
- Exclude Friction Course
- Friction Course Optional

TWO THRU LANES
(Shown With Shoulder Gutter)

THREE APPROACH LANES - TWO THRU LANES
(Shown Without Shoulder Gutter)

THREE THRU LANES - APPROACH AUXILIARY LANE
(Shown Without Shoulder Gutter)
**TAPER - TYPE ENTRANCE**
(Shown Without Shoulder Gutter)

**PARALLEL - TYPE ENTRANCE**
(Shown With Shoulder Gutter)

**REVISION**: 000-525 5 of 5