### PREFACE

All projects and works on highways, roads and streets shall have a traffic control plan. All work shall be executed under the established plan and Department approved procedures. This index contains information specific to the Federal and State guidelines and standards for the preparation of traffic control plans and for the execution of traffic control in work zones, for construction and maintenance operations and utility work on highways, roads and streets on the State Highway System. Certain requirements in this Index are based on the high volume nature of State Highways. For highways, roads and streets off the State Highway System, the local agency (City/County) having jurisdiction may adopt requirements based on the minimum requirements provided in the MUTCD.

Index No. 600 provides Department policy and standards. Changes are only to be made thru Department approved procedures. Index Nos. 601 thru 670 provide typical applications for various situations. Modification can be made to these Indexes as long as the changes comply with the MUTCD and Department Design Standards.

The sign spacings shown on the Indexes are typical (recommended) distances. These distances may be increased or decreased based on field conditions, in order to avoid conflicts or to improve site-specific traffic controls.

### MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

The Florida Department of Transportation has adopted the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD) and subsequent revisions and addendums, as published by the U.S. Department of Transportation, Federal Highway Administration, for mandatory use on the State Maintained Highway System whenever there exists the need for construction, maintenance operations or utility work.

### ABBREVIATIONS

Abbreviations assigned to the 600 series Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFPR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CSSIP</td>
<td>Cost Savings Initiative Proposal</td>
</tr>
<tr>
<td>DTDE</td>
<td>District Traffic Operations Engineer</td>
</tr>
<tr>
<td>FDOT</td>
<td>Florida Department of Transportation</td>
</tr>
<tr>
<td>HAR</td>
<td>Highway Advisory Radio</td>
</tr>
<tr>
<td>L</td>
<td>Taper Length, Buffer Length or Taper Length Plus Buffer Space</td>
</tr>
<tr>
<td>MAR</td>
<td>Motorist Awareness System</td>
</tr>
<tr>
<td>MOP</td>
<td>Maintenance of Traffic</td>
</tr>
<tr>
<td>MUTCD</td>
<td>Manual on Uniform Traffic Control Devices for Streets and Highways</td>
</tr>
<tr>
<td>NCHRP</td>
<td>National Cooperative Highway Research Program</td>
</tr>
<tr>
<td>PCMS</td>
<td>Portable Changeable (Variable) Message Sign</td>
</tr>
<tr>
<td>PHS</td>
<td>Portable Regulatory Sign</td>
</tr>
<tr>
<td>R</td>
<td>Radius</td>
</tr>
<tr>
<td>RPM</td>
<td>Raised Rectangular Pavement Marker</td>
</tr>
<tr>
<td>RSDU</td>
<td>Radar Speed Display Unit</td>
</tr>
<tr>
<td>S</td>
<td>Posted Speed or Off-Peak 85 Percentile Speed (MPH)</td>
</tr>
<tr>
<td>SLED</td>
<td>Speed and Law Enforcement Officer</td>
</tr>
<tr>
<td>TCCP</td>
<td>Temporary Traffic Control Plan(s)</td>
</tr>
<tr>
<td>TCC</td>
<td>Temporary Traffic Controls</td>
</tr>
<tr>
<td>TMA</td>
<td>Truck/Trailer Mounted Attenuator</td>
</tr>
<tr>
<td>TMAV</td>
<td>Truck/Trailer Mounted Attenuator (TMA)</td>
</tr>
<tr>
<td>TVAV</td>
<td>Truck/Trailer Mounted Attenuator (TMA)</td>
</tr>
<tr>
<td>WC</td>
<td>Work Area</td>
</tr>
<tr>
<td>W</td>
<td>Width of Taper Transition in Feet, i.e., Lateral Offset</td>
</tr>
</tbody>
</table>

### SYMBOLS

The Symbols shown are found in the FDOT site menu under Traffic Control cell library on the CADD system. Symbols assigned to the 600 series Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:

- Work Area, Hazard Or Work Phase (Any pattern within a boundary)
- Sign With 18" x 18" (Min) Orange Flag And Type B Light
- Channelizing Device
- Type III Barricade
- Work Zone Sign
- Flagger
- Traffic Signal
- Advance Warning Arrow Board
- Portable Signal
- Crash Cushion
- Stop Bar

## INDEX

**NO.** | **DESCRIPTION** | **SHEET NO.**
--- | --- | ---
1 | Manual On Uniform Traffic Devices | 1
2 | Abbreviations | 1
3 | Symbols | 1
4 | Definitions | 1
5 | Temporary Traffic Control Devices | 1
6 | Pedestrian and Bicyclist | 1
7 | Overhead Work | 1
8 | Sight Distance | 1
9 | Temporary Raised Rumble Strips | 1
10 | Survey Work Zones | 1
11 | Work Zone Sign Supports | 1
12 | Temporary Permanent Rumble Strips | 1
13 | Commonly Used Warning and Regulatory Signs In Work Zones | 1
14 | Manholes/Crossouts/Joints | 1
15 | Truck Mounted Attenuators | 1
16 | Removing Pavement Markings | 1
17 | Signals | 1
18 | Channelizing and Lighting Devices Consistency | 1
19 | Warning Lights | 1
20 | Standard Orange Flag | 1
21 | Portable Changeable (Variable) Message Signs (PCMS) | 1
22 | Advanced Warning Arrow Boards | 1
23 | Drop-Offs In Work Zones | 1
24 | Business Entrance | 1
25 | Temporary Asphalt Separator | 1
26 | Identifications - Channelizing and Lighting Devices | 1
27 | Pavement Markings | 1
DEFINITIONS

Regulatory Speed (In Work Zones)
The maximum recommended travel speed posted for the work zone is indicated by the regulatory speed limit sign. The speed zone must be shown or noted in the plan. This speed should be used as the minimum design speed to determine runup lengths, approach lengths, flare lengths, lengths of need, clear zone widths, taper lengths, crash cushion requirements, marker spacings, superelevation and other similar features.

Advisory Speed
The maximum recommended travel speed through a curve or a hazardous area.

Travel Way
The portion of the roadway for the movement of vehicles. For traffic control through work zones, travel way may include the temporary use of shoulders and any other permanent or temporary surface intended for use as a lane for the movement of vehicular traffic.

a. Travel Lane: The designated widths of roadway pavement marked to carry traffic and to separate it from opposing traffic or traffic occupying other traffic lanes.

b. Auxiliary Lane: The designated widths of roadway pavement marked to separate speed change, turning, passing and climbing maneuvers from through traffic.

Detour, Lane Shift, and Diversion
A detour is the redirection of traffic onto another roadway to bypass the temporary traffic control zone. A lane shift is the redirection of traffic onto a different section of the permanent pavement. A diversion is the redirection of traffic into a temporary roadway, usually adjacent to the permanent roadway and within the limits of the right-of-way.

Above Ground Hazard
An above ground hazard is any object, material or equipment other than traffic control devices that encroaches upon the travel way or that is located within the clear zone which does not meet the Department’s safety criteria, i.e., anything that is greater than 4’ in height and is firm and unyielding or does not burn most building requirements.

TEMPORARY TRAFFIC CONTROL DEVICES
All temporary traffic control devices shall be either the Department’s Qualified Product List (QPL) or the Department’s Approved Products List (APL). Ensure the appropriate QPL or APL number is permanently marked on the device in a readily visible location.

Arrows, Portable Changeable Message Signs, Radar Speed Display Trailer, Portable Regulatory Signs, and any other trailer mounted device shall be delineated with a temporary traffic control device placed at each corner when in use and shall be moved outside the travel way and clear zone or be shielded by a barrier or crash cushion when not in use.

OVERHEAD WORK
Work is only allowed over a traffic lane when one of the following conditions is met:

OPTION 1 (OVERHEAD WORK USING A MODIFIED LANE CLOSURE)
Overhead work using a modified lane closure is allowed if all of the following conditions are met:

a. Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.

b. Work operations are 60 minutes or less.

c. Speed limit is 45 mph or less.

d. No encroachment by any part of the work activities and equipment within an area bounded by 2 feet outside of the edge of travel way and 18 feet high.

e. Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.

f. Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.

OPTION 2 (OVERHEAD WORK ABOVE AN OPEN TRAFFIC LANE)
Overhead work above a open traffic lane is allowed if all of the following conditions are met:

a. Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.

b. Work operations are 60 minutes or less.

c. Speed limit is 45 mph or less.

d. No encroachment by any part of the work activities and equipment within an area bounded by 2 feet outside of the edge of travel way and 18 feet high.

e. Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.

f. Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.

OPTION 3 (OVERHEAD WORK ADJACENT TO AN OPEN TRAFFIC LANE)
Overhead work adjacent to an open traffic lane is allowed if all of the following conditions are met:

a. Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.

b. Work operations are 1 day or less.

c. Speed limit is 45 mph or less.

d. No encroachment by any part of the work activities and equipment within 2 feet from the edge of travel way to 18 height.

Above 18’ in height, no encroachment by any part of the work activities and equipment within 5 feet from the edge of travel way to 18 height.

Above 18’ in height, no encroachment by any part of the work activities and equipment within 2 feet from the edge of travel way to 18 height.

f. Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.

g. Adequate precautions are taken to prevent parts, tools, equipment and other objects from falling into open lanes of traffic.

h. Other Governmental Agencies, Rail facilities, or Codes may require a greater clearance. The greater clearance required.

OPTION 4 (OVERHEAD WORK MAINTAINING TRAFFIC WITH NO ENCROACHMENT BELOW THE OVERHEAD WORK AREA)
Traffic must be detoured, shifted, or closed to not encroach in the area directly below the overhead work operations in accordance with the appropriate standard index or detailed in the plans. This option applies to, but is not limited to, the following construction activities:

a. Beam, girder, segment, and bent/ pier cap placement.

b. Form and falsework placement and removal.

c. Concrete placement.

d. Railing construction located at edge of deck.

OPTION 5 (CONDUCTOR/CABLE PULLING ABOVE AN OPEN TRAFFIC LANE)
Overhead cable and/or de-energized conductor installations initial pull to proper tension shall be done in accordance with the appropriate Standard Index or temporary traffic control plan.

Continuous pulling operations of secured cable and/or conductors are allowed over open lanes of traffic with no encroachment by any part of the work activities, materials or equipment within the minimal vertical clearance above the travel way. The utility shall take precautions to ensure that pull ropes and conductors/cables at no time fall below the minimum vertical clearance.

On Limited Access facilities, a site specific temporary traffic control plan is required. The temporary traffic control plan shall include:

a. The temporary traffic control set up for the initial pulling of the pull rope across the roadway.

b. During pulling operations, advance warning consisting of no less than a Changeable Message Sign upstream of the work area with alternating messages, Overhead Work Ahead and Be Prepared to Stop followed by a traffic control officer and police vehicle with blue lights flashing during the pulling operation.

RAILROADS
Railroad crossings affected by a construction project should be evaluated for traffic controls to reduce queuing on the tracks. The evaluation should include as a minimum, traffic volumes, distance from the tracks to the intersections, lane closure or taper locations, signal timing, etc.

SIGHT DISTANCE
Tapers: Transition tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the curve's obstruction. The beginning of tapers should not be hidden behind curves.

Intersections: Traffic control devices at intersections must provide sight distances for the road user to perceive potential conflicts and to traverse the intersection safely. Construction equipment and materials shall not restrict intersection sight distance.

ABOVE GROUND HAZARD
Above ground hazards (see definitions) are to be considered work areas during working hours and through traffic. A temporary traffic control plan shall be in place during nonworking hours. All objects, materials, and equipment that constitute an above ground hazard must be stored/placed outside the travel way clear zone or be shielded by a barrier or crash cushion.

For above ground hazards within a work zone the clear zone required shall be based on the regulatory speed posted during construction.
CLEAR ZONE WIDTHS FOR WORK ZONES

The term "clear zone" describes the unobstructed relatively flat area, impacted by construction, extending outward from the edge of the traffic lane. The table below gives clear zone widths in work zones for medians and roadside conditions other than for roadside canals, where roadside canals are present, clear zone widths are to conform to the distances to canals as described in Volume I, Chapter 4, Section 4.2 and Exhibit 4-A and 4-B of the Plans Preparation Manual.

<table>
<thead>
<tr>
<th>WORK ZONE SPEED</th>
<th>TRAVEL LANES &amp; MULTILANE RAMPS</th>
<th>AUXILIARY LANES &amp; SINGLE LANE RAMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MPH)</td>
<td>(feet)</td>
<td>(feet)</td>
</tr>
<tr>
<td>60-70</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td>45-50</td>
<td>24</td>
<td>14</td>
</tr>
<tr>
<td>30-40</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>ALL SPEEDS</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

WORK ZONE SPEEDS FOR WORK ZONES

REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCPs) for all projects must include specific regulatory speeds for each phase of work. This can either be the posted speed or a reduced speed. The speed shall be noted in the TCPs, this includes indicating the existing speed if no reduction is to be made. Regulatory speeds are to be uniformly established through each phase.

In general, the regulatory speed should be established to route vehicles safely through the work zone as close to the normal highway speed as possible. The regulatory speed should not be reduced more than 10 mph below the posted speed and never below the minimum statutory speed for the class of facility. When a speed reduction greater than 10 mph is imposed, the reduction is to be done in 10 mph per 500 Increments.

Temporary regulatory speed signs shall be removed as soon as the conditions requiring the reduced speed no longer exist. Once the work zone regulatory speeds are removed, the regulatory speed existing prior to construction will automatically be brought back. If the existing regulatory speed is to be used, consideration should be given to supplementing the existing signs when the construction work zone is between existing regulatory speed signs. For projects where the reduced speed conditions exist for greater than 1 mile in rural areas (non-interstate) and no urban or interstate, additional regulatory speed signs are to be placed at not more than 1 mile intervals. Engineering judgment should be used in placement of additional signs. Locating these signs beyond ramp entrances and beyond major intersections is considered to be examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at a maximum of 1000 feet apart.

When field conditions warrant speed reductions different from those shown in the TCP the contractor may submit to the project engineer for approval by the Department, a signed and sealed study to justify the need for further reducing the posted speed, or, the engineer may request the District Traffic Operations Engineer (DTOE) to investigate the need. It will not be necessary for the DTOE to issue regulations for regulatory speeds in work zones due to the revised provisions of P.S. 350.0745(1)(b). Advisory Speed plates will be used at the option of the field engineer for temporary use while processing a request to change the regulatory speed specified in the plans when deemed necessary. Advisory speed plates cannot be used alone but must be placed below the construction warning sign for which the advisory speed is required.

For additional information refer to the FDOT Plans Preparation Manual, Volume I, Chapter 10.
TEMPORARY RAISED RUMBLE STRIP SET

TYPICAL PLACEMENT OF TEMPORARY RAISED RUMBLE STRIPS

TEMPORARY PORTABLE RUMBLE STRIP SET

TYPICAL PLACEMENT OF TEMPORARY INTERNALLY BALLASTED RUMBLE STRIPS

DISTANCE BETWEEN SIGNS

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>55 or greater</td>
<td>500</td>
<td>500</td>
<td>1000</td>
<td>500</td>
</tr>
</tbody>
</table>

GENERAL NOTES
1. Temporary rumble strips sets shall be placed in advance of each flagging station when called for in the plans.
2. Temporary rumble strip sets are used to supplement a series of advanced warning signs and shall be installed and removed when the signs are installed and removed.
3. Remove the temporary rumble strips prior to removing the advance warning signs.
FLAGGER CONTROL
Where flaggers are used, a FLAGGER symbol or legend sign must replace the WORKERS symbol or legend sign.

The flagger must be clearly visible to approaching traffic for a distance sufficient to permit proper response by the motorist to the flagging instructions, and to permit traffic to reduce speed or to stop as required before entering the work zone. Flaggers shall be positioned to maintain maximum color contrast between the Flagger’s high-visibility safety apparel and equipment and the work area background.

Hand-Signaling Devices
STOP/SLOW paddles are the primary hand-signaling device. The STOP/SLOW paddle shall be placed on a rigid staff supported by a tripod, the minimum length of the staff, measured from the bottom of the staff to the end of the staff, at ground level, must be 15 feet. The STOP/SLOW paddle shall be at least 24 inches wide with letters at least 1 inch high and should be fabricated from light semirigid material. The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be orange with black letters and border. When used at nighttime, the STOP/SLOW paddle shall be retroreflectorized.

Flag use is limited to immediate emergencies, intersections, and when working on the centerline or shared left turn lanes where two (2) flaggers are required and there is opposing traffic in the adjacent lanes. Flags, when used, shall be a minimum of 24 inches square, made of a good grade of red material, and securely fastened to a staff that is approximately 36 inches in length. When used at night-time, flags shall be retroreflectorized.

Flashlight, lantern or other lighted signal that will display a red warning light shall be used at night.

Flagger Stations
Flagger stations shall be located far enough in advance of the work space so that approaching road users will have sufficient distance to stop before entering the work space. When used at night-time, the flagger station shall be illuminated.

SURVEY WORK ZONES
The SURVEY CREW AHEAD symbol or legend sign shall be the principal Advance Warning Sign. The significance of this sign shall be: a) to alert motorists 500 feet beyond the ADVANCE WARNING sign that survey work is in progress; b) to alert motorists of the presence of survey personnel and equipment; and c) to provide the minimum advance warning of survey work necessary to permit traffic to reduce speed or to stop as required before entering the survey work zone.

Survey Between Active Traffic Lanes or Shared Left Turn Lanes
The following provisions apply to Main Roadway Traffic Control Work Zones. These provisions may be adjusted by the Party Chief to fit roadway and traffic conditions when the Work Zone area includes intersections.

(A) A STOP IN YOUR LANE (W7-1-06) sign shall be added to the Advance Warning Sign sequence as the second most immediate sign from the work area.

(B) Elevation Surveys-Corners may be used at the discretion of the Party Chief to protect prism holder and flagger/crew corners. If used, may be placed at up to 50 intervals along the break line throughout the work zone.

(C) Horizontal Control-With traffic flow in the same direction, cones shall be used to protect the backtipped tripod or instrument. Cones shall be placed at the equipment, and up to 50 intervals for at least 200 feet. With traffic flow in opposite directions, cones shall be used to protect the backtipped tripod or instrument (if there is opposing traffic in the adjacent lanes). Cones shall be placed at the equipment, and up to 50 intervals for at least 200 feet in both directions towards the flow of traffic.

SIGNS
SIGN MATERIALS
Mesh signs may be used only for Daytime Operations. Vinyl signs may be used for Day or Night Operations not to exceed 1 day except as noted in the standards. Rigid or Lightweight sign panels may be used in accordance with the vendor drawings.

INTERSECTING ROAD SIGNING
Signing for the control of traffic entering and leaving work zones by way of intersecting crossroads shall be adequate to make drivers aware of work zone conditions. The Advance Warning Sign shall be placed on the opposite side of the intersection from the work zone and at a distance of not less than the ROAD WORK AHEAD sign.

ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING
Adjoining work zone signs may not have sufficient spacing for standard placement of signs and other traffic control devices in their advance warning areas or in some cases directly within their traffic control zones. Where such restrictions or conflicts occur or are likely to occur, one of the following methods will be employed to avoid conflicts and prevent conditions that could lead to misunderstanding on the part of the traveling public. As to the intended travel way by the traffic control procedures:

(A) For scheduled projects the engineer in charge of project design will resolve anticipated work zone conflicts during the development of the project traffic control plan. This may entail revision of plans on preceding projects and coordination of plans on concurrent projects.

(B) Unanticipated conflicts arising between adjoining or overlapping highway construction projects will be resolved by the Resident Engineer for projects under his residency, and, by the District Construction Engineer for in progress projects under adjoining residencies.

(C) The District Maintenance Engineer will resolve anticipated and occurring conflicts within scheduled maintenance operations.

(D) The Unit Maintenance Engineer will resolve conflicts that occur within routine maintenance work, between routine maintenance work, unscheduled work and/or permitted work, and, between unit controlled maintenance work and highway construction projects.

SIGN COVERING AND INTermittent WORK STOPPAGE SIGNING
Existing or temporary traffic control signs that are no longer applicable or are inconsistent with intended travel paths shall be removed or fully covered. Sign blanks or other available coverings must completely cover the existing sign. Rigid sign coverings shall be the same size as the sign it is covering, and bolted in a manner to prevent movement. Sign covers are incidental to work operations and are not paid for separately.

SIGNING FOR DETOURS, LANE SHIFTS AND DIVERSIONS
Detours should be signed clearly near their entire length so that motorists can easily determine how to return to the original roadway. The reverse curve (W1-4) warning sign should be used for the advanced warning for a lane shift. A diversion should be signed as a lane shift.

EXTENDED DISTANCE ADVANCE WARNING SIGN
Advance Warning Signs shall be used at extended distance of one-half mile or more where there is opposing traffic or the nature of the obstruction may require a motorist to bring their vehicle to a stop. Extended Distance Advance Warning Signs may be required on any type roadway, but particularly to be considered on multilane divided highways where vehicle speed is generally in the higher range (45 MPH or more).

UTILITY WORK AHEAD SIGN
The UTILITY WORK AHEAD (W3-1) sign may be used as an alternate to the ROAD WORK AHEAD or the ROAD WORK EX FT (W20-1) sign for utility operations on or adjacent to a highway.

LENGTH OF ROAD WORK SIGN
The length of road work sign (G2-2) bearing the legend ROAD WORK NEXT_____ MILES is required for all projects of more than 2 miles in length. The number of miles entered should be rounded up to the nearest mile. The sign shall be located at beginning points.

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT SIGN
The SPEEDING FINES DOUBLED WHEN WORKERS PRESENT sign should be installed on all projects, but may be omitted if the work operation is less than 1 day. The placement should be 500 feet beyond the ROAD WORK AHEAD sign or midway to the next sign whichever is less.

GROOVED PAVEMENT AHEAD SIGN
The Grooved Pavement Ahead sign is required 500 feet in advance of a milled or grooved surface open to traffic. The W8-15P placard shall be used in conjunction with the GROOVED PAVEMENT AHEAD sign.

END ROAD WORK SIGN
The END ROAD WORK sign (G2-2) should be installed on all projects, but may be omitted if the work operation is less than 1 day. The sign shall be placed approximately 500 feet beyond the end of a construction or maintenance project unless another distance is called for in the plans. When other Construction or Maintenance Operations occur within 1 mile this sign should be omitted and signing coordinated in accordance with Index No. 600, ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING.

PROJECT INFORMATION SIGN
The Project Information sign shall be installed where called for in the plans.
GENERAL NOTES:
1. All signs shall be post mounted when work operations exceed one day except for:
a. Road closure signs mounted in accordance with the vendor drawing for the Type III Barricade shown on the QPL.
b. Pedestrian advanced warning or regulatory signs mounted on sign supports in accordance with the vendor drawing shown on the QPL.
2. If post mounting criteria cannot be achieved and a barrier or traffic railing exists, use Index 1187.

TEMPORARY SIGN SUPPORT NOTE:
1. Signs mounted on temporary supports or barricades, and barricade/sign combination shall be crashworthy in accordance with NCHRP 350 requirements and included on the Qualified Products List (QPL).

POST MOUNTED SIGN NOTES:
1. Use only approved systems listed on the Department's Qualified Products List.
2. Manufacturers seeking approval of U-channel and steel square tube sign support assemblies for inclusion on the Qualified Products List (QPL) must submit a QPL application, design calculations (for square tube only), and detailed drawings showing the product meets all the requirements of this Index.

3. Provide 3 lb/ft Steel U-Channel Posts with a minimum section modulus of 0.43 in³ for 60 ksi steel, a minimum section modulus of 0.37 in³ for 70 ksi steel, or a minimum section modulus of 0.34 in³ for 80 ksi steel.

4. Provide 4 lb/ft Steel U-Channel Posts with a minimum section modulus of 0.56 in³ for 60 ksi steel, a minimum section modulus of 0.47 in³ for 70 ksi steel or 80 ksi steel.

5. U-channel posts shall conform with ASTM A 499, Grade 60, or ASTM A 276, Grade 1080 (with a minimum yield strength of 60 ksi). Square tube posts shall conform with ASTM A 500, Grade 50, or ASTM A 501, Grade 50.

6. Sign attachment bolts, washers, nuts and spacers shall conform with ASTM A 307 or A 36.

7. For diamond warning signs with supplement plaque (up to 3 ft wide) in areas, use 4 lb/ft posts for up to 10 ft Clear Height (measure to the bottom of diamond warning sign).

8. Install 4 lb/ft Steel U-Channel Posts with approved Breakaway splice in accordance with the manufacturer’s detail shown on the QPL.

9. The contractor may install 3 lb/ft Steel U-Channel Posts with approved breakaway splice in accordance with the manufacturer’s detail shown on the QPL.

10. Install all posts plumb.

11. The contractor may set posts in preformed holes to the specified depth with suitable backfill tamp securely on all sides, or drive 3 lb/ft sign posts and any size base post in accordance with the manufacturer’s detail shown on the QPL.

TYPICAL FOUNDATION DETAIL
See QPL for post, spaee and connection details. No bolts installed closer than 1” to cutting edge.

SIGN ATTACHMENT DETAIL
(WITHOUT Z-BRACKET)
MANHOLES/CROSSWALKS/JOINTS

Manholes extending 7" or more above the travel lane and crosswalks having an uneven surface greater than 90 shall have a temporary asphalt apron constructed as shown in the diagram below. All transverse joints that have a difference in elevation of 1" or more shall have a temporary asphalt apron constructed as shown in the diagram below.

The apron is to be removed prior to constructing the next lift of asphalt. The cost of the temporary asphalt shall be included in the contract unit price for Maintenance of Traffic, 15.

The apron is to be removed prior to constructing the next lift of asphalt. The cost of the temporary asphalt shall be included in the contract unit price for Maintenance of Traffic, 15.

TRUCK/TRAILER-MOUNTED ATTENUATORS

Truck/Trailer-mounted attenuators (TMA) can be used for moving operations and short-term stationary operations. For moving operations, see Index Nos. 607 and 619. For short-term, stationary operations, see Part VI of the MUTCD.

CHANNELIZING AND LIGHTING DEVICE CONSISTENCY

Barrioles, vertical panels, cones, tubular markers and drums shall not be intermixed within either the lateral transition or within the tangent alignment.

WARNING LIGHTS

Warning lights shall be in accordance with the MUTCD except for the application limitations stipulated below.

Steady-Burn Type C Steady-Burn Lights are to be mounted on barricades, drums, concrete barrier walls or vertical panels and used in combination with those devices to delineate the traffic way on lane closures, lane changes, diversion curves and other similar conditions. Steady-burn lights are intended to be placed in a line to delineate the travel way through and around obstructions in the transition, buffer, work and termination areas of the traffic control zone. Their intended purpose is not for warning drivers that they are approaching or proceeding through a hazardous area.

STANDARD ORANGE FLAG

For post-mounted signs a standard orange flag 18" x 18" (min.) shall be mounted on the first advanced warning sign and on the first and second advanced warning sign where two or more signs are used; this applies to all approaches to any work zone. The light shall be mounted on the channel post or on the upper edge of the sign nearest the traffic.

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

The PCMS can be used to:
1. Supplement standard signing in construction or maintenance work zones
2. Reinforce static advance warning messages
3. Provide motorists with updated guidance information.

PCMS should be placed approx. 500 to 800 feet in advance of the work zone conflicts or 1.5 to 2 miles in advance of complex traffic control schemes which require new and/or unusual traffic maneuvers.

For additional information refer to the FDOT Plans Preparation Manual, Volume 1, Chapter 16.

ADVANCE WARNING ARROW BOARDS

An arrow board in the arrow or chevron mode shall be used only for stationary or moving lane closures on multiline roadways.

For shoulder work, blocking the shoulder, for roadside work near the shoulder, or for temporarily closing one lane on a two-lane, two-way roadway, an arrow board shall be used only in the caution mode.

A single arrow board shall not be used to merge traffic laterally more than one lane. When arrow boards are used to close multiple lanes, a single board shall be used at the merging taper for each closed lane.

When Advance Warning Arrow Boards are used at night, the intensity of the flashers shall be reduced during darkness when lower intensities are desirable.
DROP-OFF CONDITION NOTES

1. A drop-off is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3" with slopes (A:B) steeper than 1:4. When drop-offs occur within the clear zone due to construction or maintenance activities, protection devices are required. See chart.

2. Distance X is to be the maximum practical under project conditions.

3. Distance from the travel lane to the barrier or warning device should be maximum practical for project conditions.

4. Any drop-off condition that is created and restored within the same work period will not be subject to the use of barriers; however, warning devices will be required.

5. When permanent curb heights are \( \geq 6" \), no warning device will be required. For curb heights \( < 6" \), see chart.

DROP-OFF NOTES

1. These conditions and treatments can be applied only in work areas that fall within a properly signed work zone.

2. The following are defined as acceptable warning devices:
   a. Vertical panel
   b. Type I or Type II barricades
   c. Drum
   d. Cone (where allowed)
   e. Tubular marker (where allowed)

3. Where a barrier is specified, any of the types below may be used in accordance with the applicable Index:
   
   **Index No.** | **Description**
   --- | ---
   415 | Temporary concrete barrier
   414 | Type K temporary concrete barrier
   412 | Temporary low profile barrier
   400 | Temporary guardrail and end anchorage
   600 | Temporary guardrail and end anchorage

4. Warning device spacing shall be as shown in Table I.

DROP-OFF PROTECTION REQUIREMENTS

**ALL SPEEDS**

<table>
<thead>
<tr>
<th>X (ft)</th>
<th>D (ln.)</th>
<th>Device Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12</td>
<td>&gt; 3</td>
<td>Barrier</td>
</tr>
<tr>
<td>12-CZ</td>
<td>&gt; 3 to ( \leq 5 )</td>
<td>Warning Device</td>
</tr>
<tr>
<td>0-CZ</td>
<td>&gt; 3</td>
<td>Barrier</td>
</tr>
</tbody>
</table>

For Clear Zone widths, see Index No. 600 sheet 3.

PEDESTRIAN AND/OR BICYCLIST WAY

DROP-OFF CONDITION NOTES

1. A pedestrian and/or bicyclist way drop-off is defined as:
   a. a drop in elevation greater than 10 inches that is closer than 2 feet from the edge of the pedestrian or bicyclist way
   b. a slope steeper than 1:2 that begins closer than 2 feet from the edge of the pedestrian or bicyclist way when the total drop-off is greater than 60 inches.

2. When there is a difference in elevation between adjacent travel lanes, the W8-11 sign with "UNEVEN LANES" is required at intervals of 2 mile maximum.

3. If D is 18" or less, no treatment is required.

4. Treatment allowed only when D is 2" or less.

5. Warning devices, temporary barrier wall or approved handrail.

PEDESTRIAN AND/OR BICYCLIST WAY

DROP-OFF NOTES

1. A pedestrian and/or bicyclist way drop-off is defined as:
   a. a drop in elevation greater than 10 inches that is closer than 2 feet from the edge of the pedestrian or bicyclist way
   b. a slope steeper than 1:2 that begins closer than 2 feet from the edge of the pedestrian or bicyclist way when the total drop-off is greater than 60 inches.

2. Any drop-off adjacent to a pedestrian or bicyclist way shall be protected with warning devices, temporary barrier wall or approved handrail.

PEDESTRIAN AND/OR BICYCLIST WAY

DROP-OFF CONDITIONS

1. A drop-off is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3" with slopes (A:B) steeper than 1:4. When drop-offs occur within the clear zone due to construction or maintenance activities, protection devices are required. See chart.

2. Distance X is to be the maximum practical under project conditions.

3. Distance from the travel lane to the barrier or warning device should be maximum practical for project conditions.

4. Any drop-off condition that is created and restored within the same work period will not be subject to the use of barriers; however, warning devices will be required.

5. When permanent curb heights are \( \geq 6" \), no warning device will be required. For curb heights \( < 6" \), see chart.

DROP-OFFS IN WORK ZONES

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Device Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed (mph)</td>
<td>Max. Distance Between Devices (ft)</td>
</tr>
<tr>
<td></td>
<td>Cones or Tubular Markers</td>
</tr>
<tr>
<td></td>
<td>Taper</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>30 to 45</td>
<td>25</td>
</tr>
<tr>
<td>30 to 70</td>
<td>25</td>
</tr>
</tbody>
</table>

SHOULDER TREATMENT

**NOTES**

1. Shoulder treatment may be used in lieu of barrier. Warning devices are required.

2. Daily inspections shall be conducted to assure that no erosion, excessive slopes, rutting, or other adverse conditions exist. Any deficiencies shall be repaired immediately.

3. Compensation for the placement and removal of the material required for the shoulder treatment shall be included in the cost for Maintenance Of Traffic, i.e., use of shoulder treatment in lieu of a barrier is not eligible for CSIP consideration.

TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING

**NOTES**

1. This treatment applies to resurfacing or milling operations between adjacent travel lanes.

2. Whenever there is a difference in elevation between adjacent travel lanes, the W8-11 sign with "UNEVEN LANES" is required at intervals of 2 mile maximum.

3. If D is 18" or less, no treatment is required.

4. Treatment allowed only when D is 2" or less.

5. If the slope is steeper than 1:4 (not to be steeper than 1:2), the R4-1 and MDT-3-06 signs shall be used as a supplement to the W8-11; this condition should never exceed 3 miles in length.
GENERAL INFORMATION FOR TRAFFIC
CONTROL THROUGH WORK ZONES

CHANNELIZING DEVICES

SECTION AA

Table 1

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Max. Distance Between Devices (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tubular Markers</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>30 to 45</td>
<td>25</td>
</tr>
<tr>
<td>50 to 70</td>
<td>25</td>
</tr>
</tbody>
</table>

1. Temporary lane separators shall be supplemented with any of the following approved fixed (surface mounted) channelizing devices: tubular markers, vertical panels, or opposing traffic lane divider panels. Opposing traffic lane divider panels shall be used as center lane dividers to separate opposing vehicular traffic on a two-lane, two-way operation. Tubular Markers, Vertical Panels and Opposing Traffic Lane Divider panels shall not be intermixed within the limits where the temporary lane separator is used. The connection between the channelizing device and the temporary lane separator curb shall hold the channelizing device in a vertical position.

2. Reflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night. Furnish channelizing devices having retroreflective sheeting meeting the requirements of Section 990.

3. 12" openings for drainage shall be constructed in the asphalt and portable temporary lane separator at a maximum spacing of 25' in areas with grades of 1% or less or 50' in areas with grades over 1% as directed by the Engineer.

4. Tapered ends shall be used at the beginning and end of each run of the temporary lane separator to form a gradual increase in height from the pavement level to the top of the temporary lane separator.

5. The Contractor has the option of using portable temporary lane separators containing fixed channelizing devices in lieu of the temporary asphalt separator and channelizing devices detailed on this sheet. The portable temporary lane separator shall come in portable sections that can be connected to maintain continuous alignment between the separate curb sections. Each temporary lane separator section shall be 36 inches to 48 inches in total length. Portable temporary lane separators shall duplicate the color of the pavement marking. Portable temporary lane separators shall be one of those listed on the Qualified Products List.

6. Any damage to existing pavement caused by the removal of temporary lane separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.

TEMPORARY LANE SEPARATOR

PLACEMENT OF BUSINESS ENTRANCE SIGNS AND CHANNELIZING DEVICES AT BUSINESS ENTRANCE

1. For single business entrances, place one 24" x 36" business sign for each driveway entrance affected. Signs shall show specific business names. Logos may be provided by business owners. Standard BUSINESS ENTRANCE sign in Index 17355 may be used when approved by the Engineer.

2. When several businesses share a common driveway entrance, place one 24" x 30" standard BUSINESS ENTRANCE sign according with Index 17355 at the common driveway entrance.

3. Channelizing devices shall be placed at a reduced spacing on each side of the driveway entrance, but shall not restrict sight distance for the driveway users.

4. Business entrance signs are intended to guide motorist to business entrances moved/modified or disturbed during construction projects. Business entrance signs are not required where there is minimal disruption to business driveways which is often the case with resurfacing type projects.

5. Portable temporary lane separators shall duplicate the color of the pavement marking. Portable temporary lane separators shall be one of those listed on the Qualified Products List.

6. Any damage to existing pavement caused by the removal of temporary lane separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.
GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

REVISION

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NO. SHEET

DESCRIPTION:

REVISION

1. The details shown on this sheet are for the following purposes:
   (a) For ease of identification and
   (b) To provide information that supplements or supersedes that provided by the MUTCD.

2. The Type III Barricade shall have a unit length of 6'-0" only. When barricades of greater lengths are required those lengths shall be in multiples of the 6'-0" unit.

3. No sign panel should be mounted on any channelizing device unless the channelizing device/sign combination was found to be crashworthy and the sign panel is mounted in accordance with the vendor drawing for the channelizing device shown on the QPL.

4. During hours of darkness, warning lights shall be used on LCDs, drums, vertical panels, Type I, Type II, Type III, and direction indicator barricades in accordance with 'Warning Lights' in Index No. 600.

5. Ballast shall not be placed on top rails or any striped rails or higher than 13" above the driving surface.

6. The direction indicator barricade may be used in turnarounds and transitions where specific directional guidance to drivers is necessary. If used, direction indicator barricades shall be used in series to direct the driver through the transition and into the intended travel lane.

7. The splicing of sheeting is not permitted on either channelizing devices or MUTCD signs.

8. For rails less than 3'-0" long, 4" stripes shall be used.

9. Cones shall:
   a. Be used only in active work zones where workers are present.
   b. Not exceed 2 miles in length of use at any one time.
   c. Be reflectorized as per the MUTCD with Department approved reflective collars when used at night.

10. Spacing for longitudinal channelizing devices when placed singly shall be the same as Type I or Type II barricades or drums.

11. For longitudinal channelizing devices (LCDs) less than 32" in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32" in height shall not be used for speeds greater than 45 mph.

12. For pedestrian longitudinal channelizing devices, the device shall have a minimum of 8' continuous detectable edging above the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 32" and have smooth connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2", otherwise the device must be at least 42" in height above the walkway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES
GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

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NO. SHEET INDEX

DESCRIPTION:

REV 1 6/2012

FDO T DESIGN STANDARDS

GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

Pavement Markings

Bidirectional Yellow

Non-directional Yellow

Bidirectional White/Red

Non-directional White

ONE WAY OR MULTILANE DIVIDED

2-LANE - 2-WAY

TEMPORARY SUBSTITUTION OF RPM'S FOR PAINT OR REMOVABLE TAPE

1. Paint or removable tape are the required work zone markings and shall be placed in accordance with the plans and specifications. If these work zone markings cannot be placed due to weather restrictions identified in the appropriate specification, temporary substitution of RPM's for work zone markings will be allowed until the weather condition permits the placement of appropriate work zone marking. Temporary substitution of RPM's for work zone markings will be allowed for equipment malfunction, placement of the appropriate work zone marking shall be made within 3 days, or sooner if possible. When RPM's are used as a temporary substitution for work zone markings the following shall apply:

a. Lane widths identified in the plans must be maintained. Placement of RPM's should consider where work zone markings will be placed as soon as conditions allow. If the RPM's can not be placed so that the lane width is maintained after the placement of the work zone markings, the conflicting RPM's must be removed.

b. The color of the RPM body and the reflective face shall conform to the color of the marking for which they substitute.

c. In work zones, CLASS A, B or D RPM's may be used to form lane lines, edge lines and temporary gore areas as a temporary substitute for paint or removable tape at the spacing shown above. Where the RPM's will be used for five (5) days or less, CLASS E RPM's may be used.

PLACEMENT OF PAVEMENT MARKINGS

Approach

Transition

Tangent

Transition

Approach

Double Yellow Reflectorized Pavement Markings

(Paint or Removable Tape)

White Reflectorized Pavement Markings

(Paint or Removable Tape)

5' (Typ.) Through Transition & Approach

5' (Typ.) Through Tangent

100'

WORK AREA

USE OF RPMS TO SUPPLEMENT PAINT OR REMOVABLE TAPE IN WORK ZONES

1. RPM's shall be installed as a supplement to:

a. All lane lines.

b. Edge lines in transition & approach areas.

c. Edge lines of gore areas.

2. Placement of RPM's should be as shown in Index No. 17352 with the following exceptions:

RPM's shall be placed at 5 feet center to center in approach and transition areas. Class D markers be placed at a maximum spacing of 5 feet center to center.

RPM CLASS

APPLICATION FOR REFLECTIVE PAVEMENT MARKERS

A. Work Zone Applications Only, For Traffic And Nontraffic Areas.

B. Permanent Application In Traffic And Nontraffic Areas or Can Be Used In Work Zone Applications For Traffic And Nontraffic Areas.

C. Work Zone Application Only, For Traffic And Nontraffic Areas.

D. Temporary Work Zone Application Only, Not Exceeding Five (5) Continuous Days. For Traffic And Nontraffic Areas.

NOTES FOR REFLECTIVE PAVEMENT MARKERS

1. The color of the raised pavement marker under both day and night conditions shall conform to the color of the marking for which they serve as a positioning guide, or for which they supplement or substitute.

2. To provide contrast on concrete pavement, or light asphalt, the five (5) white RPM's shall be followed by five black RPM's. The spacing between RPM's shall be 2'-6". Black RPM's will not be required for contrast with yellow RPM's.

3. RPM's used to supplement lane lines are to be paid for as Reflective Pavement Marker (Temporary), EA. RPM's used as a temporary substitute for paint or removable tape due to weather restrictions are to be paid for as Reflective Pavement Marker (Temporary), EA. RPM's used as a temporary substitute for paint or removable tape due to equipment malfunction are to be placed at the Contractor's expense.

4. RPM's used for Class D markers be placed at a maximum spacing of 5 feet center to center.