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### 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.

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 improve 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 additions, as published by the U.S. Department of Transportation, Federal Highway Administration, 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.

### 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 are applicable to traffic control plans, unless otherwise identified in the plans, 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

### ABBREVIATIONS

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

- CFR: Code of Federal Regulations
- DTOR: District Traffic Operations Engineer
- FDOT: Florida Department Of Transportation
- HAQ: Highway Advisory Radio
- L: Taper Length, Buffer Length Or Taper Length Plus Buffer Space
- MAS: Motorist Awareness System
- MOT: Maintenance Of Traffic
- MOTC: Maintenance Of Traffic Committee
- MUTCD: Manual On Uniform Traffic Control Devices For Streets And Highways
- NCHRP: National Cooperative Highway Research Program
- PCMS: Portable Changeable (Variable) Message Sign
- PVS: Portable Regulatory Sign
- R: Radius
- RPW: Raised Pedestrian Worklight
- RSDU: Radar Speed Display Unit
- S: Posted Speed Of Off-Peak 85th Percentile Speed (MPH)
- SLED: Speed Law Enforcement Officer
- TTD: Temporary Traffic Control
- TCP: Traffic Control Plants
- TTC: Traffic Control Zones
- TMA: Truck Mounted Attenuator
- TVEP: Value Engineering Change Proposal
- W: Width Of Taper Transition In Feet, I.E., Laterally Offset

### GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

**Crash Cushion**
- Stop Bar
- Work Vehicle With Flashing Beacon
- Shadow (S) Or Advance Warning (AW) Vehicle
- Truck Mounted Attenuator (TMA)
- Orange Flag For TCZ Signs
- Type B Light For TCZ Signs
- Low Enforcement Officer
- Portable Regulatory Sign
- Radar Speed Display Unit
- Portable Changeable (Variable) Message Sign
- Lane Identification + Direction Of Traffic
DEFINITIONS

Regulatory Speed (In Work Zones)

The maximum permitted travel speed posted for the work zone is indicated by the regulatory speed limit signs. The work zone speed must be shown or noted in the plans. This speed should be used as the minimum design speed to determine runout lengths, duration rates, flow rates, lengths of clear zone widths, taper lengths, crash cushion length, and all other associated features.

Advisory Speed

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

Travel Way

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

Detour, Lane Shift, and Diversion

A detour is the redirection of traffic onto another roadway that bypasses the temporary traffic control zone. A lane shift is the redirection of traffic onto a temporary roadway, usually adjacent to the permanent roadway within the right-of-way.

Above Ground Hazard

Any object that could encroach the travel way and close the lane.

TEMPORARY TRAFFIC CONTROL DEVICES

All temporary traffic control devices shall be removed as soon as possible when they are no longer needed. Temporary traffic control devices that are no longer appropriate shall be removed or covered. Arrow Panels, Portable Changeable Message Signs, Radar Speed Display Trailers, Portable Regulatory Signs, and any other trailer mounted devices shall be delineated with retroreflective materials.

PEDESTRIAN AND BICYCLIST

When an existing pedestrian way or bicycle way is located within a work zone, accommodation must be maintained and provision for the disabled must be provided. Only approved temporary traffic control devices may be used to delineate a temporary traffic control zone pedestrian walkway.

Advanced notification of sidewalk closures and marked detours should be provided by appropriate signs.

RAILROADS

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

OVERHEAD WORK

Work is only allowed over a traffic lane when one of the following options is used.

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:

- Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.
- Work operations are 60 minutes or less.
- No equipment can encroach upon the travel way and 18 feet high.
- No equipment can encroach upon the travel way and clear zone or be shielded by a barrier or crash cushion.
- All temporary traffic control devices shall be delineated with retroreflective materials.
- Aerial lift equipment in the work area has high-intensity, rotating, oscillating and flashing lights operating.
- Volume of traffic and 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 an open traffic lane is allowed if all of the following conditions are met:

- Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.
- Work operations are 60 minutes or less.
- Speed limit is 45 mph or less.
- No equipment can encroach upon the travel way and clear zone or be shielded by a barrier or crash cushion.
- All temporary traffic control devices shall be delineated with retroreflective materials.
- Aerial lift equipment in the work area has high-intensity, rotating, oscillating and flashing lights operating.
- Volume of traffic and complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- Adequate preparations are taken to prevent the movement of vehicles, tools, equipment, and other objects from falling into open lanes of traffic.
- Other Governmental Agencies, Rail Facilities, or Codes may require supplementary controls.
- The greater clearance required prevails as the rule.

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:

- Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.
- Work operations are 60 minutes or less.
- Speed limit is 45 mph or less.
- No equipment can encroach upon the travel way and clear zone or be shielded by a barrier or crash cushion.
- All temporary traffic control devices shall be delineated with retroreflective materials.
- Aerial lift equipment in the work area has high-intensity, rotating, oscillating and flashing lights operating.
- Volume of traffic and complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- Adequate preparations are taken to prevent the movement of vehicles, tools, equipment, and other objects from falling into open lanes of traffic.
- Other Governmental Agencies, Rail Facilities, or Codes may require supplementary controls.
- The greater clearance required prevails as the rule.

OPTION 4 (OVERHEAD WORK USING A STANDARD LANE CLOSURE)

The lane below the overhead work is closed in accordance with the appropriate standard index drawing or detailed in the plans.

SIGHT DISTANCE

Tapers: Transition tapers should be provided to drivers. Under restricted sight distance conditions, a taper should be provided in accordance with the clearance of the obstruction. The beginning of tapers should not be located behind curvances.

INTERSECTIONS

Traffic control devices at intersections must provide an adequate sight distance for the road user to perceive potential conflicts and to traverse the intersection safely.

ABOVE GROUND HAZARD

Above ground hazards (see definitions) are to be considered work areas during working hours and to be cleared with appropriate work zone traffic control procedures. During nonworking hours, all objects, materials and equipment that constitute an above ground hazard must be stored or moved outside the travel way and clear zone or be shielded by a barrier or crash cushion.

CLEAR ZONE WIDTHS FOR WORK ZONES

The term 'clear zone' describes the unobstructed relatively flat area, impeded by construction, extending outward from the edge of the travel 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 be used in accordance with the clear zones as described in Volume 1, 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>WIDTHS</th>
</tr>
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<tbody>
<tr>
<td>(MPH)</td>
<td>(FEET)</td>
</tr>
<tr>
<td>60-70</td>
<td>30</td>
</tr>
<tr>
<td>45-50</td>
<td>18</td>
</tr>
<tr>
<td>30-40</td>
<td>14</td>
</tr>
<tr>
<td>ALL SPEEDS</td>
<td>4' BEHIND FACE</td>
</tr>
</tbody>
</table>

CURB & GUTTER OF CURB

SUPERELEVATION

Horizontal curves constructed in conjunction with work zone traffic control should have the required super-elevation applied to the design radius. Under conditions where normal cross slope controls curvature, the minimum radii that can be applied are listed in the table below.

<table>
<thead>
<tr>
<th>MINIMUM RADIUS FOR NORMAL CROSS SLOPES</th>
<th>SUPERELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(FT)</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.5%</td>
</tr>
<tr>
<td>200</td>
<td>0.5%</td>
</tr>
<tr>
<td>175</td>
<td>0.5%</td>
</tr>
<tr>
<td>150</td>
<td>0.5%</td>
</tr>
<tr>
<td>125</td>
<td>0.5%</td>
</tr>
<tr>
<td>100</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

MINIMUM RADIUS FOR NORMAL CROSS SLOPES

<table>
<thead>
<tr>
<th>(FT)</th>
<th>(FT)</th>
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<tbody>
<tr>
<td>250</td>
<td>0.5%</td>
</tr>
<tr>
<td>200</td>
<td>0.5%</td>
</tr>
<tr>
<td>175</td>
<td>0.5%</td>
</tr>
<tr>
<td>150</td>
<td>0.5%</td>
</tr>
<tr>
<td>125</td>
<td>0.5%</td>
</tr>
<tr>
<td>100</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Superelevation When Smaller Radii Used

GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES
OVERWEIGHT/OVERSIZE VEHICLES

Restrictions to lane widths, heights or load capacity can greatly impact the movement of over dimensioned loads. The Contractor shall notify the Engineer, who in turn shall notify the State Permits Office, phone no. (850) 410-5777, at least seven calendar days in advance of implementing a maintenance of traffic plan which will impact the flow of over load/oversized vehicles. Information provided shall include location, type of restriction (height, width or weight) and restriction time frames. When the roadway is restored to normal service the State Permits Office shall be notified immediately.

LANE WIDTHS

Lane widths of through roadways should be maintained through work zone travel ways wherever practical. The minimum widths for work zone travel lanes shall be as follows: 11' for Interstate with at least one 12' lane provided in each direction, unless formally expected by the Federal Highway Administration; 11' for freeways; and 10' for all other facilities.

LENGTH OF LANE CLOSURES

Lane closures shall not exceed 2 miles in total length (taper, buffer space and work space) in any given direction on the Interstate or on state highways with a posted speed of 55 MPH or greater.

TEMPORARY RAISED Rumble Strips

GENERAL NOTES

1. Temporary raised rumble strips shall be placed in advance of each flagging station when called for in the plans.

2. Temporary raised rumble strip sets are used to supplement a series of advance warning signs and shall be installed and removed when the signs are installed and removed.

3. Remove the temporary raised rumble strips prior to removing the advance warning signs.
HIGH-VISIBILITY SAFETY APPAREL

All high-visibility safety apparel shall meet the requirements of the International Safety Equipment Association (ISEA) and the American National Standards Institute (ANSI) for high-visibility safety apparel, and labeled as ANSI/ISEA 107-2004. The apparel background (outer) material color shall be either fluorescent yellow-green or an alternative color as defined by the standard. The retroreflective material shall be either orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a distance of 1000 feet. Class 3 apparel may be substituted for Class 2 apparel. Replace apparel that is not visible at 1000 feet.

WORKERS: All workers within the right-of-way shall wear ANSI/ISEA Class 2 apparel. Workers operating machinery or equipment in which loose clothing could become entangled during operation shall wear fitted high-visibility safety apparel. Worker’s inside the bucket of a bucket truck are not required to wear high-visibility safety apparel.

UTILITIES: When other industry apparel safety standards require utility workers to wear apparel that is inconsistent with FDOT requirements such as NFPA, OSHA, ANSI, etc., the standard for apparel may prevail.

FLAGGERS: For daytime activities, Flaggers shall wear ANSI/ISEA Class 2 apparel. For nighttime activities, Flaggers shall wear ANSI/ISEA Class 3 apparel.

FLAGGER CONTROL

Where Flaggers are used, a FLAGGER symbol or legend sign shall replace the WORKERS symbol or legend sign. The Flagger must be clearly visible to approaching traffic for a distance of at least 500’ to permit traffic to prepare to position the flagging instructions, and to permit traffic to reduce speed or stop as required before entering the work site. Flaggers shall be positioned to maintain maximum 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 have an octagonal shape on a rigid handle. STOP/SLOW paddles shall be at least 24 inches wide with letters at least 6 inches high and should be fabricated from high-visibility 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 night, the STOP/SLOW paddle shall be retroreflective.

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. Flag are to be used to a maximum 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, flags shall be retroreflective.

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 zone to stop before entering the work site. Flaggers shall be positioned such that the flagging instructions, and to permit traffic to reduce speed or stop as required before entering the work site. Flaggers shall be positioned to maintain maximum color contrast between the flagging instructions, and to permit traffic to reduce speed or stop as required before entering the work site. Flaggers shall be positioned to maintain maximum color contrast between the flagging instructions, and to permit traffic to reduce speed or stop as required before entering the work site.

REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCPs) for all projects shall include specific regulatory speeds for each phase of work. This can be either the posted speed or the regulatory 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 as to 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 go back into effect unless new speed limit signs are provided for in the plans.

On projects with interspaced work activities, speed reductions should be located in proximity to the activities which require the speed reduction, and not "blanketed" for the entire project. At the departure of such activities, the normal highway speed should be posted to give the motorists notice that normal speed can be resumed.

If the existing regulatory speed is to be used, consideration shall be given to supplementing the existing signs with other signs to provide notice to approaching traffic. For projects where the reduced speed conditions exist for greater than one (1) mile in rural areas (non-interstate) and on rural or urban Interstate, additional regulatory speed signs are to be placed at no more than 1 mile intervals. Engineering judgement should be used in placement of the additional signs. Location of signs beyond ramp entrances and beyond major intersections are examples of proper placement. For urban situations (non-interstate), additional speed signs are to be placed at 200’ intervals along the work zone.

When field conditions warrant speed reductions different from those shown in the TCP, the engineer may request the contractor to perform the project engineer to approve the changes, a signed and sealed letter to the District Traffic Engineering to justify the need for further reducing the posted speed, on the engineer may request the District Traffic Operations Engineer (DTOE) to investigate and make recommendations for the posted speed for work zones. The proposed speed shall be noted in the TCPs. Any advisory speed that is below the posted speed or a reduced speed shall be noted in the TCPs. All TCPs must include specific regulatory speeds for each phase of work. This can be either the posted speed or the regulatory 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.

The following provisions apply to Main Roadway Traffic Control Work Zones. These provisions shall be adjusted by the Party Chief to fit roadway and traffic conditions when the Work Zone Includes Intersections:

(A) A STAY IN YOUR LANE (MOT-1-04) sign shall be added to the Advance Warning Sign sequence as the second most immediate sign after the regulatory speed sign.

(B) Elevation Surveys—Cone must be used at the discretion of the Party Chief to protect prism holder and flagger(s). Cones, if used, may be placed at up to 50’ intervals along the work zone.

(C) Horizontal Control—With Traffic Flow in the same direction, cones shall be used to protect the backside of traffic control devices. Cones shall be placed at the work zone, and up to 50’ intervals along the work zone.

(D) Horizontal Control—With Traffic Flow in the opposite direction, cones shall be placed at the work zone, and up to 50’ intervals along the work zone.

Surveys shall be placed at the work zone, and up to 50’ intervals along the work zone.
SIGN PLACEMENT

Post-mounted signs installed at the side of the road shall be mounted at a height of at least 7 feet measured from the bottom of the sign to a horizontal line extended from the near edge of the pavement. Signs mounted on barricades, or other portable supports shall be no less than 1 foot above the traveled way.

SIGN MATERIALS

Mesh signs may be used only for Daylight Operations as noted in the standards. Type B & Orange Flags are not required except for survey work zones.

Vinyl signs may be used for Day or Night Operations not to exceed 1 day except as noted in the standards. Type B & Orange Flags are not required except for survey work zones.

INTERSECTING ROAD SIGNING

Signs or flagging required for the control of traffic entering and leaving work zones by way of intersecting highways, roads and streets shall be adequate to make drivers aware of work zone conditions. Under no condition shall intersecting leg signing be less than a ROAD WORK AHEAD sign.

ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING

Adjoining work zones may not have sufficient spacing for standard placement of signs and other traffic control devices in their advance warning areas or in cases other areas within their traffic control zones. Where such restraints 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 procedure applied:

(A) For scheduled projects the engineer in responsible 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 near work being performed in a work zone area shall be fully covered with a durable opaque street material.

Plastic film and woven fabrics including burlap will not be permitted. Reflective coverings will not be permitted. Covers, hinged panels and intermittent work stoppage shields and plaques are incidental to work operation signs and are not to be paid for separately.

SIGN COVERING AND INTERMITTENT WORK STOPPAGE SIGNING

Existing signs that conflict with temporary work zone signing shall be removed or covered as approved by the Engineer. Traffic control signs that require covers when no work is being performed in a work area shall be fully covered with a durable opaque street material.

Plastic film and woven fabrics including burlap will not be permitted. Reflective coverings will not be permitted. Covers, hinged panels and intermittent work stoppage shields and plaques are incidental to work operation signs and are not to be paid for separately.

SIGNING FOR DETOURS, LANE SHIFTS AND DIVERSIONS

Detours should be signed clearly over their entire length so that motorists can easily determine how to return to the original roadway. The reverse curve (W-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 when limited sight distance 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 roadway, but particularly 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 (W-7) sign may be used as an alternate to the ROAD WORK AHEAD or the ROAD WORK XX FT (WZ2) sign for utility operations on or adjacent to a highway.

LENGTH OF ROAD WORK SIGN

The length of road work sign (G20-2) bearing the legend ROAD WORK NEXT XX 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 begin construction points.

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT SIGN

The SPEEDING FINES DOUBLED WHEN WORKERS PRESENT sign shall be installed on all projects, but may be omitted if the work operation is less than 1 day. The sign 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.

END ROAD WORK SIGN

The END ROAD WORK sign (G20-2A) should be installed on all projects, but may be omitted where the work operation is less than 1 day. The sign should be placed approximately 500 feet beyond the end of a construction or maintenance project unless other 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.
GENERAL NOTES:
1. All signs shall be post mounted when work operations exceed one day except as noted in the standards.

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 (Manufacturers seeking QPL approval see Index 12860).
2. Provide 3 b/t ft Steel U Channel Posts with a minimum section modulus of 0.43 in⁴ for 60 ksi steel, or a minimum section modulus of 0.57 in⁴ for 70 ksi steel.
3. Provide 4 b/t ft Steel U Channel Posts with a minimum section modulus of 0.56 in⁴ for 60 ksi steel, or a minimum section modulus of 0.67 in⁴ for 70 ksi steel.
4. Steel U Channel Posts shall meet the material requirements of Specification 700, with the exception that galvanization is not required.
5. Sign attachment bolts, washers, nuts, and spacers shall conform with ASTM A307 or A325.
6. For diamond warning signs with supplemental plaque (up to 3 ft² in area), use 4 b/t ft posts for up to 10 ft Clear Height (measure to bottom of diamond warning sign).
7. Install 4 b/t ft Steel U Channel Posts with approved breakaway splice in accordance with the manufacturer's detail shown on the QPL.
8. The contractor may install 3 b/t ft Steel U Channel Posts with approved breakaway splice in accordance with the manufacturer's detail shown on the QPL.
9. Install all posts plumb.
10. The contractor shall set the posts in preformed holes to the specified depth with suitable backfill securely on all sides, or filled with flowable fiber glass bagged concrete. The cost of the flowable fiber glass bagged concrete shall be included in the cost of sign. At the contractor's option, 3 b/t ft sign post and any base post may be driven. (See Typical Foundation Details).

SIGN ATTACHMENT DETAIL

1' Min. 6" Min. Max. (Typ.) for 4" Post
2-3/16"Ø bolts, nuts & washers (Typ.)

Steel U Channel Posts
Mounting Height Min. 7'-0"
Bottom of Sign
Edge of Travelway Elevation

1' Min. 6" for 2'-6" Post Typ. for others

1'-6" for 36" Wide Signs

BARRIERS:

1. Provide 3 b/t ft posts for Clear Height up to 10' and 4 b/t ft posts for Clear Height up to 12'.
2. Minimum foundation depth is 4.5 ft for 3 b/t ft posts and 5 ft for 4 b/t ft posts.
3. Provide 4 b/t ft posts for Clear Height up to 12' and 5 b/t ft posts for Clear Height up to 14'.

NOTES:
1. Use 3 b/t ft posts for Clear Height up to 10' and 4 b/t ft posts for Clear Height up to 12'.
2. Minimum foundation depth is 4.5 ft for 3 b/t ft posts and 5 ft for 4 b/t ft posts.
MANHOLES/CROSSWALKS/JOINTS

Manholes extending 1' or more above the travel lane and crosswalks having an uneven surface greater than 2" 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, LS.

TRUCK-MOUNTED ATTENUATORS

Truck-mounted attenuators (TMA) can be used for moving operations and short-term stationary operations. For moving operations, see Index Nos. 60A and 60B. For short-term, stationary operations, see Part II of the MUTCD.

REMOVING PAVEMENT MARKINGS

Existing pavement markings that conflict with temporary work zone delineation shall be removed by any method approved by the Engineer, where operations exceed one daylight period; however, painting over existing pavement markings will not be permitted. Full pavement width overlays of either a structural or friction course are a positive means to achieve obliteration.

Existing traffic signal operations that require modification in order to carry out work zone traffic control shall be included in the TCP and be approved by the District Traffic Operations Engineer.

Maintain all existing addition or traffic responsive mode signal operations for main and side street movements for the duration of the Contract and require restoration of any loss of detection within 24 hours. The contractor shall select only detection technology listed on the Department's Approved Products List (APL) and approved by the Engineer to restore detection capabilities. The plans should identify the intersections where Temporary Traffic Detection is required.

CHANNELIZING AND LIGHTING DEVICES

Channelizing and lighting devices for work zone traffic control shall be as prescribed in Part II of the MUTCD, subject to supplemental revisions provided in the contract documents. Primary work zone traffic control devices are shown on Sheet 8 for the purpose of ready identification. Approved devices are listed on the Department's Qualified Product List.

Channelizing and Lighting Device Consistency

Barricades, 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 Section 6F-7B of the MUTCD except for the application limitations stipulated below:

- **Flashing**
  - Type A Low Intensity Flashing Warning Lights are to be mounted on barricades, drums, vertical panels or advance warning signs (except as noted below) and are intended to continuously warn drivers that they are approaching or proceeding in a hazardous area. Flashing lights shall be used to delineate the intended path of travel, and not placed with spacings that will form a continuous line to the driver's eye. The Type A light will be used to mark obstructions that are located adjacent to or in the intended travel way. Type A lights shall be mounted with the first advance warning sign and the second such sign when used.

- For post-mounted signs, Type B High Intensity Flashing Warning Lights shall be mounted on the first advance 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.

- **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 travel 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.

- For post-mounted signs, Type B High Intensity Flashing Warning Lights shall be mounted on the first advance 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.

- **STANDARD ORANGE FLAG**
  - For post-mounted sign 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 flag shall be mounted on the channel post or on the upper edge of the sign furthest from traffic.

PORTABLE CHANGEABLE (VARIABLE) MESSAGE SIGNS (PCMS)

- The PCMS can be used for:
  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.

- If PCMS are to be used at night, the intensity of the Flashers shall be reduced during darkness when lower intensities are desirable.

For additional information refer to the FDOT Plans Preparation Manual, Volume I, Chapter 10.

ADVANCE WARNING ARROW PANELS

An arrow panel in the arrow or chevron mode shall be used only for stationary or moving lane closures on multilane 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 panel shall be used only in the caution mode.

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

When Advance Warning Arrow Panels are used at night, the intensity of the Flashers shall be reduced during darkness when lower intensities are desirable.

- **ADVANCE WARNING ARROW PANELS**
  - **CAUTION**

- **INDEX NO.**

- **SHEET NO.**

- **2023 FDOT Design Standards**
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 ≥ 5", 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:

<table>
<thead>
<tr>
<th>Index No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>Temporary guardrail and end anchorage</td>
</tr>
<tr>
<td>412</td>
<td>Temporary low profile barrier</td>
</tr>
<tr>
<td>414</td>
<td>Type K temporary concrete barrier</td>
</tr>
<tr>
<td>415</td>
<td>Temporary concrete barrier</td>
</tr>
<tr>
<td>417</td>
<td>For temporary water filled barriers see the QPL</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Table I Device Spacing</th>
<th>Speed (mph)</th>
<th>Cone or Tubular Markers Type of Type K Baricade or Vertical</th>
<th>Taper</th>
<th>Tangent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
<td>25</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>30 to 45</td>
<td>25</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>50 to 70</td>
<td>25</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

DROP-OFF PROTECTION REQUIREMENTS

<table>
<thead>
<tr>
<th>X (ft.)</th>
<th>D (in.)</th>
<th>Device Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-CZ</td>
<td>&gt; D</td>
<td>Barrier</td>
</tr>
<tr>
<td>12-CZ</td>
<td>&gt; D x 5</td>
<td>Warning Device</td>
</tr>
<tr>
<td>0-CZ</td>
<td>&gt; 5</td>
<td>Barrier</td>
</tr>
</tbody>
</table>

For Clear Zone widths, see Index No. 600 sheet 2.

DROP-OFFS IN WORK ZONES

TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING

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 W-8 sign with "UNEVEN LANES" is required at intervals of ≥ mile maximum.

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

4. Treatment allowed only when D is > 3".

5. If the slope is steeper than 1:4 (not to be steeper than 1:1), the W-8, R-1, and W-8-0404 signs shall be used as a supplement to the W-8; this condition should never exceed 3 miles in length.

SHOULDER TREATMENT

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, LS. Use of shoulder treatment in lieu of a barrier is not eligible for VECP consideration.
1. Sign height shall be 7' minimum. Sign offset from edge of travel way should be between 6' and 10' and relatively consistent through the project phase.

2. Signs should show specific business names. Logos may be provided by business owners. BUSINESS ENTRANCE sign in accordance with Index 17355 may be used when approved by the Engineer.

3. Place one business sign for each driveway entrance affected. When several businesses share a common driveway entrance, place one sign per common driveway entrance.

4. Channelizing devices should be placed at a reduced spacing on each side of the driveway entrance as to not to interfere with providing sigh distances for the driveway user.

**PLACEMENT OF BUSINESS ENTRANCE SIGNS AND CHANNELIZING DEVICES AT BUSINESS ENTRANCE**

**TEMPORARY ASPHALT SEPARATOR**

1. The tubular marker is to be made of a flexible material or have a flexible joint at the base such that it will not cause damage to vehicles upon impact and will return to its original shape after being struck by a 5000 lb. vehicle at a velocity of 75 ft./sec.

2. The tubular marker shall be orange with two white retroreflective bands.

3. The tubular marker may be attached by bituminous adhesive or other methods approved by the Engineer.

4. Reflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night.

5. 12" openings for drainage will be constructed in the separator island every 25' in areas with grades of 1% or less or every 50' in areas with grades over 1% as directed by the Engineer.

6. Two-Way Traffic sign(s) shall be repeated every 1/4 mile in each direction, throughout the limits where the temporary traffic separator is used.

7. The Contractor has the option of using temporary traffic separators and tubular type warning devices from the qualified products list in lieu of the temporary asphalt separator and tubular warning device detailed on this sheet.

8. Temporary traffic separator shall be paid for under the contract unit price for Maintenance of Traffic, LS, and will include all materials and work necessary to construct, maintain, and remove the temporary traffic separator. Any damage to existing pavement caused by the removal of temporary traffic separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.
1. Only approved traffic control devices included on the Qualified Products List (QPL) may be used.

2. The FDOT approval number shall be engraved on the device at a convenient and readily visible location. Where engraving is not practical a water-resistant type label may be used.

3. 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.

4. 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. Signs used in conjunction with Type III Barricades may be mounted on or above the barricade. These signs should not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails.

5. During hours of darkness, warning lights shall be used on drums, vertical panels, Type I, Type II, Type III and direction indicator barricades in accordance with "Warning Lights" in Index No. 620.

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

7. The direction indicator barricades may be used in tapers 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.

8. The splicing of sheeting is not permitted on either channelizing devices or WOT signs.

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

10. 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.

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES
APPLICATION FOR REFLECTIVE PAVEMENT MARKERS

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.

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. J352 with the following exceptions:
   a) All lane lines.
   b) Edge lines in transition & approach areas.
   c) Edge lines of gore areas.
   d) Placement of RPM's shall be placed at 5 feet center to center in approach and transition areas.
   e) Class D markers be placed at a maximum spacing of 5 feet center to center.

PLACEMENT OF PAVEMENT MARKINGS