

PREFACE - APPENDIX C

This Appendix C contains certain Indexes from the Department's 2006 Design Standards for Design, Construction, Maintenance, and Utility Operations on the State Highway System that apply to the vast majority of the Maintenance of Traffic situations encountered by the regulated utility industry. Maintenance of traffic for utilities under other situations may fall outside of the typical applications contained in this Appendix C, and has not been specifically addressed by Department rule. If a situation is encountered by the utility that is not covered by any indexes contained in this Appendix C, then the applicable index from the remaining 2006 Design Standards for Design, Construction, Maintenance, and Utility Operations on the State Highway System Series 600 indexes shall be referenced to determine their suitability for application to the particular situation. These standards may be found on the FDOT's web site at <http://www.dot.state.fl.us/rddesign/Design%20Standards/Standards.htm>. If it is determined that the remaining indexes are not applicable to the particular situation, then generally accepted engineering practices will be applied.

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APPENDIX C

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SHEET NO.	CONTENTS	PREFACE	SYMBOLS
1	Preface Manual On Uniform Traffic Control Devices Abbreviations Symbols	<p>PREFACE</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES</p> <p>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.</p> <p>ABBREVIATIONS</p> <p>Abbreviations assigned to the 600 series Design Standards and applicable to traffic control plans, unless otherwise identified in the plans, are as follows:</p> <p>CFR Code of Federal Regulations DTOE District Traffic Operations Engineer FDOT Florida Department Of Transportation HAR 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 PRS Portable Regulatory Sign R Radius RPM Raised Retroreflective Pavement Marker RSDU Radar Speed Display Unit S Posted Speed Of Off-Peak 85 Percentile Speed (MPH) SLEO Speed and Law Enforcement Officer TTC Temporary Traffic Control TCP Traffic Control Plan(s) TCZ Traffic Control Zones TMA Truck Mounted Attenuator VECP Value Engineering Change Proposal W Width Of Taper Transition In Feet i.e., Lateral Offset</p>	<p>SYMBOLS</p> <p>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:</p> <p> Work Area, Hazard Or Work Phase (Any pattern within a boundary)</p> <p> Sign With 18" x 18" (Min.) Orange Flag And Type B Light</p> <ul style="list-style-type: none"> ■ Channelizing Device □ Type I Or Type II Barricade Or Vertical Panel Or Drum ▩ Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only) ▩ Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). ○ Type I Or Type II Barricade Or Vertical Panel Or Cone Or Tubular Marker Or Drum ● Cone Or Tubular Marker ■ Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum ▩ Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light) ▩ Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Steady Burning Light) ▩ Type III Barricade ▩ Type III Barricade (With Flashing Light) ▩ Type III Barricade (With Steady Burning Light) ▩ Work Zone Sign □ Flagger ■ Traffic Signal ➔ Advance Warning Arrow Panel ▩ Portable Signal ▩ Crash Cushion ▩ Stop Bar ▩ Work Vehicle With Flashing Beacon ▩ Shadow (S) Or Advance Warning (AW) Vehicle With Advance Warning Arrow Panel And Warning Sign ▩ Truck Mounted Attenuator (TMA) ◇ Orange Flag For TCZ Signs ○ Type B Light For TCZ Signs ▩ Law Enforcement Officer ▩ Portable Regulatory Sign ▩ Radar Speed Display Unit ▩ Portable Changeable (Variable) Message Sign ➔ Lane Identification + Direction Of Traffic
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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, departure rates, flare rates, 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.

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 onto 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 doesn't meet breakaway requirements.

TEMPORARY TRAFFIC CONTROL DEVICES

All temporary traffic control devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, 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 NCHRP 350 Category 4 devices shall be delineated with retroreflective TTC devices 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.

PEDESTRIAN AND BICYCLIST

When an existing pedestrian way or bicycle way is located within a traffic control 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 shall be provided by appropriate signs.

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.

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 in a signalized intersection and limited to signals, signs, lighting and utilities.
- Work operations are 60 minutes or less.
- Speed limit is 45 mph or less.
- Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- Aerial lift equipment is placed directly below the work area to close the lane.
- Traffic control devices are placed in advance of the vehicle/equipment closing the lane using a minimum 100 foot taper.
- 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:

- 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 encroachment by any part of the work activities and equipment within an area bounded by 2 feet outside the edge of travel way and 18 feet high.
- Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- Adequate precautions are taken to prevent parts, tools, equipment and other objects from falling into open lanes of traffic.
- Other Governmental Agencies, Rail facilities, or Codes may require a greater clearance. The greater clearance required prevails as the rule.

OPTION 3 (OVERHEAD WORK USING A STANDARD LANE CLOSURE)

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

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 overweight/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 in any given direction on the Interstate or on state highways with a posted speed of 55 MPH or greater.

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 view 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.

ABOVE GROUND HAZARD

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

For above ground hazards within a work zone the clear zone required should 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 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 conform with the distances to canals as described in Volume I Chapter 4, Sec 4.2 and Exhibit 4-A and 4-B of the Plans Preparation Manual.

CLEAR ZONE WIDTHS FOR WORK ZONES	
WORK ZONE SPEED (MPH)	WIDTHS (feet)
60-70	30
55	24
45-50	18
30-40	14
ALL SPEEDS CURB & GUTTER	4' BEHIND FACE OF CURB

SUPERELEVATION

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

MINIMUM RADII FOR NORMAL CROSS SLOPES	
DESIGN SPEED	MINIMUM RADIUS
MPH	feet
65	3130
60	2400
55	1840
50	1390
45	1080
40	820
35	610
30	430
Superelevate When Smaller Radii Used	



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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 107-1999 or ANSI/ISEA 107-2004. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow-green 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 minimum distance of 1,000 feet. Class 3 apparel may be substituted for Class 2 apparel. Replace apparel that is not visible at 1,000 feet.

WORKERS: All workers within 15 feet of the edge of travel 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.

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 other standards 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 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 site. 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 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 light semi-rigid 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 nighttime, flags shall be retroreflectorized red.

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 nighttime, the flagger station shall be illuminated.

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 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 signing is provided for in the plans.

On projects with inter spaced work activities, speed reductions should be located in proximity to those activities which merit a reduced speed, and not "blanketed" for the entire project. At the departure of such activities, the normal highway speed should be posted to give the motorist notice that normal speed can be resumed.

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 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. Locating these 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 a maximum of 1000' 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 F.S. 316.0745(2) (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 Roadway Plans Preparation Manual, Volume I, Chapter 10.

SURVEY WORK ZONES

The SURVEY CREW AHEAD symbol or legend sign shall be the principal Advance Warning Sign used for Traffic Control Through Survey Work Zones and may replace the ROAD WORK AHEAD sign when lane closures occur, at the discretion of the Party Chief. Type B Light or dual orange flags shall be used at all times to enhance the SURVEY CREW AHEAD sign, even with mesh signs.

When Traffic Control Through Work Zones is being used for survey purposes only, the END ROAD WORK sign as called for on certain 600 Series Indexes should be omitted.

Survey Between Active Traffic Lanes or Shared Left Turn Lanes

The following provisions apply to Main Roadway Traffic Control Work Zones. These provisions must be adjusted by the Party Chief to fit roadway and traffic conditions when the Survey 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 from the work area.
- (B) Elevation Surveys-Cones may 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 break line throughout the work zone.
- (C) Horizontal Control-With traffic flow in the same direction, cones shall be used to protect the backsight tripod and/or instrument. Cones shall be placed at the equipment, and up to 50' intervals for at least 200' towards the flow of traffic.
- (D) Horizontal Control-With traffic flow in opposite directions, cones shall be used to protect the backsight tripod and/or instrument. Cones shall be placed at the equipment, and up to 50' intervals for at least 200' in both directions towards the flow of traffic.



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SIGN PLACEMENT

Post-mounted signs installed at the side of the road shall be mounted at a height 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.

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 some 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 in progress 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 works; between routine maintenance work, unscheduled work and/or permitted work; and, between unit controlled maintenance works and highway construction projects.

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 sheet material.

Plastic film and woven fabrics including burlap will not be permitted. Covering of only the legend or symbol will not be permitted. Reflective coverings will not be permitted. Hinged signs designed to cover when folded will 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 MATERIALS

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

WORK ZONE SIGN SUPPORTS

All signs shall be post mounted when work operations exceed 1 day except as noted in the standards.

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).

All post mounted Work Zone signs shall be installed on either round aluminum or steel channel post as specified in the table below.

SUPPORTS FOR MAINTENANCE OF TRAFFIC SIGNS					
SIGN SIZE	SIGN BRACKET	ROUND ALUMINUM	DEPTH IN GROUND	STEEL CHANNEL	DEPTH IN GROUND
24" x 36"	2-I	NPS 2.0" x 1/8"	2'-0"	2.5 lb F/M*	3'-0"
48" x 48" DIAMOND	2-I & 1-II	NPS 3.5" x 3/16"	3'-4"	**	3'-0"
60" x 48"	3-I	NPS 3.5" x 3/16"	3'-4"	**	3'-0"
24" x 30"	2-I	NPS 2.0" x 1/8"	2'-0"	2.5 lb F/M*	3'-0"
48" x 48"	2-II	NPS 3.0" x 1/8"	2'-6"	**	3'-0"
60" x 24"	3-I	NPS 3.0" x 1/8"	2'-6"	3.0 lb F/M*	3'-0"
60" x 36"	3-I	NPS 3.5" x 3/16"	3'-4"	4.0 lb F/M*	3'-0"

* F/M Indicates Type F or Type M
 ** Requires two 3 lb/ft steel channel (F/M) at 2'-6" center to center. All sign brackets shall be Type I. The total number of brackets shall be per post as tabulated, except the "Diamond" sign which shall use two Type I brackets per post.
 The 4 lb/ft steel channel shall be installed with approved breakaway bases. Refer to Index No. 11860, Sheet 3, for round aluminum sign bracket details, and Index No. 11865, Sheet 2, for steel channel breakaway bases, and notes.

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 (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 when limited sight distance or the nature of the obstruction may require a motorist to bring their vehicle to a stop. Extended distance Advanced Warning Signs may be required on any type roadway, but particularly be considered on multi-lane divided highways where vehicle speed is generally in the higher range (45 MPH or more).

INTERSECTING ROAD SIGNING

Signing 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 will intersecting leg signing be less than a ROAD WORK AHEAD sign.

UTILITY WORK AHEAD SIGN

The UTILITY WORK AHEAD (W21-7) sign may be used as an alternate to the ROAD WORK AHEAD or the ROAD WORK XX FT (W20-1) sign for utility operations on or adjacent to a highway.

LENGTH OF ROAD WORK SIGN

The length of road work sign (G20-1) 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 begin construction 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 ft 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' 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.

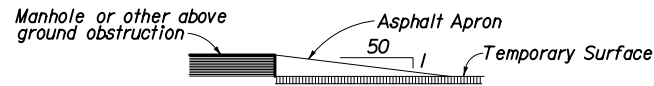
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MANHOLES/CROSSWALKS/JOINTS

Manholes extending 1" or more above the travel lane and crosswalks having an uneven surface greater than 1/4" shall have a temporary asphalt apron constructed as shown in the diagram below.

All transverse joints that have any difference in elevation 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. 607 and 619. For short-term, stationary operations, see Part VI 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.

SIGNALS

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 actuated 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 12 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 VI 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-78 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 continually warn drivers that they are approaching or proceeding in a hazardous area. Flashing lights shall not be used to delineate the intended path of travel, and not placed with spacings that will form a continuous line to the drivers 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 not be used in conjunction with the first advance warning sign nor the second such sign when used.

For post-mounted signs, Type B High Intensity Flashing Warning Lights 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.

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 traveled 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 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 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.

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 Roadway Plans Preparation Manual, Volume I, Chapter 10.

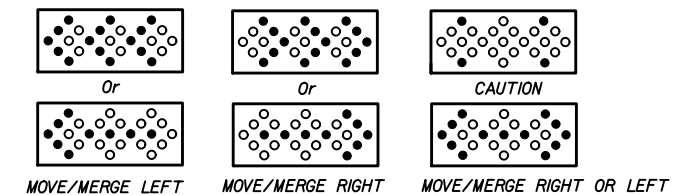
ADVANCE WARNING ARROW PANELS

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



- Minimum Required Lamps
- Additional Lamps Allowed

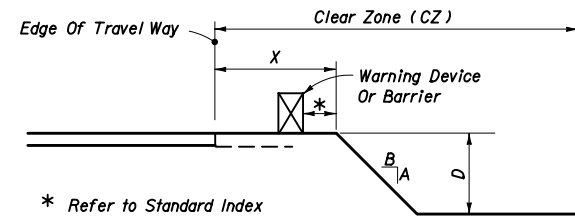
MODES

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	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES		Index No. 600

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DROPOFF CONDITION NOTES

1. A dropoff 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 dropoffs 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 dropoff 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.



* Refer to Standard Index drawing of selected barrier for required deflection space.

DROPOFF PROTECTION REQUIREMENTS ALL SPEEDS NO CURB AND GUTTER		
X (ft)	D (in)	Device Required
0-CZ	≤ 3	Sign W8-9A
0-l2	> 3	Barrier
l2-CZ	> 3 to ≤ 5	Warning Device
0-CZ	> 5	Barrier

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

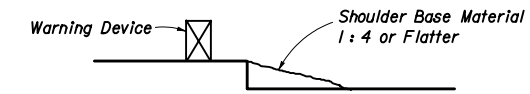
DROPOFF NOTES

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
400	Temporary guardrail and end anchorage
412	Temporary low profile barrier
414	Type K temporary concrete barrier
415	Temporary concrete barrier
416	Temporary water filled barrier
4. Warning device spacing shall be as shown in Table I.

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100

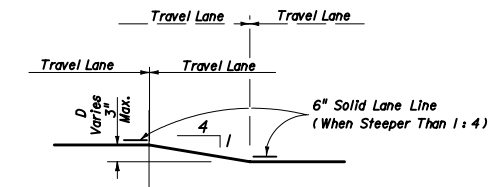
SHOULDER TREATMENT



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, LS. Use of shoulder treatment in lieu of a barrier is not eligible for VECP 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-II sign with "UNEVEN LANES" is required at intervals of $\frac{1}{2}$ mile maximum.
3. If D is $1\frac{1}{2}"$ or less, no treatment is required.
4. Treatment allowed only when D is 3" or less.
5. If the slope is steeper than 1:4 (not to be steeper than 1:1), the R4-1 and MOT-1-04 signs shall be used as a supplement to the W8-II; this condition should never exceed 3 miles in length.

DROPOFFS IN WORK ZONES

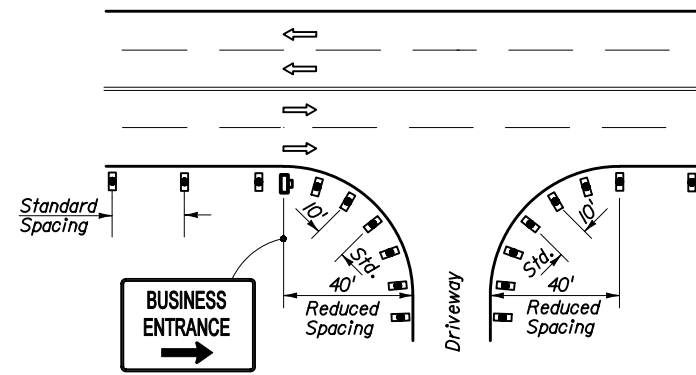


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GENERAL INFORMATION FOR TRAFFIC
CONTROL THROUGH WORK ZONES

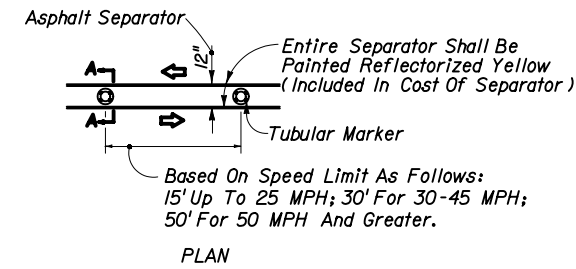
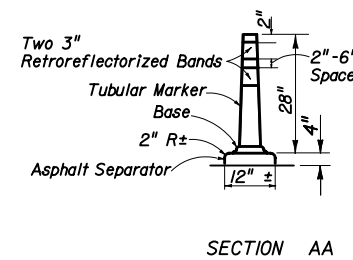
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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS



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 sight distances for the driveway user.

PLACEMENT OF BUSINESS ENTRANCE SIGNS AND CHANNELIZING DEVICES AT BUSINESS ENTRANCE



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.

TEMPORARY ASPHALT SEPARATOR

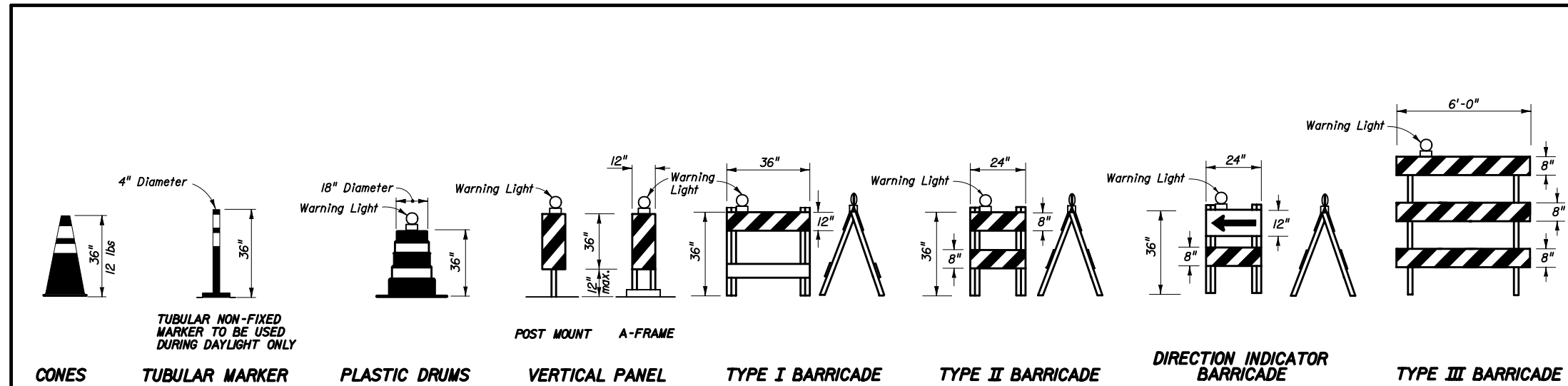


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GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

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CHANNELIZING AND LIGHTING DEVICE NOTES

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. 600.
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 barricade 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 MOT signs.
9. For rails less than 3'-0" long, 4" stripes shall be used.
10. Cones shall:
 1. Be used only in active work zones where workers are present.
 2. Not exceed 2 miles in length of use at any one time.
 3. Have as a minimum, one designated person for the purpose of continuous monitoring and maintenance of cones during lane closures.
 4. Be reflectorized as per the MUTCD with Department approved reflective collars when used at night.

IDENTIFICATIONS - CHANNELIZING AND LIGHTING DEVICES

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EXIT OPEN E5-2 B/O

EXIT CLOSED E5-2a B/O

ROAD WORK NEXT X MILES G20 1 B/O

END ROAD WORK G20 2A B/O

PILOT CAR FOLLOW ME G20 4 B/O

DETOUR M4 8 B/O

END DETOUR M4 8A B/O

DETOUR M4 9L B/O

DETOUR M4 9R B/O

DETOUR M4 10L B/O

DETOUR M4 10R B/O

STOP OM 3R B/Y

YIELD RI 1 W/R

YIELD RI 2 RW/R

SPEED LIMIT XX R2 1 B/W

DO NOT PASS R4 1 B/W

PASS WITH CARE R4 2 B/W

TRUCKS USE CENTER LANE R4 5 B/W

KEEP RIGHT R4 7 B/W

KEEP LEFT R4 8 B/W

KEEP RIGHT R4 7AL B/W

KEEP LEFT R4 7AR B/W

KEEP LEFT R4 7BL B/W

KEEP RIGHT R4 7BR B/W

DO NOT ENTER R5 1 WR/W

PEDESTRIAN CROSSWALK R9-8 B/W

SIDEWALK CLOSED R9-9 B/W

SIDEWALK CLOSED USE OTHER SIDE R9-10 B/W

SIDEWALK CLOSED AHEAD CROSS HERE R9-11 B/W

SIDEWALK CLOSED CROSS HERE R9-11a B/W

ROAD CLOSED R11 2 B/W

LANE AHEAD W1 1R B/O

LANE AHEAD W1 2R B/O

LANE AHEAD W1 3R B/O

LANE AHEAD W1 4R B/O

LANE AHEAD W1 4b B/O

LANE AHEAD W1 4c B/O

LANE AHEAD W1 6 B/O

LANE AHEAD W1 7 B/O

LANE AHEAD W1 8 B/O

LANE AHEAD W3 1A B/O

LANE ENDS W3 2A B/O

LANE ENDS W3 3 B (RYG 1/O)

LANE ENDS W3-5 B/O

LANE ENDS MERGE LEFT W4 1 B/O

LANE ENDS MERGE RIGHT W4 2 B/O

ROAD NARROWS W5 1 B/O

NARROW BRIDGE W5 2 B/O

ONE LANE BRIDGE W5 3 B/O

LANE ENDS MERGE LEFT W6 1 B/O

LANE ENDS MERGE RIGHT W6 2 B/O

LANE ENDS MERGE W6 3 B/O

BUMP W8 1 B/O

DIP W8 2 B/O

PAVEMENT ENDS W8 3 B/O

SOFT SHOULDER W8 4 B/O

TRUCK CROSSING W8 5 B/O

LOOSE GRAVEL W8 6 B/O

ROUGH ROAD W8 7 B/O

LOW SHOULDER W8 8 B/O

SHOULDER DROP OFF W8 9 B/O

UNEVEN LANES W8 9a B/O

UNEVEN LANES W8 11 B/O

LEFT LANE ENDS W9 1L B/O

RIGHT LANE ENDS W9 1R B/O

LANE ENDS MERGE LEFT W9 2L B/O

LANE ENDS MERGE RIGHT W9 2R B/O

NO LEFT TURN W10 1 B/Y

PEDESTRIAN W11 2 B/O

LANE ENDS MERGE LEFT W12 1 B/O

LANE ENDS MERGE RIGHT W12 2 B/O

ROAD WORK 500 FT W13 1 B/O

ROAD WORK 1000 FT W20 1A B/O

ROAD WORK 1500 FT W20 1B B/O

ROAD WORK 1500 FT W20 1C B/O

ROAD WORK 1 MILE W20 1D B/O

ROAD WORK 1 MILE W20 1E B/O

ROAD WORK AHEAD W20 1F B/O

DETOUR AHEAD W20 2A B/O

DETOUR 500 FT W20 2B B/O

DETOUR 1000 FT W20 2C B/O

DETOUR 1500 FT W20 2D B/O

DETOUR 1 MILE W20 2E B/O

ROAD CLOSED W20 3 B/O

ONE LANE ROAD W20 4 B/O

LEFT TWO LANES CLOSED AHEAD W20-5a B/O

LEFT LANE CLOSED W20 5L B/O

RIGHT LANE CLOSED W20 5R B/O

CENTER LANE CLOSED W20 5C B/O

FLAGGER W20 7 B/O

WORKERS W20 7A B/O

WORKERS W21 1 B/O

SHOULDER WORK W21 1A B/O

SHOULDER WORK W21 5 B/O

RIGHT SHOULDER CLOSED W21 5a B/O

500 FEET W20 7X B/O

LANE ENDS MERGE LEFT W21 6 B/O

UTILITY WORK AHEAD W21-7 B/O

BLASTING ZONE 1000 FT W22 1 B/O

TURN OFF 2-WAY RADIO AND CELL PHONE W22 2 B/O

END BLASTING ZONE W22 3 B/O

STAY IN YOUR LANE MOT-1-04 B/O

LITTER PICK UP AHEAD MOT-4-04 B/O

TRUCKS ENTERING HIGHWAY MOT-5-04 B/O

TRUCKS TURNING LEFT ODD FT MOT-6-04 B/O

MERGE RIGHT ON FLASHING ARROW MOT-7-04 B/O

LIGHTED SOLE ZONE AHEAD MOT-8-04 B/O

STATE PRISONERS WORKING MOT-9-04 B/O

BUSINESS ENTRANCE MOT-10-04 B/O

PEDESTRIAN WALKWAY MOT-11-04 BLUE/W

PEDESTRIAN WALKWAY MOT-12-04R B/W

PEDESTRIAN WALKWAY MOT-12-04L B/W

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT MOT-13-04 B/O

SPEEDING FINES DOUBLED WHEN WORKERS PRESENT MOT-14-04 B/O

GROOVED PAVEMENT AHEAD MOT-15-06 B/O

Slow Down My Daddy Works Here MOT-16-06 B/O

Slow Down My Mommy Works Here MOT-17-06 B/O

Notes:

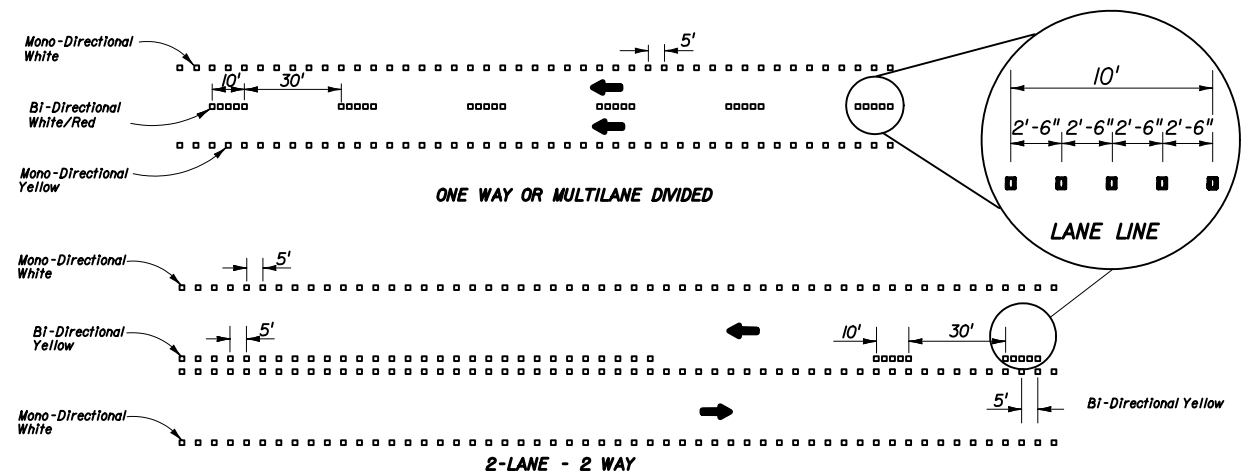
- The size of diamond shaped TTC warning signs shall be a minimum of 48" X 48".
- Fluorescent orange shall be used for all orange colored work zone signs.
- When standard orange flags or flashing warning lights are used in conjunction with signs, they shall not block the sign face.
- The sign shields, symbols and messages contained on this sheet are provided for ready reference to those signs used in the development of the 600 series Design Standards and are commonly used in the development of traffic control plans. For additional signs and sign detail information refer to the STANDARD HIGHWAY SIGNS MANUAL as specified in the MUTCD. Special signs for traffic control plans will be as approved by the State Traffic Plans Engineer. The sign codes shown on this sheet are for the purpose of identifying cell names found in the Traffic Control Cell Library (TCZ.Cel). The STANDARD HIGHWAY SIGNS MANUAL should be referenced for the official sign codes for use in the development of traffic control plans. See Index No. 17355 for MOT sign details.

COLOR CODES
Legend and/or Symbol / Background

O-Orange (Reflectorized) R-Red (Reflectorized)
B-Black (Non-Reflectorized) Y-Yellow (Reflectorized)
W-White (Reflectorized) G-Green (Reflectorized)

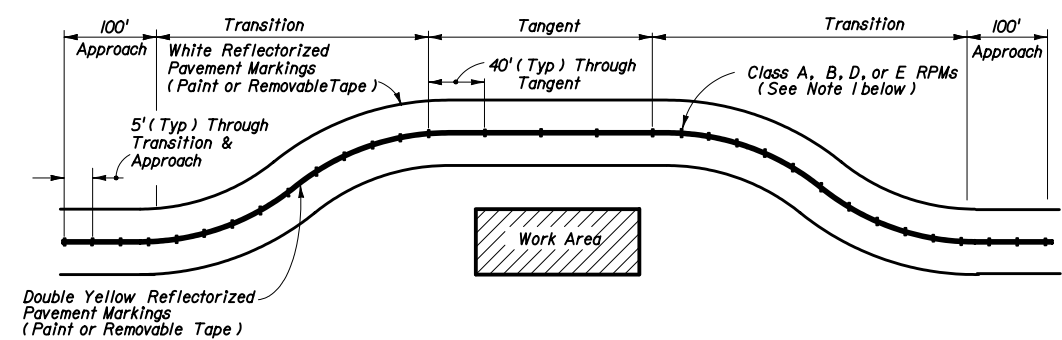
COMMONLY USED WARNING AND REGULATORY SIGNS IN WORK ZONES

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USE OF RPMS IN LIEU OF PAINT OR REMOVABLE TAPE IN WORK ZONES

- In all transition areas paint or removable tape shall be used in addition to RPMS.
- The color of the RPM body and the reflective face shall conform to the color of the marking for which they substitute.
- In work zones, CLASS A, B or D RPMS may be used to form lane lines, edge lines and temporary gore areas, in lieu of paint or removable tape at the spacing shown above. Where the RPMS will be used for five (5) days or less, CLASS E RPMS may be used to form lane or edge lines.



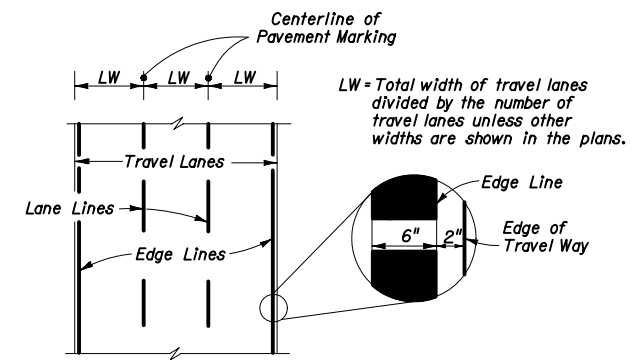
USE OF RPMS TO SUPPLEMENT PAINT OR REMOVABLE TAPE IN WORK ZONES

- RPMS shall be installed as a supplement to all lane lines and the edge lines of gore areas during construction. Placement of RPMS should be as shown in Index No. 17352 with the following exceptions:
RPMS 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	Permanent Applications In Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
B	Permanent Application In Traffic And Non-Traffic Areas Or Can Be Used In Work Zone Applications For Traffic And Non-Traffic Areas.
D	Work Zone Application Only, For Traffic And Non-Traffic Areas.
E	Temporary Work Zone Application Only, Not Exceeding Five (5) Continuous Days, For Traffic And Non-Traffic Areas.

NOTES FOR REFLECTIVE PAVEMENT MARKERS

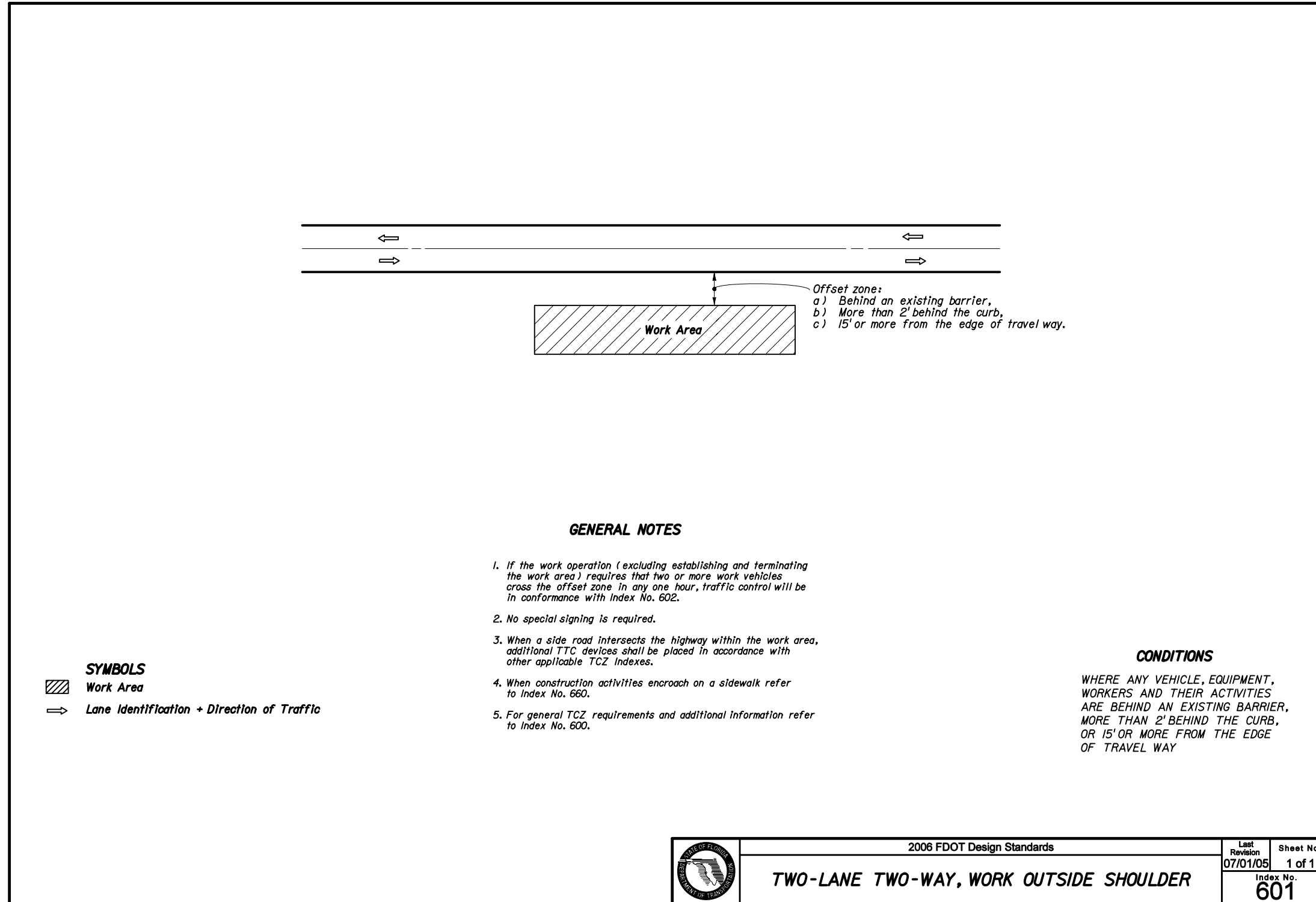
- The color of the raised pavement marker under both day and night conditions shall conform to the color of the marking for which they serve as a positioning guide, or for which they supplement or substitute.
- To provide contrast on concrete pavement, or light asphalt, the five (5) white RPMS shall be followed by five black RPMS. The spacing between RPMS shall be 2'-6". Black RPMS will not be required for contrast with yellow RPMS.
- It shall be the contractors responsibility to replace damaged or missing RPMS.
- RPMS used to supplement lane lines are to be paid for as Reflective Pavement Marker (Temporary), EA. RPMS used in lieu of paint or removable tape are to be paid for as Reflective Pavement Marker (Temporary), EA.



PLACEMENT OF PAVEMENT MARKINGS

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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS

**Table I
Device Spacing**

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100

**Table II
Taper Length - Shoulder**

Speed (mph)	1/3 L (ft)			Notes
	8' Shldr.	10' Shldr.	12' Shldr.	
25	28	35	42	L = WS ² / 60
30	40	50	60	
35	55	68	82	
40	72	90	107	L = WS
45	120	150	180	
50	133	167	200	
55	147	183	220	
60	160	200	240	
65	173	217	260	
70	187	233	280	

DISTANCE BETWEEN SIGNS

Speed	Spacing (ft)	
	A	B
40 mph or less	200	200
45 mph	350	350
50 mph or greater	500	500

* 500' beyond the ROAD WORK AHEAD sign or midway between signs whichever is less.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Lane Identification + Direction of Traffic

GENERAL NOTES

- All vehicles, equipment, workers (except flaggers), and their activities are restricted to one side of the roadway.
- When four or more work vehicles enter the through traffic lanes in a one hour period or less (excluding establishing and terminating the work area), the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs, see Index No. 603.
- WORKERS sign to be removed or fully covered when no work is being performed.
- SHOULDER WORK sign may be used as an alternate to the WORKER symbol sign only on the side where the shoulder work is being performed.
- When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ indexes.
- For general TCZ requirements and additional information refer to Index No. 600.

DURATION NOTES

- Signs and channelizing devices may be omitted if all of the following conditions are met:
 - Work operations are 60 minutes or less.
 - Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY.

**Table I
Device Spacing**

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100

**Table II
Taper Length - Shoulder**

Speed (mph)	1/3 L (ft)			Notes
	8' Shldr.	10' Shldr.	12' Shldr.	
25	28	35	42	L = WS ² / 60
30	40	50	60	
35	55	68	82	
40	72	90	107	L = WS
45	120	150	180	
50	133	167	200	
55	147	183	220	
60	160	200	240	
65	173	217	260	
70	187	233	280	

8' minimum shoulder width.
1/3 L = Length of shoulder taper in feet
W = Width of total shoulder in feet (combined paved and unpaved width)
S = Posted speed limit (mph)



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TWO-LANE TWO-WAY, WORK ON SHOULDER

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DATE	UTILITY ACCOMMODATION MANUAL REVISIONS

Speed	Spacing (ft)			
	A	B	C	D ***
40 mph or less	200	200	200	100
45 mph	350	350	350	175
50 mph	500	500	500	250
*55 mph or greater	2640	1640	1000	500

* The ROAD WORK 1 MILE sign may be used as an alternate to the ROAD WORK AHEAD sign.

** 500' beyond the ROAD WORK AHEAD sign or midway between signs whichever is less.

*** BE PREPARED TO STOP sign may be omitted for speeds of 45 MPH or less.

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25 to 45	20	50	20	50
50 to 70	20	50	20	100

Speed (mph)	Dist. (ft)
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

When Buffer Space cannot be attained due to geometric constraints, the greatest attainable length shall be used, but not less than 200 ft.

GENERAL NOTES

- Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
- All vehicles, equipment, workers (except flaggers), and their activities are restricted to one side of the roadway.
- Additional one-way control may be effected by the following means:
(1) Flag-carrying vehicle; (2) Official vehicle; (3) Pilot vehicles; (4) Traffic signals.
When flaggers are the sole means of one-way control the flaggers shall be in sight of each other or in direct communication at all times.
- The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
- When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
- The two channelizing devices directly in front of the work area and the one channelizing device directly at the end of the work area may be omitted provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
- For general TCZ requirements and additional information, refer to Index No. 600.

DURATION NOTES

- ROAD WORK AHEAD and the BE PREPARED TO STOP signs may be omitted if all of the following conditions are met:
 - Work operations are 60 minutes or less.
 - Speed limit is 45 mph or less.
 - No sight obstructions to vehicles approaching the work area for a distance equal to the buffer space.
 - Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
 - Volume and complexity of the roadway has been considered.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Flagger
- Lane Identification + Direction of Traffic

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UNSIGNALIZED

SIGNALIZED

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only).
(Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Flagger
- Stop Bar
- Lane Identification + Direction of Traffic

GENERAL NOTES

- All vehicles, equipment, workers (except flaggers) and their activities are forbidden in lane and intersection areas reserved for traffic.
- The FLAGGER legend sign may be substituted for the symbol sign.
- When vehicles in a parking zone block the line of sight to TCZ signs, the signs shall be post mounted and located in accordance with Index No. 17302.
- If the work space extends across a crosswalk, the crosswalk should be closed using the information in Index No. 660.
- Flaggers shall be located where they can control more than one direction of traffic.
Flaggers shall be in sight of each other or in direct communication at all times.
- Maximum spacing between channelizing devices shall be not greater than 20'.
- Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
- For general TCZ requirements and additional information refer to Index No. 600.

DURATION NOTES

- ROAD WORK AHEAD AND END ROAD WORK sign may be omitted if all of the following conditions are met:
 - Work operations are 60 minutes or less.
 - Speed is 45 mph or less.
 - No sight obstructions to vehicles approaching the work area for a distance equal to A plus B
 - Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
 - Volume and complexity of the roadway has been considered.

Speed	Spacing (ft)	
	A	B
40 mph or less	200	200
45 mph	350	350

CONDITIONS

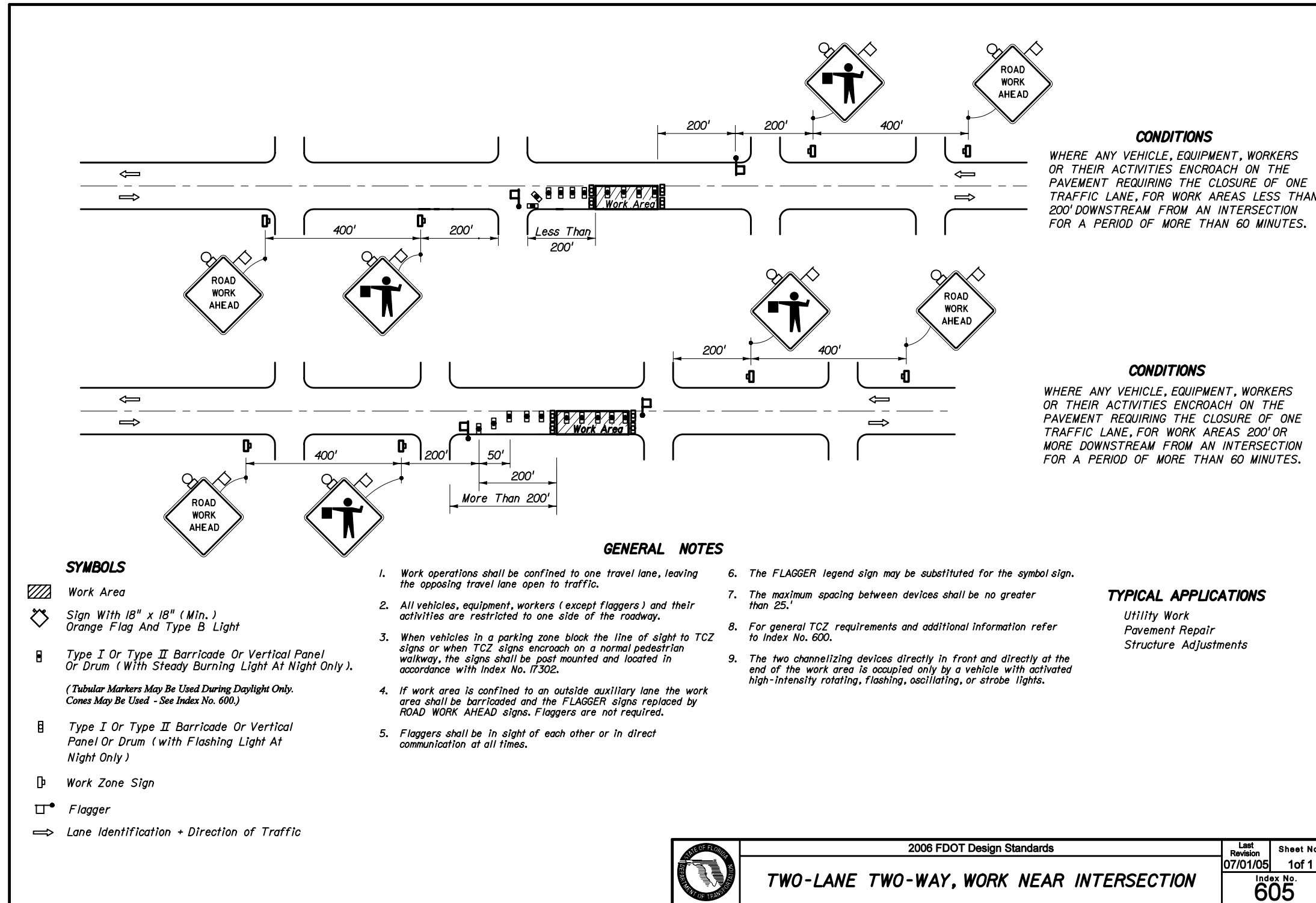
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF A PORTION OF ONE OR MORE TRAFFIC LANES IN AN INTERSECTION.

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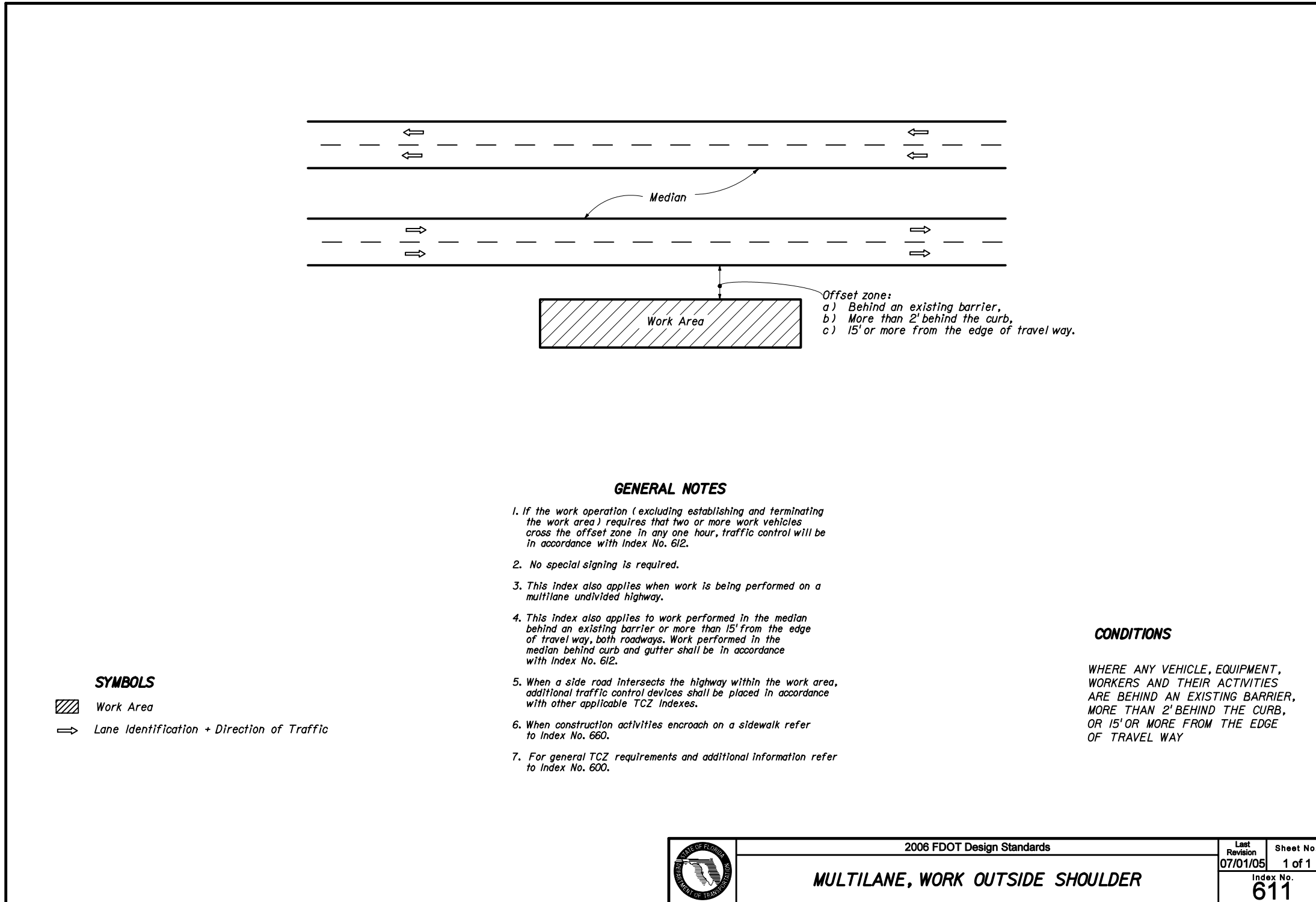
TWO-LANE TWO-WAY, WORK IN INTERSECTION

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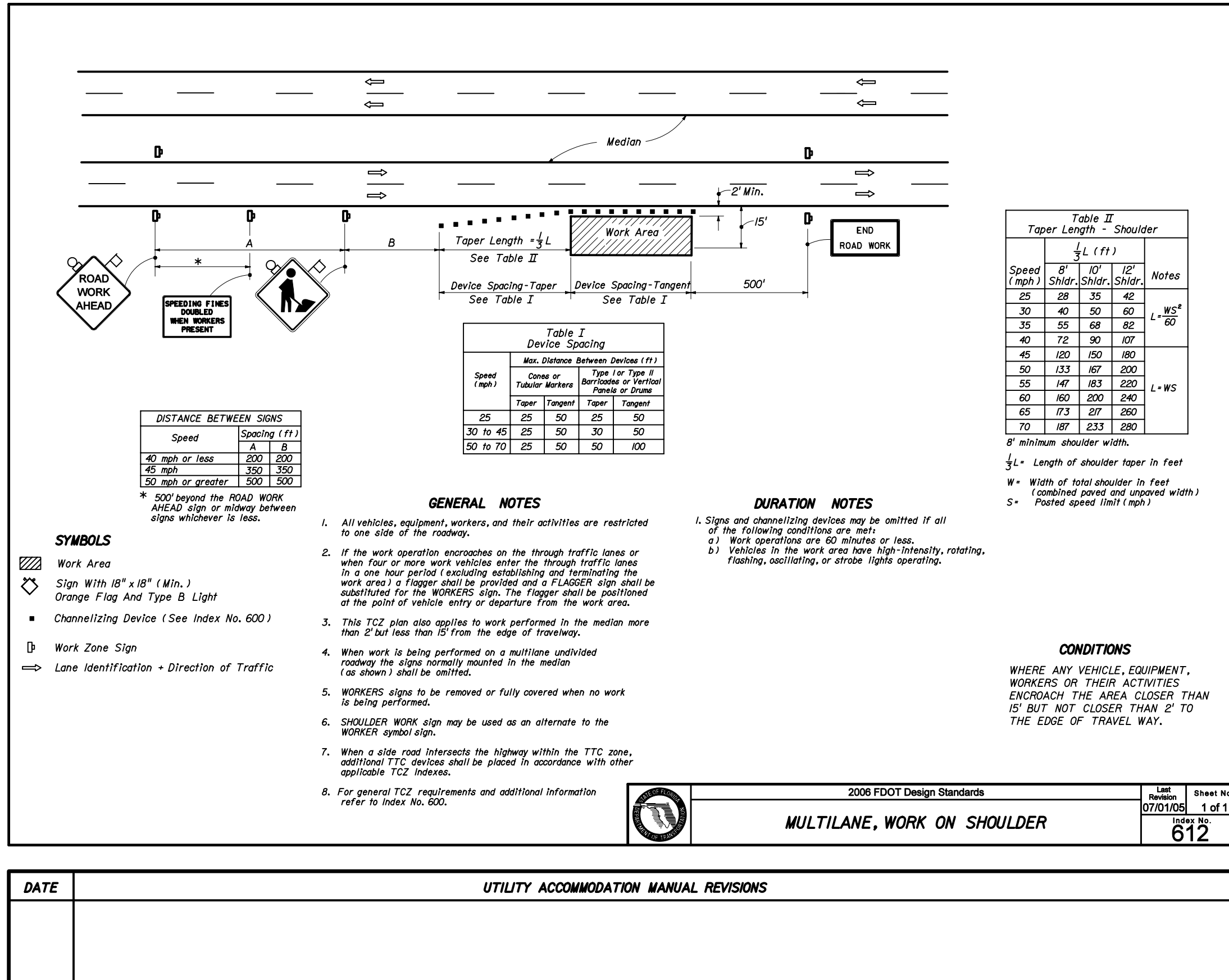
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**Table I
Device Spacing**

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100

**Table II
Buffer Space and Taper Length**

Speed (mph)	Buffer Space	Taper Length (12' Lateral Transition)		Notes (Merge)
	Dist. (ft)	L (ft)		
25	155	125		L = WS ² / 60
30	200	180		
35	250	245		
40	305	320		L = WS
45	360	540		
50	425	600		
55	495	660		
60	570	720		
65	645	780		
70	730	840		

DISTANCE BETWEEN SIGNS

Speed	Spacing (ft)		
	A	B	C
40 mph or less	200	200	200
45 mph	350	350	350
50 mph	500	500	500
*55 mph or greater	2640	1640	1000

GENERAL NOTES

- Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
- All vehicles, equipment, workers, and their activities are restricted to one side of the roadway.
- On undivided highways the median signs as shown are to be omitted.
- When work is performed in the median lane on divided highways the channelizing device plan is inverted and left lane closed and lane ends signs substituted for the right lane closed and lane end signs. The same applies to undivided highways with the following exceptions: (a) Work shall be confined within one median lane. (b) Additional barricades, cones, or drums shall be placed along the centerline abutting the work area and across the trailing end of the work area. When work on undivided highways occurs across the centerline so as to encroach on both median lanes, the inverted plan is applied to the approach of both roadways.
- Signs and traffic control devices are to be modified in accordance with INTERMITTENT WORK STOPPAGE details (sheet 2 of 2) when no work is being performed and the highway is open to traffic.
- The two channelizing devices directly in front of the work area may be omitted provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
- When paved shoulders having a width of 8 ft. or more are closed, channelizing devices shall be used to close the shoulder in advance of the merging taper to direct vehicular traffic to remain within the travel way. See Index No. 612 for shoulder taper formulas.
- When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
- This TCZ plan does not apply when work is being performed in the middle lane(s) of a six or more lane highway. See Index No. 614.
- For general TCZ requirements and additional information refer to Index No. 600.

DURATION NOTES

- Temporary white edgeline may be omitted for work operations less than 3 days.
- Signs, arrow panel and buffer space may be omitted if all of the following conditions are met:
 - Work operations are 60 minutes or less.
 - Speed limit is 45 mph or less.
 - No sight obstructions to vehicles approaching the work area for a distance equal to the buffer space and the taper length combined.
 - Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
 - Volume and complexity of the roadway has been considered.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF TRAVEL WAY.

SYMBOLS

- Work Area
- Sign With 18"x 18" (Min.) Orange Flag And Type B Light
- Channelizing Device (See Index No. 600)
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum (With Flashing Light)
- Work Zone Sign
- Advance Warning Arrow Panel

**Table I
Device Spacing**

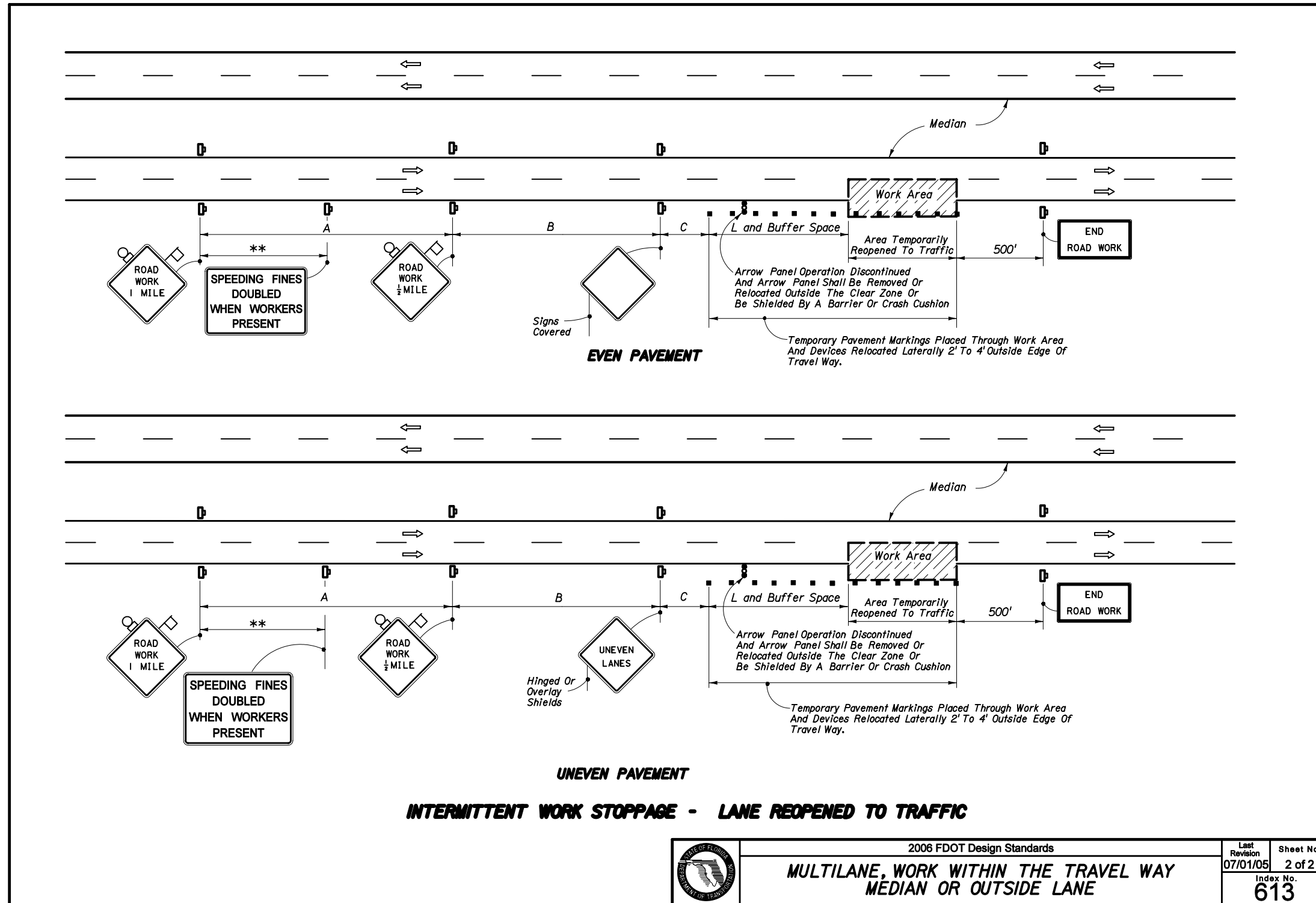
**Table II
Buffer Space and Taper Length**

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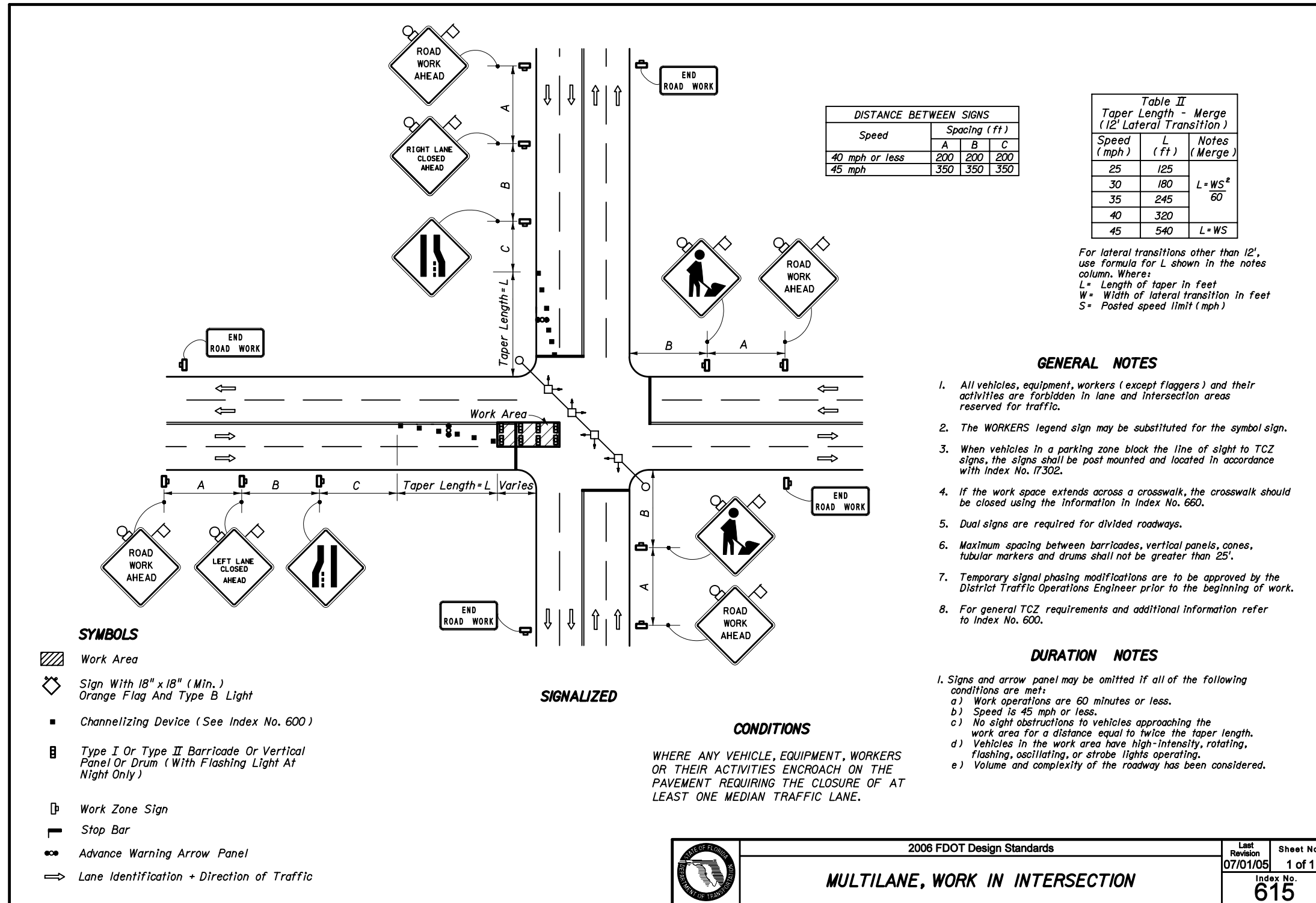
**MULTILANE, WORK WITHIN THE TRAVEL WAY
MEDIAN OR OUTSIDE LANE**

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	MULTILANE, WORK IN INTERSECTION		Index No. 615

GENERAL NOTES









1. All vehicles, equipment, workers (except flaggers) and their activities are restricted to one side of the roadway.
2. Work operations shall be confined to either one lane or lane combinations as follows:
 (a) Outside travel lane; (b) Outside auxiliary lane;
 (c) Outside travel lane and adjoining auxiliary lane;
 (d) Inside travel lane^Δ; (e) Inside auxiliary lane^Δ;
 (f) Inside travel lane and adjoining auxiliary lane^Δ;
^Δ See Sheet 3 of 3

 If the work area is confined to an auxiliary lane the work area shall be barricaded and the RIGHT (LEFT) LANE CLOSED AHEAD signs replaced by ROAD WORK AHEAD signs, and the merge symbol signs eliminated.
3. When vehicles in a parking zone block the line of sight to TCZ signs the signs shall be post mounted and located in accordance with Index No. 17302.
4. If the work space extends across a crosswalk, the crosswalk should be closed using the information in Index No. 660.
5. Signs are required on the median side for divided highways.
6. The two channelizing devices directly in front and directly at the end of the work area may be omitted provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
7. For general TCZ requirements and additional information refer to Index No. 600.

DURATION NOTES

1. Signs and arrow panel may be omitted if all of the following conditions are met:
 - a) Work operations are 60 minutes or less.
 - b) Speed limit is 45 mph or less.
 - c) No sight obstructions to vehicles approaching the work area for a distance equal to twice the taper length.
 - d) Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
 - e) Volume and complexity of the roadway has been considered.

SYMBOLS

- | | |
|--|---|
|  Work Area |  Type I Or Type II Barricade Or Vertical Panel Or Drum (With Flashing Light At Night Only) |
|  Sign With 18" x 18" (Min.) Orange Flag And Type B Light |  Type III Barricade |
|  Work Zone Sign |  Channelizing Device (See Index No. 600) |
|  Advance Warning Arrow Panel |  Lane Identification + Direction of Traffic |



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**MULTILANE, WORK NEAR INTERSECTION
MEDIAN OR OUTSIDE LANE**

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Speed	Spacing (ft)		
	A	B	C
40 mph or less	200	200	200
45 mph	350	350	350

* 500' beyond the ROAD WORK AHEAD sign or midway between signs whichever is less.

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50

Speed (mph)	L (ft)	Notes (Merge)
25	125	L = WS ² 60
30	180	
35	245	
40	320	L = WS
45	540	

For lateral transitions other than 12', use formula for L shown in the notes column. Where:
L = Length of taper in feet
W = Width of lateral transition in feet
S = Posted speed limit (mph)

1. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a right lane having significant right turning movements, then the right lane may be restricted to right turns only as shown in this detail.

2. For intersection approaches reduced to a single lane, left turning movements may be prohibited to maintain capacity for through vehicular traffic.

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	MULTILANE, WORK NEAR INTERSECTION MEDIAN OR OUTSIDE LANE		Index No. 616

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LEFT LANE CLOSED ON FAR SIDE OF MINOR SIDESTREET - RESTRICTED TURNING MOVEMENTS

LEFT LANE CLOSED ON FAR SIDE OF INTERSECTION TURNING MOVEMENTS ALLOWED

1. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a left lane having significant right turning movements, then the left lane may be reopened as a turn bay for left turns only as show in this detail.

Speed	Spacing (ft)		
	A	B	C
40 mph or less	200	200	200
45 mph	350	350	350

* 500' beyond the ROAD WORK AHEAD sign or midway between signs whichever is less.

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50

Speed (mph)	L (ft)	Notes (Merge)
25	125	L = WS ² / 60
30	180	
35	245	
40	320	L = WS
45	540	

For lateral transitions other than 12', use formula for L shown in the notes column. Where:
L = Length of taper in feet
W = Width of lateral transition in feet
S = Posted speed limit (mph)

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MULTILANE, WORK NEAR INTERSECTION
MEDIAN OR OUTSIDE LANE

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The diagram illustrates the layout of signs and devices for road work near a railroad crossing. It shows a two-lane road with a railroad crossing (R/R) in the center. Signs are placed at various distances (A, B, C, D) from the work area. A 'DO NOT STOP ON TRACKS' sign is placed near the crossing. The 'Work Area' is indicated by a hatched pattern. Distances are marked as 250', 500', and 500' from the work area. Signs include 'ROAD WORK AHEAD', 'SPEEDING FINES DOUBLED WHEN WORKERS PRESENT', 'ONE LANE ROAD AHEAD', 'BE PREPARED TO STOP', and 'FLAGGER'. A 'DO NOT STOP ON TRACKS' sign is also shown. The diagram includes labels for 'Extended Buffer Space', 'Device Spacing-Tangent', and 'Device Spacing-Taper'.

**Table I
Device Spacing**

Speed (mph)	Max. Distance Between Devices (ft)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25 to 45	20	50	20	50
50 to 70	20	50	20	100

DISTANCE BETWEEN SIGNS

Speed	Spacing (ft)			
	A	B	C	D ***
40 mph or less	200	200	200	100
45 mph	350	350	350	175
50 mph	500	500	500	250
*55 mph or greater	2640	1640	1000	500

GENERAL NOTES

- Work operations shall be confined to one traffic lane, leaving the opposite lane open to traffic.
- All vehicles, equipment, workers (except flaggers), and their activities are restricted to one side of the roadway.
- Additional one-way control may be effected by the following means: (1) Flag-carrying vehicle; (2) Official vehicle; (3) Pilot vehicles; (4) Traffic signals.
- The ONE-LANE ROAD signs are to be fully covered and the FLAGGER signs either removed or fully covered when no work is being performed and the highway is open to two-way traffic.
- When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
- The two channelizing devices directly in front of the work area and the one channelizing device directly at the end of the work area may be omitted provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
- Discontinuing of extended buffer space will not occur until the queue length plus 300' is reached.
- If the queuing of vehicles across active rail tracks cannot be avoided, a uniformed traffic control officer or flagger shall be provided at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing, even if automatic warning devices are in place.
- For general TCZ requirements and additional information, refer to Index No. 600.

DURATION NOTES

- ROAD WORK AHEAD and the BE PREPARED TO STOP signs may be omitted if all of the following conditions are met:
 - Work operations are 60 minutes or less.
 - Speed limit is 45 mph or less.
 - No sight obstructions to vehicles approaching the work area for a distance equal to the buffer space.
 - Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
 - Volume and complexity of the roadway has been considered.
 - No queuing of vehicles across rail tracks.

SYMBOLS

- Work Area
- Sign With 18" x 18" (Min.) Orange Flag And Type B Light
- Type I, Type II Or Type III Barricade Or Vertical Panel Or Drum
- Channelizing Device (See Index No. 600)
- Work Zone Sign
- Flagger
- Lane Identification + Direction of Traffic

CONDITIONS

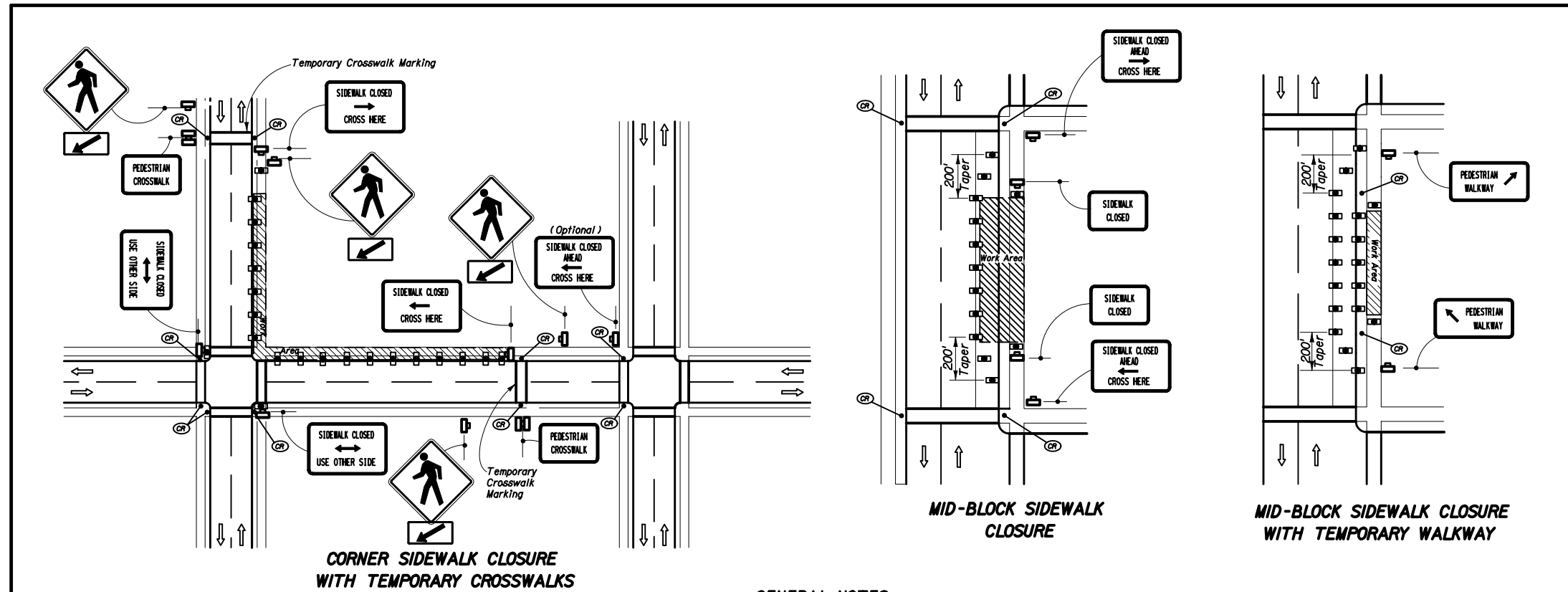
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY THAT REQUIRES A LANE CLOSURE IN THE VICINITY OF A RAILROAD CROSSING.

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WORK IN VICINITY OF RAILROAD CROSSING

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GENERAL NOTES

1. Only the signs controlling pedestrian flows are shown. Other work zone signs will be needed to control traffic on the streets.
2. For spacing of traffic control devices and general TCZ requirements refer to Index No. 600. Maximum spacing between barricades, vertical panels, drums or tubular markers shall not be greater than 25'.
3. Street lighting should be considered.
4. For nighttime closures use Type A flashing warning lights on barricades supporting signs and closing sidewalks. Use Type C steady-burn lights on channelizing devices separating the work area from vehicular traffic.
5. Pedestrian traffic signal display controlling closed crosswalks shall be covered or deactivated.
6. Post Mounted Signs located near or adjacent to a sidewalk shall have a 7' minimum clearance from the bottom of sign to the sidewalk.
7. When construction activities involve sidewalks on both sides of the street, efforts should be made to stage the construction so that both sidewalks are not out of service at the same time.
8. In the event that sidewalks on both sides of the street are closed, pedestrians shall be guided around the construction zone.
9. Temporary walkways shall be a minimum of 4' wide with a maximum 0.02 cross slope and a maximum 0.05 running slope between ramps. Temporary walkways less than 5' in width shall provide for a 5' x 5' passing space at intervals not to exceed 200'. Temporary ramps shall meet the requirements for curb ramps specified in Index No. 304, General Notes 1 through 7. Temporary walkway surfaces and ramps shall be stable, firm, slip resistant, and kept free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc.
10. Temporary ramps and temporary crosswalk markings shall be removed with reopening of the sidewalk, unless otherwise noted in the plans. All work and materials associated with constructing temporary curb ramps and temporary crosswalk markings, removal and disposal of temporary curb ramps and temporary crosswalk markings, and restoration to original condition shall be paid for as Maintenance of Traffic, Lump Sum.

SYMBOLS

- Work Area
- Type I Or Type II Barricade Or Vertical Panel Or Drum (With Steady Burning Light At Night Only). (Tubular Markers May Be Used During Daylight Only. Cones May Be Used - See Index No. 600.)
- Work Zone Sign
- Required Locations For Either Temporary Or Permanent Curb Ramps.
- Lane Identification + Direction of Traffic

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT WORKERS OR THEIR ACTIVITIES ENCROACH ON THE SIDEWALK FOR A PERIOD OF MORE THAN 60 MINUTES.

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	PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS	Index No. 660	

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