



FY 2019-20 STANDARD PLANS

*Effective for Projects with Lettings in the Fiscal Year (FY) from
July 1, 2019 through June 30, 2020*

FY 2019-20 Standard Plans for
Road and Bridge Construction
Topic No. 625-010-003

State of Florida Department of Transportation
Office of Design
Mail Station 32
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F D O T F Y 2 0 1 9 - 2 0 S T A N D A R D P L A N S

NOTICE

The Standard Plans are intended to support the various engineering processes for construction and maintenance operations on the State Highway System. They are established to ensure the application of uniform standards in the preparation of contract plans for construction of roadways and structures. These Standard Plans may be used for maintenance operations or adopted by other authorities for use on projects under their jurisdiction.

It is the responsibility of the Engineer of Record using these Standard Plans to determine the fitness for a particular use of each standard in the design of a project. The inappropriate use of and adherence to these standard Plans does not exempt the engineer from the professional responsibility of developing an appropriate design.

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Therefore, plans, blueprints, schematic drawings, and diagrams of structures owned by the Department are exempt from the public records provisions of Chapter 119, F.S. This exemption includes draft, preliminary, and final formats as described in Procedure 050-020-026 and includes paper, electronic, and other formats. The Department has provided for the limited release of such documents in Procedure 050-020-026.

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The official version of the Standard Plans is the PDF version and can be found at:

<http://www.fdot.gov/design/standardplans>

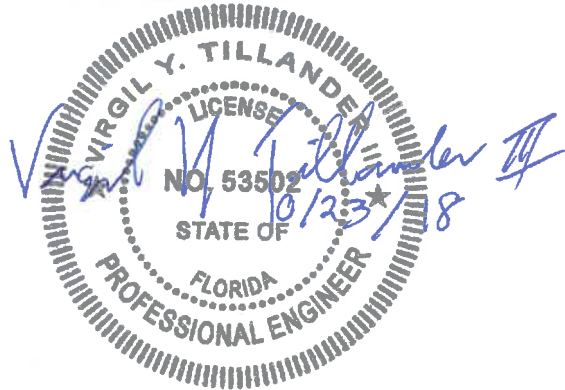
CERTIFICATION STATEMENT

I hereby certify that these Standard Plans were compiled under my responsible charge from designs prepared, examined, adopted, and implemented by the Florida Department of Transportation in accordance with established procedures, and as approved by the Federal Highway Administration.

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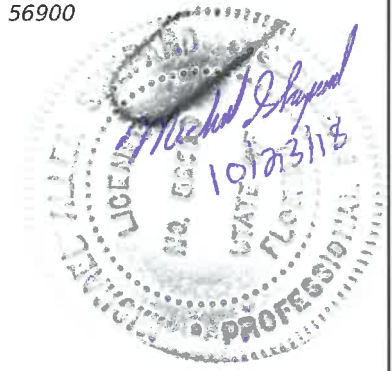
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ABBREVIATIONS

FY 2019-20 STANDARD PLANS

Abbreviation	Meaning
A	
AASHTO	American Association Of State Highway And Transportation Officials
AC	Alternating Current
Accel.	Acceleration
ACI	American Concrete Institute
ADA	Americans With Disabilities Act
ADT	Average Daily Traffic
AFAD	Automated Flagger Assistance Device
AISC	American Institute Of Steel Construction
AISI	American Iron and Steel Institute
Alt.	Alternate
Alum.	Aluminum
ANSI	American National Standards Institute
AOS	Apparent Opening Size
APL	Approved Products List
App.	Approach
Approx.	Approximate
ARTBA	American Road & Transportation Builders Association
Asph.	Asphalt
Assem.	Assembly
ASTM	American Society For Testing And Materials
ATPB	Asphalt Treated Permeable Base
Auxil.	Auxiliary
AWG	American Wire Gauge
AWS	American Welding Society
B	
Bot.	Bottom
Brkwy.	Breakaway
b/w	Between
C	
CC, C to C	Center to Center
C & G	Curb And Gutter
C.C.	Crash Cushion
CCTV	Closed-Circuit Television
CFR	Code of Federal Regulations
CFRP	Carbon Fiber Reinforced Polymer
cfs, CFS	Cubic Feet Per Second
CIP, C.I.P. or C-I-P	Cast In Place
CJP	Complete Joint Penetration
Ckt.	Circuit
☉	Center Line
Cl.	Clearance
CMP	Corrugated Metal Pipe
Con.	Connection
Conc.	Concrete
Const.	Construct or Construction
Cont.	Continuation or Continuous
Corr.	Corrugated
Cov.	Cover

Abbreviation	Meaning
C	
CP	Concrete Pipe
CSIP	Cost Savings Initiative Proposal
CSL	Cross-hole Sonic Logging
CTPB	Cement Treated Permeable Base
Ctr., Ctrs.	Center
Cu. Ft.	Cubic Feet
Cu. Yd., CY,	Cubic Yard
D	
D	Depth, Distance or Diameter
Dia. or Ø	Diameter
Dbl.	Double
Decel.	Deceleration
Deg.	Degree
Dim.	Dimension
Dist.	Distance
DMM	Domestic Mail Manual
DPI	Ditch Point Intersection
Dt	Ditch
DTOE	District Traffic Operations Engineer
E	
e	Superelevation Rate
E.P. or EOP	Edge Of Pavement
EA or Ea.	Each
EIA	Electronic Industries Alliance
El. or Elev.	Elevation
Embed.	Embedment
EPDM	Ethylene Propylene Diene Monomer
Eq.	Equation or Equal
Equip.	Equipment
etc.	Et Cetera (And So Forth)
ETP	Electronic Tough Pitch
Ex.	Example
Exist.	Existing
Exp.	Expansion
Ext.	Extension
F	
FAC	Florida Administrative Code
FC	Friction Course
Fdn.	Foundation
F.L. or \overline{f}	Flow Line
Fl.	Florida
FDEP	Florida Department Of Environmental Protection
FDOT	Florida Department Of Transportation
FHWA	Federal Highway Administration
FIB	Florida-I Beam
F.S.	Florida Statutes
FS	Far Side
Ft.	Foot or Feet
FTP	Florida Traffic Plans

Abbreviation	Meaning
G	
G	Shear Modulus
g	Gram
Ga.	Gauge or Gage
Galv.	Galvanized
GFI	Ground Fault Interrupter
GFRP	Glass Fiber Reinforced Polymer
Grd.	Ground
H	
Hd.	Head
H.S., HS	High Strength
HDPE	High Density Polyethylene
Horiz.	Horizontal
HP	Horsepower or H-Pile
HSHV	High Strength Horizontal Vertical
I	
ID, I.D.	Inside Diameter or Identification
in.	Inch(es)
Inc.	Incorporated
Int.	Interior
Inv.	Invert
ITS	Intelligent Transportation Systems
J	
JCT	Junction
Jt.	Joint
K	
k	kip
kip	1000 Pounds
ksi	Kips Per Square Inch
kVA	Kilovolt Ampere
L	
L	Length
LA	Limited Access
lb or lbs.	Pound(s)
lb/sy	Pounds Per Square Yard
lbf	Pound force
LBR	Lime rock Bearing Ratio
LF	Linear Foot (Feet)
Lgth.	Length
Long.	Longitudinally or Longitudinal
LRFD	Load Resistance Factor Design
LRS	Low-Relaxation Strand
LS	Lump Sum
LSD	Lump Sum per Day
Lt.	Left

ABBREVIATIONS

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Abbreviation	Meaning
M	
<i>m</i>	Meter
<i>m²</i>	Meter Square
<i>Mach.</i>	Machine
<i>MAS</i>	Motorist Awareness System
<i>MASH</i>	Manual for Assessing Safety Hardware (AASHTO)
<i>Max.</i>	Maximum
<i>MES</i>	Mitered End Section
<i>M.H.</i>	Manhole or Mounting Height
<i>MHW</i>	Mean High Water
<i>Mid.</i>	Middle
<i>Mil or Mils</i>	One-Thousandth Of An Inch
<i>Min.</i>	Minimum or Minute
<i>Misc.</i>	Miscellaneous
<i>MLW</i>	Mean Low Water
<i>mm</i>	Millimeter
<i>Mod.</i>	Modification
<i>MOT</i>	Maintenance Of Traffic
<i>MPH or mph</i>	Miles Per Hour
<i>MUTCD</i>	Manual On Uniform Traffic Control Devices
N	
<i>N</i>	Standard Penetration Number
<i>NA or N/A</i>	Not Available or Not Applicable
<i>NC</i>	Normal Crown
<i>NCHRP</i>	National Cooperative Highway Research Program
<i>NDCBU</i>	Neighborhood Delivery And Collection Box Unit
<i>NEMA</i>	National Electrical Manufacturers Association
<i>NHW</i>	Normal High Water
<i>No.</i>	Number
<i>Nom.</i>	Nominal
<i>NPS</i>	Nominal Pipe Size
<i>NPT</i>	National Pipe Thread
<i>NS or N.S.</i>	Near Side
<i>NS</i>	Non-Structural
<i>NTS</i>	Not To Scale
O	
<i>O.C.</i>	On Center
<i>O to O or O.O.</i>	Out to Out
<i>O.B.G.</i>	Optional Base Group
<i>OD or O.D.</i>	Outside Diameter
<i>Oz.</i>	Ounce
P	
<i>Pavt.</i>	Pavement
<i>PBR</i>	Pedestrian/Bicycle Railing
<i>PC</i>	Point Of Curvature
<i>PCC</i>	Plain Cement Concrete
<i>pcf</i>	Pounds per Cubic Foot
<i>PCMS</i>	Portable Changeable Message Sign

Abbreviation	Meaning
P	
<i>P.E. or PE</i>	Professional Engineer
<i>Pen.</i>	Penetration
<i>PPB</i>	Pier Protection Barrier
<i>PPP</i>	Polypropylene pipe
<i>Prest.</i>	Prestressed
<i>PRS</i>	Portable Regulatory Sign
<i>psf</i>	Pounds Per Square Foot
<i>PSI or psi</i>	Pounds Per Square Inch
<i>PT</i>	Point of Tangency or Pressure Treated
<i>PTFE</i>	Polytetrafluoroethylene
<i>PVC</i>	Polyvinyl Chloride
Q	
<i>Q</i>	Flow Volume
<i>Qty.</i>	Quantity
R	
<i>R or Rad.</i>	Radius
<i>Rt.</i>	Right
<i>R/W</i>	Right Of Way
<i>RC</i>	Reverse Crown
<i>RCP</i>	Reinforced Concrete Pipe
<i>Rd.</i>	Road or Round
<i>Rdwy.</i>	Roadway
<i>Rect.</i>	Reticuline or Rectangular
<i>Ref.</i>	Reference
<i>Reinf.</i>	Reinforced or Reinforcement
<i>Req. or Reqd.</i>	Required
<i>RGS</i>	Rigid Galvanized Steel
<i>RPM</i>	Raised Pavement Markers
<i>R/R or RR</i>	Railroad
<i>RSDU</i>	Radar Speed Display Unit
<i>RU</i>	Rack Unit
<i>RX</i>	Receive
S	
<i>S or s</i>	Speed, Spacing or Second
<i>Sch.</i>	Schedule
<i>SHBR</i>	Special Height Bicycle Railing
<i>Shldr.</i>	Shoulder
<i>SHW</i>	Seasonal High Water
<i>SIP</i>	Stay In Place
<i>SP</i>	Superpave
<i>Spa., Spcg. or Sp.</i>	Space(ing)(s)
<i>Spec.</i>	Specification
<i>sq</i>	Square
<i>Sq. Ft., SF, sf or S.F.</i>	Square Foot
<i>sq. in.</i>	Square Inch
<i>Sq. Yd., SY or S.Y.</i>	Square Yard
<i>SR</i>	State Road
<i>SS</i>	Stainless Steel

Abbreviation	Meaning
S	
<i>St. or ST.</i>	Street
<i>Sta.</i>	Station
<i>Std.</i>	Standard
<i>Stg.</i>	Strong
<i>Stl.</i>	Steel
<i>SW</i>	Skewed Angle
<i>Swk.</i>	Sidewalk
<i>SYM</i>	Symmetrical
T	
<i>T or t</i>	Thickness, Tangent Distance or Time
<i>Tan</i>	Tangent
<i>T&G</i>	Tongue and Groove
<i>TCP</i>	Traffic Control Plan(s)
<i>TCZ</i>	Traffic Control Zone
<i>Temp.</i>	Temperature or Temporary
<i>Theo.</i>	Theoretical
<i>THW or THWN</i>	Insulation (Flame Retardant, Moisture And Heat Resistant Thermoplastic)
<i>TMA</i>	Truck/Trailer Mounted Attenuator
<i>TN</i>	Ton
<i>Trans.</i>	Transition or Transverse
<i>TTC</i>	Temporary Traffic Control
<i>TVSS</i>	Transient Voltage Surge Suppression
<i>TX</i>	Transmit
<i>Typ.</i>	Typical
U	
<i>UL</i>	Underwriters Laboratories
<i>UPS</i>	Uninterruptible Power Supply
<i>USPS</i>	United States Postal Service
<i>Util.</i>	Utilities
<i>UV</i>	Ultraviolet
V	
<i>Veh.</i>	Vehicle
<i>Vert.</i>	Vertical
<i>VPD or Vpd.</i>	Vehicles Per Day
W	
<i>W</i>	Width or Wide
<i>WT</i>	Weight
<i>WWF</i>	Welded Wire Fabric
<i>WWM</i>	Welded Wire Mesh
<i>WWR</i>	Welded Wire Reinforcing
Y	
<i>Yd.</i>	Yard
<i>Yr.</i>	Year

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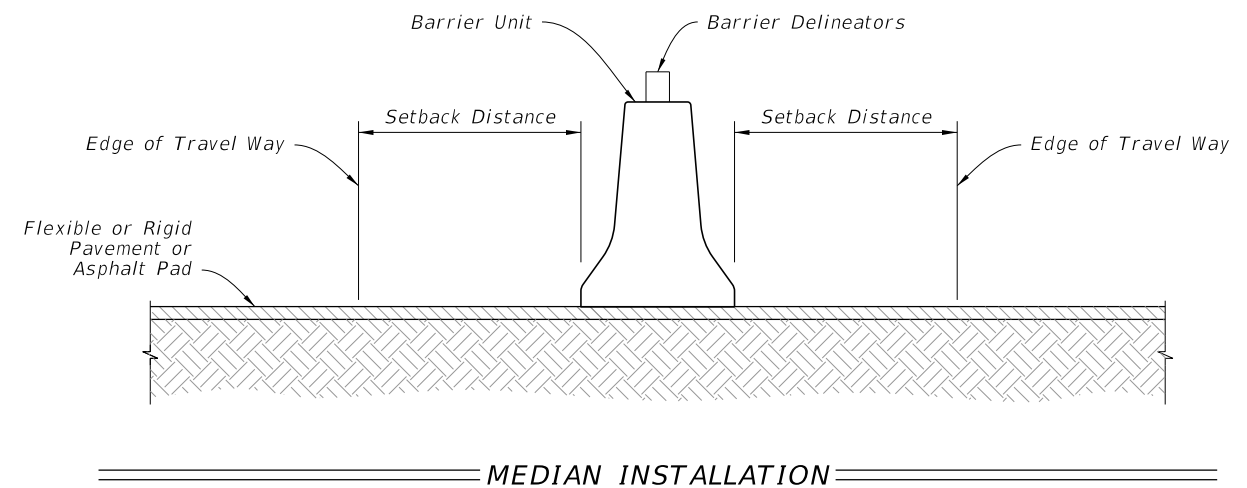
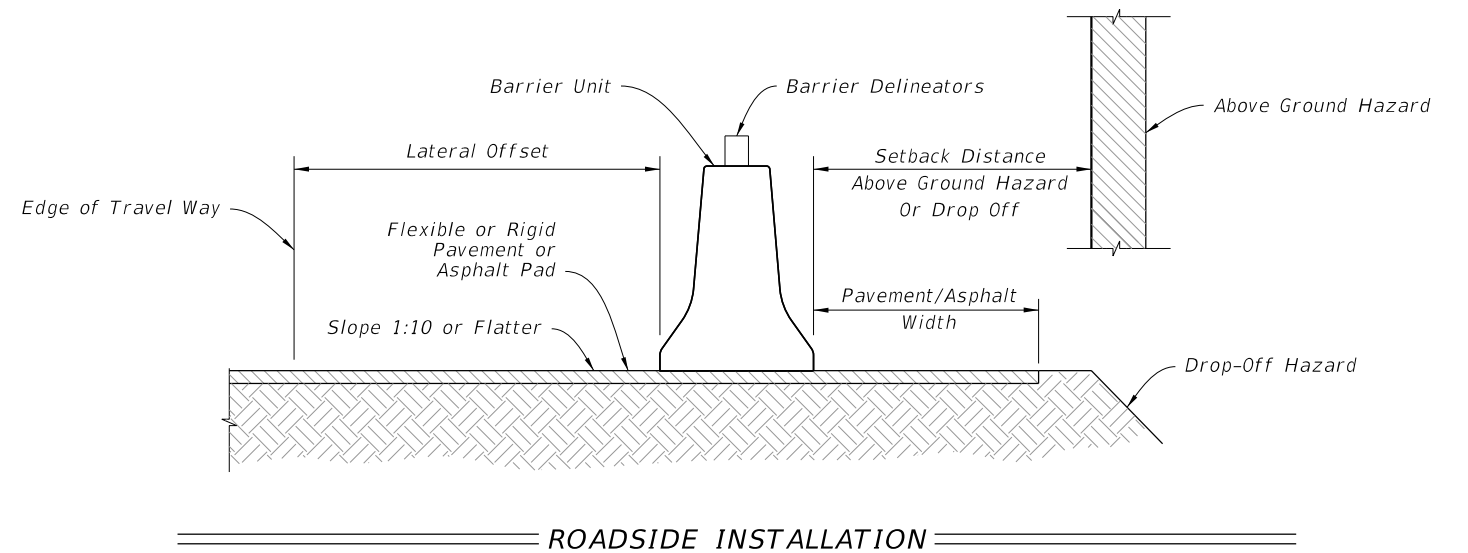
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<u>Traffic Control Through Work Zones (Cont.)</u>			<u>Fencing and Pedestrian Railings (Cont.)</u>		
613	102-613	Multilane, Work Within Travel Way-Median or Outside Lane	821	515-021	Bridge Aluminum Pedestrian/Bicycle Bullet Railing for Traffic Railing
614	102-614	Multilane, Work Within Travel Way-Center Lane	822	515-022	Bridge Aluminum Pedestrian/Bicycle Bullet Railing Details
615	102-615	Multilane, Work in Intersection	825	521-825	42" Concrete Pedestrian/Bicycle Railing
616	102-616	Multilane, Work Near Intersection-Median or Outside Lane	851	515-051	Bridge Pedestrian/Bicycle Railing (Steel)
617	102-617	Multilane, Work In Intersection - Center Lane	852	515-052	Steel Pedestrian/Bicycle Railing
618	102-618	Multilane, Work In Intersection - Two Lanes Closed-45mph or Less	861	515-061	Bridge Pedestrian/Bicycle Railing (Aluminum)
619	102-619	Multilane, Mobile Operations Work on Shoulder, Work Within Travel Way	862	515-062	Aluminum Pedestrian/Bicycle Railing
620	102-620	Multilane, Divided, Temporary Diversion Connection	870	515-070	Aluminum Pipe Guiderail
621	102-621	Multilane Undivided, Temporary Diversion Connection	880	515-080	Steel Pipe Guiderail
622	102-622	Multilane, Work Near Intersection - Temporary Diversion Connection 35mph or Less	<u>Noise And Perimeter Wall Systems</u>		
623	102-623	Multilane, Work Within the Travel Way Double Lane Closure	5200	534-200	Precast Noise Walls
625	102-625	Temporary Road Closure - 5 Minutes or Less	5210	521-510	Traffic Railing/Noise Wall (8'-0")
628	102-628	Two Way Left Turn Lane Closure	5211	521-511	Traffic Railing/Noise Wall (14'-0")
630	102-630	Crossover for Paving Train Operations, Rural	5212	521-512	Traffic Railing/Noise Wall (8'-0") Junction Slab
631	102-631	Temporary Crossover	5213	521-513	Traffic Railing/Noise Wall T-Shaped Spread Footing
640	102-640	Converting Two-Lanes to Four-Lanes Divided, Rural	5214	521-514	Traffic Railing/Noise Wall L-Shaped Spread Footing
641	102-641	Converting Two-Lanes to Four-Lanes Divided, Urban	5215	521-515	Traffic Railing/Noise Wall Trench Footing
642	102-642	Transitions for Temporary Concrete Barrier Wall on Freeway Facilities	5250	534-250	Perimeter Walls
650	102-650	Two-Lane Two-Way, Rural Structure Replacement	<u>Wall Systems</u>		
651	102-651	Multilane Divided, Maintenance and Construction	6010	400-010	C-I-P Cantilever Retaining Wall
655	102-655	Traffic Pacing	6011	400-011	Gravity Wall
660	102-660	Pedestrian Control for Closure of Sidewalks	6020	548-020	Permanent MSE Retaining Wall Systems
665	102-665	Limited Access, Temporary Opening	6030	548-030	Temporary MSE Retaining Wall Systems
667	102-667	Toll Plaza, Traffic Control Standards	6040	455-400	Precast Concrete Sheet Pile Wall
670	102-670	Motorist Awareness System	6100	521-600	MSE Wall Coping (Precast or C-I-P)
<u>Fencing and Pedestrian Railings</u>			6110	521-610	Wall Coping With Traffic Railing/Junction Slab
800	550-004	Fence Location	6120	521-620	Wall Coping With Traffic Railing/Raised Sidewalk
801	550-001	Fence - Type A	6130	521-630	Wall Coping/Parapet with C-I-P Sidewalk
802	550-002	Fence - Type B	6200	521-650	Coping Mounted Light Pole Pedestal
803	550-003	Cantilever Slide Gate - Type B Fence	6201	521-640	Junction Slab at Drainage Inlet Openings
810	550-010	Bridge Fencing (Vertical)	<u>Signing and Marking</u>		
811	550-011	Bridge Fencing (Curved Top)	11200	700-020	Multi-Column Ground Sign
812	550-012	Bridge Fencing (Enclosed)	11300	700-030	Steel Overhead Sign Structures
820	521-820	27" Concrete Parapet with Pedestrian/Bicycle Bullet Railing	11310	700-040	Cantilever Sign Structure

STANDARD PLANS
FY 2019-20 REVISIONS LOG

Standard Plans Index	Description
000-506	Changed to Index 160-001.
000-510	All Sheets: Changed Title. Sheet 1: Deleted "DESIGN SPEED" table and "RADIUS OF CURVE" table; Deleted subtitle. Sheet 2: Added Concrete Pavement note to clarify shoulder slope transitions.
000-511	All Sheets: Changed Title, Subtitles, and Renumbered. Sheet 1: Deleted Superelevations Rates Tabulated and Charted Values (information can be found in FDM); combined General Notes with Old Sheet 2; Deleted all callouts for "CHARTED VALUES" on Old Sheet 2. Sheet 2: Updated Subtitle.
000-515	Deleted Index, Criteria information moved to New FDM Chapter 214. Construction details moved to New Indexes 522-003 or 330-001.
000-516	Deleted Index and moved information to Index 330-001.
102-200	Sheet 1: "STORAGE FACILITY" Note; Changed phone number to 407-278-2727.
102-600	Sheet 3: Updated "LENGTH OF LANE CLOSURES" Note. Sheet 9: Changed "DROP-OFF CONDITION NOTES" Note 5.
102-655	Sheet 1: Changed Notes to remove limitations to Limited Access Facilities and Overhead work. Clarified "TRAFFIC PACING GUIDE" notes for the requirements of site specific traffic control plans. Added Note 6 to the "TRAFFIC PACING GENERAL NOTES" for short duration operations.
110-100	Changed Notes 1 and 8; Added Note 9; Changed the "Crown Dripline..." in the "TREE PROTECTION BARRIER-PLAN and ELEVATION" dimension; Changed the "No Open Trenching..." dimension; Added root pruning trenches; Changed the "Maintain Existing Grade..." call out in the "TREE PROTECTION BARRIER-ELEVATION" detail; Changed the "Crown Dripline" call out; Added Access to the "PROTECTION BARRIER FOR TREE GROUPINGS" detail; Changed Note 1 in the "TRUNK PROTECTION" detail; Added minimum requirements for barrier posts.
120-001	Sheet 1: Added "REMOVAL OF EXCESS BASE MATERIAL" details from FY 2018-19 Standard Plans, Index 000-506; Updated General Notes for plain language. Deleted DESIGN NOTES. Old Sheet 2: Deleted Sheet (TREATED PERMEABLE BASE OPTIONS no longer supported). Old Sheet 3: New Sheet 2; Deleted DESIGN NOTE. Old Sheet 4: New Sheet 3; Deleted DESIGN NOTE; Added Special Stabilized Subbase callout.
120-002	Sheet 1: Updated Reference to Index 160-001 in Note 5.
160-001	New Index. Previously Index 000-506; Updated Note 6 for plain language; Moved "REMOVAL OF EXCESS BASE MATERIAL" detail to Index 120-001.
330-001	New Index. Content relating to Paved or Graded Driveways moved from Sheets 5 & 6 of Old Index 000-515 and 000-516. All: Updated terminology from "Turnouts" to "Driveways"; Updated notes for plain language. Sheet 2: Added Material Types And Thicknesses Table from Old Index 000-515. Updated Asphalt Thickness values for Connections; Changed O.B.G. from type 1 to type 2.
350-001	Sheet 1: Updated Note 5 for expansion joints. Sheet 3: Deleted "KEYED JOINT" Detail; Updated the "JOINT ARRANGEMENT" Detail. Sheet 4: Updated Notes, and changed outside lane standard width to 13 ft. on all illustrations.
425-040	Editorial: Added back deleted note on "heavy wheel loads" in GENERAL NOTES.
450-010	Sheet 1: Added Note 13; Editorial - Note 11
450-036	Sheet 1: Corrected Note # references in "END VIEW".
450-045	Sheet 1: Corrected Note # references in "END VIEW".
450-054	Sheet 1: Corrected Note # references in "END VIEW".

GENERAL NOTES:

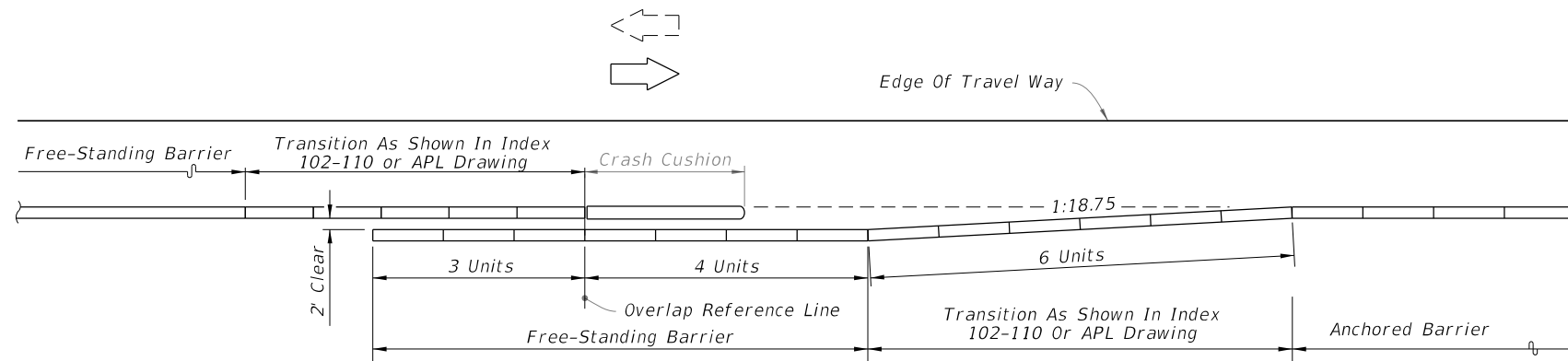
1. Temporary barrier systems may be any of the following:
 - A. Type K Temporary Concrete Barrier System (Index 102-110) installed as either Free-Standing or Anchored.
 - B. Proprietary Temporary Barrier Systems on the Approved Product List (APL).
 - a. Concrete Barrier (Free-Standing or Anchored)
 - b. Steel Barrier (Anchored)
 - c. Water Filled Barrier (Free-Standing)
2. Where existing flexible pavement is not present, construct a minimum 2" thick temporary Asphalt Pad using Miscellaneous Asphalt Pavement in accordance with Specification 339 with the exception that the use of a pre-emergent herbicide is not required.
3. For Barrier Delineators, see Specification 102. Mount on top of temporary barriers. Color must match adjacent longitudinal pavement marking.
4. Remove all grass debris, loose dirt, and sand for the pavement, bridge deck, or asphalt pad surface within the barrier footprint just prior to placement of the temporary barrier.
6. Ensure the setback distance is clear of any grass, construction debris, stockpiled materials, equipment, and objects.
7. Transitions are required between Type K Barrier and free-standing, anchored, back-filled or other types of temporary barrier. See Index 102-110 for transitions between Type K Barrier and permanent bridge or traffic railing. Refer to the APL for transitions allowed for Proprietary Temporary Barrier Systems.
8. Anchoring (Bolting) of temporary barrier or crash cushions is not permitted on bridge superstructures that contain post-tensioned tendons within the concrete deck (top flange of concrete box girders) or on bridge superstructures consisting of longitudinally prestressed, transversely post-tensioned, solid or voided concrete slab units.
9. Anchor abutting segments of temporary barrier terminated with a Crash Cushion as shown in Index 102-110 or the APL.
10. The requirements of this Index do not apply to Temporary Low Profile Barrier, See Index 102-120.
11. Setback requirements below cover most Temporary Barrier options. Provide additional setback distance for APL products that require additional setback (deflection) space.



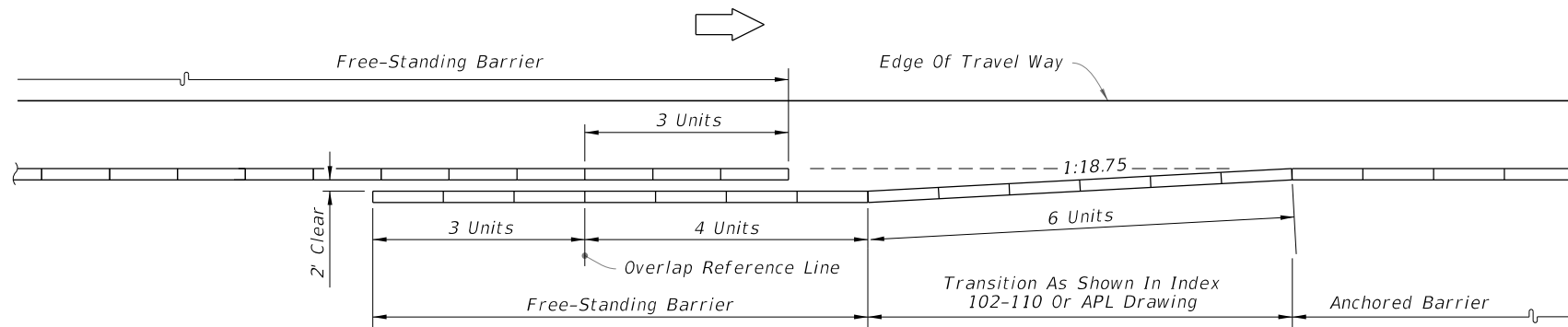
INSTALLATION DATA			
CONDITION	LATERAL OFFSET	SETBACK DISTANCE	PAVEMENT/ ASPHALT WIDTH
Anchored	2' Min.	2' Min.*	1' Min.
Free-standing	2' Min.	4' Min.	4' Min.

* For Bridge Decks see Index 102-110 or APL.

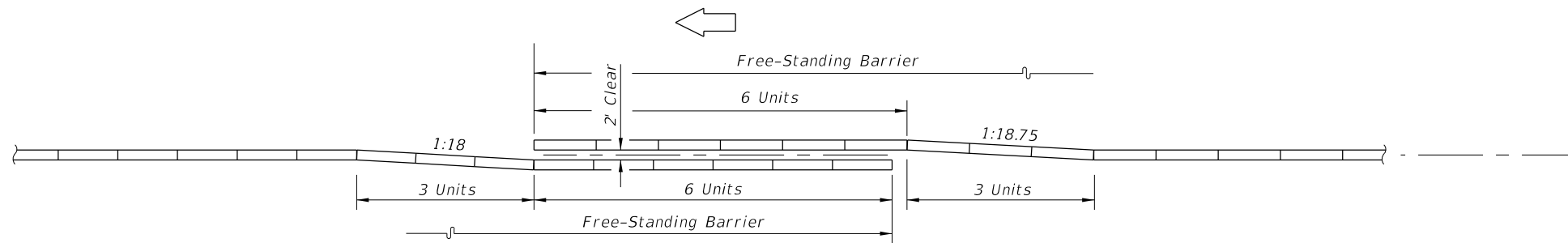
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APPROACH SHOULDER BARRIER TRANSITION ON UNDIVIDED FACILITIES



APPROACH SHOULDER BARRIER TRANSITION ON DIVIDED FACILITIES



MEDIAN BARRIER TRANSITION

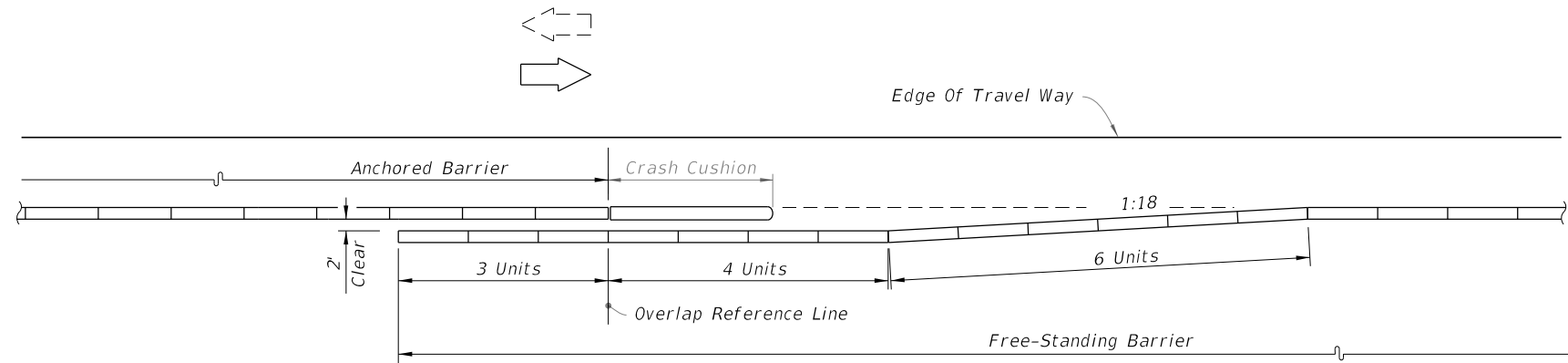
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LAST REVISION 11/01/17	REVISION	DESCRIPTION:
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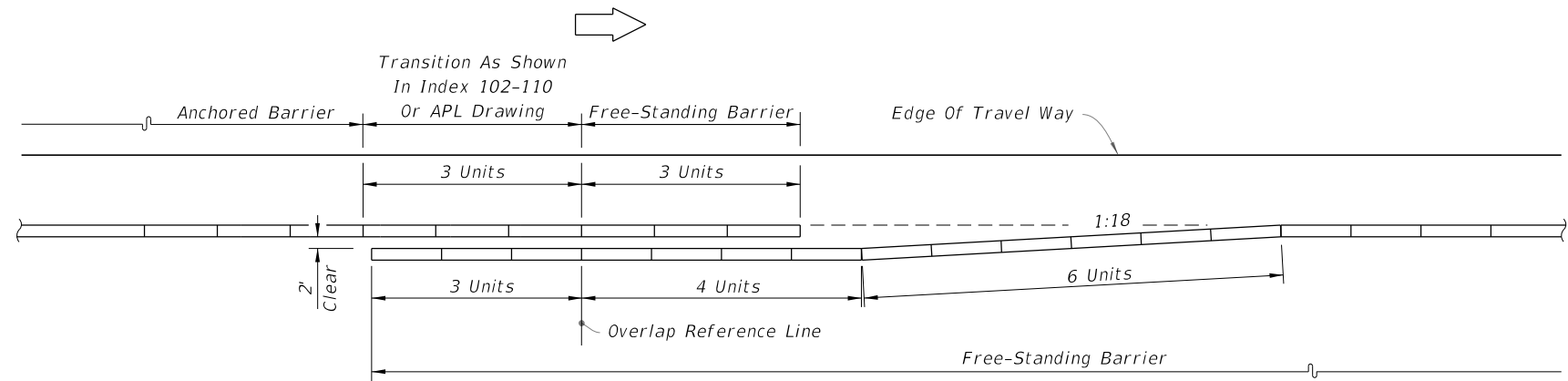

**FY 2019-20
STANDARD PLANS**

TEMPORARY BARRIER

INDEX 102-100	SHEET 2 of 3
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DEPARTURE SHOULDER BARRIER TRANSITION ON UNDIVIDED FACILITIES



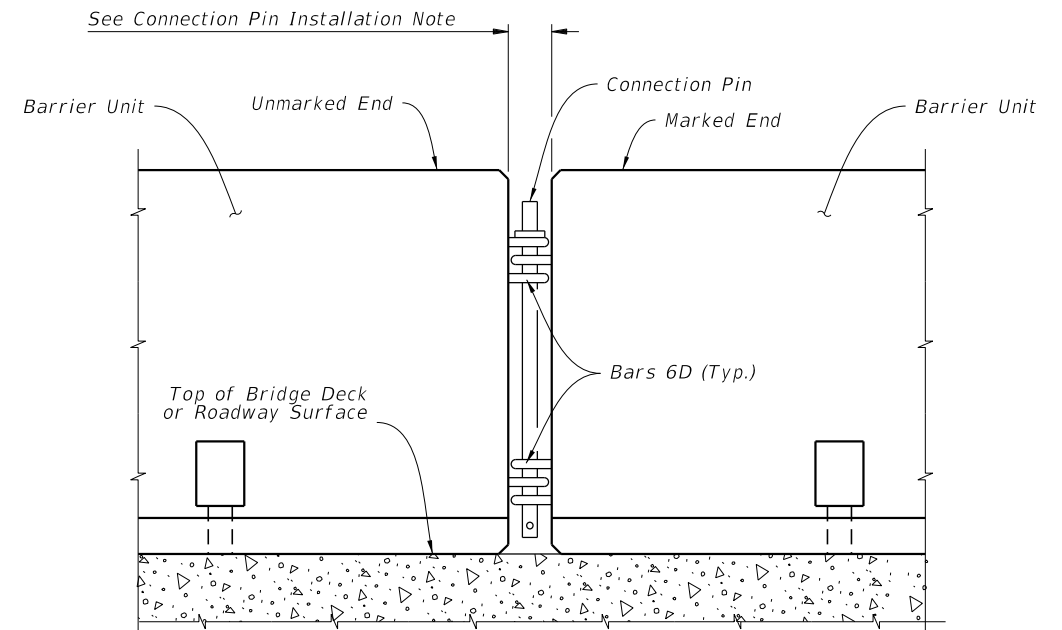
DEPARTURE (TRAILING) SHOULDER BARRIER TRANSITION ON DIVIDED FACILITIES

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LAST REVISION 11/01/17	REVISION DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TEMPORARY BARRIER	INDEX 102-100	SHEET 3 of 3
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GENERAL NOTES:

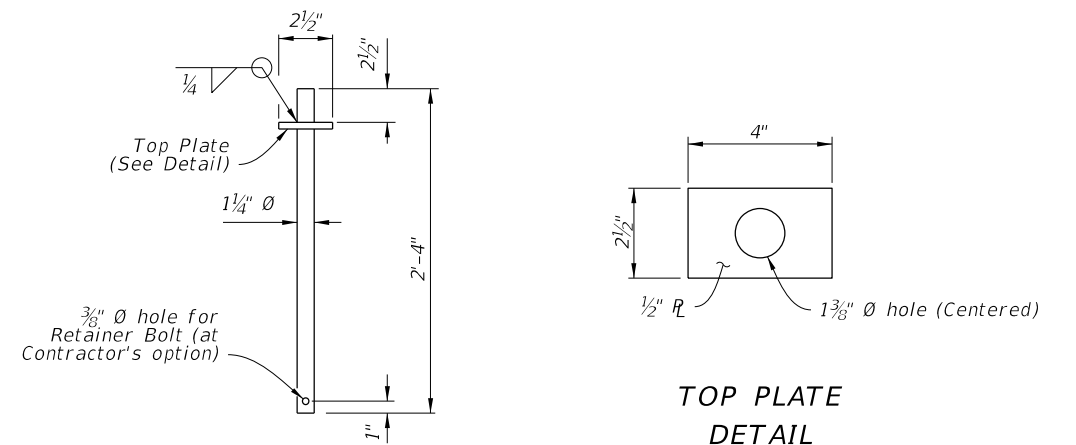
1. Meet the requirements of Index 102-100.
2. For fabrication details see Sheets 15 thru 17.
3. **HANDLING:** Do not lift or move the Barrier Units by using Bars 6D that extend from the ends of the units. Approximate weight of one unit equals 2.7 tons.
4. **CONNECTION PIN ASSEMBLY:** Use steel for Connection Pin and Top Plate assemblies in accordance with ASTM A36 or ASTM A709 Grade 36. Nondestructive testing of welds is not required. At the Contractor's option, a $\frac{3}{8}$ " diameter hole may be provided at the bottom of the Connection Pin, as shown, for the installation of a vandal resistance bolt.
5. **CONNECTION PIN INSTALLATION:** Initially set Barrier Units by using a $3\frac{5}{8}$ " wooden block between ends of adjacent units. Install Connection Pin between adjacent Barrier Units as shown, then pull newly placed Barrier Unit away from adjacent Barrier Unit to remove slack between Connection Pin and Bars 6D (except as shown on Sheet 2). Do not use Barrier Units unconnected.
6. **REUSE OF CONNECTION PINS AND STAKES:** Connection pins and stakes may be reused if they have the structural integrity of new pins.
7. **REMOVAL OF BOLTS, STAKES AND KEEPER PINS:** Upon removal or relocation of Barrier Units, remove all Anchor Bolts and completely fill the remaining holes in bridge decks, approach slabs and roadway rigid pavements that are to remain with Magnesium Ammonium Phosphate Concrete in accordance with Specification 930 or with an Epoxy Resin Compound, Type F or Q, in accordance with Specification 926. If a flexible pavement is present and is to remain, completely fill the remaining holes in the flexible pavement with hot or cold patch asphalt material.
8. Type K Anchored to Free-Standing transitions: Use the 3-3-2-1 Anchorage Transition Detail when transitioning Free-Standing and Anchored Units or when connecting Free-Standing runs to Crash Cushions, as shown in this Index.



NOTES FOR THRIE-BEAM GUARDRAIL SPLICE INSTALLATIONS:

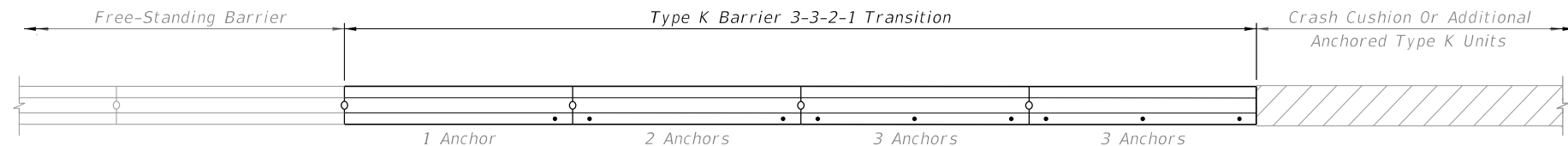
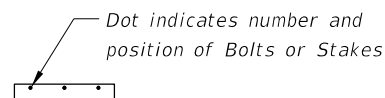
1. **THRIE-BEAM GUARDRAIL:** Provide Thrie-Beam Guardrail for splices meeting the requirements of specification 967 and as follows: Two panels per splice (One panel per side) of Class B (10 Gauge), or Four panels per splice (Two nested panels per side) of Class A (12 Gauge). Use a 12'-6" guardrail panel. Provide and install all other associated metallic guardrail components (Terminal Connectors, Shoulder Bolts, Hex Bolts and Nuts, Filler Plates, etc.) in accordance with Index 536-001. Install five Guardrail Anchor Bolts at each end of each splice in any of the standard seven anchor bolt holes in the Thrie-Beam Terminal Connector. If reinforcing steel is encountered when drilling holes for Guardrail Anchor Bolts in Type K Barrier Units, shift Thrie-Beam Terminal Connector so as to clear reinforcing steel within the given tolerances or select a different bolt hole to use. Do not drill or cut through reinforcing steel within Type K Barrier Units. Drilling or cutting through reinforcing steel within permanent concrete traffic railings is permitted.
2. **GUARDRAIL OFFSET BLOCKS:** Provide and install timber Offset Blocks meeting the requirements of Specification 967. Field trim Offset Blocks as required for proper fit. Utilize Offset Blocks as shown and required in order to prevent bending or kinking of Thrie-Beam Guardrail panels.
3. **CONCRETE FOR FILLING TAPERED TRAFFIC RAILING TOES:** Provide concrete for filling tapered toes of Traffic Railings as shown meeting the material requirements of Specification 346, any Class, or a commercially available pre-bagged concrete mix (3000 psi minimum compressive strength). Sampling, testing, evaluation and certification of the concrete in accordance with Specification 346 is not required. Saturate with water the surfaces upon and against which the concrete fill will be placed prior to placing concrete. Place and finish concrete fill using forms or by hand methods to the general configurations shown so as to provide a smooth shape transition between the Type K Barrier and the adjacent traffic railing. A low slump is desirable if placing and finishing concrete by hand methods. Cure the concrete fill by application of a curing compound, or by covering with a wet tarp or burlap for a minimum of 24 hours. Completely remove the concrete fill upon relocation or removal of the Type K Temporary Concrete Barrier.

DETAIL OF CONNECTION BETWEEN BARRIER UNITS



CONNECTION PIN DETAIL

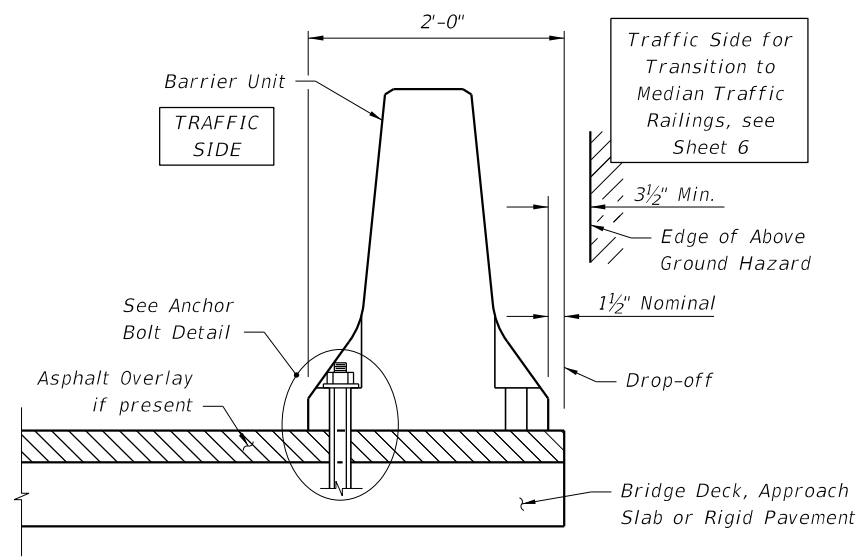
LEGEND:



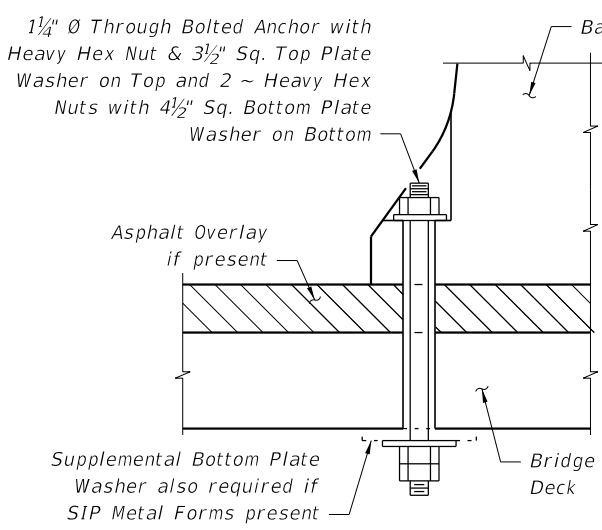
3-3-2-1 ANCHORAGE TRANSITION DETAIL

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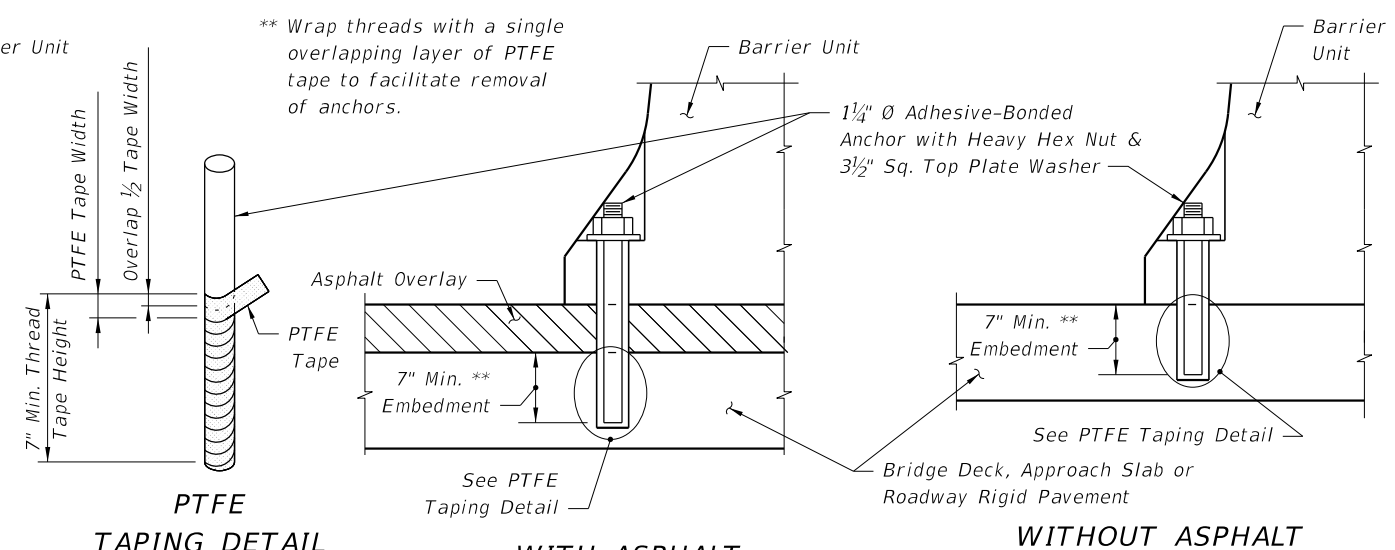
LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 1 of 17
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TYPICAL SECTION



THROUGH BOLTED ANCHOR



ADHESIVE BONDED ANCHOR INSTALLATION

NOTES FOR BOLTED INSTALLATIONS:

Bridge deck shown, approach slab or rigid pavement similar; installation adjacent to drop-off shown, median transition installation similar.

LIMITATION OF USE: This installation technique can only be used on rigid pavement and concrete bridge decks as shown. Anchor Bolts must not be installed on both sides of the Barrier Units. Do not bolt down Barrier Units across bridge finger or modular expansion joints.

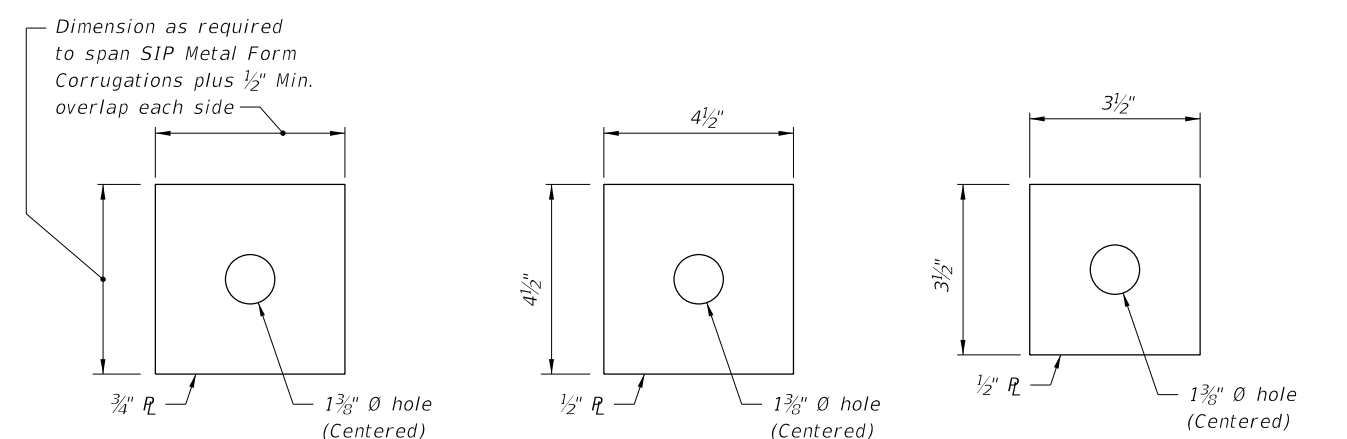
ANCHOR BOLTS, NUTS AND WASHERS: When using Adhesive-Bonded Anchor Bolts, use fully threaded rods in accordance with ASTM F 1554 Grade 36. Install Anchor Bolts for through bolting in accordance with ASTM A 307 or ASTM F 1554 Grade 36. Install nuts in accordance with ASTM A 563 or ASTM A 194. Install Flat Washers in accordance with ASTM F 436 and Plate Washers in accordance with ASTM A 36 or ASTM A 709 Grade 36.

Install three (3) Anchor Bolts per Barrier Unit on the traffic side of the Barrier Units as shown, except for Transition Installations. For the number and positions of Anchor Bolts required in Transition Installations see Sheets 8 and 9 and Index 102-100. Drilling through deck reinforcing steel to install Anchor Bolts is permitted. Unless otherwise shown in the Plans, at the Contractor's option Barrier Units may be installed by through bolting (where geometrically possible) or by the use of Adhesive-Bonded Anchor Bolts. Do not drill into or otherwise damage the tops of supporting beams or girders, bridge deck expansion joints or drains. Install Anchor Bolts and Nuts so that the maximum extension beyond the face of the Barrier Units is 1/2". Snug tighten the Nuts on the Anchor Bolts. For through bolted installations, snug tighten the double Nuts on the underside of the deck against each other to minimize the potential for loosening.

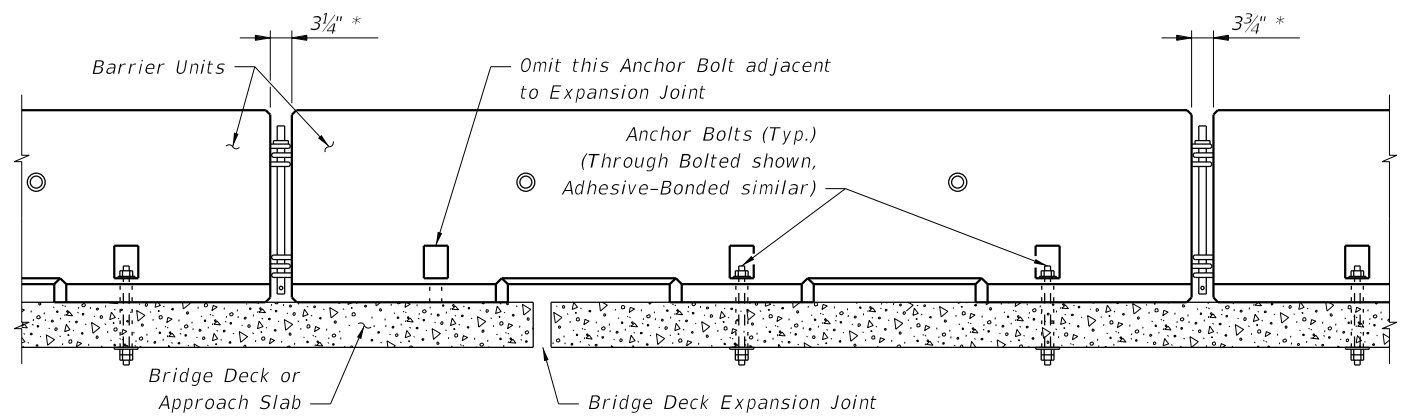
Omit one (1) Anchor Bolt within a single Barrier Unit if a conflict exists between the Anchor Bolt location and a bridge deck expansion joint or drain. The adjacent Barrier Units must each be installed with the standard three (3) Anchor Bolts.

Omit one (1) Anchor Bolt within a single Barrier Unit as shown in the Treatment at Bridge Deck Expansion Joint Schematic if the Barrier Unit straddles a bridge deck expansion joint. The adjacent Barrier Units must each be installed with the standard three (3) Anchor Bolts.

ADHESIVE-BONDING MATERIAL SYSTEMS: When using Adhesive Bonding Material Systems for Anchor Bolts, Use Type HSHV in accordance with Specification 937 and installed them in accordance with Specification 416. Prior to installation of the Barrier Units in the Plan location(s), install a demonstration Barrier Unit using the proposed production installation method, at a location approved by the Engineer. In lieu of the production test requirements of Specification 416, install six (6) Adhesive-Bonded Anchor Bolts in the demonstration Barrier Unit and test each Anchor Bolt with a 29,800 pound tensile proof load. Install and test additional demonstration Barrier Units when requested by the Engineer. Remove the demonstration Barrier Unit prior to testing the Anchor Bolts. Remove the test Anchor Bolts after testing as directed by the Engineer.



SUPPLEMENTAL BOTTOM PLATE WASHER DETAIL, BOTTOM PLATE WASHER DETAIL, TOP PLATE WASHER DETAIL



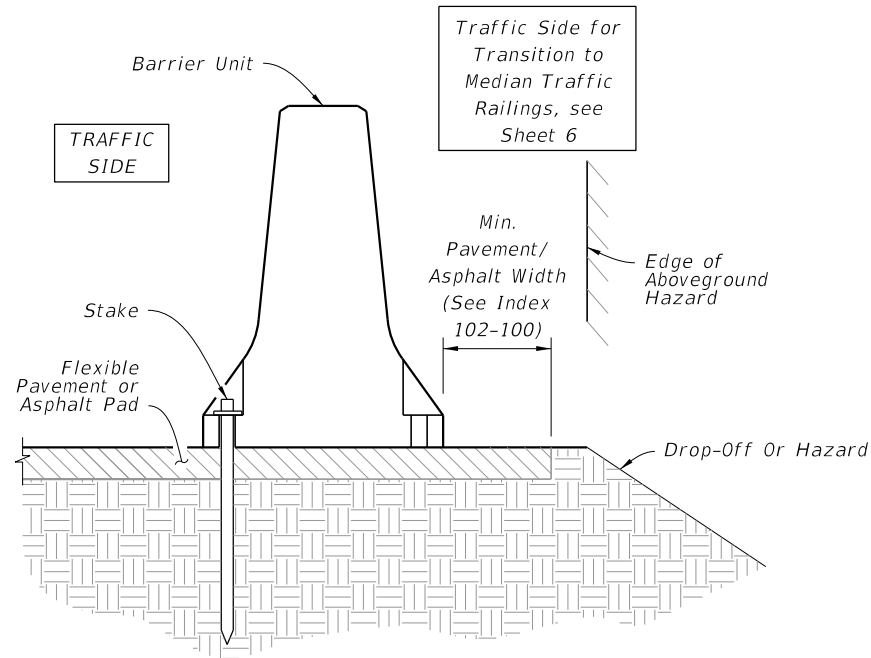
* To accommodate movement at Expansion Joint, set Barrier Units with 3 3/4" gap at locations shown.

TREATMENT AT BRIDGE DECK EXPANSION JOINT SCHEMATIC

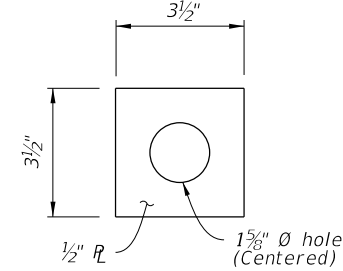
ANCHORED INSTALLATIONS - BOLTED

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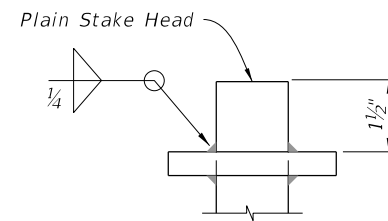
LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 2 of 17
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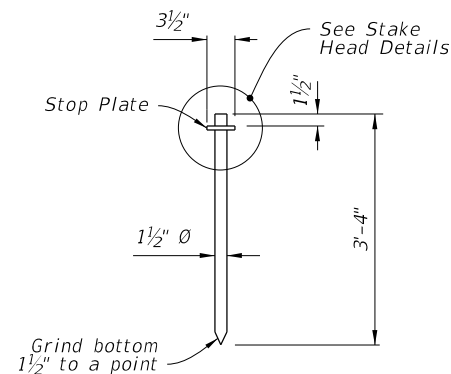
TYPICAL SECTION



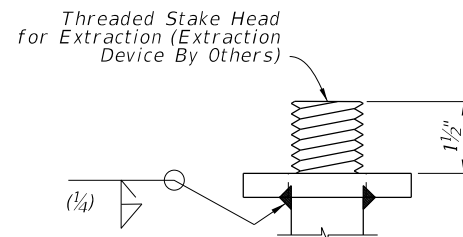
STOP PLATE DETAIL



PLAIN STAKE HEAD DETAIL



STAKE DETAIL



OPTIONAL EXTRACTION STAKE HEAD DETAIL

NOTES FOR STAKED INSTALLATIONS:

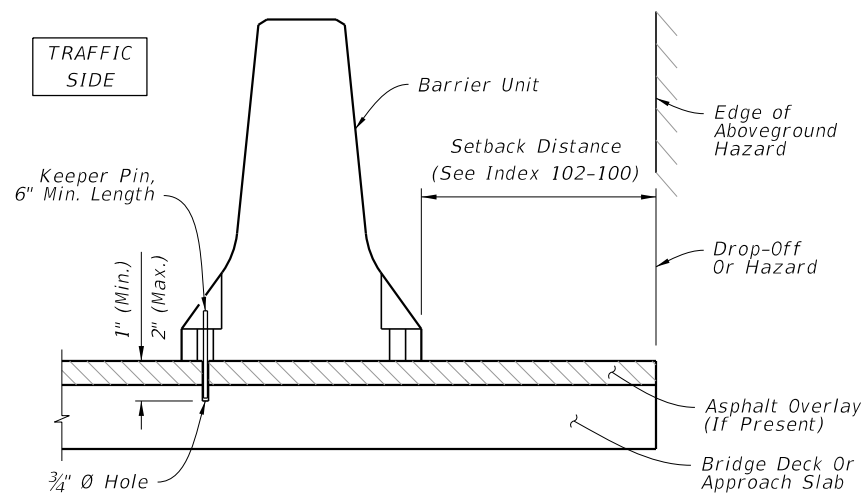
LIMITATION OF USE: This installation technique can only be used on flexible pavement or an Asphalt Pad as shown. Stakes must not be installed on both sides of the Barrier Units.

STAKES: Provide steel for Stake assemblies in accordance with ASTM A 36 or ASTM A 709 Grade 36. Weld in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). Welding metal are E60XX or E70XX. Nondestructive testing of welds is not required.

Install three (3) Stakes on the traffic side of the Barrier Units as shown, except for Transition Installations. For the number and positions of stakes required in Transition Installations see Sheets 4, 5 and 6 and Index 102-100. Install Stakes so that the Stop Plate is snug against the bottom of the Anchor Blockout.

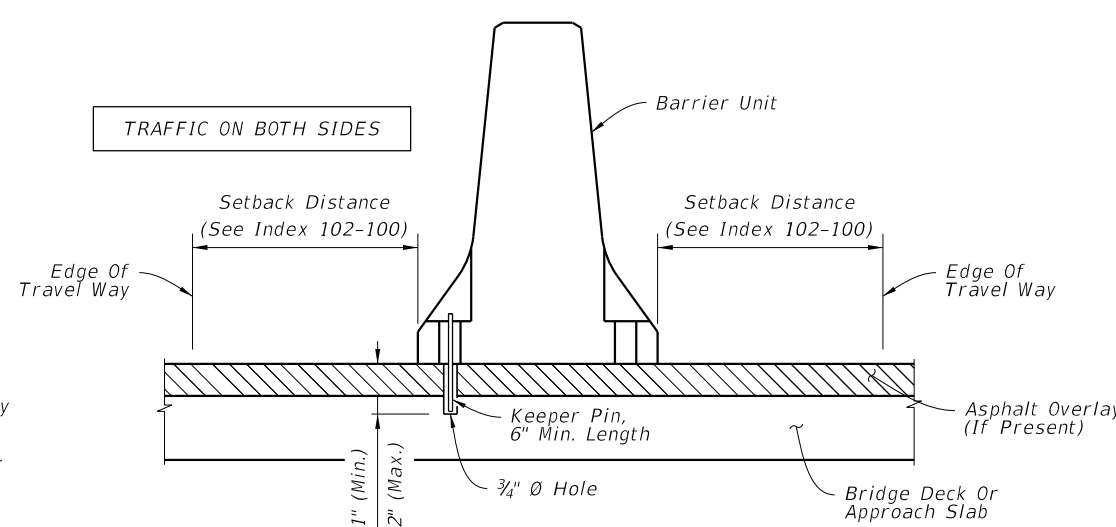
BURIED UTILITIES: Prior to installation of Stakes verify locations of all adjacent buried utilities, drainage structures, pipes, etc. If conflicts between Stake locations and buried elements exist, a maximum of two (2) Stakes within a single Barrier Unit may be omitted if the adjacent Barrier Units are installed with the standard three (3) Stakes.

ANCHORED INSTALLATIONS - STAKED

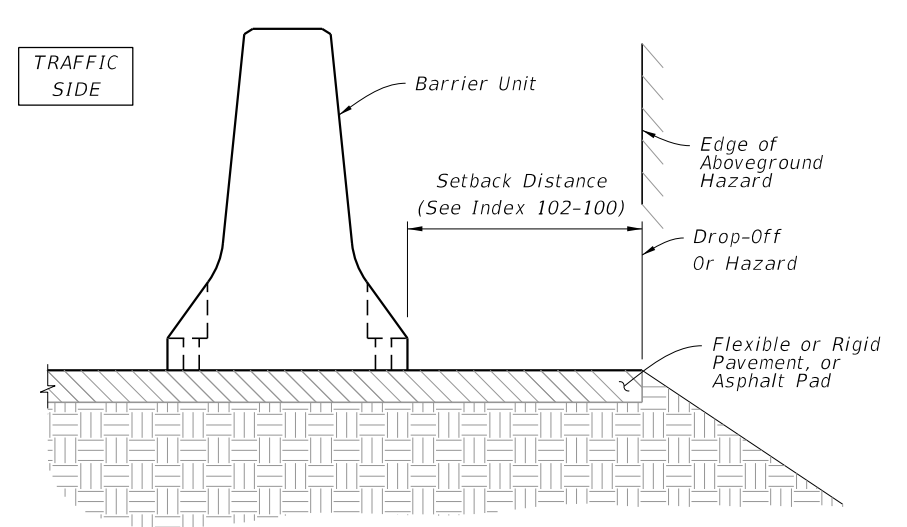


(Bridge Deck Shown, Approach Slab Similar)

TYPICAL BRIDGE SECTION



TYPICAL MEDIAN SECTION



TYPICAL ROADWAY SECTION

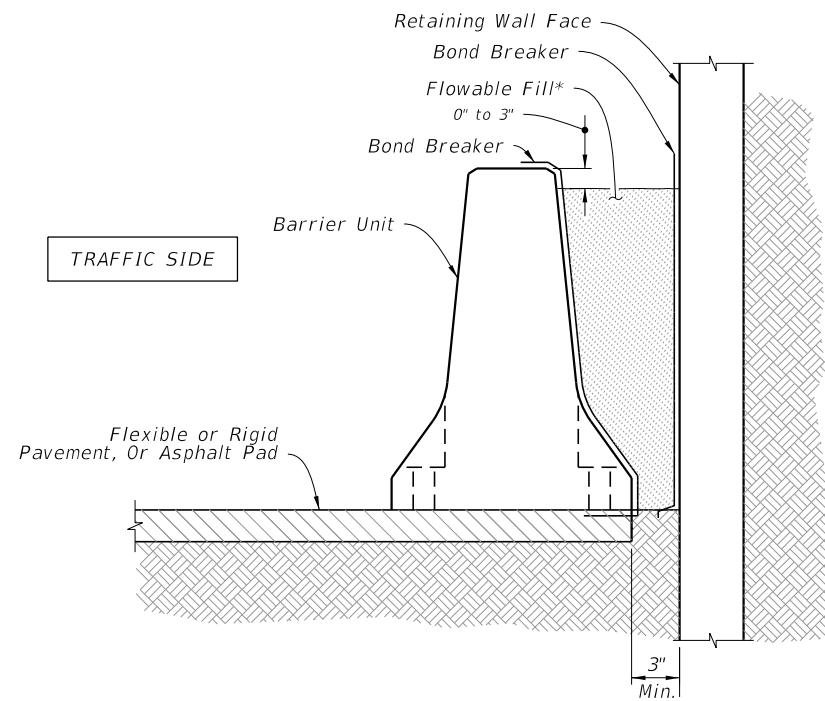
NOTES FOR FREE-STANDING INSTALLATION:

1. For Bridge Decks only, use Keeper Pins that are 1/2 inch diameter, smooth steel bar in accordance with ASTM A36 or ASTM A709 Grade 36. As directed by the Engineer in order to limit vibration induced translation of the Barrier Units, install one (1) Keeper Pin per Barrier Unit as shown.
2. If traffic is on both sides of the Barrier (i.e. Median Installation), alternate Keeper Pin locations from side to side of Barrier Units along the length of the installation. If traffic is on only one side of the barrier install keeper pins on the traffic side as shown.
3. Do not drill into or otherwise damage bridge deck expansion joints or drains.

FREE-STANDING INSTALLATION

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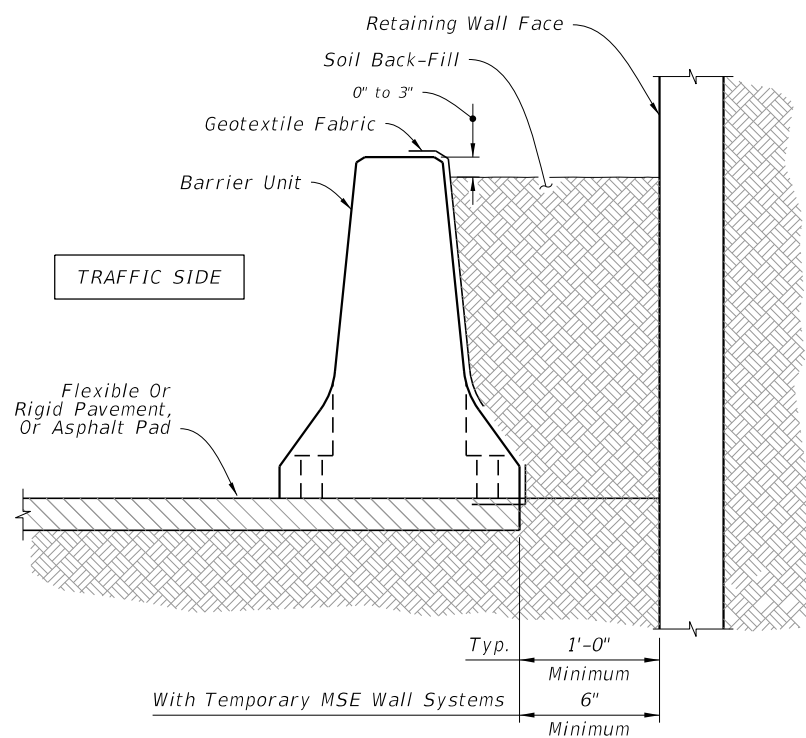
LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 3 of 17
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**TYPICAL SECTION
ADJACENT TO RETAINING WALL WITH FLOWABLE FILL BACK-FILL**

*FLOWABLE FILL: Provide Excavatable Flowable Fill in accordance with Specification 121.

FLOWABLE FILL BACK-FILL ROADSIDE INSTALLATIONS

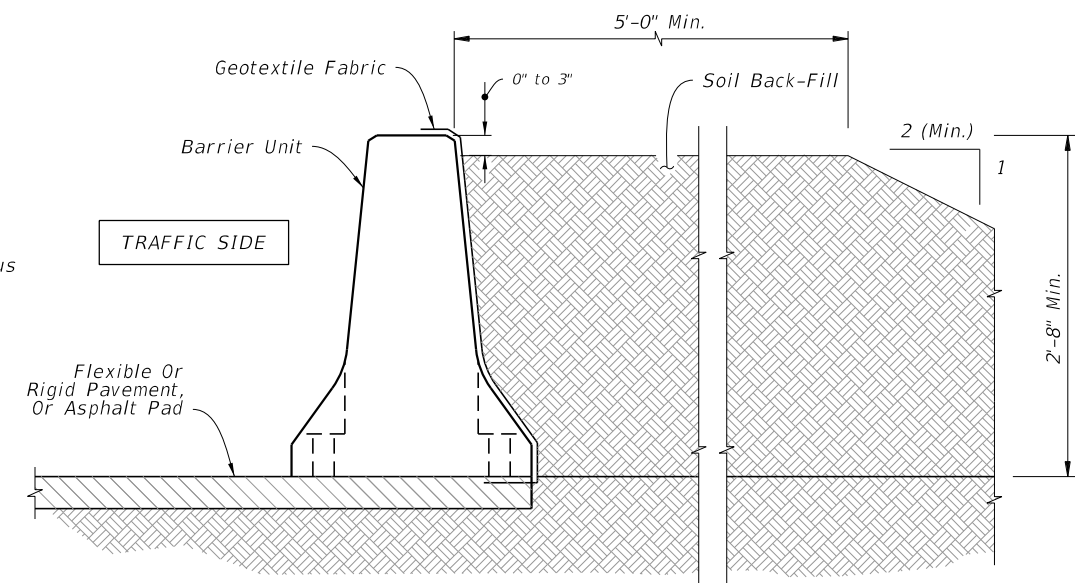


**TYPICAL SECTION
ADJACENT TO RETAINING WALL WITH SOIL BACK-FILL**

NOTES FOR SOIL BACK-FILLED ROADSIDE INSTALLATIONS:

SOIL BACK-FILL MATERIAL: Provide Back-Fill Material consisting of any available clean soil. Compact Back-Fill Material until the soil mass is firm and unyielding. Provide erosion control as specified in the Plans. If none is specified in the Plans, provide erosion control as required to maintain the integrity of the Back Fill embankment.

GEOTEXTILE FABRIC: Provide Type D-5 Geotextile Fabric in accordance with Specification 985 to contain Back Fill Material behind Barrier Units. Geotextile Fabric may be continuous over the length and height of the installation or may be individual pieces as required to cover the Lift / Drain Slots and open vertical joints between Barrier Units.



**TYPICAL SECTION
WITH SOIL BACK-FILL**

SOIL BACK-FILLED ROADSIDE INSTALLATIONS

10/30/2018 9:17:30 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:
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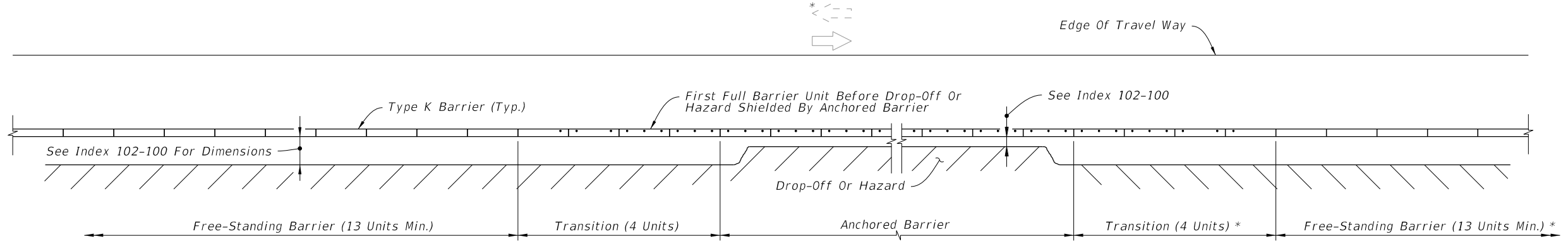


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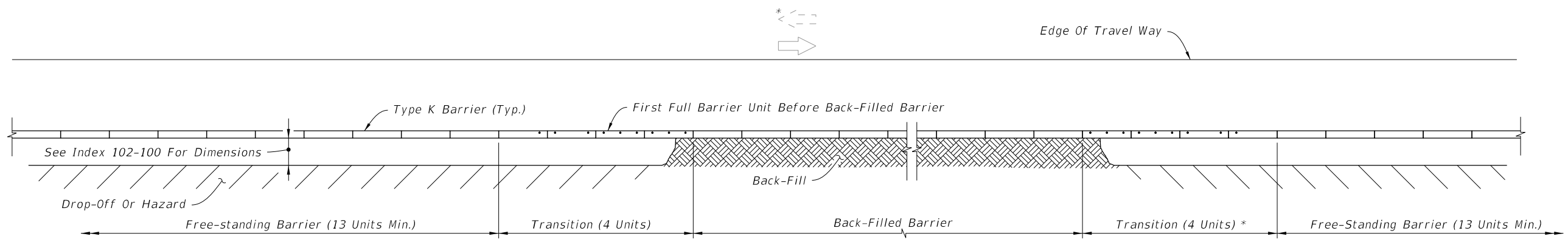
TYPE K TEMPORARY CONCRETE BARRIER SYSTEM

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102-110

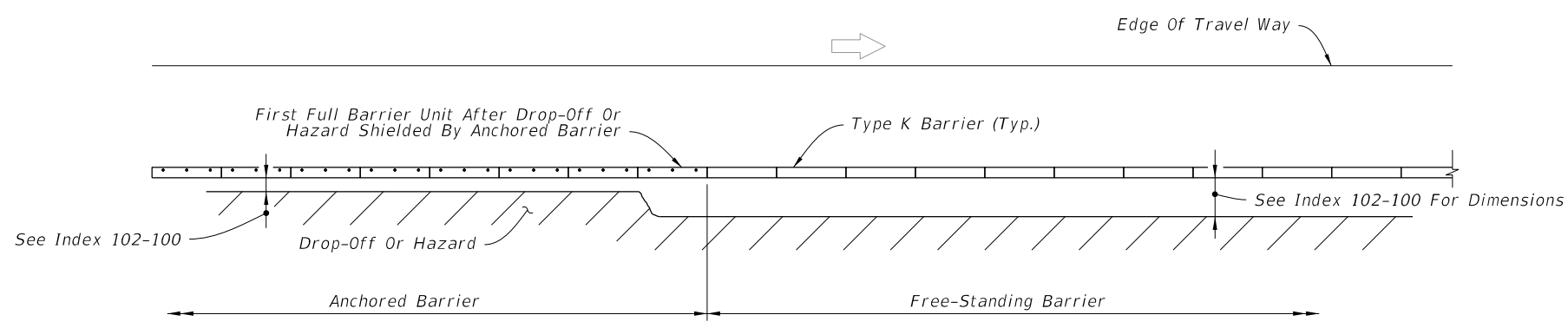
SHEET
4 of 17



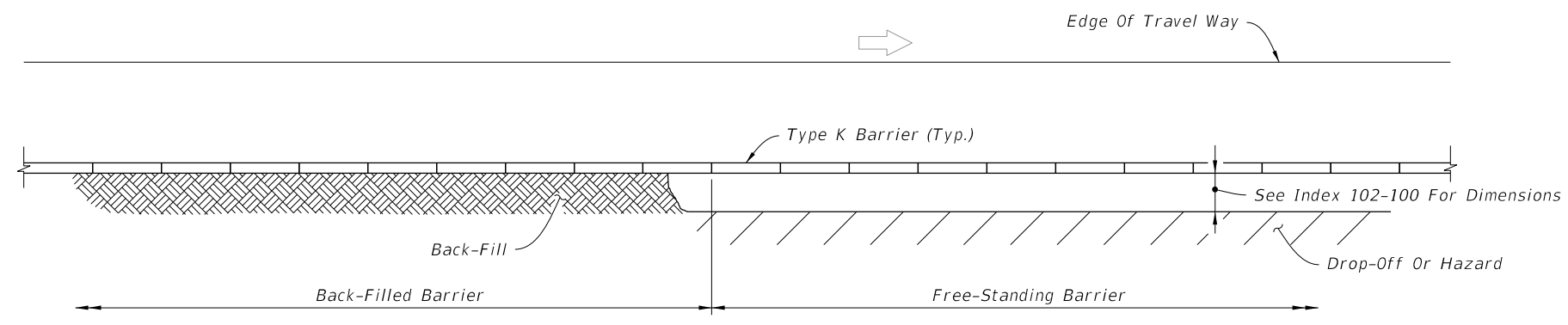
APPROACH TRANSITION FROM FREE-STANDING TO ANCHORED TYPE K TEMPORARY CONCRETE BARRIERS



APPROACH TRANSITION FROM FREE-STANDING TO BACK-FILLED TYPE K TEMPORARY CONCRETE BARRIERS



TRAILING END TRANSITION FROM ANCHORED TO FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS



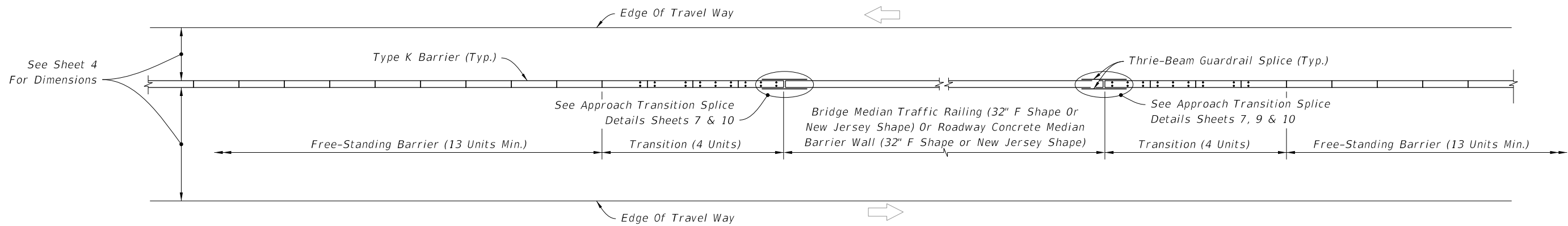
TRAILING END TRANSITION FROM BACK-FILLED TO FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS

*** NOTE:**
Where Barrier is located within Clear Zone of opposing traffic, Approach Transition is required.

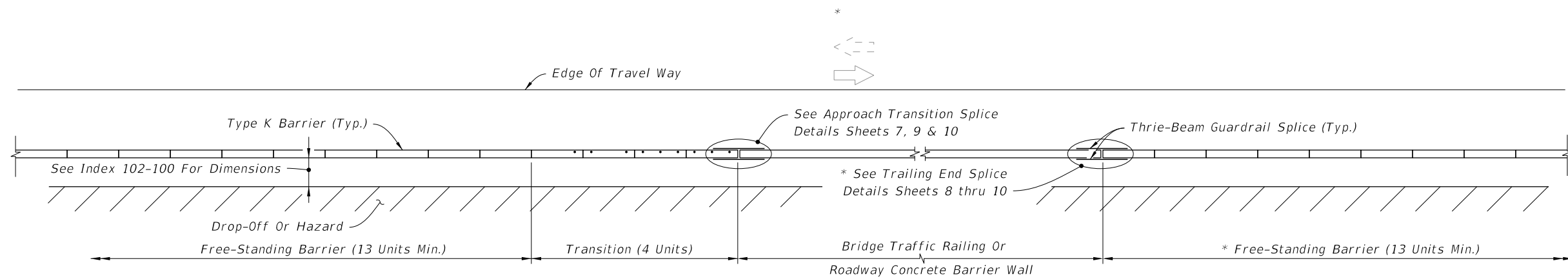
LEGEND:
Dot indicates number and position of Bolts or Stakes

10/30/2018 9:17:33 AM

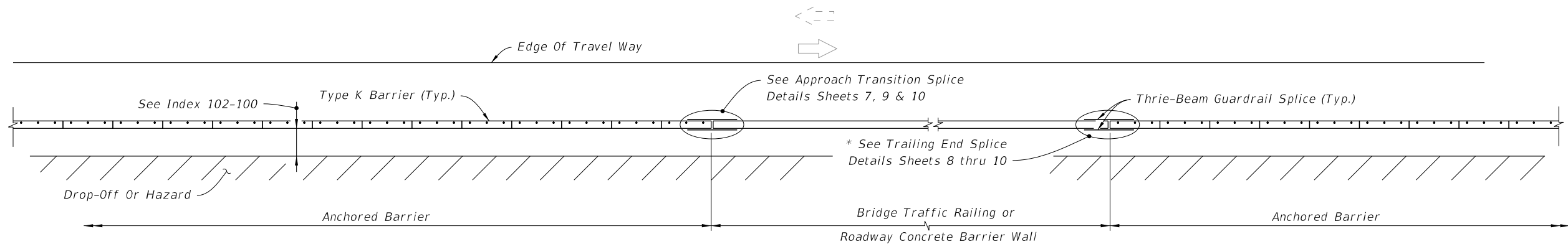
LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 5 of 17
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TRANSITION FROM FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS TO BRIDGE MEDIAN TRAFFIC RAILING OR ROADWAY MEDIAN CONCRETE BARRIER WALL



TRANSITION FROM FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS TO BRIDGE TRAFFIC RAILING OR ROADWAY CONCRETE BARRIER WALL



TRANSITION FROM ANCHORED TYPE K TEMPORARY CONCRETE BARRIERS TO BRIDGE TRAFFIC RAILING OR ROADWAY CONCRETE BARRIER WALL


*** NOTE:**

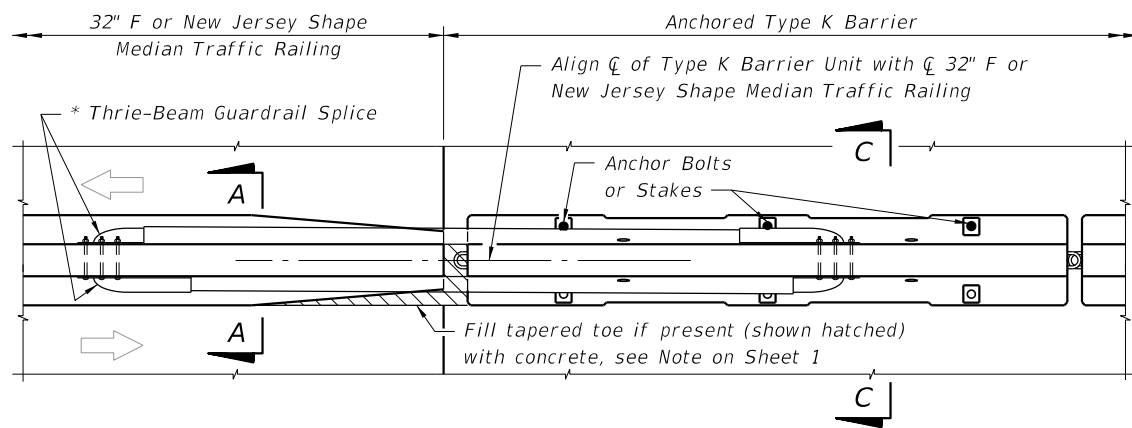
Where barrier is located within clear zone of opposing traffic, approach transition is required.

LEGEND:

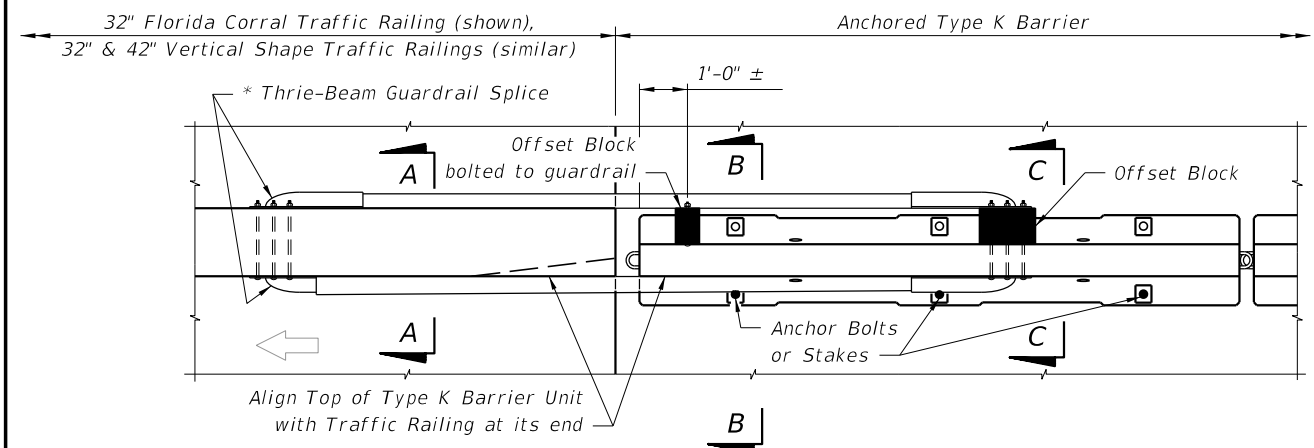
Dot indicates number and position of Bolts or Stakes

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 6 of 17
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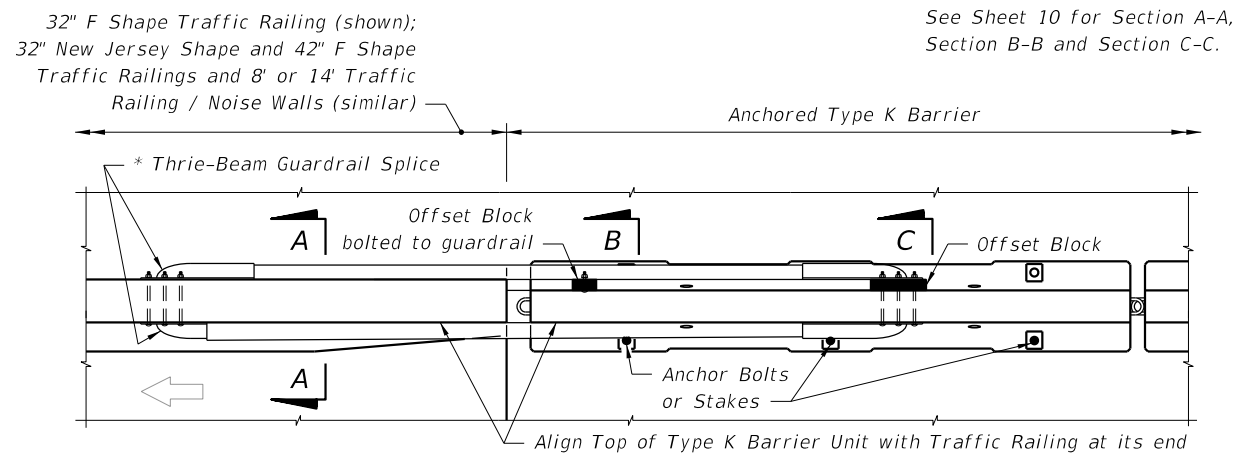


PARTIAL PLAN VIEW AT MEDIAN TRAFFIC RAILING



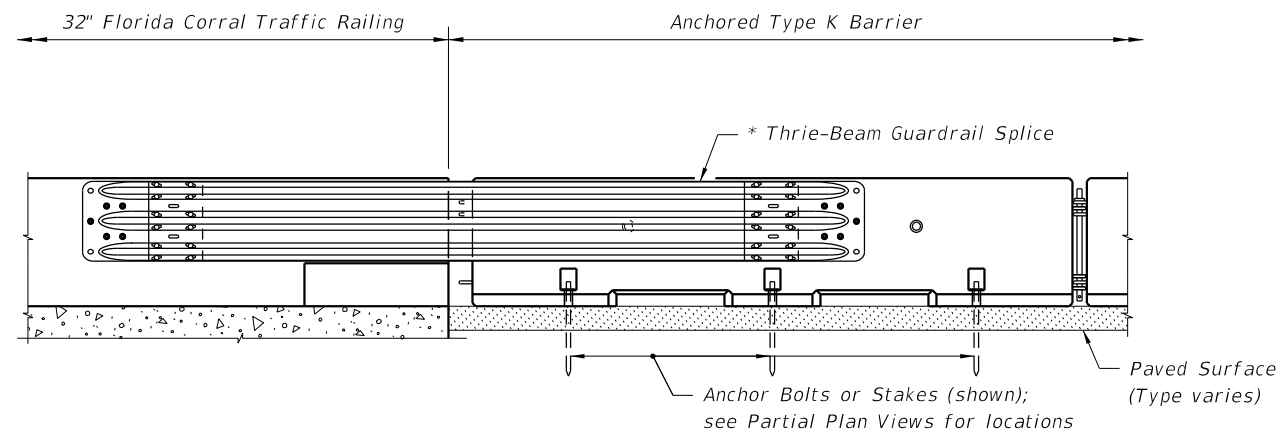
PARTIAL PLAN VIEW

Cross References:
See Sheet 10 for Section A-A,
Section B-B and Section C-C.

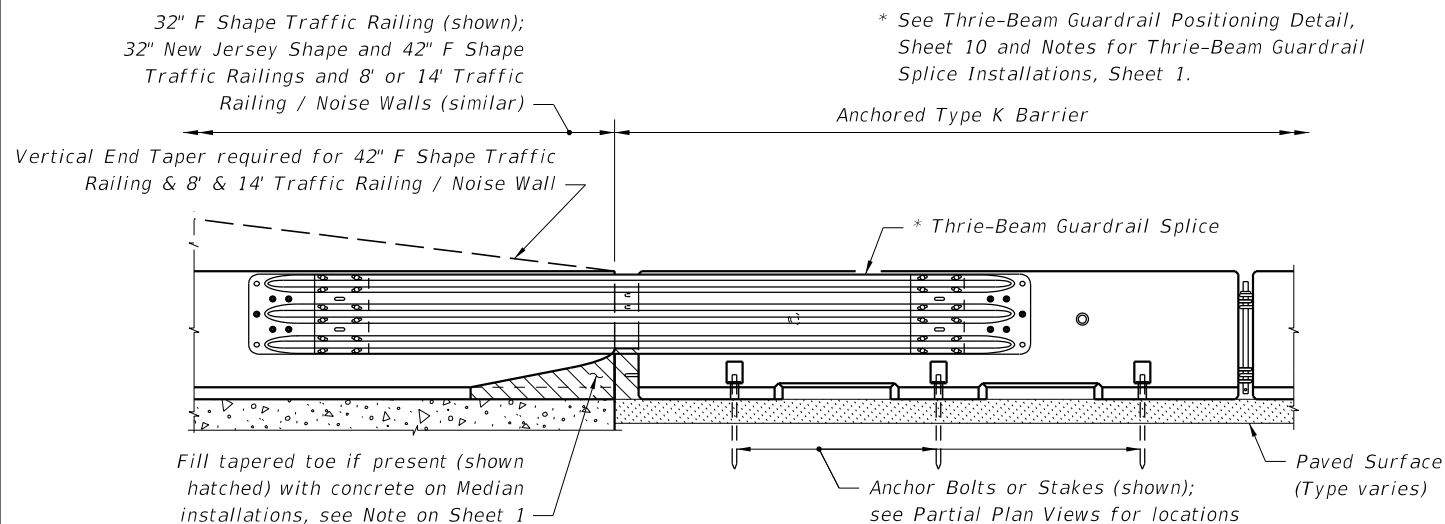


PARTIAL PLAN VIEW AT SHOULDER TRAFFIC RAILING

Cross References:
See Sheet 10 for Section A-A,
Section B-B and Section C-C.

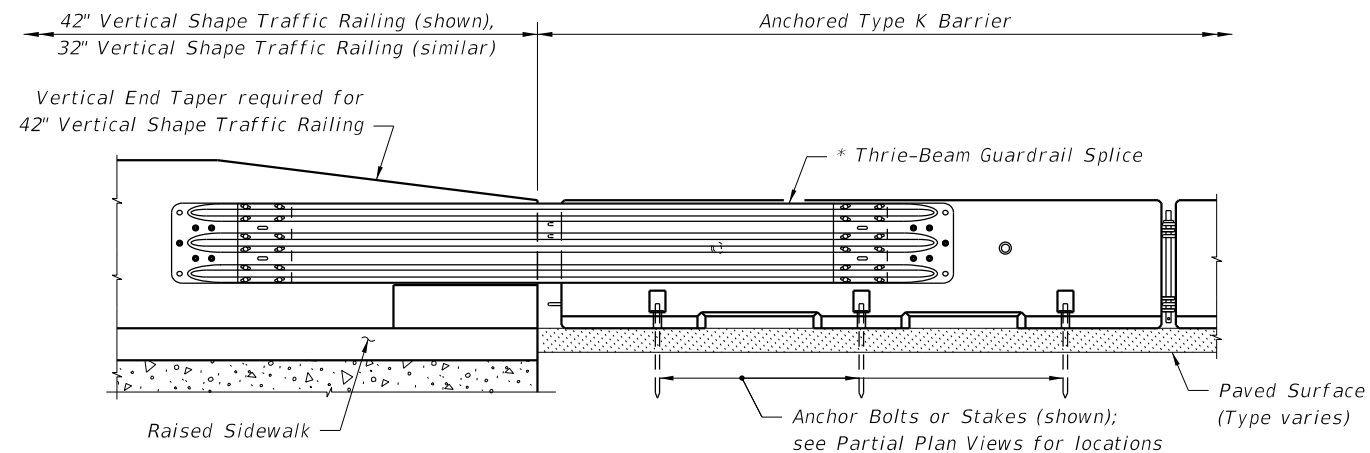


PARTIAL ELEVATION VIEW - FLORIDA CORRAL TRAFFIC RAILING



PARTIAL ELEVATION VIEW

* See Thrie-Beam Guardrail Positioning Detail,
Sheet 10 and Notes for Thrie-Beam Guardrail
Splice Installations, Sheet 1.



PARTIAL ELEVATION VIEW - VERTICAL SHAPE TRAFFIC RAILINGS

==== APPROACH TRANSITION SPLICE DETAIL ====
FOR F AND NEW JERSEY SHAPE TRAFFIC RAILINGS AND 8' & 14'
TRAFFIC RAILING / NOISE WALLS (CONCRETE BARRIER WALL SIMILAR)

==== APPROACH TRANSITION SPLICE DETAIL ====
FOR FLORIDA CORRAL AND VERTICAL
SHAPE TRAFFIC RAILINGS

10/30/2018 9:17:39 AM

LAST REVISION 11/01/17	DESCRIPTION:
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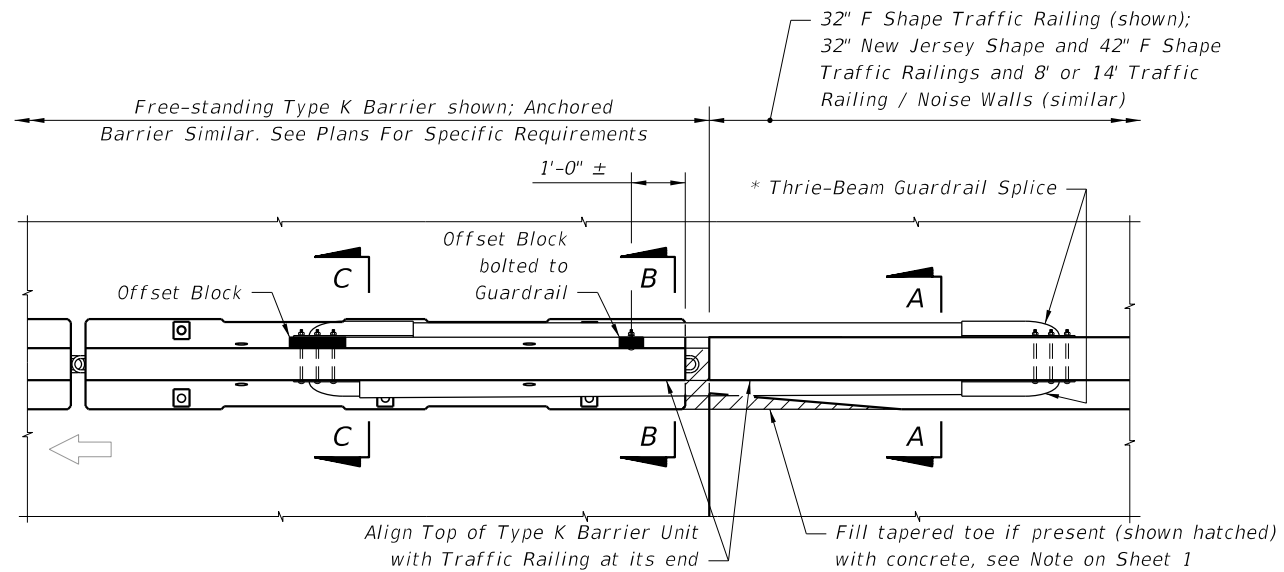


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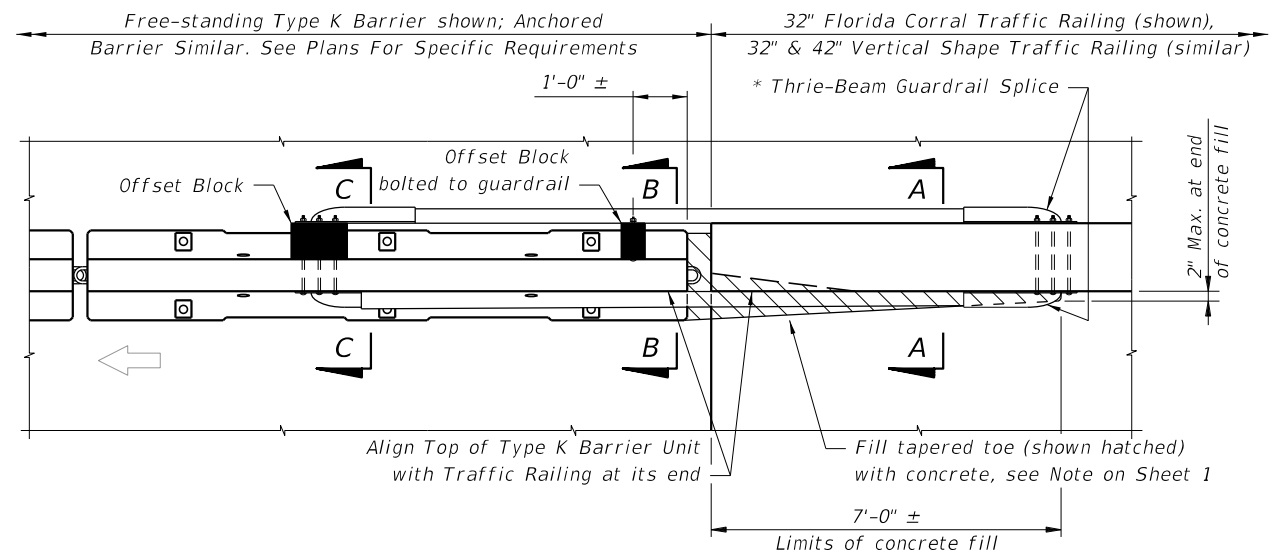
TYPE K TEMPORARY CONCRETE BARRIER SYSTEM

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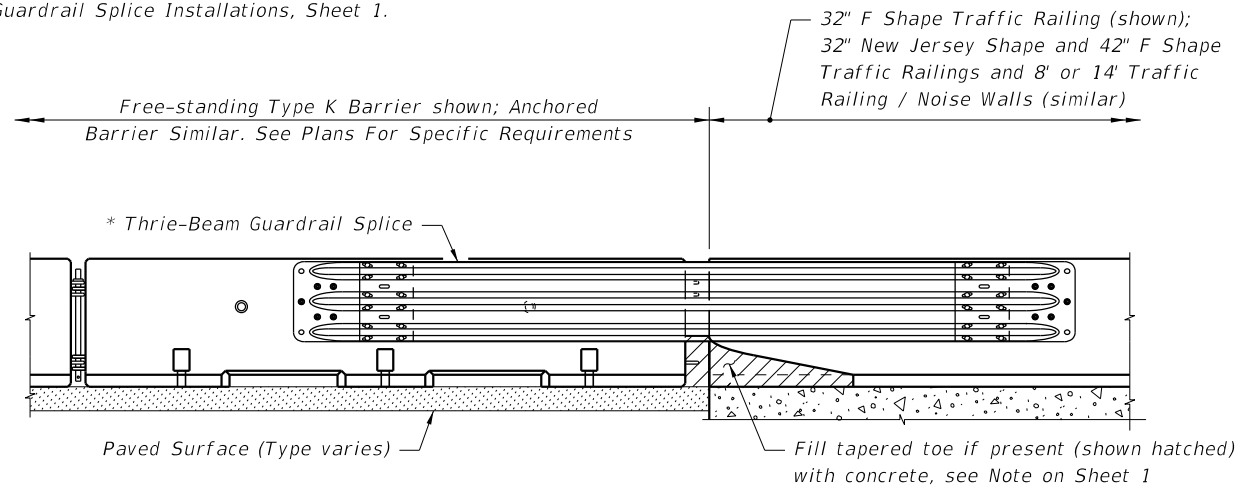


PARTIAL PLAN VIEW



PARTIAL PLAN VIEW

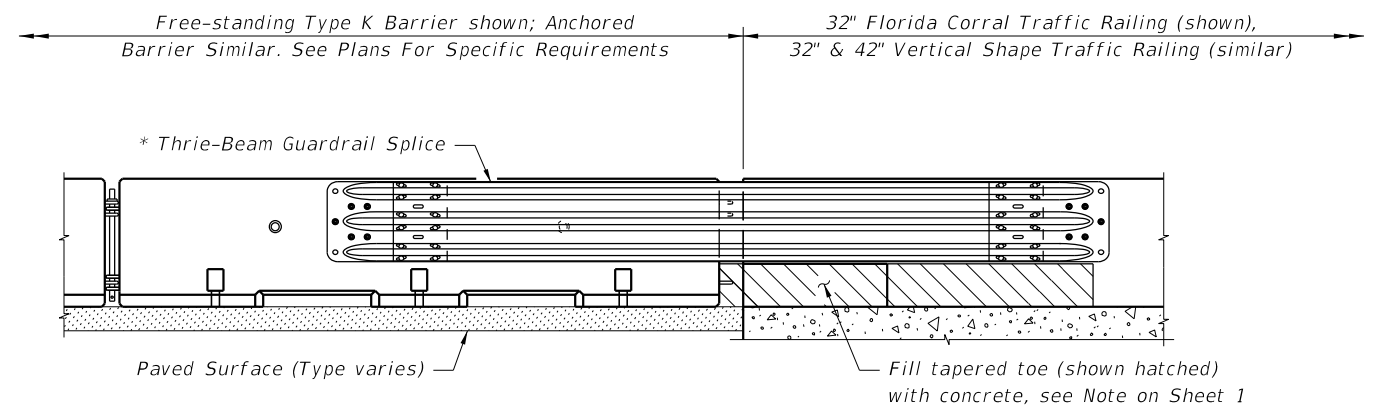
* See Thrie-Beam Guardrail Positioning Detail, Sheet 10 and Notes for Thrie-Beam Guardrail Splice Installations, Sheet 1.



PARTIAL ELEVATION VIEW

Cross References:
See Sheet 10 for Section A-A,
Section B-B and Section C-C.

TRAILING END SPLICE DETAIL
FOR F AND NEW JERSEY SHAPE TRAFFIC RAILINGS
AND 8' & 14' TRAFFIC RAILING / NOISE WALLS




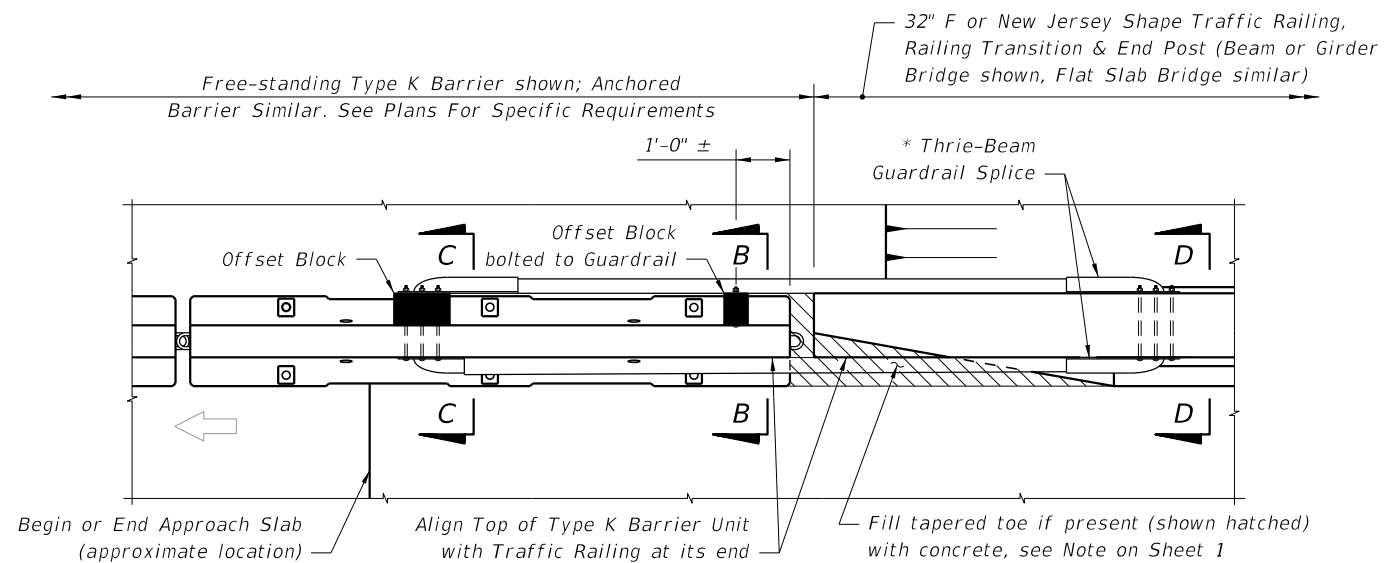
PARTIAL ELEVATION VIEW

Cross References:
See Sheet 10 for Section A-A,
Section B-B and Section C-C.

TRAILING END SPLICE DETAIL
FOR FLORIDA CORRAL AND VERTICAL
SHAPE TRAFFIC RAILINGS

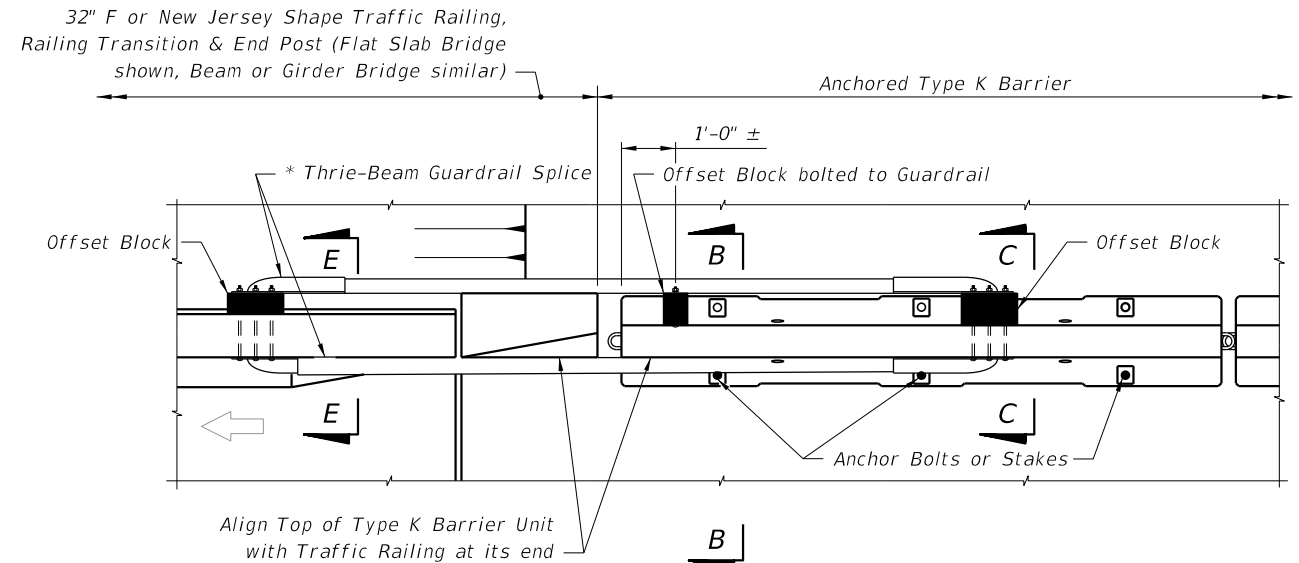
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LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 8 of 17
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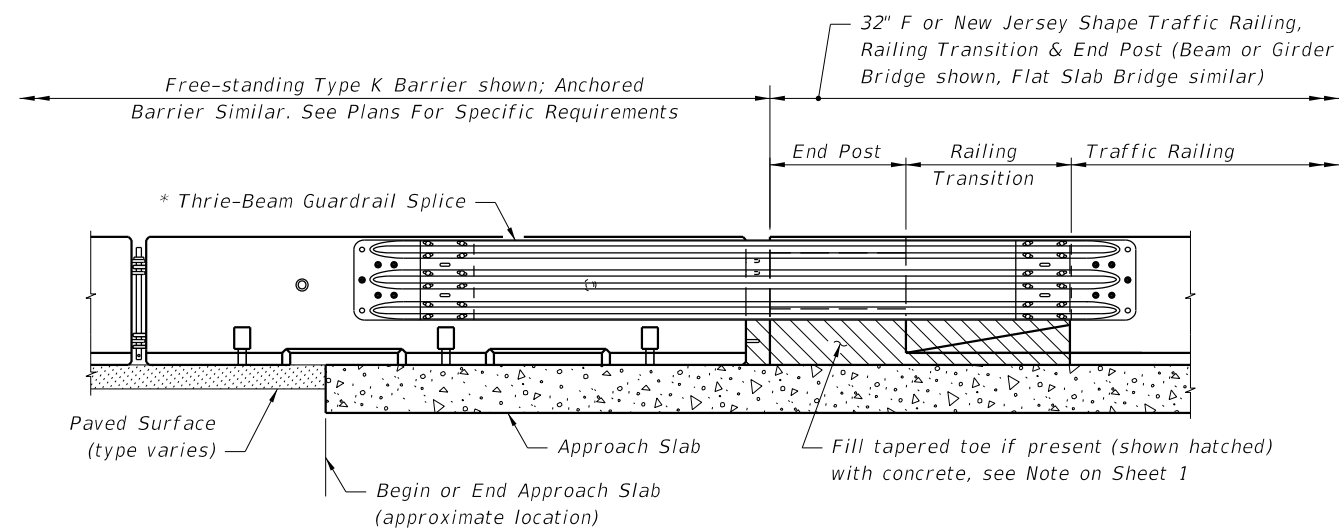


PARTIAL PLAN VIEW

* See Thrie-Beam Guardrail Positioning Detail, Sheet 10 and Notes for Thrie-Beam Guardrail Splice Installations, Sheet 1.

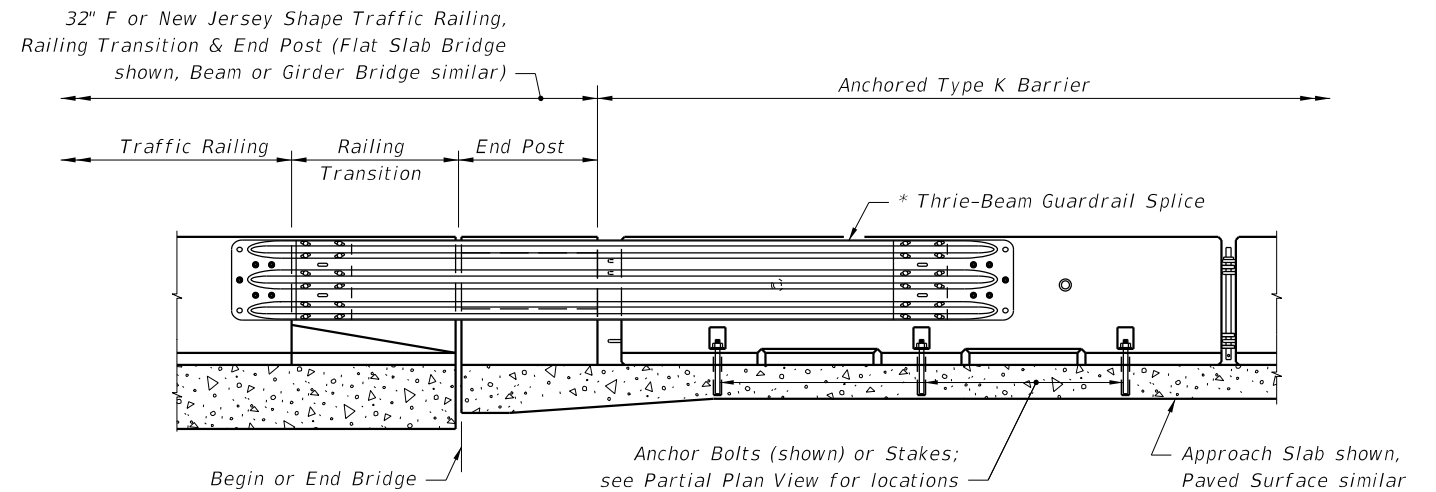


PARTIAL PLAN VIEW



PARTIAL ELEVATION VIEW

Cross References:
See Sheet 10 for Section B-B,
Section C-C and Section D-D.




PARTIAL ELEVATION VIEW

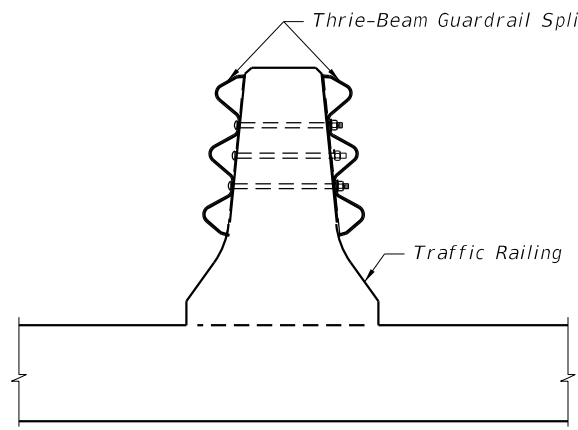
Cross References:
See Sheet 10 for Section B-B,
Section C-C and Section E-E.

TRAILING END SPLICE DETAIL
FOR 32" F AND NEW JERSEY SHAPE TRAFFIC RAILINGS
WITH RAILING TRANSITION AND END POST

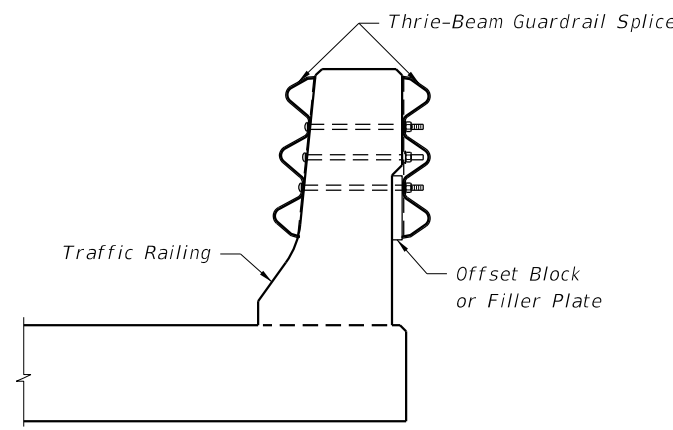
APPROACH TRANSITION SPLICE DETAIL
FOR 32" F AND NEW JERSEY SHAPE TRAFFIC RAILINGS
WITH RAILING TRANSITION AND END POST

10/30/2018 9:17:51 AM

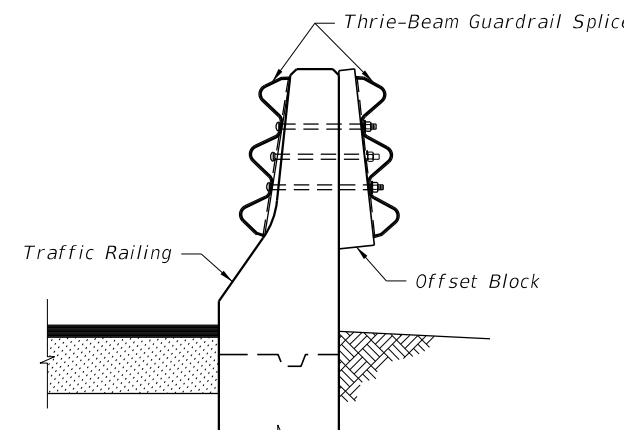
LAST REVISION 11/01/17	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 9 of 17



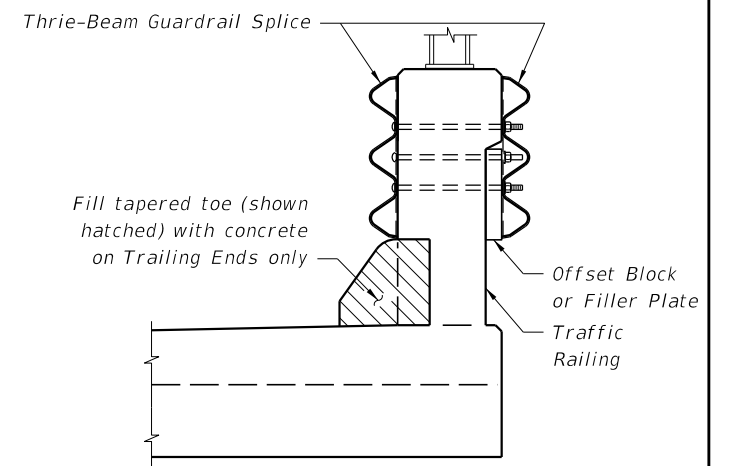
SECTION A-A
32" F Shape Median Traffic Railing (shown),
Median Concrete Barrier Wall (similar)



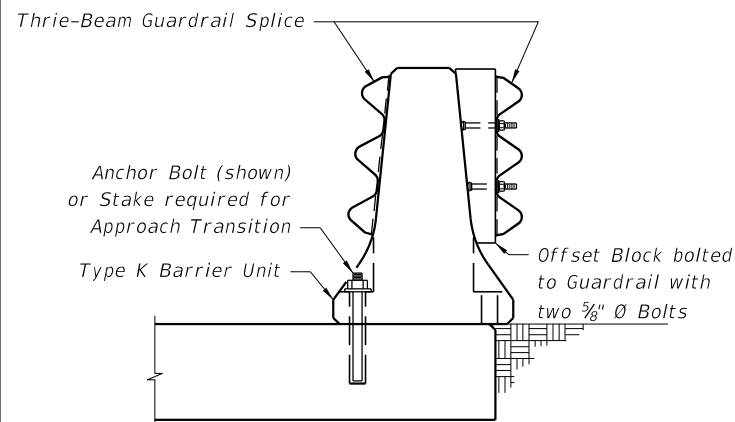
SECTION A-A
32" F Shape Traffic Railing (shown),
42" Traffic Railing and 8' & 14' Traffic
Railing / Noise Walls (similar)



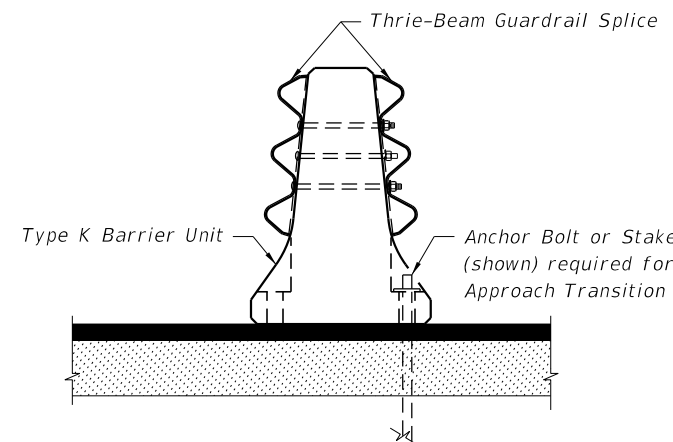
SECTION A-A
32" New Jersey Shape Concrete Barrier
Wall (shown), 32" New Jersey Shape Traffic
Railing & other Narrow Traffic Railings (similar)



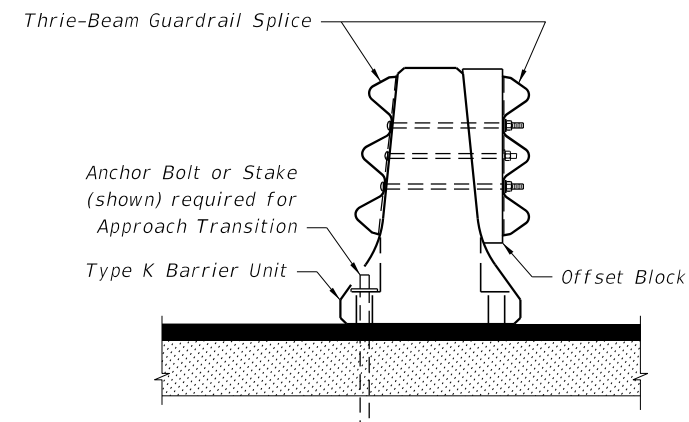
SECTION A-A
32" & 42" Vertical Shape Traffic
Railing (shown), Florida Corral
Traffic Railing (similar)



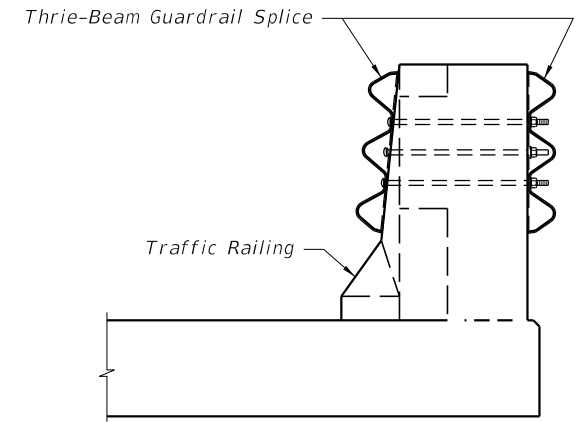
SECTION B-B
Adjacent to Shoulder Traffic Railings



SECTION C-C
Adjacent to 32" F or New Jersey Shape
Median Traffic Railing or
Median Concrete Barrier Wall

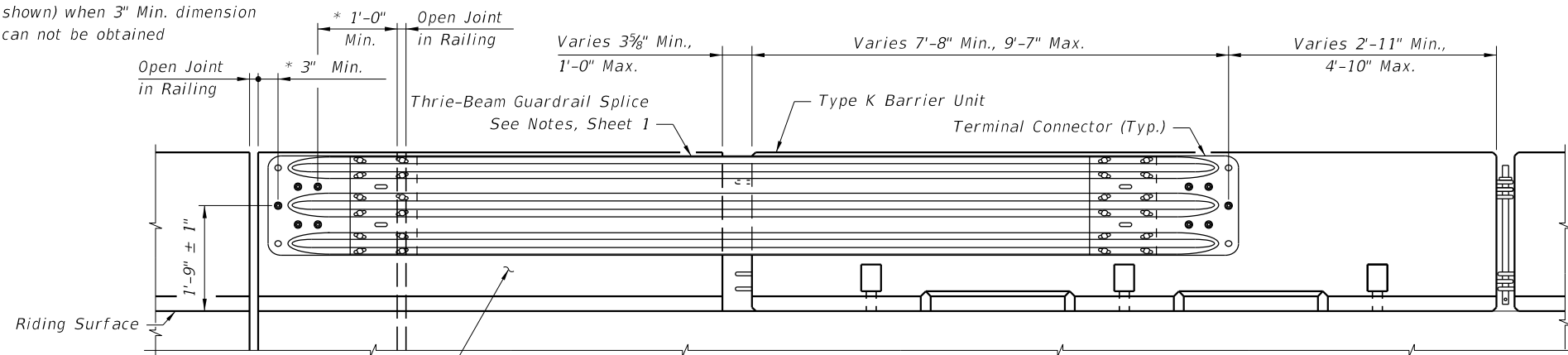


SECTION C-C
Adjacent to Shoulder Traffic Railings

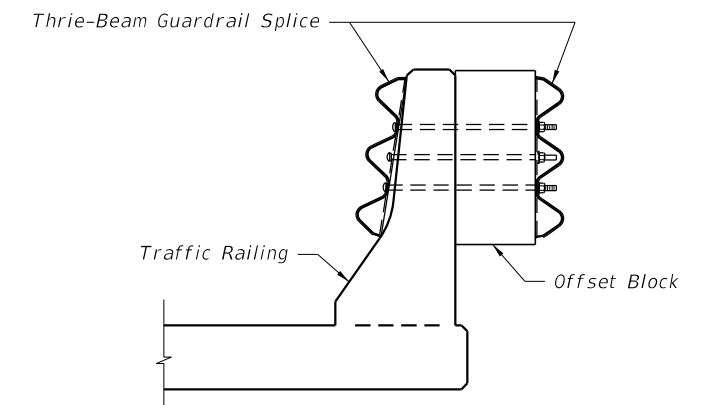


SECTION D-D
32" F or New Jersey Shape Traffic
Railing, Railing Transition & End Post

* Shift Thrie-Beam Guardrail Splice
beyond Open Joint 1'-0" Min. (as
shown) when 3" Min. dimension
can not be obtained



THRIE-BEAM GUARDRAIL POSITIONING DETAIL



SECTION E-E
32" New Jersey Shape Traffic Railing
(shown), 32" F Shape Traffic
Railing (similar)

10/30/2018 9:17:55 AM

LAST REVISION
11/01/17

REVISION DESCRIPTION:

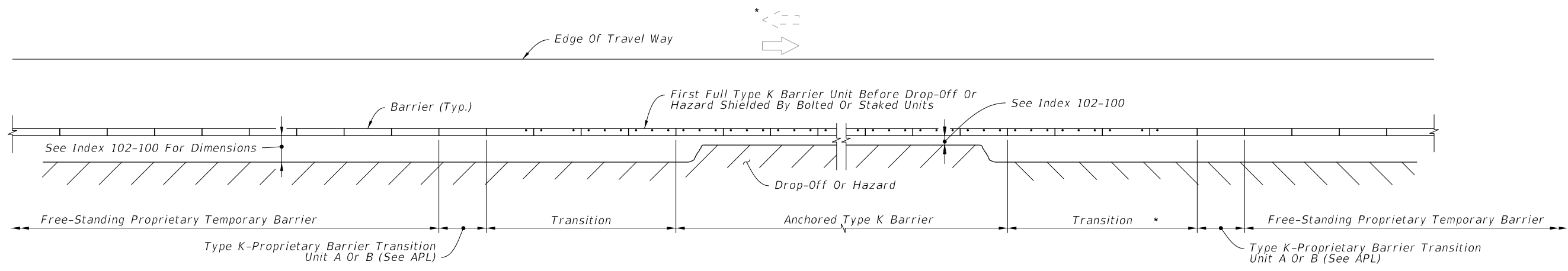


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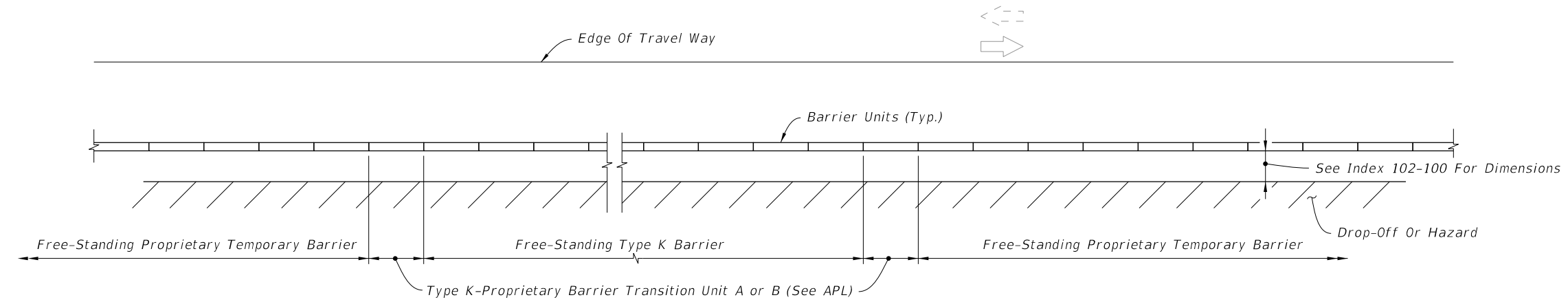
TYPE K TEMPORARY CONCRETE BARRIER SYSTEM

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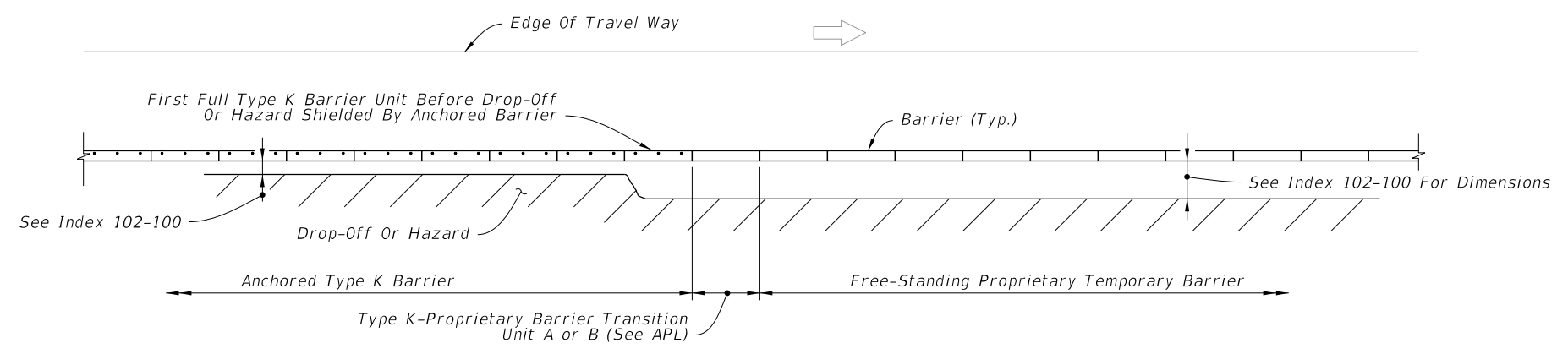
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APPROACH TRANSITION FROM FREE-STANDING PROPRIETARY TEMPORARY BARRIERS TO ANCHORED TYPE K TEMPORARY CONCRETE BARRIERS



APPROACH AND TRAILING END TRANSITIONS FROM FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS




TRAILING END TRANSITION FROM ANCHORED TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS

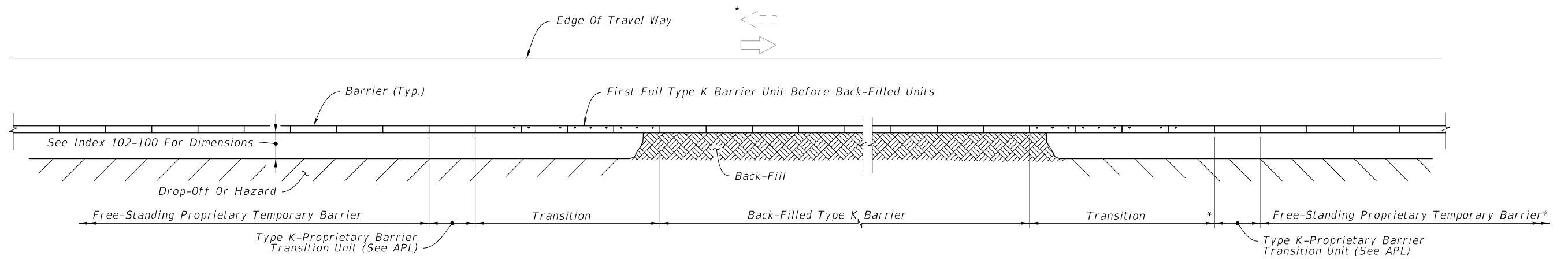
*** NOTE:**
Where Barrier is located within Clear Zone of opposing traffic, Approach Transition is required.

LEGEND:
Dot indicates number and position of Bolts or Stakes

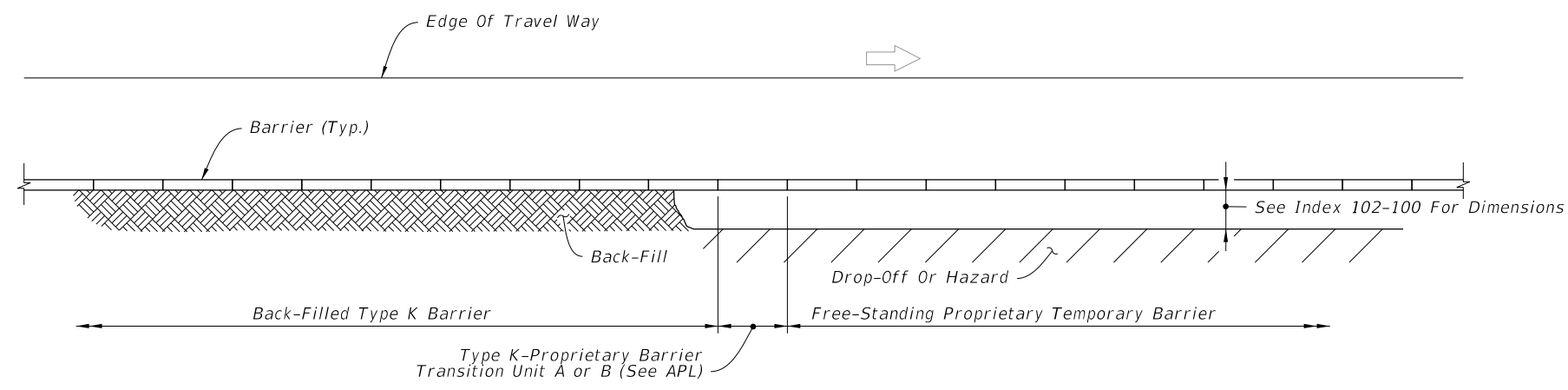
TYPE K-PROPRIETARY TEMPORARY CONCRETE BARRIER TRANSITIONS

10/30/2018 9:17:58 AM

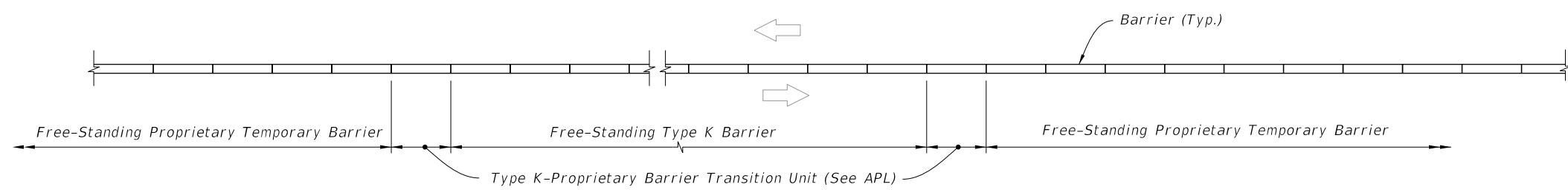
LAST REVISION 11/01/17	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 11 of 17
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APPROACH TRANSITION FROM FREE-STANDING PROPRIETARY TEMPORARY BARRIERS TO BACK-FILLED TYPE K TEMPORARY CONCRETE BARRIERS



TRAILING END TRANSITION FROM BACK-FILLED TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS




MEDIAN APPROACH AND TRAILING END TRANSITIONS FROM FREE-STANDING TYPE K TEMPORARY CONCRETE BARRIERS TO FREE-STANDING PROPRIETARY TEMPORARY BARRIERS

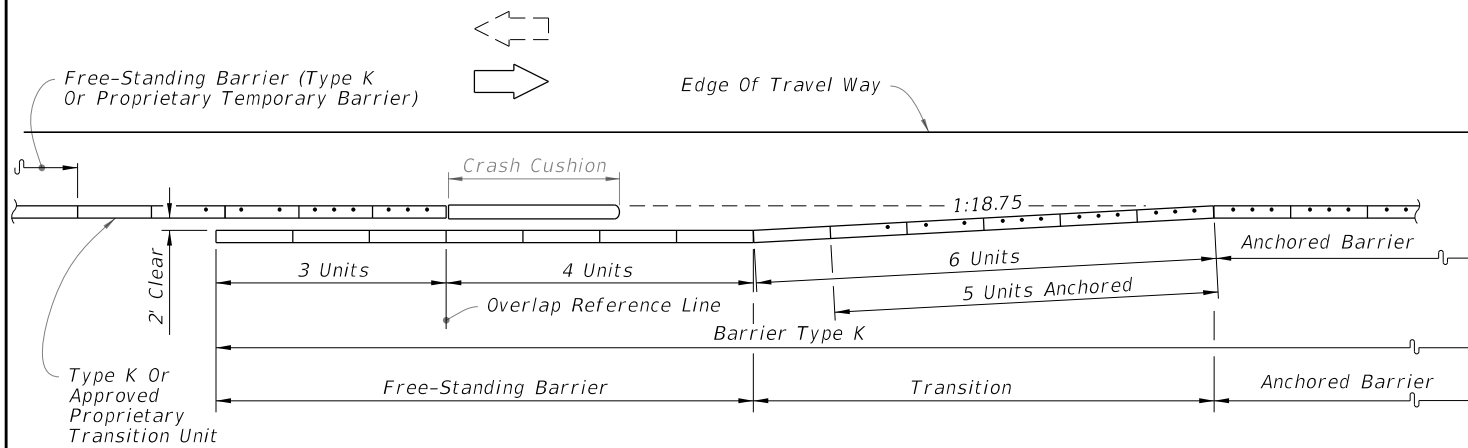
NOTE:
Where Barrier is located within Clear Zone of opposing traffic, Approach Transition is required.

LEGEND:
Dot indicates number and position of Bolts or Stakes

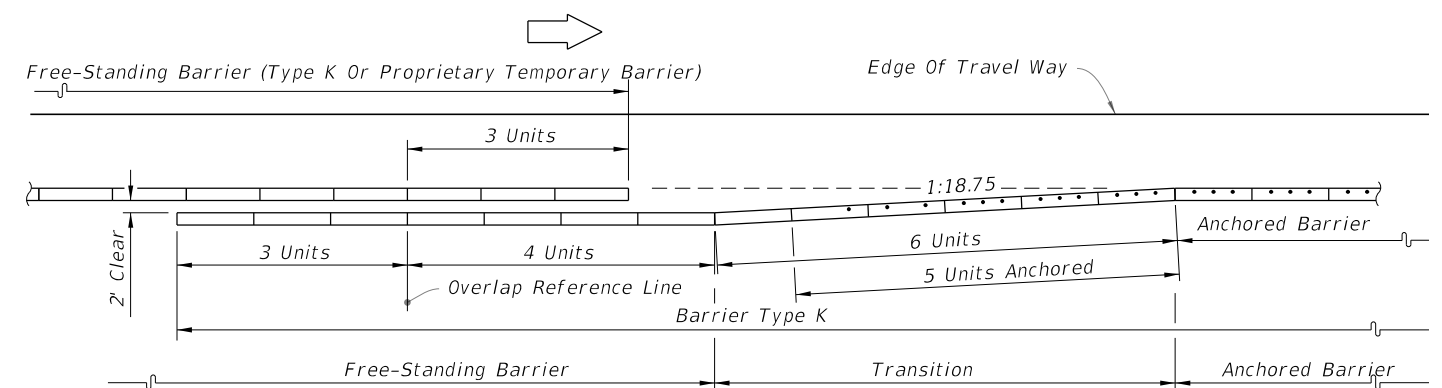
TYPE K-PROPRIETARY TEMPORARY CONCRETE BARRIER TRANSITIONS

10/30/2018 9:18:01 AM

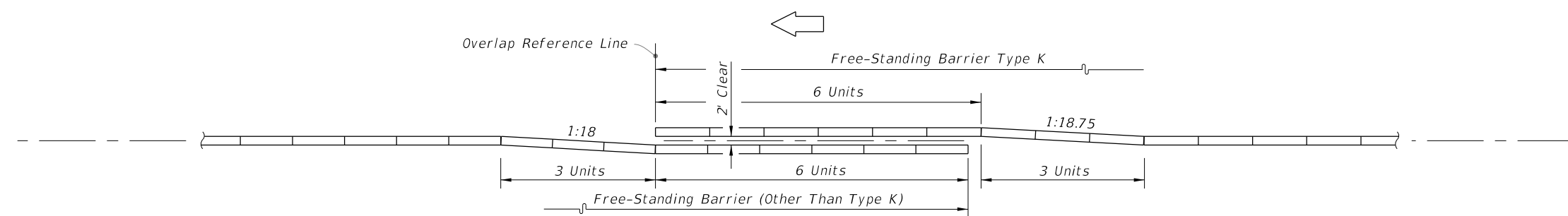
LAST REVISION 11/01/17	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 12 of 17
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APPROACH SHOULDER BARRIER ON UNDIVIDED FACILITIES

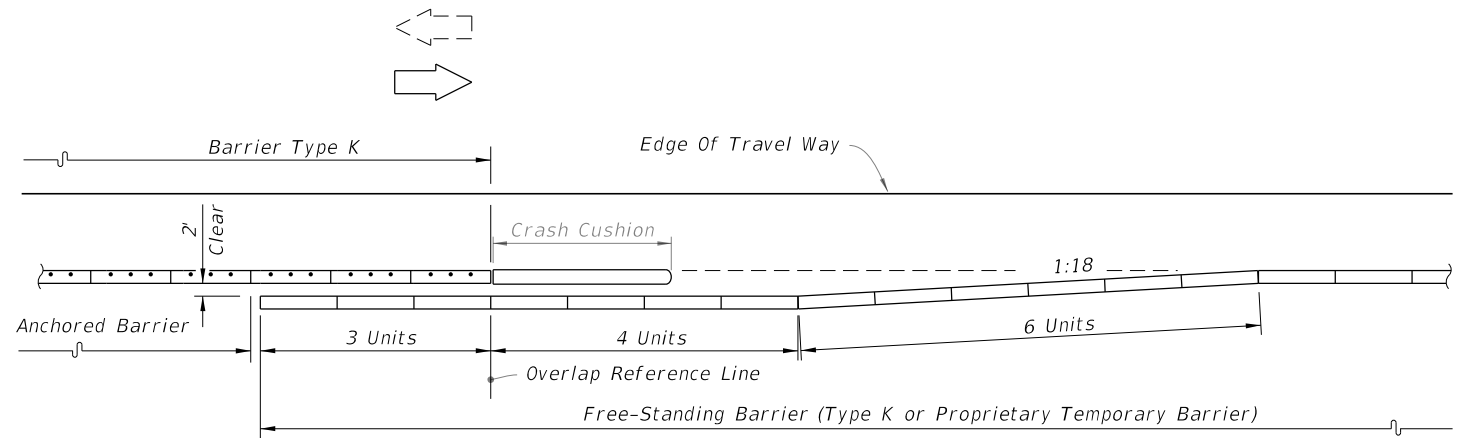


APPROACH SHOULDER BARRIER ON DIVIDED FACILITIES

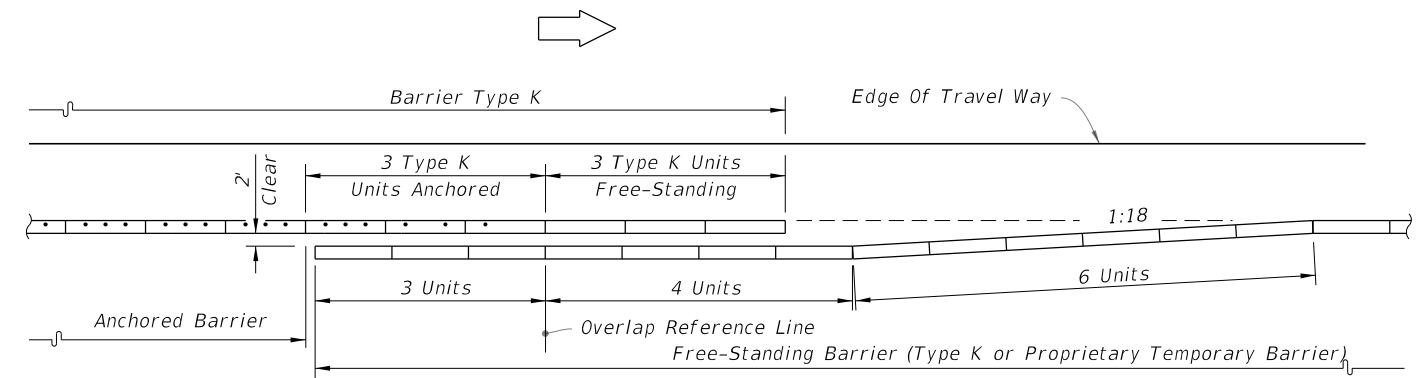


INTERIOR MEDIAN BARRIER

LEGEND
 Dot Indicates Number And Position Of Bolts Or Stakes



DEPARTURE (TRAILING) SHOULDER BARRIER ON UNDIVIDED FACILITIES
 (BARRIER TYPE K ON BRIDGES AND APPROACH SLABS)



DEPARTURE (TRAILING) SHOULDER BARRIER ON DIVIDED FACILITIES
 (BARRIER TYPE K ON BRIDGES AND APPROACH SLABS)

CONTINUATION OF BARRIER • FROM OTHER TYPE BARRIERS TO BARRIER TYPE K

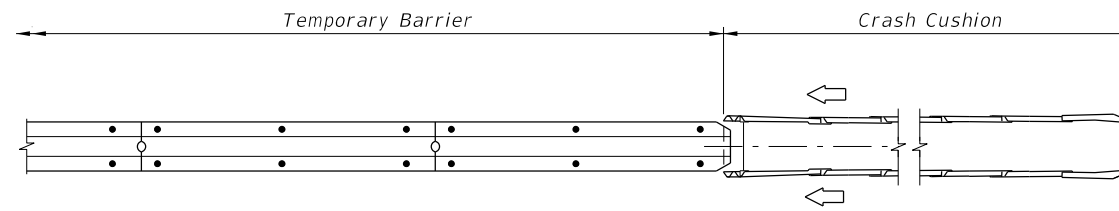
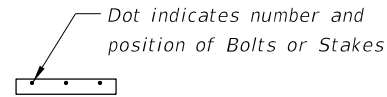
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LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 13 of 17
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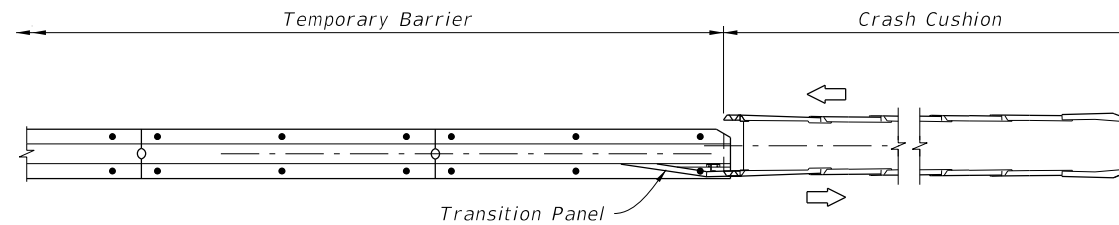
NOTE:

When subjected to reverse direction hits, construct Transition Panels from Temporary Barrier to Crash Cushions; for additional details refer to the applicable crash cushion drawings on the APL.

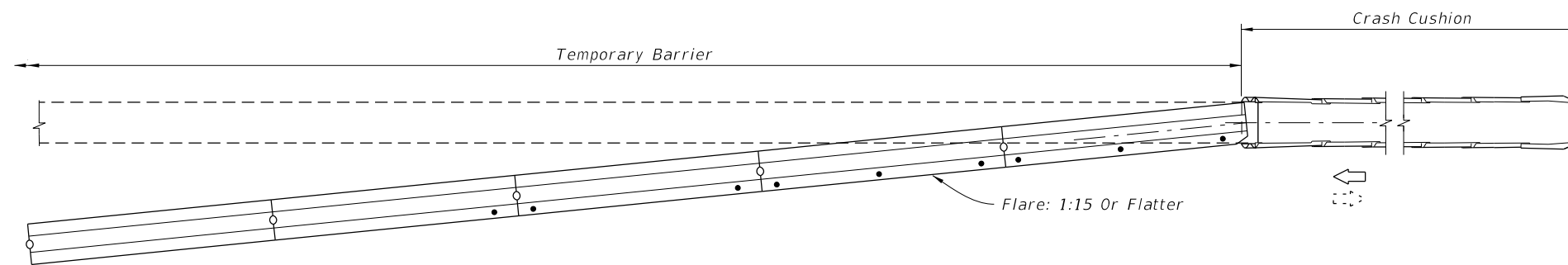
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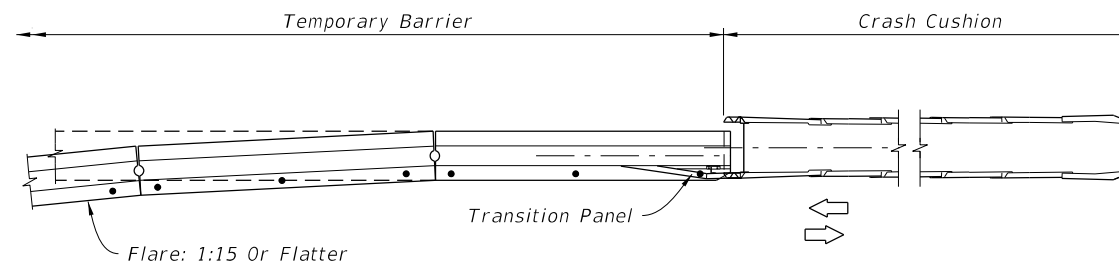
UNIDIRECTIONAL - SEPARATED TRAFFIC



BIDIRECTIONAL - SEPARATED TRAFFIC



TWO-WAY TRAFFIC WITH CRASH CUSHION LOCATED OUTSIDE OPPOSING LANE CLEAR ZONE OR ONE-WAY TRAFFIC



TWO-WAY TRAFFIC WITH CRASH CUSHION LOCATED WITHIN OPPOSING LANE CLEAR ZONE



END TREATMENT WHEN SHIELDED BY A CRASH CUSHION

SHOULDER - RIGHT OR LEFT (RIGHT SIDE SHOWN)

SHIELDING ENDS WITH REDIRECTIVE CRASH CUSHIONS (REDIRECTIVE OPTION)

4/10/2019 2:19:06 PM

LAST REVISION 11/01/17	DESCRIPTION:
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TYPE K TEMPORARY CONCRETE BARRIER SYSTEM

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FABRICATION NOTES:

In order to maintain crashworthiness of the Barrier System, do not substitute different grades, sizes, shapes or types of reinforcing steel for those shown for constructing Type K Barrier Units. Also, do not substitute different type, size, length or material grade anchor bolts, nuts, washers, adhesives, connector pins, stakes, keeper pins, or guardrail components for installing Type K Barrier Units.

FABRICATOR PREQUALIFICATIONS:

- A. The Concrete Plant that meets the requirements;
 - a. Specifications 450 for prestressed concrete
 - b. Specification 105 for precast.

CONCRETE:

- A. Construct Barrier Units with Class IV concrete in accordance with Specification 346.
- B. Specification 346-10.2 through 346-10.4 are not applicable.
- C. Barrier Units represented by concrete acceptance strength tests which fall below 5000 psi will be rejected.

REINFORCING STEEL:

- A. Use only steel reinforcing that meet ASTM A 615, Grade 60, with the exception of Bars 6D1, 6D2 and 6D3.
- B. Bars 6D1, 6D2 and 6D3 use steel reinforcing that meets ASTM A 706, with the exception that a 2 $\frac{3}{4}$ " diameter pin must be used for the 180 degree bend test.
- C. After steel reinforcing fabrication, hot dip galvanized in accordance with Specification 962 or coated with a cold galvanizing compound in accordance with Specification 562, all or part of Bars 6D.
- D. At the Fabricator's option, the entire length of Bars 6D may be galvanized or coated.
- E. The minimum limit of galvanizing or coating is shown in the Bending Diagrams.
- F. Install Bars 6D within $\frac{1}{8}$ " of the plan dimensions.
- G. Correct placement of Bars 6D is critical for proper fit up and performance of individual Barrier Units.
- H. At the option of the Fabricator, Deformed Welded Wire Fabric in accordance with Specification Section 931 and the details shown on Sheet 15 may be utilized in lieu of Bars 4A and 5B.
- I. All dimensions in the Bending Diagrams are out to out.
- J. Install all reinforcing steel with a 2" minimum cover, except as noted.

LIFTING SLEEVE ASSEMBLY:

- A. Inclusion of the Lifting Sleeve Assemblies is optional.
- B. Use steel in accordance with ASTM A 53 for the Pipe Sleeve.
- C. Hot-dip galvanize the Lifting Sleeve Assemblies after their fabrication in accordance with the Specifications.


SURFACE FINISH:

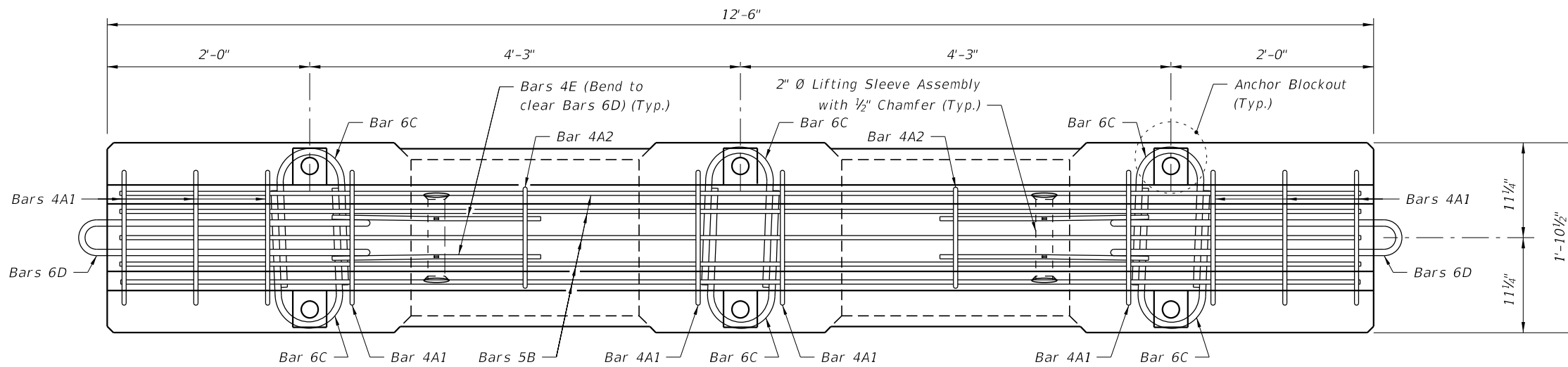
- A. Construct Barrier Units in accordance with Specification Sections 400 and 521.
- B. Finish the top and sides of the Barrier Units with a General Surface Finish.
- C. Finish the bottom of the Barrier Units to a dense uniform surface by floating in lieu of the General Surface Finish.
- D. Use stationary metal forms or stationary timber forms with a form liner.

MARKING:

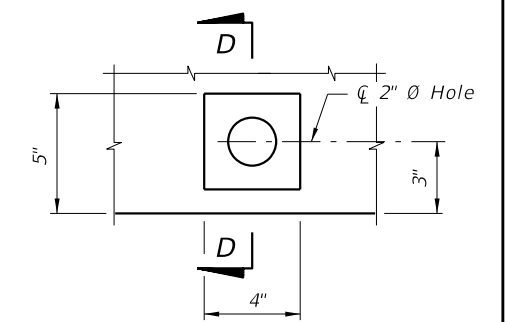
- A. Permanently mark the top left end of each Barrier Unit by the use of an embedded and anchored metallic plate with letters and figures a minimum of 0.5" tall.
- B. Ink stamps are not allowed.
- C. Permanently mark with the following information:
 - Type K1
 - Fabricator's name or symbol
 - Date of manufacture (day, month and year)

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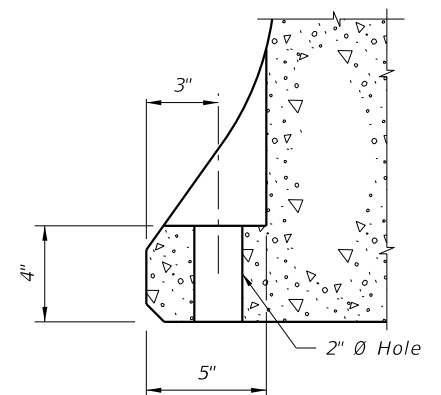
LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TYPE K TEMPORARY CONCRETE BARRIER SYSTEM	INDEX 102-110	SHEET 15 of 17
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PLAN VIEW

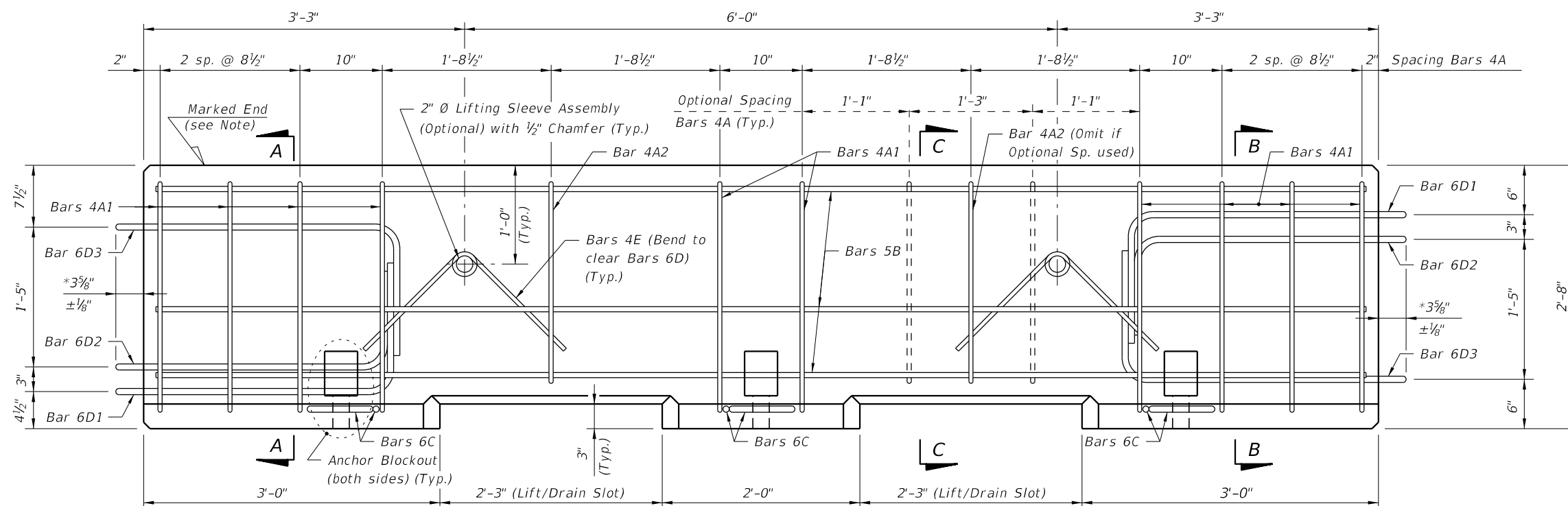


ANCHOR BLOCKOUT DETAIL

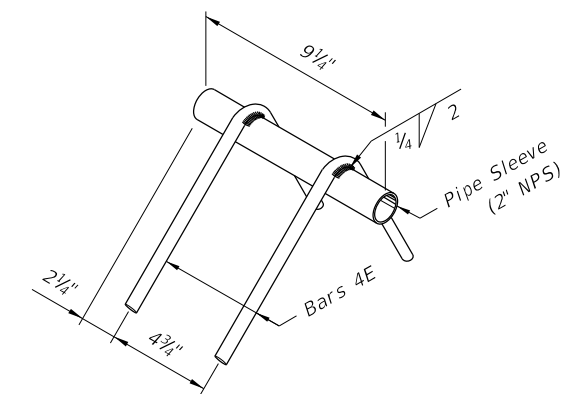


SECTION D-D
(Reinforcement not shown for clarity)

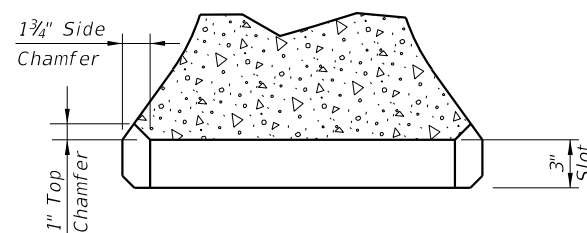
* Measured from end of Barrier Unit to outside edge of Bars 6D.



ELEVATION VIEW



LIFTING SLEEVE
ASSEMBLY DETAIL (OPTIONAL)



SECTION THRU LIFT/DRAIN SLOT

ESTIMATED TEMPORARY CONCRETE BARRIER QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete	CY	1.29
Reinforcing Steel	LB	218

The above quantities are for one Barrier Unit.

Cross References:
For Section A-A, Section B-B and Section C-C see Sheet 16.

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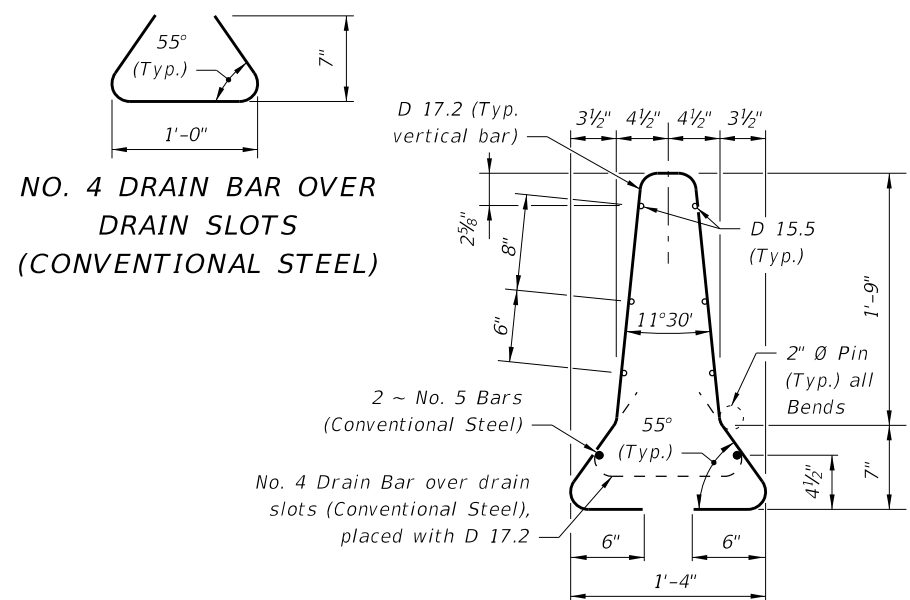
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TYPE K TEMPORARY CONCRETE BARRIER SYSTEM

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ALTERNATE REINFORCING STEEL DETAIL
WELDED WIRE REINFORCEMENT

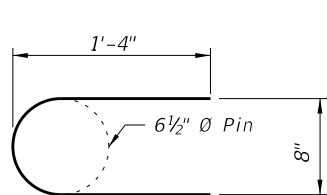


NOTES:
Place 2 ~ No. 5 Bars (12'-3" long) in bottom of Welded Wire Reinforcement cage as shown.
Match D17.2 spacing to Bars 4A in the Elevation View, Sheet 15.
Field trim D17.2 to clear drain slot by 2".

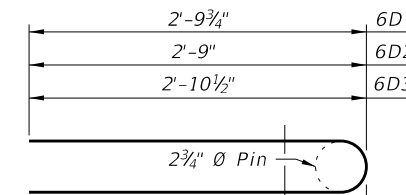
CONFIGURATION ONE

CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

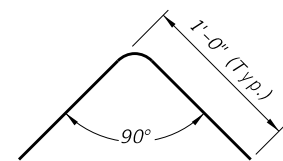
BILL OF REINFORCING STEEL			
MARK	SIZE	NUMBER	LENGTH
A1	4	10	6'-1"
A2	4	2	5'-5"
B	5	5	12'-3" (Straight)
C	6	6	3'-1"
D1	6	2	8'-4"
D2	6	2	7'-6"
D3	6	2	8'-6"
E	4	4	2'-0"



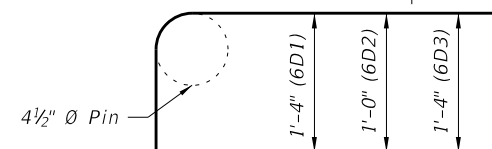
BAR 6C



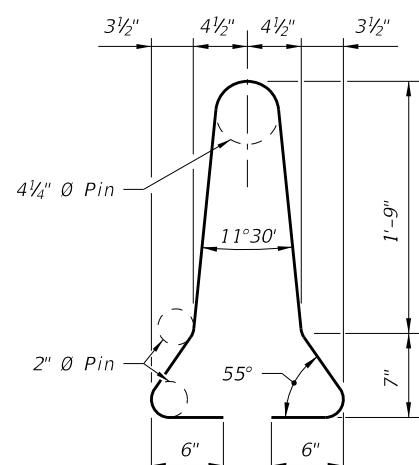
TOP VIEW
BARS 6D1, 6D2 & 6D3



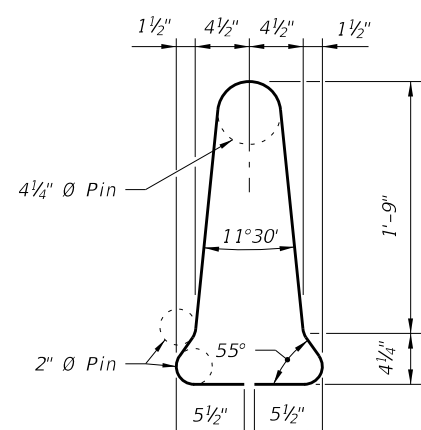
BAR 4E



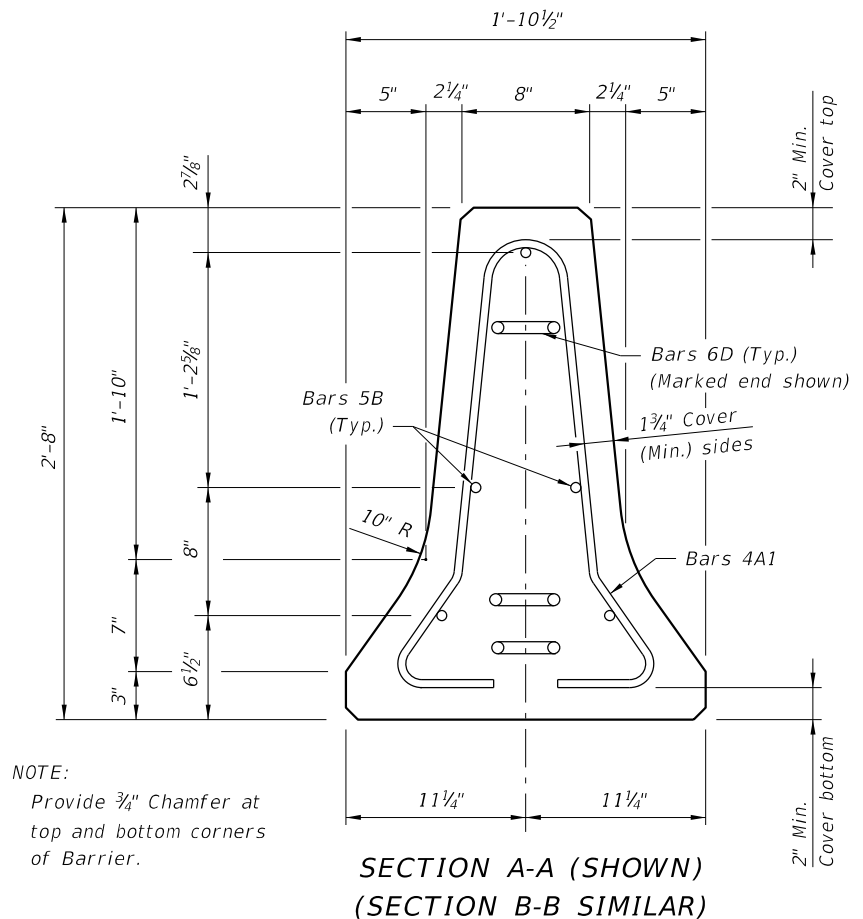
SIDE VIEW
BARS 6D1, 6D2 & 6D3



STIRRUP BAR 4A1

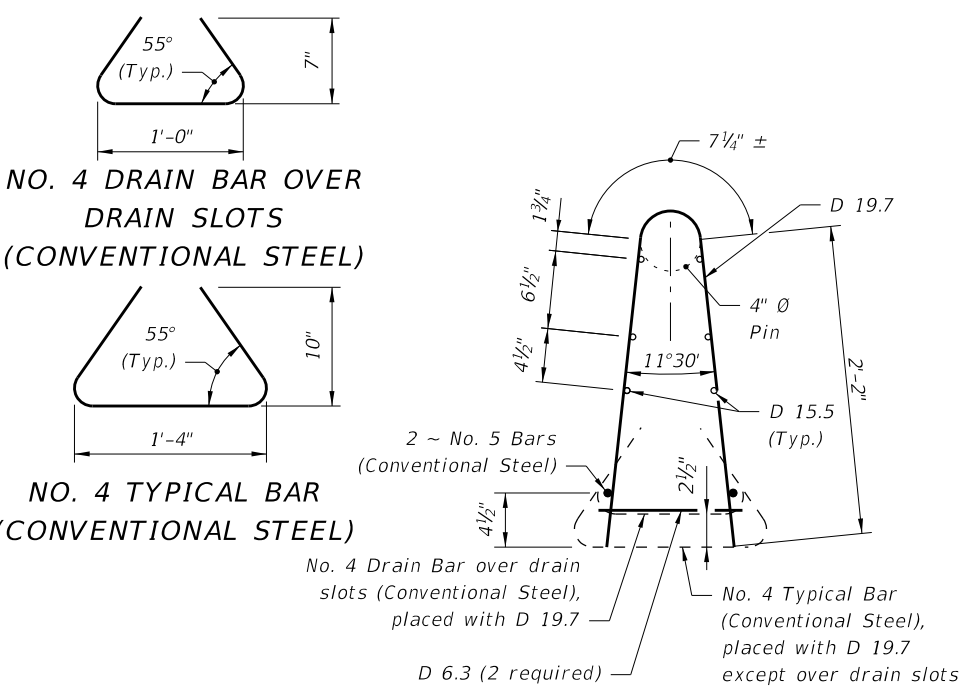


STIRRUP BAR 4A2



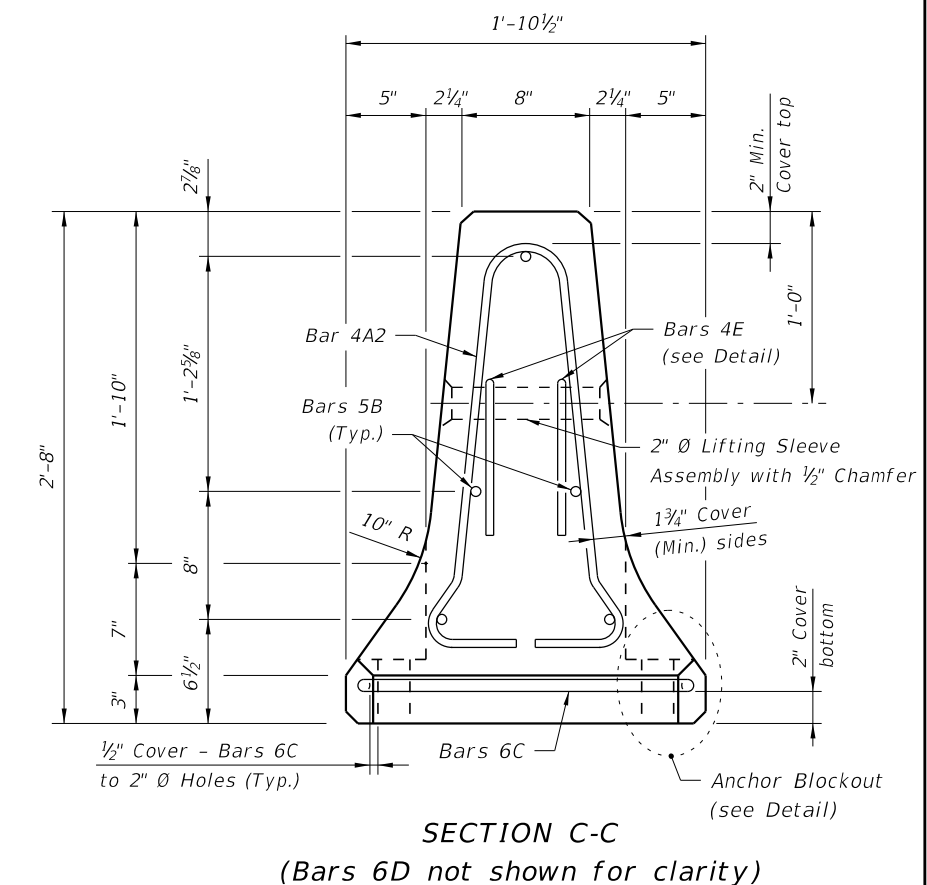
NOTE:
Provide 3/4" Chamfer at top and bottom corners of Barrier.

SECTION A-A (SHOWN)
(SECTION B-B SIMILAR)



NOTES:
Place 2 ~ No. 5 Bars (12'-3" long) tied to D 19.7 inside of bottom Welded Wire Reinforcement cage as shown.
Match D19.7 spacing to Bars 4A in the Elevation View, Sheet 15.
Field trim D19.7 to clear drain slot by 2".

CONFIGURATION TWO



SECTION C-C
(Bars 6D not shown for clarity)

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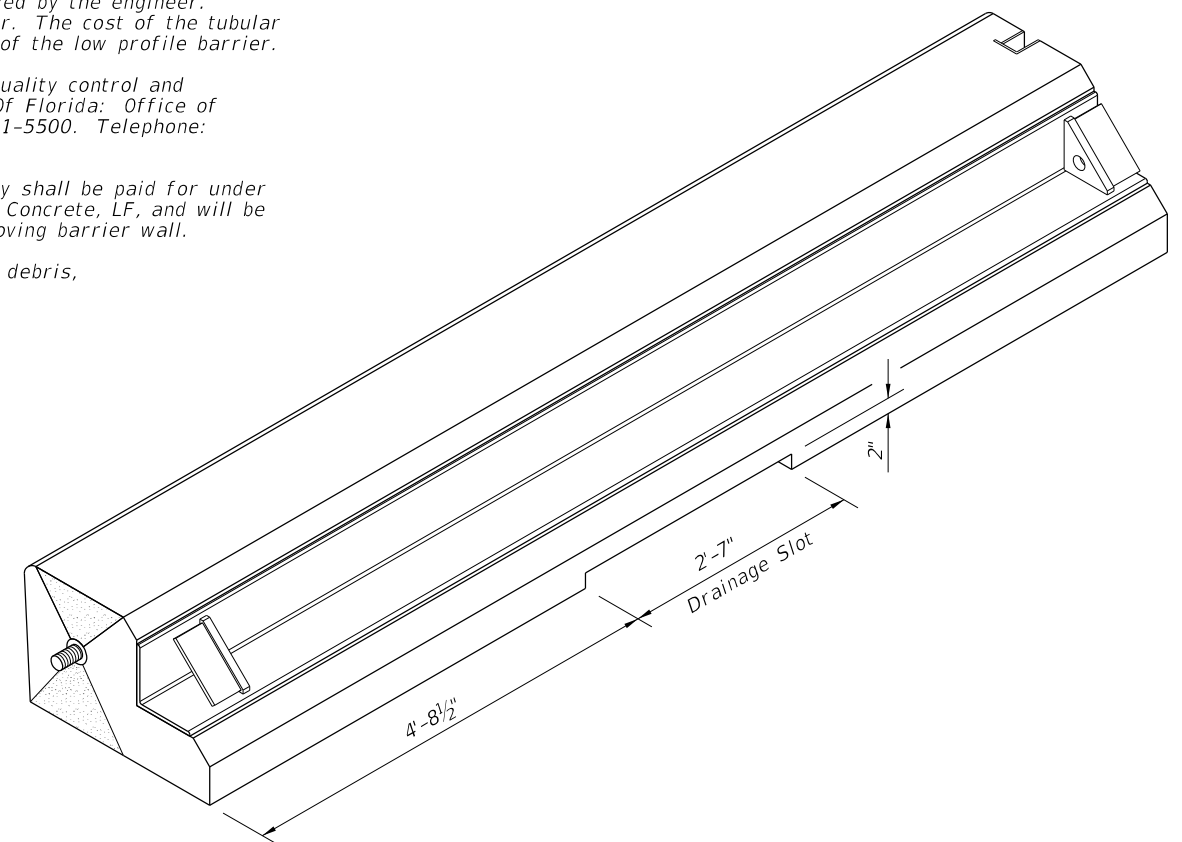
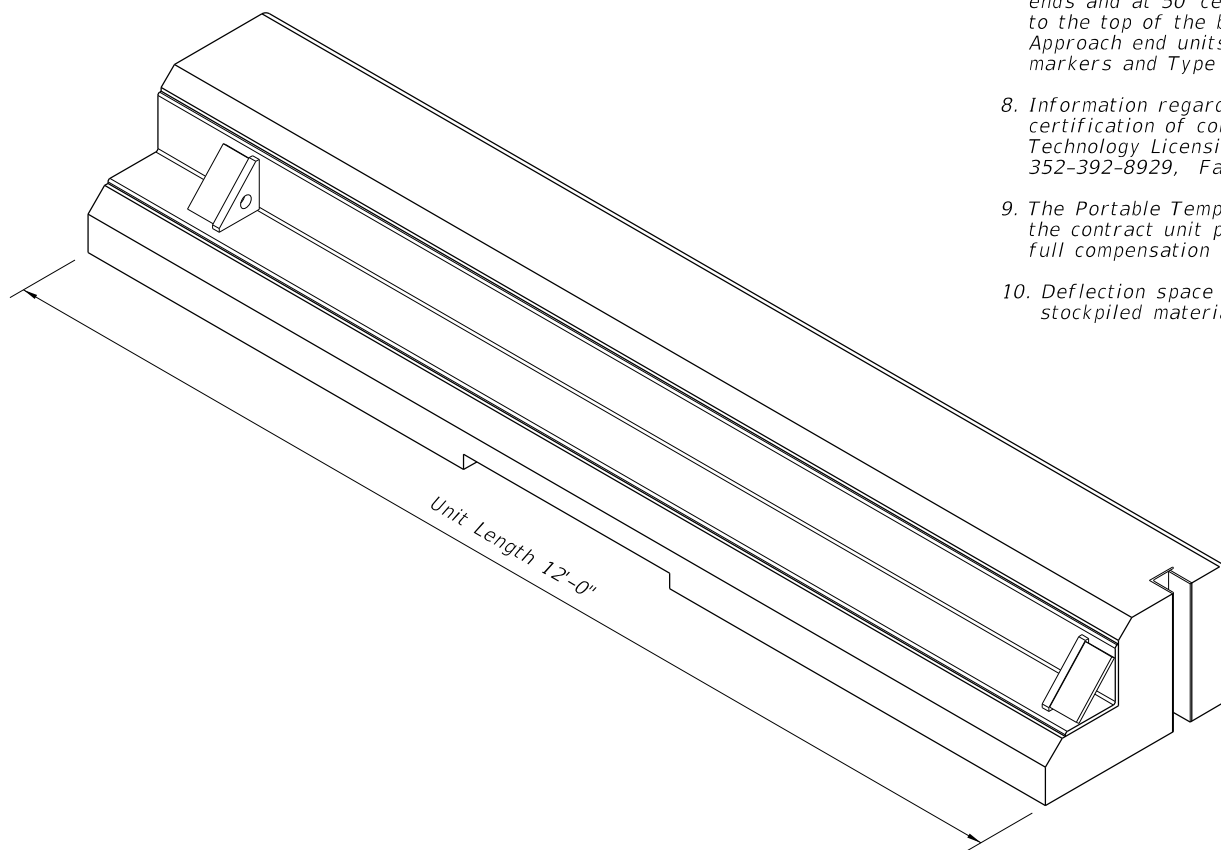
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TYPE K TEMPORARY CONCRETE BARRIER SYSTEM

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GENERAL NOTES


1. Pursuant to 35 United States Code, Chapter 18, also known as the Bayh Dole Act of 1980, the non mountable curb was developed through federal funding. The 'Portable Temporary Low Profile Barrier For Roadside Safety' is a licensed design by the University Of Florida. Any infringement on the rights of the designer shall be the sole responsibility of the user.
2. This Index is provided by the Florida Department Of Transportation solely for use by the Department and its assignees. The purpose for this Index is to indicate the approval of use of the barrier on the State Highway System; to provide sufficient pictorials for identifying the barrier unit; and, to provide general installation geometry for the barrier.
3. This legally mandated relationship is unique to federally funded University patents that Department contractors use on Contracts. Pursuant to federal law, the University may pursue royalties for a valid patent. Only those barrier units cast by producers licensed by the University Of Florida will be allowed for installation on the State Highway System in Florida. Barrier wall units shall conform to Section 521 of the Standard Specification and shall be produced in Department-approved plants with quality control plans for precasting concrete barrier walls. Each barrier wall unit shall be permanently marked with an identification that is traceable to the manufacturer, the producing precast concrete plant and the date of production. This permanent identification mark will serve as certification that the unit has been manufactured in accordance with University of Florida drawings and specifications, and the approved quality control program.
4. The low profile barrier is to be installed only with hardware and accessories furnished by the licensed barrier producer. Units shall be used for no purpose other than as interconnected segments in a run of barrier. Low profile barrier wall units shall maintain firm contact with adjoining units. Nuts on tensioning rods shall be installed snug tight.
5. The low profile barrier is applicable for work zone speeds of 45 mph or less.
6. If the plans specify Low Profile Barrier then substitution with other barrier types is not permitted.
7. Tubular markers shall be orange in color and installed along the run of barrier at the ends and at 50' centers on tangents and 25' centers on radii. The markers shall be fixed to the top of the barrier by an adhesive or other method approved by the engineer. Approach end units shall be marked with a Type I object marker. The cost of the tubular markers and Type I object marker shall be included in the cost of the low profile barrier.
8. Information regarding licensing, shop drawings, specifications, quality control and certification of compliance can be obtained from the University Of Florida: Office of Technology Licensing, P.O. Box 115500, Gainesville, Florida, 32611-5500. Telephone: 352-392-8929, Fax: 352-392-6600. Reference UF#11052.
9. The Portable Temporary Low Profile Barrier For Roadside Safety shall be paid for under the contract unit price for Barrier Wall (Temporary) Low Profile Concrete, LF, and will be full compensation for furnishing, installing, maintaining and removing barrier wall.
10. Deflection space shall be kept clear of any grass, construction debris, stockpiled materials, equipment, and objects.

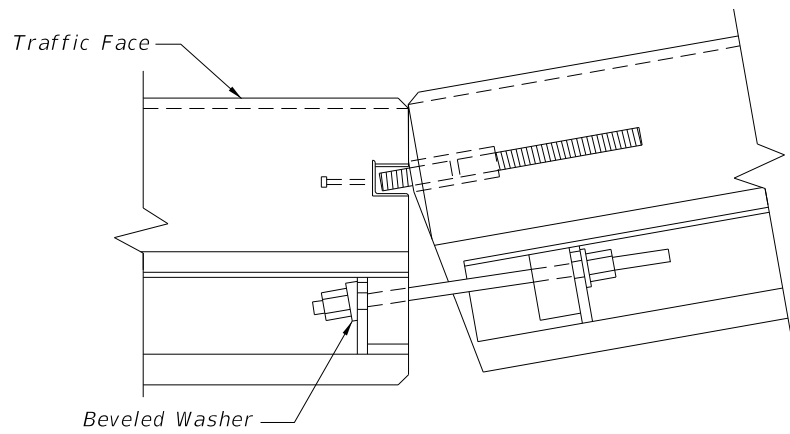


BACKSIDE AND END PICTORIAL VIEWS

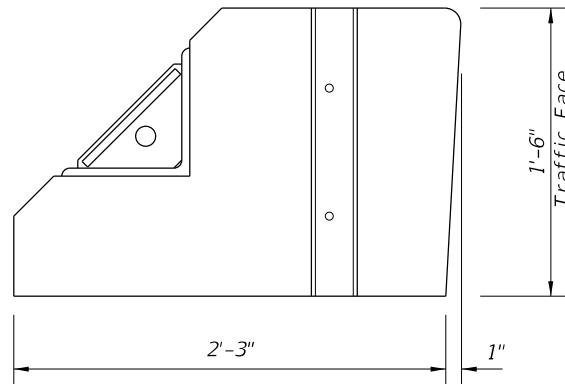
PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

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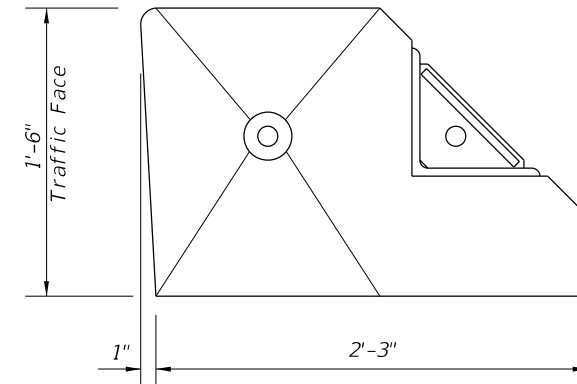
LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	LOW PROFILE BARRIER	INDEX 102-120	SHEET 1 of 5
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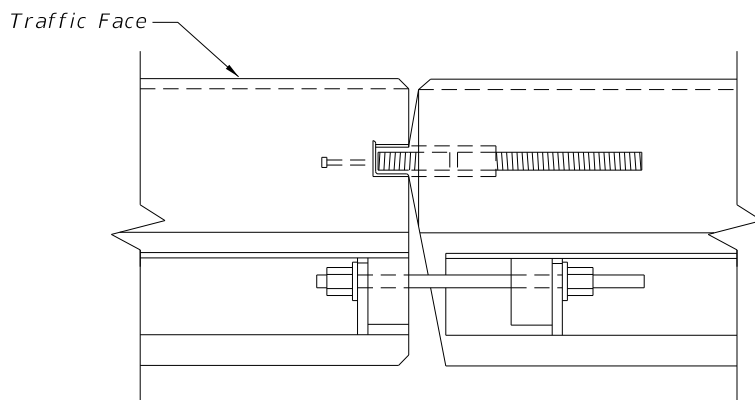
CONCAVE CONNECTION



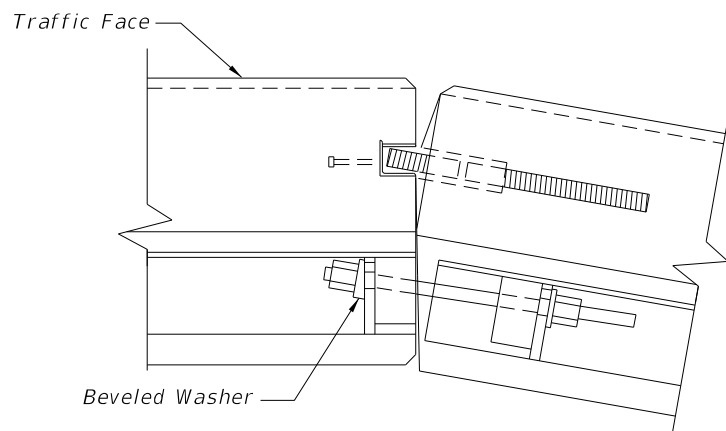
FLAT FACE FEMALE END



BEVELED FACE MALE END



PARALLEL CONNECTION

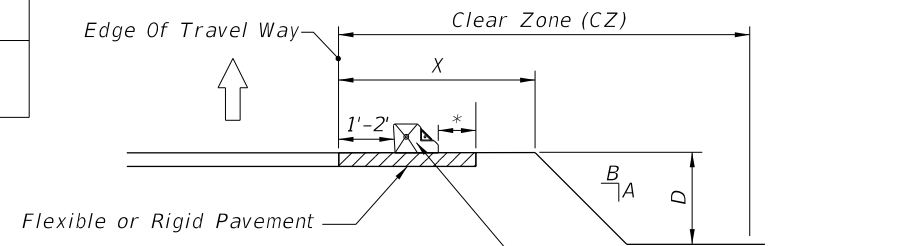


CONVEX CONNECTION

PLAN VIEWS OF CONNECTIONS

WORK ZONE SPEED	OFFSET TO TRAVELWAY	DEFLECTION SPACE
45 MPH OR LESS	1' MIN, 2' PREFERRED	9"

END VIEWS



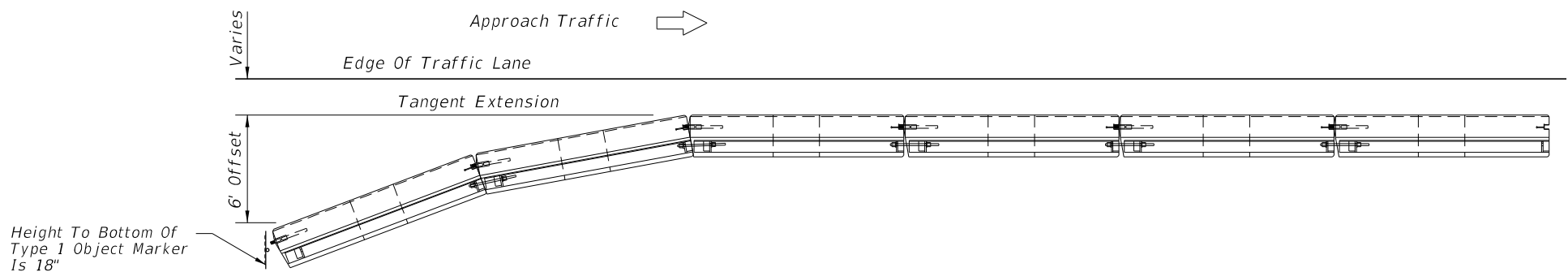
* Minimum 9" on 1:10 or flatter slopes for 'Portable Temporary Low Profile Barrier For Roadside Safety.' For values A, B, D and X see Index 102-600.

Notes:

LIMITATION OF USE: This installation technique can only be used on flexible or rigid pavement.

ASPHALT PAD: Where existing pavement is not present, construct 2" Asphalt Pad using miscellaneous asphalt pavement in accordance with Specification Section 339 with the exception that the use of a pre-emergent herbicide is not required. Payment for asphalt pad will be included in the cost of the barrier.

DEFLECTION SPACE AT DROP-OFFS



PLAN VIEW OF APPROACH END OFFSET

PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

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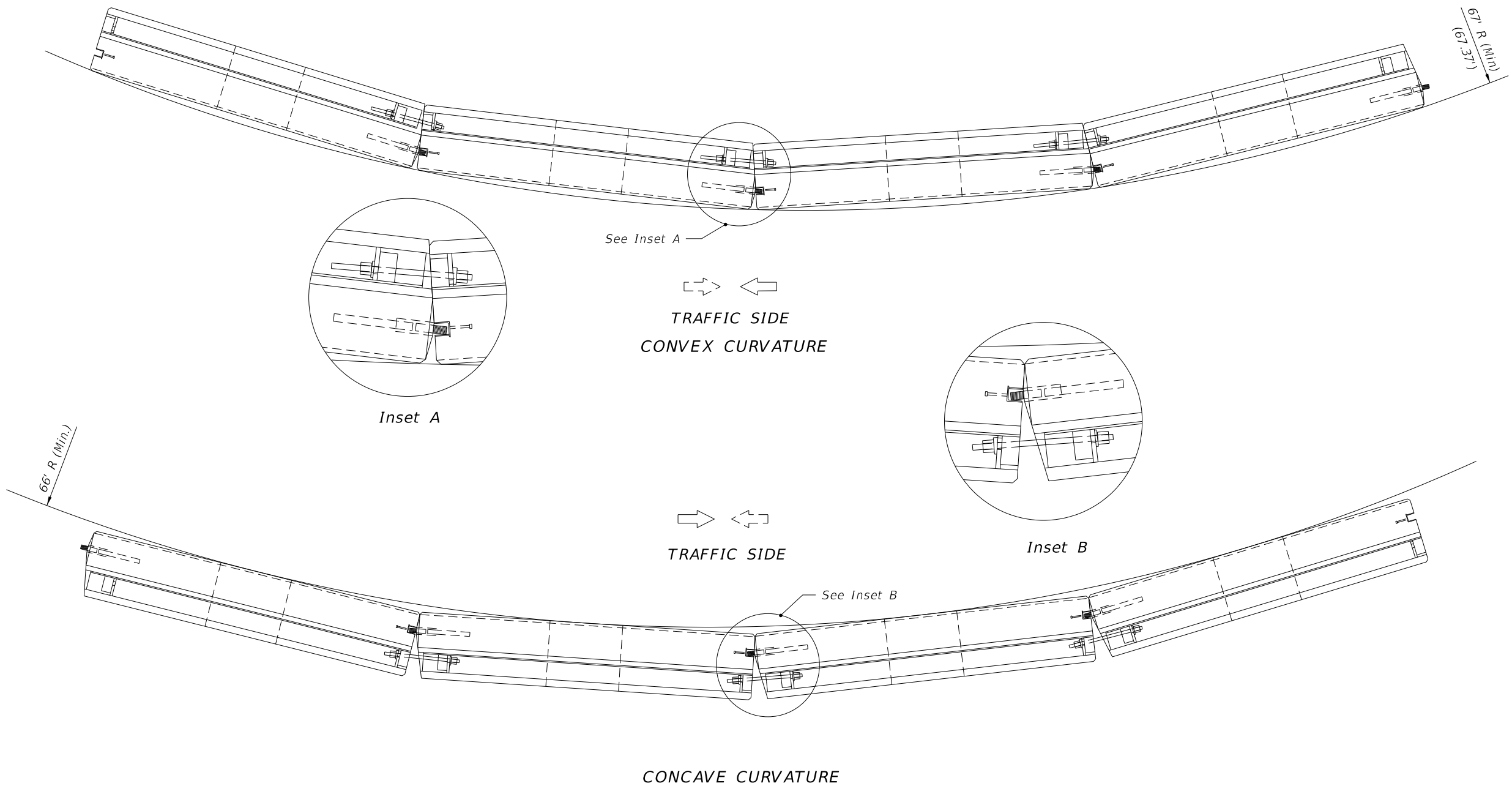


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LOW PROFILE BARRIER

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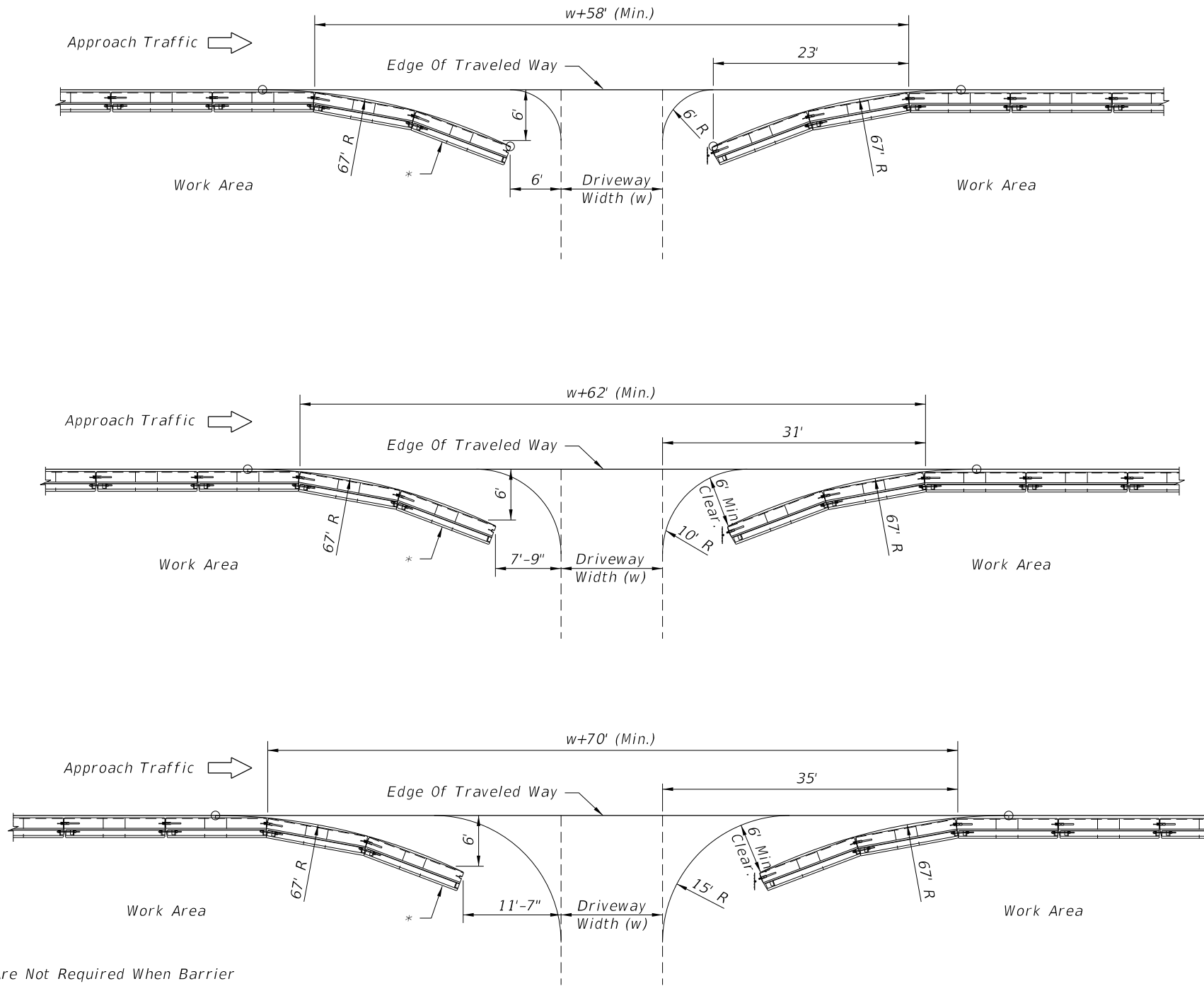


MAXIMUM CURVATURE ● MINIMUM RADIUS
 PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

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* Trailing End Flares Are Not Required When Barrier Located Outside The Clear Zone Of Opposing Traffic
 Type I Object Marker To Be Installed When Trailing End Flare Falls Within The Clear Zone Of Opposing Traffic

LEGEND
 Type I Object Marker

BARRIER OPENINGS AT DRIVEWAYS

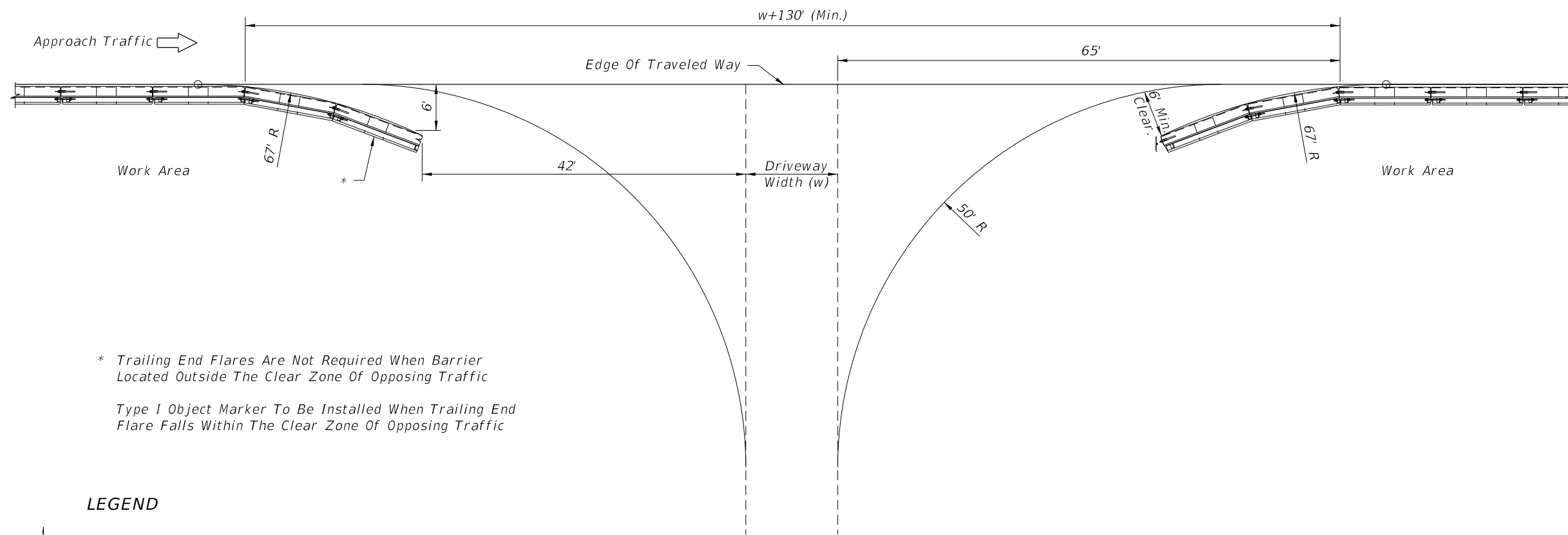
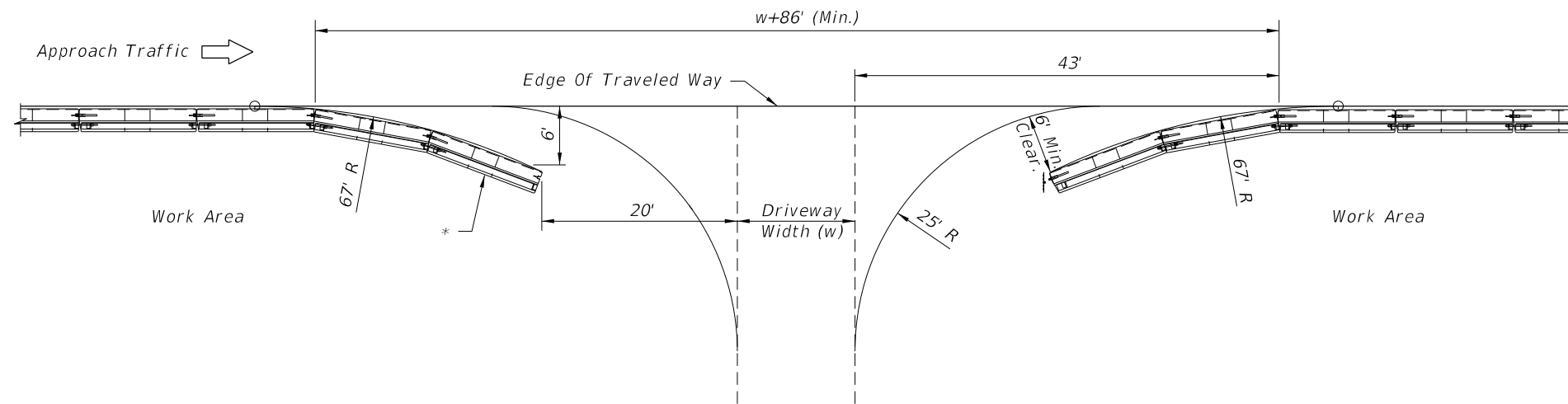
PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

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LOW PROFILE BARRIER


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BARRIER OPENINGS AT DRIVEWAYS

PORTABLE TEMPORARY LOW PROFILE BARRIER FOR ROADSIDE SAFETY

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1	General Notes
2	Definitions Temporary Traffic Control Devices Pedestrian and Bicyclist Overhead Work Railroads Sight Distance Above Ground Hazard
3	Clear Zone Widths For Work Zones Superelevation Length Of Lane Closures Overweight/Oversize Vehicles Lane Widths High-Visibility Safety Apparel Regulatory Speeds In Work Zones
4	Flagger Control Survey Work Zones Signs
5	Work Zone Sign Supports
6	Project Information Sign
7	Commonly Used Warning and Regulatory Signs In Work Zones
8	Manholes/Crosswalks/Joints Truck Mounted Attenuators Removing Pavement Markings Signals Channelizing Devices Channelizing Devices Consistency Portable Changeable (Variable) Message Signs (PCMS) Advanced Warning Arrow Boards
9	Drop-Offs In Work Zones
10	Business Entrance Temporary Asphalt Separator
11	Channelizing Devices Notes Temporary Barrier Notes
12	Pavement Markings

GENERAL NOTES:

- 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.
- Indexes 102-601 through 102-670 are Department-specific typical applications of commonly encountered situations. Adjust device location or number thereof as recommended by the Worksite Traffic Supervisor and approved by the Engineer. Devices include, but are not limited to, Flaggers, portable temporary signals, signs, pavement markings, and channelizing devices. Comply with MUTCD or applicable Department criteria for any changes and document the reason for the change.
- Except for emergencies, any road closure on State Highway System shall comply with Section 335.15, F.S.

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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 runoff 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.

- a. **Travel Lane:** The designated widths of roadway pavement marked to carry through traffic and to separate it from opposing traffic or traffic occupying other traffic lanes.
- b. **Auxiliary Lane:** The designated widths of roadway pavement marked to separate speed change, turning, passing and climbing maneuvers from through traffic.

Detour, Lane Shift, and Diversion

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

Aboveground Hazard

An aboveground 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 ON the Department's Approved Products List (APL). Ensure the appropriate APL number is permanently marked on the device in a readily visible location.

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

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 pedestrian longitudinal channelizing 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.

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:

- a. Work operation is located in a signalized intersection and limited to signals, signs, lighting and utilities.
- b. Work operations are 60 minutes or less.
- c. Speed limit is 45 mph or less.
- d. Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- e. Aerial lift equipment is placed directly below the work area to close the lane.
- f. Traffic control devices are placed in advance of the vehicle/equipment closing the lane using a minimum 100 foot taper.
- g. Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.

OPTION 2 (OVERHEAD WORK ABOVE AN OPEN TRAFFIC LANE)

Overhead work above a open traffic lane is allowed if all of the following conditions are met:

- a. Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.
- b. Work operations are 60 minutes or less.
- c. Speed limit is 45 mph or less.
- d. No encroachment by any part of the work activities and equipment within an area bounded by 2 feet outside the edge of travel way and 18 feet high.
- e. Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- f. Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- g. Adequate precautions are taken to prevent parts, tools, equipment and other objects from falling into open lanes of traffic.
- h. Other Governmental Agencies, Rail facilities, or Codes may require a greater clearance. The greater clearance required 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:

- a. Work operation is located on a utility pole, light pole, signal pole, or their appurtenances.
- b. Work operations are 1 day or less.
- c. Speed limit is 45 mph or less.
- d. No encroachment by any part of the work activities and equipment within 2 foot from the edge of travel way up to 18' height.
Above 18' in height, no encroachment by any part of the work activities and equipment over the open traffic lane (except as allowed in Option 2 for work operations of 60 minutes or less).
- e. Aerial lift equipment in the work area has high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- f. Volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- g. Adequate precautions are taken to prevent parts, tools, equipment and other objects from falling into open lanes of traffic.
- h. Other Governmental Agencies, Rail facilities, or Codes may require a greater clearance. The greater clearance required prevails as the rule.

OPTION 4 (OVERHEAD WORK MAINTAINING TRAFFIC WITH NO ENCROACHMENT BELOW THE OVERHEAD WORK AREA)

Traffic shall be detoured, shifted, diverted or paced as to not encroach in the area directly below the overhead work operations in accordance with the appropriate index drawing or detailed in the plans. This option applies to, but not limited to, the following construction activities:

- a. Beam, girder, segment, and bent/pier cap placement.
- b. Form and falsework placement and removal.
- c. Concrete placement.
- d. Railing construction located at edge of deck.
- e. Structure demolition.

OPTION 5 (CONDUCTOR/CABLE PULLING ABOVE AN OPEN TRAFFIC LANE)

Overhead cable and/or de-energized conductor installations initial pull to proper tension shall be done in accordance with the appropriate Index or temporary traffic control plan.

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

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

- a. The temporary traffic control set up for the initial pulling of the pull rope across the roadway.
- b. During pulling operations, advance warning consisting of no less than a Changeable Message Sign upstream of the work area with alternating messages, "Overhead Work Ahead" and "Be Prepared to Stop" followed by a traffic control officer and police vehicle with blue lights flashing during the pulling operation.

RAILROADS

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

SIGHT DISTANCE

Tapers: Transition tapers should be obvious to drivers. If restricted sight distance is a problem (e.g., a sharp vertical or horizontal curve), the taper should begin well in advance of the 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. Construction equipment and materials shall not restrict intersection sight distance.

ABOVEGROUND HAZARD

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

For aboveground hazards within a work zone the clear zone required should be based on the regulatory speed posted during construction.

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CLEAR ZONE WIDTHS FOR WORK ZONES

The term 'clear zone' describes the unobstructed relatively flat area, impacted by construction, extending outward from the edge of the traffic lane. The table below gives clear zone widths in work zones for medians and roadside conditions other than for roadside canals; where roadside canals are present, clear zone widths are to conform with the distances to canals as described in the FDOT Design Manual 215.2.

CLEAR ZONE WIDTHS FOR WORK ZONES		
WORK ZONE SPEED (MPH)	TRAVEL LANES & MULTILANE RAMPS (feet)	AUXILIARY LANES & SINGLE LANE RAMPS (feet)
60-70	30	18
55	24	14
45-50	18	10
30-40	14	10
ALL SPEEDS CURB & GUTTER	4' BEHIND FACE OF CURB	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 crown controls curvature, the minimum radii that can be applied are listed in the table below.

MINIMUM RADII FOR NORMAL CROWN	
WORK ZONE POSTED SPEED	MINIMUM RADIUS
MPH	feet
70	4090
65	3130
60	2400
55	1840
50	1390
45	1080
40	820
35	610
30	430
Superelevate When Smaller Radii is Used	

LENGTH OF LANE CLOSURES

For interstates and state highways with a posted speed of 55MPH or greater, lane closures must not exceed 3 miles (includes taper, buffer, and work zone) in any given direction and must not close two consecutive interchanges.

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 excepted by the Federal Highway Administration; 11' for freeways; and 10' for all other facilities.

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 or newer. 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 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 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. Workers 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 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.

REGULATORY SPEEDS IN WORK ZONES

Traffic Control Plans (TCP's) 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 interspaced 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. 316.07451(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 Design Manual 240.

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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. If the STOP/SLOW paddle is placed on a rigid staff, the minimum length of the staff, measured from the bottom of the paddle to the end of the staff that rests on the ground, must not be less than 6 ft. STOP/SLOW paddles shall be at least 24 inches wide with letters at least 6 inches high and should be fabricated from light semirigid material. The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be orange with black letters and border. When used at night-time, 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.

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.

When Traffic Control Through Work Zones is being used for survey purposes only, the END ROAD WORK sign as called for on certain 102 Series of 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-1-06) 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.

SIGNS

SIGN MATERIALS

Mesh signs and non-retroreflective vinyl signs may only be used for daylight operations. Non-retroreflective vinyl signs must meet the requirements of Specifications Section 994.

Retroreflective vinyl signs meeting the requirements of Specification Section 994 may be used for daylight or night operations not to exceed 1 day except as noted in the Indexes.

Rigid or Lightweight sign panels may be used in accordance with the vendor APL drawing for the sign stand to which they are attached.

INTERSECTING ROAD SIGNING

Signing for the control of traffic entering and leaving work zones by way of intersecting crossroads shall be adequate to make drivers aware of work zone conditions. When Work operations exceed 60 minutes, place the ROAD WORK AHEAD sign on the side street entering the work zone.

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 or temporary traffic control signs that are no longer applicable or are inconsistent with intended travel paths shall be removed or fully covered.

Sign blanks or other available coverings must completely cover the existing sign. Rigid sign coverings shall be the same size as the sign it is covering, and bolted in a manner to prevent movement.

Sign covers are incidental to work operations and are not paid for separately.

SIGNING FOR DETOURS, LANE SHIFTS AND DIVERSIONS

Detours should be signed clearly 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 multilane divided highways where vehicle speed is generally in the higher range (45 MPH or more).

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 feet beyond the ROAD WORK AHEAD sign or midway to the next sign whichever is less.

GROOVED PAVEMENT AHEAD SIGN

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


END ROAD WORK SIGN

The END ROAD WORK sign (G20-2) 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 102-600, ADJOINING AND/OR OVERLAPPING WORK ZONE SIGNING.

PROJECT INFORMATION SIGN

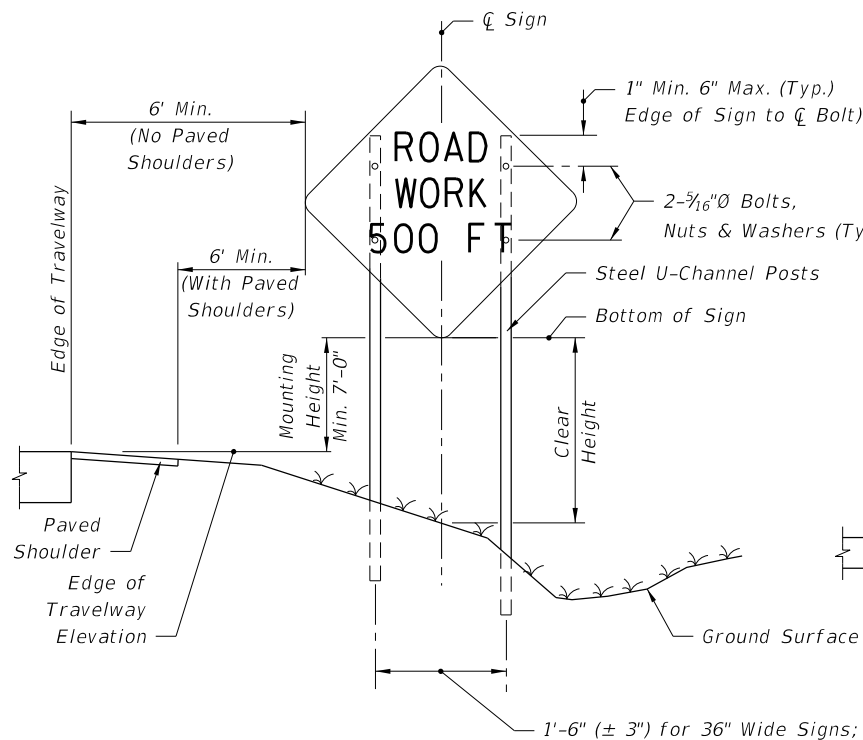
The Project information sign shall be installed when called for in the plans.

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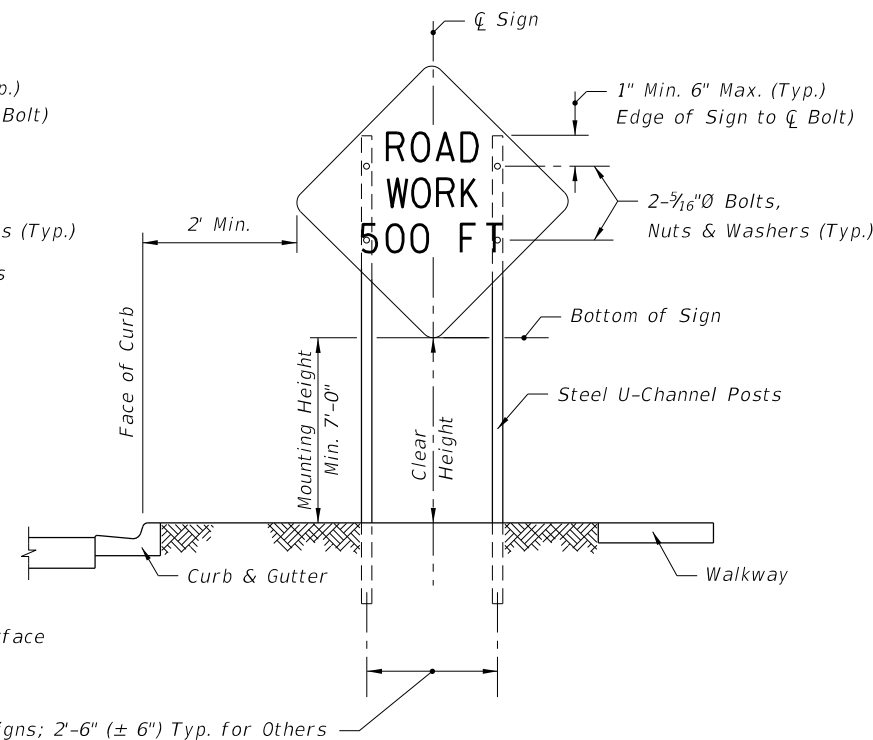
LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX 102-600	SHEET 4 of 12
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TEMPORARY SIGN SUPPORT NOTES:

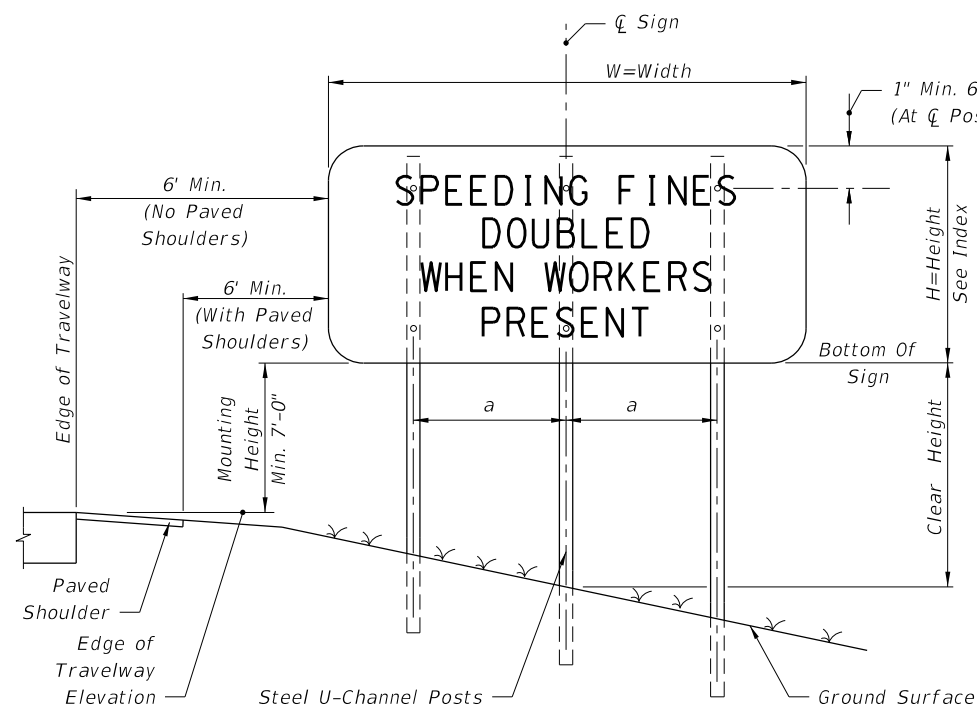
- All signs shall be post mounted when work operations exceed one day except for:
 - Road closure signs mounted in accordance with the vendor drawing for the Type III Barricade shown on the APL.
 - Pedestrian advanced warning or pedestrian regulatory signs mounted on sign supports in accordance with the vendor drawing shown on the APL.
 - Median barrier mounted signs per Index 700-013.
- Unless shielded with barrier or outside of the Clear Zone, signs mounted on temporary supports or barricades, and barricade/sign combination must be crashworthy in accordance with NCHRP 350 requirements and included on the Approved Products List (APL).
- Use only approved systems listed on the Department's Approved Products List (APL).
- Manufacturers seeking approval of U-Channel and steel square tube sign support assemblies for inclusion on the Approved Products List (APL) must submit a APL application, design calculations (for square tube only), and detailed drawings showing the product meets all the requirements of this Index.
- Provide 3 lb/ft Steel U-Channel Posts with a minimum section modulus of 0.43 in³ for 60 ksi steel, a minimum section modulus of 0.37 in³ for 70 ksi steel, or a minimum section modulus of 0.34 in³ for 80 ksi steel.
- Provide 4 lb/ft Steel U-Channel Posts with a minimum section modulus of 0.56 in³ for 60 ksi steel, or a minimum section modulus of 0.47 in³ for 70 ksi or 80 ksi steel.
- U-channel posts shall conform with ASTM A 499, Grade 60, or ASTM A 576, Grade 1080 (with a minimum yield strength of 60 ksi). Square tube posts shall conform with ASTM A 653, Grade 50, or ASTM A 1011, Grade 50.
- Sign attachment bolts, washers, nuts, and spacers shall conform with ASTM A307 or A 36.
- For diamond warning signs with supplement plaque (up to 5 ft² in area), use 4 lb/ft posts for up to 10 ft Clear Height (measure to the bottom of diamond warning sign).
- Install 4 lb/ft Steel U-Channel Posts with approved breakaway splice in accordance with the manufacturer's detail shown on the APL.
- The contractor may install 3 lb/ft Steel U-Channel Posts with approved breakaway splice in accordance with the manufacturer's detail shown on the APL.
- Install all posts plumb.
- The contractor may set posts in preformed holes to the specified depth with suitable backfill tamped securely on all sides, or drive 3 lb/ft sign posts and any size base post in accordance with the manufacturer's detail shown on the APL.



**2 POST SIGN SUPPORT MOUNTING DETAILS
(SINGLE POST SIMILAR)
RURAL**

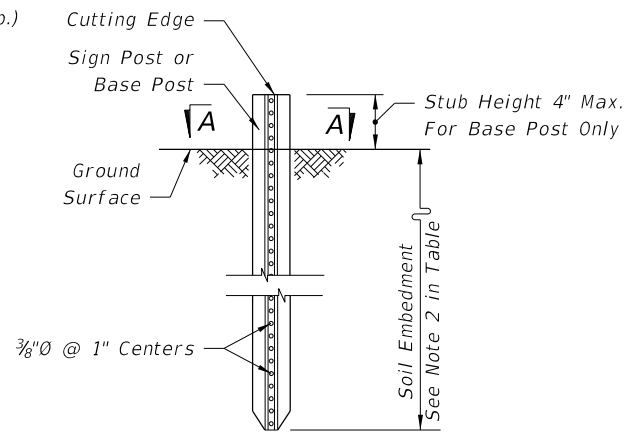


**2 POST SIGN SUPPORT MOUNTING DETAILS
(SINGLE POST SIMILAR)
URBAN**



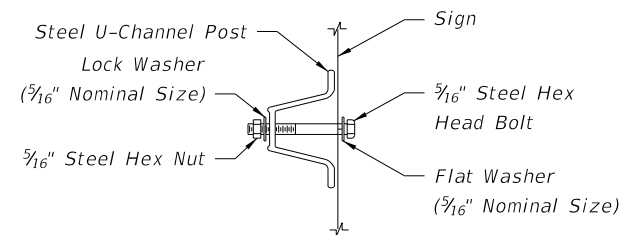
3 POST SIGN SUPPORT MOUNTING DETAILS

Where $W = 48"$: $a = 1' - 4\frac{1}{2}" (\pm 1")$
 $W = 60"$: $a = 1' - 9" (\pm 1")$
 $W = 72"$: $a = 2' - 1" (\pm 1")$



TYPICAL FOUNDATION DETAIL

See APL for post, splice and connection details.
No bolts installed closer than 1" to cutting edge.



**SECTION A-A
(SCHEMATIC)**

**SIGN ATTACHMENT DETAIL
(WITHOUT Z-BRACKET)**

POST AND FOUNDATION TABLE FOR WORK ZONE SIGNS		
SIGN SHAPE	SIGN SIZE (inches)	NUMBER OF STEEL U CHANNEL POSTS
Octagon	30x30	1
	36x36x36	1
	48x48x48	1
Triangle	60x60x60	2
	24x18	1
	24x30	1
Rectangle (W x H)	30x24	1
	36x18	1
	36x24	1
	48x18	1
	48x24	1
	36x48	2
	48x30	2
	48x36	2
	54x36	2
	48x60	3
	60x54	3
	72x48	3
	120x60*	4*
Square	30x30	1
	36x36	2
	48x48	2
Diamond (See Note 7)	48x48	2
Circle	360	2

Notes For Table:

- Use 3 lb/ft posts for Clear Height up to 10' and 4 lb/ft posts for Clear Height up to 12'.
- * Use 4 lb/ft U-channel sign post with a mounting height of 7' min. and 8' max. Attach sign panel using Z-bracket detail on Sheet 6.
- Minimum foundation depth is 4.0' for 3 lb/ft posts and 4.5' for 4 lb/ft posts.
- For both 3 lb/ft and 4 lb/ft base or sign posts installed in rock, a minimum cumulative depth of 2' of rock layer is required.
- The soil plate as shown on the APL vendor drawing is not required for base posts or sign posts installed in existing rock (as defined in Note 3), asphalt roadway, shoulder pavement or soil under sidewalk.

WORK ZONE SIGN SUPPORTS

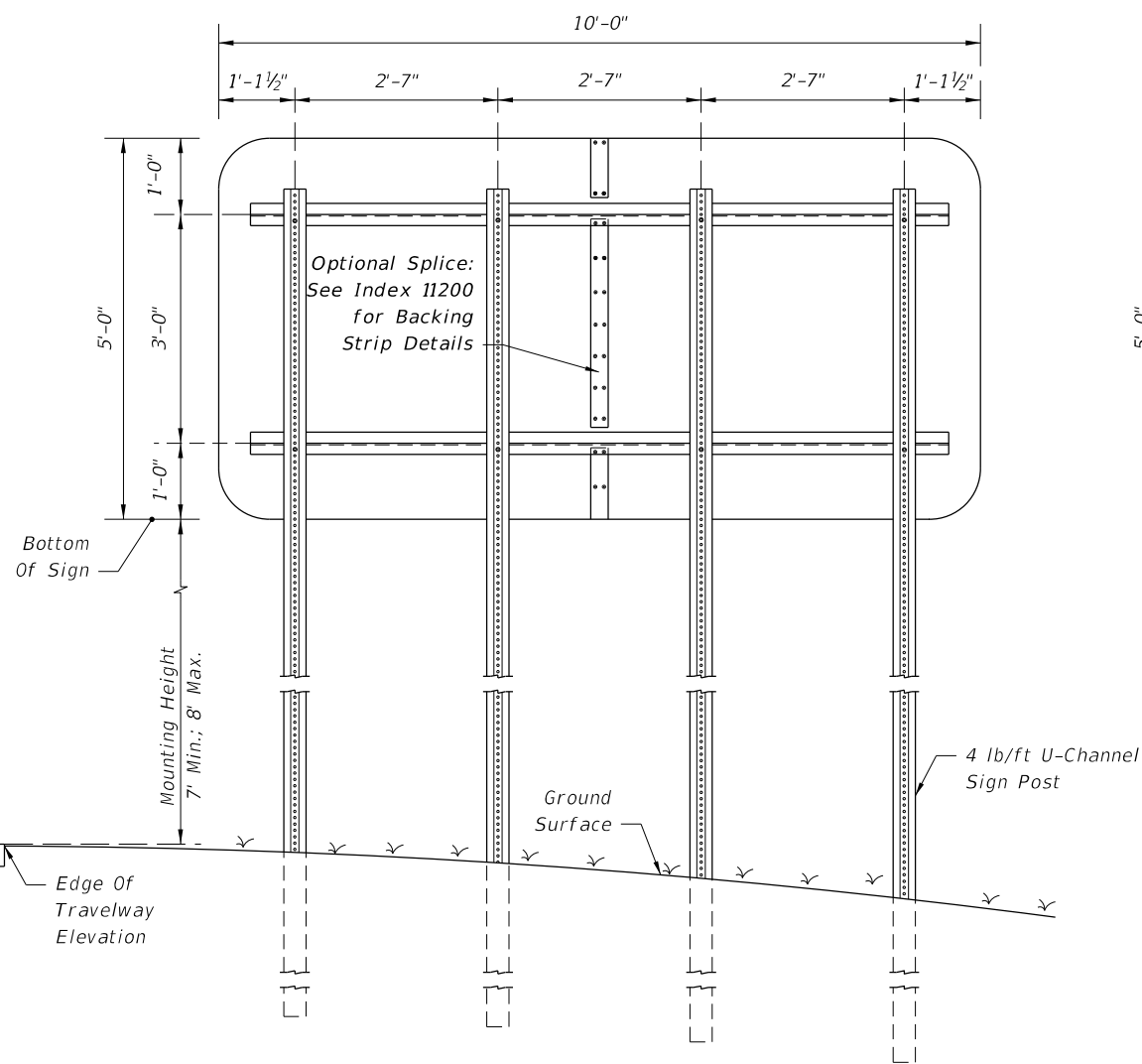
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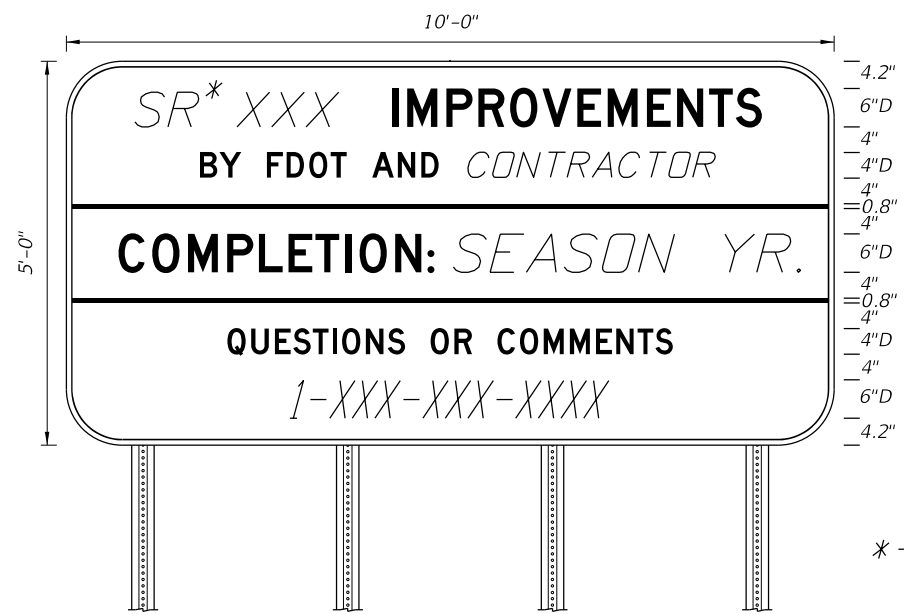
**FY 2019-20
STANDARD PLANS**

GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES

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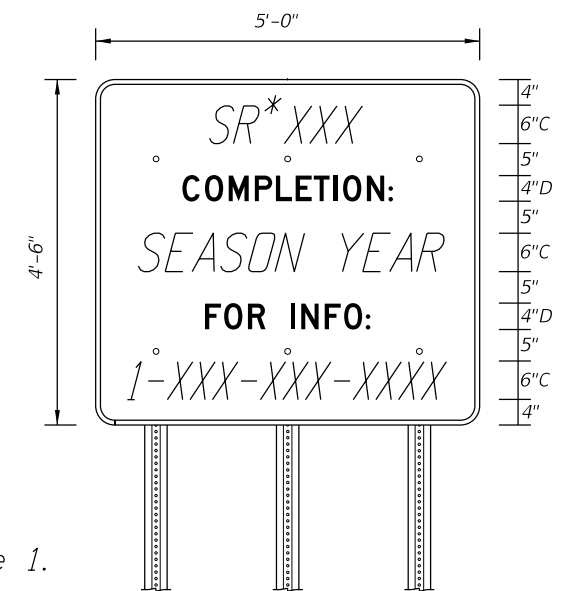


4 POST SIGN SUPPORT MOUNTING DETAIL



BORDER 10'-0" x 5'-0"
 R=8" 8" Radii
 TH=0.25" 4" and 6" series D Legend
 IN=0.75" Blue Background
 White Legend and Border

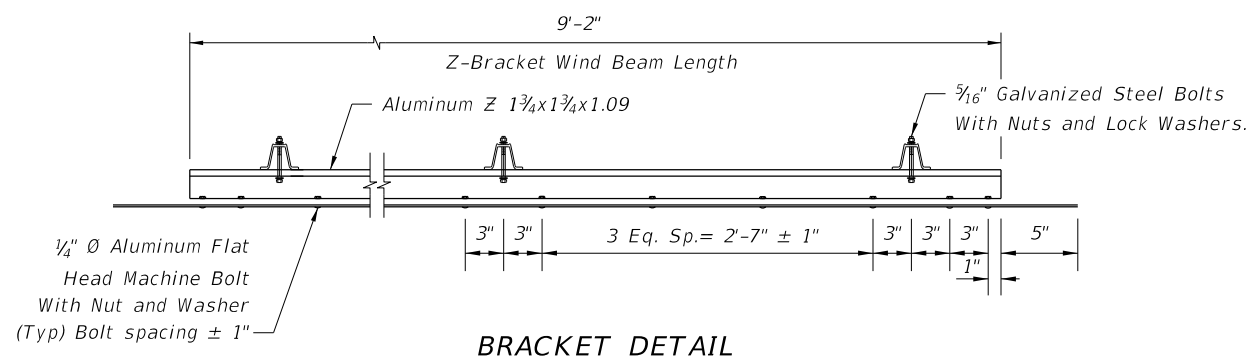
PROJECT INFORMATION SIGN DETAIL
 50 MPH OR GREATER
 Use SIGN ATTACHMENT DETAIL
 (WITH Z-BRACKET).



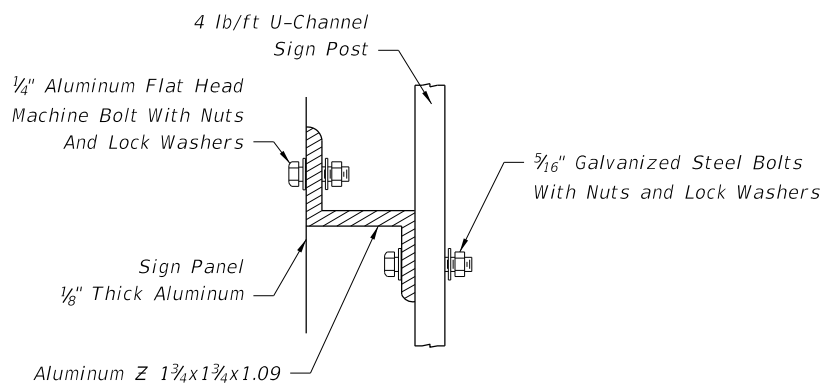
BORDER 5'-0" x 4'-6"
 R=3" 3" Radii
 TH=0.25" 4" series D Legend and
 IN=0.75" 6" series C Legend
 Blue Background
 White Legend and Border

PROJECT INFORMATION SIGN DETAIL
 45 MPH OR LESS
 Use SIGN ATTACHMENT DETAIL
 (WITHOUT Z-BRACKET)
 On Sheet 5.

*-See Note 1.



BRACKET DETAIL



SIGN ATTACHMENT DETAIL
 (WITH Z-BRACKET)

PROJECT INFORMATION SIGN NOTES:

1. Road designation should be the most common designation (i.e. I-Interstate, SR-State Road or US.)
2. Italic text on signs indicate variable information specific to the project.
3. See Sheet 5 for Typical Foundation Details and Post and Foundations Table.

PROJECT INFORMATION SIGN

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E5-2 B/O	E5-2a B/O	G20-1 B/O	G20-2 B/O	G20-4 B/O	M4-8 B/O	M4-8A B/O	M4-9L B/O	M4-9R B/O	M4-10L O/B	M4-10R O/B	OM-3R B/Y	R1-1 W/R	R1-2 RW/R	R2-1 B/W	R4-1 B/W	R4-2 B/W	R4-5 B/W	R4-7 B/W	R4-8 B/W	R4-7AL B/W
R4-7AR B/W	R4-7BL B/W	R4-7BR B/W	R5-1 WR/W	R9-8 B/W	R9-9 B/W	R9-10 B/W	R9-11 B/W	R9-11a B/W	R11-2 B/W	W1-1R B/O	W1-2R B/O	W1-3R B/O	W1-4R B/O	W1-4b B/O	W1-4c B/O	W1-6 B/O	W1-7 B/O	W1-8 B/O	W3-1 RB/O	W3-2 RB/O
W3-3 B(RYG)/O	W3-4 B/O	W3-5 B/O	W4-1 B/O	W4-2 B/O	W5-1 B/O	W5-2 B/O	W5-3 B/O	W6-1 B/O	W6-2 B/O	W6-3 B/O	W8-1 B/O	W8-2 B/O	W8-3 B/O	W8-4 B/O	W8-5 B/O	W8-6 B/O	W8-7 B/O	W8-8 B/O	W8-9 B/O	W8-9a B/O
W8-11 B/O	W9-1L B/O	W9-1R B/O	W9-2L B/O	W9-2R B/O	W10-1 B/Y	W11-2 B/O	W12-1 B/O	W12-2 B/O	W13-1 B/O	W20-1A B/O	W20-1B B/O	W20-1C B/O	W20-1D B/O	W20-1E B/O	W20-1F B/O	W20-2A B/O	W20-2B B/O	W20-2C B/O	W20-2D B/O	W20-2E B/O
W20-3 B/O	W20-4 B/O	W20-5a B/O	W20-5L B/O	W20-5R B/O	W20-5C B/O	W20-7A B/O	W20-7 B/O	W21-1A B/O	W21-1 B/O	W21-5 B/O	W21-5a B/O	W21-6 B/O	W21-7 B/O	W8-15P B/O						
W22-1 B/O	W22-2 B/O	W22-3 B/O																		
<p>Notes:</p> <ol style="list-style-type: none"> The size of diamond shaped Temporary Traffic Control (TTC) warning signs shall be a minimum of 48" X 48". Fluorescent orange shall be used for all orange colored work zone signs. The sign shields, symbols and messages contained on this sheet are provided for ready reference to those signs used in the development of the 102 Series of Indexes 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. <p>The sign codes shown on this sheet are for the purpose of identifying cell names found in the Traffic Control Cell Library (TCZ.Cel).</p> <p>The STANDARD HIGHWAY SIGNS MANUAL should be referenced for the official sign codes for use in the development of traffic control plans.</p> <p>See Index 700-102 for MOT sign details.</p>																				
<p>COLOR CODES Legend and/or Symbol Background</p> <p>O-Orange (Reflectorized) R-Red (Reflectorized) B-Black (Non-Reflectorized) Y-Yellow (Reflectorized) W-White (Reflectorized) G-Green (Reflectorized)</p>																				
MOT-1-06 B/O	MOT-4-06 B/O	MOT-5-06 B/O	MOT-7-06 B/O	MOT-8-06 B/O	MOT-9-06 B/O	MOT-10-06 B/O	MOT-11-06 BLUE/W	MOT-12-06R B/W	MOT-12-06L B/W	MOT-13-06 (Limited access facilities)	MOT-14-06 (All other facilities)	MOT-15-06 B/O	MOT-16-06 B/O	MOT-17-06 B/O	MOT-18-10 B/O	W8-15P B/O				

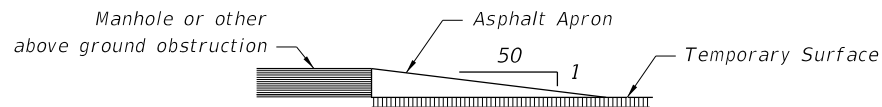
COMMONLY USED WARNING AND REGULATORY SIGNS IN WORK ZONES

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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 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.

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. Remove conflicting pavement marking using a method that will not damage the surface texture of the pavement, unless the pavement will be restored prior to traffic use. Painting over existing pavement markings with black paint or spraying with asphalt shall not be accepted as substitute for removal or obliteration. Full pavement width overlays of either a structural or friction course (non-final surface) are an acceptable alternate means to achieve removal.

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.

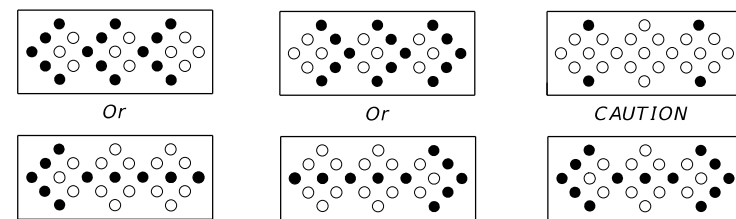
ADVANCE WARNING ARROW BOARDS

An arrow board 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 board shall be used only in the caution mode.

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

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



MODES

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

The PCMS can be used to:

1. Supplement standard signing in construction or maintenance work zones.
2. Reinforce static advance warning messages.
3. Provide motorists with updated guidance information.

PCMS should be placed approx. 500 to 800 feet in advance of the work zone conflicts or 0.5 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 Design Manual 240.

TRUCK/TRAILER-MOUNTED ATTENUATORS


Truck/Trailer-mounted attenuators (TMA) can be used for moving operations and short-term stationary operations. For moving operations, see Indexes 102-607 and 102-619. For short-term, stationary operations, see Part VI of the MUTCD.

CHANNELIZING DEVICES

Channelizing 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 and the 102 Series of Indexes. Lighting Devices must not be used to supplement channelization.

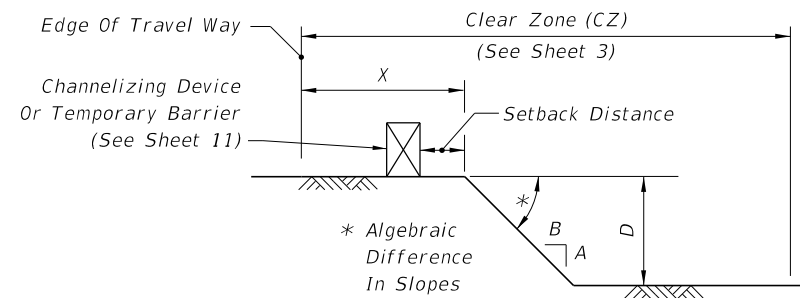
CHANNELIZING DEVICE CONSISTENCY

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

LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	GENERAL INFORMATION FOR TRAFFIC CONTROL THROUGH WORK ZONES	INDEX 102-600	SHEET 8 of 12
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DROP-OFF CONDITION NOTES

1. These conditions and treatments can be applied only in work areas that fall within a properly signed work zone.
2. When drop-offs occur within the clear zone due to construction or maintenance activities, protection devices are required (See Table 1). A drop-off is defined as a drop in elevation, parallel to the adjacent travel lanes, greater than 3" with slope (A:B) steeper than 1:4. In superelevated sections, the algebraic difference in slopes should not exceed 0.25 (See Drop-off Condition Detail).
3. Drop-offs may be mitigated by placement of slopes with optional base material per Specification 285. Slopes shallower than 1:4 may be required to avoid algebraic difference in slopes greater than 0.25. Include the cost for the placement and removal of the material in Maintenance of Traffic, LSD. Use of this treatment in lieu of a temporary barrier is not eligible for CSIP consideration. Conduct daily inspections for deficiencies related to erosion, excessive slopes, rutting or other adverse conditions. Repair any deficiencies immediately.
4. For Setback Distance, refer to the Index or Approved Products List (APL) drawing of the selected barrier.
5. For Conditions 1 and 3 provided in Table 1, any drop-off condition that is created and restored within the same work period will not be subject to the use of temporary barriers; however, channelizing devices will be required.
6. When permanent curb heights are $\geq 6"$, no channelizing device will be required. For curb heights $< 6"$, see Table 1.



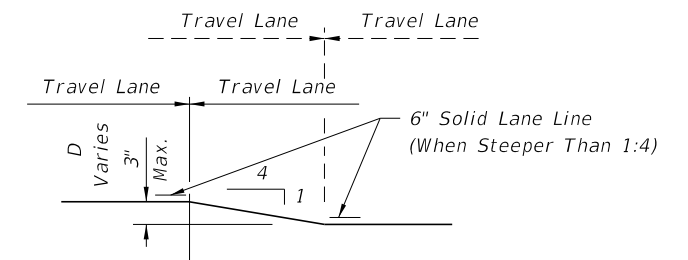
DROP-OFF CONDITION DETAIL

**Table 1
Drop-off Protection Requirements**

Condition	X (ft)	D (in.)	Device Required
1	0-12	> 3	Temporary Barrier
2	> 12-CZ	> 3 to ≤ 5	Channelizing Device
3	0-CZ	> 5	Temporary Barrier
4	Removal of Bridge or Retaining Wall Barrier		Temporary Barrier
5	Removal of portions of Bridge Deck		Temporary Barrier

TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING NOTES

1. This treatment applies to resurfacing or milling operations between adjacent travel lanes.
2. Whenever there is a difference in elevation between adjacent travel lanes, the W8-11 sign with "UNEVEN LANES" is required at intervals of 1/2 mile maximum.
3. If D is 1 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-1-06 signs shall be used as a supplement to the W8-11; this condition should never exceed 3 miles in length.



TRAVEL LANE TREATMENT FOR MILLING OR RESURFACING DETAIL

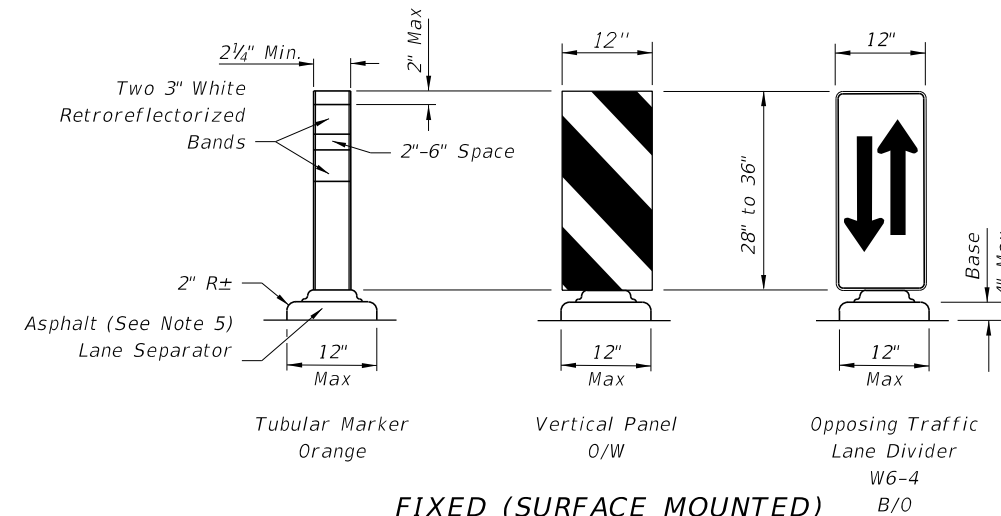
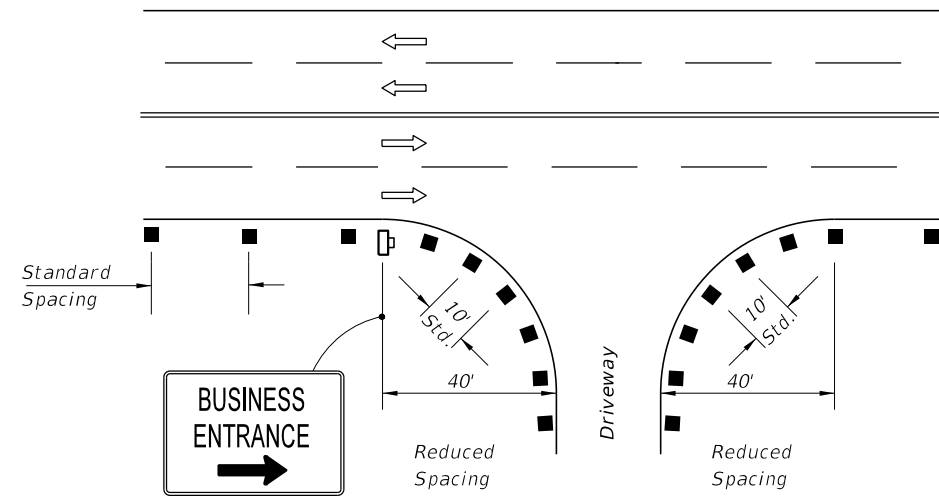
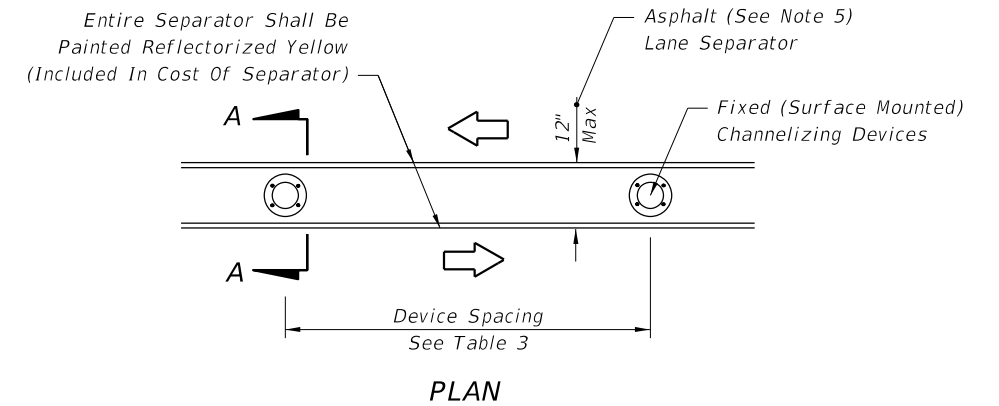
PEDESTRIAN WAY DROP-OFF CONDITION NOTES

1. A pedestrian way drop-off is defined as:
 - a. a drop in elevation greater than 10" that is closer than 2' from the edge of the pedestrian way
 - b. a slope steeper than 1:2 that begins closer than 2' from the edge of the pedestrian way when the total drop-off is greater than 60"
2. Protect any drop-off adjacent to a pedestrian way with pedestrian longitudinal channelizing devices, temporary barrier wall, or approved handrail.

DROP-OFFS IN WORK ZONES

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Speed (mph)	Max. Distance Between Devices (ft.)			
	Tubular Markers		Vertical Panels or Opposing Traffic Lane Divider	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100



FIXED (SURFACE MOUNTED)
CHANNELIZING DEVICES

SECTION AA

1. For single business entrances, place one 24" x 36" business sign for each driveway entrance affected. Signs shall show specific business names. Logos may be provided by business owners. Standard BUSINESS ENTRANCE sign in Index 700-102 may be used when approved by the Engineer.
2. When several businesses share a common driveway entrance, place one 24" x 36" standard BUSINESS ENTRANCE sign in accordance with Index 700-102 at the common driveway entrance.
3. Channelizing devices shall be placed at a reduced spacing on each side of the driveway entrance, but shall not restrict sight distance for the driveway users.
4. Business entrance signs are intended to guide motorist to business entrances moved/modified or disturbed during construction projects. Business entrance signs are not required where there is minimal disruption to business driveways which is often the case with resurfacing type projects.

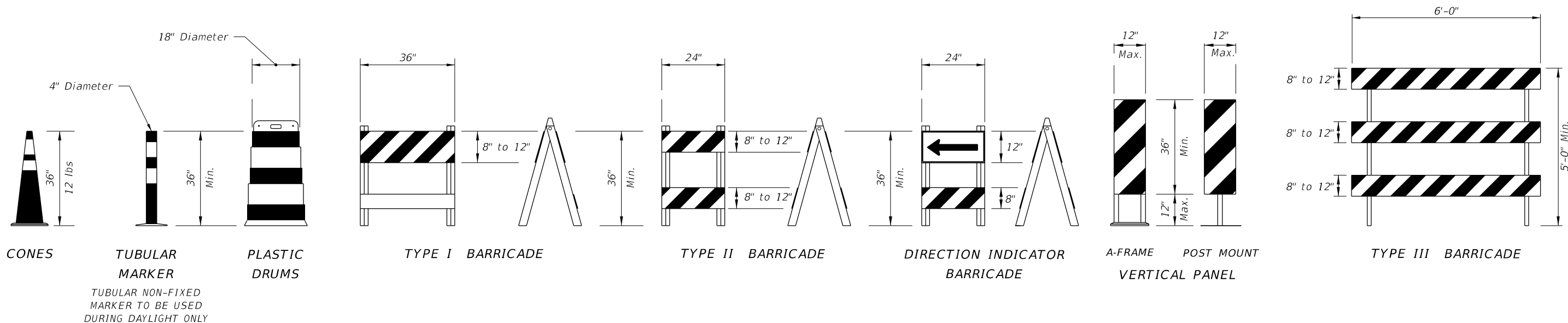
1. Temporary lane separators shall be supplemented with any of the following approved fixed (surface mounted) channelizing devices: tubular markers, vertical panels, or opposing traffic lane divider panels. Opposing traffic lane divider panels (W6-4) shall only be used as center lane dividers to separate opposing vehicular traffic on a two-lane, two-way operation. Tubular Markers, Vertical Panels and Opposing Traffic Lane Divider panels shall not be intermixed within the limits where the temporary lane separator is used. The connection between the channelizing device and the temporary lane separator curb shall hold the channelizing device in a vertical position.
2. Reflectorized materials shall have a smooth sealed outer surface which will display the same approximate color day and night. Furnish channelizing devices having retroreflective sheeting meeting the requirements of Section 990.
3. 12" openings for drainage shall be constructed in the asphalt and portable temporary lane separator at a maximum spacing of 25' in areas with grades of 1% or less or 50' in areas with grades over 1% as directed by the Engineer.
4. Tapered ends shall be used at the beginning and end of each run of the temporary lane separator to form a gradual increase in height from the pavement level to the top of the temporary lane separator.
5. The Contractor has the option of using portable temporary lane separators containing fixed channelizing devices in lieu of the temporary asphalt separator and channelizing devices detailed on this sheet. The portable temporary lane separator shall come in portable sections that can be connected to maintain continuous alignment between the separate curb sections. Each temporary lane separator section shall be 36 inches to 48 inches in total length. Portable temporary lane separators shall duplicate the color of the pavement marking. Portable temporary lane separators shall be one of those listed on the Approved Products List.
6. Any damage to existing pavement caused by the removal of temporary lane separator shall be satisfactorily repaired and the cost of such repairs are to be included in the cost of Maintenance of Traffic, LS.

TEMPORARY LANE SEPARATOR

PLACEMENT OF BUSINESS ENTRANCE SIGNS AND
CHANNELIZING DEVICES AT BUSINESS ENTRANCE

10/30/2018 9:19:24 AM

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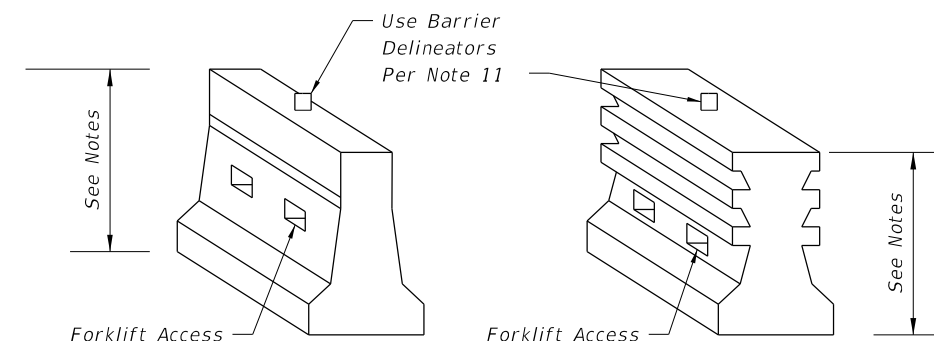
CHANNELIZING DEVICES

CHANNELIZING DEVICE NOTES:

- The details shown on this sheet are for the following purposes:
 - For ease of identification and
 - To provide information that supplements or supersedes that provided by the MUTCD.
- 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.
- No sign panel should be mounted on any channelizing device unless the channelizing device/sign combination was found to be crashworthy and the sign panel is mounted in accordance with the vendor drawing for the channelizing device shown on the Approved Products List (APL).
- Ballast shall not be placed on top rails or any striped rails or higher than 13" above the driving surface.
- 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.
- The splicing of sheeting is not permitted on either channelizing devices or MOT signs.
- For rails less than 3'-0" long, 4" stripes shall be used.
- Cones shall:
 - Be used only in active work zones where workers are present.
 - Be reflectorized as per the MUTCD with Department-approved reflective collars when used at night.
- Vehicular longitudinal channelizing devices shall not exceed 36" in height. For vehicular longitudinal channelizing devices (LCDs) less than 32" in height, the LCD shall be supplemented with approved fixed (surface mounted) channelizing devices (tubular markers, vertical panels, etc.) along the run of the LCD, at the ends, at 50' centers on tangents, and 25' centers on radii. The cost of the fixed supplemented channelizing devices shall be included in the cost of the LCD. LCDs less than 32" in height shall not be used for speeds greater than 45 mph.

10. For pedestrian longitudinal channelizing devices, the device shall have a minimum of 8" continuous detectable edging above the walkway. A gap not exceeding a height of 2" is allowed to facilitate drainage. The top surface of the device shall be a minimum height of 32" and have a 1/8" or less difference in any plane at all connection points between the devices to facilitate hand trailing. The bottom and the top surface of the device shall be in the same vertical plane. If pedestrian drop-off protection is required, the device shall have a footprint or offset of at least 2', otherwise the device must be at least 42" in height above the walkway and be anchored or ballasted to withstand a 200 lb lateral point load at the top of the device.

11. For Barrier Delineators, see Specification 102. Place on top of unit so that retroreflective sheeting faces vehicular traffic. Color must match adjacent longitudinal pavement marking.

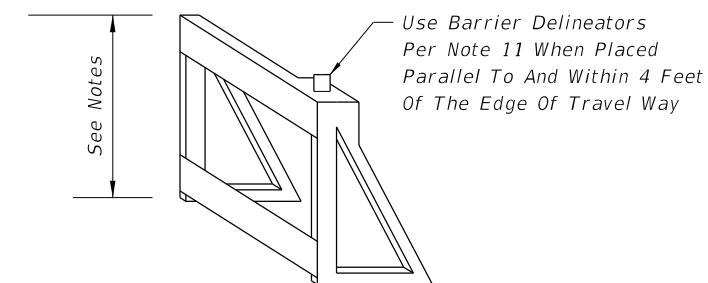


TEMPORARY BARRIER NOTES:

1. Where a barrier is specified, any of the types below may be used in accordance with the applicable Index:

Index	Description
102-100	Temporary Barrier
102-120	Low Profile Barrier
536-001	Guardrail

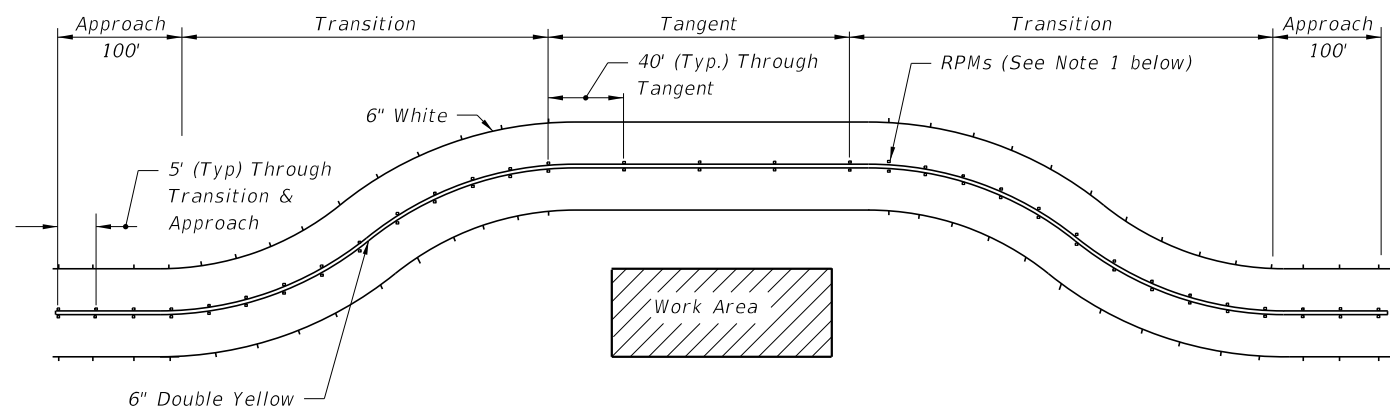
2. Trailer Mounted Barriers may be used to provide positive protection for workers within the work areas. APL drawings may be used as a guide to develop project specific Temporary Traffic Control Plans that are signed and sealed by the Contractor's Engineer.



LONGITUDINAL CHANNELIZING DEVICE

1/30/2019 9:15:45 AM

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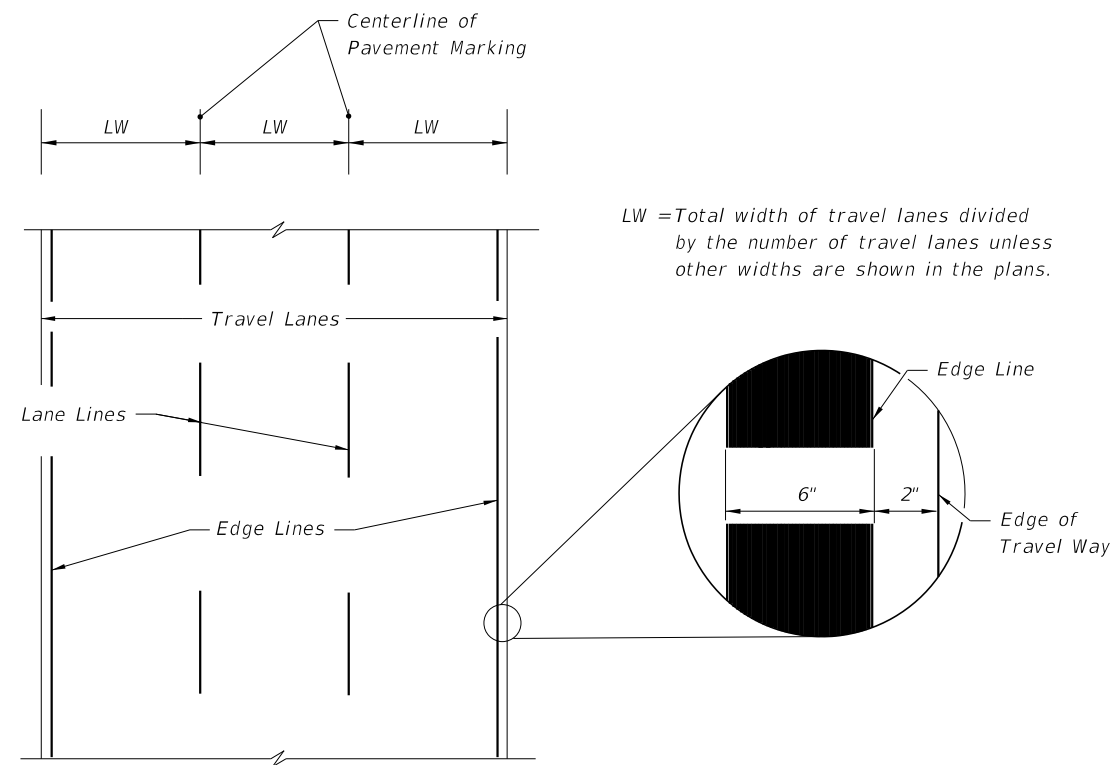


USE OF RPMS TO SUPPLEMENT PAINT OR REMOVABLE TAPE IN WORK ZONES

1. RPMS 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 RPMS should be as shown in Index 706-001 with the following exceptions:
 - RPMS shall be placed at 5 feet center to center in approach and transition areas.

NOTES FOR RAISED 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.
2. RPMS used to supplement lane lines are to be paid for as Raised Pavement Marker (Temporary), EA. RPMS used as a temporary substitute for paint or removable tape due to equipment malfunction are to be placed at the Contractor's expense.

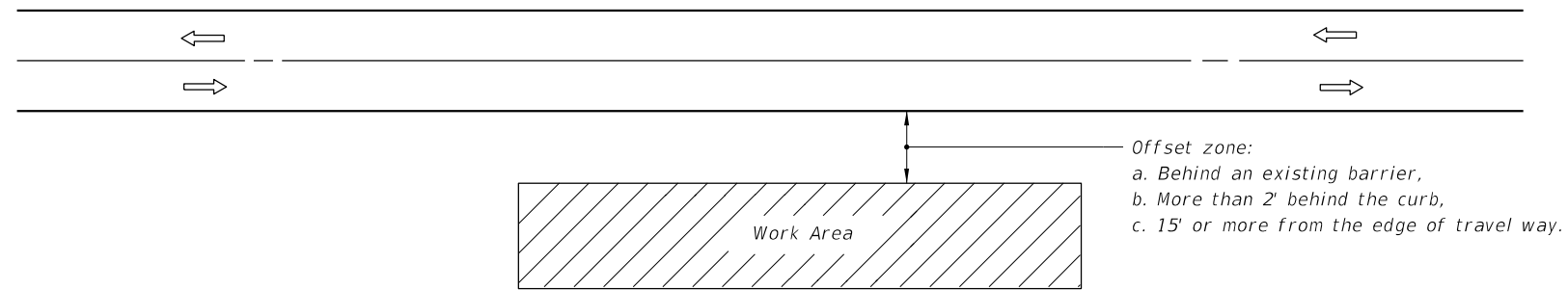


PLACEMENT OF PAVEMENT MARKINGS

PAVEMENT MARKINGS

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
GENERAL NOTES

1. If the work operation (excluding establishing and terminating the work area) requires that two or more work vehicles cross the offset zone in any one hour, traffic control will be in conformance with Index 102-602.
2. No special signing is required.
3. When a side road intersects the highway within the work area, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
4. When construction activities encroach on a sidewalk refer to Index 102-660.
5. For general TCZ requirements and additional information, refer to Index 102-600.


CONDITIONS

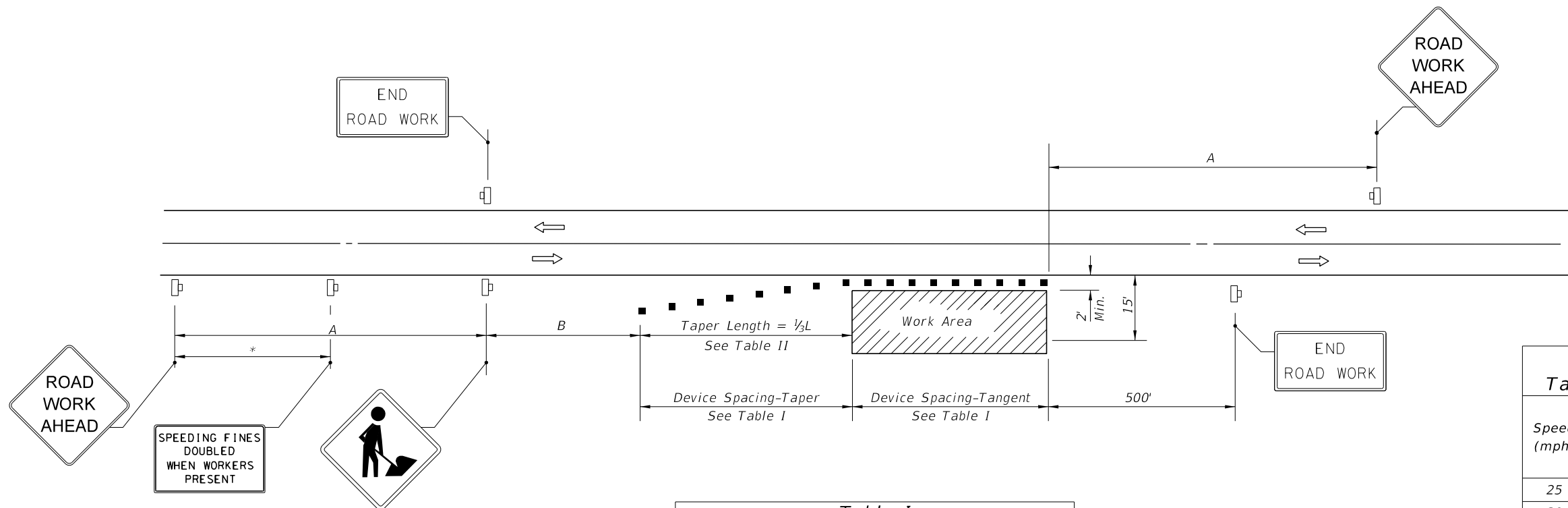
WHERE ANY VEHICLE, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE BEHIND AN EXISTING BARRIER, MORE THAN 2' BEHIND THE CURB, OR 15' OR MORE FROM THE EDGE OF TRAVEL WAY.

SYMBOLS

-  Work Area
-  Lane Identification + Direction of Traffic

10/30/2018 9:19:47 AM

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

*Midway between signs.

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

Speed (mph)	1/3 L (ft)			Notes
	8' Shldr.	10' Shldr.	12' Shldr.	
25	28	35	42	$L = \frac{WS^2}{60}$
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)

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification + Direction of Traffic

GENERAL NOTES

- 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 102-603.
- 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 102-600.

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.

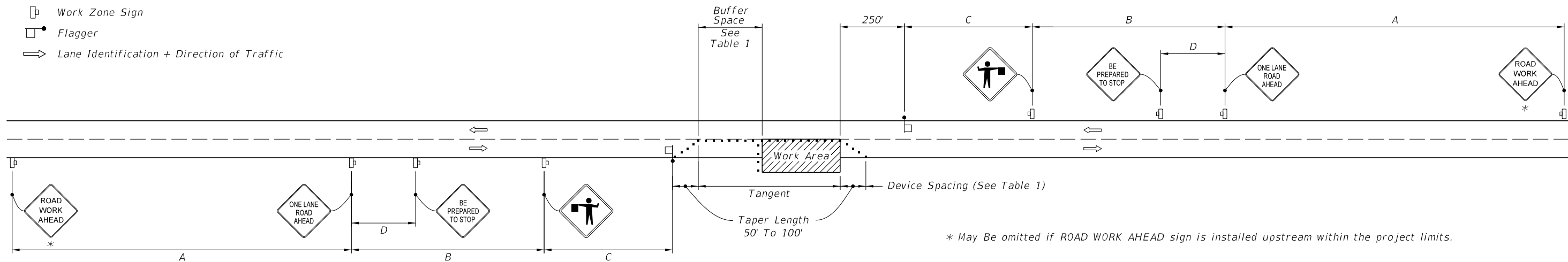
CONDITIONS

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.

10/30/2018 9:19:50 AM

SYMBOLS:

-  Work Area
-  Channelizing Device (See Index 102-600)
-  Work Zone Sign
-  Flagger
-  Lane Identification + Direction of Traffic



* May Be omitted if ROAD WORK AHEAD sign is installed upstream within the project limits.

WITHOUT TEMPORARY RAISED RUMBLE STRIPS

GENERAL NOTES:

1. Special Conditions may be required in accordance with these notes and the following sheets:
 - A. Railroad Crossings:
 - a. If an active railroad crossing is located closer to the Work Area than the queue length plus 300 feet, extend the Buffer Space as shown on Sheet 3.
 - b. If the queuing of vehicles across an active railroad crossing cannot be avoided, provide a uniformed traffic control officer or flagger at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing, even if automatic train warning devices are in place.
 - B. If the Work Area encroaches on the Centerline, use the Layout for Temporary Lane Shift to Shoulder on Sheet 3 only if the Existing Paved Shoulder width is sufficient to provide for an 11' lane between the Work Area and the Edge of Existing Paved Shoulder. Reduce the posted speed when appropriate.
2. Temporary Raised Rumble Strips:
 - A. Use when both of the following conditions are met concurrently:
 - a. Existing Posted Speed is 55 mph or greater;
 - b. Work duration is greater than 60 minutes.
 - B. Use a consistent Strip color throughout the work zone.
 - C. Place each Rumble Strip Set transversely across the lane at locations shown.
 - D. Use Option 1 or Option 2 as shown on Sheet 2. Use only one option throughout work zone.
3. Additional one-way control may be provided by the following means:
 - A. Flag-carrying vehicle;
 - B. Official vehicle;
 - C. Pilot vehicles;
 - D. Traffic signals.


When flaggers are the sole means of one-way control, the flaggers must be in sight of each other or in direct communication at all times.
4. When a side road intersects the highway within the TTC zone, place additional TTC devices in accordance with other applicable TCZ Indexes.
5. 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.
6. When Buffer Space cannot be attained due to geometric constraints, use the greatest attainable length, not less than 200 ft, for posted speeds greater than 25 mph.
7. ROAD WORK AHEAD and the BE PREPARED TO STOP signs 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. There are no sight obstructions to vehicles approaching the work area for a distance equal to the Buffer Space shown in Table 1.
 - 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.
 - F. If a railroad crossing is present, vehicles will not queue across rail tracks.
 - G. AFADs are not in use.
8. See Index 102-600 for general TCZ requirements and additional information.
9. Automated Flagger Assistance Devices (AFADs) may be used in accordance with Specifications Section 102, 990 and the APL vendor drawings.

TABLE 1									
Posted Speed	DEVICE SPACING				Distance Between Signs				Buffer Space
	Maximum Spacing of Cones or Tubular Markers		Maximum Spacing of Type I or Type II Barricades/Panels/Drums		A	B	C	D	
	On a Taper	On a Tangent	On a Taper	On a Tangent					
25	20'	50'	20'	50'	200'	200'	200'	100'	155'
30	20'	50'	20'	50'	200'	200'	200'	100'	200'
35	20'	50'	20'	50'	200'	200'	200'	100'	250'
40	20'	50'	20'	50'	200'	200'	200'	100'	305'
45	20'	50'	20'	50'	350'	350'	350'	175'	360'
50	20'	50'	20'	100'	500'	500'	500'	250'	425'
55	20'	50'	20'	100'	2640'	1500'	1000'	500'	495'
60	20'	50'	20'	100'	2640'	1500'	1000'	500'	570'
65	20'	50'	20'	100'	2640'	1500'	1000'	500'	645'
70	20'	50'	20'	100'	2640'	1500'	1000'	500'	730'






CONDITIONS

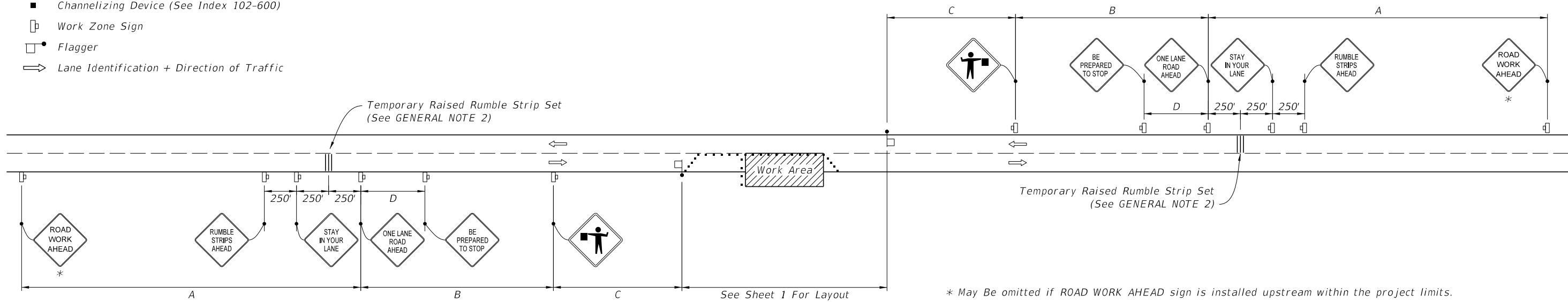
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY.

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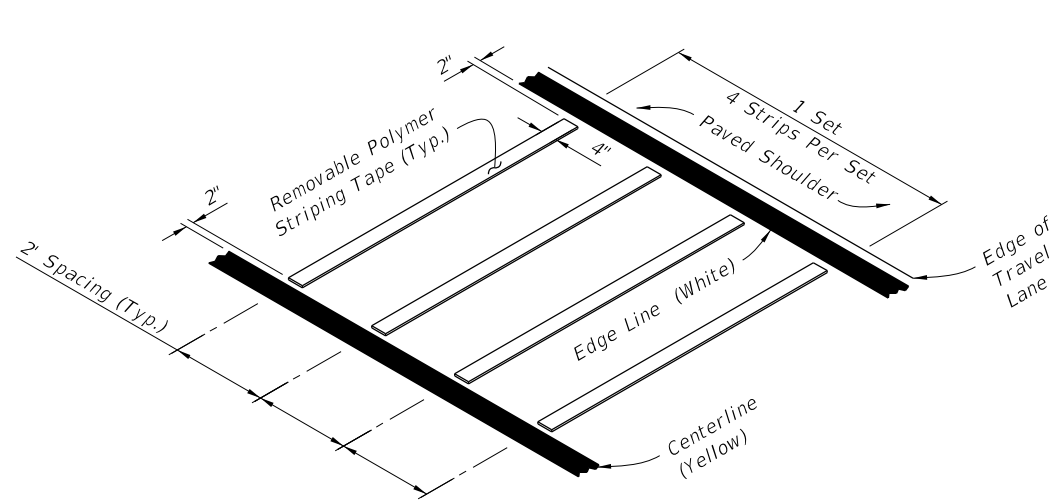
LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY	INDEX 102-603	SHEET 1 of 3
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SYMBOLS:

-  Work Area
-  Channelizing Device (See Index 102-600)
-  Work Zone Sign
-  Flagger
-  Lane Identification + Direction of Traffic

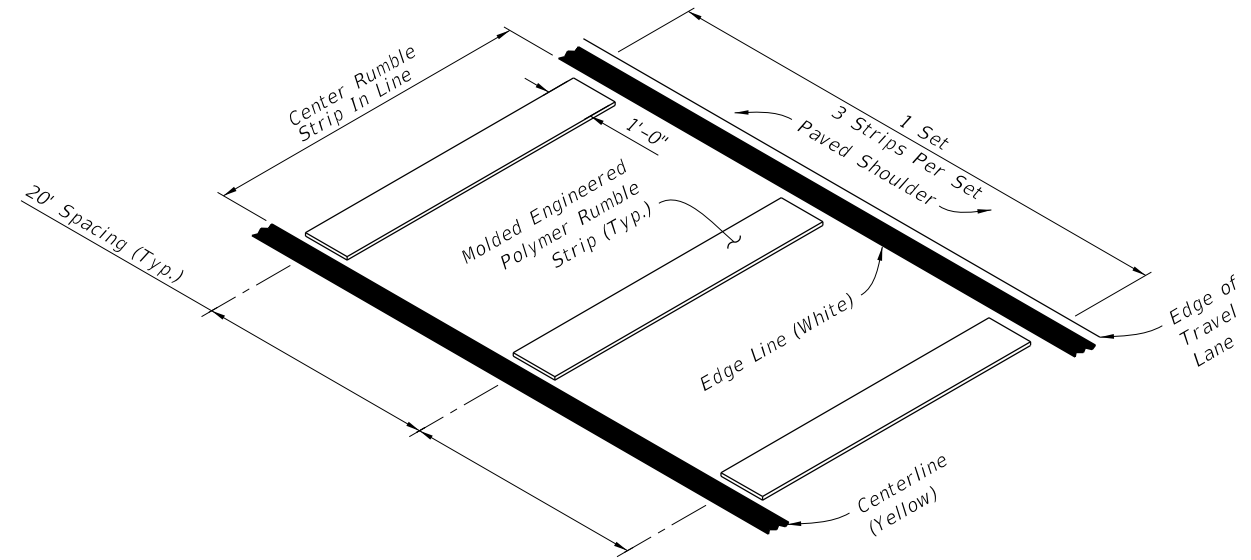


WITH TEMPORARY RAISED RUMBLE STRIPS
(When Required See GENERAL NOTE 2)



REMOVABLE POLYMER STRIPING TAPE

RUMBLE STRIP SET
OPTION - 1




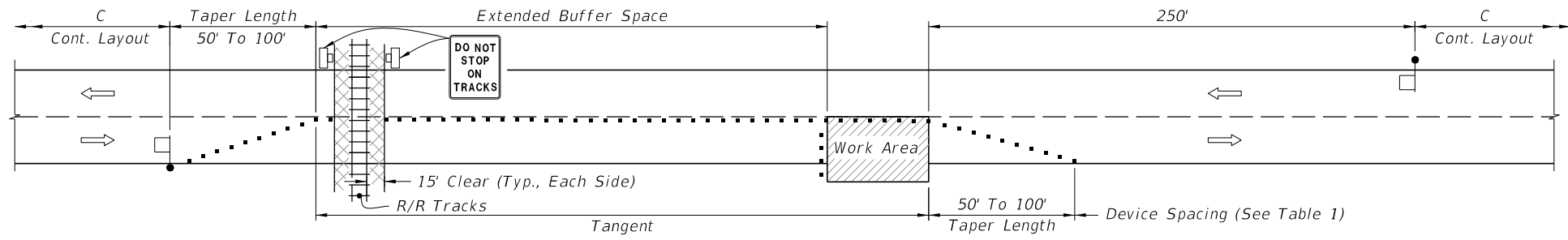
MOLDED ENGINEERED POLYMER SET

RUMBLE STRIP SET
OPTION - 2

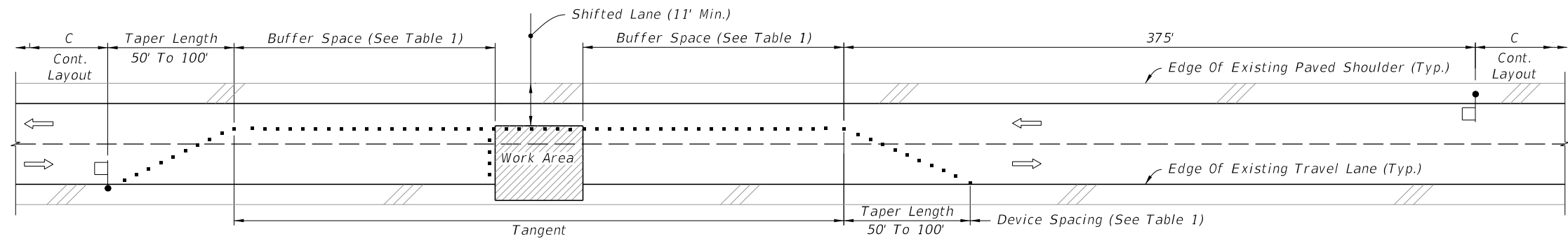
TEMPORARY RAISED RUMBLE STRIPS

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TEMPORARY RAILROAD CROSSING BUFFER SPACE EXTENSION




TEMPORARY LANE SHIFT TO SHOULDER WHEN WORK AREA ENCROACHES ON THE CENTERLINE

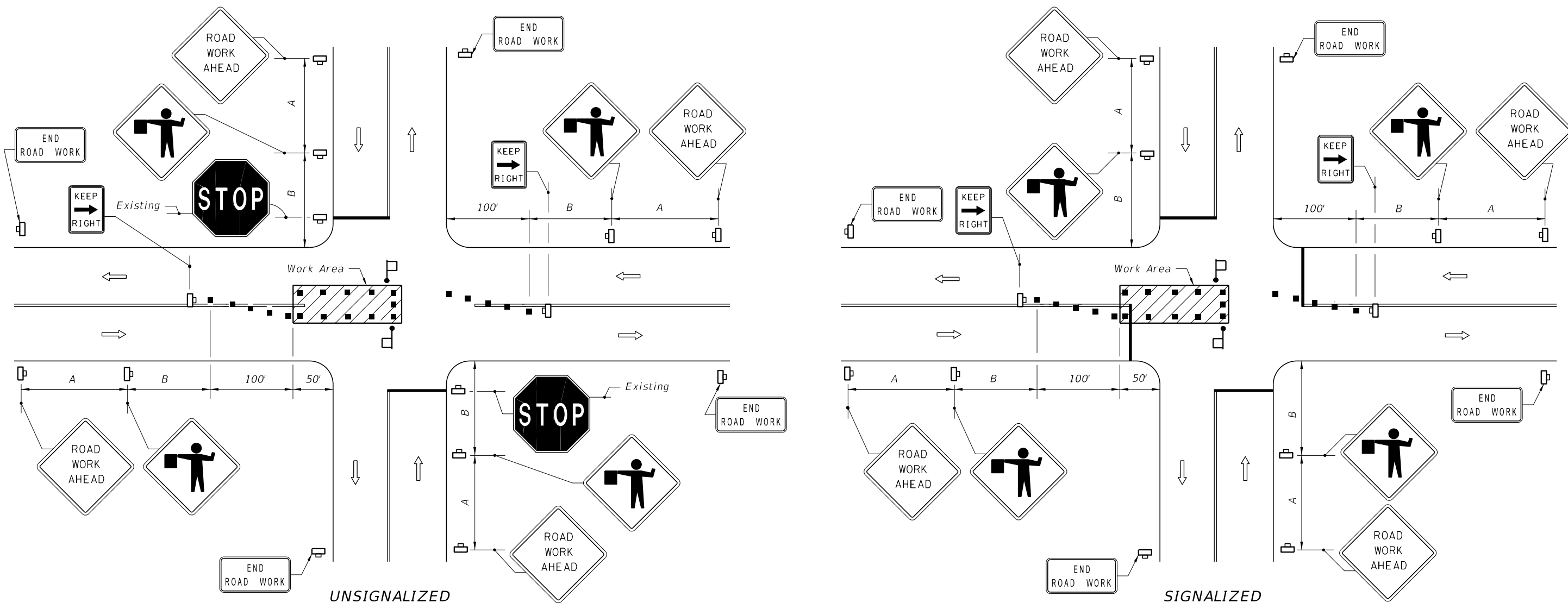
SPECIAL CONDITIONS

Cross Reference:
1. See General Note 1, Sheet 1 for more information.

10/30/2018 9:20:00 AM

SPECIAL CONDITIONS

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UNSIGNALIZED

SIGNALIZED

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Flagger
- Stop Bar
- Lane Identification + Direction of Traffic

GENERAL NOTES

1. The FLAGGER legend sign may be substituted for the symbol sign.
2. 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 700-101.
3. If the work space extends across a crosswalk, the crosswalk should be closed using the information in Index 102-660.
4. 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.
5. Maximum spacing between channelizing devices shall be not greater than 20'.
6. Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
7. For general TCZ requirements and additional information, refer to Index 102-600.
8. For unsignalized intersections, use Temporary Raised Rumble Strips in accordance with Index 102-603. Placement of Rumble Strips and additional signs should begin at FLAGGER sign location.

DURATION NOTES

1. ROAD WORK AHEAD AND END ROAD WORK sign may be omitted if all of the following conditions are met:
 - a. Work operations are 60 minutes or less.
 - b. Speed is 45 mph or less.
 - c. No sight obstructions to vehicles approaching the work area for a distance equal to A plus B.
 - 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.

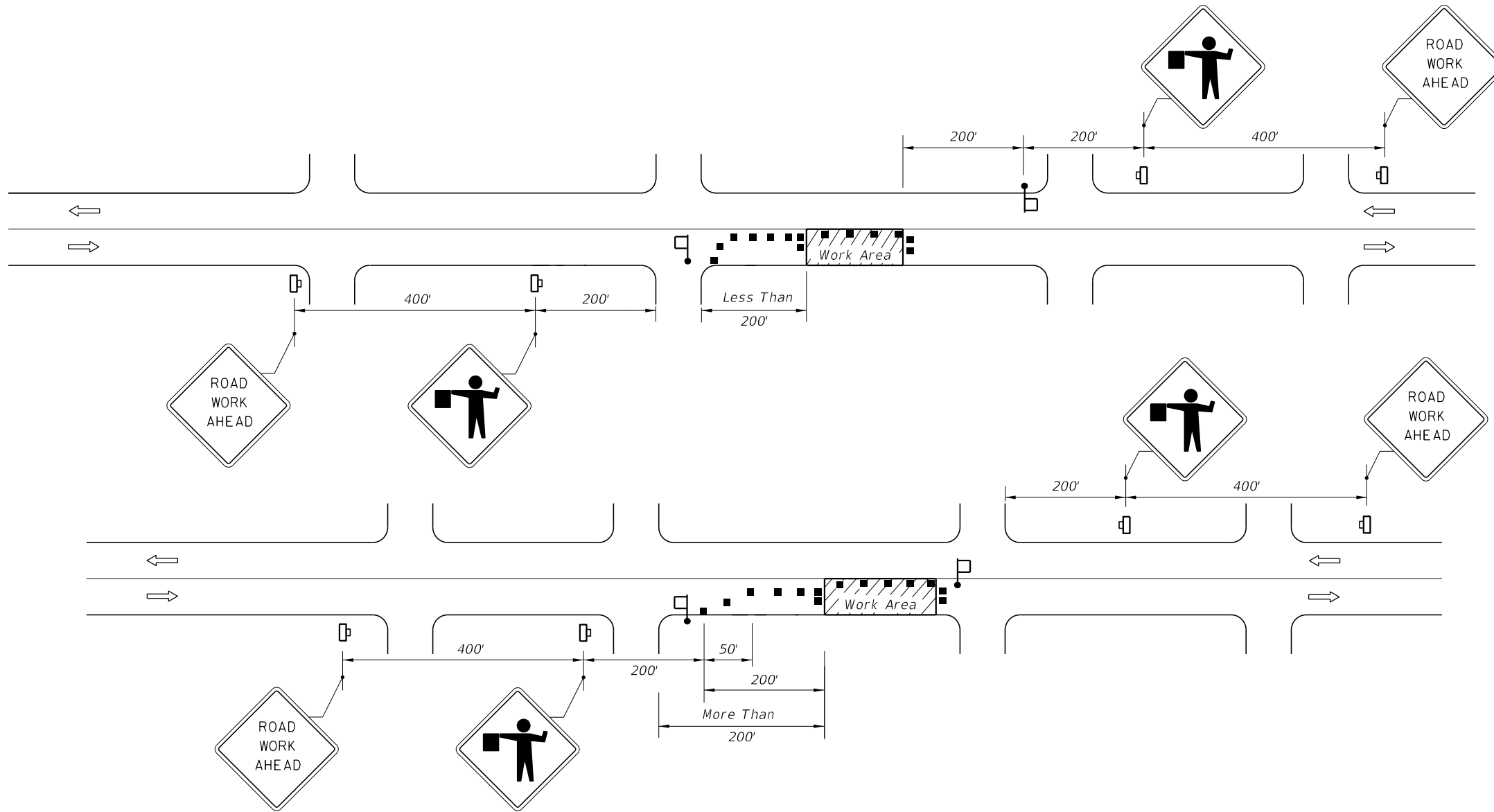
DISTANCE BETWEEN SIGNS

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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CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF ONE TRAFFIC LANE, FOR WORK AREAS LESS THAN 200' DOWNSTREAM FROM AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF ONE TRAFFIC LANE, FOR WORK AREAS 200' OR MORE DOWNSTREAM FROM AN INTERSECTION FOR A PERIOD OF MORE THAN 60 MINUTES.

DURATION NOTES

1. ROAD WORK AHEAD sign may be omitted if all of the following conditions are met:
 - a. Work operations are 60 minutes or less.
 - b. Speed is 45 mph or less.
 - c. No sight obstructions to vehicles approaching the work area for a distance of 600 feet.
 - 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
 - Channelizing Device (See Index 102-600)
 - Work Zone Sign
 - Flagger
 - Lane Identification + Direction of Traffic

GENERAL NOTES

1. Work operations shall be confined to one travel lane, leaving the opposing travel lane open to traffic.
2. When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index 700-101.
3. If work area is confined to an outside auxiliary lane, the work area shall be barricaded and the FLAGGER signs replaced by ROAD WORK AHEAD signs. Flaggers are not required.
4. Flaggers shall be in sight of each other or in direct communication at all times.
5. The FLAGGER legend sign may be substituted for the symbol sign.
6. The maximum spacing between devices shall be no greater than 25'.
7. For general TCZ requirements and additional information, refer to Index 102-600.
8. 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.
9. Use Temporary Raised Rumble Strips in accordance with Index 102-603. Placement of Rumble Strips and additional signs should begin at FLAGGER sign location.

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







LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TWO-LANE, TWO-WAY, WORK NEAR INTERSECTION	INDEX 102-605	SHEET 1 of 1
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10/30/2018 9:20:10 AM

GENERAL NOTES


1. Use either portable signals or span wire signals and include two signal faces for each approach.
2. Obtain approval from the District Traffic Operations Engineer for the installation and timing of the signals prior to the signals being placed in operation. Adjust timing based on changing field conditions as approved by the Worksite Traffic Supervisor. Obtain approval from the District Traffic Operations Engineer for any timing changes that are either reoccurring or last longer than 24 hours.
3. For the maximum distance between portable temporary traffic signals do not exceed the distance at which the signals can safely communicate. When the distance between signals is 0.25 miles to 0.50 miles, use a countdown timer on both signals. When the distance between signals is greater than 0.50 miles, use a combination of a pilot vehicle and manually controlled temporary traffic signals.
4. The SIGNAL AHEAD legend sign may be substituted for the symbol sign.
5. Use Type III Barricades to block haul road access when the haul road is not in operation and a flagger/signal operator is not on duty, except when the haul road is an existing properly marked road.
6. Monitor temporary traffic signals by having one or more workers present during operation. In the event of a temporary traffic signal failure, maintain traffic with flaggers.
7. Use Temporary Raised Rumble Strips in accordance with Index 102-603.

SYMBOLS

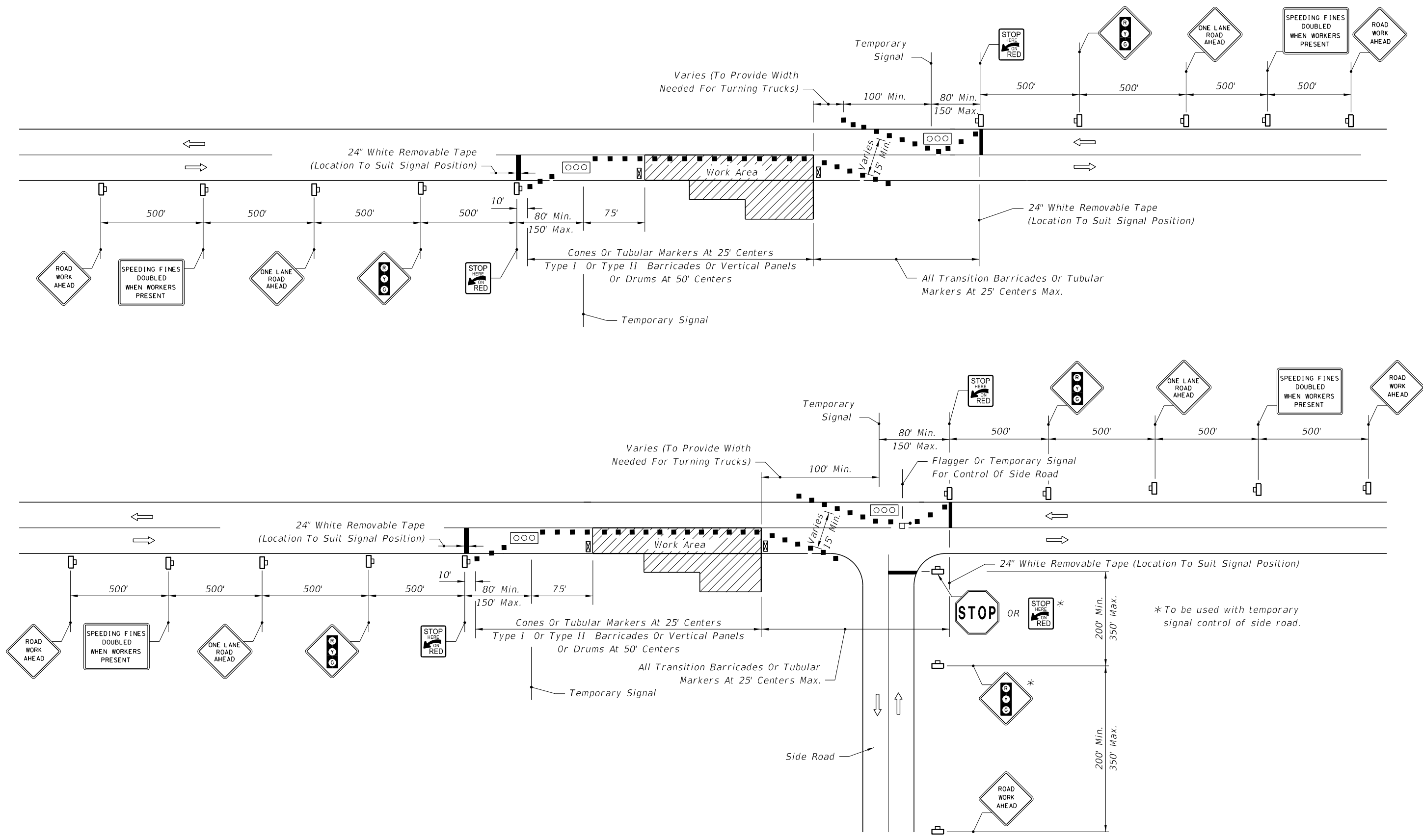
-  Work Area
-  Work Zone Sign
-  Temporary Traffic Signal
-  Channelizing Device (See Index 102-600)
-  Type III Barricade
-  Stop Bar
-  Flagger
-  Lane Identification + Direction of Traffic

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES WILL ENCROACH ON ONE LANE OR MOMENTARILY ENCROACH ON BOTH LANES OF A TWO-LANE TWO-WAY ROADWAY AND TRAFFIC SIGNALS ARE NEEDED.

LAST REVISION 11/01/17	REVISION DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY - SIGNAL CONTROL	INDEX 102-606	SHEET 1 of 4
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10/30/2018 9:20:15 AM



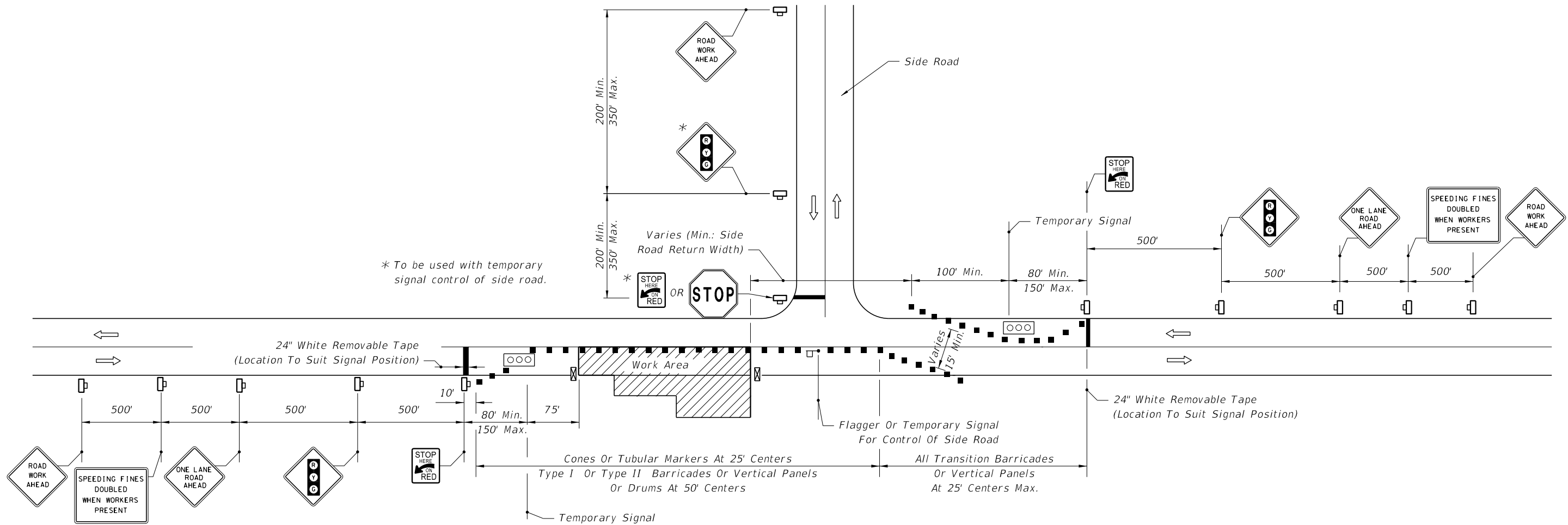
SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

LAST REVISION 11/01/17	REVISION	DESCRIPTION:
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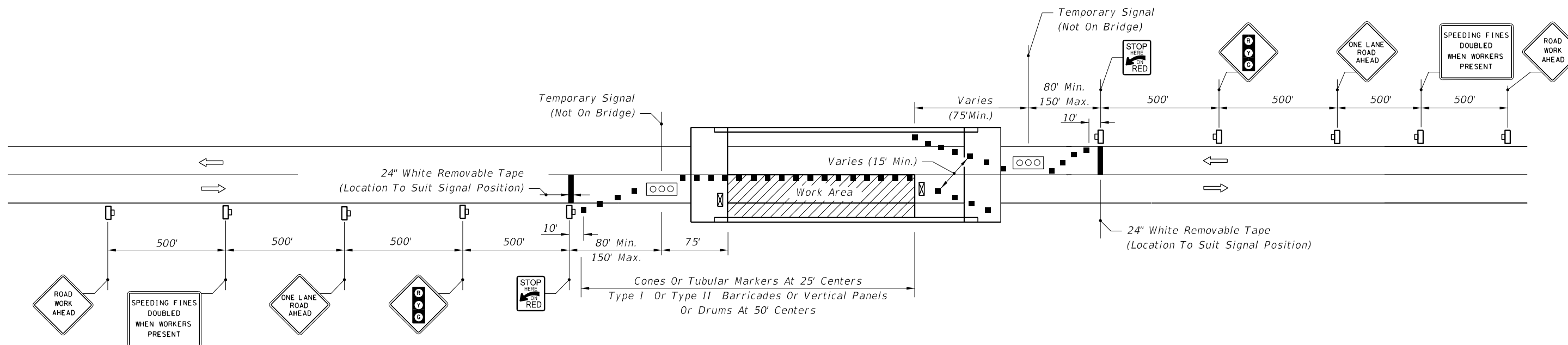


TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY - SIGNAL CONTROL

INDEX 102-606	SHEET 2 of 4
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SINGLE LANE CLOSURE • ROADWAY AND BRIDGES ALL LENGTHS

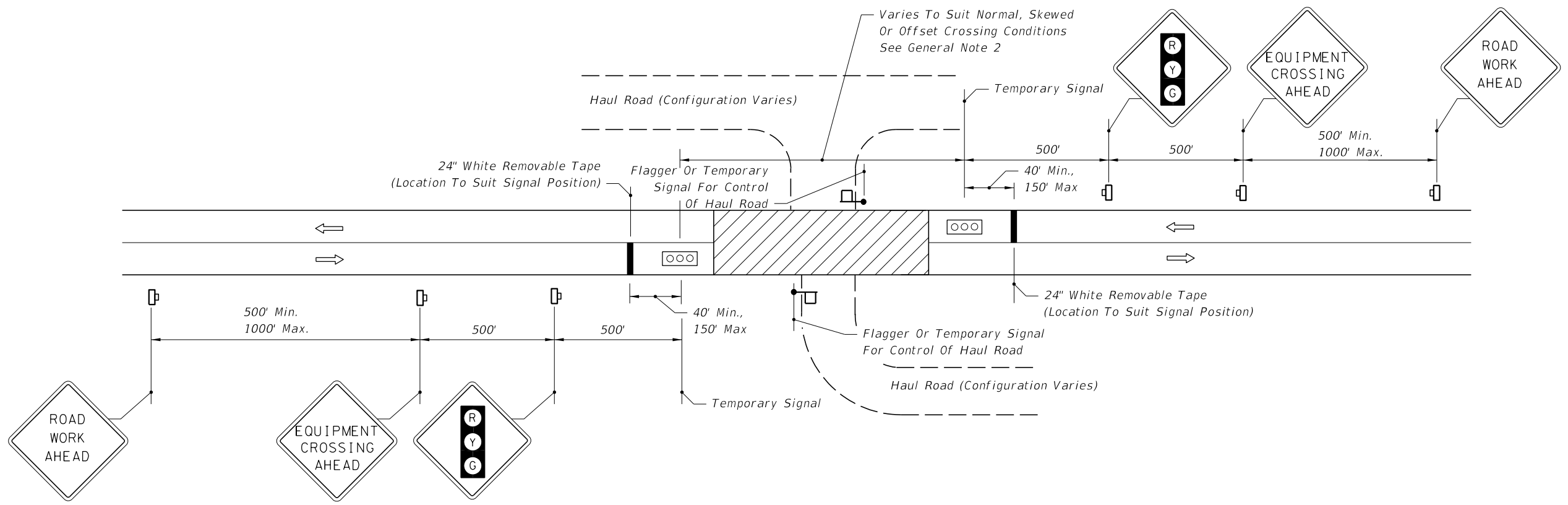


SINGLE LANE CLOSURE • SHORT BRIDGES

10/30/2018 9:20:20 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY - SIGNAL CONTROL	INDEX 102-606	SHEET 3 of 4
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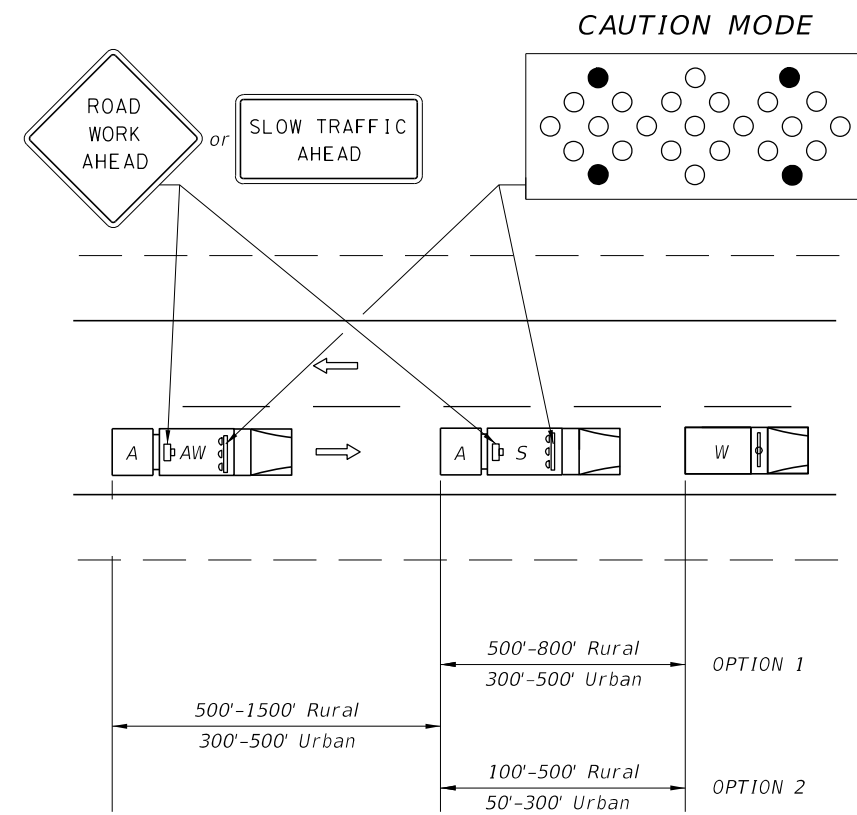
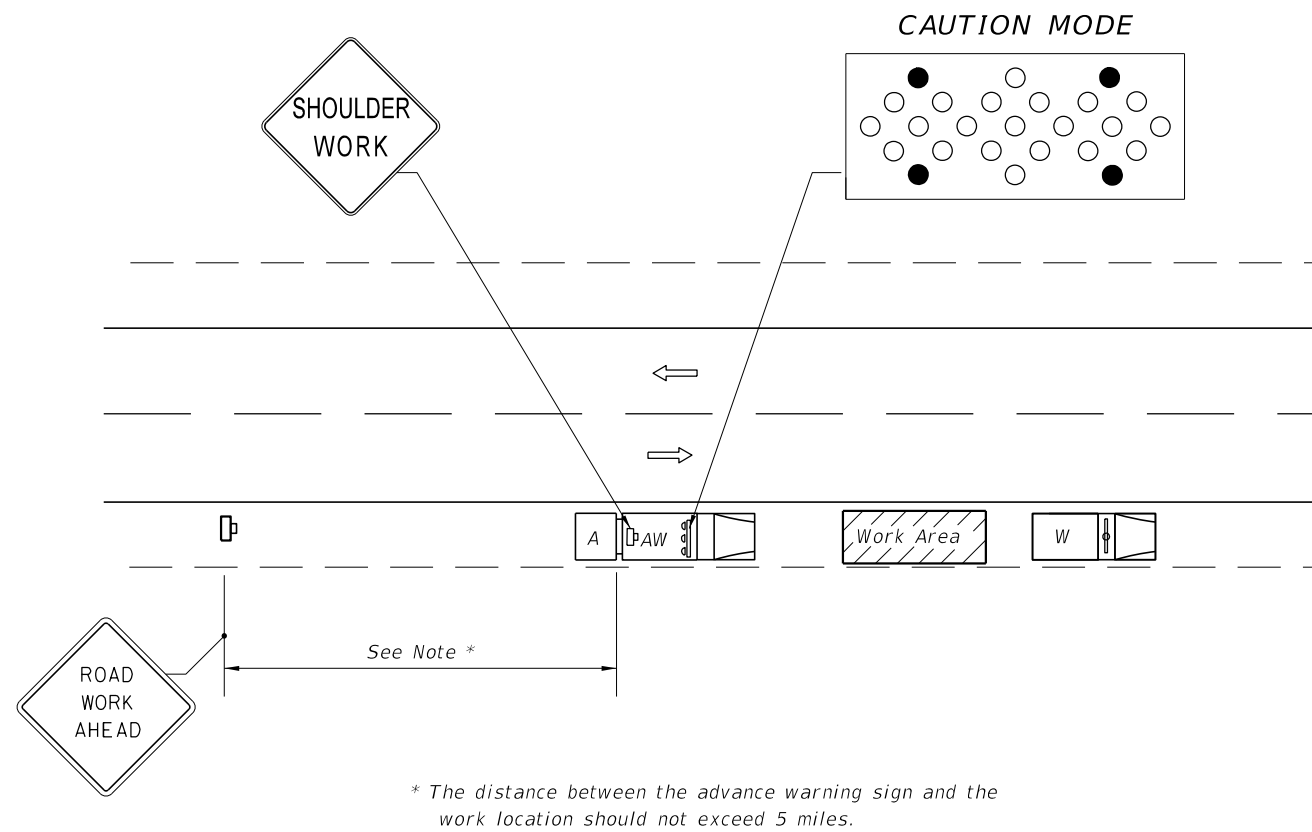
MOMENTARY ROADWAY CLOSURE • HAUL ROUTE CROSSING

LAST REVISION 11/01/17	DESCRIPTION:
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TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY - SIGNAL CONTROL

INDEX 102-606	SHEET 4 of 4
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OPTION 1: Advanced Warning Vehicle is optional and to be operated on the shoulder when feasible. If an Advance Warning Vehicle is operated in the shoulder, an approved Truck Mounted Attenuator is required on both the Advance Warning and Shadow Vehicles. If an Advance Warning Vehicle is operated in the lane behind the Shadow Vehicle, an approved Truck Mounted Attenuator will be required on the Advance Warning Vehicle, but not required on the Shadow Vehicle. The Advance Warning Arrow Board and Warning Sign is required on both the Advance warning and Shadow Vehicles.

OPTION 2: Advanced Warning Vehicle is required and must be operated in the lane behind the shadow vehicle. An approved Truck Mounted Attenuator will be required on the Advanced Warning Vehicle but not required on the Shadow Vehicle. The Advance Warning Arrow Board and Warning Sign is required on both the Advance Warning and Shadow Vehicles.

WORK IN TRAVEL WAY
(Option 2 Shown, Option 1 Similar)

SYMBOLS

- Work Area
- Work Zone Sign
- Lane Identification + Direction of Traffic
- Work Vehicle With Rotating/Strobe Lights
- Shadow (S) Or Advance Warning (AW)
- Vehicle with Advance Warning Arrow Board and Sign Message
- Truck/Trailer Mounted Attenuator (TMA)
- Advanced Warning Arrow Board

GENERAL NOTES

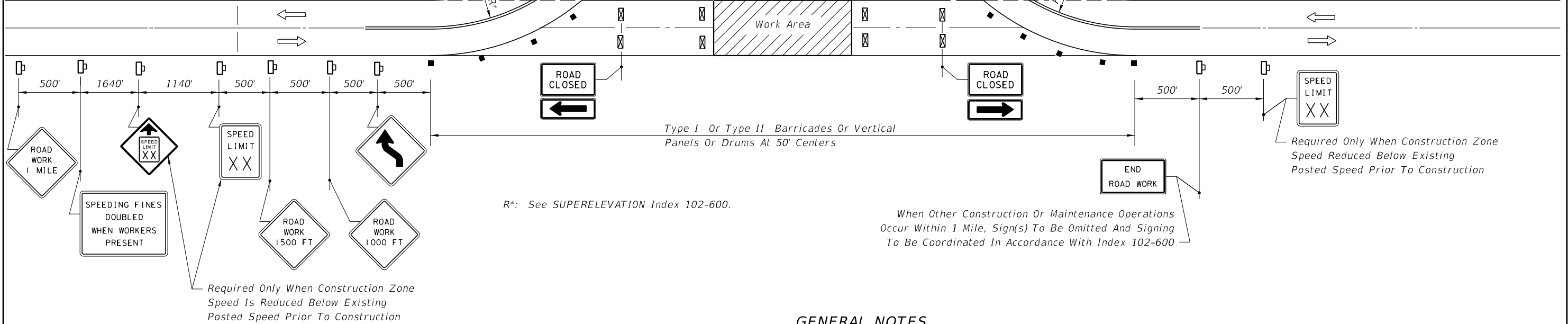
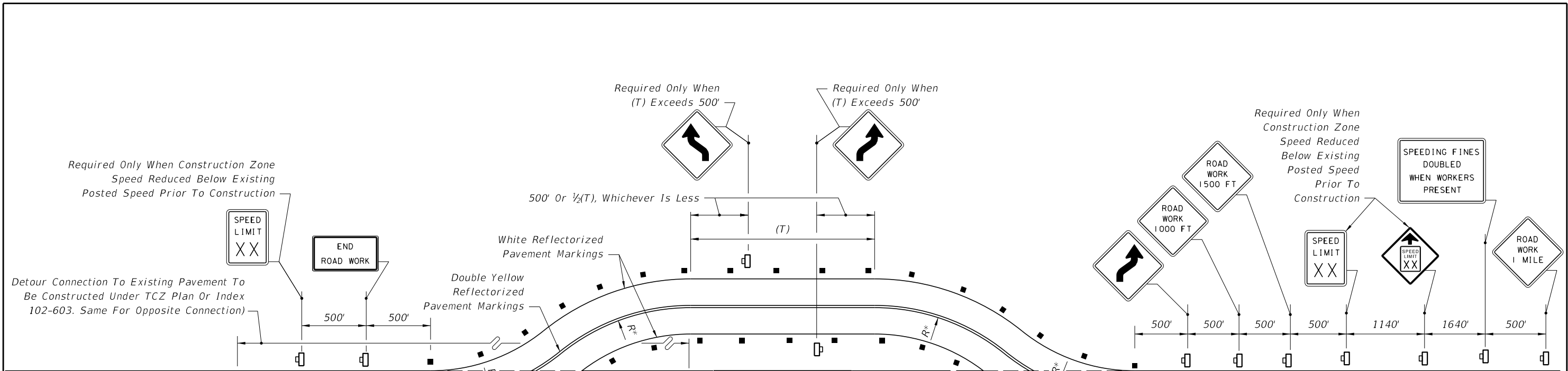
1. Where work activities within 2' of the edge of travel way are incidental (i.e., Mowing, Litter Removal), the Engineer may delete requirements for signs and the advance warning vehicle provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
2. If an arrow board is used, the caution mode shall be used.
3. Shadow and Advance Warning Vehicle shall display rotating/strobe lights.
4. For general TCZ requirements and additional information, refer to Index 102-600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE AN INTERMITTENT OR CONTINUOUS MOVING OPERATION.

10/30/2018 9:20:26 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TWO-LANE, TWO-WAY MOBILE OPERATION, WORK ON SHOULDER AND WORK WITHIN THE TRAVEL WAY	INDEX 102-607	SHEET 1 of 1
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SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Type III Barricade
- Work Zone Sign
- Lane Identification + Direction of Traffic

GENERAL NOTES

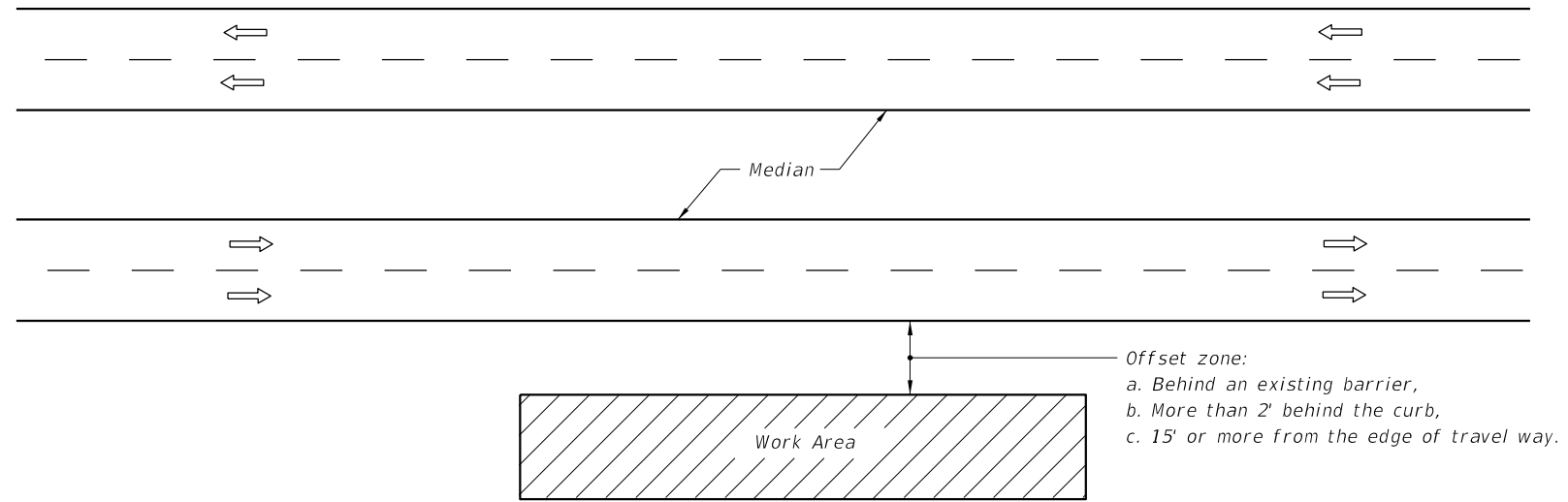
1. For speed sign applications, see Index 102-600.
2. Where the tangent distance (T) exceeds 600', spacing between cones or tubular markers may be increased to 50' or spacing between Type I or Type II barricades, vertical panels or drums may be increased to 100' within limits of the tangent, or post mounted delineators at 50' centers may be substituted for the barricades, vertical panels or drums.
3. On the existing pavement, all existing markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking a new centerline and edge lines.
4. Where the tangent distance (T) exceeds 600' and no passing or stopping sight distance restrictions exist, the yellow reflectORIZED markings used to indicate the centerline of the traveled way may be replaced with yellow reflectORIZED markings in a broken pattern. For raised pavement marker application see Index 102-600 and Index 706-001.
5. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
6. If temporary structures are required on the diversion, traffic control will be in conformance with Index 105-650.
7. For general TCZ requirements and additional information, refer to Indexes 102-600 and 706-001.
8. If posted speed for Work Zone is 45 mph or less, use "ROAD WORK 1/2 MILE" and space accordingly.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF BOTH LANES AND A TEMPORARY DIVERSION IS CONSTRUCTED.

10/30/2018 9:20:29 AM



LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TWO-LANE, TWO-WAY TEMPORARY DIVERSION CONNECTION	INDEX 102-608	SHEET 1 of 1
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GENERAL NOTES

1. If the work operation (excluding establishing and terminating the work area), requires that two or more work vehicles cross the offset zone in any one hour, traffic control will be in accordance with Index 102-612.
2. No special signing is required.
3. This index also applies when work is being performed on a multilane undivided highway.
4. This index also applies to work performed in the median behind an existing barrier or more than 15' from the edge of travel way, both roadways. Work performed in the median behind curb and gutter shall be in accordance with Index 102-612.
5. When a side road intersects the highway within the work area, additional traffic control devices shall be placed in accordance with other applicable TCZ Indexes.
6. When construction activities encroach on a sidewalk, refer to Index 102-660.
7. For general TCZ requirements and additional information, refer to Index 102-600.


SYMBOLS

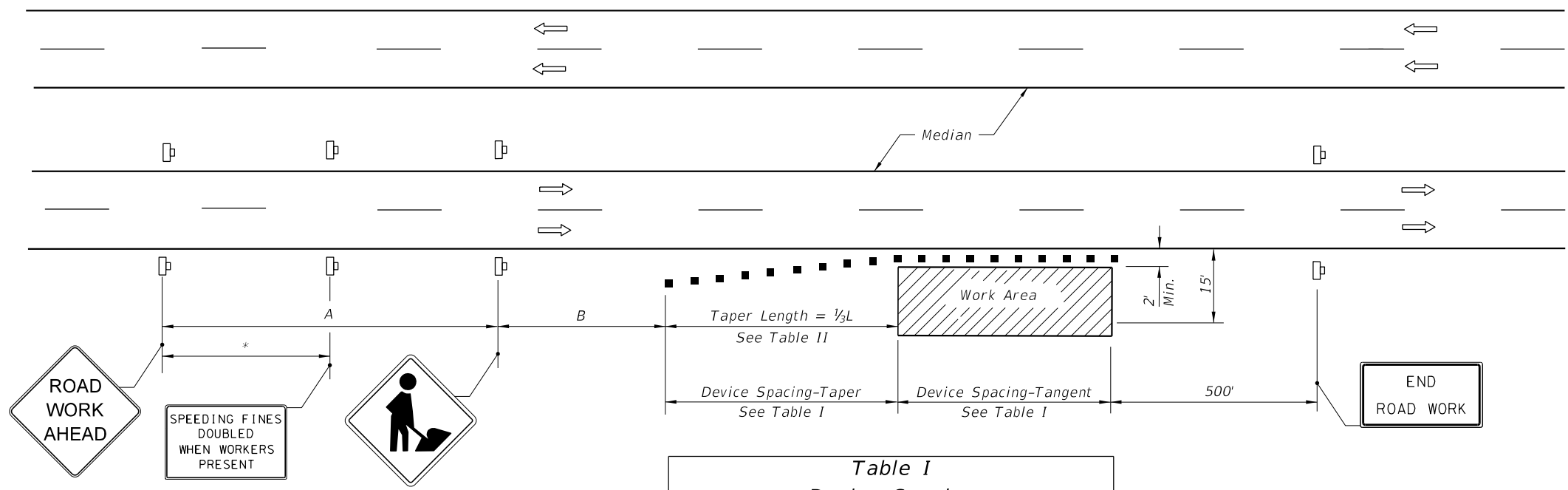
-  Work Area
-  Lane Identification + Direction of Traffic

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE BEHIND AN EXISTING BARRIER, MORE THAN 2' BEHIND THE CURB, OR 15' OR MORE FROM THE EDGE OF TRAVEL WAY.

10/30/2018 9:20:35 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	MULTILANE, WORK OUTSIDE SHOULDER	INDEX 102-611	SHEET 1 of 1
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Speed	Spacing (ft.)	
	A	B
40 mph or less	200	200
45 mph	350	350
50 mph or greater	500	500

* 250' 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
50 to 70	25	50	50	100

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

GENERAL NOTES

- When a high volume of work vehicles are entering and leaving the Work Area at speeds slower than 10 MPH below the posted speed, place an M0T-5-06 sign in the ROAD WORK AHEAD sign location and shift the ROAD WORK AHEAD sign upstream 500 ft.
- This TCZ plan also applies to work performed in the median more than 2' but less than 15' from the edge of travelway.
- When work is being performed on a multilane undivided roadway the signs normally mounted in the median (as shown) shall be omitted.
- WORKERS signs 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.
- 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 102-600.

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.

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification + Direction of Traffic

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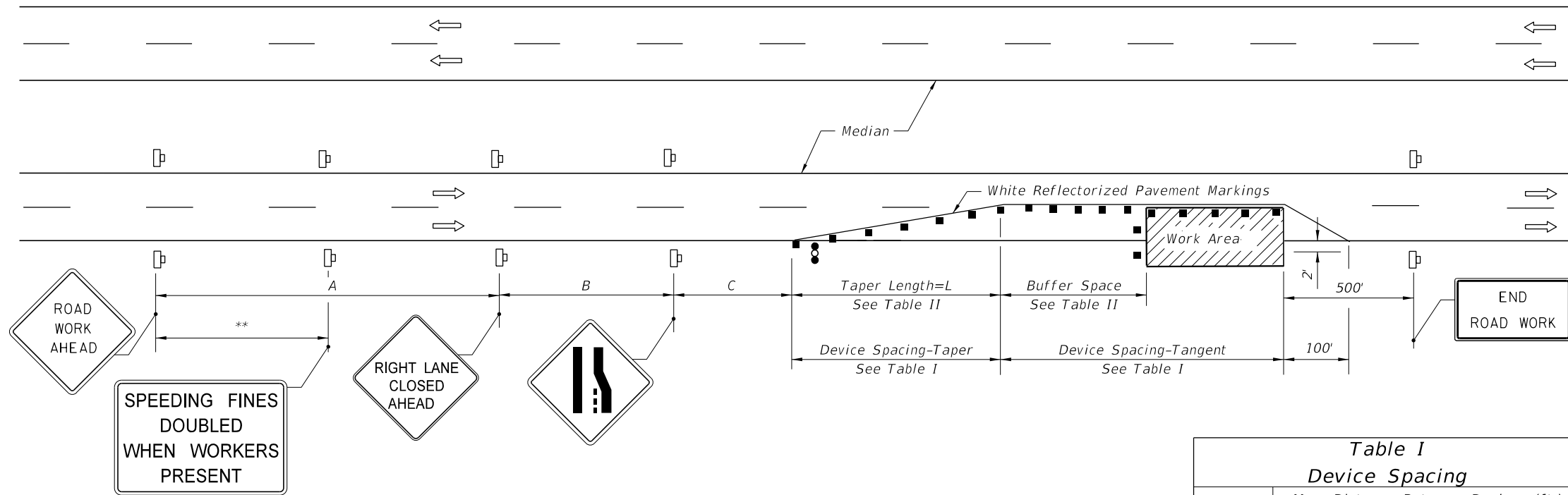


Table II
Buffer Space and Taper Length

Speed (mph)	Buffer Space (ft.)	Taper Length (12' Lateral Transition)	
		L (ft.)	Notes (Merge)
25	155	125	$L = \frac{WS^2}{60}$
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	

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

For lateral transitions other than 12', use formula for L shown in notes column. Where:

L = Length of taper in feet
W = Width of lateral transition in feet
S = Posted speed limit (mph)

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

DURATION NOTES

- Temporary white edgeline may be omitted for work operations less than 3 consecutive calendar days.
- For work operations up to approximately 15 minutes, signs, channelizing devices, arrow board, and buffer space may be omitted if all of the following conditions are met:
 - 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.
 - Volume and complexity of the roadway has been considered.
 - The closed lane is occupied by a class 5 or larger, medium duty truck(s) with a minimum gross weight vehicle rating (GWVR) of 16,001 lb with high-intensity, rotating, flashing, oscillating, or strobe lights mounted above the cab height and operating.
- For work operations up to 60 minutes, arrow board and buffer space may be omitted if conditions a, b, and c in DURATION NOTE 2 are met, and 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 ON THE LANE ADJACENT TO EITHER SHOULDER AND THE AREA 2' OUTSIDE THE EDGE OF TRAVEL WAY.

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

* The ROAD WORK 1 MILE sign may be used as an alternate to the ROAD WORK AHEAD sign and the RIGHT LANE CLOSED 1/2 MILE sign may be used as an alternate to the RIGHT LANE CLOSED AHEAD sign.

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

GENERAL NOTES

- Work operations shall be confined to one traffic lane, leaving the adjacent lane open to traffic.
- 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:

- Work shall be confined within one median lane.
- Additional barricades, cones, or drums shall be placed along the centerline abutting the work area and across the trailing end of the work area.

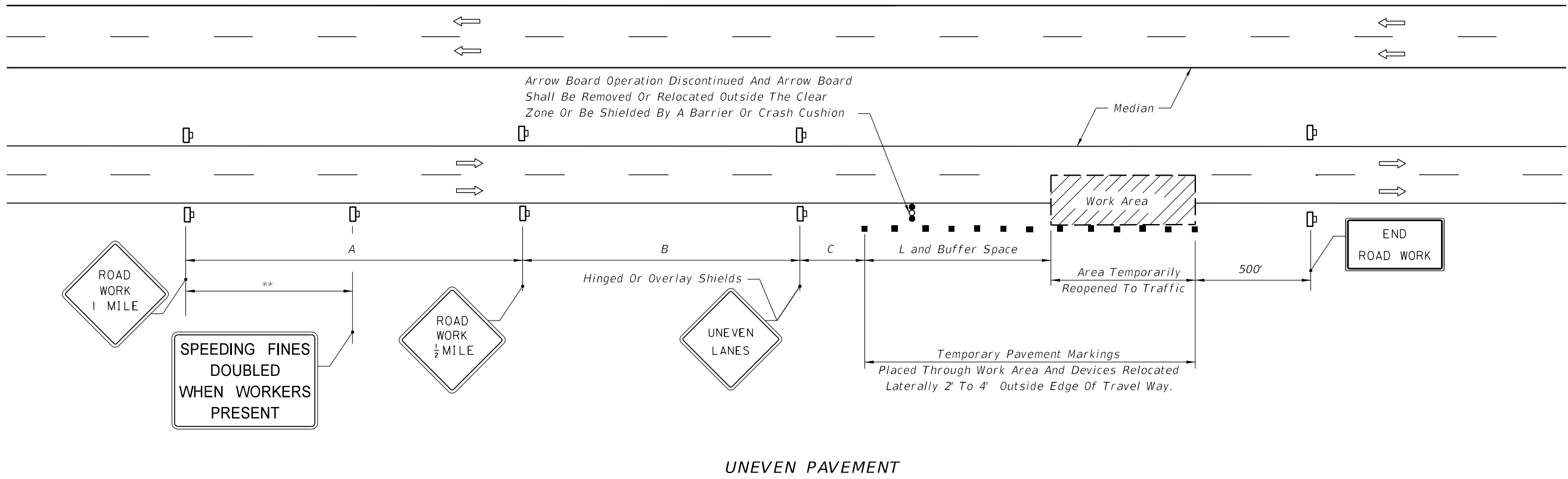
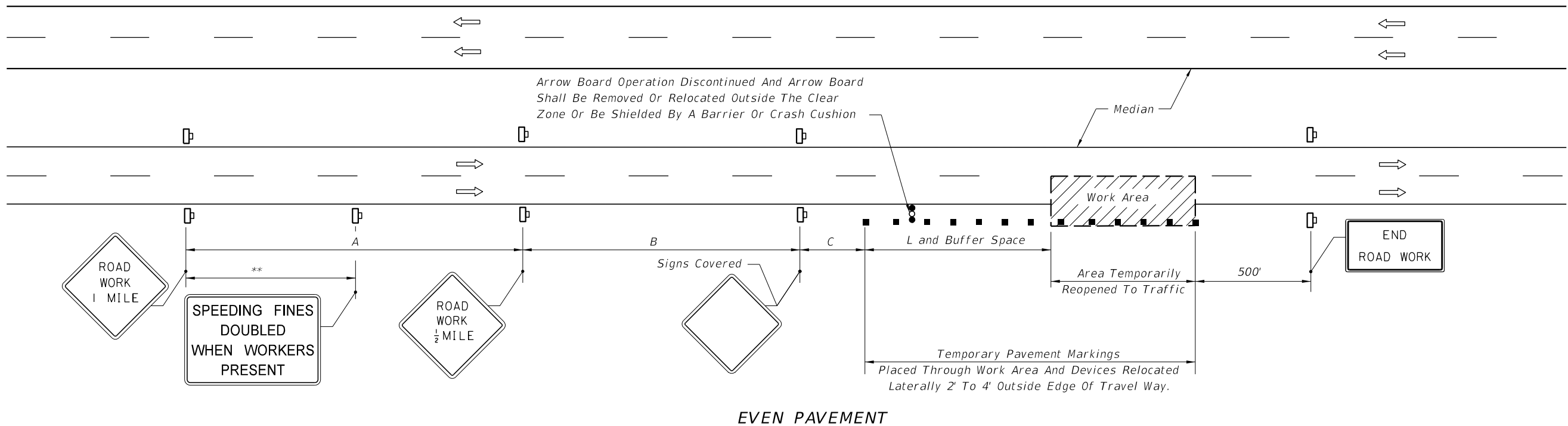
When work on undivided highways occurs across the centerline so as to encroach on both median lanes, the inverted plan is applied to the approach of both roadways.

- 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 102-612 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 102-614.
- For general TCZ requirements and additional information, refer to Index 102-600.

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board

10/30/2018 9:20:41 AM

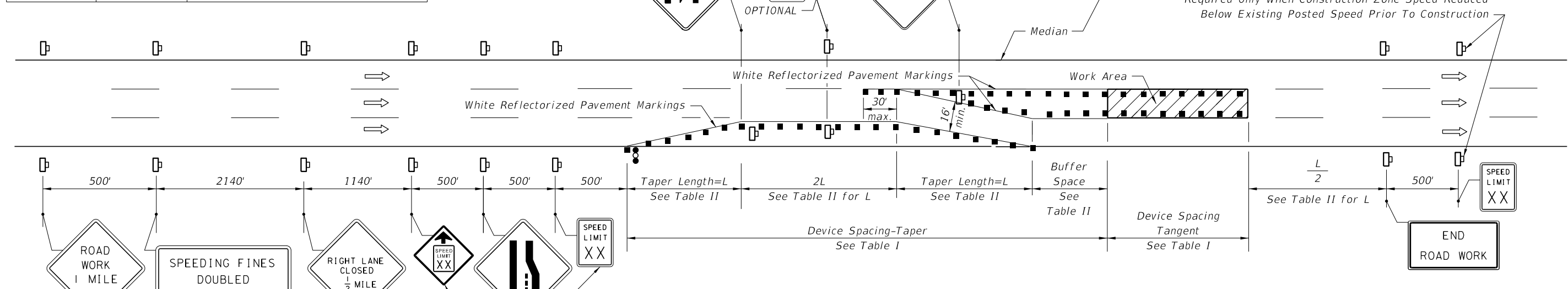


INTERMITTENT WORK STOPPAGE - LANE REOPENED TO TRAFFIC

10/30/2018 9:20:44 AM

LAST REVISION 11/01/17	REVISION DESCRIPTION:	 FY 2019-20 STANDARD PLANS	MULTILANE, WORK WITHIN TRAVEL WAY MEDIAN OR OUTSIDE LANE	INDEX 102-613	SHEET 2 of 2
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EXISTING POSTED SPEED	PROPOSED WORK ZONE SPEED	REMARKS
MPH	MPH	The 'Proposed Work Zone Speeds' are recommended speeds for the traffic control plan detailed below; however, where the Engineer deems other speeds are appropriate, the applicable speeds are to be shown on the plans.
65	55	
55	45	
45	35	



**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	$L = \frac{WS^2}{60}$	
30	200	180		
35	250	245		
40	305	320		
45	360	540	$L = WS$	
50	425	600		
55	495	660		
60	570	720		
65	645	780		
70	730	840		

CONDITION NOTES

- The RIGHT LANE CLOSED and lane reduction signs are to be removed or fully covered when no work is being performed and the center lane is opened to traffic.
- For work performed in the median or outside lane, refer to Index 102-613.
- When the lane closure exceeds a continuous 24 hour period, all existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement marking used for marking new edge lines and centerline.

GENERAL NOTES

- 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 102-600.

DURATION NOTES

- Temporary pavement markings may be omitted for work operations less than 3 days.

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

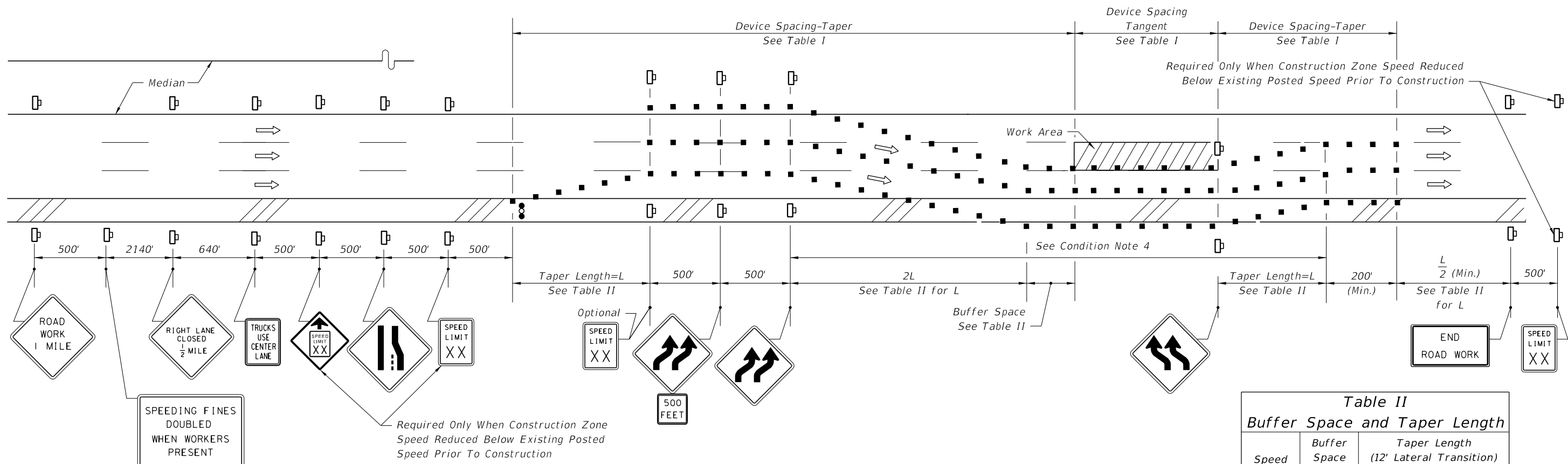
For lateral transitions other than 12', use formula for L shown in the notes column. Where:
 L = Length of taper in feet
 W = Width of lateral transition in feet
 S = Posted speed limit (mph)

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON ANY PORTION OF A CENTER LANE OF A MULTILANE HIGHWAY, AND TWO DRIVING LANES ARE MAINTAINED ON THE TRAVEL WAY.

- SYMBOLS**
- Work Area
 - Channelizing Device (See Index 102-600)
 - Work Zone Sign
 - Advance Warning Arrow Board
 - Lane Identification + Direction of Traffic

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EXISTING POSTED SPEED	PROPOSED WORK ZONE SPEED	REMARKS
MPH	MPH	The 'Proposed Work Zone Speeds' are recommended speeds for the traffic control plan detailed below; however, where the Engineer deems other speeds are appropriate, the applicable speeds.
65	55	
55	45	
45	35	

Table I
Device Spacing

Max. Distance Between Devices (ft.)

Speed (mph)	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
	25	25	50	25
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)	
	Dist. (ft)	L (ft)	Notes (Merge)
25	155	125	$L = \frac{WS^2}{60}$
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	

CONDITION NOTES

1. See General Notes, Sheet 1.
2. Length of time that traffic is using shoulder should be minimized. For example, remove lane closure and lane shift at night (unless performing night work) if practical.
3. The RIGHT LANE CLOSED, lane reduction and reverse curve signs are to be removed or fully covered when no work is being performed and the travel way is open to traffic.
4. When the lane closure exceeds a continuous 24 hour period, all existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for marking new edge lines and centerlines.
5. For general TCZ requirements and additional information, refer to Index 102-600.

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board

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

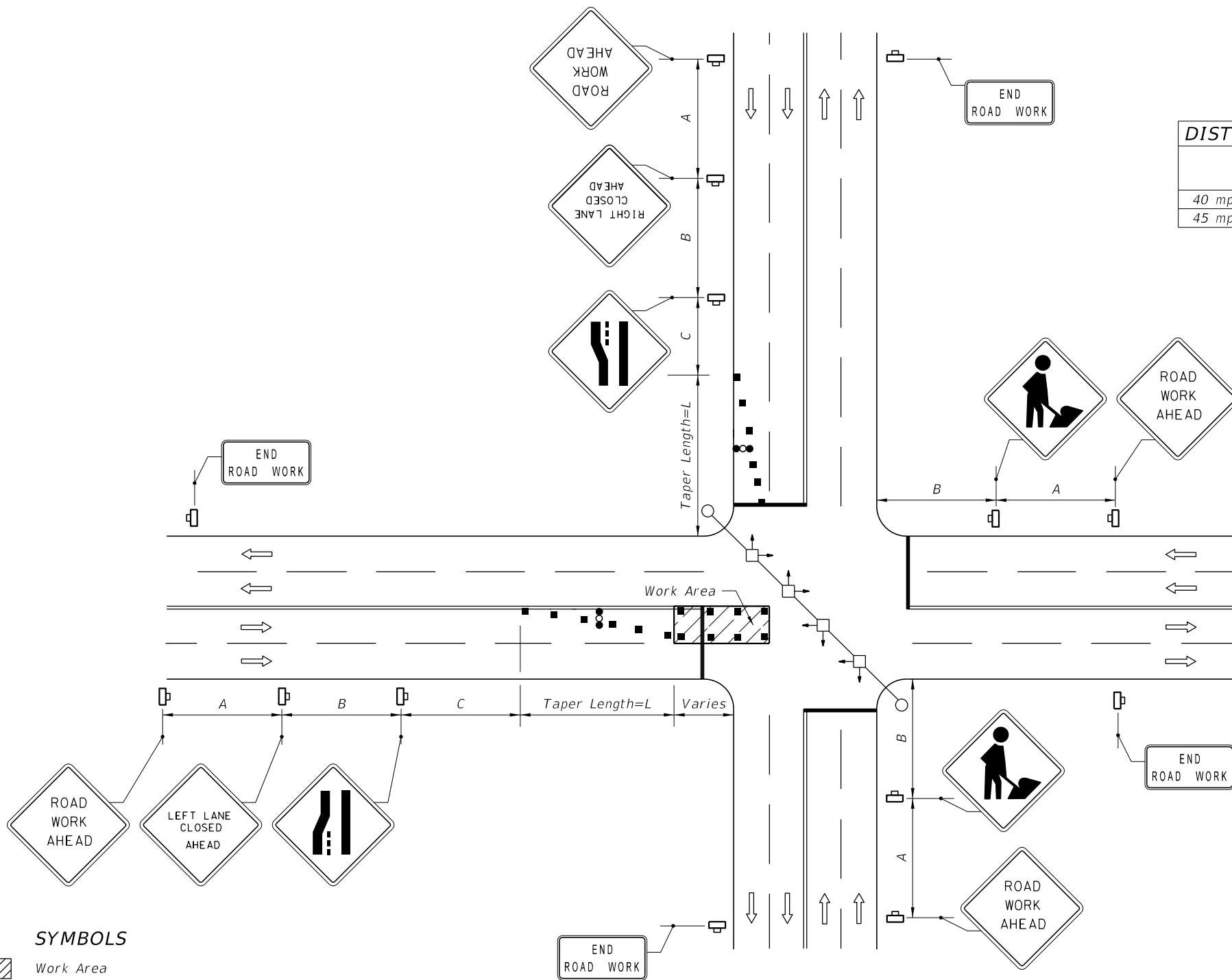
For lateral transitions other than 12', use formula for L shown in the notes column. Where:
 L = Length of taper in feet
 W = Width of lateral transition in feet
 S = Posted speed limit (mph)

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON ANY PORTION OF A CENTER LANE OF A MULTILANE HIGHWAY, AND TWO DRIVING LANES ARE MAINTAINED, AND, THE OUTSIDE SHOULDER PAVEMENT IS TEMPORARILY USED AS A TRAVEL LANE.

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10/30/2018 9:20:57 AM



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

Table II
Taper Length - Merge
(12' Lateral Transition)

Speed (mph)	L (ft.)	Notes (Merge)
25	125	$L = \frac{WS^2}{60}$
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)

GENERAL NOTES

1. The WORKERS legend sign may be substituted for the symbol sign.
2. 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 700-101.
3. If the work space extends across a crosswalk, the crosswalk should be closed using the information in Index 102-660.
4. Dual signs are required for divided roadways.
5. Maximum spacing between barricades, vertical panels, cones, tubular markers and drums shall not be greater than 25'.
6. Temporary signal phasing modifications are to be approved by the District Traffic Operations Engineer prior to the beginning of work.
7. For general TCZ requirements and additional information, refer to Index 102-600.

DURATION NOTES

1. Signs and arrow board may be omitted if all of the following conditions are met:
 - a. Work operations are 60 minutes or less.
 - b. Speed 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
 - Channelizing Device (See Index 102-600)
 - Work Zone Sign
 - Stop Bar
 - Advance Warning Arrow Board
 - Lane Identification + Direction of Traffic

SIGNALIZED

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF AT LEAST ONE MEDIAN TRAFFIC LANE.

GENERAL NOTES

1. 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

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.
2. 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 700-101
3. If the work space extends across a crosswalk, the crosswalk should be closed using the information in Index 102-660.
4. Signs are required on the median side for divided highways.
5. 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.
6. For general TCZ requirements and additional information, refer to Index 102-600.


DURATION NOTES

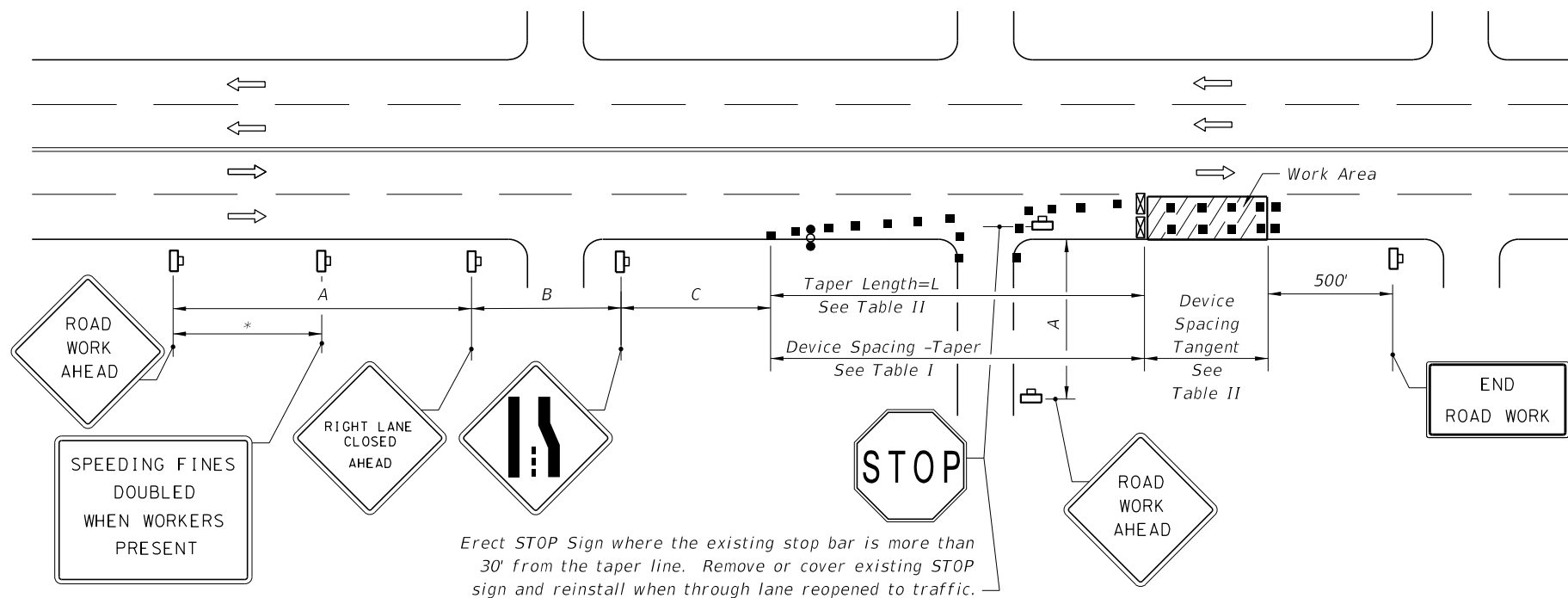
1. For work operations up to approximately 15 minutes, signs, channelizing devices, and arrow board may be omitted if all of the following conditions are met:
 - a. Speed limit is 45 mph or less.
 - b. No sight obstructions to vehicles approaching the work area for a distance equal to twice the taper length.
 - c. Volume and complexity of the roadway has been considered.
 - d. The closed lane is occupied by a class 5 or larger, medium duty truck(s) with a minimum gross weight vehicle rating (GWVR) of 16,001 lb with high-intensity, rotating, flashing, oscillating, or strobe lights mounted above the cab height and operating.
2. For work operations up to 60 minutes, the arrow board may be omitted if conditions a, b, and c in DURATION NOTE 1 are met, and vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.

SYMBOLS

-  Work Area
-  Work Zone Sign
-  Advance Warning Arrow Board
-  Type III Barricade
-  Channelizing Device (See Index 102-600)
-  Lane Identification + Direction of Traffic

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	MULTILANE, WORK NEAR INTERSECTION MEDIAN OR OUTSIDE LANE	INDEX 102-616	SHEET 1 of 3
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Erect STOP Sign where the existing stop bar is more than 30' from the taper line. Remove or cover existing STOP sign and reinstall when through lane reopened to traffic.

RIGHT LANE CLOSED ON FAR SIDE OF MINOR SIDE STREET

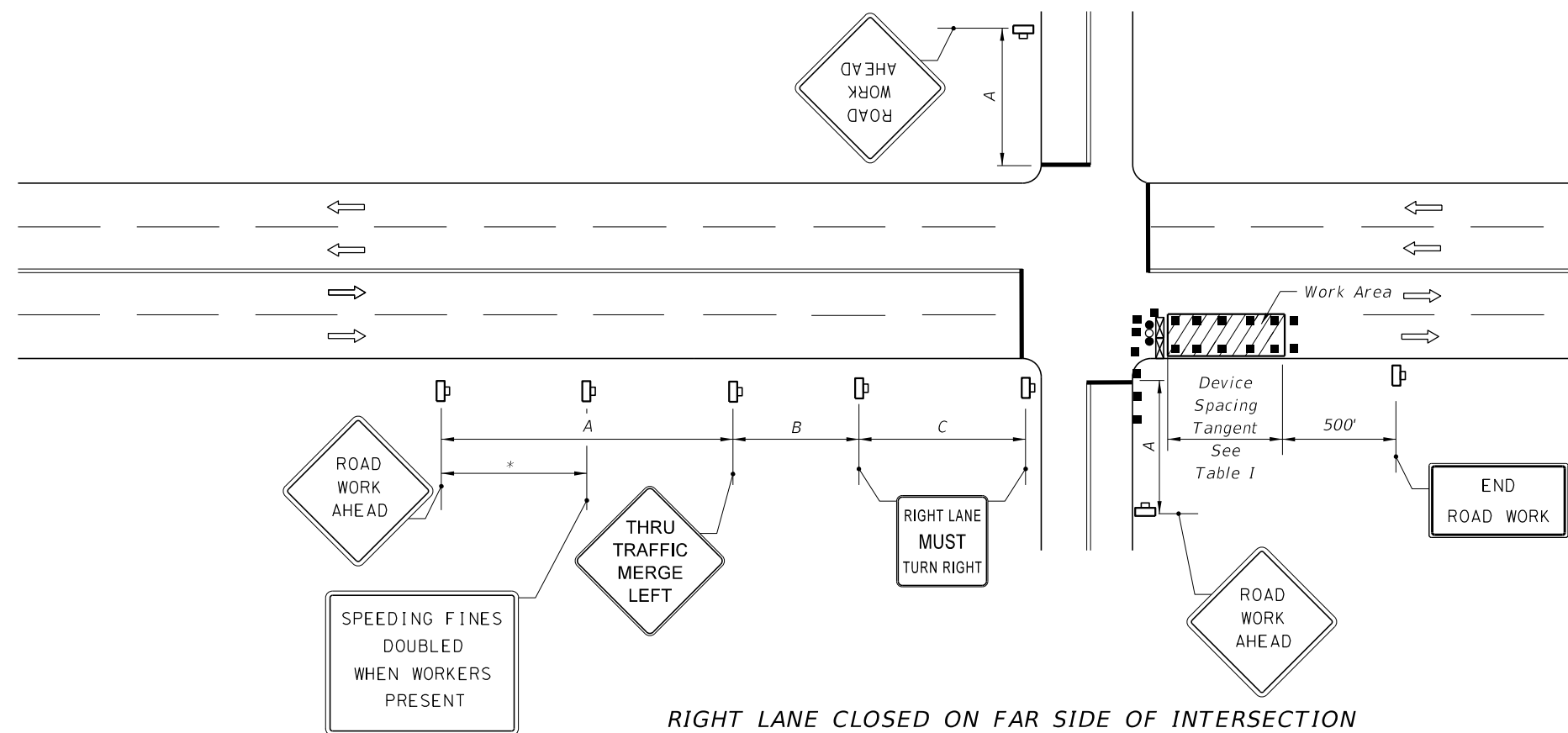
DISTANCE BETWEEN SIGNS

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.

**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



RIGHT LANE CLOSED ON FAR SIDE OF INTERSECTION WITH SIGNIFICANT RIGHT TURNING MOVEMENTS

**Table II
Taper Length - Merge
(12' Lateral Transition)**

Speed (mph)	L (ft)	Notes (Merge)
25	125	$L = \frac{WS^2}{60}$
30	180	
35	245	
40	320	
45	540	$L=WS$

For lateral transitions other than 12', use formula for L shown in the notes column. Where:

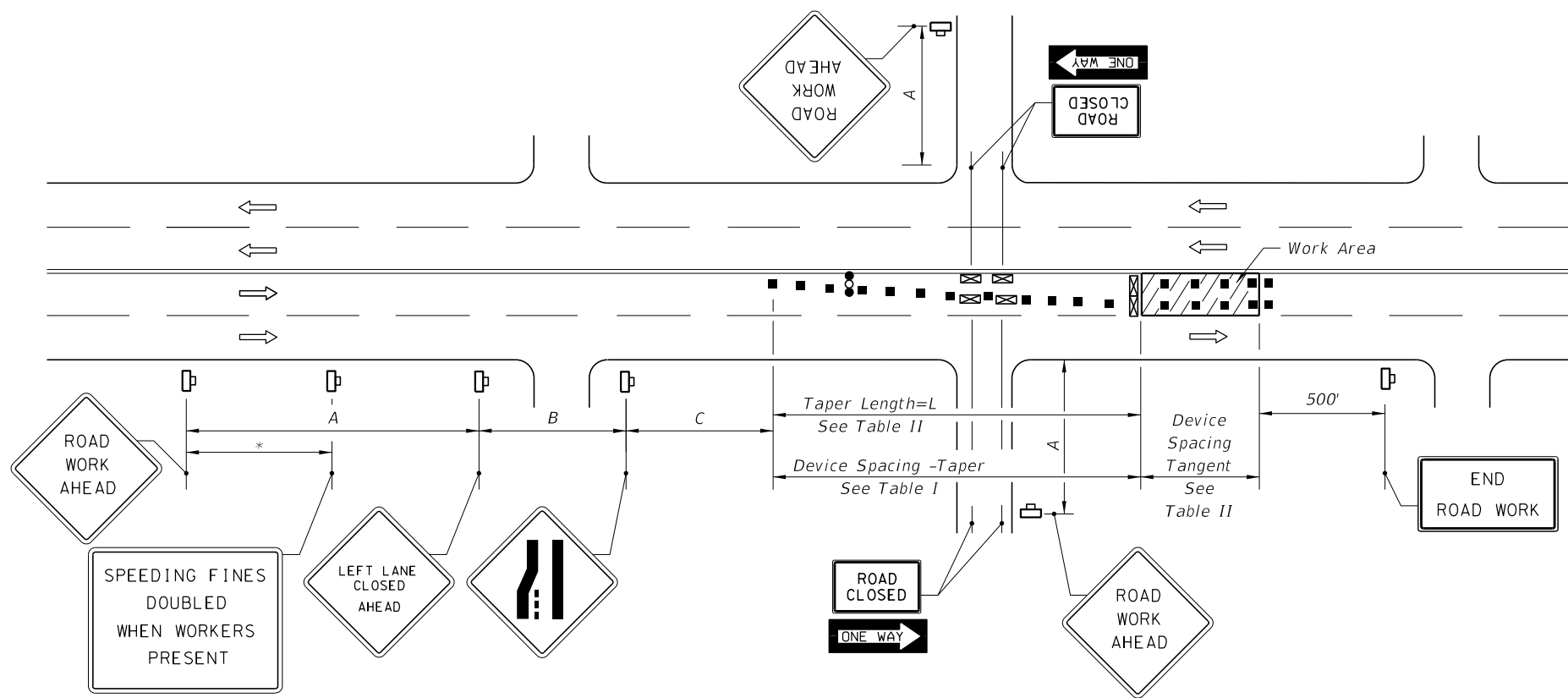
L = Length of taper in feet
W = Width of lateral transition in feet
S = Posted speed limit (mph)

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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10/30/2018 9:21:10 AM

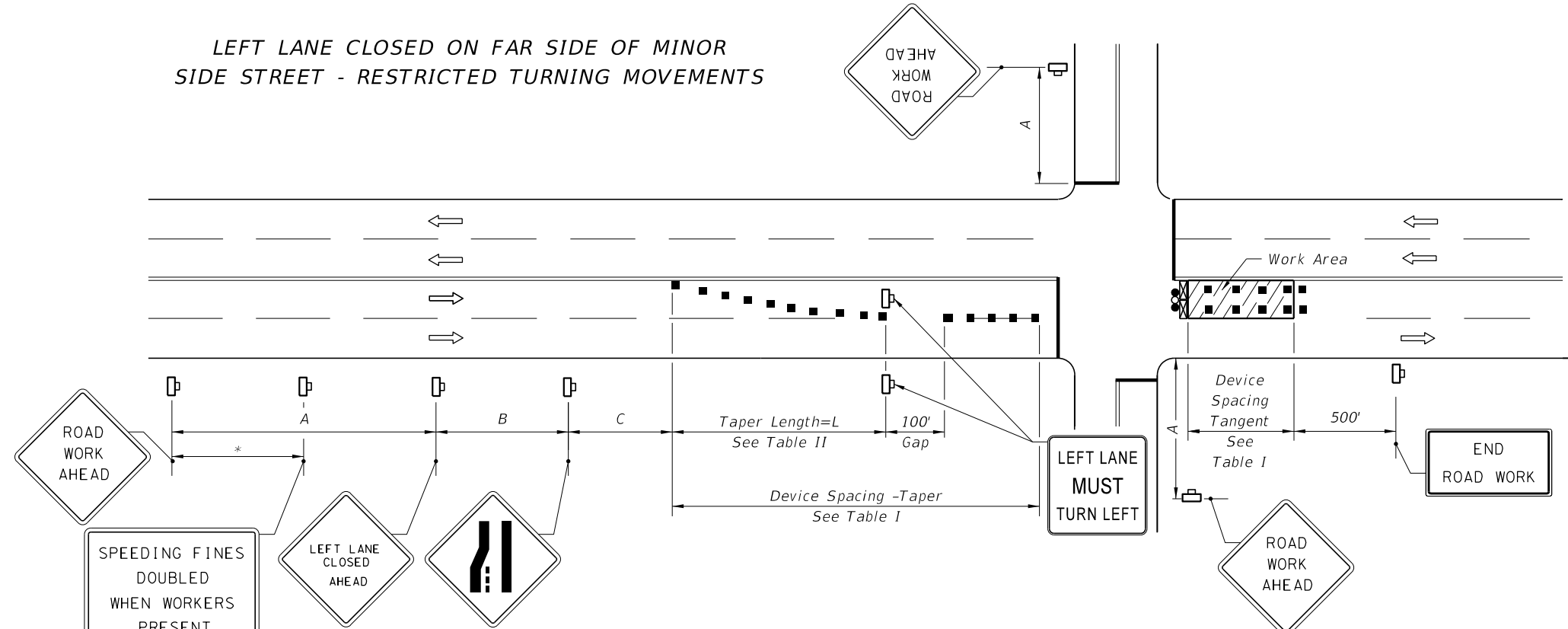


Speed	Spacing (ft.)		
	A	B	C
40 mph or less	200	200	200
45 mph	350	350	350

* 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

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



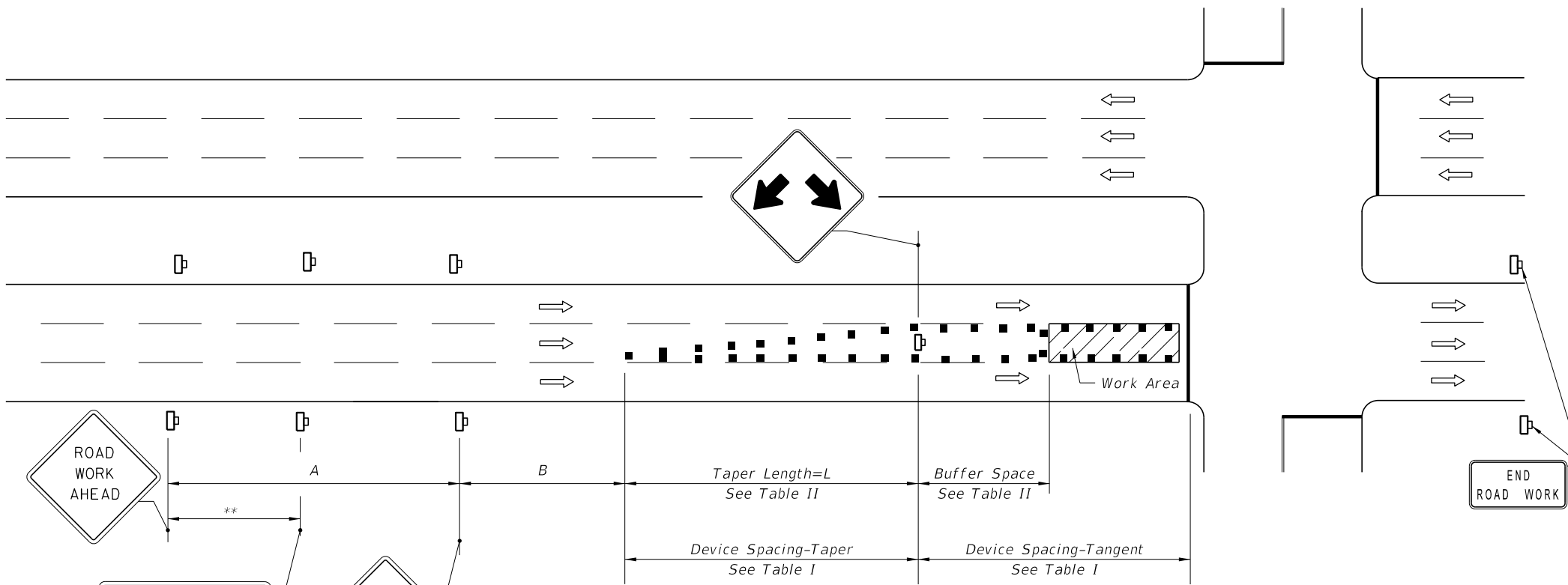
Speed (mph)	L (ft.)	Notes (Merge)
25	125	$L = \frac{WS^2}{60}$
30	180	
35	245	
40	320	
45	540	$L = WS$

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)

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 left turning movements, then the left lane may be reopened as a turn bay for left turns only as show in this detail.

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

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

Speed (mph)	Buffer Space Dist. (ft.)	Taper Length (12' Lateral Transition)	
		L (ft.)	Notes (Merge)
25	155	125	$L = \frac{WS^2}{60}$
30	200	180	
35	250	245	
40	305	320	$L = WS$
45	360	540	

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

GENERAL NOTES

1. Work operations shall be confined to one center travel lane, leaving the adjacent travel lanes open to traffic.
2. The merging taper shall direct vehicular traffic into either the right or left lane, but not both.
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 700-101.
4. If the work space extends across a crosswalk, the crosswalk should be closed using the information in Index 102-660.
5. For general TCZ requirements and additional information, refer to Index 102-600.

DURATION NOTES

1. Signs and buffer space 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 the buffer space and the taper length combined.
 - 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.

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

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)

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF THE CENTER LANE NEAR AN INTERSECTION.

SYMBOLS

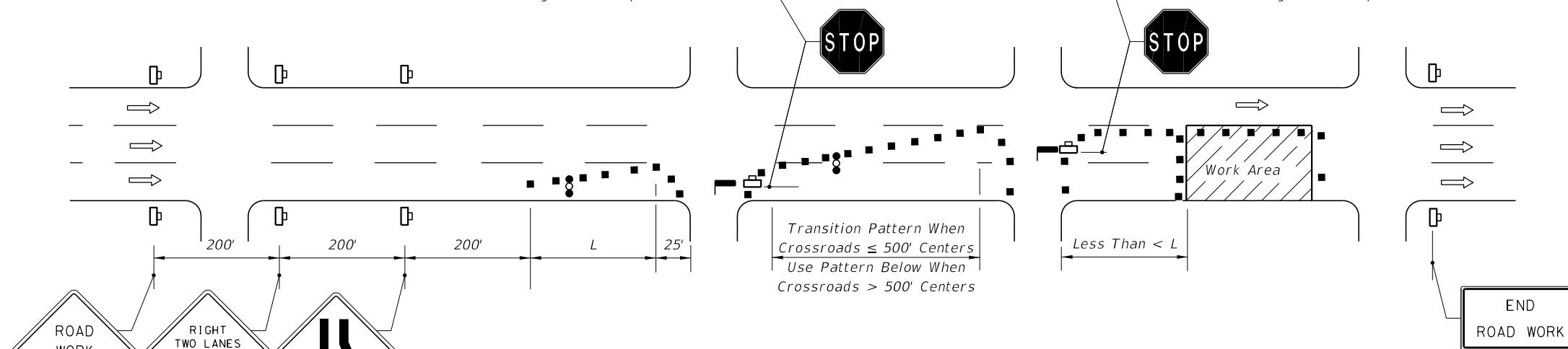
- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board
- Lane Identification + Direction of Traffic

Erect STOP Sign And Install Removable Stop Bar Marking. Remove Or Cover Existing STOP Sign And Reinstall When Through Lane Reopened To Traffic.

Erect STOP Sign And Install Removable Stop Bar Marking. Remove Or Cover Existing STOP Sign And Reinstall When Through Lane Reopened To Traffic.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE AND CENTER TRAVEL LANES OR THE MEDIAN AND CENTER TRAVEL LANES, WITH OR WITHOUT CLOSURE OF ADJOINING AUXILIARY LANES, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

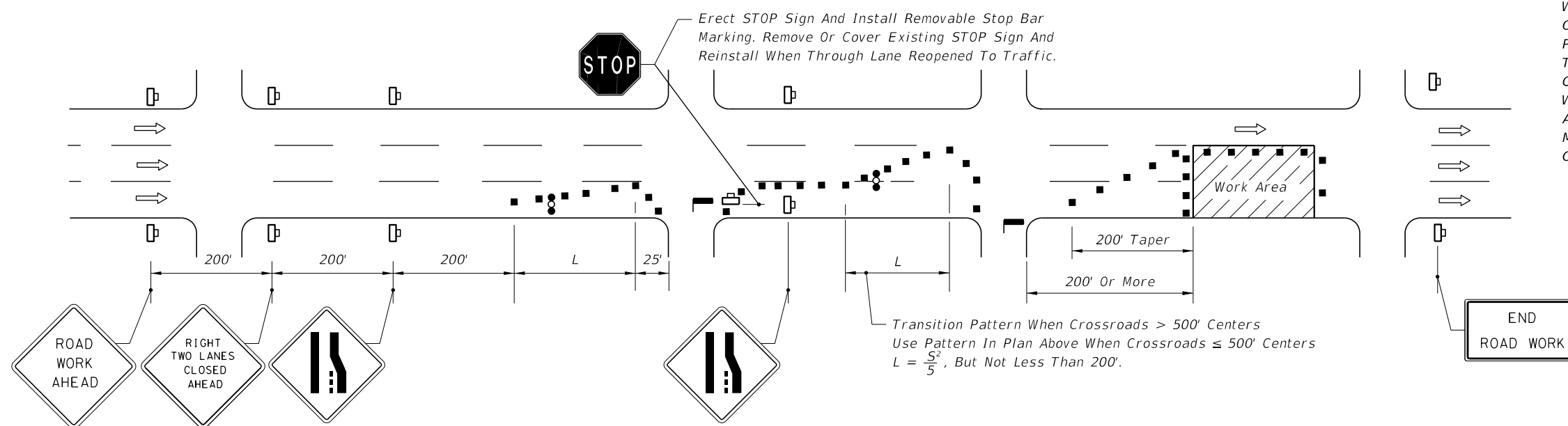


Transition Pattern When Crossroads ≤ 500' Centers
Use Pattern Below When Crossroads > 500' Centers

Less Than < L

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF EITHER THE OUTSIDE AND CENTER TRAVEL LANES OR THE MEDIAN AND CENTER TRAVEL LANES, WITH OR WITHOUT CLOSURE OF ADJOINING AUXILIARY LANES, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.



Erect STOP Sign And Install Removable Stop Bar Marking. Remove Or Cover Existing STOP Sign And Reinstall When Through Lane Reopened To Traffic.

Transition Pattern When Crossroads > 500' Centers
Use Pattern In Plan Above When Crossroads ≤ 500' Centers
 $L = \frac{S^2}{5}$, But Not Less Than 200'.

200' Taper

200' Or More

GENERAL NOTES

1. If the work space extends across a crosswalk, the crosswalk should be closed using the information in Index 102-660.
2. Signs are required on the median side for divided highways.
3. 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.
4. Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH.

Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' centers for Type I or Type II barricades or vertical panels or drums for 250', thereafter, cones or tubular markers at 50' centers and Type I or Type II barricades or vertical panels or drums at 100' centers.
5. For general TCZ requirements and additional information, refer to Index 102-600.

Table II
Taper Length - Merge
(12' Lateral Transition)

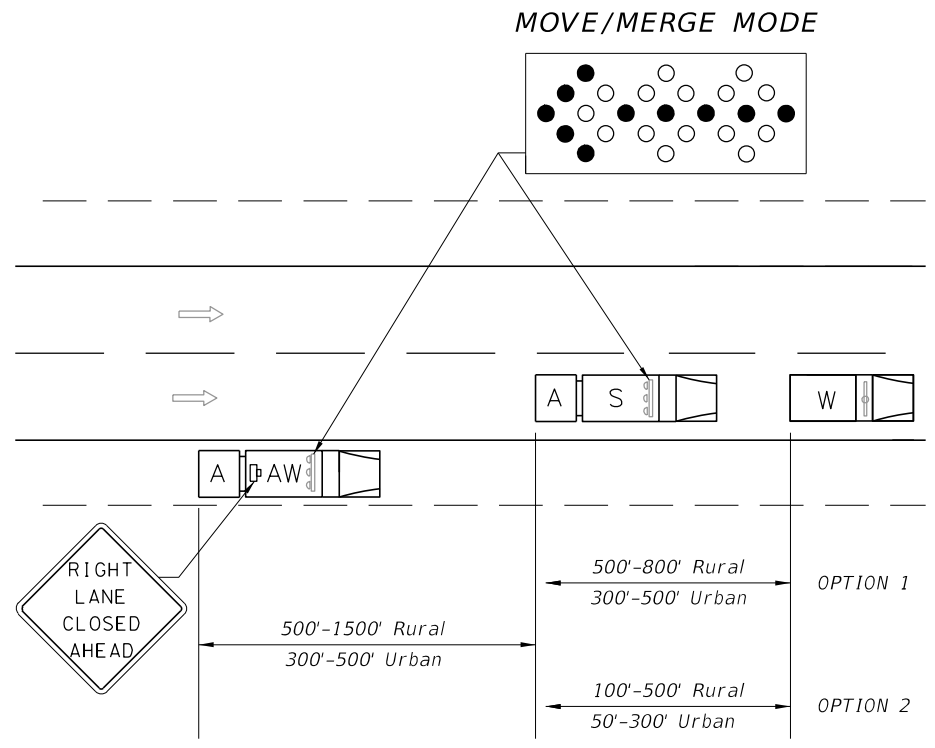
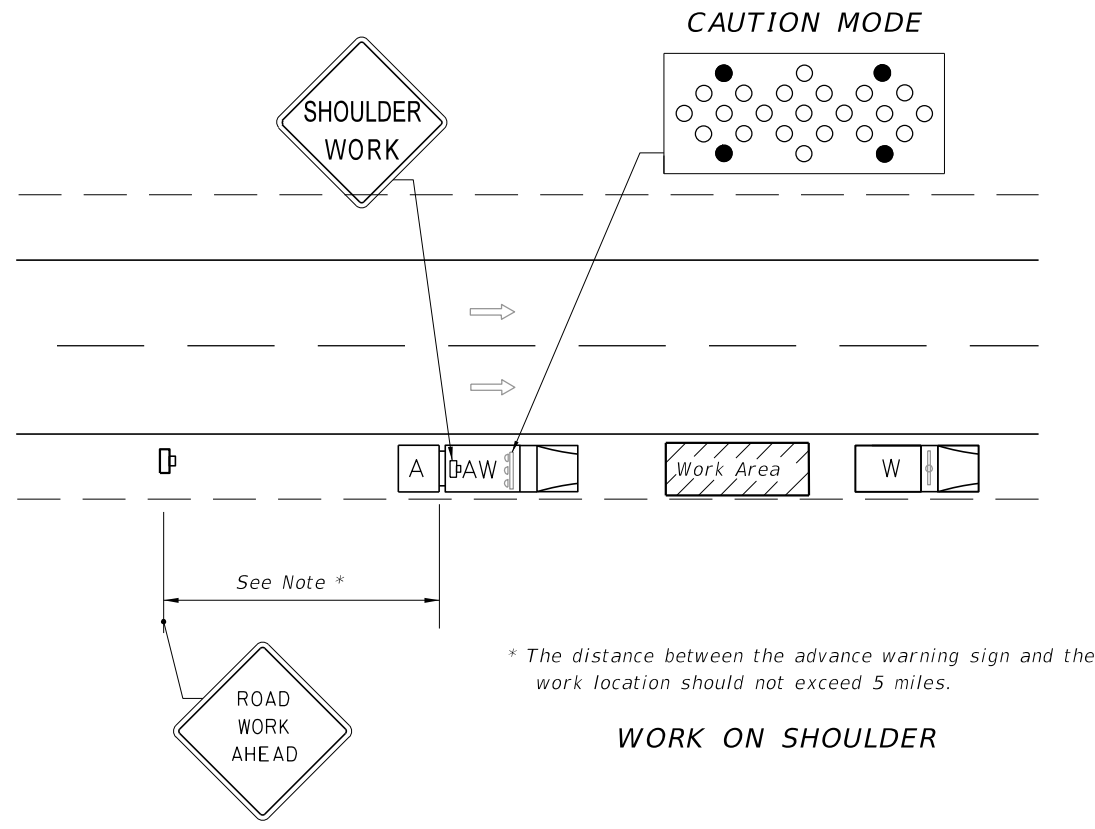
Speed (mph)	L (ft.)	Notes (Merge)
25	125	$L = \frac{WS^2}{60}$
30	180	
35	245	
40	320	$L = WS$
45	540	

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)

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board
- Stop Bar
- Lane Identification + Direction of Traffic

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OPTION 1: Advanced Warning Vehicle may be operated in the lane behind the Shadow Vehicle where adequate shoulder width is not available. Approved Truck Mounted Attenuators are required on both the Advance Warning Vehicle and the Shadow Vehicle.

OPTION 2: Advance Warning Vehicle must be operated in the lane behind the Shadow Vehicle. Approved Truck Mounted Attenuators are required on both the Advance Warning Vehicle and the Shadow Vehicle.

GENERAL NOTES

1. These illustrations are representative of general conditions.
2. The figures illustrate closing the right shoulder or right lanes for various lane configurations. When work is required on left side of roadways, the inverted plan is to be applied. The intent of this index is to allow passing on only one side of the work convoy.
3. Arrow boards shall not be obscured by equipment, supplies, signs, or the enclosure.
4. Vehicle-mounted signs shall be mounted with the bottom of the sign at a minimum height of 48 inches above the pavement. Vehicle mounted changeable message signs may be used in lieu of truck mounted static signs. Changeable message signs shall flash alternately to read "Left or Right Lane" or "Two Left or Two Right Lanes", "Closed Ahead", and the arrow symbol. Arrow boards shall not be used with truck mounted changeable message signs. Sign legends shall be covered or turned from view when work is not in progress.
5. On freeway facilities (interstates, toll roads, and expressways), a traffic control officer is required for all nighttime non-emergency operations for work within the travel lane.
6. If the work vehicle speed exceeds the minimum legal speed limit on limited access facilities and one half the posted speed limit on other facilities, the Engineer may delete requirements for shadow vehicle and attenuator. The work vehicle will be required to have an arrow board and sign message.
7. Where work activities within 2' of the edge of travel way are Incidental (i.e. Mowing, Litter Removal), the Engineer may delete requirements for signs and the advance warning vehicle provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
8. Work, Shadow, and Advance Warning Vehicles shall have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
9. Functional two-way communication is required between all vehicles in the mobile operation convoy.
10. For general TCZ requirements and additional information, refer to Index 102-600.

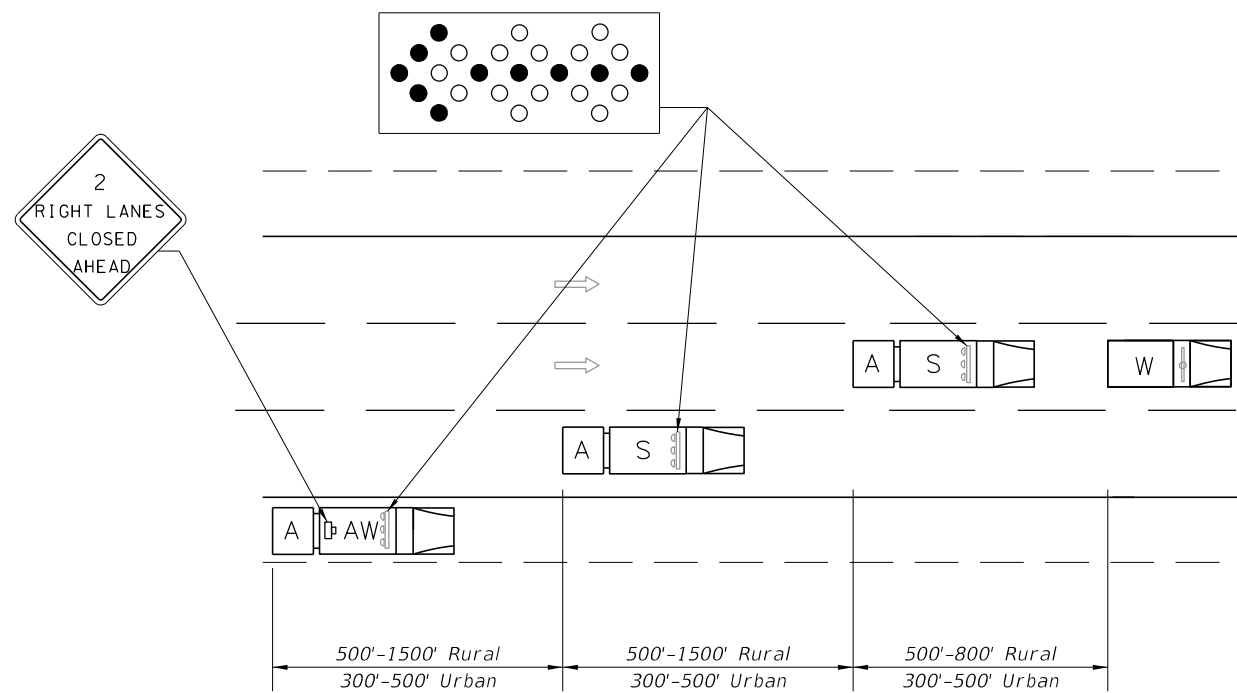
SYMBOLS

- Work Vehicle
- Shadow (S) Vehicle with Arrow Board
- Advance Warning (AW) Vehicle with Arrow Board and Sign Message or Changeable Message Sign
- Truck/Trailer Mounted Attenuator (TMA)
- Lane Identification And Direction Of Traffic
- Arrow Board

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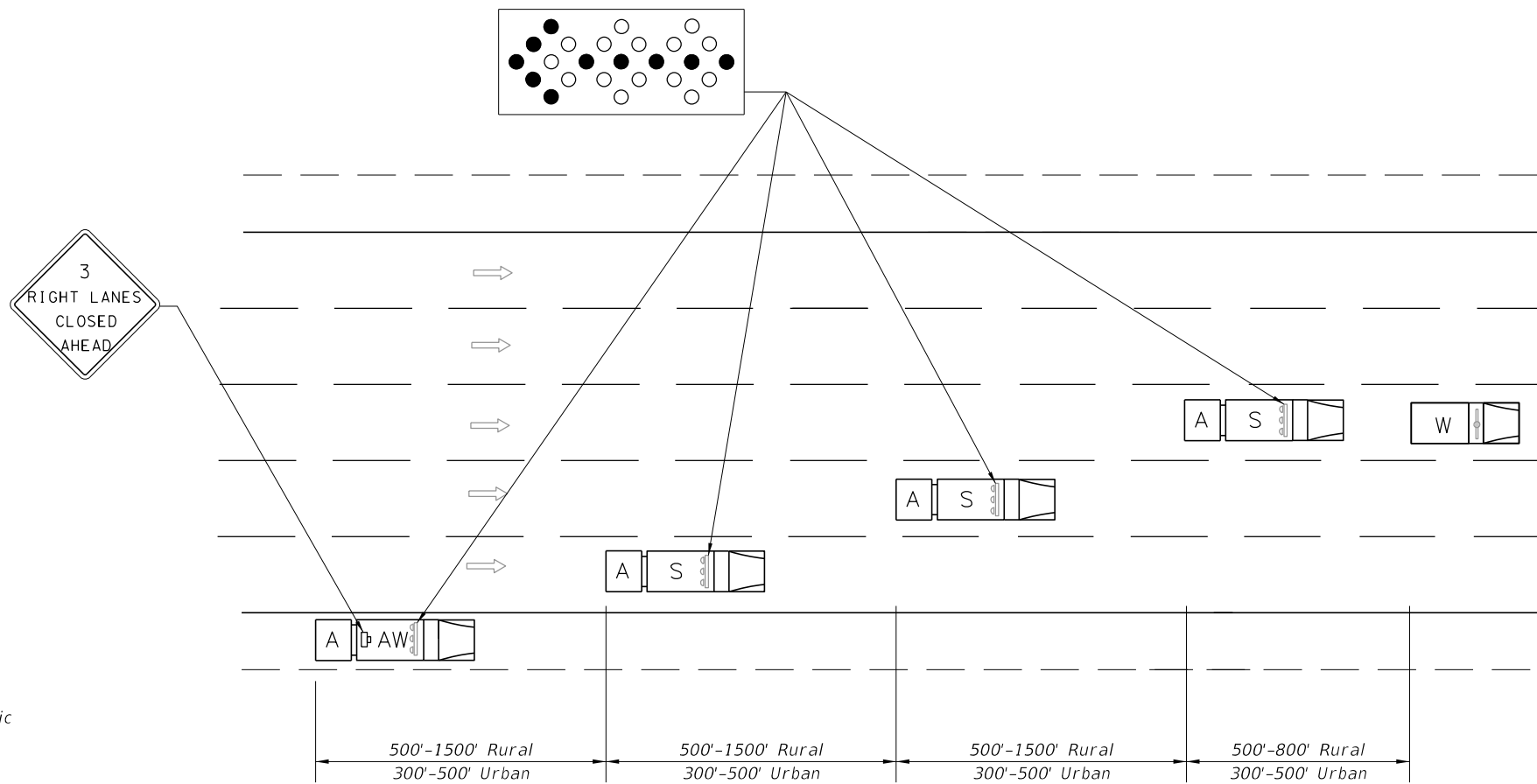
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MOVE/MERGE MODE



WORK WITHIN TRAVEL WAY, CENTER LANE OR OUTSIDE CENTERLINE
 Where adequate shoulder width is not available, the advance warning vehicle may drive in the lane.

MOVE/MERGE MODE



SYMBOLS

- Work Vehicle
- Shadow (S) Vehicle with Arrow Board
- Advance Warning (AW) Vehicle with Arrow Board and Sign Message or Changeable Message Sign
- Truck/Trailer Mounted Attenuator (TMA)
- Lane Identification And Direction Of Traffic
- Arrow Board

WORK WITHIN TRAVEL LANE

LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	MULTILANE, MOBILE OPERATIONS WORK ON SHOULDER, WORK WITHIN TRAVEL WAY	INDEX 102-619	SHEET 2 of 2
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GENERAL NOTES

1. TWO-WAY TRAFFIC sign(s) shall be repeated every 1/4 mile in each direction, throughout the tangent distance (T).
2. L (min.) = $\frac{WS^2}{60}$ for speeds ≥ 45 mph
= — for speeds ≤ 40 mph

Where:
W= Width of lateral transition in feet.
S= Posted speed limit (mph).

3. Where the tangent distance (T) exceeds 250', spacing between Type I or II barricades or vertical panels or drums may be increased to 100' within the limits of the tangent, or post mounted delineators at 50' centers may be substituted for barricades, vertical panels or drums.
4. All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and removable pavement markings used for making new edge lines.
5. When side roads, cross roads or interchanges intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
6. For general TCZ requirements and additional information, refer to Index 102-600.

SCHEME APPLICATIONS

Scheme 1: Restricted Construction Limits.






Scheme 2: Unrestricted Construction Limits And Light To Moderate Traffic.

Scheme 3: Unrestricted Construction Limits And Moderate To Heavy Traffic.

Where: Construction Limits Are The Outward Beginning Or Ending Of Lane Reductions.

Where: Unless A Specific Scheme Is Called For In The Plans, Scheme Selection Shall Be At The Contractor's Option And As Approved By The Engineer.

SYMBOLS

-  Work Area
-  Channelizing Device (See Index 102-600)
-  Work Zone Sign
-  Advance Warning Arrow Board
-  Lane Identification + Direction of Traffic

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPOSING ROADWAY IS CONVERTED TO TEMPORARY TWO-WAY TRAVEL BY WAY OF CROSSOVERS.

LAST REVISION 11/01/17	REVISION	DESCRIPTION:
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 **FY 2019-20
STANDARD PLANS**

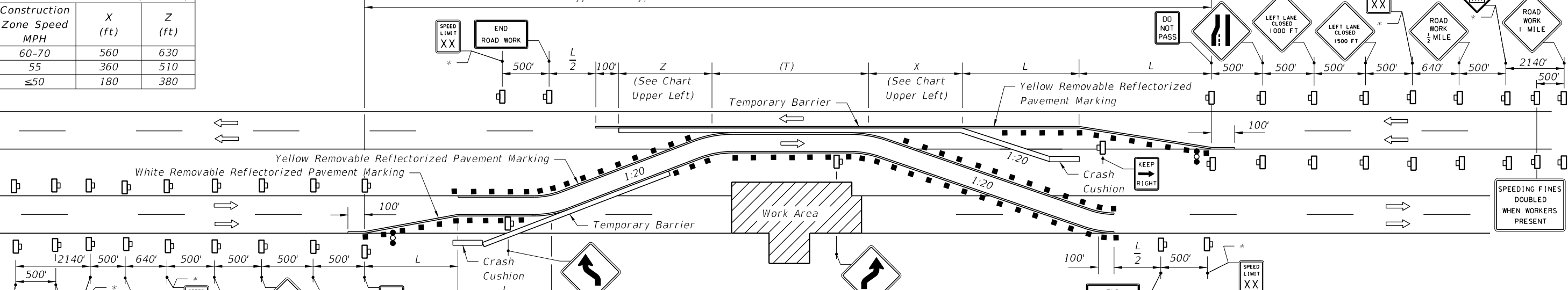
**MULTILANE, DIVIDED
TEMPORARY DIVERSION CONNECTION**

INDEX 102-620	SHEET 1 of 2
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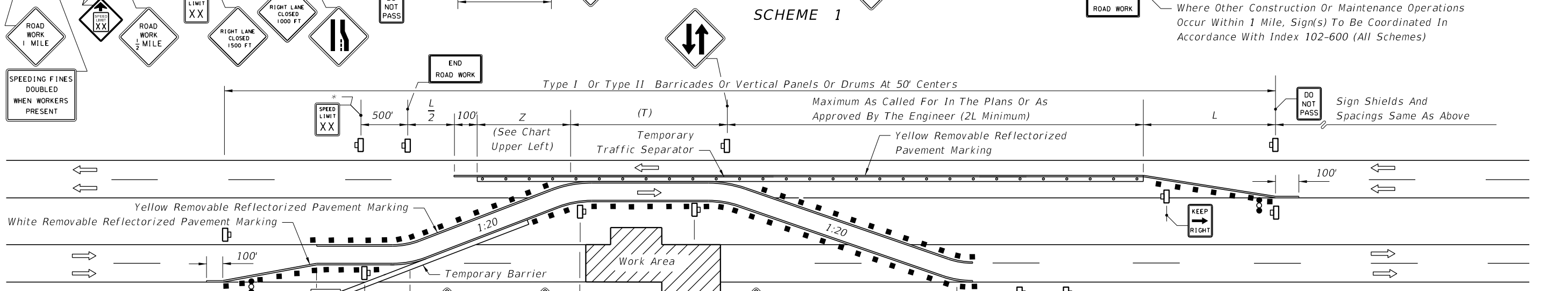
BUFFER LENGTH (FEET)

Construction Zone Speed MPH	X (ft)	Z (ft)
60-70	560	630
55	360	510
≤50	180	380

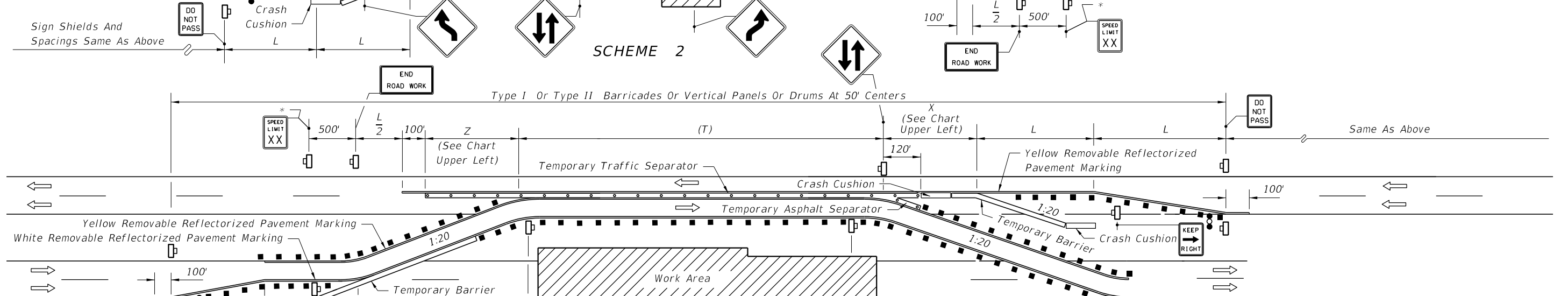
Type I Or Type II Barricades Or Vertical Panels Or Drums At 50' Centers



Where Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Coordinated In Accordance With Index 102-600 (All Schemes)



Maximum As Called For In The Plans Or As Approved By The Engineer (2L Minimum)

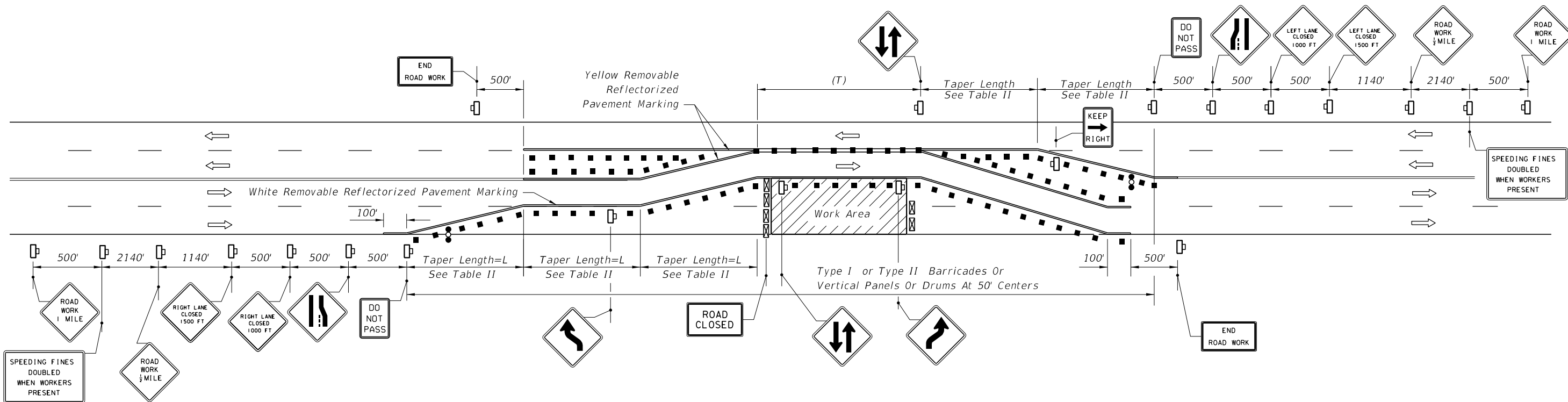


Channelizing Device (See Index 102-600)

Note: See Sheet 1 for Scheme Applications

* Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

10/30/2018 9:21:52 AM



GENERAL NOTES

1. TWO-WAY TRAFFIC signs shall be repeated every 1/4 mile in each direction, through the tangent distance (T).
2. 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 102-612 for shoulder taper formulas.
3. Where the tangent distance (T) exceeds 250', spacing between cones or tubular markers may be increased to 50' or spacing between Type I or Type II barricades or vertical panels or drums may be increased to 100' within the limits of the tangent.
4. This index does not apply when work is being performed in the middle lane(s) of a six or more lane highway. Special maintenance of traffic details will be required.
5. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
6. For general TCZ requirements and additional information, refer to Index 102-600.

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Type III Barricade
- Work Zone Sign
- Advance Warning Arrow Board
- Lane Identification + Direction of Traffic

**Table II
Taper Length - Merge
(12' Lateral Transition)**

Speed (mph)	L (ft.)	Notes (Merge)
25	125	$L = \frac{WS^2}{60}$
30	180	
35	245	
40	320	
45	540	L=WS
50	600	
55	660	
60	720	
65	780	
70	840	

For lateral transitions other than 12' use formula for L shown in the notes column. Where:

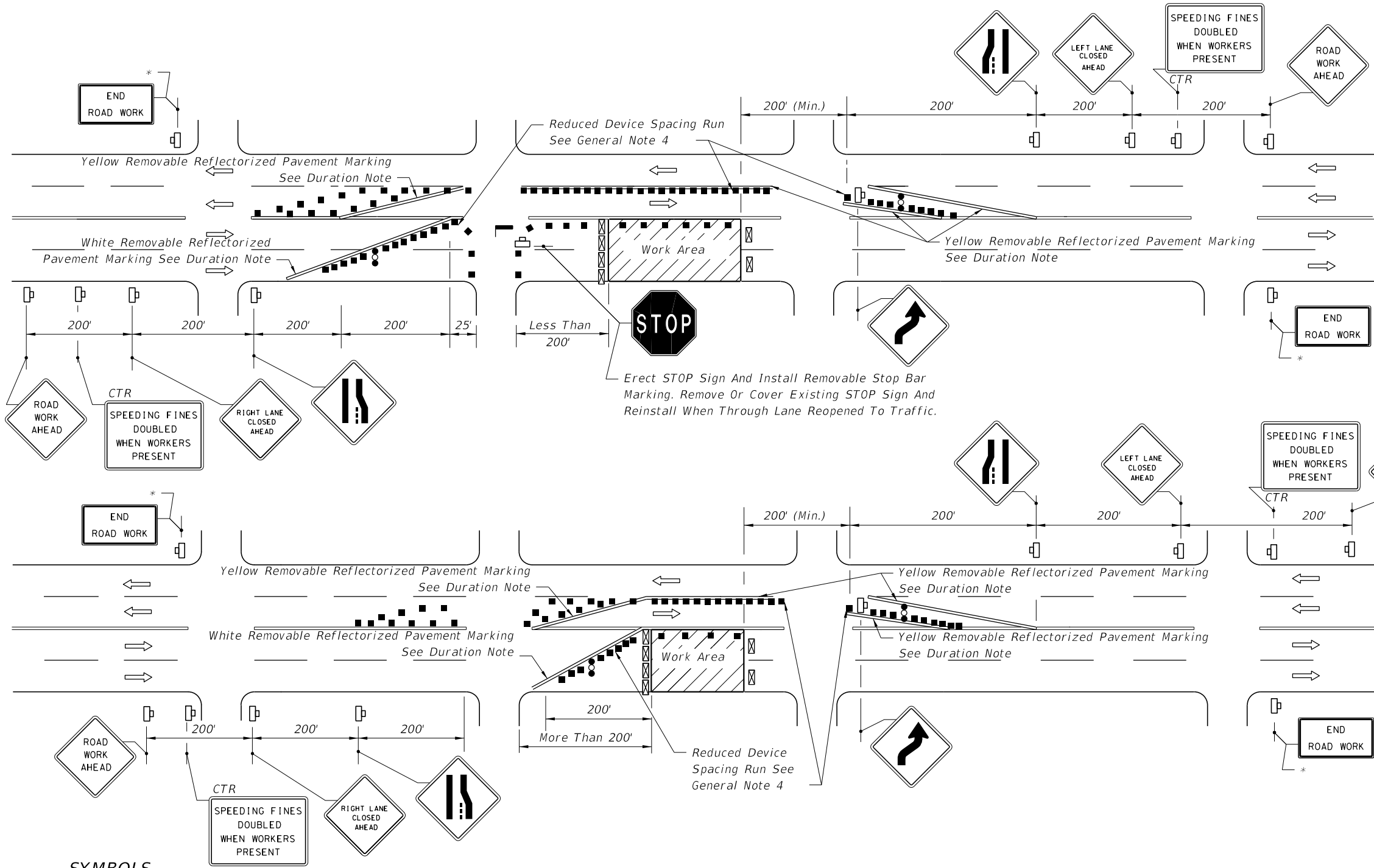
- L = Length of taper in feet
- W = Width of lateral transition in feet
- S = Posted speed limit (mph)

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF THE LANES IN ONE DIRECTION AND A DIVERSION IS PROVIDED BY UTILIZING ONE LANE OF THE OPPOSING TRAFFIC LANES.

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10/30/2018 9:22:01 AM



CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF TRAFFIC LANES IN ONE DIRECTION AND THE USE OF ONE OPPOSING TRAFFIC LANE TO MAINTAIN TWO-WAY TRAFFIC, FOR WORK AREA LESS THAN 200' FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

CONDITIONS
 WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE PAVEMENT REQUIRING THE CLOSURE OF TRAFFIC LANES IN ONE DIRECTION AND THE USE OF ONE OPPOSING TRAFFIC LANE TO MAINTAIN TWO-WAY TRAFFIC, FOR WORK AREA 200' OR MORE FROM INTERSECTION, FOR A PERIOD OF MORE THAN 60 MINUTES.

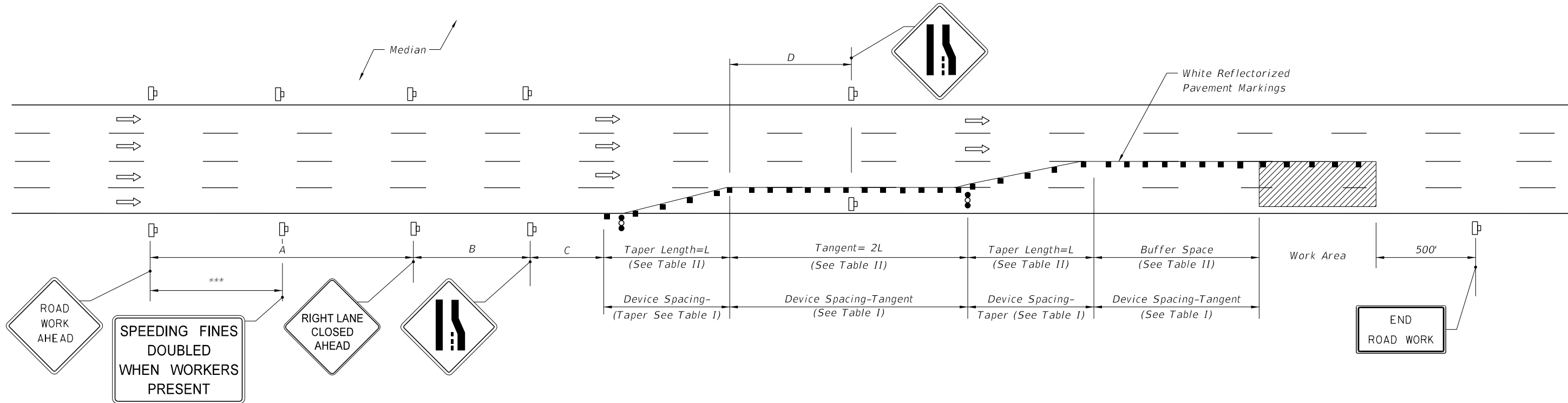
* When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign To Be Omitted And Signing To Be Coordinated In Accordance With Index 102-600.

- SYMBOLS**
- Work Area
 - Channelizing Device (See Index 102-600)
 - Type III Barricade
 - Work Zone Sign
 - Advance Warning Arrow Board
 - Stop Bar
 - Lane Identification + Direction of Traffic

- GENERAL NOTES**
- When vehicles in a parking zone block the line of sight to TCZ signs or when TCZ signs encroach on a normal pedestrian walkway, the signs shall be post mounted and located in accordance with Index 700-101.
 - Dual signs are required for divided roadways.
 - Channelizing devices are to be spaced with Type I or Type II barricades or vertical panels or drums at 30' centers in tapers, 50' centers in tangent sections and 15' centers where reduced device spacing runs are identified in the drawing.
 - For general TCZ requirements and additional information, refer to Index 102-600.

DURATION NOTE
 Removable reflectorized pavement markings shall be used when closure time exceeds one daylight period.

LAST REVISION 07/01/15	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	MULTILANE WORK NEAR INTERSECTION-TEMPORARY DIVERSION CONNECTION - 35 MPH OR LESS	INDEX 102-622	SHEET 1 of 1
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DISTANCE BETWEEN SIGNS				
Speed	Spacing (ft.)			
	A	B	C	D**
40 mph or less	200	200	200	L
45 mph	350	350	350	L
50 mph	500	500	500	L
*55 mph or greater	2640	1640	1000	L

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

** See Table II for L

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

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)		Tangent
		Dist. (ft.)	L (ft.) Notes (Merge)	
25	155	125	$L = \frac{WS^2}{60}$	250
30	200	180		360
35	250	245		490
40	305	320	$L = WS$	640
45	360	540		1080
50	425	600		1200
55	495	660		1320
60	570	720		1440
65	645	780		1560
70	730	840	1680	

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

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)

GENERAL NOTES

1. Work operations shall be confined to the two outside traffic lanes, leaving the adjacent lane(s) open to traffic.
2. On undivided highways the median signs as shown are to be omitted.
3. When work is performed in the median lane on divided highways, the channelizing device plan is inverted and left lanes closed and lane ends signs substituted for the right lanes closed and lane end signs.
4. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
5. For general TCZ requirements and additional information, refer to Index 102-600.
6. 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 102-612 for shoulder taper formulas.

DURATION

Temporary white edgeline may be omitted for work operations less than three (3) days.

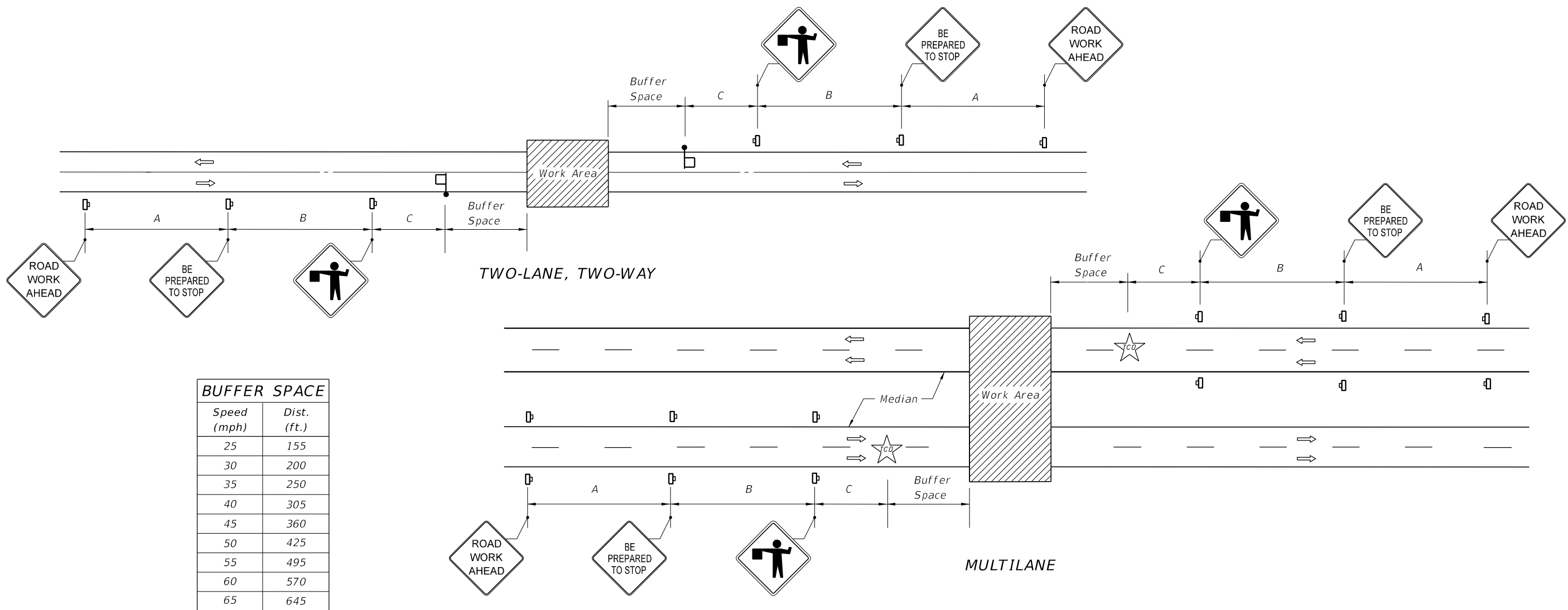
CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH ON THE TWO LANES ADJACENT TO EITHER SHOULDER.

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board

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

DISTANCE BETWEEN SIGNS			
Speed (mph)	Spacing (ft.)		
	A	B	C
40 or less	200	200	200
45	350	350	350
50 or greater	500	500	500

SYMBOLS

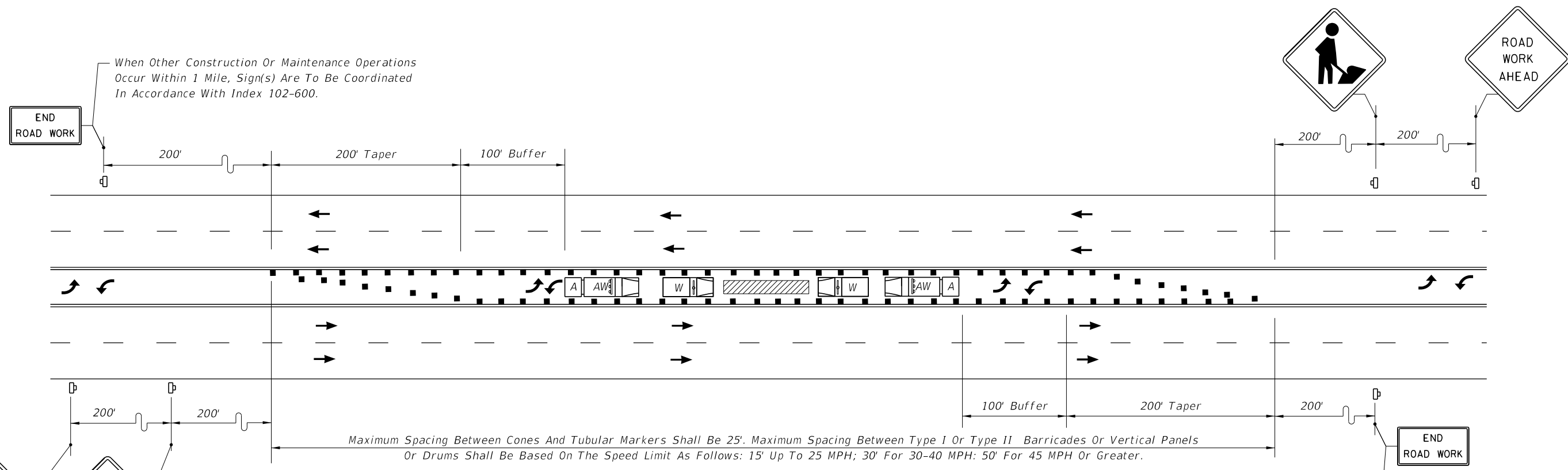
- Work Area
- Work Zone Sign
- Flagger
- Traffic Control Officer
- Lane Identification + Direction of Traffic

GENERAL NOTES

- This Index does not apply to limited access facilities.
- When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with applicable TCZ Indexes.
- Traffic volume or complexity of the roadway may dictate additional devices, signs, flagmen and/or a traffic control officer.
- The buffer space may be omitted if there are no sight obstructions to vehicles approaching the Flagger/Officer for distance equal to the buffer space.
- A Flagger may be substituted for a Traffic Control Officer and the BE PREPARED TO STOP sign may be omitted, when the following conditions are met:
 - Speed limit is 45 mph or less.
 - No sight obstructions to vehicles approaching the Flagger/Officer for a distance equal to the buffer space.
 - Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
- On undivided highways the median sign as shown are to be omitted.
- For general TCZ requirements and additional information refer to Index 102-600.







CONDITIONS
 PLANNED CLOSURE NOT EXCEEDING 5 MINUTES.

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Maximum Spacing Between Cones And Tubular Markers Shall Be 25'. Maximum Spacing Between Type I Or Type II Barricades Or Vertical Panels Or Drums Shall Be Based On The Speed Limit As Follows: 15' Up To 25 MPH; 30' For 30-40 MPH; 50' For 45 MPH Or Greater.

SYMBOLS

-  Work Area
-  Channelizing Device (See Index 102-600)
-  Work Zone Sign
-  Work Vehicle With Rotating/Strobe Lights
-  Shadow (S) Or Advance Warning (AW) Vehicle with Advance Warning Arrow Board and Sign Message
-  Truck/Trailer Mounted Attenuator (TMA)

GENERAL NOTES

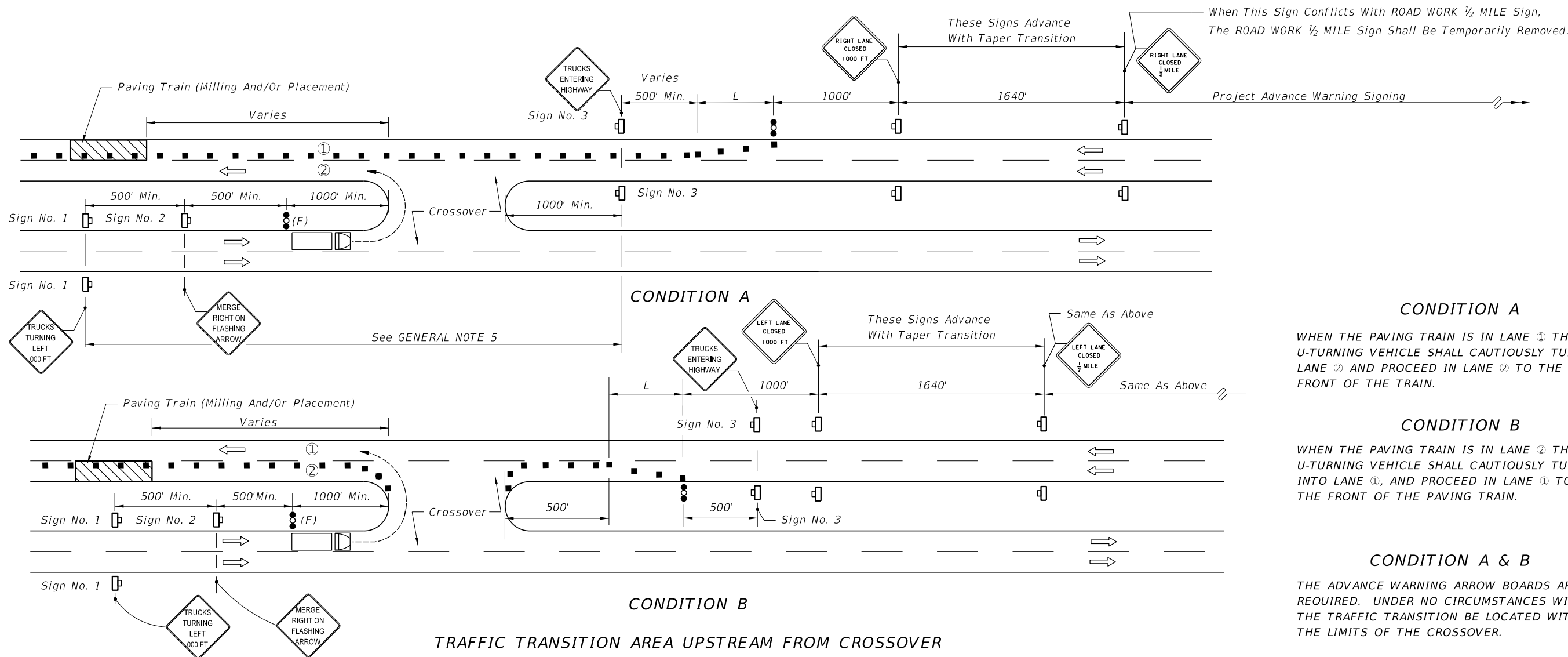
1. Work operations shall be confined to two way left turn lane, leaving the adjacent lanes open to traffic.
2. Advance Warning Vehicle will have an Advanced Warning Arrow Board in the Warning Mode.
3. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
4. For general TCZ requirements and additional information, refer to Index 102-600.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ARE BEING CONDUCTED IN THE TWO WAY LEFT TURN LANE.

10/30/2018 9:22:10 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TWO WAY LEFT TURN LANE CLOSURE	INDEX 102-628	SHEET 1 of 1
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CONDITION A
 WHEN THE PAVING TRAIN IS IN LANE ① THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ② AND PROCEED IN LANE ② TO THE FRONT OF THE TRAIN.

CONDITION B
 WHEN THE PAVING TRAIN IS IN LANE ② THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ①, AND PROCEED IN LANE ① TO THE FRONT OF THE PAVING TRAIN.

CONDITION A & B
 THE ADVANCE WARNING ARROW BOARDS ARE REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSOVER.

CONDITION B
TRAFFIC TRANSITION AREA UPSTREAM FROM CROSSOVER

CASE I

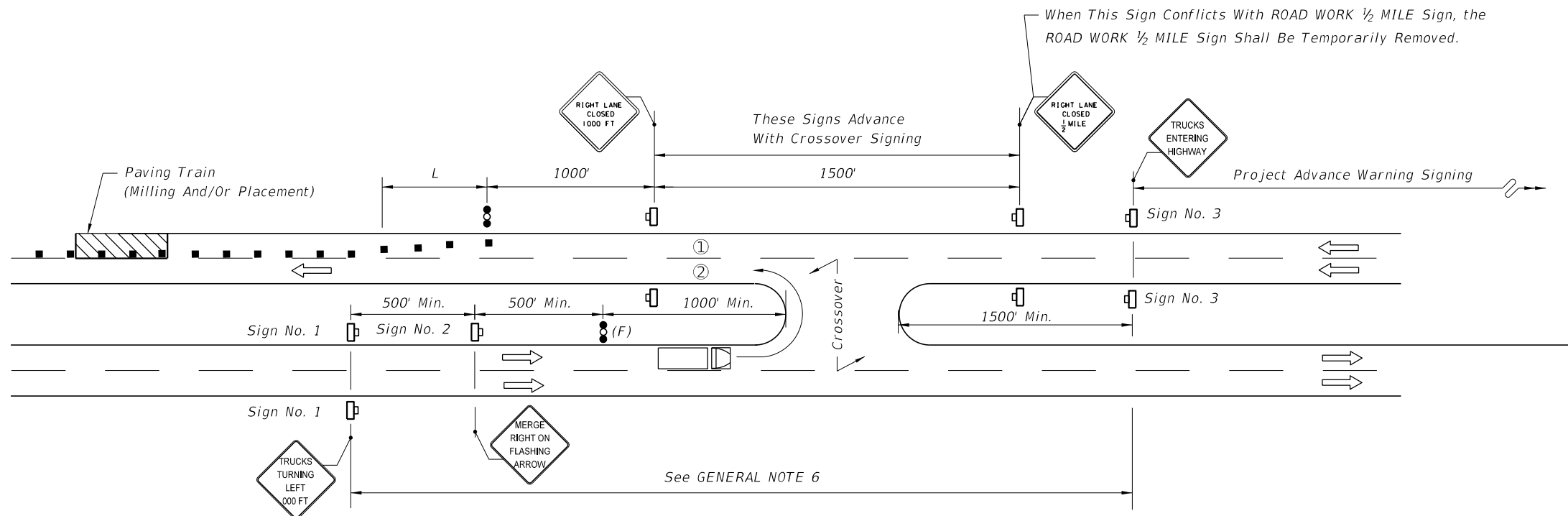
GENERAL NOTES

- This index does not apply to limited access facilities.
- When crossovers do not exist, the contractor will construct temporary crossovers in accordance with Index 102-631.
- L = Length of taper in feet:
 $= WS$ for speeds ≥ 45 mph
 $= \frac{WS^2}{60}$ for speeds ≤ 40 mph
 Where:
 W = Width of lateral transition in feet.
 S = Posted speed limit (mph).
- Within the lateral transitions, the maximum spacing between cones and tubular markers shall be 25'. Maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater.
 Spacing for devices parallel to the travel lanes shall be 25' centers for cones or tubular markers and 50' for Type I or Type II barricades or vertical panels or drums.
- For Case I, Condition A, when the median width is too narrow for trucks to make turns into Lane No. 2, Sign Nos. 1, 2, 3 and the Flagger Actuated Advance Warning Arrow Board shall be moved ahead to a crossover in advance of the paving lane taper. Project advance warning signs (not shown) shall be located in advance of the relocated Sign No. 3.
- For Case II, Conditions A & B, when the median width is too narrow for trucks to make turns into Lane No. 2, Sign Nos. 1, 2, 3 and the Flagger Actuated Advance Warning Arrow Board shall be moved ahead to a crossover in advance of the 'RIGHT LANE CLOSED 1/2 MILE' sign. Project advance warning signs (not shown) shall be located in advance of the relocated Sign No. 3.

- SYMBOLS**
- Work Area
 - Channelizing Device (See Index 102-600)
 - Work Zone Sign
 - Advance Warning Arrow Board - Type C (48"x 96")
 - Advance Warning Arrow Board - Type C (48"x 96")
Trailer Mounted And Actuated By Flagger Upon Approach Of The Work Vehicle
 - Work Vehicle
 - Lane Number
 - Lane Identification + Direction of Traffic

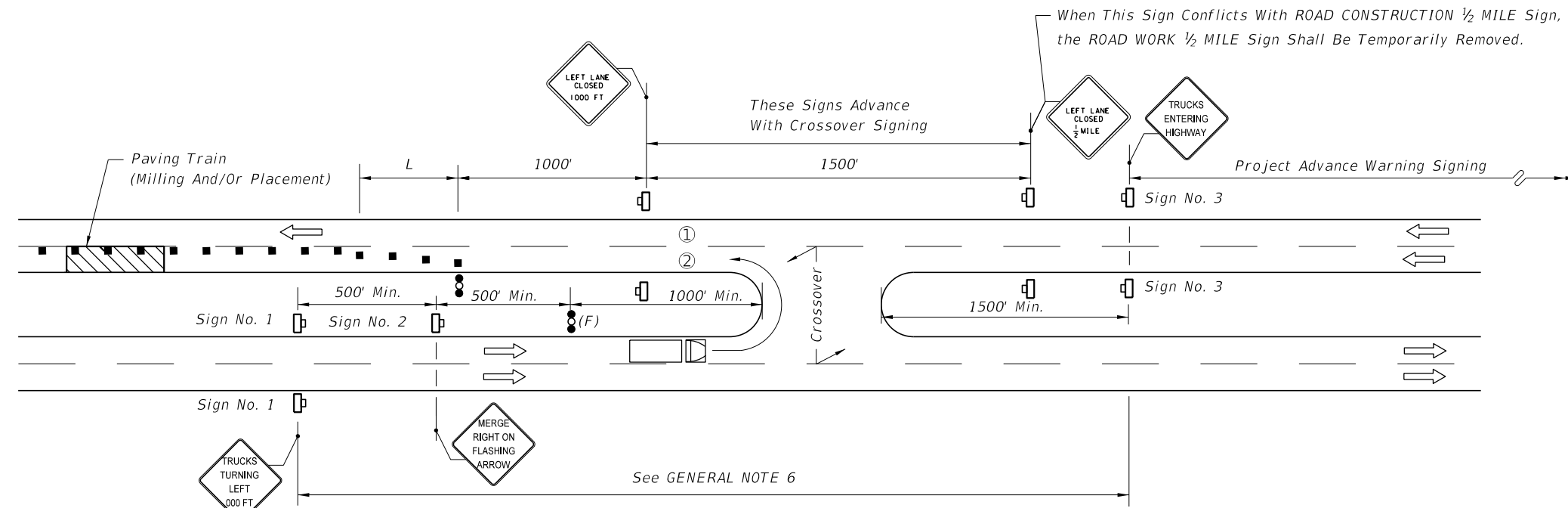
10/30/2018 9:22:12 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	CROSSOVER FOR PAVING TRAIN OPERATIONS, RURAL	INDEX 102-630	SHEET 1 of 2
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CONDITION A

CONDITION A
 WHEN THE PAVING TRAIN IS IN LANE ① THE U-TURNING VEHICLE SHALL CAUTIOUSLY TURN INTO LANE ② AND PROCEED IN LANE ② TO THE FRONT OF THE TRAIN.



CONDITION B

CONDITION B
 WHEN THE PAVING TRAIN IS IN LANE ② THE U-TURNING VEHICLE SHALL TURN INTO LANE ①, CAUTIOUSLY MERGE INTO LANE ① AND PROCEED TO THE FRONT OF THE PAVING TRAIN.


CONDITION A & B
 THE ADVANCE WARNING ARROW BOARD IS REQUIRED. UNDER NO CIRCUMSTANCES WILL THE TRAFFIC TRANSITION BE LOCATED WITHIN THE LIMITS OF THE CROSSOVER.

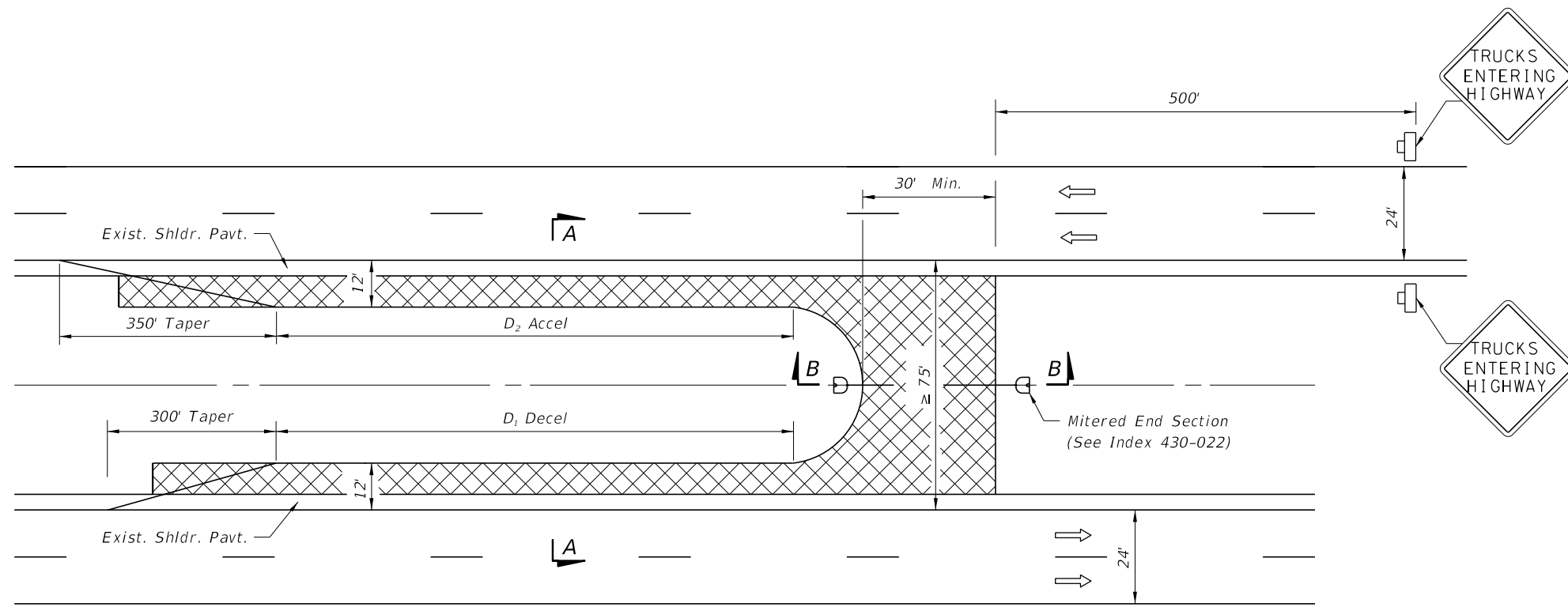
TRAFFIC TRANSITION AREA DOWNSTREAM FROM CROSSOVER

CASE II

Note: See Sheet 1 for General Notes.

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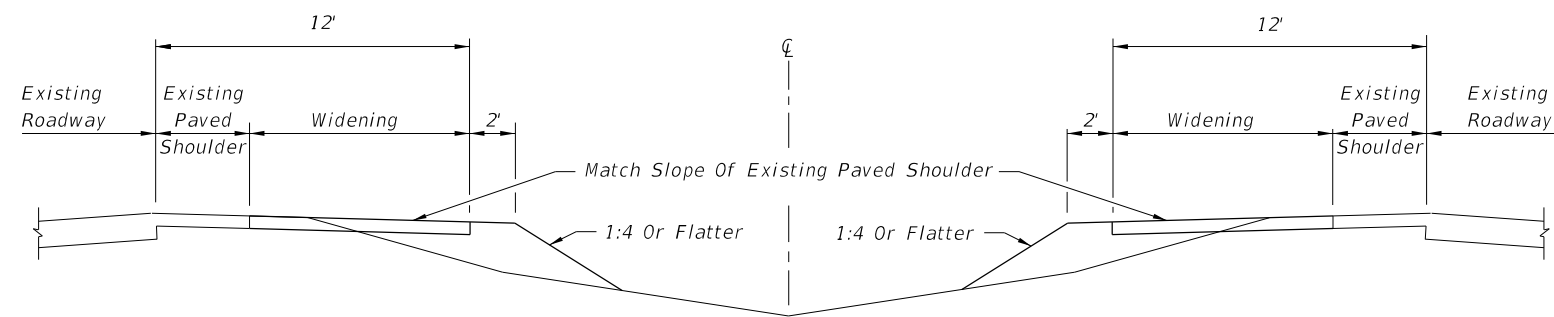
LAST REVISION 11/01/17	REVISION DESCRIPTION:	 FY 2019-20 STANDARD PLANS	CROSSOVER FOR PAVING TRAIN OPERATIONS, RURAL	INDEX 102-630	SHEET 2 of 2
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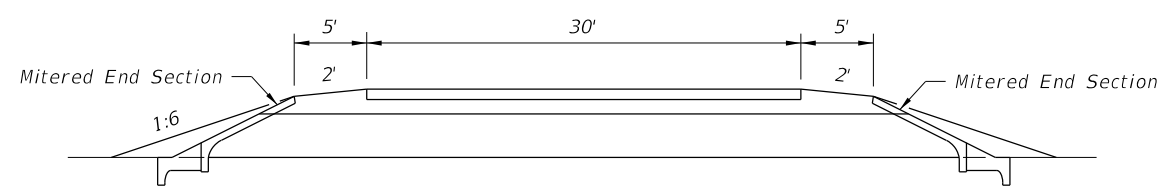
LENGTH OF ACCESS LANES (Ft.)		
Grade	D ₁	D ₂
2% or less	590'	1540'
3 to 4% Upgrade	530'	2310'
3 to 4% Downgrade	710'	925'

PLAN

GENERAL NOTES



SECTION AA



SECTION BB

1. Temporary median crossovers shall be within the project limits and shall not be used for transporting materials to or from any other project. The acceleration-deceleration surfaces shall be paved. RAP material is acceptable for crossing surfacing.
2. Temporary median crossovers shall be located only in areas having adequate sight distance. On limited access facilities temporary median crossovers shall not be located within 1.5 miles of interchanges nor within 2000 ft. of acceleration-deceleration lanes at rest areas, other access openings or other highway service areas.
3. For paving train operations at permanent crossovers, see Index 102-630.
4. All traffic control devices are to be removed when crossover will not be in use for one hour or longer.
5. Trailer mounted advance warning panel may be used in lieu of advance warning vehicle.
6. When a crossover is no longer needed, all temporary construction shall be immediately removed and the area restored to its original condition.
7. Cost of construction, maintenance, removal and restoration work related to temporary crossovers shall be included in the contract unit price for Maintenance of Traffic, LS.
8. Temporary crossovers on limited access right of way and use of this Index are prohibited unless specifically permitted in the Contract Plans or Special Provisions. When permitted in the Contract Plans or Special Provisions and prior to construction of any temporary crossover, the Contractor must submit, in writing, a request identifying specific locations for approval by the Engineer.
9. Pipe and mitered end sections are not required when crossover is located at the high point of a crest vertical curve.

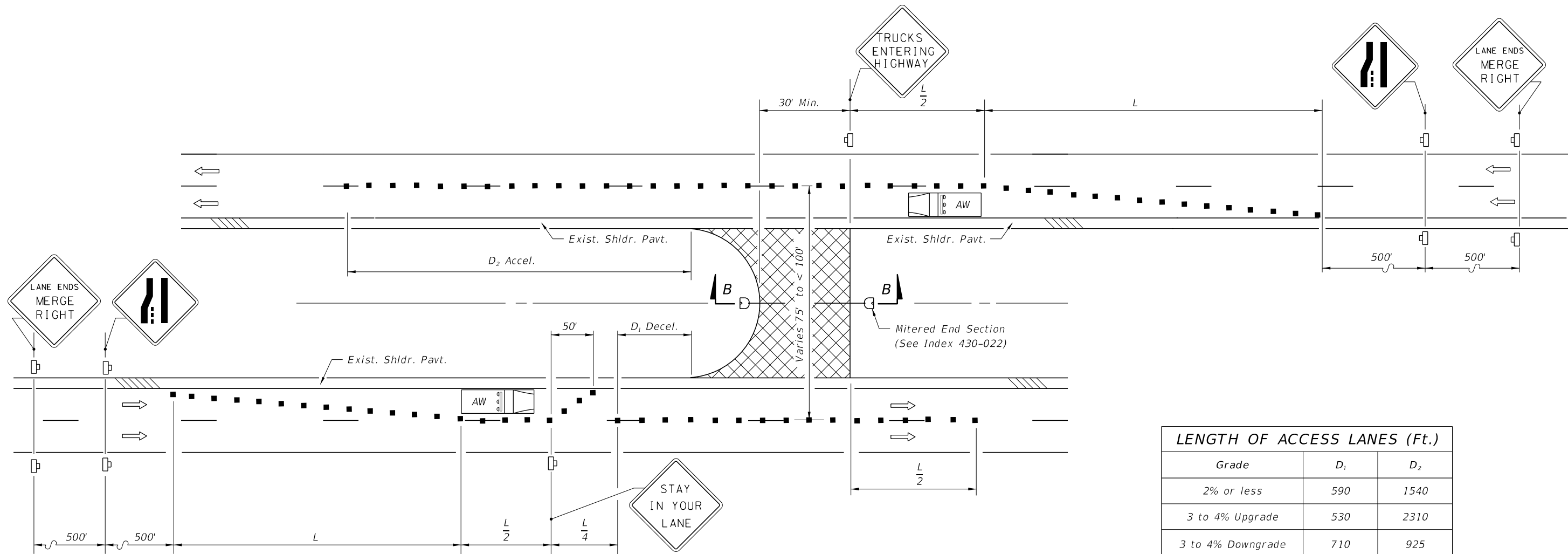
SYMBOLS

- Work Zone Sign
- Lane Identification + Direction of Traffic
- Temporary Pavement

TEMPORARY CROSSOVER FOR MEDIAN WIDTHS ≥ 75'

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TEMPORARY CROSSOVER	INDEX 102-631	SHEET 1 of 2
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LENGTH OF ACCESS LANES (Ft.)		
Grade	D ₁	D ₂
2% or less	590	1540
3 to 4% Upgrade	530	2310
3 to 4% Downgrade	710	925

NOTE

1. A lane closure analysis will be required to determine the times of day that this crossover can be in operation.

SYMBOLS

- Temporary Pavement
- Work Zone Sign
- Channelizing Device (See Index 102-600)
- Advance Warning Vehicle
- Lane Identification + Direction of Traffic

Maximum Spacing Between Cones And Tubular Markers Shall Be 25'

$L \text{ (Min.)} = WS$

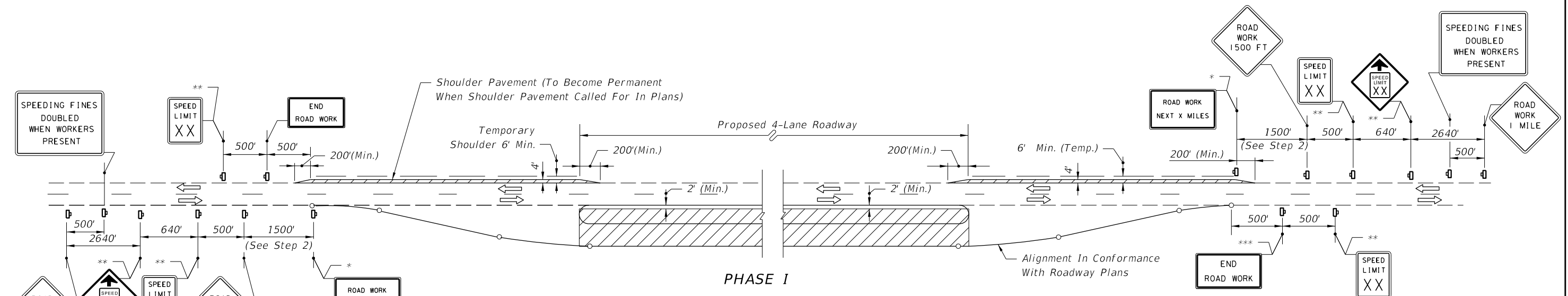
S = Existing Posted Speed (MPH)

TEMPORARY CROSSOVER FOR MEDIAN WIDTHS FROM 50' TO < 75'

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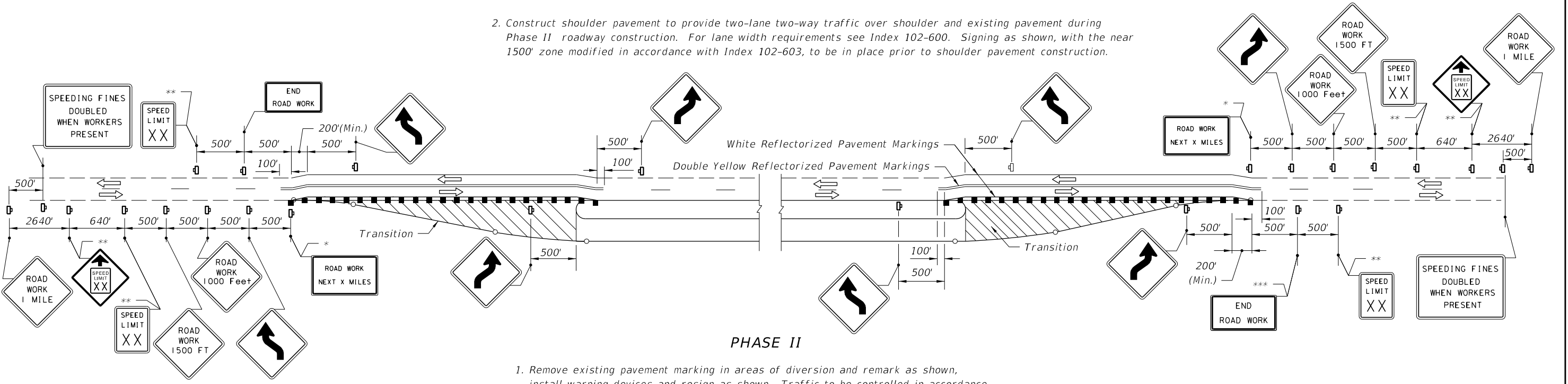
LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TEMPORARY CROSSOVER	INDEX 102-631	SHEET 2 of 2
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PHASE I

1. Maintain two-lane two-way traffic over existing pavement. Construct new roadway within the proposed 4-lane limits, excluding the friction course. Sign as shown if roadway construction area falls within 15' of existing pavement edge. When the construction area falls more than 15' from the existing pavement edge, traffic shall be controlled in accordance with Index 102-601 or 102-602.
2. Construct shoulder pavement to provide two-lane two-way traffic over shoulder and existing pavement during Phase II roadway construction. For lane width requirements see Index 102-600. Signing as shown, with the near 1500' zone modified in accordance with Index 102-603, to be in place prior to shoulder pavement construction.



PHASE II

1. Remove existing pavement marking in areas of diversion and remark as shown, install warning devices and resign as shown. Traffic to be controlled in accordance with Index 102-607. For lane width requirements see Index 102-600.
2. Route through traffic to temporary and existing pavement.
3. Construct transitions, excluding friction course.

SYMBOLS

- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification + Direction of Traffic

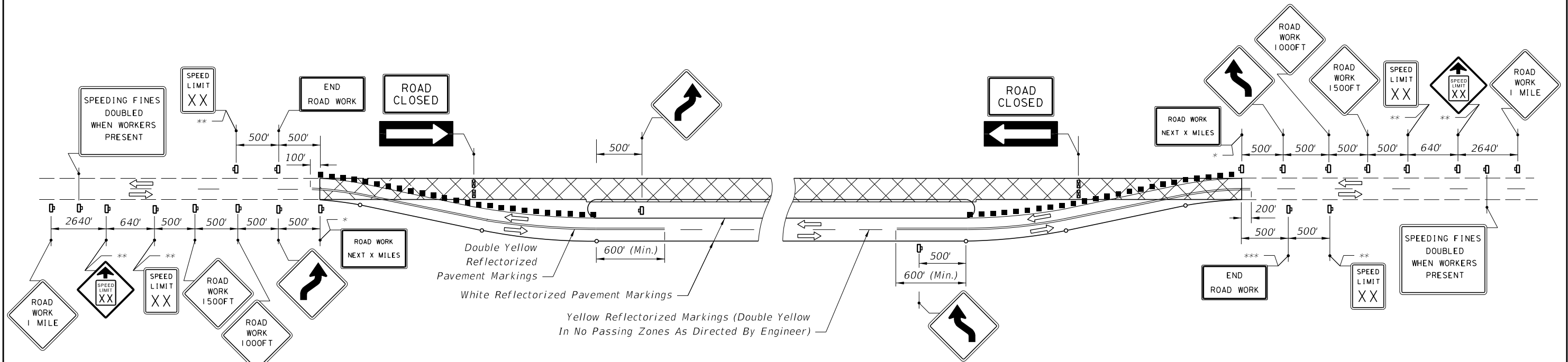
LEGEND

- Phase I Construction
- Phase II Construction
- Phase III Construction

Note: See Sheet 2 for General Notes.

- * Required For Projects > 2 Miles
- ** Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction
- *** When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index 102-600.

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	CONVERTING TWO LANES TO FOUR LANES DIVIDED, RURAL	INDEX 102-640	SHEET 1 of 2
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PHASE III

1. Remove temporary marking from the existing pavement and temporary shoulder pavement. Mark pavement, install warning devices and resign as shown. Traffic to be controlled in accordance with Index 102-607. For lane width requirements see Index 102-600.
2. Route through traffic to newly constructed roadway.
3. Resurface or reconstruct existing pavement including required shoulder pavement and friction course.

PHASE IV

1. Reroute through traffic as shown in Phase II. Signing to be as shown in Phase II.
2. Construct friction course over pavement constructed in Phases I and II.

GENERAL NOTES

1. Existing signs and pavement markings that conflict with construction signing and marking shall be obliterated or removed.
2. Lane widths for maintenance of two-way traffic should desirably be equal to lane widths of the existing facility, but lanes shall be not less than 10' in width. When one-lane one-way operations are necessary, a minimum width of 12' shall be maintained and traffic controlled in accordance with Indexes 102-603 and 102-607. Minimum width for the temporary shoulders is 6'.
3. Within the lateral transitions, the maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30'-40 MPH; 50' for 45 MPH or greater.

The maximum spacing between warning devices used for delineation between the travel way and construction area is 50' for Type I or Type II barricades or vertical panels or drums.
4. Warning devices shall be in conformance with 'Drop-offs In Work Zones', see Index 102-600.
5. For speed sign applications, see 'Regulatory Speed In Work Zones' Index 102-600.
6. For reflectORIZED raised pavement marker applications, see 'Pavement Markers' Index 102-600 and Index 706-001.
7. Additional barricades, signing, or other traffic controls shall be provided for limited work areas in accordance with other applicable TCZ Indexes.
8. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
9. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
10. For general TCZ requirements and additional information, refer to Index 102-600.

* Required For Projects > 2 Miles
 ** Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction
 *** When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index 102-600.

SYMBOLS

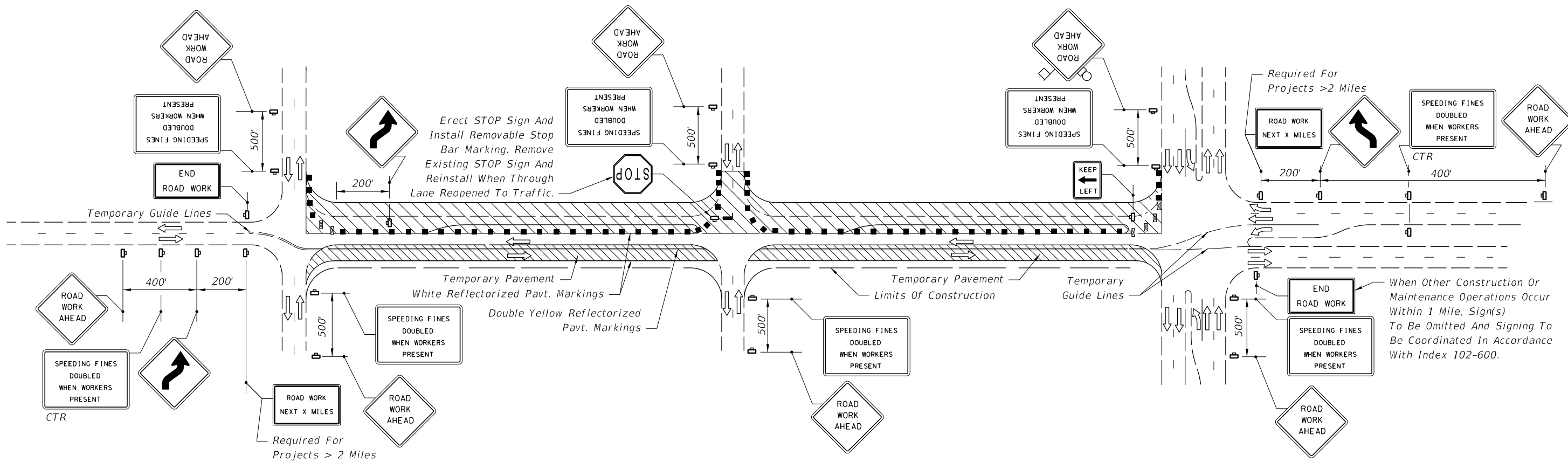
- Channelizing Device (See Index 102-600)
- ▩ Type III Barricade
- Work Zone Sign
- ⇒ Lane Identification + Direction of Traffic

LEGEND

- ▨ Phase I Construction
- ▧ Phase II Construction
- ▩ Phase III Construction

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	CONVERTING TWO LANES TO FOUR LANES DIVIDED, RURAL	INDEX 102-640	SHEET 2 of 2
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PHASE I

1. Maintain two-lane two-way traffic along existing facility. Install construction signing.
2. Remark existing pavement to facilitate temporary pavement construction. For lane width requirements see Index 102-600.
3. Construct temporary pavement of sufficient width to accommodate two-lane two-way traffic on the temporary pavement and a portion of the existing pavement during Phase I roadway construction. When two-lane two-way traffic can not be maintained during temporary pavement construction one-lane operations shall be maintained in accordance with Index 102-605. Channelizing devices shall be in conformance with 'Drop-Offs in Work Zones' of Index 102-600.
4. Mark the pavement in accordance with the Phase I diagram. Reroute through traffic to the temporary pavement and a portion of the existing pavement. For lane width requirements see Index 102-600.
5. Construct two lanes of the proposed roadway, excluding the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes 102-604, 102-605, and 102-615. Barricading shall be in conformance with 'Drop-Offs in Work Zones', Index 102-600. When work extends through an intersection, temporarily reroute the cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets, in accordance with Indexes 102-604, 102-605, and 102-615.

SYMBOLS

- Channelizing Device (See Index 102-600)
- ⊘ Type III Barricade
- Work Zone Sign
- ▬ Stop Bar
- ⇒ Lane Identification + Direction of Traffic

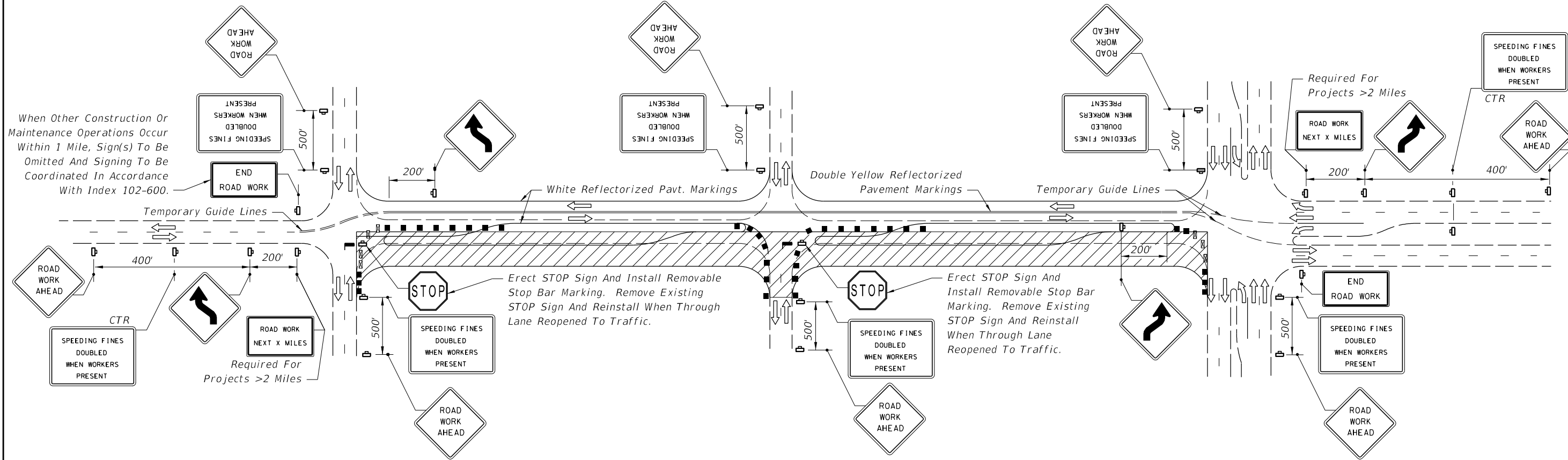
LEGEND

- ▨ Phase I Construction
- ▧ Phase II Construction
- ▩ Phase III Construction

See Sheet 3 for General Notes.

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:	 FY 2019-20 STANDARD PLANS	CONVERTING TWO LANES TO FOUR LANES DIVIDED, URBAN	INDEX 102-641	SHEET 1 of 3
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When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index 102-600.

PHASE II

1. Sign and mark Phase I pavement in accordance with the Phase II diagram. For lane width requirements see Index 102-600.
2. Reroute through traffic to Phase I pavement.
3. Complete all Phase II construction, including the friction course. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Indexes 102-604, 102-605, and 102-615. Channelizing devices shall be in conformance with 'Drop-Offs in Work Zones' of Index 102-600. When work extends through an intersection, temporarily reroute cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane access (minimum) each direction for four-lane two-way cross streets, in accordance with Indexes 102-604, 102-605, and 102-615.

SYMBOLS

- Channelizing Device (See Index 102-600)
- ⊠ Type III Barricade
- Work Zone Sign
- Stop Bar
- Lane Identification + Direction of Traffic

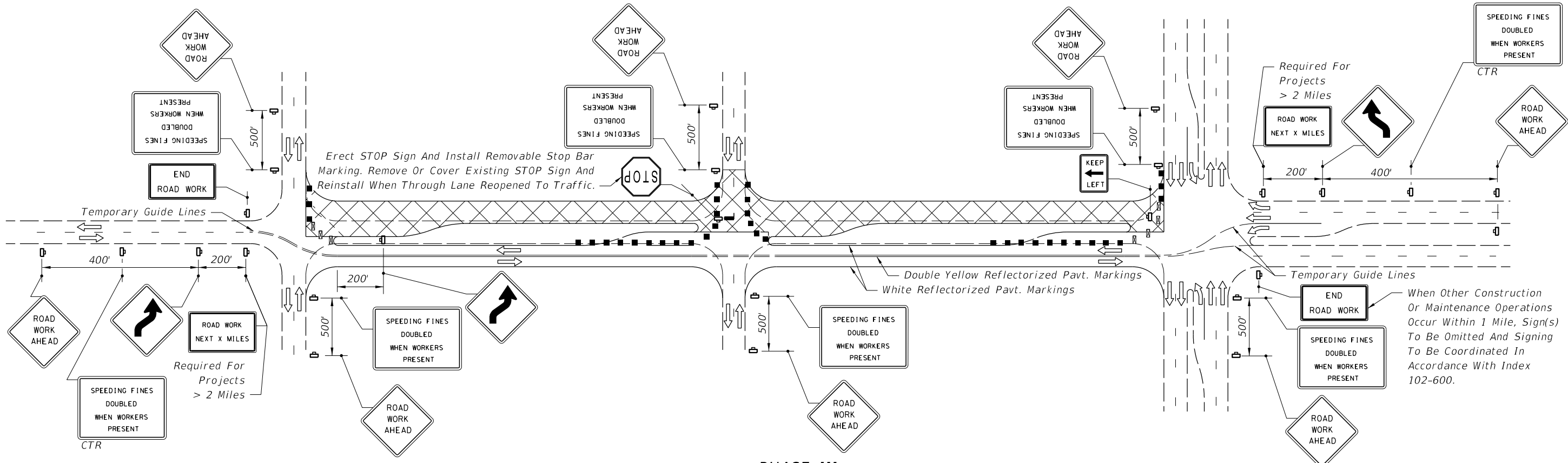
LEGEND

- Phase I Construction
- Phase II Construction
- Phase III Construction

See Sheet 3 for General Notes.

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	CONVERTING TWO LANES TO FOUR LANES DIVIDED, URBAN	INDEX 102-641	SHEET 2 of 3
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PHASE III

1. Sign and mark Phase II pavement in accordance with the Phase III diagram.
2. Reroute through traffic to Phase II pavement.
3. Construct friction course over Phase I pavement. Side street traffic to be maintained. Through and cross traffic to be controlled in accordance with Index 102-604, 102-605, or 102-615. When work extends through an intersection, temporarily reroute cross traffic to other cross streets. When rerouting is not possible, provide one-lane access (minimum) for two-lane two-way cross streets and one-lane across (minimum) each direction for four-lane two-way cross streets.

GENERAL NOTES

1. All signing, pavement marking, and barricades necessary for maintenance of traffic shall conform to Index 102-600.
2. Lane widths for maintenance of two-way traffic should desirably be equal to lane widths of the existing facility, but lanes shall not be less than 10' in width. When one-lane one-way operations are necessary, a minimum width of 12' should be maintained and traffic controlled in accordance with Index 102-604, 102-605, or 102-615.
3. At signalized intersections, signals shall be directed or relocated as required to the center of relocated lanes.
4. For reflectorized raised pavement marker application, see Indexes 102-600 and 706-001.
5. Additional barricades, signing, lighting or other traffic controls for limited work areas shall be provided in accordance with other applicable TCZ Indexes as conditions warrant in each phase.
6. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
7. For general TCZ requirements and additional information, refer to Index 102-600.

SYMBOLS

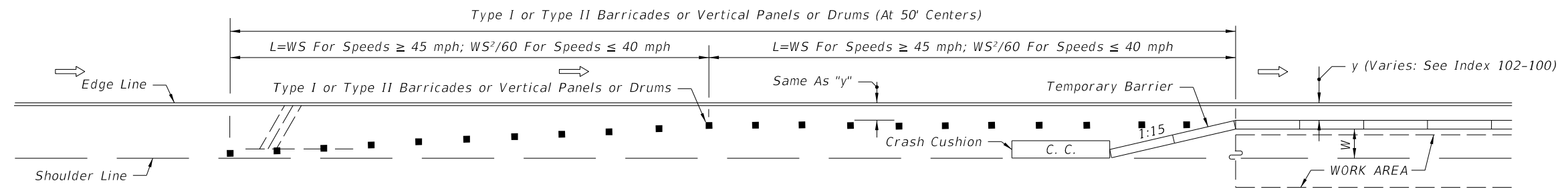
- Channelizing Device (See Index 102-600)
- ▣ Type III Barricade
- Ⓜ Work Zone Sign
- ▬ Stop Bar
- ➡ Lane Identification + Direction of Traffic

LEGEND

- Phase I Construction
- Phase II Construction
- Phase III Construction

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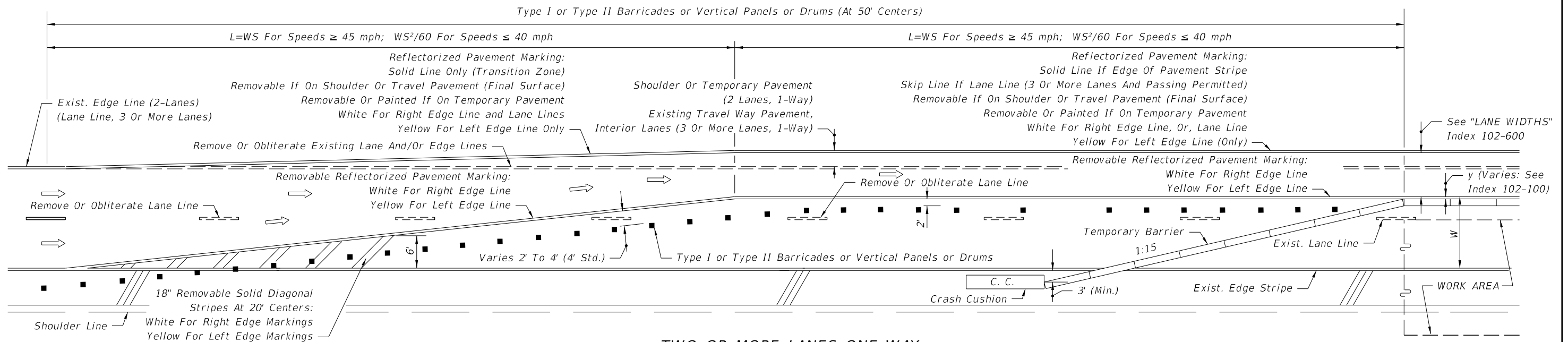
LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	CONVERTING TWO LANES TO FOUR LANES DIVIDED, URBAN	INDEX 102-641	SHEET 3 of 3
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**BARRIER AND TRANSITION LOCATED ON PAVED OR UNPAVED SHOULDERS
PLAN SHOWN FOR RIGHT LANE - INVERTED PLAN FOR LEFT LANE**



**TWO OR MORE LANES ONE WAY
LANE DROP • PLAN SHOWN FOR RIGHT LANE MERGE LEFT - INVERTED PLAN FOR LEFT LANE MERGE RIGHT**



**TWO OR MORE LANES ONE WAY
LANE DROP AND LANE SHIFTS - PLAN SHOWN FOR RIGHT LANE MERGE LEFT - INVERTED PLAN FOR LEFT LANE MERGE RIGHT**


SYMBOLS

- ➡ Lane Identification + Direction of Traffic
- Channelizing Device (See Index 102-600)

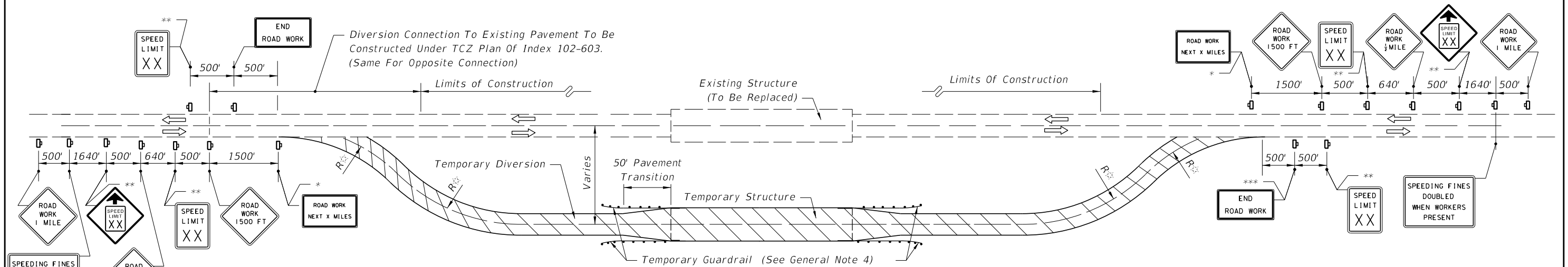
GENERAL NOTES

1. For signing information see the Plans, Specifications, MUTCD and other TCZ Indexes.
2. Where W=width of lateral transition in feet, S=posted speed limit.

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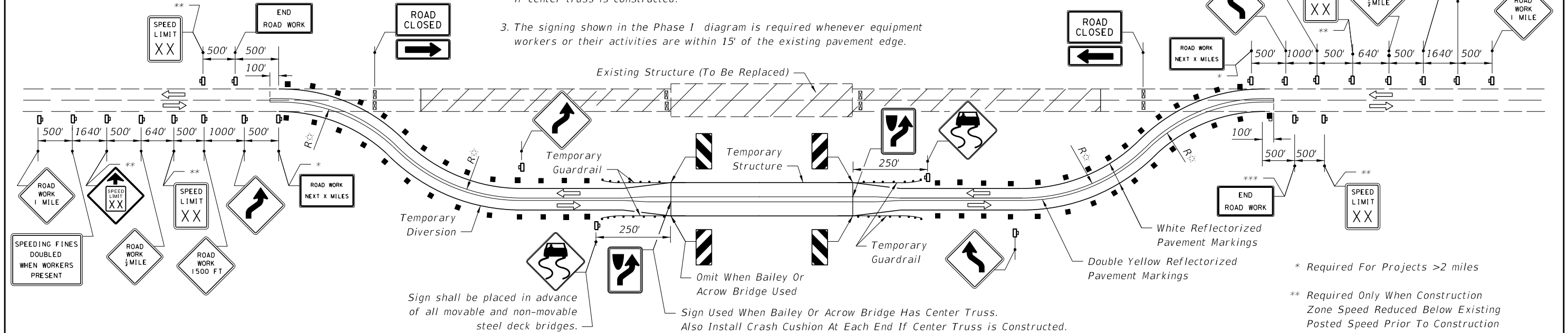
LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TRANSITIONS FOR TEMPORARY BARRIER ON FREEWAY FACILITIES	INDEX 102-642	SHEET 1 of 1
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PHASE I

1. Maintain two-lane two-way traffic over existing facility.
2. Construct temporary structure, approaches, guardrail and install crash cushions if center truss is constructed.
3. The signing shown in the Phase I diagram is required whenever equipment workers or their activities are within 15' of the existing pavement edge.



PHASE II

1. Resign and mark as shown in Phase II plan.
2. Reroute traffic to diversion and maintain two-way traffic on diversion. Install Type III barricades.
3. Construct proposed structure and reconstruct or resurface existing approaches.

SYMBOLS

- Channelizing Device (See Index 102-600)
- ⊠ Type III Barricade
- ⊡ Work Zone Sign
- Lane Identification + Direction of Traffic

LEGEND

- Phase I
- Phase II

☆ See SUPERELEVATION Index 102-600.

* Required For Projects >2 miles

** Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction

*** When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index 102-600.

Sign shall be placed in advance of all movable and non-movable steel deck bridges.

Omit When Bailey Or Acrow Bridge Used
Sign Used When Bailey Or Acrow Bridge Has Center Truss.
Also Install Crash Cushion At Each End If Center Truss is Constructed.

White ReflectORIZED Pavement Markings
Double Yellow ReflectORIZED Pavement Markings

PHASE III and General Notes (See Sheet 2)

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TWO-LANE TWO-WAY, RURAL STRUCTURE REPLACEMENT	INDEX 102-650	SHEET 1 of 2
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PHASE III

1. Reroute traffic to final alignment and maintain two-way traffic.
2. Remove all temporary construction items.

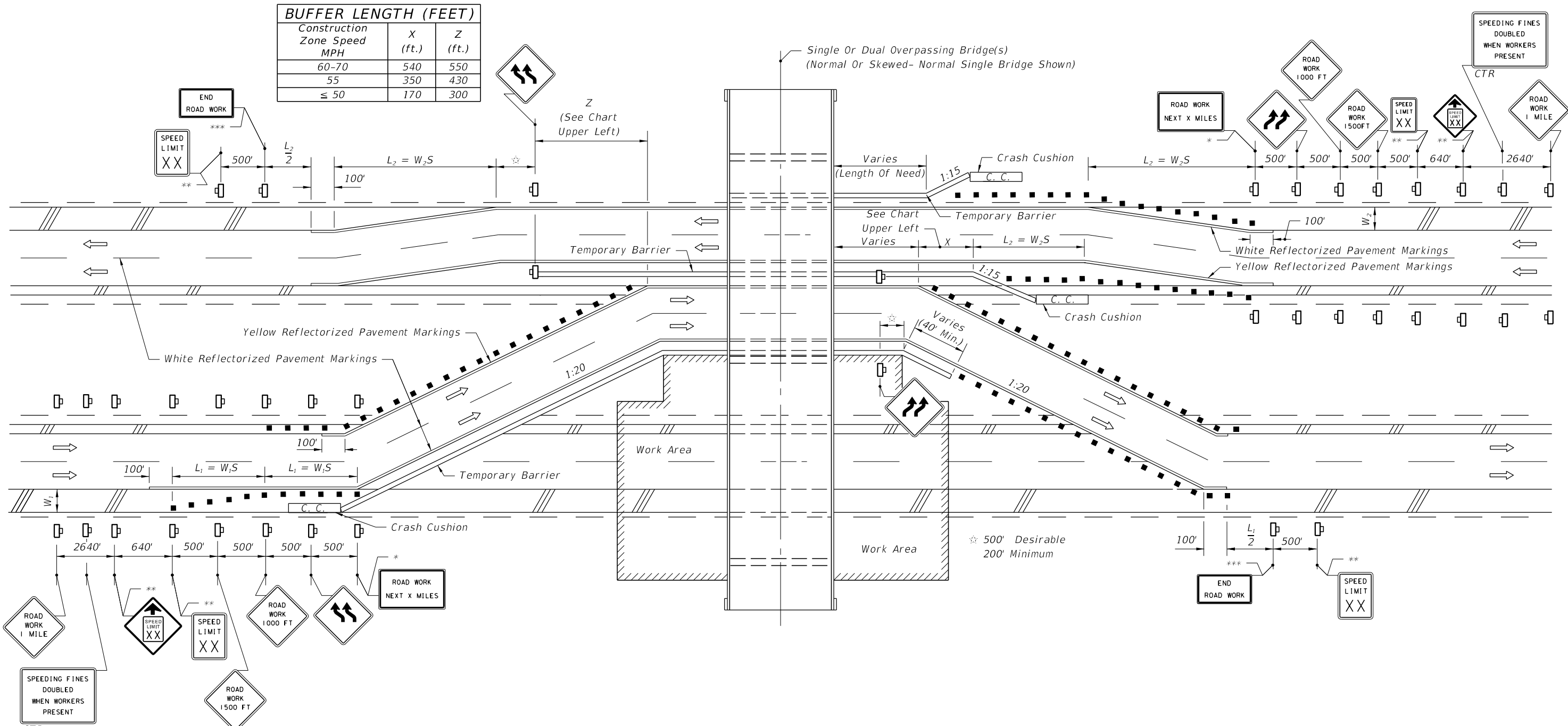
GENERAL NOTES

1. All signing, pavement marking, and barricades necessary for maintenance of traffic shall conform to Index 102-600.
2. For speed sign applications, see Index 120-600.
3. For lane width requirements see Index 102-600. When one-way one-lane operations are necessary, a minimum width of 12' shall be maintained and traffic controlled in accordance with Index 102-603, 102-606, or 102-607. Minimum width for the diversion shoulders is 6'.
4. Method of attaching temporary guardrail to the diversion structure to be approved by the Engineer. Cost of temporary guardrail systems, including end anchorage assemblies, transitions and attachment to temporary structures, are to be included in the contract unit price for Guardrail (Temporary) LF.
5. Provisions approved by the Engineer shall be made for the removal of storm water from the roadway(s) during construction.
6. Only temporary crash cushions approved by the Department shall be used unless specified devices called for in the plans.
7. Where the temporary structure is not required, the diversion may be constructed in accordance with Index 102-608, unless otherwise stipulated in the plans.
8. For reflective raised pavement marker application, see Indexes 102-600 and 706-001.
9. For general TCZ requirements and additional information, refer to Index 102-600.

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LAST REVISION 11/01/17	REVISION DESCRIPTION:	 FY 2019-20 STANDARD PLANS	TWO-LANE TWO-WAY, RURAL STRUCTURE REPLACEMENT	INDEX 102-650	SHEET 2 of 2
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BUFFER LENGTH (FEET)		
Construction Zone Speed MPH	X (ft.)	Z (ft.)
60-70	540	550
55	350	430
≤ 50	170	300



GENERAL NOTES

1. S=Posted speed limit (mph).
2. Within the lateral transitions, the maximum spacing between Type I or Type II barricades or vertical panels or drums shall be based on the speed limit as follows: 15' up to 25 MPH; 30' for 30-40 MPH; 50' for 45 MPH or greater. Barricades, vertical panels, and drums shall not be intermixed in lateral transitions.
3. For speed sign applications, see 'Regulatory Speed in Work Zones' Index 102-600.
4. All existing pavement markings within the realignment which conflict with the revised traffic pattern are to be removed and new pavement markings used for marking edge lines and lane lines.
5. When side roads, cross roads or interchanges within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes
6. For general TCZ requirements and additional information, refer to Index 102-600.

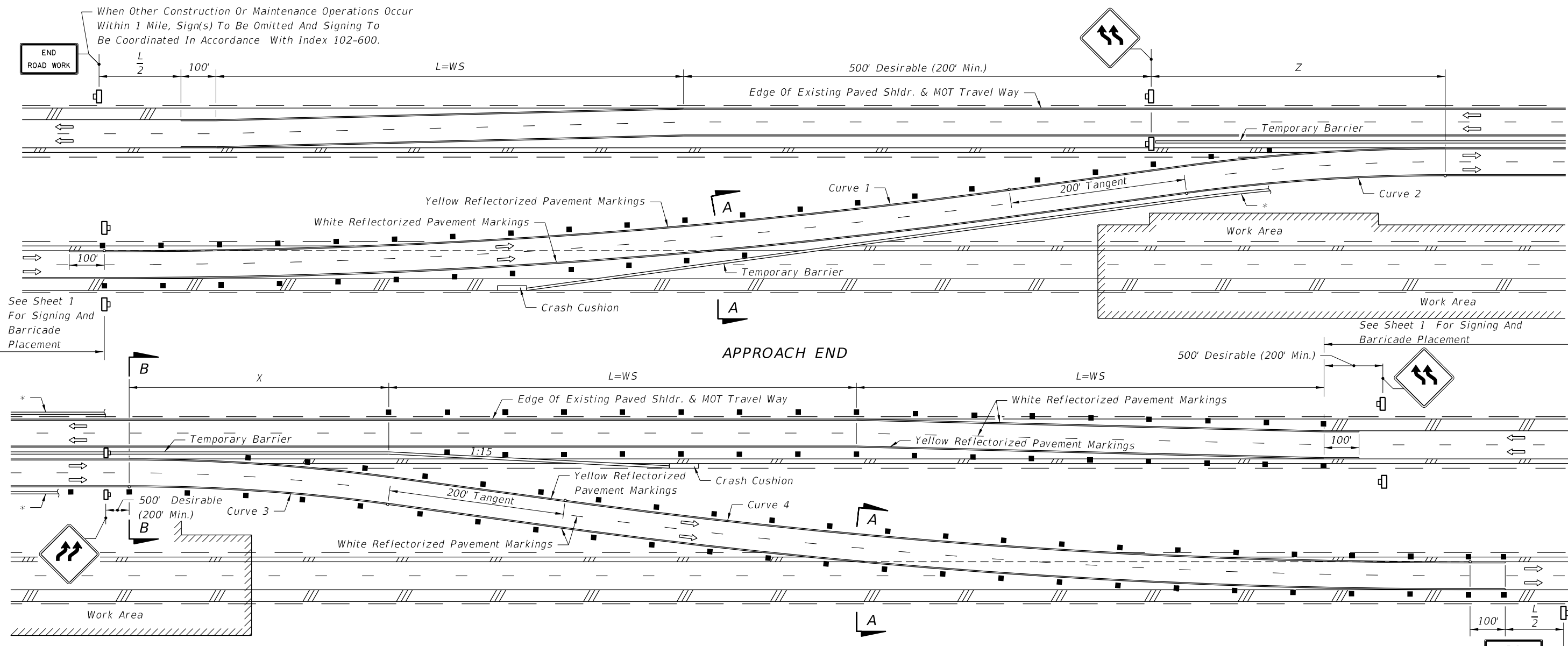
CONDITIONS

- * Required For Projects > 2 miles
 - ** Required Only When Construction Zone Speed Reduced Below Existing Posted Speed Prior To Construction
 - *** When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index 102-600.
- WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES REQUIRE THE CLOSURE OF ONE ROADWAY AND THE OPPOSING ROADWAY IS CONVERTED TO TEMPORARY TWO-WAY TRAVEL BY WAY OF CROSSOVERS.

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification + Direction of Traffic

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See Sheet 1 For Signing And Barricade Placement

See Sheet 1 For Signing And Barricade Placement

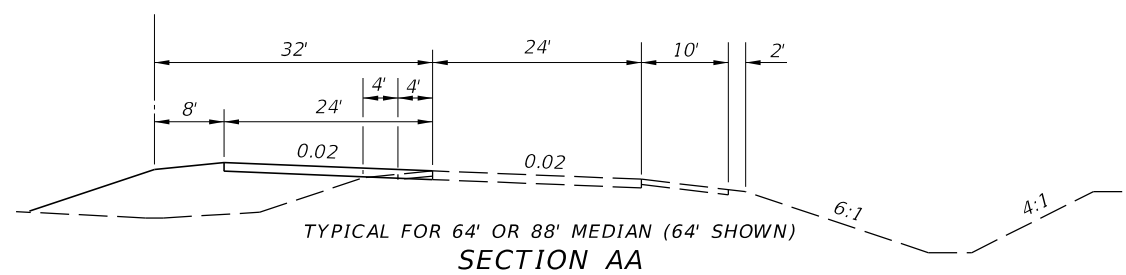
*Length of barrier needed for protection of work area and/or other hazards to be shown in the plans. For complimentary information on barrier and work area see Sheet 1. See Index 102-600 for clear zone requirements.

When Other Construction Or Maintenance Operations Occur Within 1 Mile, Sign(s) To Be Omitted And Signing To Be Coordinated In Accordance With Index 102-600.

TRAILING END
CURVILINEAR ALIGNMENT CROSSOVER

BUFFER LENGTH (ft)				
Construction Zone Speed MPH	64' Median		88' Median	
	X	Z	X	Z
70	607	588	582	545
65	581	562	552	514
60	562	543	531	492
55	337	369	330	350
50	201	286	200	276
45	115	164	115	163
40	104	149	104	148
35	91	134	91	132
30	78	118	78	115

MINIMUM RADII FOR NORMAL CROSS SLOPES		
Construction Zone Speed MPH	Minimum Radius (ft)	
	Curves 1 & 4	Curves 2 & 3
70	22,918 (0° 15')	4,584 (1° 15')
65	22,918 (0° 15')	3,820 (1° 30')
60	22,918 (0° 15')	3,274 (1° 45')
55	11,459 (0° 30')	2,546 (2° 15')
50	11,459 (0° 30')	2,292 (2° 30')
45	1,080 (5° 18')	700 (8° 11')
40	830 (6° 54')	550 (10° 25')
35	620 (9° 14')	410 (13° 58')
30	450 (12° 44')	285 (20° 06')



NOTE: Diversions with speeds of 50 mph or greater are considered high speed facilities; curvature and superelevation criteria for open highway conditions apply.

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TRAFFIC PACING GUIDE

Traffic pacing is a traffic control technique to slow but not stop traffic to facilitate short duration work operations without an elaborate and difficult detour or diversion. Traffic Control Officers pace or slow the traffic to a speed that provides approximately 20-30 minutes to perform the work operation. The Department has frequently used this technique for setting bridge beams, overhead sign structures and replacing overhead sign panels.

NOTICE

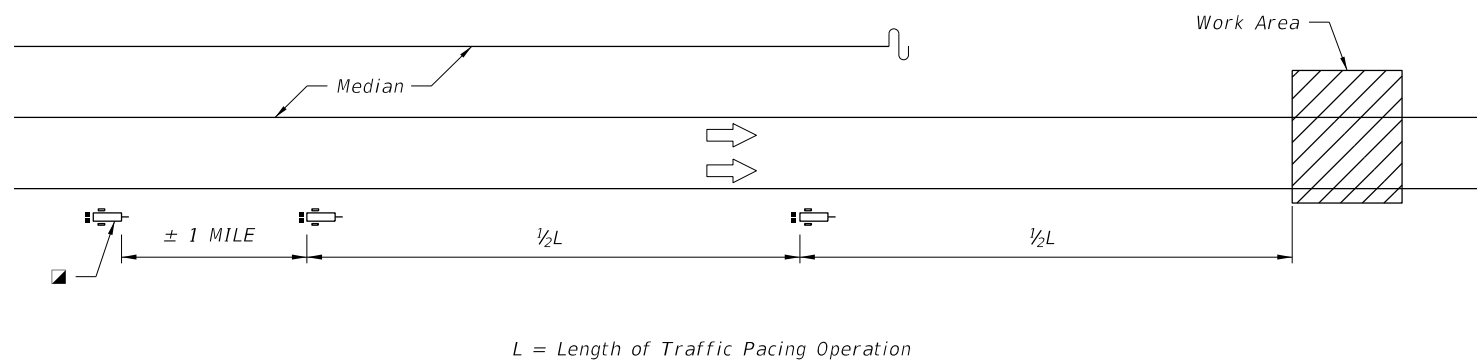
This Index represents the minimum requirements for traffic pacing operations on the State Highway System.

Develop a site specific traffic control plan for each pacing operation location.

TRAFFIC PACING GENERAL NOTES

1. Install ROAD CLOSED (W20-3) signs approximately 1000' prior to the work area. These signs shall remain covered until the pacing operation begins and covered when the pacing operation has ended.
2. Prior to requesting that the traffic control officer supervisor initiate the pacing operation, the contractor shall ensure that the necessary equipment is properly positioned (off the roadway) for the construction activity requiring the traffic pacing operation.
3. Truck mounted attenuator(s) with changeable message sign(s) are required to protect workers and/or equipment positioned in a travel lane(s) at the work area during the pacing operation from an errant vehicle. If no workers and/or equipment are positioned in a travel lane(s) at the work area, truck mounted attenuator(s) are not required.
4. A traffic control officer supervisor shall be stationed at the work area continuously throughout the pacing operation to insure radio communications between the contractor and/or the project administrator, and all the police vehicles involved in the pacing operation.
5. When more than one pacing operation is required in one work period the contractor shall allow sufficient time between pacing operations to permit traffic to return to normal speeds and flow. Additional time may be required between pacing operations to allow traffic to resume normal speeds and flow upstream of the work area as determined by the project administrator or traffic control officer supervisor.
6. For work durations of less than five minutes, coordinate with traffic control officer to provide resources necessary for pacing traffic. Portable changeable message signs, truck-mounted attenuators, ROAD CLOSED signs, and site specific traffic control plans are not required for such operations. Use traffic pacing distance values from the five minute column of the table on Sheet 3.

CHANGEABLE MESSAGE SIGNS (Typical Placement and Messages)



CHANGEABLE MESSAGE SIGN MESSAGE (MAINLINE AND RAMPS)

Symbols

- Channelizing Device (See Index 102-600)
- Marked Police Vehicle with Flashing Blue Lights
- PCMS, Portable Changeable Message Sign
- To be placed the day of pacing operation
- ⇒ Lane Identification and Direction of Traffic

ONE WEEK PRIOR TO
PACING OPERATION

EXPECT DELAYS ON	MMM DD-DD X AM - X AM
------------------------	-----------------------------

DURING DAY
OF PACING OPERATION

ROAD WORK TONIGHT	EXPECT PERIODIC DELAYS
-------------------------	------------------------------

DURING PACING
OPERATION

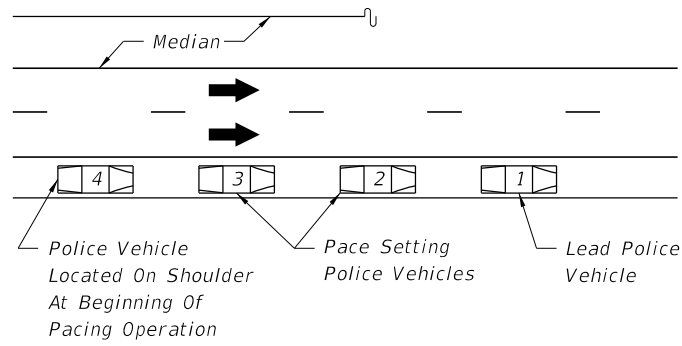
SLOW TRAFFIC AHEAD	BE PREPARED TO STOP
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TRAFFIC CONTROL PLANS OR TECHNICAL SPECIFICATION

1. The specific activities and locations, along with allowable times of day and days of the week, when pacing will be allowed should be clearly detailed in the traffic control plans or technical specification. If there are specific holiday or special event dates that, due to anticipated traffic congestion, pacing operations should not be allowed, these dates should also be spelled out in plans or specifications. When detailing the specific activities and locations of pacing activities, identify the minimum number of traffic control officers needed for each function and location of the pacing operation. If there are certain work activities that need to be completed prior to the contractor starting the work anticipated during the pacing operation, the activities should be clearly detailed in the plans or technical specification.
2. When developing a pacing plan, failsafe "stop points" should be identified for those work operations in which a construction problem could create a condition that could not be immediately cleared. A failsafe stop point is the last safe egress from the highway facility prior to traffic coming upon the work that is being completed during the operation. In the unlikely event that the work is not completed during the time estimated for the pacing, the plans or specification should direct the pacing to not proceed past the failsafe stop point until the highway is cleared. In the event of major construction problem that cannot be immediately cleared, traffic can then be diverted off the facility.
3. The traffic control plans or technical specification should require the contractor to submit a pacing plan in advance of the operation. The pacing plan should outline the contractors expected equipment and personnel, outline the operation, and include a contingency plan should any of the contractor's critical equipment break down. If the project includes a damage recovery clause, the traffic control plan or technical specification should be clear that the damage recovery applies to the pacing operation as well.
4. Changeable message signs shall be displayed one week prior to work using messages described in the traffic pacing plan. The number and location of changeable message signs shall be called out in the traffic control plans.

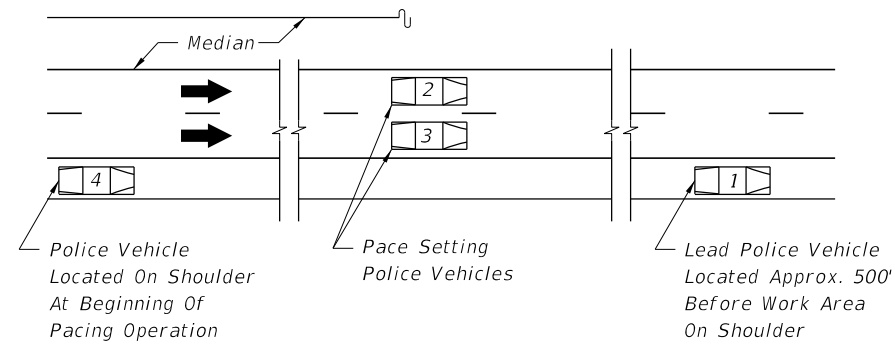
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**MAINLINE PACING DETAILS
(1 DIRECTION OF FOUR LANE ROADWAY EXAMPLE)**



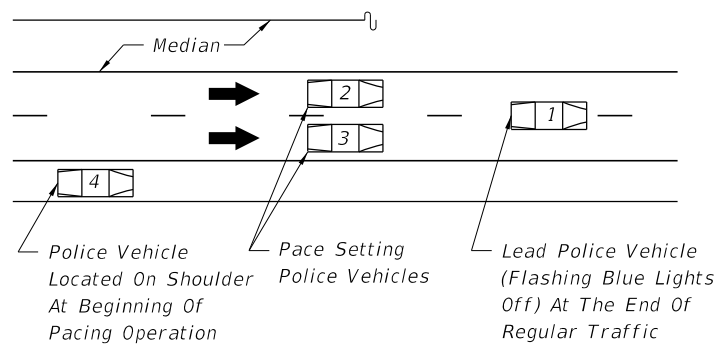
STAGE ONE

1. Four police vehicles located upstream of the work area at the beginning location of the traffic pacing operation with flashing blue lights off.



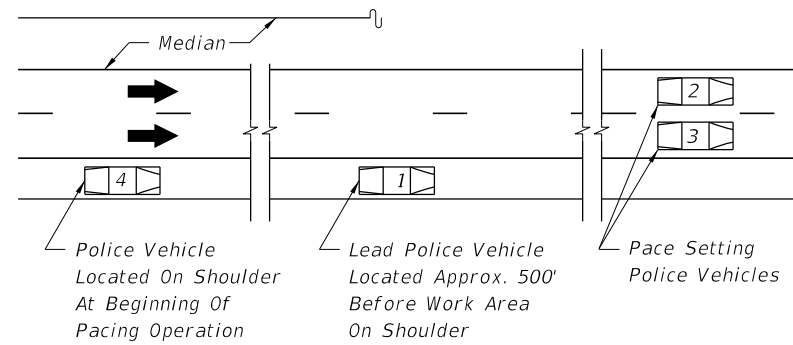
STAGE THREE

1. The two pace setting police vehicles shall begin to slow to the pacing speed (20 mph is preferred, 10 mph minimum), for the duration of the traffic pacing operation.
2. The lead police vehicle (flashing blue lights off) shall match the speed of the last vehicles ahead of the pacing vehicles and continue following traffic until a point approximately 500' in advance of the work area. The lead police vehicle shall then come to a complete stop on the right shoulder and turn on its flashing blue lights. If required, crash truck(s) with rear mounted impact attenuator(s) and changeable message sign(s) shall move into the travel lanes approximately 200 ft. upstream of the work area with the impact attenuators down and operating once traffic has cleared the work area.



STAGE TWO

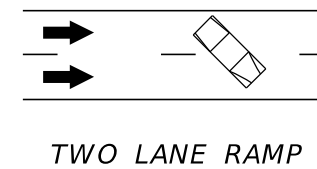
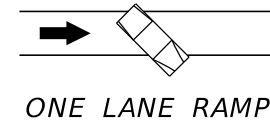
1. Once the police vehicles are in place and the traffic control officer supervisor at the work area notifies all officers to begin the traffic pacing operation, the last three police vehicles shall turn on their flashing blue lights. The first three police vehicles shall enter the travel lanes with the second and third police vehicles immediately forming a side by side "pacing operation" of all lanes behind the lead police vehicle (flashing blue lights off).



STAGE FOUR

1. When the pace setting police vehicles are within approximately two miles of the work area they shall notify the onsite traffic control officer supervisor who will immediately inform the contractors on site supervisor of their location. Once the contractors on site supervisor has been notified of the pacing vehicles location, the contractor shall begin to clear the travel lanes of all equipment and debris in order to reopen all travel lanes.
2. In case of emergency the pace setting police vehicles shall come to a complete stop once they reach the lead police vehicle. If no emergency is encountered, the crash truck(s) shall be moved from the travel lanes and the two pace setting police vehicles shall clear the work area and immediately move to the right shoulder or an area designated by the traffic control officer supervisor and turn off the flashing blue lights. Once the two pace setting police vehicles pass the work area, the traffic control officer supervisor shall instruct the lead and last police vehicles to turn off their flashing blue lights.

RAMP PACING DETAILS



RAMP CLOSURE DETAIL

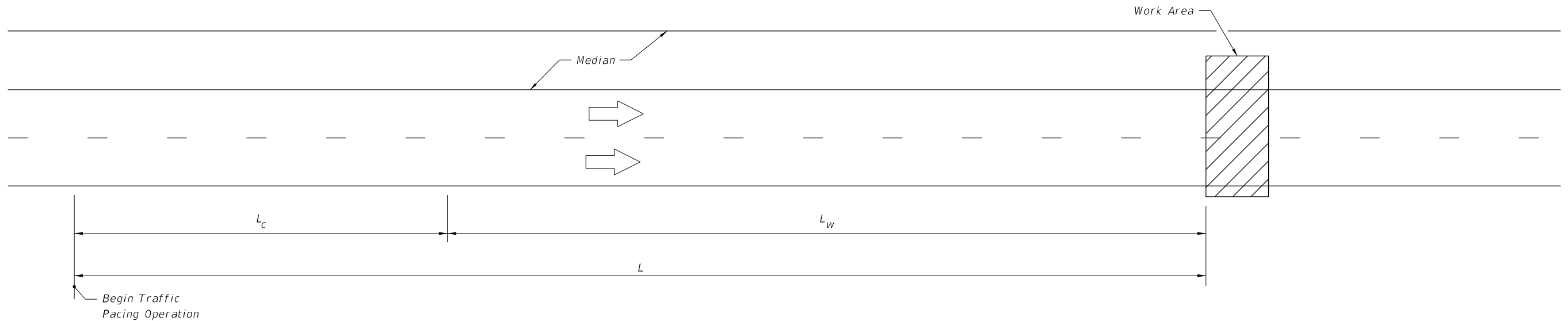
1. Once notified by the on site traffic control officer supervisor to begin the traffic pacing operation each police vehicle at the indicated ramp shall turn their flashing blue lights on and position the vehicle across the ramp lane(s) to close ramp access.
2. Once the pacing operation passes the closed on ramp the police vehicle on the ramp shall turn off the flashing blue lights and move from the ramp lane(s) to allow traffic to enter the mainline pacing operation.

GENERAL NOTES

1. Each Traffic Control Officer shall have a marked vehicle with flashing blue lights, for the pacing operation. The location and number of officers at each location will be as follows:

No. Of Traffic Control Officers With Vehicles	Function	Location
1 min.	Supervisor	Work Area
1 Lead Vehicle	Varies	Mobile operation
1 for each travel lane	Pacing Operation	Mobile operation beginning x miles upstream and terminating at the work area
1 Stationed at the Beginning of Pacing Operation	Advanced Warning to Motorist	Stationed at the Beginning of Pacing Operation
1 for each entrance ramp	Entrance Ramp Roadblocks	One at each of the entrance ramps upstream of the work area

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DESIGN CONSIDERATIONS:

The design shall evaluate the actual distance required for the pacing operation based on site specific features such as: roadway geometrics, pacing speeds, regulatory speeds, interchange spacing, work duration, availability of traffic control officers, traffic volumes and maximum queue length.

The starting point of a traffic pacing operation must consider the following factors: the speed of the pacing vehicles, the location of entrance ramps, horizontal and vertical alignment of the facility.

In some instances, it may be necessary to close a lane at the work site to position a crane(s) and the materials to be lifted.

All material to be installed shall be on-site before the traffic pacing operation begins.

It may be necessary to install temporary barrier walls to protect pre-positioned and assembled materials in the right of way.

The minimum speed allowed for a pacing operation is 10 mph with 20 mph the preferred speed.

The maximum allowed work duration is 1/2 hour (30 min).

The maximum practical pacing operation length is 10 miles.

S_r = Regulatory speed (mph)

S_p = Pacing speed (mph)

t_w = Work duration (min)

L = Total pacing distance in miles

$$L = \frac{t_w}{60} S_p \left(\frac{S_p}{S_r - S_p} + 1 \right)$$

$$L = L_c + L_w$$

L_c = distance paced vehicles must travel before the vehicles at regulatory speed have cleared the work zone

$$L_c = \left(\frac{t_w}{60} \times \frac{S_p^2}{S_r - S_p} \right)$$

L_w = distance paced vehicles travel while work is performed

$$L_w = \left(\frac{t_w}{60} \times S_p \right)$$

F_{HV} = Heavy Vehicle Factor

$$F_{HV} = 1 + \left(\frac{P_t}{100} \times 0.5 \right)$$

P_t = % Trucks

TRAFFIC PACING DISTANCES (L) miles						
$S_p=20$; $pcphpl \leq 1,750$						
S_r	t_w (min)					
	5	10	15	20	25	30
70	2.3	4.7	7.0	9.3	*	*
65	2.4	4.8	7.2	9.6	*	*
60	2.5	5.0	7.5	10.0	*	*
55	2.6	5.2	7.9	*	*	*
50	2.8	5.6	8.3	*	*	*

* Calculation required, for additional guidance see FDOT Design Manual 242.

NOTES FOR TABLE:

t_w is the total time allowed for work activity in minutes. This time starts just after the last vehicle traveling at the pre-pacing regulatory speed clears the work area and ends just as the pacing operation reaches the work area. t_w must include the time required to clear the roadway of equipment, materials, and personnel.

Demand volume may not exceed 1,750 pcphpl (passenger cars per hour per lane) without a site specific design. Traffic counts can be obtained from the Office of Planning, or you may need to collect traffic counts. Hourly directional traffic volumes must be converted to pcphpl using the following:

$$pcphpl = \left(\frac{\text{Hourly Directional Volume}}{\# \text{ Lanes (each direction)}} \right) \times \text{Heavy Vehicle Factor}$$

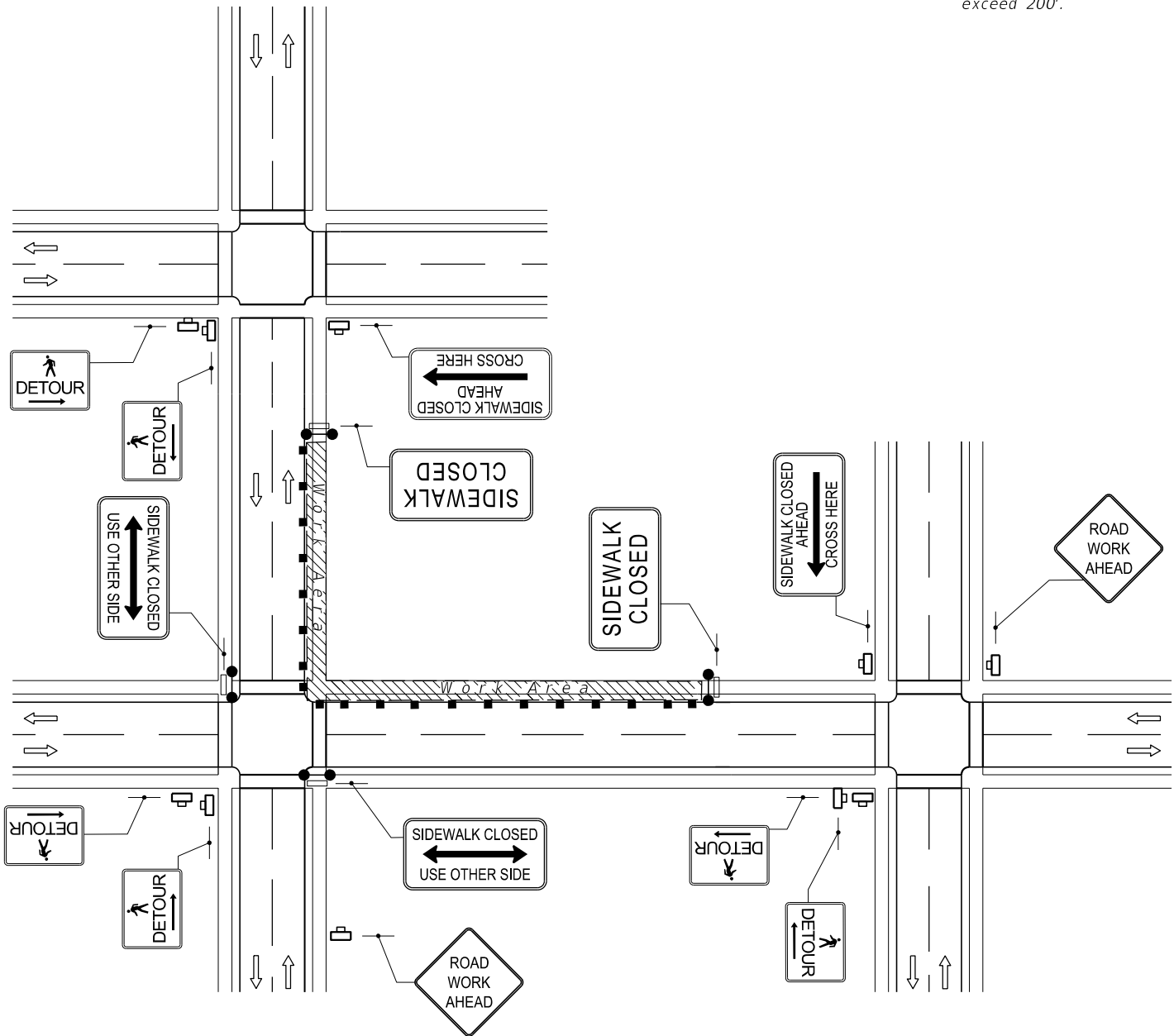
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SYMBOLS

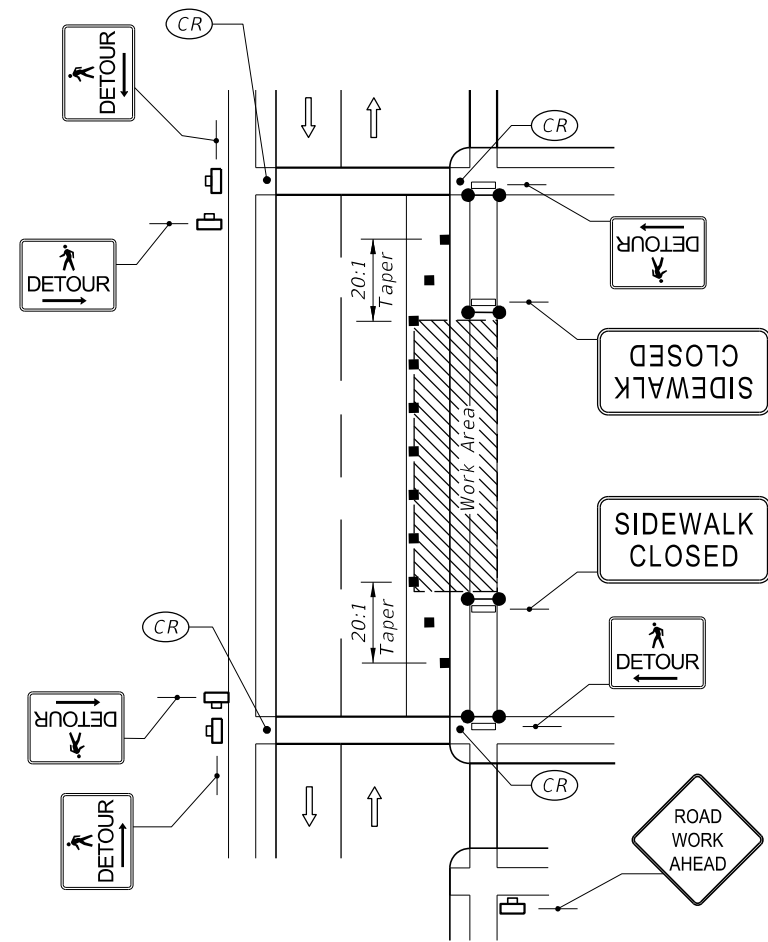
-  Work Area
-  Channelizing Device
-  Work Zone Sign
-  Required Locations For Either Temporary Or Permanent Curb Ramps.
-  Lane Identification + Direction of Traffic
-  Pedestrian Longitudinal Channelizing Device (LCD) with Mounted Work Zone Sign or separate Work Zone Sign
-  Pedestrian Longitudinal Channelizing Device (LCD)
-  Temporary Sidewalk

GENERAL NOTES:

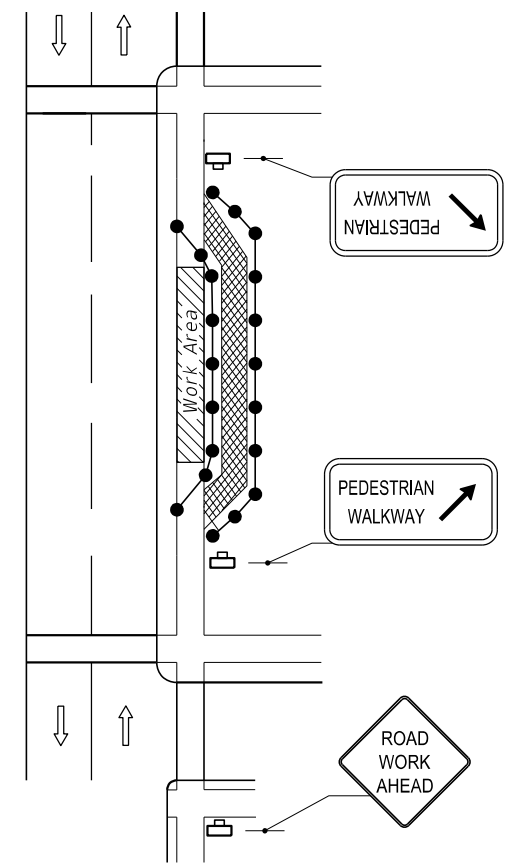
1. When encroaching work requires a sidewalk closure for 60 minutes or greater, provide an alternate pedestrian route.
2. For spacing of vehicular Channelizing Devices, see applicable vehicular temporary traffic control Indexes.
3. Cover or deactivate pedestrian traffic signal display(s) controlling closed crosswalks.
4. For post mounted signs located near or adjacent to a sidewalk, maintain a minimum 7' clearance from the bottom of the sign panel to the surface of the sidewalk.
5. Provide a 5' wide temporary walkway, except where space restrictions warrant a minimum width of 4'. Provide a 5' x 5' passing space for temporary walkways less than 5' in width at intervals not to exceed 200'.
6. Provide a cross-slope with a maximum value of 0.02 for all temporary walkways.
7. Maintain temporary walkway surfaces and ramps that are stable, firm, slip-resistant, and free of any obstructions or hazards such as holes, debris, mud, construction equipment, and stored material.
8. Remove temporary walkways immediately after reopening of the sidewalk, unless otherwise noted in the plans.
9. Meet the requirements of Index 522-002 for temporary curb ramps.
10. Place pedestrian longitudinal channelizing device(s) across the full width of the closed sidewalk. For temporary walkways, similar to the Sidewalk Diversion, place LCDs to delineate both sides of the temporary walkway.
11. For sidewalk diversions, ensure that there is sufficient R/W for placement of temporary sidewalk and pedestrian longitudinal channelizing devices.



CROSSWALK CLOSURE AND PEDESTRIAN DETOUR




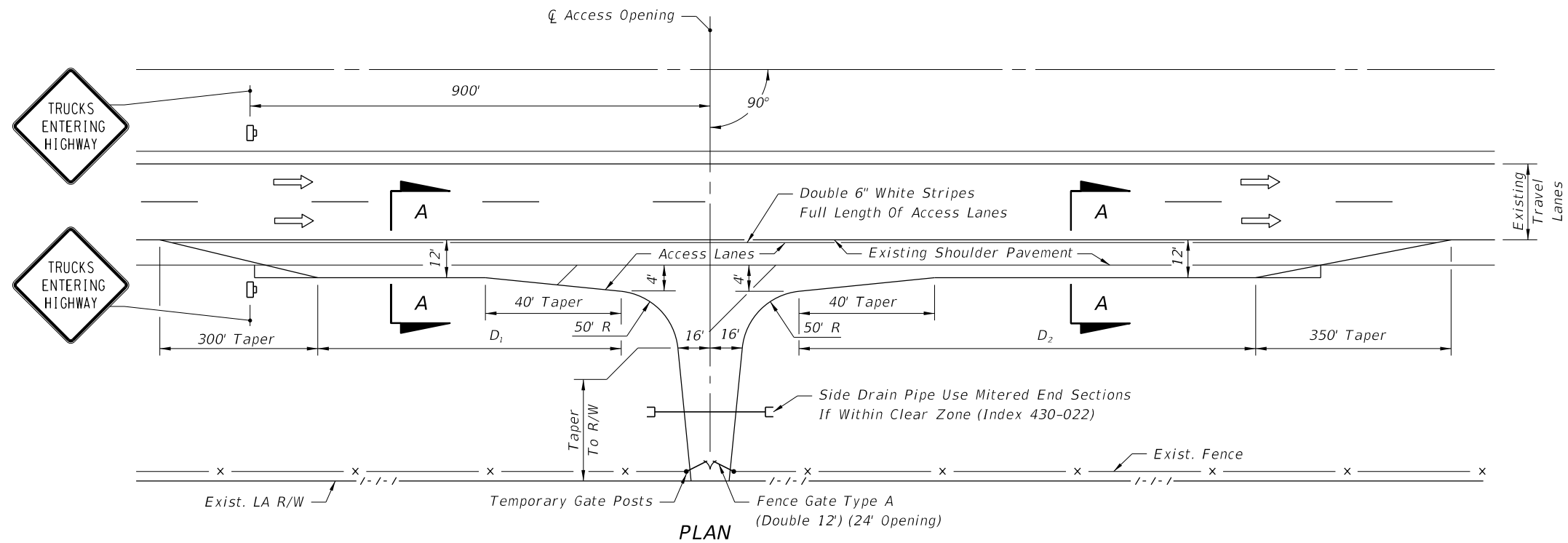
SIDEWALK DETOUR



SIDEWALK DIVERSION

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LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS	INDEX 102-660	SHEET 1 of 1
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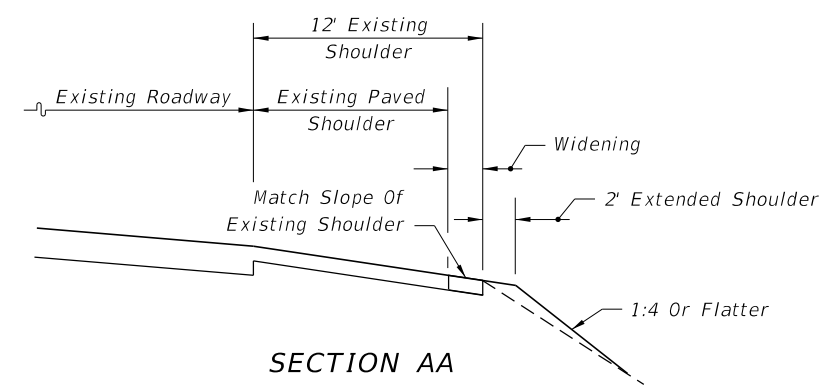


PLAN

GENERAL NOTES

LENGTH OF ACCESS LANES (Ft.)		
Grade	D ₁	D ₂
2% or less	590	1540
3 to 4% Upgrade	530	2310
3 to 4% Downgrade	710	925

1. Access openings across limited access right of way and use of this Index are prohibited unless specifically permitted in the Contract Plans or Special Provisions. When permitted in the Contract Plans or Special Provisions and prior to construction of any opening, the Contractor must submit, in writing, a request identifying specific locations for approval by the Engineer.
2. No more than two (2) access openings will be allowed on each project.
3. Access openings shall be located only in areas having adequate sight distance and shall not be located within 1.5 miles of interchanges nor within 2000 ft. of acceleration-deceleration lanes at rest areas, other access openings or other highway service areas.
4. Access openings shall not be constructed directly opposite temporary median crossovers nor within 2000 ft. of temporary median crossovers.
5. Access openings shall be within the project limits and shall not be used for transporting materials to or from any other project. The acceleration-deceleration surfaces shall be paved. RAP material is acceptable for driveway surfacing.
6. Any Motorist Aid Call Boxes affected by the temporary access openings shall be relocated outside the limits of access lanes and remain in use during construction. Upon removal of access lanes, call boxes shall be returned to their previous location. Temporary relocation and restoration of call boxes shall be at the contractor's expense.
7. Access openings in the limited access fence shall have gates which are to be locked during nonwork hours or periods when the access is not in active use.
8. The contractor shall take all precautions necessary to insure against entrance by livestock or unauthorized persons or vehicles.
9. The contractor shall not vary from the plan detail without approval of the Engineer.
10. Gates shall be removed and access opening locations shall be restored to preconstruction condition immediately upon completion of activities utilizing the materials being transported through the openings whether or not the project is completed.
11. Failure to comply with any provision of the access opening plan shall be cause for terminating use of all openings. Upon notification by the Engineer, the contractor shall cease hauling and begin restoration of affected areas. Under this condition expense of removal, restoration and of additional hauling distances shall be borne by the contractor.
12. No guardrail or barrier wall will be removed for access openings.
13. Construction and removal of the access and restoring the area to preconstruction condition shall be included in the cost of Maintenance Of Traffic, LS.

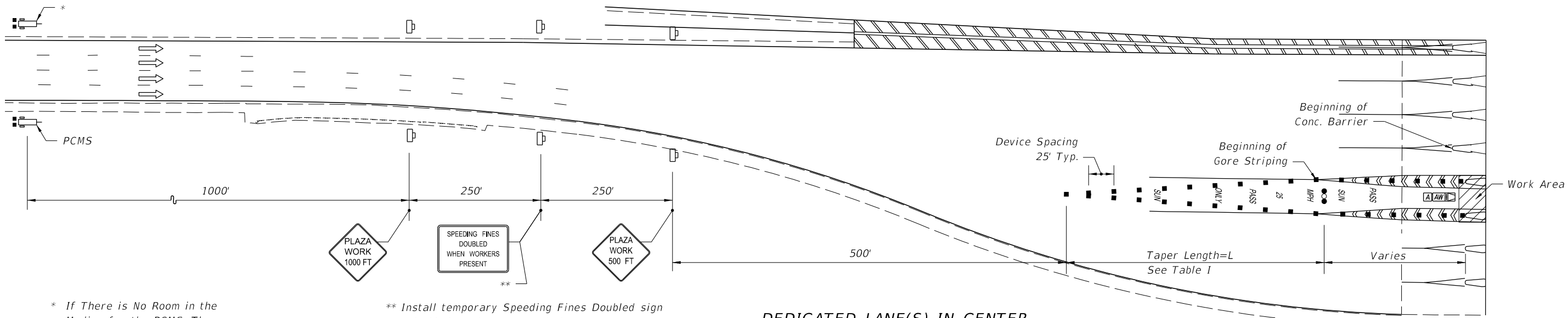


SECTION AA

SYMBOLS

Work Zone Sign

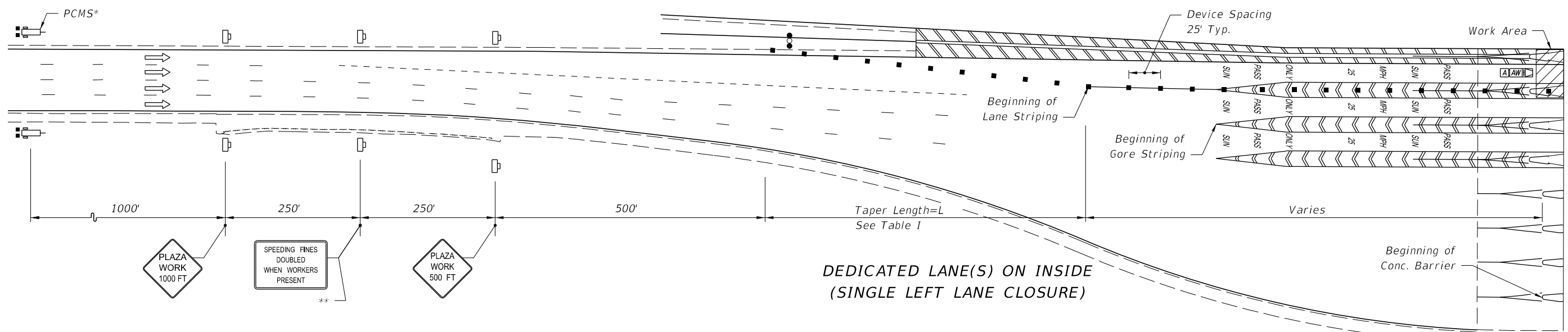
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DEDICATED LANE(S) IN CENTER

* If There is No Room in the Median for the PCMS, Then Locate it on the Outside of the Roadway only.

** Install temporary Speeding Fines Doubled sign only if there is not an existing permanent "Speeding Fines Doubled Through Toll Plaza" sign or an existing "Speeding Fines Doubled When Workers Present" sign in place.



DEDICATED LANE(S) ON INSIDE (SINGLE LEFT LANE CLOSURE)

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board
- Lane Identification + Direction of Traffic
- Advance Warning Vehicle Equipped with Advance Warning Arrow Board and Truck/Trailer Mounted Attenuator
- Portable Changeable (Variable) Message Sign

<u>PCMS DISPLAY A</u>			
MESSAGE 1:	SUNPASS LANE(S) CLOSED	MESSAGE 2:	USE CASH LANES
<u>PCMS DISPLAY B</u>			
MESSAGE 1:	SUNPASS ONLY LANE(S)	MESSAGE 2:	CLOSED AT PLAZA
<u>PCMS DISPLAY C</u>			
MESSAGE 1:	SUNPASS ONLY LANE(S)	MESSAGE 2:	KEEP LEFT/RIGHT

Dedicated Lane Location	Number of Dedicated Lanes	Number of Dedicated Lanes Closed	Taper Length (Feet)	PCMS Display
Center	1	1	200	A
	2	1	200	B
		2	350	A
	3	1	350	B
		2	350	A
	Inside***	1	1	350
2		1	350	C
3		1	350	C

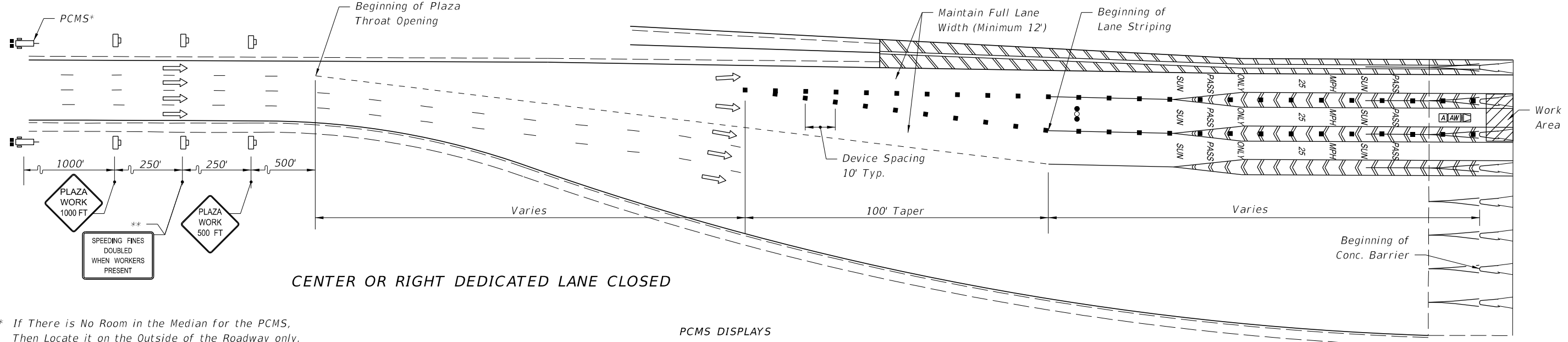
*** See Index 102-667 Sheet 2 for Right or Center Inside Dedicated Lane Closed, or Two or More Inside Dedicated Lanes Closed Configurations.

GENERAL NOTES

1. This Plan is to be used at Mainline Plazas Only.
2. This Plan is for Lane Closures that exceed three hours.
3. Plaza canopies which have existing DMS signs on the canopies shall display the message "LANE CLOSED" for the duration of this closure.
4. A truck/trailer mounted attenuator is required.
5. Lane use control lights, signs, or signals over toll lanes shall be switched to the appropriate symbol, message, or correct color prior to the start of any lane closure. They should also be switched at project completion.
6. At least 48 hours prior to any closure, other than emergencies, the plaza manager shall be notified for security and staffing.

DEDICATED LANES

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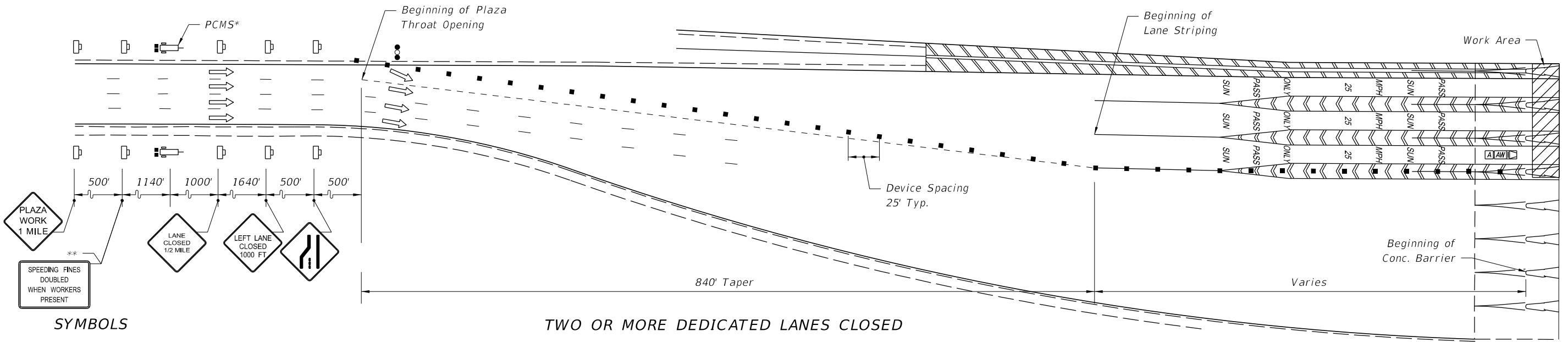
CENTER OR RIGHT DEDICATED LANE CLOSED

* If There is No Room in the Median for the PCMS, Then Locate it on the Outside of the Roadway only.

** Install temporary Speeding Fines Doubled sign only if there is not an existing permanent "Speeding Fines Doubled Through Toll Plaza" sign or an existing "Speeding Fines Doubled When Workers Present" sign in place.

PCMS DISPLAYS

MESSAGE 1: CENTER SUNPASS LANE	MESSAGE 2: CLOSED AT PLAZA	MESSAGE 1: SUNPASS ONLY LANE(S)	MESSAGE 2: KEEP LEFT
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TWO OR MORE DEDICATED LANES CLOSED

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board
- Lane Identification + Direction of Traffic
- Advance Warning Vehicle Equipped with Advance Warning Arrow Board and Truck/Trailer Mounted Attenuator
- Portable Changeable (Variable) Message Sign

PCMS DISPLAY

MESSAGE 1: SUNPASS LANES CLOSED	MESSAGE 2: USE CASH LANES
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GENERAL NOTES

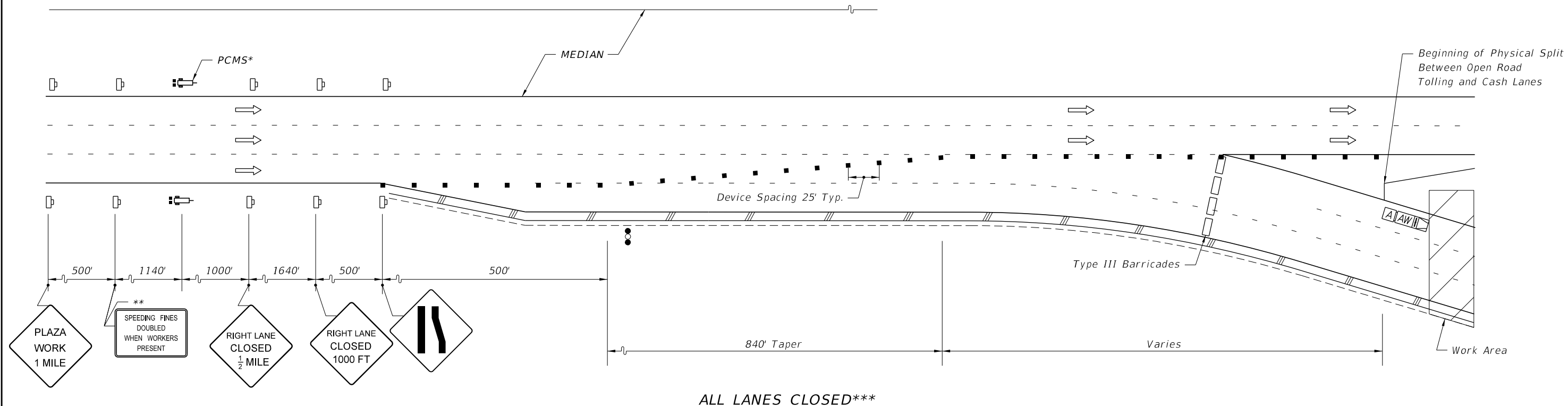
1. This Plan is to be used at Mainline Plazas Only.
2. This Plan is for Lane Closures that exceed three hours.
3. Plaza canopies which have existing DMS signs on the canopies shall display the message "LANE CLOSED" for the duration of this closure.
4. A truck/trailer mounted attenuator is required.
5. See Sheet 1 for Two or More Inside Dedicated Lanes Single Left Lane Closed Configuration.
6. Lane use control lights, signs, or signals over toll lanes shall be switched to the appropriate symbol, message, or correct color prior to the start of any lane closure. They should also be switched at project completion.
7. At least 48 hours prior to any closure, other than emergencies, the plaza manager shall be notified for security and staffing.

INSIDE DEDICATED LANES

10/30/2018 9:23:22 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TOLL PLAZA TRAFFIC CONTROL STANDARDS	INDEX 102-667	SHEET 2 of 6
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* If there is no room in the median for the PCMS then locate it on the outside of the roadway only.



ALL LANES CLOSED***

** Install temporary Speeding Fines Doubled sign only if there is not an existing permanent "Speeding Fines Doubled Through Toll Plaza" sign or an existing "Speeding Fines Doubled When Workers Present" sign in place.

*** Inverted for Inside Open Road Tolling Lanes Configuration

GENERAL NOTES

1. This Plan is to be used at Mainline Plazas Only.
2. This Plan is for lane closures of any time length.
3. Plaza canopies which have existing DMS signs on the canopies shall display the message "LANE CLOSED" for the duration of this closure.
4. For planned lane closure, a portable changeable message sign shall be placed and shall display the message shown at a minimum of one week prior to closure. If planned lane closure is less than one week, place portable changeable message sign immediately using "prior to closure" messages.
5. A truck/trailer mounted attenuator is required.
6. Lane closure configurations applicable to 2 or 3 lane open road tolling plazas.
7. At least 48 hours prior to any closure, other than emergencies, the plaza manager shall be notified for security and staffing.

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board
- Lane Identification + Direction of Traffic
- Advance Warning Vehicle Equipped with Advance Warning Arrow Board and Truck/Trailer Mounted Attenuator
- Portable Changeable (Variable) Message Sign
- Type III Barricades and "RAMP CLOSED" sign

PCMS DISPLAYS

PCMS DISPLAY PRIOR TO CLOSURE

MESSAGE 1: SUNPASS ONLY LANES MESSAGE 2: CLOSED "DATE(S)"

PCMS DISPLAY DURING CLOSURE

MESSAGE 1: SUNPASS LANES CLOSED MESSAGE 2: USE CASH LANES

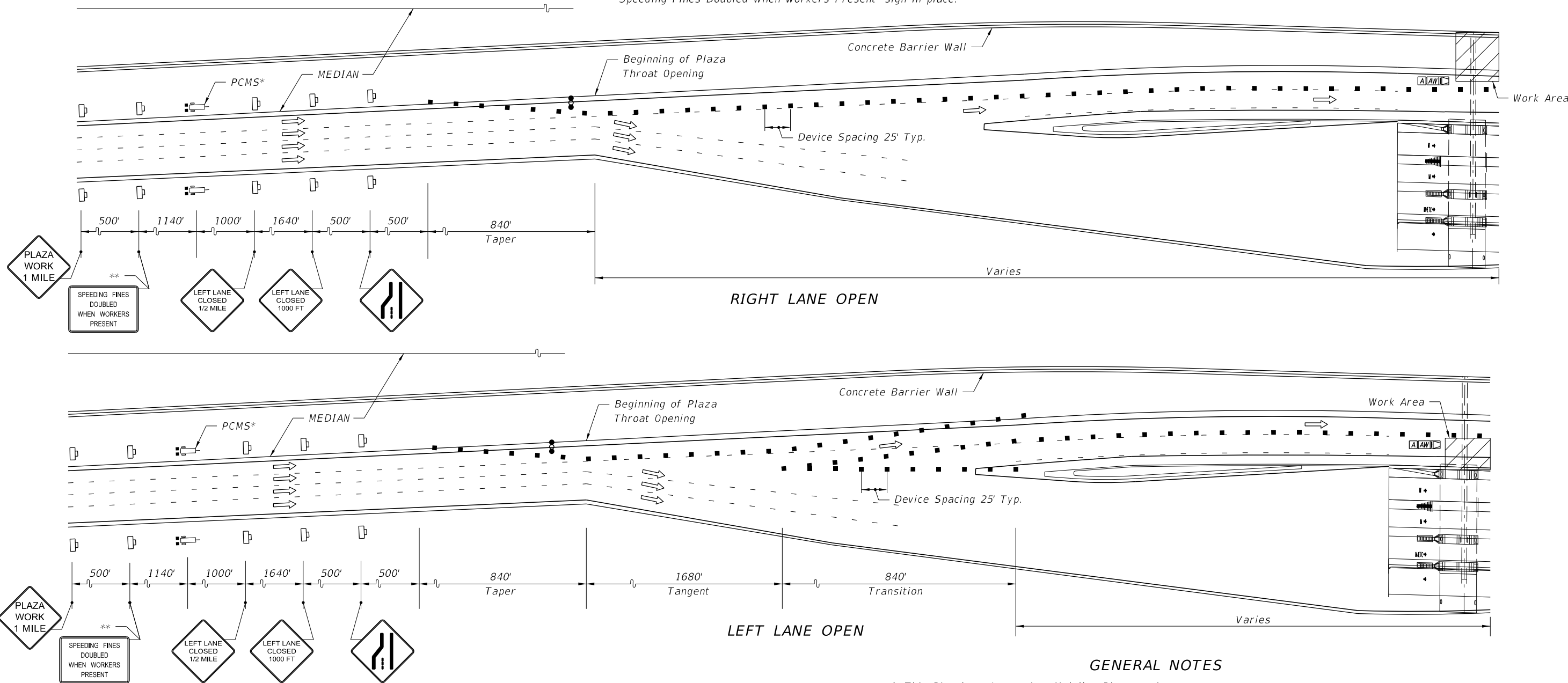
OUTSIDE OPEN ROAD TOLLING LANES

10/30/2018 9:23:30 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TOLL PLAZA TRAFFIC CONTROL STANDARDS	INDEX 102-667	SHEET 3 of 6
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* If there is no room in the median for the PCMS sign, then locate it on the outside of the roadway only.

** Install temporary Speeding Fines Doubled sign only if there is not an existing permanent "Speeding Fines Doubled Through Toll Plaza" sign or an existing "Speeding Fines Doubled When Workers Present" sign in place.



SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board
- Lane Identification + Direction of Traffic
- Advance Warning Vehicle Equipped with Advance Warning Arrow Board and Truck/Trailer Mounted Attenuator
- Portable Changeable (Variable) Message Sign

PCMS DISPLAYS

PCMS DISPLAY PRIOR TO CLOSURE

Message 1: ONE SUNPASS ONLY	Message 2: LANE OPEN "DATE(S)"
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PCMS DISPLAY DURING CLOSURE

Message 1: SUNPASS ONLY LANE	Message 2: OPEN USE CAUTION
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GENERAL NOTES

1. This Plan is to be used at Mainline Plazas only.
2. This Plan is for lane closures of any time length.
3. Plaza canopies which have existing DMS signs on the canopies shall display the message "LANE CLOSED" for the duration of this closure.
4. For planned lane closure, a portable changeable message sign shall be placed and shall display the messages shown at a minimum of one week prior to closure. If planned lane closure is less than one week, place portable changeable message sign immediately using "prior to closure" messages.
5. A truck/trailer mounted attenuator is required.
6. Lane closure configurations applicable to 2 or 3 lane open road tolling plazas.
7. At least 48 hours prior to any closure, other than emergencies, the plaza manager shall be notified for security and staffing.

INSIDE OPEN ROAD TOLLING LANES

10/30/2018 9:23:36 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TOLL PLAZA TRAFFIC CONTROL STANDARDS	INDEX 102-667	SHEET 4 of 6
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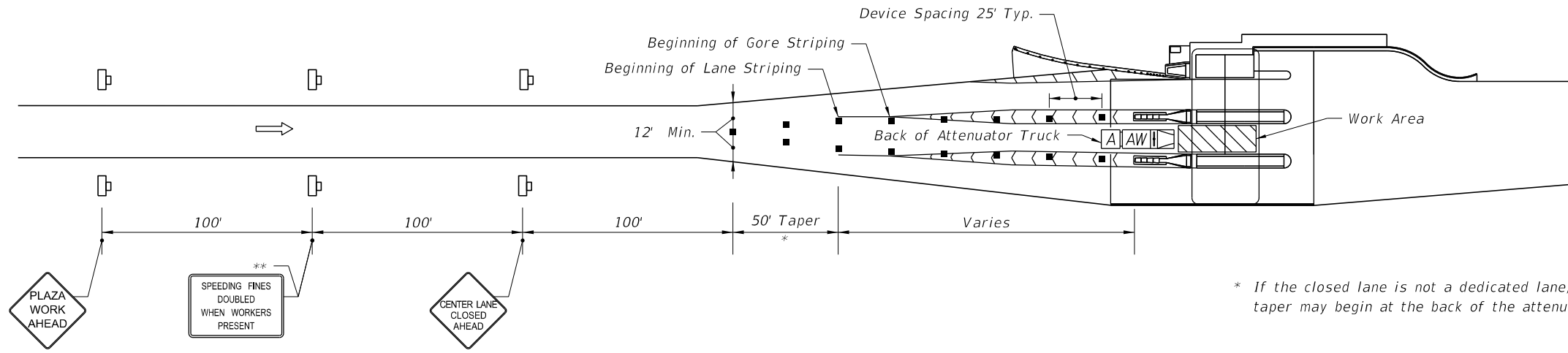


EXHIBIT A
DEDICATED, CASH, OR MIXED-USE LANES IN CENTER - ONE LANE CLOSED
(This same plan can be used for any non-dedicated lane even if they are not in the center of the plaza)

** Install temporary Speeding Fines Doubled sign only if there is not an existing permanent "Speeding Fines Doubled Through Toll Plaza" sign or an existing "Speeding Fines Doubled When Workers Present" sign in place.

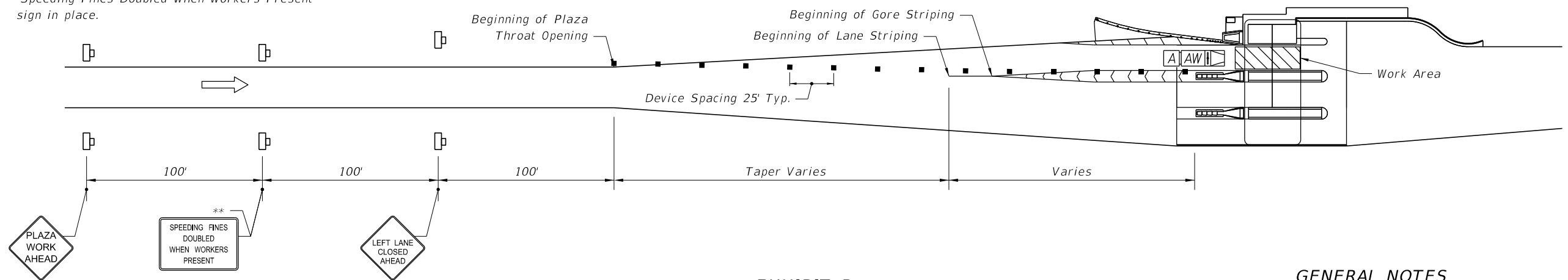


EXHIBIT B
DEDICATED LANE INSIDE OR OUTSIDE - ONE LANE CLOSED
(Outside Lane Closure is a Mirror Image of this Exhibit)

GENERAL NOTES

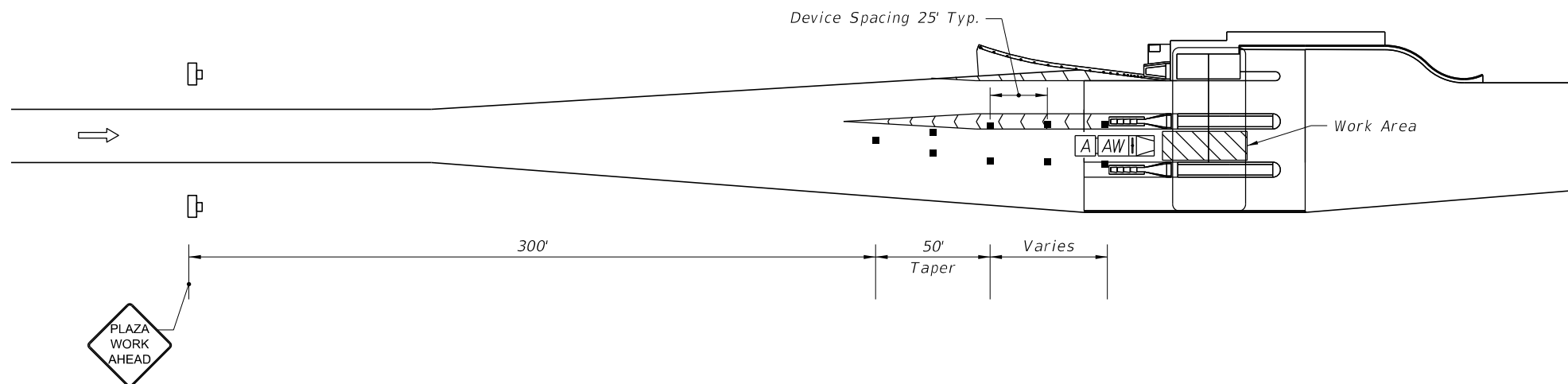
1. This Plan is for lane closures that exceed three hours.
2. If the closed lane is a dedicated lane, Exhibit A shall be used at Ramp Plazas only. If the closed lane is a cash or mixed-use lane, Exhibit A may be used at Ramp or Mainline Plazas.
3. A truck/trailer mounted attenuator is required.
4. Exhibit B shall be used at Ramp Plazas only.
5. Lane use control lights, signs, or signals over toll lanes shall be switched to the appropriate symbol, message, or correct color prior to the start of any lane closure. They should also be switched at project completion.
6. At least 48 hours prior to any closure, other than emergencies, the plaza manager shall be notified for security and staffing.

- SYMBOLS**
- Work Area
 - Channelizing Device (See Index 102-600)
 - Work Zone Sign
 - Lane Identification + Direction of Traffic
 - Advance Warning Vehicle Equipped with Advance Warning Arrow Board and Truck/Trailer Mounted Attenuator

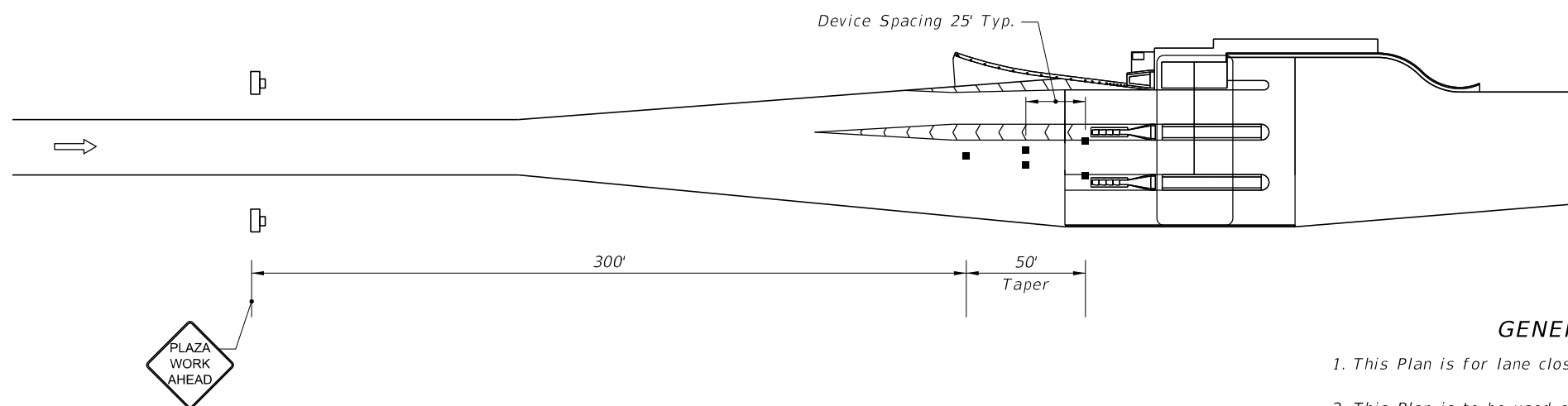
MAINLINE PLAZAS & RAMP PLAZAS

10/30/2018 9:23:41 AM

LAST REVISION 11/01/17	REVISION	DESCRIPTION:		FY 2019-20 STANDARD PLANS	TOLL PLAZA TRAFFIC CONTROL STANDARDS	INDEX 102-667	SHEET 5 of 6
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WORK DONE WITHIN TRAVEL LANE - ONE LANE CLOSED



WORK NOT DONE WITHIN TRAVEL LANE - ONE LANE CLOSED

SYMBOLS


-  Work Area
-  Channelizing Device (See Index 102-600)
-  Work Zone Sign
-  Lane Identification + Direction of Traffic
-  Advance Warning Vehicle Equipped with Advance Warning Arrow Board and Truck/Trailer Mounted Attenuator

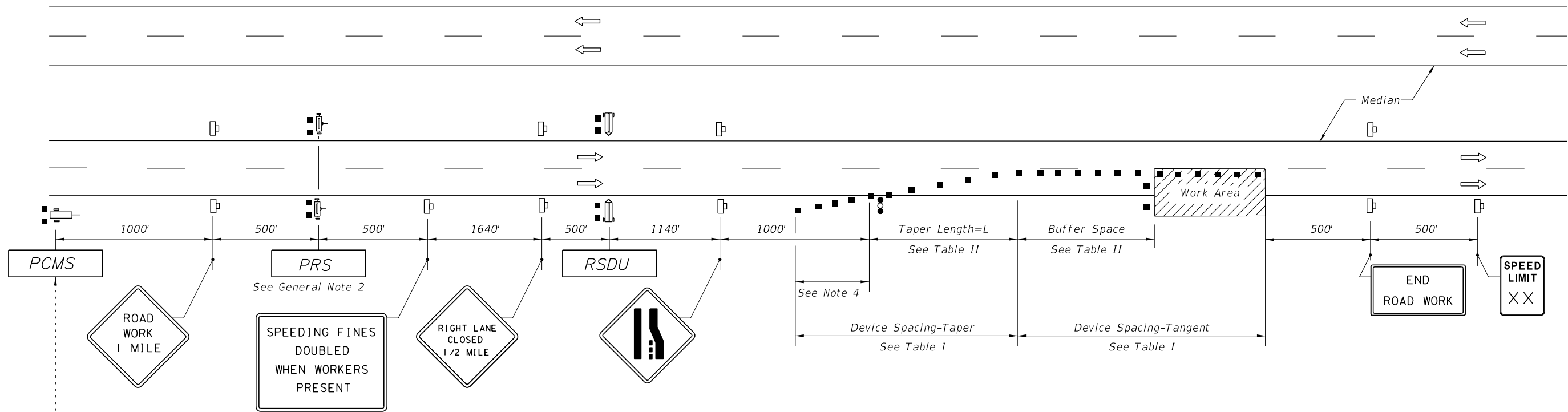
GENERAL NOTES

1. This Plan is for lane closures that are three hours or less.
2. This Plan is to be used at Ramp or Mainline Plazas.
3. This plan can be used for any lane, with appropriate modifications, even if it is not in the center of the Plaza.
4. Lane use control lights, signs, or signals over toll lanes shall be switched to the appropriate symbol, message, or correct color prior to the start of any lane closure. They should also be switched at project completion.
5. At least 48 hours prior to any closure, other than emergencies, the plaza manager shall be notified for security and staffing.
6. A Truck/Trailer Mounted Attenuator is required for all aerial work operations (lift truck). For non-aerial operations, the Truck Mounted Attenuator or additional devices may be required by the Engineer based on the work being performed.

SHORT-TERM CLOSURES

10/30/2018 9:23:45 AM

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TYPICAL PCMS DISPLAY

With speed reduction:
 Message 1: WORKERS PRESENT AHEAD
 Message 2: SPEED REDUCED NEXT XMI

Without speed reduction:
 Message 1: WORKERS PRESENT AHEAD
 Message 2: NEXT X MILES

**Table I
Device Spacing**

Posted 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
55 to 70	25	50	50	100

**Table II
Buffer Space and Taper Length**

Posted Speed (mph)	Buffer Space	Taper Length (12' Lateral Transition)		Notes (Merge)
	Dist. (ft.)	L (ft.)		
55	495	660		L = WS
60	570	720		
65	645	780		
70	730	840		

GENERAL NOTES:

1. Use the MAS for lane closures of 5 day or more on multilane divided facilities with a posted speed of 55 MPH or greater when workers are present and not protected by a barrier.
2. For posted speeds of 65 MPH or greater, reduce Work Zone Speeds by 10 MPH. For posted speeds of 60 MPH, use a Work Zone Speed of 55 MPH.
3. Right lane closure shown, left lane closure similar using left lane signing.
4. Use shoulder taper in accordance with Index 102-612 for shoulder widths 8 feet or greater.
5. See Index 102-600 for general TCZ requirements and additional information.

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

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)

SYMBOLS

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Advance Warning Arrow Board
- Lane Identification + Direction of Traffic
- (1) PCMS= Portable Changeable(Variable) Message Sign
- (2) PRS= Portable Regulatory Sign- Speed Limit When Flashing
- (2) RSDU= Radar Speed Display Unit

10/30/2018 9:23:48 AM