



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 12-01

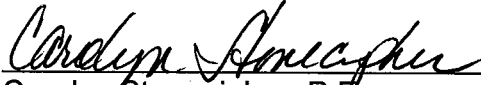
**Regarding Revised Traffic Control Standard Drawings
To Conform 2009 MUTCD**

Effective immediately, the revised Traffic Control Standard Drawings are to be printed with the plans. These drawings shall be identified on the lower left side of the index sheet **"To be printed with plans"** until the drawings are formally distributed.

<u>DRAWING NUMBER</u>	<u>CURRENT REVISION DATE</u>	<u>DESCRIPTION</u>
T-M-1	11-01-2011	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS AND MARKING ABBREVIATIONS
T-M-2	11-01-2011	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS
T-M-4	11-01-2011	STANDARD INTERSECTION PAVEMENT MARKINGS
T-M-5	11-01-2011	MARKING DETAILS FOR EXPRESSWAYS & FREEWAYS
T-M-6	11-01-2011	MARKING DETAIL FOR EXPRESSWAY & FREEWAY INTERCHANGES
T-M-8	11-01-2011	MARKING DETAILS FOR EXPRESSWAYS & FREEWAYS
T-M-9	11-01-2011	PAVEMENT MARKING AND SIGNING DETAILS FOR RAMP INTERSECTIONS
T-M-10	11-01-2011	SIGNING AND PAVEMENT MARKINGS FOR SHARED-USE PATHS
T-M-11	11-01-2011	SIGNING AND PAVEMENT MARKINGS FOR BICYCLE ROUTES ON RURAL ROADS
T-M-12	11-01-2011	SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES ON URBAN ROADWAYS
T-M-14	11-01-2011	SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES AT INTERSECTIONS
T-M-15A	11-01-2011	ASPHALT SHOULDER RUMBLE STRIP INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES
T-M-16	11-01-2011	ASPHALT SHOULDER RUMBLE STRIPE INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES

<u>DRAWING NUMBER</u>	<u>CURRENT REVISION DATE</u>	<u>DESCRIPTION</u>
T-PBR-2	11-01-2011	DETAIL FOR VERTICAL PANELS AND FLEXIBLE DELINEATORS
T-RR-1	11-01-2011	TYPICAL PAVEMENT MARKING AT RAILROAD ACTIVE HIGHWAY GRADE CROSSINGS AND RAILROAD ADVANCE WARNING SIGN
T-RR-2	11-01-2011	STANDARD DRAWING FOR RAILROAD AND HIGHWAY CROSSING SIGNAL WITH GATE
T-RR-3	11-01-2011	RAILROAD-HIGHWAY CROSSING SIGNAL WITH CANTILEVER SIGN
T-RR-4	11-01-2011	STANDARD DRAWING FOR TYPICAL CURB & GUTTER PLAN FOR RAILROAD-HIGHWAY CROSSING WITH OR WITHOUT GATES
T-RR-5	11-01-2011	STANDARD DRAWING FOR RAILROAD-HIGHWAY CROSSING SIGNAL TYPICAL CANTILEVER SIGN
T-S-9	11-01-2011	STANDARD LAYOUT GROUND MOUNTED SIGNS
T-S-16	11-01-2011	GROUND MOUNTED ROADSIDE SIGN AND DETAILS
T-S-16A	11-01-2011	GROUND MOUNTED ROADSIDE SIGN PLACEMENT DETAILS
T-S-20	11-01-2011	SIGN DETAILS
T-SG-1	11-01-2011	WOOD POLE, DETAILS FOR SPAN MOUNTED SIGNALS
T-SG-7	11-01-2011	SIGNAL HEAD ASSEMBLIES AND PEDESTRIAN PUSH BUTTON SIGNS
T-SG-7A	11-01-2011	TYPICAL SIGNAL HEAD PLACEMENT
T-SG-8	11-01-2011	STRAIN POLE DETAILS FOR SPAN MOUNTED SIGNALS
T-SG-12	11-01-2011	TYPICAL WIRING FOR SIGNAL HEADS AND DETECTION LOOPS

Copies of the revised standard drawings are attached.


Carolyn Stonecipher, P.E.,
Civil Engineering Director
Design Division

January 18, 2012
CS:ARH
Attachment

REV. 2-22-88: ADDED EDGE LINES, CHANGED DIMENSIONS AND MARKING DETAILS. CHANGED DIMENSIONS FROM 1'-4" TO 1'-0" AND 1'-0" TO 1'-4". CHANGED RAISED PAVEMENT MARKERS TO ADDED MARKING ABBREVIATIONS.

REV. 3-20-91: REDREW SHEET. CHANGED DIMENSIONS AND MARKING DETAILS (CLEARLY TO NON-DIRECTIONAL PAVEMENT MARKERS). CHANGED TYPE 1 MARKERS TO TYPE 2 MARKERS. BI-DIRECTIONAL MARKERS (YELLOW).

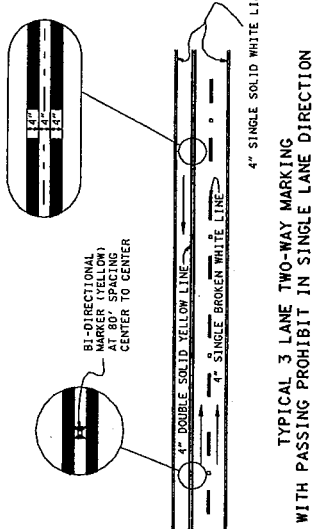
REV. 10-26-92: ADDED GENERAL NOTE C. CHANGED DIMENSIONS AND MARKING BETWEEN EDGE LINE PAVEMENT MARKING AND EDGE LINE FROM 4" TO 2".

REV. 4-15-94: CHANGED SPACING BETWEEN DOUBLE LEFT TURN ARROWS TO COMPLY WITH 2003 AASHTO.

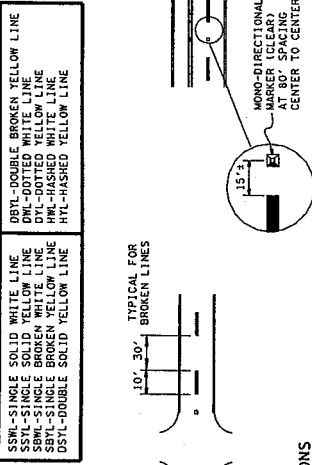
REV. 11-1-11: UPDATED TYPICAL MARKING DETAILS TO REFLECT CURRENT MUTED STANDARD DETAILS.

MARKING ABBREVIATIONS

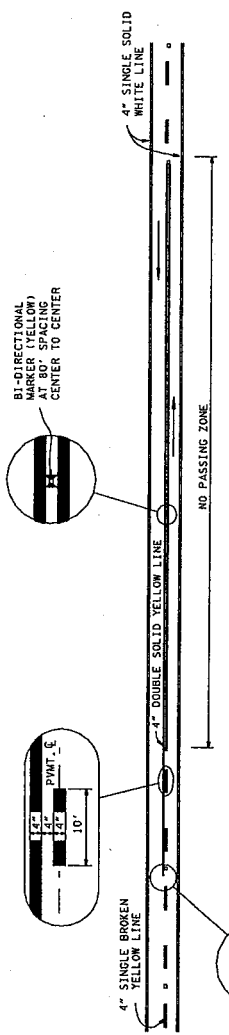
SSWL-SINGLE SOLID WHITE LINE	DBYL-DOUBLE BROKEN YELLOW LINE
SSYL-SINGLE SOLID YELLOW LINE	DWLD-DOTTED WHITE LINE
SBWL-SINGLE BROKEN WHITE LINE	DWLD-DOTTED YELLOW LINE
SBYL-SINGLE BROKEN YELLOW LINE	HYL-HASHED YELLOW LINE
DSYL-DOUBLE SOLID YELLOW LINE	



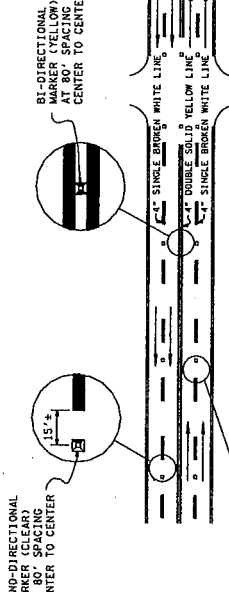
TYPICAL 3 LANE TWO-WAY MARKING WITH PASSING PROHIBIT IN SINGLE LANE DIRECTION



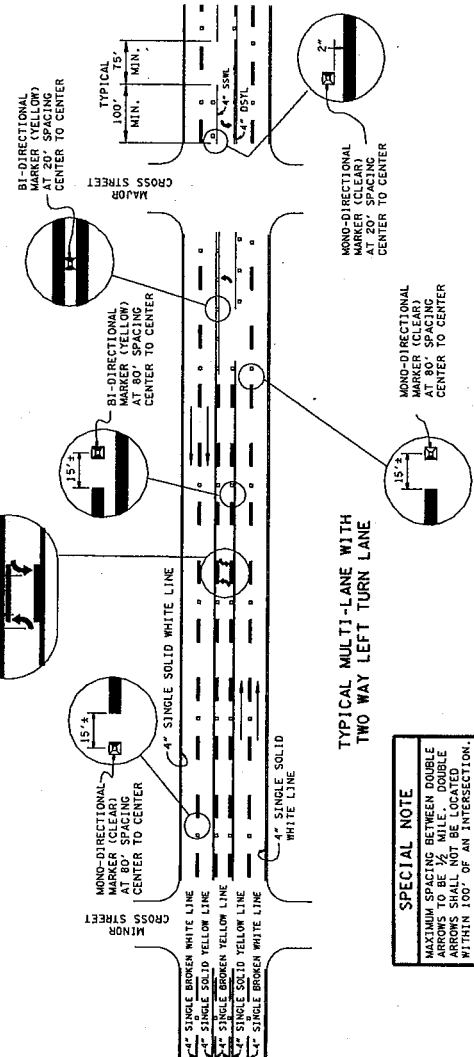
TYPICAL TWO-LANE, TWO WAY MARKING WITH PASSING PERMITTED IN BOTH DIRECTIONS



TYPICAL TWO-LANE, TWO WAY MARKING WITH NO PASSING ZONES



TYPICAL MULTI-LANE, TWO-WAY MARKING



TYPICAL TWO-LANE WITH SINGLE LANE LEFT TURN CHANNELIZATION LANE

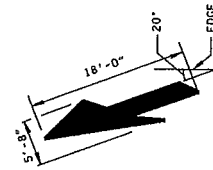
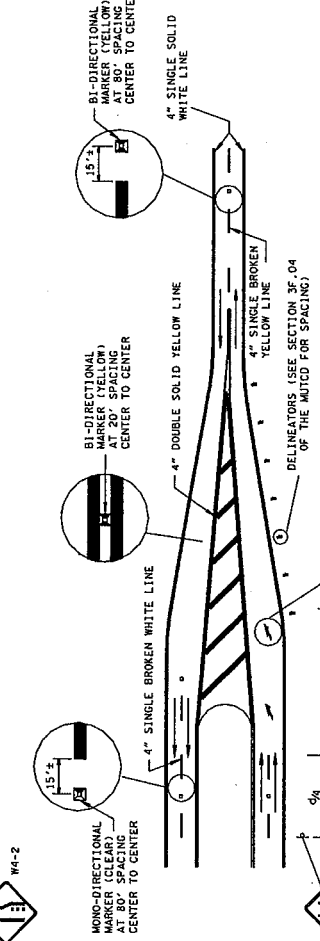
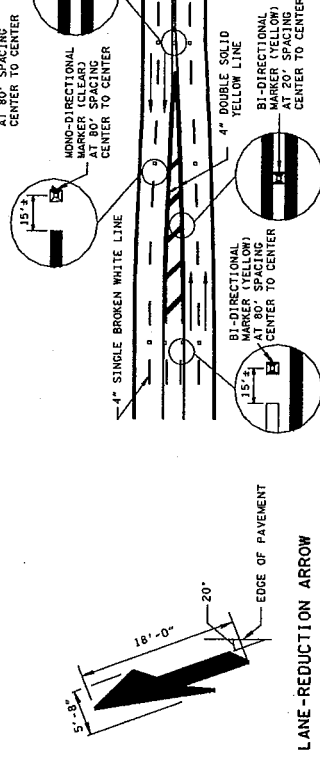
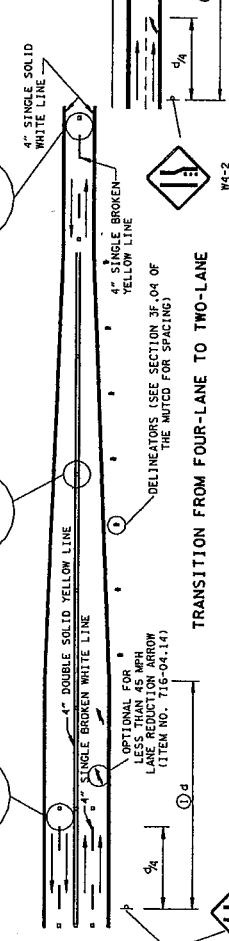
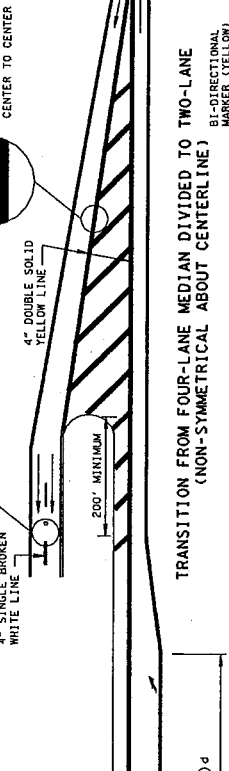
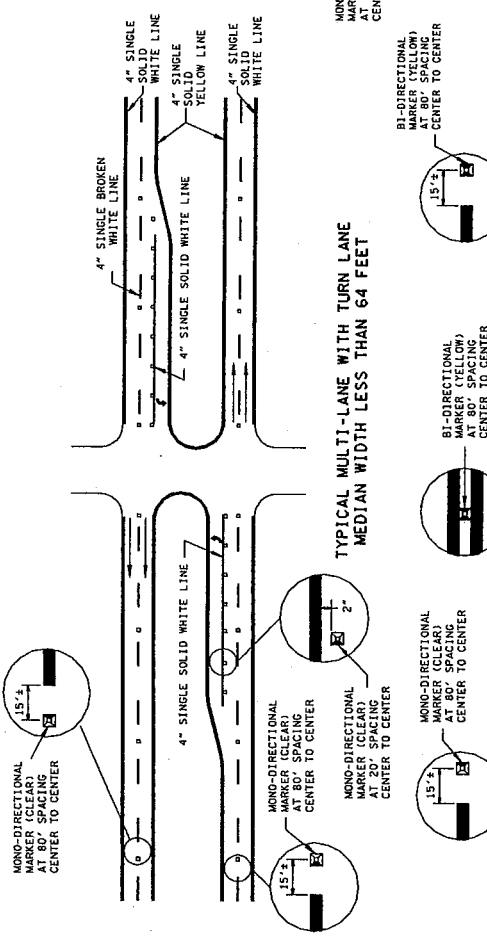
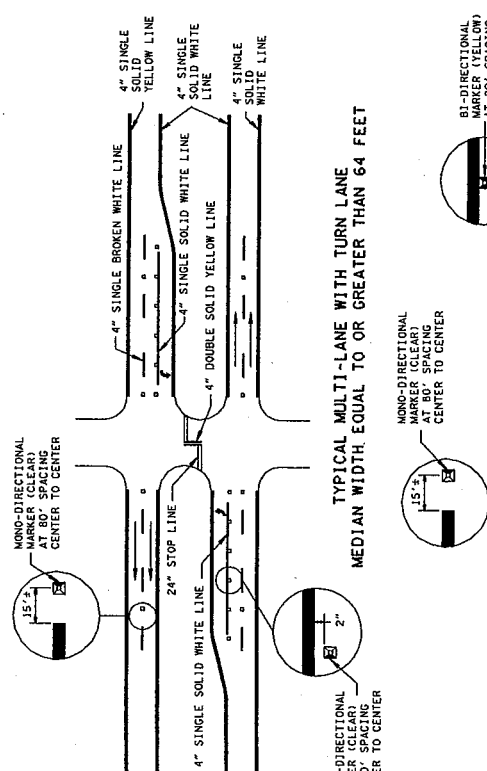
SPECIAL NOTE
MAXIMUM SPACING BETWEEN DOUBLE ARROWS TO BE 1/2 MILE. DOUBLE ARROWS TO BE PLACED WITHIN 100' OF AN INTERSECTION.

GENERAL NOTES
A. EDGE LINES ARE NOT REQUIRED FOR PAVEMENT WIDTH LESS THAN 16 FEET ON CURB AND GUTTER SECTIONS UNLESS SPECIFIED IN PLANS.
B. SEE STANDARD DRAWING NOS. T-3-M-3 AND T-3-M-4 FOR CHANNELIZATION MARKING AND INTERSECTION MARKING DETAILS.
C. PAVEMENT MARKERS ARE REQUIRED ONLY WHEN SPECIFIED IN THE PLANS.

MINOR REVISION -- FIRM APPROVAL NOT REQUIRED.
STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

DETAILS OF PAVEMENT MARKING FOR CONVENTIONAL ROADS AND MARKING ABBREVIATIONS

- REV. 7-25-81: ADDED REVISION LINES, NOTES, AND DETAILS FOR TRANSITION MARKING. SEE DRAWING NO. T-4-2 TO T-4-2 TO T-4-2. ADDED DETAILS ON RIGHT OF SHEET.
- REV. 7-25-81: ADDED REVISION LINES, NOTES, AND DETAILS FOR TRANSITION MARKING. SEE DRAWING NO. T-4-2 TO T-4-2 TO T-4-2. ADDED DETAILS ON RIGHT OF SHEET.
- REV. 10-26-82: ADDED GENERAL NOTE.
- REV. 12-18-83: ADDED GENERAL NOTE.
- REV. 1-19-84: CHANGED WIDTH CRITERION FOR MEDIAN WIDTHS LESS THAN 44 FEET.
- REV. 1-19-84: CHANGED WIDTH CRITERION FOR MEDIAN WIDTH FROM 44 FEET TO 64 FEET.
- REV. 1-19-84: CHANGED W-2 SIGNS AND FOOTNOTES TO COMPLY WITH 2003 MUTCD.
- REV. 3-5-04: CHANGED W-2 SIGN TO COMPLY WITH 2003 MUTCD.
- REV. 11-11-11: ADDED DELINEATORS WITH NOTE AND LANE REDUCTION ARROWS WITH NOTE. ADDED PAT ITEM NO. 15-2 AND GENERAL NOTE.



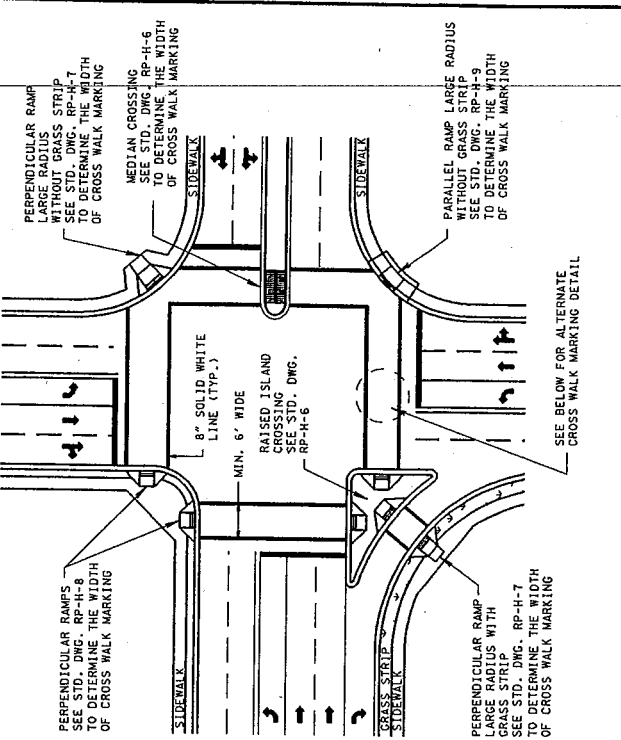
GENERAL NOTES

- EDGE LINES ARE NOT REQUIRED FOR PAVEMENT WIDTHS LESS THAN 16 FEET OR ON CURB AND GUTTER SECTIONS UNLESS SPECIFIED IN PLANS.
- SEE STANDARD DRAWING NOS. T-4-3 AND T-4-4 FOR CHANNELIZATION MARKING AND INTERSECTION MARKING DETAILS.
- PAVEMENT MARKERS ARE REQUIRED ONLY WHEN SPECIFIED IN THE PLANS.
- SEE STD. DWG. T-5-11 FOR DETAILS OF DELINEATORS.

FOOTNOTE

- SEE TABLE 2C-4 OF PART 2 OF THE MANUAL ON UNIFORM TRAFFIC DEVICES (MUTCD) FOR GUIDELINES FOR ADVANCE PLACEMENT OF WARNING SIGNS DISTANCE d.

- REV. 2-15-07: REVISED TO REFER TO THE MARKING AND TO DETERMINE THE MINIMUM WIDTH OF CROSS WALK MARKINGS.
- REV. 6-1-09: TYPICAL STOP LINE PLACEMENT NOTE REVISED.
- REV. 11-1-11: REVISED PAVEMENT MARKINGS FOR LEFT TURN DETAILS.
- REV. 2-22-08: REVISED DETAIL LEFT TURN LANE MARKING. ADDED NOTE FOR STOP LINE TO DETERMINE THE MINIMUM WIDTH OF NOTED LONGITUDINAL CROSS-WALK LINES TO BE WHITE. CHANGED LINES TO BE WHITE. ADDED DETAIL FOR DOUBLE LEFT TURN LANE.
- REV. 5-20-01: REDREW AND REORGANIZED SHEET. ADDED PAY ITEMS AND THEIR DESCRIPTIONS, DESCRIPTION IN ITEM NO. 716-02.05.
- REV. 3-5-01: CHANGED DESCRIPTION IN ITEM NO. 716-02.05.
- REV. 1-19-05: CHANGED HANDICAP MARKING ON CROSSWALK MARKING DETAILS.



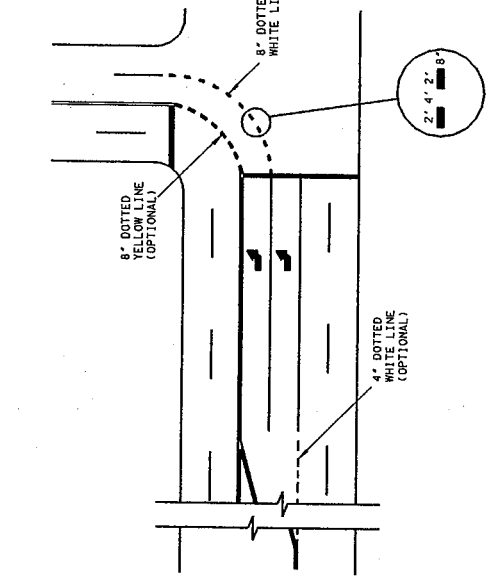
TYPICAL PLAN VIEW OF STANDARD CROSS WALK MARKING

STANDARD CROSS-WALK MARKING SHALL BE PAID FOR UNDER ITEM NO. 716-02.03. PLASTIC PAVEMENT MARKING (CROSS-WALK) PER LINEAR FOOT.



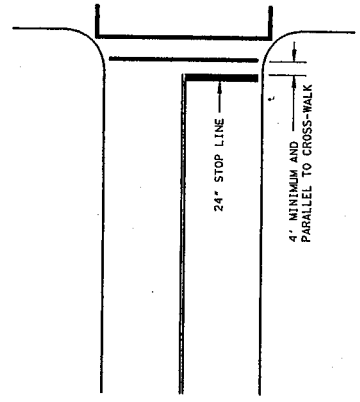
2' WHITE STRIPES SPACED 24" EDGE TO EDGE

<input type="checkbox"/> MINOR REVISION -- FINA APPROVAL NOT REQUIRED.
STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION
STANDARD INTERSECTION PAVEMENT MARKINGS
T-M-4



LEFT TURN ARROWS SHALL BE PAID FOR UNDER ITEM NO. 716-02.06. PLASTIC PAVEMENT MARKING (TURN LANE ARROWS) PER EACH. EIGHT INCH DOTTED WHITE LINE SHALL BE PAID FOR UNDER ITEM NO. 716-02.08. PLASTIC PAVEMENT MARKING (8\"/>

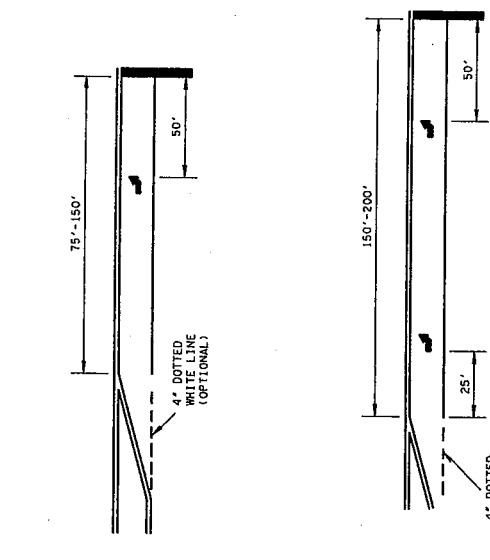
TYPICAL MARKING FOR DOUBLE LEFT TURN LANES



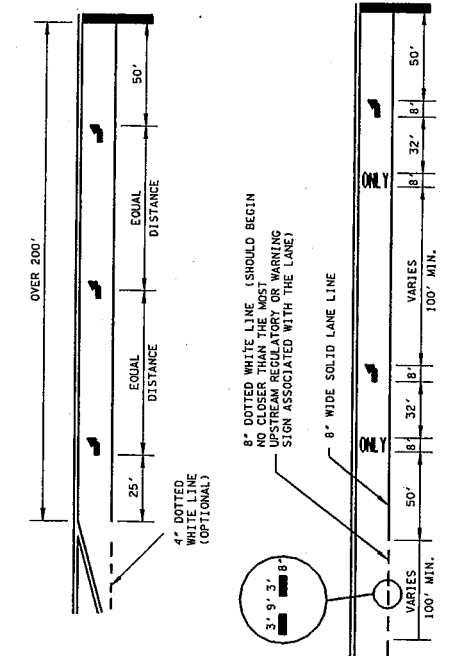
IF CROSS-WALKS ARE NOT USED, STOP LINE SHALL BE NOT MORE THAN 30 FEET NOR LESS THAN 4' FROM NEAREST EDGE OF INTERSECTING TRAVELED WAY.

LOCATION SHALL BE DETERMINED BY VEHICLE TURNING PATHS FROM THE INTERSECTING ROADWAY, AND IF SIGNALIZED, ITS POSITION RELATIVE TO SIGNAL HEADS. PER MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. STOP LINES SHALL BE PAID FOR UNDER ITEM NO. 716-02.05. PLASTIC PAVEMENT MARKING (STOP LINE) PER LINEAR FOOT.

TYPICAL STOP LINE PLACEMENT



IF A THROUGH LANE BECOMES AN EXCLUSIVE LEFT TURN LANE, AN \"ONLY\" MESSAGE IS REQUIRED FOR EACH ARROW. THE \"ONLY\" MESSAGE SHALL BE PAID FOR UNDER ITEM NO. 716-03.01. PLASTIC WORD PAVEMENT MARKING (ONLY) PER EACH.



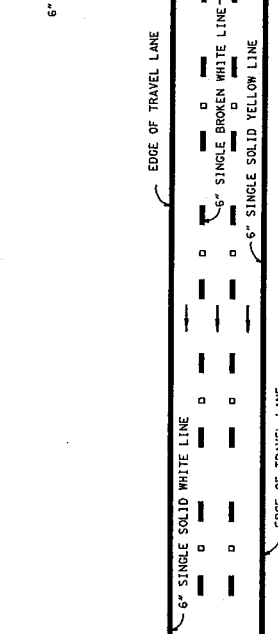
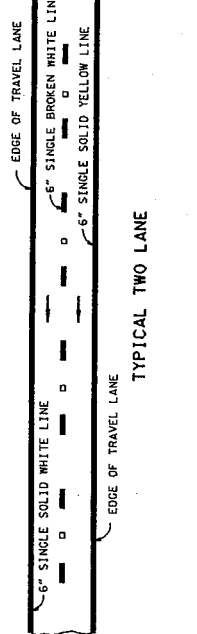
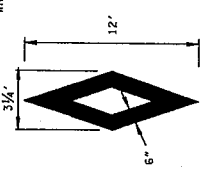
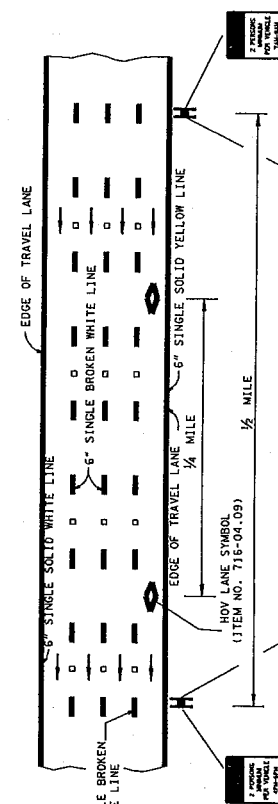
IF A THROUGH LANE BECOMES AN EXCLUSIVE LEFT TURN LANE, AN \"ONLY\" MESSAGE IS REQUIRED FOR EACH ARROW. THE \"ONLY\" MESSAGE SHALL BE PAID FOR UNDER ITEM NO. 716-03.01. PLASTIC WORD PAVEMENT MARKING (ONLY) PER EACH.

TYPICAL MARKING FOR LEFT TURN LANES
ALSO APPLICABLE FOR RIGHT TURN LANES

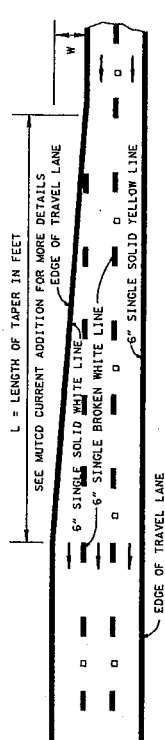
NOTE: STOP LINES REQUIRED ONLY ON APPROACHES CONTROLLED BY STOP SIGNS OR TRAFFIC SIGNALS.

CROSS-WALK MARKING WITH LONGITUDINAL LINES

- REV. 2-22-88: REVISED TO SHOW RAISED REFLECTIVE PAVEMENT MARKERS CENTERED BETWEEN BREAKS DURING NO. FROM T-4-2 TO T-4-5.
- REV. 3-20-91: REBREW SHEET CHANGED TYPE 2 PAVEMENT MARKERS (CLEAR) TO NON-DIRECTIONAL PAVEMENT MARKERS (CLEAR).
- REV. 10-26-92: ADDED GENERAL NOTE ①.
- REV. 7-29-98: CHANGED WIDTH OF HOV LANE SYMBOL FROM 12" TO 6" AND DOTTED WHITE LINES FROM 4" TO 6" INCHES.
- REV. 4-15-04: CHANGED W4-2 SIGNS AND TRANSITION NOTE IN LOWER RIGHT CORNER TO COMPLY WITH 2003 MUTCD.
- REV. 9-5-04: IN TYPICAL SHOWING OF ADDITIONAL LANE CHANGE NOTE ①.
- REV. 11-11-11: ADDED HOV SIGNS AND PAVEMENT MARKING DETAILS. ADDED LANE REDUCTION ARROWS. REVISED PAVEMENT MARKING TYPICAL DETAILS.



TYPICAL FOR HOV LANE
(FOR MORE DETAILS SEE MUTCD CURRENT EDITION)



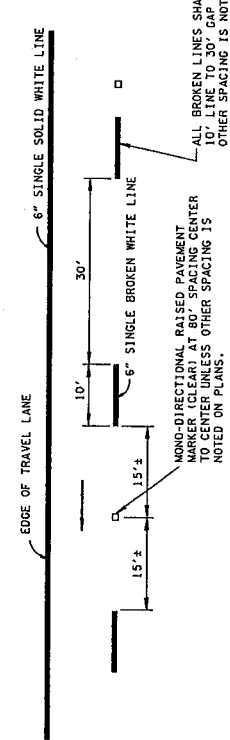
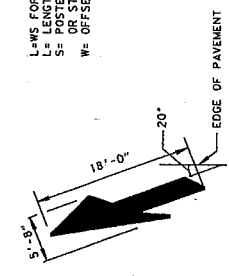
TYPICAL SHOWING
BEGINNING OF ADDITIONAL LANE

DELINEATORS (SEE SECTION 3E 04 OF THE MUTCD FOR SPACING)

L = LENGTH OF TAPER IN FEET

W = WIDTH OF TAPER IN FEET

S = OFFSET IN FEET



NON-DIRECTIONAL RAISED PAVEMENT MARKERS SHALL BE SPACING CENTER TO CENTER UNLESS OTHER SPACING IS NOTED ON PLANS.

ALL BROKEN LINES SHALL HAVE A 10' LINE TO 30' GAP RATIO UNLESS OTHER SPACING IS NOTED ON PLANS.

SPACING DETAILS

① SEE TABLE 2C-4 (GUIDELINES FOR SPACING) FOR MORE DETAILS OF MARKING SIGNS IN MUTCD FOR d

L = LENGTH OF TAPER IN FEET

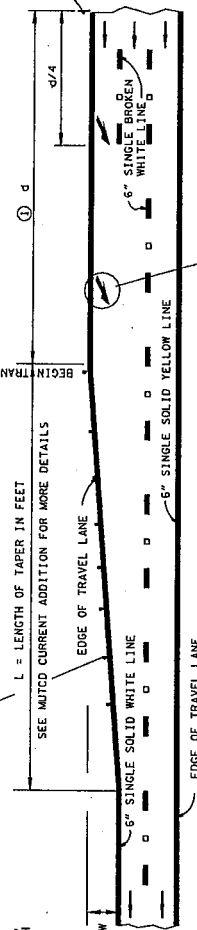
SEE MUTCD CURRENT ADDITION FOR MORE DETAILS

EDGE OF TRAVEL LANE

6" SINGLE SOLID WHITE LINE

6" SINGLE SOLID YELLOW LINE

EDGE OF TRAVEL LANE



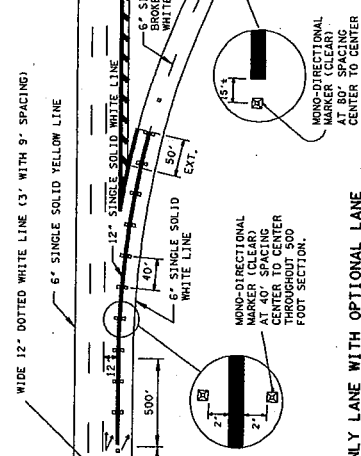
LANE REDUCTION ARROWS
(ITEM NO. 716-04.14)

TYPICAL LANE REDUCTION TRANSITION

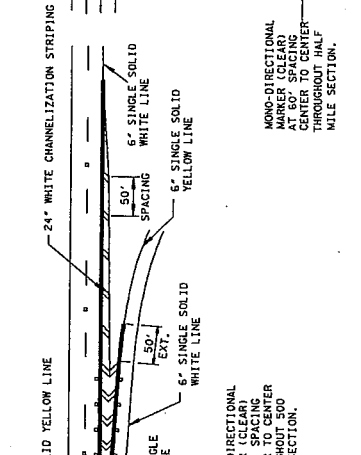
MINOR REVISION - FHWA APPROVAL NOT REQUIRED.
STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION
MARKING DETAILS FOR EXPRESSWAYS & FREEWAYS
T-M-5

REV. 2-22-88: ADDED
 DETAIL FOR TEXT ONLY.
 MARKING. CHANGED SHEET
 ACCELERATION LANE
 FROM T-4-3 TO T-4-6.
 REV. 1-12-84: ADDED
 DETAILS FOR TWO LANE
 EXIT AND PARALLEL
 LINES AT EXIT RAMP.
 REV. 10-20-82: SCHEDULE
 CHANGED WIDTH OF EXIT
 PAYMENT APPROX TO 12'.
 REV. 2-20-81: ADDED
 MONO-DIRECTIONAL MARKER
 ONLY LANE DETAIL AND THE
 LANE EXIT WITH OPTIONAL
 GENERAL NOTES. CHANGED
 REMAINDER OF SHEET
 MONO-DIRECTIONAL MARKER
 MONO-DIRECTIONAL
 PAYMENT MARKERS (CLEAR).
 REV. 10-25-82: ADDED
 GENERAL NOTE @
 REV. 12-18-82: MOVED
 MONO-DIRECTIONAL MARKER
 INSIDE OF CHANNELIZATION
 MARKING TO OUTSIDE OF
 CHANNELIZATION MARKING.
 REV. 1-19-84: IN DETAIL
 MONO-DIRECTIONAL MARKER
 RAMP AND AND PAYMENT
 MARKERS.
 REV. 2-22-88: CHANGED
 EDGE LINES AND NOTES.
 WHITE LANE LINES FROM
 USE OF DOTTED WHITE LANE
 LINES IN PARALLEL AND
 ACCELERATION DETAILS AND
 BROKEN WHITE LINE TO
 PARALLEL ACCELERATION
 LANE.
 REV. 11-11-81: REVISED
 DETAIL FOR PARALLEL
 EXIT ONLY LANE DETAIL
 EXIT ONLY WITH OPTIONAL
 AND PARALLEL ACCELERATION
 LANE DETAIL
 GENERAL NOTE @

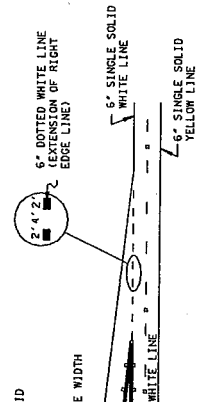
MINOR REVISION -- FIRM
 APPROVAL NOT REQUIRED.
 STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 MARKING DETAIL
 FOR
 EXPRESSWAY & FREEWAY
 INTERCHANGES
 T-M-6



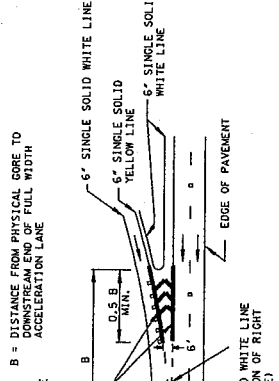
EXIT ONLY LANE WITH OPTIONAL LANE



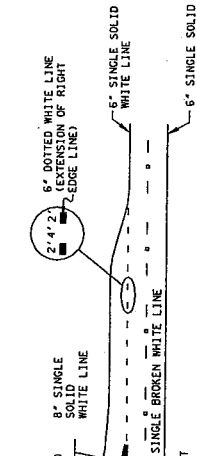
EXIT ONLY LANE



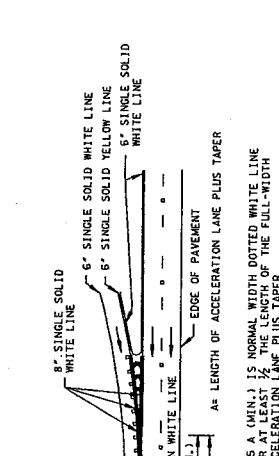
TAPERED DECELERATION LANE
 EXIT RAMP



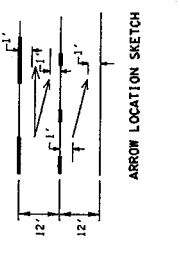
TAPERED ACCELERATION LANE
 ENTRANCE RAMP



PARALLEL DECELERATION LANE



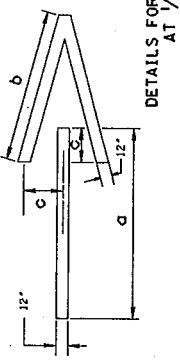
PARALLEL ACCELERATION LANE



ARROW LOCATION SKETCH

ARROW	DIMENSIONS		
	a	b	c
1	14'-0"	8'-6"	2'-2"
2	10'-4"	8'-6"	2'-2"
3	18'-6"	10'-0"	2'-6"

DETAILS FOR EXIT PAYMENT ARROWS
 AT 1/4 MILE SPACING



GENERAL NOTES
 SEE STANDARD DRAWING NO. T-M-T FOR CORE MARKING
 DETAILS.

REV. 2-10-88: CHANNELIZED WIDTH OF SOLID YELLOW AND WHITE LINES ON SHOULDER OF "NARROW BRIDGE" DETAIL STRIPPED AWAY. CHANNELIZED WIDTH OF SOLID WHITE LINE AT 20' SPACING ADDED. LANE WIDTHS REVISED RAISED LOCATIONS TO CENTERED BETWEEN BROKEN LINES AND CHANNELIZATION MARKERS. CHANNELIZATION CHANGED DRAWING NO. FROM T-4-5 TO T-4-8.

REV. 3-20-91: RENEW SHEET. CHANGED TO 1/2" PAVEMENT MONO-DIRECTIONAL MARKING MARKERS (CLEAR). REDUCED CHANNELIZATION MARKING TO 1/2" DETAIL AND MODIFIED SPACING SLIGHTLY.

REV. 10-26-92: ADDED GENERAL NOTE

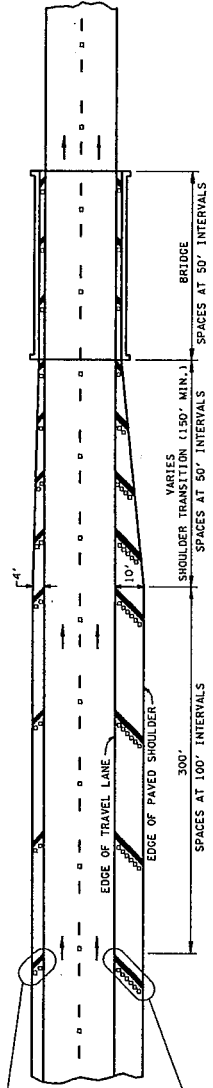
REV. 12-18-92: MOVED MONO-DIRECTIONAL MARKERS (CLEAR) FROM INSIDE OF CHANNELIZATION MARKING TO OUTSIDE OF CHANNELIZATION MARKING.

REV. 7-29-98: CHANGED WIDTH OF SOLID WHITE LINES FROM 4 TO 6 INCHES.

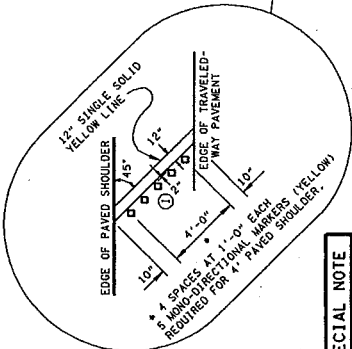
REV. 10-10-98: 24" SINGLE SOLID WHITE LINE BOUNDARY TO BE PAID FOR UNDER ITEM NO. 716-02.07, WHICH BARRIER LINE PER LINEAR FOOT.

REV. 11-11-11: REVISED TYPICAL CORE DETAILS FOR SPLITS.

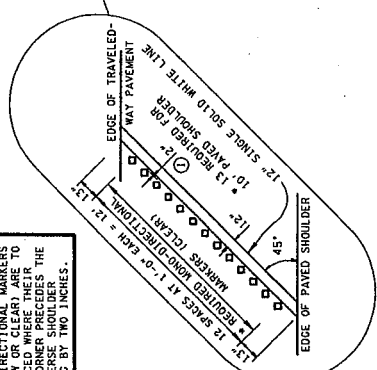
GENERAL NOTE
 (A) PAVEMENT MARKERS ARE REQUIRED ONLY WHEN SPECIFIED IN THE PLANS.



DETAILS DELINEATING NARROW BRIDGES
 TO BE USED ON ALL BRIDGES WITH LESS THAN A FULL SHOULDER



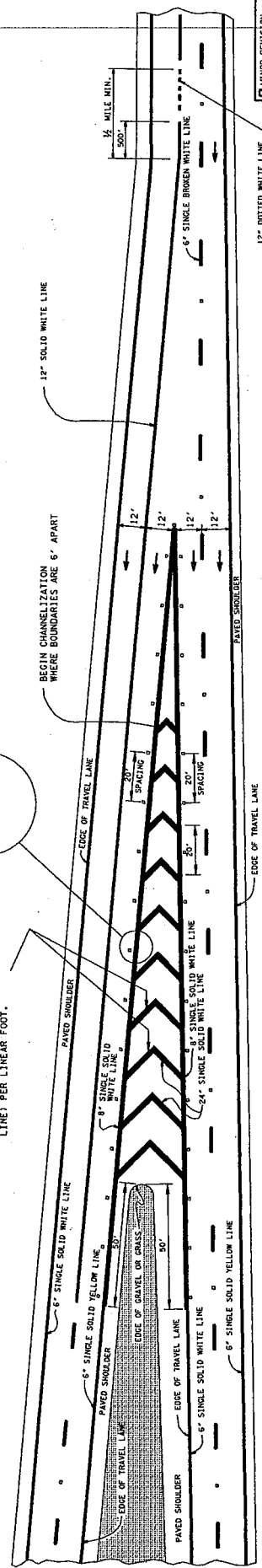
① SPECIAL NOTE
 MONO-DIRECTIONAL MARKERS (YELLOW OR CLEAR) ARE TO BE PLACED WHERE THEIR BACK CORNER PRECEDES THE MARKING BY TWO INCHES.



24" SINGLE SOLID WHITE LINE BOUNDARY TO BE PAID FOR UNDER ITEM NO. 716-02.07, PLASTIC PAVEMENT MARKING (24" INCH BARRIER LINE) PER LINEAR FOOT.

MONO-DIRECTIONAL MARKER (CLEAR) AT 20' SPACING CENTER TO CENTER

BEGIN CHANNELIZATION WHERE BOUNDARIES ARE 6' APART



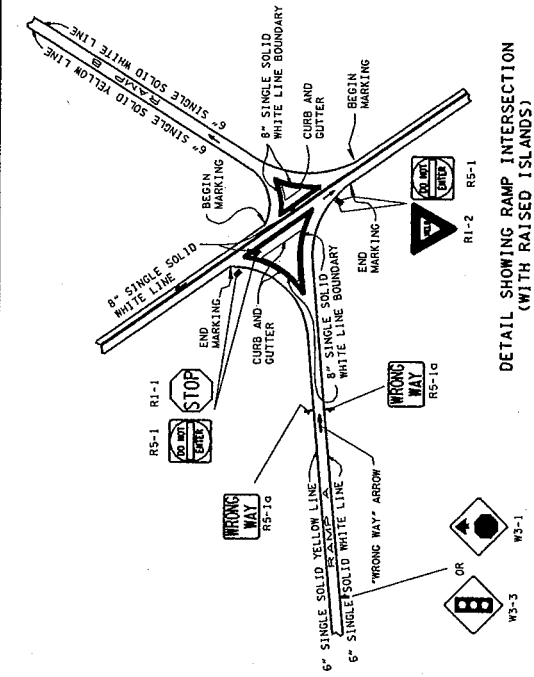
TYPICAL CORE DETAILS FOR SPLITS

12" DOTTED WHITE LINE (3" LENGTH, 9" SPACING)

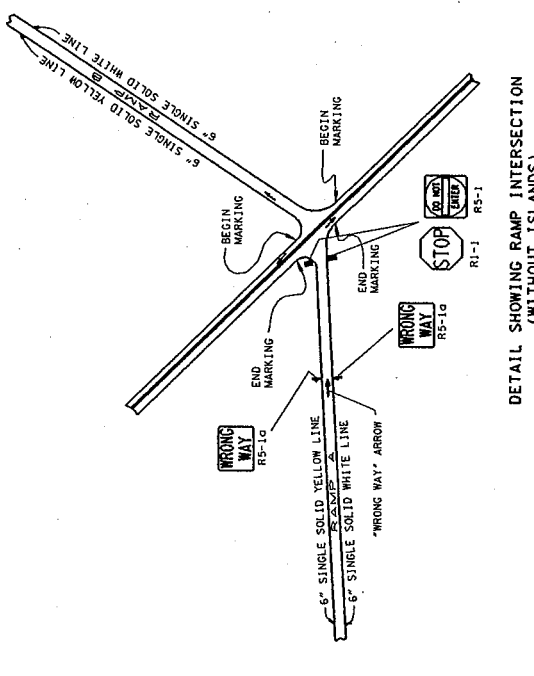
1/4" MILE MIN. 500'

MINOR REVISION - FHWA APPROVAL NOT REQUIRED.

- REV. 3-22-85: REVISED TO SHOW 8" BOUNDARY AROUND ISLANDS.
- REV. 2-22-88: ADDED REFERENCE NOTE FOR DMC, NO. T-M-3, CHANGED DMC, NO. FROM T-4-6 TO T-4-5.
- REV. 7-15-91: REDREW AND REORGANIZED SHEET.
- REV. 7-25-91: CHANGED WIDTH OF CHANNELIZATION MARKINGS TO 4 TO 6 INCHES.
- REV. 12-12-00: MOVED WRONG WAY PAVEMENT ARROW DETAILS FROM STD. DWG. NO. T-5-11 TO THIS PLAN VIEW. ADDED GENERAL NOTE.
- REV. 11-30-04: CHANGED WRONG WAY DESIGNATION FROM RS-9 TO RS-10.
- REV. 11-3-11: ADDED ADDITIONAL SIGN TO RAMP INTERSECTION DETAIL.

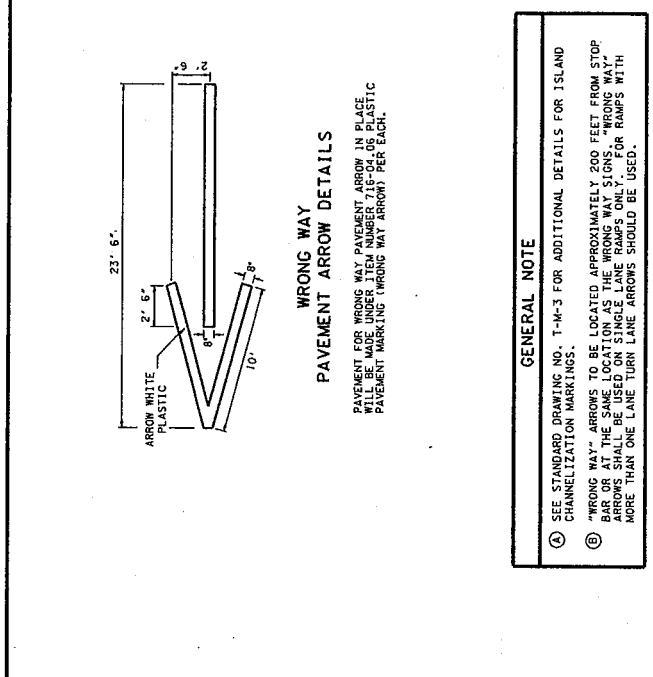


DETAIL SHOWING RAMP INTERSECTION (WITH RAISED ISLANDS)



DETAIL SHOWING RAMP INTERSECTION (WITHOUT ISLANDS)

<input type="checkbox"/> UNLESS NOTED OTHERWISE, APPROVAL NOT REQUIRED.
STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION
PAVEMENT MARKING AND SIGNING DETAILS FOR RAMP INTERSECTIONS
T-M-9



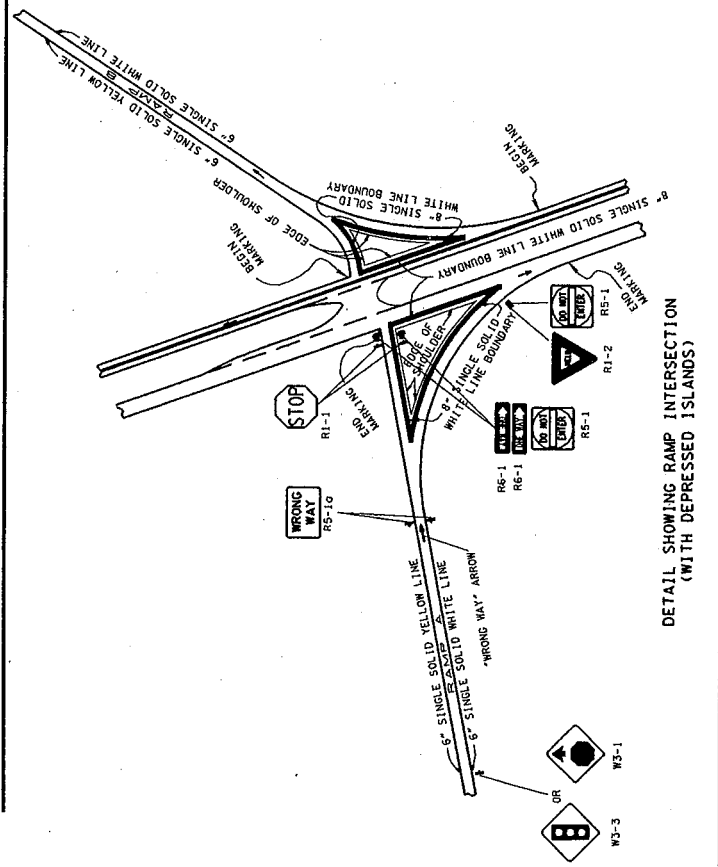
WRONG WAY PAVEMENT ARROW DETAILS

PAVEMENT FOR WRONG WAY PAVEMENT ARROW IN PLACE WILL BE MADE UNDER ITEM NUMBER 716-04-05 PLASTIC PAVEMENT MARKING (WRONG WAY ARROW) PER EACH.

GENERAL NOTE

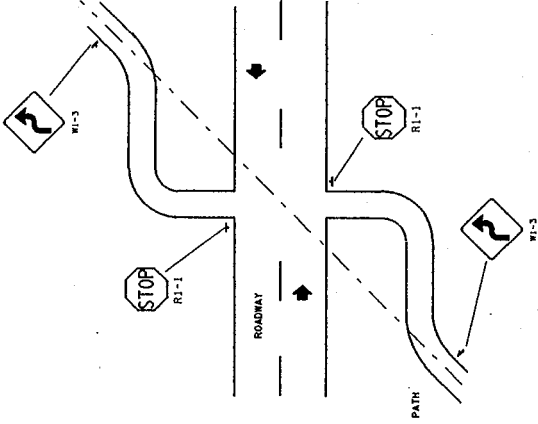
SEE STANDARD DRAWING NO. T-M-3 FOR ADDITIONAL DETAILS FOR ISLAND CHANNELIZATION MARKINGS.

"WRONG WAY" ARROWS TO BE LOCATED APPROXIMATELY 200 FEET FROM STOP BAR OR AT THE SAME LOCATION AS THE WRONG WAY SIGN. "WRONG WAY" ARROWS TO BE PLACED IN SINGLE LANE RAMP ONLY. FOR RAMPS WITH MORE THAN ONE LANE TURN LANE ARROWS SHOULD BE USED.



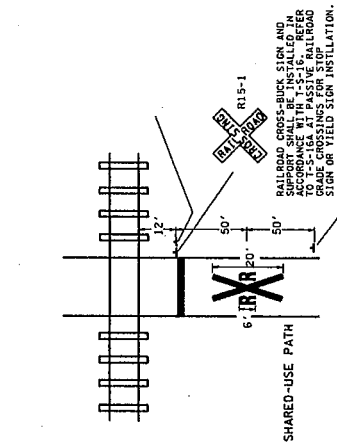
DETAIL SHOWING RAMP INTERSECTION (WITH DEPRESSED ISLANDS)

REV. 11-1-11. REVISED OVERHEAD SIGN DETAIL. DELETED NOTE (C) D11-1 AND M-6. DELETED SIGN M-4 AND M-6. DELETED SIGN M-12 AND M-11 AND M-5. REASSIGNED NOTE (C) AND ADDED GENERAL NOTE (C).

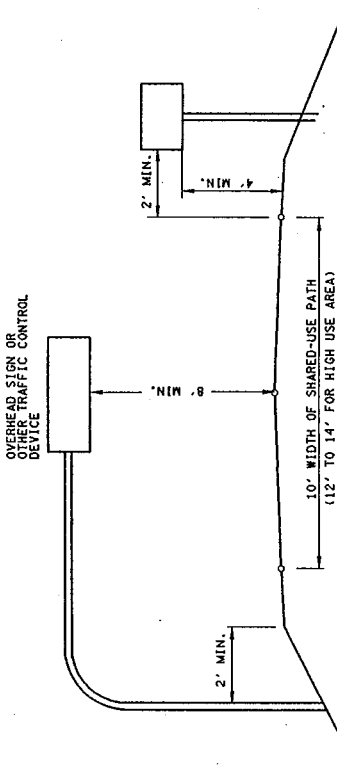


TYPICAL REDESIGN OF A DIAGONAL ROAD CROSSING

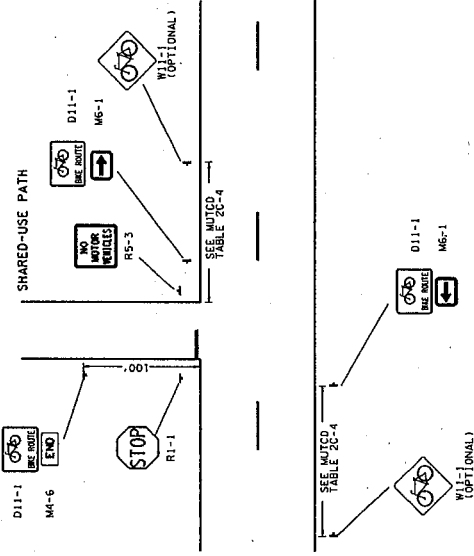
- GENERAL NOTES**
- WHEN OVERHEAD SIGNS ARE USED ON SHARED-USE PATHS, THE CLEARANCE FROM THE BOTTOM EDGE OF THE SIGN TO THE PATH SURFACE DIRECTLY UNDER THE SIGN SHALL BE A MINIMUM OF 8 FEET.
 - WHEN PLACEMENT OF STOP OR YIELD SIGNS IS CONSIDERED, PRIORITY AT A CROSSING SHALL BE DETERMINED BY THE FOLLOWING: (1) THE PRESENCE OF A TRAFFIC CONTROL SIGNAL; (2) RELATIVE VOLUMES OF SHARED-USE PATH AND ROADWAY USERS; (3) RELATIVE IMPORTANCE OF SHARED-USE PATH AND ROADWAY. WHEN PLACEMENT OF STOP OR YIELD SIGNS IS CONSIDERED, PRIORITY AT A CROSSING SHALL BE DETERMINED BY THE FOLLOWING: (1) THE PRESENCE OF A TRAFFIC CONTROL SIGNAL; (2) RELATIVE VOLUMES OF SHARED-USE PATH AND ROADWAY USERS; (3) RELATIVE IMPORTANCE OF SHARED-USE PATH AND ROADWAY. WHEN PLACEMENT OF STOP OR YIELD SIGNS IS CONSIDERED, PRIORITY AT A CROSSING SHALL BE DETERMINED BY THE FOLLOWING: (1) THE PRESENCE OF A TRAFFIC CONTROL SIGNAL; (2) RELATIVE VOLUMES OF SHARED-USE PATH AND ROADWAY USERS; (3) RELATIVE IMPORTANCE OF SHARED-USE PATH AND ROADWAY.
 - WHEN ENGINEERING JUDGMENT DETERMINES THAT THE VISIBILITY OF THE SHARED-USE PATH IS LIMITED AT THE INTERSECTION, TRAFFIC CONTROL SIGNALS SHOULD BE USED AT THE INTERSECTION. TRAFFIC SIGNALS SHOULD BE USED WHERE THE SHARED-USE PATH APPROACHES TO THE INTERSECTION IS CONTROLLED BY A STOP SIGN, YIELD SIGN, OR A TRAFFIC CONTROL SIGNAL.
 - A SOLID WHITE LINE MAY BE USED ON SHARED-USE PATHS TO SEPARATE DIFFERENT TYPES OF TRAFFIC. SMALLER SIZE LETTERS AND SYMBOLS MAY BE USED ON SHARED-USE PATHS. MARKINGS ADJACENT TO SHARED-USE PATHS MAY BE MARKED WITH DOTTED LINES.
 - THE MINIMUM SIGN SIZE FOR SHARED-USE PATHS SHALL BE THOSE SHOWN IN TABLE 20-4 IN MUTCD PART 9 AND SHALL BE USED ONLY FOR SIGNS INSTALLED SPECIFICALLY FOR BICYCLE TRAFFIC. APPLICATIONS FOR THE MINIMUM SIGN SIZES FOR SHARED-USE PATHS SHALL BE SUBMITTED TO THE TDM DIVISION. A LOCATION THAT WOULD HAVE ANY APPLICATION TO OTHER VEHICLES.
 - SEE T-4-12 FOR OTHER SIGNING AND PAVEMENT MARKINGS.



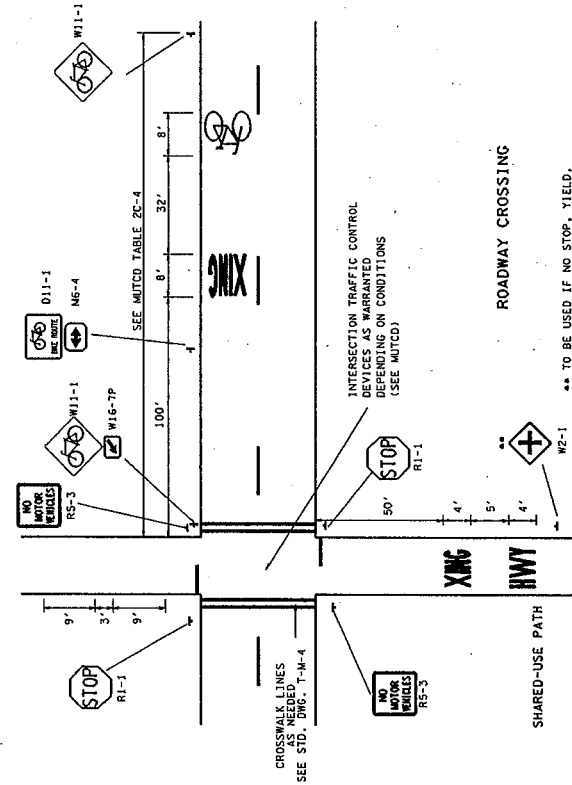
RAILROAD CROSSING



SIGN PLACEMENT ON SHARED-USE PATHS (SEE RD-TS-8 FOR TYPICAL CROSS SECTION DETAILS)



BEGINNING AND END OF A DESIGNATED BICYCLE ROUTE ON A SHARED-USE PATH

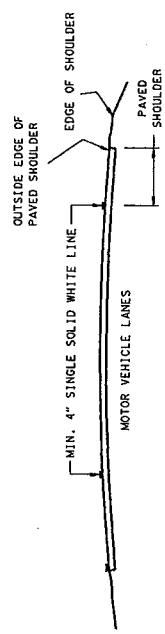


ROADWAY CROSSING

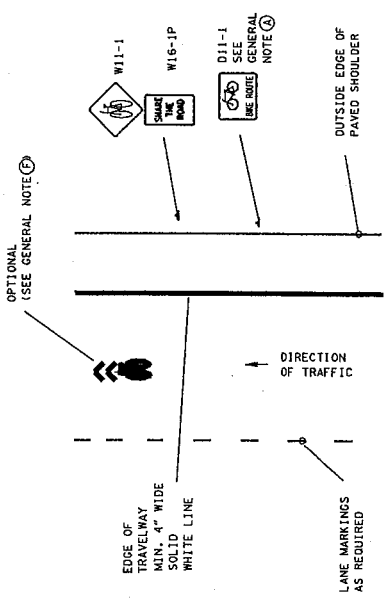
** TO BE USED IF NO STOP, YIELD, OR SIGNAL CONTROL IS USED.

REV. 12-1-09, REMOVED RUMBLE
 DETAILS TO T-M-15 AND 15A.
 REV. 11-1-11, REVISED GENERAL
 NOTES AND DIMENSIONS AND
 ADDED BIKE SYMBOL/ARROW
 LANE MARKING DETAIL.

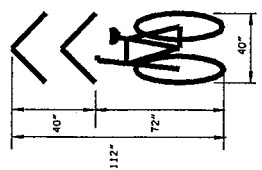
TYPICAL BIKE ROUTE CROSS SECTION
 FOR NON-ACCESS CONTROLLED RURAL ROUTES



ELEVATION VIEW



PLAN VIEW



BIKE SYMBOL/ARROW SHARED LANE MARKING
 (ITEM NO. 716-04.15)

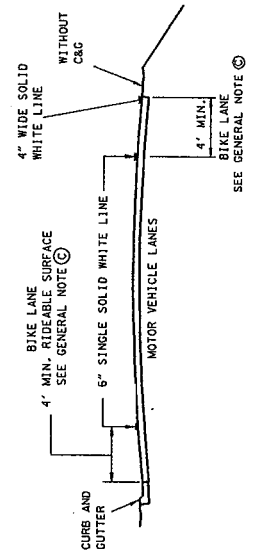
NOTE: TO BE PLACED IMMEDIATELY AFTER AN INTERSECTION AND
 SPACED AT INTERVALS NOT GREATER THAN 250 FEET.

- GENERAL NOTES**
- A SIGNS SHOULD BE PLACED APPROXIMATELY EVERY 0.25 MILES, AT EVERY TURN, AND AT ALL SIGNALIZED INTERSECTIONS. SIGN SPACING SHOULD NOT EXCEED A MILE ON RURAL ROADS.
 - B SEE STD. DWG. T-M-11A IF RUMBLE STRIP OR RUMBLE STRIPE IS PROPOSED IN CONJUNCTION WITH BIKE ROUTE.
 - C BIKE LANES AND BIKE ROUTES ARE NOT PERMITTED ON ACCESS CONTROLLED FACILITIES.
 - D IF BIKE LANE IS FINISHED ON THE VEHICLE SIDE, THE SHOULDER SHOULD NOT BE USED. THE SHOULDER SHOULD BE FINISHED ON THE BIKE SIDE. THE SHOULDER SHOULD NOT BE USED WHEN THE DISTANCE FROM THE WHITE LINE TO THE CURB OR GUARDRAIL IS LESS THAN 5 FEET. IF THERE IS AN OBSTRUCTION SUCH AS A CURB OR GUARDRAIL TO THE RIGHT OF THE RUMBLE STRIP FOR BIKE ROUTE USE SEE T-M-15 FOR FURTHER INFORMATION.
 - E SEE SECTIONS 98.06, 98.18, 98.19, 98.20, 98.04, AND 98.07 FOR ADDITIONAL SIGNING AND PAVEMENT MARKING INFORMATION IN THE MUTCD.
 - F OPTIONAL SHARED BIKE LANE MARKINGS SHOULD NOT BE PLACED ON ROADWAYS THAT HAVE A SPEED LIMIT ABOVE 35 MPH.

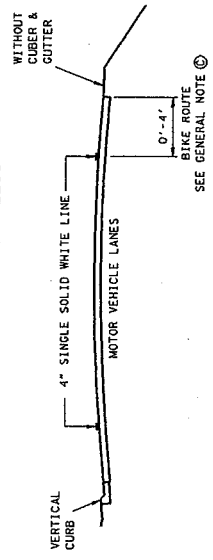
REV. 12-1-03: ADDED SIGN GENERAL NOTE (C) REARRANGED. REV. 11-1-01: ADDED BARRIER POST STRIPING DETAIL AND REVISED GENERAL NOTE (C)

TYPICAL BIKE LANE CROSS SECTIONS FOR URBAN COLLECTORS AND STREETS

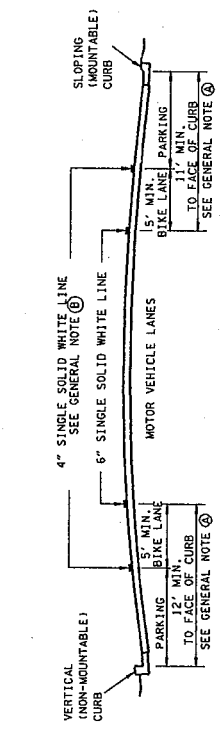
URBAN COLLECTORS AND STREETS WITH **BIKE LANE** MIN. PAVED SHOULDER WIDTH 4' - 8'



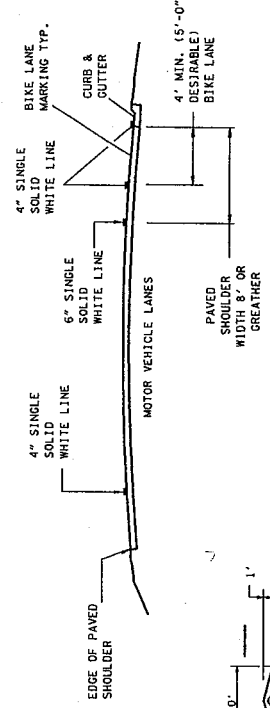
URBAN COLLECTORS AND STREETS WITH **BIKE ROUTE** MIN. PAVED SHOULDER WIDTH LESS THAN 4'



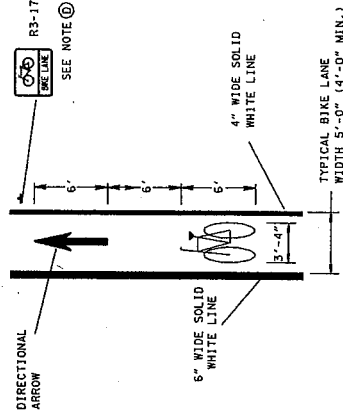
4-5 LANE URBAN COLLECTORS AND STREETS (CURB AND GUTTER) WITH **BIKE LANE** MIN. PAVED SHOULDER WIDTH 8' OR GREATER



PARKING IS PERMITTED

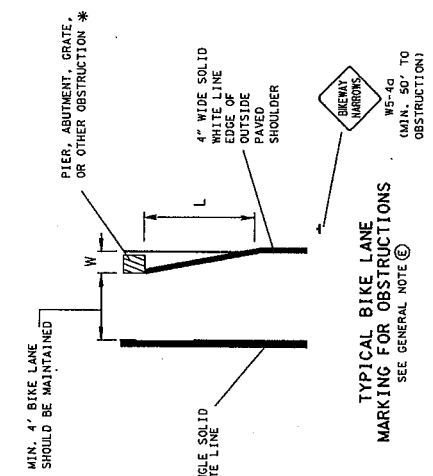


PARKING IS PROHIBITED



TYPICAL PAVEMENT MARKING FOR BICYCLE LANES (MIN. 1000' INTERVALS)

BARRIER POST STRIPING



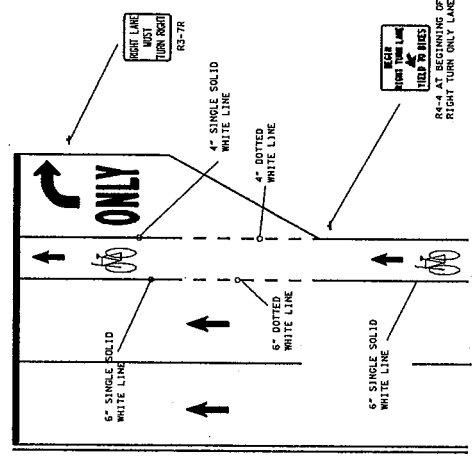
TYPICAL BIKE LANE MARKING FOR OBSTRUCTIONS (MIN. 50' TO OBSTRUCTION)

NOTE: WHERE THE ROADWAY DESIGN SPEEDS IS MORE THAN 40 mph SHARED USE BIKE ROUTES ARE NOT RECOMMENDED.

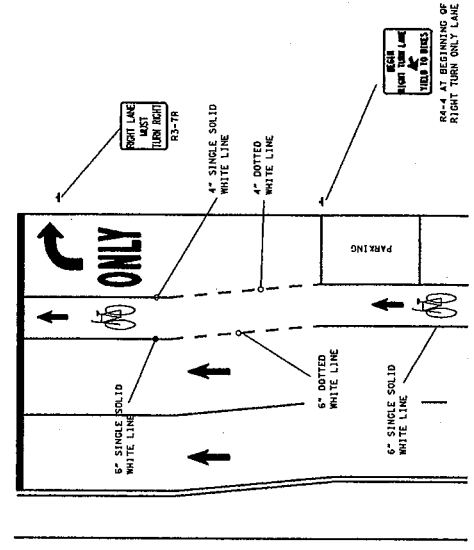
GENERAL NOTES

- (A) 13'. IS RECOMMENDED WHERE THERE IS SUBSTANTIAL PARKING OR TURNOVER OF PARKED CARS IS HIGH (E.G. COMMERCIAL AREAS).
- (B) THE OPTIONAL SOLID WHITE LINE MAY BE ADVISABLE WHERE PARKING STALLS ARE UNNECESSARY BECAUSE PARKING IS LIGHT BUT THERE IS CONCERN THAT MOTORISTS ARE DISOBSERVING THE BIKE LANE TO BE A TRAFFIC LANE.
- (C) AVISORY SIGN SHOULD BE PLACED AT THE BEGINNING OF THE BIKE LANE. THE ROADWAY DESIGN SPEEDS SHOULD BE PLACED AT APPROXIMATELY EVERY 0.25 MILES AND AT ALL MAJOR INTERSECTIONS.
- (D) WHEN PIER, BRIDGE ABUTMENT, GRATE, OR OTHER ROADWAY OBSTRUCTION INTRUDES IN THE BIKE PATH, THE BIKE LANE SHOULD BE MARKED AS SHOWN; LENS WHERE A RAISED OBSTRUCTION AND USE THE FORMULA $L = (W/11) S$ FOR THE TAPER LENGTH. SEE SECTION 9C.06 OF THE MUTCD FOR ADDITIONAL INFORMATION.
- (E) FOR BIKE ROUTE SIGNING REQUIREMENTS SEE T-M-11.

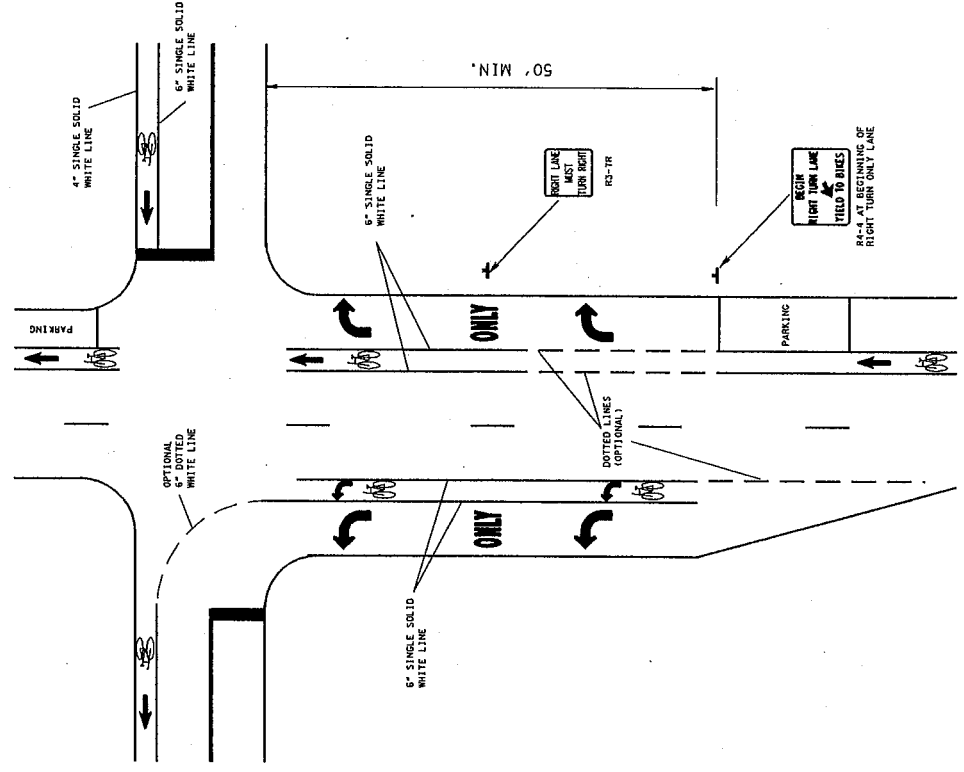
TYPICAL BICYCLE LANE TREATMENT AT A RIGHT TURN ONLY LANE



TYPICAL BICYCLE LANE TREATMENT AT PARKING LANE INTO A RIGHT TURN ONLY LANE



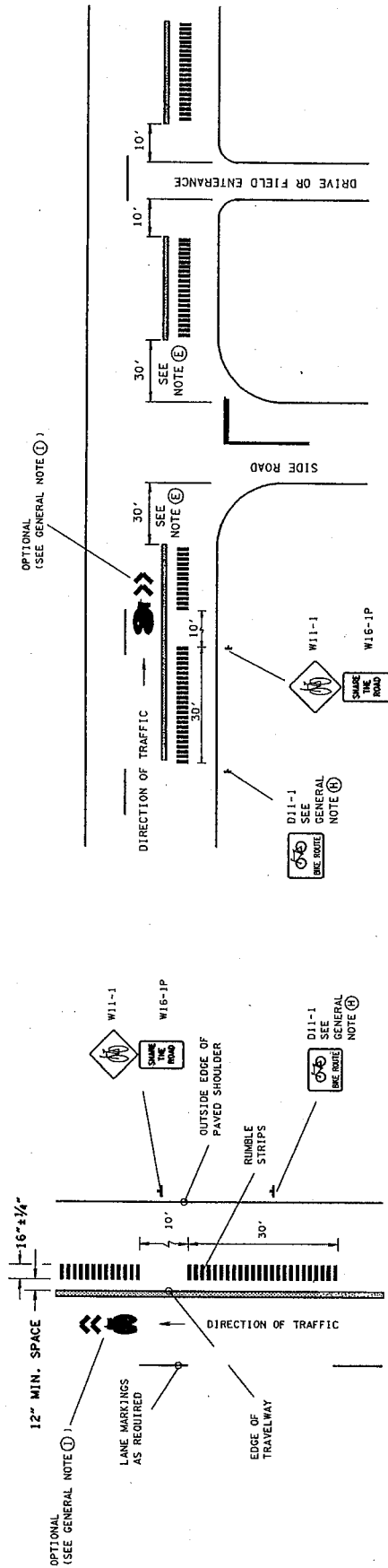
DESIGNATED BICYCLE LANE WITH LEFT-TURN AREA, ON-STREET PARKING, ONE-WAY TRAFFIC, OR HEAVY TURN VOLUMES, OR DIVIDED HIGHWAY



SEE T-M-13 FOR GENERAL NOTES

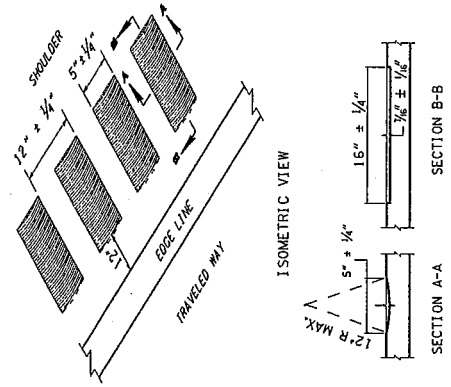
REV. 11-2-11, ADDED BIKE SYMBOL/ MARKINGS TO DETAILS AND ADDED GENERAL NOTE (C) AND (D)

TYPICAL RUMBLE STRIP INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES



AVAILABLE PAVED SHOULDER WIDTH 8' OR GREATER

SIDE ROAD AND DRIVEWAY RUMBLE STRIP INSTALLATION DETAILS

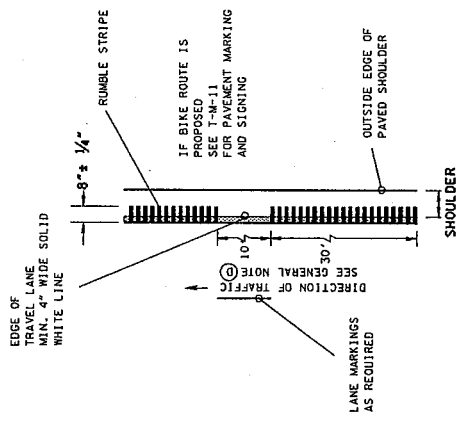


TYPICAL RUMBLE STRIP INSTALLATION

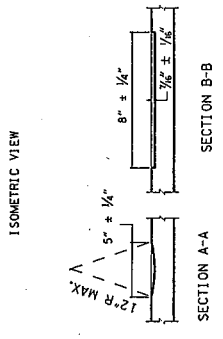
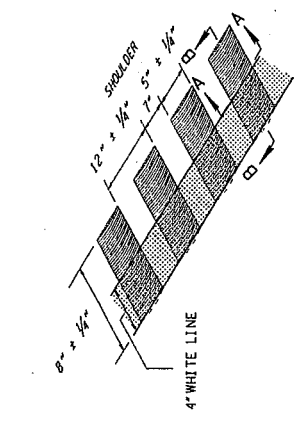
- #### RUMBLE STRIP GENERAL NOTES
- (A) WHEN RUMBLE STRIPS ARE USED ON NON-ACCESS CONTROLLED ROUTES, THEY SHOULD BE DISCONTINUED IN ADVANCE OF DRIVEWAYS, INTERSECTIONS, AND MEDIAN OPENINGS.
 - (B) MILLED-IN RUMBLE STRIP WITH 5" x 1/4" GROOVES, 1/16" x 1/16" DEEP, ON 12" x 1/4" SPACING, ACCOMMODATE BICYCLES.
 - (C) A 10 FOOT LONG GAP BETWEEN 30 FOOT LONG SECTIONS OF RUMBLE STRIPS IS REQUIRED TO ACCOMMODATE BICYCLES.
 - (D) ON NON-ACCESS CONTROLLED ROUTES WITH A MEDIAN AND/OR INSIDE SHOULDERS, CONTINUOUS RUMBLE STRIPS SHOULD BE PLACED UNDER ITEM 411-12.01 SCORING SHOULDERS (CONTINUOUS) (16" WIDTH) PER LANE BREAKS. BREAKS SHALL BE MADE AT SIDE ROADS AND MEDIAN OPENINGS BREAKS SHALL BEGIN 10' PRIOR TO OPENING.
 - (E) ON SIDE ROAD RUMBLE STRIPS GREATER THAN 30' RUMBLE STRIP APPLICATION SHOULD BE DISCONTINUED 50' IN ADVANCE OF THE INTERSECTION.
 - (F) RUMBLE STRIPS SHOULD ONLY BE PLACED ON PAVED SHOULDERS 8'.
 - (G) RUMBLE STRIP INSTALLATION SHALL BE PAID UNDER ITEM NUMBER 411-12.02. SCORING SHOULDERS (NON-CONTINUOUS) (16" WIDTH) PER L.M.
 - (H) SIGNS SHOULD BE PLACED APPROXIMATELY EVERY 0.25 MILES OF RURAL ROUTES AND AT ALL SIGNALIZED INTERSECTIONS. SIGN SPACING SHOULD NOT EXCEED A MILE ON RURAL ROADS.
 - (I) OPTIONAL SHARED BIKE LANE MARKINGS SHOULD NOT BE PLACED ON ROADWAYS THAT HAVE A SPEED LIMIT ABOVE 35 MPH.

REV. 10-1-11 CHANGED GENERAL NOTE 1 TO READ: "SEE GENERAL NOTE 1 FOR SHARED LANE MARKING DETAILS AND ADDED GENERAL NOTE 1 AND 2"

TYPICAL RUMBLE STRIPE INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES

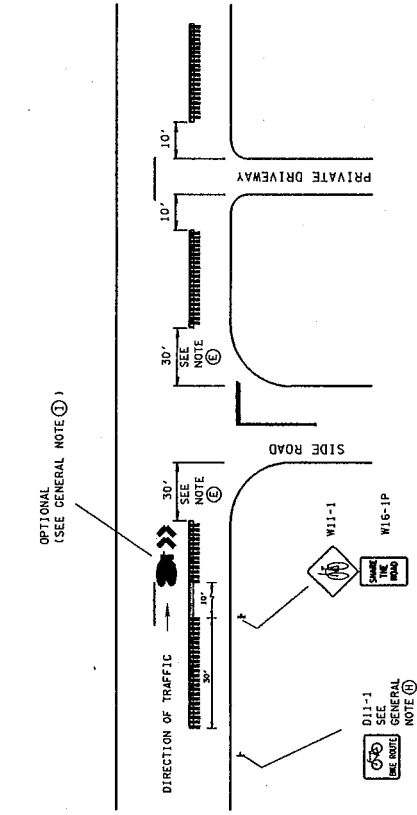


AVAILABLE PAVED SHOULDER WIDTH 2' OR GREATER

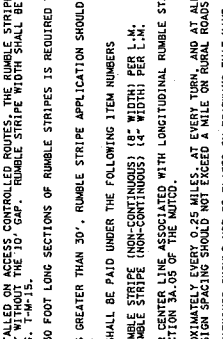
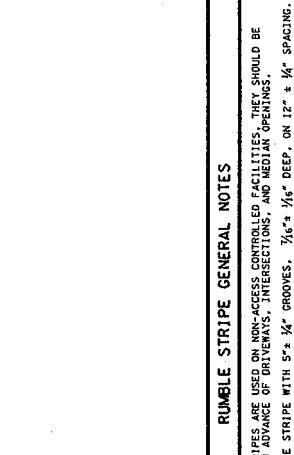


TYPICAL 4" WIDE RUMBLE STRIPE INSTALLATION

NOTE:
WHEN RUMBLE STRIPES ARE NOT PREFERRED OPERATIONS, IT SHOULD BE USED IN LOCATIONS WHERE NO SHOULDER IS AVAILABLE AND RUMBLE STRIPES ARE REQUIRED FOR A SAFETY UPGRADE.



SIDE ROAD AND DRIVEWAY RUMBLE STRIPE INSTALLATION DETAILS

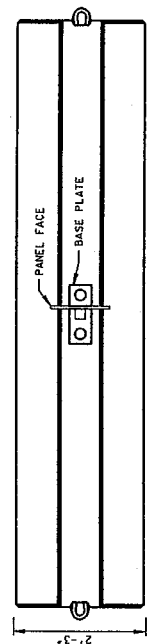


TYPICAL 8" WIDE RUMBLE STRIPE INSTALLATION

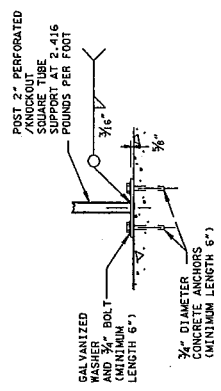
- RUMBLE STRIPE GENERAL NOTES**
- 1 WHEN RUMBLE STRIPES ARE USED ON NON-ACCESS CONTROLLED FACILITIES, THEY SHOULD BE DISCONTINUED IN ADVANCE OF DRIVEWAYS, INTERSECTIONS, AND MEDIAN OPERATIONS.
 - 2 MILLED-IN RUMBLE STRIPE WITH 5/8" GROOVES, 3/16" x 1/4" DEEP, ON 12" x 1/4" SPACING.
 - 3 WHEN RUMBLE STRIPES ARE INSTALLED ON ACCESS CONTROLLED ROUTES, THE RUMBLE STRIPE IS TO BE 10' WIDE AND 10' LONG. RUMBLE STRIPE WIDTH SHALL BE 10' WIDE AS DETAILED ON STD. DRG. T-14-15.
 - 4 A 10 FOOT LONG GAP BETWEEN 30 FOOT LONG SECTIONS OF RUMBLE STRIPES IS REQUIRED TO ACCOMMODATE BICYCLES.
 - 5 WHEN THE SIDE ROAD RADIUS IS GREATER THAN 30', RUMBLE STRIPE APPLICATION SHOULD BE DISCONTINUED 30' IN ADVANCE.
 - 6 RUMBLE STRIPE INSTALLATION SHALL BE PAID UNDER THE FOLLOWING ITEM NUMBERS:
411-12.04: SCORING FOR RUMBLE STRIPE (NON-CONTINUOUS) (8" WIDTH) PER L.M.
411-12.04: SCORING FOR RUMBLE STRIPE (NON-CONTINUOUS) (4" WIDTH) PER L.M.
 - 7 THE COLOR OF AN EDGE LINE OR CENTER LINE ASSOCIATED WITH LONGITUDINAL RUMBLE STRIPE SHALL BE ACCORDANCE WITH SECTION 3A.05 OF THE MUTCD.
 - 8 STONE SHOULD BE PLACED APPROXIMATELY EVERY 0.25 MILES AT EVERY TURN, AND AT ALL SIGNALIZED INTERSECTIONS. SIGN SPACING SHOULD NOT EXCEED A MILE ON RURAL ROADS.
 - 9 OPTIONAL, SHARED BIKE LANE MARKINGS SHOULD NOT BE PLACED ON ROADWAYS THAT HAVE A SPEED LIMIT ABOVE 35 MPH.

REV. 10-10-06: ADDED DETAIL FOR GROUND MOUNTED FLEXIBLE DELINEATOR AND GENERAL NOTES.
 REV. 11-1-11: REVISED SHOULDER DETAILS.

VERTICAL PANEL MOUNTED ON INTERCONNECTED PORTABLE BARRIER RAIL

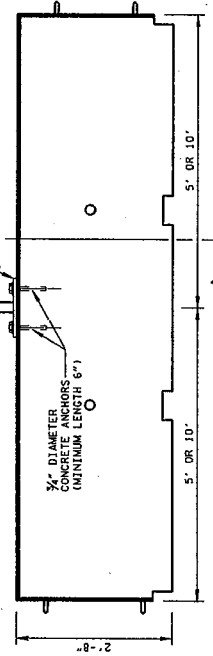
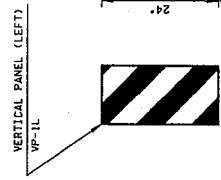


PLAN VIEW

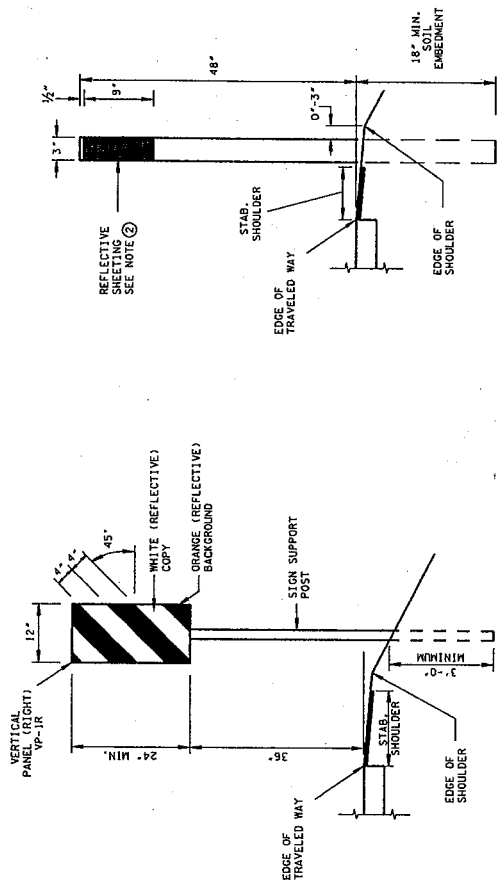


ELEVATION

BASE PLATE DETAIL



ELEVATION VIEW



DETAIL FOR VERTICAL PANEL WHICH IS TO BE GROUND MOUNTED

GROUND MOUNTED FLEXIBLE DELINEATOR

VERTICAL PANEL GENERAL NOTES

- SPACING FOR VERTICAL PANELS NOT IN A TAPER SHOULD BE A DISTANCE IN FEET APPROXIMATELY EQUAL TO TWO TIMES THE POSTED SPEED LIMIT IN MILES PER HOUR. APPROXIMATELY EQUAL TO TWO TIMES THE POSTED SPEED LIMIT IN MILES PER HOUR. APPROXIMATELY EQUAL TO TWO TIMES THE POSTED SPEED LIMIT IN MILES PER HOUR, BUT WILL NOT EXCEED ONE HALF THE SPACING OF THE PANELS NOT IN A TAPER.
- FOR TRAFFIC MOVING TO THE LEFT OF THE VERTICAL PANELS, USE SIGN WP-1R. FOR TRAFFIC MOVING TO THE RIGHT OF THE VERTICAL PANELS, USE SIGN WP-1L.
- IF USED FOR TRAFFIC IN TWO DIRECTIONS, BACK TO BACK PANELS SHALL BE USED.
- THE VERTICAL PANELS FACE, SUPPORT, INSTALLATION AND HARDWARE ARE TO BE PAID FOR UNDER THE PRICE BID FOR ITEM NUMBER 712-06.01, VERTICAL PANEL PER SQUARE FOOT.

FLEXIBLE DELINEATOR GENERAL NOTES

- THE REFLECTIVE SHEETING SHALL MEET THE REQUIREMENTS OF AASHTO M288, TYPE IIII OR HIGHER RETROREFLECTION PERFORMANCE LEVEL.
- THE REFLECTIVE SHEETING STRIP ON THE DELINEATORS SHALL BE MIN. 8 INCHES IN LENGTH AND SUFFICIENT WIDTH TO PROVIDE A MIN. 3 INCHES WIDE PROFILE FACING APPROACHING TRAFFIC. THE VARIATIONS IN REFLECTIVE SHEETING DIMENSION SHOULD NOT EXCEED ± 10%.
- THE CONTRACTOR SHALL SELECT MATERIAL FROM THE DEPARTMENT'S DPL PLANS.
- THE COLOR OF THE DELINEATOR POST SHALL BE WHITE UNLESS OTHERWISE NOTED ON THE PLANS.
- THE COLOR OF THE REFLECTIVE SHEETING SHALL CONFORM TO THE COLOR OF EDGE LINES STIPULATED IN SUBSECTION 309-5 (PAGE 30-8 AND 30-11) OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- PAYMENT FOR GROUND MOUNTED FLEXIBLE DELINEATORS WILL BE MADE AS FOLLOWS: ITEM NUMBER 712-06.01, FLEXIBLE DELINEATOR (YELLOW) PER EACH. ITEM NUMBER 713-02.15, FLEXIBLE DELINEATOR (YELLOW) PER EACH.
- SPACING FOR FLEXIBLE DELINEATOR POSTS SHALL BE 20' OR LESS.

UNLESS OTHERWISE SHOWN APPROVAL NOT REQUIRED

SEE STANDARD DRAWING NO. T-PBR-1 FOR DETAILS REGARDING INTERCONNECTED PORTABLE BARRIER RAIL

STATE OF VERMONT
 DEPARTMENT OF TRANSPORTATION
 DETAIL FOR VERTICAL PANELS AND FLEXIBLE DELINEATORS
 1-19-92 T-PBR-2

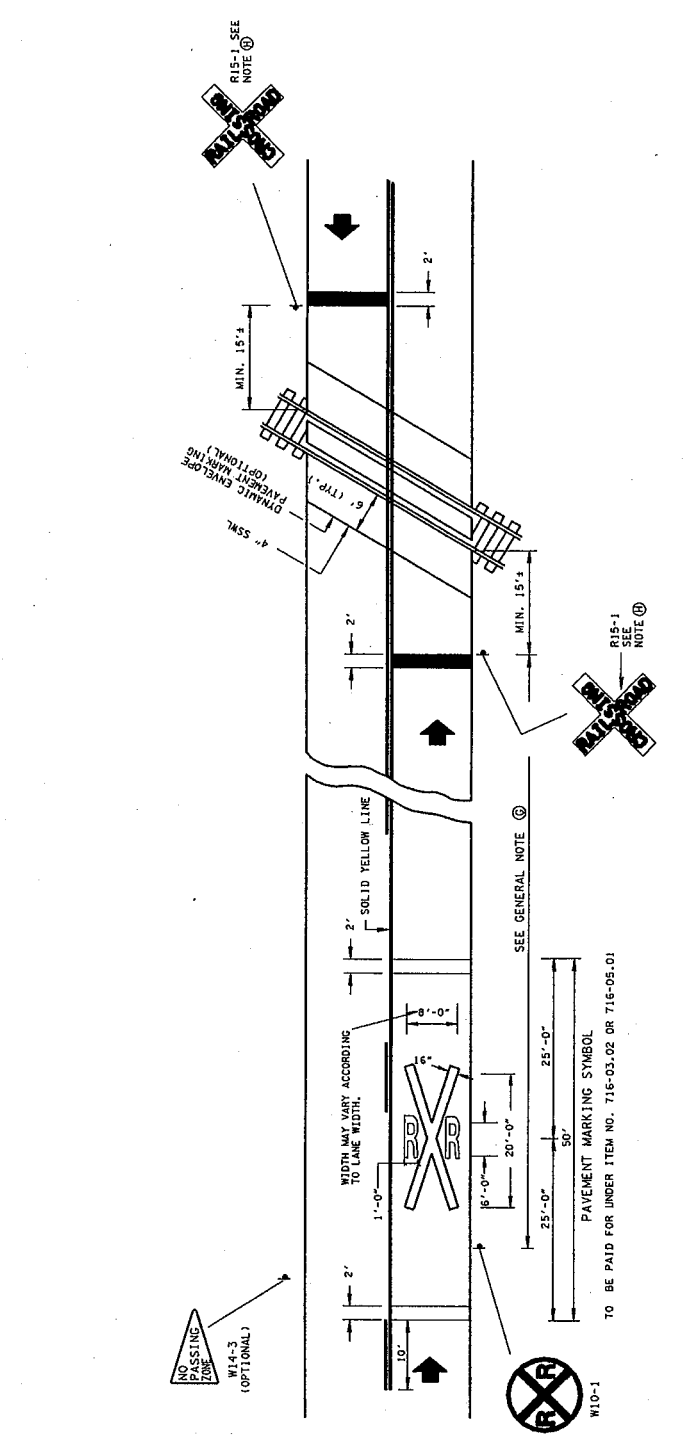
- REV. 5-16-75: ADDED NOTE PERTAINING TO HEIGHT OF RAILROAD ADVANCE WARNING SIGN IN RURAL, COMMERCIAL & RESIDENTIAL DISTRICTS.
- REV. 10-10-75: ADDED NOTE REGARDING PAVEMENT MARKING MATERIAL.
- REV. 5-9-78: ADDED RAILROAD ADVANCE WARNING SIGN FOR RURAL AREAS AND REQUESTED DISTANCES FOR SIGN AND PAVEMENT MARKINGS.
- REV. 9-14-78: ADJUSTED STOP BARS AT TRACK.
- REV. 7-20-79: ADDED TABLE SHOWING DIMENSION C. ADDED DIMENSIONS TO TYPICAL PAVEMENT MARKING SYMBOL. ADDED TABLE SHOWING DISTANCES FOR WARNING DEVICES. DELETED NOTE REGARDING WARNING DEVICES IN RURAL AREAS AND NOTE REGARDING DISTANCE FROM MARKINGS TO SIGN DISTANCE.
- REV. 4-3-80: CHANGED DIMENSION A FROM 2'-0" TO THE CENTER OF THE "RR" TO 25'-0". CHANGED THE DIMENSION B FROM 2'-0" TO THE CENTER LINE. CHANGED STRIPES THROUGH THE CROSSING.
- REV. 4-10-80: UPDATE TO CONFORM WITH THE M.U.U.T.C.D. NUMBER FROM AN-01 TO T-RR-1.
- REV. 6-15-82: CORRECTED NOTE REGARDING OFFSET DISTANCE TO PAVEMENT MARKING. ADDED NOTE REGARDING PAVEMENT MARKING TRANSVERSE LINES AT EACH CROSSING.
- REV. 5-22-84: WIDTH OF "R" CORRECTED TO 1'-0".
- REV. 8-5-85: CHANGED DIMENSION C. ADDED GENERAL NOTE. CHANGED PAVEMENT MARKING NOTE AND SIGN NOTE.
- REV. 6-22-88: CHANGED WEIGHT OF STEEL POST.
- REV. 11-1-88: ADDED SIGN SHEET THICKNESS.
- REV. 8-22-91: RELOCATED PLACEMENT OF W10-3 SIGN. ADDED NOTE ① AND REVISED NOTE ②.
- REV. 7-29-95: CHANGED MATERIAL OR BACKGROUND OF RAILROAD ADVANCE WARNING SIGN FOOTNOTE ③.
- REV. 1-19-99: ADDED FOOTNOTE ④.
- REV. 7-29-04: CHANGED PLAN VIEW TO CLARIFY DETAIL.
- REV. 10-23-05: ADDED CROSSBUCK SIGN AND GENERAL NOTE ⑤.
- REV. 11-2-11: REVISED GENERAL NOTES A, C, AND H. MOVED RAILROAD ADVANCE WARNING SIGN DETAIL WITH FOOTNOTES TO TYPICAL PAVEMENT MARKING DETAIL. ADDED OPTIONAL SIGN W14-3.

MINOR REVISION - CIVIL APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL PAVEMENT MARKING AT RAILROAD CROSSINGS AND RAILROAD ADVANCE WARNING SIGN

T-RR-1



TYPICAL PAVEMENT MARKINGS AT ACTIVE RAILROAD-HIGHWAY GRADE CROSSINGS

GENERAL NOTES

- ① A PORTION OF THE X SYMBOL SHOULD BE DIRECTLY OPPOSITE THE GRADE CROSSING ADVANCE WARNING SIGN (R15-1). THE X SYMBOL AND LETTERS SHOULD BE ELONGATED TO ALLOW FOR THE LOG ANGLE AT WHICH THEY WILL BE VIEWED.
- ② A THREE LANE ROADWAY SHOULD BE MARKED WITH A CENTERLINE FOR TWO LANE APPROACH OPERATION ON THE APPROACH TO A CROSSING.
- ③ ON MULTI-LANE ROADS THE TRANSVERSE BANDS SHOULD EXTEND ACROSS ALL APPROACH LINES, AND INDIVIDUAL "RR" SYMBOLS SHOULD BE USED IN EACH APPROACH LANE.
- ④ PAVEMENT MARKINGS MATERIAL CAN BE EITHER PAINT OR PLASTIC AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.
- ⑤ REFER TO STANDARD ALPHABET FOR HIGHWAY SIGNS AND MARKINGS FOR RRR SYMBOLS DETAILS.
- ⑥ THE COST OF ALL TRANSVERSE BANDS SHALL BE IN THE PRICE BID FOR THE "RRR" SYMBOLS AT EACH RAILROAD CROSSING.
- ⑦ PLACEMENT OF THE RAILROAD ADVANCE WARNING SIGN SHALL GENERALLY BE IN ACCORDANCE WITH TABLE 20-4 CONDITION B OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- ⑧ RAILROAD CROSS-BUCK SIGN AND SUPPORT SHALL BE INSTALLED IN ACCORDANCE WITH T-RR-11.

REV. 4-11-80: CHANGED DRAWING NO. FROM RR-ES-01 TO T-RR-2.
 REV. 7-29-86: REDREW ON CAD. MADE MINOR CHANGES.
 REV. 11-11-11: REVISED GATE DIMENSIONS AND REFINISHED NOTES THROUGHOUT. NOTE FOR SIGNAL MANUAL DRAWING 1489.

□

STATE OF TEXAS
 DEPARTMENT OF TRANSPORTATION

CROSS-REFERENCE DRAWINGS NOTED ON THIS SHEET: T-RR-4

MINOR REVISION -- ENA APPROVAL NOT REQUIRED.

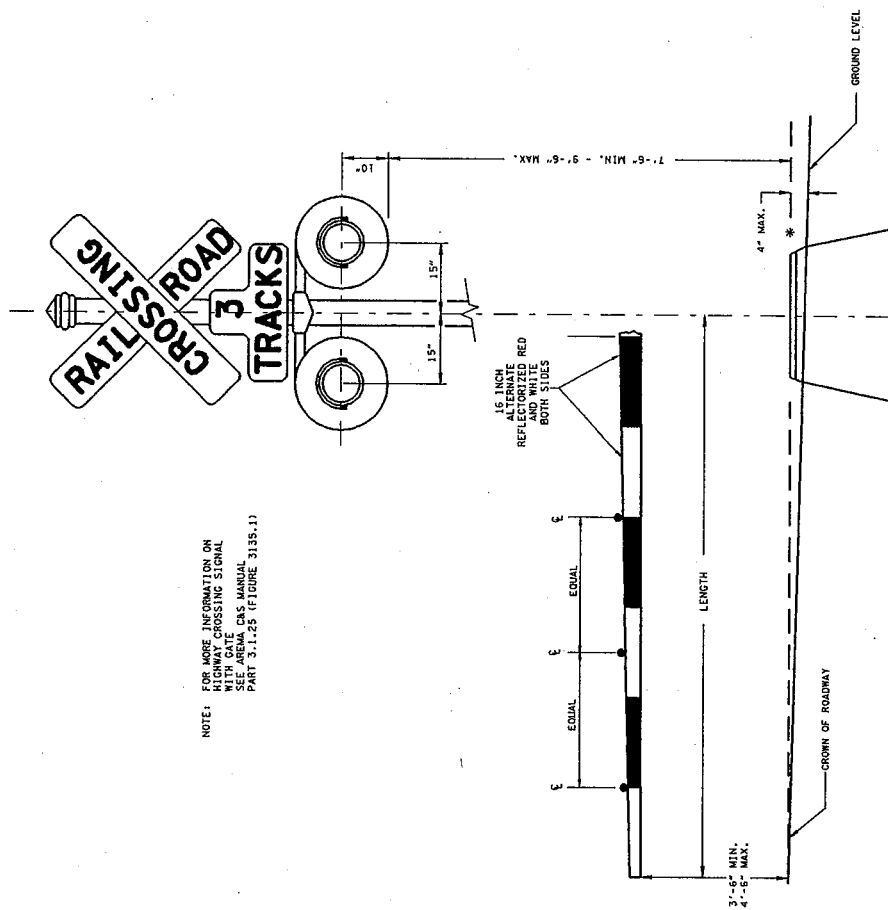
STATE OF TEXAS
 DEPARTMENT OF TRANSPORTATION

STANDARD DRAWING FOR RAILROAD AND HIGHWAY CROSSING SIGNAL WITH GATE

T-RR-2

GENERAL NOTES

- ① THE MEANS OF FLASHING-LIGHT SIGNALS AND GATES SHALL BE AS STATED IN THE UNIFORM VEHICLE CODE (USE SECTIONS 1-10 AND 1-11) AND THE UNIFORM TRAFFIC CONTROL DEVICES (SEE PAGE 1 OF THE MUTCD FOR THE ADDRESS).
- ② LOCATION AND CLEARANCE DIMENSIONS FOR FLASHING-LIGHT SIGNALS AND GATES SHALL BE AS SHOWN IN FIGURE 8C-1 OF THE MUTCD.
- ③ WHEN THERE IS A CURB, A HORIZONTAL OFFSET OF AT LEAST 2 FEET SHALL BE PROVIDED FROM THE FACE OF THE VERTICAL CURB TO THE CLOSEST PART OF THE SIGNAL OR GATE. WHEN THERE IS NO CURB, THE HORIZONTAL CLEARANCE FROM THE FACE OF THE SIGNALS HIGHWAY TO THE LOWEST POINT OF THE SIGNAL UNIT.
- ④ WHEN THERE IS A SHOULDER, BUT NO CURB, A HORIZONTAL OFFSET OF AT LEAST 2 FEET FROM THE EDGE OF THE ASPAVED OR SURFACED SHOULDER SHALL BE PROVIDED. WHEN AN ASPAVED OR SURFACED SHOULDER IS PROVIDED, THE MINIMUM HORIZONTAL OFFSET FROM THE EDGE OF THE TRAVELED WAY SHALL BE 6 FEET FROM THE



NOTE: FOR MORE INFORMATION ON SIGNALS AND GATES WITH GATE SEE AREMA CRS MANUAL PART 3.1.25 (FIGURE 3135.1)

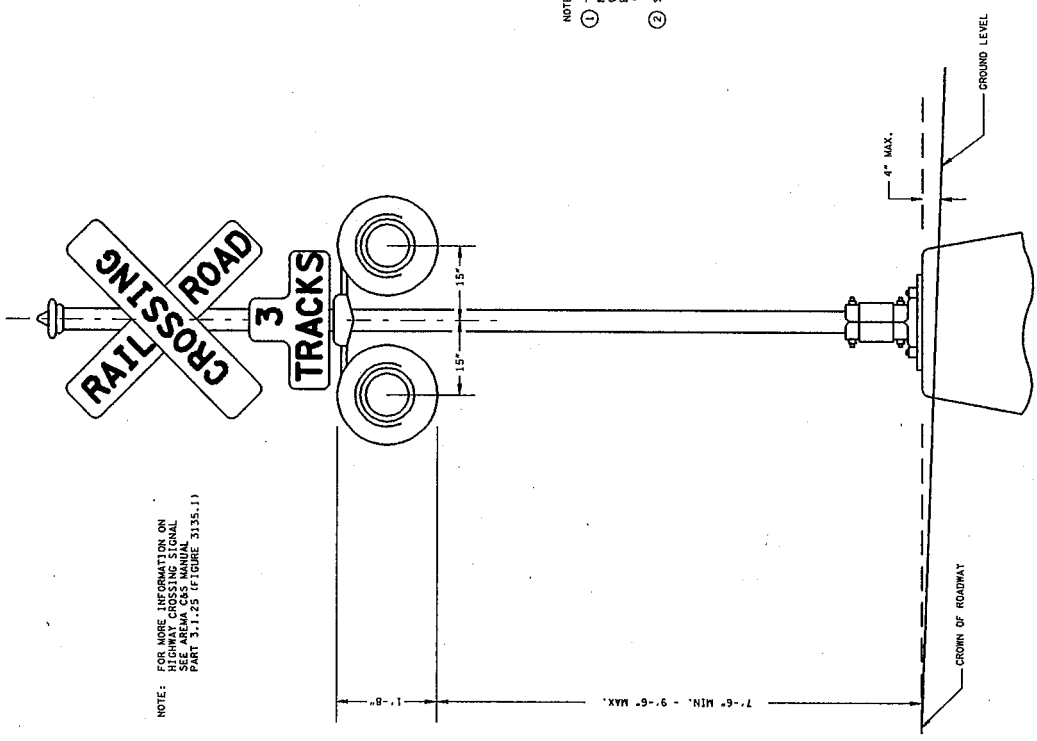
* TOP OF FOUNDATION TO BE AT THE SAME ELEVATION AS THE SURFACE OF THE TRAVELED WAY AND NO MORE THAN 4 INCHES ABOVE THE SURFACE OF THE GROUND (FOR CURBED SECTIONS SEE DRAWING T-RR-4).

RAILROAD-HIGHWAY CROSSING SIGNAL WITH GATE

REV. 4-11-80, CHANGED DRAWING NO. FROM RH-CS-02 TO T-RR-3.
 REV. 7-20-95, REVIEW ON CAD, MADE MINOR CHANGES.
 REV. 11-1-11, DESIGNED DETAIL AND ADDED NOTES AND

□

NOTE: FOR MORE INFORMATION ON HIGHWAY CROSSING SIGNAL SEE ARMA CSS MANUAL PART 311.25 (FIGURE 3135.1)



NOTE:
 ① TOP OF THE SIGNAL FOUNDATION SHOULD BE NO MORE THAN 4 INCHES ABOVE THE SURFACE OF THE ROADWAY. THE SIGNAL SHALL BE ELEVATED AS THE CROWN OF THE ROADWAY (FOR CURB SECTION SEE DRAWING T-RR-4).
 ② SEE T-RR-2 FOR LATERAL OFFSET INFORMATION.

NOTE: DETAILS SHOWN ON SIGNAL MANUAL DRAWING 1653.

RAILROAD-HIGHWAY CROSSING SIGNAL

CROSS-REFERENCE DRAWINGS NOTED ON THIS SHEET: T-RR-4

□ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

STANDARD DRAWING FOR RAILROAD-HIGHWAY CROSSING SIGNAL

T-RR-3

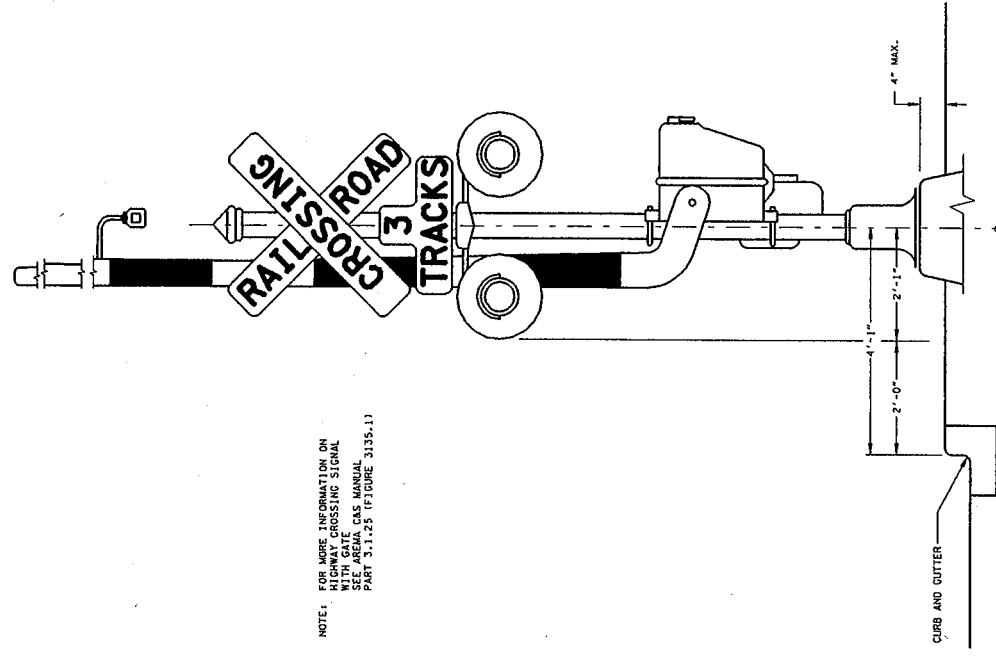
REV. 4-11-87: CHANGED DRAWING NO. FROM RR-CS-02 TO T-RR-4.
 REV. 7-29-85: CORRECTED ON CARD. MADE MINOR CHANGES.
 REV. 11-11-83: REVISED GENERAL NOTES TO CALL OUT ADDITIONAL GENERAL NOTES AND TO ADD ADDITIONAL GENERAL NOTES TO CALL OUT ADDITIONAL GENERAL NOTES.

MINOR REVISION -- FWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 STANDARD DRAWING FOR TYPICAL CURB AND GUTTER PLAN FOR CROSSING WITH OR WITHOUT GATES
 T-RR-4

GENERAL NOTES

1. WHEN THERE IS A CURB, A HORIZONTAL OFFSET OF AT LEAST 2 FEET SHALL BE PROVIDED FROM THE FACE OF THE VERTICAL CURB TO THE CLOSEST PART OF THE SIGNAL OR GATE ARM IN ITS UPRIGHT POSITION.
2. WHEN THERE IS A SHOULDER, BUT NO CURB, A HORIZONTAL OFFSET OF AT LEAST 2 FEET FROM THE EDGE OF A PAVED OR SURFACED SHOULDER SHALL BE PROVIDED, WITH AN OFFSET OF AT LEAST 6 FEET FROM THE EDGE OF THE TRAVELED WAY.
3. WHEN THERE IS NO CURB OR SHOULDER, THE MINIMUM HORIZONTAL OFFSET SHALL BE 6 FEET FROM THE EDGE OF TRAVELED WAY.
4. EQUIPMENT HOUSINGS (CONTROLLER CABINETS) SHOULD HAVE A LATERAL OFFSET OF AT LEAST 30 FEET FROM THE EDGE OF THE HIGHWAY, AND WHERE RAILROAD OR LIGHT RAIL TRANSIT PROPERTY AND CONDITIONS ALLOW, AT LEAST 25 FEET FROM THE NEAREST RAIL.
5. IF A PEDESTRIAN ROUTE IS PROVIDED, SUFFICIENT CLEARANCE FROM SUPPORTS, POSTS, AND GATE MECHANISMS SHOULD BE MAINTAINED FOR PEDESTRIAN TRAVEL.
6. WHEN DETERMINED BY AN ENGINEERING STUDY, A LATERAL ESCAPE ROUTE TO THE RIGHT OF THE HIGHWAY IN ADVANCE OF THE GRADE CROSSING TRAFFIC CONTROL DEVICES SHOULD BE KEPT FREE OF GUARDRAIL OR OTHER GROUND OBSTRUCTIONS, WHERE GUARDRAIL IS NOT DEEMED NECESSARY OR APPROPRIATE, BARRIER SHOULD NOT BE USED FOR PROTECTING SIGNAL SUPPORTS.
7. THE SAME LATERAL OFFSET AND ROADSIDE SAFETY FEATURES SHOULD APPLY TO FLASHING-LIGHT SIGNAL AND AUTOMATIC GATE LOCATION ON BOTH THE RIGHT-HAND AND LEFT-HAND SIDES OF THE ROADWAY.
8. WHERE BOTH TRAFFIC CONTROL SIGNAL AND FLASHING-LIGHT SIGNAL (WITH OR WITHOUT AUTOMATIC GATES) ARE IN OPERATION AT THE SAME HIGHWAY-RAIL GRADE CROSSING, THE OPERATION OF THE DEVICES SHOULD BE COORDINATED TO AVOID ANY DISPLAY OF CONFLICTING SIGNAL INDICATIONS.
9. WHERE GATES ARE LOCATED IN THE MEDIAN, ADDITIONAL MEDIAN WIDTH MAY BE REQUIRED TO PROVIDE THE MINIMUM CLEARANCE FOR THE COUNTERWEIGHT SUPPORTS.



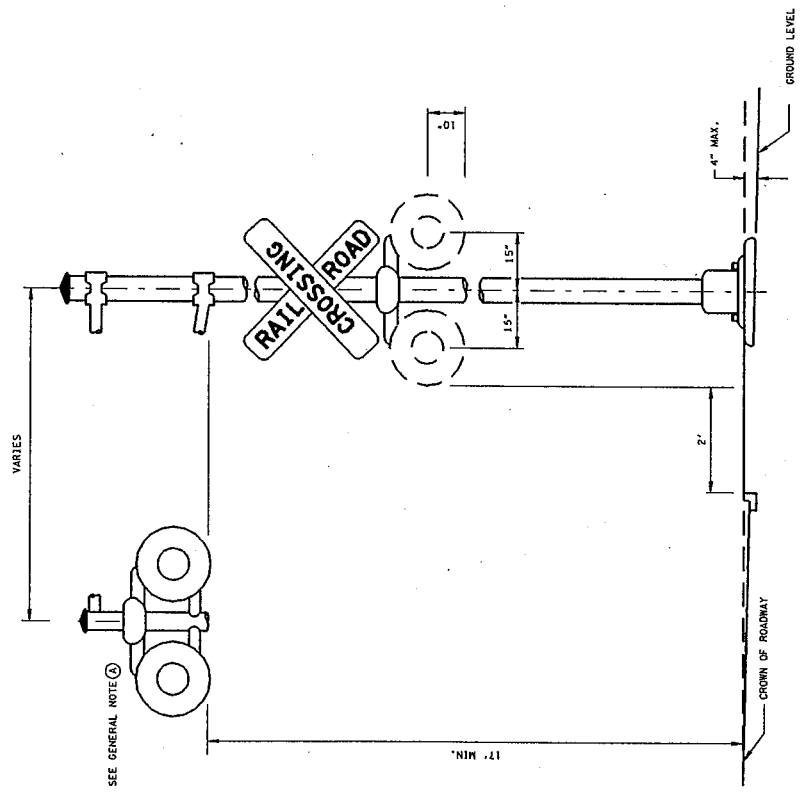
TYPICAL CURB AND GUTTER PLAN FOR RAILROAD-HIGHWAY CROSSING SIGNALS WITH OR WITHOUT GATES

NOTE: FOR MORE INFORMATION ON HIGHWAY CROSSING SIGNALS SEE ARENA GAS MANUAL PART 3.1.25 (FIGURE 3135-1)

REV. 4-11-00: CHANGED DRAWING NO. FROM RR-C5-04 TO T-RR-5.
 REV. 7-29-96: REDREW ON CADD. MADE MINOR CHANGES.
 REV. 11-1-11: REVISED TYPICAL CANTILEVER SPAN. ADDED GENERAL NOTES.

□ USER REVIEWAL - FINAL APPROVAL NOT REQUIRED.

NOTE: FOR MORE INFORMATION ON RAILROAD CROSSING SIGNALS, SEE AREMA C&S MANUAL PART 3.1.25 (FIGURE 3135.1)



GENERAL NOTES

- ① MAST MOUNTED LIGHT UNITS MAY BE PROVIDED AS CONDITIONS REQUIRE.
- ② TOP OF FOUNDATION TO BE AT THE SAME ELEVATION AS THE SURFACE OF THE ADJACENT WAY AND NO MORE THAN 4 INCHES ABOVE THE SURFACE OF THE GROUND.
- ③ SEE SECTIONS 8C-01 AND 8C-02 OF THE MUTCD FOR ADDITIONAL INFORMATION.

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

RAILROAD-HIGHWAY CROSSING SIGNAL WITH CANTILEVER SPAN
 T-RR-5

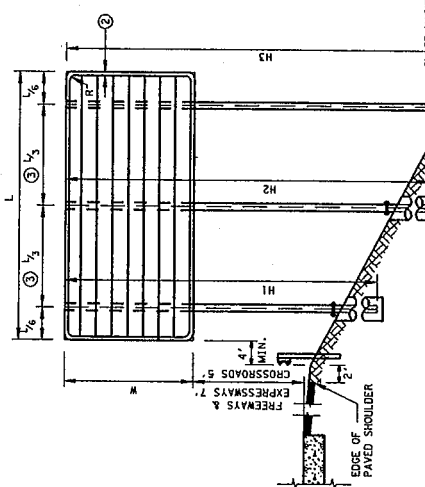
REV. 1-15-54: REVERSE SHEET, CHANGED MINIMUM OFFSET ON ALL SIGNS AND NOTED ADDED EXIT PANEL MOUNTING DETAIL, SHOULDER INSTALLATION RAMP AND CROSSROADS, CHANGED AUXILIARY MOUNTING DETAIL TO THREE POST SIGN AND SHOULDER INSTALLATION TWO POST MOUNTED SIGN, ADDED FILL SLOPE DETAIL TO 30° CORNER SIGN LOCATION, ELIMINATED TYPICAL SIGN.

REV. 12-7-60: REVERSED AND REORGANIZED SHEET, NUMBERED ALL GENERAL NOTES AND FOOTNOTES, ADDED FOOTNOTE NO. ①, ADDED TYPICAL PANEL MOUNTING DETAILS ON THIS SHEET.

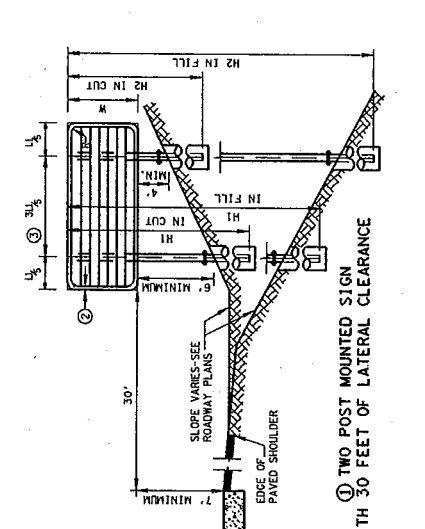
REV. 8-16-61: CHANGED MINIMUM DIMENSION IN FOOTNOTE NO. ① FROM 7'-0" TO 7'-6".

REV. 5-27-63: CORRECTED GENERAL NOTE ①.

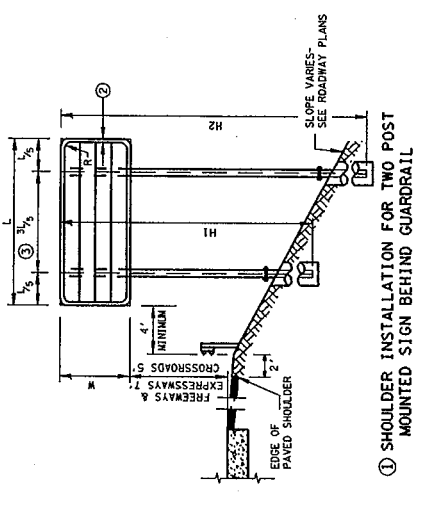
REV. 11-12-14: REVISED SHOULDER INSTALLATION HEIGHT FOR FREEWAYS AND ADDED GENERAL NOTE ②.



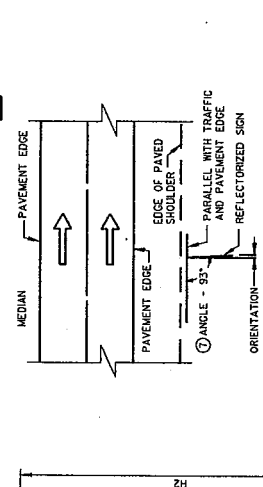
① SHOULDER INSTALLATION FOR THREE POST MOUNTED SIGN BEHIND GUARDRAIL



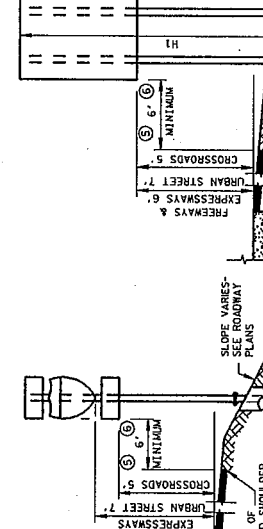
② TWO POST MOUNTED SIGN WITH 30 FEET OF LATERAL CLEARANCE



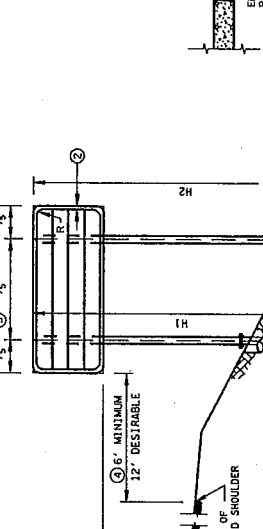
③ SHOULDER INSTALLATION FOR TWO POST MOUNTED SIGN BEHIND GUARDRAIL



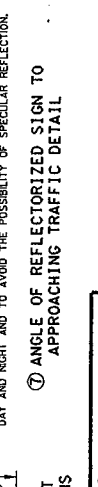
④ SHOULDER INSTALLATION FOR TWO POST MOUNTED REGULATORY AND WARNING SIGNS



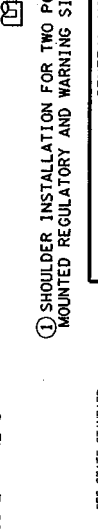
⑤ SHOULDER INSTALLATION FOR ROUTE MARKERS



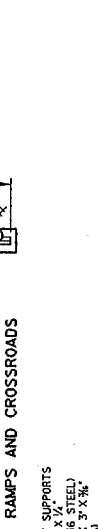
⑥ SHOULDER INSTALLATION FOR RAMP AND CROSSROADS



⑦ ANGLE OF REFLECTORIZED SIGN TO APPROACHING TRAFFIC DETAIL



⑧ EXIT PANEL MOUNTING DETAIL



⑨ ADDITIONAL PANEL MOUNTING DETAIL

NOTE: SIGNS SHALL NORMALLY BE ERRECTED SO THAT THE SIGN FACE IS TRULY VERTICAL AND 30' AWAY FROM THE CENTER OF THE LANE WHICH THE SIGN FACES AT THE POINT OF INSTALLATION. IN CURVES, SIGN FACES SHALL BE ORIENTED SO AS TO BE MOST EFFECTIVE BOTH DAY AND NIGHT AND TO AVOID THE POSSIBILITY OF SPECULAR REFLECTION.

NOTE: SIGNS SHALL NORMALLY BE ERRECTED SO THAT THE SIGN FACE IS TRULY VERTICAL AND 30' AWAY FROM THE CENTER OF THE LANE WHICH THE SIGN FACES AT THE POINT OF INSTALLATION. IN CURVES, SIGN FACES SHALL BE ORIENTED SO AS TO BE MOST EFFECTIVE BOTH DAY AND NIGHT AND TO AVOID THE POSSIBILITY OF SPECULAR REFLECTION.

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NOTE: SIGNS SHALL NORMALLY BE ERRECTED SO THAT THE SIGN FACE IS TRULY VERTICAL AND 30' AWAY FROM THE CENTER OF THE LANE WHICH THE SIGN FACES AT THE POINT OF INSTALLATION. IN CURVES, SIGN FACES SHALL BE ORIENTED SO AS TO BE MOST EFFECTIVE BOTH DAY AND NIGHT AND TO AVOID THE POSSIBILITY OF SPECULAR REFLECTION.

GENERAL NOTES

- THE LAYOUTS SHOWN ON THIS PAGE ARE TYPICAL FOR ALL SIGNS ERRECTED ON THE FREEWAY AND THE EXPRESSWAY SYSTEM AND WITHIN THEIR RESPECTIVE SYSTEMS UNLESS OTHERWISE SPECIFIED IN THE ROADWAY PLANS FOR A SPECIFIC PROJECT.
- ALL SIGNS SHALL BE ERRECTED SO THAT THE INSIDE EDGE OF THE PROPOSED SIGN OR ITS ASSEMBLY IS A MINIMUM OF SIX FEET BEYOND THE EDGE OF PAVED SHOULDER ON TWO TYPICAL SIGNS ON THE FREEWAY AND EXPRESSWAY SYSTEM SHALL BE ERRECTED ON TWO FEET FROM THE BACK FACE OF THE CURB.
- ALL DIRECTIONAL SIGNS ON THE FREEWAY AND EXPRESSWAY SYSTEM SHALL BE ERRECTED WITH AN AUXILIARY SIGN IS MOUNTED BEHIND THE MAIN SIGN. THE MAIN SIGN OR ITS ASSEMBLY SHALL BE ERRECTED AT LEAST LEAST FEET ABOVE THE EDGE OF PAVED SHOULDER AND THE AUXILIARY SIGN SHALL BE ERRECTED AT LEAST FIVE FEET ABOVE THE EDGE OF PAVED SHOULDER.
- ALL ROUTE MARKERS, WARNING SIGNS AND REGULATORY SIGNS ON THE FREEWAY AND THE EXPRESSWAY SYSTEM SHALL BE AT LEAST SIX FEET ABOVE THE EDGE OF PAVED SHOULDER.
- ALL REGULATORY SIGNS ON THE FREEWAY AND THE EXPRESSWAY SYSTEM SHALL BE ERRECTED SO THAT THE SIGN FACE IS TRULY VERTICAL AND 30' AWAY FROM THE CENTER OF THE LANE WHICH THE SIGN FACES AT THE POINT OF INSTALLATION. IN CURVES, SIGN FACES SHALL BE ORIENTED SO AS TO BE MOST EFFECTIVE BOTH DAY AND NIGHT AND TO AVOID THE POSSIBILITY OF SPECULAR REFLECTION.
- SEE SECTIONS 2A-18 THROUGH 2A-23 OF THE MUTCD FOR ADDITIONAL INFORMATION.

LEGEND

W-H HEIGHT OF SIGN FACE
 L-LENGTH OF SIGN FACE
 R-RADIUS OF BORDER
 E-EXCLUDED PANELS
 H-HEIGHT OF SIGN SUPPORT

FOOTNOTES

- SEE SIGN SCHEDULE SHEET IN THE PLANS FOR DIMENSIONS E, L, H, H₁, H₂, H₃, R, AND W.
- SEE SIGN SCHEDULE SHEET FOR WIDTH OF BORDER.
- TRAFFIC SIGN DIMENSIONS SHALL BE A MINIMUM OF SIX FEET SIX INCHES WHEN USING POST SIZE OF 1 1/2" X 1 1/2" OR LARGER.
- DISTANCE OF FOUR FEET IS TO BE USED BEHIND GUARDRAIL.
- DISTANCE OF TWENTY FEET IS DESIRABLE ON FREEWAYS AND EXPRESSWAYS.
- DISTANCE WITHIN TWENTY FEET MINIMUM IS TO BE USED ON URBAN STREETS AND CROSSROADS.
- SEE SIGN SCHEDULE SHEET IN THE PLANS FOR DIMENSIONS E, L, H, H₁, H₂, H₃, R, AND W.
- TRAFFIC SIGN DIMENSIONS SHALL BE A MINIMUM OF SIX FEET SIX INCHES WHEN USING POST SIZE OF 1 1/2" X 1 1/2" OR LARGER.
- DISTANCE OF FOUR FEET IS TO BE USED BEHIND GUARDRAIL.
- DISTANCE OF TWENTY FEET IS DESIRABLE ON FREEWAYS AND EXPRESSWAYS.
- DISTANCE WITHIN TWENTY FEET MINIMUM IS TO BE USED ON URBAN STREETS AND CROSSROADS.
- SEE SIGN SCHEDULE SHEET IN THE PLANS FOR DIMENSIONS E, L, H, H₁, H₂, H₃, R, AND W.
- TRAFFIC SIGN DIMENSIONS SHALL BE A MINIMUM OF SIX FEET SIX INCHES WHEN USING POST SIZE OF 1 1/2" X 1 1/2" OR LARGER.
- DISTANCE OF FOUR FEET IS TO BE USED BEHIND GUARDRAIL.
- DISTANCE OF TWENTY FEET IS DESIRABLE ON FREEWAYS AND EXPRESSWAYS.
- DISTANCE WITHIN TWENTY FEET MINIMUM IS TO BE USED ON URBAN STREETS AND CROSSROADS.

EXIT PANEL MOUNTING DETAIL

ITEM NO. 70-10-02, INSTALL AUXILIARY SUPPORT FOR EXIT NUMBER PANEL PER EACH (INCLUDES THE COST OF AUXILIARY SUPPORTS AND POST CLIPS).

NOTE: TO BE USED WHERE ADDITIONAL PANELS ARE REQUIRED.

ADDITIONAL PANEL MOUNTING DETAIL

ITEM NO. 70-10-02, INSTALL AUXILIARY SUPPORT FOR EXIT NUMBER PANEL PER EACH (INCLUDES THE COST OF AUXILIARY SUPPORTS AND POST CLIPS).

NOTE: TO BE USED WHERE ADDITIONAL PANELS ARE REQUIRED.

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 7-26-75: CORRECT VERTICAL AND LATERAL CLEARANCES AND RAILROAD CROSSBUCK SIGN TO MATCH WITH 1971 FEDERAL SPECIFICATIONS FOR U-P-POST SUPPORTS AND CHANGEABLE NUMERICAL DETAIL.

REV. 8-24-75: BREAKAWAY ADDED TO SQUARE TUBE POST DESCRIPTION. REV. 2-19-76: APPROPRIATE SIZES.

REV. 2-25-76: PAY ITEM AND NOTE ADDED FOR RAILROAD CROSSBUCK SIGN AND SUPPORT.

REV. 4-19-76: CHANGED DMC NO. FROM RD-3-16 (16) TO 1-3-16.

REV. 3-5-76: DELETED REFERENCE TO DMC NO. SUBSTITUTED NEW DMC NO.

REV. 4-27-76: THE WORD "STEEL" ELIMINATED FROM U-POST.

REV. 10-24-75: U-POST CONNECTION DETAIL REVISED.

REV. 12-15-83: CONNECTION DETAIL U-POST CHANGED.

REV. 5-28-84: CONNECTION DETAIL U-POST AND RAILROAD CROSSBUCK SIGN AND SUPPORT CHANGED.

REV. 10-30-84: ADDED TAMPER PROOF ADIT TO CONNECTION DETAIL U-POST.

REV. 2-24-85: ADDED POP-RIVET ALTERNATE TO U-POST CONNECTION DETAIL.

REV. 4-10-86: ADDED REFERENCE TO SECTION 24-3 OF MUTCD.

REV. 7-13-86: REMOVE SHEET, DELETED POP-RIVET ALTERNATE, ADDED NOTES.

REV. 10-16-90: REDKEN AND REORGANIZED SHEET. CHANGED MINIMUM DEPTH OF U-POST IN GROUND FROM 3'-0" TO 3'-6".

REV. 11-15-91: SWELDER INSTALLATION USING THESE SUPPORTS.

REV. 12-28-91: CORRECTED FOOTNOTE ON CROSSBUCK SIGN AND SUPPORT INSTALLATION DETAIL.

REV. 7-29-92: CHANGED U-POST TO P8 POST IN RAILROAD CROSSBUCK SIGN AND SUPPORT DETAIL.

REV. 7-29-96: CHANGED MATERIAL ON CROSSBUCK AND TRACK NUMBER SIGN TO SELECTIVE REFLECTIVE STOP TO CROSSBUCK SUPPORT.

REV. 1-18-99: ADDED FOOTNOTE (A).

REV. 5-27-01: CHANGED CROSSBUCK SIGN IN ITEM NO. 713-16.05.

REV. 7-29-04: IN RAILROAD CROSSBUCK SIGN AND SUPPORT DETAIL MOVED 18" DIMENSION LINE.

REV. 10-23-08: ADDED GENERAL NOTE (C) AND TRACK ID PLATE.

REV. 11-11-11: ADDED RAILROAD ADVANCE WARNING SIGN DETAIL.

MINOR REVISION - FINAL APPROVAL NOT REQUIRED.

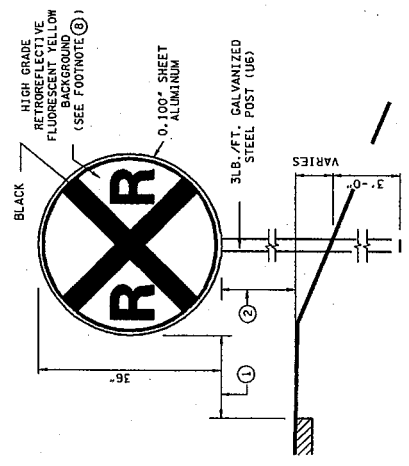
STATE OF TENNESSEE

DEPARTMENT OF TRANSPORTATION

GROUND MOUNTED ROADSIDE SIGN AND DETAILS

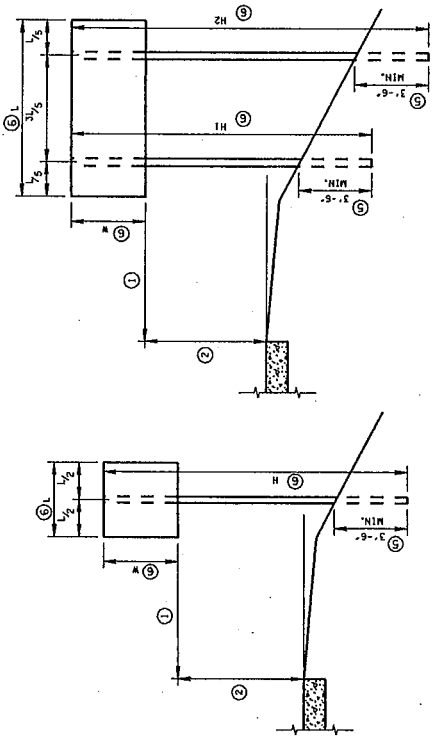
T-S-16

W10-1



(36 INCH DIAMETER SIGN)
TO BE PAID FOR UNDER ITEM 713-16.09 RAILROAD ADVANCE WARNING SIGN AND SUPPORT.

RAILROAD ADVANCE WARNING SIGN "U" POST SUPPORT



SHOULDER INSTALLATION FOR TWO "U" POST SUPPORTS

SHOULDER INSTALLATION FOR ONE "U" POST SUPPORT

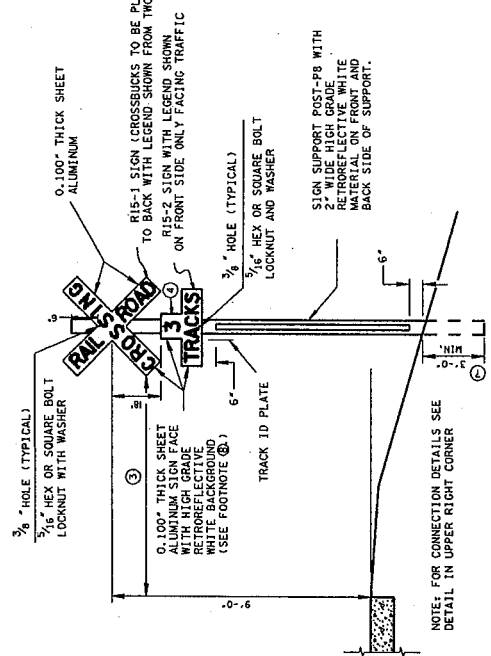
FOOTNOTES

- FOR STANDARDIZATION OF LOCATION AND LATERAL CLEARANCE SEE SUBSECTIONS 2A-16 AND 2A-19 OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- FOR HEIGHT SEE SUBSECTION 2A-18 OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- FOR LATERAL CLEARANCE OF CROSSBUCK SIGN SEE SUBSECTION 2A-19 OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- IF THERE ARE TWO OR MORE TRACKS OF TRACKS SHALL BE INDICATED ON AN AUXILIARY SIGN OF INVERTED T-SHAPE MOUNTED BELOW THE CROSSBUCK SIGN.
- IF ROCK IS ENCOUNTERED DURING THE INSTALLATION OF THE SUPPORTS SHALL BE DRILLED TO PROVIDE THE MINIMUM 3'-6" DEPTH IN GROUND.
- SEE SIGN SCHEDULE SHEET IN THE MANUAL FOR DIMENSIONS L, H, H1, H2, H3 AND M.
- IF ROCK IS ENCOUNTERED DURING THE INSTALLATION OF THE SUPPORTS SHALL BE DRILLED TO PROVIDE THE MINIMUM 3'-0" DEPTH IN GROUND.
- SEE TDOT SPECIAL PROVISION 713A FOR DIMENSIONS FOR HIGH GRADE REFLECTIVE SHEETING.

LEGEND	
W	HEIGHT OF SIGN FACE
L	LENGTH OF SIGN FACE
H	HEIGHT OF SIGN SUPPORT

RAILROAD CROSSBUCK SIGN AND SUPPORT GENERAL NOTES

- RAILROAD CROSSBUCK SIGN, NUMBER OF TRACKS AUXILIARY SIGN, TRACK ID PLATE, AND SUPPORT IS TO BE PAID FOR UNDER ITEM NO. 713-16.05. RAILROAD CROSSBUCK SIGN AND SUPPORT PER EACH. THIS PAY ITEM SHALL INCLUDE THE FURNISHING AND INSTALLING OF THE SIGNS, SUPPORT AND HARDWARE.
- LOCATION OF THE CROSSBUCK SIGN AND SUPPORT WITH RESPECT TO THE CENTERLINE OF THE NEAREST TRACK SHALL BE IN ACCORDANCE WITH THE TYPICAL LOCATION PLAN FOR FLASHING LIGHT SIGNAL LOCATIONS AS SHOWN ON FIGURE B-7 (PAGE 80-6) OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- IF AN EXISTING CROSSBUCK SIGN AND SUPPORT IS TO BE REMOVED, THE CONTRACTOR SHALL REMOVE AND INSTALL THE EXISTING TRACK ID PLATE ON THE PROPOSED CROSSBUCK SIGN. ALL COST ARE TO BE INCLUDED IN THE PRICE BID FOR ITEM NO. 713-16.05.
- AT PASSIVE RAILROAD CROSSINGS REFER TO T-S-16A FOR STOP OR YIELD SIGN INSTALLATION.
- USE SIGN SUPPORT POST-P8 FOR STOP OR YIELD SIGN ATTACHMENTS P POST EMBEDMENT IN GROUND SHALL BE MIN. 3'-6".

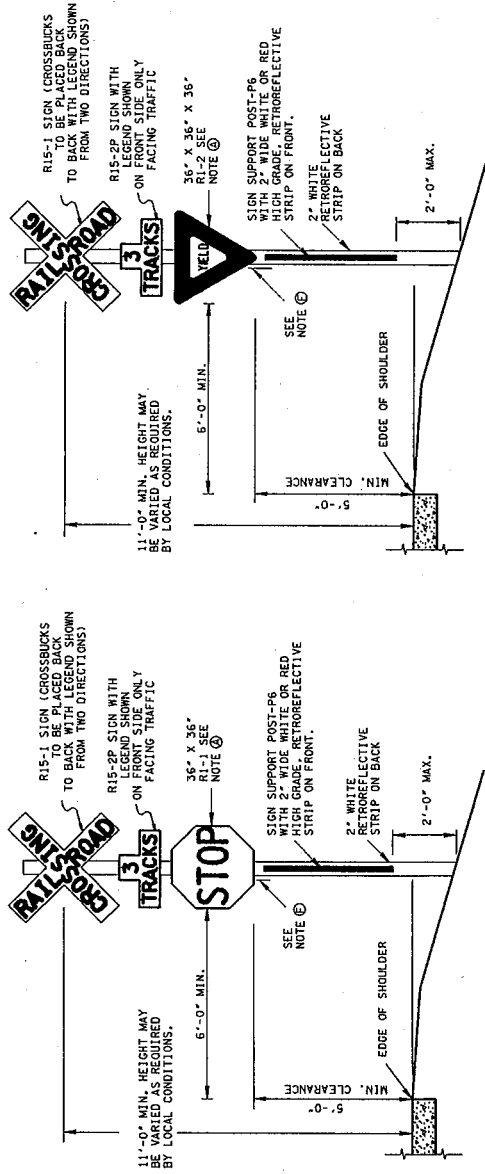


RAILROAD CROSSBUCK SIGN AND SUPPORT DETAIL PERFORATED/KNOCKOUT SQUARE TUBE SUPPORT

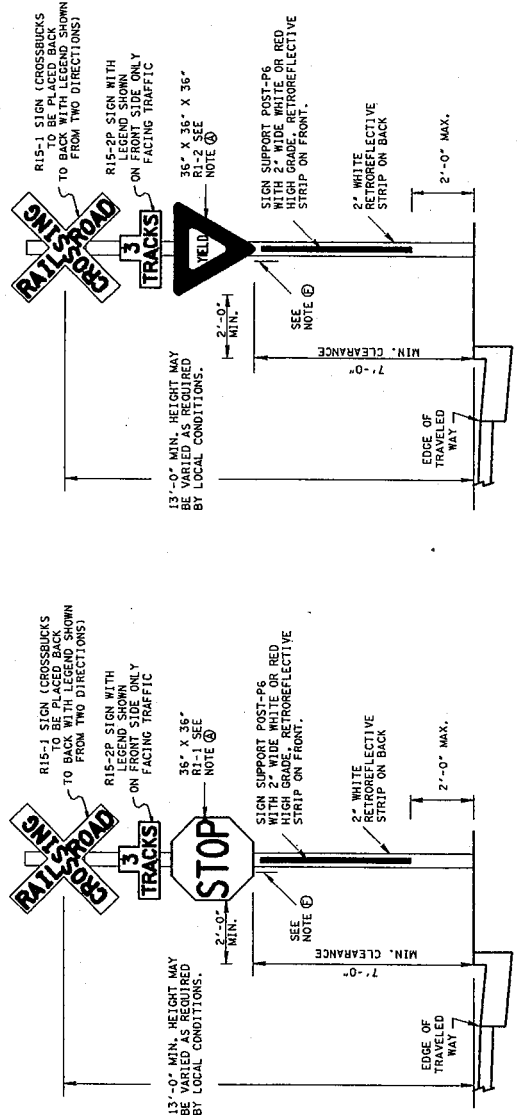
NOTE: FOR CONNECTION DETAILS SEE DETAIL IN UPPER RIGHT CORNER

REV. 11-1-11: REVISED GENERAL NOTES AND ADDED GENERAL NOTES TO R-15-2 SIGNS TO 10.15.20.

STOP OR YIELD SIGN ON SAME POST WITH THE CROSSBUCK SIGN AT PASSIVE HIGHWAY-RAIL GRADE CROSSINGS



RURAL DISTRICT



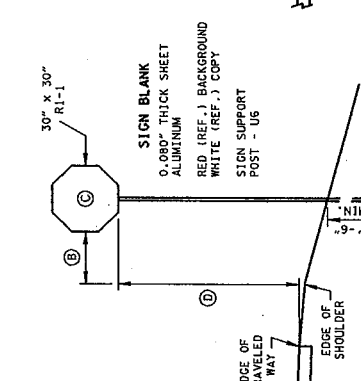
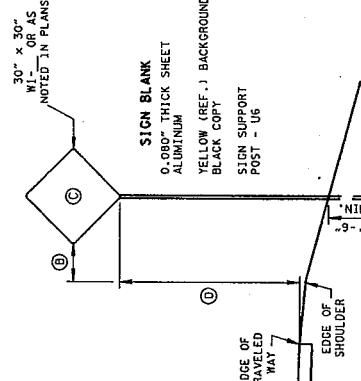
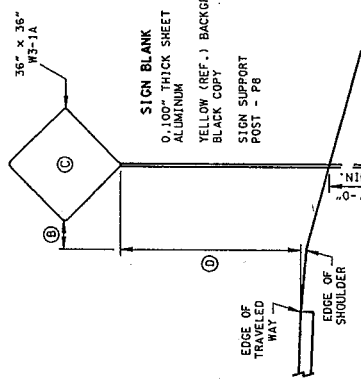
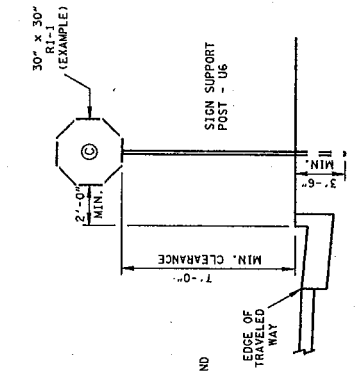
BUSINESS OR RESIDENCE DISTRICT

GENERAL NOTES

- (A) YIELD SIGNS SHALL BE THE DEFAULT SIGN AND SHALL BE USED UNLESS AN ENGINEERING STUDY DETERMINES THAT A STOP SIGN IS REQUIRED. IF A STOP SIGN IS REQUIRED, IT SHALL BE PLACED IN ADVANCE OF THE RAILROAD SIGN (W10-11) ACCORDING TO THE REQUIREMENTS OF THE MUTCD. YIELD SIGNS SHALL BE USED ON MULTI-LANE CONVENTIONAL ROADS USE 48" X 48" X 148" YIELD SIGNS FOR ADDITIONAL INFORMATION FOR STOP AND YIELD SIGN SIZES, SEE TABLE 8B-1 OF THE MUTCD.
- (B) SEE STD-DWG T-5-16 FOR RAILROAD CROSSBUCK SIGN AND SUPPORT DETAILS.
- (C) RAILROAD CROSSBUCK SIGN AND SUPPORT, YIELD/STOP SIGN, NUMBER OF TRACKS AUXILIARY SIGN, AND TRACK ID PLATE IS TO BE PAID FOR UNDER ITEM NO. 713-16.05, RAILROAD CROSSBUCK SIGN AND SUPPORT PER EACH. THIS PAY ITEM SHALL INCLUDE THE FURNISHING AND INSTALLING OF THE SIGNS, SUPPORT AND HARDWARE.
- (D) LOCATION OF THE CROSSBUCK SIGN AND SUPPORT WITH RESPECT TO THE CENTERLINE OF THE LIGHT SIGNAL LOCATIONS AS SHOWN ON FIGURE 8C-2 OF THE CURRENT EDITION OF THE MUTCD FOR ADDITIONAL INFORMATION.
- (E) IF AN EXISTING CROSSBUCK SIGN AND SUPPORT IS TO BE REMOVED, THE CONTRACTOR SHALL REMOVE AND INSTALL THE EXISTING AIR NUMBER PLATE ON THE PROPOSED CROSSBUCK SIGN. ALL COST ARE TO BE INCLUDED IN THE PRICE BID FOR ITEM NO. 713-16.05.
- (F) TRACK ID PLATE TO BE MOUNTED ON LEFT SIDE FACING TRACK.
- (G) SEE FIGURE 8B-2 AND SECTION 8B.04 OF THE MUTCD FOR ADDITIONAL INFORMATION FOR PASSIVE GRADE CROSSINGS.

MINOR REVISIONS TO FHWA APPROVAL NOT REQUIRED.

REV. 10-15-90: CHANGED DIMENSIONS OF POST IN GROUND FROM 3'-0" TO 2'-0".
 REV. 7-29-92: CHANGED UP SILK SCREENING DETAILS.
 REV. 7-29-92: CHANGED UP EMBLEMMENT OF POST FOR DIAMOND SIGNS.
 REV. 10-18-97: CHANGED GENERAL NUMBERS.
 REV. 11-1-11: REVISED GENERAL NOTES AND ADDED GENERAL NOTE (A).



TYPICAL CURB & GUTTER SECTION SIGN DETAIL

36" x 36" DIAMOND SIGN DETAIL

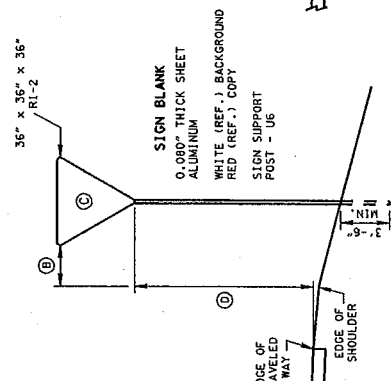
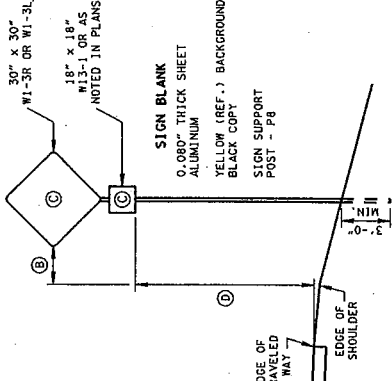
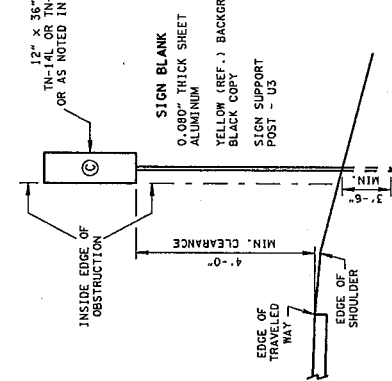
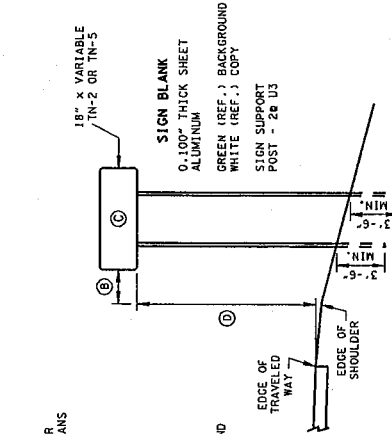
30" x 30" DIAMOND SIGN DETAIL

STOP SIGN DETAIL

SEE NOTE (A)

SEE NOTE (A, E)

SEE NOTE (A, E)



STREAM OR COUNTY LINE SIGN DETAIL

OBJECT MARKER SIGN DETAIL

30" x 30" DIAMOND SIGN WITH SUPPLEMENTAL PLATE DETAIL

YIELD SIGN DETAIL

SEE NOTE (A)

SEE NOTE (A)

SEE NOTE (A, E)

SEE NOTE (A, E)

GENERAL NOTES

(A) SIGN FACE, SUPPORT, INSTALLATION, AND HARDWARE INCLUDED IN ITEM NOS. 713-16-20 THROUGH 713-16-29 SIGNS (DESCRIPTION) PER EACH.

(B) 6'-0" DESIRABLE FROM EDGE OF SHOULDER, OR IF NONE, 12'-0" DESIRABLE FROM EDGE OF TRAVELED WAY (SEE CURRENT EDITION MUTCD SECTIONS 2A.19 THROUGH 2A.21). 4'-0" DESIRABLE FROM FACE OF GUARDRAIL.

(C) LETTERS, BORDERS, AND ALPHABET ACCESSORIES SHALL BE APPLIED BY SILK SCREENING PROCESS. SEE SECTIONS 2A.0R THROUGH 2A.15 OF THE MUTCD FOR ADDITIONAL INFORMATION.

(D) THE MINIMUM HEIGHT, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE NEAR EDGE OF THE PAVEMENT, OF SIGNS INSTALLED AT THE SIDE OF THE ROAD IN RURAL AREAS SHALL BE 5 FEET. THE MINIMUM HEIGHT, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF THE CURB, OR IN THE ABSENCE OF CURB, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE ELEVATION OF THE NEAR EDGE OF THE TRAVELED WAY, OF SIGNS INSTALLED AT THE SIDE OF THE ROAD IN BUSINESS, COMMERCIAL, OR RESIDENTIAL AREAS WHERE PARKING OR PEDESTRIAN ACCURATE VIEW OF THE SIGN IS REQUIRED SHALL BE 7 FEET. THE MINIMUM HEIGHT OF ANY OTHER SIGN MAY BE 1 FOOT LESS THAN THE APPROPRIATE HEIGHT SPECIFIED ABOVE. SEE FIGURE 2A-2 AND SECTION 2A.18 OF THE MUTCD FOR ADDITIONAL INFORMATION.

(E) FOR MULTI-LANE CONVENTIONAL ROADS USE 48"X48"X48" YIELD SIGN AND USE 36"X36"X36" YIELD SIGN FOR MULTILANE INFORMATION FOR STOP AND YIELD SIGN SIZES. SEE TABLE 2B-1 AND TABLE 2C-2 OF THE MUTCD.

MINOR REVISION -- FWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

SIGN DETAILS NOT TO SCALE

T-5-20

REV. 11-22-72: CHANGED PULL BOX TO CONTROLLER CASE. CONNECTION & CONDUIT RISER ASSEMBLY.

REV. 7-1-72: CHANGED DEPARTMENT NAME.

REV. 1-22-72: CHANGED CLAMS OR WIRE HEADS.

REV. 11-20-72: ADDED HORIZONTAL CLEARANCE TO PALE MOUNTED SIGNAL HEAD.

REV. 3-3-75: ADDED DETAIL OF DEAD END.

REV. 7-1-76: CHANGED DIM. NO. FROM 11-5-1 TO 11-5-1.

REV. 6-1-77: CHANGED PERCENT OF SAG ON SPAN WIRE.

REV. 11-22-77: ADDED SPAN WIRE TO ALTERNATE GUYING DETAIL.

REV. 11-22-77: REFERENCES TO SIZE 502 STRAIN INSULATOR. ADDED DETAIL FOR SPAN INSULATOR.

REV. 11-22-81: ADDED NOTE FOR PILE MOUNTED SIGNAL HEAD. SIZE TO CLASS 3, CHANGED INSULATOR TO STRAIN INSULATOR.

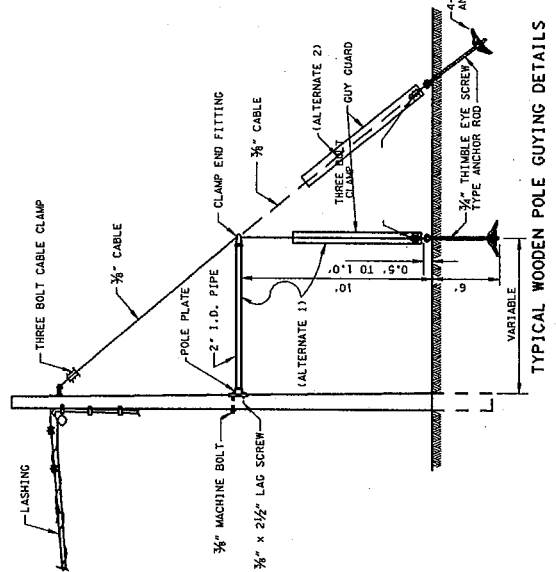
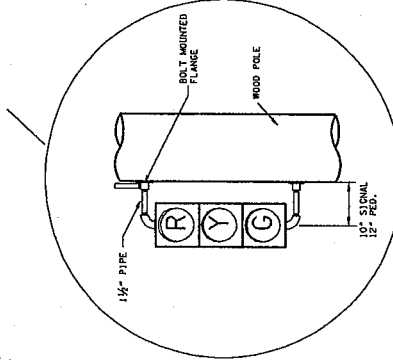
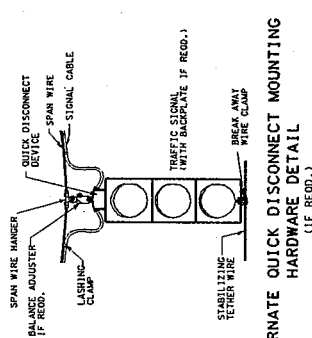
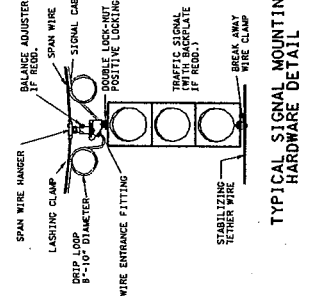
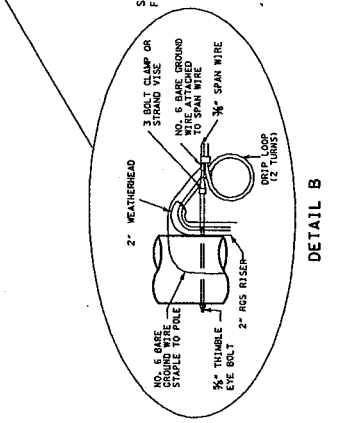
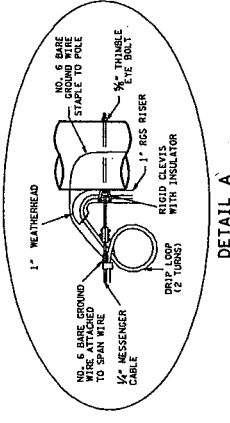
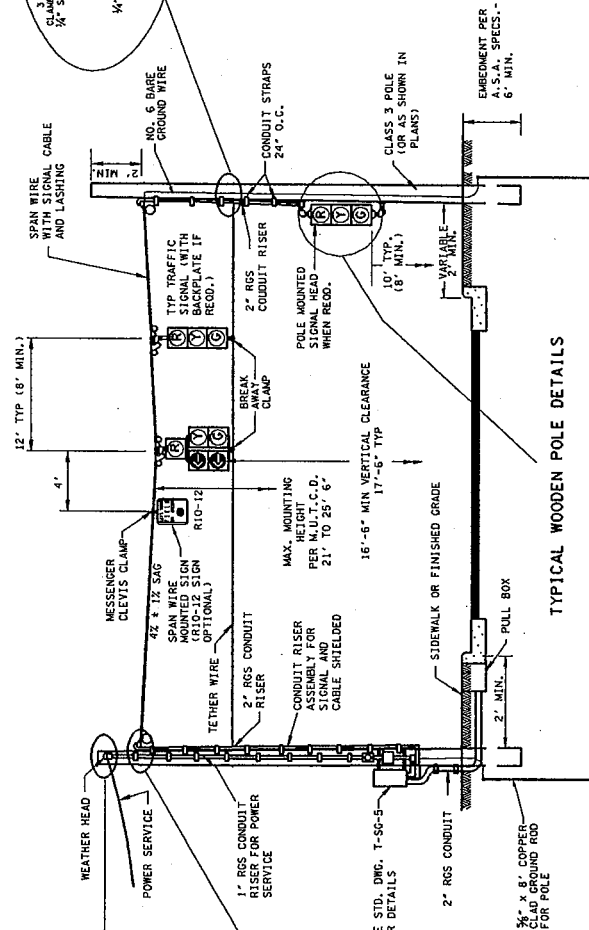
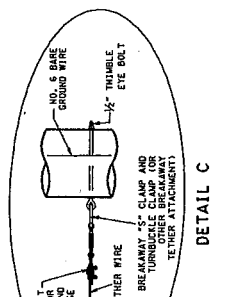
REV. 6-25-81: LASHING KEY GUARD. CHANGED CUY CABLE SIZE TO 3/8" INCH. CHANGED SERVICE CUY CABLE TO 1/2" INCH. DELETED FUSE BOX.

REV. 7-29-84: REDRAWN SHEET ON CAD AND MADE MINOR CHANGES.

REV. 11-22-84: LASHING KEY GUARD. CHANGED TO 5/8" MAX. DETAIL, AND REVISED SHEET TITLE.

REV. 1-29-84: REDRAWN, REMAILED AND RENESTED SHEET.

REV. 11-1-11: REVISED R10-12 SIGN ON OR TO BE USED AS AN OPTIONAL SIGN.



WOOD POLE GENERAL NOTES

- LOCATIONS OF SIGNAL POLES SHOWN ON PLANS ARE APPROXIMATE AND CAN BE ADJUSTED UP TO 5' TO AVOID UTILITIES. ADJUSTMENTS GREATER THAN 5' MUST BE REVIEWED AND APPROVED BY ENGINEER.
- POWER SERVICE CABLE SHALL BE RUN ON WOOD POLE IN SEPARATE 1" RGS RISER (SEE STD. DNG. T-SG-5).
- IF IT IS NECESSARY TO RUN POWER SERVICE CABLE FROM ONE POLE TO ANOTHER, IT SHALL BE RUN ON SEPARATE MESSENGER CABLE (2" ABOVE SPAN WIRE WITH SIGNAL OR DETECTOR CABLES).
- ALL WOOD SIGNAL SUPPORT POLES SHALL BE GUYED.
- SIGNALS TO BE MOUNTED WITH 17'-6" TYPICAL VERTICAL CLEARANCE (16'-6" MIN.), MAXIMUM MOUNTING HEIGHT SHALL BE CHECKED PER AUTO AND HEIGHT ADJUSTED IF NECESSARY.
- RED INDICATIONS TO BE APPROX. SAME HEIGHT. HANGER CONNECTOR EXTENDER OR TETHER EXTENDER MAY BE REQUIRED.
- SEE STD. DNG. T-SG-4 FOR ADDITIONAL DETAILS.

TYPICAL SIGNAL MOUNTING HARDWARE DETAIL

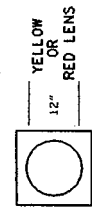
ALTERNATE QUICK DISCONNECT MOUNTING HARDWARE DETAIL (IF RECD.)

TYPICAL WOODEN POLE DETAILS

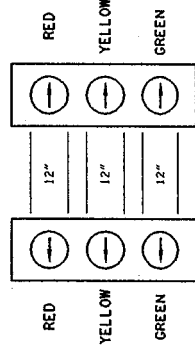
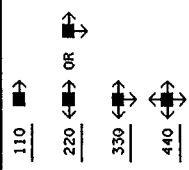
DETAIL D

TYPICAL WOODEN POLE GUYING DETAILS

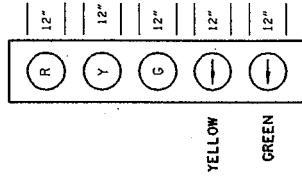
REV. 4-12-85, ADDRESS SHEET, ASSEMBLY.
 REV. 5-30-89, ADDRESS SHEET, ASSEMBLY.
 REV. 5-30-89, ADDRESS SHEET, ASSEMBLY.
 REV. 3-12-90, ADDRESS SHEET, ASSEMBLY.
 REV. 3-12-90, ADDRESS SHEET, ASSEMBLY.
 REV. 3-12-90, ADDRESS SHEET, ASSEMBLY.



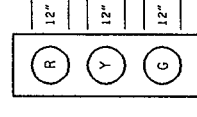
FLASHING BEACON HEADS



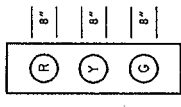
130A3



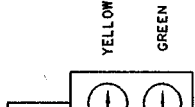
150A2V



130
260
390
4(12)0

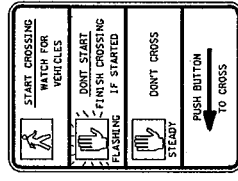


103
206
309
40(12)



YELLOW
GREEN

150A4H



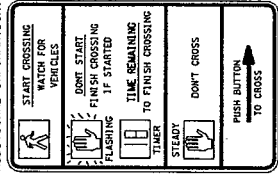
150A4H

SIZE - 9" x 12"
 LEGEND - WHITE "WALK" (FIGURE) ON BLACK
 ORANGE "DON'T WALK" (HAND) ON BLACK
 ALL ELSE BLACK
 BACKGROUND - WHITE (REF.)
 LOCATION - IMMEDIATELY ABOVE PUSH BUTTON PEDESTAL POLES.

MATERIAL - TYPE II REFLECTIVE SHEETING
 1) MOUNTED BY ADHESION ON STEEL STRAIN POLES.
 2) MOUNTED ON 0.063" MINIMUM THICK FLAT SHEET ALUMINUM AND BANDED TO WOOD POLES OR PEDESTAL POLES.

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 SIGNAL HEAD ASSEMBLIES AND PEDESTRIAN PUSH BUTTON SIGNS
 T-SC-7

NOTE: SEE SECTION 46.07 OF THE MANUAL FOR ADDITIONAL INFORMATION.



COLOR LEGEND
 MAN - WHITE
 HAND - PORTLAND ORANGE
 NUMBERS - PORTLAND ORANGE

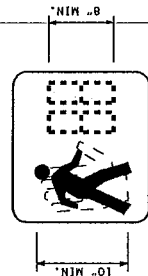
STANDARD PEDESTRIAN CROSSWALK SIGNAL

R10-3E



COUNTDOWN PEDESTRIAN CROSSWALK SIGNAL

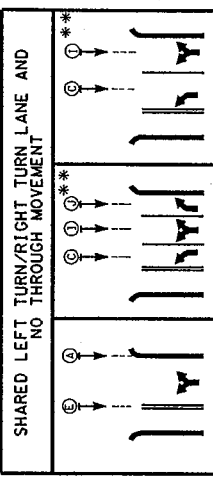
REQUIRED USE WHERE PED. CHANGE INTERVAL (FLASHING HAND) > 7 SECOND



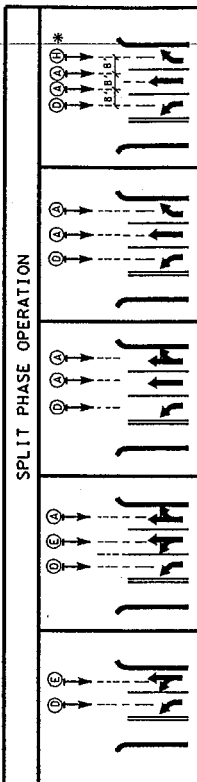
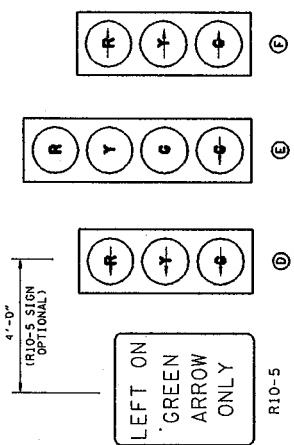
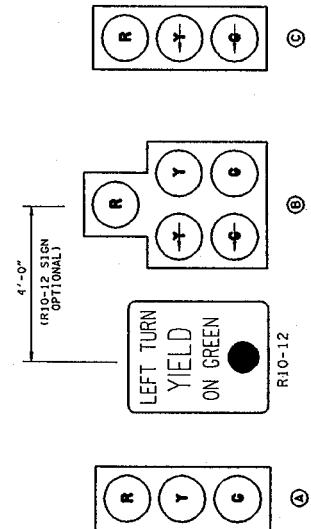
COLOR LEGEND
 MAN - WHITE
 HAND - PORTLAND ORANGE
 NUMBERS - PORTLAND ORANGE

REV. 2-14-92, ADDED BLOCK WITH OPTIONAL THRU-LEFT LANE.
 REV. 12-16-03, REVISED SIGNAL HEADS TO BE USED FOR SPLIT PHASE TREATMENT FOR PERMISSIVE LEFT TURN TREATMENT ON T-LANE ROADWAY. DELETED SIGNAL DISPLAY (A) AND DELETED LEFT TURN HEAD, REV. GENERAL NOTES.
 REV. 7-29-04, ADDED NEW SIGNAL DISPLAYS (C), (D), AND (E) MODIFIED LEFT TURN TREATMENT TABLE.

REV. 11-1-11, REVISED GENERAL NOTE 3, REVISED LEFT TURN OPERATION, ADDED SHARED LEFT TURN/RIGHT TURN TREATMENT, ADDED SIGNAL DISPLAY (D) AND CHANGED SIGNAL DISPLAY (C) TO DELETED R10-10 SIGN.



*** IF CROSS-WALK WITH RIGHT TURNS CONFLICTS, THEN REPLACE (A) WITH (A) OR (A) WITH (A).
 NOTE: (A) SEE SECTIONS 40.25, 40.26 AND FIGURES 40-20 IN THE MUTCD FOR ADDITIONAL INFORMATION.
 (B) AND (C) CAN ONLY BE USED IF THE GREEN ARROW AND CIRCULAR GREEN ARE ALWAYS TERMINATED TOGETHER.



* USE (C) IF OVERLAPPED WITH MAIN STREET LEFT TURN PHASE

GENERAL NOTES

85 PERCENTILE OR POSTED SPEED (MILES PER HOUR)	MINIMUM VISIBILITY DISTANCE (FEET)
20	175
25	215
30	270
35	325
40	390
45	460
50	540
55	625
60	715

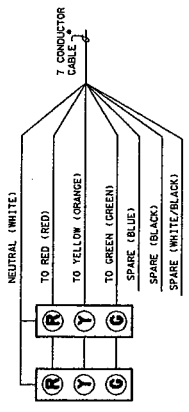
- (1) ON CURVED APPROACHES, PLACEMENT SHALL BE ADJUSTED AS NECESSARY TO MEET REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CURRENT EDITION).
- (2) SIGNAL HEAD PLACEMENT SHALL MEET MAXIMUM MOUNTING HEIGHT REQUIREMENTS OF THE MUTCD.
- (3) SEE SECTIONS 40.08 THROUGH 40.33 FOR ADDITIONAL INFORMATION REGARDING LOCATIONS AND USAGE OF SIGNAL HEADS IN THE CURRENT EDITION OF THE MUTCD.

APPROACH LANE USE (THRU/LEFT)	LEFT TURN TREATMENT		
	PERMISSIVE	PERMISSIVE/PROTECTED	PROTECTED ONLY
1/0			
2/0			
1/1			
2/1			
3/1			
2/2			
3/2			

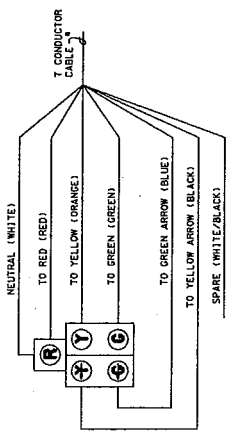
SIGNAL DISPLAYS

VEHICLE SIGNAL HEAD WIRING

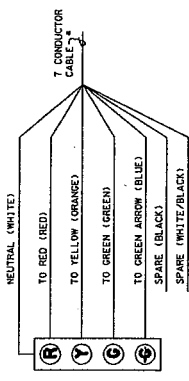
(V1) 3-SECTION SIGNAL HEAD (TYPE 130)



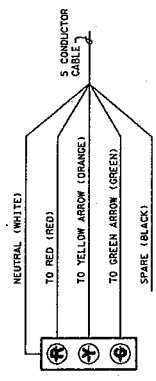
(V2) 5-SECTION SIGNAL HEAD (TYPE 150, 128, 150, 128 AND 150, 128)



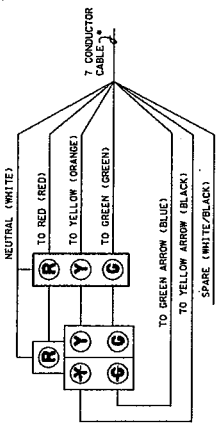
(V3) 4-SECTION SIGNAL HEAD (TYPE 140A1)



(V4) 3-SECTION SIGNAL HEAD (TYPE 130A2 OR 130A3)

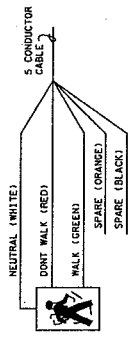


(V5) COMBINATION, TYPES 130/150A2 (LEFT TURN PERM/PROT.)

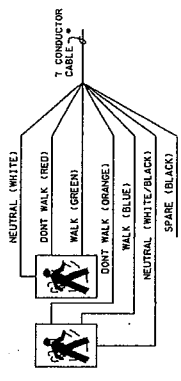


PEDESTRIAN SIGNAL HEAD & PUSHBUTTON WIRING

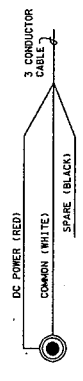
(P1) SINGLE DISPLAY



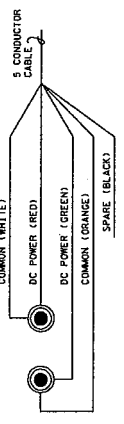
(P2) DOUBLE DISPLAY (FOR SEPARATE PEDESTRIAN CROSSING INTERVALS)



(P3) SINGLE PUSHBUTTON

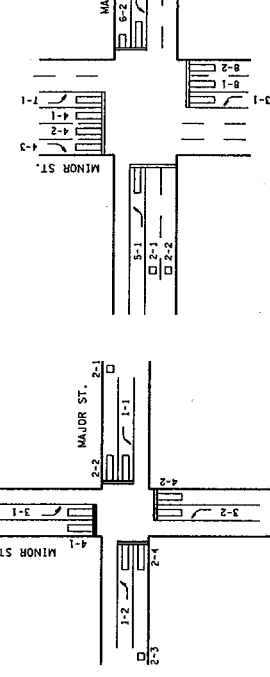
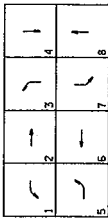


(P4) DOUBLE PUSHBUTTON (FOR SEPARATE PEDESTRIAN CROSSING INTERVALS)



* 8C OR 9C MAY BE USED

NEMA 8 PHASE



TYPICAL LOOP NUMBERING - 4 PHASE

NOTE: WIRING SHALL BE LABELED TO CORRESPOND WITH THE APPROPRIATE LOOP(S).

1. LABEL LOOP LEAD-INS IN PULLBOX OR POLE BASE.
2. LABEL SHIELDED DETECTOR CABLE IN CONTROLLER.
3. LABEL DETECTOR UNITS AND HARNESSES IN CONTROLLER.

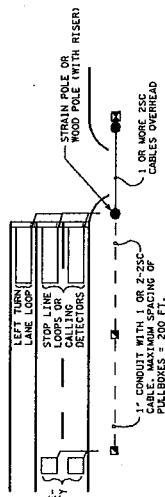
REV. 6-12-86, CHANGES 8 CONDUCTOR TO 9 CONDUCTOR CABLE.

REV. 12-16-01, CHANGE 3-SECTION TO 7 CONDUCTOR CABLE.

REV. 8-20-04, REVISED DETAILS AND ADDED TYPICAL LOOP NUMBERING-4 PHASE DETAILS.

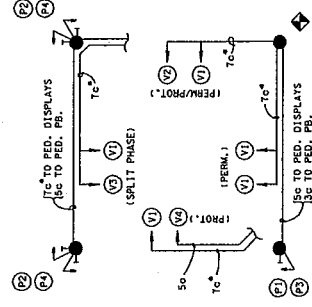
REV. 11-14-11, REVISED TYPICAL WIRING SCHEMATIC. ADDED 150 A4H TO BE BELIEVED THE WORDS LEFT TURN FROM (L).

TYPICAL LOOP NUMBERING - 8 PHASE



TYPICAL LOOP WIRING

NOTE: NOT ALL OF THE LOOPS DEPICTED MAY BE PROPOSED.



TYPICAL WIRING SCHEMATIC

(OBTAINING VARIOUS LEFT TURN TREATMENTS)

LEGEND

- CONTROLLER
- ▭ PULL BOX
- POLE FOR SIGNAL SUPPORT

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

TYPICAL WIRING FOR SIGNAL HEADS AND DETECTION LOOPS

2-14-92 T-SG-12