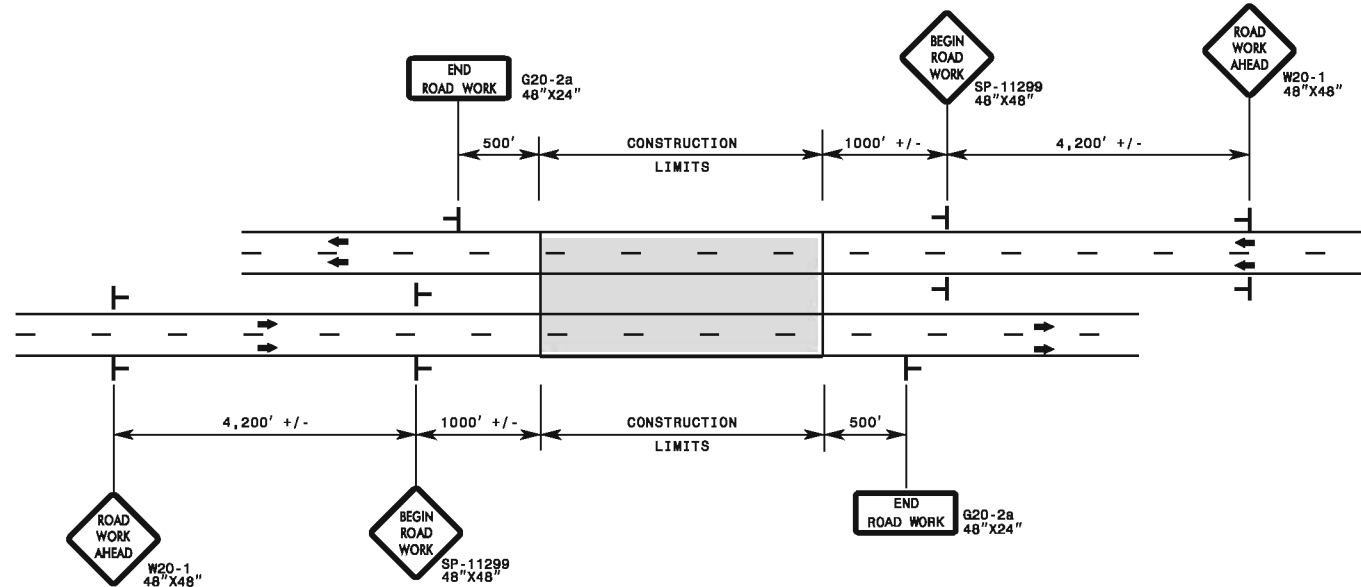
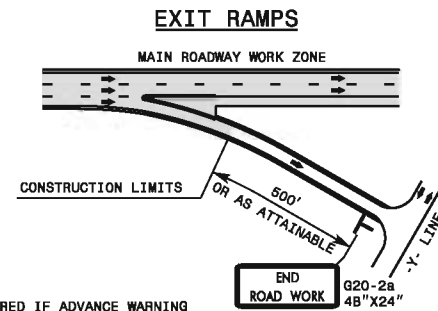


DETAIL A



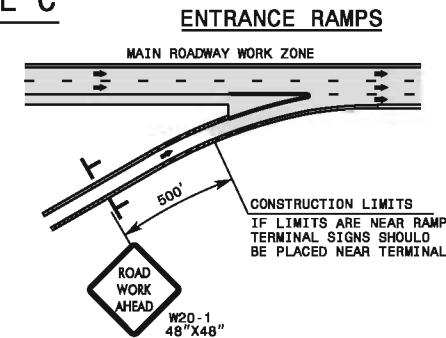
* USE THE "\$260 SPEEDING PENALTY" SIGN, SPEED LIMIT SIGN, AND ORANGE PANEL ONLY WHEN A "\$250 SPEEDING PENALTY" ORDINANCE HAS BEEN ISSUED BY THE REGIONAL TRAFFIC ENGINEER.

DETAIL B



NOTE: SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

DETAIL C



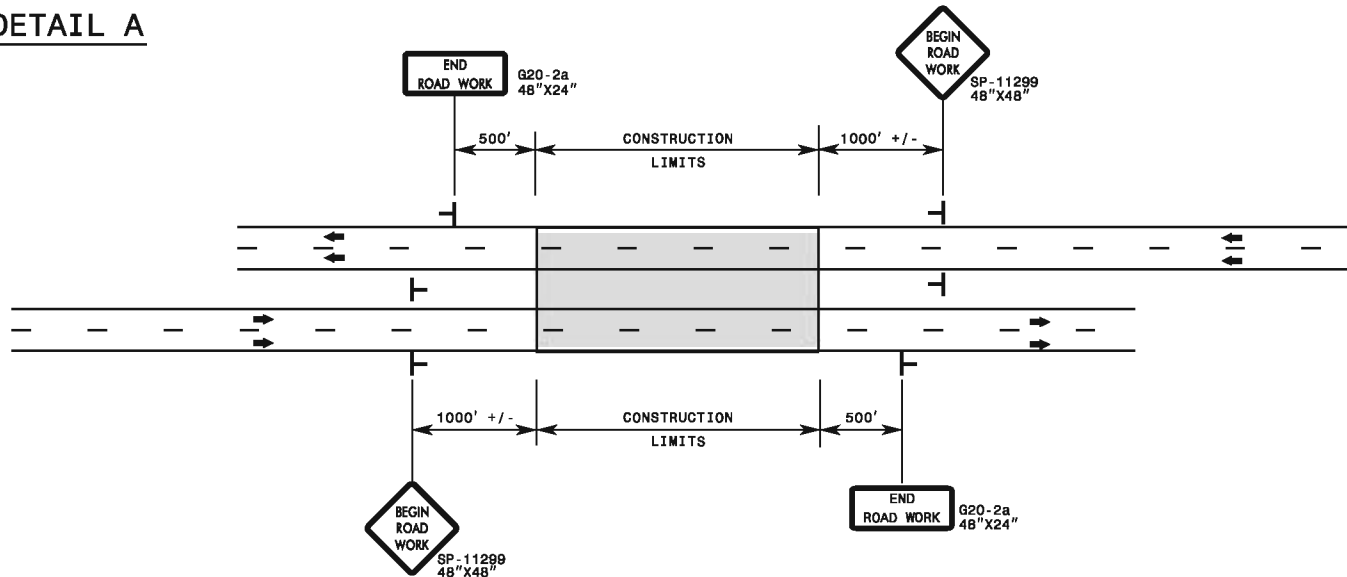
GENERAL NOTES

- 1- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- 2- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK UNLESS COVERED.
- 3- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.
- 4- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- 5- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3 LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3 LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- 6- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01.
- 7- DO NOT BACK BRACE SIGN SUPPORTS.

LEGEND

- STATIONARY SIGN
- ← DIRECTION OF TRAFFIC FLOW

DETAIL A



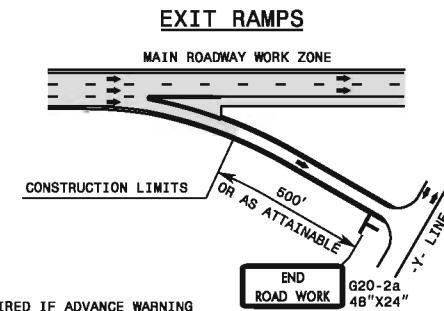
GENERAL NOTES

- 1- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- 2- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK UNLESS COVERED.
- 3- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.
- 4- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- 5- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- 6- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01.
- 7- DO NOT BACK BRACE SIGN SUPPORTS.
- 8- TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

LEGEND

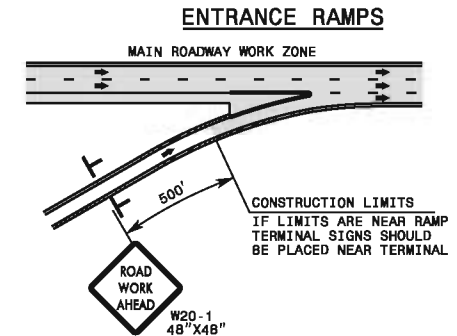
- STATIONARY SIGN
- ← DIRECTION OF TRAFFIC FLOW

DETAIL B

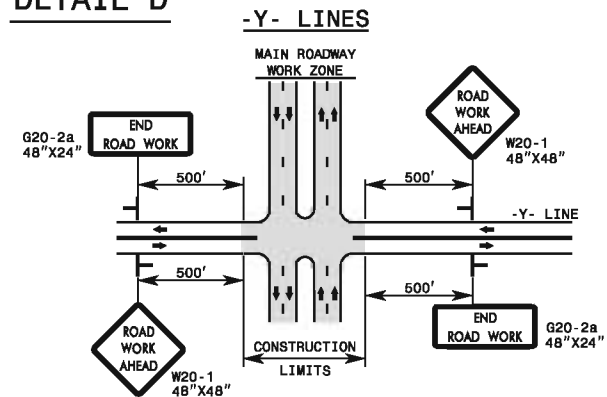


NOTE: SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

DETAIL C



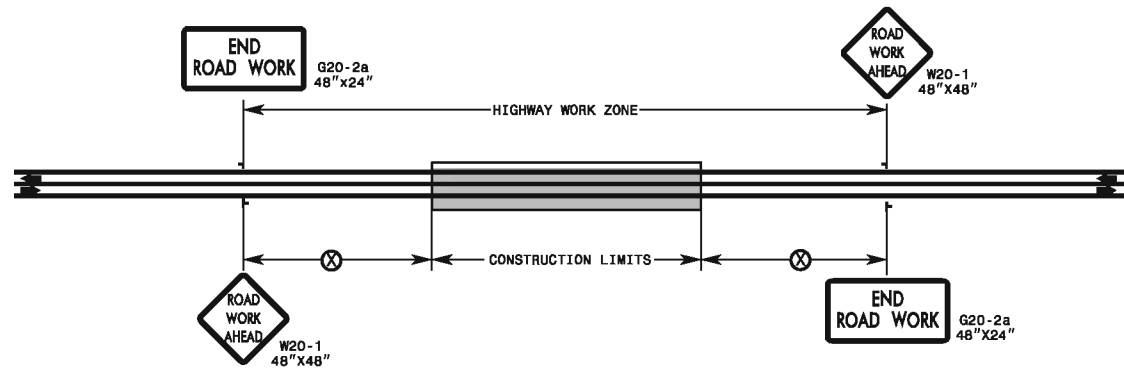
DETAIL D



DUAL MOUNT SIGNS ON DIVIDED HIGHWAYS AND INCREASE SIGN SPACING TO 1000'+/-.

1-12

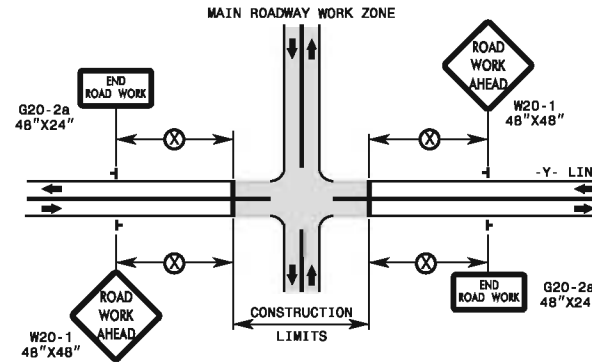
TWO-WAY UNDIVIDED (L-LINES)



POSTED SPEED LIMIT (MPH)	RECOMMENDED MINIMUM SIGN SPACING
≤ 60	500'
55	1000'

1-12

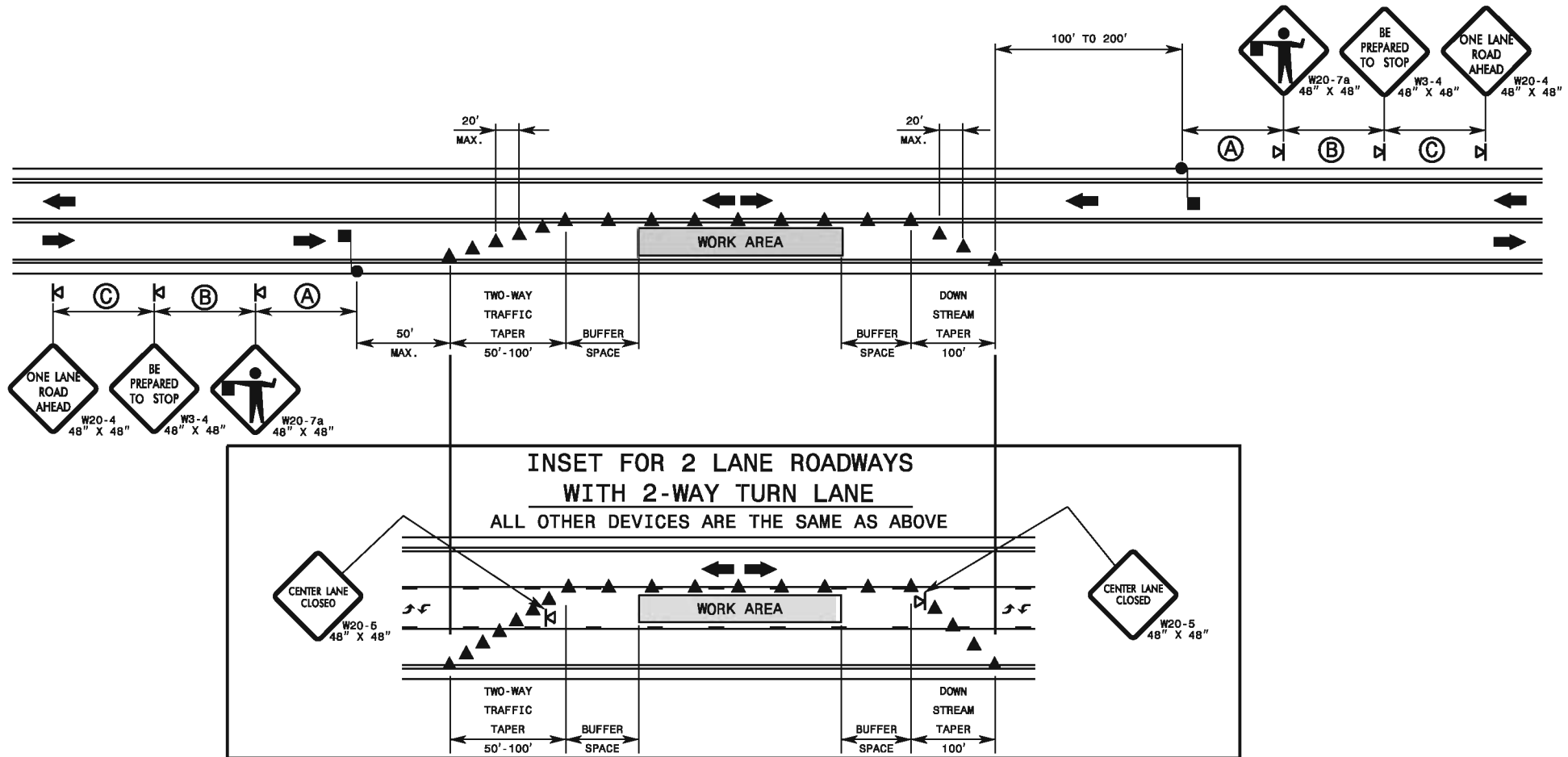
ROADWAYS INTERSECTING ALONG 2 WAY UNDIVIDED WORK ZONE (Y-LINES)



GENERAL NOTES

- 1- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- 2- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK, UNLESS COVERED.
- 3- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.
- 4- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- 5- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- 6- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01.
- 7- DO NOT BACK BRACE SIGN SUPPORTS.

LEGEND	
⊥	STATIONARY SIGN
←	DIRECTION OF TRAFFIC FLOW



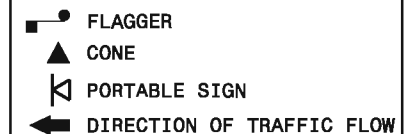
GENERAL NOTES FOR FLAGGER OPERATIONS

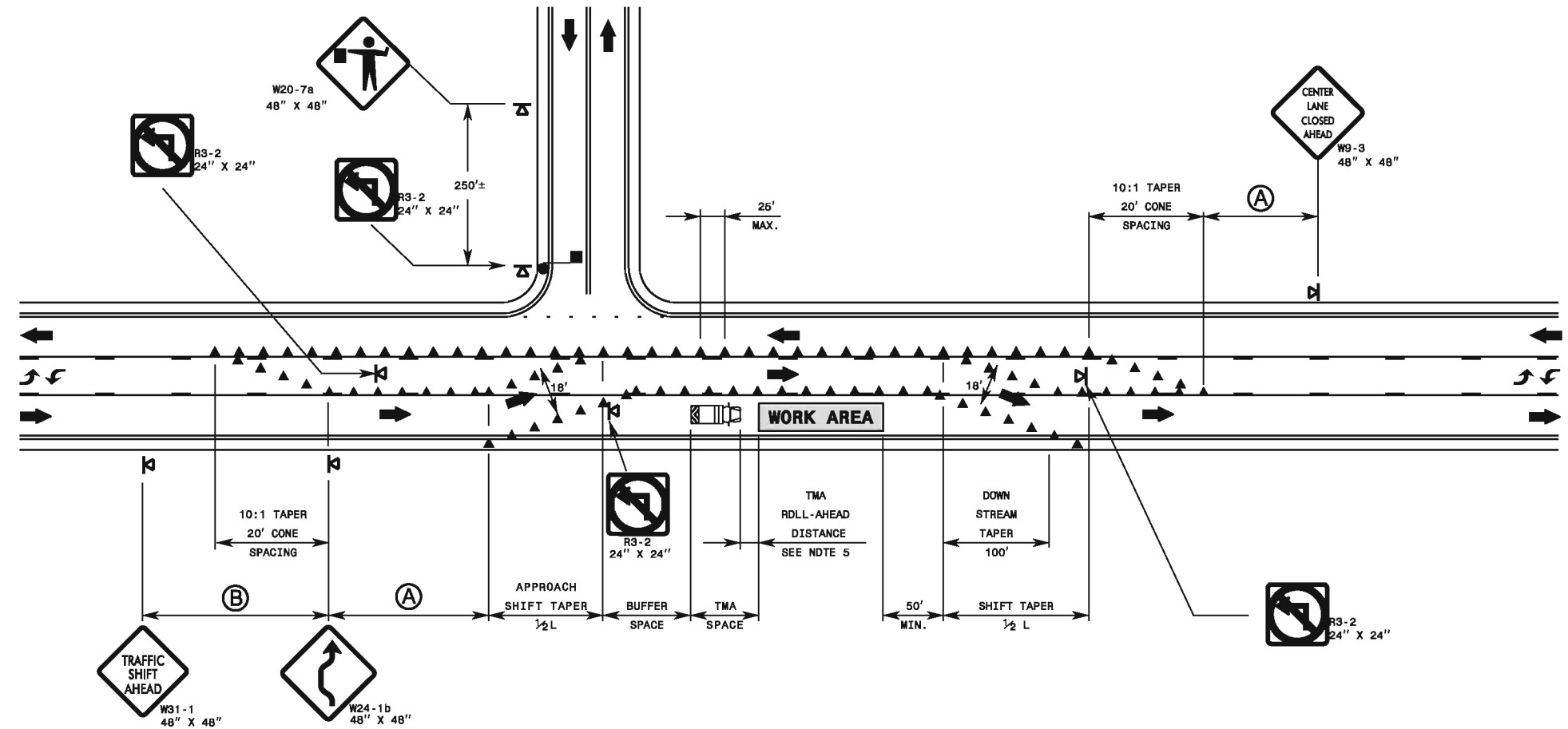
- 1- REFER TO STD. 1101.11 SHEET 4 FOR SIGN SPACING.
- 2- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC.
- 3- REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
- 4- PLACE CONES THRU THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
- 5- EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE FLAGGER (REFER TO STD. 1101.11 SHEET 2).
- 6- DO NOT STOP TRAFFIC IN ANY ONE DIRECTION FOR MORE THAN 5 MINUTES AT A TIME.
- 7- DRUMS OR SKINNY-DRUMS MAY BE USED IN LIEU OF CONES. REFER TO ROADWAY STANDARD DRAWING 1180.01 FOR SKINNY-DRUM REQUIREMENTS.
- 8- USE FLAGGERS TO CONTROL TRAFFIC AT INTERSECTIONS AFFECTED BY THE LANE CLOSURE. SUPPLEMENT FLAGGERS LOCATED AT INTERSECTIONS WITH FLAGGER AHEAD SIGNS (W20-7a) PLACED APPROXIMATELY 250 FT. IN ADVANCE OF THE FLAGGER. FOR SIGNALIZED INTERSECTIONS PLACE SIGNALS IN THE FLASH MODE AND RECOMMEND THE USE OF LAW ENFORCEMENT.
- 9- REFER TO 2009 MUTCD, CHAPTER 6, FOR FLAGGER CONTROL, REQUIREMENTS, AND PROCEDURES.
- 10- DO NOT EXCEED A 1 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

GENERAL NOTES FOR PILOT CAR OPERATIONS

- 1- USE PILOT CARS WHEN DIRECTED BY THE ENGINEER.
- 2- IF ROADWAY WIDTH IS LESS THAN 22 FEET (EOP TO EOP), CONES MAY NOT BE REQUIRED ALONG WORK AREA, AND AT THE DISCRETION OF THE ENGINEER, CONES MAY BE OMITTED ALONG THE WORK AREA IF USING A PILOT CAR.
- 3- CONES ARE ALWAYS REQUIRED IN THE UPSTREAM AND DOWNSTREAM TAPERS.
- 4- MOUNT SIGN G20-4 "PILOT CAR FOLLOW ME" AT A CONSPICUOUS POSITION ON THE REAR OF THE PILOT VEHICLE.
- 5- DO NOT INSTALL MORE THAN ONE (1) MILE OF LANE CLOSURE, MEASURED FROM THE BEGINNING OF THE MERGE TAPER TO THE END OF THE LANE CLOSURE.
- 6- ADVISE RESIDENTS AND BUSINESSES WITHIN THE LANE CLOSURE LIMITS ABOUT METHODS OF SAFE EGRESS AND INGRESS FROM DRIVEWAYS DURING FLAGGING AND PILOT CAR OPERATIONS.

LEGEND



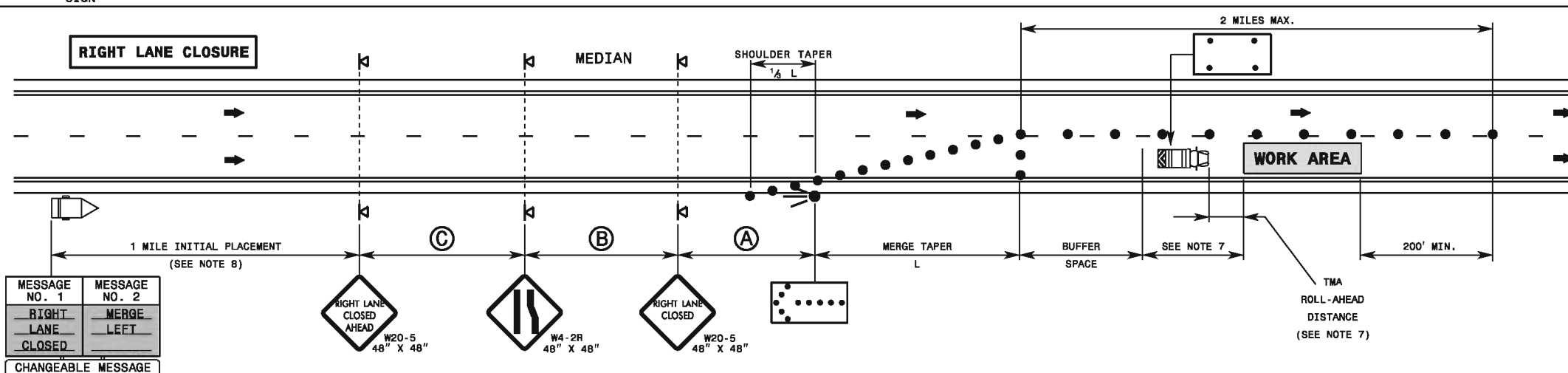
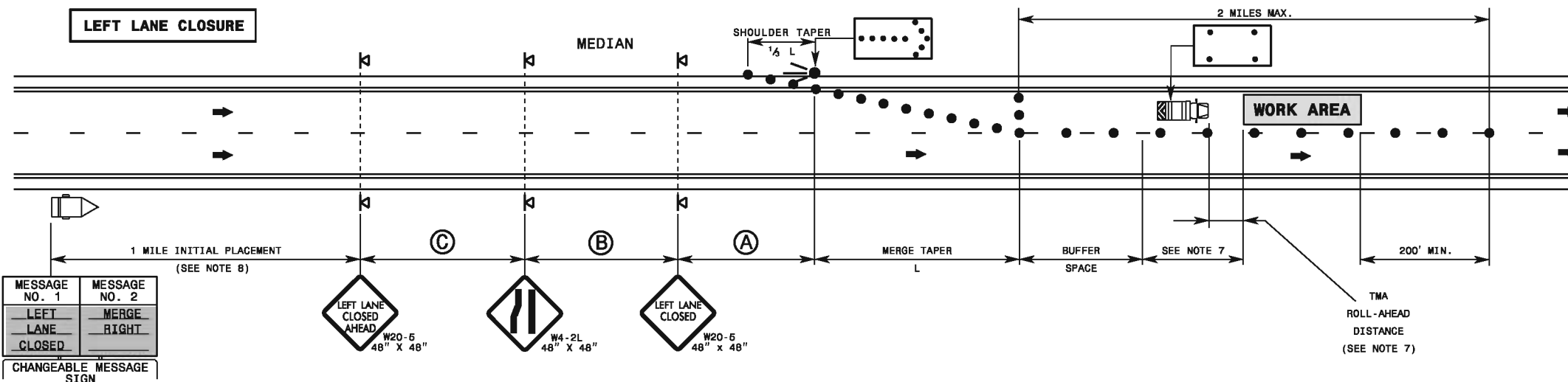


GENERAL NOTES

- 1- REFER TO STD. 1101.11, FOR "L" DISTANCE AND SIGN SPACING.
- 2- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC. REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
- 3- PLACE CONES ADJACENT TO THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT. PLACE CONES SEPARATING OPPOSING TRAFFIC AT THE MAXIMUM SPACING OF 25 FEET.
- 4- EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE BEGINNING OF THE APPROACH SHIFT TAPER (REFER TO STD. 1101.11 SHEET 2).
- 5- TMA'S ARE REQUIRED WHEN A BUFFER SPACE CANNOT BE ATTAINED, OR WHEN DIRECTED BY THE ENGINEER OR AS SHOWN IN THE PLANS. WHEN USED, POSITION TMA'S TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY THE MANUFACTURER.
- 6- DRUMS OR SKINNY-DRUMS MAY BE USED IN LIEU OF CONES. REFER TO ROADWAY STANDARD DRAWING 1180.01 FOR SKINNY-DRUM REQUIREMENTS.
- 7- DO NOT EXCEED A 1 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

LEGEND

- TMA
- FLAGGER
- CONE
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW



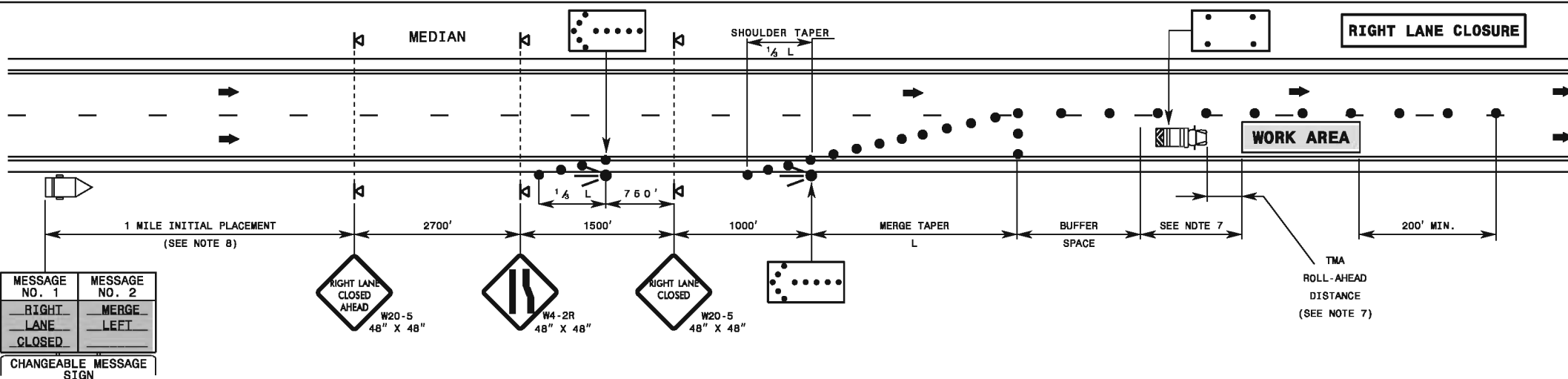
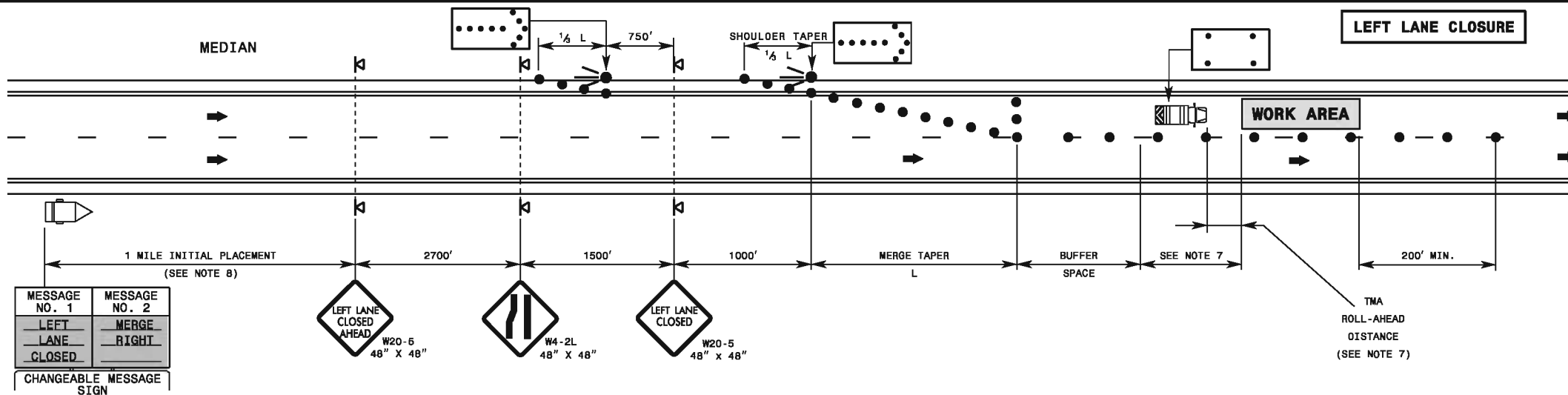
GENERAL NOTES

- 1- IF NECESSARY USE THIS STD. FOR ONE-WAY CITY TYPE STREETS WHERE SIGNS MAY BE MOUNTED ON BOTH SIDES OF THE ROADWAY.
- 2- PLACE ARROW BOARDS ON THE SHOULDER (PAVED OR UNPAVED). PLACE ARROW BOARDS WITHIN THE TAPER IF SHOULDERS DO NOT EXIST. MEET THE REQUIREMENTS FOR STOPPING SIGHT DISTANCE AT THE ARROW BOARD LOCATION. IF NEEDED, EXTEND LANE CLOSURES AT THE BUFFER SPACE, SUCH THAT STOPPING SIGHT DISTANCE TO THE ARROW BOARD IS MET (SEE STD. 1101.11 SHEET 2).
- 3- PLACE DRUMS IN TAPERS AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. PLACE DRUMS ALONG THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
- 4- REFER TO STD. 1101.11 FOR "L" DISTANCE, SIGN SPACING, AND BUFFER SPACE.
- 5- REFER TO STD. 1101.02 SHEETS 9 AND 10 FOR TREATMENT OF LANE CLOSURES THRU INTERCHANGES.
- 6- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC. REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
- 7- POSITION THE TMA TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY THE MANUFACTURER AND CONTINUOUSLY ADVANCE TMA'S AS WORK PROGRESSES.
- 8- PLACE CHANGEABLE MESSAGE SIGN (CMS) ON THE OUTSIDE OF THE TRAVELWAY AS DIRECTED BY THE ENGINEER. PLACE CMS APPROXIMATELY 1 MILE IN ADVANCE OF THE W20-5 SIGNS. IF TRAFFIC BACKS UP TO WHERE THE CMS IS INITIALLY PLACED, RELOCATE CMS 1/2 MILE IN ADVANCE OF ANTICIPATED BACKUP. CONTINUE TO MONITOR TRAFFIC, MOVE CMS APPROXIMATELY 1/2 MILE IN ADVANCE OF ANTICIPATED BACKUP.
- 9- DO NOT EXCEED A 2 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

LEGEND

- FLASHING ARROW BOARD (TYPE C)
- FLASHING ARROW BOARD, TYPE "C" (96" X 48" MIN.), "CAUTION MODE"
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN (CMS)
- DRUM
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

1-12



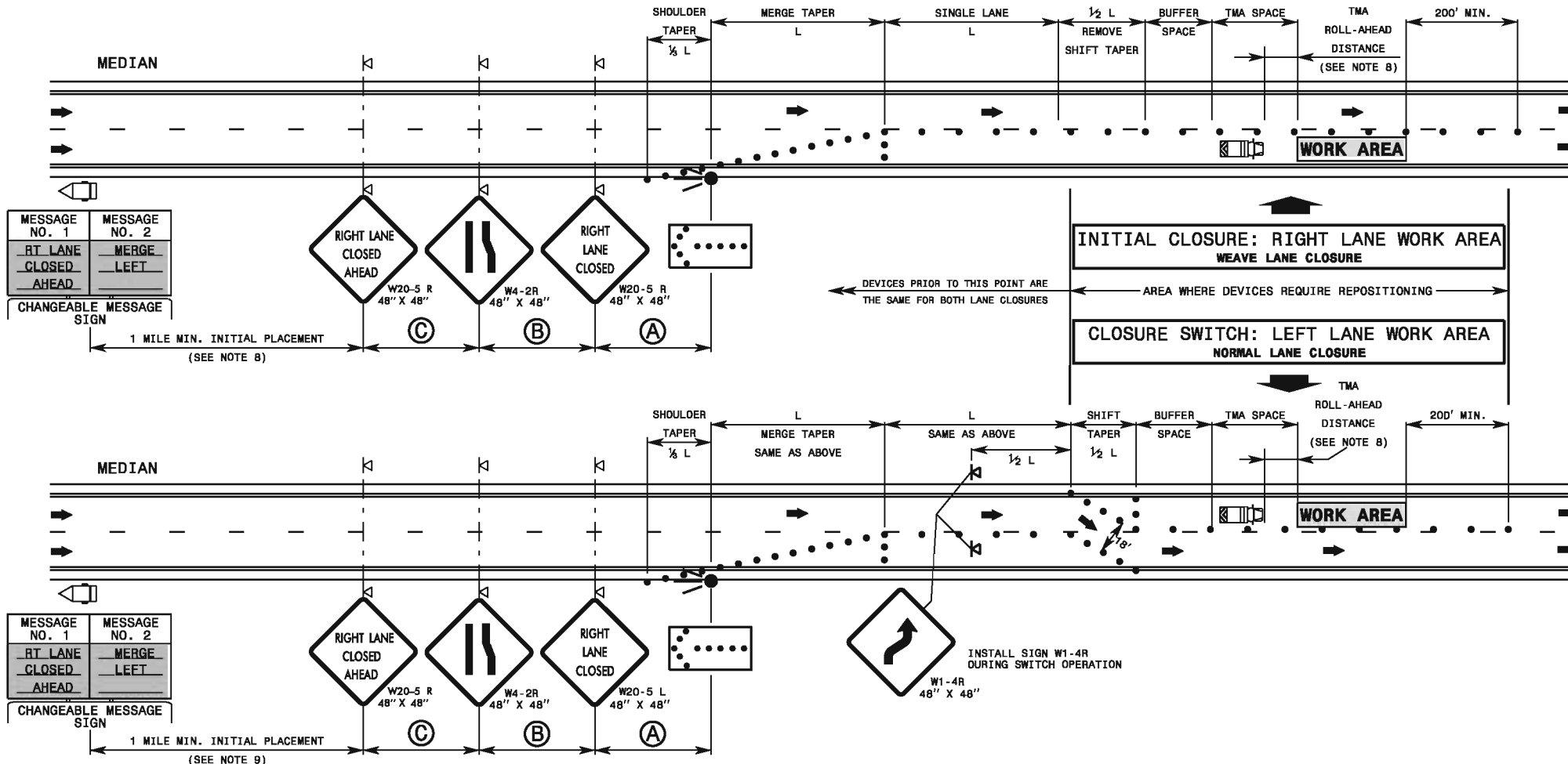
GENERAL NOTES

- IF NECESSARY USE THIS STD. FOR ONE-WAY CITY TYPE STREETS WHERE SIGNS MAY BE MOUNTED ON BOTH SIDES OF THE ROADWAY.
- PLACE ARROW BOARDS ON THE SHOULDER (PAVED OR UNPAVED). PLACE ARROW BOARDS WITHIN THE TAPER IF SHOULDERS DO NOT EXIST. MEET THE REQUIREMENTS FOR STOPPING SIGHT DISTANCE AT THE ARROW BOARD LOCATION. IF NEEDED, EXTEND LANE CLOSURES AT THE BUFFER SPACE, SUCH THAT STOPPING SIGHT DISTANCE TO THE ARROW BOARD IS MET (SEE STD. 1101.11 SHEET 2).
- PLACE DRUMS IN TAPERS AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. PLACE DRUMS ALONG THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
- REFER TO STD. 1101.11, FOR "L" DISTANCE AND BUFFER SPACE.
- REFER TO STD. 1101.02 SHEETS 9 AND 10 FOR TREATMENT OF LANE CLOSURES THRU INTERCHANGES.
- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC. REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
- POSITION THE TMA TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY THE MANUFACTURER AND CONTINUOUSLY ADVANCE TMA'S AS WORK PROGRESSES.
- PLACE CHANGEABLE MESSAGE SIGN (CMS) ON THE OUTSIDE OF THE TRAVELWAY AS DIRECTED BY THE ENGINEER. PLACE CMS APPROXIMATELY 1 MILE IN ADVANCE OF THE W20-5 SIGNS. IF TRAFFIC BACKS UP TO WHERE THE CMS IS INITIALLY PLACED, RELOCATE CMS 1/2 MILE IN ADVANCE OF ANTICIPATED BACKUP. CONTINUE TO MONITOR TRAFFIC, MOVE CMS APPROXIMATELY 1/2 MILE IN ADVANCE OF ANTICIPATED BACKUP.
- DO NOT EXCEED A 2 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

LEGEND

	FLASHING ARROW BOARD (TYPE C)
	FLASHING ARROW BOARD, TYPE "C" (96"X48" MIN.), "CAUTION MODE"
	TRUCK MOUNTED ATTENUATOR (TMA)
	CHANGEABLE MESSAGE SIGN (CMS)
	DRUM
	PORTABLE SIGN
	DIRECTION OF TRAFFIC FLOW

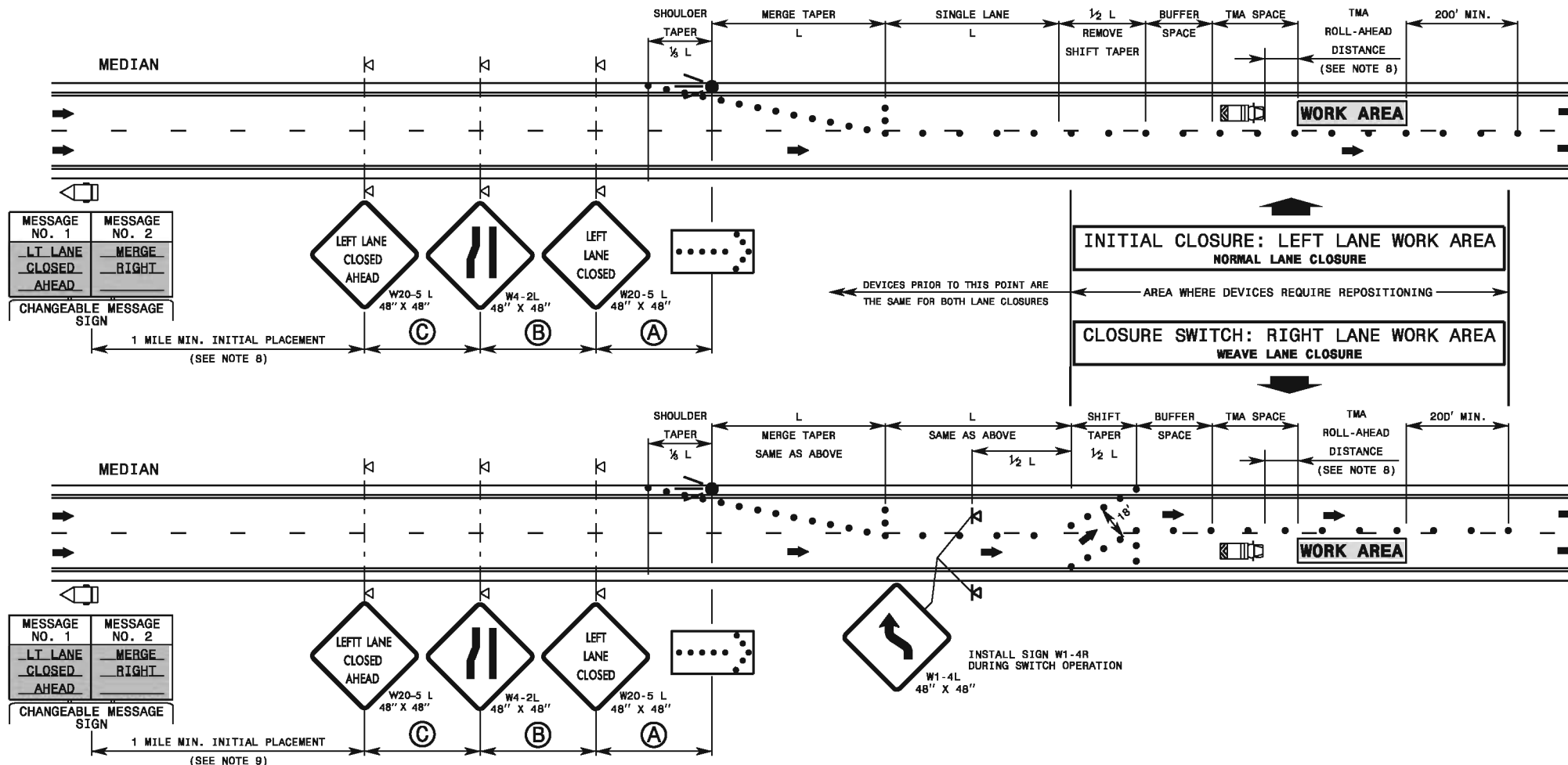
1-12



GENERAL NOTES

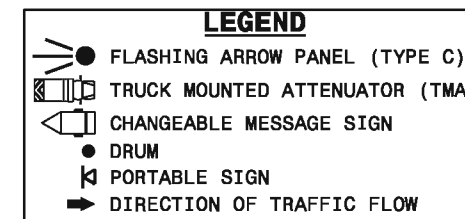
- WEAVE LANE CLOSURES ARE TO BE USED ONLY ON DIVIDED, CONTROLLED ACCESS ROADWAYS, WITH POSTED SPEED LIMITS OF 55 MPH, OR GREATER.
- FLASHING ARROW PANELS SHALL BE PLACED ON THE SHOULDER (PAVED OR UNPAVED). THE LOCATION OF THE ARROW PANEL SHALL MEET THE REQUIREMENTS FOR STOPPING SIGHT DISTANCE. LANE CLOSURES SHALL BE EXTENDED IF NEEDED, WITHIN THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE OR FLASHING ARROW PANEL IS MET. SEE STD. NO. 1101.11 SHEET 2 FOR STOPPING SIGHT DISTANCE & BUFFER SPACE TABLES.
- THE MAXIMUM SPACING OF DRUMS IN TAPERS SHALL BE EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE BUFFER SPACE, AND WORK AREA, SHALL BE EQUAL IN FEET TO (2) TIMES THE POSTED SPEED LIMIT.
- SEE STD. NO. 1101.11 FOR VALUES OF "L", AND SIGN SPACING DISTANCES.
- SEE STD. NO. 1101.02-SHEETS 9 & 10 FOR TREATMENT OF LANE CLOSURES THRU INTERCHANGES.
- LANE CLOSURES SHALL BE INSTALLED WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC. LANE CLOSURES SHALL BE REMOVED AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
- LANE CLOSURE SWITCHES TO BE PERFORMED BY A ROLLING ROADBLOCK OPERATION. SEE RSD 1101.03, SHEET 9.
- TMA'S ARE REQUIRED UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR THE PLANS. POSITION THE TMA TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY THE MANUFACTURER.
- CHANGEABLE MESSAGE SIGN SHALL BE PLACED EITHER IN THE MEDIAN, OR ON THE OUTSIDE OF THE TRAVELWAY, AS DIRECTED BY THE ENGINEER. THE SIGN SHOULD INITIALLY BE LOCATED APPROXIMATELY 2 MILES IN ADVANCE OF THE MERGE TAPER. IF IT IS ANTICIPATED THAT TRAFFIC WILL BACK UP TO WHERE THE SIGN IS LOCATED, THE SIGN SHOULD THEN INITIALLY BE PLACED APPROXIMATELY 1 MILE PRIOR TO ANTICIPATED BACKUPS. BACKUPS SHOULD BE MONITORED SUCH THAT FOR FUTURE LANE CLOSURES, THE SIGN IS PLACED APPROXIMATELY 1 MILE PRIOR TO WHERE TRAFFIC IS ANTICIPATED TO BACK UP.
- DISPLAY CHANGEABLE MESSAGE SIGN (CMS) MESSAGES AS SHOWN OR AS DIRECTED BY THE ENGINEER. USE NO MORE THAN TWO (2) MESSAGE DISPLAYS WITH ANY CYCLE.
- DO NOT EXCEED A 2 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

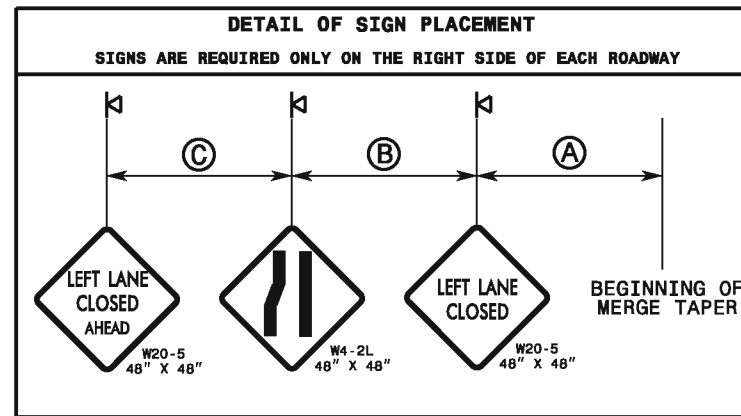
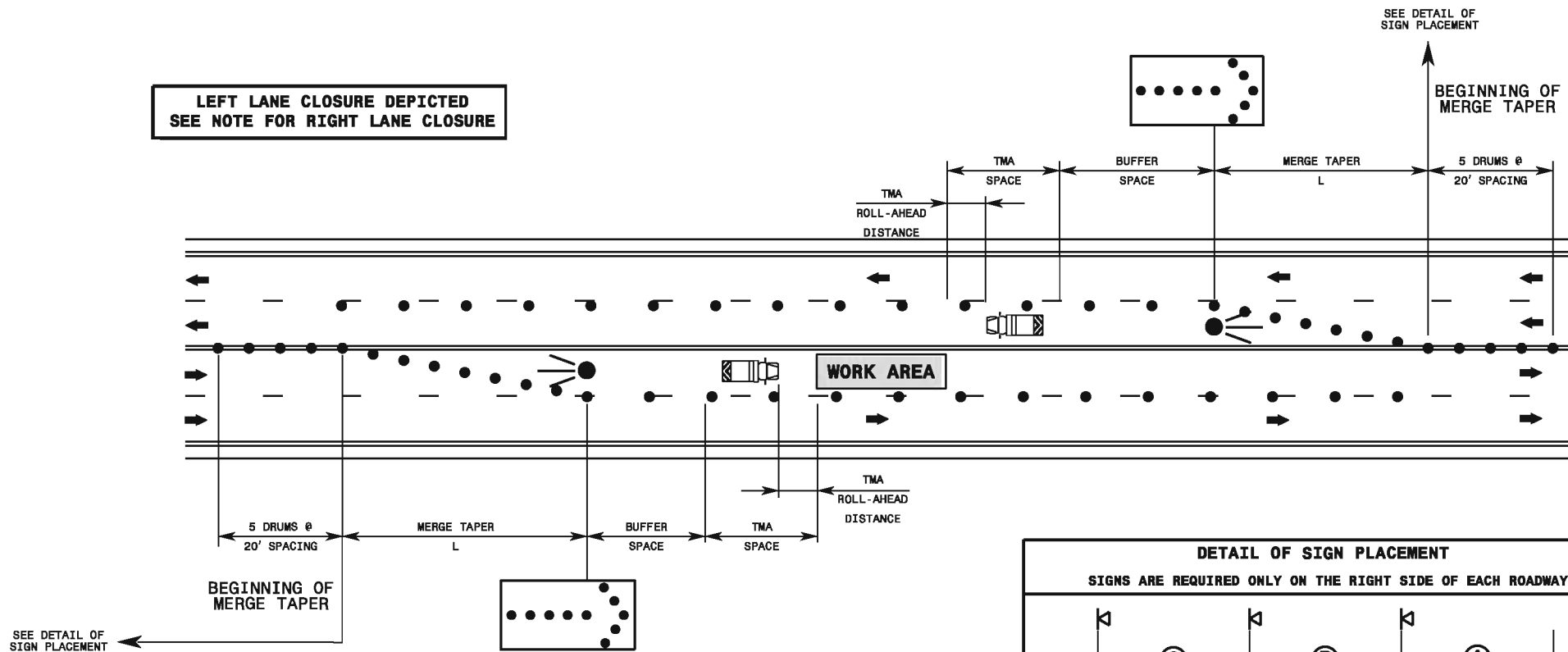
LEGEND	
	FLASHING ARROW PANEL (TYPE C)
	TRUCK MOUNTED ATTENUATOR (TMA)
	CHANGEABLE MESSAGE SIGN
	DRUM
	PORTABLE SIGN
	DIRECTION OF TRAFFIC FLOW



GENERAL NOTES

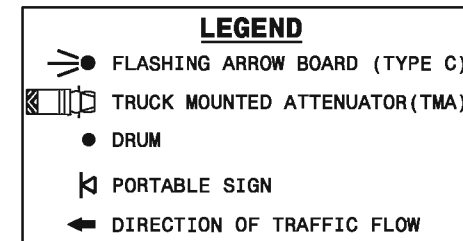
- WEAVE LANE CLOSURES ARE TO BE USED ONLY ON DIVIDED, CONTROLLED ACCESS ROADWAYS, WITH POSTED SPEED LIMITS OF 55 MPH, OR GREATER.
- FLASHING ARROW PANELS SHALL BE PLACED ON THE SHOULDER (PAVED OR UNPAVED). THE LOCATION OF THE ARROW PANEL SHALL MEET THE REQUIREMENTS FOR STOPPING SIGHT DISTANCE. LANE CLOSURES SHALL BE EXTENDED IF NEEDED, WITHIN THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE OR FLASHING ARROW PANEL IS MET. SEE STD. NO. 1101.11 SHEET 2 FOR STOPPING SIGHT DISTANCE & BUFFER SPACE TABLES.
- THE MAXIMUM SPACING OF DRUMS IN TAPERS SHALL BE EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE BUFFER SPACE, AND WORK AREA, SHALL BE EQUAL IN FEET TO (2) TIMES THE POSTED SPEED LIMIT.
- SEE STD. NO. 1101.11 FOR VALUES OF "L", AND SIGN SPACING DISTANCES.
- SEE STD. NO. 1101.02-SHEETS 9 & 10 FOR TREATMENT OF LANE CLOSURES THRU INTERCHANGES.
- LANE CLOSURES SHALL BE INSTALLED WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC. LANE CLOSURES SHALL BE REMOVED AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.
- LANE CLOSURE SWITCHES TO BE PERFORMED BY A ROLLING ROADBLOCK OPERATION. SEE RSD 1101.03, SHEET 9.
- TMA'S ARE REQUIRED UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR THE PLANS. POSITION THE TMA TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY THE MANUFACTURER.
- CHANGEABLE MESSAGE SIGN SHALL BE PLACED EITHER IN THE MEDIAN, OR ON THE OUTSIDE OF THE TRAVELWAY, AS DIRECTED BY THE ENGINEER. THE SIGN SHOULD INITIALLY BE LOCATED APPROXIMATELY 2 MILES IN ADVANCE OF THE MERGE TAPER. IF IT IS ANTICIPATED THAT TRAFFIC WILL BACK UP TO WHERE THE SIGN IS LOCATED, THE SIGN SHOULD THEN INITIALLY BE PLACED APPROXIMATELY 1 MILE PRIOR TO ANTICIPATED BACKUPS. BACKUPS SHOULD BE MONITORED SUCH THAT FOR FUTURE LANE CLOSURES, THE SIGN IS PLACED APPROXIMATELY 1 MILE PRIOR TO WHERE TRAFFIC IS ANTICIPATED TO BACK UP.
- DISPLAY CHANGEABLE MESSAGE SIGN (CMS) MESSAGES AS SHOWN OR AS DIRECTED BY THE ENGINEER. USE NO MORE THAN TWO (2) MESSAGE DISPLAYS WITH ANY CYCLE.
- DO NOT EXCEED A 2 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

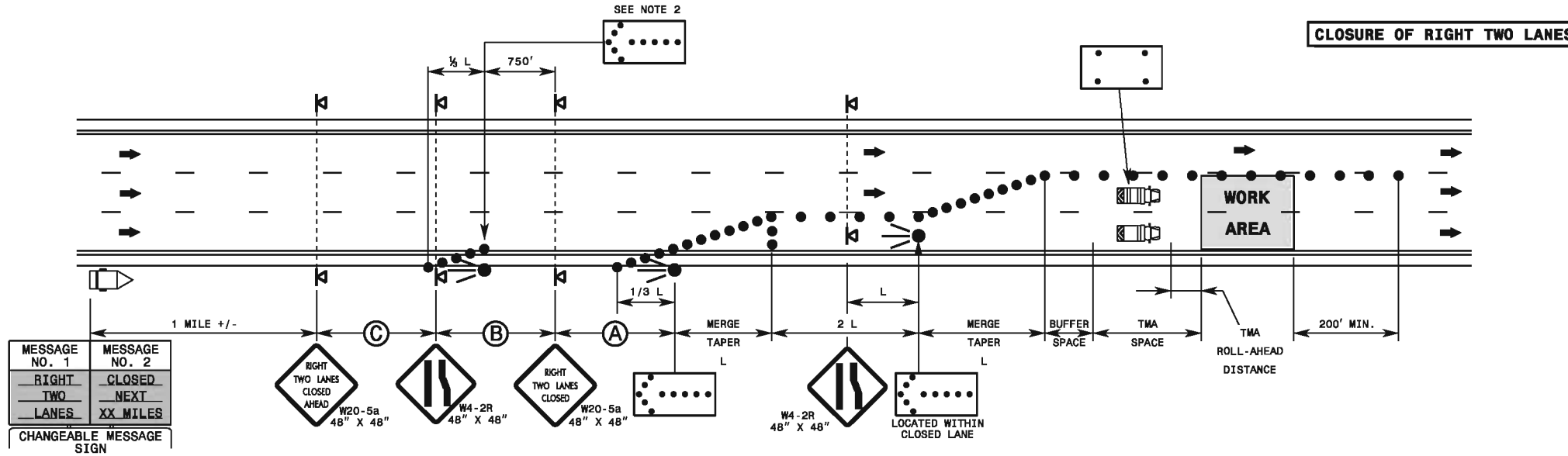
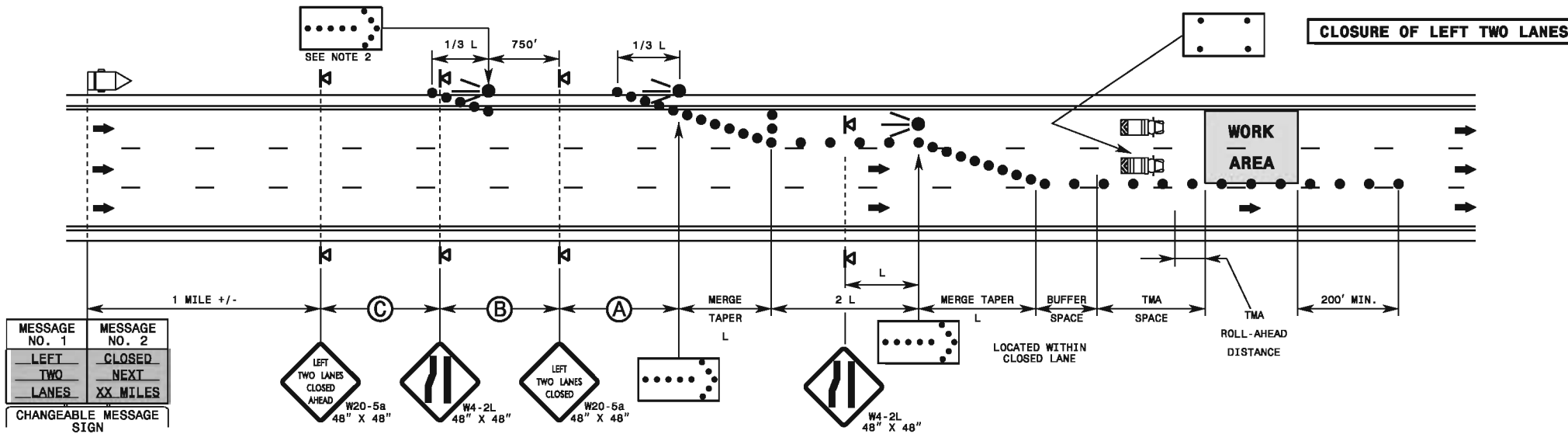




GENERAL NOTES

- 1- RIGHT LANE CLOSURES ON UNDIVIDED ROADWAYS ARE THE SAME AS FOR DIVIDED ROADWAYS AS SHOWN ON STD. 1101.02 SHEET 3, WITH THE EXCEPTION THAT THE APPROACH WARNING SIGNS ARE NOT REQUIRED TO BE MOUNTED ON THE LEFT SIDE OF THE ROADWAY.
- 2- REFER TO NOTES ON STD. 1101.02 SHEET 3.





GENERAL NOTES

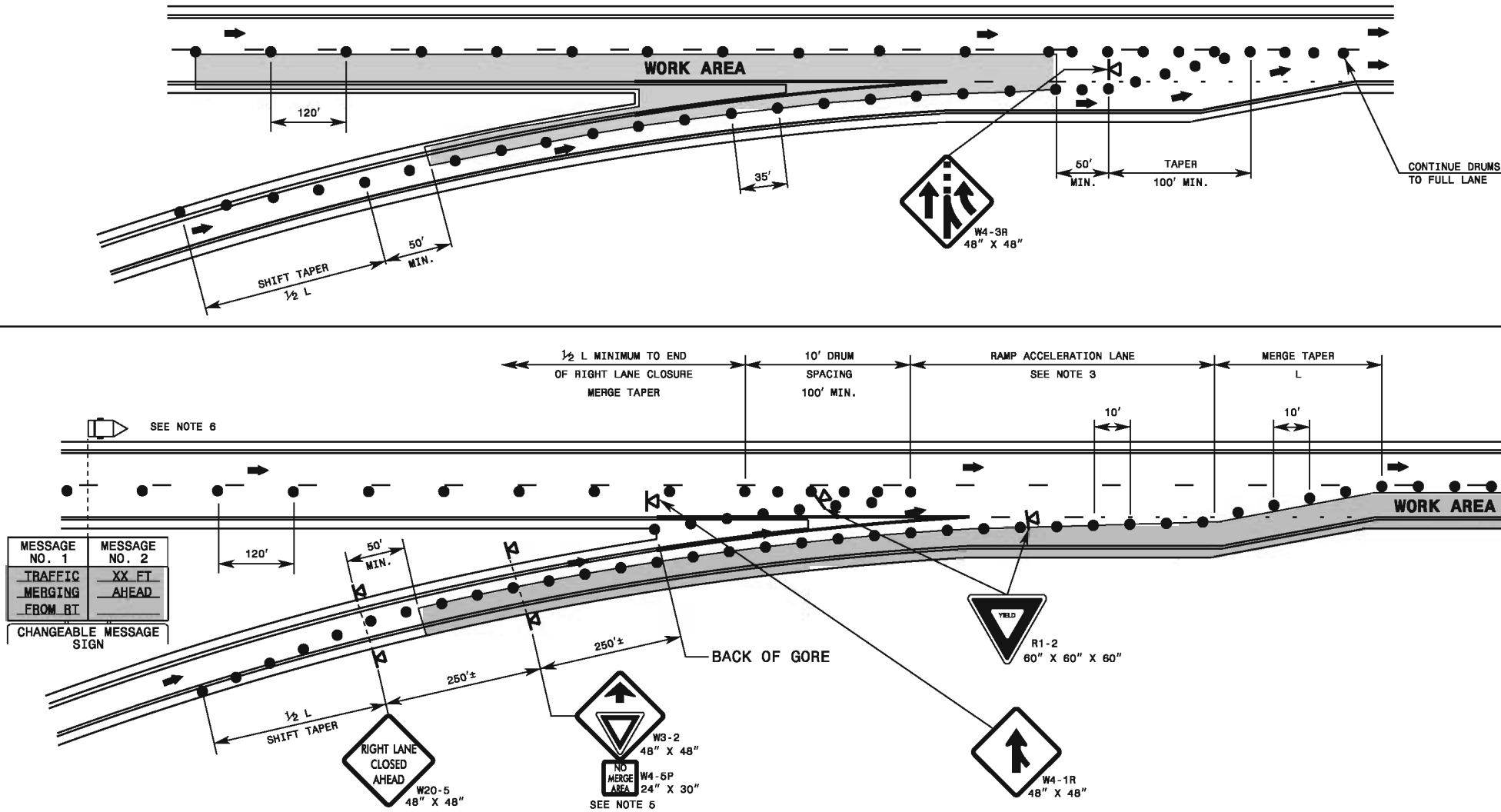
- 1- REFER TO NOTES ON STD. 1101.02 SHEET 3.
- 2- THE FIRST FLASHING ARROW BOARDS ARE NOT REQUIRED ON FACILITIES ≤ 55 MPH.

LEGEND

- FLASHING ARROW BOARD (TYPE C)
- ◻ FLASHING ARROW BOARD, TYPE "C" (96"X48" MIN.), "CAUTION MODE"
- ▣ TRUCK MOUNTED ATTENUATOR (TMA)
- DRUM
- ◻ PORTABLE SIGN
- ◻ CHANGEABLE MESSAGE SIGN (CMS)
- ➔ DIRECTION OF TRAFFIC FLOW

ENGLISH STANDARD DRAWING FOR
TEMPORARY LANE CLOSURES
RIGHT LANE CLOSURES THRU ENTRANCE RAMP

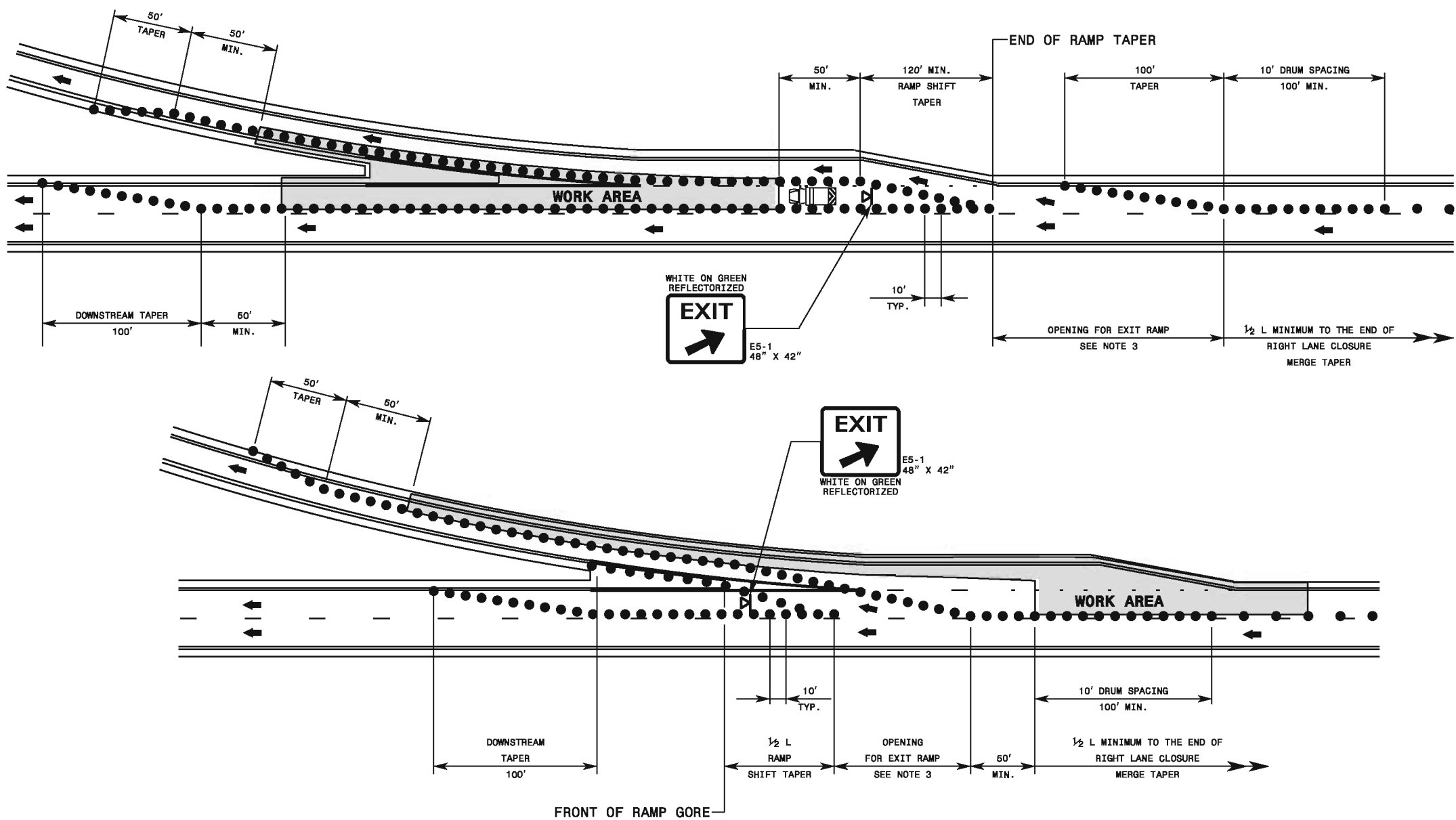
ENGLISH STANDARD DRAWING FOR
TEMPORARY LANE CLOSURES
RIGHT LANE CLOSURES THRU ENTRANCE RAMP



GENERAL NOTES

- 1- USE THE ABOVE DETAILS IN CONJUNCTION WITH A RIGHT LANE CLOSURE AS SHOWN ON ROADWAY STD. 1101.02 SHEET 3.
- 2- MOUNT SIGNS SHOWN A MINIMUM OF 5 FEET ABOVE THE PAVEMENT ELEVATION.
- 3- IF EXISTING ACCELERATION DISTANCE OR A MINIMUM OF 400' ACCELERATION DISTANCE CANNOT BE PROVIDED, CLOSE RAMP AS DIRECTED BY THE ENGINEER.
- 4- CLOSE THE RIGHT LANE SUFFICIENTLY IN ADVANCE TO STABILIZE MOTOR VEHICLE TRAFFIC FLOW BEFORE THE MERGE AS SHOWN ON STD. 1101.02 SHEET 3.
- 5- INSTALL W4-5P BELOW THE YIELD AHEAD SIGN (AS SHOWN) TO ALERT MOTORISTS IF THE ACCELERATION DISTANCE HAS BEEN REDUCED.
- 6- COORDINATE WITH THE ENGINEER FOR LOCATION OF CMS.

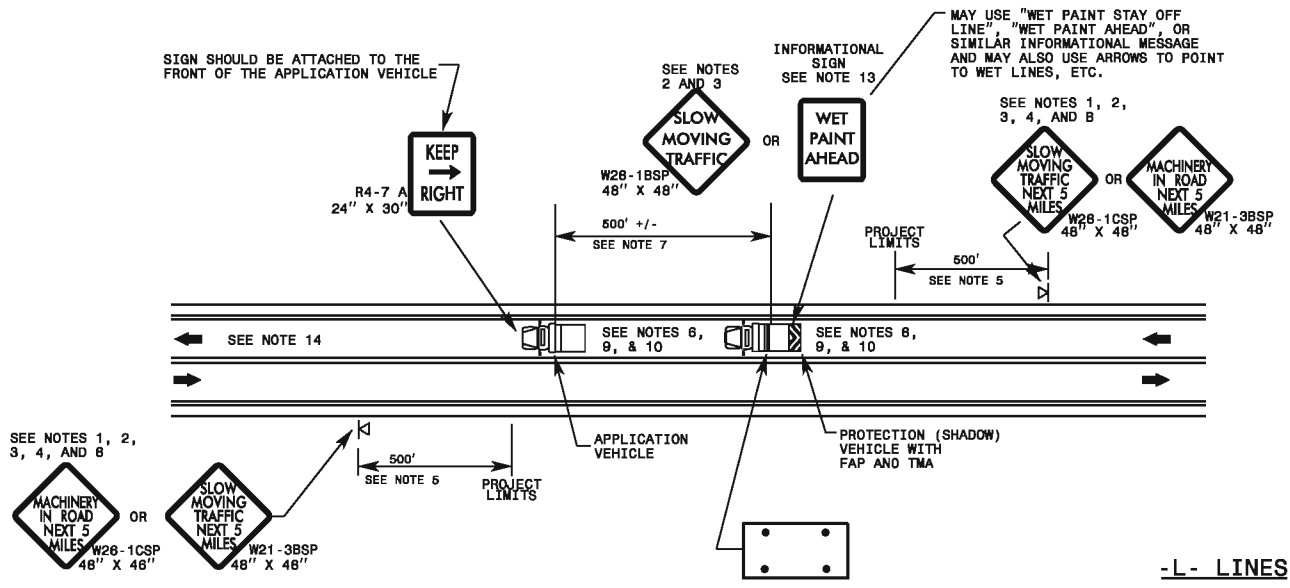
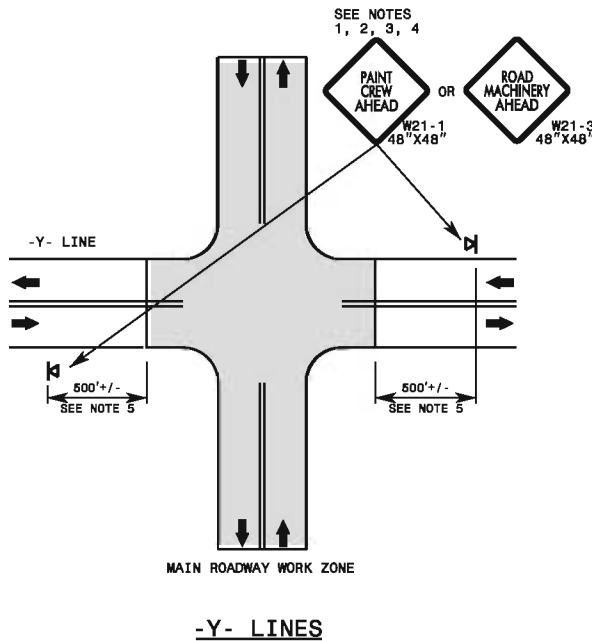
LEGEND	
	CHANGEABLE MESSAGE SIGN (CMS)
	DRUM
	PORTABLE SIGN
	DIRECTION OF TRAFFIC FLOW



GENERAL NOTES

- 1- USE THE ABOVE DETAILS IN CONJUNCTION WITH A RIGHT LANE CLOSURE AS SHOWN ON STD. 1101.02 SHEET 3.
- 2- MOUNT EXIT SIGNS A MINIMUM OF 5 FEET ABOVE THE PAVEMENT ELEVATION.
- 3- USE EXISTING RAMP OPENING LENGTH, BUT NO LESS THAN 1/2 ORIGINAL LENGTH. CONSIDER CLOSING RAMP IF 1/2 ORIGINAL LENGTH CANNOT BE OBTAINED, AS DIRECTED BY THE ENGINEER.

LEGEND	
	TRUCK MOUNTED ATTENUATOR
	DRUM
	PORTABLE SIGN
	DIRECTION OF TRAFFIC FLOW

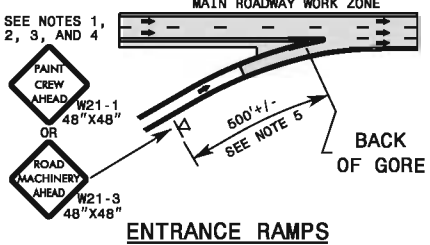
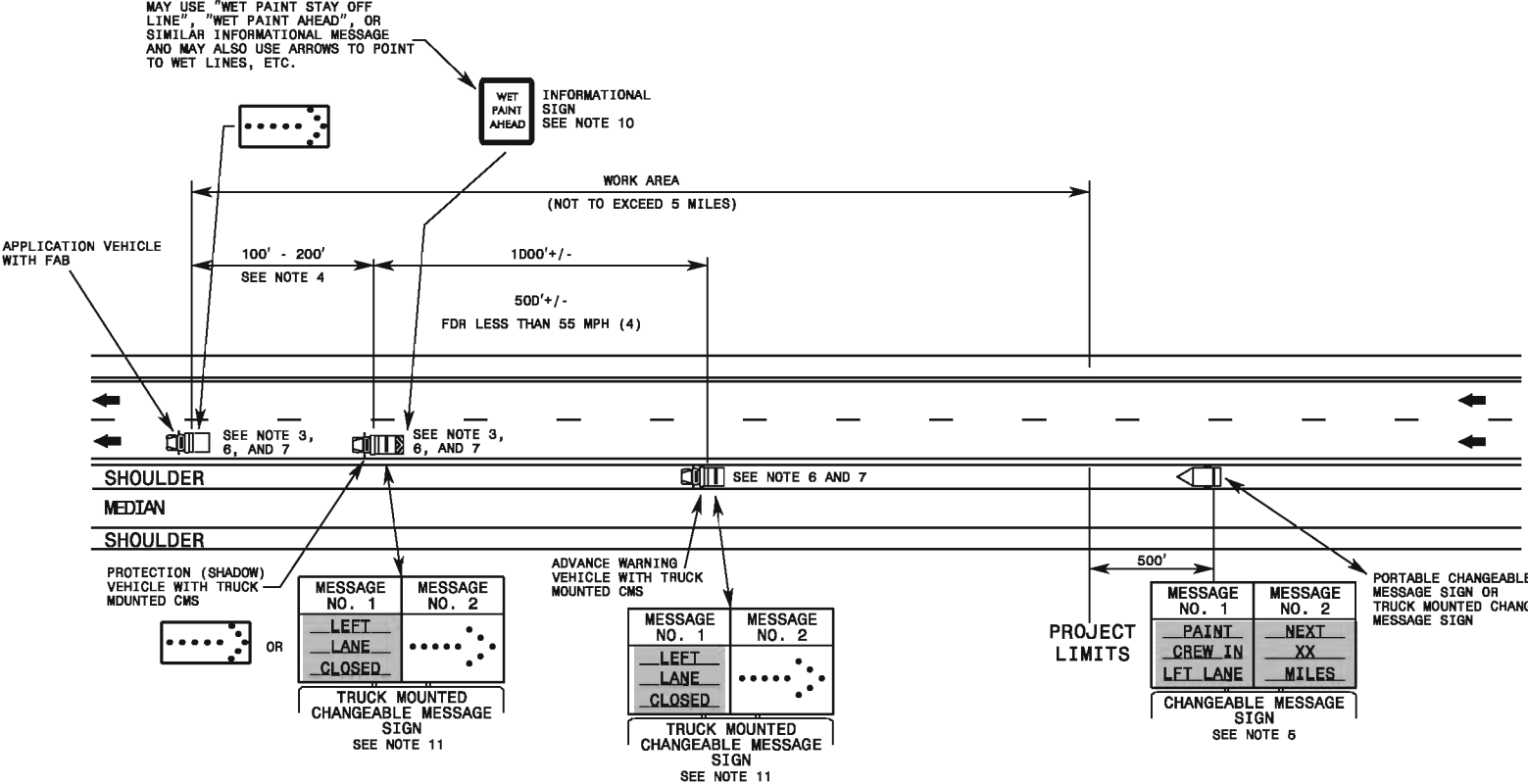
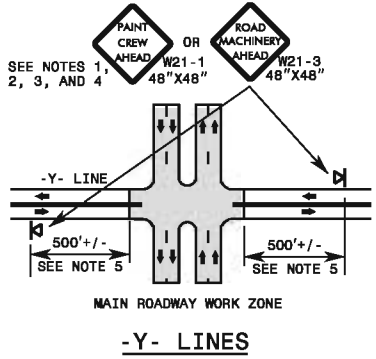


GENERAL NOTES

- 1- THE FOLLOWING OPTIONS MAY BE USED FOR ADVANCE WARNING SIGNS:
 - A. TRUCK MOUNTED SIGNS
 - B. TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (CMS)
 - C. GROUND MOUNTED ADVANCE WARNING SIGNS (MUST CIRCLE TO PICK UP SIGNS)
 - D. GROUND MOUNTED CHANGEABLE MESSAGE SIGN (CMS) (MUST CIRCLE TO PICK UP SIGNS)
- 2- ALL ADVANCE WARNING SIGNS MUST BE 48" X 48" WITH FLUORESCENT ORANGE TYPE VII OR HIGHER SHEETING. IF SPACE LIMITATIONS ON SHOULDER PROHIBIT A 48" X 48" SIGN, A SMALLER SIGN CAN BE USED WITH APPROVAL FROM ENGINEER.
- 3- SIGNS ON VEHICLES SHOULD BE MOUNTED A MINIMUM OF ONE (1) FOOT FROM THE GROUND AND SHOULD NOT BLOCK THE MOTORIST'S SIGHT OF THE FLASHING ARROW BOARD AND/OR LIGHTBAR.
- 4- GROUND MOUNTED ADVANCED WARNING SIGNS SHOULD BE MOUNTED A MINIMUM OF ONE (1) FOOT FROM THE GROUND TO BOTTOM OF SIGN.
- 5- SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES.
- 6- ADDITIONAL VEHICLES SHOULD BE USED IN WORK CARAVAN TO FACILITATE DRYING OF PAVEMENT MARKING MATERIAL (TMA'S ARE OPTIONAL ON THESE ADDITIONAL VEHICLES). HOWEVER, THE FIRST VEHICLE MOTORISTS SEE IN THE TRAVEL LANE SHALL HAVE A TMA.
- 7- ADJUST DISTANCE AS NEEDED TO PREVENT MOTORISTS FROM ENTERING SPACE BETWEEN THE APPLICATION AND PROTECTION VEHICLE. DISTANCE CAN BE LENGTHENED TO ACCOMMODATE SIGHT DISTANCE NEEDS.
- 8- WORK ZONE SHOULD NOT EXCEED FIVE (5) MILES IN LENGTH. ROUND UP MILEAGE TO NEXT WHOLE MILE.
- 9- RADIO COMMUNICATION BETWEEN VEHICLES IS REQUIRED.
- 10- USE OF A LIGHT SYSTEM ON ALL VEHICLES IS REQUIRED (REFER TO ROADWAY STANDARD DRAWING 1165.01, SHEET 1 OF 1).
- 11- IF WORK IS PERFORMED AT NIGHT, THE WORK AREA MUST BE ILLUMINATED WITH MACHINE AND/OR TOWER LIGHTS AS APPROVED BY THE ENGINEER.
- 12- ALL TRAFFIC CONTROL DEVICES WILL BE CONSIDERED INCIDENTAL TO THE PAY ITEMS FOR PAVEMENT MARKING AND MARKERS.
- 13- INFORMATIONAL SIGNS SHOULD BE ACTIVITY SPECIFIC, i.e. "PAINT CREW IN ROAD". SIGNS MAY BE RECTANGULAR OR DIAMOND SHAPE. SIGN SIZE SHOULD BE BASED ON THE MOTORIST ABILITY TO RECOGNIZE SIGN WHEN TRAVELING FIVE (5) MILES ABOVE POSTED SPEED LIMIT.
- 14- IF A LEAD VEHICLE IS ADDED TO OPERATION, IT SHOULD HAVE THE SAME ADVANCE WARNING SIGNS AS THE APPLICATION VEHICLE SHOWN BELOW.

LEGEND

- PORTABLE SIGN. SIGNS MUST BE NCHRP-350 AND NCDOT APPROVED.
- DIRECTION OF TRAFFIC FLOW
- APPLICATION VEHICLE WITH LIGHT BAR
- PROTECTION VEHICLE WITH TRUCK MOUNTED ATTENUATOR (TMA)
- AND LIGHT BAR (SEE ROADWAY STANDARD NO. 1165.01). TMA MUST BE NCHRP-350 TEST LEVEL 3 (60+MPH) APPROVED.
- FLASHING ARROW BOARD, TYPE "C" (96"X48" MIN.), "CAUTION MODE"



GENERAL NOTES

- THE FOLLOWING OPTIONS MAY BE USED FOR ADVANCE WARNING SIGNS:
A. TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (CMS)
B. GROUND MOUNTED CHANGEABLE MESSAGE SIGN (CMS)
- SIGNS ON VEHICLES SHOULD BE MOUNTED A MINIMUM OF FIVE (5) FEET FROM THE GROUND AND SHOULD NOT BLOCK THE MOTORIST'S SIGHT OF THE FLASHING ARROW BOARD AND/OR LIGHT BAR.
- ADDITIONAL VEHICLES SHOULD BE USED IN WORK CARAVAN TO FACILITATE DRYING OF PAVEMENT MARKING MATERIAL (TMA'S ARE OPTIONAL ON THESE ADDITIONAL VEHICLES). HOWEVER, THE FIRST VEHICLE MOTORISTS SEE IN THE TRAVEL LANE SHALL HAVE A TMA.
- ADJUST DISTANCE AS NEEDED TO PREVENT MOTORISTS FROM ENTERING SPACE BETWEEN THE APPLICATION AND PROTECTION VEHICLE. DISTANCE CAN BE LENGTHENED TO ACCOMMODATE SIGHT DISTANCE NEEDS.
- WORK ZONE SHOULD NOT EXCEED FIVE (5) MILES IN LENGTH. ROUND UP MILEAGE TO NEXT WHOLE MILE. RELOCATE CHANGEABLE MESSAGE SIGN SUCH THAT WORK AREA DOES NOT EXCEED 5 MILES FROM BEGIN PROJECT LIMITS.
- RADIO COMMUNICATION BETWEEN VEHICLES IS REQUIRED.
- USE OF A LIGHT SYSTEM ON ALL VEHICLES IS REQUIRED (REFER TO ROADWAY STANDARD DRAWING 1165.01, SHEET 1 OF 1).
- IF WORK IS PERFORMED AT NIGHT, THE WORK AREA MUST BE ILLUMINATED WITH MACHINE AND/OR TOWER LIGHTS AS APPROVED BY THE ENGINEER.
- ALL TRAFFIC CONTROL DEVICES WILL BE CONSIDERED INCIDENTAL TO THE PAY ITEMS FOR PAVEMENT MARKING AND MARKERS.
- INFORMATIONAL SIGNS SHOULD BE ACTIVITY SPECIFIC, i.e. "PAINT CREW IN ROAD". SIGNS MAY BE RECTANGULAR OR DIAMOND SHAPE. SIGN SIZE SHOULD BE BASED ON THE MOTORIST ABILITY TO RECOGNIZE SIGN WHEN TRAVELING FIVE (5) MILES PER HOUR ABOVE POSTED SPEED LIMIT.
- THE MINIMUM DIMENSIONS OF TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS USED SHALL BE NO LESS THAN 4' x 8'.

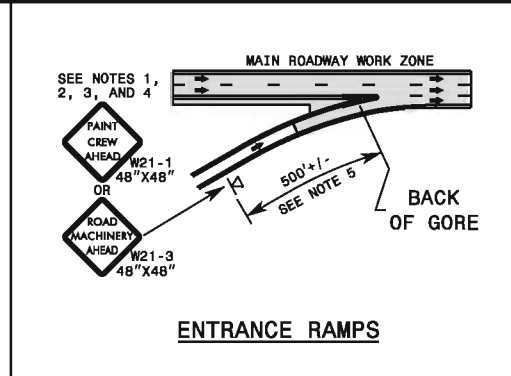
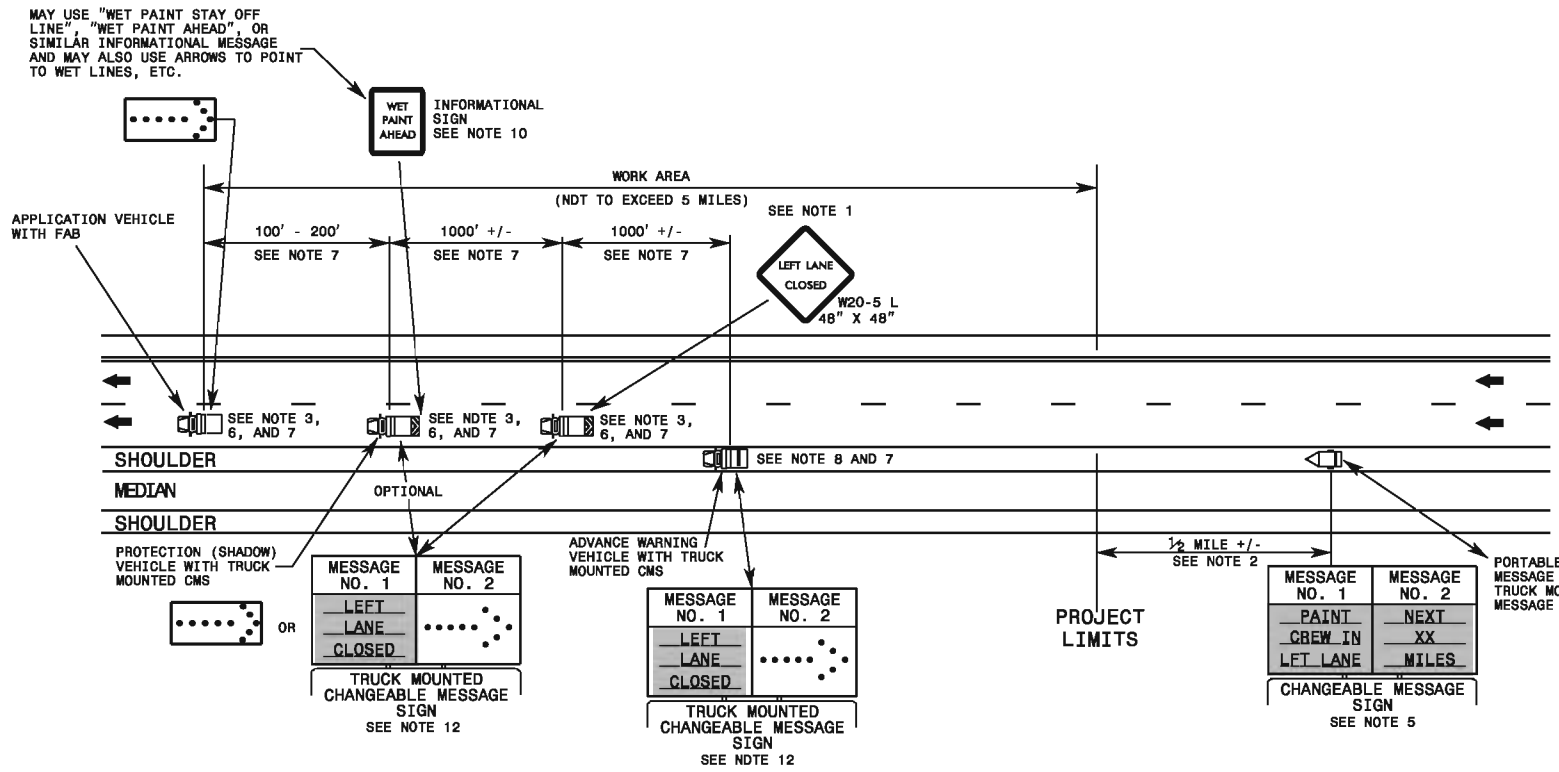
LEGEND

	PORTABLE SIGN
	DIRECTION OF TRAFFIC FLOW
	APPLICATION VEHICLE WITH LIGHT BAR
	PROTECTION VEHICLE WITH TRUCK MOUNTED ATTENUATOR (TMA) AND LIGHT BAR
	ADVANCE WARNING VEHICLE WITH TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (CMS) AND LIGHT BAR.
	FLASHING ARROW BOARD, TYPE "C" (96"X48" MIN.), APPROPRIATE DIRECTION INDICATED
	CHANGEABLE MESSAGE SIGN

1-12

SHEET 13 OF 15

1101.02



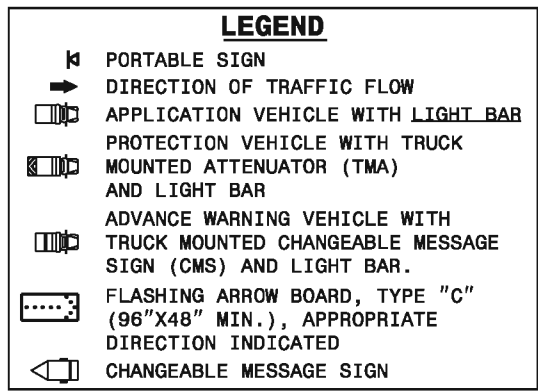
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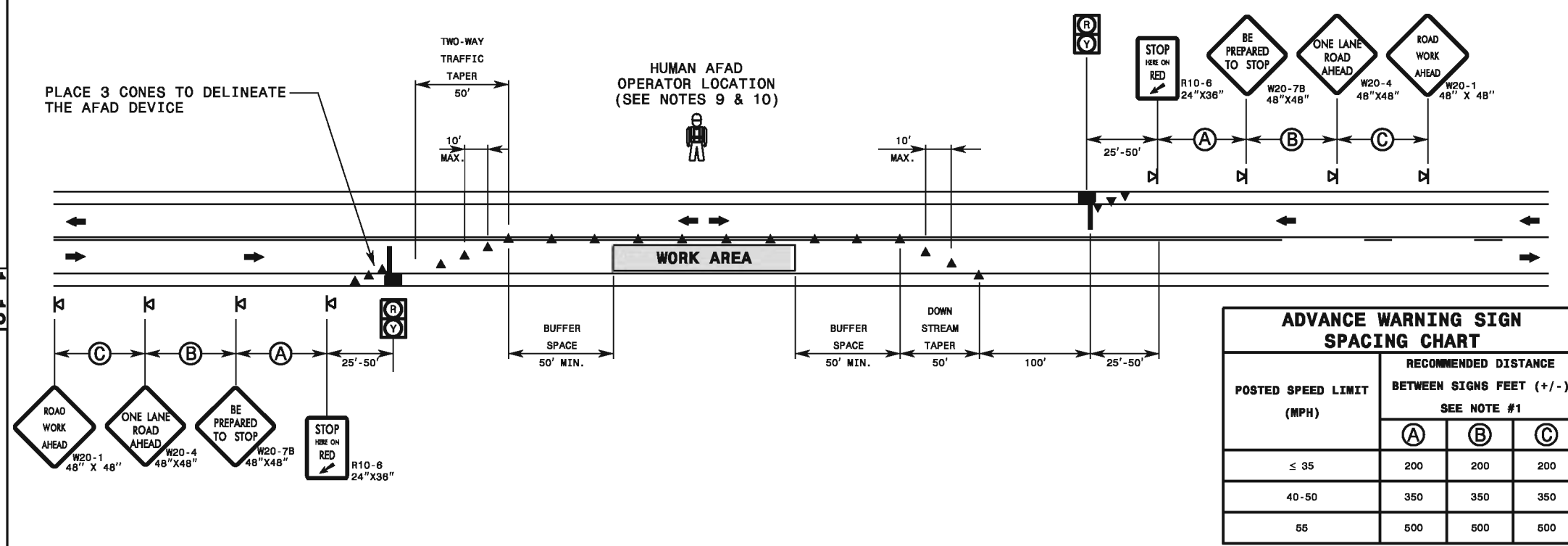
SHEET 13 OF 15

1101.02

GENERAL NOTES

- SIGNS ON VEHICLES SHOULD BE MOUNTED A MINIMUM OF FIVE (5) FEET FROM THE GROUND AND SHOULD NOT BLOCK THE MOTORIST'S SIGHT OF THE FLASHING ARROW BOARD AND/OR LIGHTBAR.
- CMS SIGN SPACING SHOULD BE ADJUSTED FOR HORIZONTAL AND VERTICAL CURVES, ETC. TO IMPROVE SIGHT DISTANCES.
- ADDITIONAL VEHICLES SHOULD BE USED IN WORK CARAVAN TO FACILITATE DRYING OF PAVEMENT MARKING MATERIAL (TMA'S ARE OPTIONAL ON THESE ADDITIONAL VEHICLES). HOWEVER, THE FIRST VEHICLE MOTORISTS SEE IN THE TRAVEL LANE SHALL HAVE A TMA.
- ADJUST DISTANCE AS NEEDED TO PREVENT MOTORISTS FROM ENTERING SPACE BETWEEN THE APPLICATION AND PROTECTION VEHICLE. DISTANCE CAN BE LENGTHENED TO ACCOMODATE SIGHT DISTANCE NEEDS.
- WORK ZONE SHOULD NOT EXCEED FIVE (5) MILES IN LENGTH. ROUND UP MILEAGE TO NEXT WHOLE MILE. RELOCATE CHANGEABLE MESSAGE SIGN SUCH THAT WORK AREA DOES NOT EXCEED 5 MILES FROM BEGIN PROJECT LIMITS.
- RADIO COMMUNICATION BETWEEN VEHICLES IS REQUIRED.
- USE OF A LIGHT SYSTEM ON ALL VEHICLES IS REQUIRED (REFER TO ROADWAY STANDARD DRAWING 1165.01, SHEET 1 OF 1).
- IF WORK IS PERFORMED AT NIGHT, THE WORK AREA MUST BE ILLUMINATED WITH MACHINE AND/OR TOWER LIGHTS AS APPROVED BY THE ENGINEER.
- ALL TRAFFIC CONTROL DEVICES WILL BE CONSIDERED INCIDENTAL TO THE PAY ITEMS FOR PAVEMENT MARKING AND MARKERS.
- INFORMATIONAL SIGNS SHOULD BE ACTIVITY SPECIFIC, i.e. "PAINT CREW IN ROAD". SIGNS MAY BE RECTANGULAR OR DIAMOND SHAPE. SIGN SIZE SHOULD BE BASED ON THE MOTORIST ABILITY TO RECOGNIZE SIGN WHEN TRAVELING FIVE (5) MILES PER HOUR ABOVE POSTED SPEED LIMIT.
- THE CARAVAN IS TO MOVE AT 3 MPH OR GREATER TO OBTAIN THE DESIRED LEVEL OF SAFETY FOR THE MOVING OPERATION. IF AT ANYTIME AN VEHICLE STOPS DURING THE OPERATION, THE REMAINDER OF THE CARAVAN SHALL CONTINUE MOVING AND THE APPLICATION VEHICLE SHALL RESUME WORK OPERATIONS WITHIN 60 SECONDS. OTHERWISE, ALL VEHICLES ARE TO BE REMOVED FROM THE TRAVEL LANE AND THE OPERATION RESET.
- THE MINIMUM DIMENSIONS OF TRUCK MOUNTED CHANGEABLE MESSAGE SIGNS USED SHALL BE NO LESS THAN 4' x 8'.



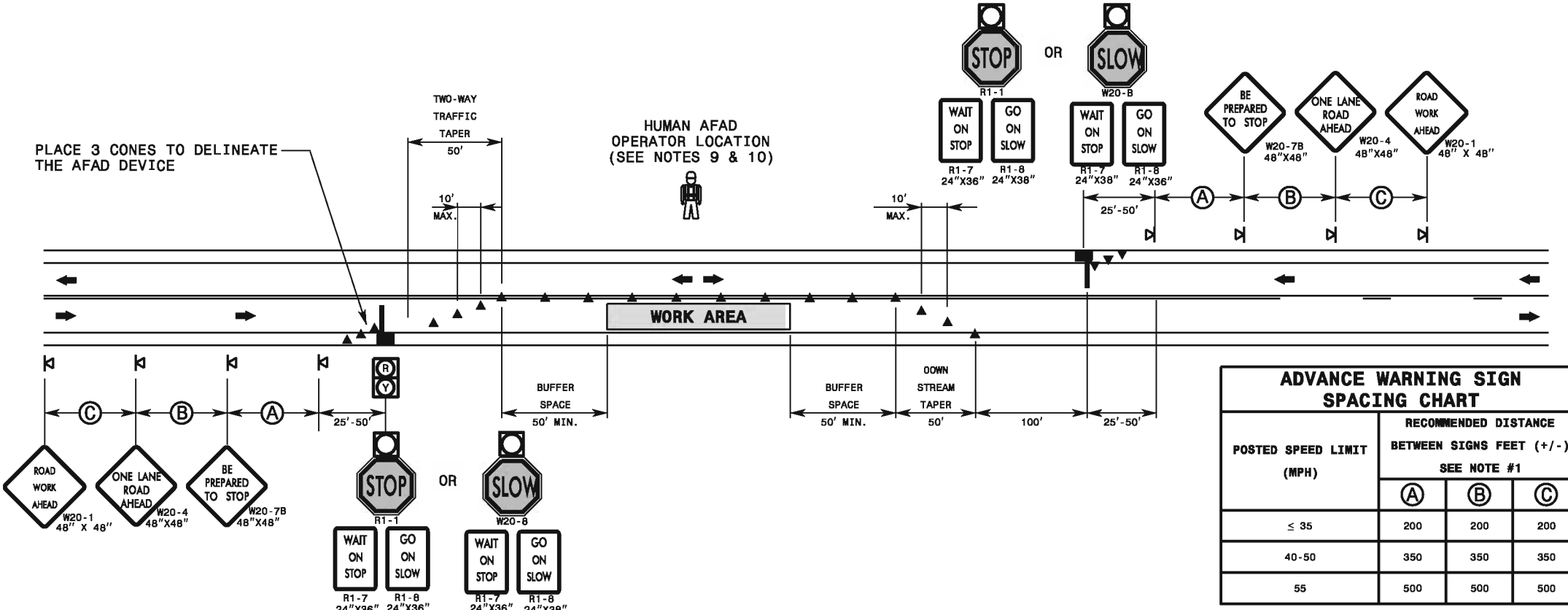


ADVANCE WARNING SIGN SPACING CHART			
POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS FEET (+/-)		
	SEE NOTE #1		
	(A)	(B)	(C)
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500

GENERAL NOTES

- 1- INSTALLATION AND REMOVAL OF THE AFAD DEVICES REQUIRES A NORMAL FLAGGING SET UP AS SHOWN ON THE DETAIL. IN ORDER TO SAFELY INSTALL THE TAPER AND DEVICES, PLACE THE SYSTEM IN THE "ALL RED"/"ALL STOP" CONDITION TO STOP BOTH DIRECTIONS OF TRAFFIC. ONCE THE DEVICES ARE INSTALLED AND WORKERS SAFELY AWAY FROM THE LANE, BEGIN CONTROLLING TRAFFIC WITH THE AFADS. REFER TO SIGN SPACING CHART BELOW FOR SIGN SPACING. ALL SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS VARIOUS CONDITIONS OCCUR, SUCH AS LIMITED SIGHT DISTANCE, OBSTRUCTIONS, ETC.
- 2- INSTALL LANE CLOSURES WITH THE DIRECTION OF THE TRAFFIC FLOW; REMOVE LANE CLOSURES AGAINST THE DIRECTION OF THE TRAFFIC FLOW.
- 3- PLACE CONES OR SKINNY DRUMS FROM THE TWO WAY TRAFFIC TAPER TO THE DOWNSTREAM TAPER ON EQUAL SPACING NO GREATER THAN TWO TIMES THE POSTED SPEED LIMIT. USE EITHER ALL CONES OR ALL SKINNY DRUMS AROUND AFAD AND FOR APPROACH TAPER.
- 4- THE BOTTOM OF THE SIGNAL HEAD HOUSING OR SIGN DISPLAYS SHALL BE A MINIMUM OF 7' ABOVE PAVEMENT.
- 5- AN AFAD SHALL BE OPERATED BY A QUALIFIED FLAGGER WHO HAS RECEIVED TRAINING ON THE OPERATION FOR THE SPECIFIC AFAD DEVICE THEY ARE OPERATING. QUALIFIED FLAGGERS MUST BE CERTIFIED BY A NCDOT APPROVED SOURCE. THE FLAGGER OPERATING THE AFAD(S) SHALL NOT LEAVE THE AFAD(S) UNATTENDED AT ANY TIME WHILE THEY ARE BEING USED TO ASSIGN THE RIGHT-OF-WAY.
- 6- THE AFAD SHOULD BE PARKED 2 FEET OUTSIDE OF THE LANE BEING CONTROLLED UNLESS THERE IS NOT ENOUGH SHOULDER. IF THERE IS LIMITED ROOM OUTSIDE THE LANE BEING CONTROLLED, THE AFAD MAY BE POSITIONED PARTIALLY WITHIN THE LANE AS NECESSARY WITH THE GATE ARM REACHING AT LEAST TO THE CENTER OF THE LANE BUT NOT EXCEEDING THE LANE WIDTH.
- 7- WHEN WORK IS NOT PURSUED FOR 30 MINUTES OR LONGER, ALL PARTS OF THE AFAD UNIT SHALL BE REMOVED FROM THE TRAVEL LANE A MINIMUM OF 2' FROM THE EDGE LINE. THE GATE ARMS SHALL BE IN THE UPRIGHT POSITION, REMOVE ALL TRAFFIC CONTROL DEVICES FROM ROAD, PLACE 2 CONES BY EACH AFAD UNIT AND ALL SIGNS ASSOCIATED WITH THE AFAD SYSTEM SHALL BE LAID DOWN EXCEPT THE "ROAD WORK AHEAD" SIGNS. EACH AFAD UNIT SHALL BE PLACED IN THE "CAUTION MODE", EITHER FLASHING YELLOW SIGNAL DISPLAY OR THE "SLOW" SIGN INDICATED AND YELLOW BEACON FLASHING.
- 8- IN THE EVENT THAT ONE OR BOTH AFAD UNITS BECOME INOPERATIVE, BE PREPARED AT ALL TIMES TO REPLACE THE UNIT OR SYSTEM WITH THE SAME TYPE AND MODEL OF AFAD, OR REVERT TO NORMAL FLAGGING OPERATIONS, OR TERMINATE ALL CONSTRUCTION ACTIVITIES REQUIRING THE USE OF THE AFAD UNTIL THE AFAD IS OPERATIVE OR QUALIFIED HUMAN FLAGGERS ARE AVAILABLE.
- 9- A SINGLE OPERATOR MAY SIMULTANEOUSLY OPERATE TWO AFADS AS LONG AS THE OPERATOR HAS AN UNOBSTRUCTED VIEW OF BOTH AFADS: THE OPERATOR HAS AN UNOBSTRUCTED VIEW OF APPROACHING TRAFFIC IN BOTH DIRECTIONS; AND THE AFADS ARE SPACED NO GREATER THAN THE MANUFACTURER'S RECOMMENDATIONS.
- 10- IF THE AFADS ARE SPACED GREATER THAN THE MANUFACTURER'S RECOMMENDATIONS, THEN AN OPERATOR MUST BE ASSIGNED TO AND CONTROL EACH INDIVIDUAL AFAD.
- 11- AFAD OPERATORS MAY CONTROL TRAFFIC AT SIDE STREETS OR DRIVEWAYS BETWEEN THE AFAD UNITS WHILE OPERATING THE AFAD SYSTEM IF APPROVED BY THE ENGINEER. AFAD UNITS MUST CONTINUE TO BE WITHIN CLEAR SIGHT OF THE OPERATOR DURING THIS WORK ACTIVITY.

LEGEND	
▲	CONES OR SKINNY DRUMS
■	AFAD (Automated Flagging Assistance Device w/ Gate Arm)
⚡	PORTABLE SIGN
←	DIRECTION OF TRAFFIC FLOW



ADVANCE WARNING SIGN SPACING CHART

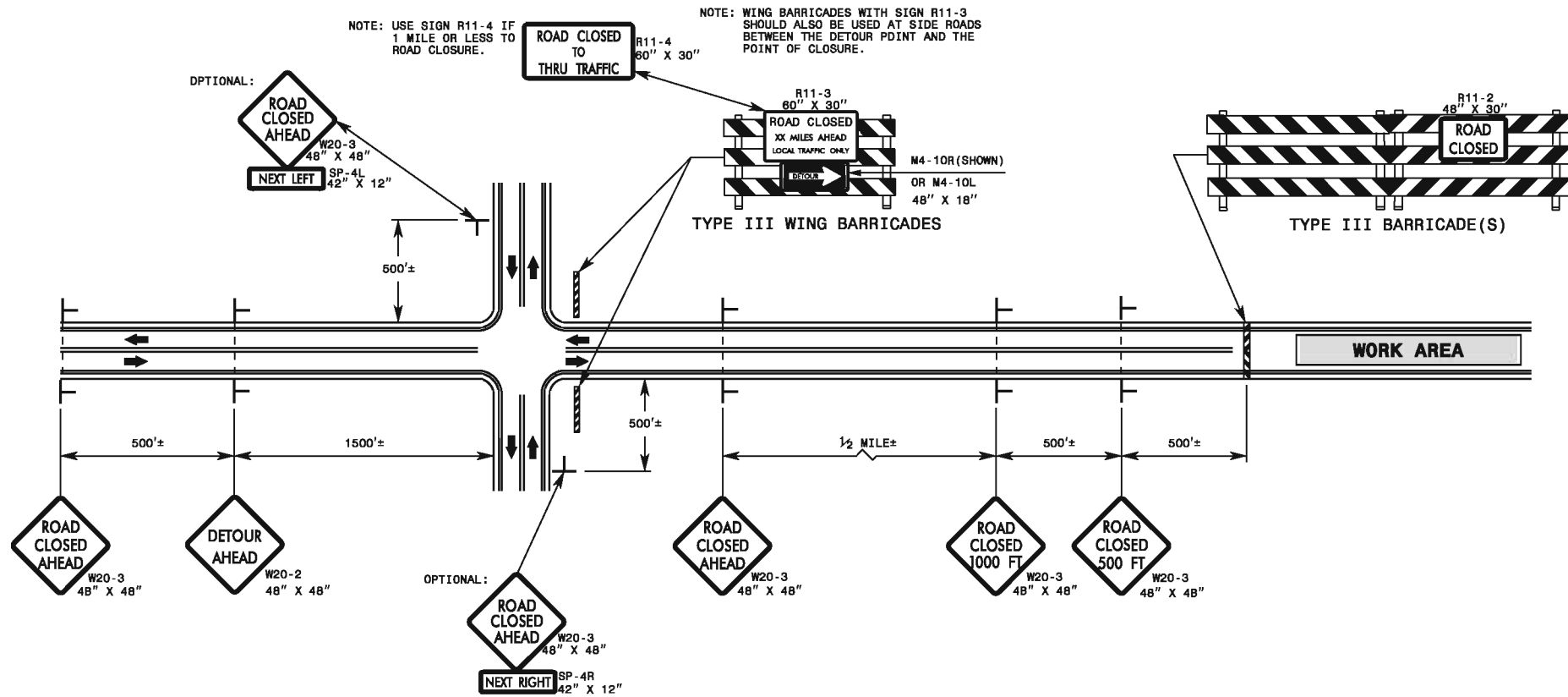
POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS FEET (+/-)		
	SEE NOTE #1		
	(A)	(B)	(C)
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500

GENERAL NOTES

- INSTALLATION AND REMOVAL OF THE AFAD DEVICES REQUIRES A NORMAL FLAGGING SET UP AS SHOWN ON THE DETAIL. IN ORDER TO SAFELY INSTALL THE TAPER AND DEVICES, PLACE THE SYSTEM IN THE "ALL RED"/"ALL STOP" CONDITION TO STOP BOTH DIRECTIONS OF TRAFFIC. ONCE THE DEVICES ARE INSTALLED AND WORKERS SAFELY AWAY FROM THE LANE, BEGIN CONTROLLING TRAFFIC WITH THE AFADS. REFER TO SIGN SPACING CHART BELOW FOR SIGN SPACING. ALL SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS VARIOUS CONDITIONS OCCUR, SUCH AS LIMITED SIGHT DISTANCE, OBSTRUCTIONS, ETC.
- INSTALL LANE CLOSURES WITH THE DIRECTION OF THE TRAFFIC FLOW; REMOVE LANE CLOSURES AGAINST THE DIRECTION OF THE TRAFFIC FLOW.
- PLACE CONES OR SKINNY DRUMS FROM THE TWO WAY TRAFFIC TAPER TO THE DOWNSTREAM TAPER ON EQUAL SPACING NO GREATER THAN TWO TIMES THE POSTED SPEED LIMIT. USE EITHER ALL CONES OR ALL SKINNY DRUMS AROUND AFAD AND FOR APPROACH TAPER.
- THE BOTTOM OF THE SIGNAL HEAD HOUSING OR SIGN DISPLAYS SHALL BE A MINIMUM OF 7' ABOVE PAVEMENT.
- AN AFAD SHALL BE OPERATED BY A QUALIFIED FLAGGER WHO HAS RECEIVED TRAINING ON THE OPERATION FOR THE SPECIFIC AFAD DEVICE THEY ARE OPERATING. QUALIFIED FLAGGERS MUST BE CERTIFIED BY A NCDOT APPROVED SOURCE. THE FLAGGER OPERATING THE AFAD(S) SHALL NOT LEAVE THE AFAD(S) UNATTENDED AT ANY TIME WHILE THEY ARE BEING USED TO ASSIGN THE RIGHT-OF-WAY.
- THE AFAD SHOULD BE PARKED 2 FEET OUTSIDE OF THE LANE BEING CONTROLLED UNLESS THERE IS NOT ENOUGH SHOULDER. IF THERE IS LIMITED ROOM OUTSIDE THE LANE BEING CONTROLLED, THE AFAD MAY BE POSITIONED PARTIALLY WITHIN THE LANE AS NECESSARY WITH THE GATE ARM REACHING AT LEAST TO THE CENTER OF THE LANE BUT NOT EXCEEDING THE LANE WIDTH.
- WHEN WORK IS NOT PURSUED FOR 30 MINUTES OR LONGER, ALL PARTS OF THE AFAD UNIT SHALL BE REMOVED FROM THE TRAVEL LANE A MINIMUM OF 2' FROM THE EDGELINE. THE GATE ARMS SHALL BE IN THE UPRIGHT POSITION, REMOVE ALL TRAFFIC CONTROL DEVICES FROM ROAD, PLACE 2 CONES BY EACH AFAD UNIT AND ALL SIGNS ASSOCIATED WITH THE AFAD SYSTEM SHALL BE LAID DOWN EXCEPT THE "ROAD WORK AHEAD" SIGNS. EACH AFAD UNIT SHALL BE PLACED IN THE "CAUTION MODE" EITHER FLASHING YELLOW SIGNAL DISPLAY OR THE "SLOW" SIGN INDICATED AND YELLOW BEACON FLASHING.
- IN THE EVENT THAT ONE OR BOTH AFAD UNITS BECOME INOPERATIVE, BE PREPARED AT ALL TIMES TO REPLACE THE UNIT OR SYSTEM WITH THE SAME TYPE AND MODEL OF AFAD, OR REVERT TO NORMAL FLAGGING OPERATIONS, OR TERMINATE ALL CONSTRUCTION ACTIVITIES REQUIRING THE USE OF THE AFAD UNTIL THE AFAD IS OPERATIVE OR QUALIFIED HUMAN FLAGGERS ARE AVAILABLE.
- A SINGLE OPERATOR MAY SIMULTANEOUSLY OPERATE TWO AFADS AS LONG AS THE OPERATOR HAS AN UNOBSTRUCTED VIEW OF BOTH AFADS; THE OPERATOR HAS AN UNOBSTRUCTED VIEW OF APPROACHING TRAFFIC IN BOTH DIRECTIONS; AND THE AFADS ARE SPACED NO GREATER THAN THE MANUFACTURER'S RECOMMENDATIONS.
- IF THE AFADS ARE SPACED GREATER THAN THE MANUFACTURER'S RECOMMENDATIONS, THEN AN OPERATOR MUST BE ASSIGNED TO AND CONTROL EACH INDIVIDUAL AFAD.
- AFAD OPERATORS MAY CONTROL TRAFFIC AT SIDE STREETS OR DRIVEWAYS BETWEEN THE AFAD UNITS WHILE OPERATING THE AFAD SYSTEM IF APPROVED BY THE ENGINEER. AFAD UNITS MUST CONTINUE TO BE WITHIN CLEAR SIGHT OF THE OPERATOR DURING THIS WORK ACTIVITY.

LEGEND

- ▲ CONES OR SKINNY DRUMS
- AFAD (Automated Flagging Assistance Device w/ Gate Arm)
- ◁ PORTABLE SIGN
- ← DIRECTION OF TRAFFIC FLOW



NOTE: USE SIGN R11-4 IF 1 MILE OR LESS TO ROAD CLOSURE.

NOTE: WING BARRICADES WITH SIGN R11-3 SHOULD ALSO BE USED AT SIDE ROADS BETWEEN THE DETOUR POINT AND THE POINT OF CLOSURE.

GENERAL NOTES

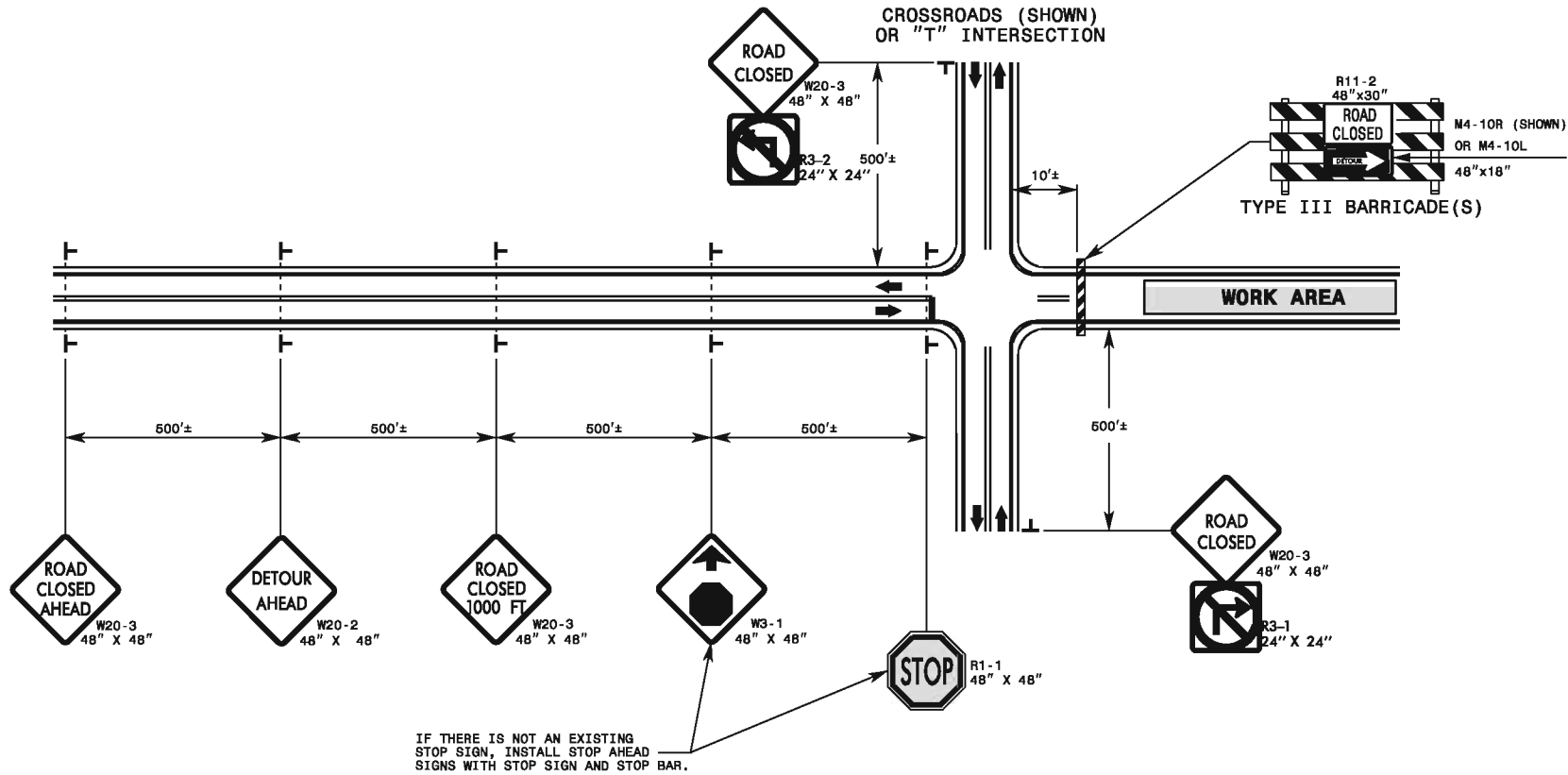
- 1- IF NECESSARY USE THIS STD. FOR TWO-LANE, TWO-WAY, AND MULTILANE DIVIDED AND UNDIVIDED ROADWAYS.
- 2- INSTALLATION OF DETOUR ROUTING PANELS, TEMPORARY ROUTE MARKERS, DESTINATION SIGNS, AND ANY NECESSARY MODIFICATIONS TO EXISTING OR PROPOSED REGULATORY OR WARNING SIGNS WILL BE MADE BY OTHERS (STATE OR CITY FORCES) UNLESS OTHERWISE DESIGNATED IN THE PLANS. PROVIDE A MINIMUM 21 CALENDAR DAY NOTICE TO STATE FORCES BEFORE A ROADWAY IS CLOSED TO TRAFFIC SUCH THAT THE NECESSARY PROVISIONS CAN BE MADE TO INSTALL DETOUR ROUTE SIGNS, INFORM LOCAL EMERGENCY AND LAW ENFORCEMENT PERSONNEL, SCHOOLS, OR ANY OTHER PARTIES AFFECTED BY THE ROAD CLOSURE.
- 3- INSTALL SIGNS BEFORE THE BARRICADES WHEN CLOSING THE ROADWAY TO TRAFFIC. REMOVE BARRICADES BEFORE SIGNS WHEN OPENING THE ROADWAY TO TRAFFIC. INSTALL/REMOVE SIGNS AND BARRICADES WITHIN THE SAME CALENDAR DAY.
- 4- USE ADDITIONAL TYPE III BARRICADES IN STAGGERED LOCATIONS SUPPLEMENTED WITH SIGN R11-4 "ROAD CLOSED TO THRU TRAFFIC" IN THE EVENT THAT TRAFFIC MUST BE MAINTAINED BEYOND THE DETOUR POINT.
- 5- DO NOT DISPLAY FRACTIONS OR DECIMALS ON SIGN R11-3 "ROAD CLOSED XX MILES AHEAD".
- 6- POSITION WING BARRICADES ON THE SHOULDERS AND SLOPE THE STRIPES DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING.
- 7- USE PORTABLE SIGNS IF ROAD CLOSURE IS TO BE IMPLEMENTED FOR LESS THAN ONE DAY OR FOR EMERGENCIES.

LEGEND

┤ STATIONARY SIGN

← DIRECTION OF TRAFFIC FLOW

1-12



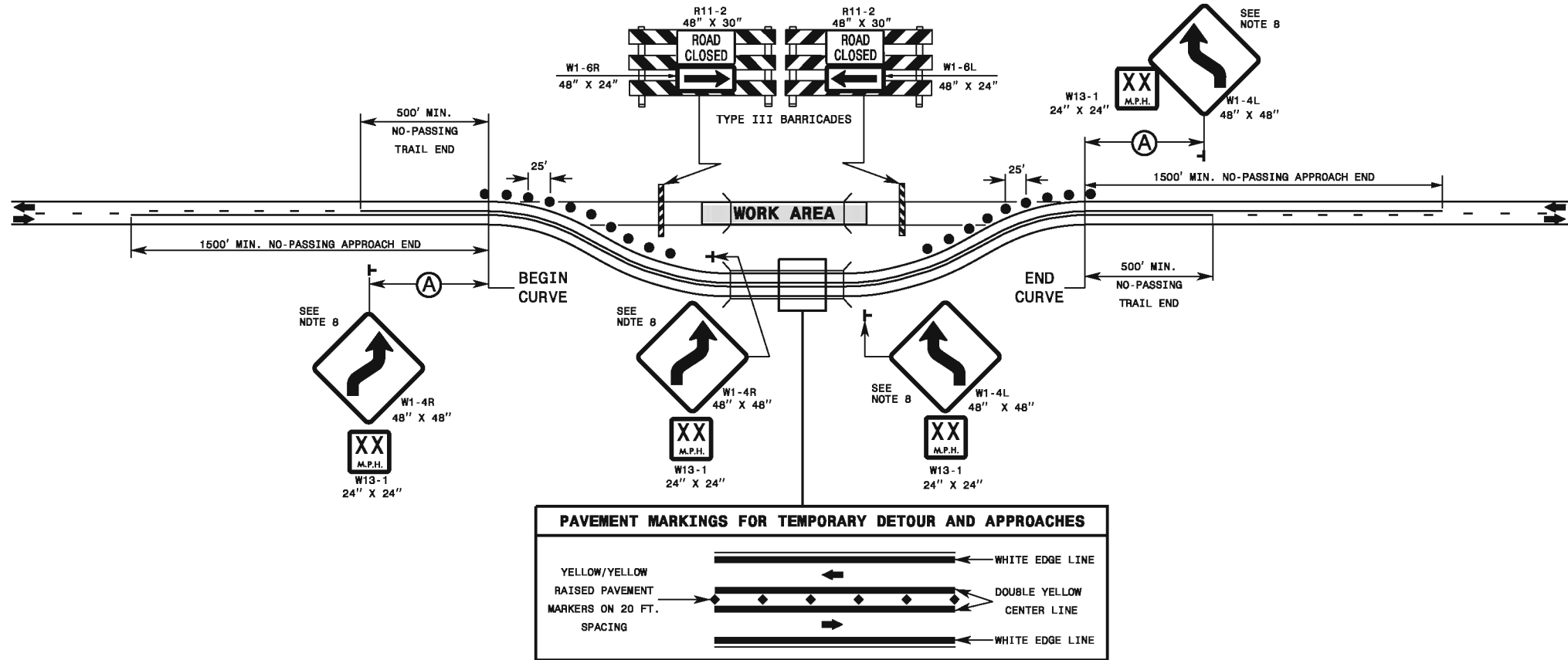
GENERAL NOTES

- 1- IF NECESSARY USE THIS STD FOR CROSS-ROADS AS SHOWN OR FOR "T" INTERSECTIONS ON TWO-LANE, TWO-WAY AND MULTILANE UNDIVIDED AND DIVIDED ROADWAYS.
- 2- INSTALLATION OF DETOUR ROUTING PANELS, TEMPORARY ROUTE MARKERS, DESTINATION SIGNS, AND ANY NECESSARY MODIFICATIONS TO EXISTING OR PROPOSED REGULATORY OR WARNING SIGNS WILL BE MADE BY OTHERS (STATE OR CITY FORCES) UNLESS OTHERWISE DESIGNATED IN THE PLANS. A MINIMUM 21 CALENDAR DAY NOTICE IS REQUIRED TO BE PROVIDED TO STATE FORCES BEFORE A ROADWAY IS CLOSED TO TRAFFIC SUCH THAT THE NECESSARY PROVISIONS CAN BE MADE TO INSTALL DETOUR ROUTE SIGNS, AND TO INFORM LOCAL EMERGENCY AND LAW ENFORCEMENT PERSONNEL, SCHOOLS, OR ANY OTHER PARTIES AFFECTED BY THE ROAD CLOSURE.
- 3- INSTALL SIGNS BEFORE BARRICADES WHEN CLOSING THE ROADWAY TO TRAFFIC. REMOVE BARRICADES BEFORE SIGNS WHEN OPENING THE ROADWAY TO TRAFFIC. INSTALL/REMOVE SIGNS AND BARRICADES WITHIN THE SAME CALENDAR DAY.
- 4- POSITION BARRICADES SUCH THAT THE STRIPES ARE SLOPED DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING.
- 5- USE PORTABLE SIGNS IF ROAD CLOSURE IS TO BE IMPLEMENTED FOR LESS THAN ONE DAY, OR FOR EMERGENCIES. IN THIS CASE, NO STOP BAR IS NECESSARY.

LEGEND

- ┆ STATIONARY SIGN
- ← DIRECTION OF TRAFFIC FLOW

1-12

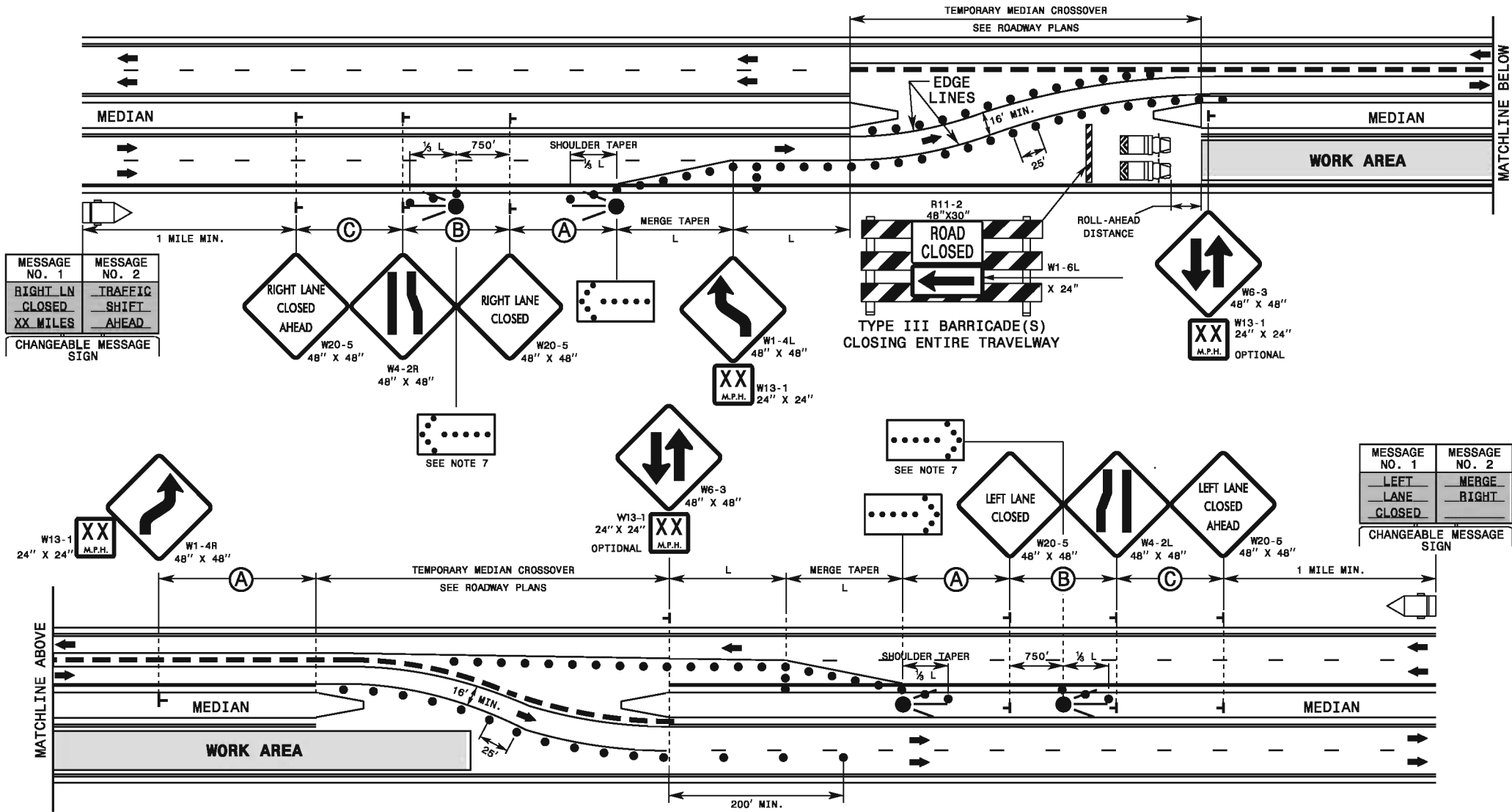


GENERAL NOTES

- 1- THE SIGNS ON THIS STD. MAY BE APPLIED TO MULTILANE ROADWAYS.
- 2- REFER TO STD. 1101.11 SHEET 4 FOR SIGN SPACING.
- 3- USE ADDITIONAL TYPE III BARRICADES IN STAGGERED LOCATIONS SUPPLEMENTED WITH SIGN R11-4 "ROAD CLOSED TO THRU TRAFFIC" IN THE EVENT THAT TRAFFIC MUST BE MAINTAINED BEYOND THE CLOSURE LIMITS.
- 4- REMOVE PAVEMENT MARKINGS THAT ARE NO LONGER APPLICABLE IN CONJUNCTION WITH OPENING/CLOSING THE TEMPORARY DETOUR TO TRAFFIC.
- 5- PLACE PAVEMENT MARKERS FROM A POINT 500 FT. PRIOR TO THE BEGINNING OF THE TEMPORARY DETOUR, ALONG THE TEMPORARY DETOUR, AND END APPROXIMATELY 500 FT. PAST THE END OF THE TEMPORARY DETOUR (PLACE MARKERS ON 20' SPACING).
- 6- USE REVERSE TURN SIGNS (W1-3L OR W1-3R) INSTEAD OF THE REVERSE CURVE SIGNS SHOWN IF THE TEMPORARY DETOUR HAS SHARP CURVES (30MPH OR LESS). PLACE CHEVRON SIGNS (W1-8) ALONG THE CURVES WHERE THERE IS INSUFFICIENT ADVANCE WARNING DISTANCE TO PLACE THE SECOND SET.
- 7- USE ADVISORY SPEED PANELS (W13-1) IF THE DESIGN SPEED IS AT LEAST 10MPH LESS THAN THE POSTED SPEED LIMIT UNLESS A LOWER SPEED IS DEEMED NECESSARY BY THE ENGINEER.
- 8- IF THE TANGENT DISTANCE ALONG THE TEMPORARY DETOUR IS LESS THAN 600FT, INSTALL THE WINDING ROAD SIGN (W1-5L OR W1-5R) AT THE LOCATION OF THE FIRST REVERSE CURVE SIGN (W1-4L OR W1-4R) AND OMIT THE SECOND REVERSE CURVE SIGN (W1-4L OR W1-4R).

LEGEND	
⊣	STATIONARY SIGN
●	DRUM
←	DIRECTION OF TRAFFIC FLOW

1-12



GENERAL NOTES

- 1- REFER TO STD. 1101.02 SHEET 3 FOR RIGHT LANE CLOSURE NOTES.
- 2- PROVIDE DELINEATORS WITH CONCRETE BARRIER.
- 3- PLACE EDGE LINES BEGINNING AT THE LANE CLOSURE MERGE TAPER AND CONTINUE THRU THE ENTIRE LENGTH OF THE SECTION. REMOVE PAVEMENT MARKINGS THAT ARE NO LONGER APPLICABLE IN CONJUNCTION WITH PLACING TRAFFIC IN THE CROSSOVER PATTERN AND WHEN RETURNING TRAFFIC BACK IN ITS NORMAL PATTERN. USE REMOVABLE TAPE IF TRAFFIC WILL BE SWITCHED ON THE SAME PAVEMENT SURFACE.
- 4- LOCATE CROSSOVERS, BARRIER, AND LANE WIDTHS AS SHOWN IN THE PLANS. FULL DEPTH SHOULDERS MAY BE REQUIRED AS SHOWN IN THE PLANS.
- 5- DISPLAY CHANGEABLE MESSAGE SIGN (CMS) MESSAGES AS SHOWN OR AS DIRECTED BY THE ENGINEER. USE NO MORE THAN TWO (2) MESSAGE DISPLAYS WITH ANY CYCLE.
- 6- GUARDRAIL ON TRAFFIC SIDE WILL REQUIRE OVERLAP AND END TREATMENTS. THIS PROCESS MUST BE REVERSED WHEN FACILITY IS OPEN TO FINAL PATTERN.
- 7- THE FIRST FLASHING ARROW BOARDS ARE NOT REQUIRED ON FACILITIES ≤ 55 MPH.

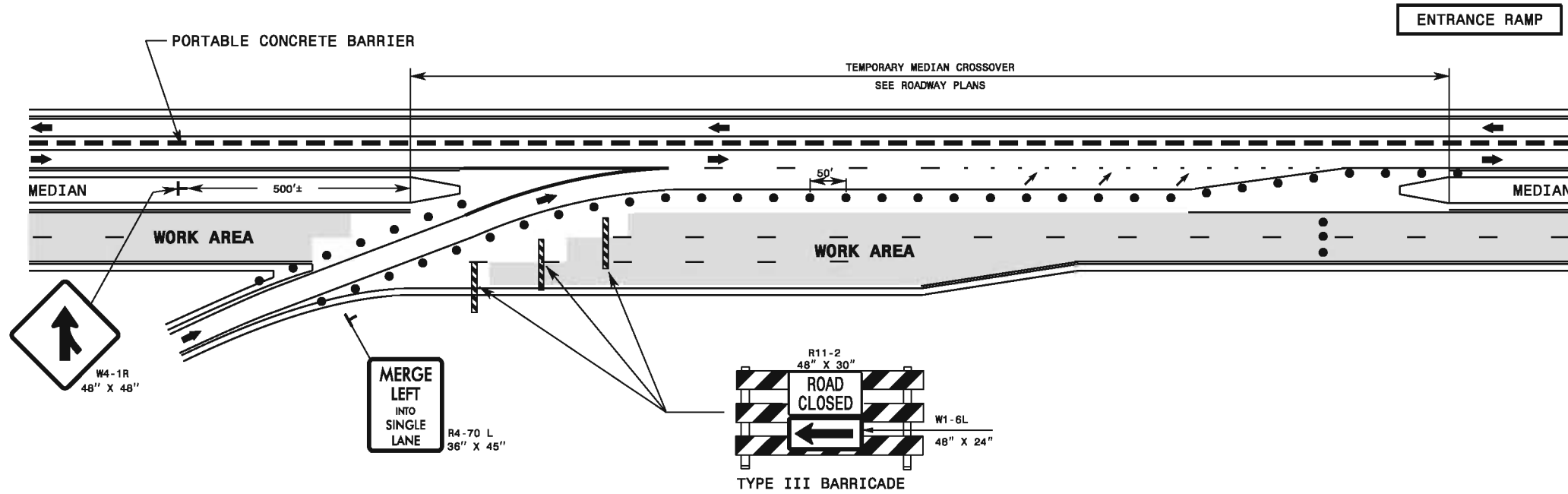
LEGEND

- DRUM
- ▩ TRUCK MOUNTED ATTENUATOR (TMA)
- ⊥ STATIONARY SIGN
- ⚡ FLASHING ARROW BOARD (TYPE C)
- PORTABLE CONCRETE BARRIER
- ▶ CHANGEABLE MESSAGE SIGN (CMS)
- ← DIRECTION OF TRAFFIC FLOW

1-12

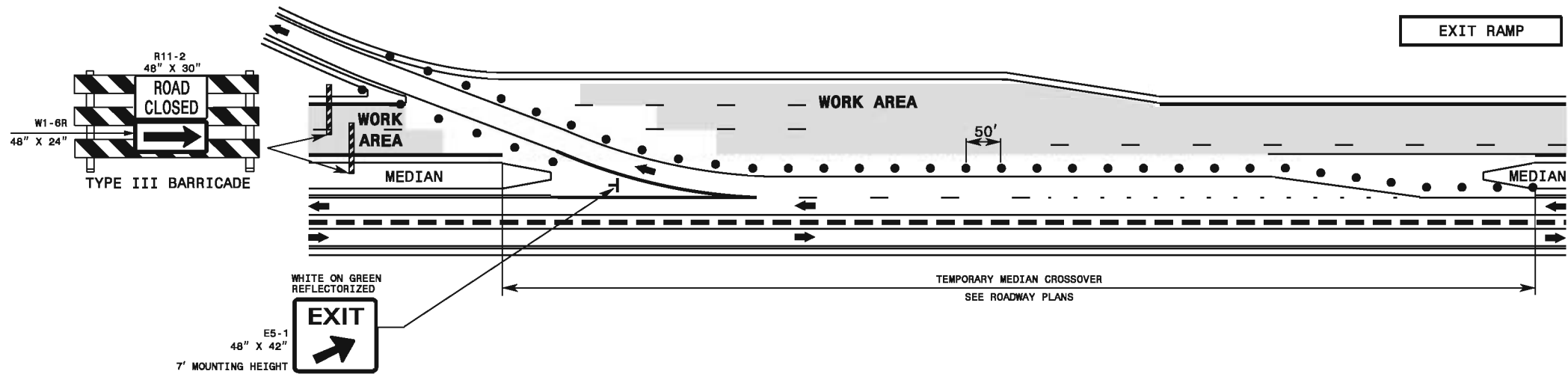
1-12

1-12



ENGLISH STANDARD DRAWING FOR
TEMPORARY ROAD CLOSURES
MEDIAN CROSSOVERS FOR RAMPS

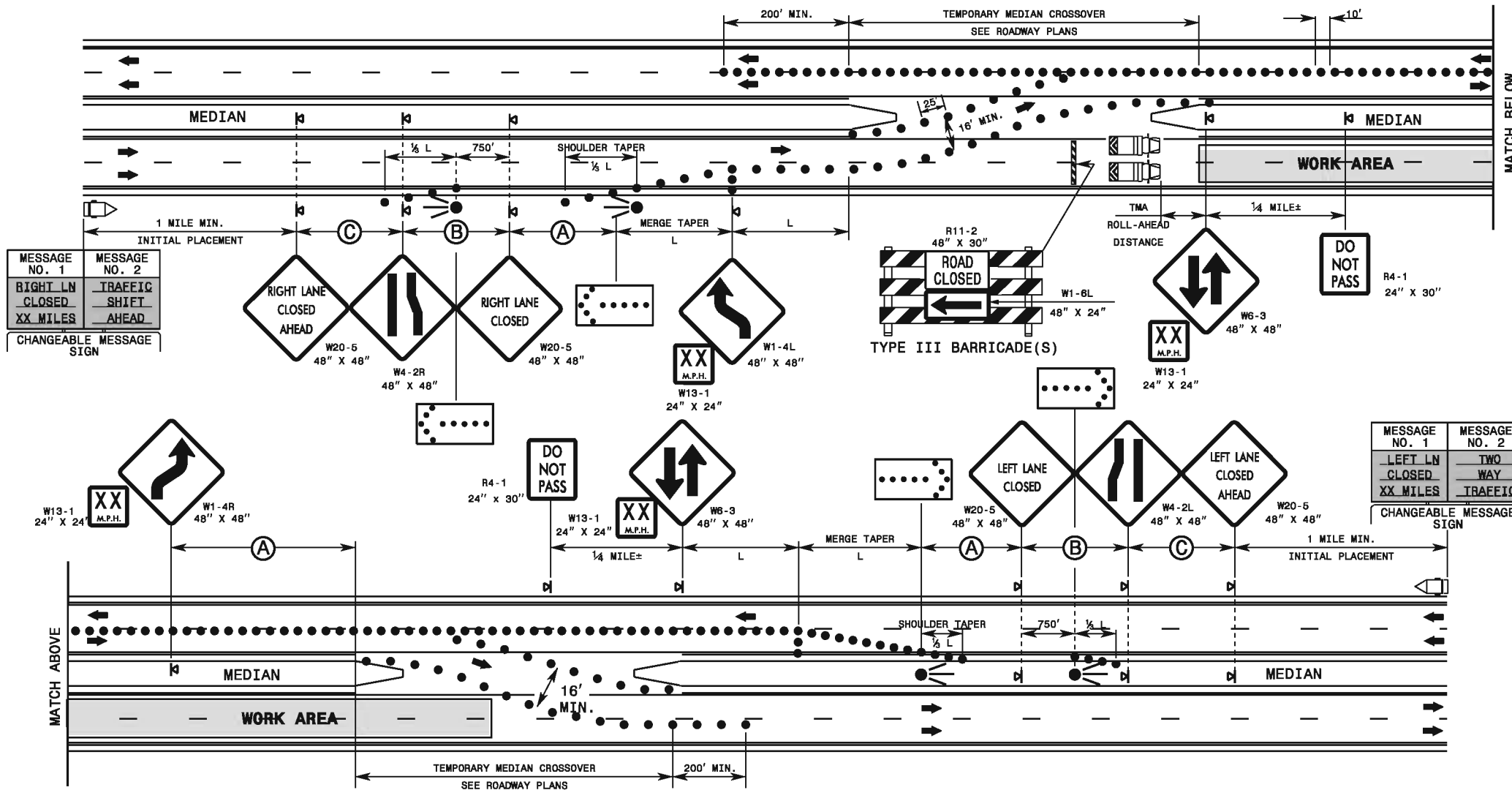
ENGLISH STANDARD DRAWING FOR
TEMPORARY ROAD CLOSURES
MEDIAN CROSSOVERS FOR RAMPS



GENERAL NOTES

- 1- THIS SHEET IS TO BE USED IN CONJUNCTION WITH STD. 1101.03 SHEET 4.
- 2- BARRICADE LOCATIONS ARE TYPICAL AND MAY BE MODIFIED FOR VARIOUS FIELD CONDITIONS, AS DIRECTED BY THE ENGINEER.
- 3- THE USE OF WIDE PAVEMENT MARKING LINES ARE RECOMMENDED.
- 4- GUARDRAIL ON TRAFFIC SIDE WILL REQUIRE OVERLAP AND END TREATMENTS. THIS PROCESS MUST BE REVERSED WHEN FACILITY IS OPEN TO FINAL TRAFFIC PATTERN.

LEGEND	
●	DRUM
▨	TYPE III BARRICADE
⊥	STATIONARY SIGN
- - -	PORTABLE CONCRETE BARRIER
←	DIRECTION OF TRAFFIC FLOW



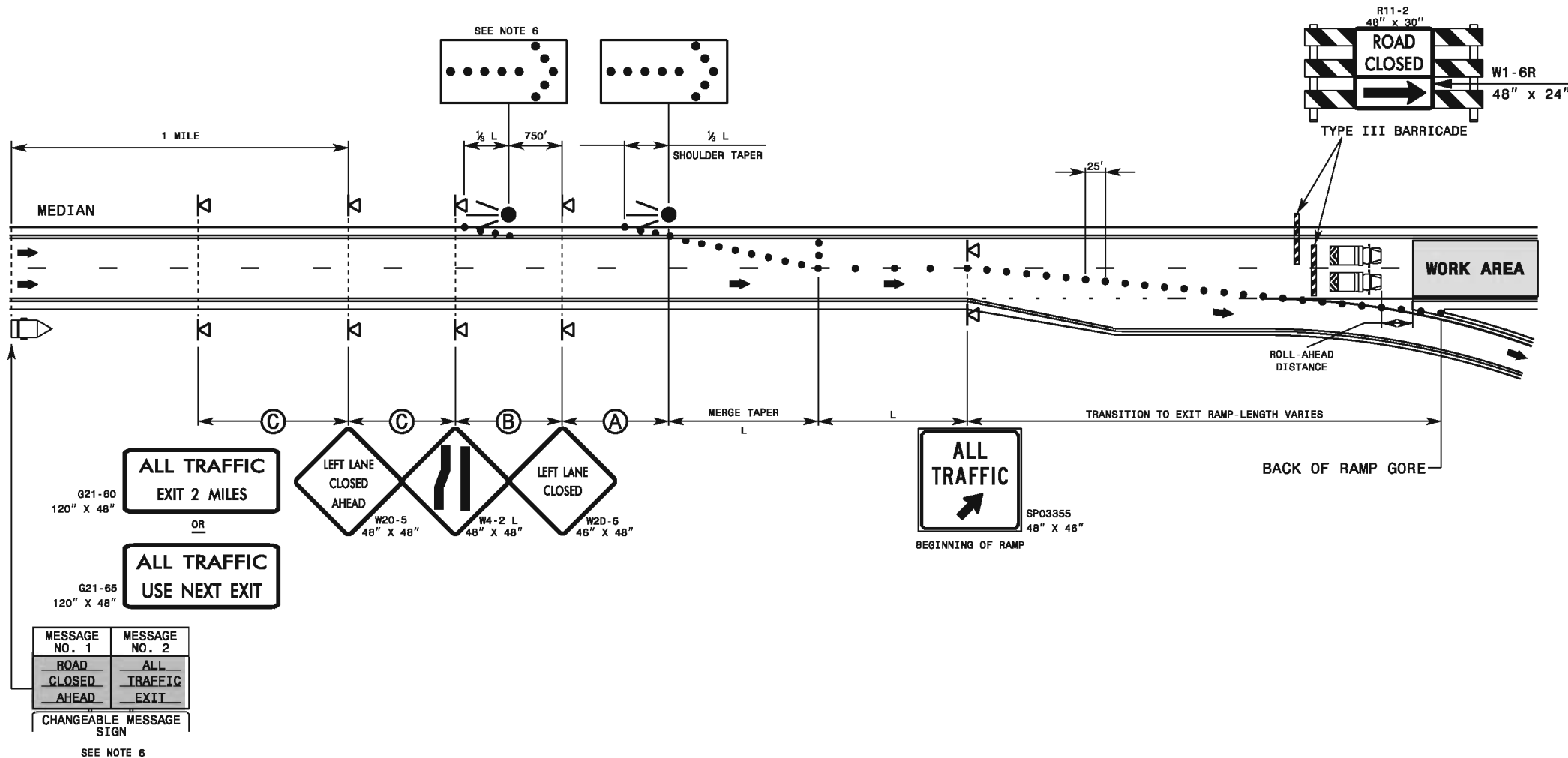
GENERAL NOTES

- 1- USE THIS STD. FOR OPERATIONS LASTING 3 DAYS OR LESS AND USING LOW SPEED CROSSOVERS DESIGNED FOR AT LEAST 20 MPH BELOW THE POSTED SPEED LIMIT.
- 2- LIMIT THE DISTANCE BETWEEN TEMPORARY CROSSOVERS TO 1/2 MILE.
- 3- REFER TO STD. 1101.02 SHEET 3 FOR RIGHT LANE CLOSURE NOTES.
- 4- SEPARATE 2 WAY TRAFFIC USING DRUMS OR ORANGE TUBULAR MARKERS WITH WHITE RETROREFLECTIVE SHEETING FIXED TO THE PAVEMENT.
- 5- DISPLAY CHANGEABLE MESSAGE SIGN (CMS) MESSAGES AS SHOWN OR AS DIRECTED BY THE ENGINEER. USE NO MORE THAN TWO (2) MESSAGE DISPLAYS WITH ANY CYCLE.
- 6- CHANGEABLE MESSAGE BOARDS AND FIRST FLASHING ARROW BOARDS ARE NOT REQUIRED ON FACILITIES ≤ 55 MPH.

LEGEND

- CHANGEABLE MESSAGE SIGN (CMS)
- TRUCK MOUNTED ATTENUATOR
- DRUM
- TYPE III BARRICADE
- PORTABLE SIGN
- FLASHING ARROW BOARD (TYPE C)
- DIRECTION OF TRAFFIC FLOW

1-12



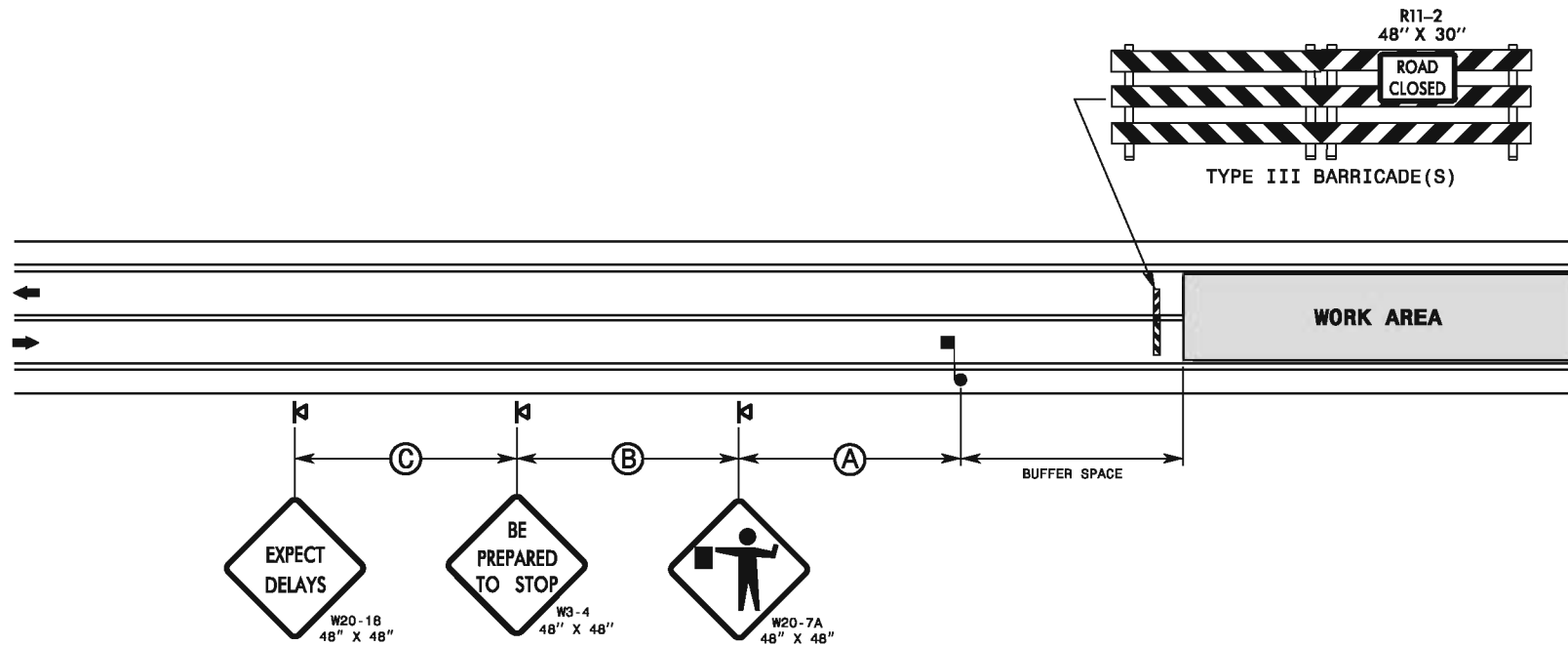
GENERAL NOTES

- 1- USE STATIONARY SIGNS FOR LONG TERM OPERATIONS (LONGER THAN 3 DAYS).
- 2- IF NECESSARY USE FLAGGERS OR LAW ENFORCEMENT TO DIRECT TRAFFIC AT RAMP TERMINAL AS DIRECTED BY THE PLANS OR THE ENGINEER.
- 3- IF RAMP TERMINAL IS SIGNALIZED, SIGNALS MAY BE PLACED IN FLASH MODE AND RECOMMEND THE USE OF LAW ENFORCEMENT.
- 4- DISPLAY CHANGEABLE MESSAGE SIGN (CMS) MESSAGES AS SHOWN OR AS DEEMED NECESSARY BY THE ENGINEER.
- 5- REFER TO NOTES ON STD. 1101.02 SHEET 3.
- 6- CHANGEABLE MESSAGE BOARDS AND FIRST FLASHING ARROW BOARDS ARE NOT REQUIRED ON FACILITIES ≤ 55 MPH.

LEGEND

- CHANGEABLE MESSAGE SIGN (CMS)
- FLASHING ARROW BOARD (TYPE C)
- DRUM
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW




1-12

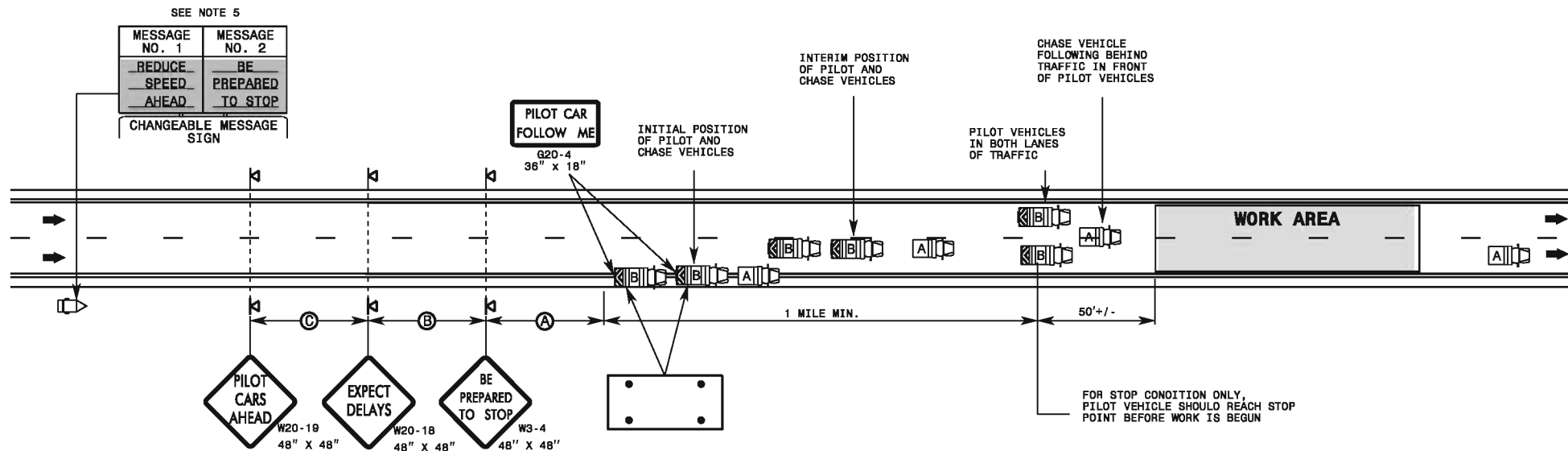


GENERAL NOTES

- 1- USE THIS DETAIL FOR OPERATIONS SUCH AS ERECTION AND REMOVAL OF OVERHEAD SIGNS, BRIDGE GIRDERS, OR OTHER TYPES OF CONSTRUCTION WHERE THE ENTIRE TRAVELWAY MUST BE CLOSED TO TRAFFIC.
- 2- IMPLEMENT THIS TYPE OF ROAD CLOSURE DURING PERIODS OF LOW TRAFFIC VOLUMES. DEplete THE EXISTING TRAFFIC QUEUE BEFORE RECLOSING THE ROADWAY TO TRAFFIC IF MULTIPLE CLOSURES ARE REQUIRED.
- 3- TRAFFIC CONTROL DEVICES ARE SHOWN FOR ONE DIRECTION OF TRAFFIC APPROACHING THE ROAD CLOSURE, THE SAME DEVICES APPLY FOR THE OPPOSITE TRAFFIC DIRECTION.
- 4- REFER TO STD. 1101.11 FOR SIGN SPACING AND BUFFER SPACE.
- 5- LAW ENFORCEMENT MAY BE USED TO SUPPLEMENT FLAGGER, AS DIRECTED BY THE ENGINEER.

LEGEND

-  PORTABLE SIGN
-  FLAGGER
-  DIRECTION OF TRAFFIC FLOW



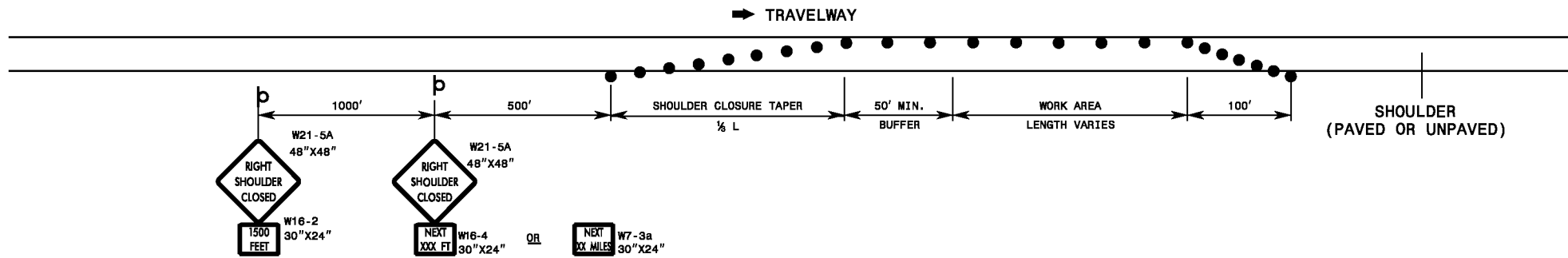
GENERAL NOTES

- 1- THIS DETAIL IS INTENDED TO BE USED FOR OPERATIONS SUCH AS INSTALLATION OF LANE CLOSURES, ERECTION AND REMOVAL OF OVERHEAD SIGNS, BRIDGE GIRDERS, OR OTHER TYPES OF CONSTRUCTION WHERE THE ENTIRE TRAVELWAY MUST BE SLOW ROLLING OR CLOSED TO TRAFFIC.
- 2- THE NUMBER OF PILOT VEHICLES SHALL EQUAL THE NUMBER OF LANES. THE NUMBER OF CHASE VEHICLES SHALL BE ONE LESS THAN THE NUMBER OF PILOT VEHICLES.
- 3- IMPLEMENT THIS TYPE OF ROAD CLOSURE DURING PERIODS OF LOW TRAFFIC VOLUMES, AND DO NOT PLACE IN EFFECT LONGER THAN 20 MINUTES BEFORE RE-OPENING THE ROADWAY UNLESS OTHERWISE SPECIFIED IN PLANS OR PERMITTED BY THE ENGINEER. IF MULTIPLE CLOSURES WILL BE REQUIRED, A MINIMUM PERIOD OF 20 MINUTES SHOULD TRANSPIRE BEFORE RE-CLOSING THE ROADWAY.
- 4- SIGNS ARE NOT REQUIRED TO BE DUAL MOUNTED FOR UNDIVIDED MULTILANE ROADWAYS. PLACE ALL NECESSARY SIGNING BEFORE IMPLEMENTING THE ROLLING ROAD BLOCK.
- 5- INITIALLY LOCATE THE CHANGEABLE MESSAGE SIGN APPROXIMATELY 2-3 MILES IN ADVANCE OF THE WORK AREA. IF IT IS ANTICIPATED THAT TRAFFIC WILL BACK UP TO THE CMS, THEN PLACE THE CMS IN A LOCATION APPROXIMATELY 1/2 MILE OR MORE PRIOR TO WHERE TRAFFIC IS EXPECTED TO BACK UP.
- 6- DISPLAY CHANGEABLE MESSAGE SIGN (CMS) MESSAGES AS SHOWN OR AS DIRECTED BY THE ENGINEER. USE NO MORE THAN TWO (2) MESSAGE DISPLAYS WITH ANY CYCLE.
- 7- START ROLLING ROAD BLOCK BY HAVING ALL VEHICLES LEAVE THE OUTSIDE SHOULDER AND ACCELERATE TO NORMAL ROADWAY SPEEDS. WHEN NORMAL ROADWAY SPEEDS ARE ATTAINED, THE PILOT VEHICLES (B) WILL POSITION THEMSELVES SIDE BY SIDE AND THEN DECELERATE TO THE SPECIFIED ROLLING ROAD BLOCK SPEED. THE CHASE VEHICLE(S) (A) WILL CONTINUE TO TRAVEL AT NORMAL ROADWAY SPEEDS BEHIND ANY VEHICLES IN FRONT OF THE ROLLING ROAD BLOCK. CLOSE ON-RAMPS/LOOPS OR STOP TRAFFIC ON SAME BETWEEN PILOT VEHICLES (B) AND THE WORK AREA. LAW ENFORCEMENT MAY BE USED AS A SUBSTITUTE FOR ANY VEHICLE(S). DO NOT BEGIN CONSTRUCTION IN ANY LOCATION WITHIN THE WORK AREA UNTIL THE CHASE VEHICLE(S) (A) HAS CLEARED THAT LOCATION.
- 8- RADIO COMMUNICATION BETWEEN ALL VEHICLES AND GROUND CREWS IS REQUIRED.
- 9- REFER TO ROADWAY STANDARD DRAWING 1165.01 FOR ATTENUATOR DELINEATION.

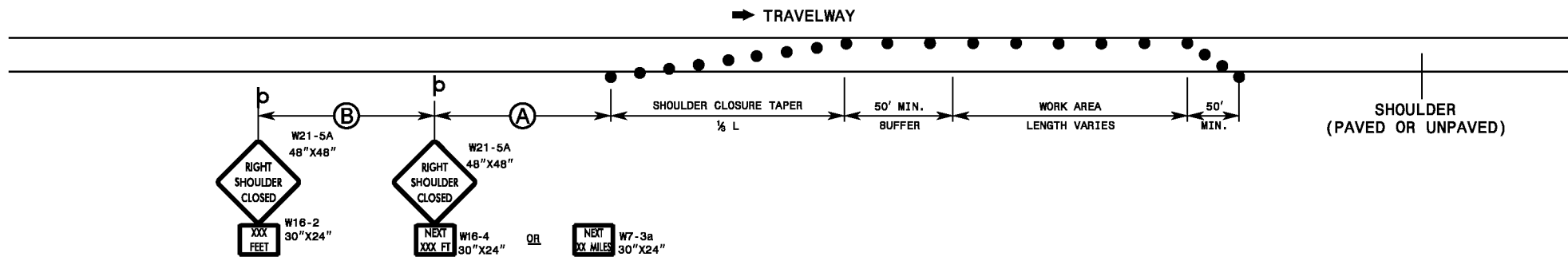
LEGEND

- CHANGEABLE MESSAGE SIGN (CMS)
- CHASE VEHICLE (A)
- PILOT VEHICLE WITH TMA (B)
- FLASHING ARROW BOARD, TYPE "C" (96"X48" MIN.), "CAUTION MODE"
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

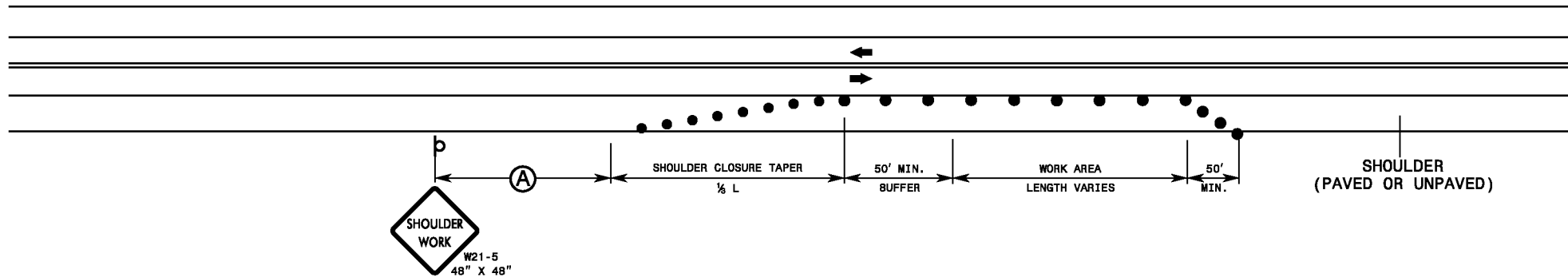
SHOULDER CLOSURE ON CONTROLLED ACCESS FACILITIES - ≥ 60 MPH



SHOULDER CLOSURE ON DIVIDED FACILITIES - ≤ 55 MPH



SHOULDER CLOSURE ON UNDIVIDED ROADWAYS
(SEE NOTE 5)



GENERAL NOTES

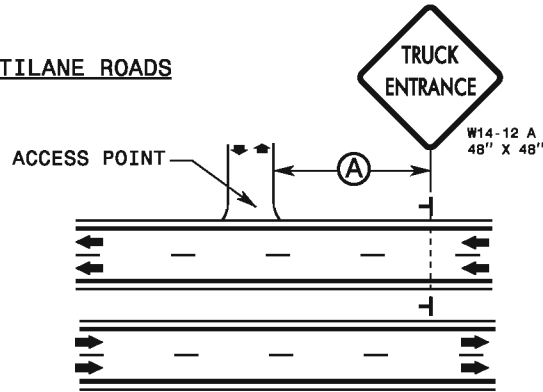
- 1- PLACE SHOULDER CLOSURE SIGNS ON THE SAME SIDE AS THE SHOULDER THAT IS CLOSED.
- 2- PLACE DRUMS IN THE SHOULDER TAPER AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE WORK AREA IS EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.
- 3- USE STATIONARY SIGNS FOR LONG TERM OPERATIONS (LONGER THAN 3 DAYS).
- 4- REFER TO STD. 1101.11 FOR "L" DISTANCE AND SIGN SPACING.
- 5- THE TWO-LANE, TWO-WAY DRAWING MAY BE APPLIED TO UNDIVIDED, MULTI-LANE FACILITIES.

LEGEND

- DRUM
- ⊔ STATIONARY OR PORTABLE SIGN
- ➔ DIRECTION OF TRAFFIC FLOW

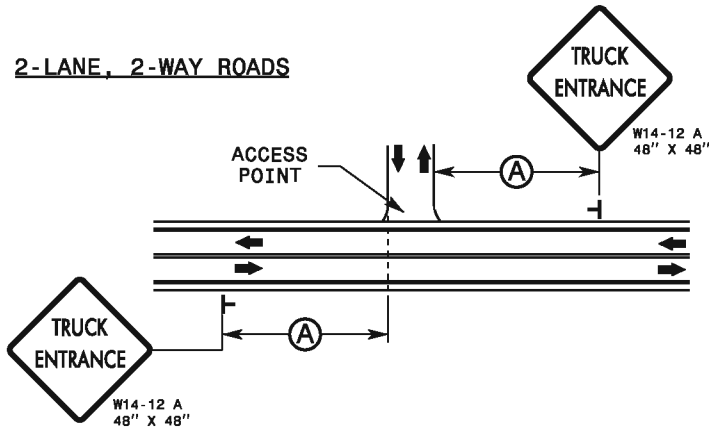
ROADSIDE ACCESS POINT

MULTILANE ROADS



RIGHT LANE CLOSURES MAY BE USED WHEN ALLOWED BY THE ENGINEER.

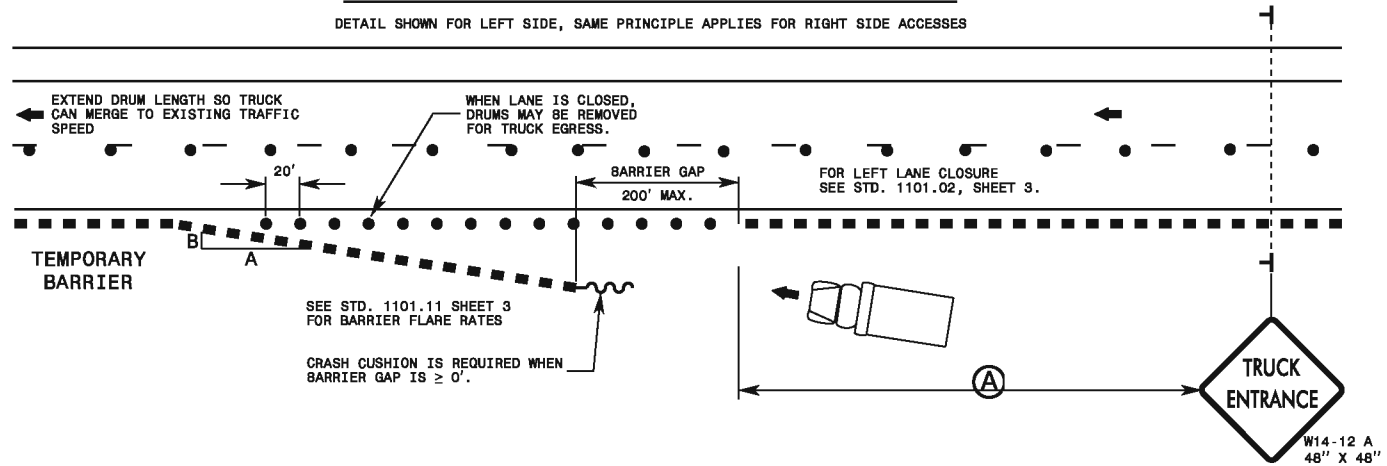
2-LANE, 2-WAY ROADS



WHEN DIRECTED BY THE ENGINEER, TRAFFIC MAY BE STOPPED TO ALLOW WORK VEHICLE ACCESS. USE THE SAME SIGNING FOR HAUL ROADS AS SHOWN IN THE ADJACENT DETAIL.

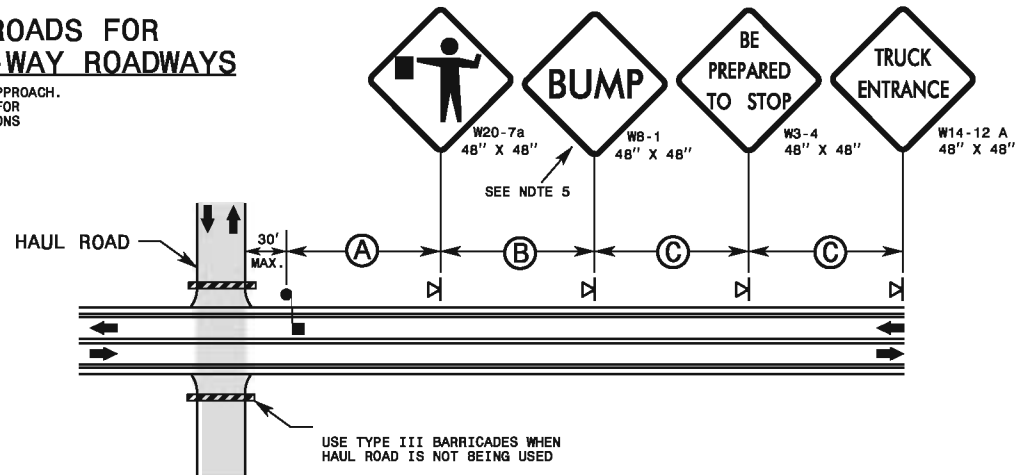
ACCESS THROUGH TEMPORARY BARRIER

DETAIL SHOWN FOR LEFT SIDE, SAME PRINCIPLE APPLIES FOR RIGHT SIDE ACCESSES



HAUL ROADS FOR 2-LANE, 2-WAY ROADWAYS

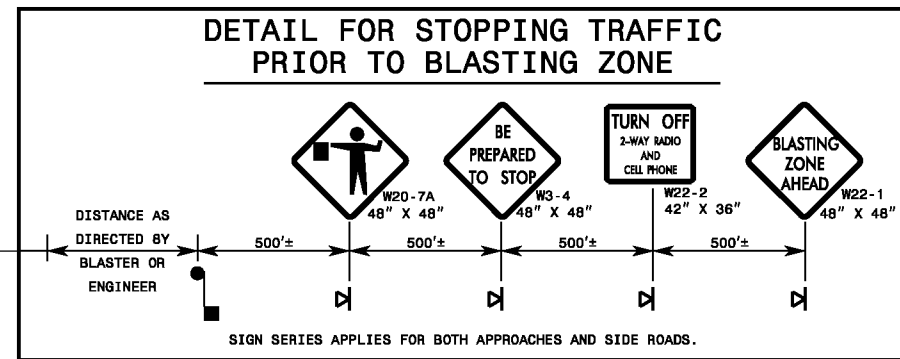
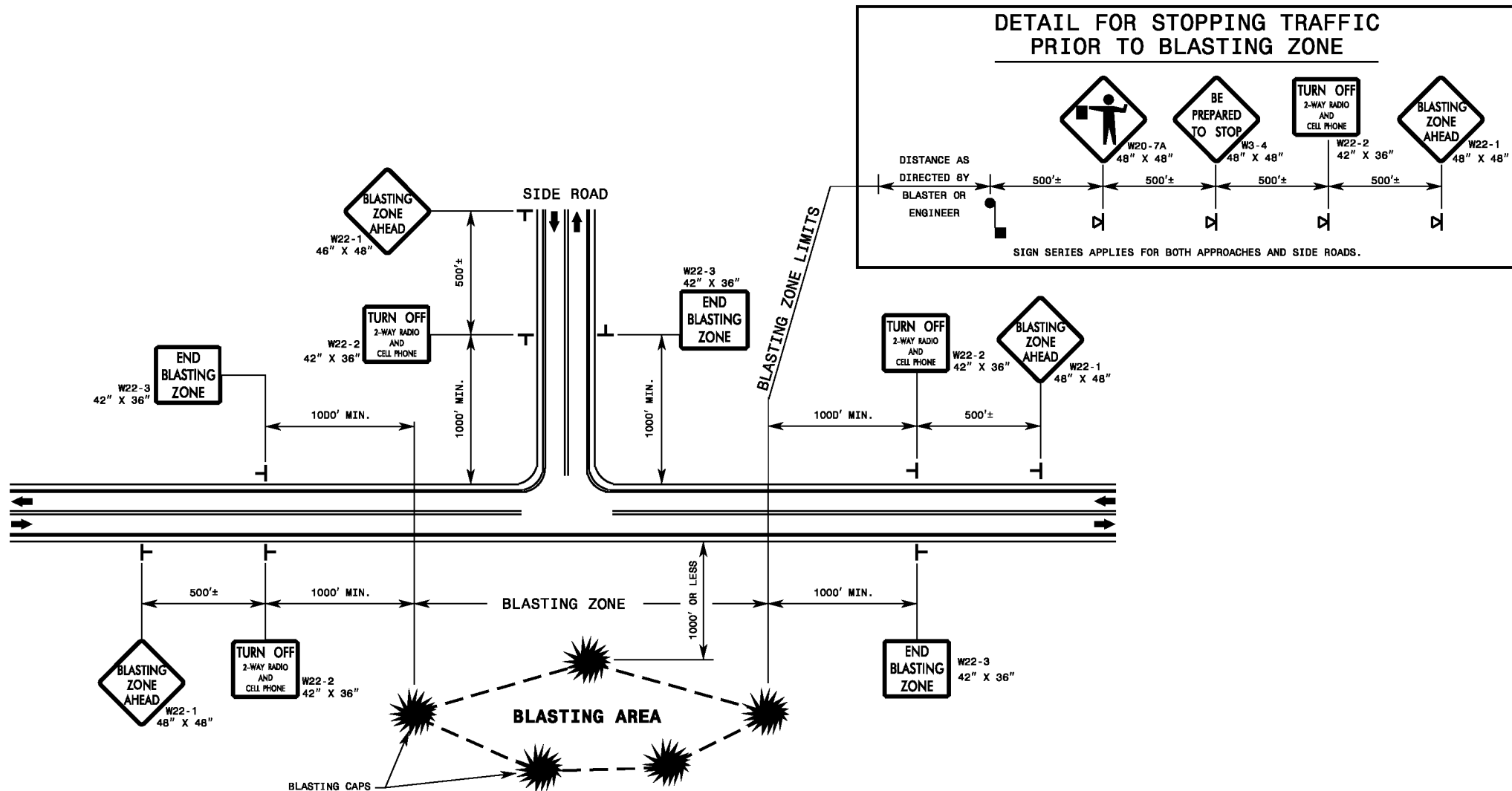
SIGNS SHOWN FOR ONE APPROACH. SAME SIGNING APPLIES FOR BOTH APPROACH DIRECTIONS



GENERAL NOTES

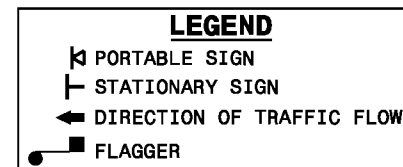
- 1- MOUNT SIGNS ON BOTH LEFT AND RIGHT SIDES ON DIVIDED ROADWAYS. SIGNS ARE REQUIRED ONLY ON THE RIGHT SIDE OF THE ROADWAY FOR UNDIVIDED ROADWAYS.
- 2- PROVIDE MINIMUM STOPPING SIGHT DISTANCE FOR EACH FLAGGER LOCATION.
- 3- REFER TO STD. 1101.11 SHEETS 2 & 4 FOR STOPPING SIGHT DISTANCE AND SIGN SPACING.
- 4- UPON COMPLETION OF EACH HAULING OPERATION, REPAIR, SWEEP, AND RESTORE THE ROADWAY TO BE SAFELY TRAVERSABLE AT NORMAL OPERATING SPEEDS.
- 5- "BUMP" SIGNS (W3-1) ARE REQUIRED ONLY IF A BUMP OVER THE ROADWAY EXISTS AS A RESULT OF IMPLEMENTING THE HAUL ROAD. USE FLAGGERS AT ALL TIMES TO STOP TRAFFIC WHEN BUMPS ARE LOCATED ACROSS THE ROADWAY. CONSTRUCT BUMPS TO PROVIDE A SMOOTH TRANSITION FOR TRAFFIC CROSSING THEM. REMOVE BUMPS PRIOR TO ALLOWING TRAFFIC TO RESUME NORMAL OPERATING SPEEDS.
- 6- WHEN NOT SPECIFIED IN THE PLANS OR BY THE ENGINEER, PAYMENT FOR CONVENIENCE WILL NOT BE MADE FOR FLAGGERS.

LEGEND	
■ ■	PORTABLE CONCRETE BARRIER
~ ~ ~	TEMPORARY CRASH CUSHION
●	DRUM
⊥	STATIONARY SIGN
⊥	PORTABLE SIGN
⊥	FLAGGER
←	DIRECTION OF TRAFFIC FLOW

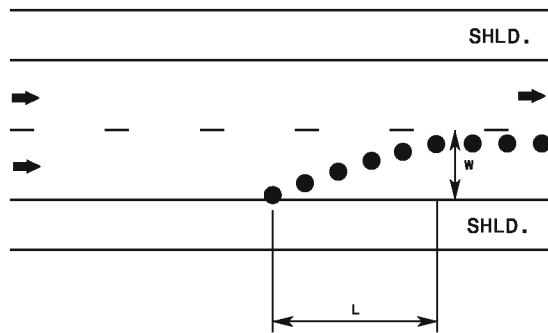


GENERAL NOTES

- 1- USE THE SIGNING SHOWN WHENEVER BLASTING CAPS ARE USED WITHIN 1,000 FEET OF A ROADWAY. MOUNT THE SIGNS ON THE RIGHT AND LEFT SIDES OF DIVIDED MULTILANE ROADWAYS. ERECT THE SAME SIGNING USED ON THE MAINLINE AS USED ON THE SIDE ROAD WHENEVER A SIDE ROAD INTERSECTS THE ROADWAY BETWEEN THE "BLASTING ZONE AHEAD" SIGN AND THE "END BLASTING ZONE" SIGN, OR A SIDE ROAD IS WITHIN 1000 FEET OF A BLASTING CAP.
- 2- PRIOR TO BLASTING, THE BLASTER IN CHARGE AND THE ENGINEER DETERMINES WHETHER TRAFFIC ENTERING THE BLASTING ZONE WILL BE ENDANGERED BY THE BLASTING OPERATION. IF THERE IS DANGER DO NOT PERMIT TRAFFIC TO PASS THRU THE BLASTING ZONE DURING BLASTING OPERATIONS (REFER TO DETAIL FOR STOPPING TRAFFIC UNLESS A ROAD CLOSURE WITH AN OFF-SITE DETOUR IS SPECIFIED) IF THERE IS DANGER. USE THE SAME SIGN SEQUENCE ON MULTILANE ROADWAYS INCLUDING TWO FLAGGERS; USE PILOT VEHICLES TO BRING TRAFFIC TO A STOP UNLESS OTHER METHODS ARE SPECIFIED IN THE PLANS.
- 3- DETERMINE LOCATIONS WHERE TRAFFIC IS TO BE STOPPED BEFORE PROCEEDING WITH THE BLASTING OPERATION, AND REQUIRE APPROVAL FROM THE ENGINEER. PROVIDE STOPPING SIGHT DISTANCE TO THE FLAGGER(S) (SEE STD. 1101.11 SHEET 2). DO NOT STOP TRAFFIC FOR PERIODS EXCEEDING 20 MINUTES AT A TIME. DO NOT STOP TRAFFIC AGAIN UNTIL THE QUEUE IS DEPLETED. CLEAR THE ROADWAY OF ANY DEBRIS PRIOR TO ALLOWING TRAFFIC TO PROCEED.
- 4- IF NECESSARY USE PORTABLE SIGNS INSTEAD OF STATIONARY SIGNS FOR SINGLE DAY OPERATIONS.



EXAMPLE OF "L" & "W" DESIGNATIONS



TAPER LENGTH CRITERIA FOR CHANNELIZING DEVICES IN WORK ZONES

TYPES OF TAPERS

TAPER LENGTH

UPSTREAM TAPER

MERGING TAPER.....	L MINIMUM
SHIFTING TAPER.....	½ L MINIMUM
SHOULDER TAPER.....	½ L MINIMUM
TWO-WAY TRAFFIC TAPER.....	.60 - 100 FEET MAXIMUM

DOWNSTREAM TAPER100 FEET MAXIMUM

QUICK REFERENCE - "L" DISTANCE TABLE

MINIMUM LONGITUDINAL DISTANCE "L" (FEET)
(ROUNDED VALUES)

POSTED SPEED "S" (MPH)	LATERAL WIDTH "W" (FEET)											
	1	2	3	4	5	6	7	8	9	10	11	12
20	10	15	20	30	35	40	50	55	60	70	75	80
25	15	25	35	45	55	65	75	85	95	105	115	125
30	15	30	45	60	75	90	105	120	135	150	165	180
35	25	45	65	85	105	125	145	165	185	205	225	245
40	30	55	80	110	135	160	190	215	240	270	295	320
45	45	90	135	180	225	270	315	360	405	450	495	540
50	50	100	150	200	250	300	350	400	450	500	550	600
55	55	110	165	220	275	330	385	440	495	550	605	660
60	60	120	180	240	300	360	420	480	540	600	660	720
65	65	130	195	260	325	390	455	520	585	650	715	780
70	70	140	210	280	350	420	490	560	630	700	770	840

GENERAL NOTES

1- TABLE FOR "L" DISTANCE IS BASED ON CHANNELIZATION TAPER FORMULA FROM THE M.U.T.C.D.
WHERE:

SPEED LIMIT

FORMULA

40 MPH OR LESS

$$L_{MIN} = \frac{W \times S^2}{60}$$

45 MPH OR GREATER

$$L_{MIN} = W \times S$$

L = MINIMUM TAPER LENGTH IN FEET (LONGITUDINAL DISTANCE)

W = WIDTH OF OFFSET IN FEET (LATERAL DISTANCE)

S = POSTED SPEED LIMIT, OR OFF-PEAK 85 PERCENTILE SPEED IN MPH PRIOR TO WORK STARTING,
OR THE ANTICIPATED OPERATING SPEED IN MPH

2- "L" DISTANCE IS FOR APPLICATION WITH CHANNELIZING DEVICE AND PAVEMENT MARKING TAPERS AND TRANSITIONS. CHANNELIZING DEVICES INCLUDE DRUMS, CONES, TUBULAR MARKERS, BARRICADES, RAISED ASPHALT ISLANDS, AND VERTICAL PANELS.

STATE OF NORTH CAROLINA
 DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 RALEIGH, N.C.

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ENGLISH STANDARD DRAWING FOR
TRAFFIC CONTROL DESIGN TABLES
 BUFFER SPACE & SIGHT DISTANCE

SHEET 2 OF 4

1101.11

DESIGN SPEED (MPH)	MINIMUM SIGHT DISTANCE		MINIMUM LONGITUDINAL BUFFER SPACE (FEET)
	STOPPING SIGHT DISTANCE (FEET)	PASSING SIGHT DISTANCE (FEET)	
30	200	1090	85
35	250	1280	120
40	305	1470	155
45	360	1625	195
50	425	1835	240
55	495	1985	290
60	570	2135	345
65	645	2285	405
70	730	2480	470
75	820	2580	540
80	910	2660	615

GENERAL NOTES

- 1- TABLES ARE BASED ON THE AASHTO GREEN BOOK "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" AND THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". MINIMUM SIGHT DISTANCE VALUES ARE FOR PASSENGER CAR VEHICLES ON WET AND LEVEL ROADWAYS. CONSULT THE AASHTO GREEN BOOK TO MAKE FINAL DETERMINATION OF STOPPING SIGHT DISTANCE REQUIREMENTS.
- 2- BUFFER SPACE TABLE IS BASED ON THE BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS.
- 3- USE OF STOPPING SIGHT DISTANCE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PROVIDING SIGHT DISTANCE FOR TRAFFIC APPROACHING A LANE CLOSURE. PROVIDE 2-LANE, 2-WAY ROADWAYS STOPPING SIGHT DISTANCE TO THE FLAGGER. FOR LANE CLOSURES ON MULTILANE ROADWAYS PROVIDE STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE MERGE TAPER, OR FLASHING ARROW BOARD. EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED.
- 4- USE OF MINIMUM PASSING SIGHT DISTANCE TABLE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PROVIDING SIGHT DISTANCE REQUIREMENTS FOR PLACEMENT OF PAVEMENT MARKING PASSING/NO-PASSING ZONES FOR 2-LANE, 2-WAY ROADWAYS.

STATE OF NORTH CAROLINA
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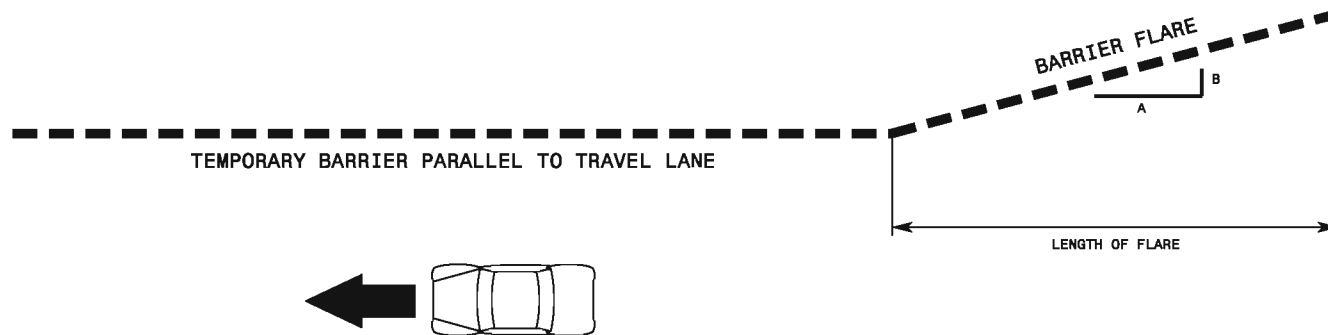
ENGLISH STANDARD DRAWING FOR
TRAFFIC CONTROL DESIGN TABLES
 BUFFER SPACE & SIGHT DISTANCE

SHEET 2 OF 4

1101.11

ENGLISH STANDARD DRAWING FOR
TRAFFIC CONTROL DESIGN TABLES
 TEMPORARY BARRIER FLARE RATES

TEMPORARY BARRIER FLARE RATES		
POSTED SPEED LIMIT (MPH)	ANCHORED (A:B)	UNANCHORED (A:B)
≤ 30	8 : 1	7 : 1
35	9 : 1	8 : 1
40	10 : 1	8 : 1
45	12 : 1	10 : 1
50	14 : 1	11 : 1
55	18 : 1	12 : 1
60	18 : 1	14 : 1
85	19 : 1	15 : 1
70	20 : 1	15 : 1



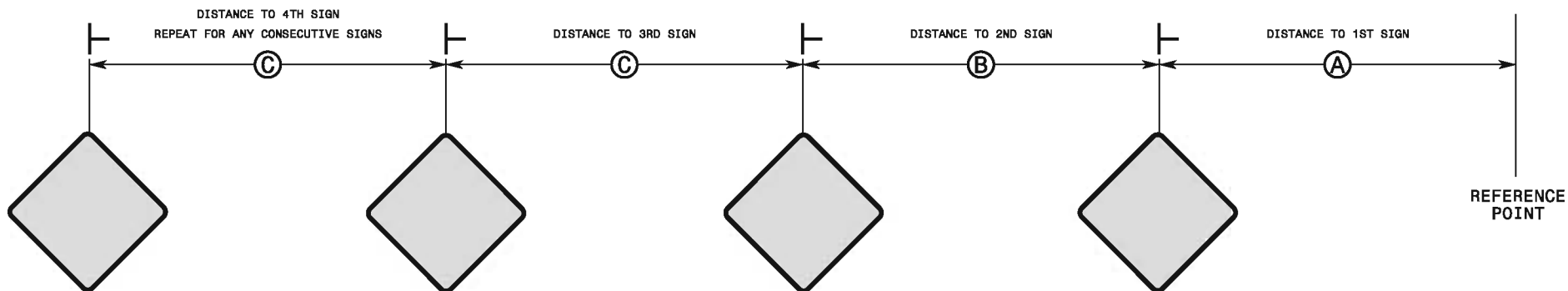
GENERAL NOTES

- 1- REFER TO 2002 ROADSIDE DESIGN GUIDE.
- 2- A BARRIER IS CONSIDERED FLARED WHEN IT IS NOT PARALLEL TO THE EDGE OF THE TRAVELWAY.
- 3- THE PRIMARY USE OF BARRIERS ARE FOR WORK AREA PROTECTION. WHEN SERVING THE ADDITIONAL FUNCTION OF A CHANNELIZING DEVICE, SUCH AS WHEN SHIFTING TRAFFIC, BARRIER TAPERS SHALL MEET STANDARD CHANNELIZING TAPER LENGTHS AS SHOWN ON STD. 1101.11 SHEET 1.

ENGLISH STANDARD DRAWING FOR
TRAFFIC CONTROL DESIGN TABLES
 TEMPORARY BARRIER FLARE RATES

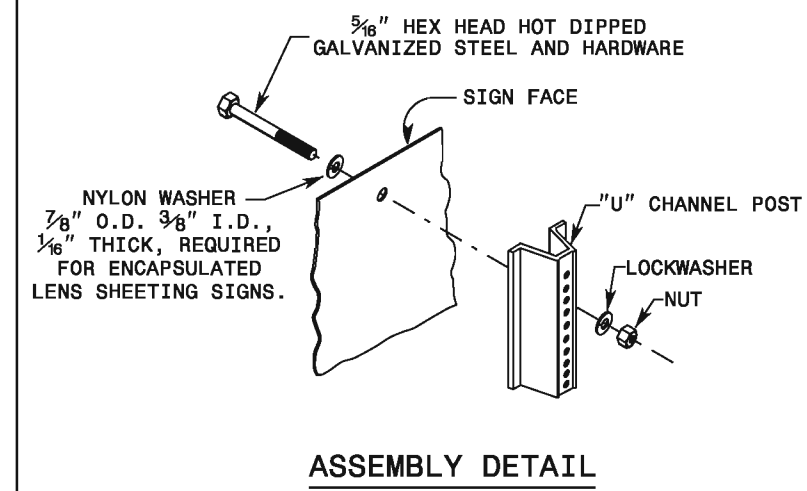
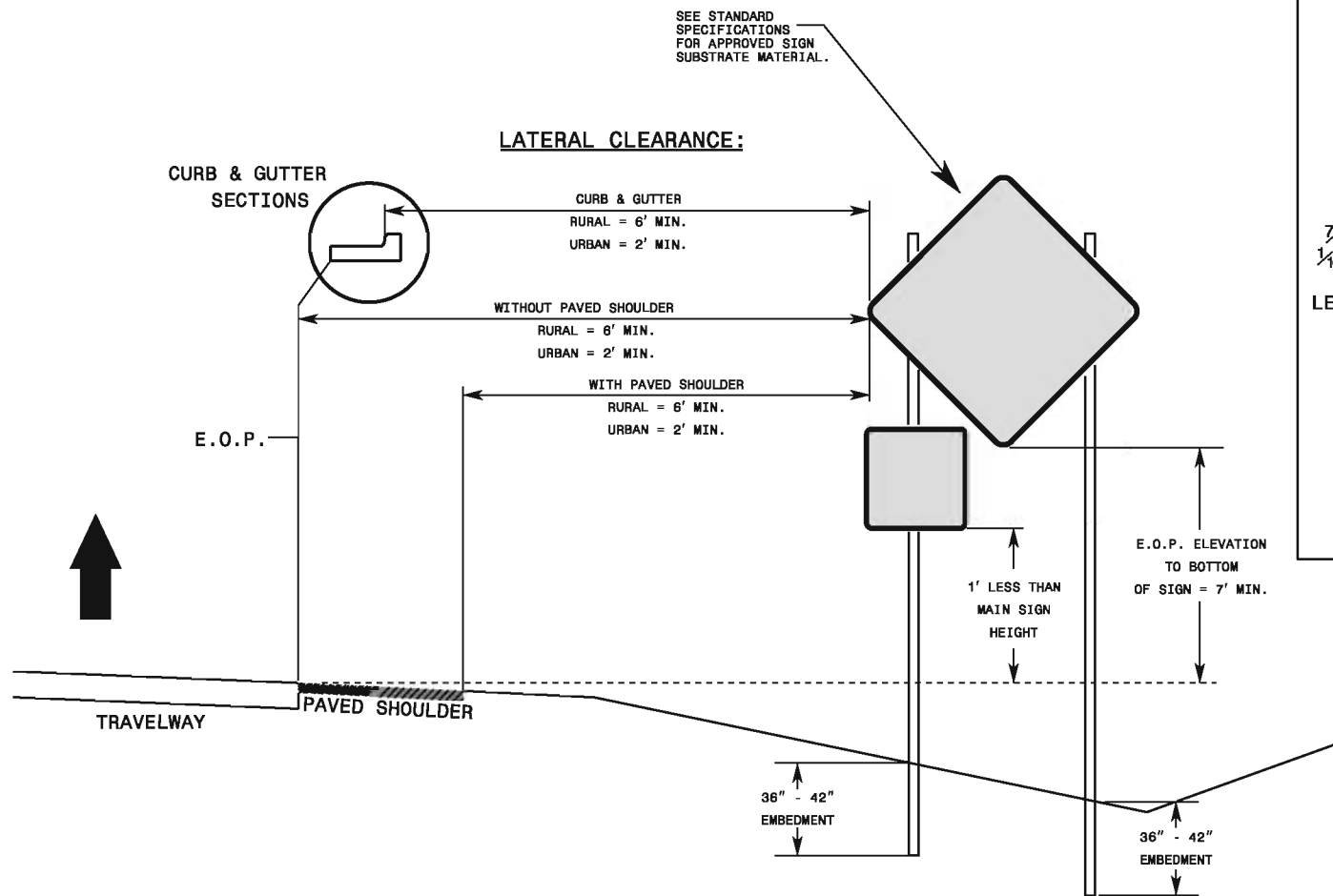
ADVANCE WARNING SIGN SPACING CHART			
POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET) ±		
	(A)	(B)	(C)
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500
CONTROLLED ACCESS ROADS (≥ 55)	1000	1500	2700

STATIONARY OR PORTABLE SIGNS



GENERAL NOTES

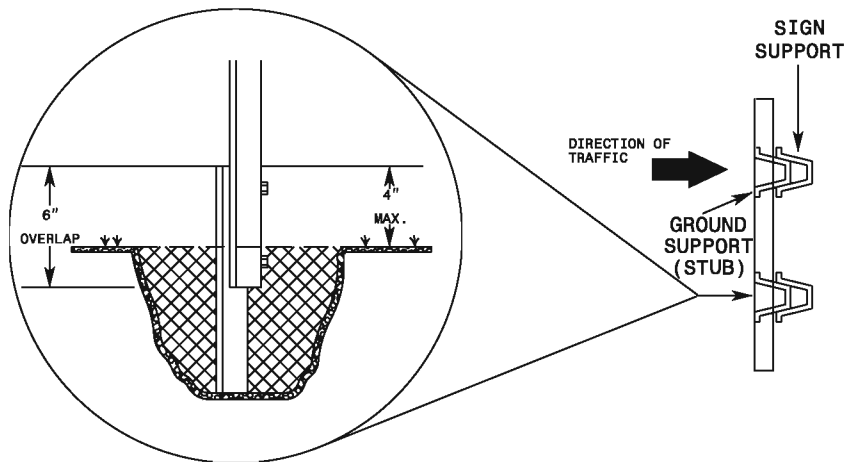
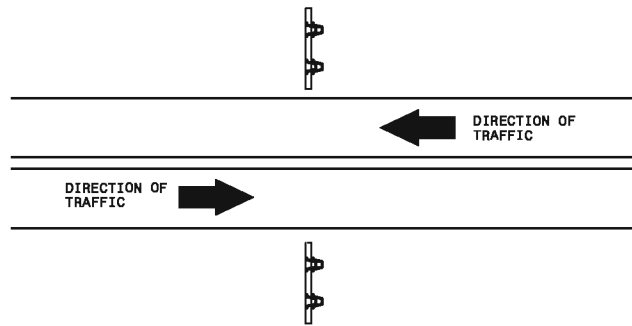
- 1- REFER TO 2009 MUTCD.
- 2- USE THIS STANDARD DRAWING IN CONJUNCTION WITH OTHER TRAFFIC CONTROL ROADWAY STANDARD DRAWINGS WHERE SIGN SPACING DISTANCES A, B, C, ARE SPECIFIED.
- 3- APPLY THE ADVANCE WARNING SIGN SPACING CHART WHERE A SERIES OF 2 OR MORE SIGNS ARE USED. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS VARIOUS CONDITIONS OCCUR, SUCH AS LIMITED SIGHT DISTANCE, OBSTRUCTION INTERFERENCE, ETC.



GENERAL NOTES

- 1- DIMENSIONS SHOWN ARE MINIMUM VALUES. WHEN SIGNS ARE MOUNTED BEHIND TRAFFIC CONTROL DEVICES SUCH AS DRUMS, BARRIER, OR OTHER OBJECTS THAT DETRACT FROM THEIR VISIBILITY, MOUNT THE SIGNS AT AN APPROPRIATE HEIGHT SUCH THAT THEY ARE CLEARLY VISIBLE TO APPROACHING TRAFFIC.
- 2- MOUNT SIGNS THAT ARE LARGER THAN 10 SQUARE FEET IN AREA ON TWO OR MORE WOOD OR U-CHANNEL SUPPORTS. PERFORATED SQUARE TUBING SUPPORT SYSTEMS MAY SUPPORT LARGER AREAS ON A SINGLE SUPPORT. FOLLOW MANUFACTURER'S RECOMMENDATIONS. THESE SYSTEMS SHALL BE NCHRP 350 COMPLIANT AND NCDOT APPROVED.
- 3- SEE STANDARD SPECIFICATION 1089-1 FOR WORK ZONE SIGNS.
- 4- SEE STANDARD SPECIFICATION 1089-2 FOR WORK ZONE SIGN SUPPORTS.
- 5- SEE ROADWAY STANDARD DRAWING 903.20 FOR WOOD POSTS.
- 6- SEE STANDARD SPECIFICATION 903-1 FOR WOOD SUPPORTS.

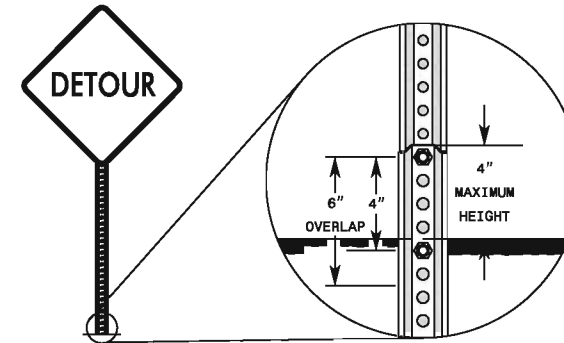
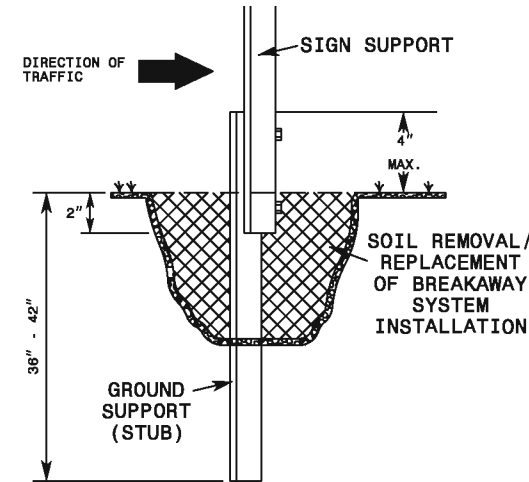
ENGLISH STANDARD DRAWING FOR
STATIONARY WORK ZONE SIGNS
SPLICING DETAIL



INSTALL THE GROUND SUPPORT (STUB) BETWEEN THE SIGN SUPPORT AND THE APPROACHING TRAFFIC IN THE ADJACENT TRAVEL LANE.

GENERAL NOTES

- 1- ALL TRAFFIC CONTROL DEVICES, INCLUDING BREAKAWAY SYSTEMS FOR GROUND MOUNTED SIGN SUPPORTS, COMPLY WITH ALL NCHRP REPORT 350 REQUIREMENTS AND SHALL BE APPROVED BY THE DEPARTMENT. ALL APPROVED TRAFFIC CONTROL DEVICES ARE ON THE DEPARTMENT'S WEB SITE AT: <https://apps.dot.state.nc.us/vendor/approvedproducts>.
- 2- INSTALL THE BREAKAWAY SYSTEM TO FUNCTION PROPERLY IN ACCORDANCE WITH THE DIRECTION OF TRAFFIC ADJACENT TO THE SIGN.
- 3- FOR PERFORATED SQUARE TUBING BREAKAWAY SYSTEMS, FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR ANCHOR EMBEDMENT DEPTHS AND POST ATTACHMENT REQUIREMENTS.

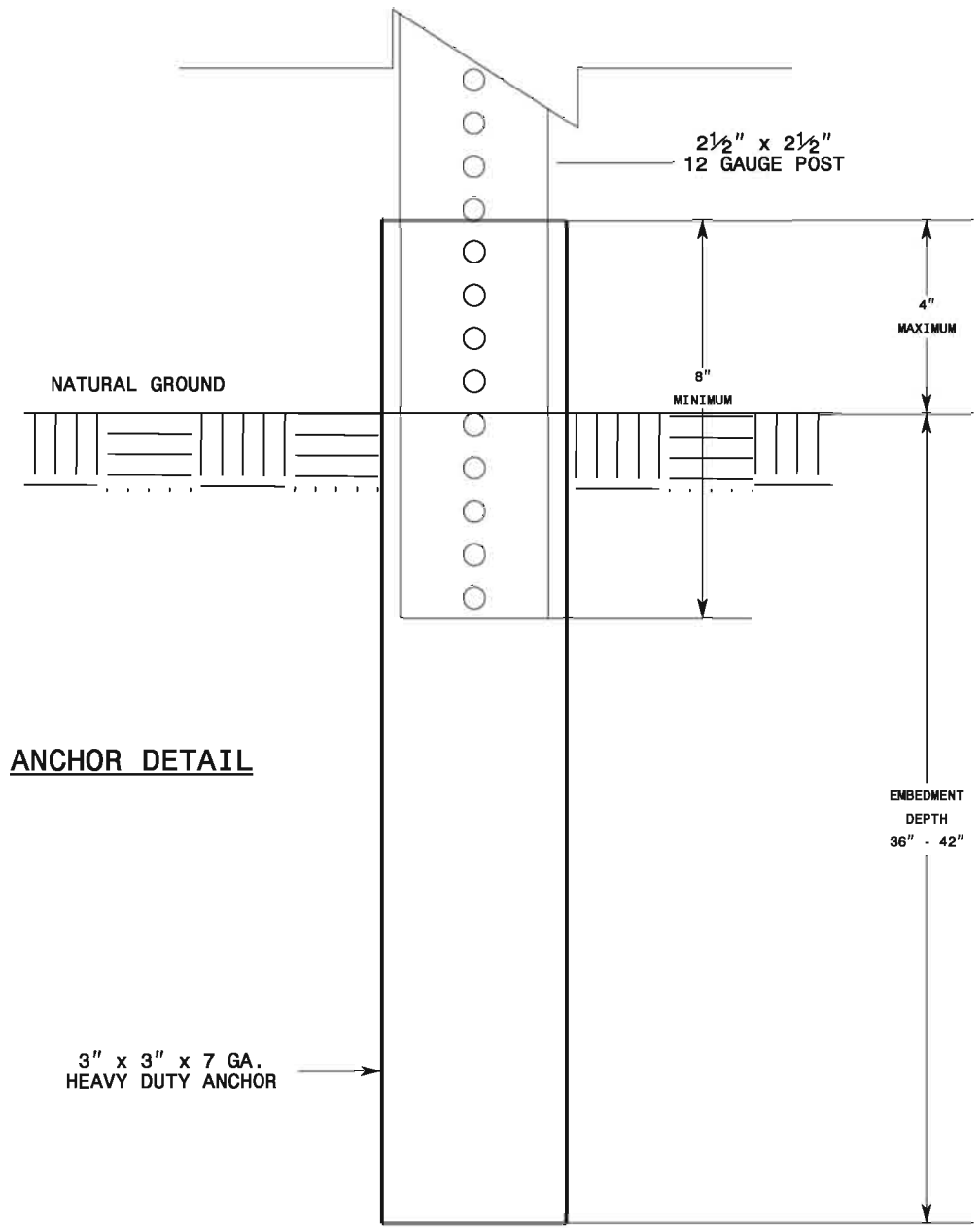


BOLTS MUST BE 4" APART. THE GROUND SUPPORT (STUB) SHALL NOT EXTEND HIGHER THAN 4" ABOVE THE GROUND. ATTACH THE SIGN SUPPORT TO THE BACK OF THE GROUND SUPPORT (STUB) WITH THE APPROPRIATE HARDWARE PROVIDED BY THE MANUFACTURER OF THE BREAKAWAY SYSTEM. OVERALL LENGTH OF THE BREAKAWAY SYSTEM IS 6".

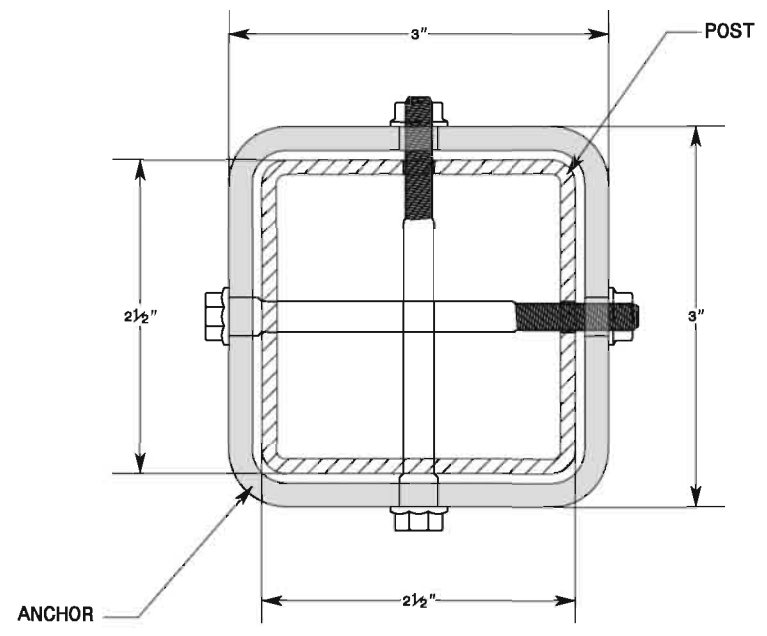
3 LB. U-CHANNEL SPLICING REQUIREMENTS

- 1- WHEN SIGN IS REMOVED AT THE END OF PROJECT, REMOVE THE GROUND SUPPORT (STUB).
- 2- WHEN SPLICING A U-CHANNEL SUPPORT, INSTALL THE GROUND SUPPORT (STUB) APPROXIMATELY 36" TO 42" INTO THE GROUND WHILE LEAVING NO MORE THAN 4" ABOVE THE EXISTING GROUND ELEVATION. REMOVE ENOUGH SOIL FROM AROUND THE GROUND SUPPORT (STUB) TO PERMIT ACCESS TO THE HOLES FOR THE BREAKAWAY SYSTEM. ONCE THE BREAKAWAY SYSTEM IS TIGHTENED, REPLACE THE SOIL AND TAMP.
- 3- OVERALL LENGTH OF THE BREAKAWAY SYSTEM IS 6". BOLTS MUST BE 4" APART. ATTACH THE SIGN SUPPORT TO THE BACK OF THE GROUND SUPPORT (STUB) WITH THE APPROPRIATE HARDWARE SUPPLIED BY THE MANUFACTURER OF THE BREAKAWAY SYSTEM.
- 4- INSTALL U-CHANNEL BREAKAWAY SYSTEMS SO THE GROUND SUPPORT (STUB) IS INSTALLED ON THE APPROACH SIDE OF TRAFFIC WHILE THE SIGN SUPPORT IS ATTACHED/SPLICED BEHIND THE GROUND SUPPORT (STUB).

ENGLISH STANDARD DRAWING FOR
STATIONARY WORK ZONE SIGNS
SPLICING DETAIL

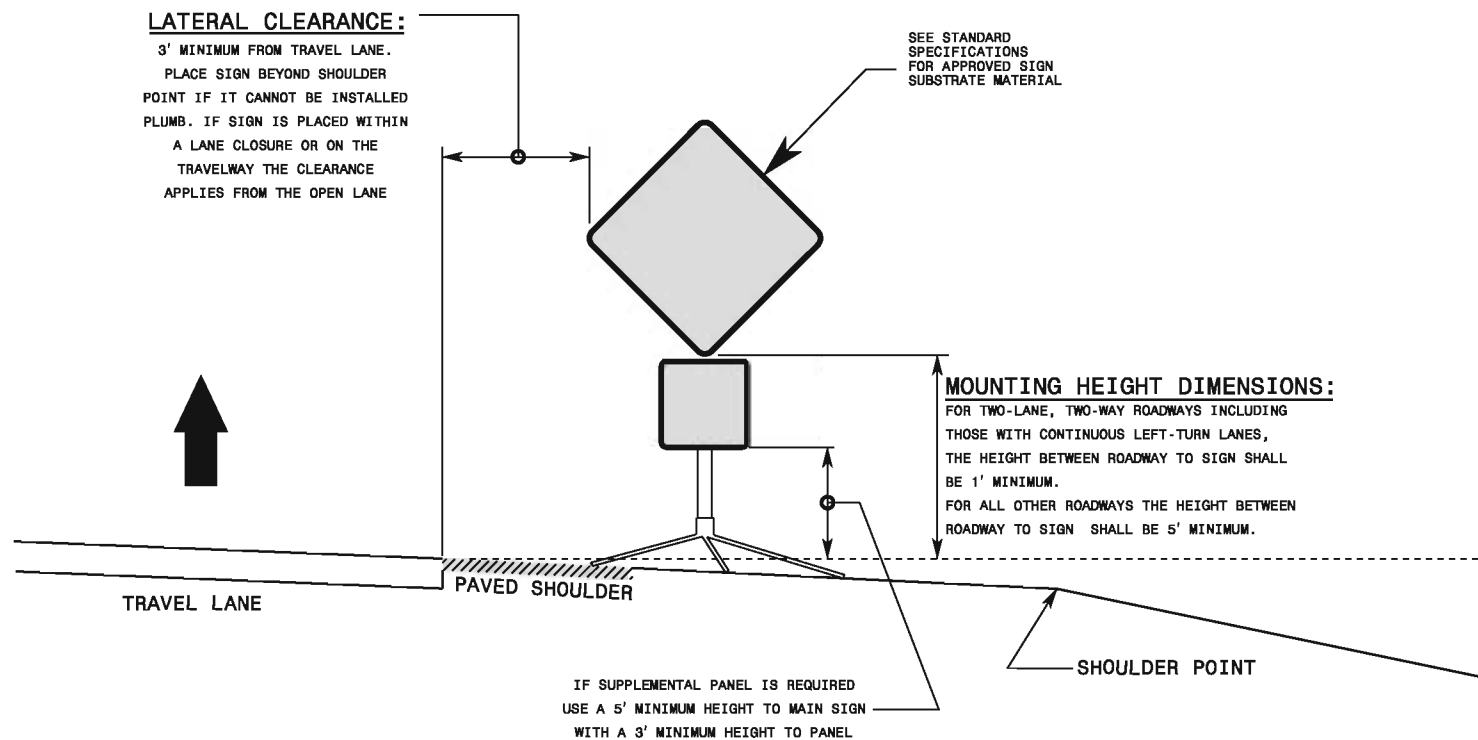


POST TO ANCHOR FASTENER DETAIL



GENERAL NOTES

- 1- POSTS SHALL BE 2 1/2" X 2 1/2" 12 GAUGE STEEL.
- 2- ANCHORS SHALL BE 3" X 3" 7 GAUGE STEEL.
- 3- CONNECTIONS SHALL BE AS RECOMMENDED BY THE MANUFACTURER.



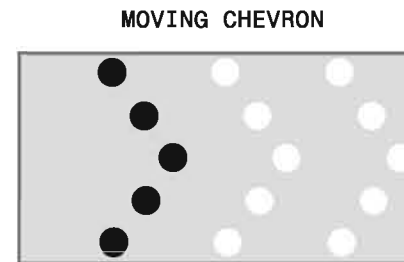
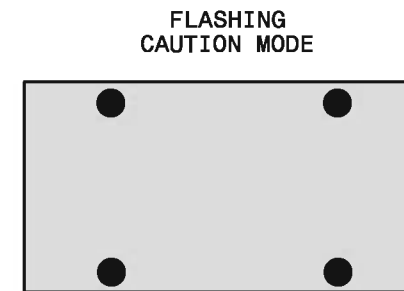
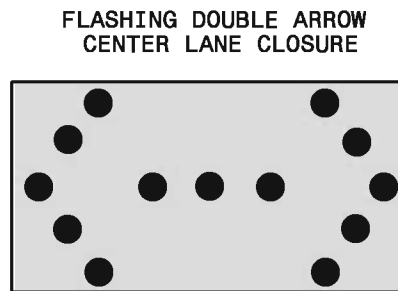
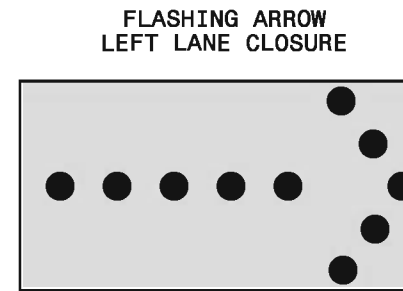
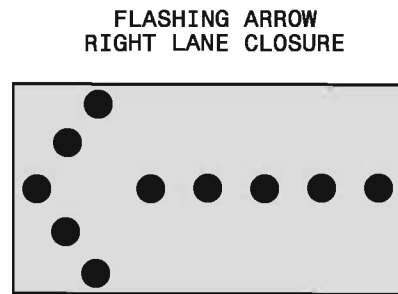
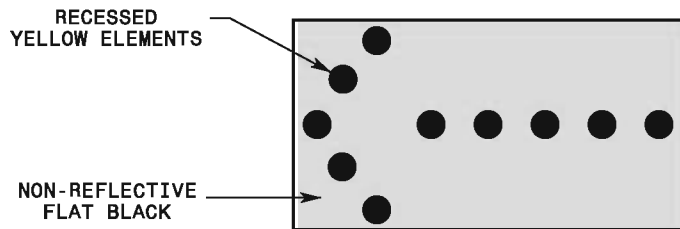
GENERAL NOTES

- 1- DIMENSIONS SHOWN ARE MINIMUM VALUES. MOUNT SIGNS SO THEY WILL BE CLEARLY VISIBLE TO APPROACHING TRAFFIC EVEN WHEN SIGNS ARE MOUNTED BEHIND TRAFFIC CONTROL DEVICES SUCH AS DRUMS, BARRIER, OR OTHER OBJECTS.
- 2- ALL PORTABLE SIGNS AND STANDS MUST MEET OR EXCEED THE REQUIREMENTS OF NCHRP 350 FOR CATEGORY II DEVICES. USE PORTABLE WORK ZONE SIGNS AND STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER.
- 3- ALL PORTABLE WORK ZONE SIGNS AND STANDS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST AT <https://apps.dot.state.nc.us/vendor/approvedproducts>.

FLASHING ARROW BOARD MODES

FLASHING ARROW BOARD TYPE			
PANEL TYPE	MINIMUM SIZE (W x H INCHES)	MINIMUM LEGIBILITY DISTANCE (MILES)	MINIMUM NUMBER OF ELEMENTS
C	96 X 48	1	15

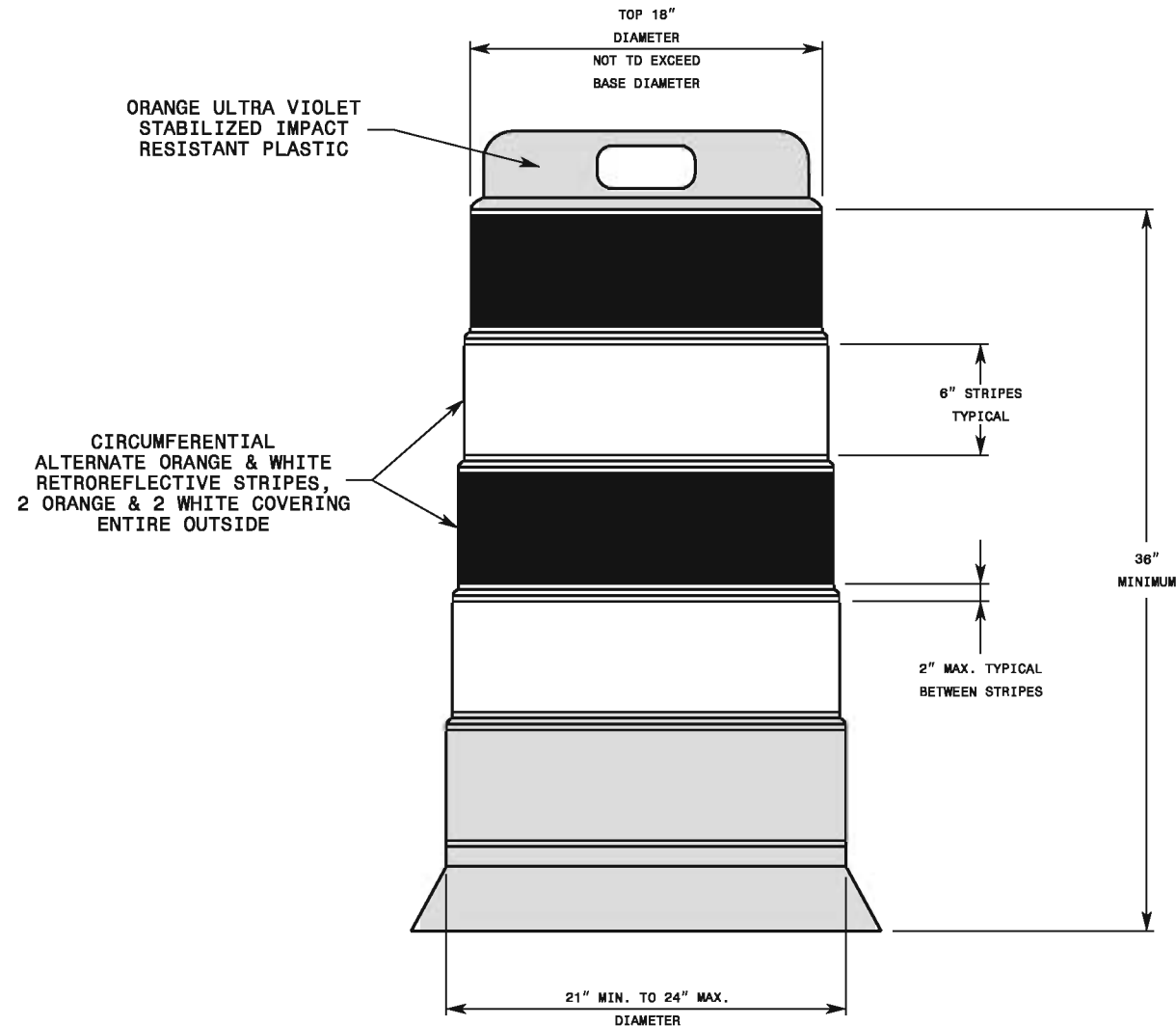
TYPICAL FLASHING ARROW BOARD



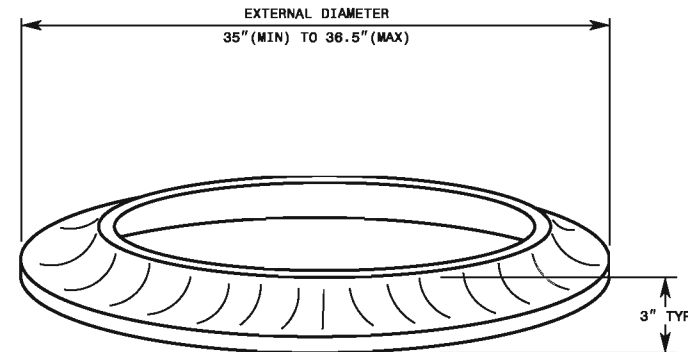
ONE CHEVRON WILL BE LIT ON THE BOARD AT A TIME, MOVING TOWARD THE DIRECTION OF OPEN TRAFFIC

GENERAL NOTES

- 1- DO NOT USE STRAIGHT-LINE CAUTION OR CHEVRON DISPLAYS.
- 2- USE A MINIMUM MOUNTING HEIGHT OF 7 FEET FROM GROUND LEVEL TO THE BOTTOM OF THE PANEL FOR TRAILER-MOUNTED ARROW BOARDS, EXCEPT ON VEHICLE-MOUNTED PANELS WHICH SHOULD BE AS HIGH AS PRACTICAL.
- 3- USE ARROW BOARD ELEMENTS CAPABLE OF A MINIMUM 50 PERCENT DIMMING FROM THEIR FULL RATED LAMP VOLTAGE. USE FULL LAMP VOLTAGE DURING THE DAY, AND USE THE DIMMED MODE AT NIGHT.
- 4- DO NOT USE ARROW BOARDS IN FLASHING ARROW MODE ON A TWO-LANE, TWO-WAY ROADWAY DURING A ONE LANE OPERATION, NOR ON MULTILANE ROADWAYS WHEN SHIFTING ALL TRAFFIC LANES LATERALLY.
- 5- SEE THE DEPARTMENT'S APPROVED PRODUCTS LIST AT <https://apps.dot.state.nc.us/vendor/approvedproducts>.



TIRE BALLAST



ALL RUBBER COLLARS MUST BE BLACK IN COLOR AND FREE OF ANY COLORED PAINT

BALLAST COLLAR SHOULD HAVE GOOD CONTACT WITH THE BARREL FLANGE AND BALLAST OUTER EDGE MUST LAY FLAT WITH ROAD SURFACE

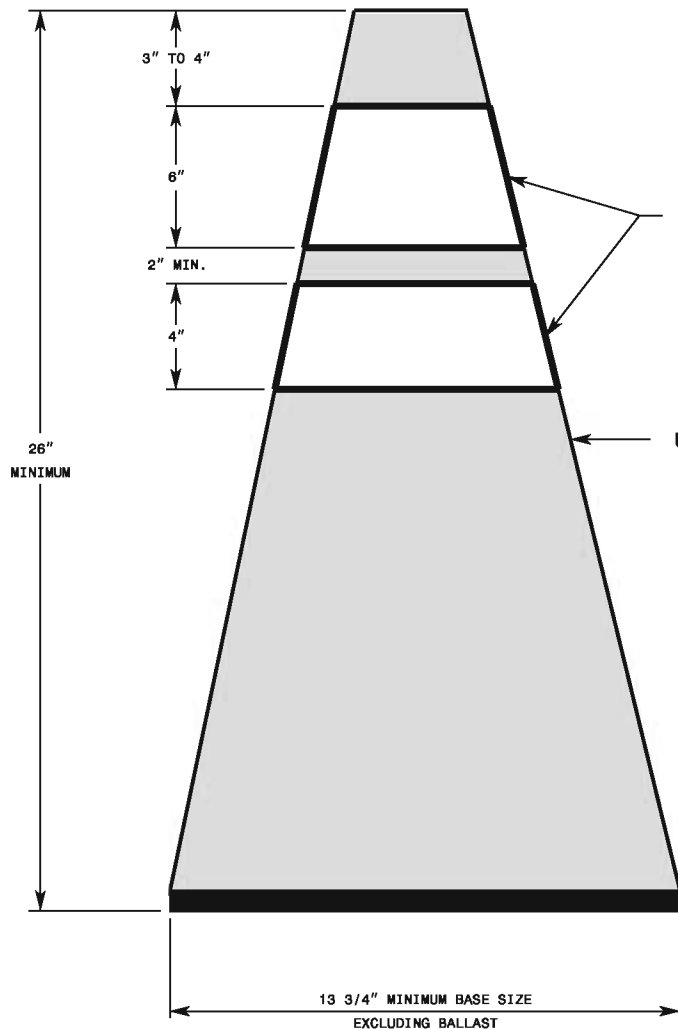
DRUMS THAT USE TIRE BALLASTS ARE MANUFACTURED SPECIFICALLY FOR THAT PURPOSE. DO NOT USE TIRE BALLASTS WITH OTHER DRUM DESIGNS.

GENERAL NOTES

- 1- BALLASTING SHALL BE ACHIEVED BY THE SAND BAG, TIRE-SIDEWALL, OR PREFORMED WEIGHTED BASE METHODS. USE THE TIRE BALLAST AS SPECIFIED BY THE MANUFACTURER. DO NOT PLACE BALLAST ON TOP OF THE DRUM.
- 2- IF NECESSARY PLACE THE NAME OF THE AGENCY, CONTRACTOR, OR SUPPLIER ON NON-RETROREFLECTIVE DRUM SURFACES. SHOW THE LETTERS AND NUMBERS USING A NON-RETROREFLECTIVE COLOR AND NOT OVER 2" IN HEIGHT.
- 3- USE TYPE 3 OR HIGHER HIGH INTENSITY PRISMATIC SHEETING.
- 4- SEE THE DEPARTMENT'S APPROVED PRODUCT LIST AT <https://apps.dot.state.nc.us/vendor/approvedproducts>.
- 5- REFER THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES FOR ADDITIONAL INFORMATION.

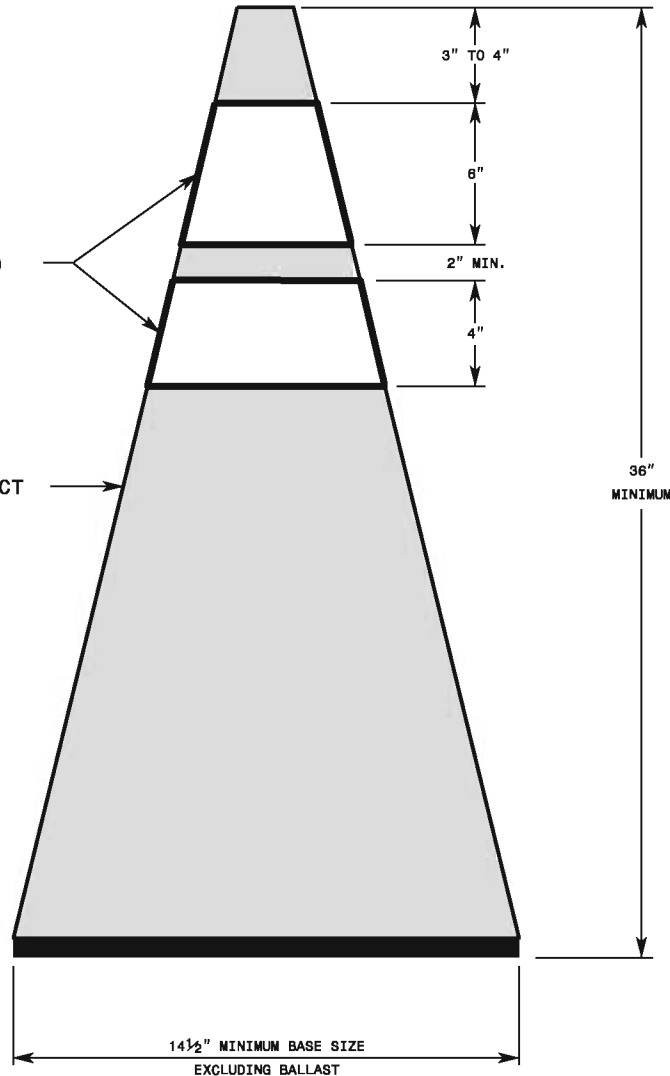
28 INCH CONE

(MINIMUM SIZE CONE FOR ALL CLASSES OF ROADS EXCEPT FREEWAYS AND INTERSTATES)



36 INCH CONE

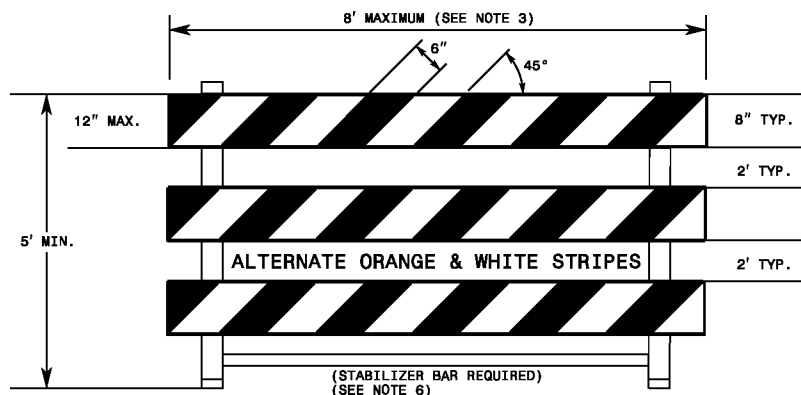
(REQUIRED FOR FREEWAYS AND INTERSTATES)



GENERAL NOTES

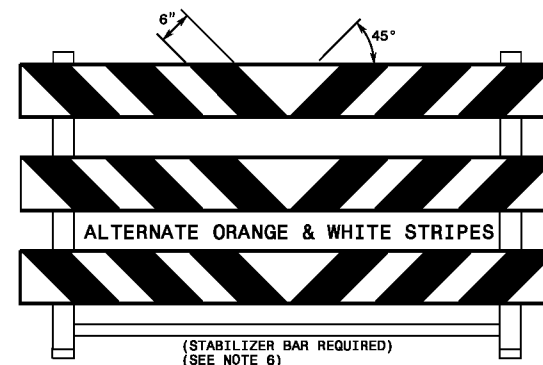
- 1- ACHIEVE BALLASTING BY USING SPECIAL WEIGHTED BASES SUCH AS SAND BAG RINGS, DOUBLING CONES, OR BASES THAT CAN BE FILLED WITH BALLAST. SEVENTY PERCENT OF THE WEIGHT OF THE CONE MUST BE IN THE BASE. USE BALLAST'S THAT DO NOT PRESENT A HAZARD WHEN STRUCK.
- 2-SEE THE DEPARTMENT'S APPROVED PRODUCTS LIST AT <https://apps.dot.state.nc.us/vendor/approvedproducts>.
- 3-USE TYPE IV OR HIGHER HIGH INTENSITY PRISMATIC SHEETING.

TYPE III BARRICADE



TYPE III BARRICADE

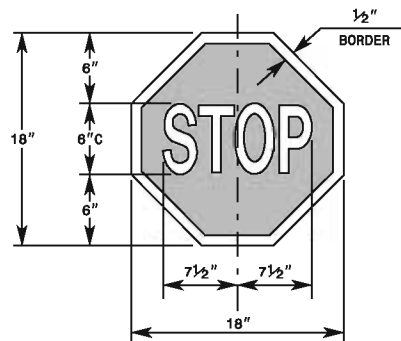
END-OF-ROADWAY APPLICATIONS



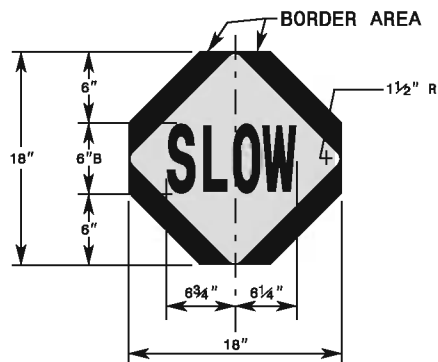
GENERAL NOTES

- 1- HORIZONTAL RAILS FOR MAY BE CONSTRUCTED OF APPROVED COMPOSITE, HOLLOW/CORRUGATED EXTRUDED RIGID POLYOLEFIN, HIGH DENSITY POLYETHYLENE, OR OTHER NCDOT APPROVED MATERIAL.
- 2- BARRICADE SHALL BE LIMITED TO A MAXIMUM LENGTH OF 8 FT UNLESS NCHRP 350 CRASH TESTED FOR CATEGORY II DEVICES AND NCDOT APPROVED.
- 3- ONLY NCDOT APPROVED COMPOSITE AND ROLL-UP SIGNS MAY BE MOUNTED ON THE BARRICADE RAILS. MOUNT SIGNS TO BARRICADE RAILS TO ENSURE SIGN WILL NOT BECOME DETACHED UNDER NORMAL WIND AND TRAFFIC CONDITIONS.
- 4- SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT FROM THE GROUND TO THE BOTTOM OF THE SIGN UNLESS SIGNS R11-3 OR R11-4 ARE REQUIRED BY THE PLANS OR DIRECTED BY THE ENGINEER.
- 5- USE TYPE VII OR HIGHER PRISMATIC RETROREFLECTIVE SHEETING ON BOTH SIDES OF THE BARRICADE RAILS.
- 6- BARRICADE MUST BE NCHRP 350 FOR CATEGORY II DEVICES AND NCDOT APPROVED WITH STABILIZER BAR OR ADEQUATE LATERAL BRACING.
- 7- ASSEMBLY OF THE GENERIC BARRICADES MUST BE SELF CERTIFIED BY THE ASSEMBLER.
- 8- BARRICADES USED TO CLOSE A ROADWAY SHALL EXTEND ACROSS THE ENTIRE ROADWAY. WHERE LOCAL TRAFFIC MUST BE MAINTAINED, THEY MAY BE PLACED IN A STAGGERED PATTERN.
- 9- STRIPES ON WORK ZONE BARRICADE RAILS SHALL BE ALTERNATE ORANGE AND WHITE RETROREFLECTIVE STRIPES, SLOPED DOWNWARD TOWARDS THE SIDE WHICH TRAFFIC IS TO PASS OR TURN IN DETOURING. WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.
- 10- USE RED AND WHITE STRIPES FOR PERMANENT BARRICADES.
- 11- SEE THE DEPARTMENT'S APPROVED PRODUCTS LIST AT <https://apps.dot.state.nc.us/vendor/approvedproducts>.
- 12- PLACE MANUFACTURER'S NAME AND FEDERAL HIGHWAY ADMINISTRATION'S NCHRP 350 APPROVAL LETTER NUMBER ON BARRICADE FRAME.
- 13- PLACE SANDBAGS OR OTHER APPROVED BALLASTING METHODS ON THE FEET OF THE FRAME. DO NOT PLACE SANDBAGS ON TOP OF A STRIPED RAIL OR STABILIZER BAR. DO NOT BALLAST BARRICADES BY HEAVY OBJECTS SUCH AS ROCKS, CHUNKS OF CONCRETE OR OTHER ITEMS THAT WOULD CAUSE DAMAGE IF THE BARRICADE IS STRUCK BY A VEHICLE.

STOP/SLOW PADDLE



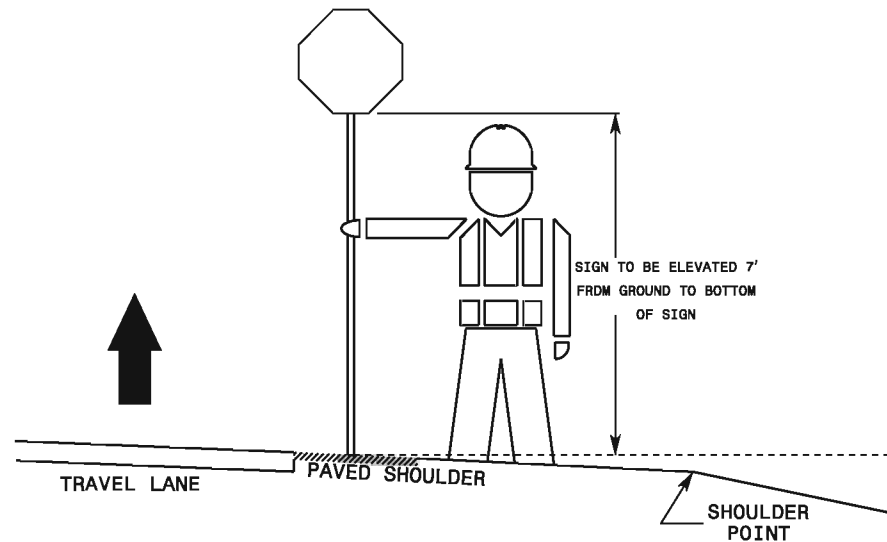
STOP:
LEGEND-WHITE REFLECTORIZED
BORDER-WHITE REFLECTORIZED
BACKGROUND-RED REFLECTORIZED



SLOW:
LEGEND-BLACK REFLECTORIZED
BORDER AREA-BLACK REFLECTORIZED
BACKGROUND-ORANGE REFLECTORIZED

NOTE: FOR OPERATIONS THAT ARE RESTRICTED FROM DUSK TO DAWN ONLY,
USE REFLECTORIZED LEGENDS, BORDERS AND BACKGROUNDS.

FLAGGER AND PADDLE PLACEMENT

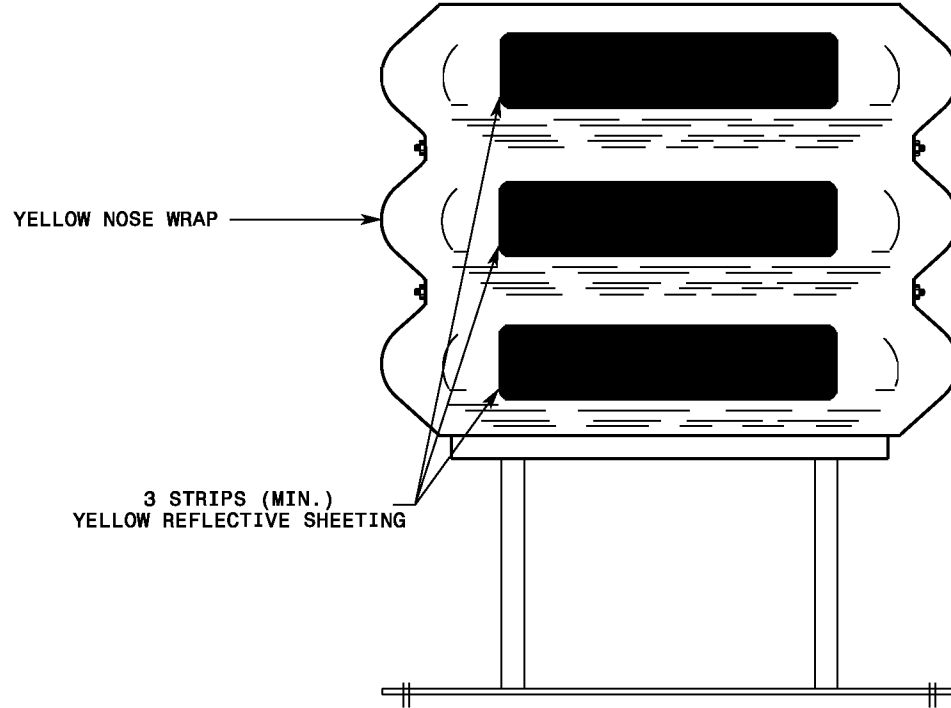


GENERAL NOTES

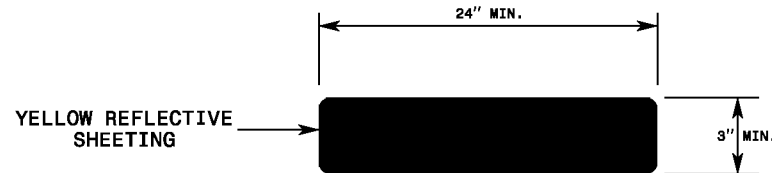
- 1- USE HAND SIGNALING DEVICES SUCH AS STOP-SLOW PADDLES, FLASHLIGHTS TO CONTROL TRAFFIC. USE STOP-SLOW PADDLES AS THE PRIMARY DEVICE.
- 2- FABRICATE STOP-SLOW PADDLES FROM SHEET METAL OR OTHER LIGHT SEMI RIGID MATERIAL. PROVIDE A RIGID HANDLE OF SUFFICIENT LENGTH SO THE PADDLE IS HELD AT 7 FEET ABOVE GROUND LEVEL.
- 3- PROVIDE STOPPING SIGHT DISTANCE TO EACH FLAGGER STATION (REFER TO STD. 1101.11 SHEET 2).
- 4- ILLUMINATE FLAGGER STATIONS DURING NIGHT OPERATIONS.
- 5- FOLLOW FLAGGER QUALIFICATIONS AND METHODS OF HAND-SIGNALING PROCEDURES IN ACCORDANCE WITH PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- 6- ALL FLAGGERS MUST BE CERTIFIED BY AN NCDOT APPROVED SOURCE.

YELLOW REFLECTIVE SHEETING

FRONT VIEWS OF CRASH CUSHION



DETAIL OF YELLOW REFLECTIVE SHEETING



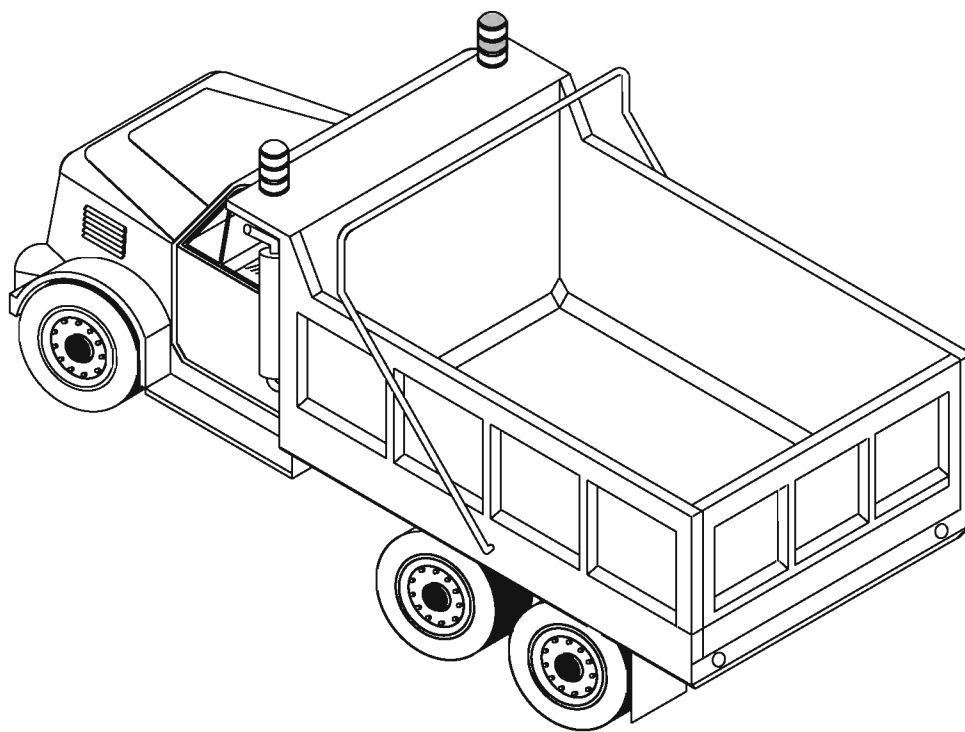
GENERAL NOTES

- 1- FULL SOLID YELLOW REFLECTIVE SHEETING MAY BE USED AS AN ALTERNATIVE TO STRIPS.

LIGHT SYSTEM OPTIONS

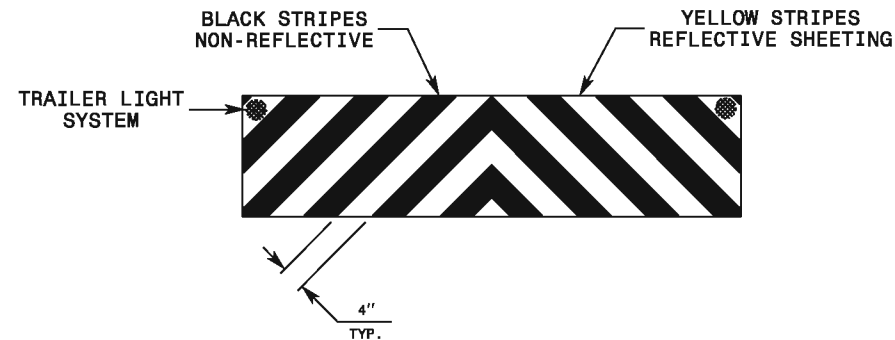
- I. TRUCKS WITHOUT DUMP BODIES- CHOICE OF EITHER:
 - A. LIGHT BARS (15" MINIMUM)- EITHER LED OR ROTATING FLASH WITH FULL AMBER LIGHTS AND AMBER DOME OR LIGHT BARS MAY BE HALF AMBER/HALF WHITE WITH AMBER DOME. (ALL WHITE LIGHT SYSTEMS ARE PROHIBITED)
 - B. 2 HIGH INTENSITY STROBES (CLASS 2)- AMBER LED/AMBER FLASH AND AMBER DOME MOUNTED ON EACH SIDE OF THE HEADBOARD
- II. TRUCKS WITH DUMP BODIES- (NOT REQUIRED, BUT ENCOURAGED)
 - A. 2 HIGH INTENSITY STROBES (CLASS 2)- AMBER LED/AMBER FLASH AND AMBER DOME MOUNTED ON EACH SIDE OF THE CAB PROTECTOR

DUMP BODY

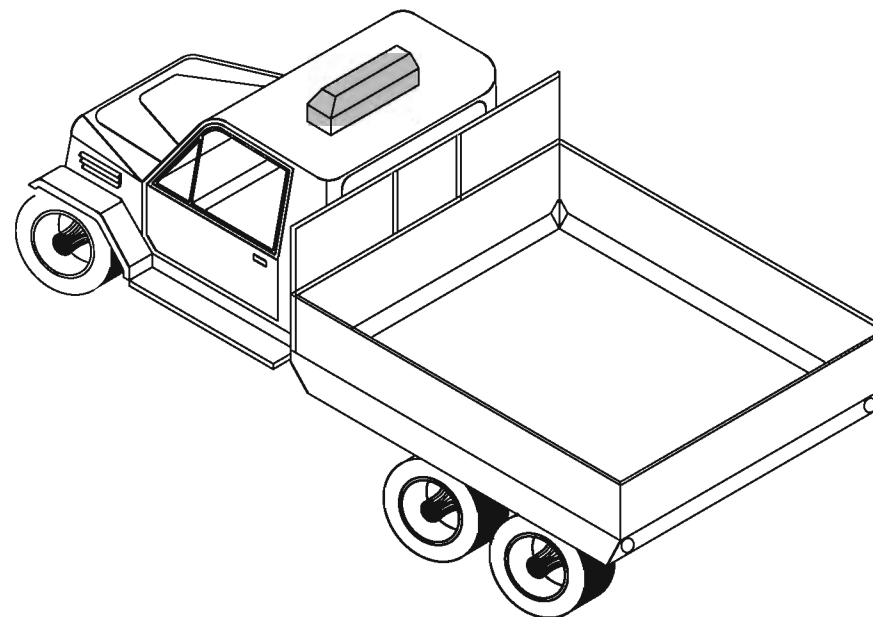


TMA DELINEATION

ENTIRE END OF ATTENUATOR SHALL BE DELINEATED

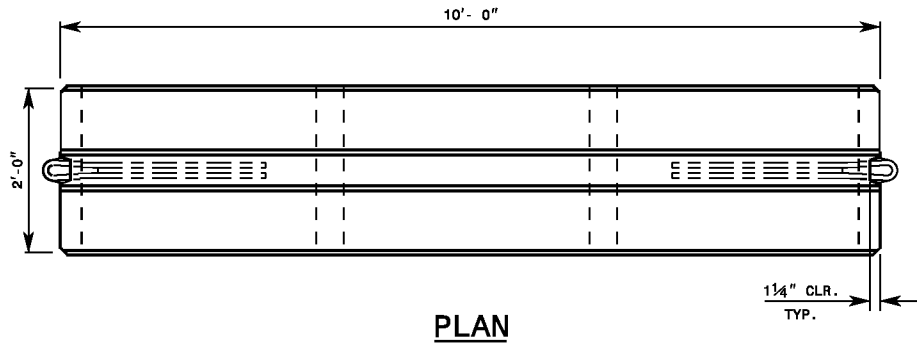


NON-DUMP BODY



GENERAL NOTES FOR TMA REQUIREMENTS

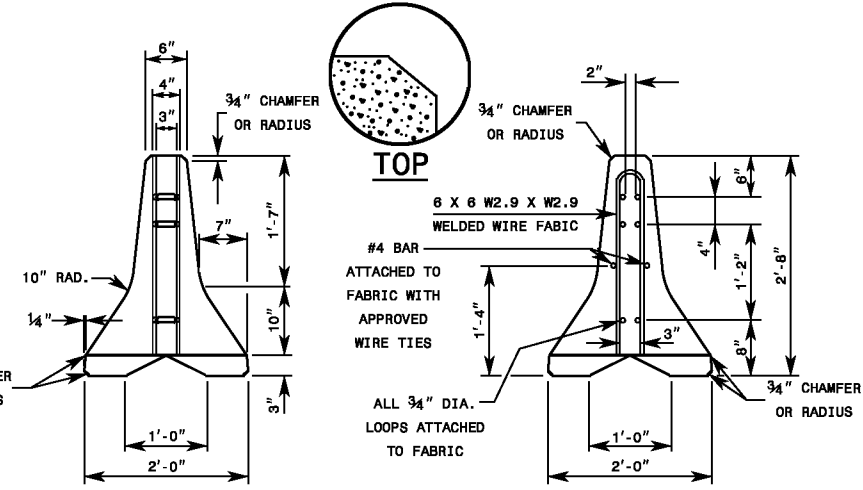
- 1- WHEN TMA'S USED FOR SHADOW VEHICLES, CONTACT THE TMA MANUFACTURER FOR SPECIFIC TRUCK REQUIREMENTS.
- 2- TMA MUST MEET OR EXCEED THE REQUIREMENTS OF NCHRP 350 TEST LEVEL II FOR WORK ZONES WITH POSTED SPEED LIMIT OF 45 MPH OR LESS; OR TEST LEVEL III FOR WORK ZONES WITH POSTED SPEED LIMIT OF 50 MPH OR GREATER. TMA MAY EITHER BE TRUCK MOUNTED OR TRAILER MOUNTED.
- 3- SEE THE DEPARTMENT'S APPROVED PRODUCT LIST AT <https://apps.dot.state.nc.us/vendor/approvedproducts>.



PLAN

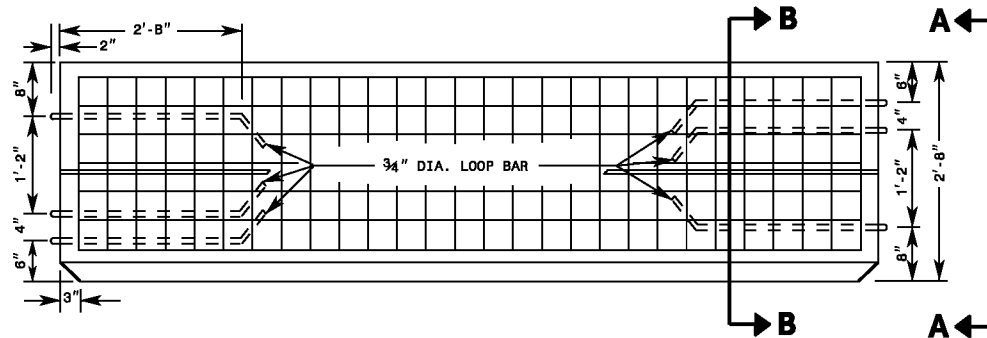


BOTTOM

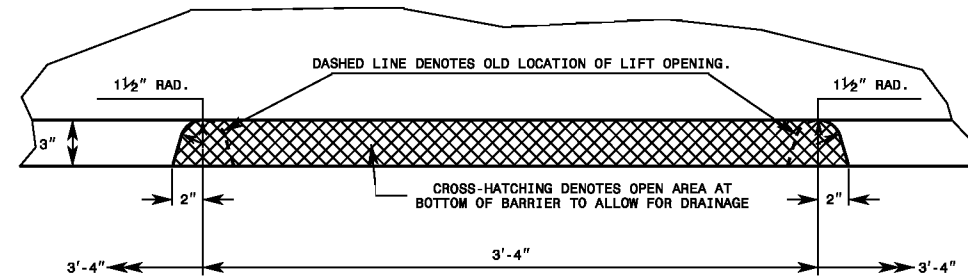


END VIEW A-A

SECTION B-B



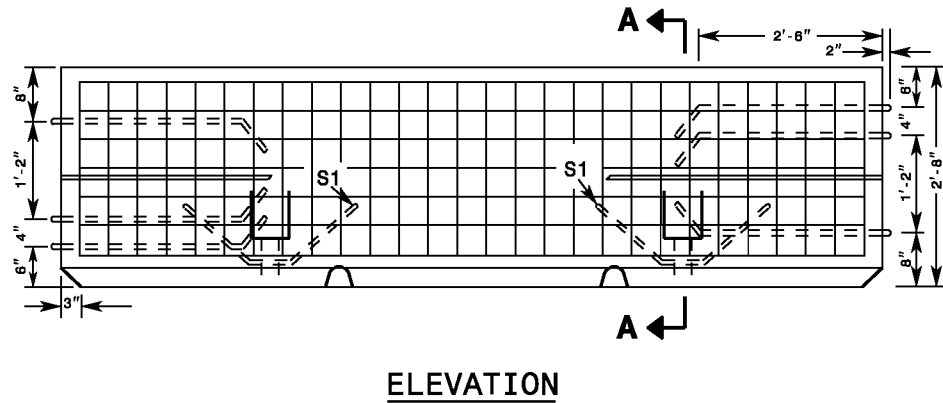
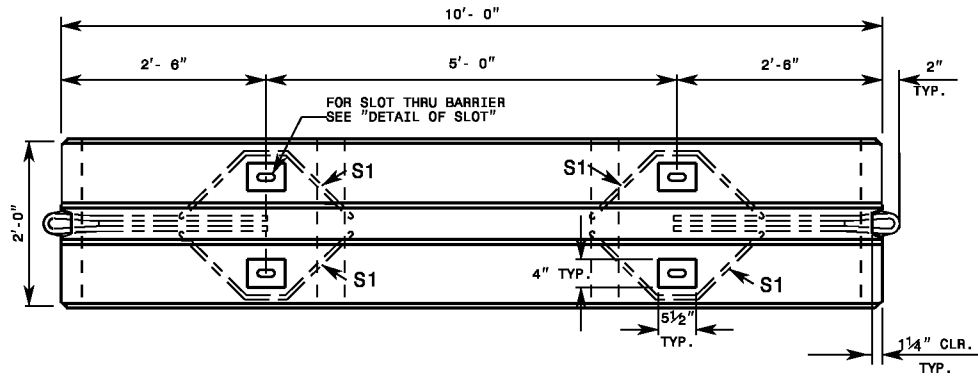
ELEVATION



ELEVATION DETAIL OF DRAINAGE/LIFT SLOT

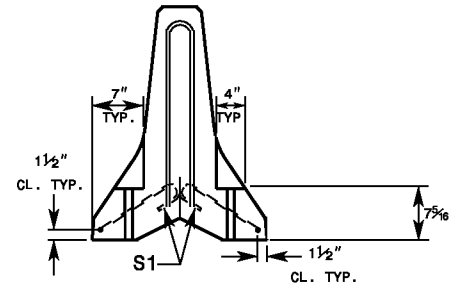
GENERAL NOTES

- 1- THE DRAINAGE/LIFT SLOT SHOWN IS A MODIFICATION OF THE LIFT OPENINGS, ALL OTHER DESIGN CRITERIA SUCH AS REINFORCEMENT BARS ETC. ARE THE SAME AS SHOWN ON THE STANDARD DRAWING.
- 2- BARRIER WITH DRAINAGE/LIFT SLOT IS INTENDED TO BE USED IN AREAS WHERE ROADWAY SURFACE WATER RUNOFF CAUSES EXCESS PUDDLING ADJACENT TO THE TEMPORARY BARRIER. INSTALL THE BARRIER AS SHOWN IN THE PLANS, OR AS DIRECTED BY THE ENGINEER.
- 3- DRAINAGE/SLOT CAN BE USED WITH ANCHORED "PORTABLE CONCRETE BARRIER".

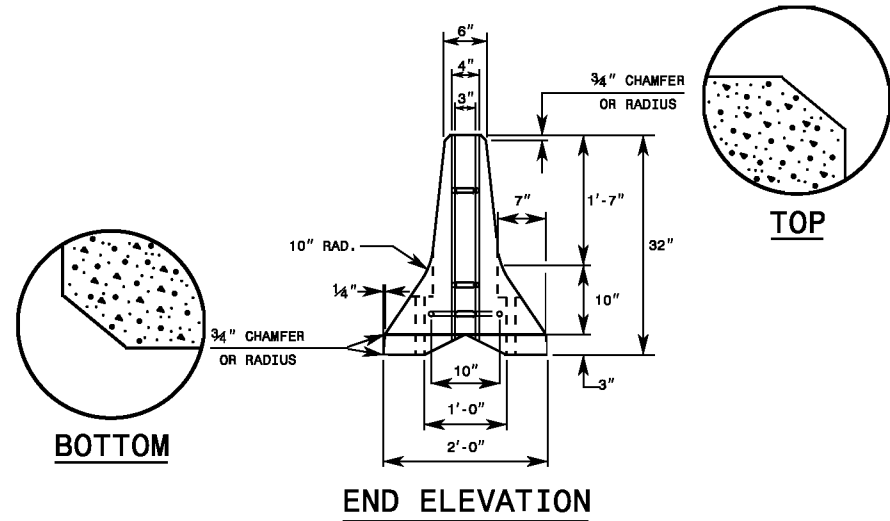


ELEVATION

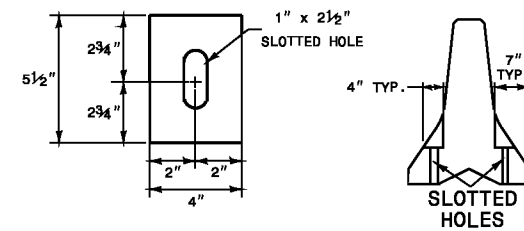
NOTE: REFER TO STD. DWG. 1170.01-SHEET 4 FOR METHODS OF ANCHORING TEMPORARY BARRIER.



SECTION A-A

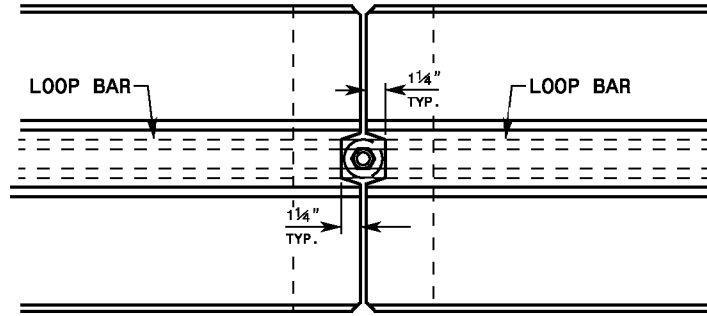


END ELEVATION

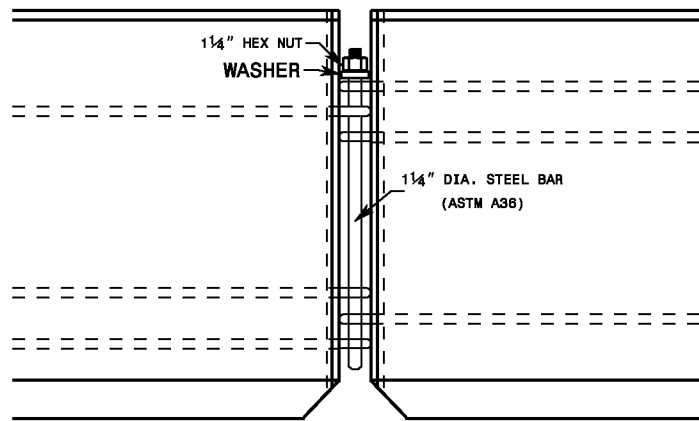


AFTER CASTING, THE DIAMETER OF THE SLOT CAN VARY BETWEEN 1" AND 1 1/8".

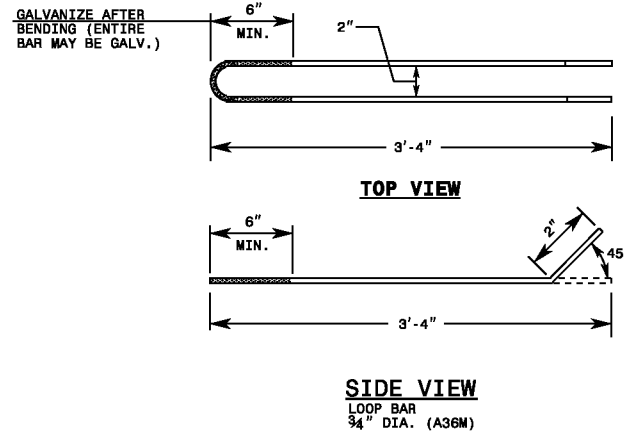
DETAIL OF SLOT



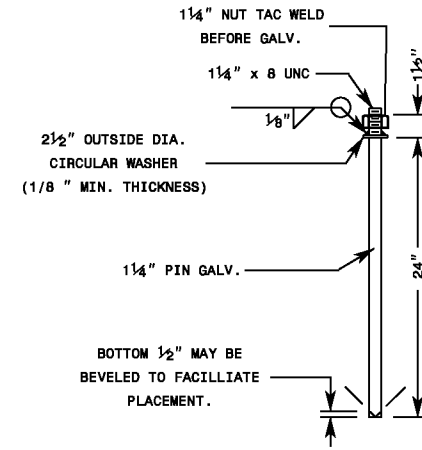
PLAN OF CONNECTION



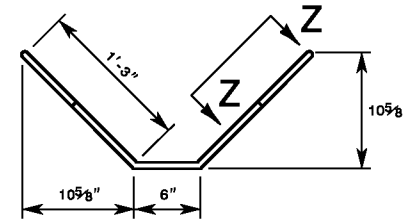
ELEVATION OF CONNECTION



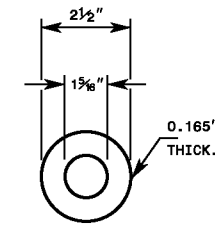
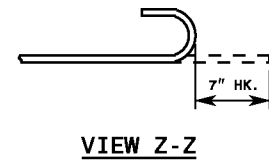
REINFORCEMENT DETAIL



CONNECTOR PIN ASSEMBLY



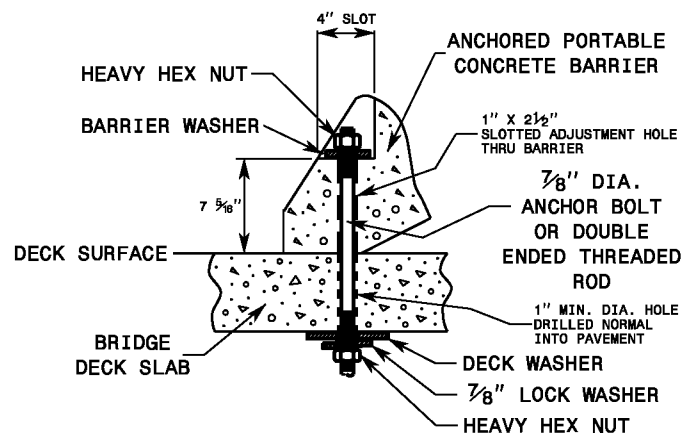
S1 BARS
#5 BARS



PLAIN GALVANIZED
STEEL WASHER
FOR 1 1/4\"/>

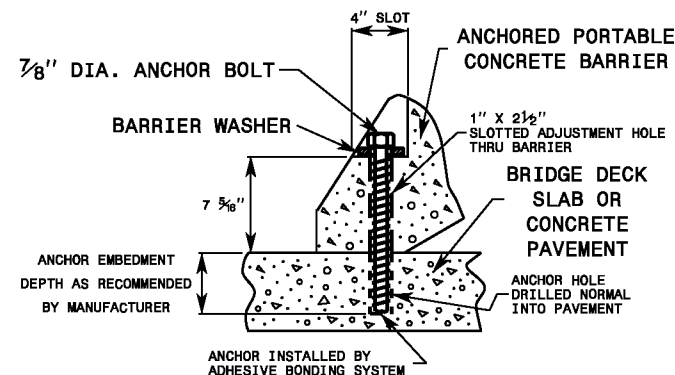
THRU-THE-DECK ANCHOR METHOD

BRIDGE DECKS
METHOD TO BE USED ON OLD BRIDGE DECKS
ONLY AT TIMES WHEN SPECIFIED IN THE PLANS,
OR WHEN DIRECTED BY THE ENGINEER.



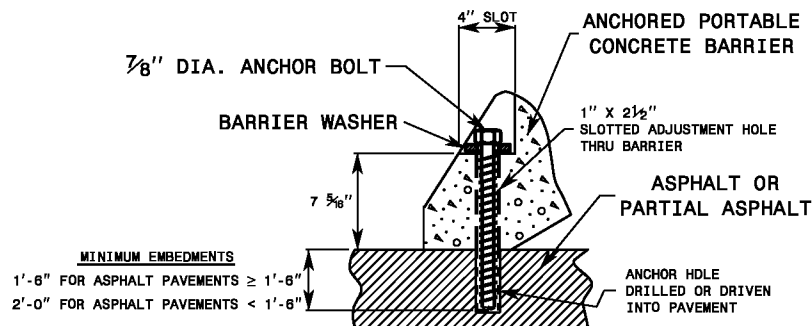
ADHESIVE BONDING SYSTEM ANCHOR METHOD

BRIDGE DECKS AND PORTLAND CEMENT CONCRETE PAVEMENTS



ANCHOR BOLT METHOD

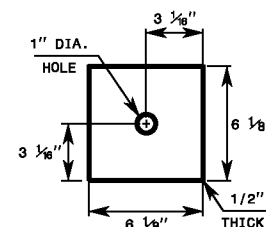
BITUMINOUS PAVEMENTS



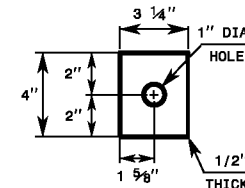
NOTE: THESE EMBEDMENT DEPTHS ARE TYPICAL FOR MDST APPLICATIONS. HOWEVER, DUE TO VARYING ASPHALT CONDITIONS, THEY MAY NOT BE ADEQUATE FOR ALL CASES.

DECK & BARRIER WASHERS

DECK WASHER
THRU-THE-DECK METHOD ONLY



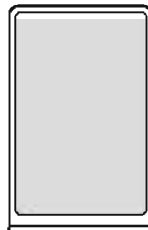
BARRIER WASHER
ALL APPLICATIONS



GENERAL NOTES

- 1- BARRIER CAN ONLY BE ANCHORED ON ASPHALT OR CONCRETE SURFACES.
- 2- BARRIER CAN ONLY BE PLACED ON ASPHALT OR CONCRETE SURFACES UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
- 3- EACH 10 FT. SECTION OF BARRIER REQUIRES 2 ANCHOR ASSEMBLIES ON THE SIDE OF TRAFFIC WHEN INSTALLED ON CONCRETE, AND 4 ANCHOR ASSEMBLIES WHEN INSTALLED ON ASPHALT.
- 4- EXPANSION ANCHORS WILL NOT BE PERMITTED FOR USE ON BRIDGE DECKS.
- 5- DO NOT DRILL HOLES INTO PRESTRESSED CONCRETE BRIDGE DECK PANELS.
- 6- USE ASTM A325 HIGH STRENGTH GALVANIZED ANCHOR BOLTS.
- 7- DRILL ANCHOR HOLES IN CONCRETE WITH A PNEUMATIC DRILL.
- 8- FOR BARRIER SECTIONS THAT EXTEND ACROSS CONCRETE JOINTS, DO NOT ANCHOR ON BOTH SIDES OF THE JOINT, OMIT THE ANCHOR CLOSEST TO THE JOINT.
- 9- TIGHTEN ANCHORS "SNUG TIGHT". TURN THREADED RODS AT LEAST 1 FULL OF THREADS EXTENDING ABOVE THE NUT. DO NOT PROTRUDE THE TOP OF THE ANCHOR ABOVE THE SIDE OF THE BARRIER.
- 10- COAT ANCHORS USED WITH THE ADHESIVE BONDING ANCHORING SYSTEM WITH A DEBONDING AGENT SO THE ANCHORS CAN BE EASILY REMOVED. DO NOT REDUCE THE STRENGTH OF THE ANCHOR SYSTEM WITH THE DEBONDING AGENT.
- 11- ONCE REMOVED, COMPLETELY FILL ANCHOR HOLES WITH AN APPROVED, NON-SHRINK, NON-METALLIC GROUT, OR AS DIRECTED BY THE ENGINEER.

DELINEATOR



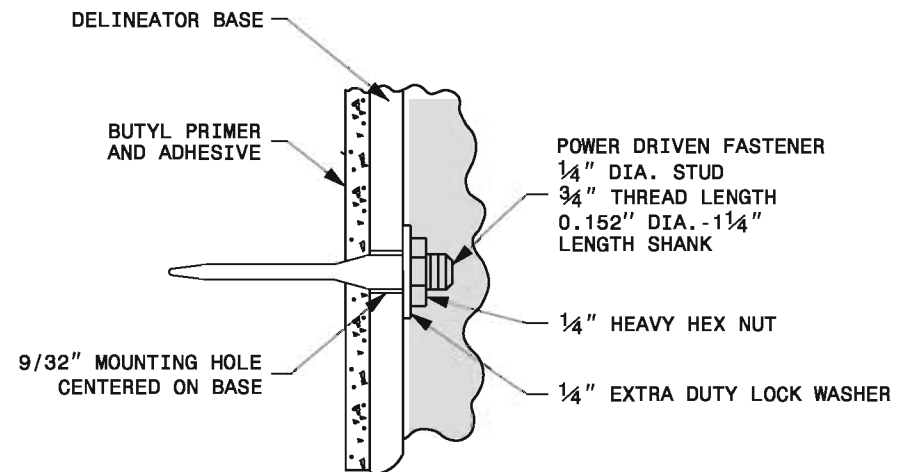
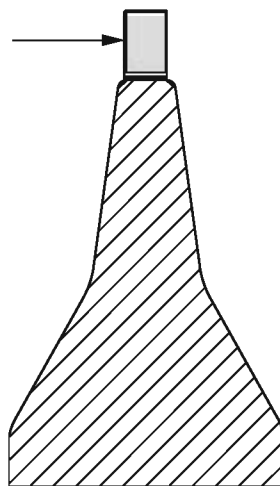
GENERAL NOTES

- 1- USE A MINIMUM 7 SQ. IN. REFLECTIVE AREA FOR SIDE MOUNTED DELINEATORS.
- 2- USE A MINIMUM 28 SQ. IN. REFLECTIVE AREA FOR TOP MOUNTED BARRIER DELINEATORS.
- 3- USE A MINIMUM 7 SQ. IN. REFLECTIVE AREA FOR TOP MOUNTED GUARDRAIL DELINEATORS.
- 4- USE ADHESIVE, CLIP ON GUARDRAIL POST, GUARDRAIL BOLTS, POWER DRIVEN FASTENERS, OR OTHER MOUNTING METHODS RECOMMENDED BY THE MANUFACTURER AS APPROVED BY THE ENGINEER.

MOUNTING DETAILS

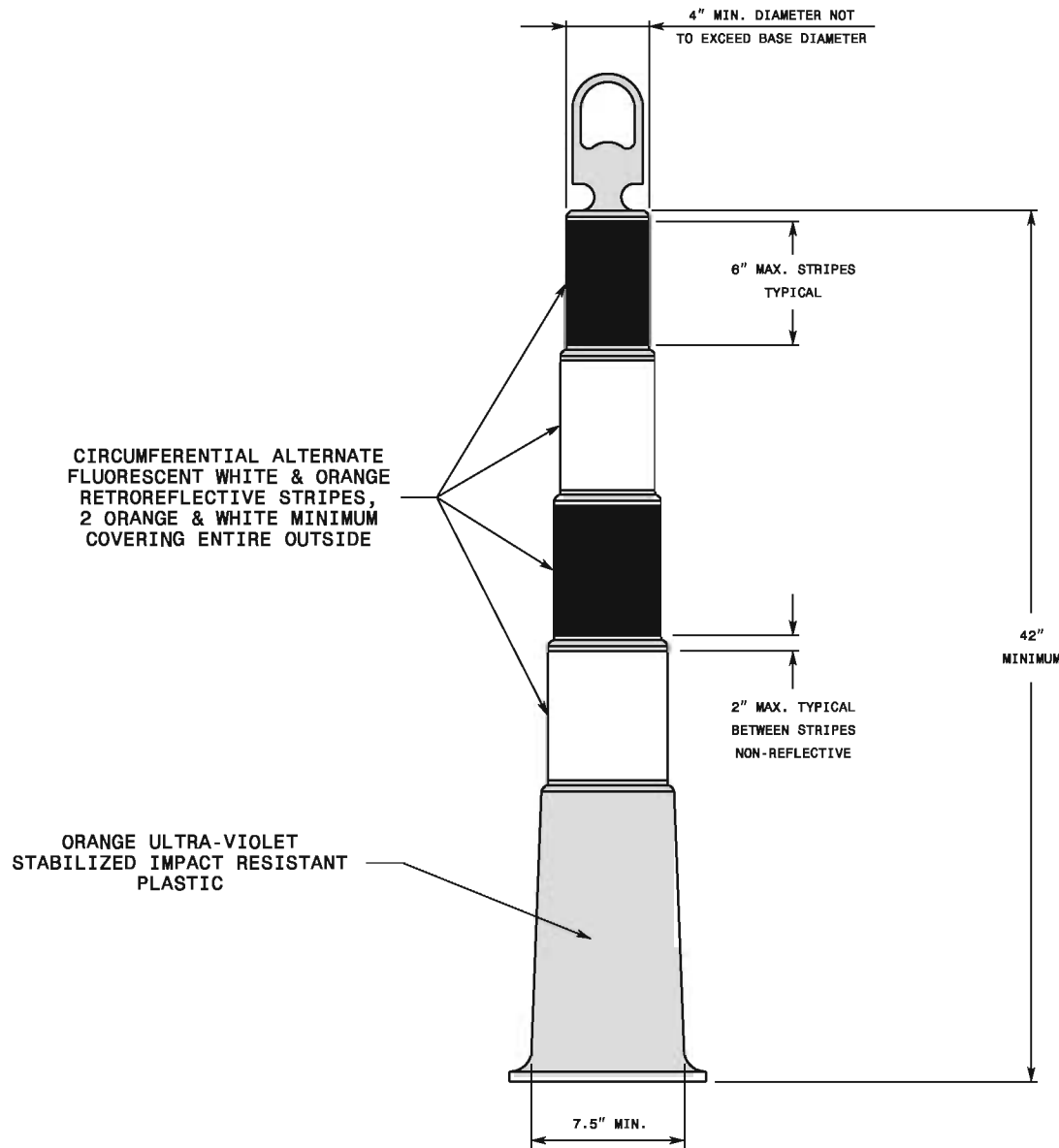
**TYPICAL POWER DRIVEN FASTENER
INSTALLATION FOR BARRIER**

FOR WORKZONE APPLICATIONS
UNLESS A GLARE SCREEN
IS UTILIZED

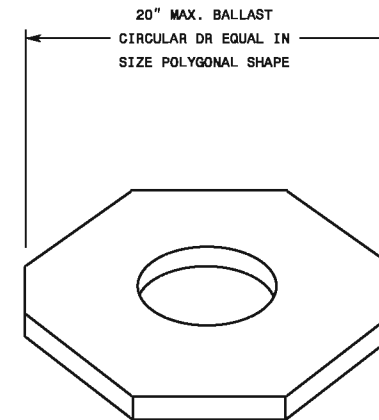


PAINT THE EXPOSED PORTIONS OF THE NUT, LOCK WASHER, AND POWER DRIVEN FASTENERS WITH ZINC-RICH PAINT TO MEET THE ENGINEER'S APPROVAL AFTER INSTALLATION OF THE ASSEMBLY.

ENGLISH STANDARD DRAWING FOR
SKINNY - DRUM



TYPICAL BALLAST



BALLAST WILL BE A MINIMUM OF 15 POUNDS

GENERAL NOTES

- 1- USE BALLAST AS SPECIFIED BY THE MANUFACTURER. DO NOT PLACE BALLAST ON TOP OF THE DRUM.
- 2- IF NECESSARY, PLACE THE NAME OF THE AGENCY, CONTRACTOR, OR SUPPLIER ON NON-RETROREFLECTIVE SURFACES. SHOW THE LETTERS AND NUMBERS USING A NON-RETROREFLECTIVE COLOR AND NOT OVER 2" IN HEIGHT.
- 3- REFER TO SECTION 1180, STANDARD SPECIFICATIONS FOR ROADS AND INSTRUCTIONS FOR ADDITIONAL REQUIREMENTS.
- 4- USE TYPE 3 OR HIGHER HIGH INTENSITY PRISMATIC SHEETING.
- 5- SEE THE DEPARTMENT'S APPROVED PRODUCTS LIST AT <https://apps.dot.state.nc.us/vendor/approvedproducts>.

ENGLISH STANDARD DRAWING FOR
SKINNY - DRUM