



REQUEST FOR BIDS
CALHOUN COUNTY ADMINISTRATION
DEPARTMENT OF PURCHASING

GRAVEL SHOULDER WORK ON US-127; RFB#112JX-16

The County of Calhoun is requesting written bids from qualified providers to perform 12.89 miles of shoulder work, including adding aggregate, grading and compacting aggregate shoulders on US-127 in Jackson County.

This Request for Bids with all pages, documents, and attachments contained herein or subsequently added or made a part hereof, submitted as a fully and properly executed bid, shall constitute a contract between the County of Calhoun and the approved low bidder, as determined by the County when approved and accepted by the County of Calhoun.

Bids must be submitted in complete original form by mail or by messenger in a properly marked and sealed envelope to the following address: Purchasing Department, County Building, 315 West Green Street, Marshall, MI 49068, no later than **JUNE 20, 2016 @ 3:00 PM LOCAL TIME**. The sealed envelope shall be clearly noted "**GRAVEL SHOULDER WORK ON US-127 - RFB #112JX-16**".

Questions regarding this request should be directed to:

Leslie Obrig, Purchasing Coordinator
Calhoun County
315 West Green Street
Marshall, MI 49068-1585
(269) 781-0981
lobrig@calhouncountymi.gov

The County reserves the right to accept or reject any or all bids and to waive informalities and irregularities in bids or bidding procedures, and to accept any bid determined by the County to be in the best interest of the County, even though not the lowest bid or to negotiate further with one or more vendors submitting bids.

LATE BIDS WILL NOT BE ACCEPTED.

MDOT JACKSON TSC

GRAVEL SHOULDER WORK ON US-127 FROM M-34 TO US-223
 PITTSFORD, WHEATLAND, ROLLIN AND WOODSTOCK TOWNSHIPS
 VILLAGES OF HUDSON AND ADDISON
 HILLSDALE AND LENAWEE COUNTIES

CS 30071, 46011
 LENGTH = 12.89 MILES

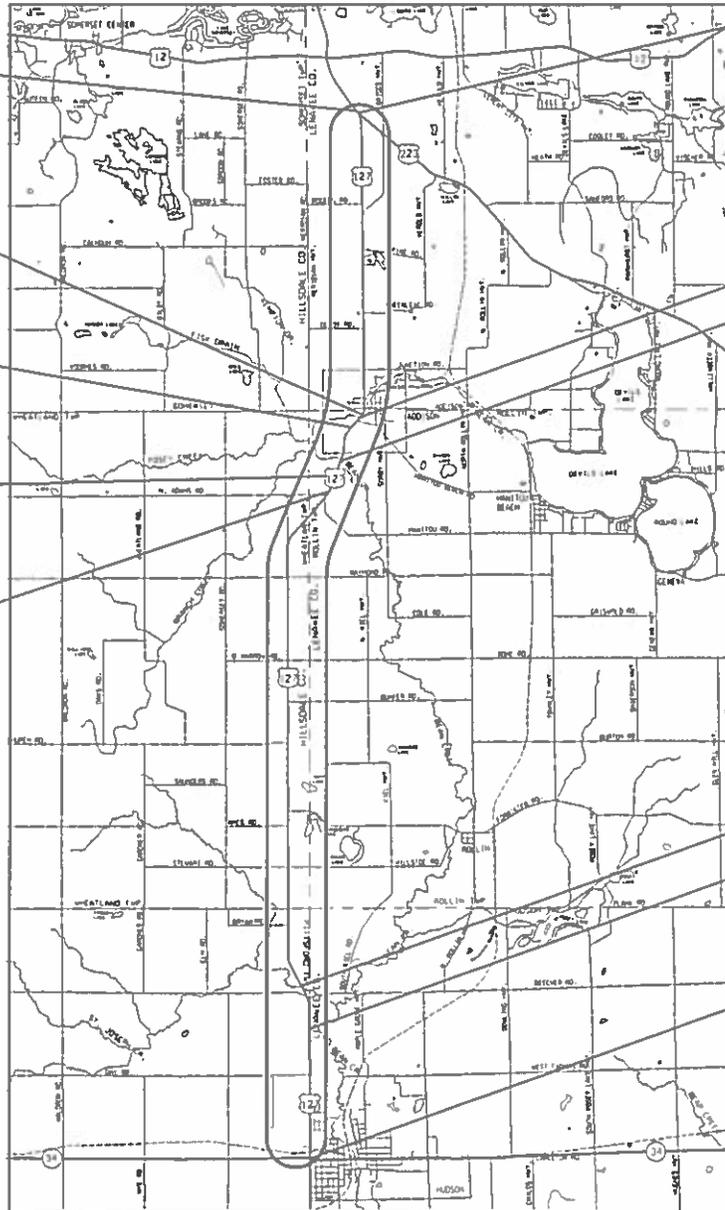
STATION EQUATION
 STA 737+77.97 BACK
 STA 738+28.50 AHEAD
 LINE SHORTENED
 50.53 FT

STATION EQUATION
 STA 539+52.50 BACK
 STA 539+65.30 AHEAD
 LINE SHORTENED
 12.8 FT

STATION EQUATION
 STA 527+38.88 BACK
 STA 527+62.92 AHEAD
 LINE SHORTENED
 24.06 FT

STATION EQUATION
 STA 491+30.20 BACK
 STA 492+00.00 AHEAD
 LINE SHORTENED
 69.8 FT

STATION EQUATION
 STA 479+80.00 BACK
 STA 488+32.40 AHEAD
 LINE SHORTENED
 1452.4 FT



MICHIGAN PROJECT
 CS 46011
 POB STA 737+00
 MP 5.140

C01 OF 46011

B02 OF 46011



B05 OF 30071

C01 OF 30071

MICHIGAN PROJECT
 C.S. 30071
 POB STA 41+00
 M.P. 10.405

GRAVEL SHOULDER WORK ON US-127
 FROM M-34 TO US-223

LOCATION MAP

CS 30071, 46011

Log of Project

1 of 3

Control Section: 30071/46011
US-127 Shoulder Maintenance Work

Location

This project is located along US-127 from Hemlock St to US-223, Pittsford, Rollin, Woodstock, Addison and Wheatland Townships, Hillsdale and Lenawee Counties.

CS	PR	BMP	TO	EMP	STA	TO	STA
30071		10.405		18.151	41+00		450+00
46011		0.0		5.14	450+00		737+00

Description of Work

US-127 Gravel Shoulder Work

This work shall consist of 12.89 miles of adding aggregate material, grading, and compacting the aggregate shoulders. All shoulders work will be completed in accordance with Section 307 of the 2012 Standard Specifications for Construction. It is estimated that 2 inches of shoulder gravel is needed, on average, throughout the limits of this project.

Traffic will be maintained by a single lane closure utilizing traffic regulators as described in the Special Provision for Maintaining Traffic and/or as directed by the Engineer.

<u>Items of Work</u>	<u>Quantity</u>	<u>Unit</u>
Shoulder, CI II	8539	Ton
Embankment, LM	100	Cyd
Slope Restoration	100	Syd
Pavt, Cleaning	1	LS
Channelizing Device, 42 inch, Furn	125	Ea
Channelizing Device, 42 inch, Oper	125	Ea
Lighted Arrow, Type C, Furn	2	Ea
Lighted Arrow, Type C, Oper	2	Ea
Sign, Type B, Temp, Prismatic, Furn	484	Sft
Sign, Type B, Temp, Prismatic, Oper	484	Sft
Traffic Regulator Control	1	LS
Plastic Drum, High Intensity, Furnished	35	Ea
Plastic Drum, High Intensity, Operated	35	Ea

General Notes

Stationing

Stationing is based on existing Right-of-Way plans. The exact locations of work shall be specified by the Engineer prior to the start of construction.

Slope Restoration

The slope restoration pay item will be used as directed by the Engineer. Slope restoration will include seed mixture, mulch, and mulch blanket.

Notes Applying to Standard Plans

Where the following items are called for on the plans, they are to be constructed according to the Standard Plans given:

Superelevation and Pavement Crowns

R-107-D

Specifications for Construction

The improvements covered by this proposal shall be done in accordance with MDOT 2012 Standard Specifications for Construction, Special Provisions, and Supplemental Specifications which are combined within this package.

Utility Information

For the protection of the underground utilities and in conformance with Public Act 53, 1974; the Contractor shall dial 1-800-482-7171 a minimum of three working days, excluding Saturday, Sunday and Holidays prior to the beginning of each excavation or other item that may affect the underground utilities in the area where public utilities have not been previously located. All "Miss Dig" participating members will thus be routinely notified. This does not relieve the contractor of the responsibility of notifying owners who may not be a part of "Miss Dig" alert system.

Notes Applying to Traffic & Safety Work Zones

Where the following items are called for on the plans, they are to be constructed according to the Maintaining Traffic Typical given:

Tables for 'L', 'D', and 'B' Values		M0020a
Advanced Signing Treatment for Intermediate & Short Term Work		M0050a
Shoulder Closure		M0130a
Two Lane Road Closed Utilizing Traffic Regulators		M0140a
Ground Driven Sign Supports for Temp Signs	WZD-100-A	(SPEC DET)
Temporary Traffic Control Devices	WZD-125-E	(SPEC DET)

Embankment

Embankment will be used on this project as directed by the Engineer in sloped areas outside the limit of the gravel shoulder work.

Progress Clause

Start work within ten (10) days after receiving Notice of Award of Contract or on the date agreed upon by the Engineer. In no case shall any work be commenced prior to the receipt of formal notice of award by the Department. **This project must be completed and an invoice submitted to the Jackson County Department of Transportation no later than September 16, 2016.**

Prequalification

Work for this project will be performed by an MDOT prequalified Contractor.

Coordination Clause

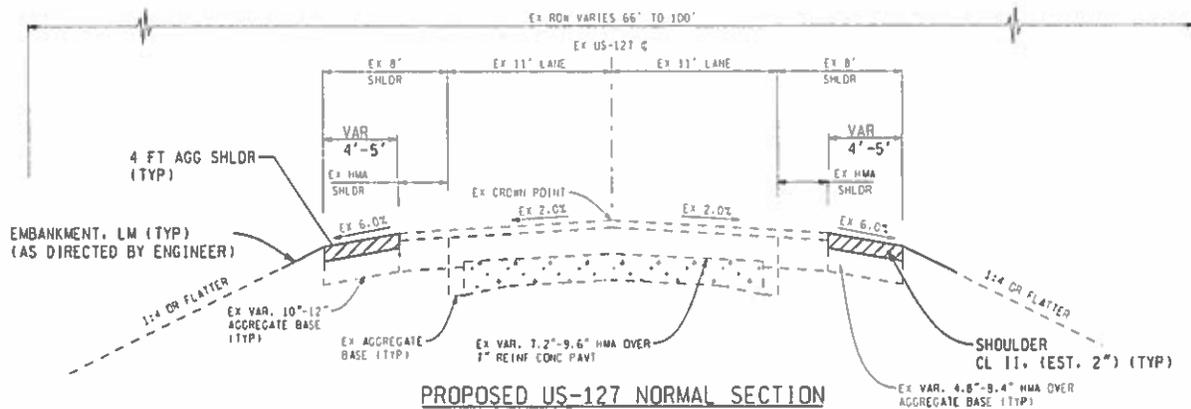
Contracts for other projects within the work limits of this contract may be in force during the life of this contract. The contractor's attention is called to the requirements of cooperation with others as covered in Section 104.08 of the 2012 Standard Specifications for Construction. These contracts include the following:

C.S. 84916 JN 128496 This project consists of Long Line Pavement Markings in various areas in Hillsdale, Jackson, and Lenawee Counties.

C.S. 84916 JN 127496 This project consists of HMA Crack Sealing in various areas in Hillsdale, Jackson, and Lenawee Counties.

No claim for extra compensation or adjustments in contract unit prices will be allowed on account of delay or failure of others to complete work units as scheduled.

Other unlisted contracts may be in force during this contract.



PROPOSED US-127 NORMAL SECTION

TO APPLY: STA 41+00 TO STA 126+43
 STA 136+11 TO STA 156+39
 STA 165+30 TO STA 423+41
 STA 435+54 TO STA 464+59
 STA 489+83 TO STA 509+03
 STA 517+66 TO STA 517+94
 STA 528+67 TO STA 538+34
 STA 544+83 TO STA 726+76

EXISTING SHOULDER TABLE

STATION	SHOULDER WIDTH	HMA SHOULDER WIDTH
41+00 - 511+50	8'	4'
511+50 - 570+00	8'	8'
570+00 - 732+00	8'	4'

MDOT
Michigan Department of Transportation

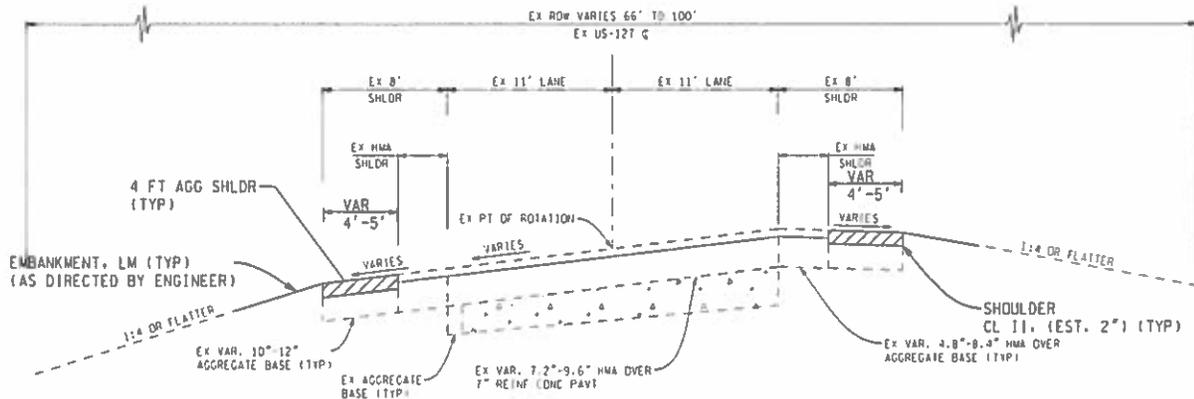
0 VERT. (FT)
 0 **NO SCALE**
 0 HORZ. (FT)

DATE: _____
 DESIGN UNIT: _____
 TSC: _____

CS: _____
 JN: _____

DRAWING SHEET
 SPCW 2

FILE:



PROPOSED US-127 SUPERELEVATED SECTION

TO APPLY: STA 126+43 TO STA 136+11
 STA 156+39 TO STA 165+30
 STA 423+41 TO STA 435+54
 STA 464+59 TO STA 489+83
 STA 509+03 TO STA 517+66
 STA 517+94 TO STA 528+67
 STA 538+34 TO STA 544+83
 STA 726+76 TO STA 737+78

EXISTING SHOULDER TABLE

STATION	SHOULDER WIDTH	HMA SHOULDER WIDTH
41+00 - 511+50	8'	4'
511+50 - 570+00	8'	8'
570+00 - 732+00	8'	4'

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
MAINTAINING TRAFFIC,
PERMANENT SIGNING AND PAVEMENT MARKING

JAK:JSF

1 of 5

UNIV:APPR:RH:04-04-16

a. **Description.** This work consists of all labor, materials and equipment required to maintain traffic in accordance with this special provision for the 12.89 miles of adding aggregate material, grading, and compacting the aggregate shoulders on US-127, located in Pittsford, Rollin, Woodstock, Addison and Wheatland Townships, Hillsdale and Lenawee Counties.

b. **General.** Maintain traffic according to Subsection 104.11 and Sections 812 and 922 of the 2012 Standard Specifications for Construction, including any Supplemental Specifications, the 2011 Edition of the Michigan Manual on Uniform Traffic Control Devices (MMUTCD), and as specified herein.

1. Notify the Project Engineer a minimum of 72 business hours prior to the implementation of any detours, road closures, bridge closures, ramp closures or lane closures and major traffic shifts.
2. Coordinate operations with Contractors performing work on other projects within or adjacent to the Construction Influence Area (CIA).
3. MDOT maintenance crews and/or contract maintenance agencies may perform maintenance work within or adjacent to the Construction Influence Area (CIA). The Maintenance Division of MDOT and/or contract maintenance agency will coordinate their operations with the Delivery Engineer to minimize the interference. All additional costs for joint use of traffic control items will be borne by the Contractor

c. **Construction Influence Area (CIA).** The CIA includes the right-of-way of the following roadways, within the approximate limits described below:

1. On US-127, from approximately 1 mile south of M-34 to 1 mile north of US-223.

Include in the CIA the rights-of-way of any intersecting roads and ramps adjacent to the work zone for a distance of approximately 550 feet in advance of the state trunkline.

d. **Traffic Restrictions.**

1. Remove lane closures and cease work prior to the Memorial Day, July 4th, or Labor Day holiday periods, as defined by the Engineer.

Remove lane closures and cease work prior to the Michigan International Speedway race weeks. MIS race weeks are defined as beginning at 7:00 am Monday, before the race weekend, and run until the normal start of work on the following Tuesday. In the case of rain delay, no lane closures or work will be allowed until the next work day

following the race. The Contractor is responsible for contacting the Michigan International Speedway for race dates.

2. Perform work during daytime hours only. Allow night work only at the discretion of the Engineer. Any additional cost for maintaining traffic at night will be borne by the Contractor.
3. Single lane closures on US-127 will be limited to two miles in length. Lane closure limits can be adjusted as directed by the Engineer.
4. Maintain a minimum of 1 lane(s) of traffic in each direction at all times on US-127 and all intersecting roads.
5. Do not place lane closures or traffic regulation sequences where work can be accomplished with a shoulder closure. Place lane closures and traffic regulation operations only in areas and situations deemed necessary by the Engineer.
6. Do not occupy any part of the active traffic lane when utilizing a shoulder closure with personnel or equipment. Avoid this situation or use a lane closure.
7. Maintain two-way traffic at all times on M-50 using a traffic regulator. Place the arrow panel, signs and channelizing taper for the traffic regulation operation at locations approved by the Engineer for adequate visibility by oncoming traffic.
8. Provide additional traffic regulators at intersections and driveways with commercial traffic. A large number of commercial driveways may cause a reduction in the allowable length of lane closures. The cost of additional traffic regulators will be borne by the Contractor.
9. Use additional traffic regulators at unsignalized intersections and driveways as directed by the Engineer. All cost associated with the Traffic Regulation Control Pay Item will be borne by the Contractor. Man T-intersections by a single traffic regulator and four-legged intersections with a traffic regulator at both crossroads.
10. Notify the Engineer at least 24 hours in advance of erection or removal of overlays on existing signs.
11. Cover existing regulatory, warning and construction signs that are not applicable during construction.
12. Continue work that is initiated that includes any lane restrictions until completed. A lack of work activity for more than one week requires the removal and replacement of lane restrictions with all the costs borne by the Contractor.
13. Restrict access for construction vehicles between traveled lanes and work areas to specific locations. The number of access points and their locations requires the approval of the Engineer.

14. During working hours, park workers' vehicles, idle construction equipment, and stored materials that cannot be removed from the project as follows:
 - A. At least 20 feet behind curb faces on roadways with barrier curb.
 - B. At least 30 feet from the pavement edge on roadways with mountable curbs.
15. During non-working hours, remove workers' vehicles, and obtain the Engineer's approval to store idle construction equipment and materials that cannot be removed from the project as follows:
 - A. At least 30 feet from the traffic lanes, if topography and right of way allow.
 - B. Less than 30 feet from the traffic lanes if delineated by signs, lights, barricades, or concrete barriers.

MDOT will not make additional payment for devices used to delineate stored equipment and material.

e. Work Zone Speeds.

1. Set work zone speeds according to the 2006 Guidelines to Establish Speed Limits in Work Zones.
2. Post additional "WHEN WORKERS PRESENT 45" mph speed limit signs at one mile intervals throughout the work zone.

f. Traffic Control Devices.

1. General.
 - A. Conform all traffic control devices and their usage to Part 6 of the 2011 Michigan Manual of Uniform Traffic Control Devices (MMUTCD). This document can be found at the following website:

<http://mdotcf.state.mi.us/public/tands/plans.cfm>
 - B. Place advance signs (W20-1 - "Road Work Ahead") and plastic drums at any work site with uncompleted work during non-working periods as the Engineer directs. All costs associated with this work will be borne by the Contractor.
 - C. During construction, maintain access to all business and residential drives.
2. Temporary Signs.
 - A. Place temporary sign spacing and taper lengths as shown on attached Typical M0020a.
 - B. Place ground driven sign supports as shown on attached Traffic and Safety Special

Detail WZD-100-A. Refer to Traffic and Safety Special Detail WZD-125-E for portable supports.

- C. Place signing for the beginning and ending of the work zone as shown on attached Typical M0050a.
- D. Place signing for a shoulder closure as shown on attached Typical M0130a.
- E. Place signing for traffic regulation as shown on attached Typical M0140a.
- F. Include (5) W20-1 (ROAD WORK AHEAD) signs in the quantities, to place on ramps or intersecting roads in advance of construction areas as the Engineer directs.
- G. Mount all temporary signs at a five-foot minimum bottom height in uncurbed areas and seven-foot minimum bottom height in curbed or pedestrian areas.
- H. Consider distances shown between construction warning, regulatory and guide signs shown on the typicals as approximate. Signs may require field adjustment, as the Engineer directs.
- I. All temporary signs shall be Type B, Prismatic.
- J. Mount all temporary signs that will be in place for more than 14 days on driven posts. When temporary sign(s) are not in use, cover sign(s) as directed by the Engineer.
- K. Refer to Traffic and Safety Special Detail WZD-125-E when installing temporary diamond signs with portable supports. Note that the Type A Warning Light is required.
- L. When a portable construction sign is no longer applicable, remove it or lay it down on its non-reflective side with its feet off.
- M. Use Type C Lighted Arrows (minimum 48 inch x 98 inch) to merge traffic and secure by elevating the tires above the ground, or use wheel chocks or sandbags.
- N. The Federal Highway Administration (FHWA) requires all signs to be NCHRP 350 crashworthy. For design and configuration refer to their website:

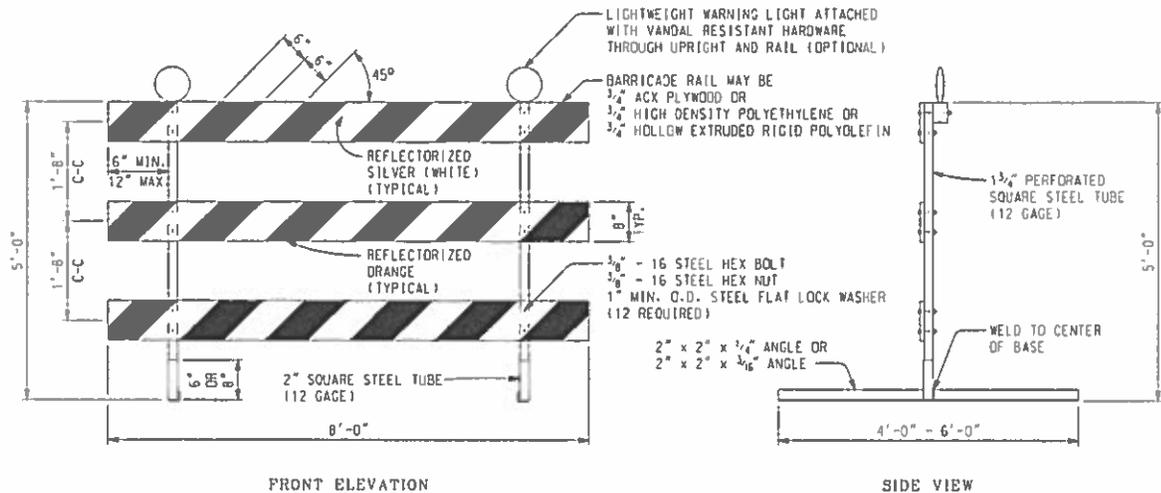
http://safety.fhwa.dot.gov/roadway_dept/road_hardware/workzone_pdmenu.cfm

3. Channelizing Devices.

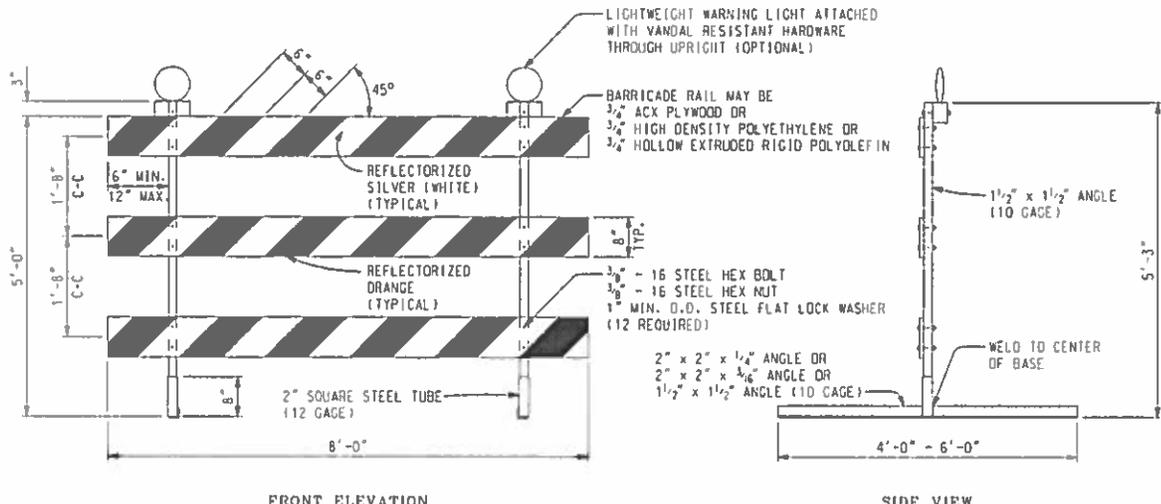
- A. Use plastic drums with high intensity sheeting for channelizing devices in the taper/shift area of closures.
- B. Use only 42" channelizing devices according to subsection 812.03.D.6 of the 2012 Standard Specifications for Construction.

g. Measurement and Payment. The estimate of quantities for maintaining traffic is based on signing and related traffic control devices for (1) set of lead in signs, (1) traffic regulation sequence (4) "ROAD WORK AHEAD" (W20-1) signs, and (2) Type C lighted arrows (minimum 48 inch by 96 inch) to be in use at any one time.

1. Measure and pay for all traffic control items in accordance with Section 812.04 of the 2012 Standard Specifications of Construction.
2. All cost of additional signing or maintaining traffic devices required to expedite the construction will be borne by the Contractor.



PERFORATED SQUARE STEEL TUBE OPTION



ANGLE IRON OPTION



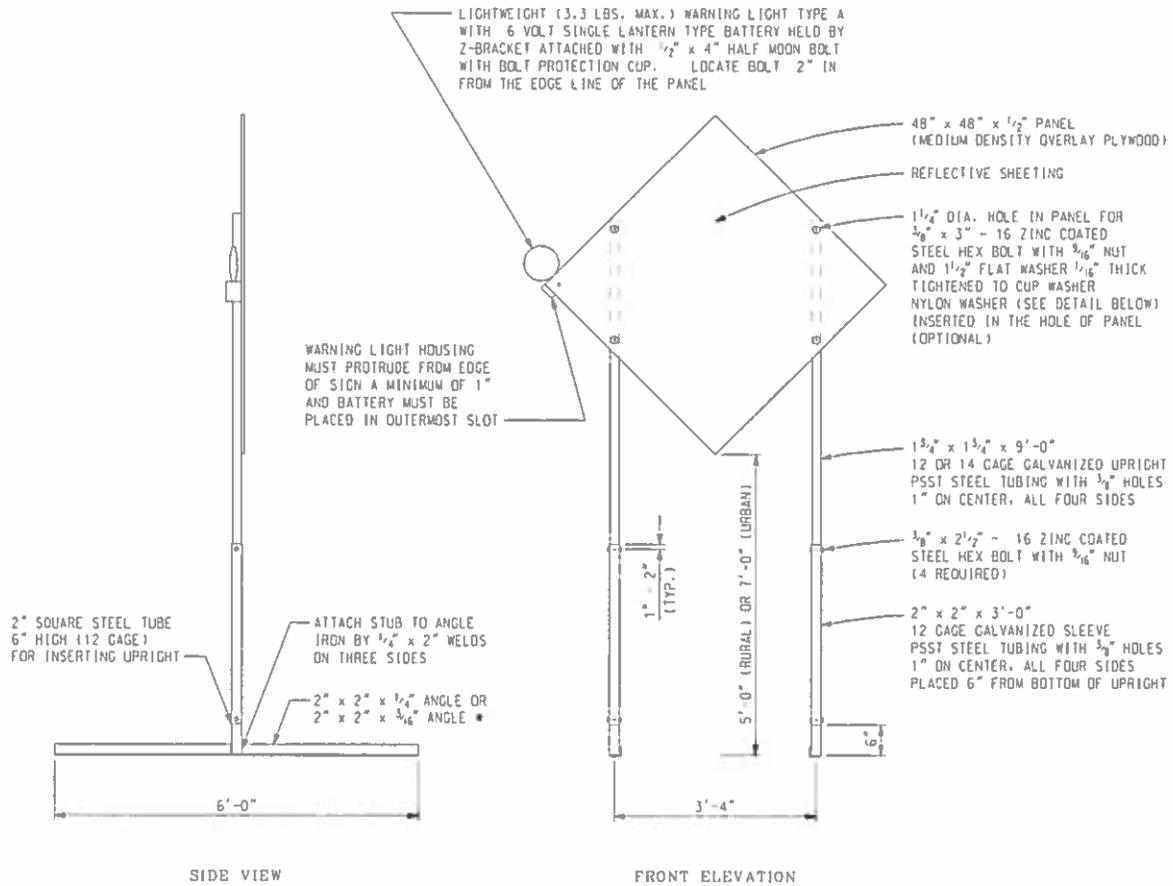
LEFT DIRECTIONAL BI-DIRECTIONAL RIGHT DIRECTIONAL CLOSURES

BARRICADE RAIL SHEETING OPTIONS
TYPE III BARRICADES

Other Type III Barricades meeting current NCHRP crash worthy criteria can be found on the FHWA Safety website at http://safety.fhwa.dot.gov/roadway_depl/road_hardware/wzd.htm

NOT TO SCALE		File: T&S/Typ/Signs/workZones/wzd 125 d		Rev. 09/22/09 PJ	
<p>MICHIGAN DEPARTMENT OF TRANSPORTATION</p> <p>PREPARED BY TRAFFIC AND SAFETY</p>	<p>ENGINEER OF DELIVERY</p> <hr/> <p>ENGINEER OF DEVELOPMENT</p>		<p>MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR</p> <p>Temporary Traffic Control Devices</p>		
	<p>DRAWN BY: ECH</p> <p>CHECKED BY: MWB</p>	<p>(SPECIAL DETAIL)</p> <p>FHWA APPROVAL DATE</p>		<p>9/22/09 PLAN DATE</p>	<p>WZD-125-E</p>

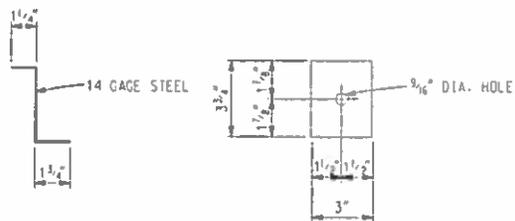
NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



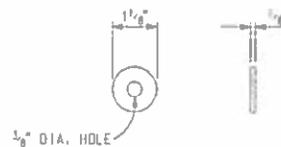
TEMPORARY SIGN SUPPORT

(WARNING LIGHT PLACED ON SIDE CLOSEST TO TRAFFIC)

- SIGN STAND IS BALLASTED WITH FOUR OR MORE 35 LB SANDBAGS. A MINIMUM OF ONE ON EACH END.
- UPRIGHTS SHALL NOT EXTEND ABOVE THE SIGN PANEL.



Z-BRACKET DETAIL



OPTIONAL NYLON WASHER

Other temporary sign supports meeting current NCIIRP crash worthy criteria can be found on the FHWA Safety website at http://safety.fhwa.dot.gov/roadway_dept/road_hardware/wzd.htm

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN

(SPECIAL DETAIL)
FHWA APPROVAL DATE

9/22/09

PLAN DATE

WZD-125-E

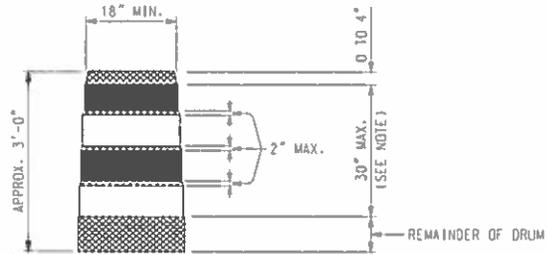
SHEET

2 of 3

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

- PLASTIC DRUM
- ▲▲▲ PROPOSED TYPE III BARRICADE
- △△△ EXISTING TYPE III BARRICADE

SYMBOLS TO BE USED ON PLANS



- REFLECTORIZED ORANGE
- REFLECTORIZED WHITE
- NON REFLECTORIZED ORANGE

NOTE:
 DRUMS SHALL HAVE AT LEAST 4 HORIZONTAL REFLECTORIZED STRIPES (2 ORANGE AND 2 WHITE) OF 6" UNIFORM WIDTH, ALTERNATING IN COLOR WITH THE TOPMOST REFLECTORIZED STRIPE BEING ORANGE. NON REFLECTORIZED SPACES BETWEEN THE HORIZONTAL REFLECTORIZED ORANGE AND WHITE STRIPES SHALL BE ORANGE IN COLOR AND EQUAL IN WIDTH.

PLASTIC DRUM

NOTES:

2" PERFORATED SQUARE STEEL TUBES MAY BE USED TO FABRICATE THE HORIZONTAL BASE OF THE TYPE III BARRICADE.

WARNING LIGHTS SHALL BE PLACED ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND ALL OTHER PROVISIONS IN THE CONTRACT WHEN THEY ARE USED ON TYPE III BARRICADES.

SEE ROAD STANDARD PLANS R-113-SERIES FOR TEMPORARY CROSSOVERS FOR DIVIDED ROADWAY, AND R-126-SERIES FOR TYPICAL LOCATION AND SPACING OF PLASTIC DRUMS FOR PLACEMENT OF TEMPORARY CONCRETE BARRIER.

SIGNS, BARRICADES, AND PLASTIC DRUMS SHALL BE FACED WITH PRESSURE-SENSITIVE REFLECTIVE SHEETING ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

SANDBAGS SHALL BE USED WHEN SUPPLEMENTAL WEIGHTS ARE REQUIRED TO ACHIEVE STABILITY OF THE BARRICADE. THE SANDBAGS SHALL BE PLACED SO THEY WILL NOT COVER OR OBSTRUCT ANY REFLECTIVE PORTION OF THE TRAFFIC CONTROL DEVICE.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	(SPECIAL DETAIL) FHWA APPROVAL DATE	9/22/09	WZD-125-E	SHEET 3 of 3
File: T&S/Typ/Signs/WorkZones/wzd 125 d	Rev. 09/22/09 PJ	PLAN DATE		

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SIGN MATERIAL SELECTION TABLE

SIGN SIZE	SIGN MATERIAL TYPE		
	TYPE I	TYPE II	TYPE III
≤ 36" X 36"		X	X
>36" X 36" ≤ 96" TO WIDE		X	
> 96" WIDE TO 144" WIDE	X	X	
> 144" WIDE	X		

TYPE I ALUMINUM EXTRUSION
 TYPE II PLYWOOD
 TYPE III ALUMINUM SHEET

ROUNDING OF CORNERS IS NOT REQUIRED FOR TYPE I OR II SIGNS.
 VERTICAL JOINTS ARE NOT PERMITTED.
 HORIZONTAL JOINTS THROUGH SIGN LEGEND OR SYMBOLS ARE NOT PERMITTED.

POST SIZE REQUIREMENTS TABLE

SIGN AREA (ft ²)	POST TYPE		
	U-CHANNEL STEEL	SQUARE TUBULAR STEEL	WOOD
≤ 9	1 - 3 lb/ft*	1 - 2" 12 or 14 GA*	N/A
9 ≤ 20	2 - 3 lb/ft	2 - 2" 12 or 14 GA	1 - 4" X 6"*
> 20 ≤ 30	N/A	N/A	2 - 4" X 6"
> 30 ≤ 60	N/A	N/A	2 - 6" X 8"
> 60 ≤ 84	N/A	N/A	3 - 6" X 8"

*SIGNS 4 FEET AND GREATER IN WIDTH REQUIRE 2 POSTS.
 SIGNS GREATER THAN 8 FEET IN WIDTH REQUIRE 2 OR 3 WOOD
 POSTS DEPENDING ON AREA OF SIGN.
 A MAXIMUM OF 2 POSTS WITHIN A 7' PATH IS PERMITTED.

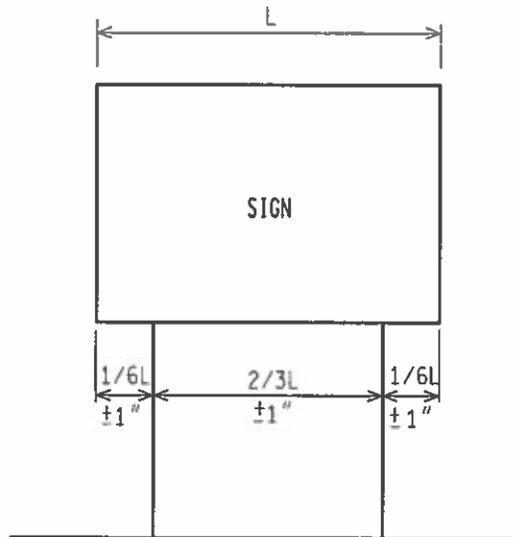
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File:PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH

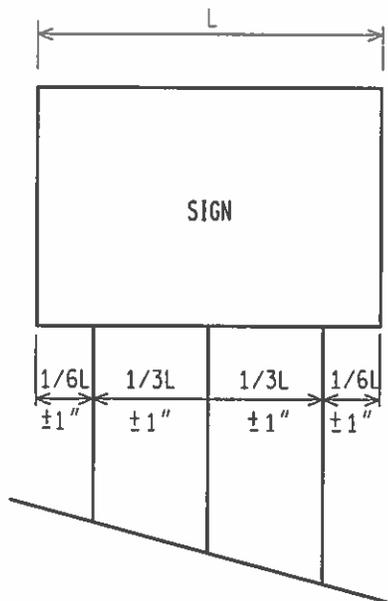
 MICHIGAN DEPARTMENT OF TRANSPORTATION PREPARED BY TRAFFIC AND SAFETY SUPPORT AREA DRAWN BY: CON/ECH CHECKED BY: AUG	_____ ENGINEER OF DELIVERY _____ ENGINEER OF DEVELOPMENT PENDING _____ FHWA APPROVAL DATE	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN FOR GROUND DRIVEN SIGN SUPPORTS FOR TEMP SIGNS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">8/2006</td> <td style="border: none; text-align: center;">WZD-100-A</td> <td style="border: none; text-align: right;">SHEET</td> </tr> <tr> <td style="border: none;">PLAN DATE</td> <td style="border: none;"></td> <td style="border: none; text-align: right;">1 of 11</td> </tr> </table>	8/2006	WZD-100-A	SHEET	PLAN DATE		1 of 11
8/2006	WZD-100-A	SHEET						
PLAN DATE		1 of 11						

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

2 POST SIGN SUPPORT SPACING



3 POST SIGN SUPPORT SPACING

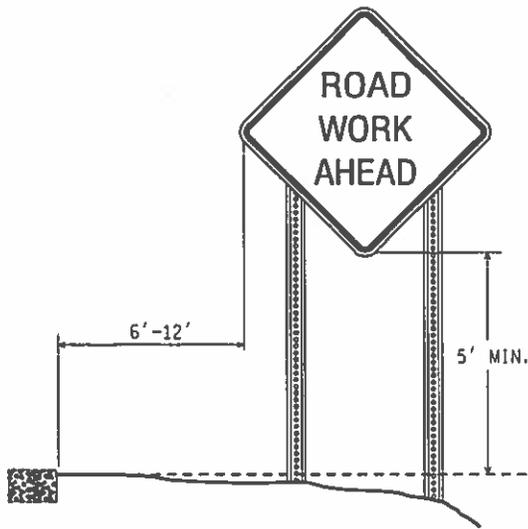


* FOR ALL 11' AND 12' LONG SIGNS ON 3 WOOD SUPPORTS, SPREAD POSTS SO AS TO HAVE A 8' MIN. TO 9' MAX. DISTANCE BETWEEN OUTSIDE POSTS.

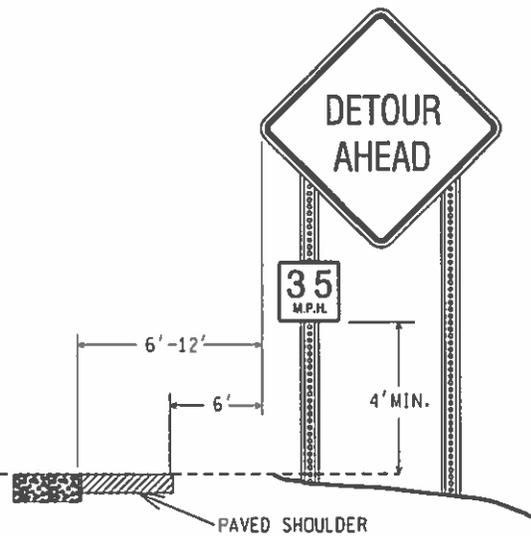
NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006	WZD-100-A	SHEET 2 of 11
File:PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH		PLAN DATE		

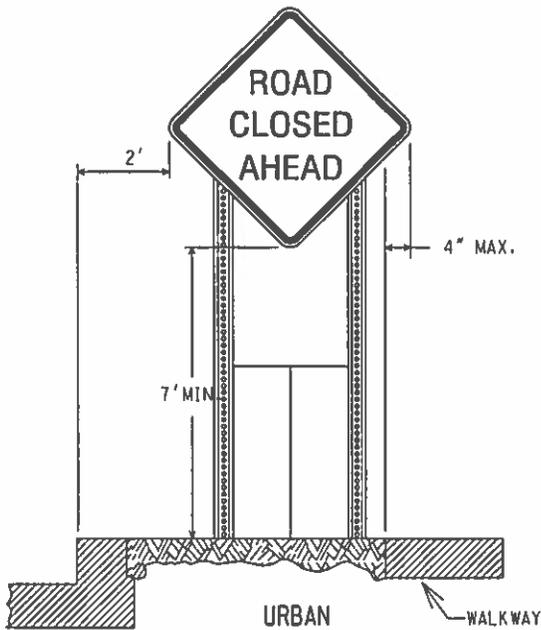
NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



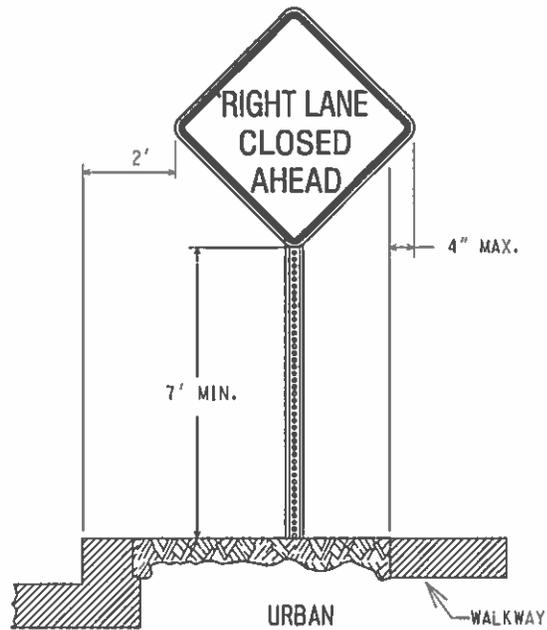
RURAL



RURAL WITH ADVISORY SPEED PLATE



(CURBED AREAS OR WHERE WALKWAYS ARE PRESENT)



(CURBED AREAS OR WHERE WALKWAYS ARE PRESENT)

BOTTOM HEIGHT AND OFFSET

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN

PENDING
FHWA APPROVAL DATE

8/2006

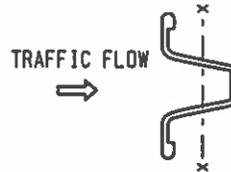
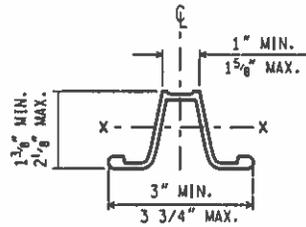
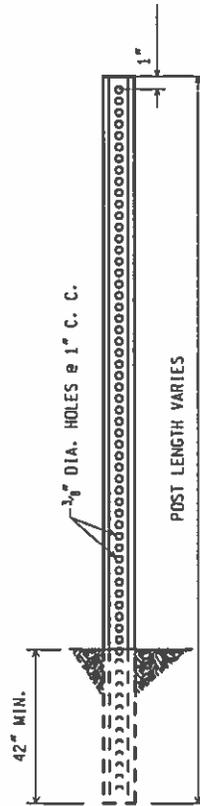
WZD-100-A

SHEET
3 of 11

File:PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH

PLAN DATE

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



WEIGHT = 3 lbs/ft
 SECT. MOD. X.-X. = 0.31 CUBIC INCHES MIN.

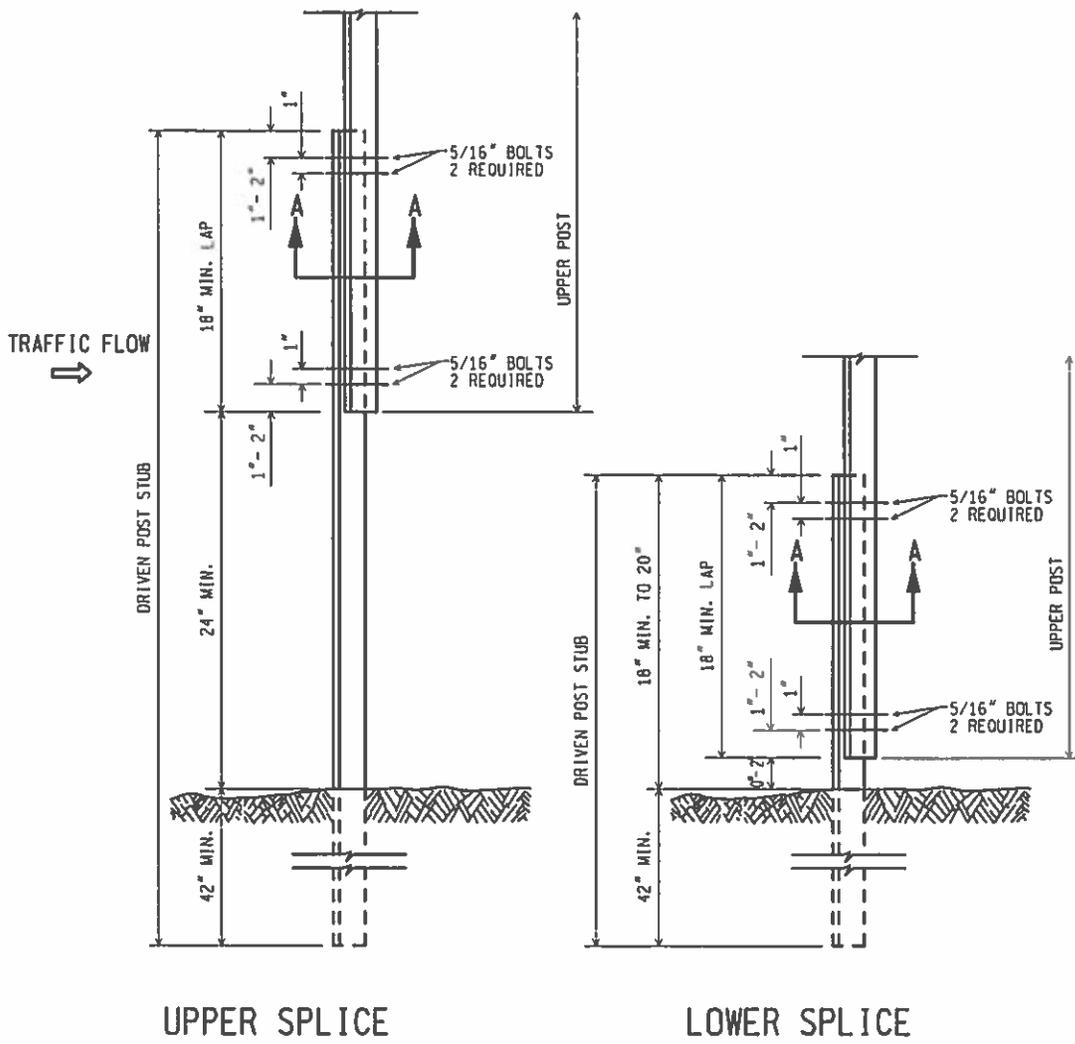
**3 lb. U - CHANNEL STEEL POST
 (NO SPLICE)**

MOUNT SIGN ON OPEN FACE OF
 U - CHANNEL STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006	WZD-100-A	SHEET 4 of 11
File:PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH	PLAN DATE			

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



UPPER SPLICE

LOWER SPLICE

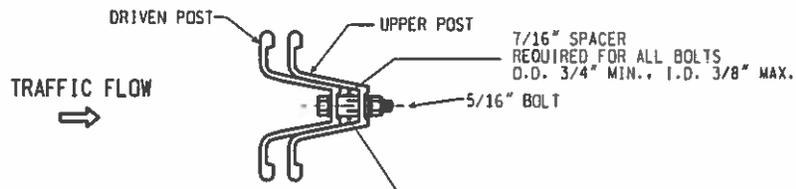
**3 lb. U - CHANNEL STEEL POST
(WITH SPLICE)**

MOUNT SIGN ON OPEN FACE OF
UPPER U - CHANNEL STEEL POST

NOT TO SCALE

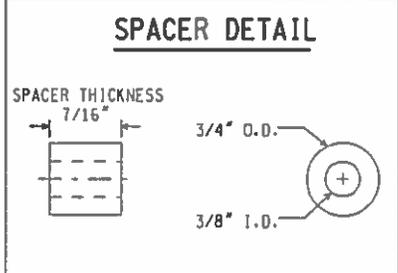
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006 PLAN DATE	WZD-100-A	SHEET 5 of 11
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NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



SECTION A-A

7/16" SPACER
REQUIRED FOR ALL BOLTS
O.D. 3/4" MIN., I.D. 3/8" MAX.



NOTES:

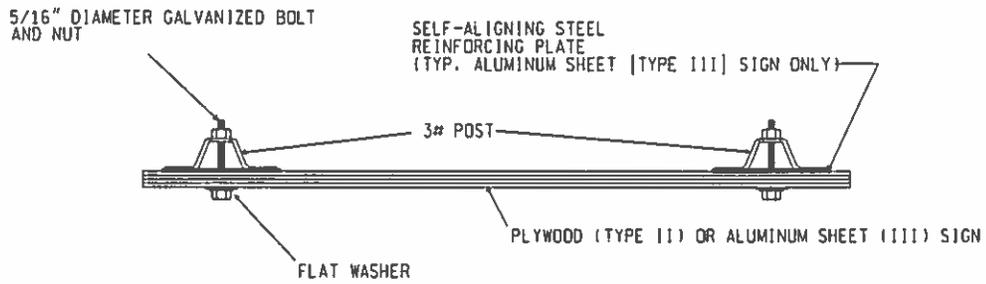
1. THE SPACER THICKNESS SHALL BE 1/16" LESS THAN THE GAP BETWEEN THE POST WHEN POSITIONED IN THE UNBOLTED CONFIGURATION.
2. THE EXTERIOR BOLT (CLOSEST TO LAP), SPACER, WASHER, AND NUT SHALL BE INSTALLED IN A PREPUNCHED HOLE 1" TO 2" FROM THE END OF THE LAP.
3. THE INTERIOR BOLT (FARTHEST FROM LAP), SPACER, WASHER, AND NUT SHALL BE INSTALLED IN THE NEXT PREPUNCHED HOLE.
4. THE DRIVEN POST SHALL ALWAYS BE MOUNTED IN FRONT OF THE UPPER POST WITH RESPECT TO THE ADJACENT ONCOMING TRAFFIC, REGARDLESS OF THE DIRECTION THE SIGN IS FACING.
5. THE SPLICE LAP SHALL BE FASTENED BY FOUR-5/16" DIA. GALVANIZED A449 BOLTS (SAE J429 GRADE 5) OR GALVANIZED A325 BOLTS.

**3 lb. U - CHANNEL STEEL POST
(WITH SPLICE)**

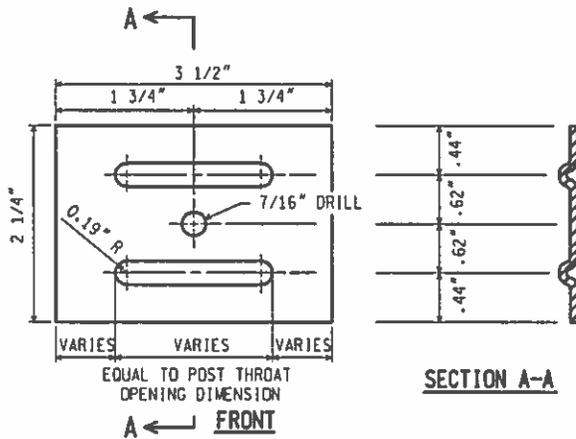
NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006 PLAN DATE	WZD-100-A	SHEET 6 of 11
File#PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH				

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SIGN TO 3 lb. POST CONNECTION



NOTES: (FOR STEEL SIGN REINF' PLATE)

1. MATERIAL: 12 GAUGE CARBON STEEL.
2. TOLERANCE ON ALL DIMENSIONS $\pm 0.0625"$
3. FINISH-AFTER STAMPING AND PUNCHING, GALVANIZE ACCORDING TO CURRENT SPECIFICATIONS FOR ZINC (HOT GALVANIZE) COATINGS ON PRODUCTS FABRICATED FROM PLATES OR STRIPS

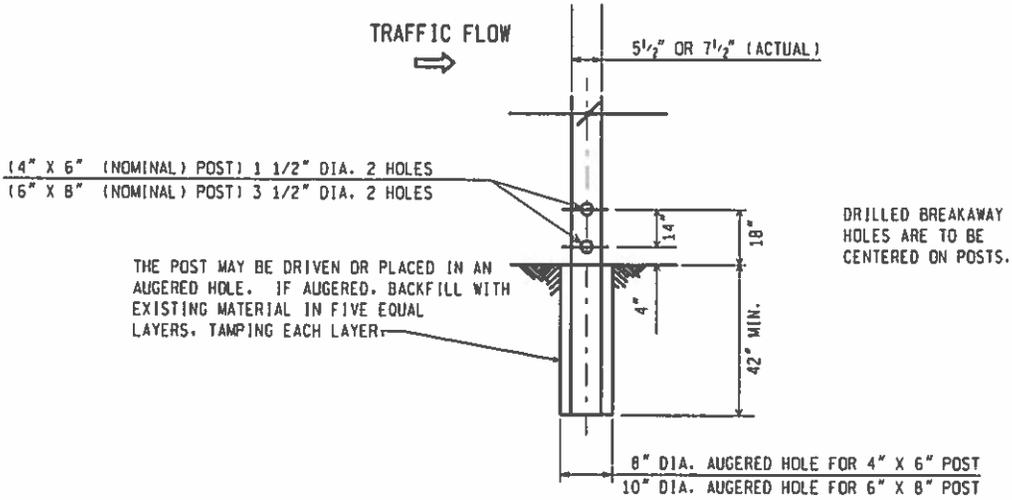
STEEL SIGN REINFORCING PLATE
REQUIRED FOR TYPE III SIGNS ONLY

3 lb. U - CHANNEL STEEL POST SIGN CONNECTION

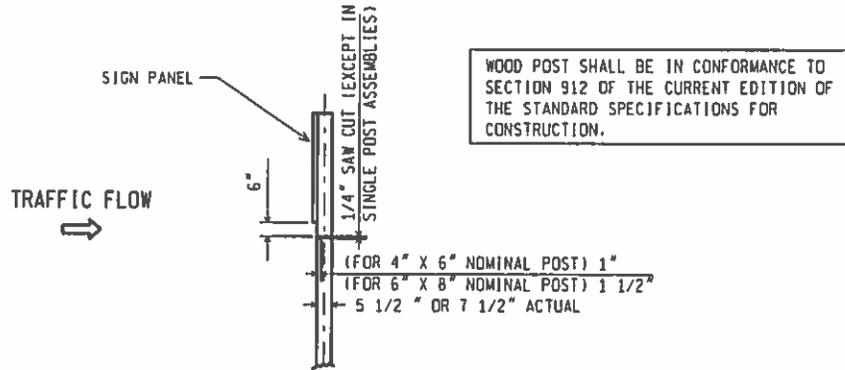
NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006 PLAN DATE	WZD-100-A	SHEET 7 of 11
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NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



**WOOD POST BREAKAWAY HOLES/
DIRECT EMBEDMENT DETAILS**



**SAW CUT DETAIL
(MULTIPLE POST INSTALLATIONS)**

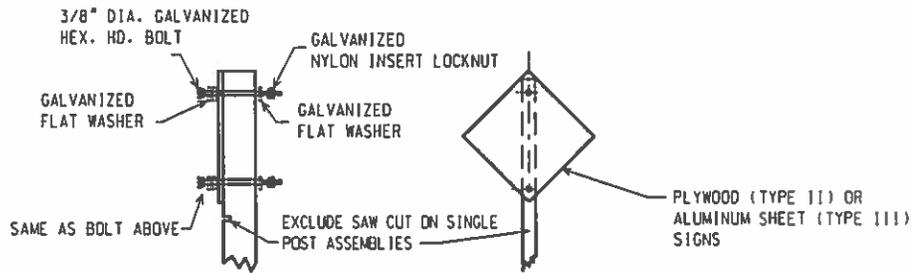
WOOD POST DETAILS

NOT TO SCALE

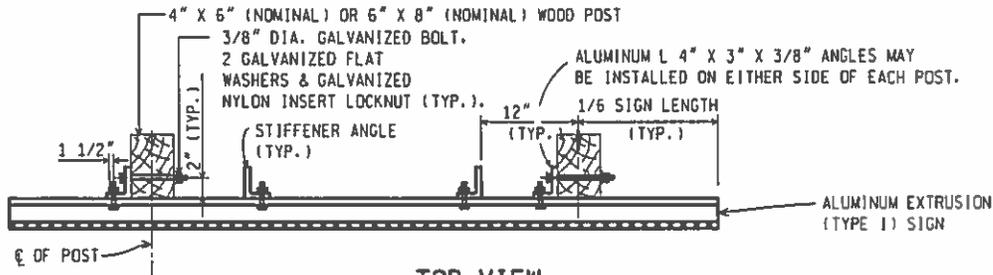
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006 PLAN DATE	WZD-100-A	SHEET 8 of 11
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File:PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH

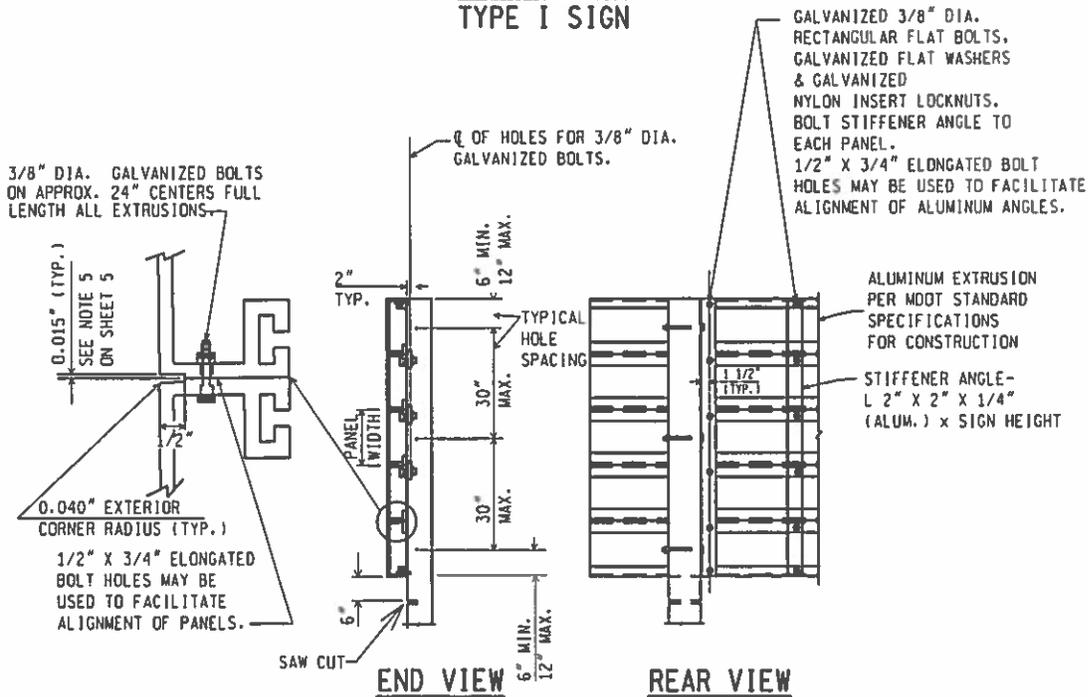
NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



TYPE II AND TYPE III SIGNS



**TOP VIEW
TYPE I SIGN**



TYPE I SIGN - ERECTION DETAILS

WOOD POST CONNECTIONS

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN

PENDING
FHWA APPROVAL DATE

8/2006

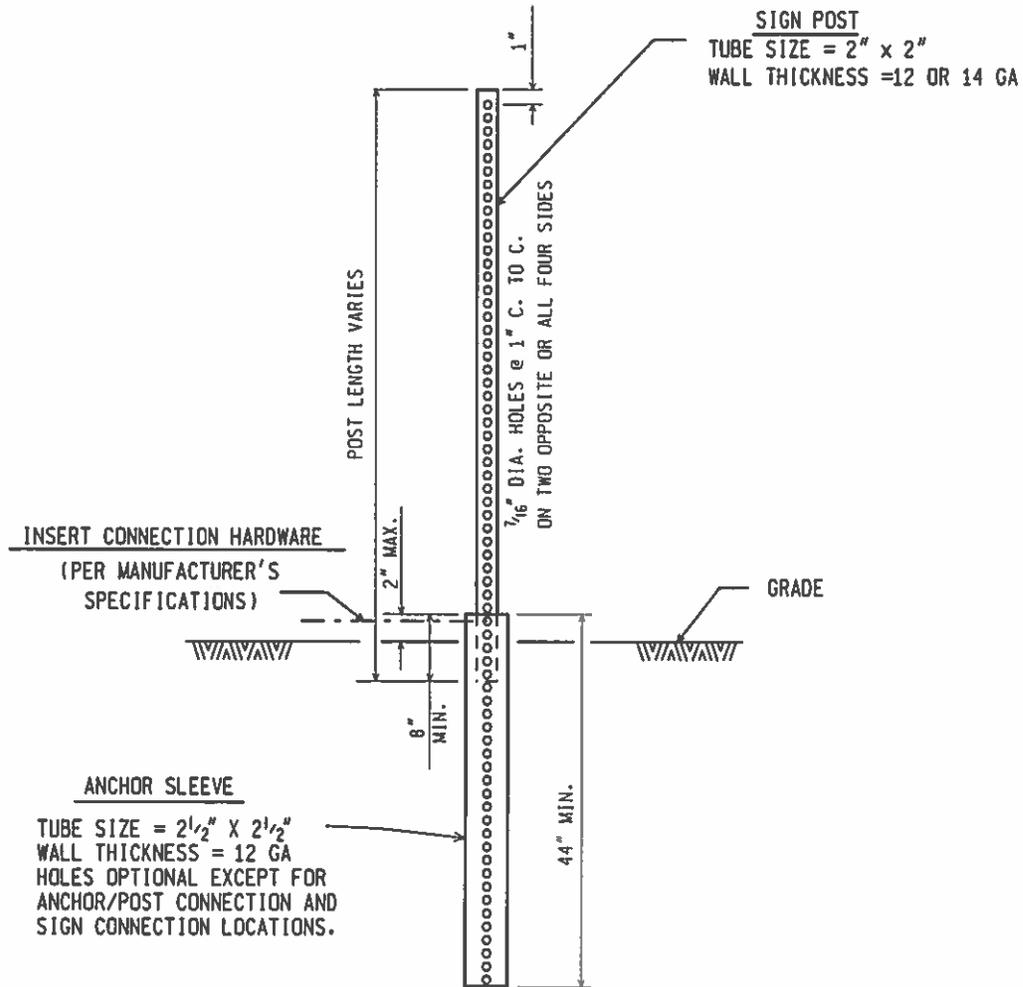
WZD-100-A

SHEET
9 of 11

File:PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH

PLAN DATE

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SQUARE TUBULAR STEEL POST

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006 PLAN DATE	WZD-100-A	SHEET 10 of 11
File:PW/Doc/RD/T&S/Typ/Dev/Sign MainTraf D/WZD-100-A Rev. 8/21/06 ECH				

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.

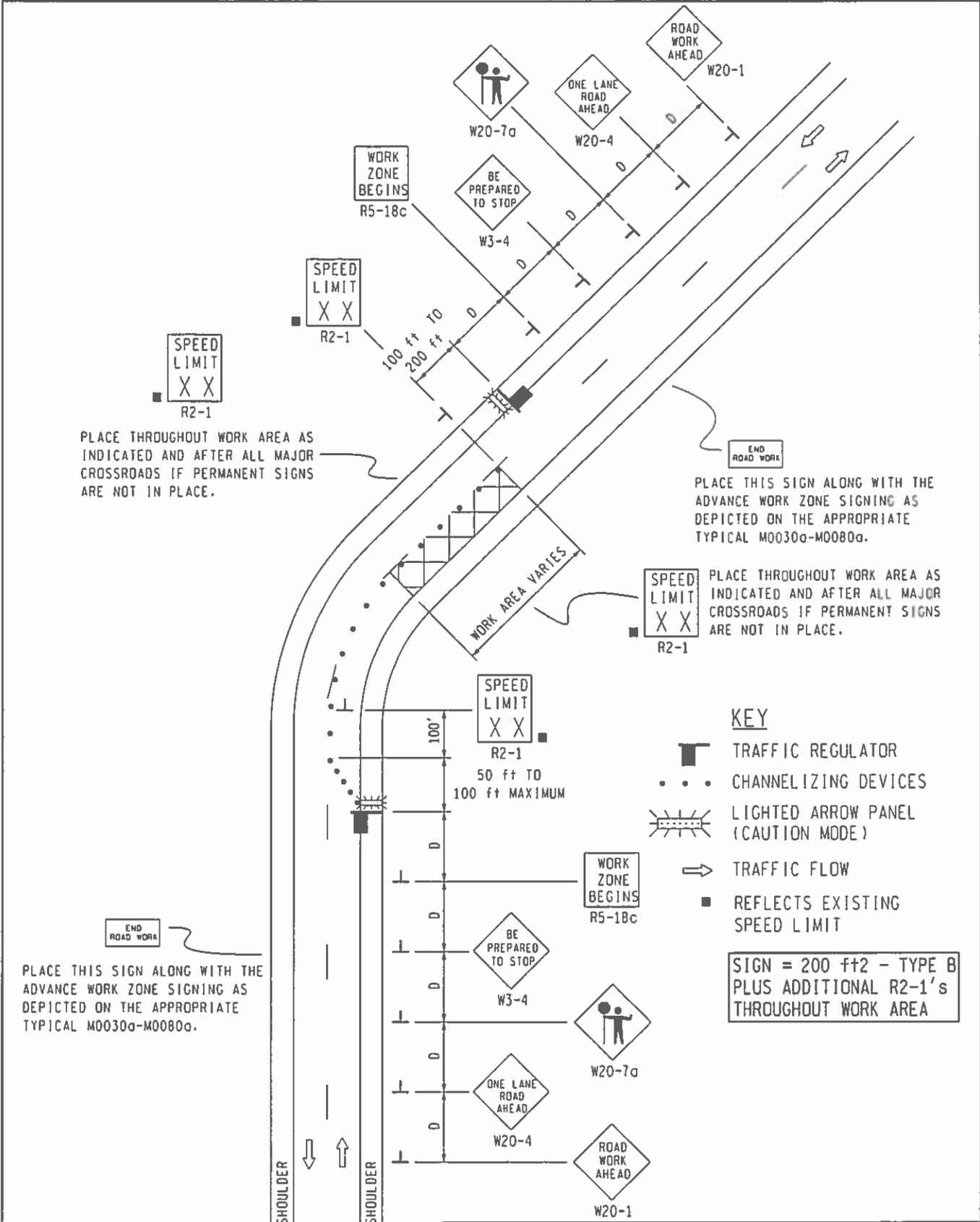
GENERAL NOTES:

1. A MAXIMUM OF TWO POSTS WITHIN A 7 FOOT PATH IS PERMITTED.
2. ALL SIGN POSTS SHALL COMPLY WITH NCHRP 350.
3. ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 42".
4. BRACING OF POST IS NOT PERMITTED.
5. SIGN SHALL BE LEVEL, AND UPRIGHT FOR THE DURATION OF INSTALLATION.
6. ERECT POSTS SO THE SIGN FACE AND SUPPORTS DO NOT VARY FROM PLUMB BY MORE THAN 3/16" IN 3'. PROVIDE A CENTER-TO-CENTER DISTANCE BETWEEN POSTS WITHIN 2 PERCENT OF PLAN DISTANCE.
7. NO MORE THAN ONE SPLICE PER POST, AS SHOWN, WILL BE PERMITTED.
8. POST TYPES SHALL NOT BE MIXED WITHIN A SIGN SUPPORT INSTALLATION.
9. NO VERTICAL JOINTS ARE PERMITTED IN SIGN. NO HORIZONTAL JOINTS THROUGH SIGN LEGEND OR SYMBOLS ARE PERMITTED IN SIGN
10. REMOVE SIGN POSTS AND/OR POST STUBS IN THEIR ENTIRETY WHEN NO LONGER REQUIRED.
11. ALL LABOR, MATERIALS, AND EQUIPMENT, INCLUDING TEMPORARY SUPPORTS REQUIRED TO INSTALL, MAINTAIN, RELOCATE, COVER, AND/OR REMOVE THE TEMPORARY SIGN, INCLUDING SUPPORTS, ARE CONSIDERED TO BE INCLUDED IN THE COST OF THE TEMPORARY SIGN.
12. SAW CUTS IN WOOD POSTS ARE TO BE PARALLEL TO THE BOTTOM OF THE SIGN.
13. POSTS SHALL NOT EXTEND MORE THAN 4" ABOVE TOP OF SIGN.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS DELIVERY STANDARD PLAN	PENDING FHWA APPROVAL DATE	8/2006 PLAN DATE	WZD-100-A	SHEET 11 of 11
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NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.

PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

KEY

- TRAFFIC REGULATOR
- CHANNELIZING DEVICES
- LIGHTED ARROW PANEL (CAUTION MODE)
- TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT

SIGN = 200 ft² - TYPE B PLUS ADDITIONAL R2-1's THROUGHOUT WORK AREA

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.

 Michigan Department of Transportation	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A TWO-LANE TWO-WAY ROADWAY WHERE ONE LANE IS CLOSED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION		
	TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL		
DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB	OCTOBER 2011 PLAN DATE:	M0140a	SHEET 1 OF 2
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0140a.dgn REV. 10/04/2011			

NOT TO SCALE

NOTES

- 1H. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES AND LENGTH OF LONGITUDINAL BUFFERS
SEE M0020a FOR "D" VALUES.
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4A. THE MAXIMUM RECOMMENDED DISTANCE(S) BETWEEN CHANNELIZING DEVICES IN THE TAPER AREA(S) SHOULD BE 15 FEET AND SHOULD BE EQUAL IN FEET TO TWICE THE POSTED SPEED IN MILES PER HOUR IN THE PARALLEL AREA(S).
5. FOR OVERNIGHT CLOSURES, TYPE III BARRICADES SHALL BE LIGHTED.
6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
9. ALL TRAFFIC REGULATORS SHALL BE PROPERLY TRAINED AND SUPERVISED.
- 9A. IN ANY OPERATION INVOLVING MORE THAN ONE TRAFFIC REGULATOR, ONE PERSON SHOULD BE DESIGNATED AS HEAD TRAFFIC REGULATOR.
10. ALL TRAFFIC REGULATORS' CONDUCT, THEIR EQUIPMENT, AND TRAFFIC REGULATING PROCEDURES SHALL CONFORM TO THE CURRENT EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CURRENT EDITION OF THE MDOT HANDBOOK ENTITLED "TRAFFIC REGULATORS INSTRUCTION MANUAL."
11. WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS, APPROPRIATE LIGHTING SHALL BE PROVIDED TO SUFFICIENTLY ILLUMINATE THE TRAFFIC REGULATOR'S STATIONS.
- 12E. THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS SHALL BE NO MORE THAN 2 MILES IN LENGTH UNLESS RESTRICTED FURTHER IN THE SPECIAL PROVISIONS FOR MAINTAINING TRAFFIC. ALL SEQUENCES OF MORE THAN 2 MILES IN LENGTH WILL REQUIRE WRITTEN PERMISSION FROM THE ENGINEER BEFORE PROCEEDING.
13. WHEN INTERSECTING ROADS OR SIGNIFICANT TRAFFIC GENERATORS (SHOPPING CENTERS, MOBILE HOME PARKS, ETC.) OCCUR WITHIN THE ONE-LANE TWO-WAY OPERATION, INTERMEDIATE TRAFFIC REGULATORS AND APPROPRIATE SIGNING SHALL BE PLACED AT THESE LOCATIONS.
14. ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W3-4 SIGNS.
15. THE HAND HELD (PADDLE) SIGNS REQUIRED BY THE MMUTCD TO CONTROL TRAFFIC WILL BE PAID FOR AS PART OF FLAG CONTROL.
- 28E. THE TRAFFIC REGULATORS SHOULD BE POSITIONED AT OR NEAR THE SIDE OF THE ROAD SO THAT THEY ARE SEEN CLEARLY AT A MINIMUM DISTANCE OF 500 FEET. THIS MAY REQUIRE EXTENDING THE BEGINNING OF THE LANE CLOSURE TO OVERCOME VIEWING PROBLEMS CAUSED BY HILLS AND CURVES.

SIGN SIZES

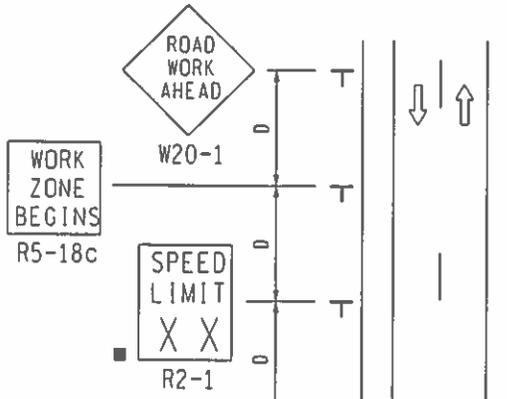
DIAMOND WARNING - 48" x 48"
 R2-1 REGULATORY - 48" x 60"
 R5-18c REGULATORY - 48" x 48"

NOT TO SCALE

 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A TWO-LANE TWO-WAY ROADWAY WHERE ONE LANE IS CLOSED UTILIZING TRAFFIC REGULATORS, NO SPEED REDUCTION
DRAWN BY: CON:AE:djf	OCTOBER 2011
CHECKED BY: BMM:CRB	PLAN DATE:
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0140a.dgn	REV. 10/04/2011
M0140a	SHEET 2 OF 2

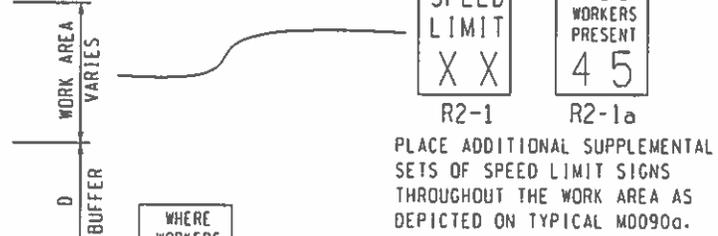
KEY

- • • CHANNELIZING DEVICES
-  LIGHTED ARROW PANEL (CAUTION MODE)
-  TRAFFIC FLOW
- ▲ SEE SHEET 2 OF 2
- REFLECTS EXISTING SPEED LIMIT
- * USE THE W20-1a PLAQUE WHEN SHOULDER CLOSURE EXCEEDS 1 MILE IN LENGTH



PLACE THROUGHOUT WORK AREA AS INDICATED AND AFTER ALL MAJOR CROSSROADS IF PERMANENT SIGNS ARE NOT IN PLACE.

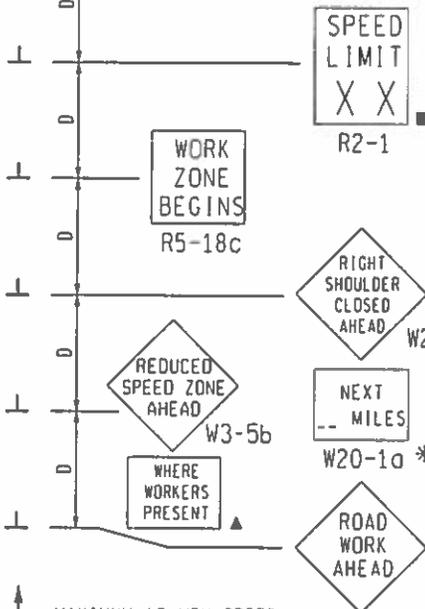
PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.



PLACE ADDITIONAL SUPPLEMENTAL SETS OF SPEED LIMIT SIGNS THROUGHOUT THE WORK AREA AS DEPICTED ON TYPICAL M0090a.

SIGN = 168 ft2 - TYPE B
W/W20-1a PLAQUE = 180 ft2 - TYPE B
PLUS ADDITIONAL SPEED LIMIT SIGNING THROUGHOUT WORK AREA

PLACE THIS SIGN ALONG WITH THE ADVANCE WORK ZONE SIGNING AS DEPICTED ON THE APPROPRIATE TYPICAL M0030a-M0080a.



MAXIMUM 10 MPH SPEED REDUCTION THIS DIRECTION. W20-1 TTCO REQUIRED THIS DIRECTION.

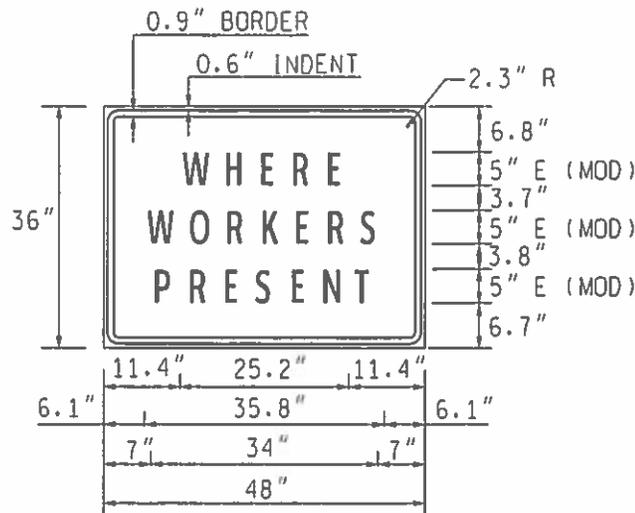
 Michigan Department of Transportation TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A SHOULDER CLOSURE ON AN UNDIVIDED ROADWAY USING A REDUCED SPEED LIMIT WHERE WORKERS PRESENT IN ONE DIRECTION ONLY		
	DRAWN BY: CON:AE:djf	OCTOBER 2011	M0130a
	CHECKED BY: BMM:CRB	PLAN DATE:	
	FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0130a.dgn	REV.	10/04/2011

NOT TO SCALE

SHEET 1 OF 2

NOTES

- 1G. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES AND LENGTH OF LONGITUDINAL BUFFERS
1/3 L = MINIMUM LENGTH OF TAPER
SEE M0020a FOR "D" AND "L" VALUES
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- 3A. THE "WORK ZONE BEGINS" (R5-18c) SIGN SHALL BE USED ONLY IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE SHALL OMIT THIS SIGN AND THE QUANTITIES SHALL BE ADJUSTED APPROPRIATELY.
- 4D. THE SPACING OF CHANNELIZING DEVICES SHOULD NOT EXCEED 45 FEET WHEN USED FOR TAPER CHANNELIZATION, AND SHOULD NOT EXCEED 90 FEET WHEN USED FOR TANGENT CHANNELIZATION.
5. FOR OVERNIGHT CLOSURES, TYPE III BARRICADES SHALL BE LIGHTED.
6. WHEN CALLED FOR IN THE FHWA ACCEPTANCE LETTER FOR THE SIGN SYSTEM SELECTED, THE TYPE A WARNING FLASHER, SHOWN ON THE WARNING SIGNS, SHALL BE POSITIONED ON THE SIDE OF THE SIGN NEAREST THE ROADWAY.
7. ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING REQUIREMENTS SHALL MEET NCHRP 350 CRASHWORTHLY REQUIREMENTS STIPULATED IN THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.
8. WHEN BUFFER AREAS ARE ESTABLISHED, THERE SHALL BE NO EQUIPMENT OR MATERIALS STORED OR WORK CONDUCTED IN THE BUFFER AREA.
- 29C. THE TYPE OF REFLECTIVE SHEETING USED FOR THE W20-1a PLAQUE AND THE "WHERE WORKERS PRESENT" PLAQUE SHALL BE THE SAME AS THE TYPE USED FOR THE PARENT SIGN.



COLORS

LEGEND AND BORDER - BLACK (NON-REFLECTORIZED)
BACKGROUND - ORANGE (REFLECTORIZED)

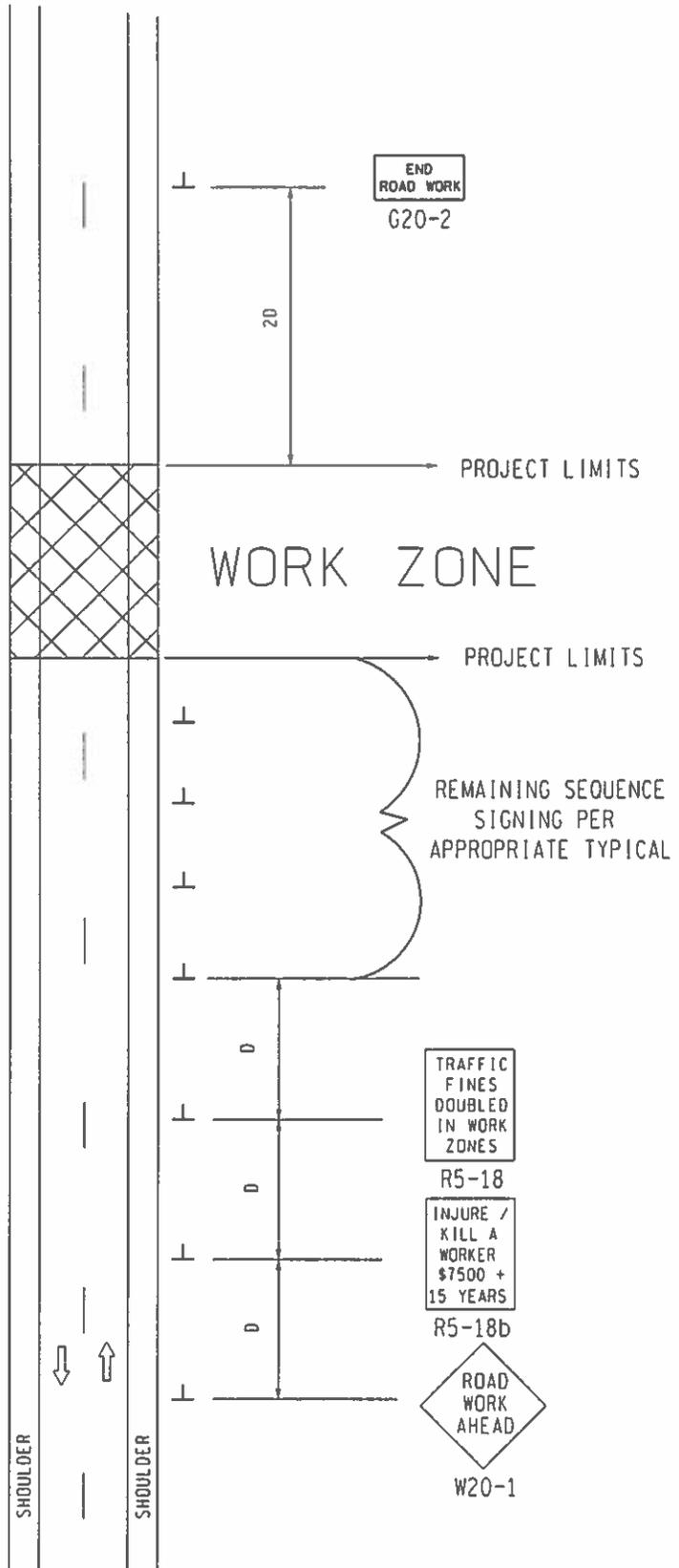
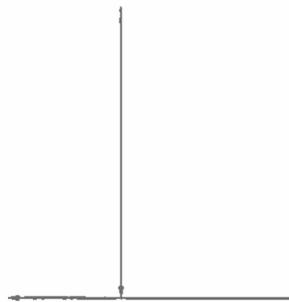
SIGN SIZES

DIAMOND WARNING	- 48" x 48"
"WORKERS PRESENT" PLAQUE	- 48" x 36"
W20-1a PLAQUE	- 48" x 36"
R2-1 REGULATORY	- 48" x 60"
R5-18c REGULATORY	- 48" x 48"

NOT TO SCALE

 TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL	TYPICAL TEMPORARY TRAFFIC CONTROL FOR A SHOULDER CLOSURE ON AN UNDIVIDED ROADWAY USING A REDUCED SPEED LIMIT WHERE WORKERS PRESENT IN ONE DIRECTION ONLY		
	DRAWN BY: CON:AE:djf	OCTOBER 2011	M0130a
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0130a.dgn REV. 10/04/2011			

SIGN PLACEMENT
IS THE SAME FOR
BOTH DIRECTIONS



SIGN = 48 f+2 - TYPE B
FOR ONE DIRECTION OF TRAFFIC
W20-1 QUANTITY INCLUDED WITH
APPROPRIATE TYPICAL FOR
SEQUENCE SIGNING

MDOT
Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC
TYPICAL

TYPICAL ADVANCE SIGNING TREATMENT FOR
INTERMEDIATE AND SHORT TERM
STATIONARY WORK ZONE OPERATIONS WHERE
ALL TRAFFIC CONTROL DEVICES ARE
REMOVED AT END OF EACH WORK DAY ON
AN UNDIVIDED TWO-WAY ROADWAY

DRAWN BY: CON:AE:djf	OCTOBER 2011	M0050a	SHEET 1 OF 2
CHECKED BY: BMM:CRB	PLAN DATE:		
FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0050a.dgn REV. 10/13/2011			

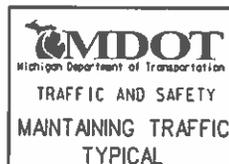
NOT TO SCALE

NOTES

30. THE APPROPRIATE ADVANCE SIGNING SEQUENCE(S), (M0030a THROUGH M0080a) SHALL BE USED ON ALL PROJECTS.
35. THESE SIGNS ARE INTENDED TO BE USED WITHIN THE LIMITS OF THE TEMPORARY SEQUENCE SIGNING AS IS SHOWN ON 1 OF 2. THESE SIGNS ARE NOT TO BE INTERMINGLED WITH ANY OTHER TEMPORARY SEQUENCE SIGNING EXCEPT AS SHOWN.

SIGN SIZES

G20-2	-	48" x 24"
R5-18	-	48" x 60"
R5-18b	-	48" x 60"
W20-1	-	48" x 48"



TYPICAL ADVANCE SIGNING TREATMENT FOR
INTERMEDIATE AND SHORT TERM
STATIONARY WORK ZONE OPERATIONS WHERE
ALL TRAFFIC CONTROL DEVICES ARE
REMOVED AT END OF EACH WORK DAY ON
AN UNDIVIDED TWO-WAY ROADWAY

DRAWN BY: CON:AE:djf

OCTOBER 2011

CHECKED BY: BMM:CRB

PLAN DATE:

M0050a

SHEET
2 OF 2

NOT TO SCALE

FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0050a.dgn REV. 10/13/2011

MINIMUM MERGING TAPER LENGTH "L" (FEET)

OFFSET FEET	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										TAPER LENGTH "L" IN FEET
	25	30	35	40	45	50	55	60	65	70	
1	10	15	20	27	45	50	55	60	65	70	
2	21	30	41	53	90	100	110	120	130	140	
3	31	45	61	80	135	150	165	180	195	210	
4	42	60	82	107	180	200	220	240	260	280	
5	52	75	102	133	225	250	275	300	325	350	
6	63	90	123	160	270	300	330	360	390	420	
7	73	105	143	187	315	350	385	420	455	490	
8	83	120	163	213	360	400	440	480	520	560	
9	94	135	184	240	405	450	495	540	585	630	
10	104	150	204	267	450	500	550	600	650	700	
11	115	165	225	293	495	550	605	660	715	770	
12	125	180	245	320	540	600	660	720	780	840	
13	135	195	266	347	585	650	715	780	845	910	
14	146	210	286	374	630	700	770	840	910	980	
15	157	225	307	400	675	750	825	900	975	1050	

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

"L" = $\frac{W \times S^2}{60}$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = S x W WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

- L = MINIMUM LENGTH OF MERGING TAPER
- S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
- W = WIDTH OF OFFSET

TYPES OF TAPERS

UPSTREAM TAPERS

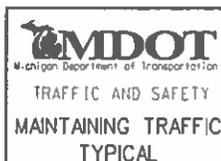
- MERGING TAPER
- SHIFTING TAPER
- SHOULDER TAPER
- TWO-WAY TRAFFIC TAPER

DOWNSTREAM TAPERS

(USE IS OPTIONAL)

TAPER LENGTH

- L - MINIMUM
- 1/2 L - MINIMUM
- 1/3 L - MINIMUM
- 100' - MAXIMUM
- 100' - MINIMUM (PER LANE)



TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf	JUNE 2006	M0020a	SHEET 1 OF 2
CHECKED BY: BMM	PLAN DATE:		
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DISTANCE BETWEEN TRAFFIC CONTROL DEVICES "D"
AND LENGTH OF LONGITUDINAL BUFFER SPACE ON
"WHERE WORKERS PRESENT" SEQUENCES

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)									
	25	30	35	40	45	50	55	60	65	70
D (FEET)	250	300	350	400	450	500	550	600	650	700

GUIDELINES FOR LENGTH OF
LONGITUDINAL BUFFER SPACE "B"

SPEED* MPH	LENGTH FEET
20	33
25	50
30	83
35	132
40	181
45	230
50	279
55	329
60	411
65	476
70	542

+ POSTED SPEED, OFF PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

1 BASED UPON AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS (A POLICY ON GEOMETRIC DESIGN OF HIGHWAY AND STREETS), AASHTO. THIS AASHTO DOCUMENT ALSO RECOMMENDS ADJUSTMENTS FOR THE EFFECT OF GRADE ON STOPPING AND VARIATION FOR TRUCKS.

MDOT
Michigan Department of Transportation
TRAFFIC AND SAFETY
MAINTAINING TRAFFIC
TYPICAL

TABLES FOR "L", "D" AND "B" VALUES

DRAWN BY: CON:AE:djf
CHECKED BY: BMM

JUNE 2006
PLAN DATE:

M0020a

SHEET
2 OF 2

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