

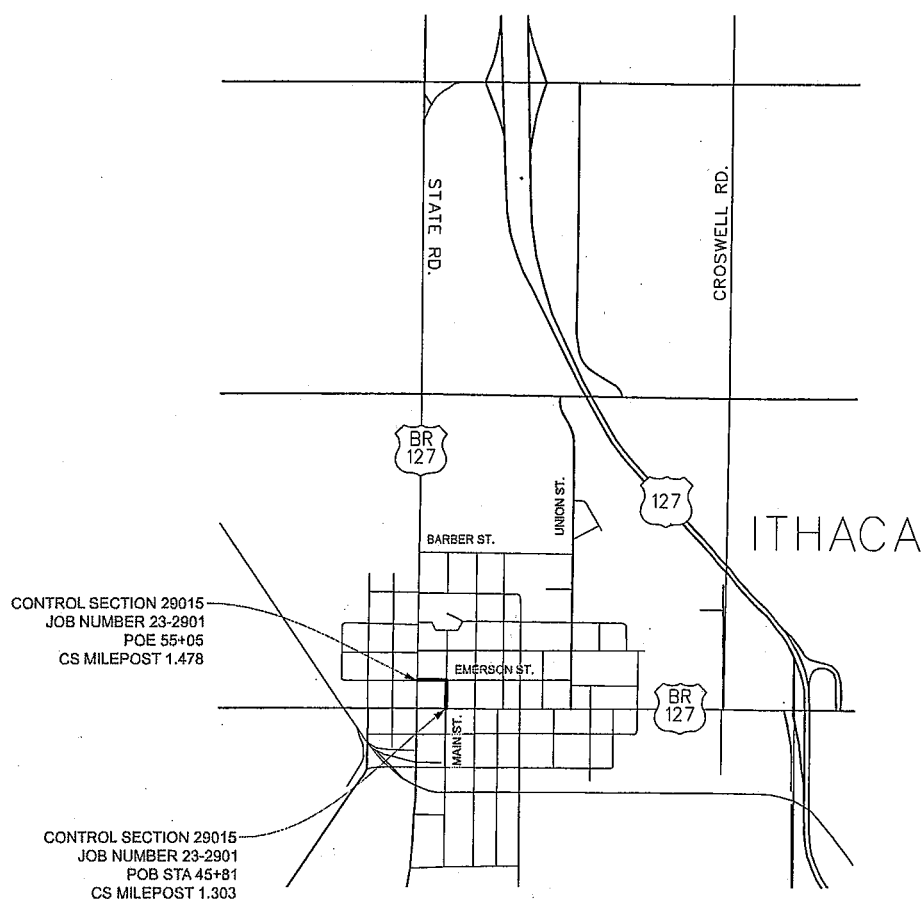
MICHIGAN DEPARTMENT OF TRANSPORTATION

US-127BR
ARCADA, EMERSON TOWNSHIP
GRATIOT



SECTION	CONTROL SEC	JOB NO.	FED AID PROJ
1	29015	23-2901	

TRAFFIC DATA				SPEED DATA			LIMITS
ROAD	YEAR	ADT	DHV	COMM	DESIGN	POSTED	
US-127BR	2021	1910	206	4%	30	25	CENTER TO EMERSON



THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2020 STANDARD SPECIFICATIONS FOR CONSTRUCTION. PHYSICAL ROAD NUMBER (PR#) & MILEPOST (MP) DATA ARE FROM MICHIGAN GEOGRAPHIC FRAMEWORK VERSION # 21.

MILES: 0.175
CONTRACT FOR:
HMA COLD MILLING AND HMA OVERLAY

BRADLEY C. WIEFERICH, P.E. - ACTING DIRECTOR



NO SCALE

DESIGN UNIT: ATKINSON

CS: 29015

JN: 23-2901

TSC: MT. PLEASANT

TITLE SHEET

DATE: 03/24/23

DRAWING SHEET

SECT

FILE:

LOG OF PROJECT

Page 2 of 8

C.S. 29015
J.N. 23-2901

PROGRESS SCHEDULE

Work may begin immediately after receiving approval from MDOT. Work must begin no earlier than July 10th, 2023 and be completed by August 15th, 2023. Work must be completed within 6 consecutive workdays, weather dependent. The workdays do not include Saturday and Sunday. Notice must be provided to Jason Potts at 989-737-0211 seven (7) calendar days prior to beginning any work.

JOB LOCATION

US-127BR: Begins in the City of Ithaca, Gratiot County on US-127BR 54 feet north of the centerline of Center Street on Main Street and continues northerly to Emerson Street where it turns to the west continues westerly until it ends 51 feet east of the centerline of Pine River Street.

CS 29015

P.O.B = C.S. Mile Point 1.303

P.O.E = C.S. Mile Point 1.478

P.O.B. Station = 45+81

P.O.E. Station = 55+05

Location Length = 0.175 miles

DESCRIPTION OF WORK

The work shall consist of a 1.5" uniform cold mill and single course HMA overlay for the entire width of the pavement from the POB to the POE. At cross streets, the milling and resurfacing limits shall be defined as a straight line from curb face to curb face at the existing joint line for the approach street.

Drainage structures and monument boxes within the resurfacing limits shall be plated or coated with a bond breaking agent prior to the placement of HMA, 5EL, High Stress, and adjusted to final grade after the completion of the proposed HMA overlay.

Traffic will be maintained as described in the Maintaining Traffic section contained in this proposal.

COORDINATING WITH OTHER NEARBY MDOT WORK

The Contractor shall coordinate his operations with contractors performing work on other projects within or adjacent to the Construction Influence Area (CIA) as described below.

- JN 211418A, Milling, HMA overlay and sidewalk ramp upgrades from Emerson Street north on US-127BR (Pine River Avenue) to Barber Street, City of Ithaca, Gratiot County. Project scheduled for summer 2023.

LOG OF PROJECT

Page 3 of 8

C.S. 29015
J.N. 23-2901

ESTIMATED QUANTITIES

The quantities included in the summations below are approximate and for reference only. Contractor will be responsible for verifying quantities before bidding by site inspection and plan review. If any major discrepancies are noted, contractor must contact Mike Loynes at (989) 621-0286.

This project is a Maintenance funded project, which means that there will be absolutely no overpayment or extras. All material, labor and mobilization shall be included in the bid.

MDOT will have the low bid reviewed and approved for funding. MDOT reserves the right to reject any bid that appears to be unqualified. Before award, MDOT may request a site and plan review meeting with the low bid contractor.

Items of Work (for information only)

Cold Milling HMA Surface	5,200	Syd
HMA, 5EL, High Stress	430	Ton
*Dr Structure Cover, Adj, Case 1, Modified	11	Ea
Pavt Mrkg, Ovly Cold Plastic, 6 inch, Crosswalk	96	Ft
Pavt Mrkg, Ovly Cold Plastic, Lt Turn Arrow Sym	2	Ea
Pavt Mrkg, Ovly Cold Plastic, Rt Turn Arrow Sym	3	Ea
Pavt Mrkg, Ovly Cold Plastic, Thru and Lt Turn Arrow Sym	3	Ea
Pavt Mrkg, Ovly Cold Plastic, Thru and Rt Turn Arrow Sym	1	Ea
Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar	28	Ft
Pavt Mrkg, Waterborne, 6 inch, White	720	Ft
Pavt Mrkg, Waterborne, 6 inch, Yellow	1,610	Ft
Witness, Log, Layout, \$1,250.00	1,250	Dlr
Recessing Pavt Mrkg, Longit	2,330	Ft
Channelizing Device, 42 inch, Fluorescent, Furn	50	Ea
Channelizing Device, 42 inch, Fluorescent, Oper	50	Ea
Lighted Arrow, Type C, Furn	2	Ea
Lighted Arrow, Type C, Oper	2	Ea
Minor Traf Devices	1	LSUM
Sign, Type B, Temp, Prismatic, Furn	514	Sft
Sign, Type B, Temp, Prismatic, Oper	514	Sft

*There are six manholes and five monitor wells that are located within cold-milling area. The necessary work around these structures is described in the special provision for "Dr Structure Cover, Adj, Case 1, Modified".

LOG OF PROJECT

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C.S. 29015
J.N. 23-2901

MAINTAINING TRAFFIC

Traffic Restrictions

Maintaining traffic will be accomplished with traffic shifts and traffic regulators utilizing the following Maintaining Traffic Typical

101-GEN-SPACING-CHARTS
102-GEN-NOTES
103-GEN-SIGN
104-GEN-AB
106-GEN-SPEED-NFW
123-NFW-1LC-(R)
124-NFW-2(R+L)LC-SHIFT

Additionally, traffic shall be maintained according to Sections 104.07, 104.11, and 812 of the 2020 Standard Specifications for Construction, including any Supplemental Specifications, and as specified herein.

Access on side streets may need to be restricted, prohibiting turning movements during stages of construction on Emerson and Main Street to ensure the safety of workers and the motoring public. This will be allowed at the approval of the engineer. Additional quantities have been included to cover this work.

Sign covers shall be placed over any regulatory, warning, or construction signs that are not applicable during construction.

The Contractor shall not create any unsafe conditions within the Construction Influence Area (CIA) that form a hazard for motorists. The CIA shall extend as far as the required advanced construction signing, or any other signs pertaining to this location. Extra caution should be used when delineating the work zone overnight to protect the roadway users.

No work shall be performed, or lane closures allowed during the Labor Day holiday period. The Labor Day holiday period shall be defined as beginning on Friday, September 1st through Tuesday, September 5th.

The Contractor shall maintain traffic on all intersecting driveways at all times. Crossroads shall remain open to traffic at all times. Additional traffic regulators shall be used at unsignalized intersections and driveways, as directed by the Engineer. Payment for these items shall be included in the lump sum price for the project.

All lanes shall be flush with each other at the end of each workday.

Traffic will not be allowed on any cold milled surface other than for crossing. Maintenance of the cold milled surface is the responsibility of the Contractor, and any costs associated with such maintenance shall be included in the lump sum price for the project.

LOG OF PROJECT

Page 5 of 8

C.S. 29015

J.N. 23-2901

No weekend work unless approved by the Engineer. Weekend work is defined as Friday through Sunday. All lanes and shoulders shall be open to traffic unless work is in progress which prohibits opening of lanes due to safety or other reasons approved by the Engineer.

Once work is initiated that includes any lane restrictions, that work shall be continuous until completed.

The storage restrictions in section 812.03.G.5 of the 2020 Standard Specifications for Construction will be strictly adhered to. The Contractor shall not park any vehicle or store any material on public recreational property.

Daily maintenance of traffic control items will not be paid for separately but will be included in the lump sum price for the project.

Control Section 29015

Charter Communications

221 Ellis Place

Mt. Pleasant, Michigan 48858

Ph: 989-621-0505(W)

Attn: Bryon Carroll

Cable

City of Ithaca

129 W. Emerson St.

Ithaca, Michigan 48847

Ph: 989-875-3200 (W)

Attn: Chris Younger *Jamey Conn*

Other

Consumers Energy

1945 West Parnall Road, P12-208A

Jackson, Michigan 49201

Ph: 517-788-0817(W)

Attn: Pete Mulhearn

Electric

Consumers Energy

1325 Wright Avenue

Alma, Michigan 48801

Ph: 517-285-4629(W)

Attn: Erica Baumann

Electric

Consumers Energy

2400 Weiss Street

Saginaw, Michigan 48602

Ph: 989-791-5918(W)

Attn: Ben Lewis

Gas

LOG OF PROJECT

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C.S. 29015
J.N. 23-2901

DTE Energy / MichCon Gas
609 Bjornson
Big Rapids, MI 49307
Ph: 231-592-3244(W)
Attn: Larry Bourke

Gas

Everstream
1781 Holloway Drive
Holt, MI 48842
Ph: 517-742-4020 (W)
Attn: Clarise Jackson

Telecom

Frontier Communications
345 Pine Avenue
Alma, Michigan 48801
Ph: 989-463-5497(W)
Attn: Doug Hovey

Telecom

Gratiot County Drain Commissioner
904 East Center Street
Ithaca, Michigan 48847
Ph: 989-875-5207(W)
Attn: Bernard Barnes

County Drain

Point Broadband Fiber
617 E. Lake St
Stanton, Michigan 48888
Ph: 989-330-6384(W)
Attn: Josh White

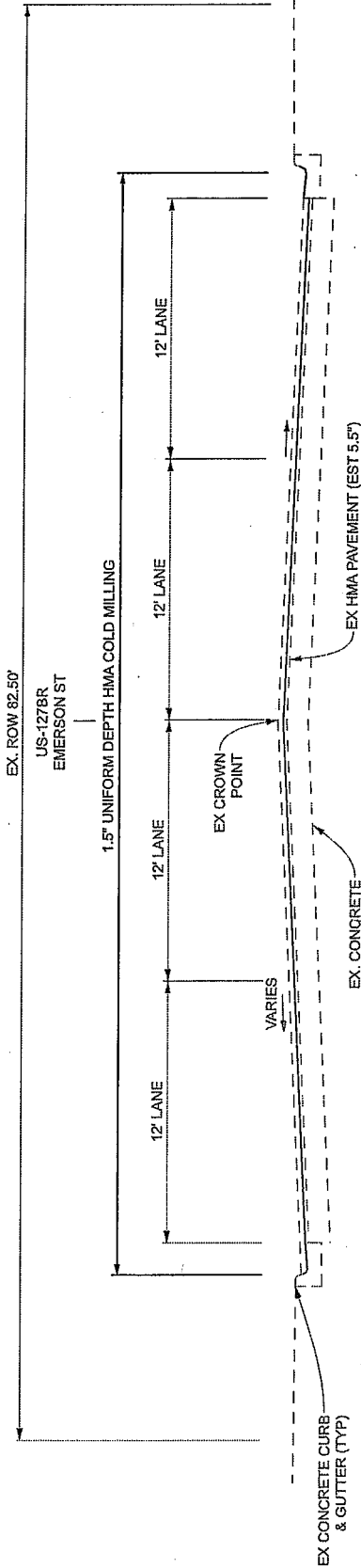
Telecom

Windstream KDL
800 N. Durand Rd
Corunna, MI 48817
Ph: 812-253-1553 (W)
Attn: Chris Rogers

Telecom

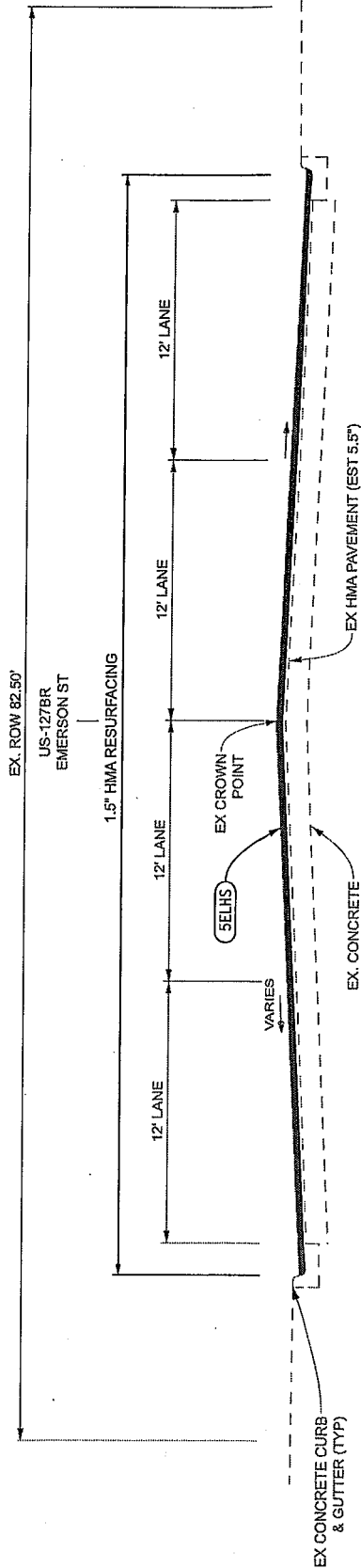
Wolverine Pipe Line Company
8075 Creekside Drive, Suite 210
Portage, Michigan 49024
Ph: 269-323-2491x124(W)
Attn: Louis Kraus

Gas



EXISTING NORMAL SECTION

SECTION APPLIES TO:
STA 45+81 (POB) TO STA 50+06



PROPOSED NORMAL SECTION

SECTION APPLIES TO:
STA 45+81 (POB) TO STA 50+06

HMA APPLICATION ESTIMATE

IDENT. NO.	ITEM	RATE LBS PER SYD	PERFORMANCE GRADE	REMARKS
SELHS	HMA, 5EL, HIGH STRESS	165	64-28	TOP COURSE, AWI = 260
	* BOND COAT	0.05-0.15 GAL		

* FOR INFORMATION ONLY



NO SCALE

DATE: 03/24/23

DESIGN UNIT: ATKINSON

TSC: MT. PLEASANT

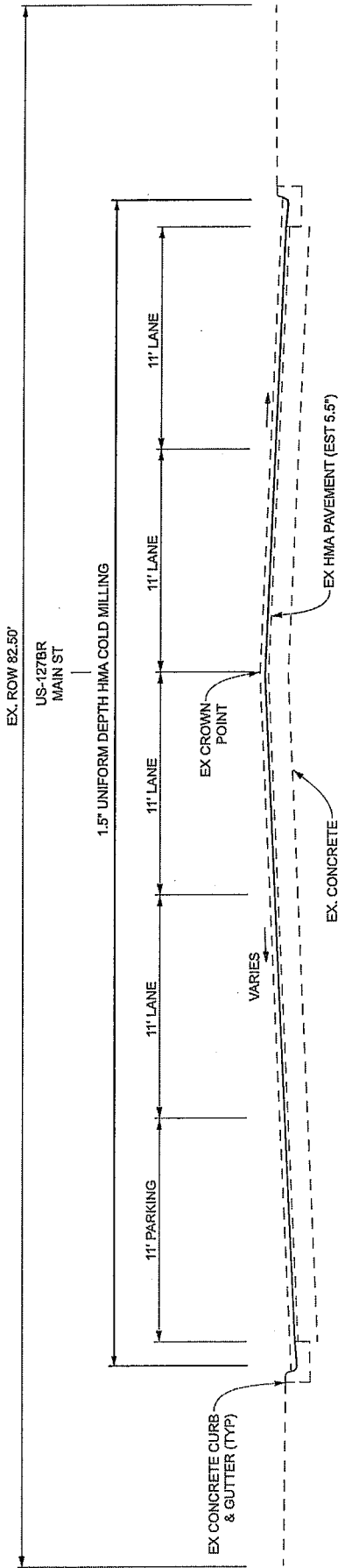
CS: 29015

JN: 23-2901

US-127BR
TYPICAL CROSS SECTIONS

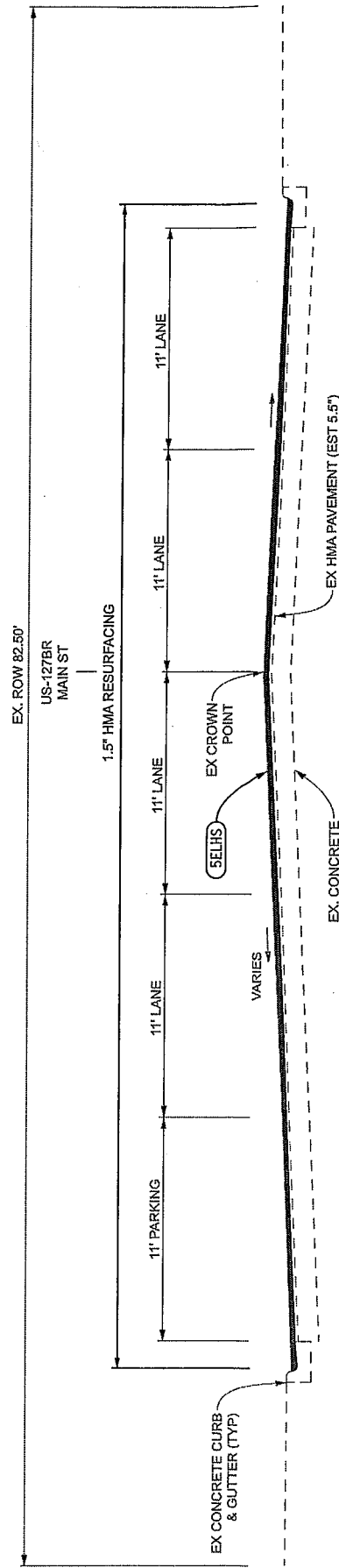
DRAWING SHEET
TYP1
SECT

FILE:



EXISTING NORMAL SECTION

SECTION APPLIES TO:
STA 50+06 TO STA 55+06 (POE)



PROPOSED NORMAL SECTION

SECTION APPLIES TO:
STA 50+06 TO STA 55+06 (POE)



NO SCALE

DATE: 03/24/23

DESIGN UNIT: ATKINSON

TSC: MT, PLEASANT

CS: 29015

JN: 23-2901

US-127BR

TYPICAL CROSS SECTIONS

DRAWING SHEET

SECT

TYP2

FILE:

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
ADJUSTING DRAINAGE STRUCTURE, CASE 1, MODIFIED

CFS:DMG

1 of 3

APPR:TES:DBP:03-08-22

FHWA:APPR:03-22-22

a. Description. This work consists of adjusting drainage structures, including utility manhole covers, in accordance with section 403 of the Standard Specifications for Construction, as shown on the plans, as directed by the Engineer, and as stated herein.

b. Materials. Furnish materials in accordance with subsection 403.02 of the Standard Specifications for Construction with the following exceptions:

Furnish Concrete, Grade 3500 or Grade P-NC as directed by the Engineer in accordance with sections 1004 and 1006 of the Standard Specifications for Construction, respectively. Furnish epoxy anchored lane ties in accordance with section 914 of the Standard Specifications for Construction. Ensure the lane ties are #5 bar size with a nominal length of 18 inches. Ensure the circular bar for the rotary cut application is epoxy coated #5 bar of a diameter that will center it between the structure cover and the existing surrounding pavement. Select epoxy for anchoring lane ties into the concrete from section 712.03J of the Qualified Products List. Furnish hot-poured joint sealant in accordance with section 914 of the Standard Specifications for Construction.

For concrete curb, concrete curb and gutter, or concrete traffic island repairs furnish materials in accordance with the standard specifications.

c. Construction. For structures within the pavement area remove pavement adjacent to the drainage structure cover using a rotary or sawing method. When using a rotary coring method, remove a minimum 4 foot diameter section of pavement around the drainage structure frame and cover. If the frame outside diameter measurement is greater than 36 inches, use a rotary coring head to remove a minimum 4.5 foot diameter section of pavement. When using a sawing method, saw cut clean and remove a 6 foot by 6 foot pavement square.

For structures within the curb line, saw cut and remove a 4 foot by 6 foot section of pavement around the frame with the 6 foot dimension measured along the curb line. Remove curb and/or curb and gutter associated with the adjustment of structures, as directed by the Engineer.

For structures located adjacent to concrete traffic control islands, remove concrete island full-width or up to 6 feet wide to facilitate adjustment of the drainage structure cover frame, as directed by the Engineer.

Prior to setting the frame, compact exposed soil using a method approved by the Engineer.

Support the cover frame over the structure matching the adjacent roadway cross slope. Secure the frame in-place to allow for placement of concrete using brick or block as required on a full bed of mortar without altering frame position.

Install epoxy anchored lane ties in accordance with section 603 of the Standard Specifications for Construction to anchor the concrete to adjacent composite pavement. Install circular epoxy coated bar as detailed herein. For structures within the pavement area, replace pavement around the frame with Concrete, Grade 3500 or Grade P-NC as directed by the Engineer matching the finished elevation and cross-slope of the roadway. Construct plane of weakness joint as directed by the Engineer.

For structures within the curb line, replace pavement around the frame with Concrete, Grade 3500 or Grade P-NC as directed by the Engineer and HMA top course as shown on the detail herein. Install epoxy anchored lane ties to anchor the concrete to adjacent composite pavement for curb drainage structures located in curbed areas. Replace concrete curb, concrete curb and gutter, or concrete traffic control islands in-kind in accordance with Standard Plan R-30 Series and section 802 of the Standard Specifications for Construction.

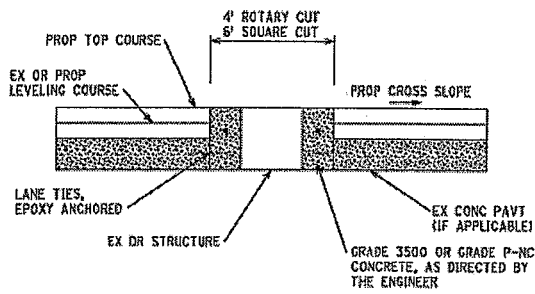
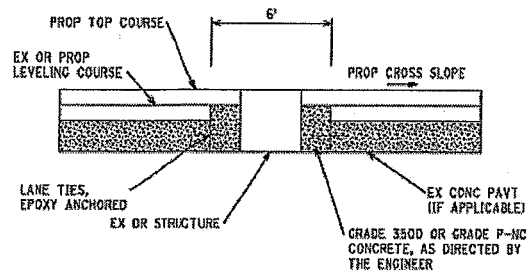
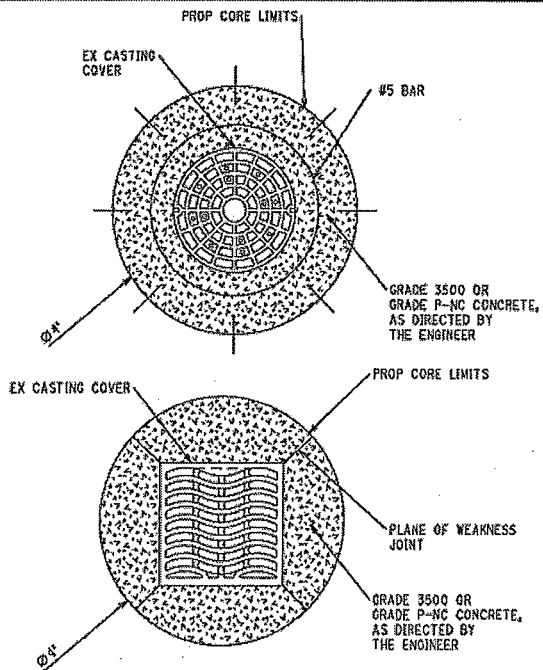
Immediately remove any debris that falls into drainage structures or other utility manholes due to Contractor operations.

Ensure saw overcuts are cleaned and sealed with hot-poured joint sealant.

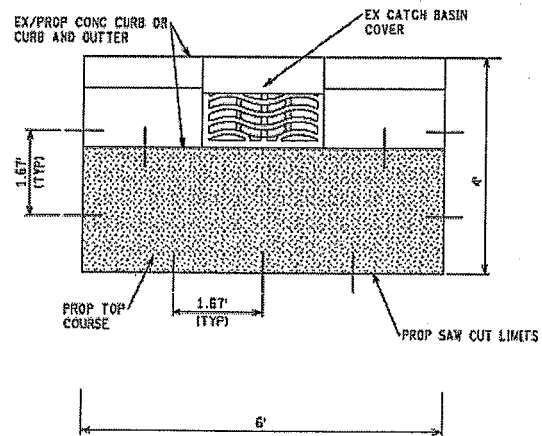
d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Dr Structure Cover, Adj, Case 1, Modified	Each

Dr Structure Cover, Adj, Case 1, Modified includes furnishing all materials, saw cutting, removal and disposal of existing pavement and curb or curb and gutter, adjustment of cover to required elevation and cross-slope, installation of epoxy anchored lane ties and epoxy coated circular bars, placement and finishing of new curb or curb and gutter, placement and finishing of new concrete and HMA, placement and removal of temporary HMA wedging for maintaining traffic, if required, placement of cover on open structures to prevent accumulation of debris and cleaning existing drainage structures due to Contractor operations.

**PAVEMENT AREAS - ELEVATION VIEW****CURBED AREAS - ELEVATION VIEW****PAVEMENT AREAS - PLAN VIEW**

PAVEMENT REMOVAL AND REPAIR DETAIL FOR
DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED

**CURBED AREAS - PLAN VIEW**

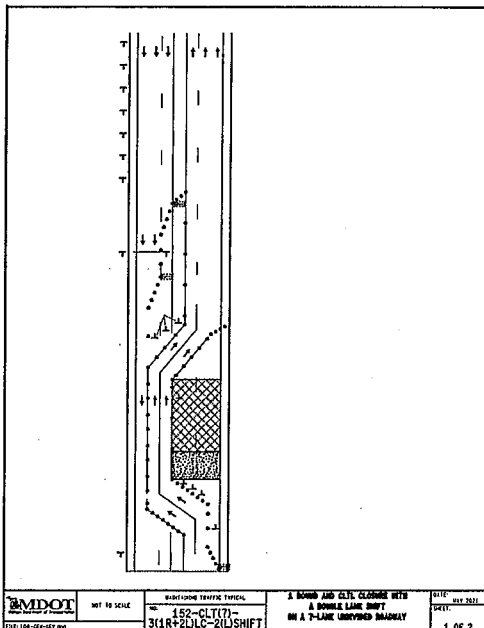
PAVEMENT REMOVAL AND REPAIR DETAIL FOR
DR STRUCTURE COVER, ADJ, CASE 1, MODIFIED

TYPICAL NUMBER KEY

CODES

AB = ARROW BOARD
 AW = ADVANCE WARNING
 C = CLOSURE
 CLT = CENTER LEFT TURN LANE
 CROSS = CROSSOVER
 CruSha = CRUSH AND SHAPE
 EM = EARLY MERGE
 EnR = ENTRANCE RAMP
 ExR = EXIT RAMP
 FW = FREEWAY
 GEN = GENERAL INFORMATION
 GORE = FREEWAY GORE AREA
 IN = INSIDE
 INT = INTERSECTION
 L = LANE
 (L) = LEFT
 LC = LANE CLOSURE
 LD = LONG DURATION

LO = LANE OPEN
 O = OUTSIDE (LANE CLOSURE)
 OUT = OUTSIDE OF SHOULDER
 MID = MIDDLE OF INTERSECTION OR ROAD
 NFW = NON-FREEWAY
 PARK = PARKING LANE
 PCMS = PORTABLE CHANGEABLE MESSAGE SIGN
 (R) = RIGHT
 ROLL = ROLLING ROADBLOCK
 RUM = RUMBLE STRIP
 SD = SHORT DURATION
 SHL = SHOULDER CLOSURE
 SIGN = SIGN
 SP = SPECIAL
 SPEED = SPEED
 STA = STOPPED TRAFFIC ADVISORY
 TR = TRAFFIC REGULATOR
 TS = TEMPORARY SIGNAL
 ZIP = ZIPPER MERGE



- 100 - GENERAL NOTES
- 110 - TRAFFIC REGULATORS
- 120 - NON-FREEWAY
- 130 - CENTER LEFT TURN (CLT) LANES
- 140 - PARKING LANES
- 150 - CLT 7 LANE SECTIONS
- 160 - SIGNAL WORK
- 200 - FREEWAY CLOSURES
- 210 - FREEWAY LANE SHIFTS
- 220 - FREEWAY ENTRANCE RAMP
- 230 - FREEWAY EXIT RAMP
- 300 - ADVANCE WARNINGS
- 310 - CROSSOVER CLOSURE
- 320 - CRUSH AND SHAPE
- 340 - MERGE SYSTEMS
- 350 - GORE LOCATIONS
- 360 - ROLLING ROADBLOCK
- 4000 - MAINTENANCE
- 5000 - SURVEY

EXAMPLE TYPICAL

CODE: 152-CTL(7)-3(1R+2L)LC-2(L)SHIFT

152 - TYPICAL NUMBER

CTL(7) = CENTER LEFT TURN LANE, 7 LANES TOTAL.

3(1R+2L)LC = 3 LANES CLOSED, (1 RIGHT LANE AND 2 LEFT LANES).

2(L)SHIFT = 2 LANES SHIFTED TO THE LEFT.

NOT TO SCALE



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO:

100-GEN-KEY

TYPICAL NUMBERING KEY

DATE:
DECEMBER 2021
SHEET:

1 OF 1

FILE: 100-GEN-KEY.dgn

DISTANCE BETWEEN TRAFFIC SIGNS, "D"

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
D (FEET)	250	300	350	400	450	500	550	600	650	700	750

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE, "B"

"B" LENGTHS	SPEED*, MPH (PRIOR TO WORK AREA)											
	20	25	30	35	40	45	50	55	60	65	70	75
B (FEET)	33	50	83	132	181	230	279	329	411	476	542	625

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

MINIMUM MERGING TAPER LENGTH, "L" (FEET)

OFFSET (FEET)	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
1	11	15	21	27	45	50	55	60	65	70	75
2	21	30	41	54	90	100	110	120	130	140	150
3	32	45	62	80	135	150	165	180	195	210	225
4	42	60	82	107	180	200	220	240	260	280	300
5	53	75	103	134	225	250	275	300	325	350	375
6	63	90	123	160	270	300	330	360	390	420	450
7	73	105	143	187	315	350	385	420	455	490	525
8	84	120	164	214	360	400	440	480	520	560	600
9	94	135	184	240	405	450	495	540	585	630	675
10	105	150	205	267	450	500	550	600	650	700	750
11	115	165	225	294	495	550	605	660	715	770	825
12	125	180	245	320	540	600	660	720	780	840	900
13	136	195	266	347	585	650	715	780	845	910	975
14	146	210	286	374	630	700	770	840	910	980	1050
15	157	225	307	400	675	750	825	900	975	1050	1125

NOT TO SCALE



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO: 101-GEN-
SPACING-CHARTS

"B", "D" AND "L" TABLES
CHANNELIZING DEVICE SPACING,
SIGN BORDER KEY, AND ROLL-AHEAD SPACING

DATE: MAY 2021

SHEET:
1 OF 3

FILE: 101-GEN-SPACING-CHARTS.dgn

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" = W X S 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
2 TO 1 LANE ROAD TAPER

TAPER LENGTH

L - MINIMUM
1/2 L - MINIMUM
1/3 L - MINIMUM
100' - MAXIMUM

DOWNSTREAM TAPERS (USE IS RECOMMENDED)

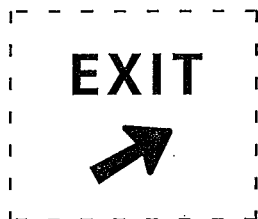
100' (PER LANE)

MAXIMUM SPACING FOR CHANNELIZING DEVICES

WORK ZONE SPEED LIMIT	DRUM AND 42" DEVICE SPACING (FT)		NIGHTTIME 42" DEVICE SPACING (FT)	
	TAPER	TANGENT	TAPER	TANGENT
< 45 MPH	1 x SPEED LIMIT	2 x SPEED LIMIT	25 FEET	50 FEET
≥ 45 MPH	50 FEET	100 FEET	25 FEET	50 FEET

SIGN OUTLINE KEY

DASHED OUTLINES INDICATE A SIGN THAT EXISTS ON SITE, AND NEEDS TO BE COVERED.



SOLID OUTLINES INDICATE A SIGN THAT IS TO BE PLACED ON THE PROJECT



NOT TO SCALE



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO: 101-GEN-SPACING-CHARTS

"B", "D" AND "L" TABLES
CHANNELIZING DEVICE SPACING
SIGN BORDER KEY AND ROLL-AHEAD SPACING

DATE: MAY 2021

SHEET: 2 OF 3

FILE: 101-GEN-SPACING-CHARTS.dgn

GUIDELINES FOR ROLL-AHEAD DISTANCES FOR TMA VEHICLES - TEST LEVEL 2

WEIGHT OF TMA VEHICLE	PREVAILING SPEED (POSTED SPEED PRIOR TO WORK ZONE)	ROLL-AHEAD DISTANCE* (DISTANCE FROM FRONT OF TMA VEHICLE TO WORK AREA)
5.5 TONS (STATIONARY)	40 MPH OR LESS	25 FT

* ROLL-AHEAD DISTANCES ARE CALCULATED USING A 4,410 POUND IMPACT VEHICLE WEIGHT.

GUIDELINES FOR ROLL-AHEAD DISTANCES FOR TMA VEHICLES - TEST LEVEL 3

WEIGHT OF TMA VEHICLE	PREVAILING SPEED (POSTED SPEED PRIOR TO WORK ZONE)	ROLL-AHEAD DISTANCE* (DISTANCE FROM FRONT OF TMA VEHICLE TO WORK AREA)
5 TONS (MOBILE)	45 MPH	100 FT
	50-55 MPH	150 FT
	60-75 MPH	175 FT
12 TONS (STATIONARY)	45 MPH	25 FT
	50-55 MPH	25 FT
	60-75 MPH	50 FT

* ROLL-AHEAD DISTANCES ARE CALCULATED USING A 10,000 POUND IMPACT VEHICLE WEIGHT.



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO: 101-GEN-
SPACING-CHARTS

"B", "D" AND "L" TABLES
CHANNELIZING DEVICE SPACING
SIGN BORDER KEY AND ROLL AHEAD SPACING

DATE: MAY 2021

SHEET:

3 OF 3

THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

GENERAL NOTES

- G1: SEE GEN-SPACING-CHARTS FOR COMMON VALUES INCLUDING:
D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
L = MINIMUM LENGTH OF TAPER
B = LENGTH OF LONGITUDINAL BUFFER
ROLL AHEAD DISTANCE
- G2: DISTANCE BETWEEN SIGNS, "D", THE VALUES FOR WHICH ARE SHOWN IN TYPICAL GEN-KEY ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.
- G3: ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING MUST MEET NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP 350) TEST LEVEL 3, OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) TL-3 AS WELL AS 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.
- G4: DO NOT STORE EQUIPMENT, MATERIALS OR PERFORM WORK IN ESTABLISHED BUFFER AREAS.
- G5: ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERN. EXCEPTION WILL BE MADE FOR TRAFFIC PATTERNS FOR WORK LESS THAN THREE DAYS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.

SIGN NOTES

- S1: ALL NON-APPLICABLE SIGNING WITHIN THE CIA MUST BE MODIFIED TO FIT CONDITIONS, COVERED, OR REMOVED. FOR GUIDANCE SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, SECTIONS 6.01.09 AND 6.01.10.
- S2: R5-18b SIGNS ARE ONLY REQUIRED ON FREEWAY PROJECTS WITH A DURATION OF 15 DAYS OR LONGER OR NON-FREEWAY PROJECTS WITH A DURATION OF 90 DAYS OR LONGER. TO APPLY THIS TYPICAL WITHOUT R5-18b SIGNS, REMOVE THE SIGNS AND CONSOLIDATE THE SEQUENCE AS APPROPRIATE.
- S3: R5-18c IS ONLY REQUIRED IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. OMIT THIS SIGN IN SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE.
- S4: ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W20-5 SIGNS.
- S5: PLACE ADDITIONAL SPEED LIMIT SIGNS REFLECTING THE WORK ZONE SPEED AFTER EACH MAJOR CROSSROAD THAT INTERSECTS THE WORK ZONE, OR AFTER EACH ENTRANCE RAMP THAT COMES ONTO THE FREEWAY WHERE THE REDUCED SPEED IS IN EFFECT. PLACE ADDITIONAL SPEED LIMIT SIGNS AT INTERVALS ALONG THE ROADWAY SUCH THAT NO SPEED LIMIT SIGNS ARE MORE THAN 2 MILES APART. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, PLACE ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED BEYOND THE LIMITS OF THE WORK AREA AS INDICATED. IF PERMANENT SIGNS DISPLAYING THE CORRECT SPEED LIMIT ARE POSTED, OMIT ALL W3-5b AND R2-1 SIGNS AND REDUCE SPACING ACCORDINGLY.
- S6: FABRICATE SPECIAL SIGNS IN ACCORDANCE WITH CURRENT SIGNING DESIGN STANDARDS.
- S7: PLACE ADDITIONAL R8-3 SIGNS AT A MAXIMUM 500' SPACING THROUGHOUT THE WORK ZONE.
- S8: WHEN SPEED LIMIT SIGNS CANNOT BE PLACED SIDE BY SIDE AS SHOWN, PLACE THEM "D" DISTANCE APART.
- S9: STOP SIGNS NOT REQUIRED IF SIGNALS ARE ON 4-WAY FLASHING RED. STOP AHEAD SIGNS ARE NOT REQUIRED IF THERE IS ADEQUATE VISIBILITY OF THE STOP SIGN OR IF SIGNALS ARE BEING USED TO CONTROL TRAFFIC.
- S10: PLACE REDUCED SPEED ZONE AHEAD SIGN (W3-5b) HERE WHEN USING A SPEED REDUCTION IN THIS DIRECTION.
- S11: THE NUMBER OF W1-6 SHIFT SIGNS TO PLACE FOR A SHIFT IS AS FOLLOWS:
SHIFTS 4FT OR LESS, PLACE ONE W1-6(R)(L)
SHIFTS 5FT TO 12FT, PLACE TWO W1-6(R)(L)
SHIFTS MORE THAN 12FT, PLACE THREE OR MORE W1-6(R)(L) SIGNS DEPENDING UPON LENGTH OF SHIFT AND AS PER THE ENGINEER.
- S12: PLACE R2-1 SIGNS AS DETAILED IN NOTE S5 WHEN THERE IS A SPEED REDUCTION IN THIS DIRECTION

TRAFFIC REGULATOR NOTES

- TR1: TRAFFIC REGULATORS MUST FOLLOW ALL THE REQUIREMENTS IN THE STANDARD SPECIFICATIONS, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS, THE CURRENT VERSIONS OF THE TRAFFIC REGULATOR'S INSTRUCTION MANUAL AND THE VIDEO "HOW TO SAFELY REGULATE TRAFFIC IN MICHIGAN". THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS IS DETERMINED BY THE ROADWAY ADT, GEOMETRICS, AND AS DIRECTED BY THE ENGINEER.
- TR2: PROVIDE APPROPRIATE BALLOON LIGHTING TO SUFFICIENTLY ILLUMINATE TRAFFIC REGULATOR'S STATIONS WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS.
- TR3: PROVIDE EITHER A STOP/SLOW AHEAD OR A RED/YELLOW LENS AHEAD, MEETING THE REQUIREMENTS OF THE MUTCD

TEMPORARY TRAFFIC CONTROL DEVICE NOTES

- TC1: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD NOT EXCEED 1.0 TIMES THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 50 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TAPERS ARE NOT TO EXCEED 25 FEET AT NIGHT.
- TC2: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TANGENT SHOULD NOT EXCEED TWICE THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 100 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TANGENTS ARE NOT TO EXCEED 50 FEET AT NIGHT.
- TC3: TYPE III BARRICADES MUST BE LIGHTED FOR OVERNIGHT CLOSURES.
- TC4: WHEN THE HAUL ROAD IS NOT IN USE, PLACE LIGHTED TYPE III BARRICADES WITH "ROAD CLOSED" EXTENDING COMPLETELY ACROSS THE HAUL ROAD.
- TC5: USE OBJECT MARKER SIGNS IN LIEU OF THE TYPE B HIGH INTENSITY LIGHT SHOWN IN THE STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER (R-53, AND R-126) WHEN USED WITH A TEMPORARY SIGNAL SYSTEM. THE OBJECT MARKERS MUST BE A MINIMUM OF 12 INCHES IN WIDTH AND 36 INCHES IN HEIGHT AND HAVE ORANGE AND WHITE RETROREFLECTIVE SHEETING. THE RETROREFLECTIVE SHEETING MUST HAVE ALTERNATING DIAGONAL ORANGE AND WHITE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION VEHICULAR TRAFFIC IS TO PASS.
- TC6: PLACE LIGHTED ARROW PANELS AS CLOSE TO THE BEGINNING OF TAPERS AS PRACTICAL, BUT NOT IN A MANNER THAT WILL OBSCURE OR CONFUSE APPROACHING MOTORISTS WHEN PHYSICAL LIMITATIONS RESTRICT PLACEMENT. IN CURBED SECTIONS, IF ARROW BOARD CANNOT BE PLACED BEHIND CURB, PLACE ARROW BOARD IN THE CLOSED LANE AS CLOSE TO THE BEGINNING OF TAPER AS POSSIBLE.
- TC7: ADDITIONAL TYPE III BARRICADES MAY BE REQUIRED TO COMPLETELY CLOSE OFF ROAD FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT.
- TC8: WHERE THE SHIFTED SECTION IS SHORTER THAN 600 FEET, A DOUBLE REVERSE CURVE SIGN (W24-1) CAN BE USED INSTEAD OF THE FIRST REVERSE CURVE SIGN, AND THE SECOND REVERSE CURVE SIGN CAN BE OMITTED.
- TC9: RUMBLE STRIPS ARE TO BE PLACED AS SPECIFIED IN THE CONTRACT. IF NOT SPECIFIED IN THE CONTRACT, PLACE RUMBLE STRIPS AS SHOWN, AND IN ACCORDANCE WITH THE RUMBLE STRIP MANUFACTURER'S RECOMMENDATIONS. AN ARRAY OF RUMBLE STRIPS CONTAINS THREE RUMBLE STRIPS. PLACE THE RUMBLE STRIPS IN THE ARRAY AT A CONSISTENT DISTANCE, BETWEEN 10' AND 20' APART.
- TC10: SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, PORTABLE CHANGEABLE MESSAGE SIGN GUIDELINES FOR RECOMMENDED AND CORRECT PCMS MESSAGING. STAGGER PCMS THAT ARE ON OPPOSING SIDES OF THE ROAD 1000 FEET FROM EACH OTHER.

RAMP NOTES

- RMP1: WHEN CONDITIONS ALLOW, E5-1 SIGNS MUST BE REMOVED OR COVERED AND CHANNELIZING DEVICES MUST BE POSITIONED TO ENABLE RAMP TRAFFIC TO DIVERGE IN A FREE MANNER
- RMP2: STOP AND YIELD CONDITIONS SHOULD BE AVOIDED WHENEVER PRACTICAL. WHEN CONDITIONS WARRANT, R1-1 SIGNS MAY BE USED IN PLACE OF R1-2 SIGNS. WHEN R-1 SIGNS ARE USED, W3-1 SIGNS MUST BE USED IN PLACE OF W3-2 SIGNS. CONSIDERATION SHOULD BE GIVEN TO CLOSING THE RAMP TO COMPLETE WORK TO ALLOW AN ADEQUATE MERGE DISTANCE. WORK SHOULD BE EXPEDITED TO AVOID THE STOP AND/OR YIELD CONDITIONS.



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THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

SIGNAL NOTES

- SIG1: EXISTING SIGNAL MUST BE EITHER 4-WAY FLASHING RED, BAGGED, OR TURNED OFF.
- SIG2: SIGNAL IS IN OPERATION.
- SIG3: DELINEATE THE WORK ZONE AREA WITH 28 INCH CONES FOR DAYTIME WORK, OR 42 INCH CHANNELIZING DEVICES FOR NIGHTTIME WORK.
- SIG4: THE CONTRACTOR MUST HAVE A DESIGNATED SPOTTER IF THE AERIAL BUCKET TRUCK IS LOCATED OVER ACTIVE TRAVEL LANES.
- SIG5: THE LOWEST POINT OF THE BUCKET MAY NOT TRAVEL BELOW 14 FOOT VERTICAL CLEARANCE. THE CONTRACTOR MUST UTILIZE AN ALTERNATE SET UP, OR PLACE THE INTERSECTION IN A 4 WAY STOP IF THE 14 FOOT VERTICAL CLEARANCE IS COMPROMIZED. USE TRAFFIC REGULATORS TO CONTROL TRAFFIC THROUGH THE INTERSECTION WHEN TRAFFIC IS PLACED IN A 4 WAY STOP.
- SIG6: DELINEATE THE TRUCK WITH CHANNELIZING DEVICES. THE POSITION OF THE TRUCK MAY BE MOVED TO FACILITATE WORK.

MAINTENANCE AND SURVEYING NOTES

- MS1: WHENEVER STOPPING SIGHT DISTANCE EXISTS TO THE REAR, THE SHADOW VEHICLES SHOULD MAINTAIN THE RECOMENDED DISTANCE FROM THE WORK AREA AND PROCEED AT THE SAME SPEED. THE SHADOW VEHICLE SHOULD SLOW DOWN AND TRAVEL AT A FARTHER DISTANCE TO PROVIDE ADEQUATE SIGHT DISTANCE IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES.
- MS2: WORKERS OUTSIDE OF VEHICLES SHOULD WORK WITHIN 150' OF WORK VEHICLES WITH AN ACTIVATED BEACON, BETWEEN THE "BEGIN WORK CONVOY" SIGN AND THE "END WORK CONVOY" SIGN, OR BETWEEN THE "WORK ZONE BEGINS" AND "END ROAD WORK" SIGN.
- MS3: WORK OR SHADOW VEHICLES WITH OR WITHOUT A TMA MAY BE USED TO SEPARATE THE WORK SPACE FROM TRAFFIC. IF USED, THE VEHICLES SHOULD BE PARKED ACCORDING TO THE ROLL AHEAD DISTANCE TABLES.
- MS4: WORK AND SHADOW VEHICLES SHALL BE APPROPRIATELY EQUIPPED WITH AN ACTIVATED AMBER BEACON.
- MS5: WHEN WORKERS ARE OUTSIDE THEIR VEHICLES IN AN EXISTING LANE WHILE A MOBILE OPERATION IS OCCURRING DURING THE NIGHTTIME HOURS, CHANNELIZING DEVICES TO DELINEATE OPEN OR CLOSED LANES AT 50 FT SPACING MUST BE USED. AN EXAMPLE OF AN OPERATION (BUT NOT LIMITED TO) IS THE LAYOUT OF CONCRETE PATCHES.
- MS6: W21-6 AND W20-1 SIGNS MAY BE SUBSTITUTED AS DETERMINED BY THE TYPE OF WORK TAKING PLACE AS PER THE ENGINEER.



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NO:

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TRAFFIC TYPICALS
NOTE SHEET

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SIGN NUMBER KEY



E5-1f
48" x 48"
60" x 48"



E5-2
48" x 36"



E5-2a
48" x 36"



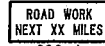
E5-3
48" x 36"



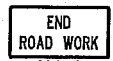
E13-1P
VAR x 24"



E13-1aP
36" x 24"



G20-1
60" x 24"



G20-2
48" x 24"



G20-4
36" x 18"



T-6a
18" x 18"
24" x 24"
30" x 30"



M1-1
18" x 18"
24" x 24"
36" x 36"
48" x 48"



M1-1
22.5" x 18"
30" x 24"
45" x 36"
60" x 48"



M1-2
18" x 18"
24" x 24"
36" x 36"
48" x 48"



M1-2
22.5" x 18"
30" x 24"
45" x 36"
60" x 48"



M1-3
18" x 18"
24" x 24"
36" x 36"
48" x 48"



M1-3
22.5" x 18"
30" x 24"
45" x 36"
60" x 48"



M1-4
18" x 18"
24" x 24"
36" x 36"
48" x 48"



M1-4
22.5" x 18"
30" x 24"
45" x 36"
60" x 48"



M1-5
18" x 18"
24" x 24"
30" x 30"
36" x 36"



M1-5a
18" x 18"
24" x 24"



M1-6
18" x 18"
24" x 24"
36" x 36"



M1-6
22.5" x 18"
30" x 24"
45" x 36"



M3-1
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M3-2
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M3-3
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M3-4
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-1
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-1a
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-2
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-3
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-4
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-5
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-6
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-7
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-7a
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M4-8
12" x 6"
18" x 9"
24" x 12"
30" x 15"



M4-8a
24" x 18"



M4-8b
24" x 12"



M4-9L
30" x 24"
48" x 36"
60" x 48"



M4-9R
30" x 24"
48" x 36"
60" x 48"



M4-9J
30" x 24"
48" x 36"
60" x 48"



M4-9KL
30" x 30"
48" x 42"
60" x 54"



M4-9KR
30" x 30"
48" x 42"
60" x 54"



M4-9mL
30" x 30"
48" x 42"
60" x 54"



M4-9mR
30" x 30"
48" x 42"
60" x 54"



M4-9dL
12" x 18"



M4-9dR
12" x 18"



M4-9e
12" x 18"



M4-9f
12" x 18"



M4-9gL
12" x 18"



M4-9gR
12" x 18"



M4-9h
12" x 24"



M4-9i
12" x 18"



M4-10L
48" x 18"



M4-10R
48" x 18"



M4-11a
12" x 6"
18" x 9"
24" x 12"
30" x 15"
36" x 18"



M5-1L
12" x 9"
21" x 15"
30" x 21"



M5-1R
12" x 9"
21" x 15"
30" x 21"



M5-2L
12" x 9"
21" x 15"
30" x 21"



M5-2R
12" x 9"
21" x 15"
30" x 21"



M5-3
12" x 9"
21" x 15"
30" x 21"



M6-1L
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-1R
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-2L
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-2R
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-3
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-4
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-5
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-6L
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-6R
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-7L
12" x 9"
18" x 12"
21" x 15"
30" x 21"



M6-7R
12" x 9"
18" x 12"
21" x 15"
30" x 21"

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NO:

103-GEN-SIGN

TRAFFIC TYPICALS
SIGN SHEET

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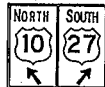
SIGN NUMBER KEY



M8-1gL
36" x 66"



M8-1gR
36" x 66"



M8-2d
60" x 48"



OM-3L
12" x 36"
24" x 48"
36" x 72"



OM-3R
12" x 36"
24" x 48"
36" x 72"



R1-1
18" x 18"
24" x 24"
30" x 30"
36" x 36"
48" x 48"



R1-1a
18" x 18"
24" x 24"



R1-2
18" x 24"
24" x 30"
30" x 36"
36" x 48"
48" x 60"



R1-2aP
24" x 18"
36" x 30"
48" x 36"



R2-1
18" x 24"
24" x 30"
30" x 36"
36" x 48"
48" x 60"



R2-1a
48" x 60"



R3-1
24" x 24"
30" x 30"
36" x 36"
48" x 48"



R3-2
24" x 24"
30" x 30"
36" x 36"
48" x 48"



R3-3
24" x 24"
36" x 36"
48" x 48"



R3-4
24" x 24"
30" x 30"
36" x 36"
48" x 48"



R3-5L
30" x 36"
36" x 48"



R3-5R
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36" x 48"



R3-5a
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36" x 48"



R3-6L
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42" x 48"



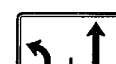
R3-6R
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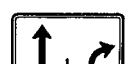
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R3-7R
30" x 30"
36" x 36"



R3-8c
36" x 30"



R3-8d
36" x 30"



R4-1
12" x 18"
18" x 24"
24" x 30"
36" x 48"
48" x 60"



R4-2
12" x 18"
18" x 24"
24" x 30"
36" x 48"
48" x 60"



R4-7
12" x 18"
18" x 24"
24" x 30"
36" x 48"
48" x 60"



R4-8
18" x 24"
24" x 30"
36" x 48"
48" x 60"



R4-9
18" x 24"
24" x 30"
36" x 48"
48" x 60"



R5-1
30" x 30"
36" x 36"
48" x 48"



R5-1a
30" x 18"
36" x 24"
42" x 30"



R5-18b
48" x 60"



R5-18c
48" x 48"



R5-18d
78" x 12"



R5-18e
72" x 12"



R5-18f
48" x 60"



R5-18g
30" x 42"



R5-18h
48" x 60"



R6-1L
36" x 12"
54" x 18"



R6-1R
36" x 12"
54" x 18"



R6-2L
12" x 16"
18" x 24"
24" x 30"
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48" x 60"



R6-2R
12" x 16"
18" x 24"
24" x 30"
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48" x 60"



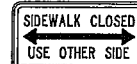
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48" x 48"



R9-8
36" x 18"



R9-9
24" x 12"
30" x 18"



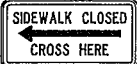
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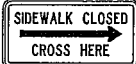
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R9-11R
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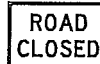
R9-11aL
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R9-11aR
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48" x 24"



R10-6b
36" x 54"



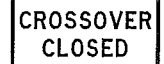
R11-2
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R11-2a
48" x 30"



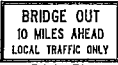
R11-2b
48" x 30"



R11-2c
60" x 30"



R11-3a
60" x 30"



R11-3b
60" x 30"



R11-4
60" x 30"

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TRAFFIC TYPICALS
SIGN SHEET

























































DATE: JUNE 2021

SHEET:

2 OF 5

FILE: 103-GEN-SIGN.dgn

SIGN NUMBER KEY

							
W1-1L 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-1R 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-2L 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-2R 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-2bL 36" x 36" 48" x 48"	W1-2bR 36" x 36" 48" x 48"	W1-3L 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-3R 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"
							
W1-4L 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-4R 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-4bL 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-4bR 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-4cL 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W1-4cR 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W24-1L 30" x 30" 36" x 36" 48" x 48"	W24-1R 30" x 30" 36" x 36" 48" x 48"
							
W24-1cL 30" x 30" 36" x 36" 48" x 48"	W24-1cR 30" x 30" 36" x 36" 48" x 48"	W24-1bL 30" x 30" 36" x 36" 48" x 48"	W24-1bR 30" x 30" 36" x 36" 48" x 48"	W1-6L 24" x 12" 36" x 18" 48" x 24" 60" x 30" 96" x 48"	W1-6R 24" x 12" 36" x 18" 48" x 24" 60" x 30" 96" x 48"	W1-8L 12" x 18" 18" x 24" 24" x 30" 30" x 36" 36" x 48"	W1-8R 12" x 18" 18" x 24" 24" x 30" 30" x 36" 36" x 48"
							
W3-1 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W3-2 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W3-3 18" x 18" 30" x 30" 36" x 36" 48" x 48"	W3-4 30" x 30" 36" x 36" 48" x 48" 60" x 60"	W3-4b 30" x 30" 36" x 36" 48" x 48"	W3-5 36" x 36" 48" x 48"	W3-5a 30" x 30" 36" x 36" 48" x 48" 60" x 60"	W3-5b 30" x 30" 36" x 36" 48" x 48"
							
W4-1L 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W4-1R 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W4-2L 30" x 30" 36" x 36" 48" x 48"	W4-2R 30" x 30" 36" x 36" 48" x 48"	W4-3L 30" x 30" 36" x 36" 48" x 48"	W4-3R 30" x 30" 36" x 36" 48" x 48"	W4-5L 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W4-5R 24" x 24" 30" x 30" 36" x 36" 48" x 48"
							
W4-5P 18" x 24" 24" x 30"	W4-6L 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W4-6R 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W4-7L 30" x 30" 36" x 36" 48" x 48" 60" x 60"	W4-7R 30" x 30" 36" x 36" 48" x 48" 60" x 60"	W5-1 30" x 30" 36" x 36" 48" x 48"	W5-2 18" x 18" 30" x 30" 36" x 36" 48" x 48"	W5-3 24" x 24" 30" x 30" 36" x 36" 48" x 48"
							
W5-4 30" x 30" 36" x 36" 48" x 48"	W6-1 30" x 30" 36" x 36" 48" x 48"	W6-2 30" x 30" 36" x 36" 48" x 48"	W6-3 30" x 30" 36" x 36" 48" x 48"	W6-4 12" x 18"	W7-1 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W7-1a 24" x 24" 30" x 30" 36" x 36" 48" x 48"	W8-1 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO:

103-GEN-SIGN

























































TRAFFIC TYPICALS
SIGN SHEET

DATE: JUNE 2021
SHEET:

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FILE: 103-GEN-SIGN.dgn

SIGN NUMBER KEY

 W8-2 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-3 18" x 18" 30" x 30" 36" x 36" 48" x 48"	 W8-4 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-5 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-5P 24" x 18" 30" x 24" 36" x 30"	 W8-7 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-8 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-9 24" x 24" 30" x 30" 36" x 36" 48" x 48"
 W8-11 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-12 30" x 30" 36" x 36" 48" x 48"	 W8-14 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-15 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-15P 24" x 18" 30" x 24" 36" x 30"	 W8-17L 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-17R 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-17P 24" x 18" 30" x 24" 36" x 30"
 W8-18 24" x 24" 36" x 36" 48" x 48"	 W8-23 24" x 24" 36" x 36" 48" x 48"	 W8-24 30" x 30" 36" x 36" 48" x 48"	 W8-25 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W8-26 36" x 36" 48" x 48"	 W9-1L 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W9-1R 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W9-2L 30" x 30" 36" x 36" 48" x 48"
 W9-2R 30" x 30" 36" x 36" 48" x 48"	 W9-3C 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W9-3L 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W9-3R 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W9-3a 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W9-3b 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W11-10 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W11-10a 24" x 24" 30" x 30" 36" x 36" 48" x 48"
 W11-24 36" x 36" 48" x 48"	 W12-1 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W12-2 18" x 18" 24" x 24" 30" x 30" 36" x 36" 48" x 48"	 W13-1P 18" x 18" 24" x 24" 30" x 30"	 W13-2 24" x 30" 36" x 48" 48" x 60"	 W13-3 24" x 30" 36" x 48" 48" x 60"	 W13-4P 24" x 24" 36" x 36"	 W13-6 24" x 42" 36" x 60" 48" x 84"
 W13-6a 24" x 42" 36" x 60" 48" x 84"	 W13-7 24" x 42" 36" x 60" 48" x 84"	 W13-7a 24" x 42" 36" x 60" 48" x 84"	 W14-3 36" x 24" 40" x 30" 48" x 36" 64" x 48"	 W16-2P 18" x 12" 24" x 18" 30" x 24"	 W16-4aP 18" x 12" 24" x 18" 30" x 24" 36" x 30"	 W16-12P 24" x 18"	 W16-13P 24" x 18" 30" x 24"
 W20-1 24" x 24" 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W20-1a 24" x 24" 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W20-1b 24" x 24" 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W20-1c 24" x 24" 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W20-1d 24" x 24" 30" x 30" 36" x 36" 48" x 48" 60" x 60"	 W20-2 30" x 30" 36" x 36" 48" x 48"	 W20-3 30" x 30" 36" x 36" 48" x 48"	 W20-3a 30" x 30" 36" x 36" 48" x 48"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO:

103-GEN-SIGN

TRAFFIC TYPICALS
SIGN SHEET

DATE: JUNE 2021
SHEET:

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FILE: 103-GEN-SIGN.dgn

SIGN NUMBER KEY



W20-3b
30" x 30"
36" x 36"
48" x 48"



W20-4
30" x 30"
36" x 36"
48" x 48"



W20-4c
36" x 36"
48" x 48"



W20-5C
30" x 30"
36" x 36"
48" x 48"



W20-5L
30" x 30"
36" x 36"
48" x 48"



W20-5L1
30" x 30"
36" x 36"
48" x 48"



W20-5L2
30" x 30"
36" x 36"
48" x 48"



W20-5R
30" x 30"
36" x 36"
48" x 48"



W20-5R1
30" x 30"
36" x 36"
48" x 48"



W20-5R2
30" x 30"
36" x 36"
48" x 48"



W20-5aL2
30" x 30"
36" x 36"
48" x 48"



W20-5aL3
30" x 30"
36" x 36"
48" x 48"



W20-5aR2
30" x 30"
36" x 36"
48" x 48"



W20-5aR3
30" x 30"
36" x 36"
48" x 48"



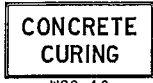
W20-7a
30" x 30"
36" x 36"
48" x 48"



W20-8
24" x 18"



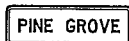
W20-9
54" x 48"



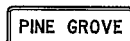
W20-10
48" x 24"
66" x 30"



W20-11
12" x 18"



W20-12P
VARIABLE x 12"



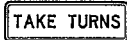
W20-13P
VARIABLE x 12"



W20-14L
36" x 36"
48" x 48"



W20-14R
36" x 36"
48" x 48"



W20-14dP
36" x 12"
48" x 12"



W20-14bP
36" x 12"
48" x 12"



W20-15
36" x 36"
48" x 48"



W20-15a
36" x 36"
48" x 48"



W20-15c
48" x 54"



W20-15d
48" x 54"



W20-16
36" x 36"
48" x 48"



W20-17
36" x 36"
48" x 48"



W21-1
24" x 24"
30" x 30"
36" x 36"
48" x 48"



W21-2
24" x 24"
30" x 30"
36" x 36"
48" x 48"



W21-2
24" x 24"
30" x 30"
36" x 36"
48" x 48"



W21-3
24" x 24"
30" x 30"
36" x 36"
48" x 48"



W21-4
36" x 18"



W21-5
24" x 24"
30" x 30"
36" x 36"
48" x 48"



W21-5aL
30" x 30"
36" x 36"
48" x 48"
60" x 60"



W21-5aR
30" x 30"
36" x 36"
48" x 48"
60" x 60"



W21-5bL
30" x 30"
36" x 36"
48" x 48"
60" x 60"



W21-5bR
30" x 30"
36" x 36"
48" x 48"
60" x 60"



W21-6
24" x 24"
30" x 30"
36" x 36"
48" x 48"



W21-7
30" x 30"
36" x 36"
48" x 48"



W21-8
30" x 30"
36" x 36"
48" x 48"



W22-1
30" x 30"
36" x 36"
48" x 48"



W22-2
42" x 36"



W22-3
36" x 30"
42" x 36"



W23-1
48" x 24"



W23-2
36" x 36"
48" x 48"

SEE MDOT SHS 13-WORK ZONE FOR SIGN DETAILS



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO:

103-GEN-SIGN

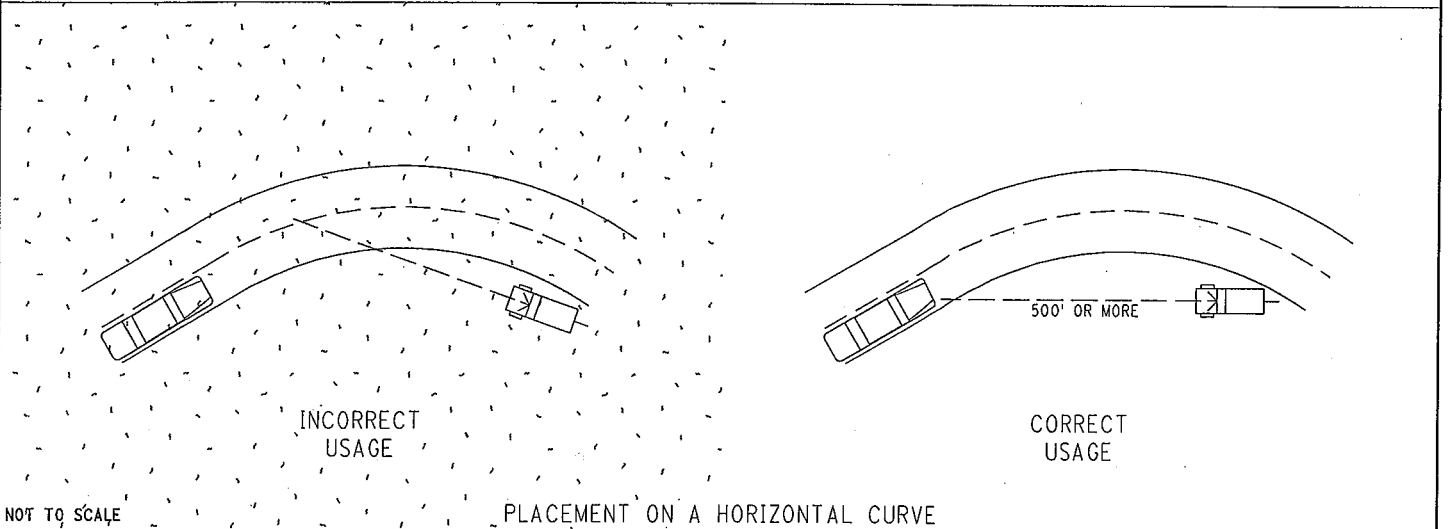
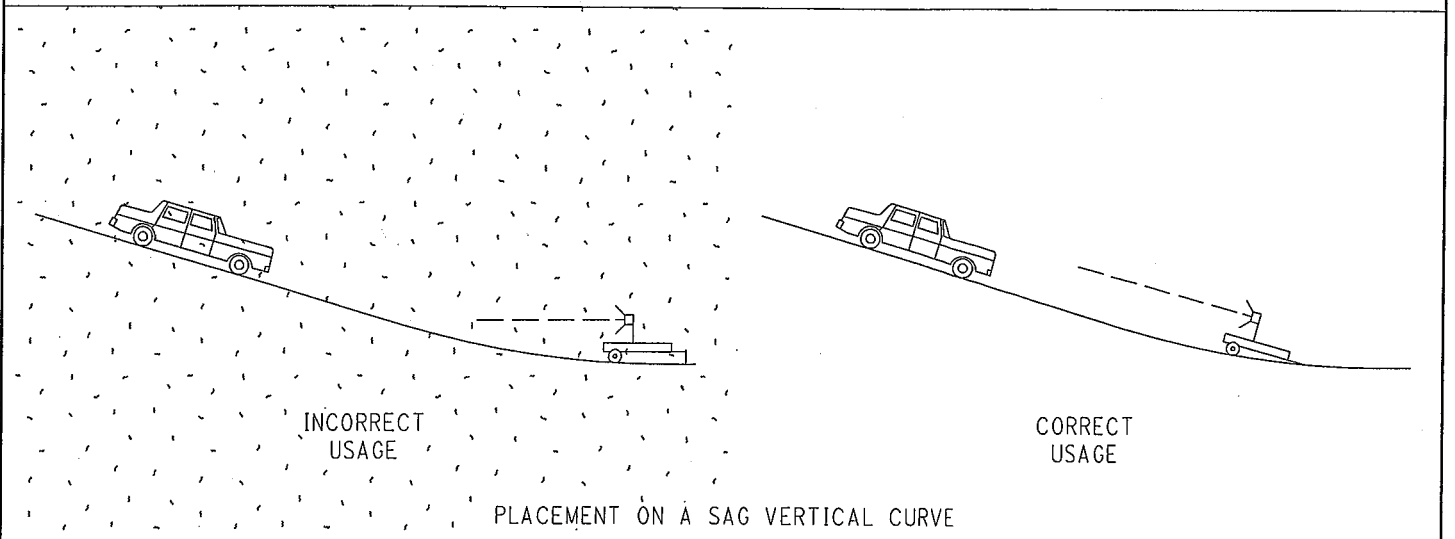
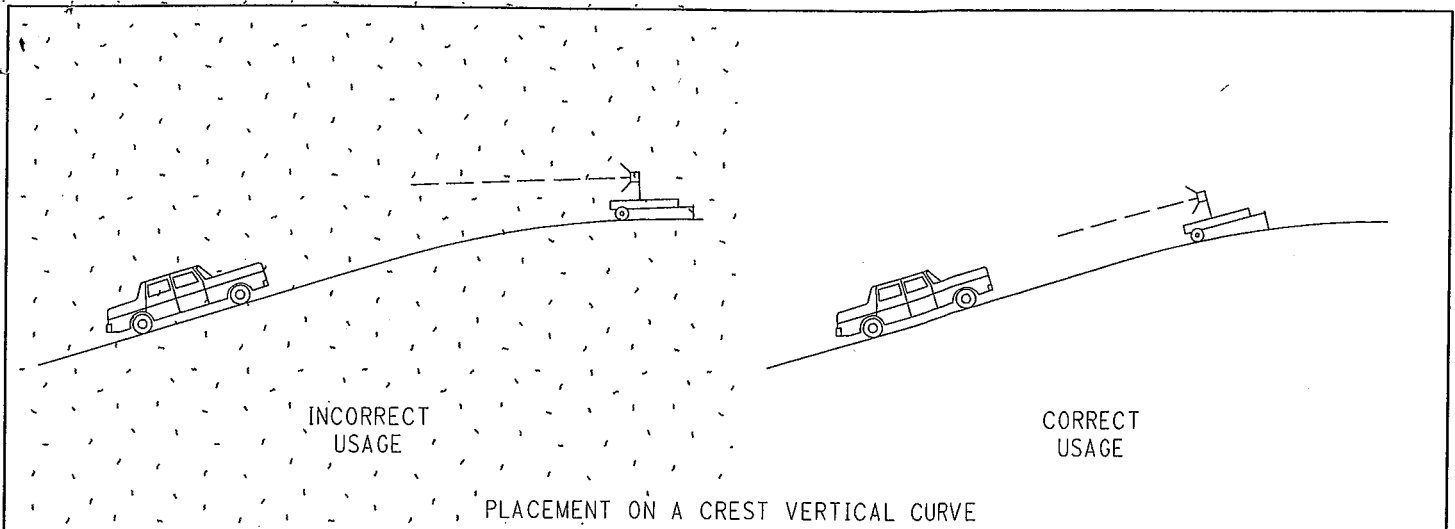
TRAFFIC TYPICALS
SIGN SHEET

DATE: JUNE 2021

SHEET:

5 OF 5

FILE: 103-GEN-SIGN.dgn



NOTE:
 ENSURE THE ARROW REMAINS CLEARLY LEGIBLE AT DISTANCES FROM 2,500 FEET TO 200 FEET, FROM ALL TRAFFIC LANES AND ROADWAY ENTRANCES. DO NOT PLACE THE LIGHTED ARROW ON A HORIZONTAL OR VERTICAL CURVE THAT MIGHT INTERFERE WITH THIS LEGIBILITY REQUIREMENT.

	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	USE OF ARROW BOARD ON HILL OR CURVE AND WORK ZONE LAYOUT	DATE: MAY 2021
		NO: 104-GEN-AB		SHEET: 1 OF 1

KEY

- ... CHANNELIZING DEVICE
- ↑ TRAFFIC FLOW
- ⬆ LIGHTED ARROW PANEL
- ⌊ TYPE III BARRICADE
- ◆ PART OF LEAD-IN SIGNING SEQUENCE
- PLACE SIGN AS INDICATED IN NOTE S5

STANDARD NOTES

(SEE GEN-NOTES)

GENERAL: G1, G2, G3, G4
SIGNING: S1, S5, S8
DEVICES: TCD1, TCD2, TCD3, TCD6

MAJOR
INTERSECTION

MAJOR
INTERSECTION

MAJOR
INTERSECTION

GREATER THAN 2 MILES
LESS THAN 4 MILES

LESS THAN 2 MILES

LESS THAN 2 MILES



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO:

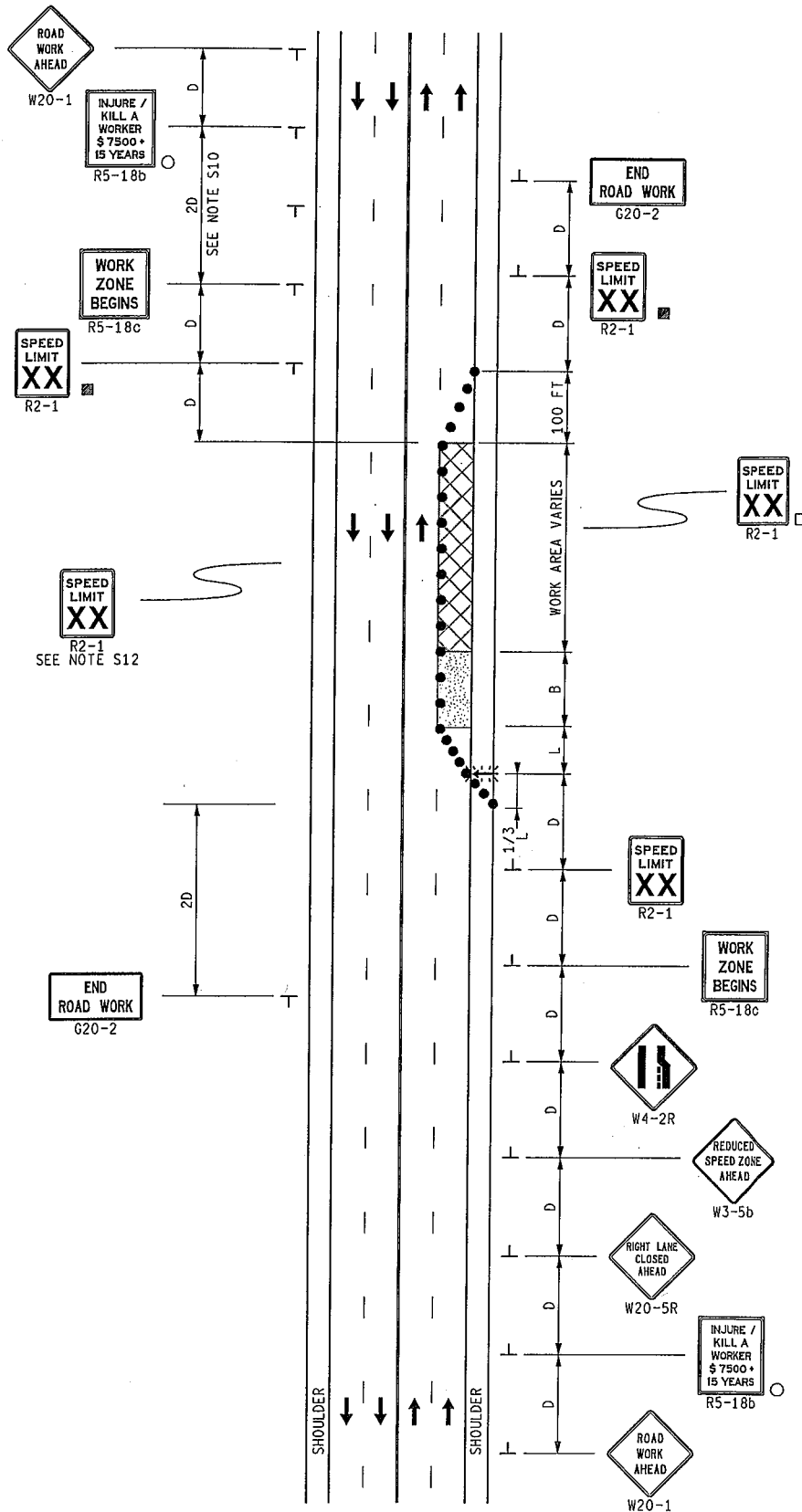
106-GEN-SPEED-NFW

SUPPLEMENTAL SPEED LIMIT
TREATMENT ON A 2-WAY ROADWAY
WHERE WORKERS PRESENT

DATE:
DECEMBER 2021
SHEET:

1 OF 1

FILE: 106-GEN-SPEED-NFW.dgn



KEY

- ... CHANNELIZING DEVICES
- ⦿ LIGHTED ARROW PANEL
- ← TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT
- PLACE SIGN AS INDICATED IN NOTE S5
- PLACE SIGN AS INDICATED IN NOTE S2

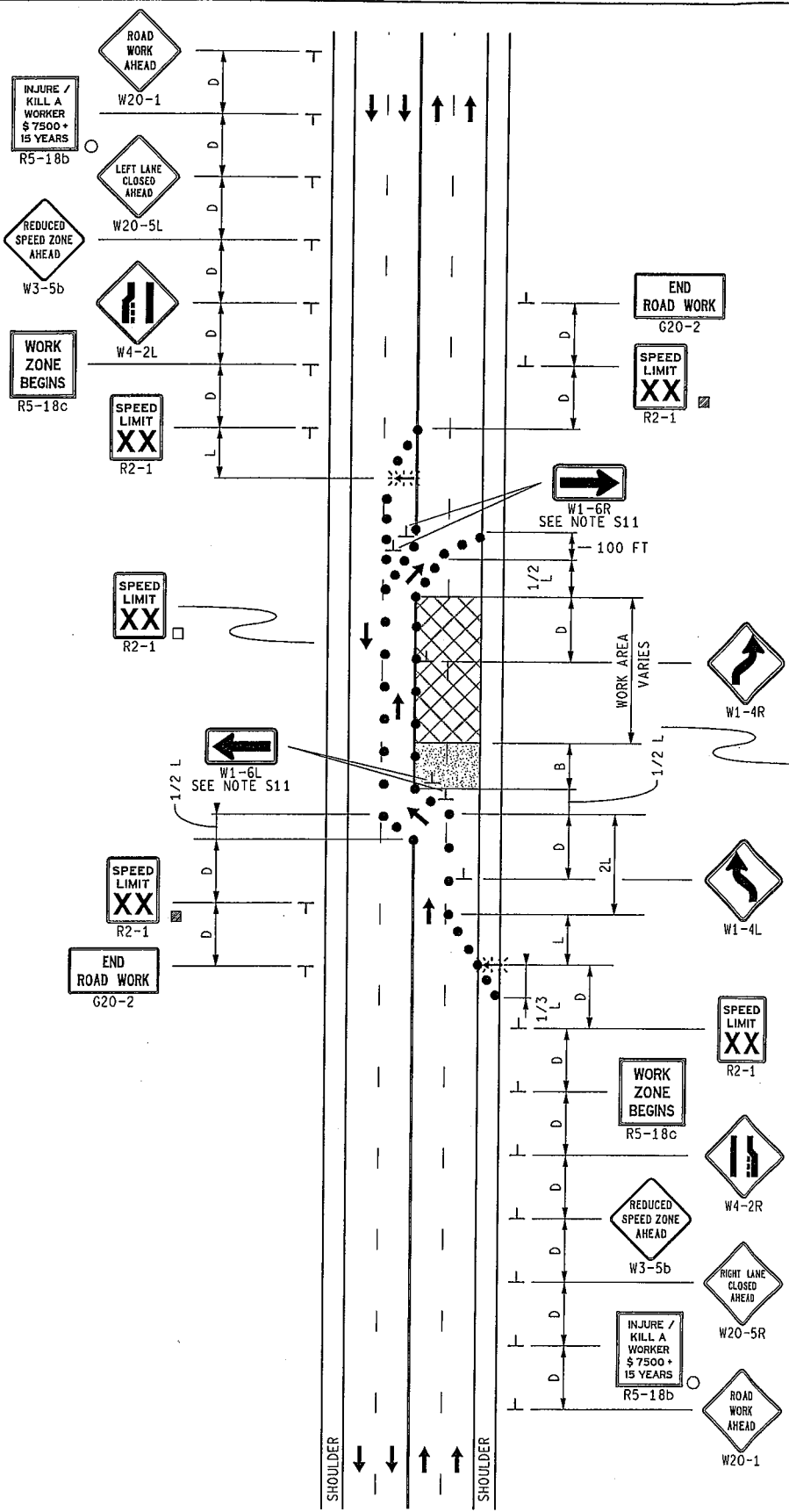
STANDARD NOTES

(SEE 102-GEN-NOTES)

GENERAL: G1, G2, G3, G4

SIGNING: S1, S2, S3, S5, S10, S12

DEVICES: TCD1, TCD2, TCD6



KEY

- ... CHANNELIZING DEVICES
- ⚡ LIGHTED ARROW PANEL
- ← TRAFFIC FLOW
- ▨ REFLECTS EXISTING SPEED LIMIT
- PLACE SIGN AS INDICATED IN NOTE S5
- PLACE SIGN AS INDICATED IN NOTE S2

STANDARD NOTES

(SEE 102-GEN-NOTES)
 GENERAL: G1, G2, G3, G4, G5
 SIGNING: S1, S2, S3, S5, S11
 DEVICES: TCD1, TCD2, TCD6, TCD8



NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO: 124-
 NFW-2(R+L)LC-SHIFT

2 LANE CLOSURES, LEFT AND RIGHT
 WITH A SINGLE LANE SHIFT
 ON A 4-LANE UNDIVIDED ROADWAY

DATE: MAY 2021
 SHEET:

FILE: 124-NFW-2(R+L)LC-SHIFT.dgn