

**Manistee County Road Commission
Plans and Specifications**

**Snyder Road 2019 HMA Resurfacing
Hoxeyville Road to M-55
Norman Township
Manistee County, Michigan**

February 1, 2019

MANISTEE COUNTY ROAD COMMISSION

PLANS OF PROPOSED IMPROVEMENTS TO

SNYDER ROAD

JOB NO.

NORMAN TWP
MANISTEE COUNTY

| | |
|-------------------|-----------|
| | SNYDER RD |
| ADT (2019)..... | 637 |
| % COMMERCIAL..... | 7% |
| ADT (2038)..... | 860 |
| POSTED SPEED..... | 55 MPH |
| DESIGN SPEED..... | 55 MPH |

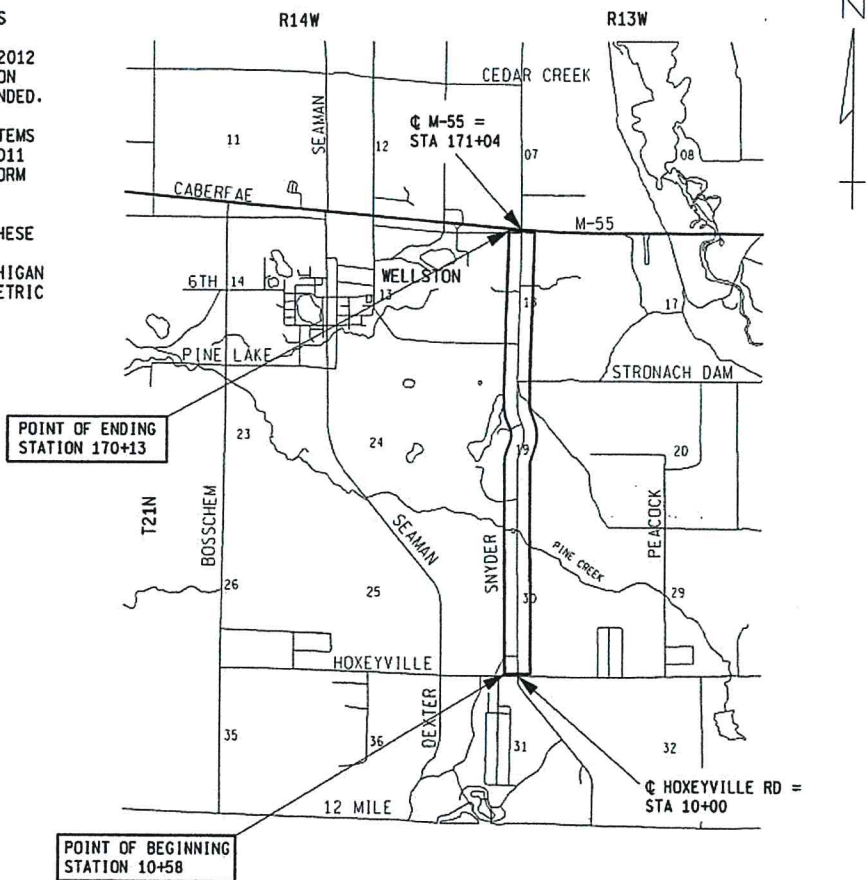
INDEX TO SHEETS

- 1 TITLE SHEET
- 2-6 DESCRIPTION OF WORK
- 7 TYPICAL SECTION SHEET
- 8 DETAIL SHEETS
- 9-10 STRIP MAP PLAN SHEETS

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2012 STANDARD SPECIFICATIONS FOR CONSTRUCTION AND SUPPLEMENTAL SPECIFICATIONS AS AMENDED.

PLACING OF TEMPORARY TRAFFIC CONTROL ITEMS SHALL BE DONE IN ACCORDANCE WITH THE 2011 EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AS REVISED.

THE PROPOSED IMPROVEMENTS COVERED BY THESE PLANS ARE IN ACCORDANCE WITH SECTION D PREVENTIVE MAINTENANCE (PM) OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2014 GEOMETRIC GUIDELINES FOR LOCAL AGENCY PROGRAMS.



PROJECT LENGTH: 3.02 MILES
CONTRACT FOR: HMA ROAD IMPROVEMENT MARKINGS.



PREPARED UNDER SUPERVISION OF
GARY L. KARTTUNEN, P.E. 30565
REGISTERED PROFESSIONAL ENGINEER REGISTRATION #

KPM Engineering
CIVIL ENGINEERING CONSULTANTS

11/30/19

COUNTY ROAD COMMISSION APPROVAL

Mark P. Sohl 11/30/19
MARK P. SOHLDEN, MCRC MANAGER DATE

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PROJECT LOG

SNYDER ROAD FROM HOXEYVILLE ROAD TO M-55 NORMAN TOWNSHIP, MANISTEE COUNTY

Project Location:

The project is on Snyder Road from 58' north of the centerline of Hoxeyville Road (POB = Station 10+58) northerly to 91' south of the centerline of M-55 (POE = Station 170+13). The project length is 3.02 miles.

Refer to the Project Title Sheet.

Description of Work:

The work at this location involves 3.02 miles of Hot Mix Asphalt (HMA) overlay, HMA quarter crown and centerline wedging, aggregate shoulders, approach paving, maintaining traffic, and pavement markings.

Specifications:

All work shall be performed in accordance with the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction, the project Special Provisions, plans, project log, and as directed by the Engineer.

Placement of temporary traffic control items within the project limits shall be done in accordance with the 2011 edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD), as revised, and the special provision for Maintaining Traffic.

Items of Work:

Mainline

In accordance with the typical cross sections and details, place full width HMA quarter crown wedging and HMA centerline wedging for the entire project length. Application will be as directed by the Engineer. Resurface the existing and wedged pavements in accordance with the typical cross sections, and place aggregate shoulders. Construct a butt joint at the POB and POE in accordance with the details.

| | |
|-----------------------------------|------------------|
| HMA Surface, Rem | 146 Syd |
| HMA, 4E1 (HMA Wedging) | 2,997 Ton |
| HMA, 4E1 (for HMA Overlay) | 4,759 Ton |
| Shoulder, CI II | 3,546 Ton |

PROJECT LOG

SNYDER ROAD FROM HOXEYVILLE ROAD TO M-55 NORMAN TOWNSHIP, MANISTEE COUNTY

Note: Widen the proposed HMA surface by 2' at all existing un-paved drive approaches in accordance with the details or as directed by the Engineer.

Stronach Dam Road Approaches (Appr Treatment Type IIB) – Sta 116+66 Rt, Sta 130+07 Lt

In accordance with Intersection Approach Detail Type IIB and as directed by the Engineer, place HMA resurfacing to meet the new pavement grade. Grade, shape and compact the existing aggregate approach prior to paving. This work will not be paid for separately, but shall be included in payment for HMA Approach. A quantity of Approach, CI I is provided to level the grade prior to paving and shall be used where directed by the Engineer. Place Approach, CI II beyond the paving limits to meet the existing aggregate road.

| | |
|-------------------------|---------------|
| HMA Surface, Rem | 88 Syd |
| Approach, CI I | 38 Ton |
| HMA Approach | 48 Ton |
| Approach, CI II | 12 Ton |

Mittenwald Road Approach (Approach Treatment Type IIA) – Sta 73+57 Lt.

In accordance with the Intersection Approach Type IIA Detail and as directed by the Engineer, Remove HMA Surface and place HMA paving on the existing paved approach.

| | |
|-------------------------|---------------|
| HMA Surface, Rem | 22 Syd |
| HMA Approach | 18 Ton |

McNeil Street – Sta 17+20 Lt.

McNeil Street is a gravel roadway with an existing HMA apron. Resurface the existing HMA apron and place Approach, CI II beyond the paving limits to meet the existing aggregate road.

| | |
|------------------------|---------------|
| HMA Approach | 10 Ton |
| Approach, CI II | 6 Ton |

Un-paved (Gravel or Dirt) Driveway Approaches

Existing un-paved drive approaches shall be resurfaced with Approach, CI II material for a distance of 10' from the new edge of pavement or as directed by the Engineer as shown on the details. As previously noted under mainline work, widen the proposed HMA surface by 2' at all existing un-paved drive approaches during the mainline HMA paving (paid for as HMA, 4E1).

| | |
|------------------------|---------------|
| Approach, CI II | 70 Ton |
|------------------------|---------------|

PROJECT LOG

SNYDER ROAD FROM HOXEYVILLE ROAD TO M-55 NORMAN TOWNSHIP, MANISTEE COUNTY

Maintaining Traffic Quantities

Maintain Traffic within the project limits in accordance with the Special Provision for Maintaining Traffic.

| | |
|------------------------------------|---------------|
| Traffic Control | 1 LSUM |
| Temporary Pavement Markings | 1 LSUM |

Entire Project Quantities

There are 6 monument boxes for government corners within the project limits that will need to be adjusted. These are shown in the strip map plan sheets. An additional quantity of Monument Boxes and Preservation are provided for use where directed by the Engineer.

| | |
|------------------------------|-------------|
| Monument Box, Adjust | 6 Ea |
| Monument Box | 2 Ea |
| Monument Preservation | 2 Ea |

A miscellaneous quantity of Hand Patching is provided for filling potholes and voids in the existing pavement prior to HMA paving. The Engineer shall determine the location of the work.

| | |
|----------------------|---------------|
| Hand Patching | 10 Ton |
|----------------------|---------------|

A miscellaneous quantity of Slope Restoration is provided for restoration of turf areas if needed where directed by the Engineer.

| | |
|--------------------------|----------------|
| Slope Restoration | 100 Syd |
|--------------------------|----------------|

Replace existing mail box posts where directed by the Engineer:

| | |
|----------------------|-------------|
| Post, Mailbox | 5 Ea |
|----------------------|-------------|

Entire project quantities for permanent pavement markings are as follows:

| | |
|---|------------------|
| Pavt Mrkg, Waterborne, 4 inch White | 31,910 Ft |
| Pavt Mrkg, Waterborne, 4 inch Yellow | 16,121 Ft |

PROJECT LOG

SNYDER ROAD FROM HOXEYVILLE ROAD TO M-55 NORMAN TOWNSHIP, MANISTEE COUNTY

General Log Notes:

1. Coordination

The contractor shall coordinate his operations with Contractors/Agencies, including the Manistee County Road Commission (MCRC), performing work on this or other projects within or adjacent to the Construction Influence Area (CIA) as defined in the Maintaining Traffic special provision.

2. Underground Utilities

For the protection of underground utilities and in conformance with Public Acts 174 of 2013, the contractor shall call (800) 482-7171 or 811 a minimum of three full working days, excluding Saturdays, Sundays, and Holidays prior to beginning each excavation. This does not relieve the contractor of the responsibility of notifying utility owners who may not be a part of the "MISS DIG" System.

3. Adjusting Monument Boxes

All government corners on this project shall be preserved, whether shown or not. It may be necessary to place or adjust monument boxes, as required.

4. Aggregate Base and Approach, C1 I

Aggregate Base used on this project shall be Aggregate 22A or Aggregate 21AA.

5. Mobilization

Mobilization is included with the pay items and will not be paid for separately.

LOG OF EXISTING PAVEMENT MARKINGS

It is the intent that existing permanent pavement markings on this project be replaced in kind. The Contractor shall verify the locations prior to beginning the work.

| | |
|--------------------------|-------------------|
| Sta 10+58 to Sta 34+50 | Skip |
| Sta 34+50 to Sta 41+80 | NB Solid, SB Skip |
| Sta 41+80 to Sta 43+10 | Skip |
| Sta 43+10 to Sta 52+90 | NB Skip, SB Solid |
| Sta 52+90 to Sta 61+50 | Skip |
| Sta 61+50 to Sta 72+10 | NB Solid, SB Skip |
| Sta 72+10 to Sta 105+30 | Double Yellow |
| Sta 105+30 to Sta 116+60 | NB Skip, SB Solid |

PROJECT LOG

SNYDER ROAD FROM HOXEYVILLE ROAD TO M-55 NORMAN TOWNSHIP, MANISTEE COUNTY

| | |
|--------------------------|-------------------|
| Sta 116+60 to Sta 119+30 | Skip |
| Sta 119+30 to Sta 126+10 | NB Solid, SB Skip |
| Sta 126+10 to Sta 130+20 | Skip |
| Sta 130+20 to Sta 135+20 | NB Skip, SB Solid |
| Sta 135+20 to Sta 136+70 | Double Yellow |
| Sta 136+70 to Sta 141+40 | NB Solid, SB Skip |
| Sta 141+40 to Sta 145+70 | Skip |
| Sta 145+70 to Sta 150+80 | NB Skip, SB Solid |
| Sta 150+80 to Sta 170+13 | Skip |

NOTES APPLYING TO ROAD STANDARD PLANS

Where the following items are called for in the log, they are to be constructed according to the Standard Plan given below opposite each item unless otherwise indicated.

MONUMENT BOXES

R-11-E

NOTES APPLYING TO TRAFFIC AND SAFETY STANDARD PLANS

Where the following items are called for in the log, they are to be constructed according to the Standard Plan given below opposite each item unless otherwise indicated.

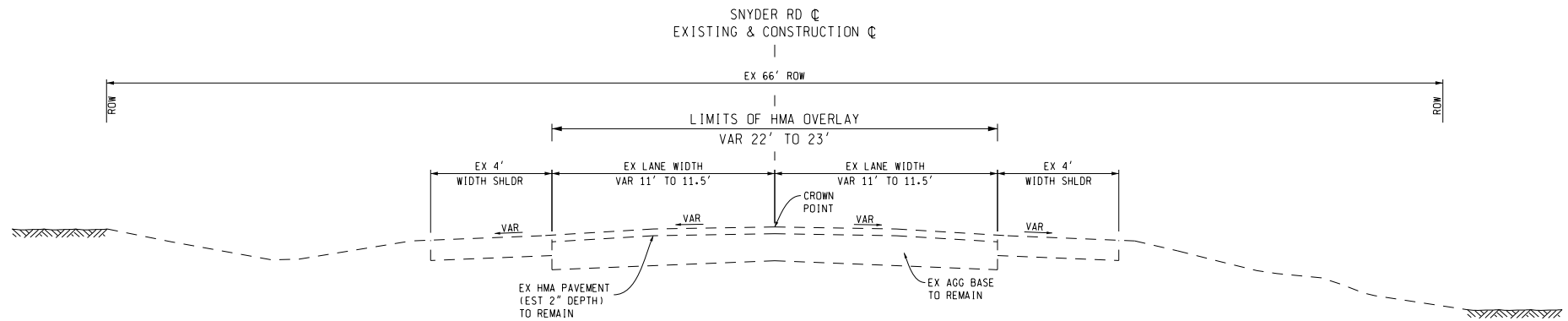
TEMPORARY TRAFFIC CONTROL DEVICES

WZD-125-E (S.D.)

LONGITUDINAL LINE TYPES AND PLACEMENT

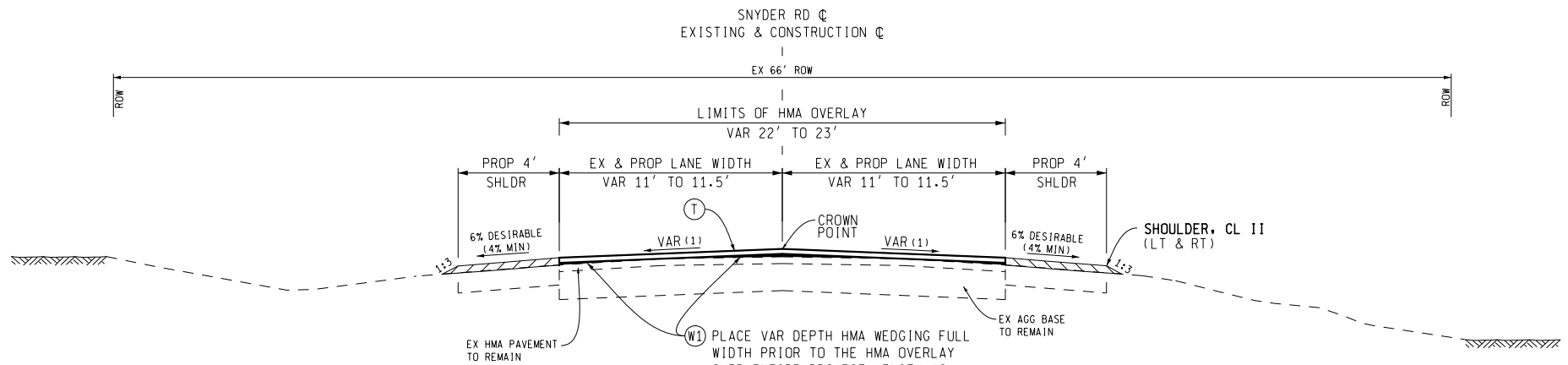
PAVE-905-D

Note: Road Standard Plans, Road Special Details, and Traffic & Safety Standard Plans are not included in the Bid Documents. All bidders are required to obtain them from the MDOT website and utilize them if they are the selected contractor for the project.



EXISTING NORMAL CROWN SECTION

SECTION APPLIES:
POB STA 10+58 TO STA POE 170+13



PROPOSED NORMAL CROWN OVERLAY SECTION

SECTION APPLIES:
POB STA 10+58 TO POE STA 170+13

HMA APPLICATION ESTIMATE

| IDENT NO. | ITEM | RATE PER SYD | PERFORMANCE GRADE | REMARKS |
|---------------|--------------|-------------------|-------------------|-------------------------------------|
| (T) | HMA, 4E1 | 220# | PG 58-28 | HMA OVERLAY, 1 COURSE AWI = 220 |
| (W1) | HMA, 4E1 (2) | VAR 0 TO 220# ± | PG 58-28 | PROP HMA WEDGING COURSE FULL WIDTH |
| (A1) | HMA APPROACH | 330# (Avg) | PG 58-28 | HMA, 4E1 FOR APPROACHES (2 COURSES) |
| *** BOND COAT | | 0.05-0.15 GAL/SYD | | |

*** FOR INFORMATION ONLY

NO SCALE



SNYDER ROAD
TYPICAL SHEET

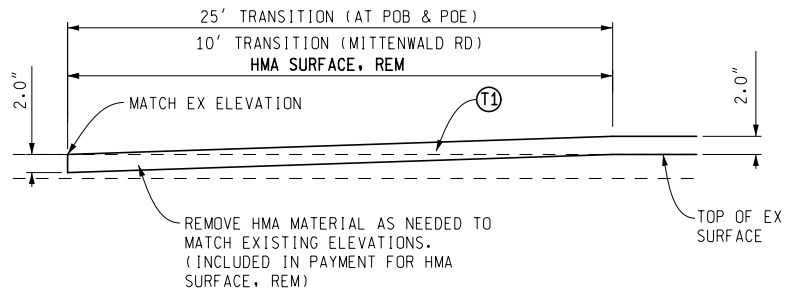
DATE: 1/30/2019

MANISTEE COUNTY
ROAD COMMISSION
8946 CHIPPEWA HWY
BEAR LAKE, MI 49614

DRAWN BY: GLK
SHEET NO.: 7

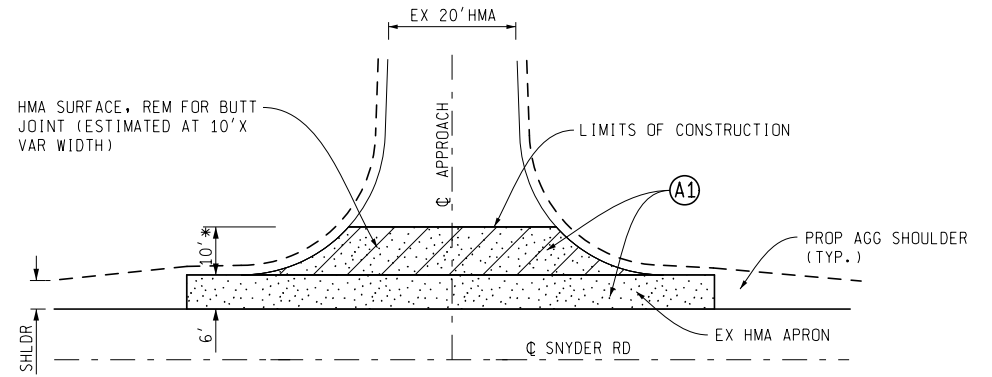
(1) VARY SLOPE 1.5% TO 3.0% (2% DESIRABLE) AS DIRECTED BY THE MCRC. MATCH EX SUPERELEVATION IN SUPERELEVATED SECTIONS AND MATCH EX SUPERELEVATION TRANSITION LENGTHS.

(2) THE PROPOSED HMA WEDGING COURSE IS ESTIMATED AT 140 #/SYD (AVG). THICKNESS OF HMA SHALL VARY FROM 1.5" MAX AT CENTERLINE TO APPROXIMATELY 1" AT THE QUARTER CROWN TO OBTAIN THE PROPOSED CROSS SLOPE.



BUTT JOINT DETAIL

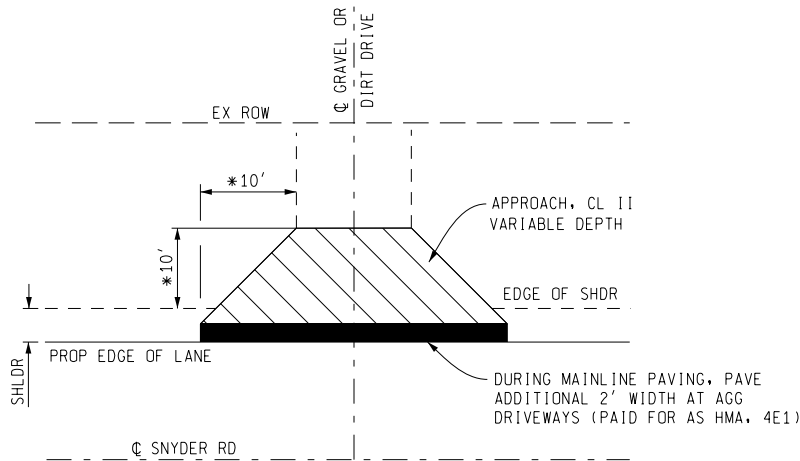
TO APPLY:
 POB STA 10+58
 POE STA 170+13
 MITTERWALD RD APPROACH LT



APPROACH TREATMENT TYPE IIA (EX HMA)

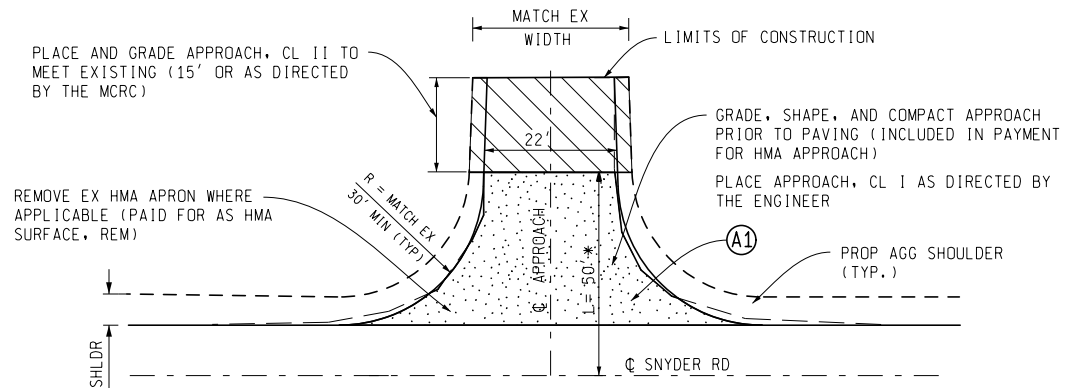
TO APPLY:
 MITTENWALD ROAD (LT)

* OR AS DIRECTED BY THE MCRC



UN-PAVED DRIVEWAY DETAIL

* OR AS DIRECTED BY THE MCRC



APPROACH TREATMENT TYPE IIB (EX AGG)

TO APPLY:
 STRONACH DAM ROAD (LT & RT)

NO SCALE



3 WORKING DAYS
 BEFORE YOU DIG
 CALL MISS 810
 800-482-7171
 OR 811



**APPROACH & MISCELLANEOUS
 DETAIL SHEET**

MANISTEE COUNTY
 ROAD COMMISSION
 8946 CHIPPEWA HWY
 BEAR LAKE, MI 49614

DATE: 1/30/2019

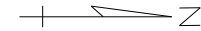
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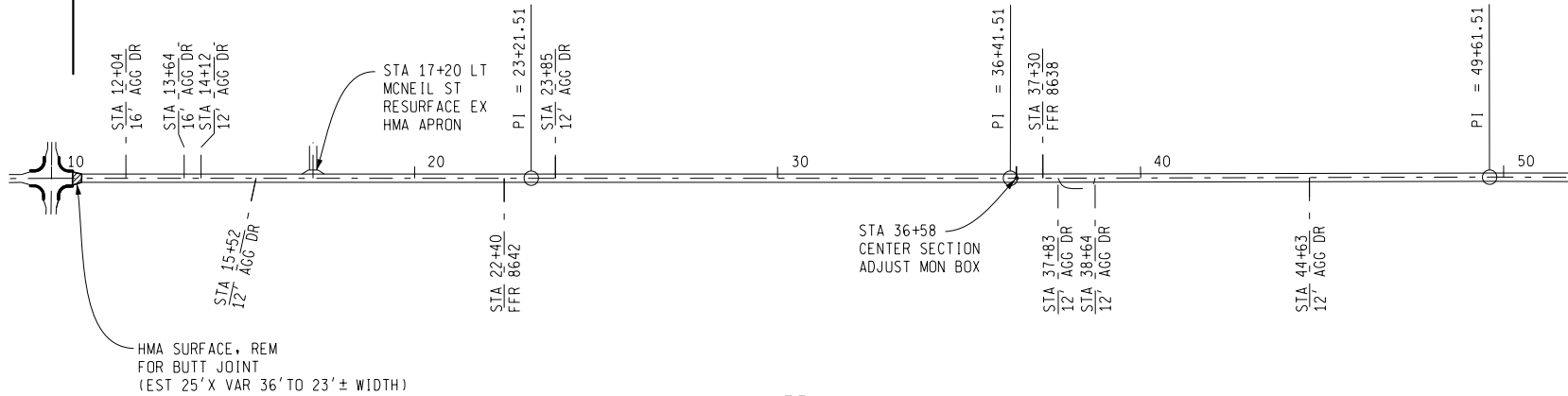
HOXEYVILLE RD
STA 10+00

MCNEIL ST
(PRIVATE)
STA 17+20

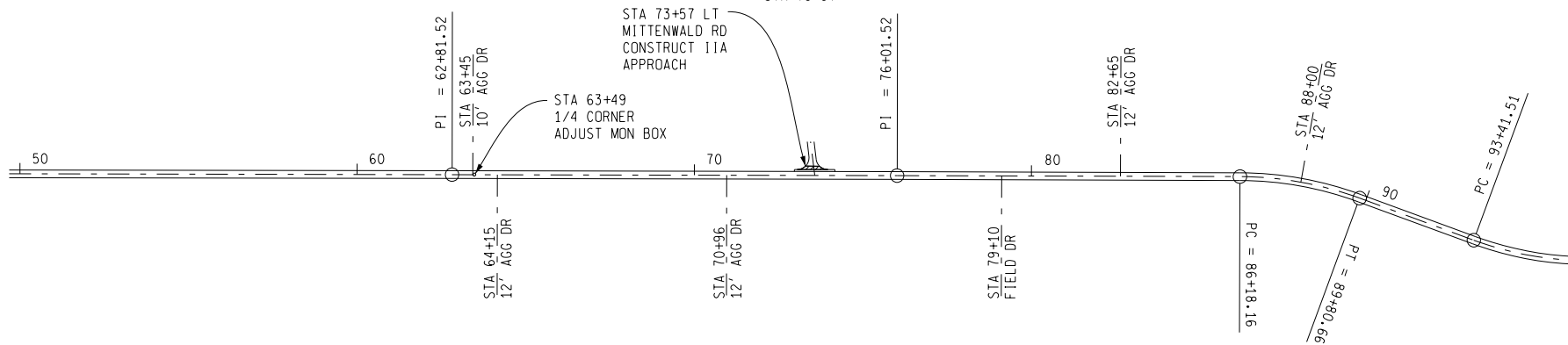
STA 10+58 TO STA 95+00
PLACE HMA WEDGING AND HMA OVERLAY
23'± WIDTH



POB STA 10+58
SNYDER ROAD

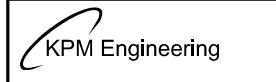


MITTENWALD RD
(PRIVATE)
STA 73+57



NOTE: ALIGNMENT INFORMATION HAS BEEN DERIVED FROM AERIAL PHOTOGRAPHY AND IS FOR INFORMATION ONLY.

NO SCALE



SNYDER RD
POB STA 10+58 TO STA 95+00
NORMAN TWP

DATE: 1/30/2019

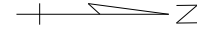
MANISTEE COUNTY
ROAD COMMISSION
8946 CHIPPEWA HWY
BEAR LAKE, MI 49614

DRAWN BY: GLK
SHEET NO.: 9

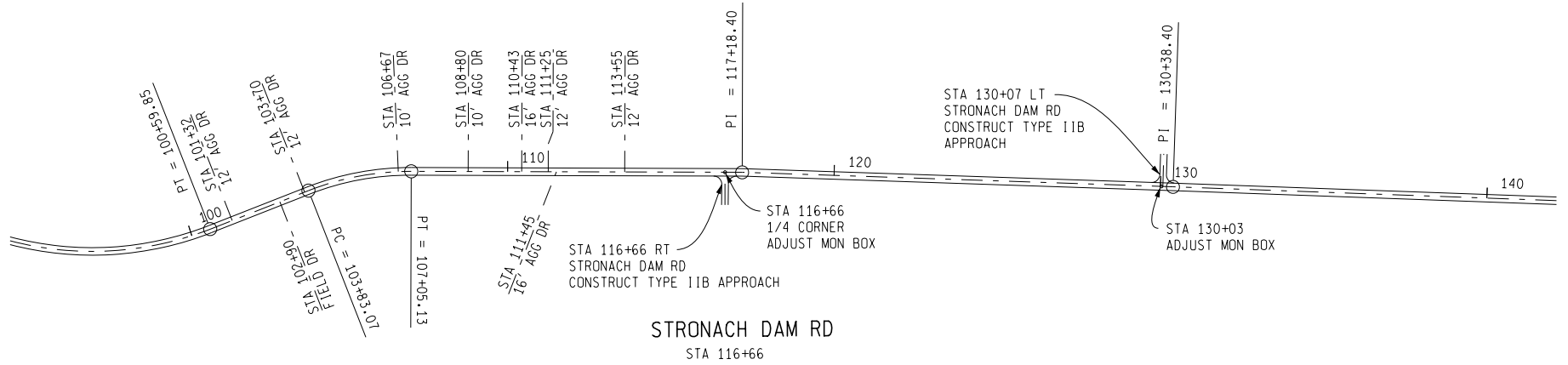
2:29:40 PM

1/30/2019

STRONACH DAM RD
STA 130+07

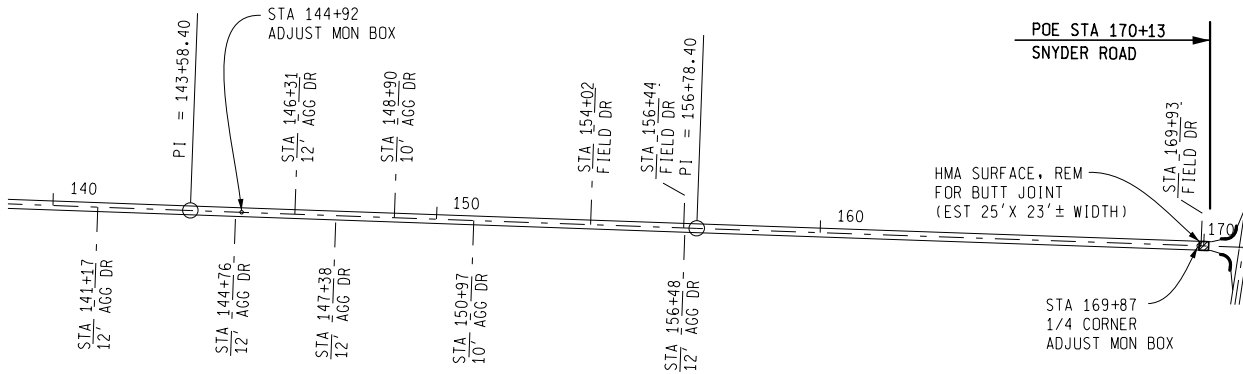


STA 95+00 TO STA 170+13
PLACE HMA WEDGING AND
HMA OVERLAY 23'± WIDTH



STRONACH DAM RD
STA 116+66

M-55
STA 171+04



M-55
STA 171+04

NOTE: ALIGNMENT INFORMATION HAS BEEN DERIVED FROM AERIAL PHOTOGRAPHY AND IS FOR INFORMATION ONLY.

NO SCALE



SNYDER RD
STA 95+00 TO POE STA 170+13
NORMAN TWP

DATE: 1/30/2019

MANISTEE COUNTY
ROAD COMMISSION
8946 CHIPPEWA HWY
BEAR LAKE, MI 49614

| | |
|----------|-----------|
| DRAWN BY | SHEET NO. |
| GLK | 10 |

Manistee County Road Commission
Special Provision
For
Maintaining Traffic

KPM:GLK

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01/30/19

General

Traffic will be maintained in accordance with the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction including any supplemental specifications and as herein specified. All traffic control devices and their usage shall comply with the 2011 edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD), as amended.

The Manistee County Road Commission (MCRC) may perform maintenance work within or adjacent to the Construction Influence Area (CIA). The MCRC will coordinate their operations to minimize the interference to the Contractor. No additional payment will be made to the Contractor for the joint use of the traffic control items.

Construction Influence Area (CIA)

The CIA limits shall include the area within the right-of-ways for Snyder Road from Hoxeyville Road to M-55 in Norman Township, plus a distance in advance as required for the advance construction signing and traffic control devices. The CIA shall also extend down all intersecting roadways a distance of 550 feet.

Traffic and Work Restrictions

Conduct all work between sunrise and sunset local time. "Work" is defined as any activity on the project including the setting up and taking down of traffic control devices. No work shall be permitted on Sundays, holidays, or during special events unless approved by the MCRC due to special circumstances. Holiday periods are defined as:

Memorial Day – 5:00 pm, Friday 05/24/19 to 6:00 am, Tuesday, 05/28/19

Independence Day – 5:00 pm Wednesday, 07/03/19 to 6:00 am, Monday, 07/08/19

Labor Day - 5:00 pm, Friday 08/30/19 to 6:00 am, Tuesday, 09/03/19

A minimum of one lane of traffic shall be maintained at all times. All lanes shall be opened for traffic at night. Work shall only be allowed on one side of the road at a time.

Snyder Road
2019 HMA Resurfacing

Manistee County Road Commission
Special Provision
For
Maintaining Traffic

KPM:GLK

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01/30/19

Traffic shall be maintained with traffic regulator control in accordance with the attached Maintaining Traffic Typical M0020a and M0150a.

A short duration lane closure on Hoxeyville Road and on M-55, utilizing traffic regulator control, may be required when paving in the approach areas.

G20-2 (End Road Work) signs will not be required on this short duration project.

Access for commercial and residential drives within the project limits and for emergency services shall be maintained at all times during construction.

Traffic Control Devices

All warning signs shall be 48" x 48" mounted at a 5' minimum bottom height in uncurbed areas and 7' minimum bottom height in curbed or pedestrian areas.

Temporary Traffic Control Devices shall conform to the attached MDOT Work Zone Device Special Detail WZD-125-E.

All construction signs left in place for a duration exceeding 14 days will be on driven posts as per the MDOT Work Zone Device Special Detail WZD-100-A which is available on the MDOT website or available from the MCRC (upon request).

Quantities for traffic control devices have been estimated based on One (1) sequence of Maintaining Traffic Typical M0150a, plus eight (8) W20-1 "Road Work Ahead" signs to be placed on the intersecting roads a minimum of 550' in each direction from the centerline of Snyder Road or as directed by the Engineer. Additional signing and one additional lighted arrow are estimated for traffic regulator control in the vicinity of the Hoxeyville Road intersection at the POB and the M-55 intersection at the POE.

Temporary Pavement Markings

Temporary centerline pavement markings shall be Pavt Mrkg, Type NR tape, 4 inch, Yellow, Temp and shall be placed daily on the HMA top course in accordance with the MDOT 2012 Standard Specifications for Construction. The temporary markings shall be placed in a single line of 4' strips spaced 50' center-to-center for passing zones and a double line of 4' strips spaced 50' center-to-center for each course of HMA paving for no-passing zones.

Snyder Road
2019 HMA Resurfacing

Manistee County Road Commission
Special Provision
For
Maintaining Traffic

KPM:GLK

Page 3 of 3

01/30/19

Measurement and Payment

The completed work for Maintaining Traffic and for Temporary Pavement Markings, including furnishing and placement of all materials, labor, and equipment, will be measured and paid for at the contract unit price for the following contract items (pay items).

| <u>Contract Item</u> | <u>Pay Unit</u> |
|----------------------------------|------------------------|
| Traffic Control..... | Lump Sum |
| Temporary Pavement Markings..... | Lump Sum |

Estimates of Maintaining Traffic Quantities

| | |
|---|-----------------|
| Lighted Arrow, Type C, Furn, | 3 Each |
| Lighted Arrow, Type C, Oper, | 3 Each |
| Sign, Type B, Temp, Prismatic Furn | 536 Square Foot |
| Sign, Type B, Temp, Prismatic Oper..... | 536 Square Foot |
| Traf Regulator Control (with Intermediate Flaggers) | 1 Lump Sum |
| Minor Traf Devices | 1 Lump Sum |

Estimated quantities for the items above are provided for information only. They shall be included in the lump sum pay item for Traffic Control.

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 |
| 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 |

TAPER LENGTH "L" IN FEET

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)

| | | | |
|---|------------------------------------|-----------------|--------------|
|  TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL | TABLES FOR "L", "D" AND "B" VALUES | | |
| | DRAWN BY: CON:AE:djf | JUNE 2006 | SHEET 1 OF 2 |
| CHECKED BY: BMM | PLAN DATE: | M0020a | |
| FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn | | REV. 08/21/2006 | |

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 |

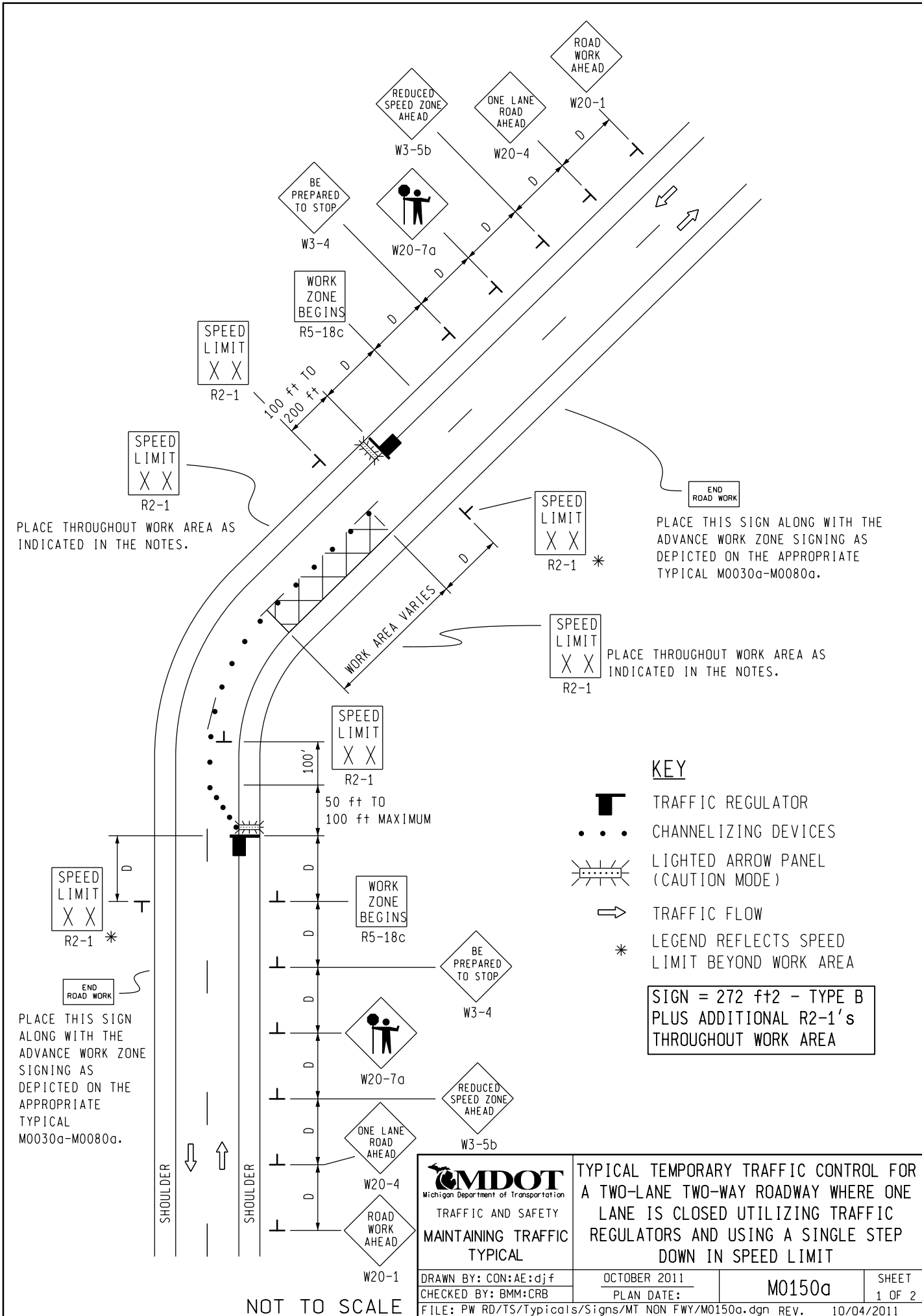
GUIDELINES FOR LENGTH OF
LONGITUDINAL BUFFER SPACE "B"

| 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.

| | | | |
|--|---|-------------------------|--------|
|  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 |
| FILE: K:/DGN/TSR/STDS/ENGLISH/MNTTRF/M0020a.dgn REV. 08/21/2006 | | | |








PLACE THROUGHOUT WORK AREA AS INDICATED IN THE NOTES.

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

PLACE THROUGHOUT WORK AREA AS INDICATED IN THE NOTES.


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

KEY

-  TRAFFIC REGULATOR
-  CHANNELIZING DEVICES
-  LIGHTED ARROW PANEL (CAUTION MODE)
-  TRAFFIC FLOW
-  * LEGEND REFLECTS SPEED LIMIT BEYOND WORK AREA

SIGN = 272 ft x 2 - TYPE B PLUS ADDITIONAL R2-1's THROUGHOUT WORK AREA

NOT TO SCALE

| | | | |
|---|----------------------------|---|-----------------|
|  Michigan Department of Transportation 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 AND USING A SINGLE STEP DOWN IN SPEED LIMIT | |
| DRAWN BY: CON:AE:djf CHECKED BY: BMM:CRB FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0150a.dgn REV. | OCTOBER 2011 PLAN DATE: | M0150a | SHEET 1 OF 2 |


NOTES

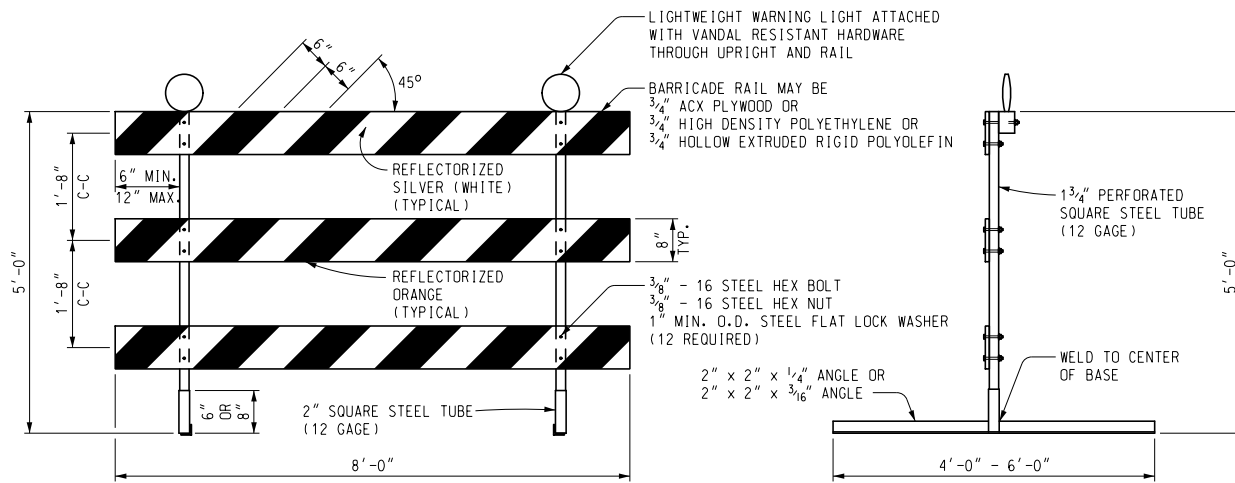
- 1H. D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES AND LENGTH OF LONGITUDINAL BUFFERS
SEE **M0020a** FOR "D" VALUES.
2. ALL NON-APPLICABLE SIGNING WITHIN THE CIA SHALL BE MODIFIED TO FIT CONDITIONS, COVERED OR REMOVED.
3. DISTANCES BETWEEN SIGNS, THE VALUES FOR WHICH ARE SHOWN IN TABLE D, ARE APPROXIMATE 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.
- 16A. ADDITIONAL SPEED LIMIT SIGNS REFLECTING THE REDUCED SPEED SHALL BE PLACED AFTER EACH MAJOR CROSSROAD THAT INTERSECTS THE WORK AREA WHERE THE REDUCED SPEED IS IN EFFECT, AND AT INTERVALS ALONG THE ROADWAY SUCH THAT NO SPEED LIMIT SIGNS REFLECTING THE REDUCED SPEED ARE MORE THAN TWO MILES APART.
- 16B. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED SHALL BE PLACED BEYOND THE LIMITS OF THE REDUCED SPEED AS INDICATED.
- 16E. WHEN EXISTING SPEED LIMITS ARE REDUCED MORE THAN 10 MPH, THE SPEED LIMIT SHALL BE STEPPED DOWN IN NO MORE THAN 10 MPH INCREMENTS.
- 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" |
| RECTANGULAR REGULATORY | - 48" x 60" |
| R5-18c REGULATORY | - 48" x 48" |

NOT TO SCALE

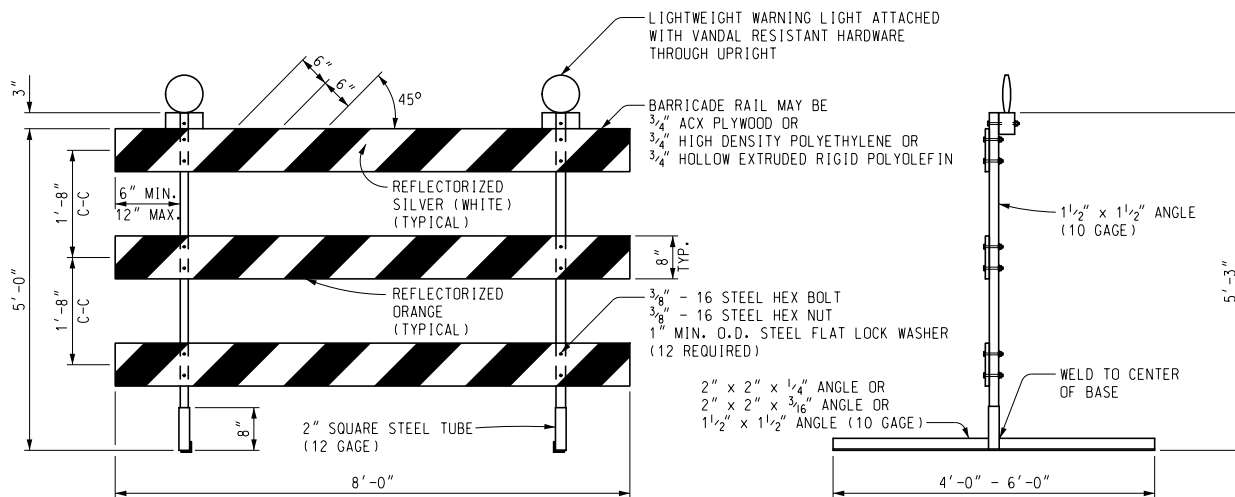
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|---|---|
|  TRAFFIC AND SAFETY MAINTAINING TRAFFIC TYPICAL | TYPICAL TEMPORARY TRAFFIC CONTROL FOR A TWO-LANE TWO-WAY ROADWAY WHERE ONE LANE IS CLOSED UTILIZING TRAFFIC REGULATORS AND USING A SINGLE STEP DOWN IN SPEED LIMIT |
| DRAWN BY: CON:AE:djf | OCTOBER 2011 |
| CHECKED BY: BMM:CRB | PLAN DATE: |
| | M0150a |
| FILE: PW RD/TS/Typicals/Signs/MT NON FWY/M0150a.dgn | SHEET 2 OF 2 REV. 10/04/2011 |



FRONT ELEVATION

SIDE VIEW

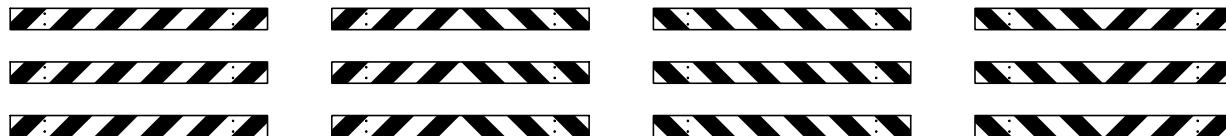
PERFORATED SQUARE STEEL TUBE OPTION



FRONT ELEVATION

SIDE VIEW

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_dept/road_hardware/wzd.htm



PREPARED BY
DESIGN DIVISION

DRAWN BY: ECH

CHECKED BY: MWB

DEPARTMENT DIRECTOR
Kirk T. Steudle

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES
ENGINEER OF DEVELOPMENT

APPROVED BY: _____
(SPECIAL DETAIL)
DIRECTOR, BUREAU OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**Temporary
Traffic Control Devices**

F.H.W.A. APPROVAL

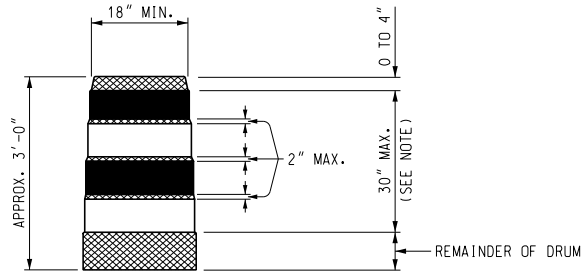
1/18/11
PLAN DATE

WZD-125-E

SHEET
1 OF 3

- 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 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 DEVELOPMENT STANDARD PLAN

(SPECIAL DETAIL)
 F.H.W.A. APPROVAL

1/18/11
 PLAN DATE

WZD-125-E

SHEET
 3 OF 3

**MANISTEE COUNTY ROAD COMMISSION
HMA APPLICATION ESTIMATE**

KPM:GLK

1 of 2

DATE: 01/30/19

a. Description.- This work shall be done in accordance with the requirements of Division 5 of the Michigan Department of Transportation (MDOT) 2012 Standard Specifications for Construction except as herein specified.

b. Construction Methods.- The construction methods shall be in accordance with Section 501 of the MDOT 2012 Standard Specifications for Construction.

c. Tests.- The Nuclear Gauge Method or Coring Method for testing the compaction is hereby waived for this project. The Number of Rollers Method chart below shall apply.

| Average Laydown Rate, Square Yards Per Hour | Number of Rollers Required | |
|--|----------------------------|----------------|
| | Compaction Rollers | Finish Rollers |
| Less than 800 | 1 | *1 |
| 800-1800 | 1 | 1 |
| 1800-4000 | 2 | 1 |
| 4000-7200 | 3 | 1 |

*The compaction roller may also be used as the finish roller.

d. Materials.- The HMA, 4E1 wedging course to correct existing distorted and damaged pavement areas shall have a variable yield per square yard.

The HMA, 4E1 top course for the HMA overlay shall have a yield of 220 pounds per square yard and shall be placed after the HMA wedging. Increase the HMA application rate as needed for the butt joints at the project POB and POE.

MANISTEE COUNTY ROAD COMMISSION
HMA APPLICATION ESTIMATE

KPM:GLK

2 of 2

DATE: 01/30/19

The HMA Approach for paving approach roads will consist of HMA, 4E1 and shall have a average yield of 330 pounds per square yard placed in 2 courses. The yield shall increase where needed to match existing HMA thickness.

The Performance Grade asphalt binder grades for the HMA top course and leveling course for HMA, 4E1 shall be 58-28.

Reclaimed Asphalt Pavement (RAP) in the HMA top courses shall not exceed 17% RAP binder by weight of total binder in the mixture.

The Target Air Void percentage shall be 3.5% for all HMA on this project.

The HMA Bond Coat material shall be per Section 501.02 of the MDOT 2012 Standard Specifications for Construction. The uniform rate of application shall be 0.05 to 0.15 gallons per square yard.

HMA Bond Coat is included with payment for HMA, 4E1, and HMA Approach.

The Aggregate Wear Index (AWI) for all aggregates used in the HMA top course mixtures shall be a minimum of 220.

The Contractor shall provide an HMA mix design that meets the proposed HMA mixtures in these bid documents and in accordance with the MDOT 2012 Standard Specifications for Construction.

The Contractor shall provide written certification that the HMA materials used on the projects meet the requirements of these bid documents, the HMA Application Estimate, and the MDOT 2012 Standard Specifications for Construction.

The MCRC (or their Consultant) may obtain samples of the HMA mixtures from the HMA plant or the project site at their discretion to test the materials to verify conformance with the HMA mix design provided by the Contractor.

e. Measurement and Payment.- Measurement and Payment shall be at the contract unit price per ton of the HMA, 4E1 and HMA Approach Items.

MANISTEE COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
SLOPE RESTORATION

KPM/GLK

1 of 1

01-21-19

a. Description:

This work shall be done in accordance with the requirements of section 816 of the 2012 Edition of the Michigan Department of Transportation Standard Specifications for Construction, except as specified herein.

b. Materials:

The following materials shall meet the requirements of Section 917 of the 2012 Standard Specifications for Construction, and as shown below:

| <u>Material</u> | <u>Application Rate</u> |
|-------------------------------------|---|
| Topsoil Surface | 4 inches |
| Seeding, Mixture TDS | 220 #/Acre |
| Fertilizer, Chemical Nutrient, CI A | 176 #/Acre |
| Mulch Blanket | (Must be from MDOT Qualified Products list) |

c. Construction Methods:

Topsoil, seed, fertilizer and place mulch blanket meeting the requirements of the 2012 MDOT Standard Specifications for Construction will be placed on disturbed areas beyond the roadway shoulder. Topsoil shall be furnished by the contractor but salvaged topsoil may be used as approved by engineer. Topsoil depth shall be not less than 4 inches. The Contractor is responsible for determining the amount of existing topsoil that can be salvaged.

d. Measurement and Payment:

The completed work shall be measured and paid for at the contract unit price for the following contract pay item and includes all materials, equipment and labor necessary to complete this item as described above.

Pay Item

Unit

Slope Restoration

Square Yard

Payment for **Slope Restoration** will be measured by area in square yard in place. All materials, labor and equipment required to install **Slope Restoration**, which includes Topsoil Surface, Furnished or Salvaged; Fertilizer, Chemical Nutrient, Class A; Seeding Mixture; and Mulch Blanket will not be paid for separately but shall be included in the contract unit price bid for **Slope Restoration**.

Snyder Road
2019 HMA Resurfacing

MANISTEE COUNTY ROAD COMMISSION

**NOTICE TO BIDDERS
UTILITY COORDINATION**

KPM:GLK

1 of 1

01-23-19
SNYDER RD 2019 OVERLAY

The contractor shall cooperate and coordinate construction activities with the owners of utilities as stated in Section 104.08 of the 2012 MDOT Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Section 107.12 of the 2012 MDOT Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon Section 108.09 and 109.05 of the 2012 MDOT Standard Specifications for Construction.

For protection of underground utilities and in conformance with Public Acts 174 of 2013, the contractor shall dial 1-800-482-7171 or 811 a minimum of three full working days, excluding Saturdays, Sundays, and holidays prior to beginning each excavation in areas where public utilities have not been previously located. Members will thus be routinely notified. This does not relieve the contractor of the responsibility of notifying utility owners who may not be a part of the MISS DIG alert system.

Public Utilities:

The following Public Utilities have facilities located within the Right-of-Way:

Kaleva Telephone Company Telephone
9281 Osmo Street
Kaleva, MI49645
Contact: Gary Mazeske
Cell (231) 590-6110

Consumers Energy Electric
821 Hastings St
Traverse City, MI 49684
Contact: Curtis Hansen
(231) 929-6242

AT&T Telecom
205 E. Harris Street
Cadillac, MI 49601-2161
Contact: Jeff Shuster
(231) 779-8451

Great Lakes Energy Electric
525 W US-10
PO Box 248
Scottville, MI 49454
Contact: Larry Phillips
(888) 485-2537

The owners of existing service facilities that are within grading or structure limits and in conflict will move them to locations designated by the Engineer or will remove them entirely from the highway Right-of-Way, when feasible. Owners of Public Utilities will not be required by the County to move additional poles or structures in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such poles or structures constitute a hazard to the public or are dangerous to the Contractor's operations.