

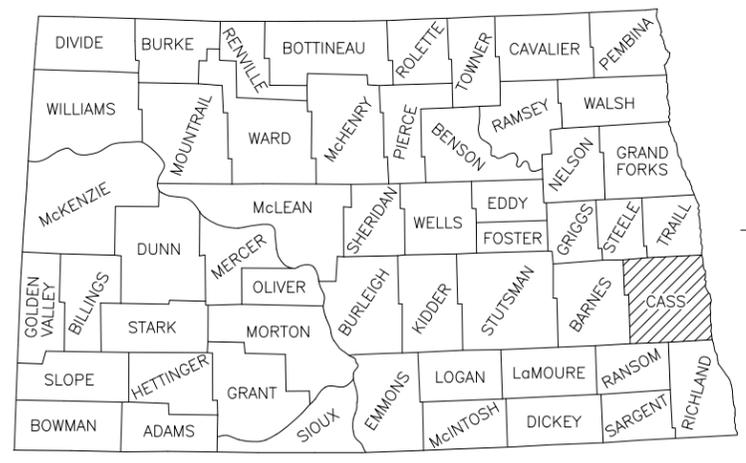
STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	1	10

# CASS COUNTY HIGHWAY DEPARTMENT

## PLANS FOR THE PROPOSED IMPROVEMENT OF A COUNTY HIGHWAY PROJECT NO. CH1515 BITUMINOUS OVERLAY

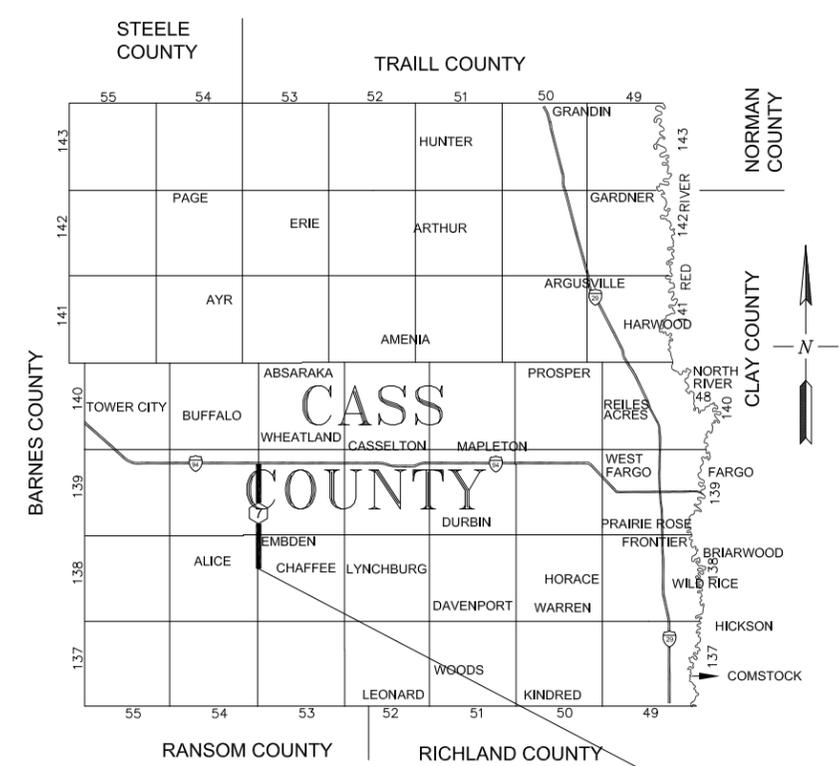
CASS CO. HWY 7; FROM INTERSTATE 94 TO CASS CO. HWY 6

GOVERNING SPECIFICATIONS:  
2014 STANDARD SPECIFICATIONS ADOPTED BY  
THE NORTH DAKOTA DEPARTMENT OF  
TRANSPORTATION AND THE SUPPLEMENTAL  
SPECIFICATIONS EFFECTIVE ON THE DATE THE  
PROJECT IS ADVERTISED.



SKETCH MAP OF NORTH DAKOTA  
SHOWING COUNTIES

DESIGN SPEED 55 MPH  
MINIMUM SIGHT DISTANCE (STOPPING) 495 FEET  
SUPERELEVATION .05 FT/FT  
HIGHWAY CROSS SLOPE 2.1%

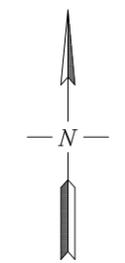
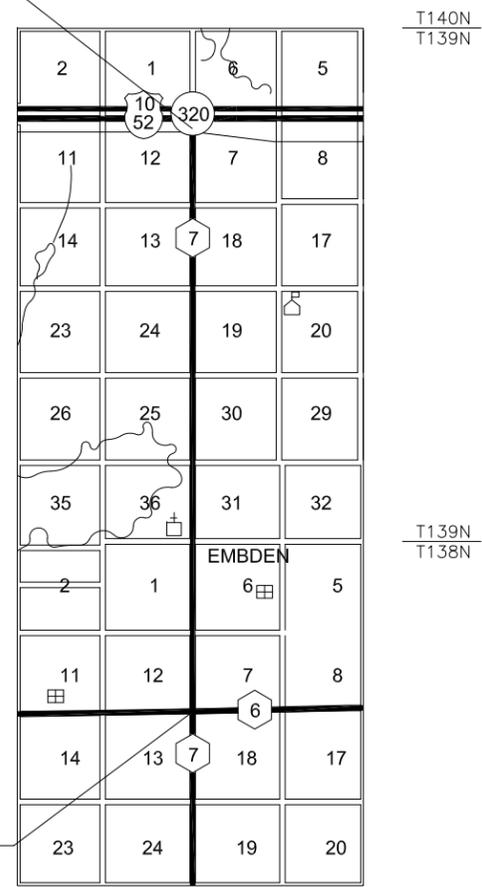


PROJECT CH1515

END PROJECT  
STA. 361+50.00 = N.W. CORNER  
SEC. 7, T139N, R49W.

- (E) 361+50.00
- (7)
- (7) 316+64.00
- (6)
- (6) 263+55.00
- (5)
- (5) 210+80.00
- (4)
- (4) 158+25.00
- (3)
- (3) 105+69.80
- (2)
- (2) 52+80.00
- (1)
- (1) 0+00.00
- (B)

BEGIN PROJECT  
STA. 0+00.00 = S.W. CORNER  
SEC. 7, T138N, R49W.



INDEX OF DRAWINGS

SHEET NO.	TITLE
1	COVER SHEET
2	CONSTRUCTION NOTES
3	BASIS OF ESTIMATE
4	ESTIMATED QUANTITIES
5	TYPICAL SECTIONS
6	APPROACH DETAILS
7	INTERSECTION DETAILS
8	RUMBLE STRIP DETAILS
9-10	CONSTRUCTION SIGNING

STANDARD DRAWINGS

NUMBER	TITLE
D-704-7,8,9,10, 11,12,13,14,15 20,22,26	CONSTRUCTION SIGNING & BARRICADE DETAILS
D-762-4	PAVEMENT MARKING
D-762-6	SHORT TERM PVMT. MARKING
D-766-1	MAILBOX LOCATION DETAILS

LENGTH OF PROJECT

PROJECT SECTION	MILES GROSS	MILES NET
	6.847	6.847

DESIGN FEBRUARY 2015

STANDARD DRAWINGS ARE INCLUDED IN PLANS BUT  
ARE AVAILABLE AT THE COUNTY ENGINEERS OFFICE

THIS DOCUMENT WAS ORIGINALLY ISSUED  
AND SEALED BY  
JASON P. BENSON  
N.D. REG. NO. 7490  
ON 02/27/2015 AND THE ORIGINAL  
DOCUMENT IS STORED AT THE CASS COUNTY  
HIGHWAY DEPARTMENT, WEST FARGO, ND

CASS COUNTY HIGHWAY DEPARTMENT  
PROJECT NO. CH1515  
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.  
JASON P. BENSON /s/ DATE: 02/27/15  
JASON P. BENSON N.D. REG. NO. 7490

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	2	10

GENERAL PROVISIONS:

Thicknesses shown on the typical sections for surfacing are approximate. It is intended that the plan tonnages provided for by the basis of estimate will be used uniformly throughout the project unless otherwise authorized by the Engineer.

The attention of the bidders is directed to M.S. 298.75 (Aggregate Material Tax), pursuant to the removal of aggregates from any deposit in Minnesota.

HOT BITUMINOUS PAVEMENT:

The hot bituminous pavement shall be placed and accepted according to NDDOT Standard Specifications Section 430. **OUTSIDE EDGE OF SLOUGH MUST REMAIN 1.5" OR THINNER OR BE RAKED OUT OR REPAIRED BY CONTRACTOR AT THEIR EXPENSE.**

All compaction equipment shall meet the NDDOT Standard Specification 151.01.

All hot bituminous mix and asphalt cement required shall be measured and paid for by the ton of "RAP – SUPERPAVE FAA 42" and "PG 58–28 ASPHALT CEMENT". This shall be considered full payment for performing this work.

WARM MIX ASPHALT (WMA):

Warm Mix Asphalt (WMA) may be substituted for Hot Mix Asphalt (HMA) at the Contractor's choosing. The WMA additive or technology is at the Contractor's choosing, and to be approved by the Engineer. All costs and savings associated with WMA shall be included in the unit cost for "RAP – SUPERPAVE FAA 42."

HAUL ROADS:

The Contractor's attention is directed to Section 107.08 of the Standard Specifications regarding the use of public roads for hauling materials to the project. Haul roads that will not be allowed for this project are as follows: Barnes County Highway 6 from State Highway 32, East to the Cass County line. Cass County Highway 26, from the Barnes County line East to State Highway 38, and Cass County Highway 10 from Tower City East to State Highway 38. No Township roads anywhere in Cass County will be allowed for haul road usage. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INVESTIGATE THE SUITABILITY OF ROUTES WITH THE AGENCY HAVING CONTROL OF THE ROAD PRIOR TO SUBMITTING A BID.

PRIME OR TACK COAT:

This item shall be included in the unit cost for "RAP – SUPERPAVE FAA 42." The approximate quantity required for this project is: 5,451 Gallons at 0.05 GAL/SY.

The emulsified asphalt must be applied in accordance with Section 401.04 of the Standard Specifications.

FOG COAT:

The pavement shall receive a fog coat in the driving lanes and shoulders with CSS–1H, SS–1H or MS–1 emulsified asphalt (diluted 50/50) at a rate of 0.10 gallons per square yard. The fog coat shall be placed after the rumble strips are cut. Rumble strips fogged first @ 2' wide in one direction, then fog the pavement surface the opposite direction, staying 1' from the centerline stripe and re–shooting the 2' rumble strip.

PLACEMENT OF CLASS 5 AGGREGATE:

The Contractor shall be responsible for the direction, placement (Dumpman) and coordination of aggregate trucks.

CULTURAL RESOURCE PRESERVATION AND CLEARANCES OF GRAVEL PITS:

In accordance with section 107.05 of the standard specifications, the contractor is required to ensure that applicable cultural resource laws and regulations have been followed for all material sources. Below is the NDDOT website of pits that been certified.

<http://www.dot.nd.gov/dotnet2/materialsource/certificatesofapproval.aspx>

All material source locations, even those opened prior to the current project, must have been subjected to class III cultural resources inventory prior to use. Inventory results will determine recommendations regarding use of a particular source. The contractor's attention is directed to section 107.06 of the standard specifications for the treatment of any cultural resources that may be uncovered within the right of way.

WEED CONTROL:

Successful bidders as part of their supply contract will be required as part of the bid acceptance to comply with the following:

1. All noxious weeds must be controlled within the pit and extraction area each year in compliance with North Dakota State Agriculture Department recommendations for noxious weed control.
2. The county weed officer shall inspect the pit and extraction area before any materials shall be removed and shall by written letter certify operator's compliance with the North Dakota Department of Agriculture's recommendations for noxious weed control.
3. Any questions concerning the certifications of compliance for noxious weed control and the requirements thereunder is available from the County Weed Officer at (701) 298–2388.

This request is made pursuant to section 4.1–47 of the North Dakota Century Code.

TRAFFIC CONTROL FOR RUMBLE STRIPS:

The contractor shall use Standard Drawing D–704–15 layout A or Standard Drawing D–704–56 for shoulder rumble strips.

Any other method of traffic control must be requested by the Contractor and approved by the Engineer prior to use in the field. All costs for this work shall be included in the price bid for "RUMBLE STRIPS – ASPHALT SHOULDER".

RECYCLED ASPHALT PAVEMENT (RAP):

Contractor may add up to 15% recycled asphalt pavement (RAP), with a tolerance of ±5% in the Superpave FAA 42 mixture. Contractor may add millings from own stockpile or alternate source to achieve 15% RAP mixture. All additional millings shall be approved by the Engineer prior to use. All costs and savings of using the recycled material shall be included in the unit cost for "RAP – SUPERPAVE FAA 42."

RAP must be utilized in accordance with Section 430.03 E of the Standard Specification.

TRAFFIC CONTROL:

Lump sum "TRAFFIC CONTROL" bid item shall include all signage required for construction (See sheet 10 for devices listing), flagging and pilot car. Flagging hours are estimated at 113 hours for the project, Pilot Car hours are estimated at 57 hours for the project.

STRIPING:

All striping must be 4" wide (both temporary or permanent). If striping is measured at a thinner width, the prorated amount of width will be paid for the quantity placed.

MILLING PAVEMENT SURFACE:

All milling will be 1" in depth and 24' wide throughout project except from Sta. 105+70 to Sta. 126+25 and from Sta. 223+50 to Sta. 232+90 where there will be no milling done.

SEEDING:

Contractor will seed and mulch areas disturbed by construction activity. Contractor shall provide erosion checks until turf is established as directed by the Engineer in the field.

Seeding – Class III shall be used as shown in the turf establishment and erosion control plans. The seed mixture for all areas except those designated as urban shall be as follows:

CLASS III	PERCENT OF PURE LIVE SEEDS PER ACRE
MEADOW BROMEGRASS	25%
INTERMEDIATE WHEATGRASS	25%
CRESTED WHEATGRASS	25%
TETRAPLOID INT. RYEGRASS	10%
CREeping ALFALFA	15%
80 LBS OF SEED AND 20 LBS OF RYE PER ACRE.	

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CASS COUNTY HIGHWAY DEPARTMENT  
 PROJECT NO. CH1515  
 CONSTRUCTION NOTES

PAVEMENT MARKING QUANTITIES								
START STA	END STA	LANE	4" YELLOW TEMPORARY (3 LIFTS)		4" PERMANENT MARKING			
			SKIP (L.F.)	NPZ (L.F.)	4" SKIP (L.F.)	4" NPZ (L.F.)	4" WHITE (L.F.)	TOTAL 4" (L.F.)
0+50	220+55		5,501		5,501		44,010	49,511
220+55	235+75	LT/RT		3,040		3,040	3,040	6,080
235+75	261+55		645		645		5,160	5,805
261+55	272+50	LT/RT		2,190		2,190	2,190	4,380
272+50	359+25		2,169		2,169		17,350	19,519
359+25	361+50	LT/RT		450		450	450	900
0+50	5+50	LT		500		500		500
214+40	235+75	RT		2,135		2,135		2,135
220+55	243+75	LT		2,320		2,320		2,320
257+55	272+50	RT		1,495		1,495		1,495
261+55	277+00	LT		1,545		1,545		1,545
TOTAL =			24,945	41,025	8,315	13,675	72,200	94,190

BASIS OF ESTIMATE (SURFACING INTERSECTIONS)			
DESCRIPTION	HWY 7 & HWY 6	EMBDEN INT.	
RECYCLED ASPHALT PAVEMENT - FAA 42	100 TON	50	TON
ASPHALT CEMENT	5 TON	2.5	TON
EMULS. ASPH. FOR TACK COAT	27 GAL.	14	GAL.
INTERSECTION RECYCLED ASPHALT PAVEMENT - FAA 42 TOTALS =150 TONS			

PAVING TONNAGE ESTIMATE CH1515							
TYPE	STA START	STA END	LENGTH (FT)	WIDTH (FT)	AREA (SF)	THICKNESS (IN)	TONS
MAINLINE	0+00	361+50	36,150	24	867,600	1.5	8,033
SLOUGH	0+00	361+50	72,300	2	144,600	1.5	670
<b>TOTAL</b>							<b>8,703</b>
<b>5% OVERAGE</b>							<b>435</b>
<b>APPROACHES/INT</b>							<b>766</b>
<b>GRAND TOTAL</b>							<b>9,904</b>

BASIS OF ESTIMATE	
MATERIAL	BASIS OF ESTIMATE
AGGREGATE BASE COURSE - CLASS 5	1.875 TON/CY
SHRINKAGE FOR CLASS 5	COMPACTED VOLUME IN PLACE PLUS 25%
CLASS 5 FOR APPROACHES	23 TONS/APPROACH
HOT BITUMINOUS PAVEMENT	2 TON/CY
ADDED ASPHALT CEMENT	5.0% OF HBP BY WEIGHT
EMULSIFIED ASPHALT FOR TACK COAT	0.05 GAL/SY
EMULSIFIED ASPHALT FOR RUMBLE STRIPS	0.10 GAL/SY
EMULSIFIED ASPHALT FOR FOG COAT	0.05 GAL/SY
<b>WATER</b>	
AGGREGATE BASE CLASS 5 COMPACTION	30 GAL/TON
AS A DUST PALLATIVE ON HAUL ROADS	30 M GAL PER DAY OF HAULING
	(ESTIMATED TO BE 15 DAYS)
<b>TRAFFIC CONTROL</b>	
FLAGGING	12 HOURS FLAGGING/FLAGGER/2000 TONS FAA 42
PILOT CAR	12 HOURS PILOT CAR/2000 TONS FAA 42

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	3	10

OVERLAYING APPROACHES							
DESCRIPTION	PRIVATE DRIVE		SECTION LINE		FIELD APPROACH		TOTAL
AMOUNT	6		12		32		
RECYCLED ASPHALT PAVEMENT - FAA 42	20	TON	20	TON	8	TON	616 TON
ASPHALT CEMENT	1	TON	1	TON	0.4	TON	30.8 TON
AGGREGATE BASE - CLASS 5	23	TON	23	TON	23	TON	1150 TON
EMULS. ASPH. FOR TACK COAT	15	GAL.	15	GAL.	10	GAL.	590 GAL.

MAXIMUM SIZE OF AGGREGATES		
DESCRIPTION	TYPE OF AGGR.	MAXIMUM SIZE
RECYCLED ASPHALT PAVEMENT - FAA 42	CRUSHED	5/8"
AGGREGATE BASE & SHOULDERS - CLASS 5	CRUSHED	1"

EMULSIFIED ASPHALT FOR FOGGING				
LOCATION	LENGTH (FT)	WIDTH (FT)	AREA (SY)	GAL
RUMBLE STRIPS	36,150	4	16,067	803
MAINLINE	36,150	24	96,400	4,820
TOTAL =			112,467	5,623

EMULSIFIED ASPHALT FOR TACK COAT				
LOCATION	LENGTH (FT)	WIDTH (FT)	AREA (SY)	GAL
MAINLINE - TOP LIFT	36,150	24	96,400	4,820
APPROACHES/INTERSECTIONS				631
TOTAL =			96,400	5,451

MILLING BITUMINOUS PAVEMENT				
STATION	WIDTH (FT)	LENGTH (FT)	AREA (SY)	TONS
0+00 TO 105+70	24	10,570	28,187	1,566
126+25 TO 223+50	24	9,725	25,933	1,441
232+90 TO 361+50	24	12,860	34,293	1,905
TOTAL	24	33,155	88,413	4,912

TOPSOIL BASIS OF ESTIMATE									
PLACEMENT	STA START	STA END	LENGTH (FT)	WIDTH (FT)	LANES	AREA (SF)	THICKNESS (IN)	VOLUME (CY)	
INSLOPE/SLOUGH	0+00	361+50	36,150	5	2	180,750	6	6,694	
<b>TOTAL</b>								<b>6,694</b>	

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 ON 02/27/2015 AND THE ORIGINAL DOCUMENT IS STORED AT THE CASS COUNTY HIGHWAY DEPARTMENT, WEST FARGO, ND

CASS COUNTY HIGHWAY DEPARTMENT  
 PROJECT NO. CH1515  
 BASIS OF ESTIMATE

**CASS COUNTY HIGHWAY DEPARTMENT**

**PROJECT NO. CH1515  
BITUMINOUS OVERLAY ON CASS HIGHWAY 7  
FROM INTERSTATE 94 TO CASS HIGHWAY 6**

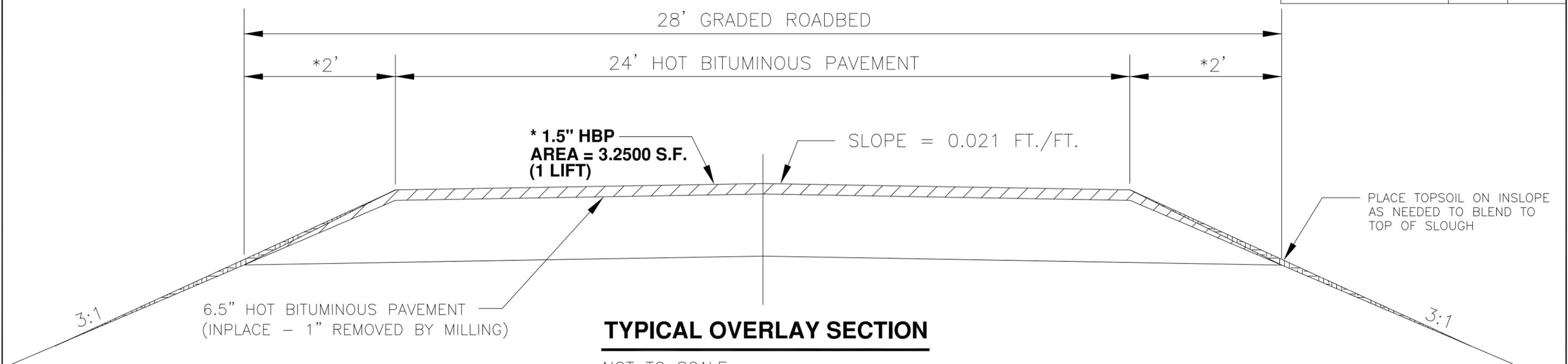
**ESTIMATED QUANTITIES**

ITEM	SPEC NO.	CODE	DESCRIPTION	UNIT	APPROX. QUANTITY
1	103	0100	CONTRACT BOND	L SUM	1
2	203	0119	TOPSOIL - IMPORTED	CY	6,694
3	216	0100	WATER	M GAL	188
4	251	0300	SEEDING CLASS III	ACRE	8.3
5	253	0101	STRAW MULCH	ACRE	8.3
6	302	0120	AGGREGATE BASE COURSE CL 5	TON	1,150
7	401	0070	FOG SEAL	GAL	5,623
8	411	0105	MILLING PAVEMENT SURFACE	SY	88,413
9	430	0142	RAP - SUPERPAVE FAA 42	TON	9,904
10	430	1000	CORING BITUMINOUS SURFACING	EA	40
11	430	5828	PG 58-28 ASPHALT CEMENT	TON	495
12	702	0100	MOBILIZATION	L SUM	1
13	704	1100	TRAFFIC CONTROL	L SUM	1
14	706	0301	FIELD LABORATORY-TYPE C	L SUM	1
15	760	0005	RUMBLE STRIPS-ASPHALT SHOULDER	MILE	13.6
16	762	0405	SHORT TERM 4 IN BROKEN LINE-PNT TAPE OR RSD MRK	LF	24,945
17	762	0410	SHORT TERM 4 IN LINE NPZ - PN TP OR RS MRK	LF	41,025
18	762	1104	PVMT MK PAINTED 4IN LINE	LF	94,190

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CASS COUNTY HIGHWAY DEPARTMENT  
PROJECT NO. CH1515  
ESTIMATED QUANTITIES

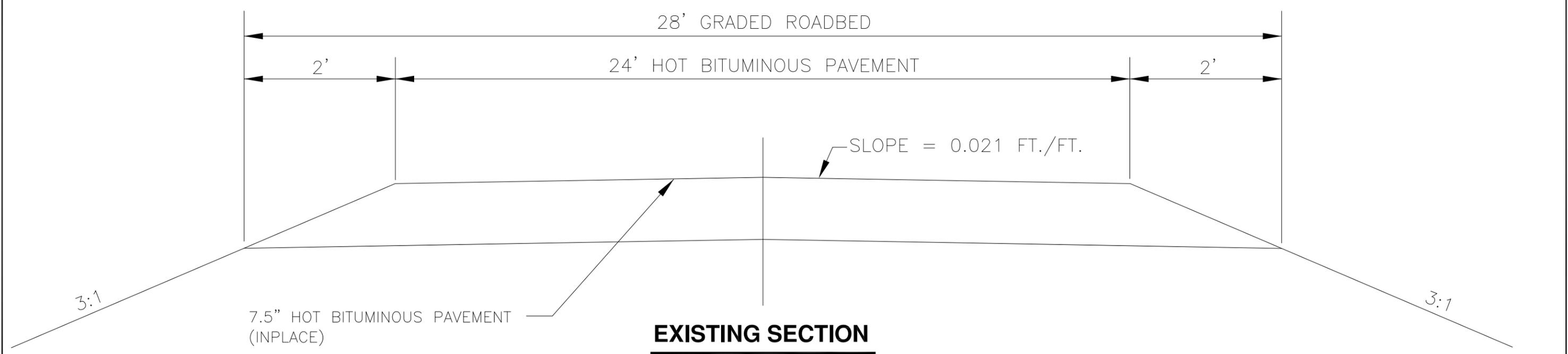
STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	5	10



**TYPICAL OVERLAY SECTION**

NOT TO SCALE  
STA 0+00.00 TO STA 361+50.00

**\*THE ENGINEER IN THE FIELD WILL DETERMINE  
THE DIMENSIONS OF THE SHOULDER AND  
SLOUGH TO BEST FIT THE FIELD CONDITIONS**



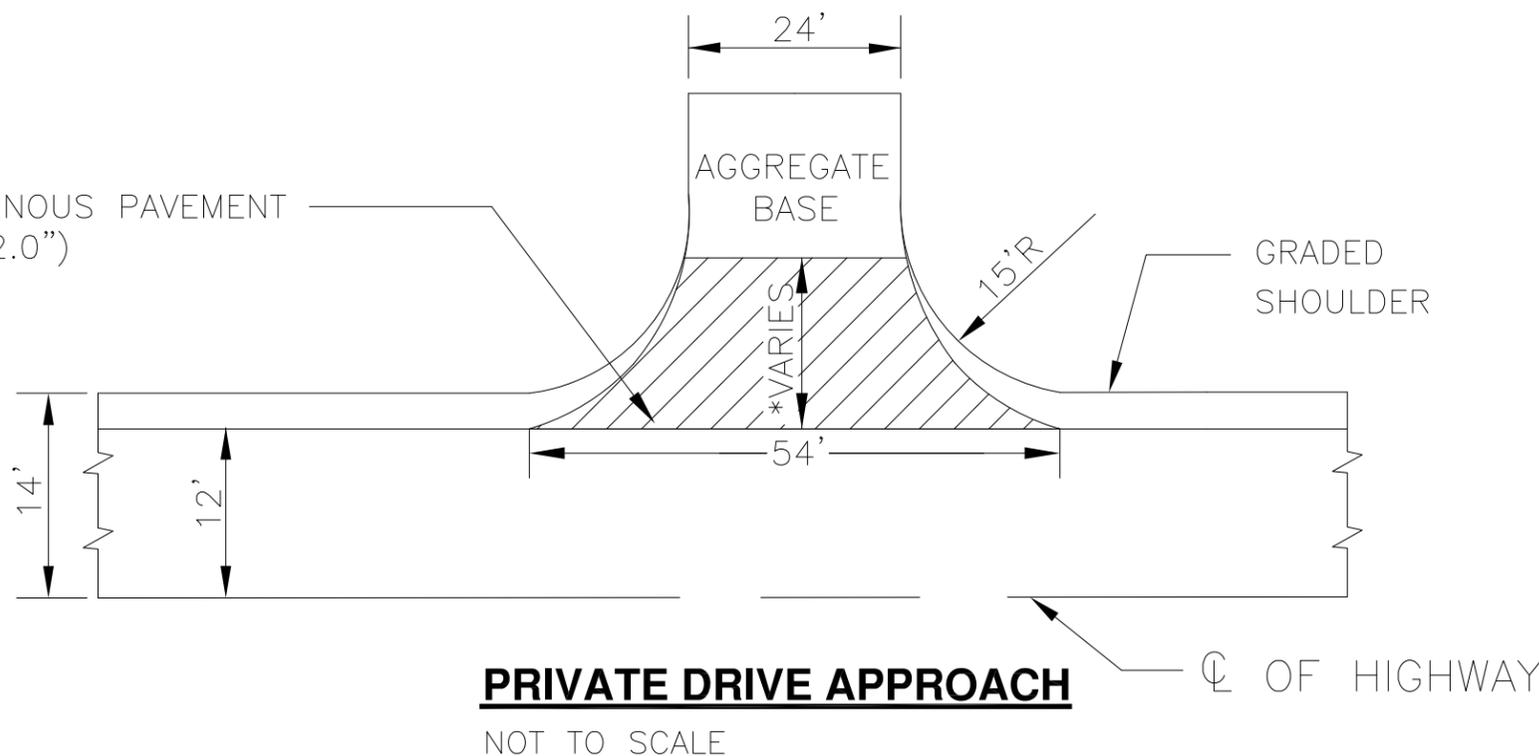
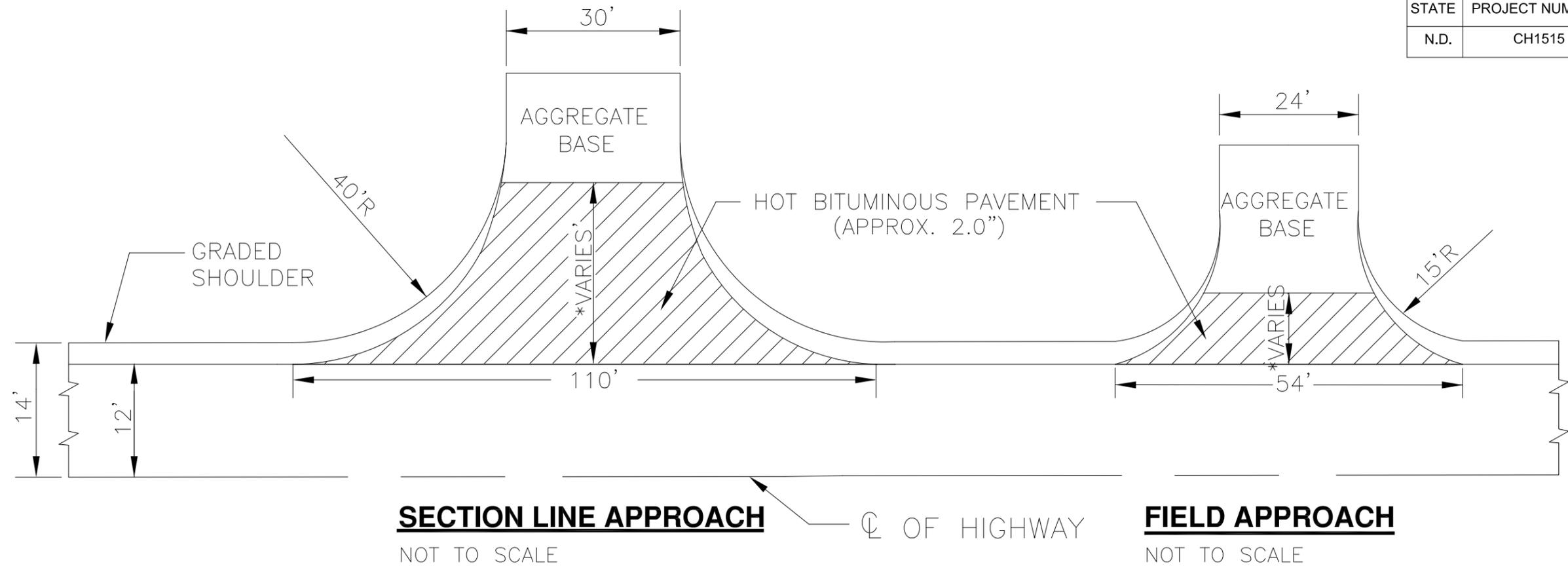
**EXISTING SECTION**

NOT TO SCALE  
STA 0+00.00 TO STA 361+50.00

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CASS COUNTY HIGHWAY DEPARTMENT  
PROJECT NO. CH1515  
TYPICAL SECTIONS

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	6	10



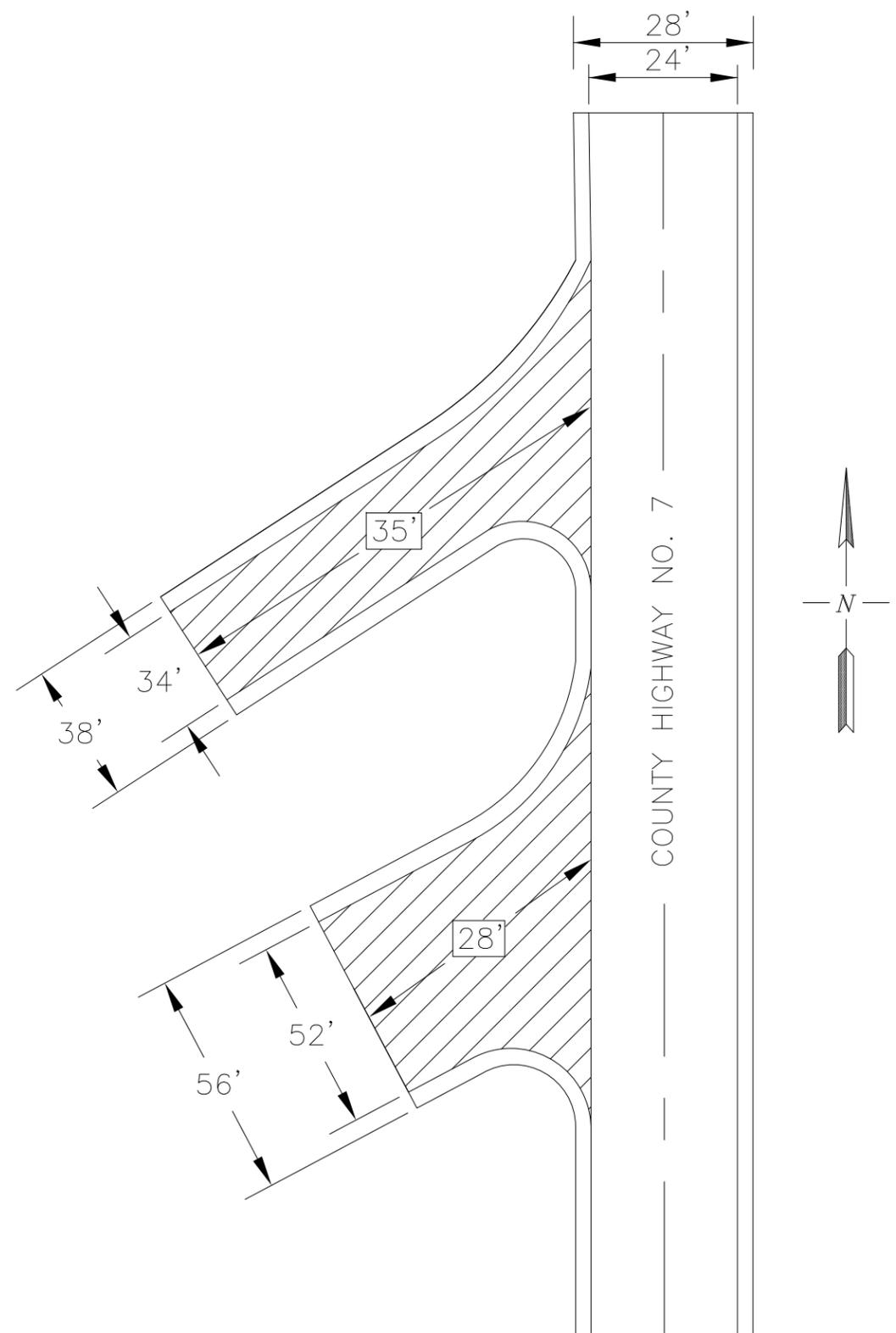
**\* DIMENSIONS MAY VARY. ENGINEER IN FIELD SHALL DETERMINE EXACT LIMITS OF SURFACING AT ALL DRIVES AND APPROACHES.**

**PLACEMENT OF APPROACH PVMT:**  
**PAVEMENT FOR APPROACHES SHALL BE PLACED AHEAD OF THE MAINLINE TOP LIFT PAVING OPERATION. NO COLD JOINT WILL BE ALLOWED BETWEEN THE MAINLINE AND APPROACHES. ONLY PAVE OVER EXISTING PAVEMENT ON ALL APPROACHES.**

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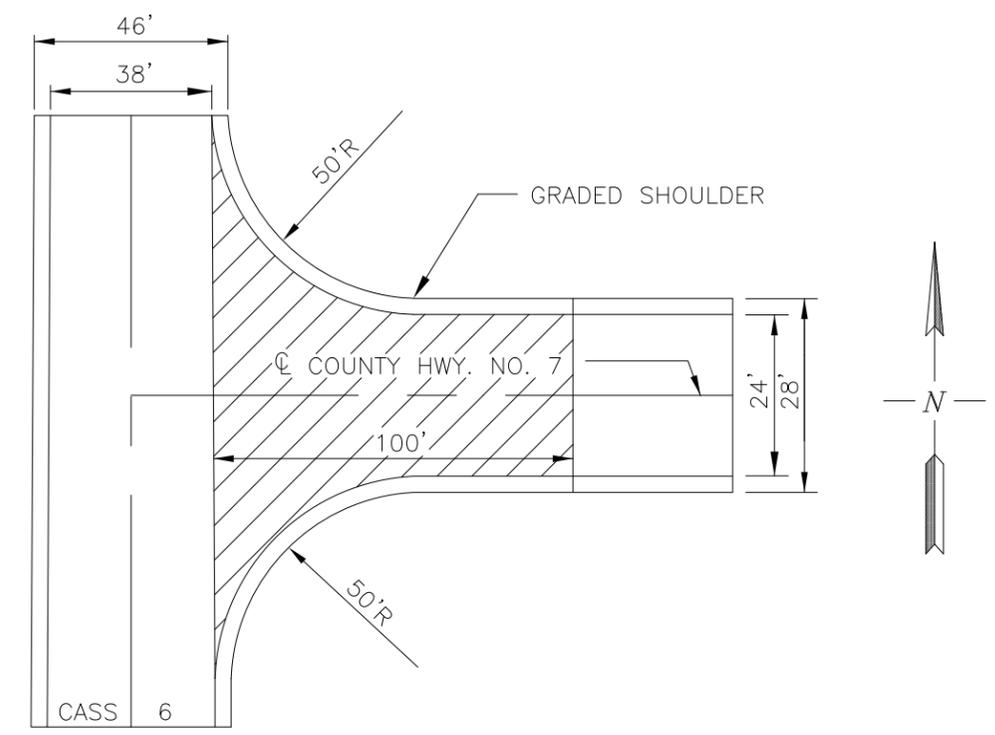
CASS COUNTY HIGHWAY DEPARTMENT  
 PROJECT NO. CH1515  
 APPROACH DETAILS

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	7	10



**EMBDEN APPROACHES**

NOT TO SCALE



**TEE INTERSECTION DETAIL**

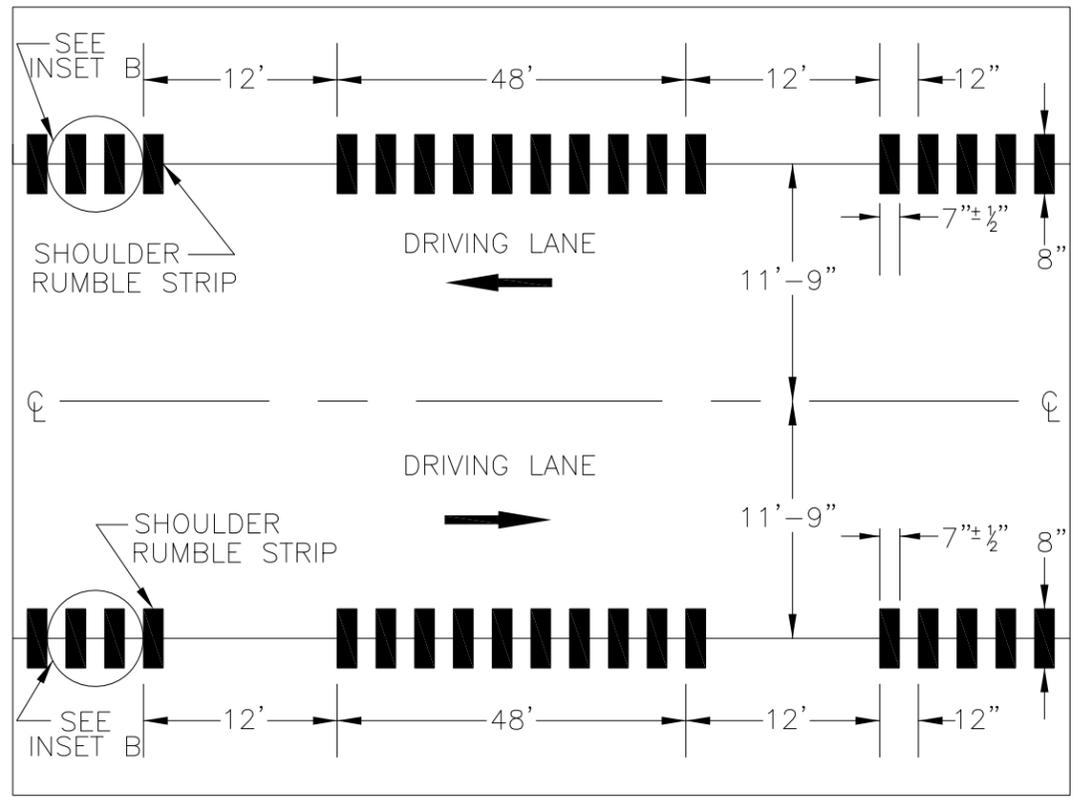
CASS COUNTY HIGHWAY 6  
 STA 0+00.00  
 NOT TO SCALE

**\* DIMENSIONS MAY VARY.  
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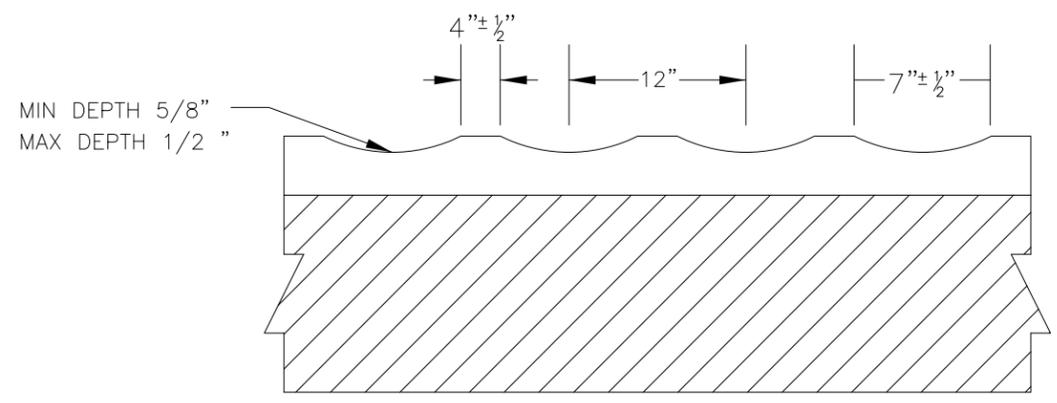
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CASS COUNTY HIGHWAY DEPARTMENT  
 PROJECT NO. CH1515  
 INTERSECTION DETAILS

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	8	10



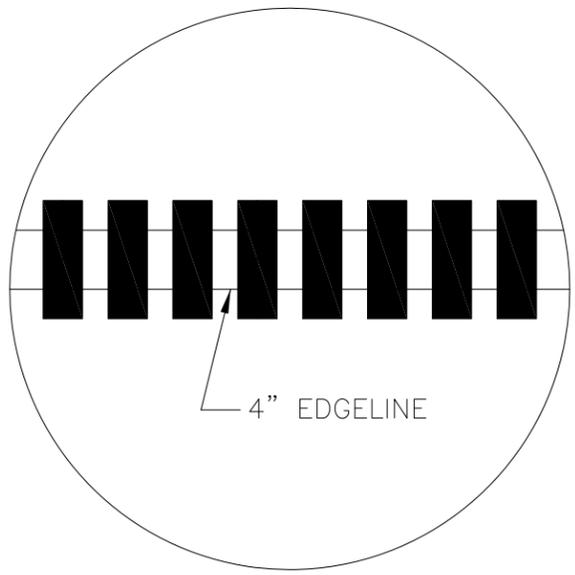
**PLAN VIEW OF RUMBLE STRIPS**



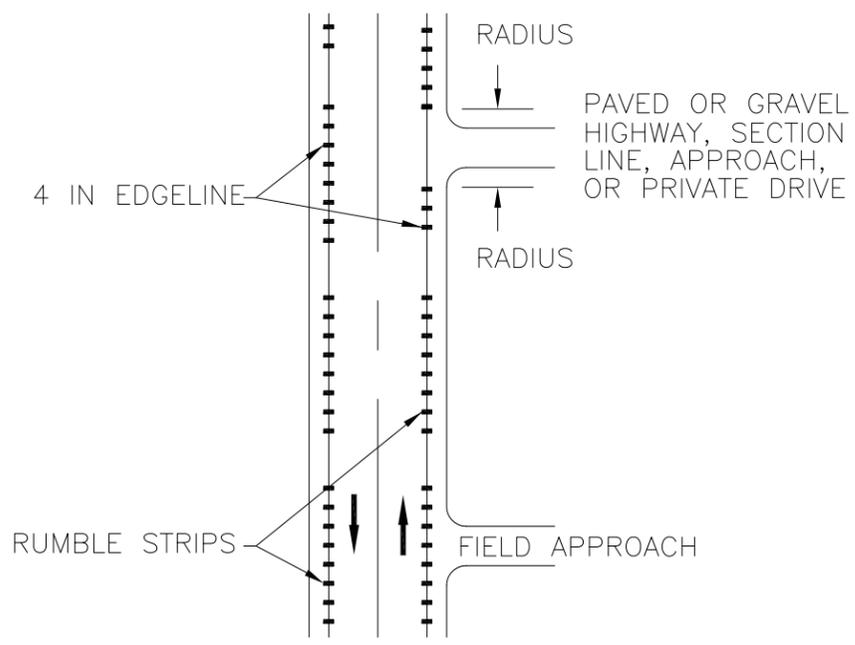
**PROFILE VIEW OF RUMBLE STRIPS**

**RUMBLE STRIP DETAILS**

NOT TO SCALE



**INSET B - SHOULDER RUMBLE STRIP**



**ENTRANCE ROADWAYS**

NOTES:

- 1) Rumble strips shall be milled into the bituminous paved shoulders. All milled materials shall be swept off of the driving lanes and paved shoulders using a mechanical sweeper. All costs for sweeping shall be included in the price bid for "RUMBLE STRIPS - ASPHALT SHOULDER."
- 2) Rumble strips milled into new or existing bituminous pavements shall be fog sealed across the full width of the milling with an application of SS-1h or CSS-1h emulsified asphalt at a rate of about 0.10 Gal/SY diluted 50/50 sprayed in both directions. All costs for fog sealing shall be included in the price bid for "RUMBLE STRIPS - ASPHALT SHOULDER."
- 3) Discontinue rumble strips across bridge decks and approach slabs, adjacent to guardrail, and 1/2 mile on either side of:
  - highways with posted speeds 45 mph or less
  - all urban areas
  - areas with curb and gutter
- 4) Discontinue shoulder rumble strips through the entire length of right turn lanes, 100' before right turn lane tapers, and at the radius of a paved or gravel highway, section line, approach, or private drive.
- 5) All costs associated with the use of a paint dribble line for rumble strip alignment shall be included in the "RUMBLE STRIPS - ASPHALT SHOULDER" bid item.

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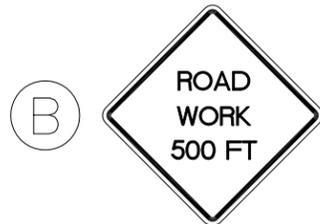
CASS COUNTY HIGHWAY DEPARTMENT  
 PROJECT NO. CH1515  
 RUMBLE STRIP DETAILS

TRAFFIC CONTROL LEGEND

⇨ POST-MOUNTED SIGN



W20-1-48



W20-1-48



G20-1a-60



G20-2a-48



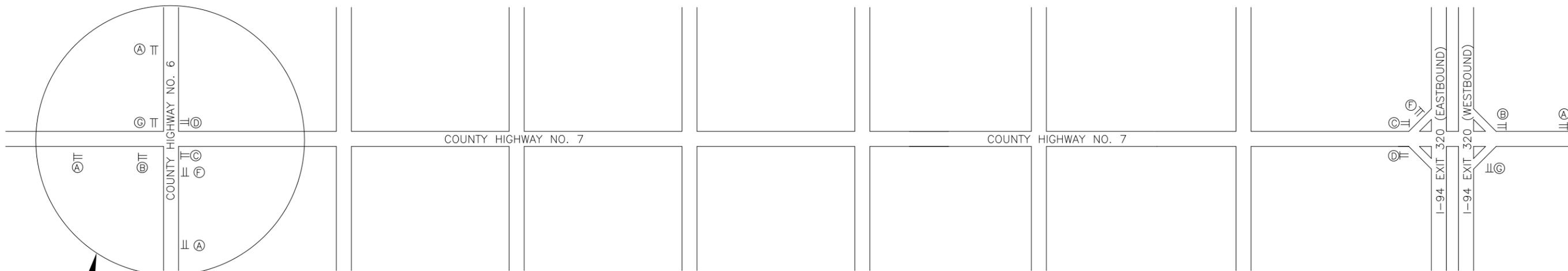
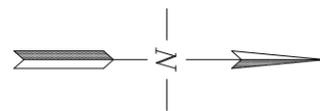
G20-50a-72



G20-52a-72



G20-52a-72



**CONSTRUCTION SIGN LAYOUT**

NOT TO SCALE

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	9	10

**THE COUNTY MAY BE PAVING COUNTY ROAD NO. 6 FROM CHAFFEE TO COUNTY ROAD NO. 38. THEREFORE CHANGES TO THE ABOVE HIGHLIGHTED SIGNS MAYBE REQUIRED.**

**\* NOTE: TRAFFIC CONTROL BID ITEM IS LUMP SUM AS PER NDDOT SPEC 704.06. B. SEE SIGN LIST ON SHEET 10 FOR SIGN QUANTITIES.**

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY  
 JASON P. BENSON  
 N.D. REG. NO. 7490  
 ON 02/27/2015 AND THE ORIGINAL DOCUMENT IS STORED AT THE CASS COUNTY HIGHWAY DEPARTMENT, WEST FARGO, ND

CASS COUNTY HIGHWAY DEPARTMENT  
 PROJECT NO. CH1515  
 CONSTRUCTION SIGN LAYOUT

STATE	PROJECT NUMBER	SHEET	TOTAL SHEETS
N.D.	CH1515	10	10

**PROJECT NO. CH1515**

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQ'D	UNITS PER AMOUNT	UNITS SUB-TOTAL
<b>G20-1a-60</b>	<b>60" X 24"</b>	<b>ROAD WORK NEXT ___ MILES</b>	<b>2</b>	<b>34</b>	<b>68</b>
<b>G20-2a-48</b>	<b>48" X 24"</b>	<b>END ROAD WORK</b>	<b>2</b>	<b>19</b>	<b>38</b>
<b>G20-4-36</b>	<b>36" X 18"</b>	<b>PILOT CAR FOLLOW ME</b>	<b>1</b>	<b>18</b>	<b>18</b>
G20-50a-72	72" X 36"	ROAD WORK NEXT ___ MILES RT & LT ARROWS		37	
<b>G20-52a-72</b>	<b>72" X 24"</b>	<b>ROAD WORK NEXT ___ MILES RT OR LT ARROWS</b>	<b>4</b>	<b>30</b>	<b>120</b>
G20-54-48	48" X 36"	OVERHEAD BRIDGE PAINTING		30	
G20-8-48	48" X 36"	TEMPORARY SURFACE NEXT ___ MILES		30	
M1-4-24	24" X 24"	ROUTE MARKER (POST AND INSTALLATION ONLY)		10	
M3-2-24	24" X 12"	EAST (MOUNTED ON ROUTE MARKER POST)		7	
M3-3-24	24" X 12"	SOUTH (MOUNTED ON ROUTE MARKER POST)		7	
M3-4-24	24" X 12"	WEST (MOUNTED ON ROUTE MARKER POST)		7	
M4-10-48	48" X 18"	DETOUR ARROW RIGHT or LEFT		23	
M4-8-24	24" X 12"	DETOUR (MOUNTED ON THE ROUTE MARKER POST)		7	
M5-1-21	21" X 15"	ARROW AHD AND RT or LT (MTD ON ROUTE MKR POST)		7	
M6-1-21	21" X 15"	ARROW RT or LT (MOUNTED ON ROUTE MARKER POST)		7	
R1-1-48	48" X 48"	STOP		32	
R1-1-30	30" X 30"	STOP		32	
<b>R1-1a-18</b>	<b>18" X 18"</b>	<b>STOP and SLOW PADDLE Back to Back</b>	<b>4</b>	<b>5</b>	<b>20</b>
R1-2-48	48" X 48"	YIELD TO ONCOMING TRAFFIC		29	
R2-1-48	48" X 60"	SPEED LIMIT		39	
R2-1a-24	24" X 24"	MINIMUM FEE \$80		10	
R2-5a-48	48" X 60"	SPEED ZONE AHEAD		39	
R4-1-48	48" X 60"	DO NOT PASS		39	
R4-7-48	48" X 60"	KEEP RIGHT SYMBOL		39	
R4-8-48	48" X 60"	KEEP LEFT SYMBOL		39	
R10-6-48	48" X 72"	STOP HERE ON RED		16	
R11-2-48	48" X 30"	ROAD CLOSED		28	
R11-2a-48	48" X 30"	STREET CLOSED		28	
R11-3a-60	60" X 30"	ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3b-60	60" X 30"	BRIDGE OUT ___ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-48	60" X 30"	STREET CLOSED		31	
R11-4a-60	60" X 30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-1-48	48" X 48"	RIGHT or LEFT SHARP CURVE ARROW		35	
W1-2-48	48" X 48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-3-48	48" X 48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48" X 48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48" X 24"	LARGE ARROW		26	
W3-1a-48	48" X 48"	STOP AHEAD SYMBOL		35	
W3-2a-48	48" X 48"	YIELD AHEAD SYMBOL		35	
W5-1-48	48" X 48"	ROAD NARROWS		35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQ'D	UNITS PER AMOUNT	UNITS SUB-TOTAL
W6-3-48	48" X 48"	TWO WAY TRAFFIC SYMBOL		35	
<b>W8-11-48</b>	<b>48" X 48"</b>	<b>UNEVEN LANES</b>	<b>6</b>	<b>35</b>	<b>210</b>
<b>W8-1-48</b>	<b>48" X 48"</b>	<b>BUMP</b>	<b>4</b>	<b>35</b>	<b>140</b>
W8-3a-48	48" X 48"	PAVEMENT ENDS SYMBOL		35	
<b>W8-53-48</b>	<b>48" X 48"</b>	<b>TRUCKS ENTERING HIGHWAY</b>	<b>4</b>	<b>35</b>	<b>140</b>
W8-54-48	48" X 48"	TRUCKS ENTERING AHEAD OR ___ FT.		35	
W8-55-48	48" X 48"	TRUCKS CROSSING AHEAD OR ___ FT.		35	
W8-9-48	48" X 48"	LOW SHOULDER		35	
W8-9a-48	48" X 48"	SHOULDER DROP OFF		35	
W13-1-24	24" X 24"	___ MPH ADVISORY SPEED PLATE		11	
W13-4-48	48" X 60"	RAMP ARROW		39	
<b>W20-1-48</b>	<b>48" X 48"</b>	<b>ROAD WORK ___ FT.</b>	<b>6</b>	<b>35</b>	<b>210</b>
W20-1a-48	48" X 48"	MEN WORKING SYMBOL		35	
W20-2-48	48" X 48"	DETOUR ___ FT.		35	
W20-3-48	48" X 48"	ROAD OR STREET CLOSED AHEAD or ___ FT.		35	
W20-4-48	48" X 48"	ONE LANE ROAD AHEAD or ___ FT.		35	
W20-51-48	48" X 48"	EQUIPMENT WORKING		35	
W20-52-54	54" X 12"	NEXT ___ MILES		12	
W20-5-48	48" X 48"	RIGHT or LEFT LANE CLOSED AHEAD or ___ FT.		35	
W20-7a-48	48" X 48"	FLAGGING SYMBOL		35	
W20-7b-48	48" X 48"	BE PREPARED TO STOP		35	
W20-7k-24	24" X 18"	___ FEET		10	
W20-8-48	48" X 48"	STREET CLOSED		35	
W21-2-48	48" X 48"	FRESH OIL		35	
W21-50-48	48" X 48"	BRIDGE PAINTING AHEAD OR ___ FT.		35	
W21-51-48	48" X 48"	MATERIAL ON ROADWAY		35	
W21-5-48	48" X 48"	SHOULDER WORK		35	
W22-7-48	48" X 48"	SINGLE LANE AHEAD or ___ FT.		35	
W22-8-48	48" X 48"	FRESH OIL LOOSE ROCK		35	
<b>TOTAL UNITS</b>					<b>964</b>

			SPEC&CODE	
				704-1000
TYPE III	8' LONG	BARRICADES	EACH	704-1052
TYPE II	2' MIN.	BARRICADES	EACH	704-1051
TYPE I	6' TO 10'	BARRICADES	EACH	704-1050
	18" X 36" MIN.	DELINEATOR DRUMS	EACH	704-1060

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CASS COUNTY HIGHWAY DEPARTMENT  
 PROJECT NO. CH1515  
 TRAFFIC CONTROL DEVICES LIST