

DESIGN DATA							
Traffic		Average Daily				Max.Hr.	
Current	2017	Pass:	675	Trucks:	50	Total: 725	-
Forecast	2037	Pass:	800	Trucks:	80	Total: 880	-
Clear Zone Distance: 32'				Design Speed: 55			
Minimum Sight Dist. for Stopping: 495							
Minimum Sight Dist. for Safe Passing: NA							
Sight Dist. for No Passing Zone: NA							

JOB# 4

BOTTINEAU COUNTY

NORTH DAKOTA

Federal Aid Project: SC-0547(062)

Milling, Hot Bituminous Pavement Overlay & Chip Seal

CMC 0547 From the West Intersection of NDSH 43,  
North 6.5 Miles Surrounding Lake Metigoshe

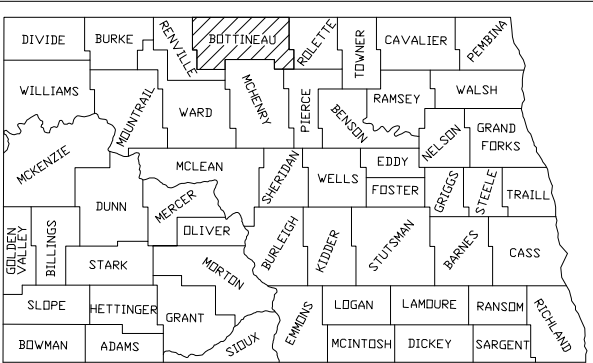
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SC-0547(062)	21930	1	1

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.

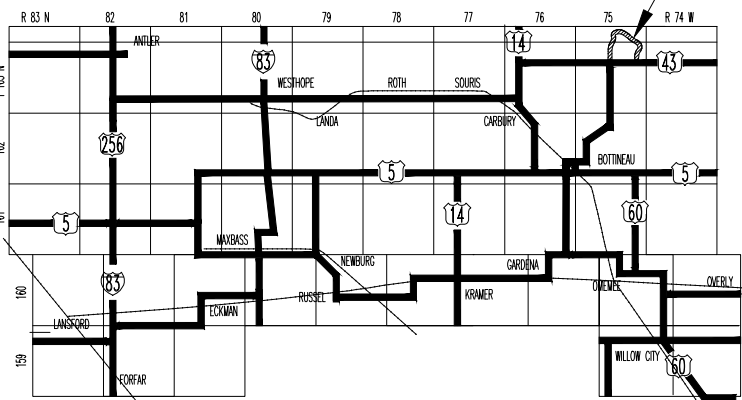
PROJECT NUMBER	DESCRIPTION	NET MILES	GROSS MILES
SC-0547(062)	Milling, Hot Bituminous Pavement Overlay & Chip Seal	6.597	6.597

Sta. 0+50 to Sta. 110+00  
1 Inch Milling, 2 1/2 Inch Hot  
Bituminous Overlay &  
Chip Seal/Fog Coat

Begin Project SC-0547(062)  
Sta. 0+00= The Southwest Corner  
Sec. 10, Twp. 163N, Rge. 75W  
= Sta. 0+00 on Project  
AC-SC-0547(057)



Project Location



SKETCH MAP OF BOTTINEAU COUNTY

DESIGNERS

Kent D. Indvik, P.E.

Bradley N. Robertson, P.L.S.

Jason I. Mayfield, P.E.

Paula Lorenz



Consulting Engineers & Land Surveyors

915 East 11th Street ~ PO Box 237 ~ Bottineau, ND 58318  
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110 8th Avenue Southwest ~ Minot, ND 58701

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 08-25-17

KENT D. INDVIK

Wold Engineering, P.C.

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**LIST OF STANDARD DRAWINGS**

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D-704-26	Miscellaneous Sign Layouts
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NOTES

- 100-P01 SCHEDULE:** The project as a whole has a completion date of September 22<sup>th</sup>, 2018. The Hot Bituminous Pavement must be completed a minimum of 7 days prior to the Chip Seal Coat. As per NDDOT Std. Specs. Sec. 420.04.A, Chip Seal work will not be started after September 1.
- 105-P01 PAVEMENT PROTECTION:** The Contractor will protect the existing pavement outside the construction limits. The Contractor, at the Contractor’s expense, will repair any pavement damaged due to their operations before the project will be accepted. Repairs may include, but are not limited to: sawing, removals and additional hot bituminous pavement to damaged areas.
- 105-P02 TYPICAL SECTION:** The dimensions shown for the bituminous pavement course are approximate. Plan quantities will be placed throughout except where the Engineer authorizes a change.
- 107-P01 ENVIRONMENTAL PROTECTION:** Any land use by the Contractor outside the Right of Way limits, for any purpose, must be approved by the land owner and the Project Engineer.
- 107-P02 ENVIRONMENTAL COMMITMENT:** The Contractor will contact the US Fish &Wildlife Service to confirm sources of water the Contractor wishes to use are not part of the USFWS refuge system, including wetland easements.
- 203-P01 SUBCUT LOCATIONS:** Common Excavation – Subcut, Aggregate Base Course Class and Geogrid quantities are included for the subcut locations shown on plans. Any additional areas and actual limits of the plan subcuts will be determined by the Engineer in the field. Payment will be made for materials used at the unit bid price.
- 230-P01 SHOULDER PREPARATION:** Before placing Hot Bituminous Pavement, the Contractor shall mow the grass shoulders a minimum of four (4) feet beyond the pavement edge and to a height not greater than three (3) inches just prior to application of the herbicide. All weeds, grass, dirt, and other objectionable material shall be removed from the existing shoulders by blading, power brooms, or other means approved by the Engineer without disturbing the underlying asphalt pavement. All sod and debris large enough to cause problems in maintaining the inslopes area shall be loaded and hauled to a disposal area. All vegetation that is within the 4 foot shoulder will be chemically killed with a non-selective herbicide (Roundup or equivalent) a minimum of three weeks before the shoulder preparation and the paving operation. Shoulder preparation will be completed from STA 0+00 to 110+00 only. The cost of this work shall be incidental to the price bid for “SUPERPAVE FAA 42”.
- 302-P01 AGGREGATE BASE COURSE CLASS 5:** The Class 5 aggregate is provided if needed for fill material in approach radius and pavement ends at the discretion of the Engineer. There is also Class 5 aggregate included for the subcut areas.

- 411-P01 MILLING PAVEMENT SURFACE:** The Contractor will mill an approximate 1” of the existing pavement where indicated on plan. It is the responsibility of the Contractor to vary the milling operation to achieve the 2% crown back into the existing pavement.
- Payment for milling will be by the square yard based on a top width of 29 feet. Sloughs or areas wider than these top widths, if present, will not be measured for payment but will be incidental to the bid item “Milling Pavement Surface”.
- The milled material will be produced in such a way that the maximum particle size is less than or equal to 1 ½ inches. The Contractor may use whatever means/methods of their choosing to remove any oversized milled material (greater than 1 ½ inches).
- All salvaged millings will be stockpiled at approximately STA 192+67 on the east side of the roadway and will become the property of Bottineau County. All costs associated with salvaging and delivering the millings will be included in the price bid for “Milling Pavement Surface”.
- 411-P02 TEMPORARY ASPHALT WEDGES:** The Contractor will place temporary asphalt or milled material wedges at the milled taper locations to allow for the smooth passage of vehicles. All costs for labor, materials, and equipment to install and remove the wedges will be included in the unit price bid for “Milling Pavement Surface”.
- 420-P01 SEAL COAT APPLICATION:** Class 41 cover coat material will be paid for actual quantity used up to plan quantity unless otherwise directed by the Engineer. Any excess chips along the shoulder or approaches after the final brooming will be removed by the Contractor. Initial light brooming will be done the following morning after the seal application.
- 420-P02 FOG COAT:** All approaches will be fog coated concurrent with the mainline fog coat application.

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NOTES

- 430-P01

**HOT BITUMINOUS PAVEMENT:** SUPERPAVE FAA 42 will have the aggregate and mix design properties as shown in Table 430-03, with this exception – the number of gyrations used in the mix design shall be 50. All paving transition work around the railroad crossing including removal of aggregate will be incidental to the price bid for “SUPERPAVE FAA 42”.
- 430-P02

**COMPACTION:** Compaction of hot bituminous pavement shall be in accordance to NDDOT Standard Specifications Section 430.04 I.3 Ordinary Compaction. The compaction equipment used shall include not less than one self-propelled pneumatic tire roller and two vibratory rollers.
- 430-P03

**APPROACH PAVING:** The lifts on the approaches shall be paved prior to or concurrent with the placement of each lift of Superpave FAA 42 mainline paving. An adequate transition to match existing conditions shall be required. All approaches will have a 2 – 1/2 inch minimum thickness. Approaches will be paver laid with one lift of Superpave FAA 42.
- 430-P04

**TOP LIFT:** The top lift of Hot Bituminous Pavement shall be placed a minimum of 24 hours after the bottom lift is placed.
- 430-P05

**SAMPLING AND TESTING:** The Contractor will be responsible for conducting QC for all materials being used on the project. Test results will be submitted daily to the Project Engineer. The Contractor will be responsible for collecting a split sample for every sample collected on the project and furnish the Project Engineer with the split sample to conduct random QA testing. All testing will be in accordance with NDDOT Standard Specifications. The cost of this work will be included in the price bid for “Superpave FAA 42”.
- 704-P01

**TRAFFIC CONTROL:** Traffic control for the milling and paving will consist of a temporary road closure, flagging, and a pilot car. Traffic Control Devices will comply with the following Standard Drawings:

1. Standard D-704-15, layout A: For temporary roadway closure during paving operations.

2. Standard D-704-20, layout G: For construction signing during paving operations. Sign G20-1b-60 will not be required. Signs R2-1-48 and R2-1a-24 are to be moved as the work area moves through the construction zone and should be placed a minimum of 500 feet in advance of flagging signs. Signs will be required at the junctions shown on the Traffic Control Layout.

3. Standard D-704-22, layouts K and L: For trucks hauling material.

5. Standard D-704-26, layouts CC, EE, and GG: For paving operations.

6. Standard D-704-7,8,9,10,11,13, and 14 are applicable.

The required traffic control signs and devices are included in the “Traffic Control Devices List” and will be measured and paid at the contract unit price for each device.

Additional devices required to accommodate the Contractor’s operation will be the Contractor’s responsibility.
- 704-P02

**TRAFFIC CONTROL DURING WORKING AND NON-WORKING HOURS:** The Contractor will maintain one lane of traffic at the posted speed limit at all times during working hours. During non-working hours, the Contractor will leave the work area free of all hazards. The Contractor will open the roadway to two-way traffic during non-working hours. A minimum 24 foot roadway width will be required to maintain two lanes of traffic.

During paving and milling operations, flagging and pilot car will be used to maintain traffic during working hours. The traffic control devices for flagging will be removed at the end of each day and reinstalled when work commences.

704-P03

**TRAFFIC CONTROL FOR SEAL COATS:** Traffic control for the seal coat will consist of a temporary road closure, flagging and a pilot car. Traffic control devices will comply with the following Standard Drawings:

1. Standard D-704-15, Layout A: For temporary roadway closures just beyond the daily work areas during seal coat operations. Intermediate flagging stations will require signs W20-7a-48 only.

2. Standard D-704-20, Layout H: For construction signing during seal coat operations.

3. Standard D-704-22, Layouts K and L: For trucks hauling material.

4. Standard Drawings D-704-7, 8, 9, 10, 11, 12, 13, and 14 are applicable.

5. Standard D-704-3, Lane Markers for Seal Jobs (Spotting Tabs)

Quantities are based on a 6 mile limitation for the sealing operations. The required traffic control signs, flaggers and pilot car operations are included in the lump sum bid item for “Traffic Control” and will not be measured and paid separately. Additional devices required to accommodate the Contractor’s operations will be the Contractor’s responsibility.

760-P01

**RUMBLE STRIPS:** Rumble strips are to be installed at both intersections with ND Highway 43 as per Std. Dwg. D-760-5.

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**NOTES**

- 762-P01    SHORT TERM PAVEMENT MARKINGS:** The short term application will be applied immediately following completion of the paving operation on the entire mainline. No intermediate application will be necessary while Sign No. W8-12-48, No Center Stripe, is in place.
- 762-P02    PERMANENT PAVEMENT MARKINGS:** Permanent pavement markings will be placed no sooner than 14 days and no later than 30 days after completion of the Short Term Pavement Markings.
- 762-P03    PAVEMENT MARKINGS EDGE LINES:** Edge lines will be continued through private drives and broken at intersections and will be placed only upon completion of the seal coat.
- 762-P04    PAVEMENT MARKINGS (SEAL COAT):** The short term application will be applied immediately following final brooming for the entire project. The permanent application will be no sooner than two weeks and no later than 30 days following the short term application. Lane markers (spotting tabs) will be installed as per Std. Dwg. D-704-3.
- 930-P01    CRACK SEALING:** The sealant material will conform to Std. Specs. Sec. 826.02 A.2. Crack cleaning and sealing will be completed a minimum of 7 days prior to the start of the chip seal. Cracks less than 3/4 inch wide will be routed to a depth not to exceed 3/4 of the router bit diameter. Cracks larger than 3/4 inch do not need to be routed but will require use of backer rod before placement of sealant material. Cost of backer rod will be incidental to the bid item “Crack Sealing”. The Contractor will be required to thoroughly clean the cracks with compressed air to remove all dirt, debris and loose material immediately prior to crack sealing. Cracks will be free of moisture prior to crack sealing. Cracks to be cleaned and sealed will be marked by the Engineer in the field.

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ESTIMATE OF QUANTITIES						
SPEC	CODE	DESCRIPTION	UNIT	MAINLINE	APPROACHES	TOTAL
103	0100	CONTRACT BOND	L SUM			1
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	197		197
203	0138	COMMON EXCAVATION - SUBCUT	CY	80		80
302	0120	AGGREGATE BASE COURSE CL 5	TON	146	360	506
401	0050	TACK COAT	GAL	3080	122	3,202
401	0070	FOG SEAL	GAL	5740		5,740
411	0105	MILLING PAVEMENT SURFACE	SY	42190	105	42,295
420	0111	CRS2P EMULSIFIED ASPHALT	GAL	42745	4410	47,155
420	0125	COVER COAT MATERIAL CL 41	TON	1274	245	1,519
430	0042	SUPERPAVE FAA 42	TON	5550	415	5,965
430	2000	PATCHING	TON	44		44
430	5828	PG 58-28 ASPHALT CEMENT	TON	366	27	393
702	0100	MOBILIZATION	L SUM			1
704	0100	FLAGGING	MHR	100		100
704	1000	TRAFFIC CONTROL SIGNS	UNIT	998		998
704	1052	TYPE III BARRICADE	EA	4		4
704	1067	TUBULAR MARKERS	EA	60		60
704	1100	TRAFFIC CONTROL (BITUMINOUS SEAL COAT)	L SUM			1
704	1185	PILOT CAR	HR	50		50
706	0600	CONTRACTOR'S LABORATORY	EA			1
709	0100	GEOSYNTHETIC MATERIAL - TYPE G	SY	170		170
760	0010	RUMBLE STRIPS - INTERSECTION	SET			2
762	0103	PVMT MK PAINTED - MESSAGE	SF	288		288
762	0430	SHORT TERM 4IN LINE - TYPE NR	LF	56404		56,404
762	0434	SHORT TERM 8IN LINE - TYPE NR	LF	4000		4,000
762	1104	PVMT MK PAINTED 4IN LINE	LF	117079		117,079
762	1108	PVMT MK PAINTED 8IN LINE	LF	4000		4,000
930	9223	CRACK SEALING	LF	30988		30,988



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**BASIS OF ESTIMATE**

Description	Unit	Width (Ft)	Unit/ Mile	Total
Typical Cross Section ~ Sta. 0+50 to 110+00 (2.074 Miles)				
Top Lift @ 2 1/2"				
Tack Coat @ 0.08 Gal/SY	GAL	27'+2' Sloughs	1,455	3,018
Superpave FAA 42 @ 2 Ton/CY	TON	27'+2' Sloughs	2,596	5,384
PG 58-28 Asphalt Cement @ 6.5%	TON	27'+2' Sloughs	169	350

Paving - Approaches					
Item	Unit	Paved Section Line	Paved Field/Private Drive	Gravel Field/Private Drive	TOTAL
Number of Locations	#	5	5	11	21
Aggr. Base Course CL 5	TON	30	20	10	360
Tack Coat	GAL	14	6	2	122
Superpave FAA 42	TON	30	20	15	415
PG 58-28 Asphalt Cement	TON	2.0	1.3	1.0	27

Patching							
Location	Removal of Pavement (SY)	Common Excavation – Subcut (CY)	Geogrid (SY)	Aggregate Base Course CL 5 (TON)	Tack Coat (GAL)	Superpave FAA 42 (TON)	PG 58-28 Asphalt Cement (TON)
STA 23+47 TO 23+74 RT	27	-	-	-	2	6	0.4
STA 28+40 TO 28+80 RT	40	14	40	25	2	9	0.6
STA 51+29 TO 52+21 LT	103	52	103	96	6	23	1.5
STA 53+14 RT (SPUR)	27	14	27	25	2	6	0.4

Milling Bituminous Pavement		
Station	Width	Area
STA 0+50 TO 110+00	29'	41,567 SY

Flagging & Pilot Car		
Description	Basis	Quantity
Flagging (Paving)	20 MHR/Mile/Lift	100 MHR
Pilot Car (Paving)	10 HR/Mile/Lift	50 HR

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**BASIS OF ESTIMATE**

Description	Unit	Width (Ft)	UNIT/MILE	TOTAL
Typical Cross Section ~ Sta. 0+50 to 129+00 (2.434 Miles)				
EMULSIFIED ASPHALT FOR SEAL COAT AT 0.42 GAL/SY (CRS-2P)	GAL	27'	6,653	16,194
COVER COAT MATERIAL AT 25LBS/SY (CL 41)	TON	27'	198	482
FOG SEAL AT 0.05 GAL/SY	GAL	31'	910	2,213
Typical Cross Section ~ Sta. 129+00 to 347+80 (4.144 Miles)				
EMULSIFIED ASPHALT FOR SEAL COAT AT 0.42 GAL/SY (CRS-2P)	GAL	26'	6,407	26,551
COVER COAT MATERIAL AT 25LBS/SY (CL 41)	TON	26'	191	792
FOG SEAL AT 0.05 GAL/SY	GAL	29'	851	3,527

Chip Seal - Approaches					
Item	Unit	Section Line Approach	Private Drive Approach	Field Approach	TOTAL
Number of Locations	#	6	110	13	129
CRS-2P EMUL ASPHALT	GAL	36	36	18	4,410
CL 41 COVER COAT	TON	2	2	1	245

Crack Sealing		
Description	Quantity Per Mile	Total
Cracks ~ STA 110+00 TO 347+80 (4.504 MILES)	6880 LF	30,988 LF

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**BASIS OF ESTIMATE**

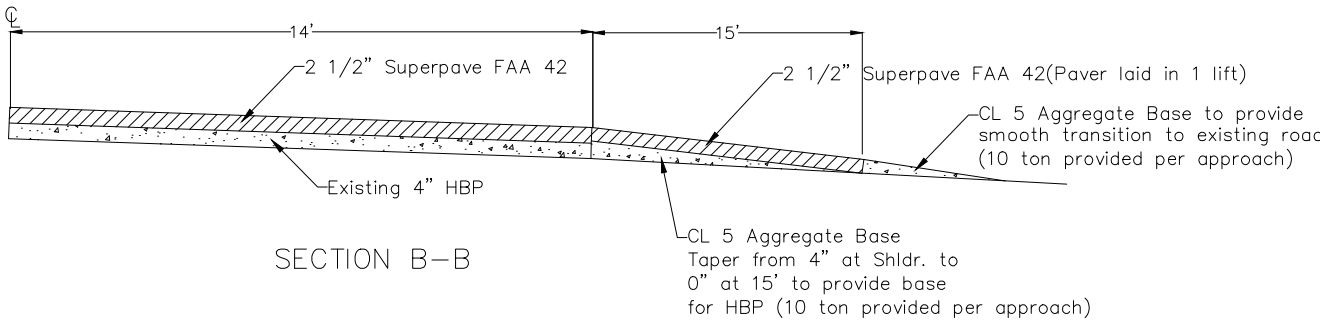
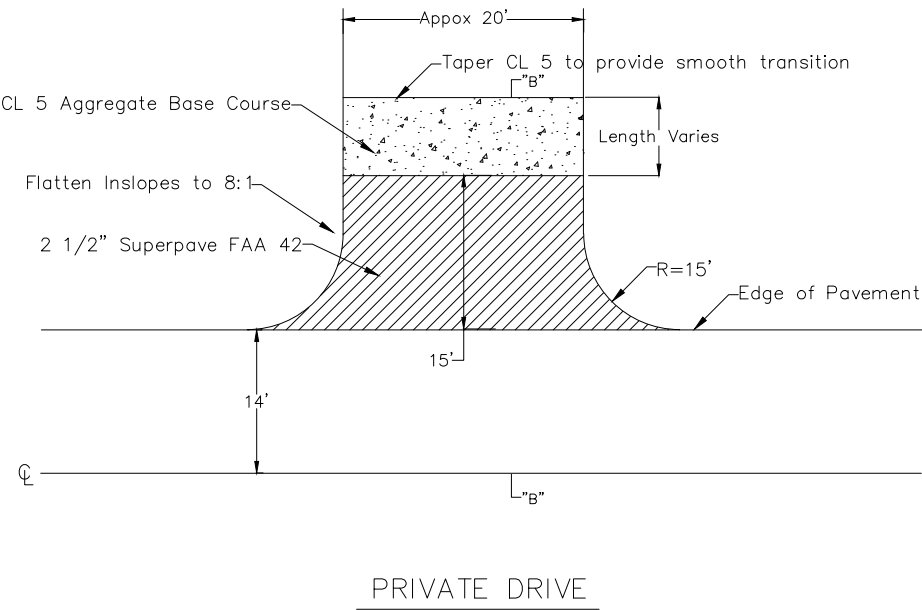
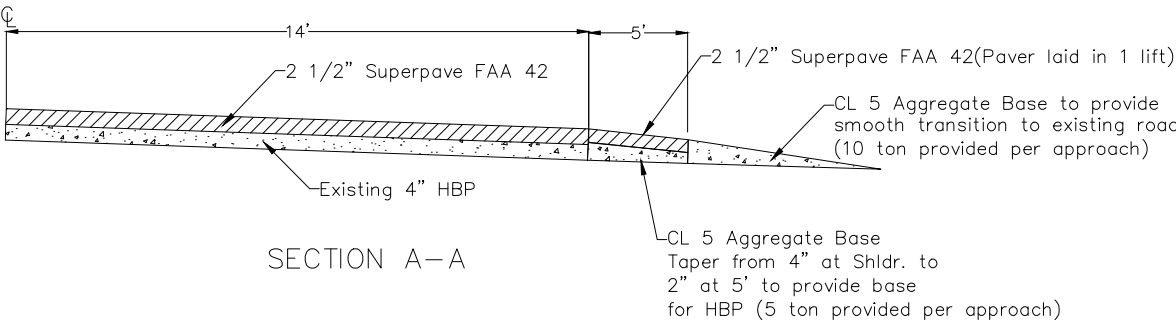
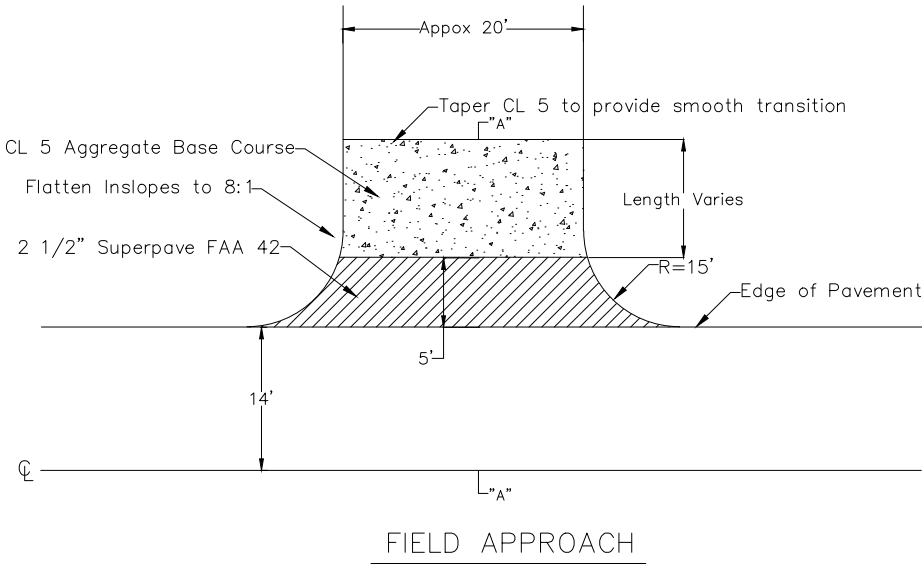
Temporary Short Term 4” Line – Type NR		
Description	Basis	Quantity
4" Yellow Centerline, 10' line, 30' skip (Centerline)	1,320 LF/mile	4,480 LF
4" Yellow NPZ (Centerline) (NPZ from STA 0+50 to 110+00 will be counted twice for paving and chip seal)	STA 0+50 to 5+00 LT & RT	1,000 LF
	STA 5+00 to 11+90 LT	690 LF
	STA 28+50 to 36+00 RT	750 LF
	STA 38+65 to 45+75 LT	710 LF
	STA 48+00 to 52+00 RT	400 LF
	STA 52+00 to 54+15 LT & RT	430 LF
	STA 54+15 to 58+00 LT	385 LF
	STA 86+40 to 92+00 RT	560 LF
	STA 92+00 to 105+00 LT & RT	2,600 LF
	STA 105+00 to 109+20 LT	420 LF
	STA 123+00 to 126+60 RT	360 LF
	STA 126+60 to 134+45 LT & RT	1,570 LF
	STA 134+45 to 139+60 LT	515 LF
	STA 144+30 to 148+00 RT	370 LF
	STA 148+00 to 198+67 LT & RT	10,134 LF
	STA 204+00 to 248+50 LT & RT	8,900 LF
	STA 248+50 to 254+40 LT	590 LF
	STA 262+00 to 267+00 RT	500 LF
	STA 267+00 to 280+00 LT & RT	2,600 LF
	STA 280+00 to 285+25 LT	525 LF
	STA 289+00 to 294+00 RT	500 LF
	STA 294+00 to 297+00 LT & RT	600 LF
	STA 297+00 to 301+55 LT	455 LF
	STA 301+55 to 308+30 RT	675 LF
	STA 308+30 to 317+50 LT & RT	1,840 LF
	STA 317+50 to 327+50 LT	1,000 LF
	STA 327+50 to 347+80 LT & RT	4,060 LF
	Birchwood Appr : LT & RT	300 LF
	TOTAL =	56,404 LF

Temporary Short Term 8” Line – Type NR		
Description	Basis	Quantity
8" White NPZ (Shoulder)	STA 153+00 to 161+00 LT	800 LF
	STA 184+00 to 190+00 LT	600 LF
	STA 190+00 to 195+00 RT	500 LF
	STA 204+00 to 208+00 RT	400 LF
	STA 210+00 to 222+00 RT	1,200 LF
	STA 230+00 to 235+00 LT	500 LF
	TOTAL =	4,000 LF

Permanent Pavement Marking		
Description	Basis	Quantity
4" Yellow Center Lines, 10' line, 30' skip	Centerline Skips 1,320 LF/mile	4,480 LF
4" Yellow- NPZ- Solid	See Temporary Pavement Marking Table Above for Barrier Locations	43,139 LF
8" White- NPZ- Solid	See Temporary Pavement Marking Table Above for Barrier Locations	4,000 LF
4" White Edge Line	10,560 LF/mile	69,460 LF
Pvmt Marking Painted - Message	72 SF/Crossing	288 SF

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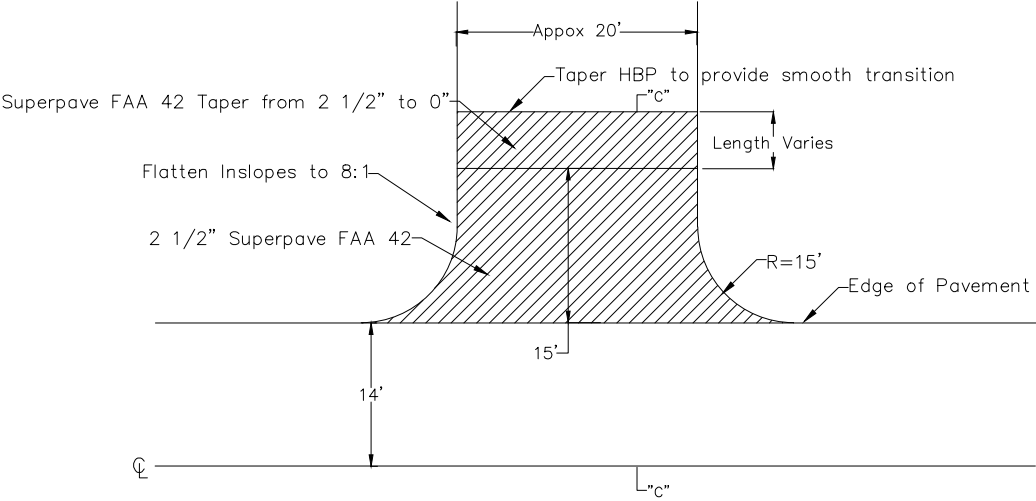
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## Approach Typical Sections

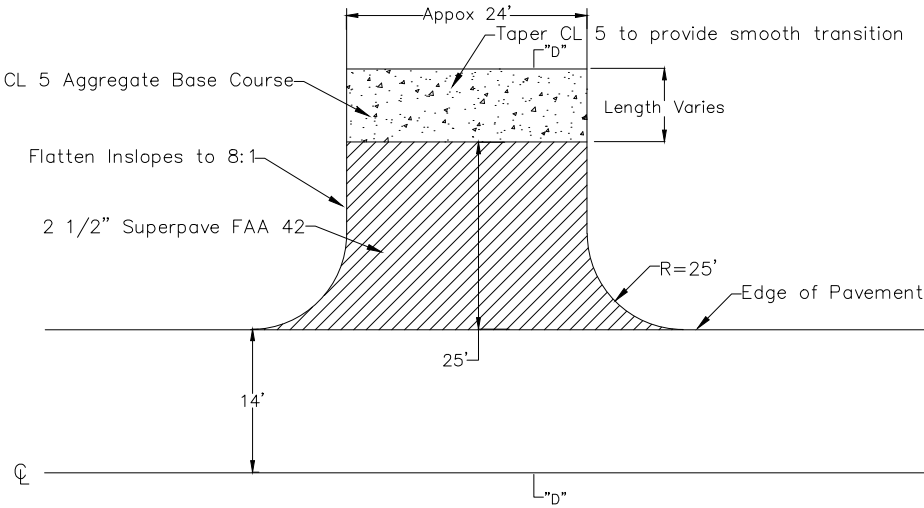
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Consulting Engineers & Land Surveyors  
BOTTINEAU - BISMARCK - MINOT

DRAWN BY: JIM      CHECKED BY: KDI      DATE: 08/25/2017

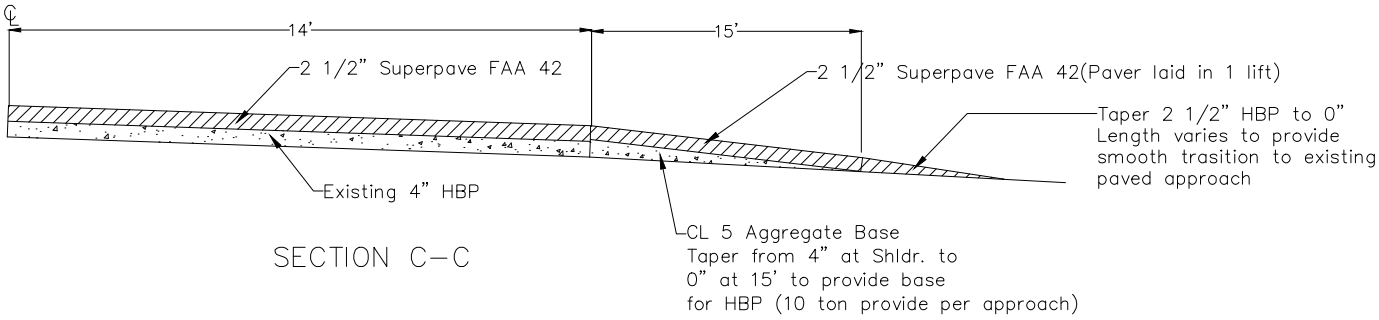
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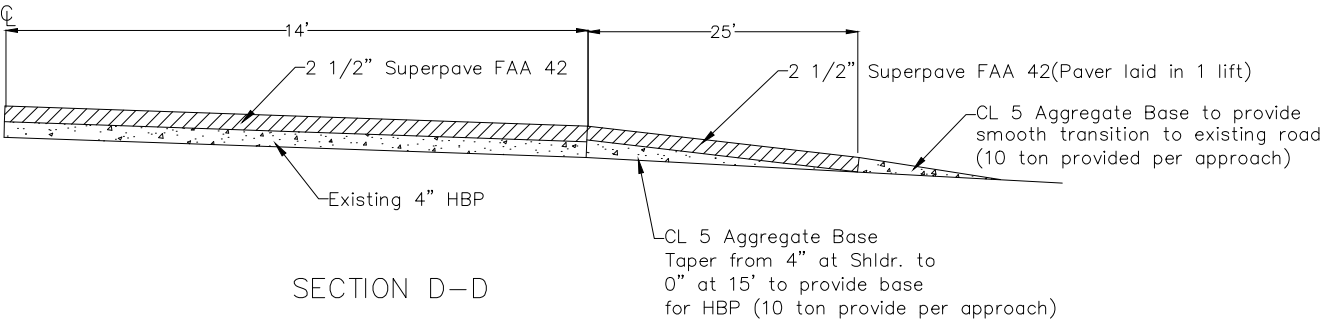
PAVED PRIVATE DRIVE



SECTION LINE APPROACH



SECTION C-C



SECTION D-D

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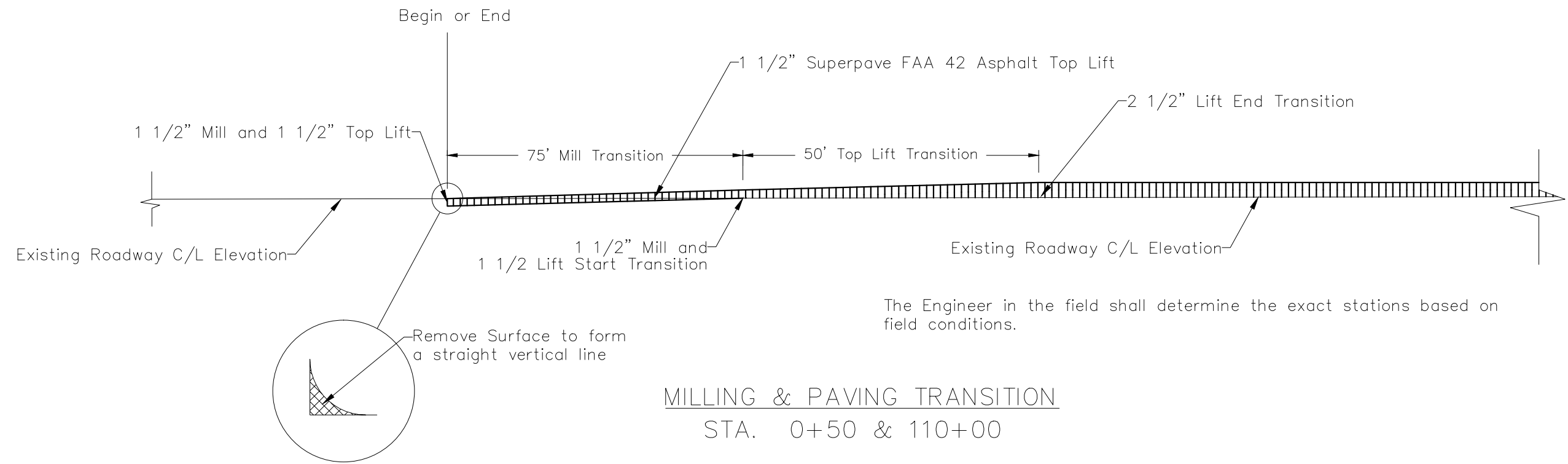
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BOTTINEAU ~ BISMARCK ~ MINOT

DRAWN BY: JIM      CHECKED BY: KDI      DATE: 08/25/2017

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0547(062)	20	4



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## PAVING TRANSITIONS

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Consulting Engineers & Land Surveyors

BOTTINEAU - BISMARCK - MINOT

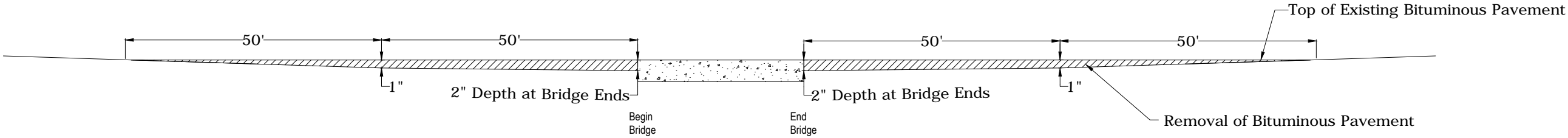
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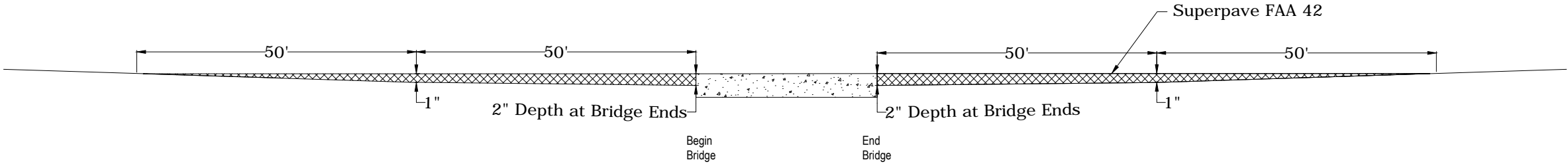
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0547(062)	20	5



Removals at Bridge

STA. 197+67 TO 198+67  
STA. 199+91 TO 200+91



Paving Transitions at Bridge

STA. 197+67 TO 198+67  
STA. 199+91 TO 200+91

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Paving Transition

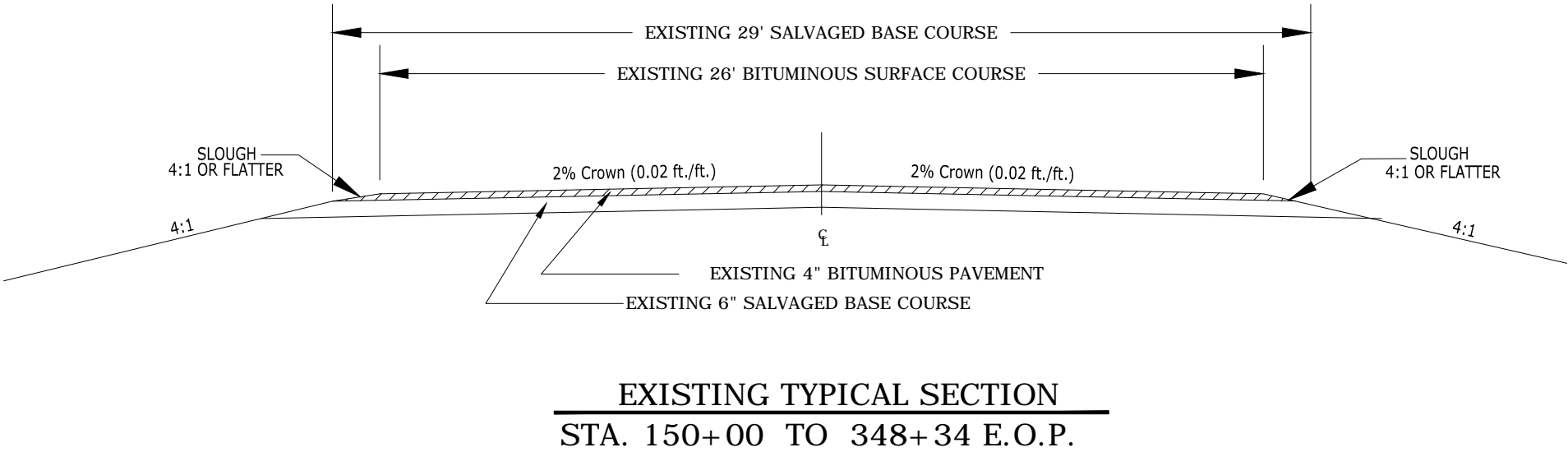
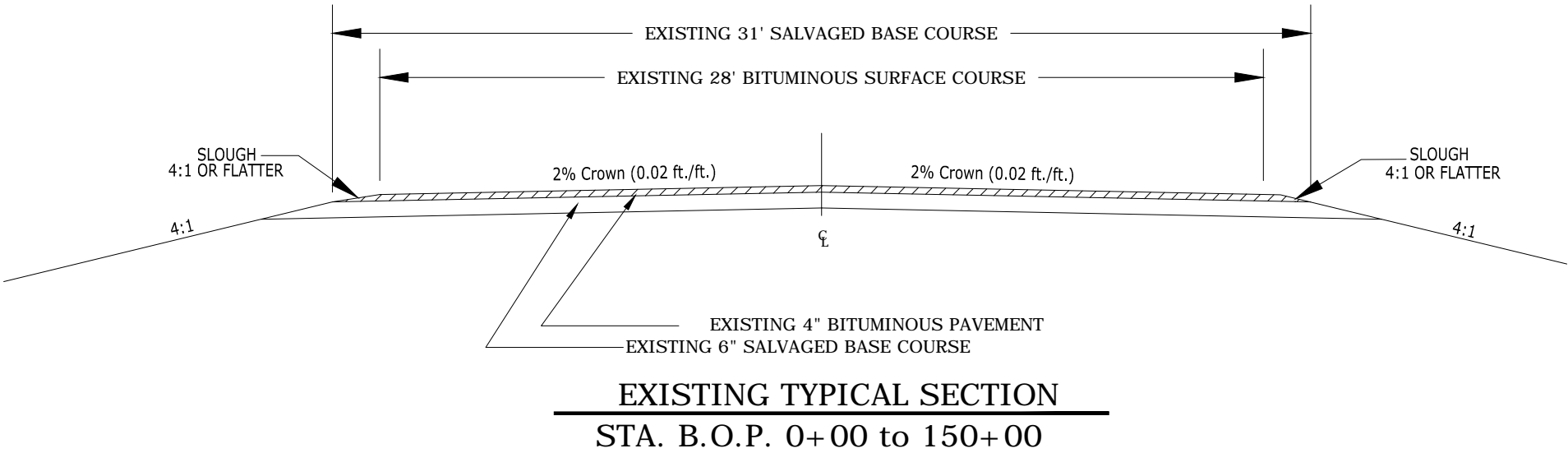


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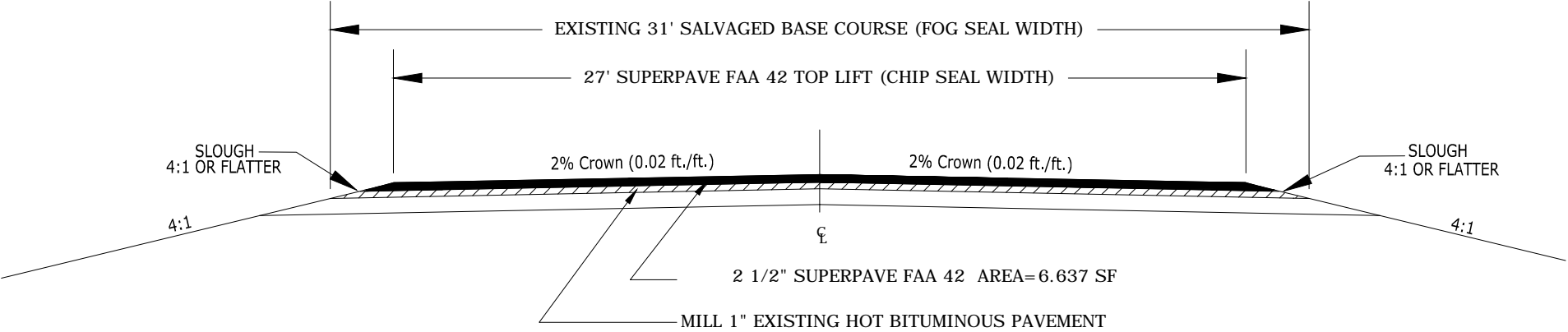
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0547 (062)	30	1



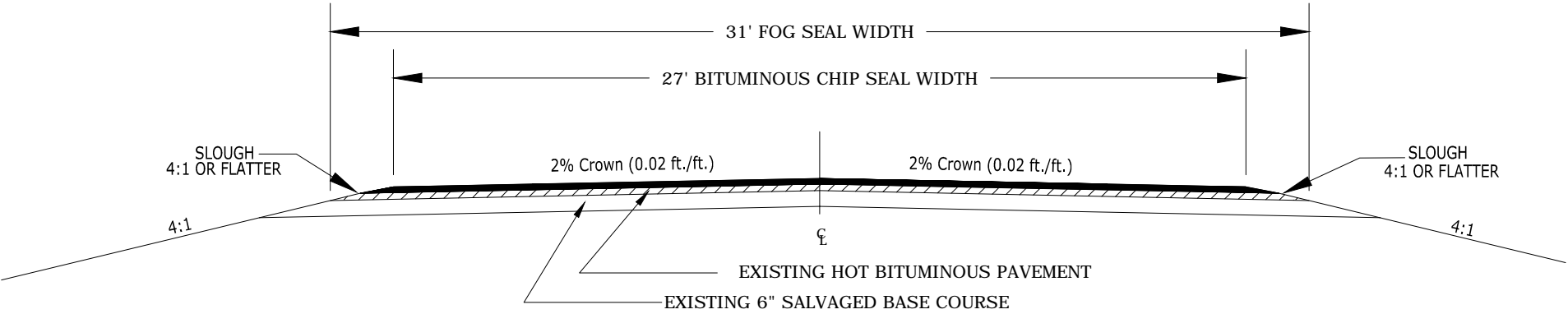
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EXISTING TYPICAL SECTIONS

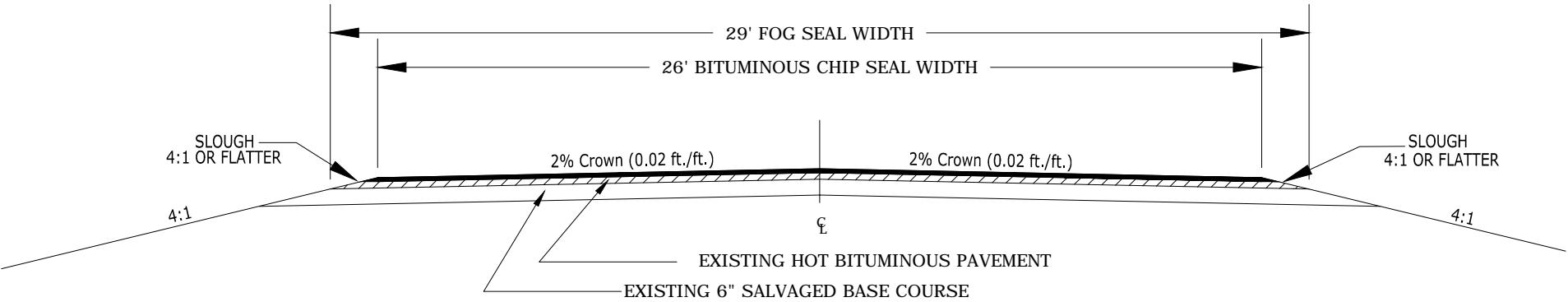
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0547(062)	30	2



**PROPOSED TYPICAL SECTION**  
**STA. 0+ 50 to 110+ 00**



**PROPOSED TYPICAL SECTION**  
**STA. 110+ 00 to 129+ 00**



**PROPOSED TYPICAL SECTION**  
**STA. 129+ 00 TO 348+ 34 E.O.P.**



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PROPOSED TYPICAL SECTIONS



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
<b>ND</b>	<b>SC-0547(062)</b>	<b>100</b>	<b>1</b>

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1a-60	60"x24"	ROAD WORK NEXT __ MILES	2	34	68
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
G20-2a-48	48"x24"	END ROAD WORK	2	19	38
G20-4-36	36"x18"	PILOT CAR FOLLOW ME	1	18	18
G20-10-108	108"x48"	CONTRACTOR SIGN		64	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS	4	37	148
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW	4	30	120
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)		7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back	2	5	10
R1-2-60	60"x60"	YIELD		29	
R2-1-48	48"x60"	SPEED LIMIT __	2	39	78
R2-1a-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)	2	10	20
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	48"x60"	DO NOT PASS	2	39	78
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED		28	
R11-2a-48	48"x30"	STREET CLOSED		28	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48"x24"	LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD SYMBOL		35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL		35	
W3-4-48	48"x48"	BE PREPARED TO STOP	2	35	70
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	2	35	70
W4-2-48	48"x48"	RIGHT or LEFT LANE TRANSITION SYMBOL		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC SYMBOL		35	
W8-1-48	48"x48"	BUMP	2	35	70
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	48"x48"	UNEVEN LANES	2	35	70
W8-12-48	48"x48"	NO CENTER STRIPE		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT.		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT.		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL		35	
W13-1-24	24"x24"	__ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)		11	
W13-4-48	48"x60"	RAMP ARROW		39	
W14-3-48	48"x36"	NO PASSING ZONE		23	
W20-1-48	48"x48"	ROAD WORK AHEAD or __ FT or __ MILE	2	35	70
W20-2-48	48"x48"	DETOUR AHEAD or __ FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT.		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT.		35	
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or __ FT.		35	
W20-7a-48	48"x48"	FLAGGING SYMBOL	2	35	70
W20-7k-24	24"x18"	__ FEET (Mounted on warning sign post)		10	
W20-8-48	48"x48"	STREET CLOSED		35	
W20-51-48	48"x48"	EQUIPMENT WORKING		35	
W20-52-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1a-48	48"x48"	WORKERS SYMBOL		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT		35	

[illegible][illegible]

SPEC & CODE			
704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	998

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
<b>704-0100</b>	<b>FLAGGING</b>	<b>MHR</b>	<b>100</b>
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
<b>704-1052</b>	<b>TYPE III BARRICADES</b>	<b>EACH</b>	<b>4</b>
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
<b>704-1067</b>	<b>TUBULAR MARKERS</b>	<b>EACH</b>	<b>60</b>
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	EACH	
<b>704-1185</b>	<b>PILOT CAR</b>	<b>HOURL</b>	<b>50</b>
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
762-1500	OBLITERATION OF PVMT MK	SF	
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

**NOTE:**  
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.  
<http://www.dot.nd.gov/>

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## Traffic Control Devices List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0547(062)	100	2

### LEGEND

- 1

ROAD WORK AHEAD

W20-1-48

POST MOUNTING
- 2

NO CENTER STRIPE

W8-12-48

POST MOUNTING
- 3

DO NOT PASS

R4-1-48

POST MOUNTING
- 4

SPEED LIMIT 40

W3-5-48

POST MOUNTING
- 5

SPEED LIMIT 40

R2-1-48

POST MOUNTING
- 6

ROAD WORK NEXT 7 MILES

G20-52a-72

POST MOUNTING
- 7

ROAD WORK NEXT 7 MILES

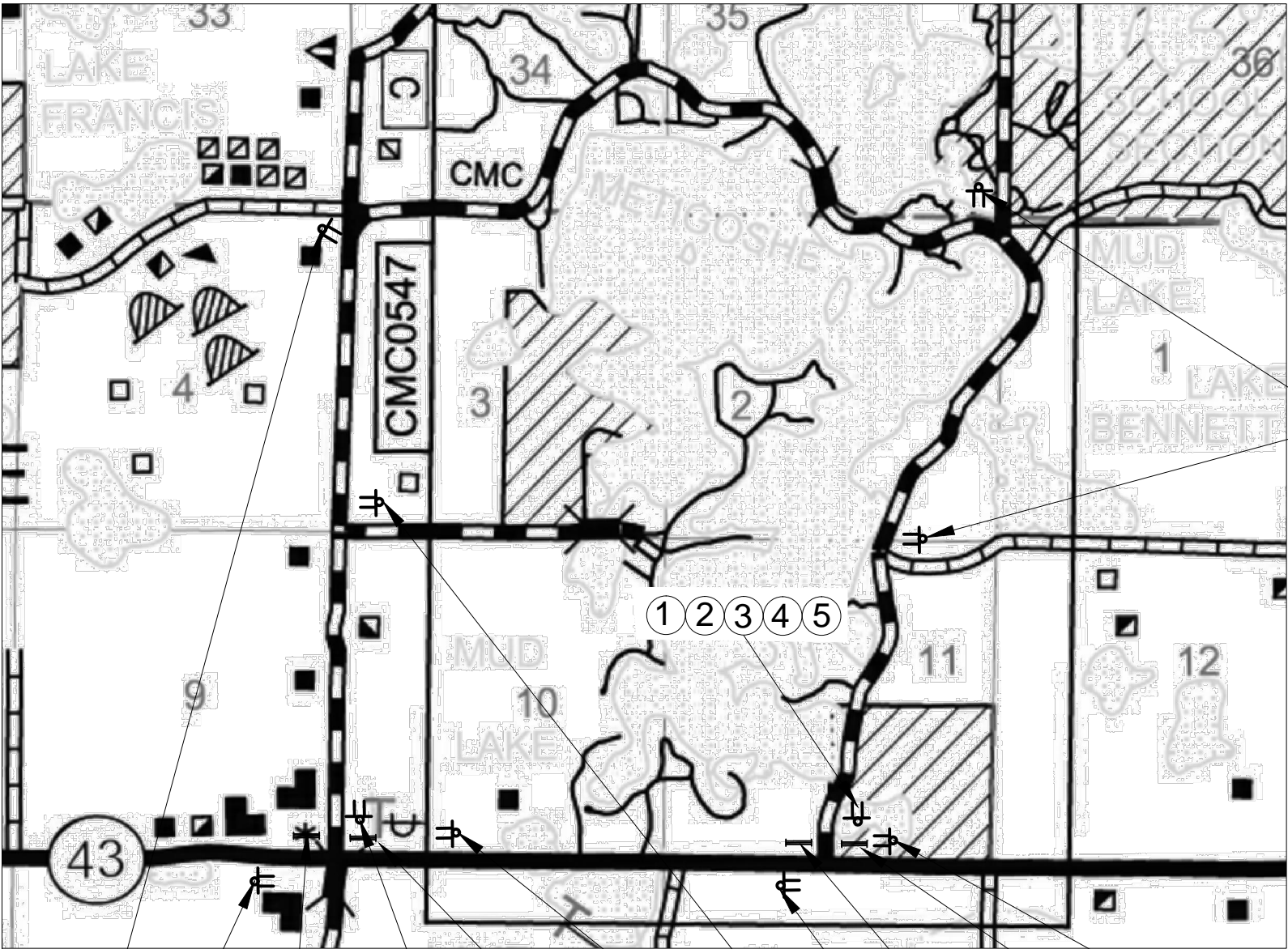
G20-52a-72

POST MOUNTING
- 8

ROAD WORK NEXT \_ MILE NEXT \_ MILE

G20-50a-72

POST MOUNTING



END ROAD WORK  
G20-2a-48  
Barricade Mounted

ROAD WORK NEXT XX MILES  
G20-1a-60  
Barricade Mounted (7 Mi)

END ROAD WORK  
G20-2a-48  
Barricade Mounted

ROAD WORK NEXT XX MILES  
G20-1a-60  
Barricade Mounted (7 Mi)

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### Traffic Control Layout

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