

DESIGN DATA				
Traffic: North Bound	Average Daily			Max.Hr.
Current 2010	Pass: 6980	Trucks: 1490	Total: 8470	845
Forecast 2030	Pass: 12145	Trucks: 2535	Total: 14680	1470
Clear Zone Dist. 42'	Design Speed: 75 MPH			
Minimum Sight Dist. for Stopping: 820'	Bridges: 138.146, 140.195, 141.196, 144.711			
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				
Pavement Design Life (years)				
DESIGN DATA				
Traffic: South Bound	Average Daily			Max.Hr.
Current 2010	Pass: 6490	Trucks: 1490	Total: 7980	800
Forecast 2030	Pass: 11295	Trucks: 2595	Total: 13890	1390
Clear Zone Dist. 42'	Design Speed: 75 MPH			
Minimum Sight Dist. for Stopping: 820'	Bridges: 144.711, 141.196, 140.195, 138.146			
Full Control of Access				
No Point of Access Other Than at Interchange Ramps				
Pavement Design Life (years)				

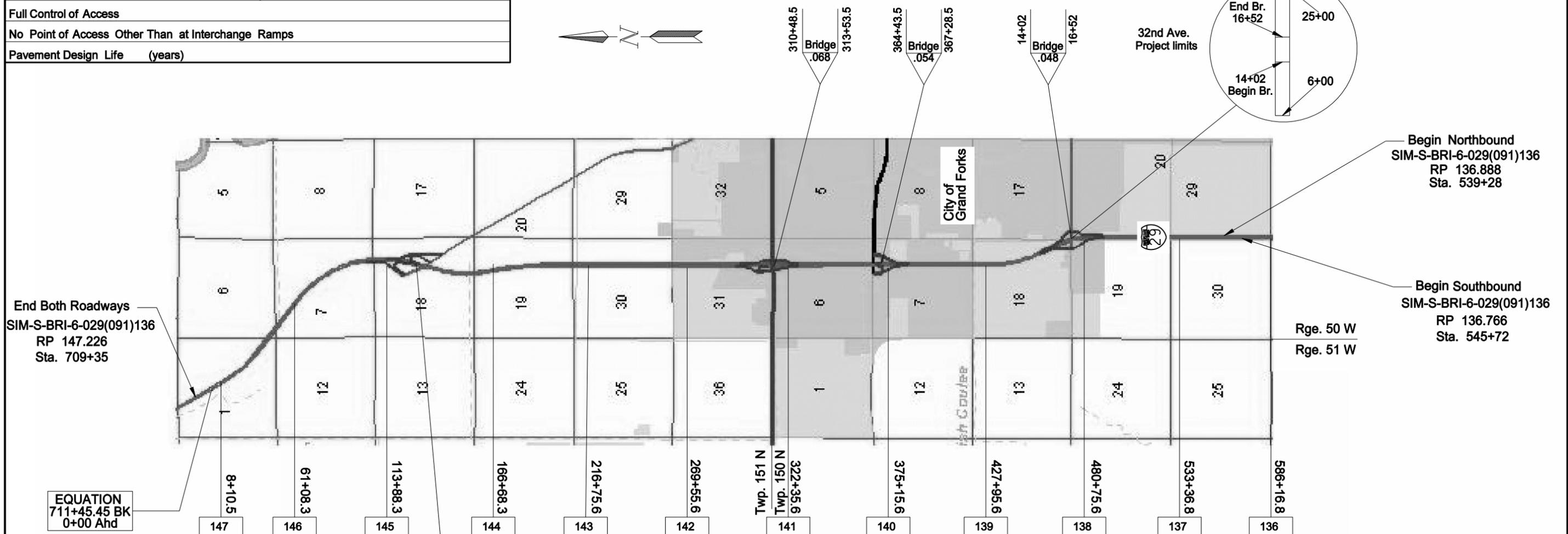
JOB# 25
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION
SIM-S-BRI-6-029(091)136

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SIM-S-BRI-6-029(091)136	18272	1	1

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

GRAND FORKS COUNTY
NB FROM NEAR 32ND AVE TO N OF NORTH GRAND FORKS INTERCHANGE
RP 136.888 - RP 147.226
SB FROM NEAR N GRAND FORKS INTERCHANGE TO NEAR 32ND AVE
RP 147.226 - RP 136.766
CPR, GRINDING, AND INCIDENTALS

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
NB SIM-S-BRI-6-029(091)136	10.141	10.338
SB SIM-S-BRI-6-029(091)136	10.263	10.460
Total	20.404	20.798



DESIGNERS
/s/ Brian Hach
/s/ Lee Westling

APPROVED DATE 03/02/2011
/s/ Edward Pavlish
GRAND FORKS DISTRICT
ND DEPARTMENT OF TRANSPORTATION

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 03/02/2011
/s/ Dustin Lang
GRAND FORKS DISTRICT

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Dustin Lang
Registration Number
PE-6394,
on 3/2/11 and the original document is stored at the
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of Transportation

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	2	1

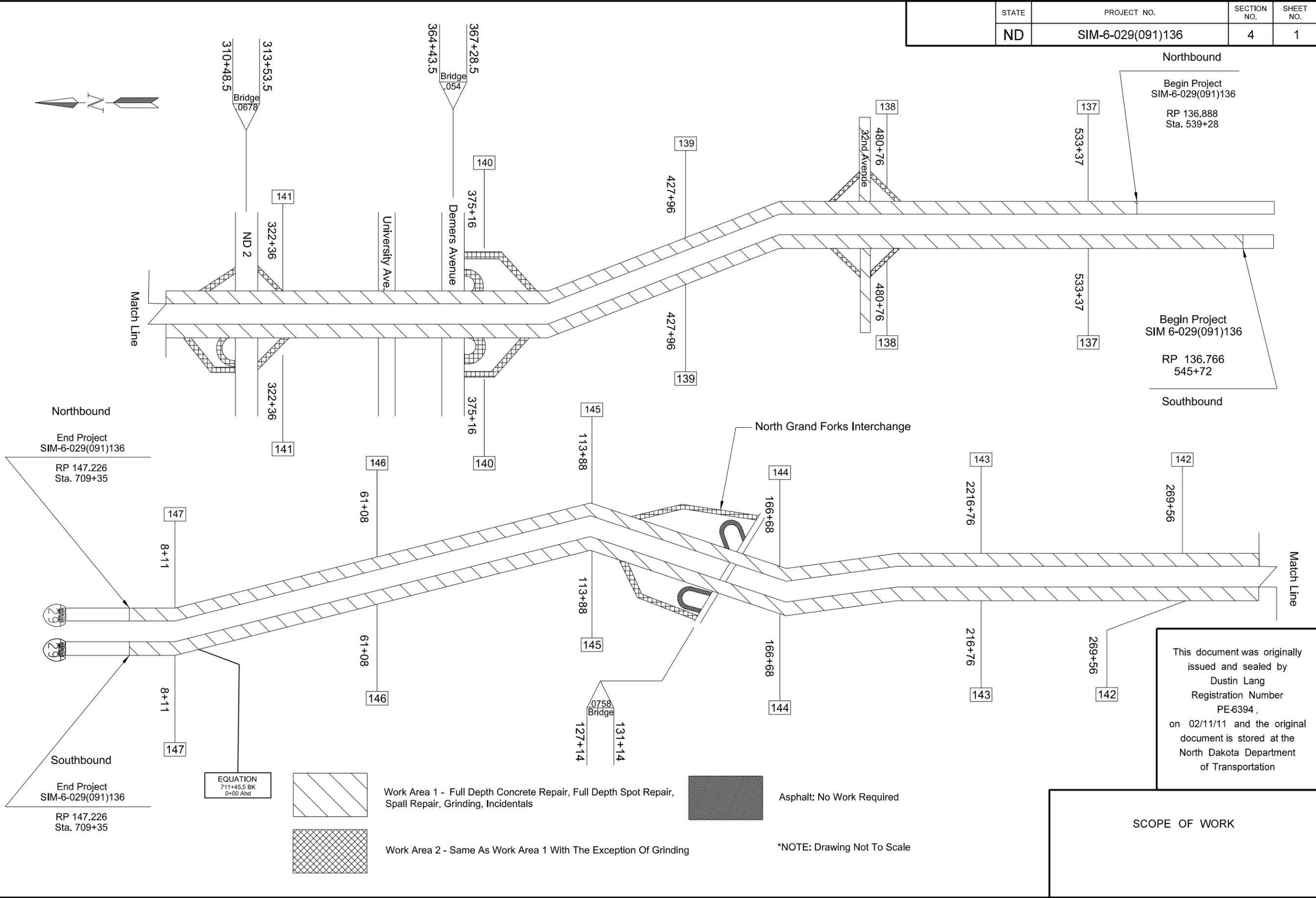
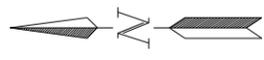
TABLE OF CONTENTS

<u>Section No.</u>	<u>Sheet No.</u>	<u>Description</u>
1	1	Title Sheet
2	1	Table of Contents
4	1	Scope of work
6	1-4	Notes
8	1	Quantities
10	1-3	Basis of Estimate
11	1-18	Data Tables (Concrete Pavement Repair Locations)
20	1-10	General Details
30	1-9	Typical Sections
100	1-2	Work Zone Traffic Control
120	1-7	Pavement Marking Layout
130	1-2	Thrie/W-Beam Guardrail
170	1-4	Bridge Layout

LIST OF STANDARD DRAWINGS

<u>Standard No.</u>	<u>Description</u>
D-20-1,2,3	Abbreviations
D-20-10	NDDOT Utility Company Abbreviations
D-20-20,21	Linestyles
D-20-30,31,32	Symbols
D-550-2	Longitudinal Joint Details
D-550-3	Transverse Contraction Joint Details
D-704-7,8	Breakaway Systems for Construction Zone Signs
D-704-9,10,11,12,12A	Construction Sign Details
D-704-13	Barricade Details and Channelizing Devices
D-704-14	Construction Sign & Barricade Assembly Details
D-704-22	Construction Sign & Barricade Location Details
D-704-28	Traffic Control for Mobile Operations
D-704-32	Sign Layout For One Lane Closure Divided Highway Moving Operation
D-704-35	Sign Layout for One Lane Closure Interstate System
D-704-35A	Sign Layout for One Lane Closure Moving Traffic to Outside Shoulder for Concrete Joint Repair Interstate System Used with D-704-35
D-704-50	Portable Sign Support Assembly
D-762-1,2	Interstate Pavement Marking 4 Lane Divided Highway
D-762-04	Pavement Marking
D-762-06	Short-Term Pavement Marking
D-764-1	Beam Guardrail - General Details
D-764-2C	Flared Energy Absorbing Terminal For Steel Breakaway System
D-764-3A	Thrie Beam to W-Beam Transition and Connection to Double Box Beam Retrofit
D-764-9A	Guardrail at Bridge Ends 75 mph Design Speed
D-764-13A	Typical Grading at Bridge Ends With Flared W-Beam Gdrl 75 MPH Design Speed
D-764-29	Short Term End Treatment for Bridges (Attenuation Device Method)

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	4	1



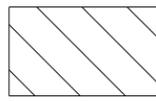
Northbound
 Begin Project
 SIM-6-029(091)136
 RP 136.888
 Sta. 539+28

Southbound
 Begin Project
 SIM 6-029(091)136
 RP 136.766
 545+72

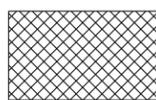
Northbound
 End Project
 SIM-6-029(091)136
 RP 147.226
 Sta. 709+35

Southbound
 End Project
 SIM-6-029(091)136
 RP 147.226
 Sta. 709+35

EQUATION
 711+45.5 BK
 0+00 And



Work Area 1 - Full Depth Concrete Repair, Full Depth Spot Repair, Spall Repair, Grinding, Incidentals



Work Area 2 - Same As Work Area 1 With The Exception Of Grinding



Asphalt: No Work Required

*NOTE: Drawing Not To Scale

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SCOPE OF WORK

NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	6	1

GENERAL NOTES

- 100-P01 COORDINATION OF PROJECTS: Other projects under contract during the 2011 construction season in the vicinity of this project are SIM-6-029(093)136, a signing project on I-29 from RP 136 to RP 161 in NB & SB roadways, ITS-9-999(265), a dynamic message board to be installed near RP 143 SB and RP 136 NB, and S-NHU-6-002(086)355, a CPR/Grinding project on Hwy 2 from RP 355.530 to RP 357.948.

- 107-P01 HAUL ROADS: All paved roads off the state system shall not be designated as haul roads. The contractor shall obtain approval from the local government agency before using any off system road as a haul road.

- 401-P01 FOG COAT: The final lift of pavement shall receive a fog seal with a SS1H or CSS1H emulsified asphalt. MS1 shall not be used as a fog seal. After final rolling, the fog seal shall be applied to pavement with a minimum of 125 degrees F. Blotter sand may be necessary to correct an over application of emulsion. The blotter material shall be applied with equipment as specified in section 151.06 of the Standard Specifications or as approved by the engineer. The blotter will not be a separate pay item, and all costs for providing and placing the blotter sand shall be included in the price bid for "SS1H or CSS1H or MS1 Emulsified Asphalt".

- 408-P01 HOT BITUMINOUS PAVEMENT CL 33: The mix design shall be Contractor Developed Mix Design and shall meet the requirements of NDDOT Standard Specifications 409.04 B.

The asphalt cement shall be PG 64-28 and shall be of such content as recommended by the mix design. The material for the tack coat shall be SS1H or CSS1H emulsified asphalt. All costs for labor, materials, and equipment for the placement of SS1H or CSS1H emulsified asphalt (tack) and PG 64-28 Asphalt cement (AC) shall be included in the unit price for "Hot Bituminous Pavement Cl. 33."

- 411-P01 TEMPORARY ASPHALT WEDGES: The Contractor shall place temporary asphalt wedges at the ends of bridge approach slabs and milling transitions to allow smooth passage of vehicles at these locations. Bituminous surfacing shall be placed on these milled areas prior to the traffic being allowed back on the milled roadway section. The Contractor shall only be allowed to perform milling 5 calendar days prior to paving. All costs associated with labor, materials, and equipment for the installation and removal of the asphalt wedges shall be included in the price bid for "Milling Pavement Surface".

- 550-P01 FINAL SURFACE FINISH: Standard spec 550.04 J.6 only applies to areas that will not receive PCC pavement grinding.

- 570-P01 CONCRETE PAVEMENT REPAIR: An additional 20% has been added to the quantities for 10 IN Conc Pvmt Repair-Full Depth-Doweled", 10 IN Conc Pvmt Repair-Spot Full Depth", "Saw Concrete", "Dowel Bars", "Doweled Contraction Joint Assembly" and "Spall Repair-Partial Depth" to be used as directed by the Engineer.

- 570-P02 CONCRETE PAVEMENT REPAIR: All 10 IN and 11 IN concrete pavement repair costs needed for labor, materials, and equipment to complete all 10 IN and 11 IN concrete pavement repair shall be paid for at the unit bid price of "10 IN Conc Pvmt Repair-Spot Full Depth", and "10 IN Conc Pvmt Repair- Full Depth Doweled".

- 570-P03 10 IN CONCRETE PAVEMENT REPAIR-SPOT FULL DEPTH: The Spot Full Depth Repairs shall be constructed as shown on the detail sheets in the plans. This work shall take place at the same time as the Full Depth and Partial Depth Repairs. The repair of these areas shall be in accordance with sections 570.04 A & B of the standard specifications.

Repair areas shall be a minimum of 3.5' x 3.5' in size and will be measured by the square foot (SF).

Dowel bars that are part of a transverse contraction joint that are removed shall be re-established with the new repair. This may require installation of partial dowel basket or drilling into the existing

- concrete. If drilling is required, the holes shall be drilled approximately midway between the existing dowel bars that were cut off. The quantity on the CPR Location sheet for dowel bars was determined using the assumption that repairs longer than 4 feet would cross a transverse joint.

- Tie Bars for the longitudinal joints for repairs less than 15' in length shall not be re-established. The tie bars for repairs longer than 15' shall be re-established in accordance with standard specification 570.04 A.6.b.

- All costs for labor, materials, and equipment to complete this work shall be paid for at the unit price bid for "Saw Concrete", "Dowel Bars" and "10 IN Conc Pvmt Repair-Spot Full Depth."

- 570-P04 TRANSVERSE AND LONGITUDINAL JOINT SEALING: All costs for labor, materials, and equipment to form, clean and seal smooth doweled transverse joints and longitudinal joints in the repair areas shall be included in the unit price bid for Full Depth Repair Items.

- 570-P05 PCC PAVEMENT GRINDING: All slurry or residue from the pavement grinding operation on 32nd Ave shall be contained, from STA 6+00 to STA 25+00 in both eastbound and westbound lanes, and become property of the contractor, and disposed of properly outside the project limits.

- 570-P06 EPOXY COATED DEFORMED BARS (STITCHING): Most joints to be stitched are not presently sealed.

Item 570-1600 includes the quantity of deformed bars required for stitching and for spot full depth pavement repairs. The data tables in Section 11 show the number of bars estimated at each location for stitching.

- 570-P07 The bid item "Saw Concrete" shall include all equipment, labor and materials. Sawing shall create a clean, vertical, full-depth cut along the entire length of the joint to facilitate material removal. The material to be removed shall then be removed without disturbing the material that is designated to remain. Sawing pay items shall be measured by the linear foot on a one-time basis.

- 704-P01 TRAFFIC CONTROL SUPERVISOR: Section 704.03U of the North Dakota Standard Specifications shall be used on this project.

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NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	6	2

704-P02 TRAFFIC CONTROL: Traffic control shall be in accordance with Standard D-704-35 and D-704-35A. In full-depth and spot full depth removal areas, vertical panels shall be spaced at 10 feet along the centerline of the roadway until the concrete has been replaced. Type I Barricades shall be placed in front of each open area or as directed by the engineer. The barricades shall not encroach onto the traffic lane. The quantities provide for 16 Type I Barricade locations per lane closure and 10 vertical panels for full-depth removal areas.

In some spot full depth removal areas work may need to be completed in the adjacent lane of traffic. This work will be limited to approximately 1.75' into the adjacent lane. Traffic shall be shifted as shown on Standard D-704-35A to accommodate this work.

The quantities have been based on two 4 mile lane closure(s), one in each direction, from the South end of the project to North of Gateway Drive, two 6 mile lane closure(s), one in each direction, from North of Gateway Drive to the North end of project limits on interstate, and two lane closure(s), one in each direction, over the 32nd Ave Interchange.

Lane closures will only be allowed in areas where work is being performed and/or areas where concrete has not reached its required strength or curing time. Once the concrete has reached sufficient strength and required curing time, and the grinding has been completed that portion of the lane closure shall be removed. The contractor shall schedule his activities to assure that all other related work needed to be completed before opening to traffic will be complete by the time that the concrete has reached sufficient strength and required curing time, and grinding has been completed.

704-P03 TRAFFIC CONTROL DEVICES: The traffic control devices list has been developed using the following layouts on the Standard Drawing for traffic control:

D-704-22 and D-704-26, Layouts Type K, Type L, and Type Y for Construction Truck Hauling Material.

D-704-28 Traffic Control for Mobile Operations on divided multi-lane highways.

D-704-32 for One-Lane Closure Interstate System for daytime grinding.

D-704-35, and D-704-35A, Sign Layout for One-Lane Closure Interstate System for CPR, Grinding, DBR, etc.

704-P04 MAINTAINING ACCESS: Contractor shall maintain access to all business within the project limits on 32nd Ave Interchange.

704-P05 TRAFFIC CONTROL: Daily operation skid mounted speed limit construction signs shall be removed or completely covered when no work is in progress and speeds shall be 65 MPH through work zone.

704-P06 TRAFFIC CONTROL: The traffic control devices summary includes the total number of required devices. It is expected that the devices for each lane closure will be removed and reset as required for each closure. No extra compensation shall be allowed for relocation due to work progression.

Should the contractor desire to proceed on a schedule other than as proposed by the plans any cost associated with the modification of the proposed traffic control plan, provision for additional easements, lighting, or other traffic control features as the revised plan may require, will become the responsibility of the contractor. The traffic control plans shall be approved by the engineer.

Flagging will be required when the contractor's traffic conflicts with public traffic and local access. Flagging shall be signed as indicated on Standard Drawing D-704-15, Type A. There will be truck hauling materials and these trucks will be entering or crossing roadways that have public traffic. These locations will have to be signed as shown on Standard Drawings D-704-22, Type K and L.

Installation of signing and pavement marking should be completed while the roadway segments are closed. Should the contractor elect to proceed in a different schedule, all costs for traffic control items necessary to perform the work shall be the contractor's responsibility.

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	6	3

NOTES

SECTION 120

762-P01 PAVEMENT MARKING EXPERIMENTAL FEATURE:

The following bid items shall be the subject of the experimental feature:

- Pavement Marking Groove
- Pavement Marking Painted 4 In Line
- Pavement Marking Painted 4 In Line - Wet Reflective
- Epoxy Pavement Marking 4 In Line
- Epoxy Pavement Marking 4 In Line - Wet Reflective
- Preformed Patterned Pavement Marking 4 In Line Contrast - Grooved

All manufacturer representation, labor, equipment, and materials necessary to furnish and install the pavement marking shall be included in the price bid for the items identified above.

EDGE LINE

The item "Pavement Marking Painted 4 In Line - Wet Reflective" shall be 3M All Weather Paint with Series 90 Wet Reflective Elements. The item "Epoxy Pavement Marking 4 In Line - Wet Reflective" shall meet NDDOT Standard Specification Section 880.09 with 3M Series 70E Wet Reflective Elements. The items "Pavement Marking Painted 4 In Line" and "Epoxy Pavement Marking 4 In Line" shall be constructed according to NDDOT specifications.

Prior to applying pavement markings, the Contractor shall clean the roadway surfaces by sandblasting, shotblasting, grinding, or waterblasting, to remove all surface treatments, laitance, or existing pavement markings. The item "Pavement Marking Groove" shall be constructed according to NDDOT specification 762.04 B6 with the following modification: Groove depth 40 mils ± 5 mils.

The following items shall be installed according to manufacturer's recommendations:

- Pavement Marking Painted 4 In Line - Wet Reflective
- Epoxy Pavement Marking 4 In Line - Wet Reflective

It is the Contractor's responsibility to coordinate with 3M to insure a manufacturer's representative is on site at the time of installation.

The Contractor shall equip striping equipment with a computerized Data Logging System (DLS). It shall be operational, calibrated and in use during striping operations. The Contractor shall provide the Engineer with certification that the equipment meets manufacturer's recommended calibration. The system shall document for long line markings only. The following documentation shall be required with the DLS:

1. Application vehicle speed to nearest 0.1 MPH
2. Weight and/or volume amount of paint material used by color,
3. Weight of beads and weight of reflective elements used,
4. Pavement surface temperature,
5. Air temperature,
6. Dew Point,
7. Humidity,

8. The system shall record the average material application rates and film thickness calculated over the section painted.

The Contractor shall provide the Engineer the above records for all 4 In lines painted by direction.

CENTERLINE

The item "Preformed Patterned Pavement Marking 4 In Line Contrast - Grooved" shall be 3M 380 AW-5 and shall be installed according to manufacturers recommendations. The groove shall be cut according to NDDOT specification 762.06 B6.

SECTION 130

764-P01 REMOVE W-BEAM GUARDRAIL & POSTS: The removed W-beam guardrail materials which are not reset shall be delivered by the contractor to the NDDOT Maintenance Storage Yard in Grand Forks, and neatly stacked at a location designated by the engineer.

The cost for delivery and stacking of the removed W-beam guardrail materials which are not to be reset shall not be paid for separately, but shall be included in the price bid for the item "Remove W-Beam Guardrail & Posts."

764-P02 REMOVE END TREATMENT & TRANSITION: The removed end treatment and transition materials shall be delivered by the contractor to the NDDOT Maintenance Storage Yard in Grand Forks, and neatly stacked at a location designated by the engineer.

The item "Remove End Treatment & Transition" shall be measured by the number removed.

The cost for delivery and stacking of the removed end treatment and transition materials shall not be paid for separately, but shall be included in the price bid for the item "Remove End Treatment and Transition."

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ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	8	1

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----
103	0100 CONTRACT BOND	L SUM	1	1
202	0132 REMOVAL OF BITUMINOUS SURFACING	SY	2,195	2,195
408	0190 HOT BITUMINOUS PAVEMENT CL 33	TON	955	955
411	0105 MILLING PAVEMENT SURFACE	SY	1,638	1,638
570	0095 SAW CONCRETE	LF	15,861	15,861
570	0210 PCC PAVEMENT GRINDING	SY	308,060	308,060
570	0240 DOWELED CONTRACTION JOINT ASSEMBLY	LF	258	258
570	0424 DOWEL BARS	EA	3,928	3,928
570	0705 10IN CONC PVMT REPAIR-SPOT FULL DEPTH	SF	7,489	7,489
570	0710 10IN CONC PVMT REPAIR-FULL DEPTH-DOWELED	SY	1,259	1,259
570	1512 SPALL REPAIR-PARTIAL DEPTH	SF	6,178	6,178
570	1600 EPOXY COATED DEFORMED BARS	EA	295	295
602	1210 BRIDGE END POST MODIFICATION	EA	1	1
624	3002 DOUBLE BOX BEAM RAIL RETROFIT - E-RAIL	LF	285	285
702	0100 MOBILIZATION	L SUM	1	1
704	0100 FLAGGING	MHR	2,500	2,500
704	1000 TRAFFIC CONTROL SIGNS	UNIT	3,539	3,539
704	1050 TYPE I BARRICADE	EA	16	16
704	1052 TYPE III BARRICADE	EA	24	24
704	1060 DELINEATOR DRUMS	EA	97	97
704	1067 TUBULAR MARKERS	EA	490	490
704	1087 SEQUENCING ARROW PANEL-TYPE C	EA	4	4
762	0100 PAVEMENT MARKING GROOVE	LF	151,496	151,496
762	0103 PVMT MK PAINTED-MESSAGE	SF	112	112
762	0113 EPOXY PVMT MK 4IN LINE	LF	84,480	84,480
762	0150 EPOXY PVMT MK 4IN LINE-WET REFLECTIVE	LF	68,136	68,136
762	0430 SHORT TERM 4IN LINE-TYPE NR	LF	28,403	28,403
762	1004 PVMT MK PAINTED 4IN LINE-WET REFLECTIVE	LF	21,120	21,120
762	1104 PVMT MK PAINTED 4IN LINE	LF	34,478	34,478
762	1108 PVMT MK PAINTED 8IN LINE	LF	6,355	6,355
762	1124 PVMT MK PAINTED 24IN LINE	LF	624	624
762	1305 PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED	LF	27,393	27,393
762	1340 PREF PATT PVMT MK 4IN LINE CONTRAST-GROOVED	LF	60	60

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	8	2

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----
764 0131	W-BEAM GUARDRAIL	LF	83	83
764 0145	W-BEAM GUARDRAIL END TERMINAL	EA	1	1
764 0151	REMOVE W-BEAM GUARDRAIL & POSTS	LF	264	264
764 1050	RESET W-BEAM GUARDRAIL	LF	163	163
764 1990	REMOVE CONCRETE SAFETY SHAPE TRANSITION	EA	1	1
764 2081	REMOVE END TREATMENT & TRANSITION	EA	1	1

BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	10	1

List of Special Provisions: 541(08) Rigid Pavement Surface Tolerance – Grinding
 559(08) Permanent Pavement Marking Monitoring System
Scope of Work: CPR, Grinding, E-Rail Retrofit and Incidentals
Exceptions: Bridges – 140.195 (L) (R), 141.196 (L) (R), 144.711 (L) (R)
ADT: 8470 (1490 Trucks) **ESALS:** 1718

762

Permanent Pavement Marking

570

PCC Pavement Grinding

Location	Basis	Quantity
I-29 NB	2-12' Lanes Plus a 6" Transition Area Left and Right Equaling 25'	14,667 SY/Mile
I-29 SB	2-12' Lanes Plus a 6" Transition Area Left and Right Equaling 25'	14,667 SY/Mile
32 nd Ave EB	2-12' Lanes, 24' Total	14,080 SY/Mile
32 nd Ave WB	2-12' Lanes, 24' Total	14,080 SY/Mile

Note: Grinding will not take place on bridge decks

762

Temporary Pavement Marking

Short Term 4IN Line –Type NR		
Location	Basis	Quantity
I-29 NB	Centerline Skips 1,320 LF/Mile	13,646 LF
I-29 SB	Centerline Skips 1,320 LF/Mile	13,807 LF
32 nd Ave EB	Centerline Skips 1,320 LF/Mile	475 LF
32 nd Ave WB	Centerline Skips 1,320 LF/Mile	475 LF

Segment ⁹	Location	Length (Feet)	Type	Material	Groove Depth (mils)
1A	RP 136.888 to RP 138.000 (NB) RP 136.766 to RP 138.000 (SB)	5,872 (NB) 6,516 (SB)	4" White and Yellow Edge-line	Water Based Paint with Ordinary Beads ²	40±5
1B	RP 138.000 to RP 140.000 (NB&SB)	10,560	4" White and Yellow Edge-line	Water Based Paint with 3M AW Element Series 90	40±5
2A	RP 140.000 to RP 142.000 (NB&SB)	10,560	4" White and Yellow Edge-line	Epoxy with Ordinary Glass Beads ²	40±5
2B	RP 142.000 to RP 144.000 (NB&SB)	10,560	4" White and Yellow Edge-line	Epoxy with 3M AW Element Series 70E	40±5
3A	RP 144.000 to RP 146.000 (NB&SB)	10,560	4" White and Yellow Edge-line	Epoxy with Ordinary Glass Beads ²	N/A ¹
3B	RP 146.000 to RP 147.226 (NB&SB)	6,474	4" White and Yellow Edge-line	Epoxy with 3M AW Element Series 70E	N/A ¹
4	RP 136.888 (NB)	250 (10ft line 30ft skip)	4" Centerline	3M 380 AW-5 Preformed Patterned Tape	100±10
1A,1B,2A,2B,3A,3B	RP 136.935 to RP 147.226 (NB)	54,337	4" Centerline	Preformed Patterned Tape	100±10
1A,1B,2A,2B,3A,3B	RP 136.766 to RP 147.226 (SB)	55,229	4" Centerline	Preformed Patterned Tape	100±10

¹Test Segments 3A and 3B will be surface applied.
²Ordinary glass beads shall meet section 880.02 of the NDDOT Standard Specifications.
³Refer to Pavement Marking Layout Sheets.

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BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	10	2

762 Permanent Pavement Marking

Location	Basis	Bid Item	Quantity
32 nd Ave. (EB&WB)	Centerline Skips 1,320 LF/Mile	PVMT MK Painted 4IN Line	950 LF
32 nd Ave. (EB&WB)	4" White and Yellow Edge Line 5280 LF/Mile	PVMT MK Painted 4IN Line	7,600 LF
Entrance Ramps	8" White Channel Line 195 LF/EA	PVMT MK Painted 8IN Line	1,755 LF
Exit Ramps	8" White Channel Line 440 LF/EA	PVMT MK Painted 8IN Line	3,520 LF
Exit Ramps	4" White Dotted Line 128 LF/EA	PVMT MK Painted 4IN Dotted Line	1,152 LF
Exit Ramps	24" White Stop Line 60 LF/EA	PVMT MK Painted 24IN Line Stop Bar	480 LF
32 nd Ave Crossroad	24" White Stop Line 36 LF/EA	PVMT MK Painted 24IN Line Stop Bar	144 LF
32 nd Ave Crossroad Turn Lanes	8" White Channel Line	PVMT MK Painted 8IN Line	1080 LF
32 nd Ave Crossroad Turn Lanes	Turn Arrow 16 SF/EA	PVMT MK Painted - Message	112 SF

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BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	10	3

Material	Unit	North Grand Forks Bridge NB - South Approach	North Grand Forks Bridge NB - North Approach	North Grand Forks Bridge SB - South Approach	North Grand Forks Bridge SB - North Approach	Total
		Quantity/Location	Quantity/Location	Quantity/Location	Quantity/Location	
Hot Bit Pvmt CL 33 @ 2 Ton/CY	Ton	457.4	172.4	153.2	171.4	954.4
SS-1h or CSS-1h Emuls Asphalt @ 0.05 Gal/SY (1st Lift)	Gal	29	35	46	51	161
SS-1h or CSS-1h Emuls Asphalt @ 0.05 Gal/SY (2nd Lift)	Gal	45	35	46	51	177
SS-1h or CSS-1h Emuls Asphalt @ 0.05 Gal/SY (3rd Lift)	Gal	51	-	-	-	51
SS-1h or CSS-1h Emuls Asphalt @ 0.05 Gal/SY (4th Lift)	Gal	79	-	-	-	79
SS-1h or CSS-1h Emuls Asphalt @ 0.05 Gal/SY (fog coat)	Gal	85	52	46	51	234
PG 64-28 Asphalt Cement @ 6.2%	Ton	28.4	10.7	9.7	10.8	59.6
Saw Concrete	LF	38.0	45.4	38.0	38.0	159.4
Milling Pavement Surface	SY	422	370	423	423	1,638
Removal of Bituminous Surfacing	SY	844	633	338	380	2,195

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STATION	LANE	CONCRETE PAVEMENT REPAIR								SPALL REPAIR			RANDOM PCC CRACK CLEANING AND SEALING		Remarks	
		DIMENSIONS		CONCRETE PAVEMENT REPAIR - FULL DEPTH - DOWELED SY	10IN CONC PAVMT REPAIR - SPOT FULL DEPTH SF	SAW CONCRETE LF	DOWEL BARS EA	TIE BARS EA	Smooth Dowel Bars LF	Doweled Joint Contraction Assembly LF	DIMENSIONS		AREA SF	LONGITUDINAL LF		TRANSVERSE LF
		L FT	W FT								L FT	W FT				
710+45	Passing SB		x											15		
710+48	Passing SB		x											15		
710+60	Passing SB	15	x	15	25.00		60	27.5	6			30				
710+62	Passing SB		x													
710+75	Passing SB		x											15		
710+77	Passing SB		x											15		
711+24	Passing SB		x											15		
0+03	Passing SB		x											15		
0+18	Passing SB		x											15		
0+95	Driving SB	12	x	12	16.00		48	22	4			24				
0+95	Passing SB	4	x	4		16.00	16		12			8				
0+97	Driving SB	6	x	12	8.00		36	22	2			12				
1+03	Passing SB	4	x	6		24.00	20		16			8				
34+13	Driving SB	11	x	10	12.22		42	18	4			22				
34+24	Driving SB	6	x	3.5		21.00	19		11			12				
34+30	Passing SB	10	x	10	11.11		40	18	4			20				
34+69	Driving SB		x									2	x	2	4	
41+59	Passing SB		x									2	x	2	4	
50+34	Driving SB		x									13	x	2	26	
50+51	Driving SB		x									9	x	2	18	
51+22	Driving SB	5	x	5		25.00	20		14			10				
51+29	Driving SB	15	x	8	13.33		46	15	6			30				
51+45	Driving SB	15	x	5		75.00	40		14			30				
51+58	Driving SB	15	x	5		75.00	40		14			30				
51+72	Driving SB	15	x	4		60.00	38		12			30				
51+87	Driving SB		x									0				
52+03	Driving SB		x									4	x	2	8	
52+52	Driving SB		x									2	x	2	4	
52+52	Driving SB		x									8	x	2	16	
52+61	Driving SB		x									10	x	2	20	
52+83	Driving SB	9	x	12	12.00		42	22	4			18				
52+92	Driving SB	15	x	4		60.00	38		12			30				
53+08	Driving SB	15	x	4		60.00	38		12			30				
53+23	Driving SB	15	x	4		60.00	38		12			30				
53+57	Driving SB	15	x	4		60.00	38		12			30				
53+71	Driving SB	15	x	4		60.00	38		12			30				
53+87	Driving SB	15	x	4		60.00	38		12			30				
54+01	Driving SB	15	x	3.5		52.50	37		11			30				
54+16	Driving SB		x									15	x	2	30	
54+32	Driving SB		x									12	x	2	24	
54+91	Driving SB		x									12	x	2	24	
55+21	Driving SB	15	x	6		90.00	42		16			30				
55+36	Driving SB	15	x	5		75.00	40		14			30				
55+50	Driving SB	10	x	3.5		35.00	27		11			20				
55+71	Driving SB		x									7	x	2	14	
55+81	Driving SB	10	x	3.5		35.00	27		11			20				
56+32	Driving SB		x						4			10	x	2	20	
56+65	Driving SB	8	x	12	10.67		40	22	2			16				
56+90	Driving SB		x									8	x	2	16	
57+02	Driving SB	3	x	3.5		10.50	13		11			6				
57+05	Driving SB	15	x	6	10.00		42	11	6			30				
57+20	Driving SB	15	x	5		75.00	40		14			30				
57+35	Driving SB	15	x	5		75.00	40		14			30				
57+50	Driving SB	15	x	5		75.00	40		14			30				
57+65	Driving SB	15	x	5		75.00	40		14			30				
57+80	Driving SB	15	x	7	11.67		44	13	6			30				
57+95	Driving SB	15	x	3.5		52.50	37		11			30				
58+10	Driving SB	15	x	3.5		52.50	37		11			30				
58+25	Driving SB	15	x	3.5		52.50	37		11			30				
58+40	Passing SB	15	x	3.5		52.50	37		11			30				
58+55	Driving SB		x									10	x	2	20	
58+72	Driving SB	12	x	3.5		42.00	31		11			24				
58+84	Driving SB	15	x	6		90.00	42		16			30				
59+03	Driving SB	15	x	6		90.00	42		16			30				
59+14	Driving SB	15	x	5		75.00	40		14			30				
59+24	Driving SB	15	x	5		75.00	40		14			30				
59+44	Driving SB	15	x	12	20.00		54	22	6			30				
59+50	Passing SB		x									10	x	2	20	
59+60	Driving SB	15	x	4		60.00	38		12			30				
59+75	Driving SB	15	x	12	20.00		54	22	6			30				
59+90	Driving SB	15	x	5		75.00	40		14			30				
60+05	Driving SB	15	x	6		90.00	42		16			30				
60+20	Driving SB	15	x	6		90.00	42		16			30				
60+35	Driving SB	15	x	3.5		52.50	37		11			30				
60+50	Driving SB	15	x	12	20.00		54	22	6			30				
60+65	Driving SB	15	x	5		75.00	40		14			30				
60+80	Driving SB		x									8	x	2	16	

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Data Table

STATION	LANE	CONCRETE PAVEMENT REPAIR								SPALL REPAIR			RANDOM PCC CRACK CLEANING AND SEALING		Remarks	
		DIMENSIONS		CONCRETE PAVEMENT REPAIR - FULL DEPTH - DOWELED	10IN CONC PVMT REPAIR - SPOT FULL DEPTH	SAW CONCRETE	DOWEL BARS	TIE BARS*	Smooth Dowel Bars	Doweled Joint Contraction Assembly	DIMENSIONS		AREA	LONGITUDINAL		TRANSVERSE
		L	W	SY	SF	LF	EA	EA	LF	LF	FT	FT	SF	LF		LF
465+03	Driving SB										2	x	2	4		
465+03	Passing SB										2	x	2	4		
471+50	Driving SB										2	x	2	4		
471+94	Driving SB										2	x	2	4		
472+01	Passing SB	9	x	3.5		31.50		25						11		18
473+59	Driving SB										2	x	4	8		
474+05	Passing SB										2	x	2	4		
474+64	Driving SB										2	x	2	4		
480+84	Passing SB										2	x	3	6		
481+85	Passing SB										2	x	2	4		
482+19	Driving SB										2	x	2	4		
482+32	Driving SB										2	x	2	4		
482+19	Passing SB	18	x	6		108.00		48						16		36
482+32	Passing SB	15	x	8	13.33			46	15					6		30
482+48	Passing SB	12	x	4		48.00		32						12		24
482+70	CL SB	30	x	3.5		105.00		67						11		60
483+07	CL SB	6	x	3.5		21.00		19						11		12
485+39	Passing SB										2	x	2	4		
489+68	Driving SB										2	x	2	4		
491+23	Driving SB										2	x	2	4		
491+38	Driving SB										2	x	2	4		
492+13	Driving SB										2	x	2	4		
492+29	Driving SB										4	x	2	8		
494+99	Driving SB										2	x	2	4		
495+14	Driving SB										2	x	2	4		
495+30	Driving SB										2	x	2	4		
496+95	Driving SB										2	x	2	4		
498+30	Driving SB										2	x	3	6		
502+81	Driving SB										2	x	2	4		
515+40	Driving SB										2	x	2	4		
525+51	Passing SB										2	x	2	4		
520+08	Passing SB										4	x	2	8		
537+95	Driving SB										2	x	2	4		
543+17	Passing SB										2	x	2	4		
543+34	Passing SB										2	x	2	4		
545+70	Driving SB	6	x	24	16.00			60	44	2						12
545+66	Driving SB										2	x	24	48		

	Concrete pavement Repair	10IN CONC PVMT REPAIR	SAW CONCRETE	DOWEL BARS	TIE BARS	DEFORMED BARS	Contraction assemb.	SPALL REPAIR TOTALS
	SY	SF	LF	EA	EA	EA	LF	SF
Total	442.56	4373.75	4120	710	130	982	72	2604
Total + 20 %	531.07	5248.50	4944	851	156	1178	86	3124.8

*Tie bars will not be measured and paid for separately; quantity is included for information only.
Note: Deformed and smooth dowel bars are both included in the item 570-0424 Dowel Bars.

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STATION	CONCRETE PAVEMENT REPAIR								SPALL REPAIR			Remarks			
	DIMENSIONS			CONCRETE PAVEMENT REPAIR - FULL DEPTH - DOWELED	10IN CONC PVMT REPAIR - SPOT FULL DEPTH	SAW CONCRETE	DOWEL BARS	TIE BARS*	Dowel Bar Joint Assembly	Deformed Bars	DIMENSIONS			AREA	
	L	x	W	SY	SF	LF	EA	EA	LF	EA	L		x	W	SF
FT	x	FT								FT	x	FT			
Gateway NB Off Ramp															
1+50	3.5	X	3.5		12.25	25				11					
1+85	3.5	X	3.5		12.25	25				11					
7+80															
9+60											2	2	4	Uneven Panels	
Gateway NB On Ramp															
16+13	28	X	12	37.33		672	22		11						
Gateway SB Off Ramp															
7+41	8	X	24	21.33		384	46								
7+67	3.5	X	3.5		12.25	25				11					
8+17	3.5	X	3.5		12.25	25				11					
8+28	18	X	12	24.00		432	22		11						
10+10		X												Random Crack 10'	
12+10	6	X	6		36	72	10								
12+57	3.5	X	3.5		12.25	25				11					
15+00											2	2	4		
Gateway SB On Ramp															
None															
NGF Interchange NB On Ramp															
6+15	3.5	X	12		42	84	22								
NGF Interchange SB Off Ramp															
-10	3.5	X	20	7.78		140	38							Random Crack 12'	
0+40	3.5	X	22	8.56		154	42							Random Crack 12'	
1+02	5	X	24	13.33		240	46							Random Crack 12'	
1+72	6	X	24	16.00		288	46							Random Crack 12'	
3+05	3.5	X	24	9.33		168	46							Random Crack 12'	
3+95														Random Crack 12'	
7+25														Random Crack 12'	
18+82	7	x	12	9.33		168	22								

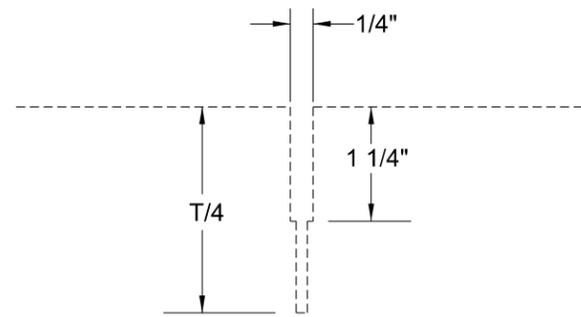
	Concrete Pvmt. Repair Full Depth Doweled	10IN CONC PVMT REPAIR - Spot Full Depth	SAW CONCRETE	DOWEL BARS	TIE BARS*	Dowel Bar Joint Assembly	Deformed Bars	SPALL REPAIR
	SY	SF	LF	EA	EA	LF	EA	SF
Total	344.00	494.00	7180.00	614.00	50.00	72.00	183.00	144
Total + 20%	412.80	592.80	8616.00	736.80	60.00	86.40	219.60	172.80

*Tie bars will not be measured and paid for separately; quantity is included for information only.
 Note: Deformed and smooth dowel bars are both included in the bid item 570-0424 Dowel Bars.

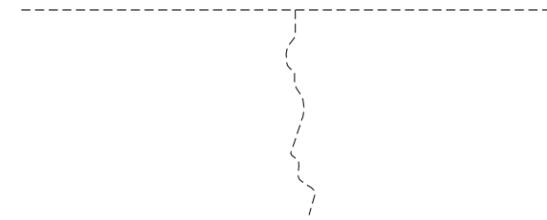
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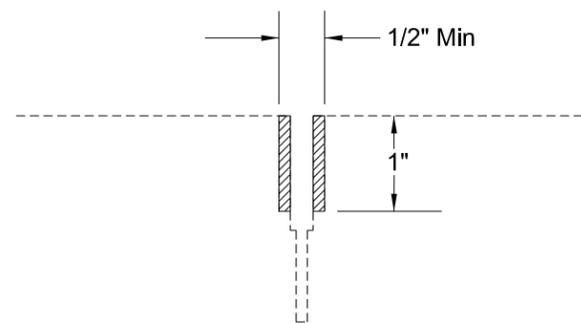
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-6-029(091)136	20	1



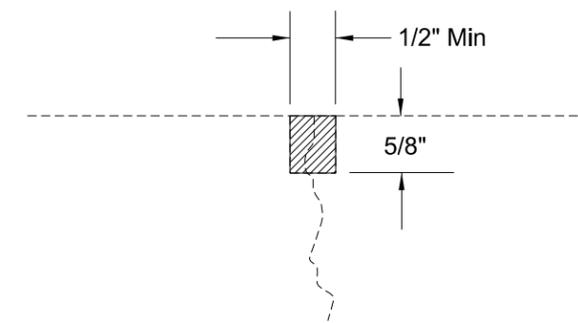
Reestablished Transverse Joint After Initial Sawing



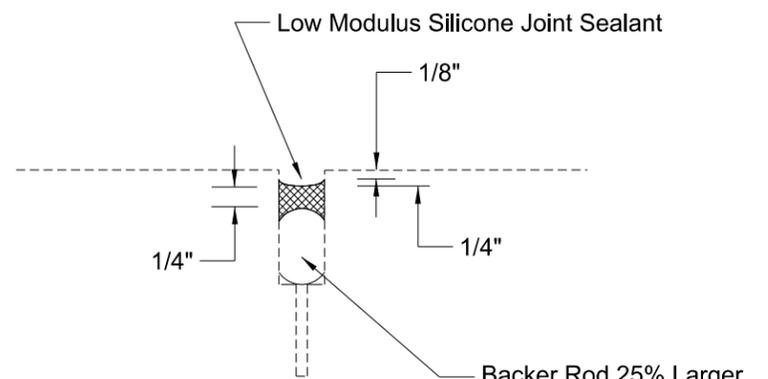
Existing Random Crack



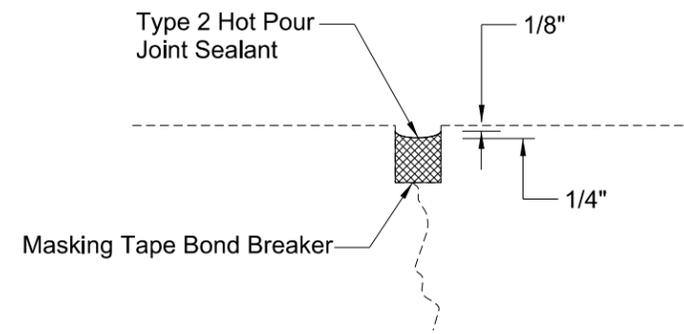
Transverse Joint Sawing



Random Crack Sawing



Transverse Joint Sealing

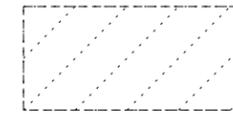
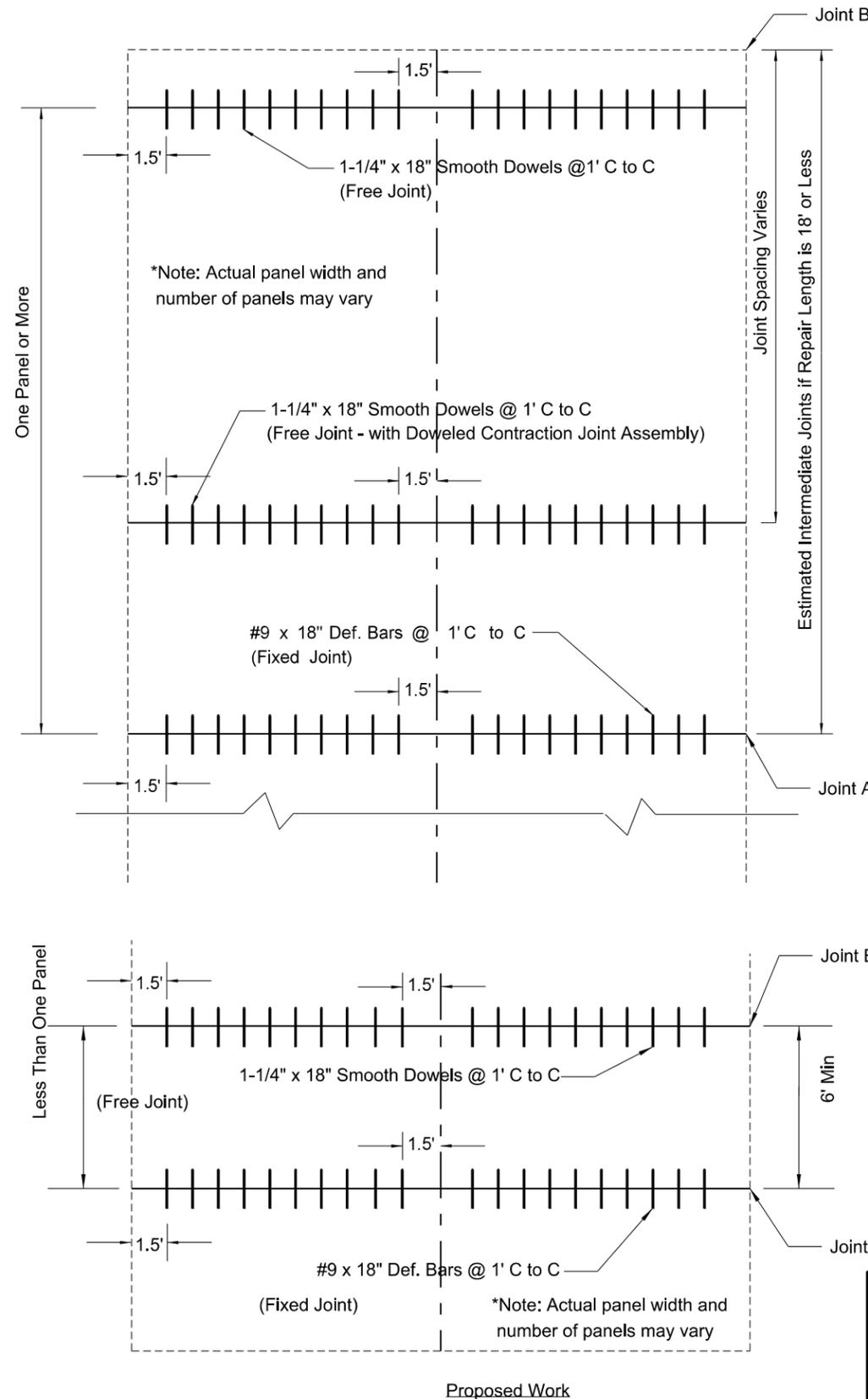
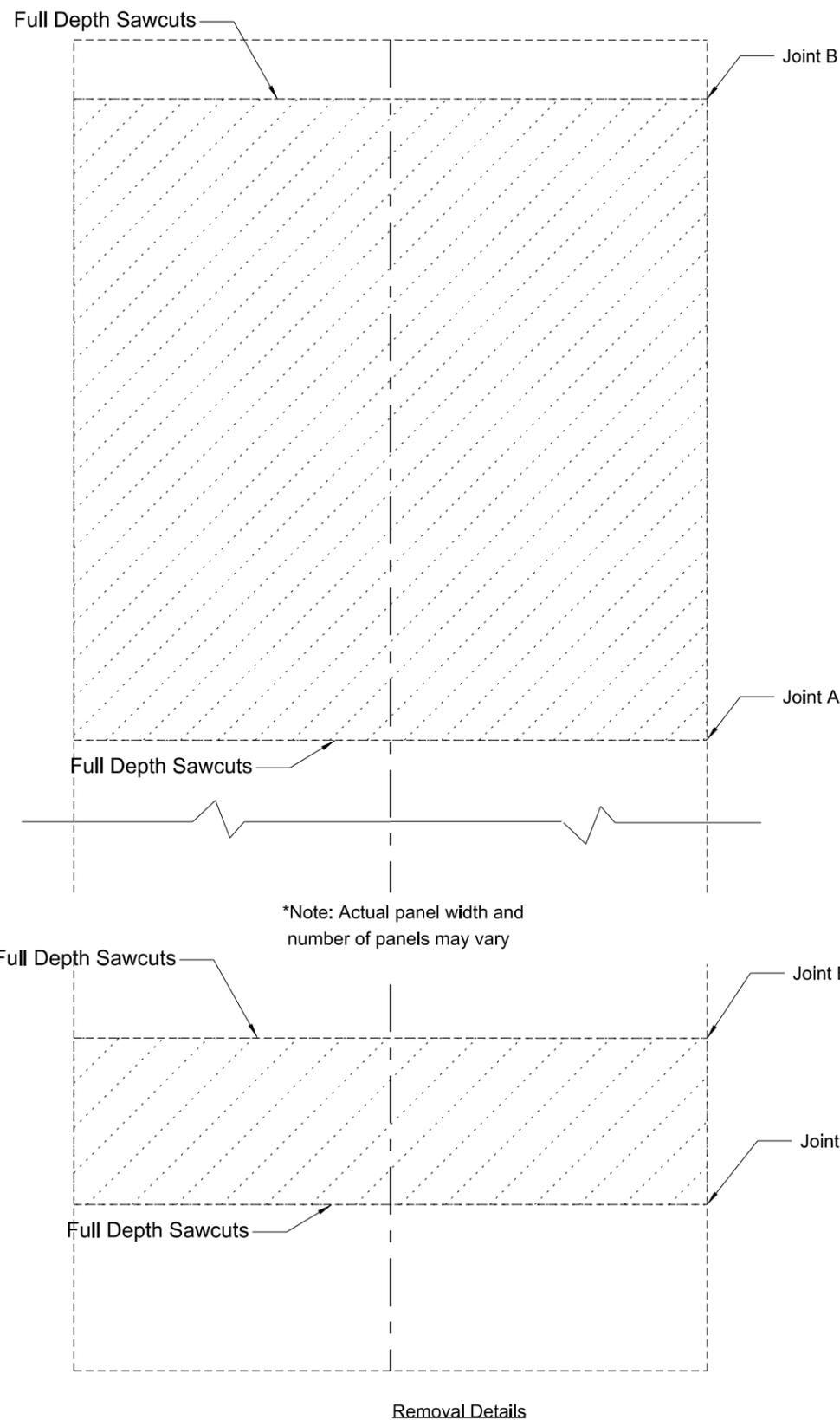


Random Crack Sealing

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Joint and Random Crack Cleaning & Sealing

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	20	2

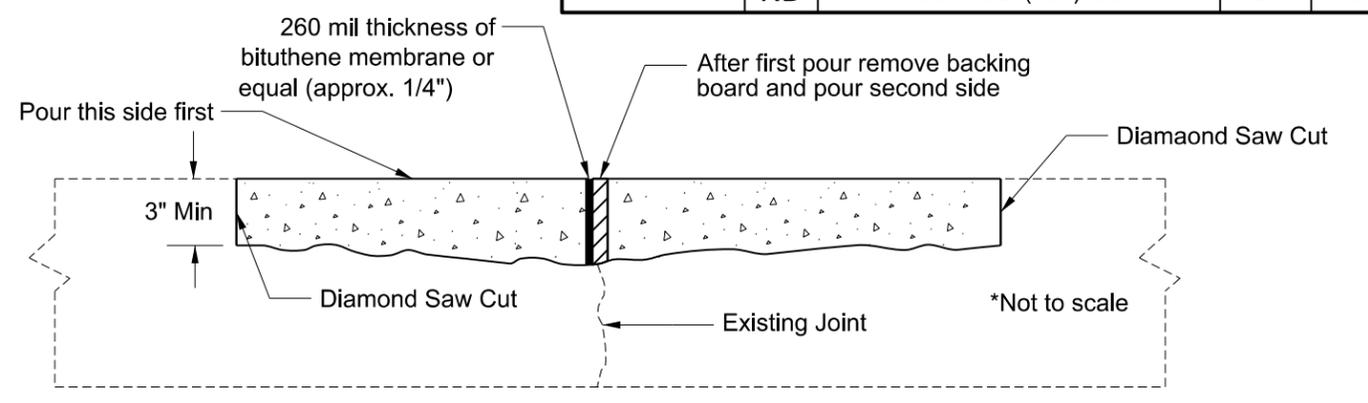
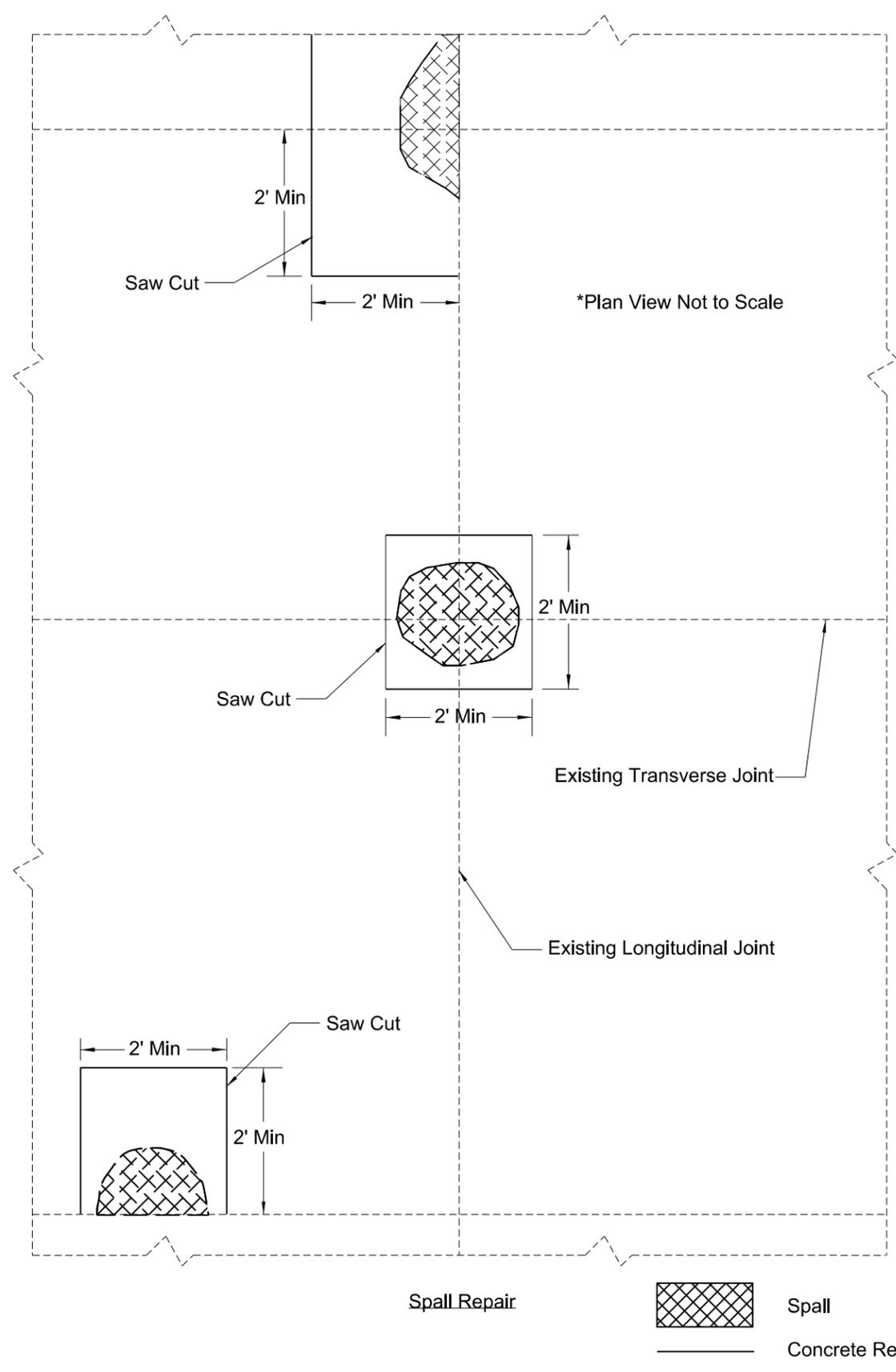


- Notes:
1. Joint A (Fixed Joint) shall be the new joint with the shortest distance to the next transverse joint or working random crack. The saw cut will be made at 90° to the centerline. The deformed bars shall be placed perpendicular to the face of the saw cut.
 2. Joint B (Free Joint) shall be the new joint with the greatest distance to the next transverse joint or working random crack. The smooth bars shall be installed within the tolerances shown on the "Dowel Bar Placement-Full Depth Repair" detail sheet.
 3. When the distance to the next transverse joint or working random crack is equal for both new joints, the free joint (Joint B) shall be placed on the approach side of the repair.
 4. If greater than one panel in length, a Doweled Contraction Joint Assembly shall be installed at transverse contraction joints.
 5. In repair areas which are not the entire roadway width, joints shall be placed to match the existing pavement wherever possible.
 6. The joints at the beginning and end of a full depth repair section can be either a Joint B or Joint A depending on the existing joint.

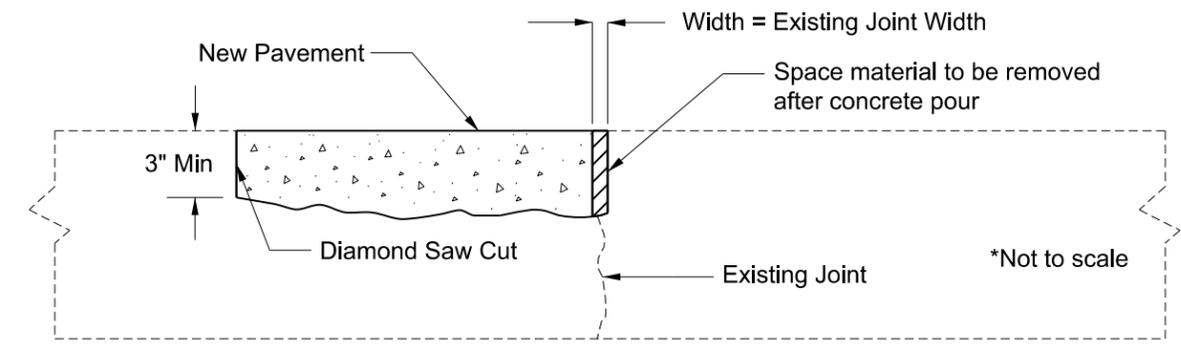
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Removal of Concrete & Dowel Bar
 Placement - Full Depth Repair
 Straight Joint

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM6-029(091)136	20	3



Cross Section - Repair Area on Both Sides of Joint



Cross Section - Repair Area on One Side of Joint

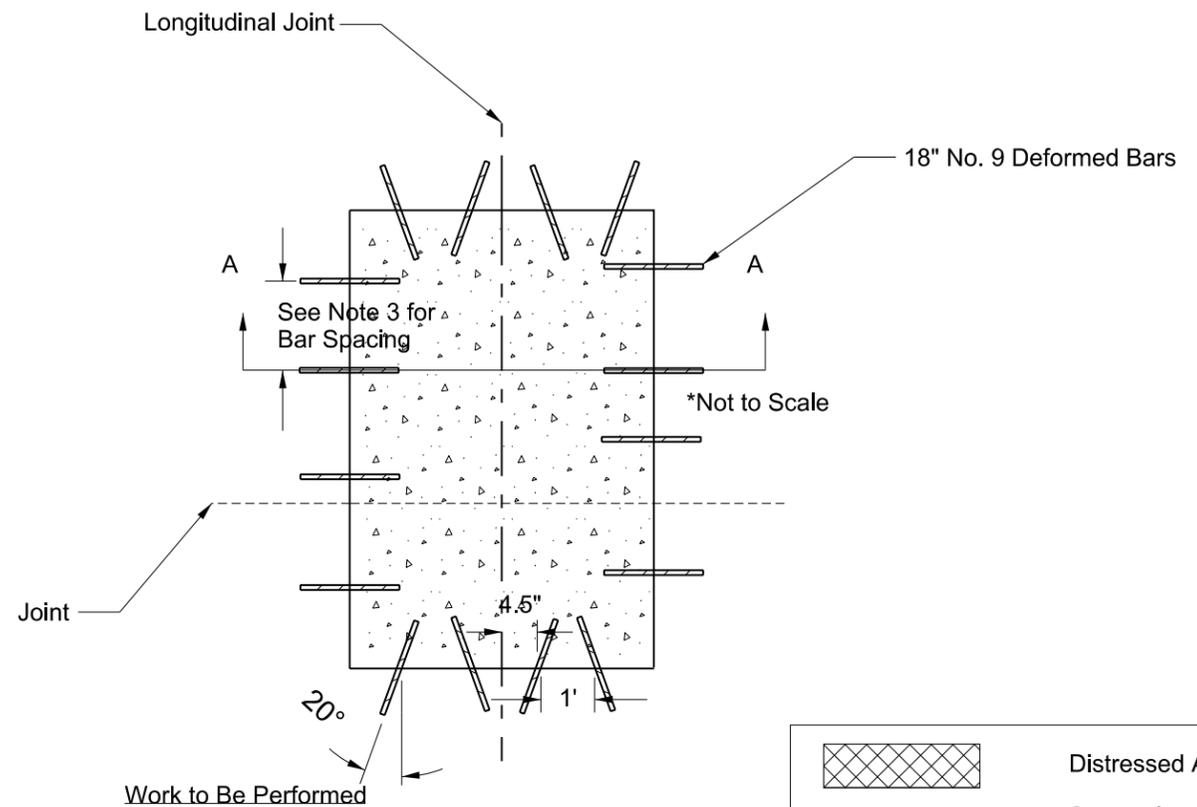
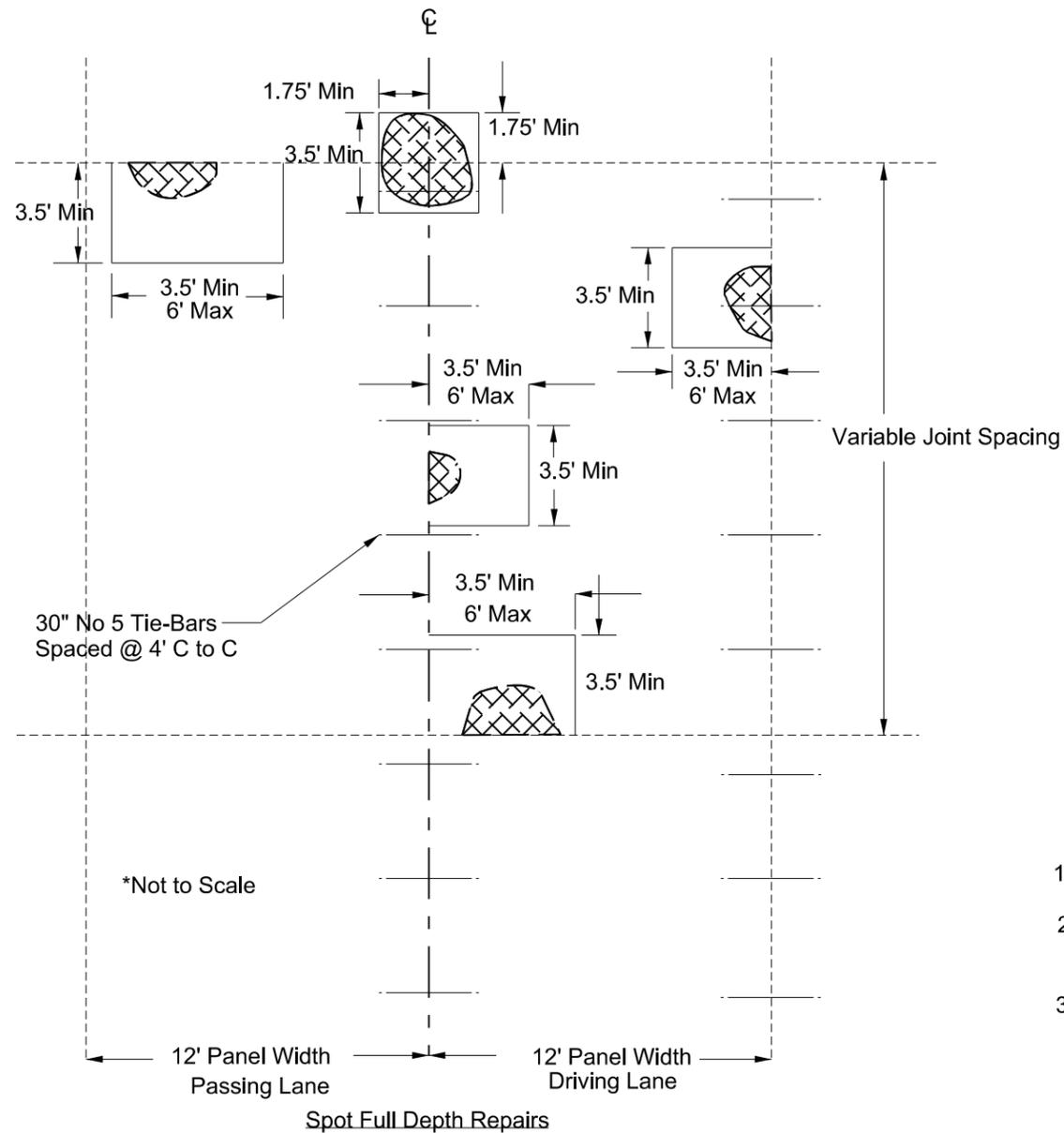
Notes:

- Existing concrete shall be removed with a chipping hammer or other methods as approved by the engineer. A milling machine may be used, as approved by the engineer, but sawing and chipping will still be required to finish the removal.
- Grout shall be applied to the sides, excluding joint faces, and bottom of the repair.
- A spacer material, as approved by the engineer, shall be placed on the joint face to maintain the joint during repair. The material shall have the capability of maintaining a width equal to that of the existing joint, and being easily removed after the pour. In the case of repair on both sides of the transverse joint each side shall be poured separately.
- In the case of repair on both sides of the joint, if deemed necessary by the engineer, a bituthene waterproofing membrane will be placed on the face of the newly poured joint in lieu of the spacer material prior to the concrete pour. The material shall be a minimum of 260 mil (approx. 1/4") thick or equal to the width of the existing joint, whichever is larger. The material shall be cut to fit over the entire face of the existing joint. The material shall be placed to provide for expansion and to prevent water from entering the existing joint through the sides or bottom. The material shall be hand pressed into place to conform to the face of the existing joint. In the case of repair on both sides of the joint a backer board material, as approved by the engineer shall be placed over the bituthene material on the side facing the second pour prior to the second pour. The backer board shall be removed after the repair is complete. In the case of repair on one side of the joint, if deemed necessary by the engineer, a bituthene waterproofing membrane will be placed on the face of the existing joint in lieu of the spacer material and prior to the concrete pour.
- All joints shall be sealed according to NDDOT specifications.
- All costs for cleaning and sealing joints and bituthene installment shall be covered under the bit item, "Spall Repair-Partial Depth".

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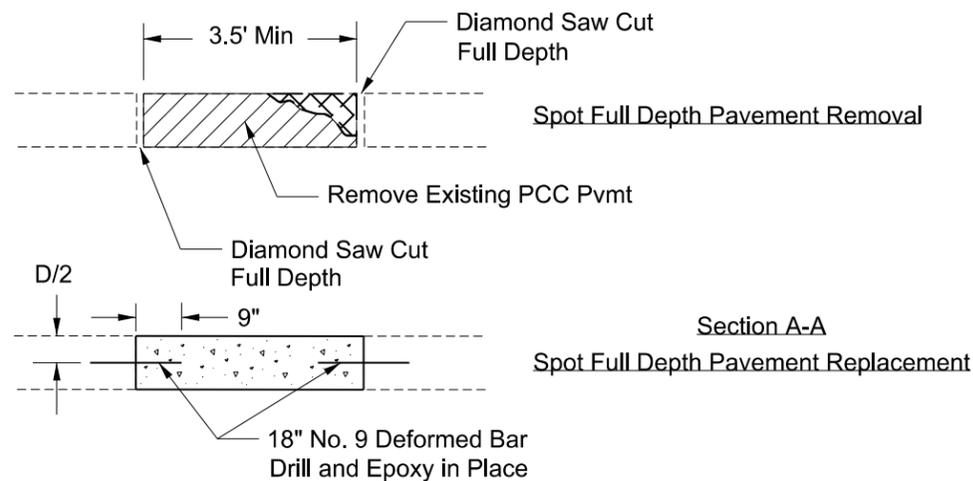
Spall Repair Detail

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	20	4



	Distressed Area
	Sawcutting Limits
	Existing Conc. Jnt.

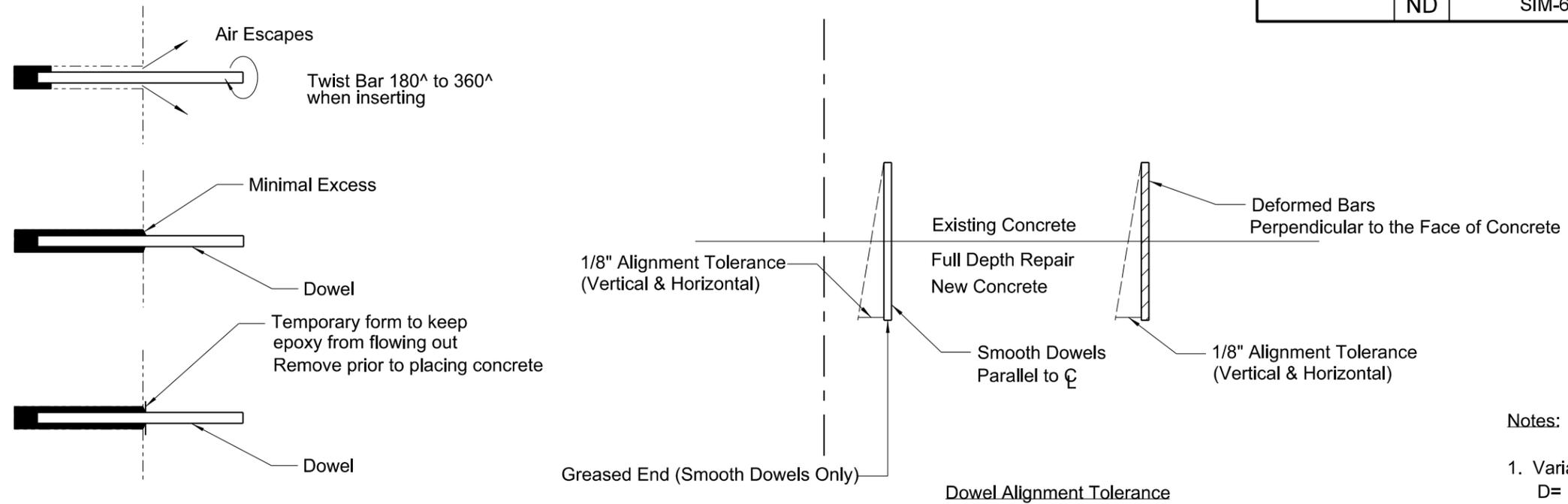
1. Sawcut the marked removal area.
2. Remove concrete full depth. Restore and compact in place base if disturbed.
3. Furnish and install 18" long No. 9 deformed bars. The spacing and layout shall be as follows:
 - Transverse Edges: 12" C to C, and skewed 20° from the face of the joint.
 - Longitudinal Edges: Parallel to the skewed joint. If the repair is 2' or less in length from a transverse joint then use one bar centered on the repair. If 2' to 4' in length from a transverse joint use two bars evenly spaced. If longer than 4' space at 24" C to C.
 - All costs to drill, epoxy, and insert deformed bars, shall be paid for at the unit price bid for "Dowel Bars".
4. Restore dowel bars if necessary. Use partial dowel bar assembly, dowel chairs, or drill holes as appropriate.
5. Clean exposed surface of in place concrete. Coat exposed surface of the dowel bars, if any with grease.
6. Place, consolidate, finish, and cure the concrete.
7. Restore transverse and longitudinal joints.
8. Clean and seal restored longitudinal and transverse joints with silicone seal.



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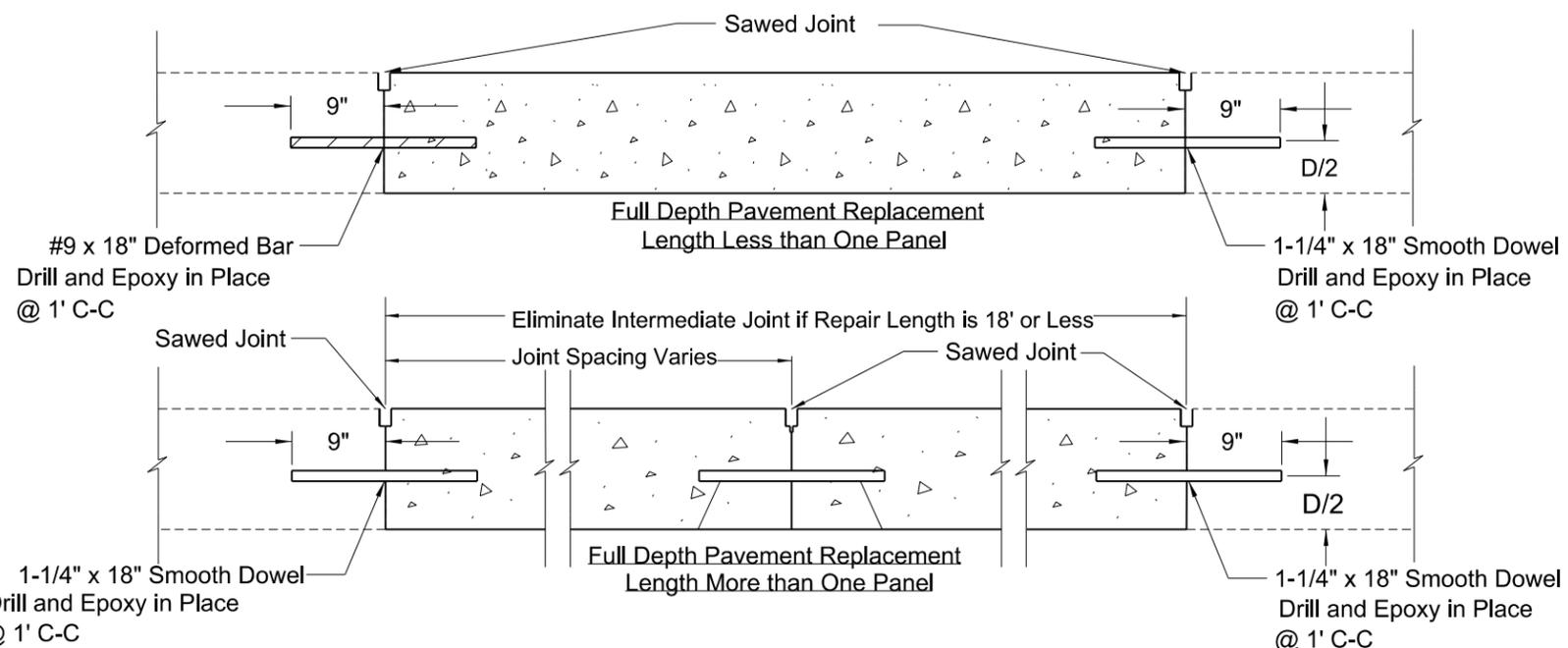
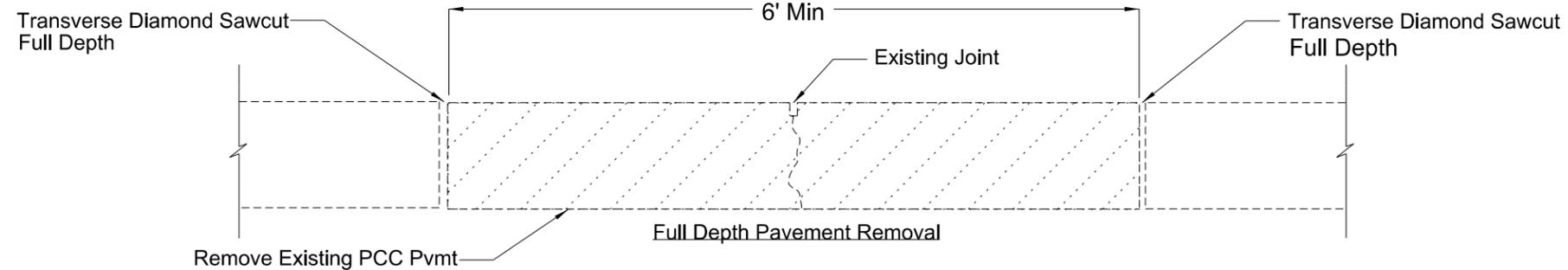
Spot Full Depth Repair Details

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	20	5



Notes:

- Variables:
D= Depth of Pavement (9" Typical)
- Removal and Replacement also applies to full depth repairs at cracks.
- Place smooth dowel bars in repair joint which is farthest away from the next transverse joint or working random crack. If distance is equal for both repair joints, place smooth dowels on approach side of repair.
- Dowels / Deformed Bars, or baskets, shall have spacing @ 1' C-C, and 18" from longitudinal joints; total of 10 bars per 12' lane.

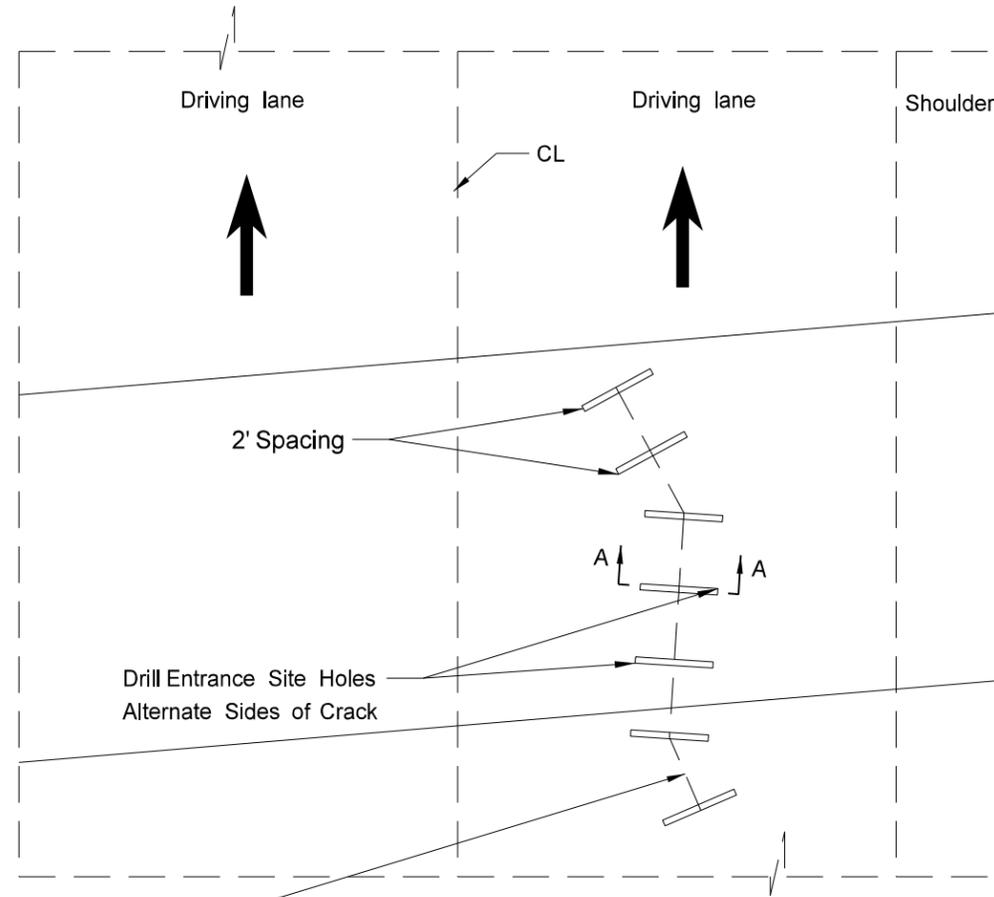


*Drawings Not to Scale

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Concrete Pavement Repair - Full Depth
Non-Reinforced PCC Pavement

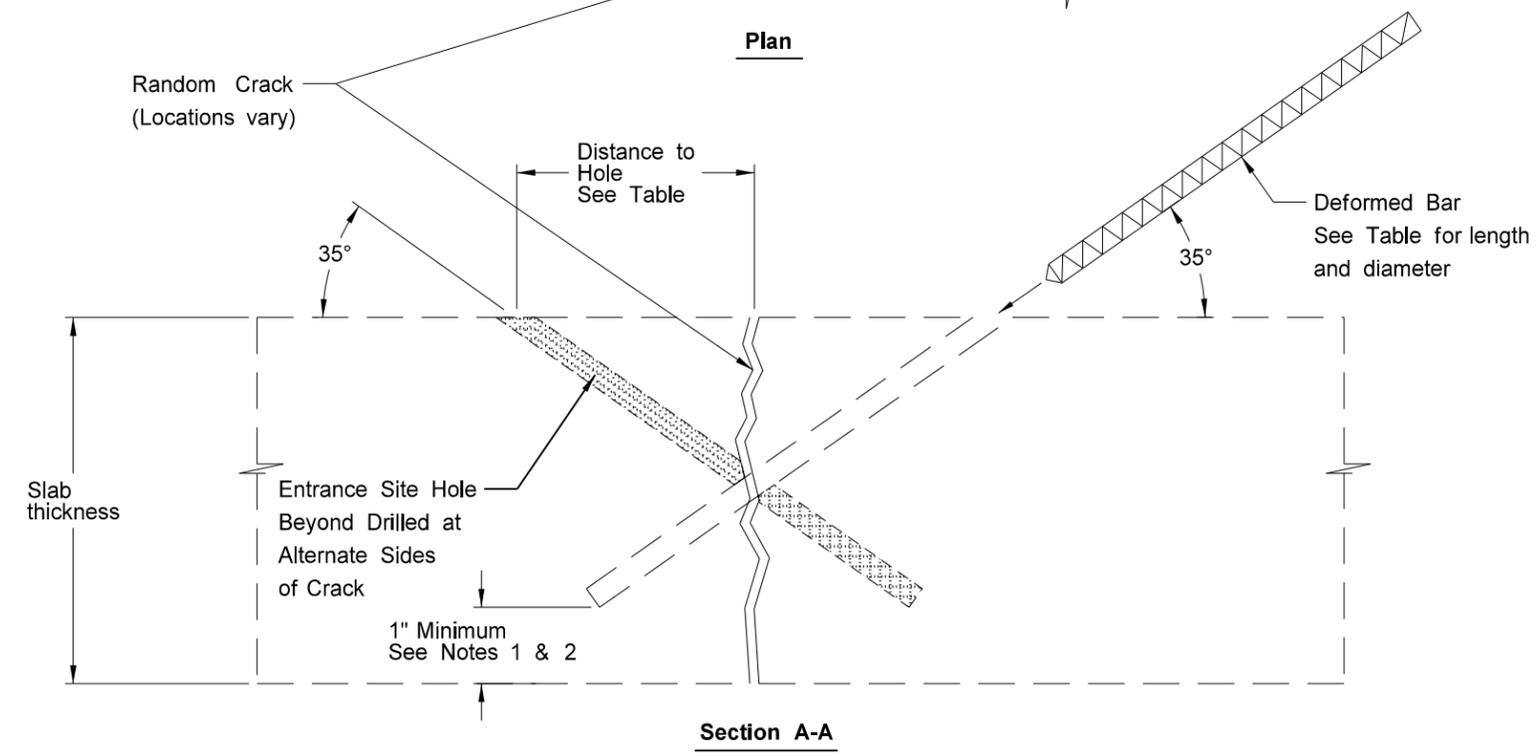
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	20	6



Cross Stitching Bar Dimensions	South Bound		Random Crack Stitching Locations	
	Beginning Station	End Station	Length of Crack Feet	# of Bars Each
Slab Thickness (in)				
10	51+96	52+36	40	20
Distance to Hole				
7.25	53+08	53+78	70	35
Length of Bar (in)				
12.5	55+04	56+49	145	72
Size of Bar				
No. 6	57+37	58+25	88	44
Degree of Bar				
35	59+38	63+34	390	195
			Total Bars	366

Notes:

1. Epoxy deformed bar into hole. Length shown in table provide 1 inch cover at surface and assume drilling per note 2.
2. Do not drill hole completely through slab. Stop drilling so epoxy/grout will not run out of the bottom when filling.



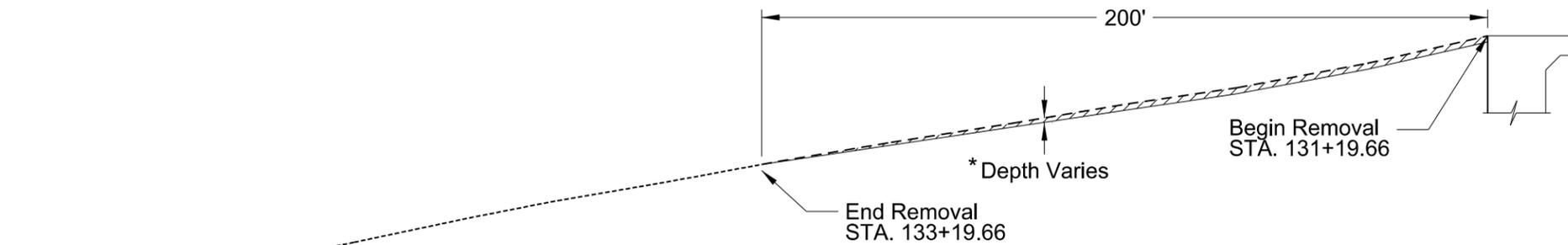
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Random Crack Stitching Detail

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ND	SIM-6-029(091)136	20	7

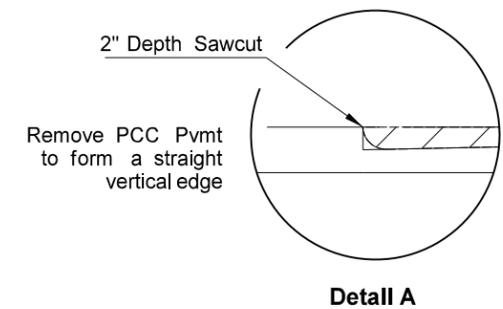
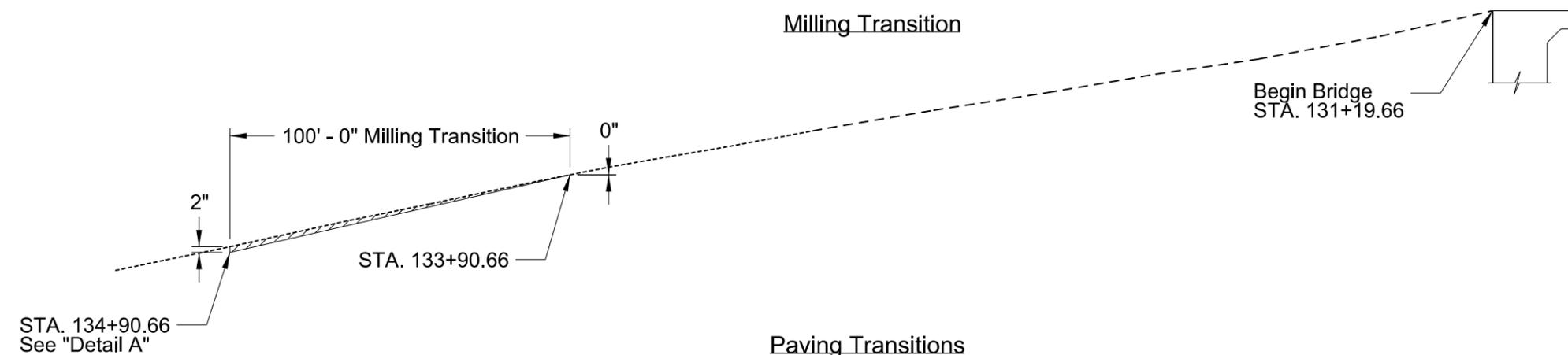
North Grand Forks Bridge NB - South Approach

Existing Asphalt Removal

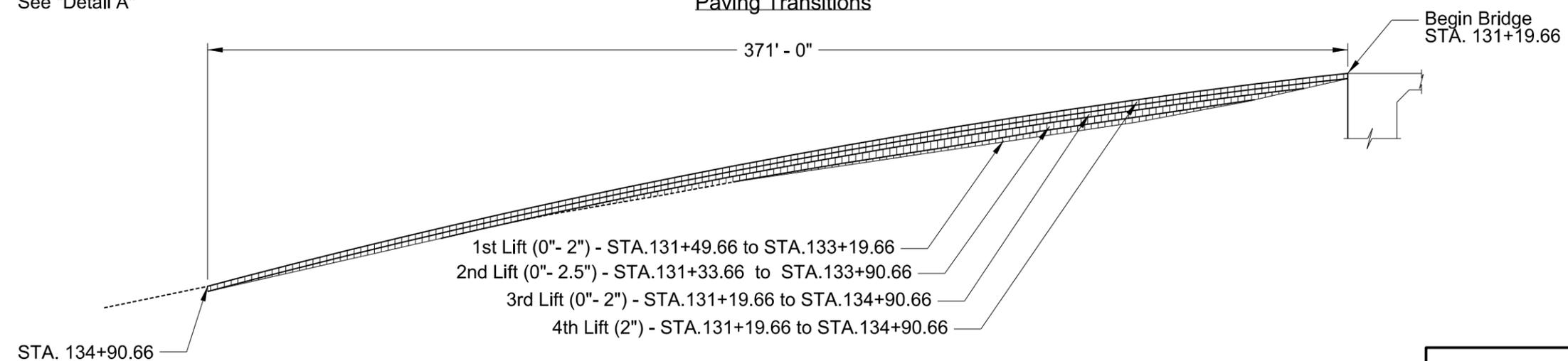


* Existing asphalt patch depth varies.

Milling Transition



Paving Transitions



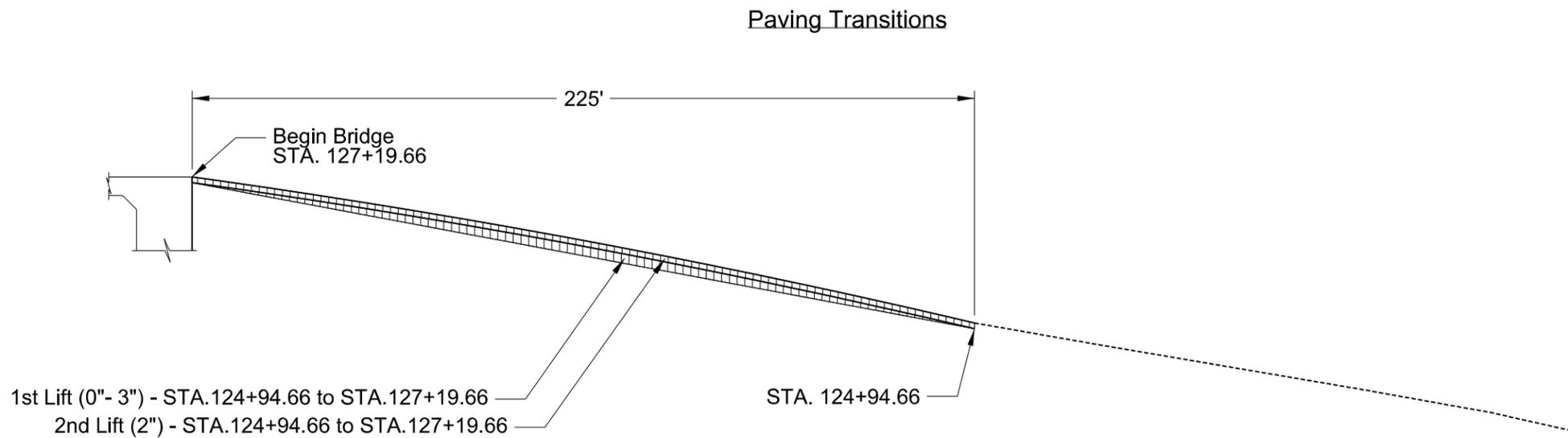
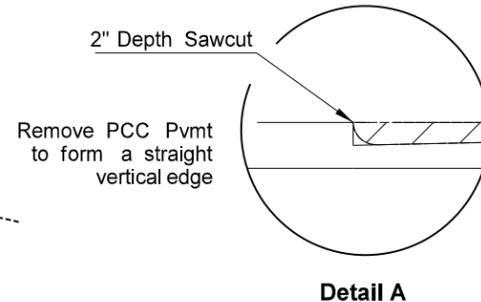
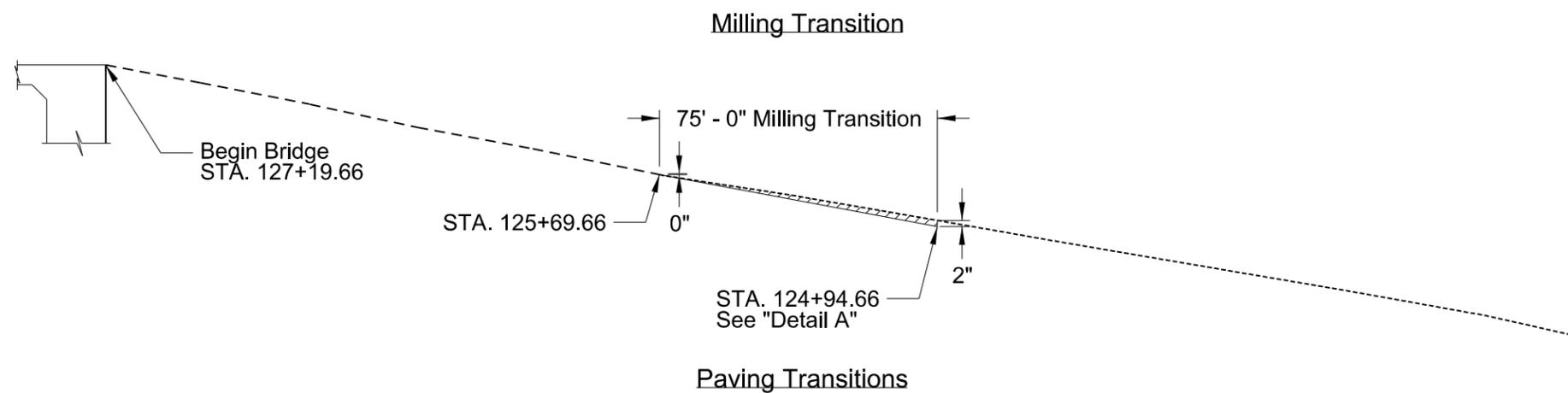
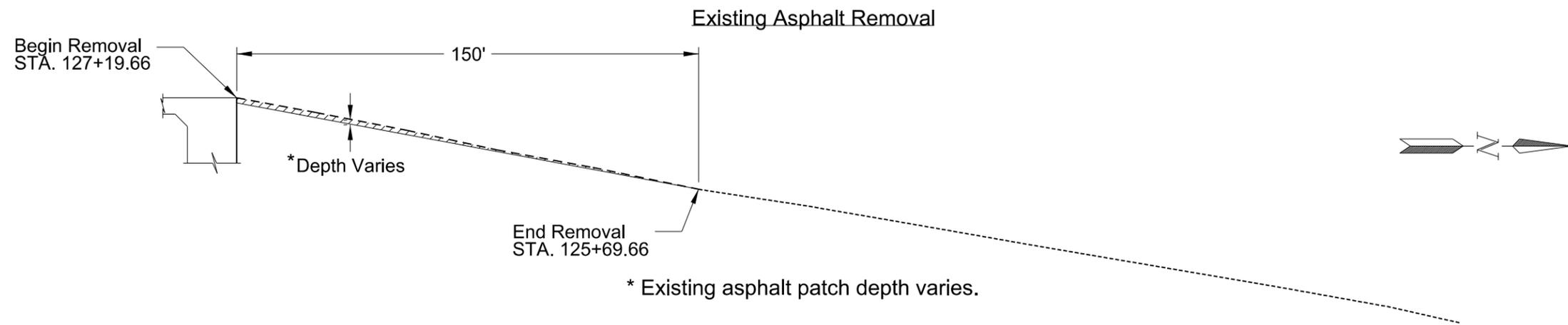
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Note: To be verified in the field.
 * Refer to Section 30 Sheet No. 6 for Typical Proposed Sections.

North Grand Forks Bridge NB - North Approach

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ND	SIM-6-029(091)136	20	8



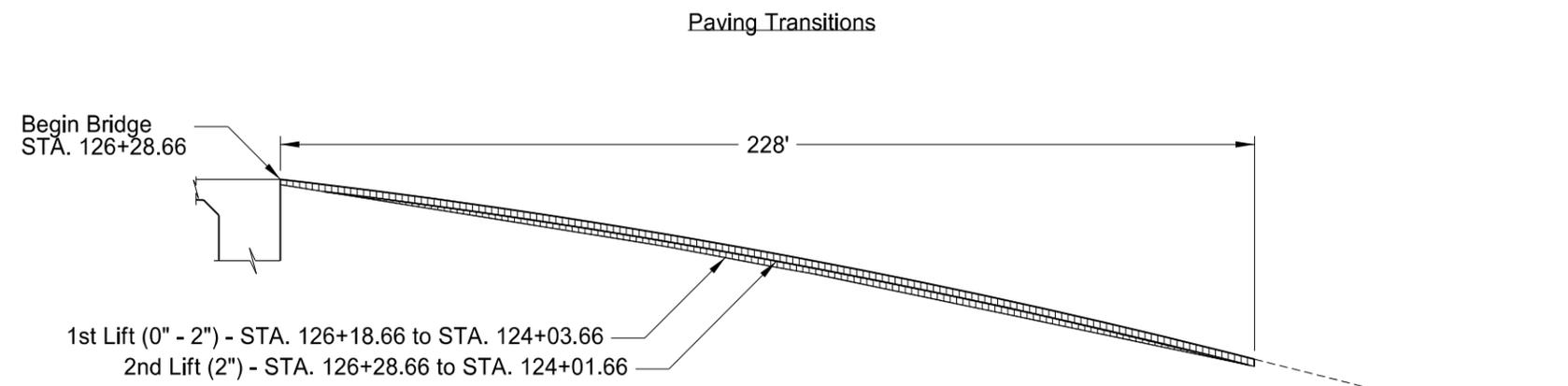
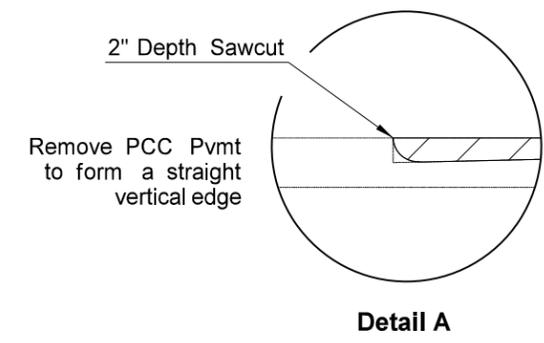
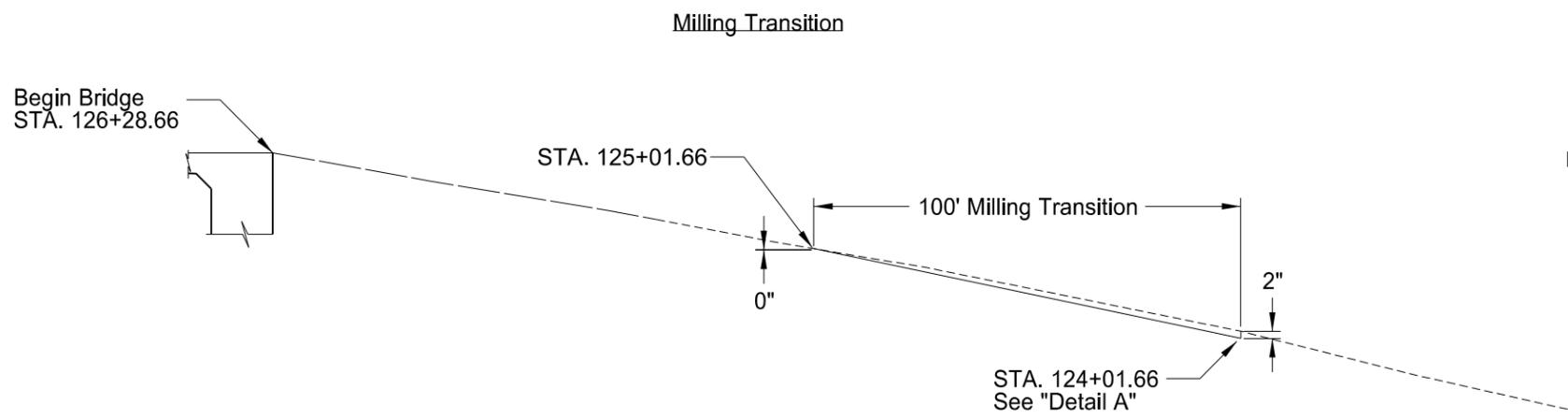
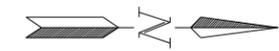
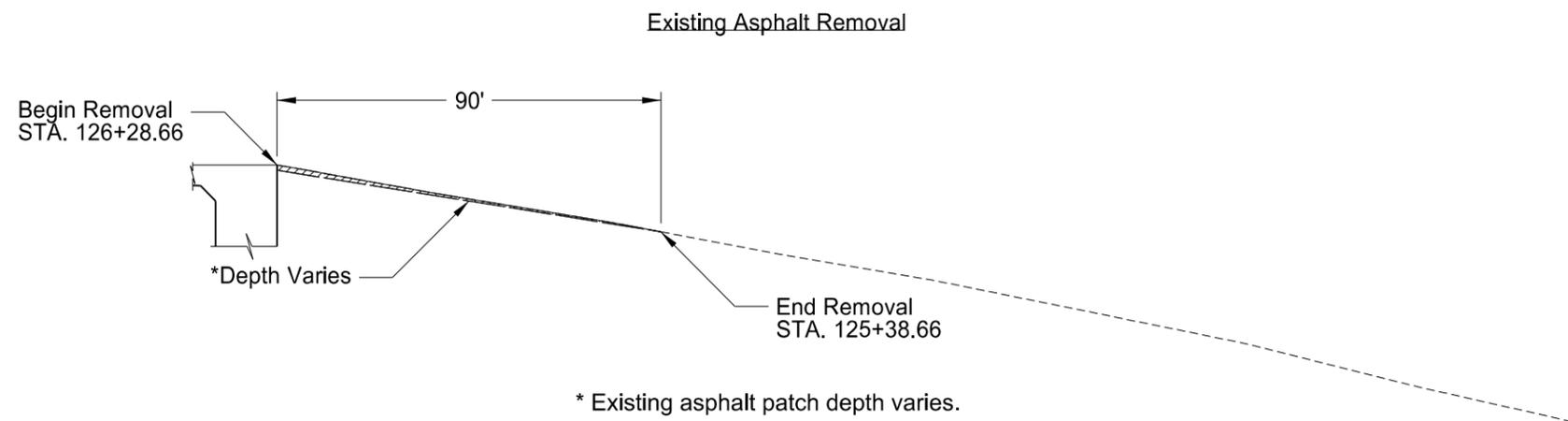
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North Grand Forks Bridge
 NB - North Approach

Note: To be verified in the field.
 * Refer to Section 30 Sheet No. 7 for Typical Proposed Sections.

North Grand Forks Bridge SB - North Approach

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	20	9



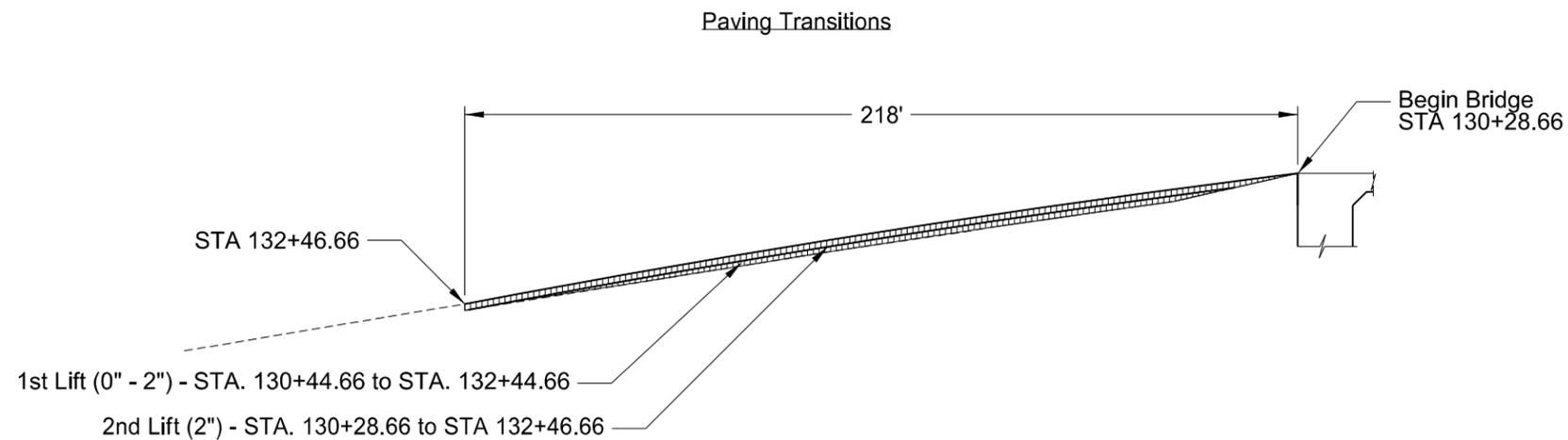
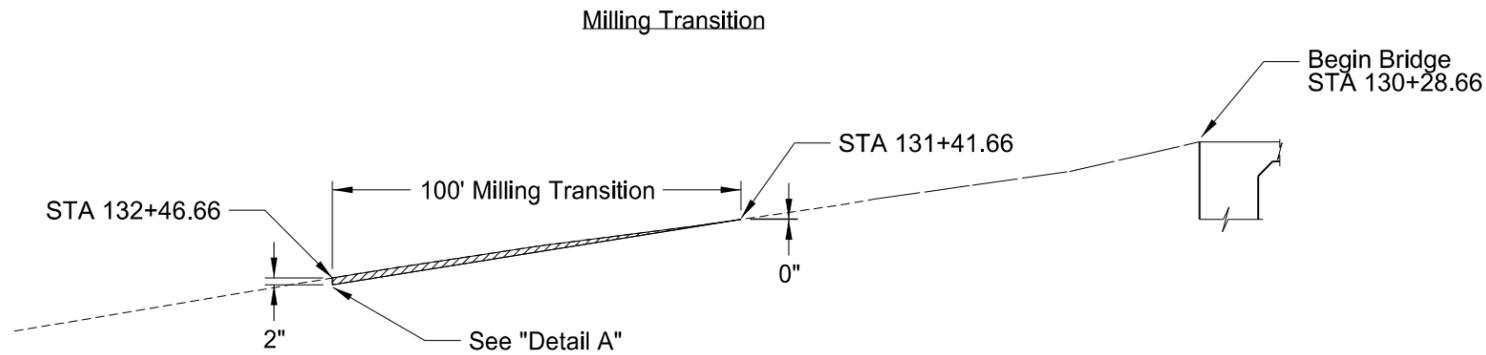
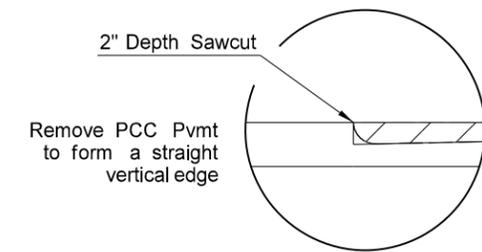
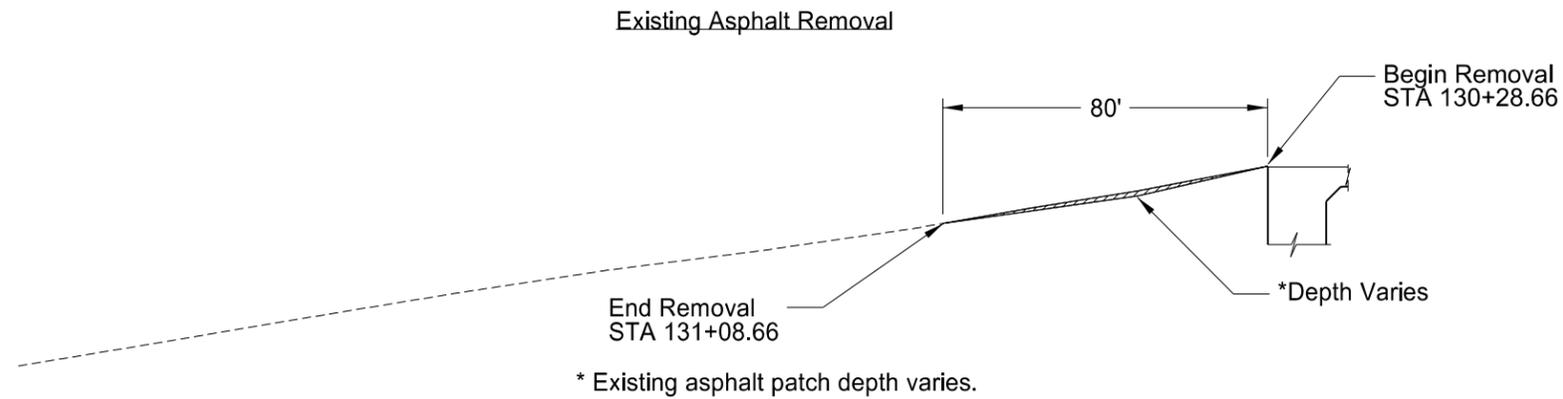
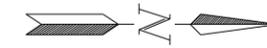
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N. Grand Forks Bridge
SB - North Approach

Note: To be verified in the field.
*Refer to Section 30 Sheet 8 for typical proposed sections.

North Grand Forks Bridge SB - South Approach

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	20	10

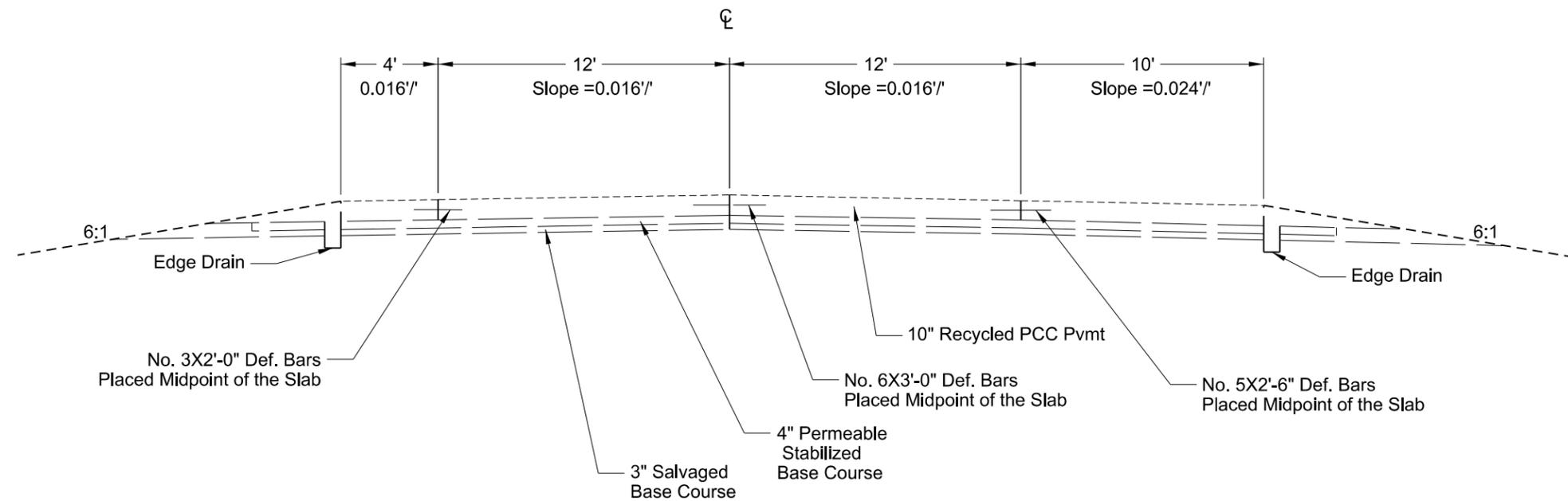


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N. Grand Forks Bridge
 SB - South Approach

Note: To be verified in the field
 * Refer to Section 30 Sheet 9 for typical proposed sections.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-6-029(091)136	30	1



Typical Existing Section I-29
 Northbound RP 136.880 to 147.226
 And
 Southbound RP 136.7661 to 147.226

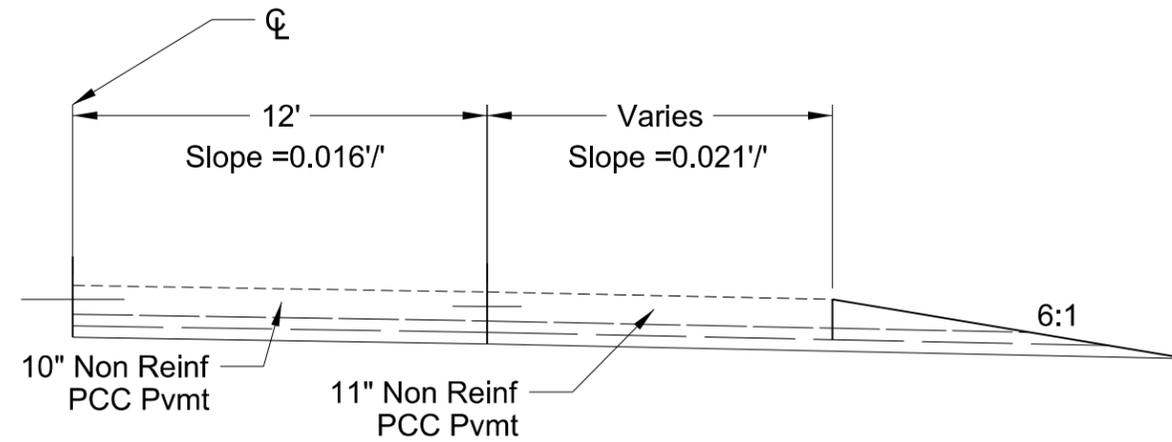
*Note: Mainline Typical is Symmetrical on Both Roadways

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I-29
 Typical Section
 Northbound
 And
 Southbound

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-6-029(091)136	030	2

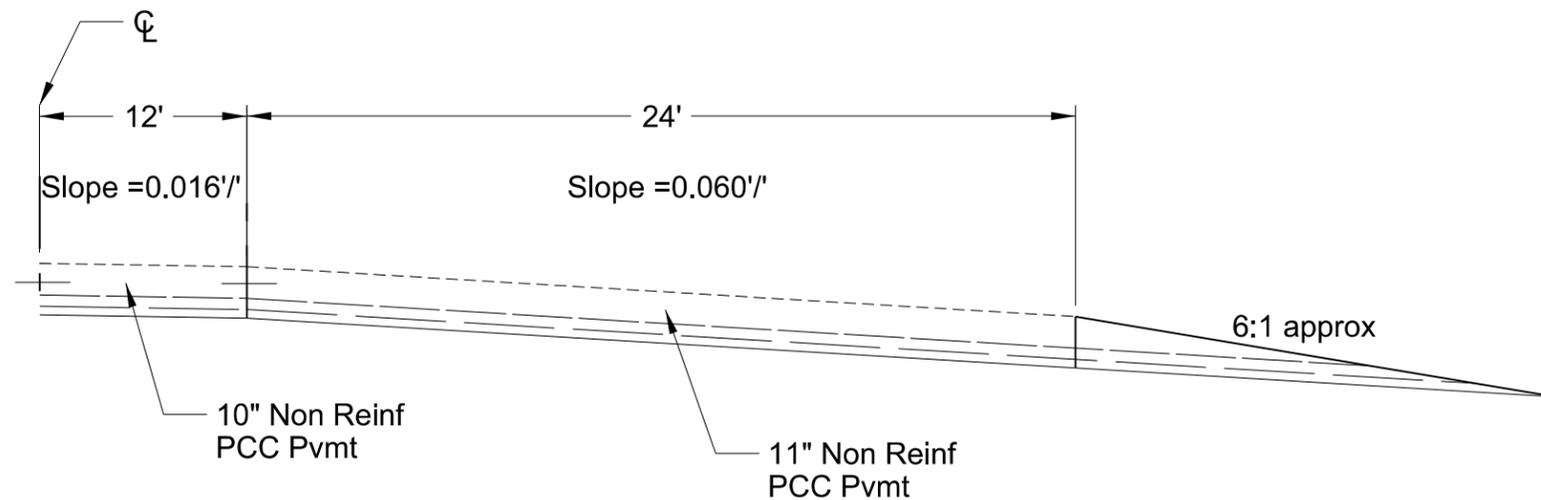
Ramp Taper



Typical Existing Section

Northbound And Southbound Ramp Tapers
 32nd Ave, Demers Ave, Gateway Ave (US HWY 2), North Grand Forks Interchange

Exit Ramp And Entrance Ramp



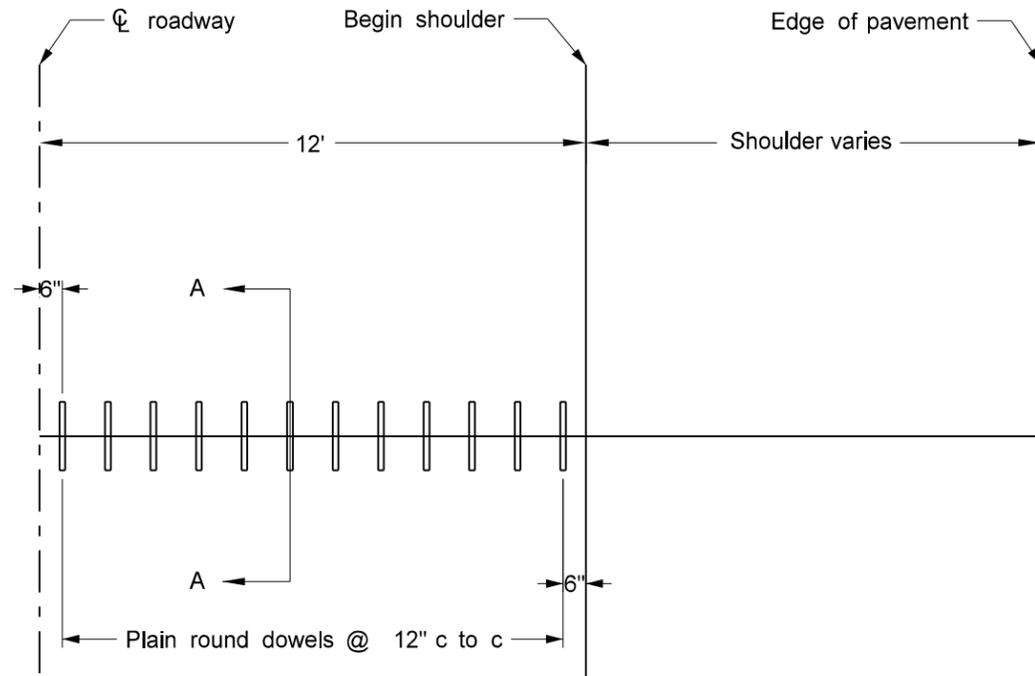
Typical Existing Section

Northbound And Southbound Ramps
 32nd Ave, Demers Ave, Gateway Ave (US HWY 2), North Grand Forks Interchange

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Ramp Taper PCC Pavement Sections

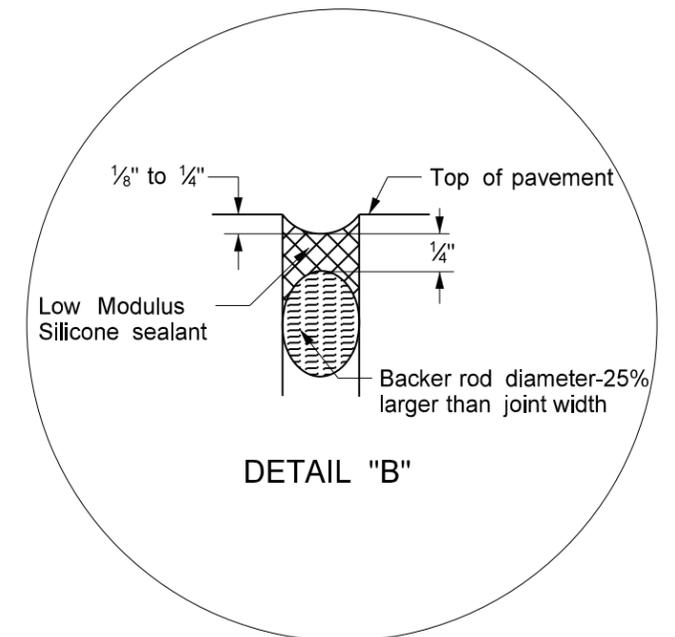
TRANSVERSE CONTRACTION JOINT DETAILS



CONTRACTION JOINT DOWEL ASSEMBLY
(1/2 roadway shown)

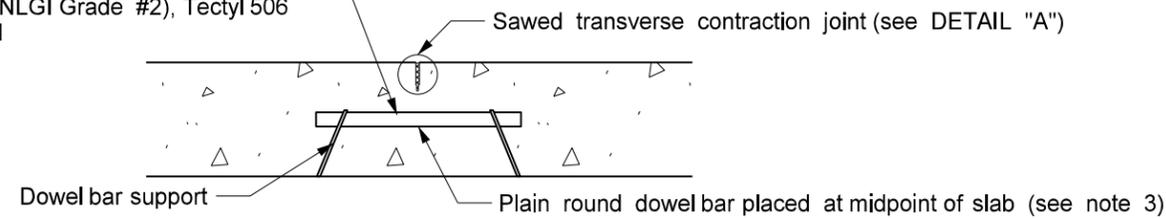
Notes

1. The joint seal details apply to both doweled and non-doweled (plain) transverse joints.
2. T = Thickness of pavement.
3. Dowels
 Pavement 10" or less: 1 1/4" X 18" plain round
 Pavement greater than 10": 1 1/2" X 18" plain round
4. B = T/4 + 1/4" for AE or YE non-doweled concrete pavement
 or T/3 for high early or doweled concrete pavement

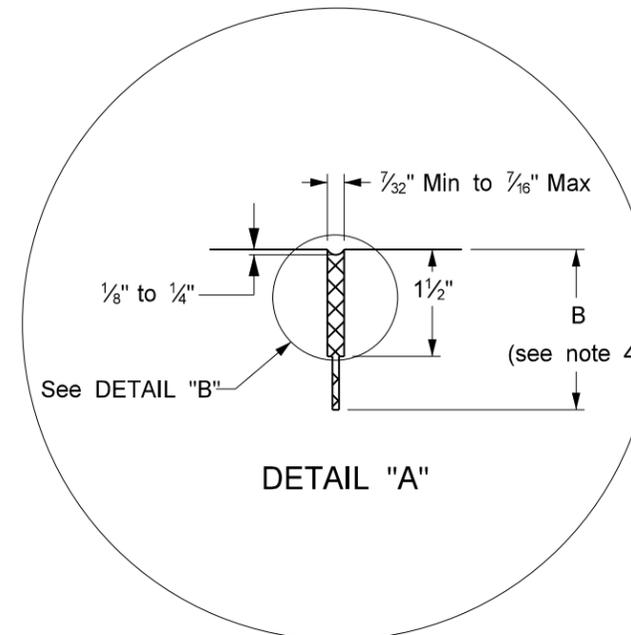


DETAIL "B"

Coat entire dowel bar length with Multipurpose Lithium Grease (NLGI Grade #2), Tectyl 506 or approved equal



SECTION A-A



DETAIL "A"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE

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