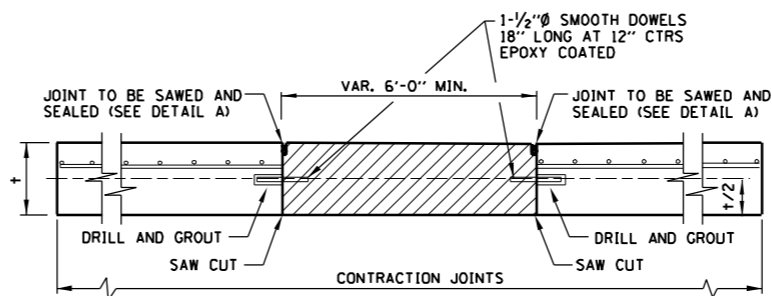
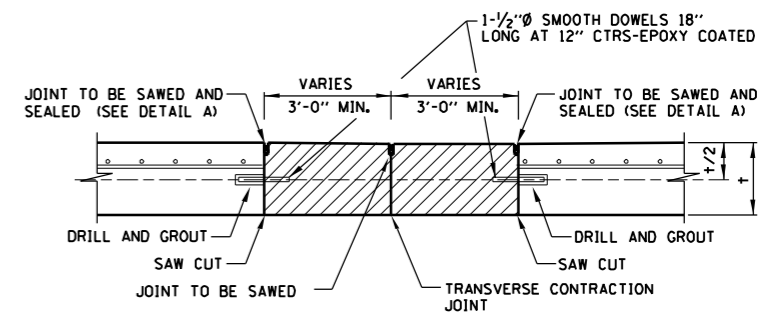


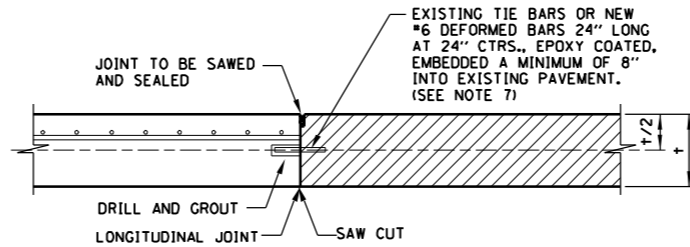
PROPOSED CONCRETE PAVEMENT FULL DEPTH REPAIR TYPICAL ROADWAY PLAN (PAID AS CLASS B PATCH)



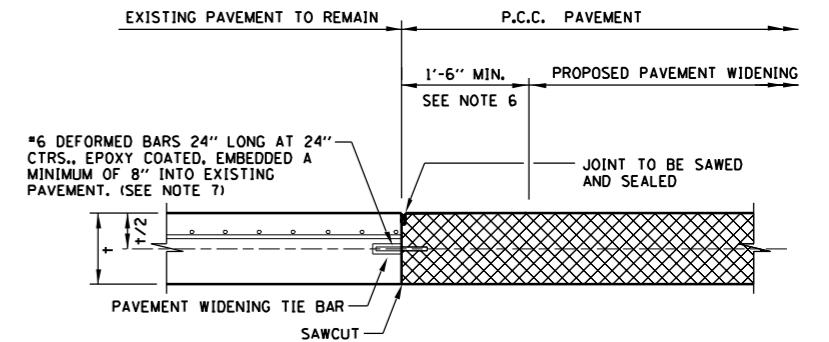
SECTION A-A REPAIR - FULL DEPTH, ONE LANE



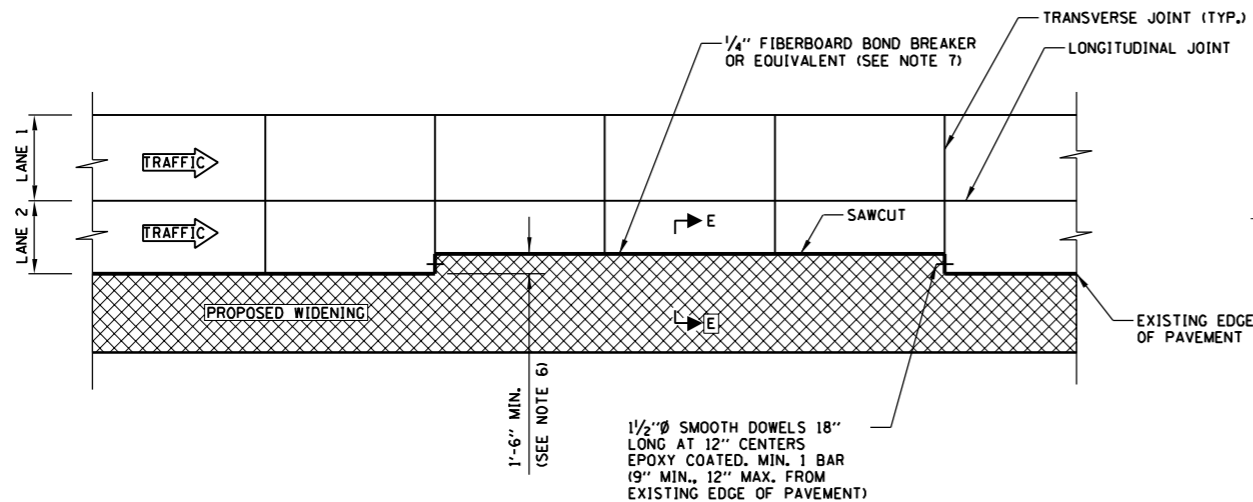
SECTION D-D REPAIR AT CONTRACTION JOINT



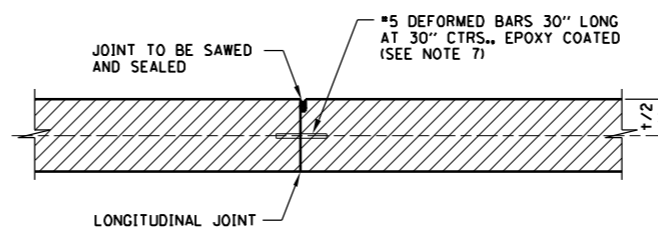
SECTION B-B REPAIR ALONG LONGITUDINAL JOINT



SECTION E-E REPLACEMENT OF DETERIORATED PAVEMENT EDGES ADJACENT TO PROPOSED WIDENING



REPLACEMENT OF DETERIORATED PAVEMENT EDGES ADJACENT TO PROPOSED WIDENING (PAID AS PART OF WIDENING)



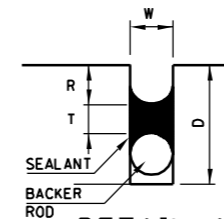
SECTION C-C REPAIR THROUGH LONGITUDINAL JOINT

GENERAL NOTES:

1. THE MINIMUM OVERALL DIMENSIONS OF REPAIRS SHALL BE SIX (6) FEET BY THE LANE WIDTH EXCEPT FOR REPLACEMENT OF DETERIORATED PAVEMENT EDGES ADJACENT TO PROPOSED WIDENING (SEE SECTION E-E). REPAIRS TERMINATING AT TRANSVERSE CONTRACTION JOINTS SHALL BE EXTENDED THREE FEET ACROSS THE JOINT. WHEN A REPAIR EXTENDS ACROSS AN EXISTING JOINT THE MINIMUM DIMENSION ON EITHER SIDE OF THE JOINT SHALL BE THREE FEET. LONGITUDINAL JOINTS IN THE REPAIR AREA SHALL BE SAWED AND SEALED (SEE DETAIL A).
2. WHENEVER A REPAIR IS CONSTRUCTED IN TWO OR MORE SEGMENTS BECAUSE OF MAINTENANCE OF TRAFFIC STAGING REQUIREMENTS, EACH SEGMENT SHALL BE CONSIDERED A SEPARATE PATCH WITH SIX (6) FOOT MINIMUM DIMENSION.
3. DRILLED AND GROUTED BARS SHALL BE EMBEDDED 1/3 THEIR LENGTH INTO THE EXISTING CONCRETE USING AN EPOXY GROUT AS SPECIFIED.
4. ALL TRANSVERSE CONTRACTION AND LONGITUDINAL JOINTS IN THE REPAIR AREA IN PAVEMENT NOT TO BE RESURFACED SHALL BE SAWCUT AND SEALED PER IDOT STANDARD 420001 (PAVEMENT JOINTS).
5. FOR SPOT REPAIR OF OVERLAID CONCRETE BITUMINOUS OVERLAY AND P.C.C. PAVEMENT SHALL BE SAW CUT FULL DEPTH.
6. AT LOCATIONS OF PROPOSED PAVEMENT WIDENING, EDGE DETERIORATION REQUIRING FULL DEPTH REPAIR SHALL BE REPAIRED BY REMOVAL AND REPLACEMENT OF A MINIMUM OF 1'-6" WIDE STRIP. THE NEW PAVEMENT SHALL BE CONSTRUCTED MONOLITHICALLY WITH THE PAVEMENT WIDENING. ANY SAW CUTTING AND REMOVAL WILL BE CONSIDERED EXTRA WORK, WITH PAYMENT PER ARTICLE 109.04 OF THE STANDARD SPECIFICATIONS, UNLESS OTHERWISE PROVIDED IN THE CONTRACT.
7. WHEN PATCH LENGTH OR EDGE REPAIR LENGTH IS 20' OR LESS, TIE BARS CAN BE OMITTED. IF TIE BARS ARE OMITTED, THEN FIBERBOARD BOND BREAKER OR EQUIVALENT SHALL BE USED. WHEN PATCH LENGTH IS MORE THAN 20', TIE BARS SHALL BE USED.
8. TYPICAL ROADWAY PLAN FOR FULL DEPTH REPAIR IS APPLICABLE TO ALL PAVEMENTS, LANE WIDTHS AND NUMBER OF EXISTING LANES.

LEGEND

- EXISTING WELDED WIRE FABRIC (10" PAVEMENT ONLY)
- EXISTING PAVEMENT
- PROPOSED CONCRETE PAVEMENT REPAIR - FULL DEPTH
- PROPOSED CONCRETE PAVEMENT WIDENING
- = CONCRETE PAVEMENT THICKNESS



TYPICAL JOINT CROSS-SECTION

- W = SEALANT WIDTH, 3/8" MIN.
 - T = SEALANT THICKNESS
 - R = SEALANT RECESS, FLUSH OR OVER BANDING NOT ALLOWED
 - D = JOINT CHANNEL DEPTH
- AS RECOMMENDED BY MANUFACTURER

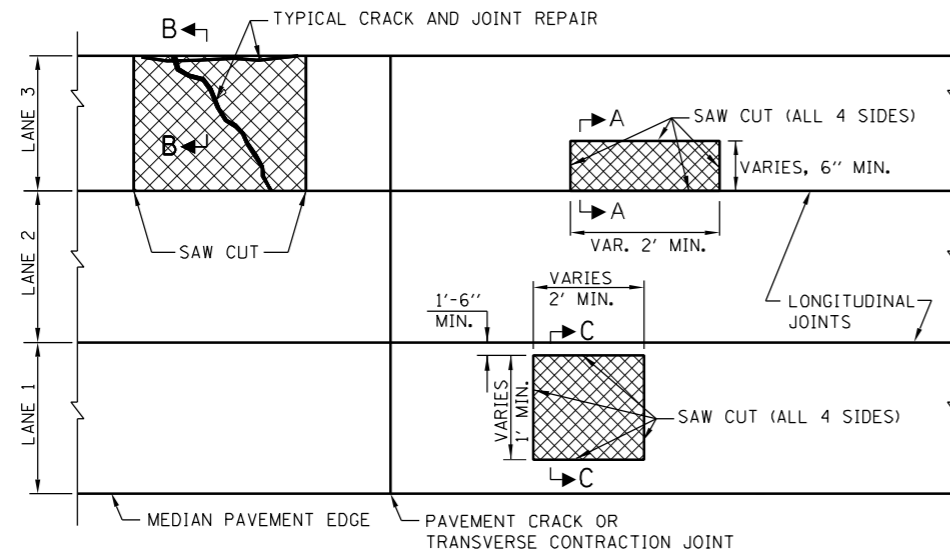
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009

DATE	REVISIONS
5-1-2009	MODIFIED JOINT DETAILS
1-1-2011	REVISED NOTE 7.

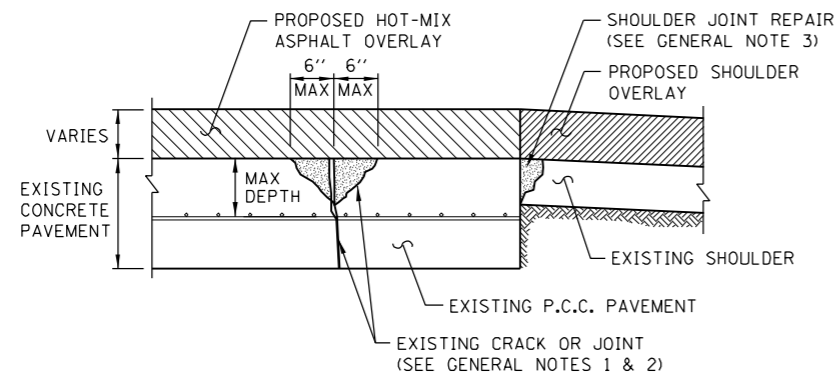
Illinois Tollway
Open Roads for a Faster Future

CONCRETE PAVEMENT REPAIR FULL DEPTH

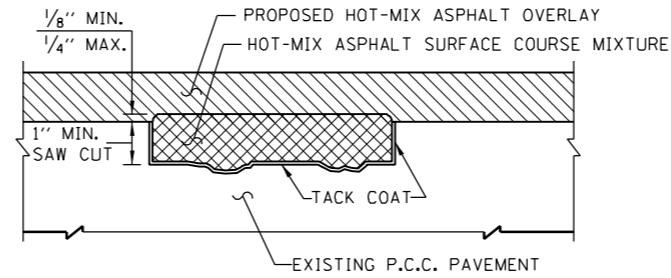
STANDARD A1-02



PROPOSED PAVEMENT REPAIR (PARTIAL DEPTH)
TYPICAL ROADWAY PLAN



SECTION B-B
EXISTING CRACK AND JOINT REPAIR



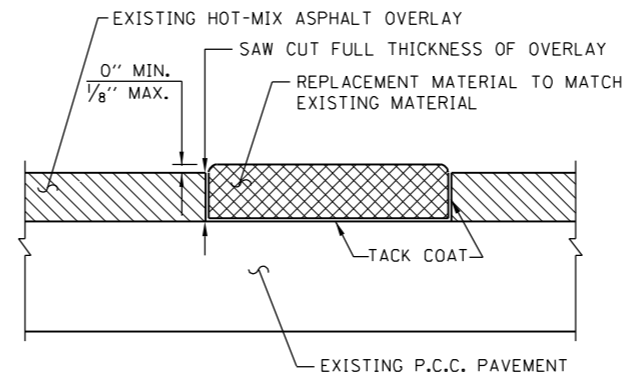
SECTIONS A-A & C-C
PAVEMENT REPAIR (PARTIAL DEPTH) HOT-MIX ASPHALT

NOTES: PARTIAL DEPTH HOT-MIX ASPHALT

1. LOCATION OF PATCHING AREAS SHALL BE DETERMINED BY THE ENGINEER.
2. MINIMUM SAW CUT SHALL BE TO A DEPTH OF 1".
3. MINIMUM DIMENSIONS SHALL BE AS SHOWN.
4. TACK COAT SHALL BE APPLIED TO ALL EXPOSED SURFACES OF THE CAVITY.
5. ALL CONCRETE SHALL BE REMOVED TO A MINIMUM DEPTH OF ONE INCH.
6. THE COST OF TACK COAT AND HOT-MIX ASPHALT SURFACE MIXTURE SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR PAVEMENT REPAIR (PARTIAL DEPTH) HOT-MIX ASPHALT.

GENERAL NOTES:

1. THE CRACKS OR JOINTS SHALL BE CLEANED OF ALL DIRT, LOOSE OR SPALLED CONCRETE AND FOREIGN MATERIAL TO A DEPTH WHERE THE CRACK BECOMES LESS THAN 3/8 INCH WIDE OR UNTIL THE REINFORCEMENT IS ENCOUNTERED. THIS WORK SHALL BE PERFORMED BY MEANS OF APPROVED HAND TOOLS AND/OR PNEUMATIC TOOLS.
2. AFTER REMOVING LOOSE MATERIAL IN AND ADJACENT TO THE CRACK OR JOINT, THE CRACK OR JOINT SHALL BE FILLED WITH MIXTURE FOR CRACKS AND JOINTS AS REQUIRED BY STANDARD SPECIFICATIONS, OR AS DIRECTED BY THE ENGINEER.
3. REMOVE JOINT SEALER AND LOOSE OR DAMAGED HOT-MIX ASPHALT, THEN FILL VOID WITH MIXTURE FOR CRACKS AND JOINTS AS REQUIRED BY THE STANDARD SPECIFICATIONS, OR AS DIRECTED BY THE ENGINEER.
4. WHEN THE SPALLED OR DETERIORATED AREA EXTENDS BELOW THE REINFORCING STEEL, OR ONE HALF THE PAVEMENT THICKNESS, A FULL DEPTH PATCH SHALL BE CONSTRUCTED.



SECTION A-A & C-C
HOT-MIX ASPHALT OVERLAY REPAIR

NOTES: TYPICAL HOT-MIX ASPHALT OVERLAY REPAIR

1. LOCATION OF ALL OVERLAY REPAIR AREAS SHALL BE DETERMINED BY THE ENGINEER.
2. MINIMUM DIMENSIONS SHALL BE AS SHOWN IN TYPICAL ROADWAY PLAN.
3. ALL HOT-MIX ASPHALT OVERLAY SHALL BE REMOVED TO THE TOP OF THE P.C. CONC. PAVEMENT.
4. SAWCUT MAY BE ELIMINATED IF MILLING EQUIPMENT IS USED AND VERTICAL AND STRAIGHT SIDES ARE OBTAINED.

LEGEND

- — — — — EXISTING REINFORCING MATERIAL
- ▨ EXISTING OR PROPOSED HOT-MIX ASPHALT OVERLAY
- ▩ PROPOSED PAVEMENT REPAIR PARTIAL DEPTH (HOT-MIX ASPHALT)
- ▧ MIXTURE FOR CRACKS AND JOINTS
- ▦ EXISTING AGGREGATE MATERIAL EARTH

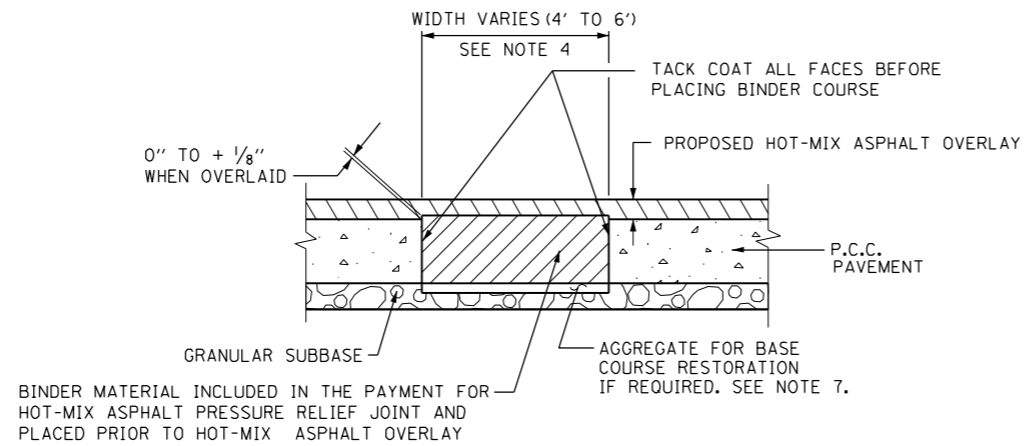
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009

DATE	REVISIONS
5-1-2009	DELETED DETAIL A, REVISED NOTES
1-1-2011	REMOVED PARTIAL DEPTH P.C. CONCRETE REPAIR, ADDED SAW CUT TO CRACK REPAIR

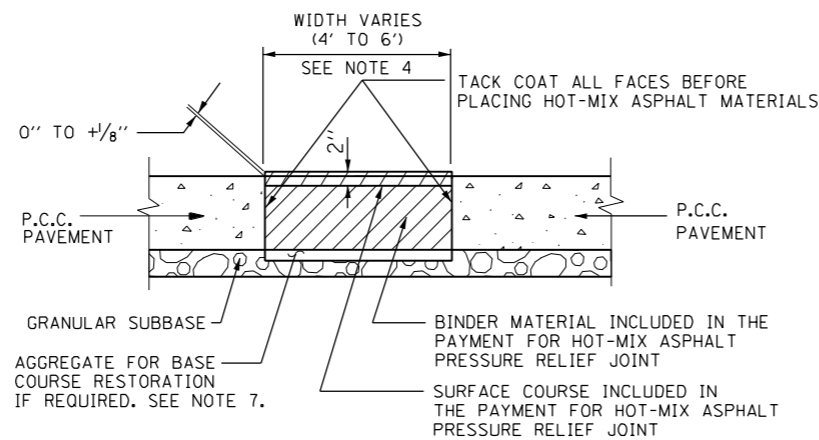


PAVEMENT REPAIR
PARTIAL DEPTH

STANDARD A2-02



HOT-MIX ASPHALT PRESSURE RELIEF JOINT WITH PROPOSED OVERLAY



HOT-MIX ASPHALT PRESSURE RELIEF JOINT WITHOUT PROPOSED OVERLAY

NOTES FOR HOT-MIX ASPHALT PRESSURE RELIEF JOINT:

1. PAVEMENT SHALL BE SAWCUT OR BULKHEADED FULL DEPTH ALONG A NEAT LINE PERPENDICULAR TO THE EDGE OF PAVEMENT AT LOCATIONS SHOWN ON THE PLANS OR AS DETERMINED BY THE ENGINEER. PAVEMENT BETWEEN SAWCUTS SHALL BE REMOVED AND THE AREA SHALL BE CLEANED TO THE SATISFACTION OF THE ENGINEER.
2. THE IN-PLACE DENSITY SHALL NOT BE LESS THAN 95% OF THE BULK SPECIFIC GRAVITY ("d") DENSITY, EXCEPT THAT IF A TARGET DENSITY HAS BEEN PREVIOUSLY ESTABLISHED FOR THE SAME MIX, THE IN-PLACE DENSITY OF EACH LIFT OF THE MIX WILL BE ACCEPTED AT 95% OF THE BULK SPECIFIC GRAVITY ("d") DENSITY, OR 98% OF THE TARGET DENSITY WHICHEVER IS THE LEAST.
3. THE REMOVAL OF EXISTING LONGITUDINAL TIE BARS OR REINFORCEMENT SHALL BE CONSIDERED INCIDENTAL TO HOT-MIX ASPHALT PRESSURE RELIEF JOINT.
4. EXACT LOCATIONS AND WIDTH OF HOT-MIX ASPHALT PRESSURE RELIEF JOINTS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.
5. THE CONTRACT UNIT PRICE PER SQUARE FOOT FOR HOT-MIX ASPHALT PRESSURE RELIEF JOINT SHALL INCLUDE THE COST OF THE SAW CUT OR BULKHEAD FULL DEPTH, REMOVAL OF EXISTING PAVEMENT, HOT-MIX ASPHALT MATERIALS (TACK COAT), AND HOT-MIX ASPHALT CONCRETE MATERIALS.
6. REFER TO THE CONTRACT DOCUMENTS FOR THE REQUIRED BINDER AND SURFACE COURSE MATERIALS.
7. IF REQUIRED, AGGREGATE FOR BASE COURSE RESTORATION WILL BE MEASURED AND PAID FOR IN TONS, PER SECTION 351.

LEGEND

- P.C.C. PAVEMENT
- PROPOSED SURFACE COURSE (SEE DETAIL FOR HOT-MIX ASPHALT P.R.J. W/OUT PROPOSED OVERLAY)
- PROPOSED OVERLAY
- GRANULAR SUBBASE

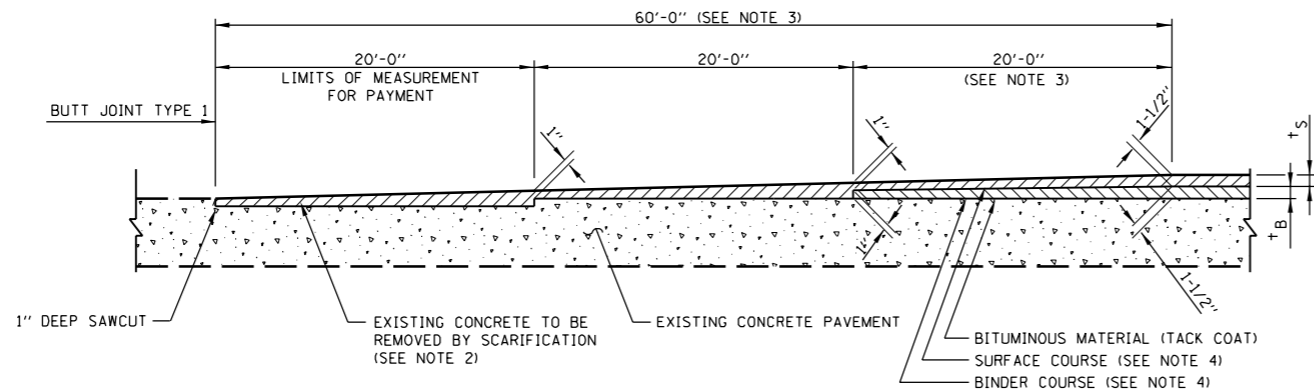
APPROVED  DATE 1-1-2007
CHIEF ENGINEER

DATE	REVISIONS



HOT-MIX ASPHALT PRESSURE RELIEF JOINTS

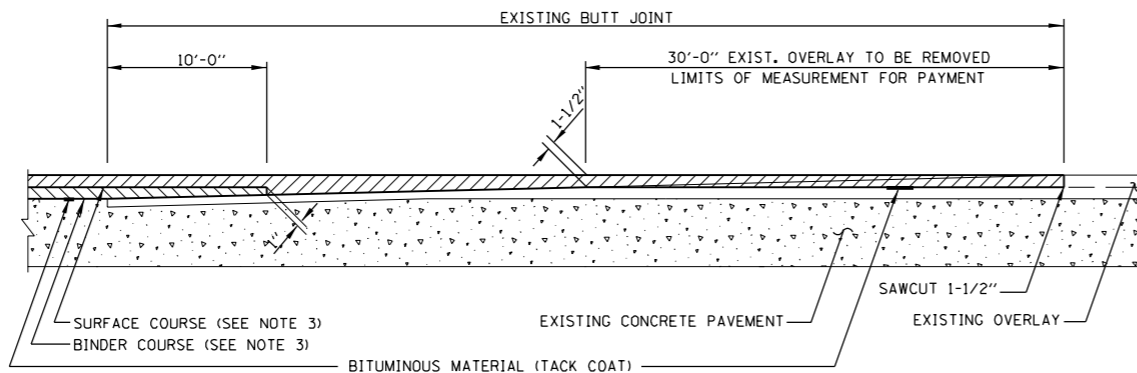
STANDARD A3-00



DETAIL OF BUTT JOINT, TYPE 1

NOTES FOR BUTT JOINT TYPE 1

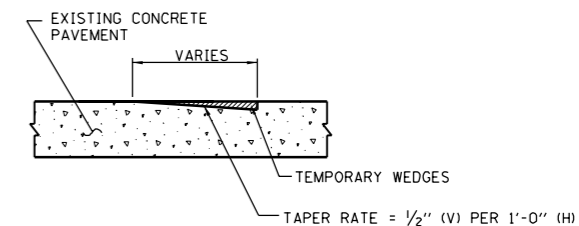
1. THE ABOVE WORK WILL BE PERFORMED AT THE ENDS OF ALL HOT-MIX ASPHALT RESURFACING. THE REMOVAL OF CONCRETE PAVEMENT WILL BE INCLUDED IN CONTRACT UNIT PRICE PER SQUARE YARD FOR "PORTLAND CEMENT CONCRETE SURFACE REMOVAL - BUTT JOINT". HOT-MIX ASPHALT OVERLAY TO BE PAID FOR UNDER ITEMS: "HOT-MIX ASPHALT BINDER COURSE" AND "HOT-MIX ASPHALT SURFACE COURSE", OF THE TYPE SPECIFIED IN THE CONTRACT.
2. ONLY APPROVED SCARIFYING OR MILLING EQUIPMENT SHALL BE USED TO SCARIFY THE CONCRETE PAVEMENT.
3. REGARDLESS OF TYPE OF SURFACE MIX USED, NUMBER OR THICKNESS OF COURSES OR LAYERS, THE OVERLAY THICKNESS TRANSITION LENGTH SHALL BE BASED ON 1" IN 20' AND THE MINIMUM LAYER THICKNESS SHALL BE 1".
4. REFER TO THE CONTRACT DOCUMENTS FOR THE REQUIRED BINDER AND SURFACE COURSE MATERIALS. "t_S" IS THE THICKNESS OF THE SURFACE COURSE SPECIFIED IN THE CONTRACT. "t_B" IS THE THICKNESS OF THE BINDER COURSE SPECIFIED IN THE CONTACT. SEE NOTE 3.



**DETAIL OF BUTT JOINT, TYPE 2
AT EXISTING OVERLAY AREAS**

NOTES FOR BUTT JOINT, TYPE 2

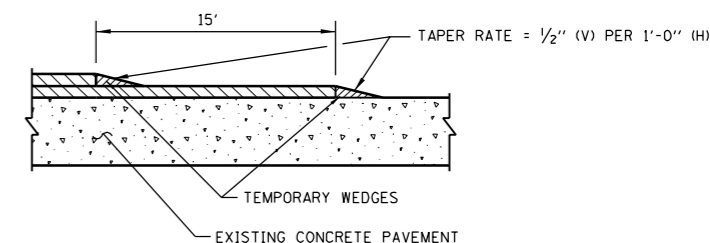
1. THE ABOVE WORK WILL BE PERFORMED AT THE ENDS OF ALL HOT-MIX ASPHALT RESURFACING WHERE BUTT JOINTS EXIST. THE REMOVAL OF HOT-MIX ASPHALT OVERLAY AND SAWCUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE PER SQUARE YARD FOR "HOT-MIX ASPHALT SURFACE REMOVAL - BUTT JOINT".
2. HOT-MIX ASPHALT OVERLAY TO BE PAID UNDER ITEMS: "HOT-MIX ASPHALT BINDER COURSE" AND "HOT-MIX ASPHALT SURFACE COURSE", OF THE TYPE SPECIFIED IN THE CONTRACT.
3. REFER TO THE CONTRACT DOCUMENTS FOR THE REQUIRED BINDER AND SURFACE COURSE MATERIALS.



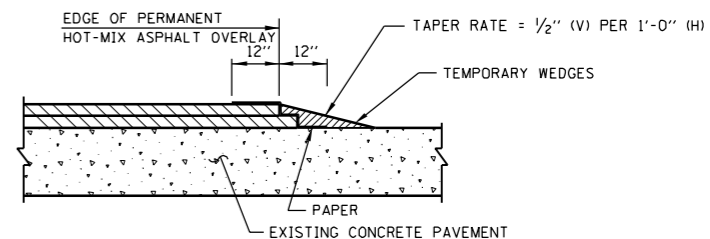
**TEMPORARY HOT-MIX ASPHALT WEDGE
AT SCARIFIED BUTT JOINT**

NOTE FOR TEMPORARY HOT-MIX ASPHALT WEDGE AT SCARIFIED BUTT JOINT

TEMPORARY WEDGES AT SCARIFIED BUTT JOINTS AND TRANSVERSE TEMPORARY BUTT JOINTS ARE INCLUDED IN COST OF PAVEMENT RESURFACING MATERIALS.



TEMPORARY TRANSVERSE BUTT JOINT



TEMPORARY LONGITUDINAL BUTT JOINT

NOTES FOR TEMPORARY LONGITUDINAL BUTT JOINT

1. THIS ITEM WILL BE USED ONLY WHERE DIRECTED BY THE ENGINEER.
2. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE PER SQUARE YARD FOR "TEMPORARY WEDGES" WHICH INCLUDES THE MAINTENANCE OF THE TEMPORARY WEDGES AS REQUIRED IN THE STANDARD SPECIFICATIONS.
3. UPON REMOVAL OF THE WEDGES, THE SURFACE COURSE SHALL BE SAWCUT PARALLEL TO THE JOINT TO PROVIDE A TRUE VERTICAL SURFACE.
4. REFER TO THE CONTRACT DOCUMENTS FOR THE REQUIRED BINDER AND SURFACE COURSE MATERIALS.

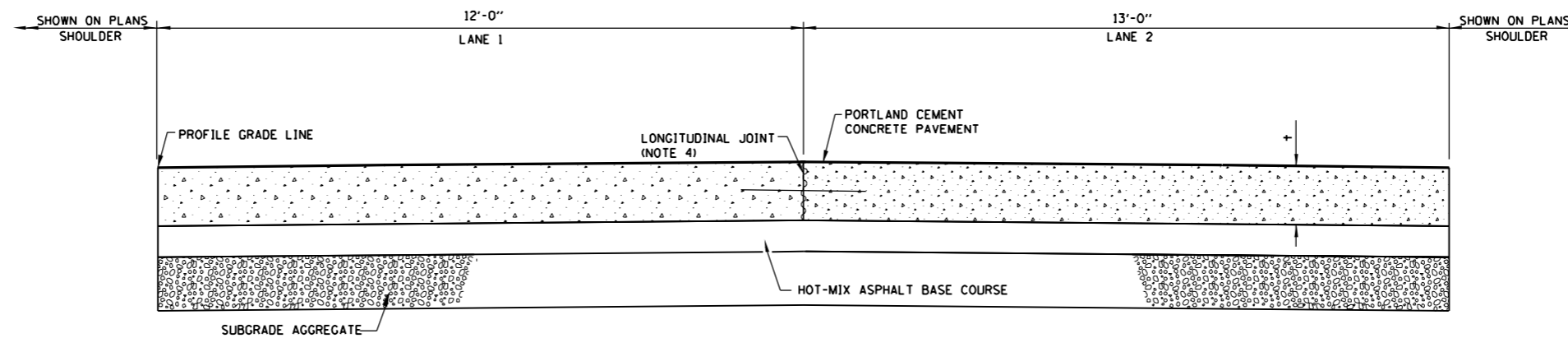
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009

DATE	REVISIONS
5-1-2009	CHANGED WEDGE TAPER RATE NOTATION, REVISED NOTES

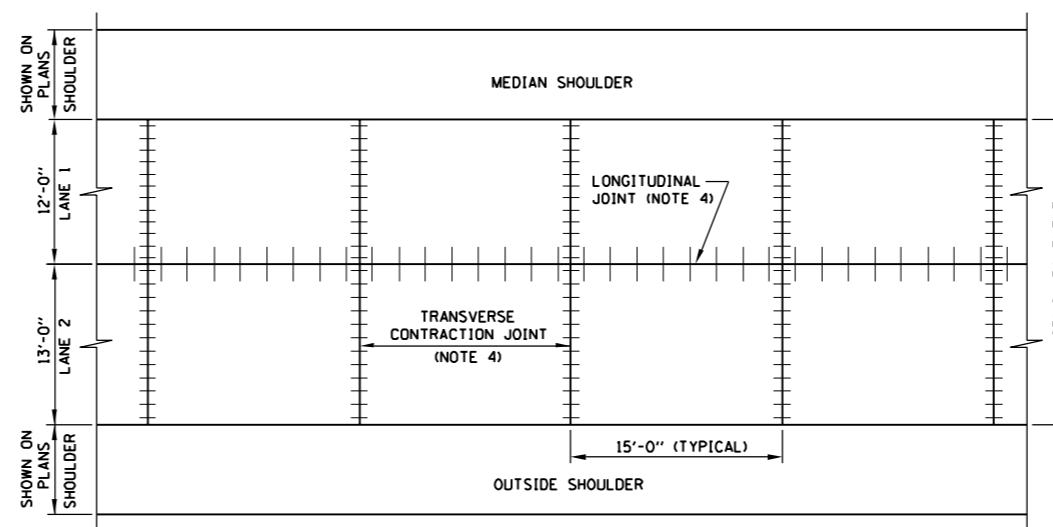


BUTT JOINTS

STANDARD A4-01



PAVEMENT CROSS - SECTION (2 LANES)



PAVEMENT PLAN
2 - LANE SECTION

GENERAL NOTES:

1. DOWEL BASKET ASSEMBLIES, WHERE USED, SHALL BE SUPPORTED AND ANCHORED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
2. WHEN ADJACENT LANES ARE NOT BUILT IN ONE OPERATION, A LONGITUDINAL JOINT SHALL BE REPLACED WITH BULKHEAD LONGITUDINAL JOINT.
3. MATERIALS ARE PROJECT SPECIFIC, REFER TO PROJECT PLANS AND CONTRACT DOCUMENTS FOR DETAILS.
4. SEE STANDARD A7 (PAVEMENT JOINTS) AND IDOT STANDARD 420001 (PAVEMENT JOINTS) FOR DETAILS OF JOINTS AND TIE BARS NOT SHOWN.
5. PAVEMENT DESIGNS ARE PROJECT SPECIFIC, OTHER MATERIALS MAY BE SUBSTITUTED FOR HOT-MIX ASPHALT BASE COURSE AND SUBGRADE AGGREGATE. REFER TO PROJECTS PLANS FOR DETAILS AND MATERIAL THICKNESS.

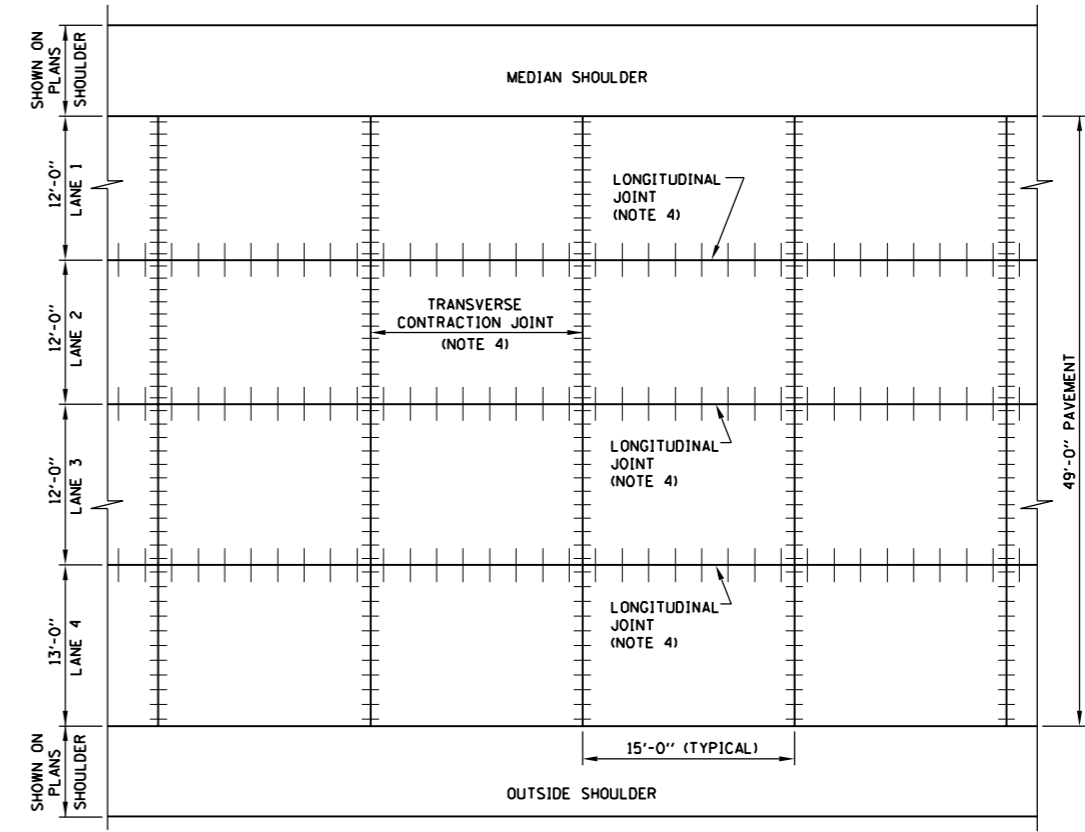
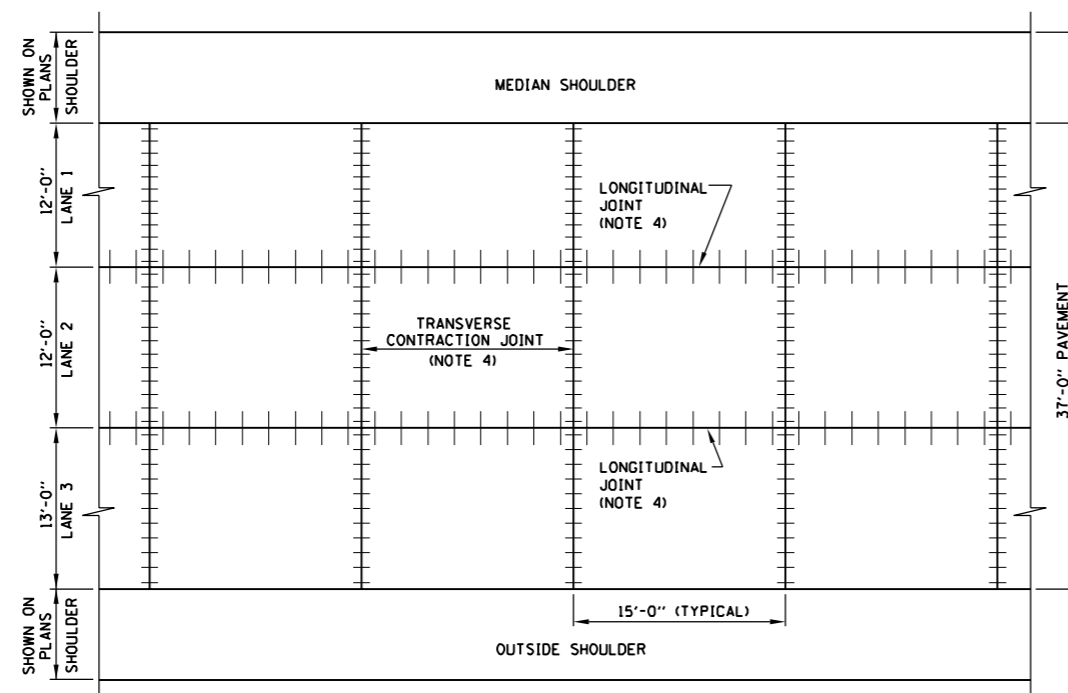
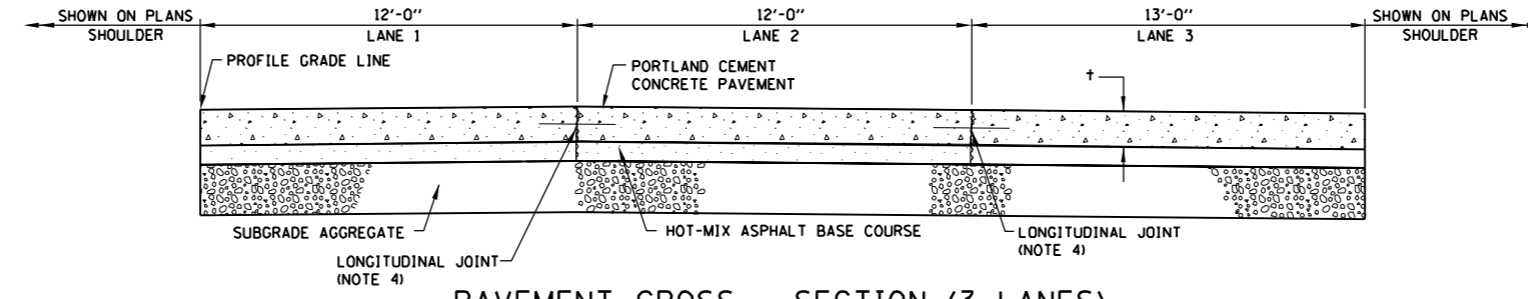
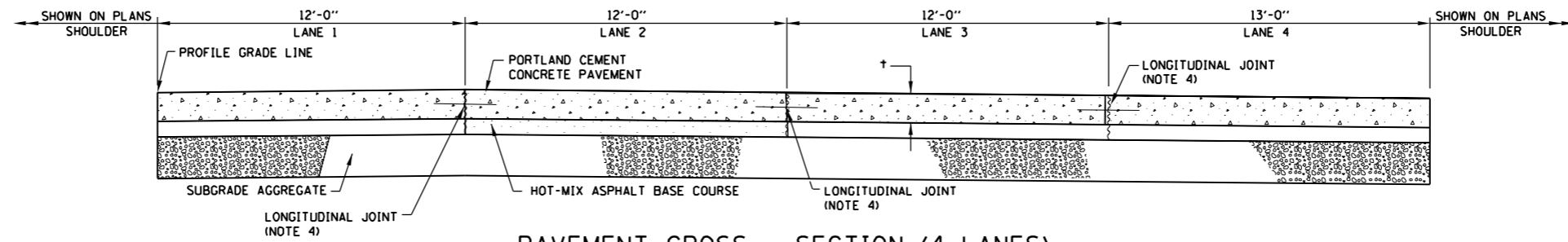


DATE	REVISIONS
5-1-2009	DELETED BLOCK-OUTS DETAIL, REMOVED SHOULDER DIMENSIONS

J.P.C. PAVEMENT
12" OR LESS

STANDARD A5-01

APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009



PAVEMENT PLAN
3 - LANE SECTION

PAVEMENT PLAN
4 - LANE SECTION

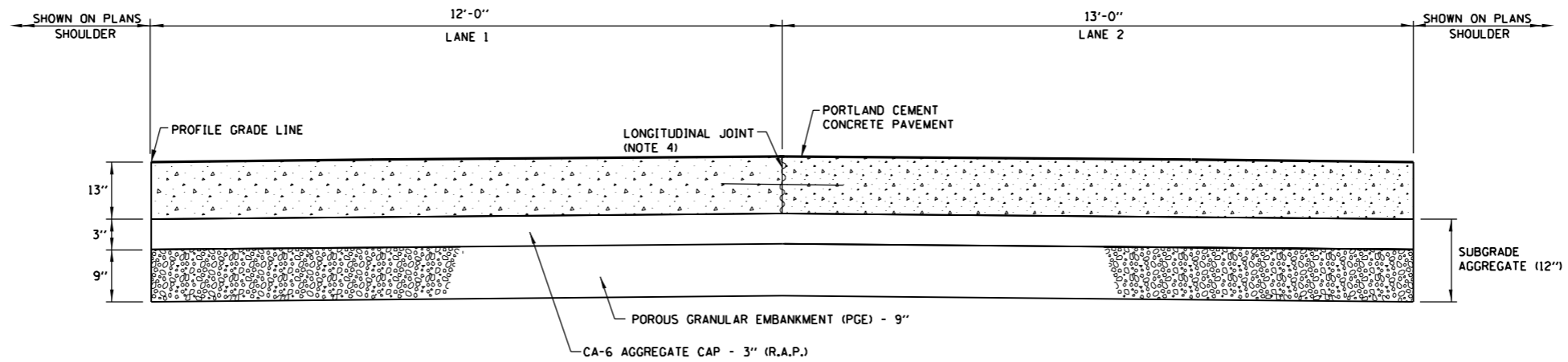


J.P.C. PAVEMENT
12" OR LESS

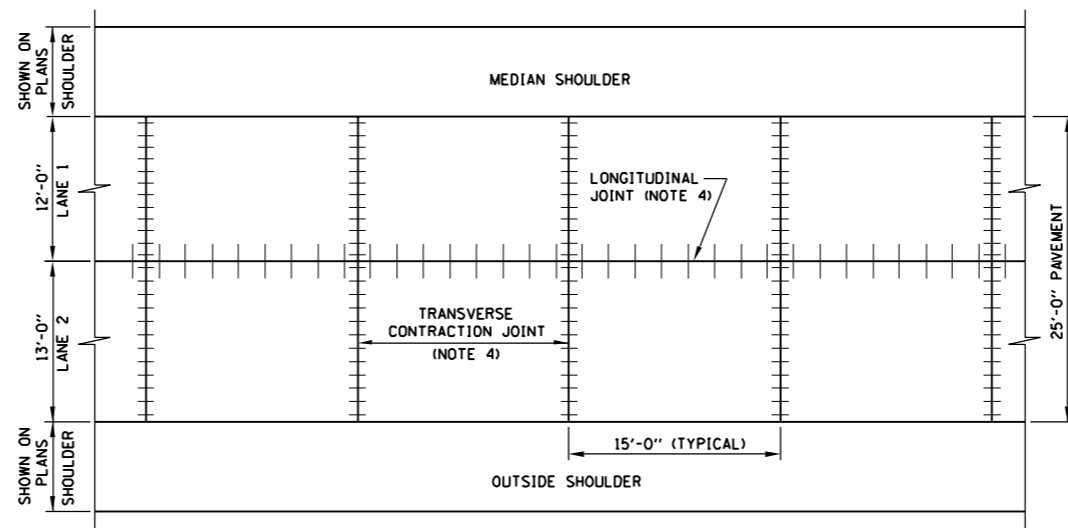
STANDARD A5-01

SEE SHEET 1 (OF 1)
IN THIS SERIES
FOR GENERAL NOTES.

APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009



PAVEMENT CROSS - SECTION (2 LANES)



PAVEMENT PLAN
2 - LANE SECTION

GENERAL NOTES:

1. DOWEL BASKET ASSEMBLIES, WHERE USED, SHALL BE SUPPORTED AND ANCHORED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
2. WHEN ADJACENT LANES ARE NOT BUILT IN ONE OPERATION, A LONGITUDINAL JOINT SHALL BE REPLACED WITH BULKHEAD LONGITUDINAL JOINT.
3. MATERIALS ARE PROJECT SPECIFIC. REFER TO PROJECT PLANS AND CONTRACT DOCUMENTS FOR DETAILS.
4. SEE STANDARD A7 (PAVEMENT JOINTS) AND IDOT STANDARD 420001 (PAVEMENT JOINTS) FOR DETAILS OF JOINTS AND TIE BARS NOT SHOWN.
5. PAVEMENT DESIGNS ARE PROJECT SPECIFIC, OTHER MATERIALS MAY BE SUBSTITUTED FOR HOT-MIX ASPHALT BASE COURSE AND SUBGRADE AGGREGATE. REFER TO PROJECTS PLANS FOR DETAILS AND MATERIAL THICKNESS.

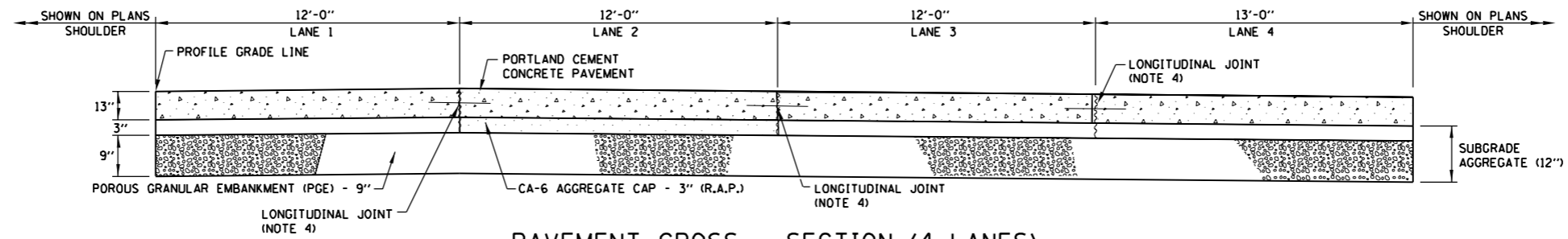


DATE	REVISIONS
5-1-2009	DELETED BLOCK-OUTS DETAIL REMOVED SHOULDER DIMENSIONS

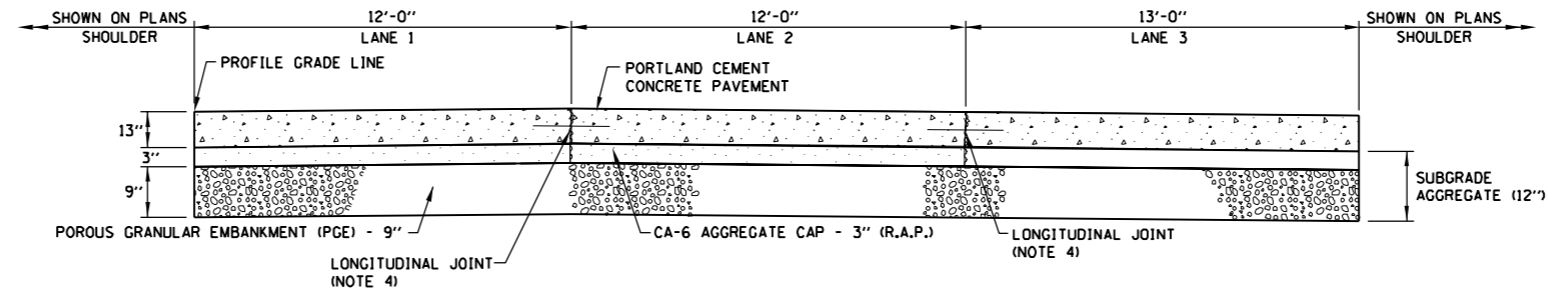
J.P.C. PAVEMENT - 13"

STANDARD A6-01

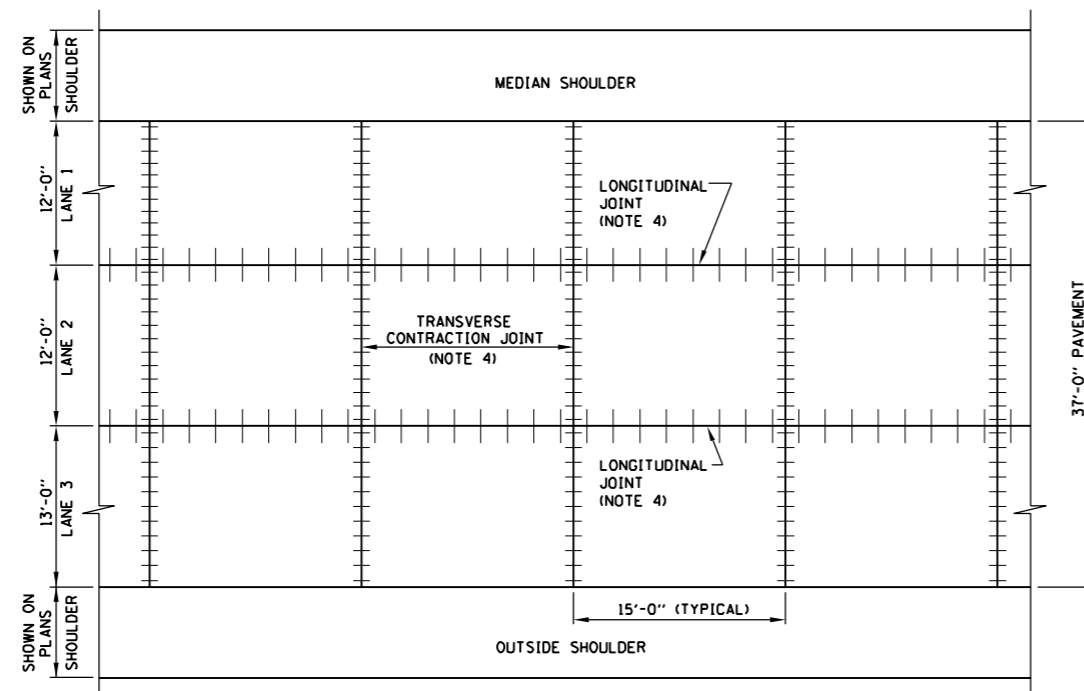
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009



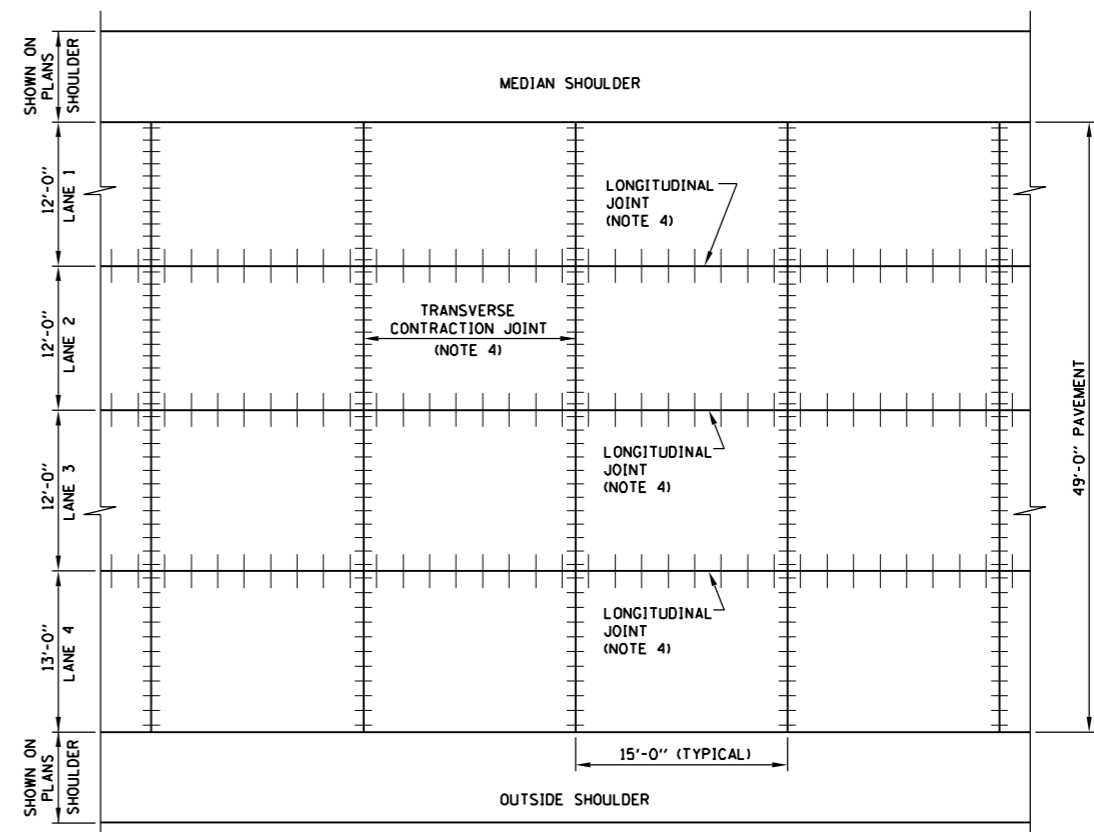
PAVEMENT CROSS - SECTION (4 LANES)



PAVEMENT CROSS - SECTION (3 LANES)



PAVEMENT PLAN
3 - LANE SECTION



PAVEMENT PLAN
4 - LANE SECTION

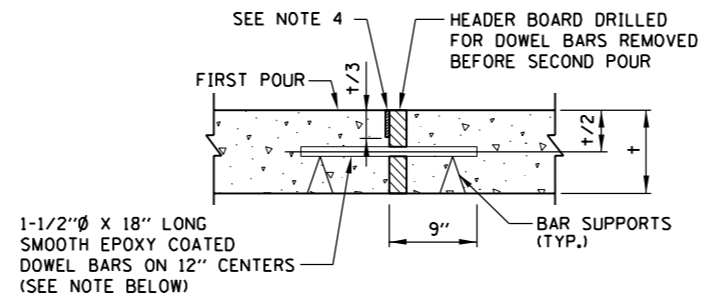


J.P.C. PAVEMENT - 13"

STANDARD A6-01

SEE SHEET 1 (OF 1)
IN THIS SERIES
FOR GENERAL NOTES.

APPROVED: *Paul Kovacs*
CHIEF ENGINEER DATE 5-1-2009



NOTE: FOR 13" PAVEMENT USE THE FOLLOWING
 1-1/2"Ø X 18" LONG ON 9" CENTERS OR
 1-3/4"Ø X 18" LONG ON 12" CENTERS

**TRANSVERSE CONSTRUCTION JOINT
 (JOINTED PLAIN CONCRETE PAVEMENT)**

GENERAL NOTES

1. DOWEL BAR CAPS SHALL BE PLACED ON OPPOSITE END OF ADJACENT DOWEL BARS.
2. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SHOWN.
3. † = PAVEMENT THICKNESS
4. A 3/8" SAW CUT SHALL BE PROVIDED FOR PAVEMENT CRACK CONTROL.

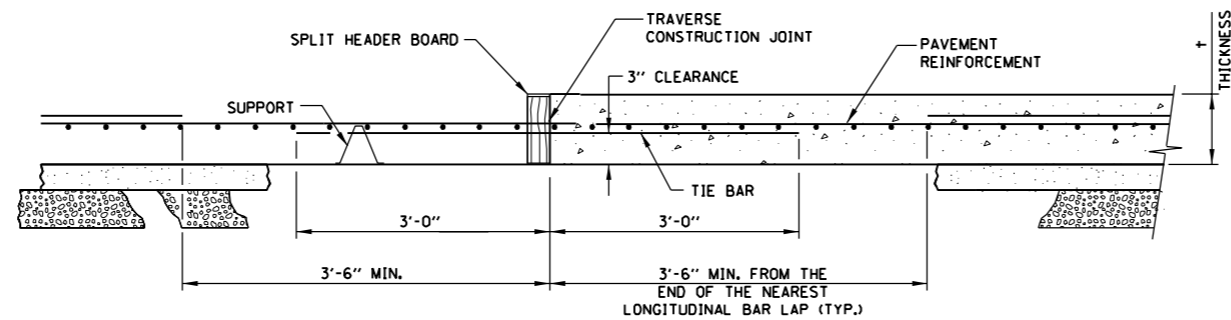
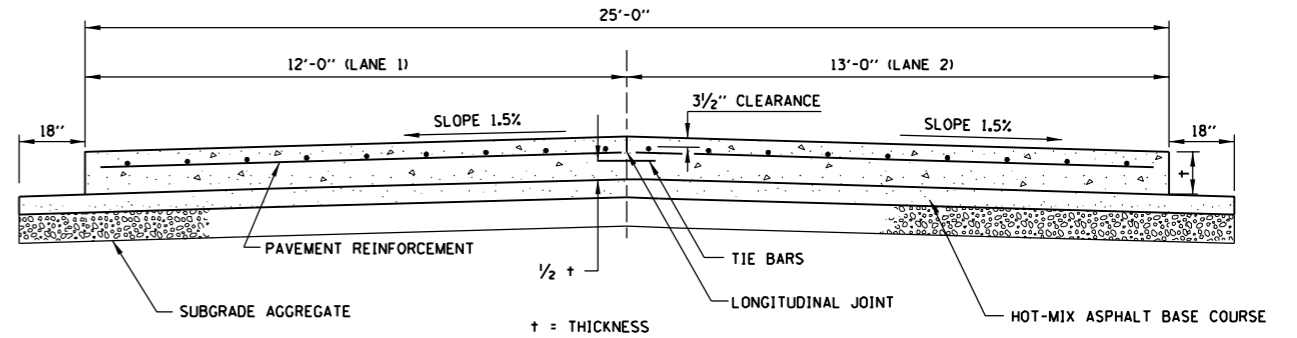
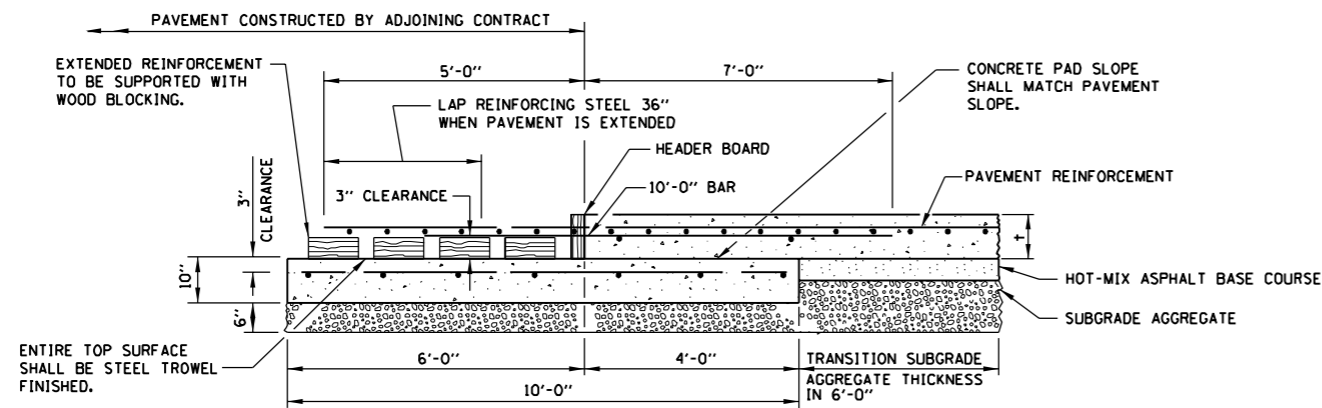
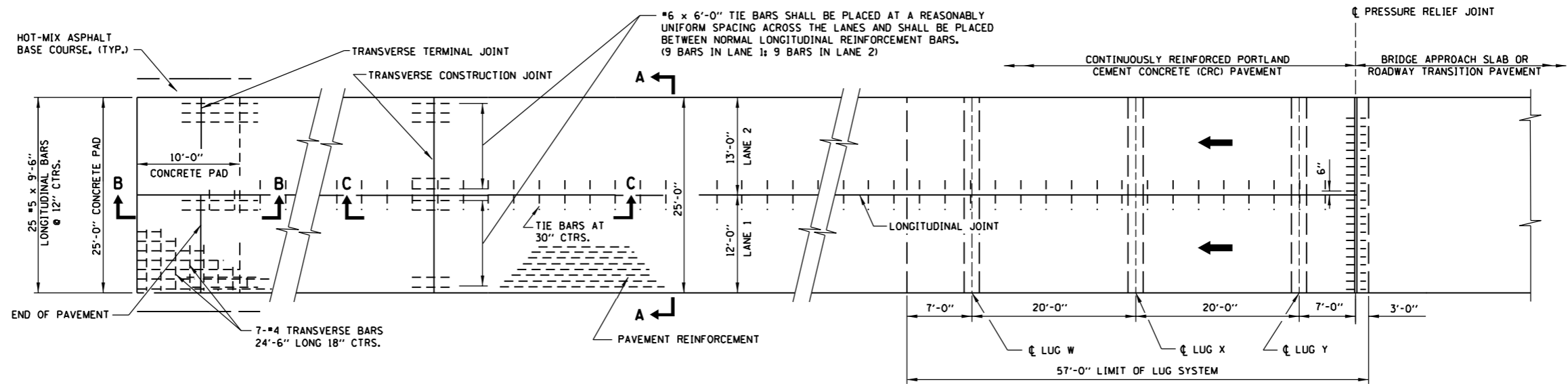
Paul Kovacs
 APPROVED CHIEF ENGINEER DATE 5-1-2009

DATE	REVISIONS
5-1-2009	MODIFIED JOINT DETAIL, REVISED NOTES



PAVEMENT JOINTS

STANDARD A7-01



NOTES:

- SEE STANDARD A12 (BAR REINFORCEMENT FOR CRC PAVEMENT) FOR DETAILS OF PAVEMENT REINFORCEMENT.
- SEE STANDARD A7 (PAVEMENT JOINTS) AND IDOT STANDARD 420001 (PAVEMENT JOINTS) FOR DETAILS OF JOINTS AND TIE BARS NOT SHOWN.
- SEE STANDARD G6 (APPROACH SLAB TO CRC PAVEMENT, MAINLINE, GENERAL PLAN, AND SECTIONS AND DETAILS) FOR DETAILS OF BRIDGE APPROACH SLAB OR STANDARD A13 (CRC ROADWAY TRANSITION PAVEMENT) FOR DETAILS OF ROADWAY TRANSITION PAVEMENT.
- REINFORCEMENT BARS DESIGNATED "E" SHALL BE EPOXY COATED.
- REINFORCEMENT BAR BENDING DIMENSIONS ARE OUT TO OUT.
- SAWED AND CONSTRUCTION JOINTS MAY BE INTERCHANGED TO MATCH MAINTENANCE OF TRAFFIC. JOINTS SHOWN ARE FOR NEW CONSTRUCTION.
- THICKNESS OF MATERIALS IS PROJECT SPECIFIC. REFER TO PROJECT PLANS FOR DETAILS.
- QUANTITIES LISTED IN TABLE ON SHEET 2 HAVE BEEN ROUNDED AS FOLLOWS:
 - CONCRETE TO NEAREST CU YD
 - REINFORCING BARS TO NEAREST 10 LBS
 - SUBGRADE AGGREGATE TO NEAREST 50 YD

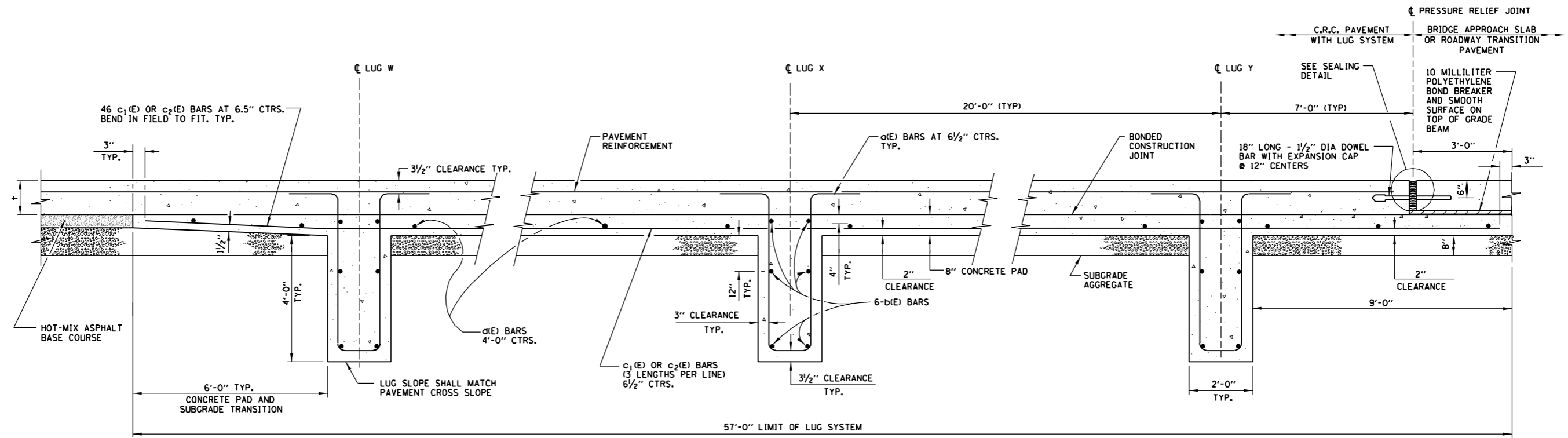


DATE	REVISIONS
5-1-2009	REMOVED PIPE UNDERDRAIN CHANGED BOND BREAKER MATERIAL CHANGED SUBGRADE AGGREGATE DEPTH

2-LANE CRC PAVEMENT
(WITH LUG SYSTEM)

STANDARD A8-01

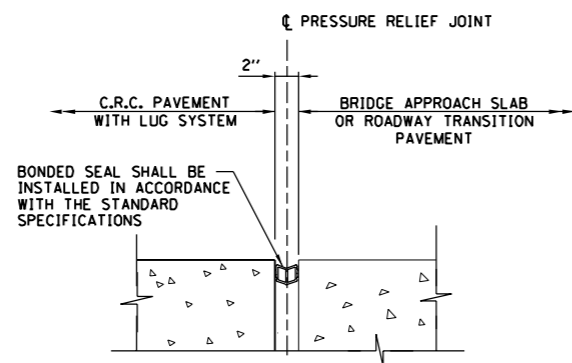
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009



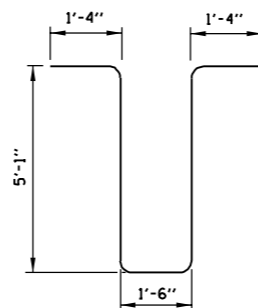
SECTION AT LUG W

SECTION AT LUG X

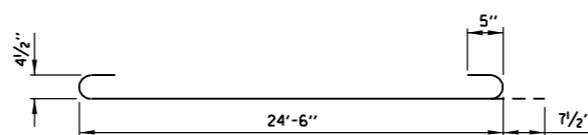
SECTION AT LUG Y



SEALING DETAIL



BAR a(E)



BAR b(E)

MATERIALS REQUIRED FOR ONE LUG SYSTEM (EXCLUDING PAVEMENT CONCRETE AND PAVEMENT REINFORCEMENT)					
BAR	QTY.	SIZE	LENGTH	SHAPE	LANE WIDTH
a(E)	138	NO. 8	14'-4"		ALL
b(E)	18	NO. 5	25'-9"		ALL
c1(E)	92	NO. 5	21'-0"		ALL
c2(E)	46	NO. 5	18'-10"		ALL
d(E)	15	NO. 4	24'-6"		ALL
CONCRETE, CU. YDS.					57
REINFORCING BARS EPOXY COATED, LBS.					8,930
SUBGRADE AGGREGATE, SQ. YDS.					142
DOWEL BARS, EACH					25
PRESSURE RELIEF JOINT, LF					25

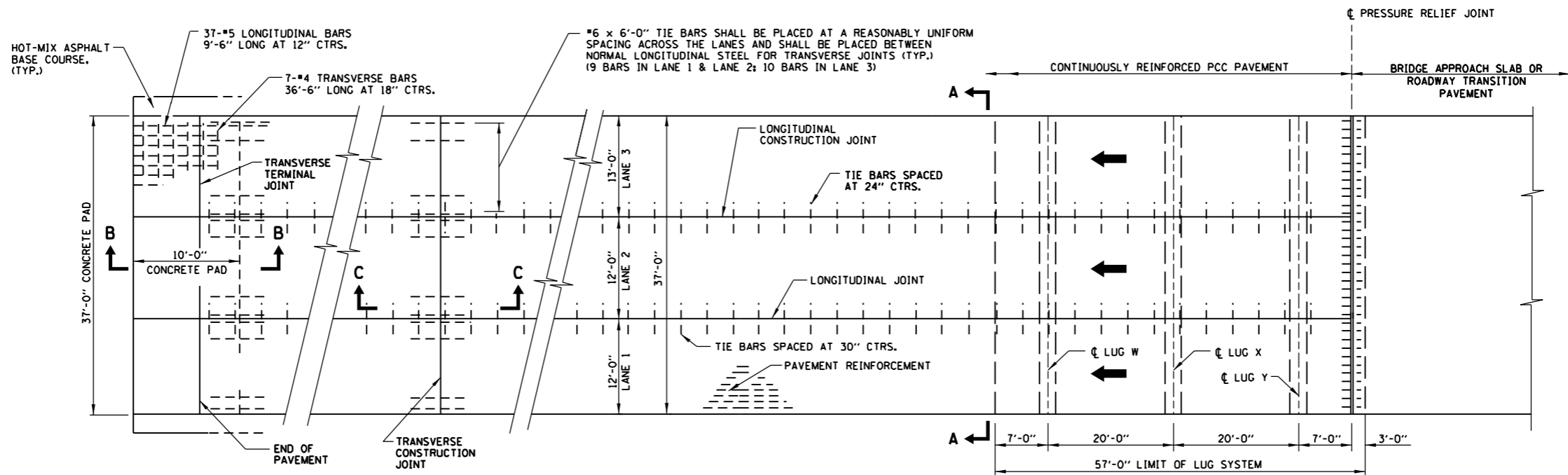
SEE SHEET 1 (OF 1) IN THIS SERIES FOR GENERAL NOTES.

APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009

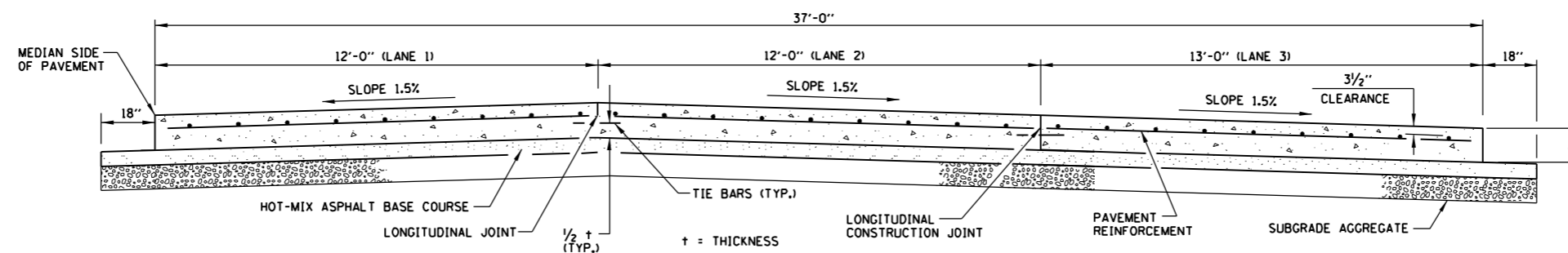
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2-LANE CRC PAVEMENT
(WITH LUG SYSTEM)

STANDARD A8-01

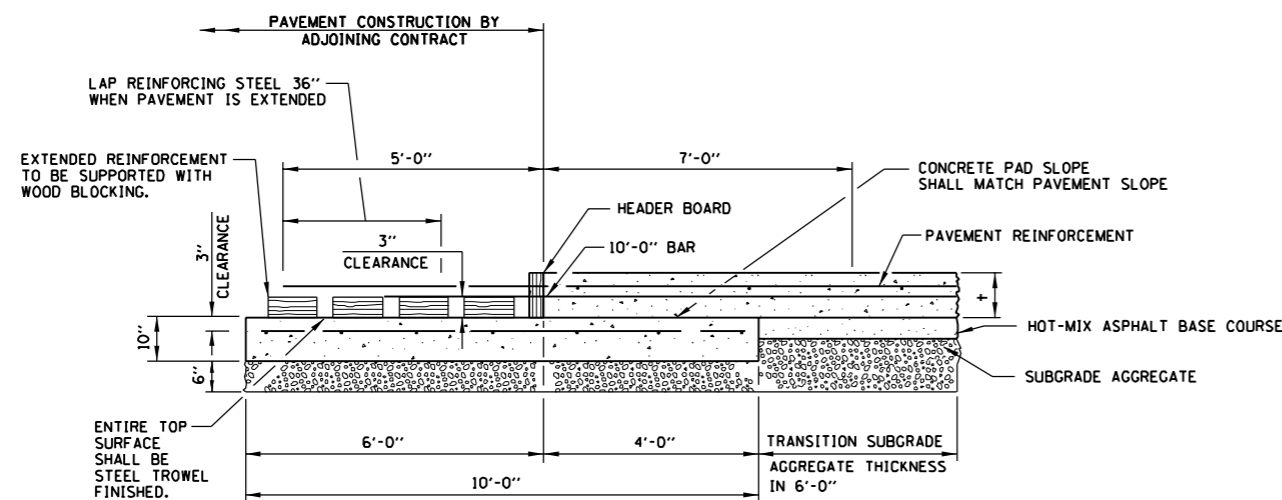


PLAN

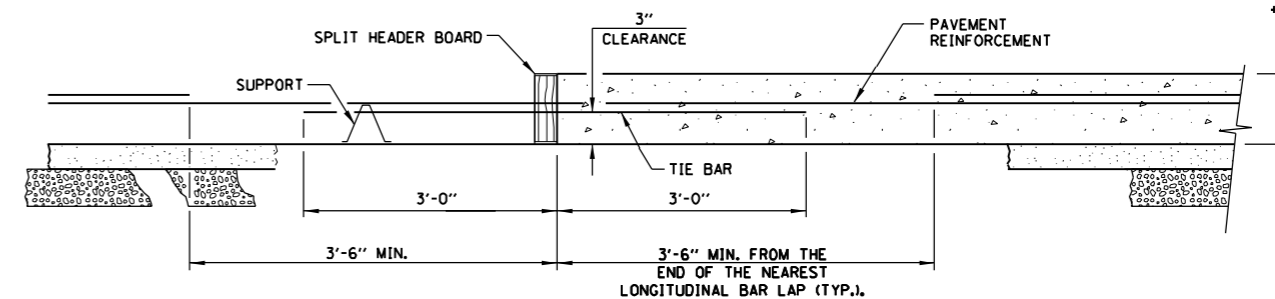


SECTION A-A

(TYPICAL 3-LANE, 1-WAY WITH SHOULDERS)



TRANSVERSE TERMINAL JOINT
(ADJACENT TO NEW CONSTRUCTION)
SECTION B-B



TRANSVERSE CONSTRUCTION JOINT
SECTION C-C

SHEET 1 OF 2

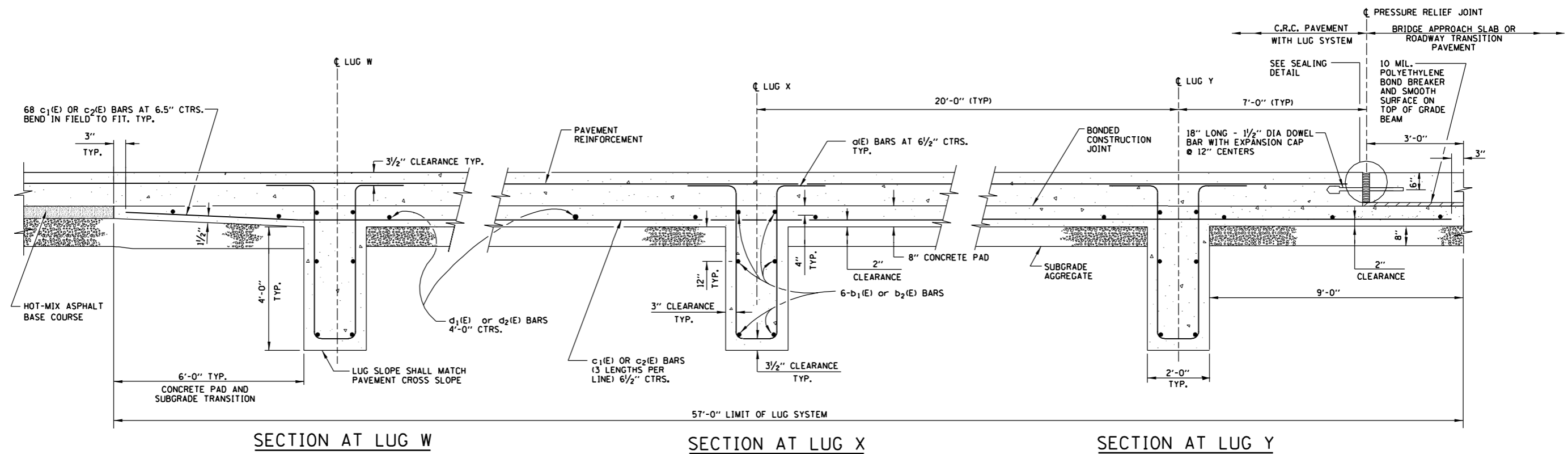


DATE	REVISIONS
5-1-2009	REMOVED PIPE UNDERDRAIN CHANGED BOND BREAKER MATERIAL CHANGED SUBGRADE AGGREGATE DEPTH

3-LANE CRC PAVEMENT
(WITH LUG SYSTEM)

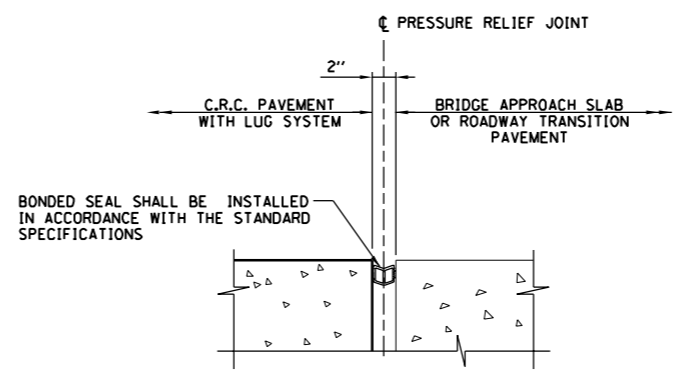
STANDARD A9-01

APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009



MATERIALS REQUIRED FOR ONE LUG SYSTEM
(EXCLUDING PAVEMENT CONCRETE AND PAVEMENT REINFORCEMENT)

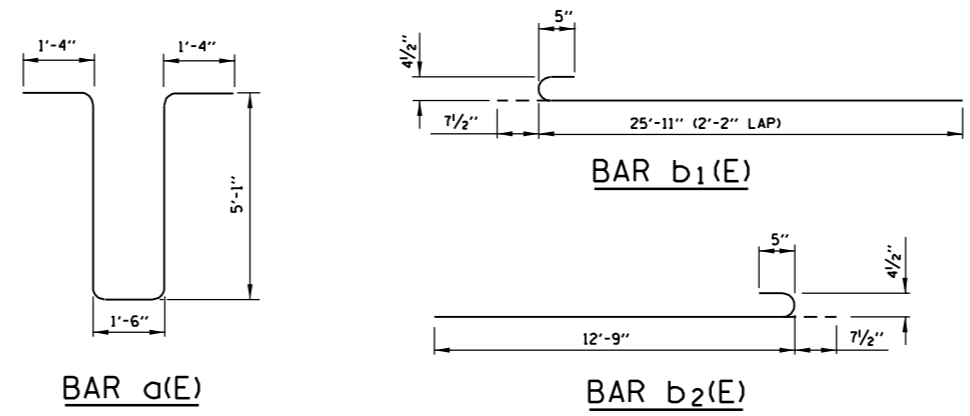
BAR	QTY.	SIZE	LENGTH	SHAPE	LANE WIDTH
a(E)	204	#8	14'-4"		ALL
b1(E)	18	#5	26'-6 1/2"		1.2
b2(E)	18	#5	13'-4 1/2"		3
c1(E)	136	#5	21'-0"		ALL
c2(E)	68	#5	18'-10"		ALL
d1(E)	15	#4	25'-5"		1.2
d2(E)	15	#4	12'-9"		3
CONCRETE, CU. YDS.			85		
REINFORCING BARS EPOXY COATED, LBS.			13,250		
SUBGRADE AGGREGATE, SQ. YDS.			210		
DOWEL BARS, EACH			37		
PRESSURE RELIEF JOINT, LF			37		



SEALING DETAIL

NOTES:

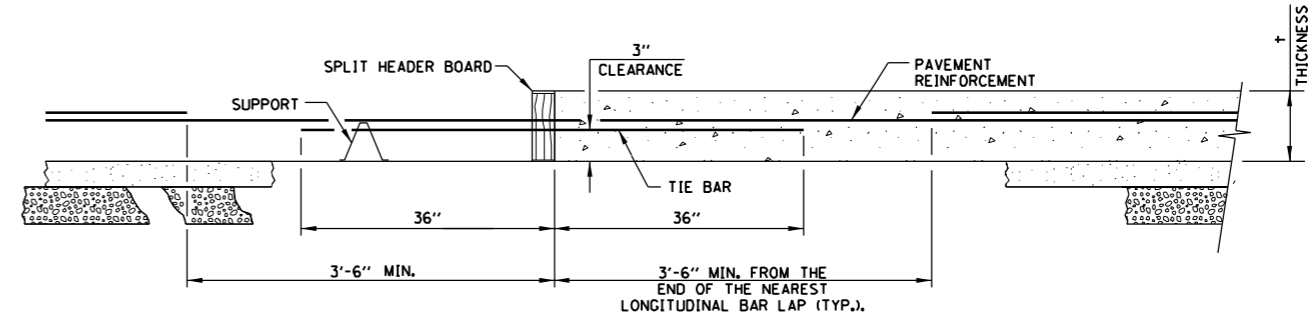
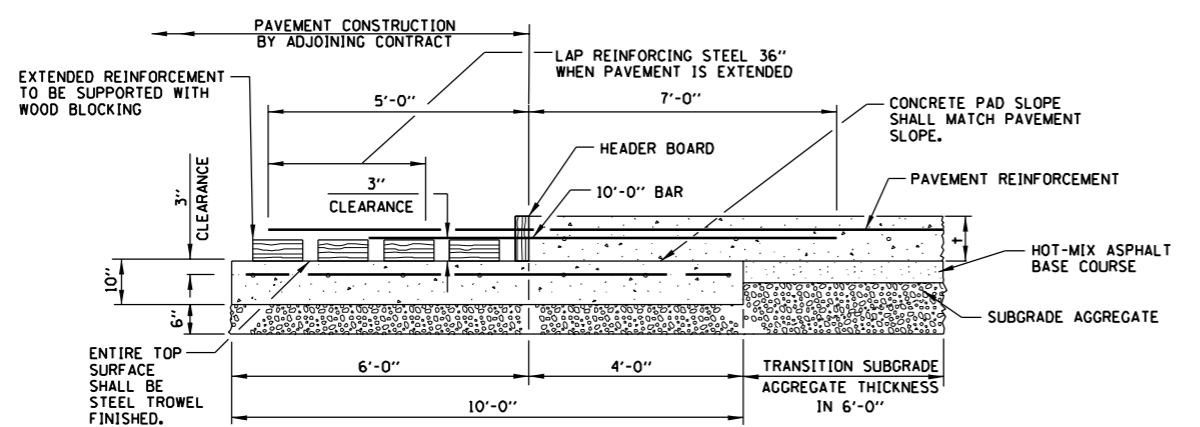
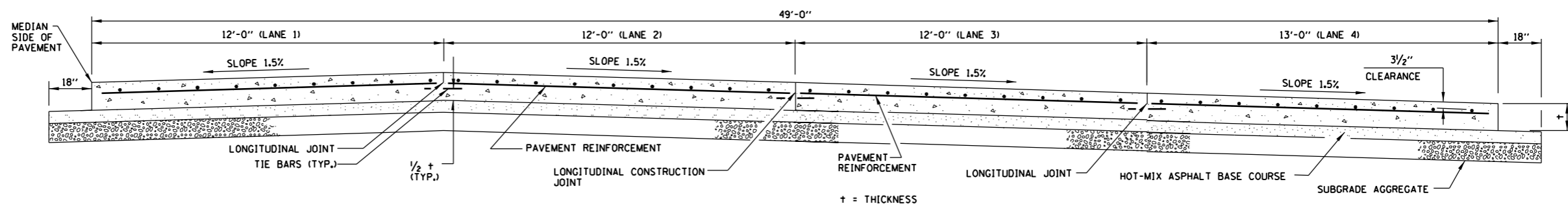
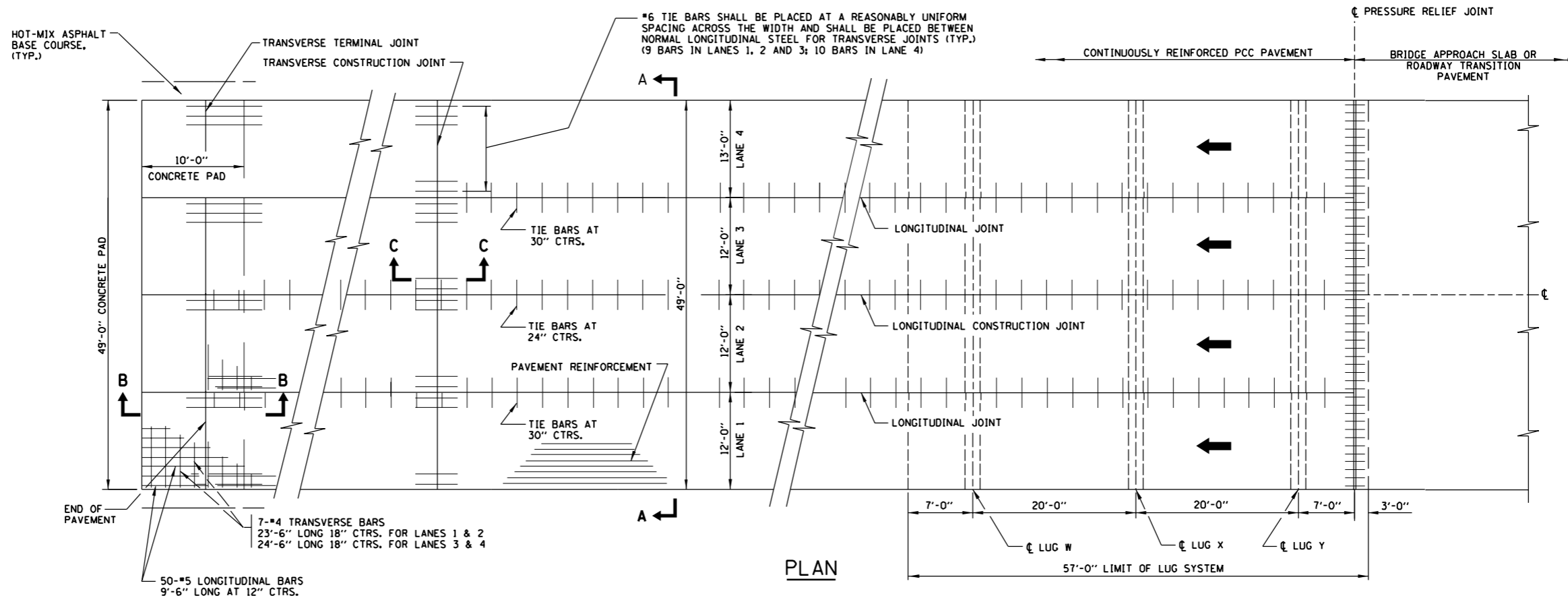
- SEE STANDARD A12 (BAR REINFORCEMENT FOR CRC PAVEMENT) FOR DETAILS OF PAVEMENT REINFORCEMENT.
- SEE STANDARD A7 (PAVEMENT JOINTS) AND IDOT STANDARD 420001 (PAVEMENT JOINTS) FOR DETAILS OF JOINTS AND TIE BARS NOT SHOWN.
- SEE STANDARD G6 (APPROACH SLAB TO CRC PAVEMENT, MAINLINE, GENERAL PLAN, AND SECTIONS AND DETAILS) FOR DETAILS OF BRIDGE APPROACH SLAB OR STANDARD A13 (CRC ROADWAY TRANSITION PAVEMENT) FOR DETAILS OF ROADWAY TRANSITION PAVEMENT.
- REINFORCEMENT BARS DESIGNATED "E" SHALL BE EPOXY COATED.
- REINFORCEMENT BAR BENDING DIMENSIONS ARE OUT TO OUT.
- SAWED AND CONSTRUCTION JOINTS MAY BE INTERCHANGED TO MATCH MAINTENANCE OF TRAFFIC. JOINTS SHOWN ARE FOR NEW CONSTRUCTION.
- THICKNESS OF MATERIALS IS PROJECT SPECIFIC. REFER TO PROJECT PLANS FOR DETAILS.
- QUANTITIES LISTED IN TABLE HAVE BEEN ROUNDED AS FOLLOWS:
 - CONCRETE TO NEAREST CU YD
 - REINFORCING BARS TO NEAREST 10 LBS
 - SUBGRADE AGGREGATE TO NEAREST SQ YD



3-LANE CRC PAVEMENT
(WITH LUG SYSTEM)

STANDARD A9-01

Paul Kovacs
APPROVED CHIEF ENGINEER DATE 5-1-2009



SHEET 1 OF 2

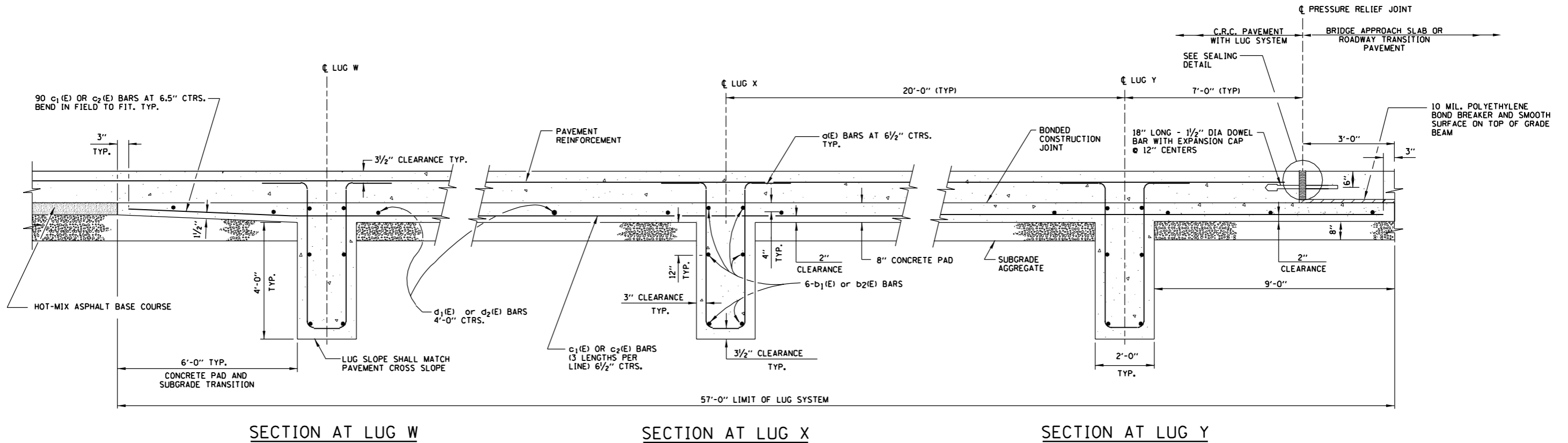
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009

DATE	REVISIONS
5-1-2009	REMOVED PIPE UNDERDRAIN CHANGED BOND BREAKER MATERIAL CHANGED SUBGRADE AGGREGATE DEPTH

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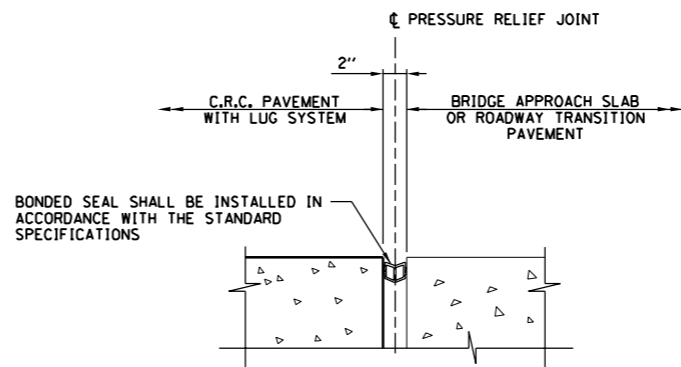
4-LANE CRC PAVEMENT (WITH LUG SYSTEM)

STANDARD A10-01



MATERIALS REQUIRED FOR ONE LUG SYSTEM
(EXCLUDING PAVEMENT CONCRETE AND PAVEMENT REINFORCEMENT)

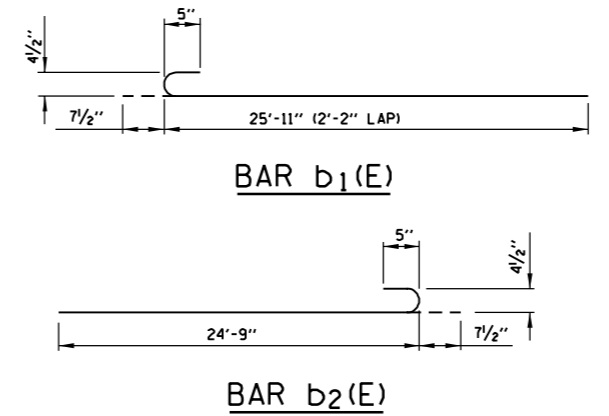
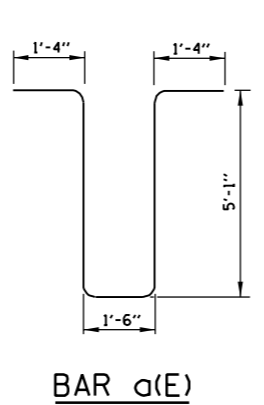
BAR	QTY.	SIZE	LENGTH	SHAPE	LANE WIDTH
a1(E)	270	#8	14'-4"		ALL
b1(E)	18	#5	26'-6 1/2"		1,2
b2(E)	18	#5	25'-4 1/2"		3,4
c1(E)	180	#5	21'-0"		ALL
c2(E)	90	#5	18'-10"		ALL
d1(E)	15	#4	25'-5"		1,2
d2(E)	15	#4	24'-9"		3,4
CONCRETE, CU. YDS.			113		
REINFORCING BARS EPOXY COATED, LBS.			17,520		
SUBGRADE AGGREGATE, SQ. YDS.			278		
DOWEL BARS, EACH			49		
PRESSURE RELIEF JOINT, LF			49		



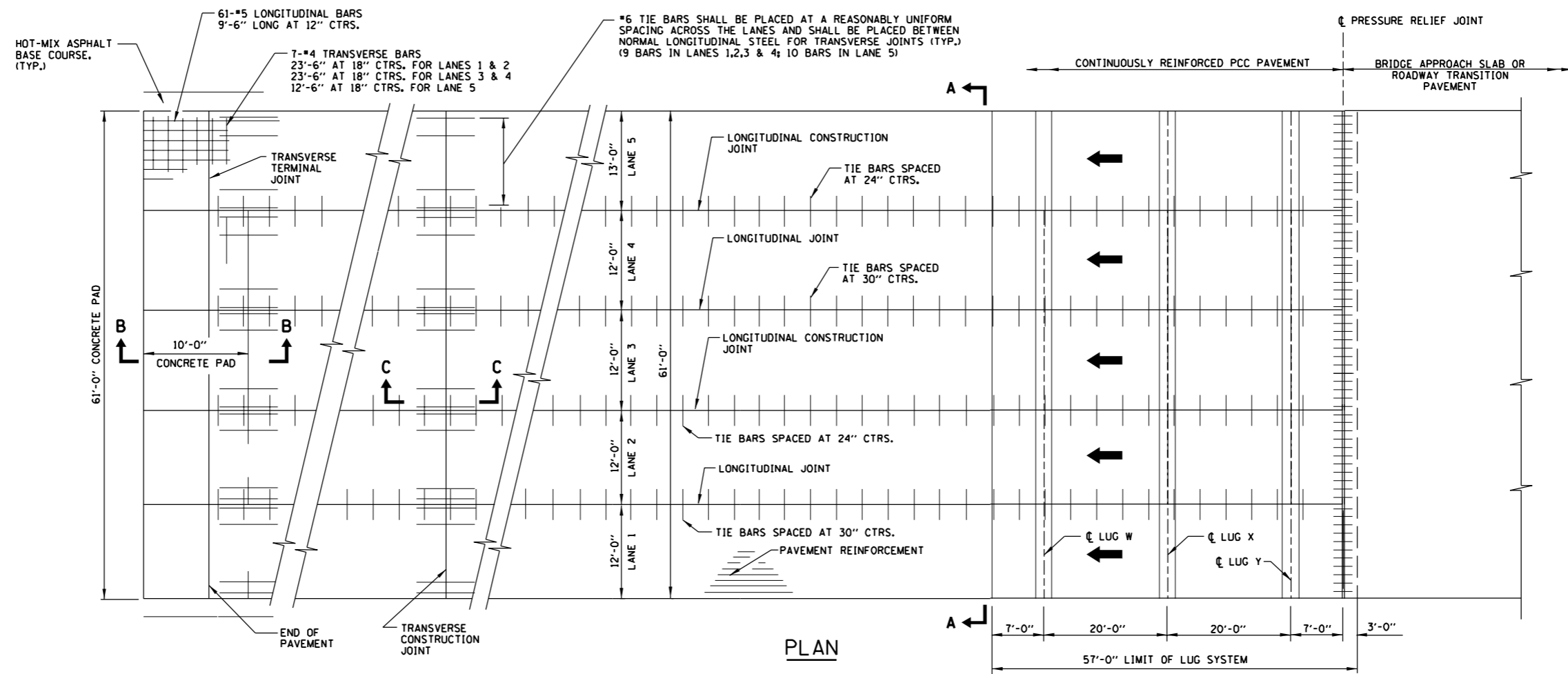
SEALING DETAIL

NOTES:

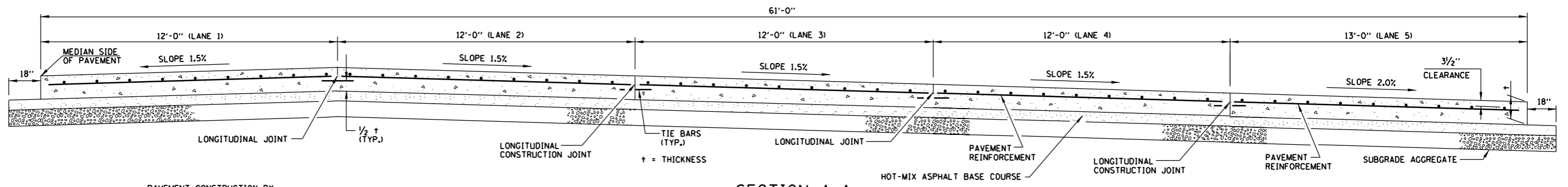
- SEE STANDARD A12 (BAR REINFORCEMENT FOR CRC PAVEMENT) FOR DETAILS OF PAVEMENT REINFORCEMENT.
- SEE STANDARD A7 (PAVEMENT JOINTS) AND IDOT STANDARD 420001 (PAVEMENT JOINTS) FOR DETAILS OF JOINTS AND TIE BARS NOT SHOWN.
- SEE STANDARD G6 (APPROACH SLAB TO CRC PAVEMENT, MAINLINE, GENERAL PLAN, AND SECTIONS AND DETAILS) AND STANDARD G8 (APPROACH SLAB TO CRC PAVEMENT, MAINLINE, BAR DETAILS AND SCHEDULES FOR 4 LANES) FOR DETAILS OF BRIDGE APPROACH SLAB OR STANDARD A13 (CRC ROADWAY TRANSITION PAVEMENT) FOR DETAILS OF ROADWAY TRANSITION PAVEMENT.
- REINFORCEMENT BARS DESIGNATED "(E)" SHALL BE EPOXY COATED.
- REINFORCEMENT BAR BENDING DIMENSIONS ARE OUT TO OUT.
- SAWED AND CONSTRUCTION JOINTS MAY BE INTERCHANGED TO MATCH MAINTENANCE OF TRAFFIC. JOINTS SHOWN ARE FOR NEW CONSTRUCTION.
- THICKNESS OF MATERIALS IS PROJECT SPECIFIC. REFER TO PROJECT PLANS FOR DETAILS.
- QUANTITIES LISTED IN TABLE HAVE BEEN ROUNDED AS FOLLOWS:
 - CONCRETE TO NEAREST CU YD
 - REINFORCING BARS TO NEAREST 10 LBS
 - SUBGRADE AGGREGATE TO NEAREST SQ YD



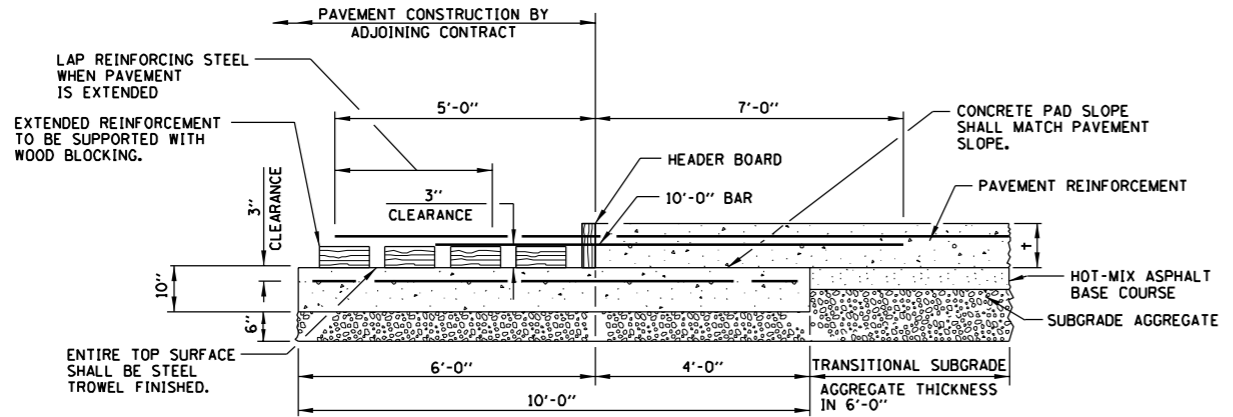
Paul Kovacs
APPROVED CHIEF ENGINEER DATE 5-1-2009



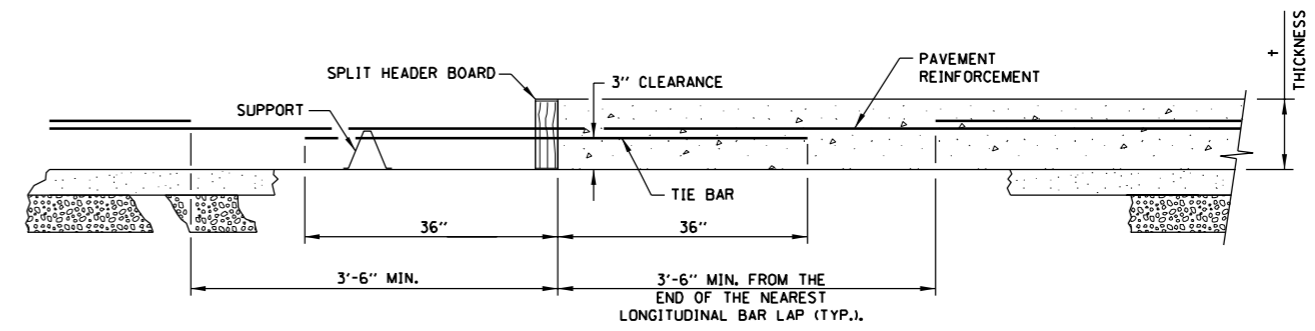
PLAN



SECTION A-A
(TYPICAL 5-LANE, 1-WAY WITH SHOULDERS)



TRANSVERSE TERMINAL JOINT (ADJACENT TO NEW CONSTRUCTION)
SECTION B-B



TRANSVERSE CONSTRUCTION JOINT
SECTION C-C

SHEET 1 OF 2

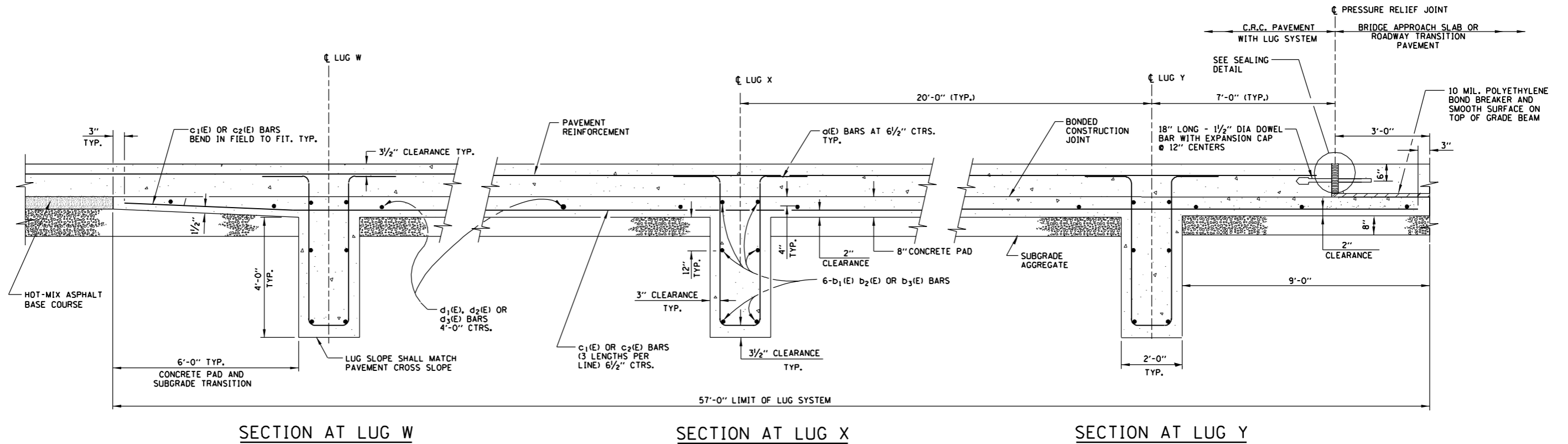
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009

DATE	REVISIONS
5-1-2009	REMOVED PIPE UNDERDRAIN CHANGED BOND BREAKER MATERIAL CHANGED SUBGRADE AGGREGATE DEPTH

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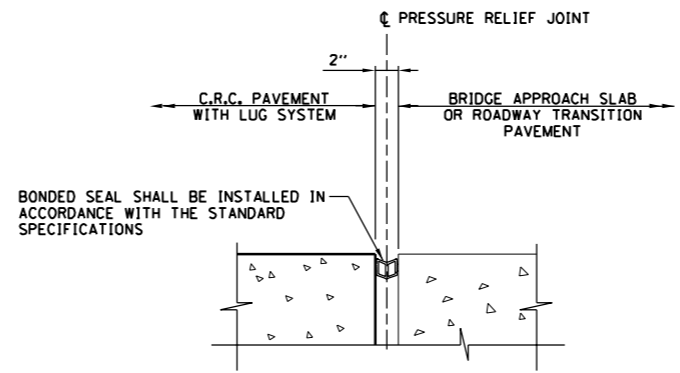
5-LANE CRC PAVEMENT
(WITH LUG SYSTEM)

STANDARD A11-01

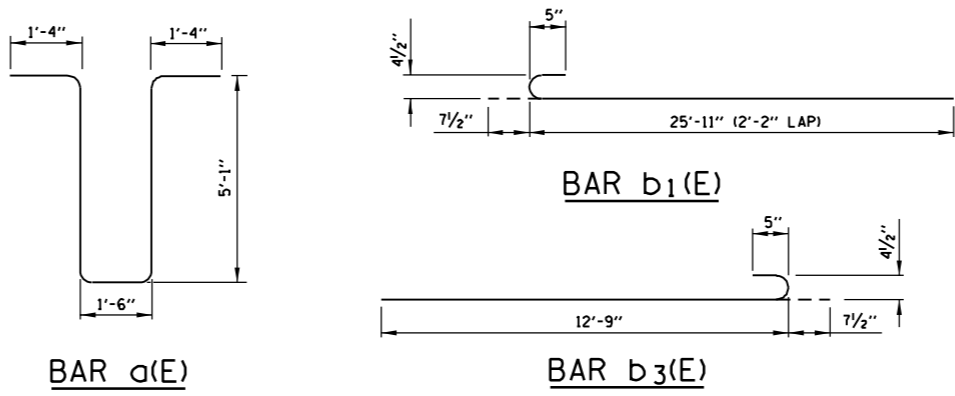


MATERIALS REQUIRED FOR ONE LUG SYSTEM
(EXCLUDING PAVEMENT CONCRETE AND PAVEMENT REINFORCEMENT)

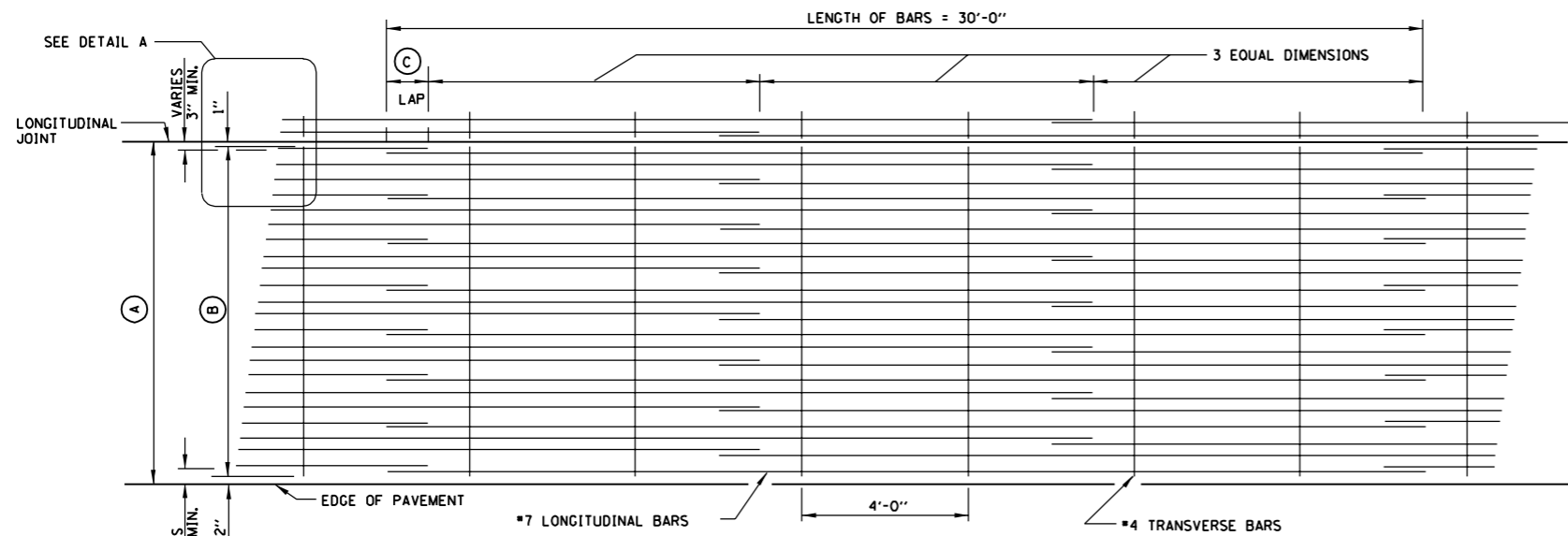
BAR	QTY.	SIZE	LENGTH	SHAPE	LANE WIDTH
a(E)	336	#8	14'-4"		ALL
b ₁ (E)	18	#5	26'-6 1/2"		1,2
b ₂ (E)	18	#5	26'-2"		3,4
b ₃ (E)	18	#5	13'-4 1/2"		5
c ₁ (E)	224	#5	21'-0"		ALL
c ₂ (E)	112	#5	18'-10"		ALL
d ₁ (E)	15	#4	25'-5"		1,2
d ₂ (E)	15	No. 4	25'-8"		3,4
d ₃ (E)	15	No. 4	12'-9"		5
CONCRETE, CU. YDS.			140		
REINFORCING BARS EPOXY COATED, LBS.			21,850		
SUBGRADE AGGREGATE, SQ. YDS.			346		
DOWEL BARS, EACH			61		
PRESSURE RELIEF JOINT, LF			61		



- NOTES:**
- SEE STANDARD A12 (BAR REINFORCEMENT FOR CRC PAVEMENT) FOR DETAILS OF PAVEMENT REINFORCEMENT.
 - SEE STANDARD A7 (PAVEMENT JOINTS) AND IDOT STANDARD 420001 (PAVEMENT JOINTS) FOR DETAILS OF JOINTS AND TIE BARS NOT SHOWN.
 - SEE STANDARD G6 (APPROACH SLAB TO CRC PAVEMENT, MAINLINE, GENERAL PLAN, AND SECTIONS AND DETAILS) AND STANDARD G7 (APPROACH SLAB TO CRC PAVEMENT, MAINLINE, BAR DETAILS AND SCHEDULES FOR 5 LANES) FOR DETAILS OF BRIDGE APPROACH SLAB OR STANDARD A13 (CRC ROADWAY TRANSITION PAVEMENT) FOR DETAILS OF ROADWAY TRANSITION PAVEMENT.
 - REINFORCEMENT BARS DESIGNATED "IE" SHALL BE EPOXY COATED.
 - REINFORCEMENT BAR BENDING DIMENSIONS ARE OUT TO OUT.
 - SAWED AND CONSTRUCTION JOINTS MAY BE INTERCHANGED TO MATCH MAINTENANCE OF TRAFFIC. JOINTS SHOWN ARE FOR NEW CONSTRUCTION.
 - THICKNESS OF MATERIALS IS PROJECT SPECIFIC. REFER TO PROJECT PLANS FOR DETAILS.
 - QUANTITIES LISTED IN TABLE HAVE BEEN ROUNDED AS FOLLOWS:
 - CONCRETE TO NEAREST CU YD
 - REINFORCING BARS TO NEAREST 10 LBS
 - SUBGRADE AGGREGATE TO NEAREST SQ YD



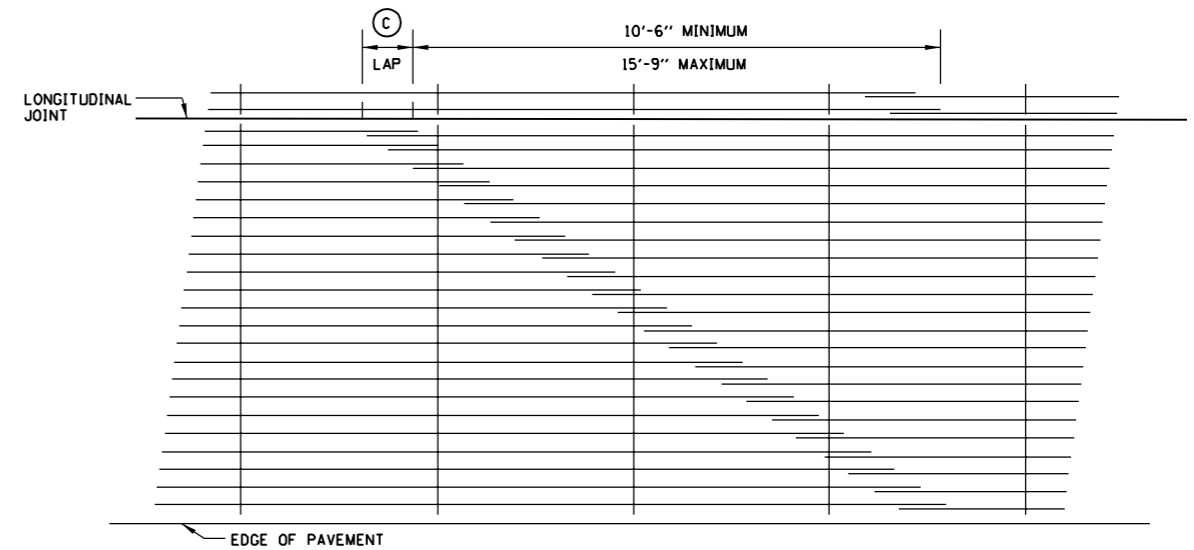
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009



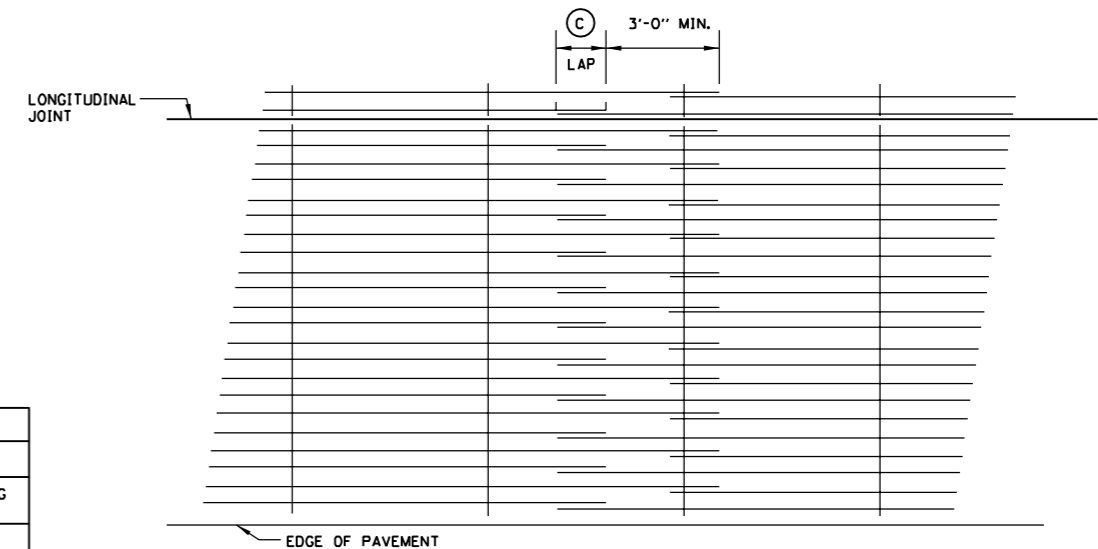
LAP DETAIL I
REINFORCEMENT BAR LAP PLAN LONGITUDINAL REINFORCEMENT BARS

(A) LANE WIDTH	(B)
12'-0"	11'-9"
13'-0"	12'-9"

BAR SIZE	(C) LAP
#7	26"



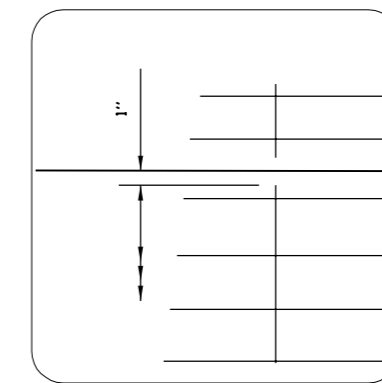
LAP DETAIL II



LAP DETAIL III

12'-0" LANE		PAVEMENT THICKNESS (IN.) (†)													
		10		10.5		11		11.5		12		12.5		13	
		NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)
PERCENTAGE OF STEEL REINFORCEMENT	0.65%	16	9 ⁵ / ₈	17	8 ⁵ / ₈	18	8 ⁵ / ₈	18	8 ⁵ / ₈	20	7 ¹ / ₄	19	7 ⁵ / ₈	20	7 ¹ / ₄
	0.70%	17	8 ⁵ / ₈	18	8 ⁵ / ₈	19	7 ⁵ / ₈	19	7 ⁵ / ₈	21	6 ⁷ / ₈	21	6 ⁷ / ₈	22	6 ¹ / ₂
	0.75%	18	8 ⁵ / ₈	19	7 ⁵ / ₈	20	7 ¹ / ₄	21	6 ⁵ / ₈	22	6 ¹ / ₂	23	6 ¹ / ₄	24	6
	0.80%	19	7 ⁵ / ₈	20	7 ¹ / ₄	22	6 ¹ / ₂	22	6 ¹ / ₂	23	6 ¹ / ₄	24	6	25	5 ³ / ₄
	0.85%	20	7 ¹ / ₄	22	6 ¹ / ₂	23	6 ¹ / ₄	24	6	25	5 ³ / ₄	26	5 ¹ / ₂	27	5 ¹ / ₄

13'-0" LANE		PAVEMENT THICKNESS (IN.) (†)													
		10		10.5		11		11.5		12		12.5		13	
		NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)	NO. OF BARS (EA.)	SPACING (IN.)
PERCENTAGE OF STEEL REINFORCEMENT	0.65%	17	9 ³ / ₈	18	8 ³ / ₄	19	8 ¹ / ₄	19	8 ¹ / ₄	20	7 ⁵ / ₈	21	7 ¹ / ₂	22	7 ¹ / ₈
	0.70%	18	8 ³ / ₄	19	8 ¹ / ₄	20	7 ⁵ / ₈	21	7 ¹ / ₂	22	7 ⁵ / ₈	23	6 ³ / ₄	24	6 ¹ / ₂
	0.75%	20	7 ⁵ / ₈	21	7 ¹ / ₂	22	7 ¹ / ₈	23	6 ³ / ₄	24	6 ¹ / ₂	25	6 ¹ / ₄	26	6
	0.80%	21	7 ¹ / ₂	22	7 ¹ / ₈	23	6 ³ / ₄	24	6 ¹ / ₂	25	6 ¹ / ₄	26	6	27	5 ³ / ₄
	0.85%	23	6 ³ / ₄	24	6 ¹ / ₂	25	6 ¹ / ₄	26	6	27	5 ³ / ₄	28	5 ¹ / ₂	29	5 ¹ / ₄



DETAIL A

GENERAL NOTES:

- EXCEPT AS NOTED OR SHOWN, THE DIMENSIONS AND NOTES SPECIFIED FOR LAP DETAIL I ARE TYPICAL FOR LAP DETAIL II AND III.
- #7 REINFORCEMENT BARS ARE USED THROUGHOUT THESE TABLES.
- THE DISTANCE FROM THE END OF THE TRANSVERSE BAR TO THE EDGE OF PAVEMENT MAY BE INCREASED BY 1" FOR SLIP FORM PAVING.
- THE PERCENT OF STEEL REINFORCEMENT IS PROJECT SPECIFIC. REFER TO PROJECT PLANS AND CONTRACT DOCUMENTS FOR DETAILS.

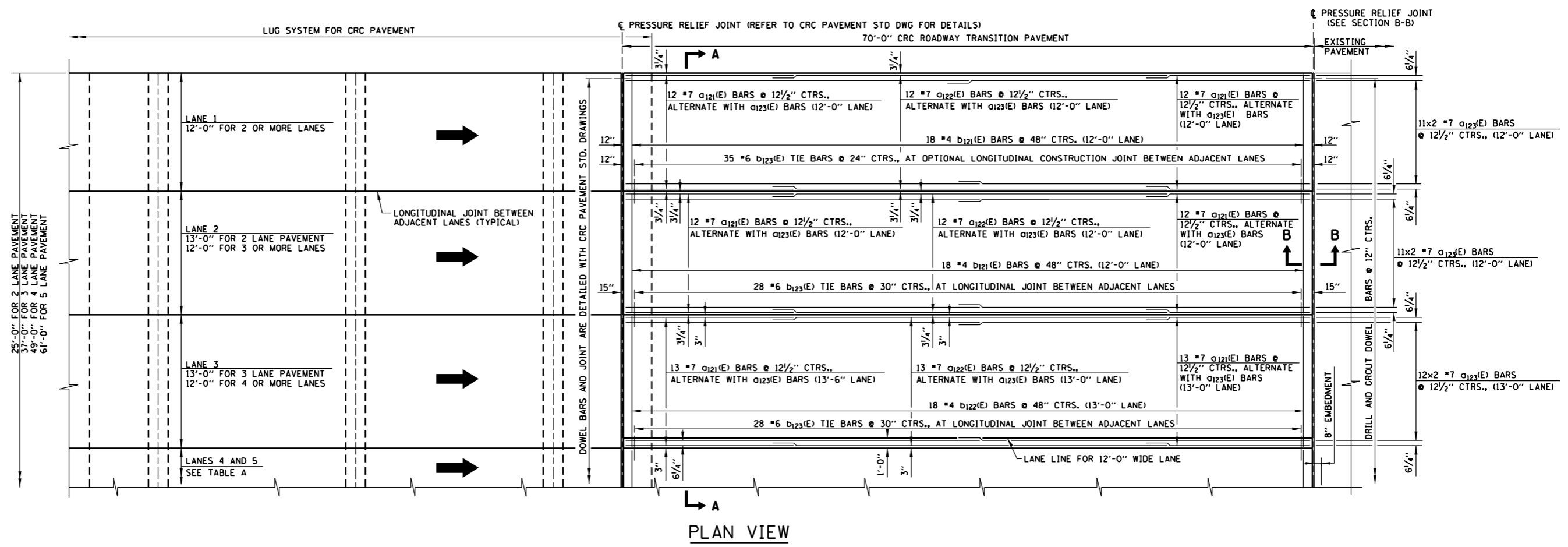
APPROVED *Jeff Daley* CHIEF ENGINEER DATE 1-1-2007

DATE	REVISIONS

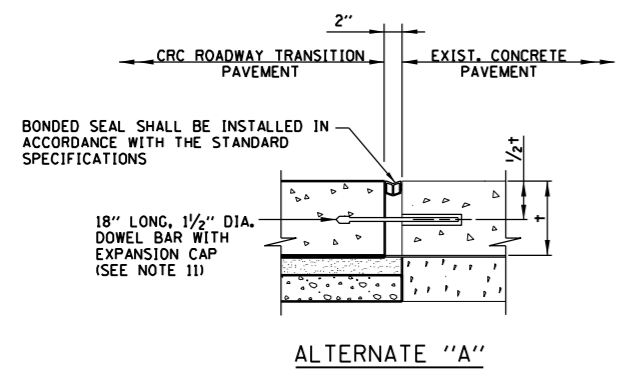


BAR REINFORCEMENT FOR CRC PAVEMENT

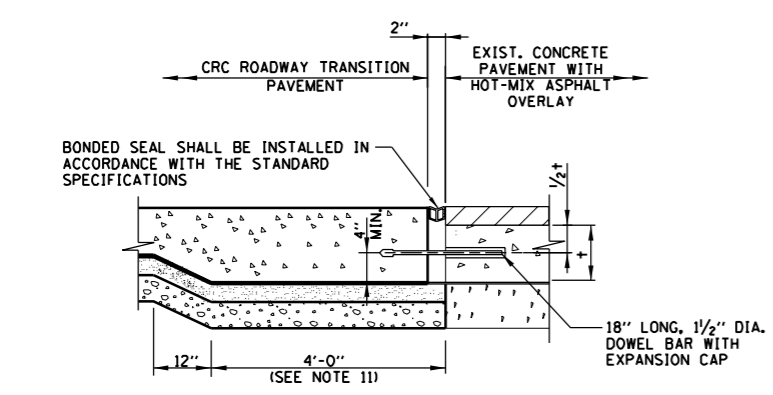
STANDARD A12-00



PLAN VIEW

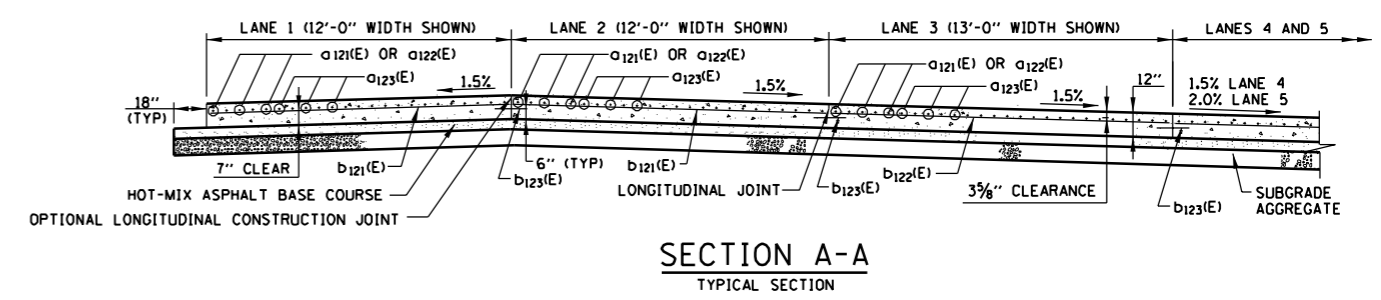


ALTERNATE "A"



ALTERNATE "B"
SECTION B-B

PAVEMENT SECTION	LANE 4 WIDTH	LANE 5 WIDTH
4 LANE PAVEMENT	13'-0"	N/A
5 LANE PAVEMENT	12'-0"	13'-0"



SECTION A-A
TYPICAL SECTION

NOTES:

- SEE STANDARDS A8, A9, A10 AND A11 (2-LANE, 3-LANE, 4-LANE, AND 5-LANE CRC PAVEMENT (WITH LUG SYSTEM) - RESPECTIVELY) FOR DETAILS OF CRC PAVEMENT, LUG SYSTEM, PRESSURE RELIEF JOINT ADJACENT TO LUG SYSTEM, AND CROSS SECTIONS THRU SAWED LONGITUDINAL JOINT AND LONGITUDINAL CONSTRUCTION JOINT.
- REINFORCEMENT BARS DESIGNATED "E" SHALL BE EPOXY COATED.
- USE 2'-2" MINIMUM LAP FOR #7 BARS.
- REINFORCING BARS SHOWN IN THE SCHEDULE ARE ALL STRAIGHT.
- THE DESIGN DRAWINGS GOVERN THE TYPE OF LONGITUDINAL JOINT, SAWED OR CONSTRUCTION, BETWEEN ADJACENT LANES DEPENDING ON MAINTENANCE OF TRAFFIC.
- BARS b₁₂₃(E) (TIE BARS) IN THE BILL OF MATERIAL ASSUME A SPACING OF 24".
- THE QUANTITIES FOR CONCRETE, REINFORCING STEEL (INCLUDING TIE BARS), DOWEL BARS AND PRESSURE RELIEF JOINT ARE TYPICAL FOR 12" PAVEMENT.
- DOWEL BARS DRILLED AND GROUTED INTO EXISTING PAVEMENT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- TOOL EDGES OF PRESSURE RELIEF JOINTS TO 1/4" RADIUS.
- THE NOTATION MxN-#7a FOR REINFORCING BARS IS DEFINED AS M LINES OF BARS WITH N LENGTHS PER LINE.
- AT EXISTING PAVEMENT JOINT:
 - FOR PAVEMENT STRUCTURES > CRC ROADWAY TRANSITION PAVEMENT THICKNESS- PAVEMENT SHALL BE INCREASED AS REQUIRED TO MEET BOTTOM OF EXISTING CONCRETE PAVEMENT. ADDITIONAL CONCRETE SHALL BE INCLUDED IN THE COST OF CONTINUOUSLY REINFORCED PC CONCRETE PAVEMENT (12").
 - FOR PAVEMENT STRUCTURES < CRC ROADWAY TRANSITION PAVEMENT THICKNESS - 12" THICKNESS SHALL BE MAINTAINED. INSTALL DOWEL BAR AT 1/2" EXISTING PAVEMENT THICKNESS OR A MINIMUM OF 4" FROM TOP OF NEW PAVEMENT.

DESCRIPTION	UNIT	QUANTITY			
		2	3	4	5
CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE ROADWAY TRANSITION PAVEMENT	SO. YD.	194	288	381	474
CONCRETE (12")	CU. YD.	64.8	95.9	127.0	158.1
REINFORCING STEEL, EPOXY COATED	LBS	7,575	11,273	14,971	18,669
DRILL & GROUT DOWEL BARS	EACH	25	37	49	61
PRESSURE RELIEF JOINT	LIN. FT.	25	37	49	61

BAR	SIZE	LENGTH	NUMBER OF BARS			
			2	3	4	5
a ₁₂₁ (E)	#7	17'-0"	50	74	98	122
a ₁₂₂ (E)	#7	40'-0"	25	37	49	61
a ₁₂₃ (E)	#7	35'-10"	46	68	90	112
b ₁₂₁ (E)	#4	11'-8"	18	36	54	72
b ₁₂₂ (E)	#4	12'-8"	18	18	18	18
b ₁₂₃ (E)	#6	2'-6"	35	70	105	140

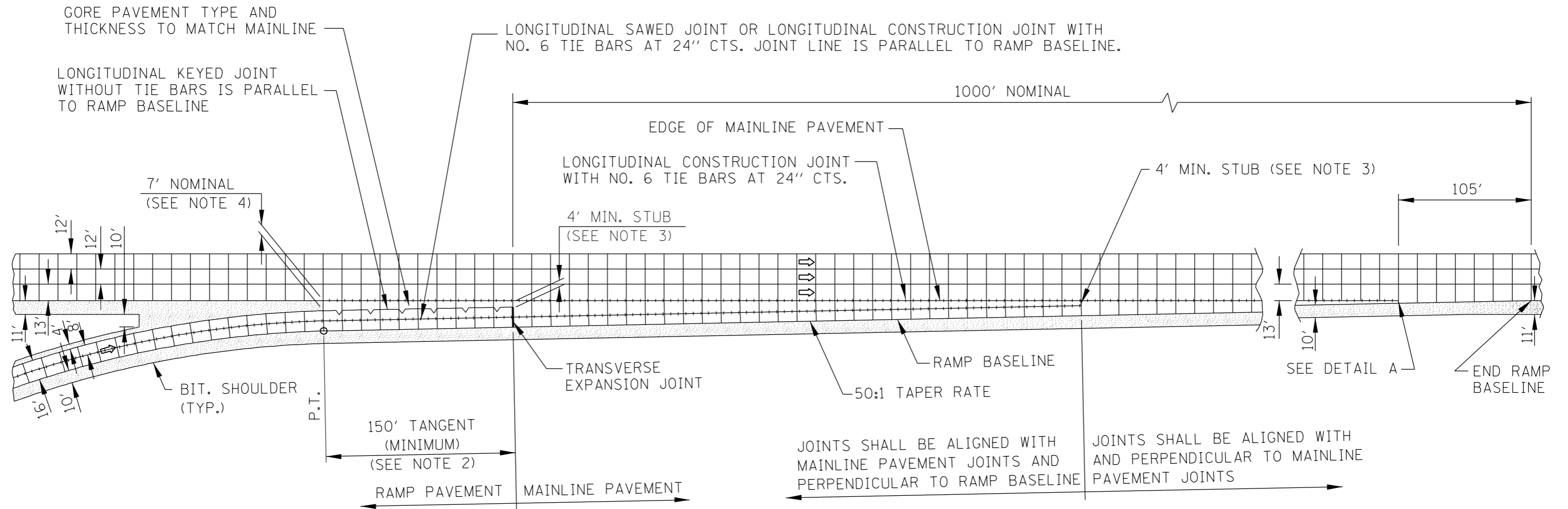
APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009

DATE	REVISIONS
5-1-2009	DELETE NOTE FROM SECTION B-B

Illinois Tollway
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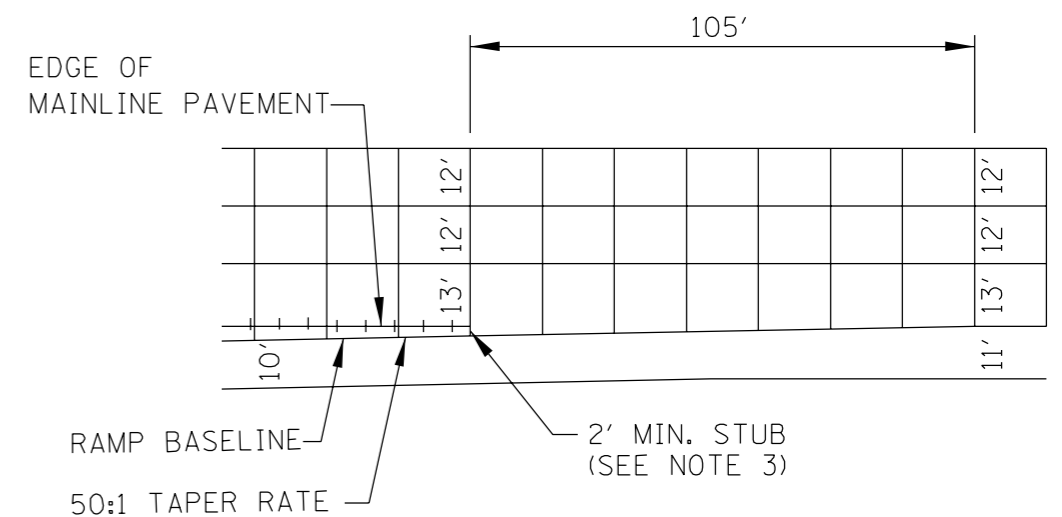
CRC ROADWAY TRANSITION PAVEMENT

STANDARD A13-01



NOTES:

1. ALL PAVEMENT JOINTS SHALL BE DETAILED AS SHOWN ON I.D.O.T. HWY. STANDARD 420001, EXCEPT EXPANSION JOINT SEALS SHALL BE AS DESCRIBED IN THE SPECIAL PROVISION, BONDED PREFORMED JOINT SEALER.
2. THE THICKNESS OF THE JOINTED RAMP PAVEMENT IN THE TANGENT AREA SHALL MATCH THE MAINLINE PAVEMENT. THE EXTRA THICKNESS OF PAVEMENT SHALL BE INCLUDED IN THE PRICE FOR THE RAMP PAVEMENT.
3. STUBS SHALL BE THE MINIMUM DIMENSION AS SHOWN AND ALIGNED WITH A MAINLINE TRANSVERSE JOINT.
4. 7' NOSE LOCATION SHALL BE ADJUSTED TO BE ALIGNED WITH A MAINLINE TRANSVERSE JOINT.
5. TYPICAL PCC PAVEMENT JOINT SPACING SHALL BE 15'.
6. AS ADDITIONAL RAMP LANES ARE ADDED, THE MAXIMUM JOINT SPACING SHALL BE 15' LONG BY 15' WIDE. TYPICAL SPACING IS 15' LONG BY 12' WIDE. LONGITUDINAL JOINT LOCATION IN THE WHEEL PATH SHALL BE MINIMIZED.



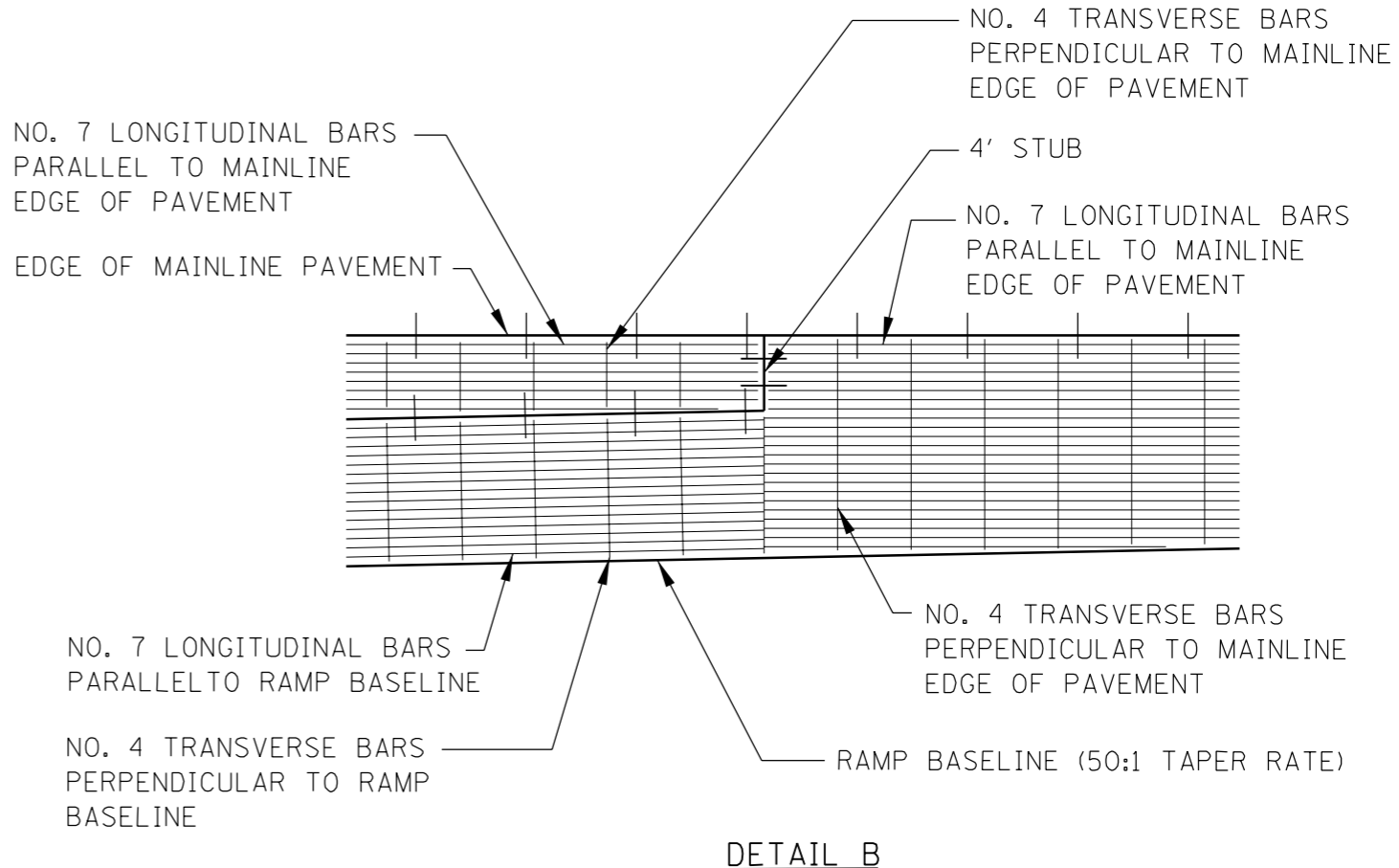
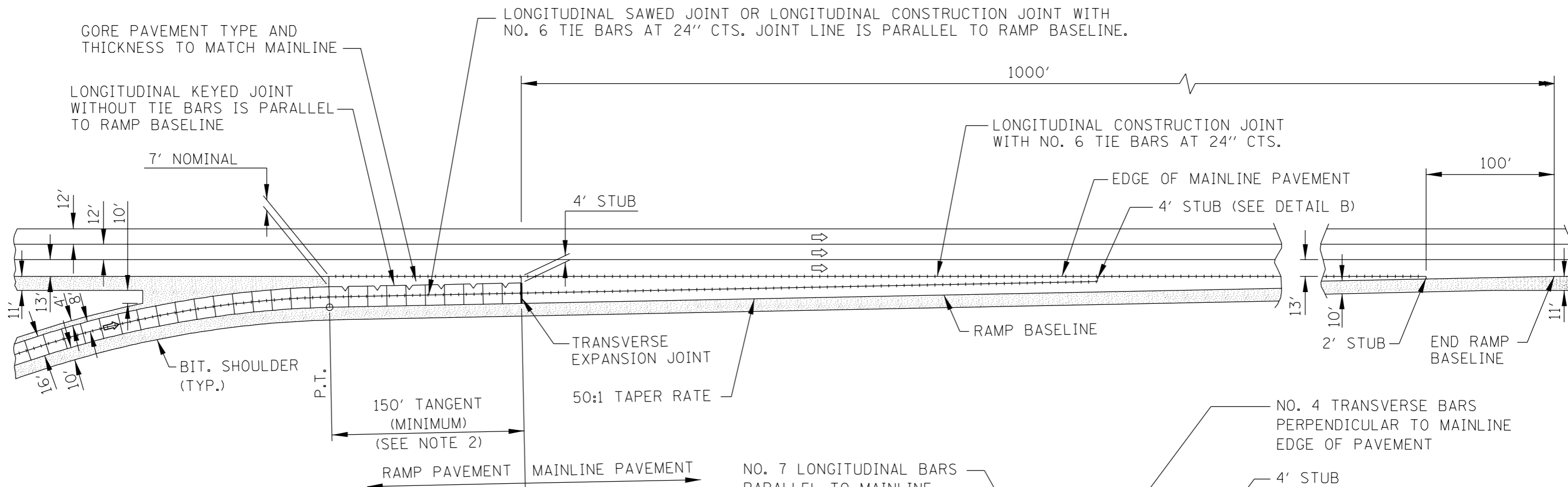
DETAIL A



DATE	REVISIONS

JOINTING PLAN
 ENTRANCE RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT ADJACENT
 TO JOINTED PCC MAINLINE PAVEMENT)
 STANDARD A14-00

APPROVED *Jeff Daley* DATE 10-15-2007
 CHIEF ENGINEER



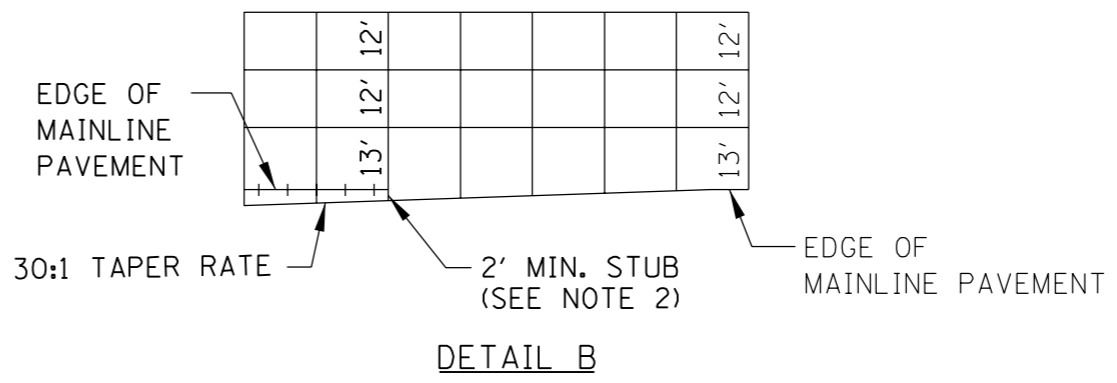
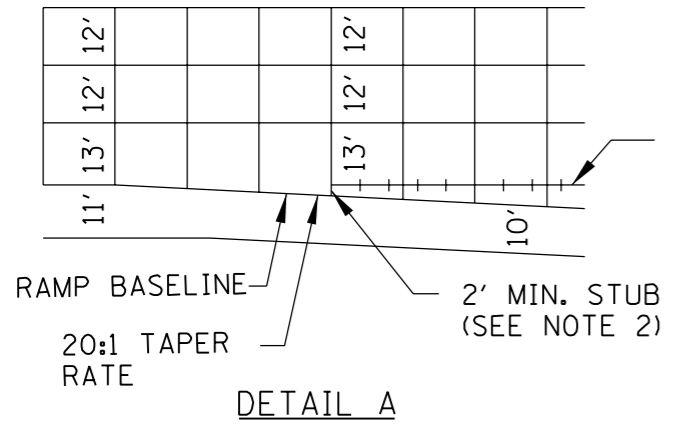
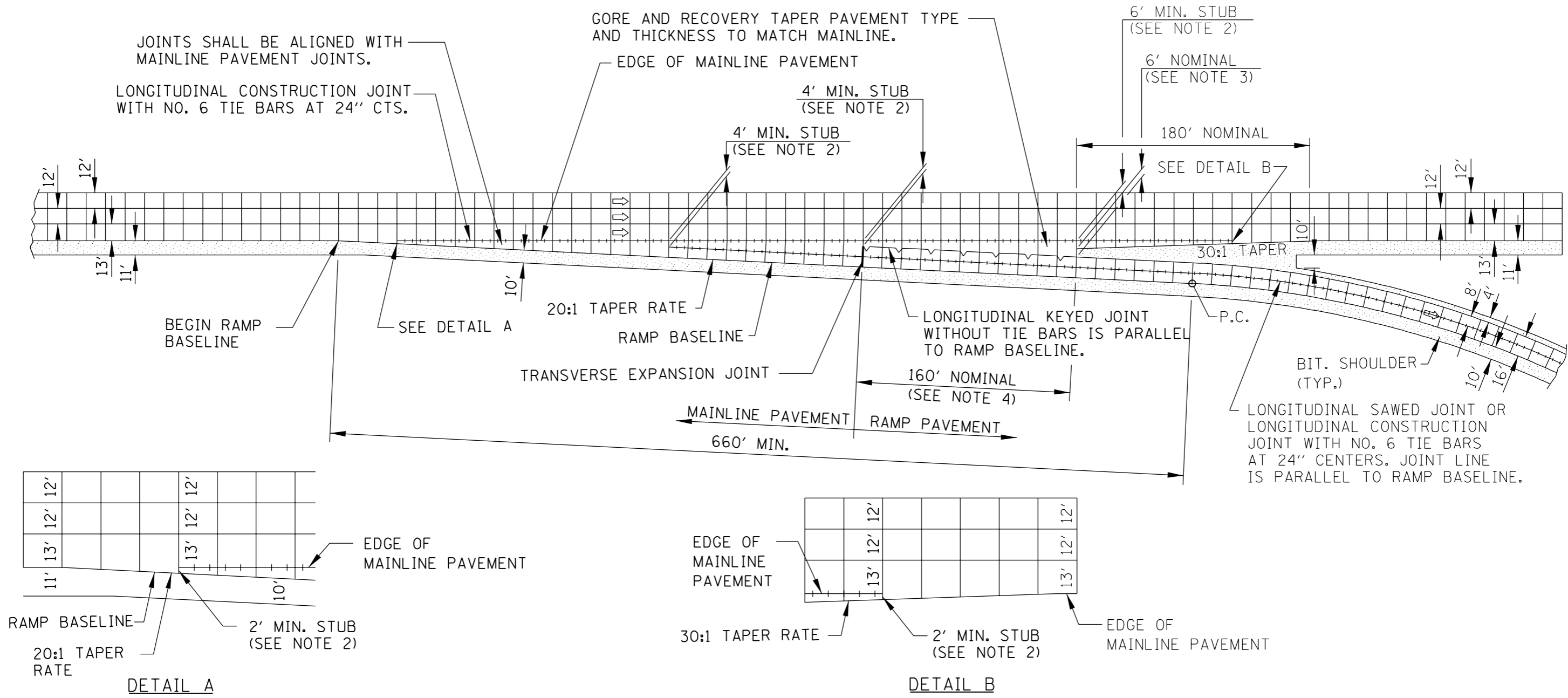
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3. SEE STANDARD A12 (BAR REINFORCEMENT FOR CRC PAVEMENT) FOR DETAILS OF PAVEMENT REINFORCEMENT.
4. TYPICAL PCC PAVEMENT JOINT SPACING SHALL BE 15 FEET.
5. AS ADDITIONAL RAMP LANES ARE ADDED, THE MAXIMUM JOINT SPACING SHALL BE 15' LONG BY 15' WIDE. TYPICAL JOINT SPACING IS 15' LONG BY 12' WIDE. LONGITUDINAL JOINT LOCATIONS IN THE WHEEL PATH SHALL BE MINIMIZED.

APPROVED *Jeff Daley* CHIEF ENGINEER DATE 10-15-2007



JOINTING PLAN
ENTRANCE RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT ADJACENT
TO JOINTED CRC MAINLINE PAVEMENT)
STANDARD A14-00



NOTES:

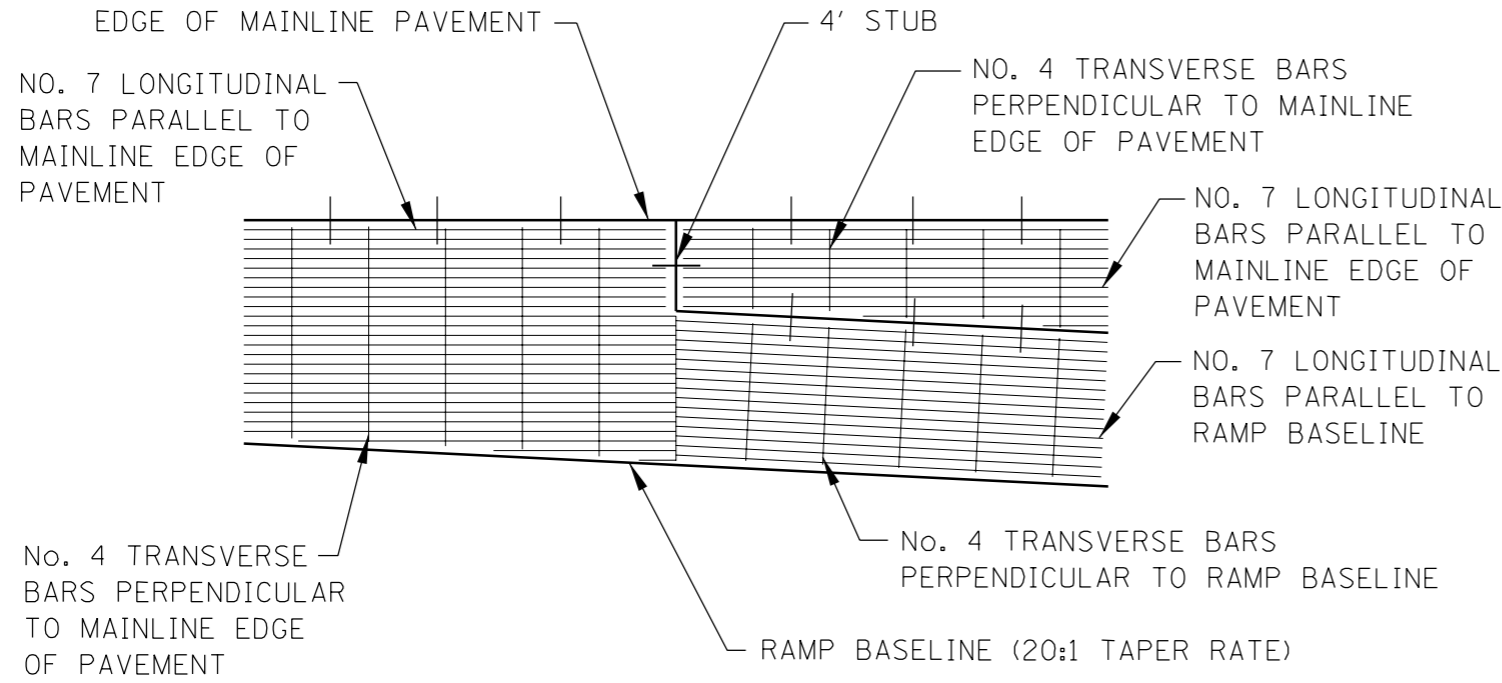
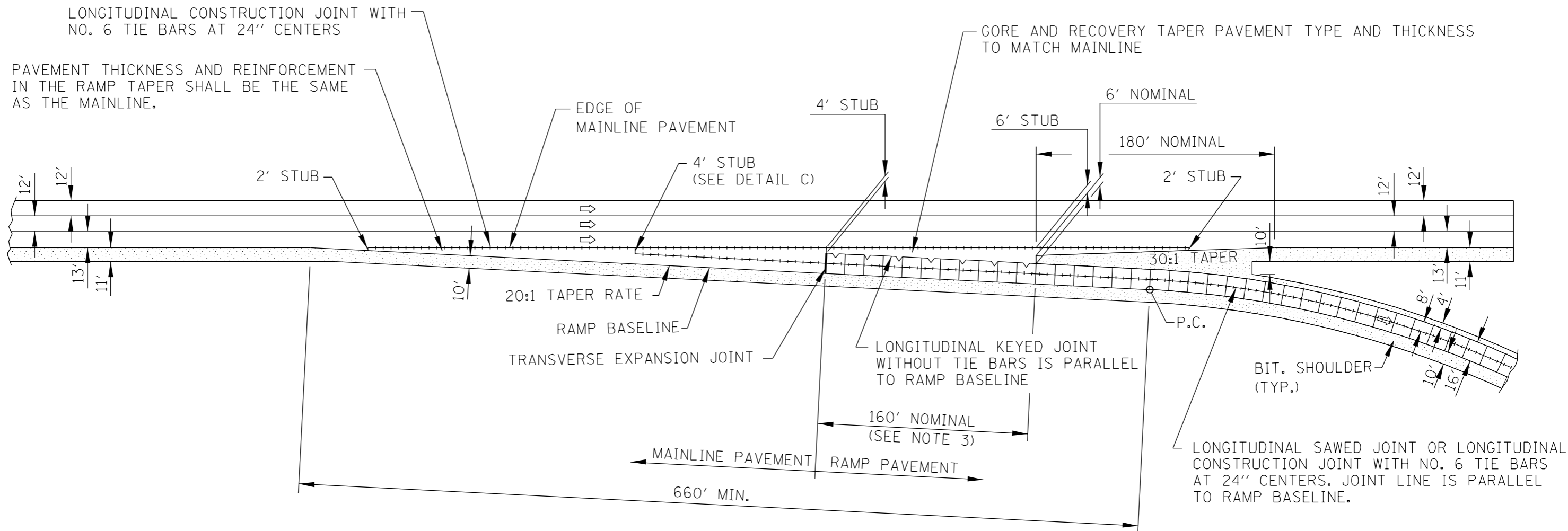
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3. 6-FOOT NOSE LOCATION SHALL BE ADJUSTED TO BE ALIGNED WITH A MAINLINE TRANSVERSE JOINT.
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APPROVED *Jeff Daley* CHIEF ENGINEER DATE 10-15-2007

DATE	REVISIONS

JOINTING PLAN
EXIT RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT ADJACENT
TO JOINTED PCC MAINLINE PAVEMENT)
STANDARD A15-00



DETAIL C

NOTES:

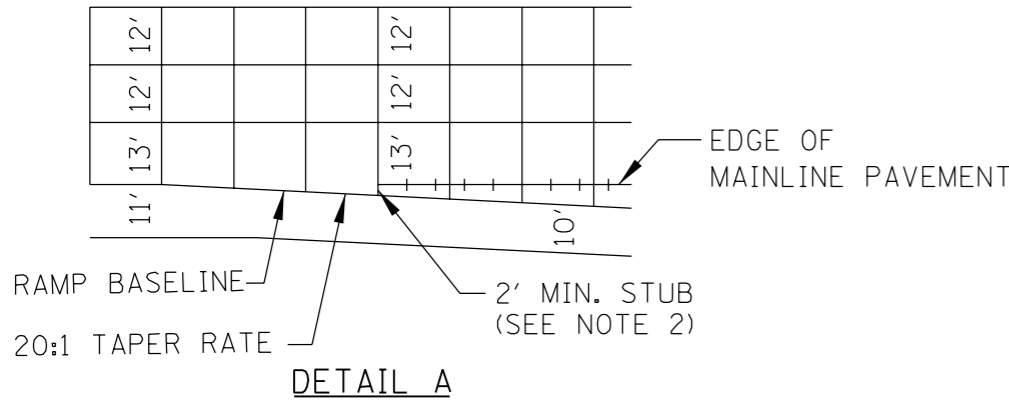
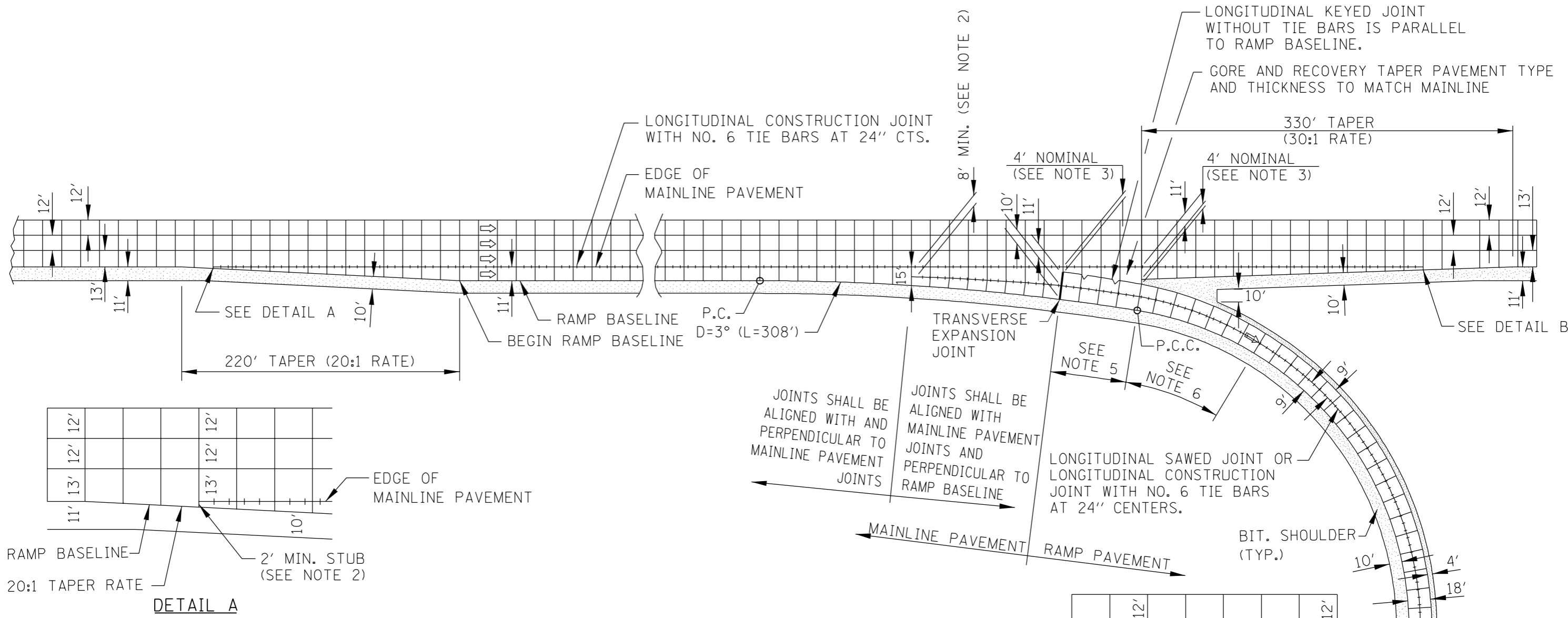
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APPROVED *Jeff Daley* CHIEF ENGINEER DATE 10-15-2007

Illinois Tollway
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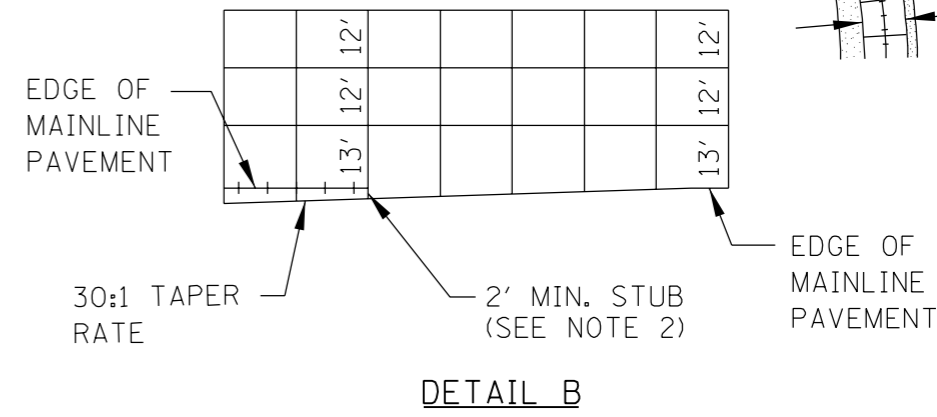
JOINTING PLAN
EXIT RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

STANDARD A15-00



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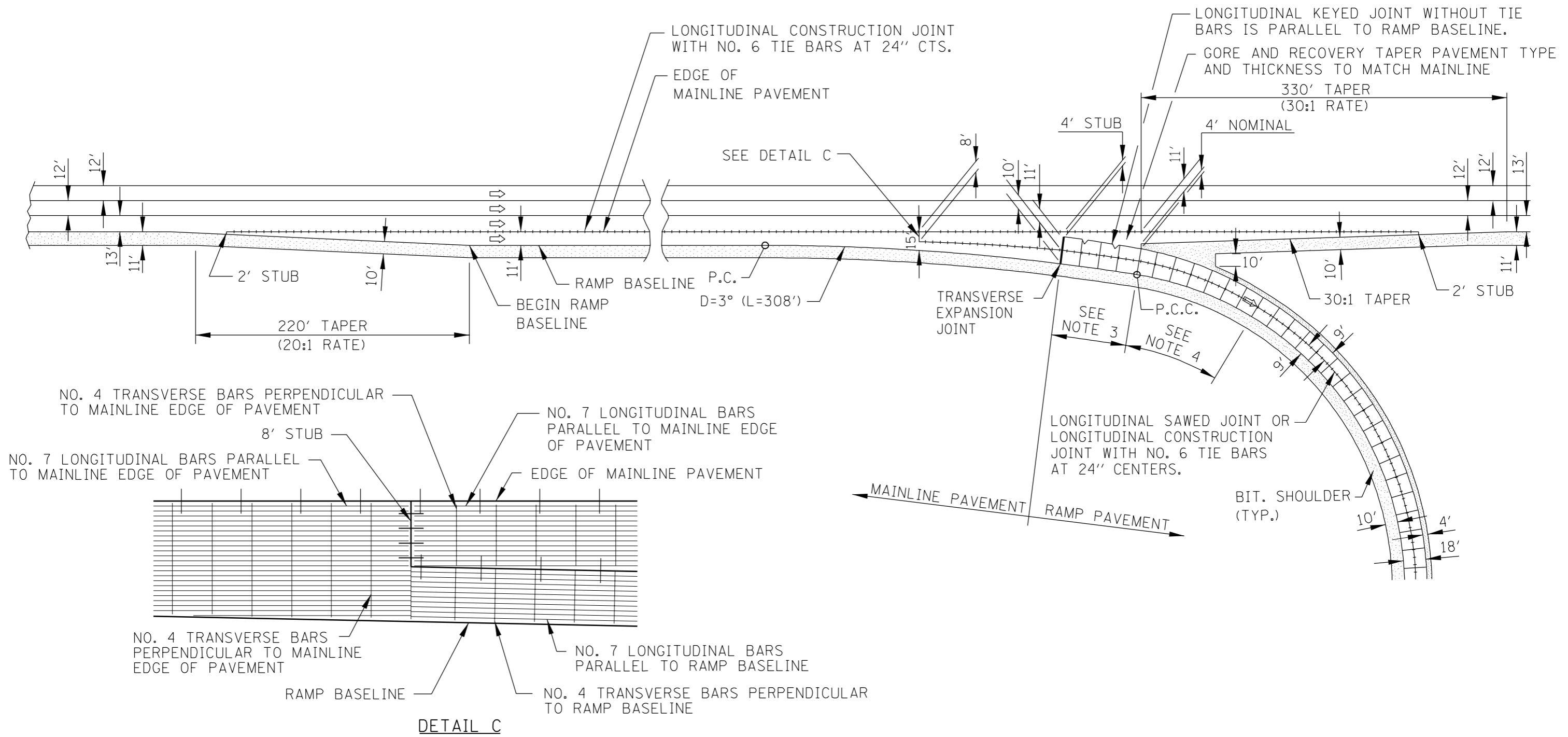
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2. STUBS SHALL BE THE MINIMUM DIMENSION AS SHOWN AND ALIGNED WITH A MAINLINE TRANSVERSE JOINT.
3. 4-FOOT NOSE LOCATION SHALL BE ADJUSTED TO BE ALIGNED WITH A MAINLINE TRANSVERSE JOINT.
4. TYPICAL PCC PAVEMENT JOINT SPACING SHALL BE 15 FEET.
5. THE THICKNESS OF THE JOINTED RAMP PAVEMENT SHALL MATCH THE MAINLINE PAVEMENT. THE EXTRA THICKNESS OF PAVEMENT SHALL BE INCLUDED IN THE PRICE FOR THE RAMP PAVEMENT.
6. RAMP NARROWS FROM 21' TO 18'. LONGITUDINAL JOINT SHALL TRANSITION FROM 10' FROM THE RAMP BASELINE TO 9' FROM THE RAMP BASELINE.
7. AS ADDITIONAL RAMP LANES ARE ADDED, THE MAXIMUM JOINT SPACING SHALL BE 15' LONG BY 15' WIDE. TYPICAL JOINT SPACING IS 15' LONG BY 12' WIDE. LONGITUDINAL JOINT LOCATIONS IN THE WHEEL PATH SHALL BE MINIMIZED.



APPROVED *Jeff Daley* DATE 10-15-2007
CHIEF ENGINEER

DATE	REVISIONS

JOINTING PLAN
 PARALLEL EXIT RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)
 STANDARD A16-00



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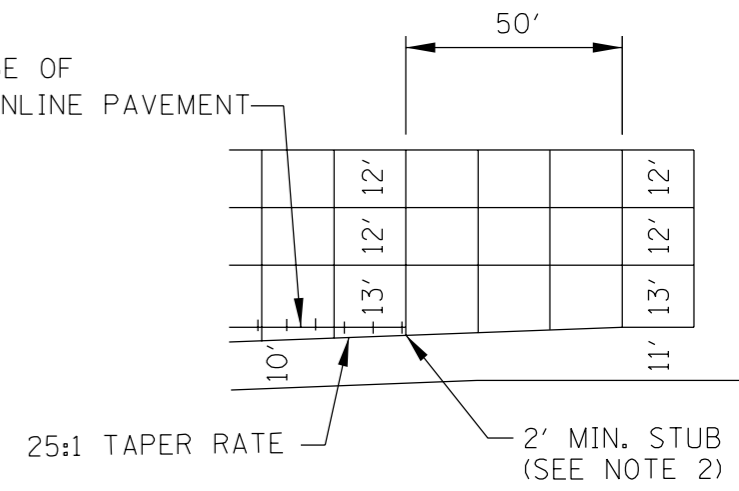
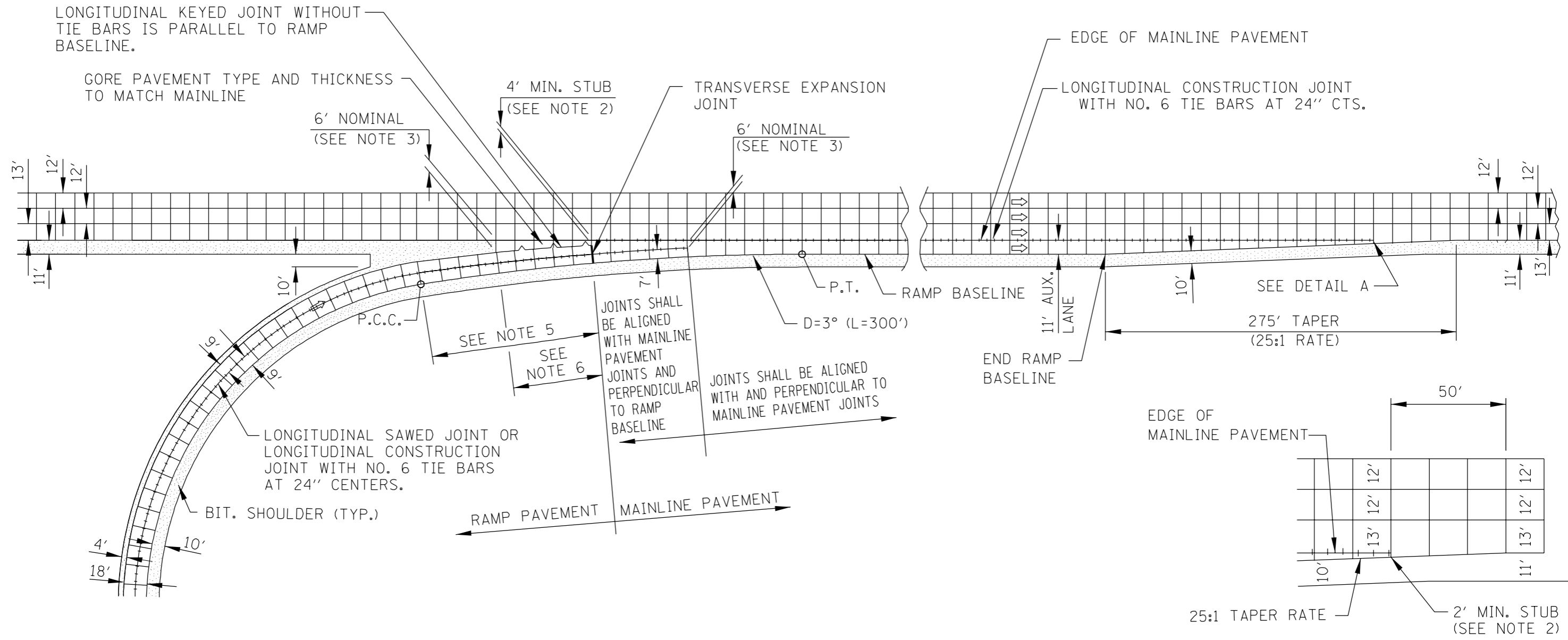
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APPROVED *Jeff Daley* CHIEF ENGINEER DATE 10-15-2007

Illinois Tollway
Open Roads for a Faster Future

JOINTING PLAN
 PARALLEL EXIT RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT ADJACENT
 TO CRC MAINLINE PAVEMENT)

STANDARD A16-00



NOTES:

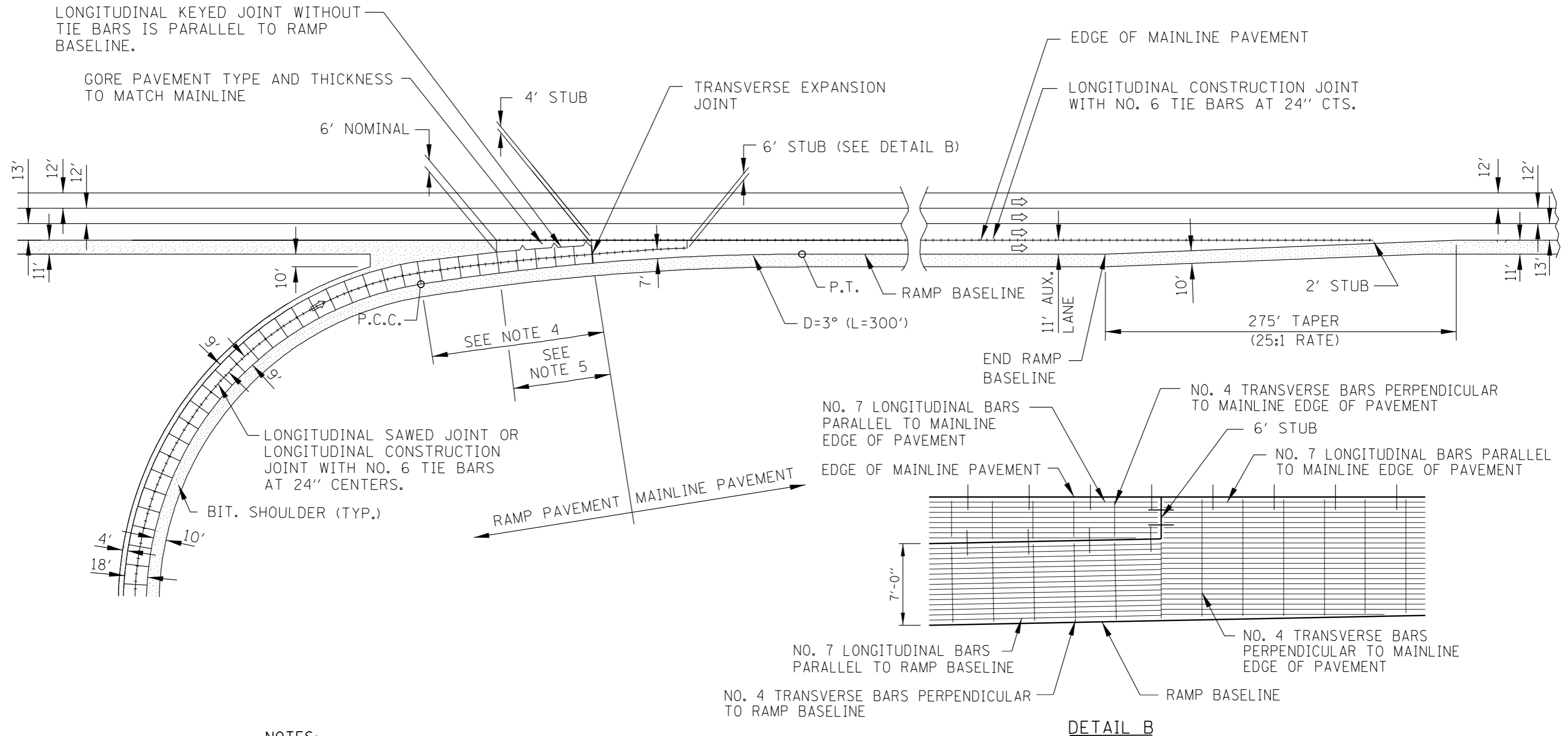
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3. 6-FOOT NOSE LOCATION SHALL BE ADJUSTED TO BE ALIGNED WITH A MAINLINE TRANSVERSE JOINT.
4. TYPICAL PCC PAVEMENT JOINT SPACING SHALL BE 15 FEET.
5. RAMP TAPERS FROM 18' TO 14'. LONGITUDINAL JOINT SHALL BE 9' FROM THE RAMP BASELINE AT THE PCC AND TRANSITION TO BE 7' FROM THE RAMP BASELINE AT THE EXPANSION JOINT.
6. THE THICKNESS OF THE JOINTED RAMP PAVEMENT SHALL MATCH THE MAINLINE PAVEMENT. THE EXTRA THICKNESS OF PAVEMENT SHALL BE INCLUDED IN THE PRICE FOR THE RAMP PAVEMENT.
7. AS ADDITIONAL RAMP LANES ARE ADDED, THE MAXIMUM JOINT SPACING SHALL BE 15' LONG BY 15' WIDE. TYPICAL JOINT SPACING IS 15' LONG BY 12' WIDE. LONGITUDINAL JOINT LOCATIONS IN THE WHEEL PATH SHALL BE MINIMIZED.



DATE	REVISIONS

JOINTING PLAN PARALLEL
ENTRANCE RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT ADJACENT
TO JOINTED PCC MAINLINE PAVEMENT)
STANDARD A17-00

APPROVED *Jeff Daley* DATE 10-15-2007
CHIEF ENGINEER



NOTES:

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2. SEE STANDARD A12 (BAR REINFORCEMENT FOR CRC PAVEMENT) FOR DETAILS OF PAVEMENT REINFORCEMENT.
3. TYPICAL PCC PAVEMENT JOINT SPACING SHALL BE 15 FEET.
4. RAMP TAPERS FROM 18' TO 14'. LONGITUDINAL JOINT SHALL BE 9' FROM THE RAMP BASELINE AT THE PCC AND TRANSITION TO BE 7' FROM THE RAMP BASELINE AT THE EXPANSION JOINT.
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APPROVED *Jeff Daley* DATE 10-15-2007
CHIEF ENGINEER

Illinois Tollway
Open Roads for a Faster Future

JOINTING PLAN PARALLEL
 ENTRANCE RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT ADJACENT
 TO CRC MAINLINE PAVEMENT)

STANDARD A17-00

FABRICATION GENERAL NOTES

MATERIALS:

1. EPOXY COATED DOWEL BARS USED SHALL COMPLY WITH ASTM A 615 GRADE 60.
2. ALL EMBEDDED LIFTING HARDWARE USED SHALL BE GALVANIZED.
 - A. FOR LIFTING INSERTS, INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION INCLUDING MINIMUM EDGE DISTANCE AND SPACING REQUIREMENTS. UNLESS THE CONTRACTOR AND FABRICATOR WILL BE USING A LIFTING BEAM OR ROLLING SHEAVE TO ENSURE THAT EACH OF THE FOUR INSERTS WILL SHARE THE LOAD EQUALLY, TWO OF THE FOUR INSERTS MUST BE CAPABLE OF CARRYING THE TOTAL LOAD WITH A 4:1 SAFETY FACTOR WHILE ADJUSTING FOR THE ANGLE OF THE CABLES AND THE STRENGTH OF THE CONCRETE OVER TIME. THE INSERT SHOULD BE RECESSED A MINIMUM OF 1/2" UNLESS THE SLAB IS TO BE OVERLAID IMMEDIATELY AFTER PLACEMENT. THE INSERT SHALL LEAVE A MAXIMUM 1/4" DIAMETER THREADED HOLE TO BE GROUTED AFTER SLAB INSTALLATION. IF THE INSERT IS INSTALLED WITH A FULL SLAB PENETRATION, THE LIFTING INSERT CAN BE USED AS A BEDDING GROUT PORT AT THE CONTRACTOR'S DISCRETION.
 - B. FOR LIFTING PLATES, INSTALLATION MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND HAVE A STANDARD 5:1 SAFETY FACTOR FOR LIFTING HARDWARE. UNLESS A LIFTING BEAM IS USED TO SPACE THE FOUR PICK POINTS DIRECTLY ABOVE THE INSERTS, THE LIFTING HARDWARE MUST BE RATED FOR USE WITH CABLES AT AN ANGLE AND TWO OF THE FOUR DEVICES MUST BE CAPABLE OF LIFTING THE FULL LOAD AS WITH THE INSERTS REFERENCED IN THE PREVIOUS NOTE.
3. REINFORCEMENT USED SHALL BE EPOXY COATED, IN ACCORDANCE WITH ASTM A706 GRADE 60 AND IN COMPLIANCE WITH ARTICLE 1006.10 OF THE STANDARD SPECIFICATIONS.
4. CONCRETE COVER OVER REINFORCEMENT TO BE MAINTAINED USING WIRE OR THERMOPLASTIC CHAIRS OR SPACERS OR AN APPROVED EQUIVALENT.
5. CONCRETE USED SHALL MEET THE FOLLOWING REQUIREMENTS:
 - A. CONCRETE USED SHALL BE CLASS PC (f'c = 4,500 PSI @ 28 DAYS) IN ACCORDANCE WITH SECTION 1020 OF THE STANDARD SPECIFICATIONS.
 - B. MINIMUM STRIPPING STRENGTH OF CONCRETE SHALL BE 3,000 PSI.
 - C. CONCRETE MIX DESIGN TO BE SUBMITTED AND APPROVED PRIOR TO FABRICATION.
 - D. CURING OF CONCRETE SLABS TO BE IN ACCORDANCE WITH THE SPECIFIED METHODS OF SECTION 1020 OF THE STANDARD SPECIFICATIONS. THE CURING PROCEDURE TO BE USED SHALL BE SUBMITTED AND APPROVED PRIOR TO FABRICATION.

SLAB DESIGN:

6. FOR STANDARD SLABS:
 - A. USE SLAB DIMENSIONS SHOWN ON THE TOLLWAY STANDARD DRAWINGS FOR DESIGN SLAB THICKNESS, WIDTH, AND LENGTH.
 - B. USE ONE LAYER OF REINFORCEMENT WITH A MINIMUM STEEL AREA RATIO OF 0.2%.
 - C. SIZE ANY PREFORMED SLOTS THAT ARE DESIGNED FOR CONSECUTIVE STANDARD SLABS CONSISTENT WITH THE THICKNESS OF THE SLAB SUCH THAT THE BOTTOM OF THE OPENING IS AT LEAST 2 1/2" (±1/4") WIDE AND AT LEAST 1/2" OF GROUT COVER IS PROVIDED UNDER THE DOWEL.
 - D. FOR STANDARD SLABS, IT SHALL BE THE CONTRACTOR'S OPTION TO EITHER PRE-INSTALL/EMBED THE DOWEL BARS INTO THE SLABS AT THE PRECAST PLANT AND PARTIALLY RETROFIT THE EMBEDDED DOWELS INTO ADJACENT PAVEMENT SLABS IN THE FIELD, OR TO FULLY RETROFIT THE DOWEL BARS INTO BOTH THE INSTALLED PRECAST SLAB AND ANY ADJACENT SLAB IN THE FIELD DURING PLACEMENT IN ACCORDANCE WITH CONTRACT SPECIFICATIONS AND THE GENERAL NOTES FOR INSTALLATION. THE LOCATIONS AND SPACING OF THE DOWEL BARS IN THE STANDARD SLABS SHALL BE SHOWN ON THE TOLLWAY STANDARD DRAWINGS AND WITHIN THE SPECIFIED TOLERANCES FOR ALIGNMENT. FOR DOWEL BAR RETROFITTING WITH STANDARD SLAB INSTALLATION, A STANDARD TEMPLATE SHALL BE USED TO LOCATE THE CUTS AND POSITION THE DOWEL SLOTS CONSISTENTLY.
7. FOR CUSTOM SLABS:
 - A. USE SLAB DIMENSIONS SHOWN ON THE TOLLWAY STANDARD DRAWINGS FOR DESIGN SLAB THICKNESS, LENGTHS AND WIDTHS OF EACH CUSTOM SLAB SHALL BE ACCURATE DIMENSIONS BASED ON FIELD SURVEY DATA COLLECTED BY THE CONTRACTOR TO DEVELOP WORKING DRAWINGS FOR THE SLAB. MINIMUM AND MAXIMUM DIMENSIONS FOR LENGTHS AND WIDTHS ARE NOTED ON THE STANDARD DRAWINGS.

- B. ANY CUSTOM SLABS > 6 FT. IN LENGTH THAT WILL BE OPENED TO TRAFFIC BEFORE ANY HARDWARE AND UNDERSLAB GROUTING OR FILLING OCCURS SHALL REQUIRE TWO (2) LAYERS OF STEEL REINFORCEMENT AS NOTED ON SHEET 5.
 - C. FOR ANY CUSTOM SLAB FABRICATED TO REPLACE EXISTING WARPED PAVEMENT AT AN ISOLATED LOCATION, THE CUSTOM SLAB SHALL BE FABRICATED ON A SINGLE PLANE. THE SLAB THICKNESS OR BEDDING MATERIAL SHALL BE ADJUSTED TO ALLOW FOR THE ELEVATION OF ALL FOUR (4) CORNERS OF THE CUSTOM SLAB TO BE FLUSH OR HIGHER THAN THE EXISTING OR ADJOINING PAVEMENT WHEN INSTALLED. THE SURFACE OF ALL CUSTOM SLABS REPLACING WARPED PAVEMENT SHALL RECEIVE A COMPLETE PROFILE DIAMOND GRIND AFTER INSTALLATION AND GROUTING TO PROVIDE A SMOOTH SURFACE AND LEAVE ALL EDGES FLUSH WITH THE ADJOINING PAVEMENTS. THE PROFILE GRINDING OPERATION FOR CUSTOM SLABS REPLACING ANY WARPED PAVEMENTS, ON CURVED RAMPS OR SUPERELEVATED MAINLINE SECTIONS, SHALL BE IN ACCORDANCE WITH CONTRACT SPECIAL PROVISIONS FOR PROFILE DIAMOND GRINDING AND PAID FOR SEPARATELY. FOR CONSECUTIVELY PLACED CUSTOM SLABS FABRICATED TO REPLACE EXISTING WARPED PAVEMENT, FULL SURVEYS FOR X, Y, AND Z DIMENSIONS SHALL BE TAKEN BY THE CONTRACTOR BEFORE FABRICATION IN ORDER TO MATCH EXISTING GRADES AT ALL CORNERS DURING INSTALLATION.
 - D. FOR ALL CUSTOM SLABS, THE DOWEL BARS SHALL BE FULLY RETROFITTED INTO ADJACENT PAVEMENT SLABS DURING FIELD INSTALLATION OF THE PRECAST SLAB IN ACCORDANCE WITH CONTRACT SPECIFICATIONS AND GENERAL NOTES FOR INSTALLATION.
8. ALL FABRICATED SLABS:
- A. THE MAXIMUM ALLOWABLE JOINT WIDTH CAN NOT BE LESS THAN THE TOTAL OF THE ALLOWABLE SLAB FABRICATION TOLERANCES.
 - B. BEDDING GROUT PORT HOLES SHALL BE LOCATED ON TRANSVERSE LINES ACROSS THE SLAB THAT ARE PARALLEL WITH EXISTING TRANSVERSE JOINTS. EACH PORT HOLE SHALL BE EVENLY DISTRIBUTED ON EACH LINE. THE DISTANCE BETWEEN BEDDING GROUT PORT HOLES SHALL NOT EXCEED 4'-0", WITH THE PORT HOLES AT THE END OF THE TRANSVERSE LINES TO BE NO LESS THAN 1'-8" AND NO MORE THAN 3'-0" OFF A LONGITUDINAL JOINT. THE TRANSVERSE LINES FOR PORT HOLES SHALL BE NO MORE THAN 4'-0" APART, AND NO LESS THAN 1'-8" AND NO MORE THAN 2'-6" OFF OF A TRANSVERSE JOINT.
 - C. RECESS LIFTING DEVICES 1" MINIMUM BELOW THE SURFACE OF THE SLAB TO ALLOW FOR A MINIMUM GROUT COVER OF 1" ON SLABS THAT WILL NOT BE OVERLAID.

FABRICATION:

9. PREPARE WORKING DRAWINGS THAT SHALL INCLUDE THE FOLLOWING INFORMATION:
 - A. SLAB LAYOUT DRAWING FOR TYPICAL STANDARD SLABS AND FOR EACH CUSTOM SLAB TO BE FABRICATED, WITH ACCURATE DIMENSIONS CITED.
 - B. REINFORCEMENT SIZES, SPACING, NUMBER OF MATS, AND METHOD OF MAINTAINING CONCRETE COVER.
 - C. SIZES AND LOCATIONS FOR EMBEDDED DOWELS, OF DOWEL BARS TO BE RETROFITTED AFTER PLACEMENT OF THE SLAB, AND OF PREFORMED SLOTS AT THE FEMALE END OF STANDARD SLABS FOR CONSECUTIVE PLACEMENT.
 - D. SIZE AND LOCATION OF GROUT PORTS, LIFTING ANCHORS, AND GROUT SEAL GASKETS.
 - E. COMPRESSIVE STRENGTH AND AIR CONTENT OF CONCRETE.
 - F. CONCRETE CURING METHOD TO BE USED.
 - G. MARKING LEGEND FOR EACH SLAB TO INDICATE PRECAST MANUFACTURER, AND DATE OF PRODUCTION; AND FOR EACH CUSTOM SLAB TO INCLUDE CONTRACT NUMBER AND MARK NUMBER OF THE SLAB.
 - H. WEIGHT OF EACH SLAB.
 - I. THE SIZE AND LOCATION OF ANY EMBEDDED HARDWARE (TREADLE FRAMES, CONDUITS, ETC.) REQUIRED FOR CUSTOM PLAZA SLABS.
10. PERFORM A PRE-POUR INSPECTION OF THE FORMS TO CONFIRM THAT THEY ARE ASSEMBLED IN ACCORDANCE WITH THE FOLLOWING TOLERANCES:

LENGTH AND WIDTH	± 1/8"
DIAGONALS	± 3/16"
DOWEL VARIANCE FROM LEVEL, SQUARENESS TO EDGE OF SLAB, AND LOCATION.	± 1/8"
EDGE SQUARENESS -1/8" IN 10" (IN RELATION TO TOP AND BOTTOM SURFACES).	
11. INCLUDE A 1 INCH CHAMFER ALONG ALL BOTTOM EDGES OF SLABS. AND A STONED EDGE TO ALL TOP EDGES OF THE SLAB.
12. THE EXPOSED SURFACES OF ALL PREFORMED SLOTS FOR DOWEL BARS SHALL BE SANDBLASTED.

13. ACCURATELY SCREED TOP OF SLAB TO MEET SURFACE AND THICKNESS TOLERANCES.
14. APPLY EITHER AN ASTRO TURF DRAG FINISH TO TOP OF SLAB IN ACCORDANCE WITH ARTICLE 420.09(e)(2) OF THE STANDARD SPECIFICATIONS, OR A TINED FINISH IN ACCORDANCE WITH ARTICLE 420.09(e)(1) OF THE STANDARD SPECIFICATIONS AS INDICATED IN THE SLAB DESIGN SCHEDULE ON CONTRACT DRAWINGS.

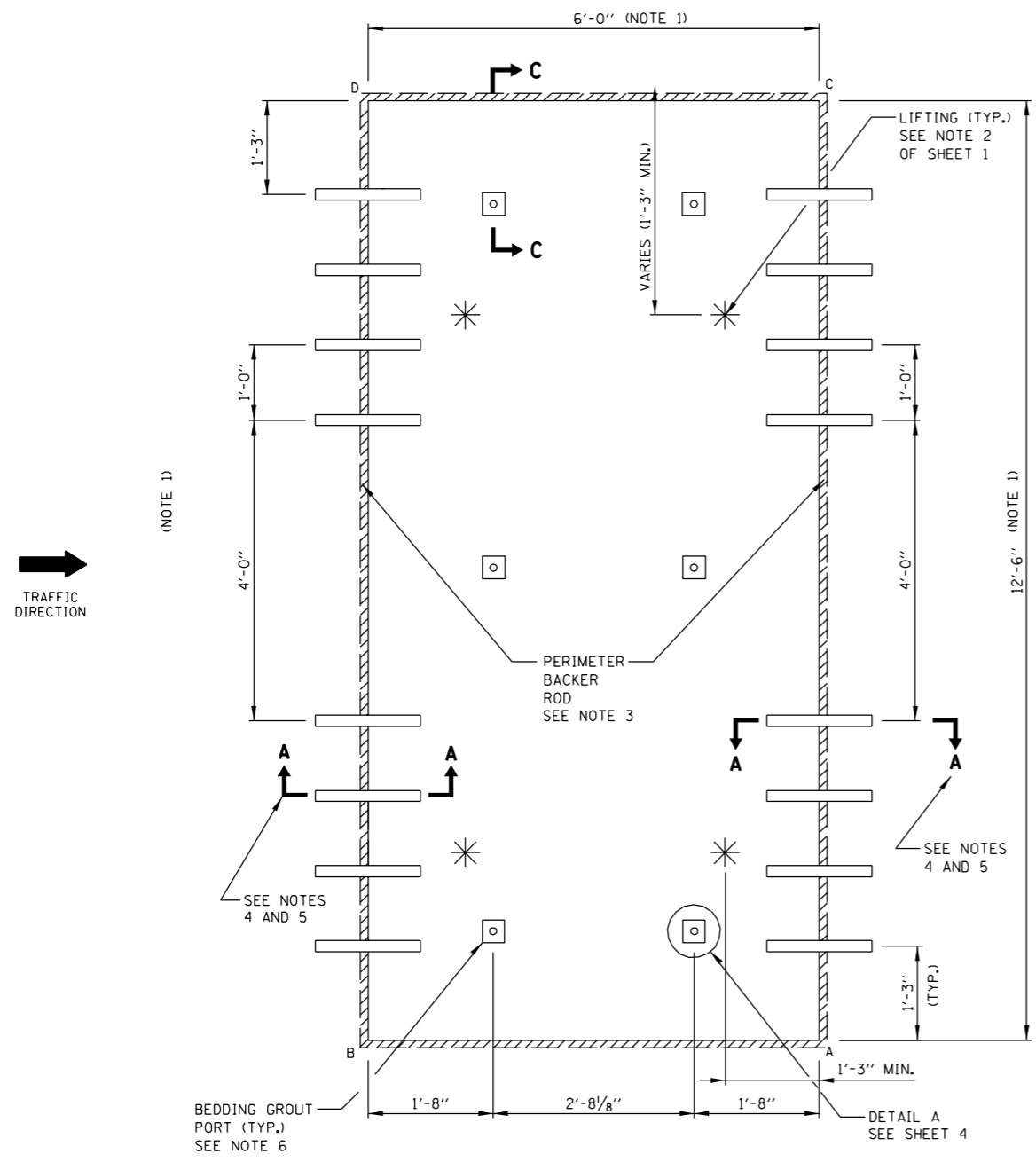


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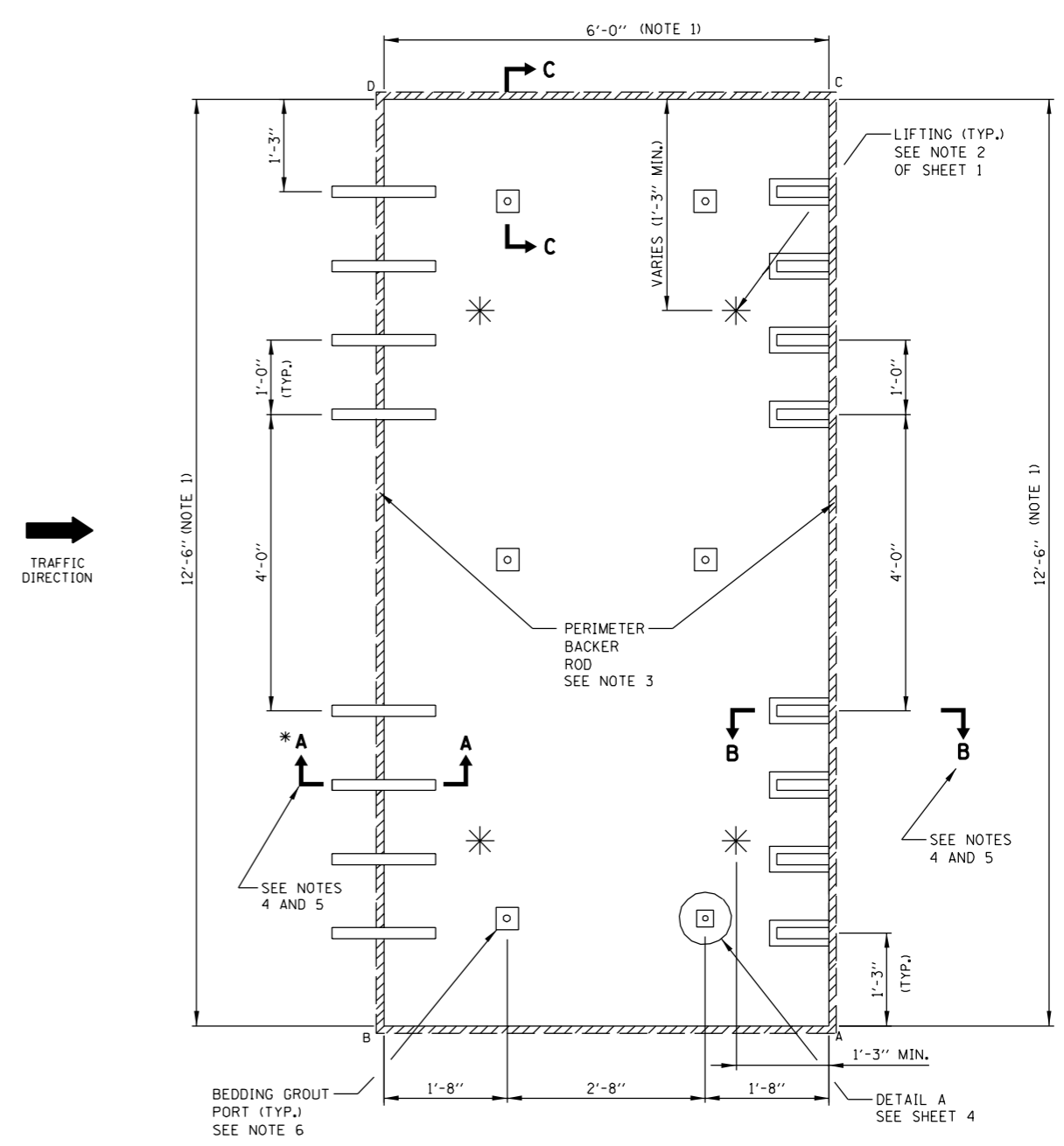
PRECAST PAVEMENT SLABS

STANDARD A18-00

APPROVED
CHIEF ENGINEER
DATE 5-1-2009



STANDARD 12'-6" WIDE PANEL LAYOUT FOR ISOLATED PLACEMENT



STANDARD 12'-6" WIDE PANEL LAYOUT FOR CONSECUTIVE PLACEMENT

NOTES:

1. THE WIDTH AND LENGTH OF PRODUCED SLABS SHALL BE THE INDICATED DIMENSIONS $\pm 1/8"$.
2. SLAB THICKNESS SHALL BE $11\frac{1}{2}" \pm 1/8"$.
3. A FOAM BACKER ROD SHALL BE PLACED AROUND THE OUTSIDE PERIMETER OF THE SLAB AT THE BOTTOM OF THE JOINTS AFTER THE SLAB HAS BEEN SET AND BEFORE BEDDING GROUT OR POLYURETHANE LEVELING FILL IS APPLIED. THE BACKER ROD SHALL NOT BE REQUIRED WHEN ANY SLAB IS LEVELED WITH A FLOWABLE FILL.
4. SEE SHEET 4 FOR SECTION DETAILS.
5. IT SHALL BE THE CONTRACTOR'S OPTION TO REPLACE ANY EMBEDDED DOWEL BARS OR PREFORMED SLOTS AS SHOWN ON THESE DRAWINGS WITH FULLY RETROFITTED DOWEL BARS FIELD INSTALLED IN ACCORDANCE WITH "DETAIL C" OF SHEET 11. THE CONTRACTOR SHALL USE AN APPROVED TEMPLATE TO LOCATE THE SAW CUTS REQUIRED FOR PROPER SPACING AND RETROFITTING OF THE DOWEL BARS IN ACCORDANCE WITH THESE DRAWINGS. EITHER SINGLE DIAMOND BLADED SAWS OR DIAMOND BLADED GANG SAWS SHALL BE USED TO MAKE THE SAW CUTS PERPENDICULAR TO THE TRANSVERSE (NONSKewed) JOINT LINE TO ALLOW FOR DOWEL BAR PLACEMENTS WITHIN THE SPECIFIED TOLERANCES.
6. SEE NOTE 8 ON SHEET 1 FOR LOCATING BEDDING GROUT PORTS.

* FOR INTERNAL CONSECUTIVE SLABS, PREFORMED SLOTS IN ACCORDANCE WITH SECTION B-B OF SHEET 4 MAY BE USED IN-PLACE OF EMBEDDED DOWELS OR OF FIELD RETROFITTED DOWEL BARS WITH SAWCUT SLOTS. ALL PREFORMED SLOTS MUST BE FILLED BEFORE BEING OPENED TO TRAFFIC.

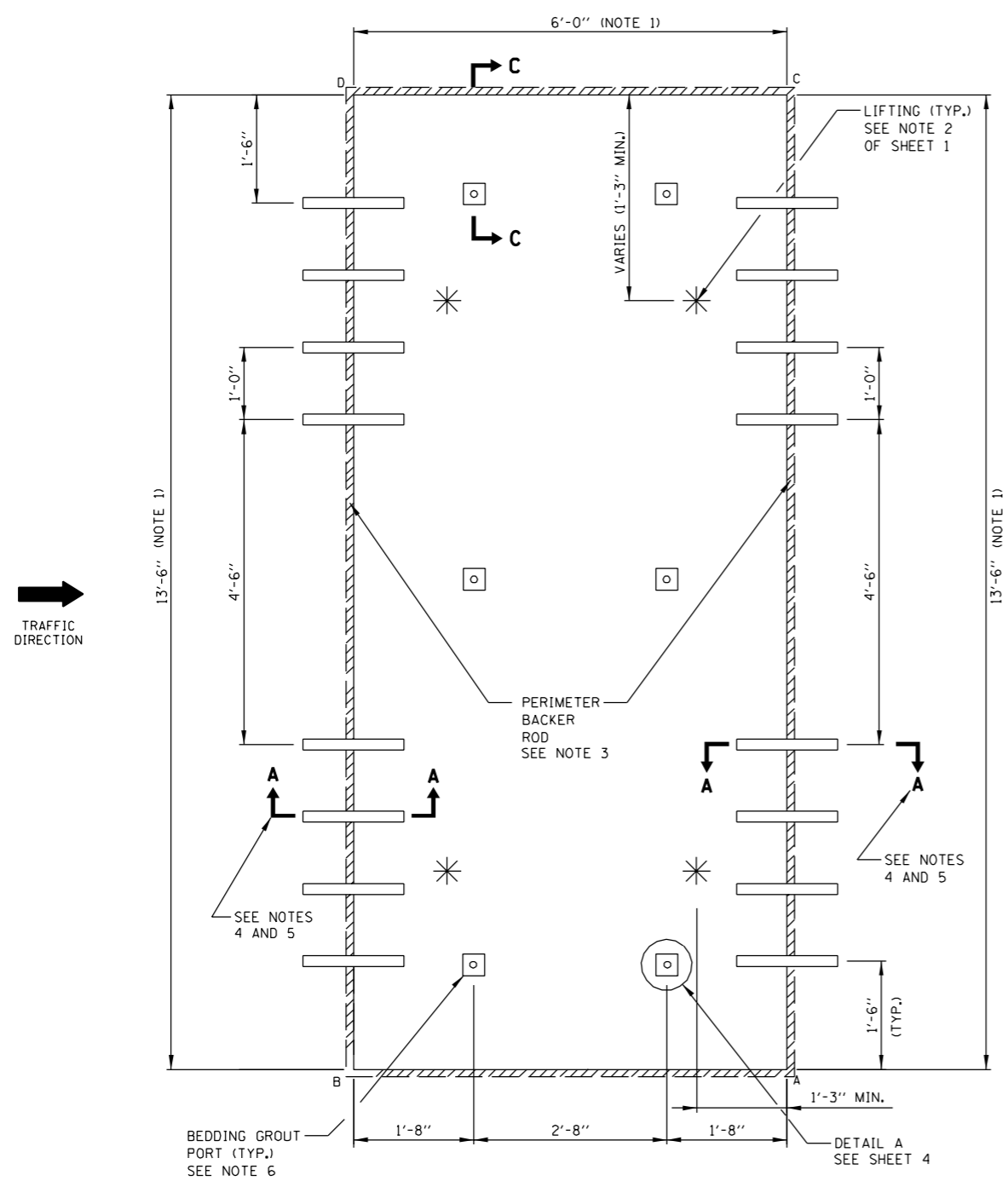
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PRECAST PAVEMENT SLABS

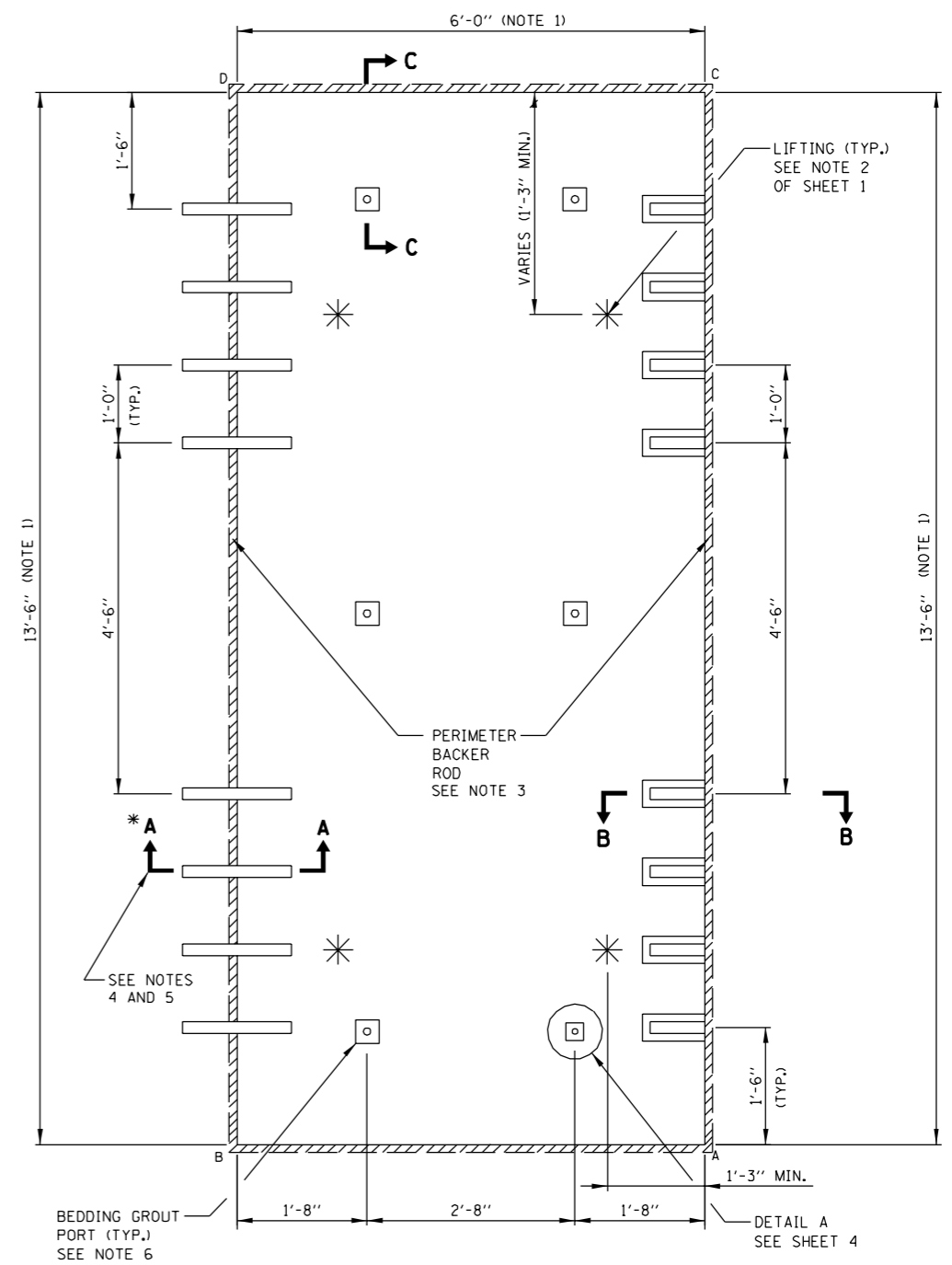
STANDARD A18-00



STANDARD 13'-6" WIDE PANEL LAYOUT FOR ISOLATED PLACEMENT

NOTES:

1. THE WIDTH AND LENGTH OF PRODUCED SLABS SHALL BE THE INDICATED DIMENSIONS $\pm 1/8"$.
2. SLAB THICKNESS SHALL BE $11\frac{1}{2}" \pm 1/8"$.
3. A FOAM BACKER ROD SHALL BE PLACED AROUND THE OUTSIDE PERIMETER OF THE SLAB AT THE BOTTOM OF THE JOINTS AFTER THE SLAB HAS BEEN SET AND BEFORE BEDDING GROUT OR POLYURETHANE LEVELING FILL IS APPLIED. THE BACKER ROD SHALL NOT BE REQUIRED WHEN ANY SLAB IS LEVELED WITH A FLOWABLE FILL.
4. SEE SHEET 4 FOR SECTION DETAILS.
5. IT SHALL BE THE CONTRACTOR'S OPTION TO REPLACE ANY EMBEDDED DOWEL BARS OR PREFORMED SLOTS AS SHOWN ON THESE DRAWINGS WITH FULLY RETROFITTED DOWEL BARS FIELD INSTALLED IN ACCORDANCE WITH "DETAIL C" OF SHEET 11. THE CONTRACTOR SHALL USE AN APPROVED TEMPLATE TO LOCATE THE SAW CUTS REQUIRED FOR PROPER SPACING AND RETROFITTING OF THE DOWEL BARS IN ACCORDANCE WITH THESE DRAWINGS. EITHER SINGLE DIAMOND BLADED SAWS OR DIAMOND BLADED GANG SAWS SHALL BE USED TO MAKE THE SAW CUTS PERPENDICULAR TO THE TRANSVERSE (NON-SKEWED) JOINT LINE TO ALLOW FOR DOWEL BAR PLACEMENTS WITHIN THE SPECIFIED TOLERANCES.
6. SEE NOTE 8 ON SHEET 1 FOR LOCATING BEDDING GROUT PORTS.



STANDARD 13'-6" WIDE PANEL LAYOUT FOR CONSECUTIVE PLACEMENT

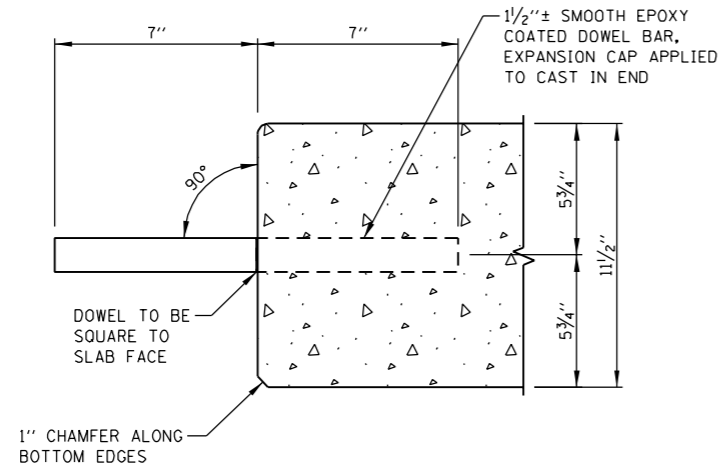
* FOR INTERNAL CONSECUTIVE SLABS, PREFORMED SLOTS IN ACCORDANCE WITH SECTION B-B OF SHEET 4 MAY BE USED IN-PLACE OF EMBEDDED DOWELS OR OF FIELD RETROFITTED DOWEL BARS WITH SAWCUT SLOTS. ALL PREFORMED SLOTS MUST BE FILLED BEFORE BEING OPENED TO TRAFFIC.

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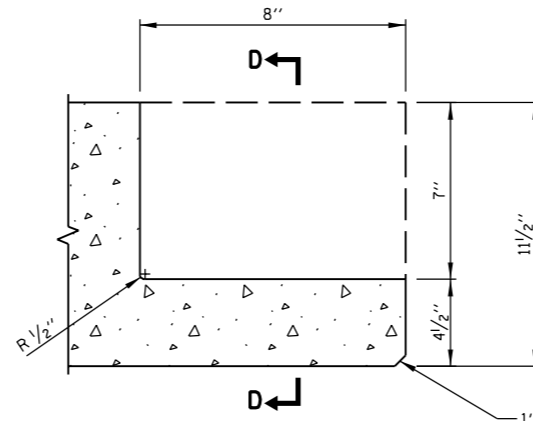
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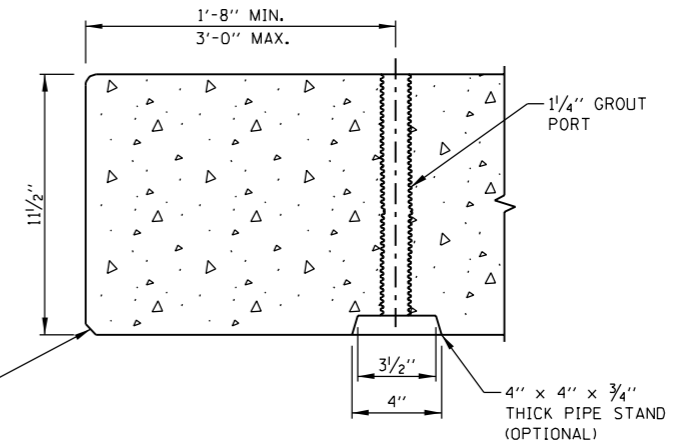
SECTION A-A

TRANSVERSE JOINT-DOWEL BAR (EMBEDDED INTO STANDARD PRECAST PAVEMENT SLAB FOR BOTH ISOLATED AND CONSECUTIVE PLACEMENT-TYP.)



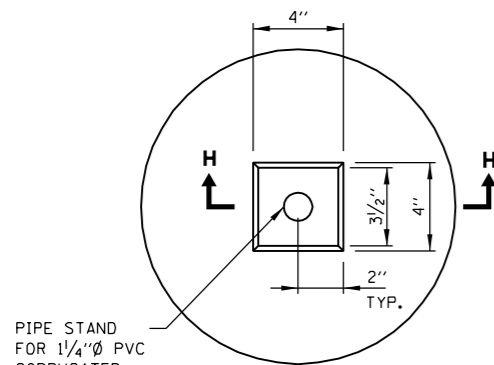
SECTION B-B

TRANSVERSE SLOT DETAIL FOR CONSECUTIVE STANDARD SLABS

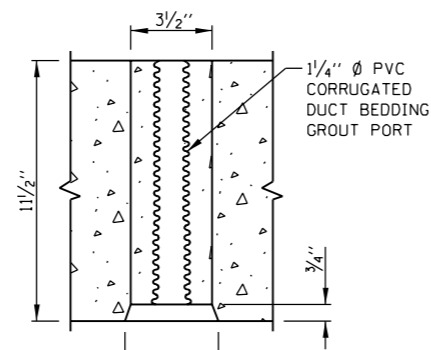


SECTION C-C

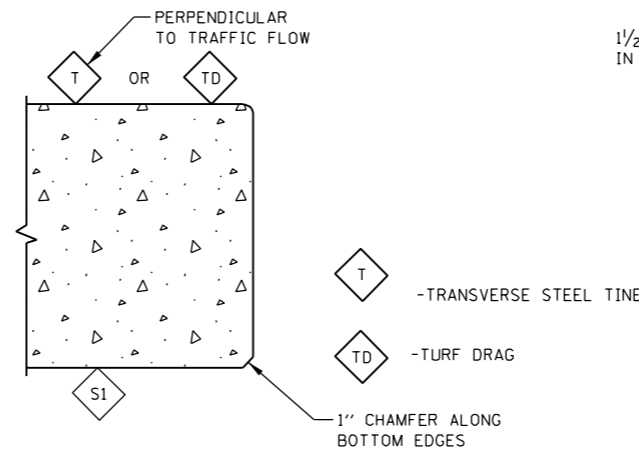
GROUT CHANNEL & PORT LOCATION



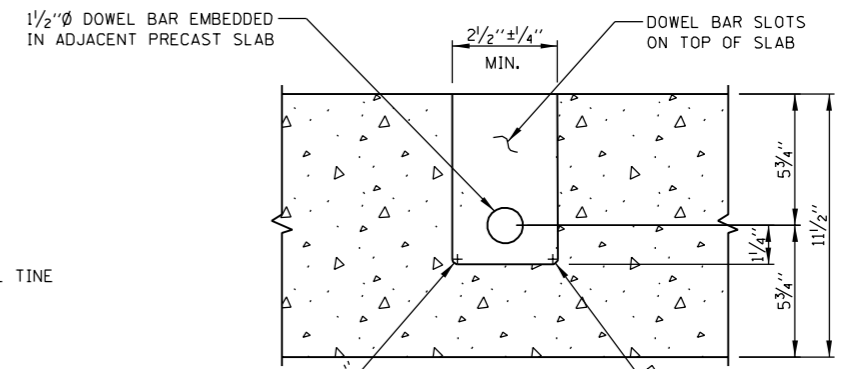
DETAIL A
GROUT PIPE STAND



SECTION H-H
PIPE STAND ELEVATION



FINISH SCHEDULE



SECTION D-D
DOWEL BAR SECTION

FABRICATION DETAILS

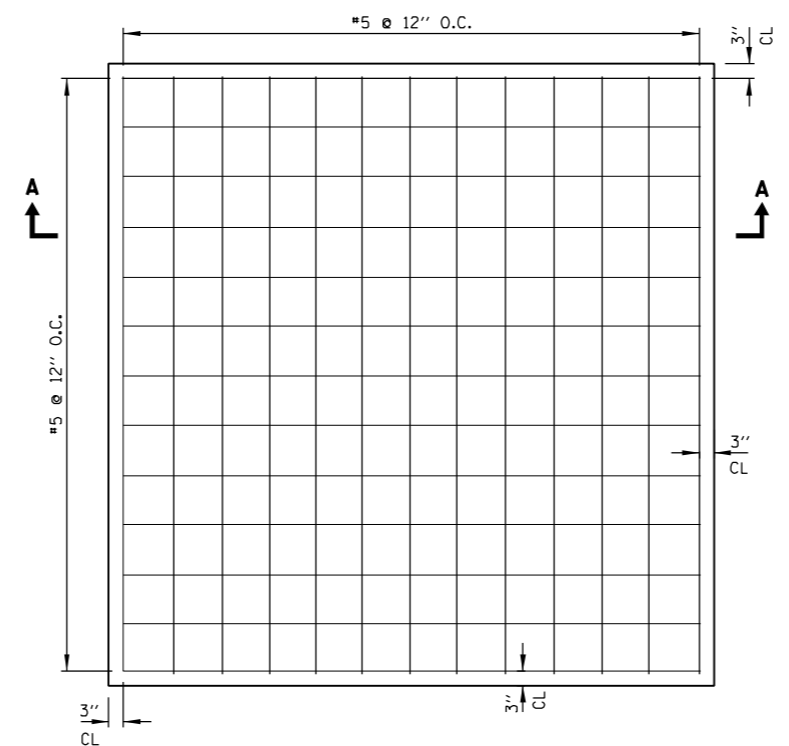


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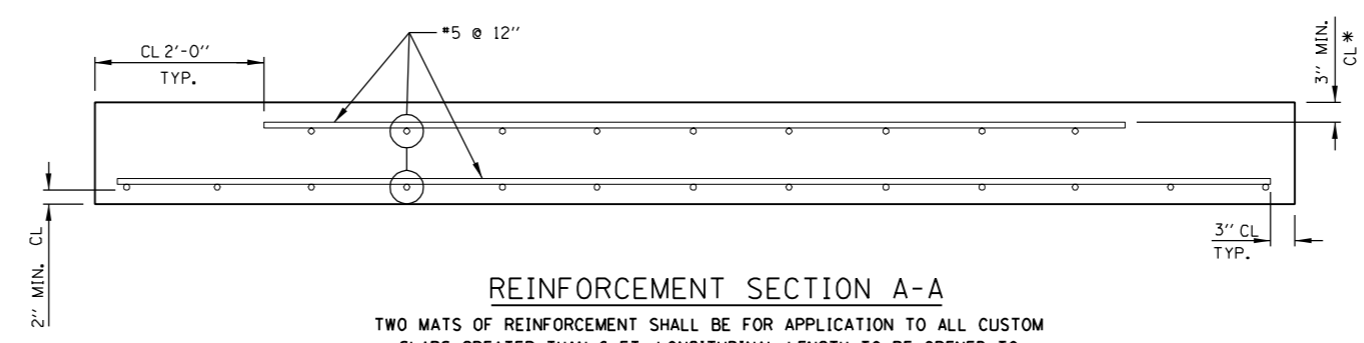
PRECAST PAVEMENT SLABS

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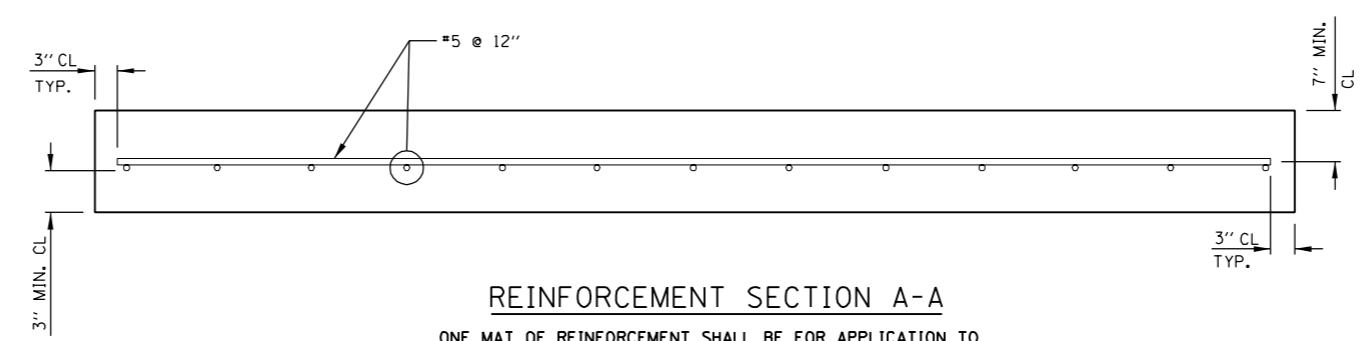
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TYPICAL REINFORCEMENT DETAIL



REINFORCEMENT SECTION A-A
 TWO MATS OF REINFORCEMENT SHALL BE FOR APPLICATION TO ALL CUSTOM SLABS GREATER THAN 6 FT. LONGITUDINAL LENGTH TO BE OPENED TO TRAFFIC BEFORE GROUTING IS COMPLETED
 ALL BARS ARE TRIM TO FIT #5 BAR



REINFORCEMENT SECTION A-A
 ONE MAT OF REINFORCEMENT SHALL BE FOR APPLICATION TO ALL STANDARD SLABS AND FOR ANY CUSTOM SLABS GREATER THAN 6 FT. LONGITUDINAL LENGTH TO BE OPENED TO TRAFFIC ONLY AFTER GROUTING IS COMPLETED.
 ALL BARS ARE TRIM TO FIT #5 BAR

NOTE:
 FOR ALL CUSTOM SLABS OF TRAPEZOID SHAPES, REINFORCEMENT SHALL BE LAID OUT IN A PERPENDICULAR GRID PATTERN, NOT SKEWED.
 * MIN. CLEARANCE FOR TOP REINFORCEMENT SHALL BE ADJUSTED FOR PLAZA SLAB TO FIT TREADLE FRAMES OR INSERTED HARDWARE.



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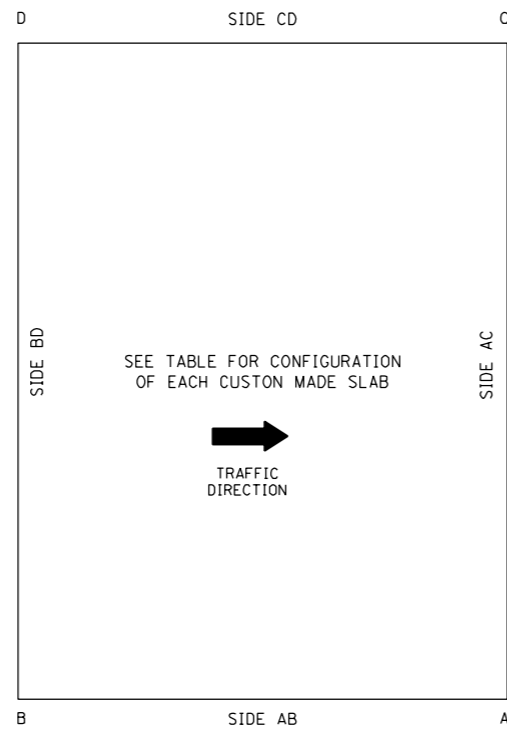
FOR NON STANDARD SLABS, UPON COMPLETION BY THE CONTRACTOR A SLAB LAYOUT WILL BE ADDED WITH SLAB DIMENSIONS TO INCLUDE BUT NOT BE LIMITED TO THE TABLE SHOWN BELOW.

EXAMPLE	CORRIDOR	STATION NUMBER	MAINLINE LANE NO.	RAMP ID.	RAMP LANE NO.	PLAZA NO.	PLAZA LANE NO.	MARK NO.	LANE TYPE	VARIABLES (FT.)				AB* SIDE	BD* SIDE	CD* SIDE	AC* SIDE	AREA (SQ.FT.)	VOLUME (CU. FT.)	WEIGHT (TONS)	DIAGONALS (FT.)	
										AB (FT.)	AC (FT.)	BD (FT.)	CD (FT.)								AD	BC

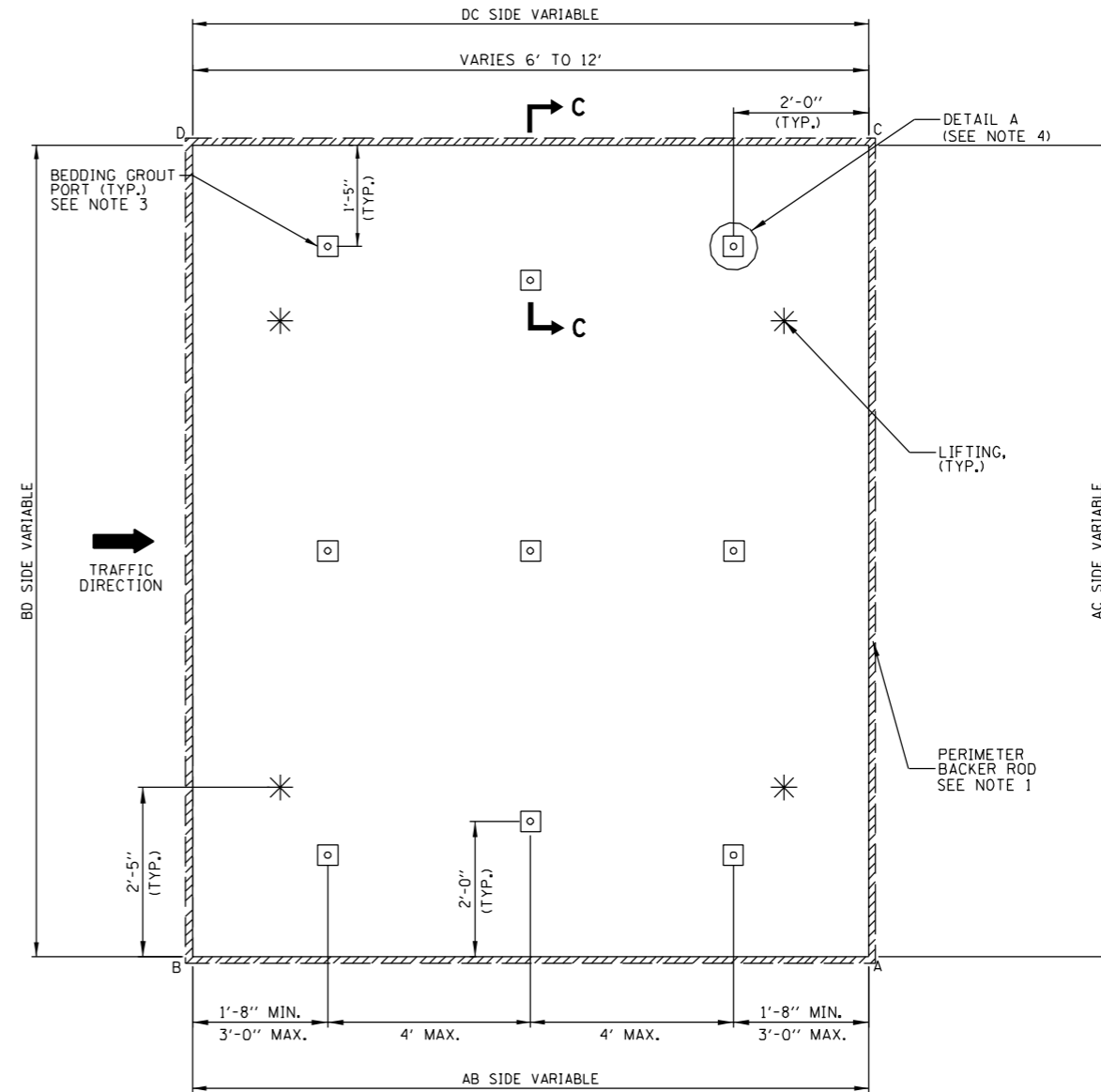
MAINLINE LANE NO.: LANE NO. 1 IS ADJACENT TO MEDIAN SHOULDER.
 RAMP LANE NO.: LANE NO. 1 IS ADJACENT TO THE BUILDING
 PLAZA LANE NO.: LANE NO. 1 IS ADJACENT TO THE BUILDING
 MARK NO.: EACH PANEL SHALL BE INDIVIDUALLY MARKED FOR CORRECT PLACEMENT.
 LANE TYPE: "OUT" IN THIS COLUMN INDICATES OUTSIDE LANE.
 "MID" IN THIS COLUMN INDICATES MIDDLE LANE.
 "IN" IN THIS COLUMN INDICATES INSIDE LANE.
 "PLAZA" IN THIS COLUMN INDICATES PLAZA LANE.

***LEGEND**

DB= DOWEL BAR EMBEDDED
 DS= DOWEL SLOT
 ST= SLOT OR HOLE FOR STITCHED TIE BAR
 RD= FIELD RETROFITTED DOWEL BARS



LAYOUT FOR CUSTOM SLABS
LAYOUT KEY



LAYOUT DETAIL FOR CUSTOM SLABS 6'-12' IN LENGTH (VARIED WIDTH)**

** FOR TRAPEZOID SLABS MINIMUM WIDTH IS 2 FT. WITH MAXIMUM WIDTH OF 16 FT.

NOTES:

1. A FOAM BACKER ROD SHALL BE PLACED AROUND THE OUTSIDE PERIMETER OF THE SLAB AT THE BOTTOM OF THE JOINTS AFTER THE SLAB HAS BEEN SET AND BEFORE BEDDING GROUT OR POLYURETHANE LEVELING FILL IS APPLIED. THE BACKER ROD SHALL NOT BE REQUIRED WHEN ANY SLAB IS LEVELLED WITH A FLOWABLE FILL.
2. EITHER SINGLE DIAMOND BLADED SAWS OR DIAMOND BLADED GANG SAWS SHALL BE USED TO MAKE THE SAW CUTS PERPENDICULAR TO THE TRANSVERSE (NONSKewed) JOINT LINE TO ALLOW FOR DOWEL BAR PLACEMENTS WITHIN THE SPECIFIED TOLERANCES.
3. SEE NOTE 8 ON SHEET 1 FOR LOCATING BEDDING GROUT PORTS.
4. SEE SHEET 4 FOR SECTION DETAILS.



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PRECAST PAVEMENT SLABS

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INSTALLATION GENERAL NOTES

ALIGNMENT:

1. WHEN THE TRANSVERSE JOINTS OF ANY PRECAST SLAB CAN NOT BE ALIGNED WITH TRANSVERSE JOINTS IN ADJACENT LANES, A MAXIMUM 2'-0" OFFSET BETWEEN JOINTS SHALL BE PROVIDED.
2. THE LONGITUDINAL JOINT OF ANY ISOLATED OR CONSECUTIVE STANDARD PRECAST SLAB MUST BE ALIGNED TO BE PARALLEL WITH EXISTING LONGITUDINAL JOINTS. THE WIDTH OF ANY OF THE STANDARD PRECAST SLABS SHALL BE NO MORE THAN 3 INCHES OUTSIDE OF THE EXISTING LONGITUDINAL JOINTS IN ADJACENT LANES OF EXISTING CONCRETE PAVEMENTS. THE WIDTH OF THE PRECAST SLAB SHALL BE NO MORE THAN 1/4 INCH LESS THAN THE WIDTH OF THE EXISTING SLAB BEING REPLACED. IF A STANDARD SLAB DOES NOT COMPLY WITH TOLERANCES FOR MAXIMUM AND MINIMUM WIDTHS, THEN A CUSTOM SLAB SHALL BE REQUIRED TO BE PRODUCED AND PLACED.
3. THE TRANSVERSE JOINT OF ANY PRECAST SLAB SHALL BE NO LESS THAN 4'-0" DISTANCE FROM AN EXISTING TRANSVERSE JOINT THAT REMAINS, OR NO LESS THAN 2'-0" DISTANCE PAST ANY EXISTING TRANSVERSE JOINT THAT IS REMOVED AND REPLACED WITH A PRECAST SLAB.
4. PRIOR TO THE PLACEMENT OF AN ISOLATED STANDARD PRECAST SLAB IN A MIDDLE LANE, THE WIDTH BETWEEN EXISTING LONGITUDINAL CONCRETE PAVEMENT JOINTS SHALL BE MEASURED BY THE CONSTRUCTION MANAGER UNDER MAINTENANCE OF TRAFFIC PROVIDED BY THE CONTRACTOR TO CONFIRM THAT THE PLACEMENT OF THE SLAB WILL NOT RESULT IN NEW LONGITUDINAL JOINTS MORE THAN 3 INCHES OUTSIDE OF THE EXISTING CONCRETE LONGITUDINAL JOINTS. NO NEW LONGITUDINAL JOINT SHALL BE ALLOWED INSIDE OF THE EXISTING JOINT. IF THESE TOLERANCES CAN NOT BE MET, THEN A CUSTOM SLAB SHALL BE REQUIRED. FOR ISOLATED STANDARD SLABS PLACED IN THE OUTSIDE OR INSIDE LANES, THE NEW CONCRETE LONGITUDINAL JOINT SHALL MATCH THE EXISTING JOINT BY NO MORE THAN 3 INCHES. THE PRECAST SLAB MAY EXTEND INTO THE EXISTING BITUMINOUS SHOULDERS NO MORE THAN 6 INCHES TO ALLOW FOR PROPER ALIGNMENT OF THE CONCRETE JOINTS.
5. FOR STANDARD SLAB PLACEMENTS, A TEMPLATE SUPPLIED BY THE PRECAST FABRICATOR SHALL BE USED TO LOCATE THE PERIMETER SAW CUTS FOR THE SLAB AND FOR THE EMBEDDED/SLOTTED DOWEL BAR LOCATIONS TO BE RETROFITTED INTO EXISTING PAVEMENT.

LOAD TRANSFER:

6. ACROSS STANDARD SLABS
 - A. THE EMBEDDED DOWEL BARS OF ISOLATED STANDARD PRECAST SLABS SHALL BE RETROFITTED INTO EXISTING CONCRETE PAVEMENT IN ACCORDANCE WITH DETAIL D (SEE SHEET 12).
 - B. THE EMBEDDED DOWEL BARS OF CONSECUTIVE STANDARD SLABS SHALL BE:
 - i) RETROFITTED INTO THE EXISTING CONCRETE PAVEMENT AT THE LOCATION OF THE FIRST SLAB PLACEMENT IN ACCORDANCE WITH DETAIL D (SEE SHEET 12).
 - ii) RETROFITTED INTO THE PREFORMED SLOTS OF ADJACENT PRECAST SLABS IN ACCORDANCE WITH DETAIL E (SEE SHEET 13).
 - iii) EITHER FULLY RETROFITTED INTO THE PREFORMED SLOT OF THE LAST INSTALLED CONSECUTIVE PRECAST SLAB AND THE ADJACENT CONCRETE PAVEMENT IN ACCORDANCE WITH DETAIL F (SEE SHEET 14), OR PARTIALLY RETROFIT AN EMBEDDED DOWEL BAR OF A STANDARD ISOLATED SLAB INTO ADJACENT PAVEMENT AS THE LAST INSTALLED CONSECUTIVE PRECAST SLAB IN ACCORDANCE WITH DETAIL D (SEE SHEET 12).
 - C. FOR PRECAST STANDARD SLABS WITH NO EMBEDDED DOWEL BARS, THE DOWEL BARS SHALL BE FULLY RETROFITTED ACROSS ALL TRANSVERSE JOINTS IN THE FIELD IN ACCORDANCE WITH DETAIL C (SEE SHEET 11). THE LOCATIONS AND SPACING OF ALL FIELD RETROFITTED DOWEL BARS SHALL COMPLY WITH THE SPECIFIED TOLERANCES AS SHOWN ON SHEETS 2 AND 3.
7. ACROSS CUSTOM MADE SLABS

THE DOWEL BARS OF CUSTOM DESIGNED PRECAST SLABS SHALL BE FULLY RETROFITTED ACROSS THE JOINT IN THE FIELD IN ACCORDANCE WITH DETAIL C (SEE SHEET 11). FOR ALL CUSTOM SLABS, THE DOWELS BETWEEN ANY EXISTING CONCRETE PAVEMENT AND ANY ADJACENT PRECAST SLAB, AND BETWEEN CONSECUTIVELY PLACED CUSTOM PRECAST SLABS SHALL BE 1'-0" ON CENTER ACROSS THE ENTIRE JOINT. NO END DOWEL BARS SHALL BE RETROFITTED WITHIN 8" OR NO MORE THAN 1' - 7" FROM THE CORNER OF THE PRECAST SLAB OR ADJOINING CONCRETE PAVEMENT SLAB THAT EXISTS.

LONGITUDINAL TIE BAR STITCHING:

8. THE LOCATIONS OF LONGITUDINAL TIE BARS SHALL BE DETERMINED BASED ON THE CRITERIA THAT LONGITUDINAL TIES SHALL BE REQUIRED FOR ANY CLASS B FULL DEPTH REPAIR AND PRECAST REPAIR GREATER THAN 20 FT. IN LENGTH OR WITH ANY PRECAST REPAIR THAT REQUIRES MORE THAN 3 CONSECUTIVE PRECAST SLABS.
9. THE SPACING BETWEEN TIE BARS SHALL BE NO LESS THAN 24 INCHES. TIE BAR INSERTIONS SHALL BE NO LESS THAN 24 INCHES FROM ANY EXISTING TRANSVERSE JOINT OR FROM THE LOAD TRANSFER JOINTS OF ANY PLACED PRECAST SLAB OR CASAL-IN-PLACE CONCRETE PATCH IN EITHER LANE ADJACENT TO THE LONGITUDINAL JOINT. THE PROCEDURE AND LOCATIONS FOR TIE BAR STITCHING SHALL BE IN ACCORDANCE WITH DETAIL G (SEE SHEET 16).

MATERIALS:

10. FOR GRADE SUPPORTED PRECAST SLABS, THE BEDDING MATERIAL FOR LEVELING AND SUPPORT SHALL CONSIST OF:

- A. LEVELING SAND SHALL BE 100% CRUSHED FINE AGGREGATE OF AN FA-6, FA-20, OR FA-21 GRADATION AS SPECIFIED IN SECTION 1003 OF THE STANDARD SPECIFICATIONS. THE FINE AGGREGATE SHALL BE REASONABLY FREE FROM AN EXCESS OF SOFT AND UNSOUND PARTICLES AND OTHER OBJECTIONABLE MATTER.
- B. FOR GRADE SUPPORTED SLABS, BEDDING GROUT SHALL BE USED AFTER SLAB INSTALLATION TO FILL ALL VOIDS BENEATH THE PRECAST PANELS. THE MIXTURE USED FOR BEDDING GROUT SHALL CONSIST OF PORTLAND CEMENT, FLY ASH, GROUND GRANULATED BLAST FURNACE SLAG (OPTIONAL), A SUPERPLASTICIZER, AND WATER ALL IN ACCORDANCE WITH DIVISION 1000 OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL SUBMIT THE PROPOSED MIX DESIGN FOR BEDDING GROUT TO THE ENGINEER FOR TOLLWAY APPROVAL PRIOR TO PLACEMENT. THE BEDDING GROUT PRODUCED SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
 - i) THE BEDDING GROUT SHALL REMAIN FLUID AND NOT EXHIBIT A RESISTANCE TO FLOW FOR A MINIMUM OF ONE HOUR. THE GROUT MIXTURE SHALL HAVE A FLOW RATE OF 15 TO 25 SECONDS AS MEASURED BY ASTM C 939 TO ENSURE FLUIDITY.
 - ii) THE BEDDING GROUT SHALL ACHIEVE AN INITIAL SET IN LESS THAN 4 HOURS AND A COMPRESSIVE STRENGTH AS MEASURED BY ASTM C 942 OF 300 PSI BEFORE OPENING THE SLAB TO TRAFFIC AND A COMPRESSIVE STRENGTH OF 500 PSI IN 12 HOURS.
11. FOR PRECAST SLABS SUPPORTED AND LEVELED BY FLOWABLE FILL PLACED BEFORE SLAB INSTALLATION, THE FLOWABLE FILL SHALL CONSIST OF PORTLAND CEMENT, FLY ASH, COARSE AND/OR FINE AGGREGATES, WATER, AND AIR ENTRAINING ADMIXTURE (OPTIONAL). THE CONTRACTOR SHALL SUBMIT THE PROPOSED MIX DESIGN FOR FLOWABLE FILL TO THE ENGINEER FOR TOLLWAY APPROVAL PRIOR TO PLACEMENT. THE FLOWABLE FILL PRODUCED SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
 - i) PORTLAND CEMENT SHALL BE TYPE 1 CEMENT IN ACCORDANCE WITH SECTION 1001 OF THE STANDARD SPECIFICATIONS.
 - ii) FLY ASH SHALL BE IN ACCORDANCE WITH SECTION 1010 OF THE STANDARD SPECIFICATIONS.
 - iii) FINE AGGREGATE SHALL BE IN ACCORDANCE WITH SECTION 1003 OF THE STANDARD SPECIFICATIONS.
 - iv) COARSE AGGREGATE, IF USED, SHALL BE IN ACCORDANCE WITH SECTION 1004 OF THE STANDARD SPECIFICATIONS WITH A MAXIMUM AGGREGATE SIZE OF 12.5 MM.
 - v) IF AN AIR ENTRAINMENT ADMIXTURE IS USED, THE AIR CONTENT OF THE FLOWABLE FILL SHALL NOT EXCEED 35% OF THE FLOWABLE FILL VOLUME.
 - vi) THE COMPRESSIVE STRENGTH OF THE FLOWABLE FILL MIXTURE SHALL NOT BE LESS THAN 50 PSI AT 3 DAYS, NOR LESS THAN 75 PSI OR GREATER THAN 150 PSI AT 28 DAYS.
 - vii) THE FINAL SET TIME SHALL BE DETERMINED IN ACCORDANCE WITH ASTM C403 ON A TRIAL BATCH SPECIMEN.
12. FOR PRECAST SLABS SUPPORTED AND LEVELED BY HIGH-DENSITY FOAM PLACED AFTER SLAB INSTALLATION, THE HIGH-DENSITY FOAM SHALL BE EXPANDING POLYURETHANE FOAM HAVING A WATER INSOLUBLE DILUENT AND SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

DENSITY (LBS./CU. FT.)-AIR RISE	2.1 MIN.
TENSILE STRENGTH (PSI) ASTM D 1623	54 MIN.
ELONGATION (%)	5.1
COMPRESSIVE STRENGTH (PSI) ASTM D 1621 (AT YIELD)	47 MIN.
VOLUME CHANGE (% OF ORIGINAL)	0

THE MANUFACTURER SHALL PROVIDE DOCUMENTATION THAT THE LOT(S) OF FOAM MEETS THE SPECIFIED PROPERTIES. MANUFACTURER'S CERTIFICATION SHALL LIST LOT NUMBER(S) AND DOCUMENTATION OF COMPLIANCE WITH THE SPECIFICATION.
13. HARDWARE GROUT/ADHESIVES
 - A. FOR DOWEL BAR RETROFITS, FOR THE FILLING OF ANY GROUT PORT HOLES USED FOR HIGH DENSITY FOAM INJECTIONS, AND FOR THE FILLING OF RECESSED LIFTING DEVICES, A NON-SHRINK BACKFILL MATERIAL SHALL BE USED THAT HAS BEEN TESTED AS A RAPID SET CONCRETE PATCHING MATERIAL PER THE AASHTO PRODUCT EVALUATION PROGRAM, OR A TOLLWAY APPROVED EQUIVALENT, WHICH CONFORMS TO ASTM C 928. THE GROUT MATERIAL IS REQUIRED TO PROVIDE A COMPRESSIVE STRENGTH OF 4,000 PSI IN 24 HOURS (OPENING TO TRAFFIC AFTER 2,500 PSI) PER ASTM C 39, EXHIBITS EXPANSION OF LESS THAN 0.10 PERCENT PER ASTM C 531, AND HAS A CALCULATED DURABILITY FACTOR OF 90.0 PERCENT MINIMUM AT THE END OF 300 FREEZE-THAW CYCLES PER ASTM C 666. THE PROPOSED MATERIAL SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO ANY PLACEMENT.
 - B. FOR TIE BAR STITCHING AN APPROVED CHEMICAL ADHESIVE IN ACCORDANCE WITH ARTICLE 1027.01 OF THE STANDARD SPECIFICATIONS SHALL BE USED AS THE ANCHORING MATERIAL FOR STITCHED TIE BARS.
14. EPOXY COATED DOWEL BARS SHALL COMPLY WITH ASTM A 615 GRADE 60. ANY ADDITIONAL MATERIAL REQUIRED FOR DOWEL BAR RETROFITTING SHALL BE IN ACCORDANCE WITH THE TOLLWAY SPECIAL PROVISION FOR "DOWEL BAR RETROFIT".
15. EPOXY COATED TIE BARS FOR STITCHING SHALL COMPLY WITH THE REQUIREMENTS OF ARTICLE 1006.10 OF THE STANDARD SPECIFICATIONS.
16. THE BACKER ROD USED AS A GASKET AROUND THE PERIMETER OF A SLAB, AT THE BOTTOM OF THE JOINTS, SHALL BE A CLOSED-CELL, PLASTIC FOAM ROD COMPATIBLE WITH THE SEALANT AND THE ELEVATED TEMPERATURES OF FINAL JOINT SEALANT APPLICATION.

EQUIPMENT:

17. FOR BASE PREPARATION, A MECHANICALLY-CONTROLLED SCREEDING DEVICE OR STRAIGHTEDGE DEVICE CAPABLE OF GRADING FULLY COMPACTED FINE AGGREGATE USED AS THE LEVELING SAND TO A TOLERANCE OF $\pm 1/8"$.

18. CHIPPING HAMMERS SHALL BE HAND HELD AND HAVE A MAXIMUM WEIGHT OF 30 LBS. PRIOR TO ANY HANDLE MODIFICATION WHERE APPLICABLE.
19. WITH ANY FIELD INSTALLATION OR RETROFITTING OF DOWEL BARS, A TEMPLATE SHALL BE ROUTINELY USED FOR ALL STANDARD SLABS IN ORDER TO LOCATE AND ALIGN THE SAWCUTS CONSISTENTLY. EITHER SINGLE DIAMOND BLADED SAWS OR DIAMOND BLADED GANG SAWS SHALL BE USED TO MAKE SAW CUTS PERPENDICULAR TO THE TRANSVERSE (NONSKWEVED) JOINT LINE TO ALLOW FOR DOWEL BAR PLACEMENTS WITHIN THE FOLLOWING TOLERANCES:
 - ± 1 INCH OF THE MIDDLE OF THE CONCRETE SLAB DEPTH.
 - ± 1 INCH OF BEING CENTERED OVER THE TRANSVERSE JOINT
 - $\pm 1/4"$ FROM PARALLEL TO THE CENTERLINE
 - $\pm 1/4"$ FROM PARALLEL TO THE ROADWAY SURFACE

SAWCUTS SAWED ACROSS SKEWED JOINTS SHOULD ALLOW EQUAL LENGTH OF THE DOWEL BAR TO BE PLACED ACROSS THE TRANSVERSE JOINT. THE ALIGNMENT OF SAWCUTS MUST BE PARALLEL TO THE ROADWAY CENTERLINE, REGARDLESS OF TRANSVERSE JOINT SKEW.
20. THE COMPRESSOR FOR AIR BLASTING SHALL HAVE A MINIMUM CAPACITY OF 120 CFM. THE COMPRESSED AIR SHALL BE FREE FROM OIL AND OTHER CONTAMINANTS.
21. CONSOLIDATION EQUIPMENT USED TO CONSOLIDATE THE CONCRETE REPAIR MATERIAL IN THE DOWEL BAR SLOTS SHALL BE INTERNAL VIBRATORS WITH A MAXIMUM DIAMETER OF 1 INCH AND SHALL HAVE A RESILIENT COVERING THAT WILL NOT DAMAGE THE EPOXY COATED REINFORCEMENT DURING USE.
22. BATCHING EQUIPMENT FOR FLOWABLE FILL SHALL HAVE DEVICES DESIGNED TO MEASURE THE SPECIFIED QUANTITIES OF EACH COMPONENT MATERIAL, AND MIXING SHALL BE OF SUFFICIENT DURATION TO INSURE UNIFORM CONSISTENCY OF THE MIXTURE. NO WATER WILL BE ADDED TO THE FLOWABLE FILL MIXTURE AFTER BATCHING. WATER CONTENT SHALL BE MAINTAINED SUCH THAT COMPRESSIVE STRENGTHS ARE ACHIEVED AND A UNIFORM, FLOWABLE MIXTURE IS DEVELOPED THAT IS ESSENTIALLY SELF-LEVELLING WHEN PLACED.
23. EQUIPMENT FOR HIGH-DENSITY FOAM INJECTION SHALL INCLUDE A TRUCK MOUNTED PUMPING UNIT CAPABLE OF INJECTING THE POLYURETHANE BETWEEN THE CONCRETE AND THE SLAB SUBBASE. THE PUMP SHALL BE CAPABLE OF CONTROLLING THE RATE OF RISE OF THE PAVEMENT SLAB. A LEVELING UNIT SHALL BE PROVIDED TO ENSURE THE SLABS ARE RAISED TO AN EVEN PLANE, WITH VERTICAL ELEVATION DIFFERENCE ACROSS ANY CORNER NOT TO EXCEED 1/4 INCH.
24. EQUIPMENT FOR MIXING AND PUMPING ANY GROUT/ADHESIVE MATERIALS FOR BEDDING THE SLABS, RETROFITTING DOWEL BARS, OR CROSS STITCHING TIE BARS SHALL BE IN ACCORDANCE WITH THE MATERIAL MANUFACTURER'S INSTRUCTIONS AND THE SPECIFICATIONS.

REMOVAL/INSTALLATION:

25. PERIMETER SAWCUTTING OF THE REMOVAL AREA AND SAWCUTTING OF THE DOWEL BAR SLOTS SHALL NOT BE CARRIED OUT MORE THAN (1) WEEK IN ADVANCE OF THE EXPECTED DATE OF REPAIR. THE CONTRACTOR SHALL USE A TEMPLATE TO PRECISELY DELINEATE THE LIMITS OF THE AREAS TO BE REPAIRED AS DEFINED ON THE CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS. WITHIN A TOLERANCE OF 1/2 INCH, REPAIRS SHALL BE NO LESS THAN THE FULL WIDTH OF A LANE AND THE FULL DEPTH OF CONCRETE.
26. REMOVAL OF EXISTING PAVEMENT SHALL BE IN ACCORDANCE WITH SECTION 440 OF THE STANDARD SPECIFICATIONS EXCEPT AS FOLLOWS:
 - A. THE OUTER LIMITS OF THE REPAIR AREA WILL BE SAWCUT FULL DEPTH AND SHALL NOT EXTEND (OVERCUT) BY MORE THAN 10 INCHES INTO THE ADJACENT CONCRETE THAT IS TO REMAIN IN PLACE. OVERCUTS SHALL BE FILLED WITH A PRODUCT ACCEPTABLE TO THE TOLLWAY. THE OUTER LIMITS FOR REPAIR SHALL BE MARKED OUT BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO ANY SAWCUTTING.
 - B. REMOVAL OF CONCRETE WITHIN THE PERIMETER SAWCUTS SHALL BE BY THE LIFT-OUT METHOD, AND CONCRETE BETWEEN SAWCUTS FOR DOWEL BAR RETROFITS SHALL BE REMOVED USING JACKHAMMER AND HAND TOOLS. THE CONTRACTOR SHALL ENSURE THAT REMOVALS ARE CARRIED OUT WITHOUT DAMAGING THE ADJACENT CONCRETE PAVEMENT OR ASPHALT SHOULDER OR DISTURBING THE UNDERLYING BASE. HEAVY BREAKING EQUIPMENT SUCH AS HOE RAMS SHALL NOT BE USED IN THE REMOVAL OPERATION. THE CONCRETE PAVEMENT SHALL NOT BE BROKEN IN PLACE.



DATE	REVISIONS	
		PRECAST PAVEMENT SLAB
		STANDARD A18-00

APPROVED: CHIEF ENGINEER DATE: 5-1-2009

INSTALLATION GENERAL NOTES

- C. IF DURING THE REMOVAL PROCESS THE ADJACENT CONCRETE IN THE SAME LANE IS DAMAGED OR CRACKED DUE TO THE CONTRACTOR'S REMOVAL PROCEDURE, THE DAMAGED AREA SHALL BE CUT BACK FULL DEPTH TO SOUND CONCRETE AND REPLACED AT THE CONTRACTOR'S EXPENSE. IF CONCRETE IN THE ADJOINING LANE IS DAMAGED DURING THE REMOVAL PROCESS, THE DAMAGED CONCRETE SHALL BE REPAIRED IN ACCORDANCE SECTION 442 OF THE STANDARD SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE. ASPHALT SHOULDER DAMAGED DURING THE REMOVAL PROCESS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL PROVIDE A PROPOSAL FOR REPAIRS TO THE TOLLWAY FOR APPROVAL.
- D. DISPOSAL OF EXCAVATED MATERIALS FROM THE REMOVAL OF CONCRETE AND FROM ANY BASE COURSE RESTORATION SHALL BE IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF ARTICLE 202.03 OF THE STANDARD SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE.
27. IF THE ENGINEER DETERMINES THAT THE EXISTING GRANULAR SUBBASE IS UNSUITABLE FOR THE INTENDED PURPOSE, THE CONTRACTOR SHALL REMOVE THE UNSUITABLE MATERIAL IN THE PAVEMENT REMOVAL AREAS TO THE DEPTH SPECIFIED BY THE ENGINEER AND NO LESS THAN 2 INCHES. THE MATERIAL REMOVED SHALL BE REPLACED WITH AN EQUAL THICKNESS OF NEW MATERIAL PLACED AND COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE TOLLWAY SPECIAL PROVISION FOR "AGGREGATE FOR BASE COURSE RESTORATION, SPECIAL".
28. LEVELING MATERIAL PLACED BEFORE SLAB INSTALLATION SHALL BE EITHER A FLOWABLE FILL OR A FINE AGGREGATE MEETING THE REQUIREMENTS OF THIS CONTRACT DOCUMENT. FLOWABLE FILL SHALL BE USED AS A LEVELING MATERIAL ONLY ON TANGENT PAVEMENT SECTIONS. GRADE CONTROL SHALL BE ESTABLISHED FOR ALL LEVELING MATERIAL USING STRINGLINES, LASER GUIDANCE, OR OTHER APPROVED METHODS. THE TEMPERATURE OF THE FLOWABLE FILL MIXTURE AS MANUFACTURED AND DELIVERED SHALL BE AT LEAST 50° F. NO FLOWABLE FILL WILL BE ALLOWED IF THE ANTICIPATED AIR TEMPERATURE WILL BE 36° F OR LESS WITHIN 24 HOURS OF SLAB PLACEMENT. THE FLOWABLE FILL MUST OBTAIN FINAL SET BEFORE THE PAVEMENT MAY BE OPENED TO TRAFFIC.
29. WHEN FLOWABLE FILL IS USED AS THE LEVELING MATERIAL WITH SLAB INSTALLATION, A PERIMETER BACKER ROD WILL NOT BE REQUIRED AROUND THE PERIMETER OF THE SLAB.
30. LEVELING MATERIAL PLACED IMMEDIATELY AFTER SLAB INSTALLATION SHALL ONLY BE A HIGH-DENSITY POLYURETHANE FOAM MEETING THE REQUIREMENTS OF THIS CONTRACT DOCUMENT. PLACEMENT OF POLYURETHANE FOAM SHALL FILL ALL VOIDS BENEATH THE PRECAST PANELS THAT MAY BE PRESENT AFTER PLACING THE PANELS OVER THE PREPARED SUBBASE AND LEVELING AGGREGATE. PLACEMENT OF THE POLYURETHANE SHALL UTILIZE THE UNDERSLAB GROUT PORT HOLES AS SHOWN ON THE PLANS. THE PORT HOLES ARE TO BE FILLED WITH THE DOWEL BAR BACKFILLING MATERIAL.
31. FOLLOWING PROPER REMOVAL OF EXISTING PAVEMENTS AND ACCEPTABLE BASE PREPARATION/LEVELING, THE CONTRACTOR SHALL HAVE ALL EQUIPMENT REQUIRED FOR PANEL INSTALLATION ON-SITE PRIOR TO BEGINNING PANEL INSTALLATION. LIFTING AND TRANSPORTING EQUIPMENT SHALL NOT DAMAGE THE PREPARED SUBBASE/LEVELING MATERIALS PRIOR TO OR DURING PANEL INSTALLATION.
32. PANELS SHALL BE INSTALLED ONE AT A TIME, AND SHALL BE INSTALLED IN SUCH A MANNER THAT THE SUBBASE/LEVELING MATERIAL OR ANY REMAINING PAVEMENT IS NOT DAMAGED DURING INSTALLATION. DURING PLACEMENT OF THE SLABS, USE TIE OFF ROPES TO AVOID CHIPPING OR SPALLING EDGES OF THE PRECAST UNITS. USE WOOD SHIMS OR WEDGES TO GUIDE THE SLAB INTO THE CORRECT POSITION. THE USE OF STEEL PRY BARS THAT CHIP EDGES SHOULD BE AVOIDED.
33. IMMEDIATELY AFTER THE SLAB HAS BEEN SET AND LEVELED, SURVEY THE VERTICAL ELEVATION ACROSS ALL CORNERS TO VERIFY THAT THE VERTICAL DIFFERENCE BETWEEN ADJACENT SLABS ACROSS ANY CORNER DOES NOT EXCEED 1/4 INCH. IF THE DIFFERENCE EXCEEDS 1/4 INCH, THAN THE SLAB SHALL BE REMOVED AND RESET OR THE SURFACE SHALL RECEIVE A CORRECTIVE DIAMOND GRIND AT THE CONTRACTORS EXPENSE AFTER ANY REQUIRED BEDDING GROUT OR LEVELING MATERIAL HAS BEEN PLACED.
34. NO CUSTOM SLAB GREATER THAN 6 FT. IN LONGITUDINAL LENGTH SHALL BE SET AND OPENED TO TRAFFIC BEFORE GROUTING IS COMPLETE UNLESS THE SLAB WAS FABRICATED WITH TWO MATS OF STEEL REINFORCEMENT IN ACCORDANCE WITH THE DESIGN REQUIREMENTS SHOWN ON SHEET 5. IF THE SET PRECAST SLAB IS OPENED TO TRAFFIC BEFORE THE SLAB IS DOWEL RETROFITTED, TIE BAR STITCHED, OR UNDERSLAB GROUTED, PLACE INCOMPRESSIBLE SHIMS APPROVED BY THE ENGINEER DURING INSTALLATION IN EACH TRANSVERSE AND LONGITUDINAL JOINT TO CORRECT AND MAINTAIN HORIZONTAL ALIGNMENT OF THE SLABS. THE TOTAL THICKNESS OF SHIMS USED IN ANY JOINT SHALL BE NO MORE THAN 1/8 INCH. BEFORE OPENING A NON-GROUTED SLAB TO TRAFFIC, BACKFILL THE ASPHALT SHOULDERS TO MAINTAIN HORIZONTAL ALIGNMENT. ANY OPEN DOWEL SLOTS LEFT OPEN BEFORE THE SLAB IS OPENED TO TRAFFIC SHALL BE TEMPORARILY FILLED WITH A COMPRESSION SEAL APPROVED BY THE ENGINEER TO WITHIN 1 INCH OF THE PAVEMENT SURFACE.
35. PRIOR TO DOWEL BAR PLACEMENT, THE TRANSVERSE JOINT SHOULD BE CAULKED WITH A SILICONE SEALANT AT THE BOTTOM AND SIDES OF THE SLOT. THE CAULKING FILLER SHOULD NOT BE PLACED ANY FARTHER THAN 1/2 INCH OUTSIDE EITHER SIDE OF THE JOINT, AND APPLIED SUFFICIENTLY TO PREVENT ANY PATCHING MATERIAL FROM ENTERING THE JOINT AT THE BOTTOM OR SIDES OF THE SLOT. EXCESSIVE SEALANT AROUND THE SLOT DOES NOT ALLOW THE CONCRETE PATCHING MATERIAL TO BOND TO THE SIDES OF THE SLOT. BEFORE PLACEMENT, THE DOWEL BARS SHOULD BE LIGHTLY COATED WITH PARTING

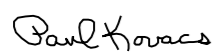
- COMPOUND AND PLACED ON A CHAIR THAT WILL PROVIDE A MINIMUM 1/2 INCH CLEARANCE BETWEEN THE BOTTOM OF THE DOWEL AND THE BOTTOM OF THE SLOT. A 3/8 INCH THICK FOAM INSERT SHOULD BE PLACED AT THE MIDDLE OF THE DOWEL TO MAINTAIN THE TRANSVERSE JOINT. THE FOAM INSERT SHOULD FIT TIGHTLY AROUND THE DOWEL, THE BOTTOM, AND THE EDGES OF THE SLOT, AND BE UP TO THE SURFACE OF THE EXISTING CONCRETE SURFACE. THE FOAM INSERT SHOULD BE CAPABLE OF REMAINING IN A VERTICAL POSITION AND HELD TIGHTLY TO ALL EDGES DURING PLACEMENT OF THE PATCH. IF FOR ANY REASON THE FOAM INSERT SHIFTS DURING PLACEMENT OF THE CONCRETE PATCHING MATERIAL, THE WORK SHALL BE REJECTED AND REDONE AT THE CONTRACTOR'S EXPENSE.
36. PLACEMENT OF HARDWARE GROUT/ADHESIVES
- A. DOWEL BARS - THE PLACEMENT OF ANY APPROVED BACKFILL MATERIAL FOR DOWEL BAR RETROFITTING SHALL BE IN ACCORDANCE WITH THE TOLLWAY SPECIAL PROVISION FOR "DOWEL BAR RETROFIT". THE PAVEMENT WILL NOT BE OPENED TO TRAFFIC UNTIL THE BACKFILL MATERIAL AROUND THE PAVEMENT HARDWARE OBTAINS 2,500 PSI COMPRESSIVE STRENGTH. ALL CONCRETE SURFACES WITHIN THE SLOT SHALL BE SOLID, FREE FROM LOOSE OR UNSOUND FRAGMENTS. BEFORE GROUTING, SANDBLAST ALL EXPOSED SURFACES IN THE DOWEL BAR SLOT FOLLOWED BY AIR BLASTING TO REMOVE ANY DUST, RESIDUE OR DEBRIS LEFT IN THE SLOT. UPON COMPLETION OF THE RETROFITTING WORK, THE GROUT OR CONCRETE PATCH MATERIAL SHALL FILL ALL SLOTS TO THE SURFACE OF THE EXISTING PAVEMENTS. ANY SLOTS INSUFFICIENTLY FILLED BELOW EXISTING PAVEMENT SURFACES SHALL BE REDONE AT THE CONTRACTOR'S EXPENSE.
- B. TIE BARS - AFTER PREDRILLED HOLES ARE AIR BLASTED, PRESSURE INJECT THE APPROVED ADHESIVE INTO THE PREDRILLED HOLES, LEAVING SOME VOLUME FOR THE BAR TO OCCUPY THE HOLE. INSERT THE TIEBAR INTO THE HOLE, LEAVING ABOUT 1 INCH FROM THE TOP OF THE TIE BAR TO THE PAVEMENT SURFACE. REMOVE EXCESS ADHESIVE AND FINISH FLUSH WITH THE PAVEMENT SURFACE.
- C. FILL LIFTING INSERT HOLES WITH THE APPROVED GROUT USED FOR DOWEL BAR RETROFITTING.
37. PLACEMENT OF BEDDING GROUT OR THE USE OF POLYURETHANE MATERIAL AS A COMBINED LEVELING/BEDDING GROUT METHOD SHALL FILL ALL VOIDS BENEATH THE PRECAST PANELS AND GROUT PORT HOLES THAT MAY BE PRESENT AFTER PLACING THE PANELS OVER THE PREPARED SUBBASE AND LEVELING AGGREGATE. PLACEMENT OF THE BEDDING GROUT SHALL UTILIZE THE UNDERSLAB GROUT PORT HOLES AS SHOWN ON THE PLANS. PLACEMENT OF BEDDING GROUT SHALL NOT OCCUR UNTIL AFTER ALL HARDWARE DEVICES ARE PLACED AND GROUTED. IF BEDDING GROUT FILLS ANY JOINT TO WITHIN 9" OF THE SLAB SURFACE, A 9" SAW CUT OF THE JOINT SHALL BE REQUIRED DURING INSTALLATION. GROUT PORT HOLES SHALL BE FILLED WITH APPROVED PATCHING MATERIAL USED FOR DOWEL BAR RETROFITTING.
38. AFTER INSTALLATION AND GROUTING IS COMPLETED ALL LONGITUDINAL AND TRANSVERSE JOINTS SHALL BE SEALED IN ACCORDANCE WITH ARTICLE 420.12.



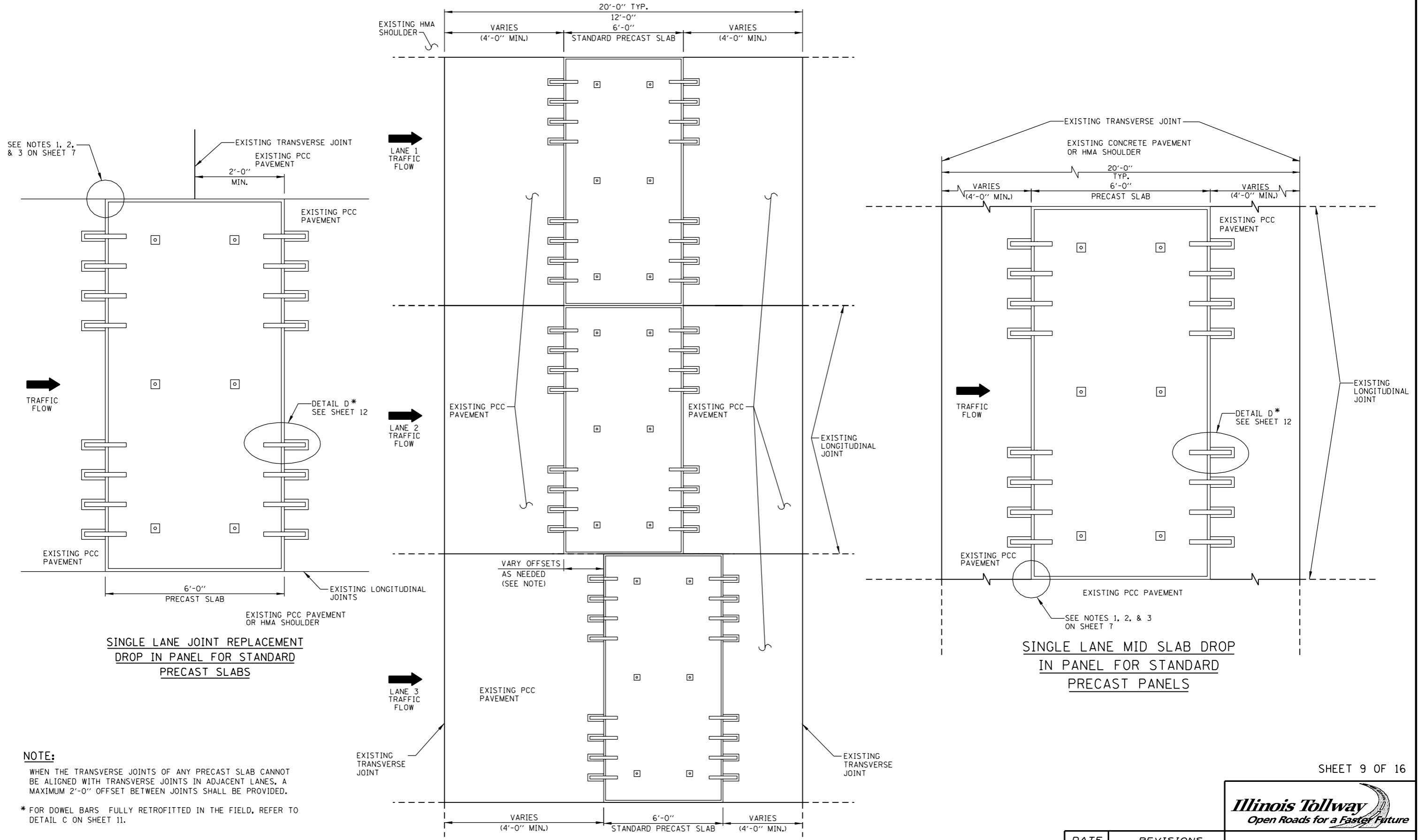
DATE	REVISIONS

PRECAST PAVEMENT SLABS

STANDARD A18-00


 APPROVED DATE 5-1-2009
CHIEF ENGINEER

INSTALLATION OF ISOLATED STANDARD PRECAST SLABS



**SINGLE LANE JOINT REPLACEMENT
DROP IN PANEL FOR STANDARD
PRECAST SLABS**

**SINGLE LANE MID SLAB DROP
IN PANEL FOR STANDARD
PRECAST PANELS**

**MULTIPLE LANE MID SLAB DROP IN PANEL
FOR STANDARD PRECAST PANELS**

NOTE:

WHEN THE TRANSVERSE JOINTS OF ANY PRECAST SLAB CANNOT BE ALIGNED WITH TRANSVERSE JOINTS IN ADJACENT LANES, A MAXIMUM 2'-0" OFFSET BETWEEN JOINTS SHALL BE PROVIDED.

* FOR DOWEL BARS FULLY RETROFITTED IN THE FIELD, REFER TO DETAIL C ON SHEET 11.

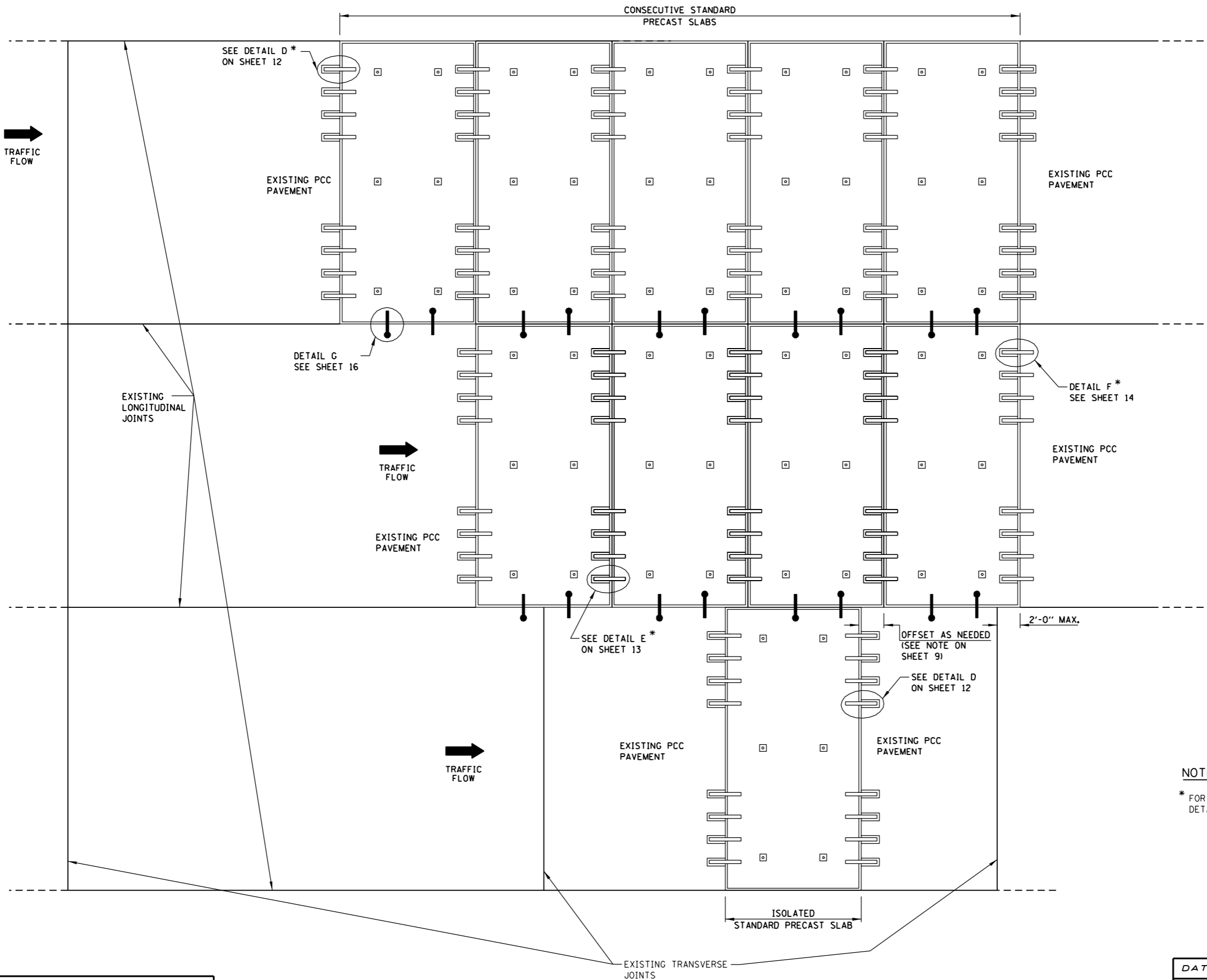


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Paul Kovacs
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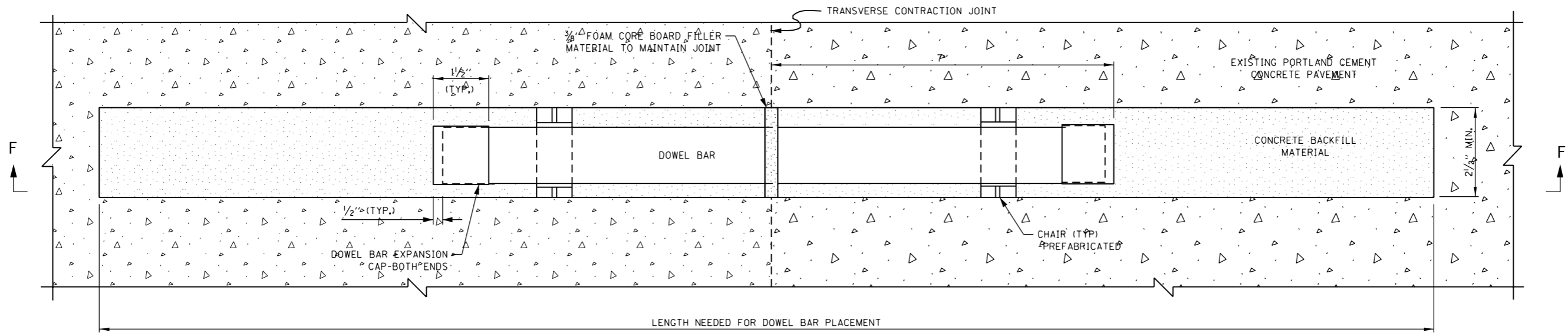
DATE	REVISIONS

PRECAST PAVEMENT SLABS

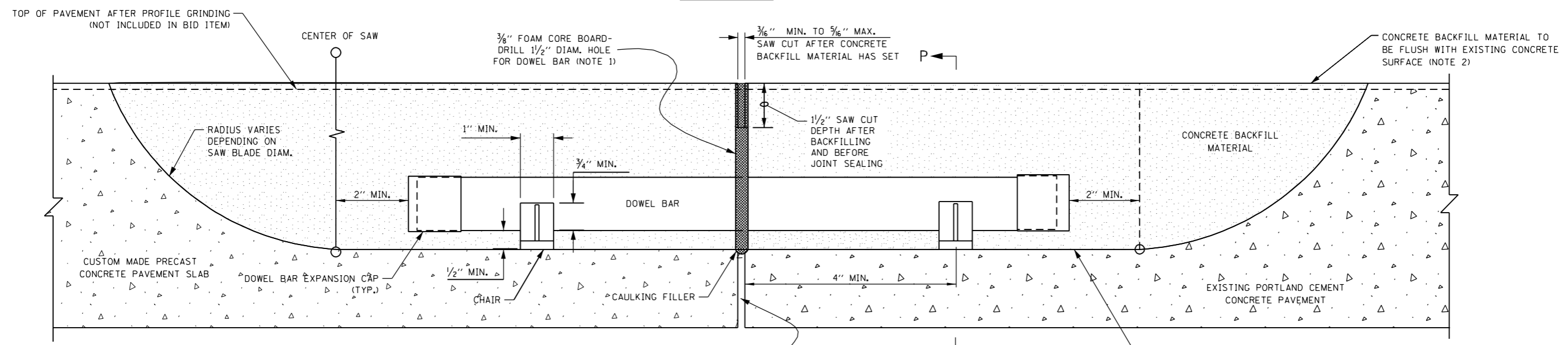
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INSTALLATION OF CONSECUTIVE STANDARD PRECAST SLABS

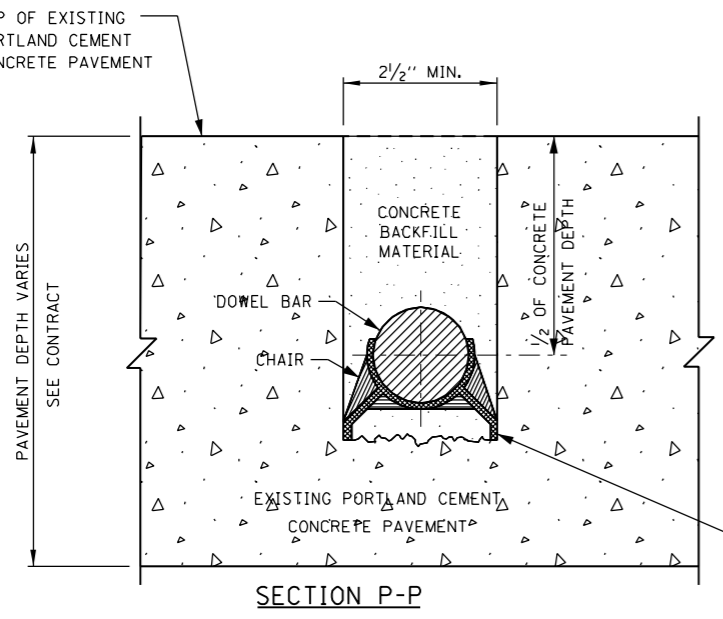


PLAN VIEW

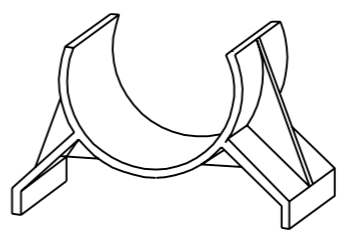


SECTION F-F

DETAIL-C, DOWEL BAR PLACEMENT DETAIL FOR ALL CUSTOM MADE PRECAST PANELS AND OPTIONAL FOR STANDARD SLABS



SECTION P-P



CHAIR DETAIL

- NOTES:**
1. PLACE FOAM CORE BOARDS TO THE TOP OF PATCH.
 2. UPON COMPLETION, THE FINISHED SURFACE OF THE CONCRETE BACKFILL MATERIAL SHALL NOT BE BELOW EXISTING CONCRETE SURFACE.

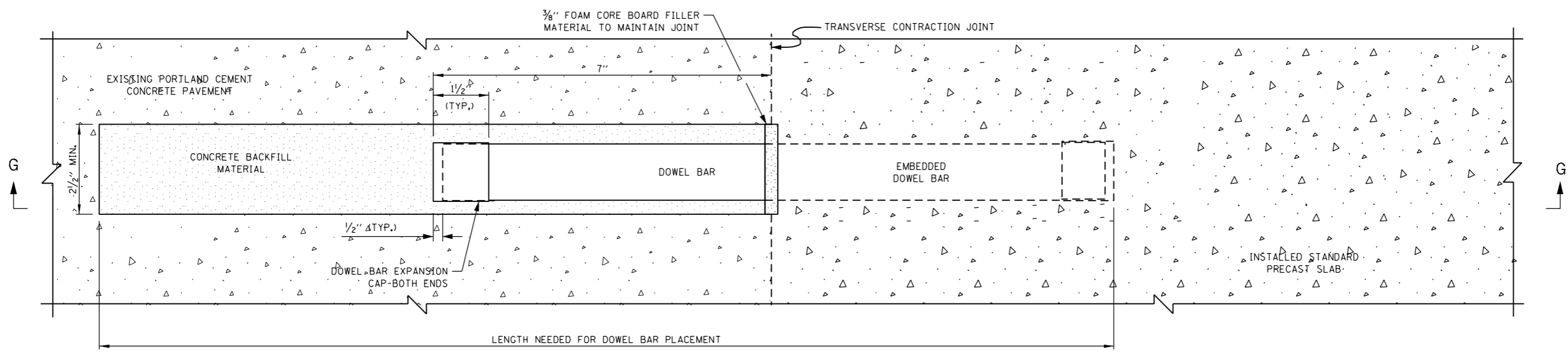


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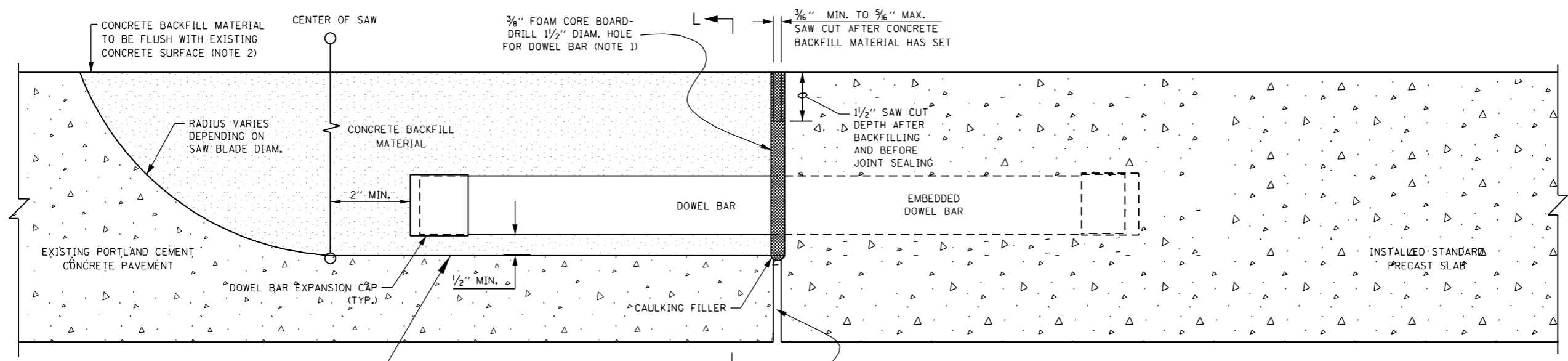
PRECAST PAVEMENT SLABS

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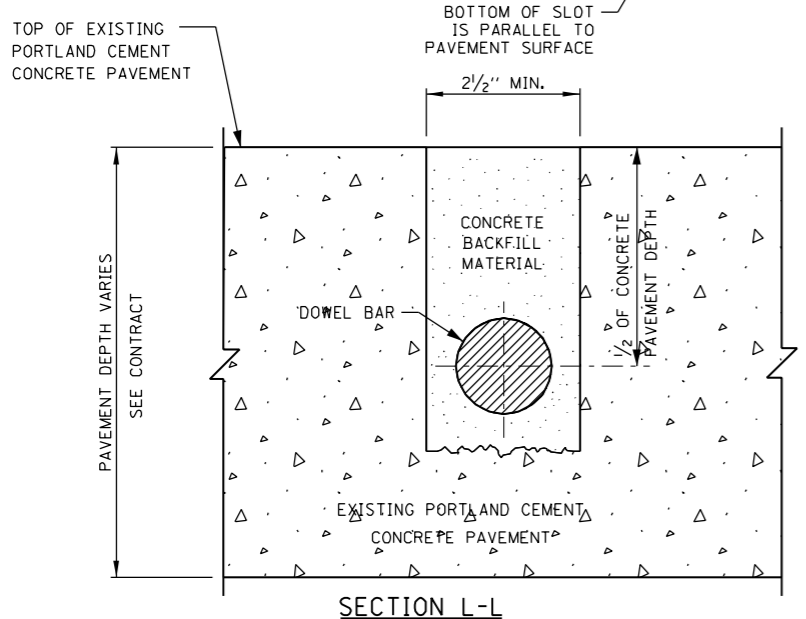
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PLAN VIEW



SECTION G-G



SECTION L-L

DETAIL D - DOWEL BAR PLACEMENT
 DETAIL FOR STANDARD PRECAST PANELS
 (FOR APPLICATION WITH ALL ISOLATED STANDARD
 SLABS AND WITH INITIAL PLACEMENT OF
 CONSECUTIVE STANDARD SLABS)

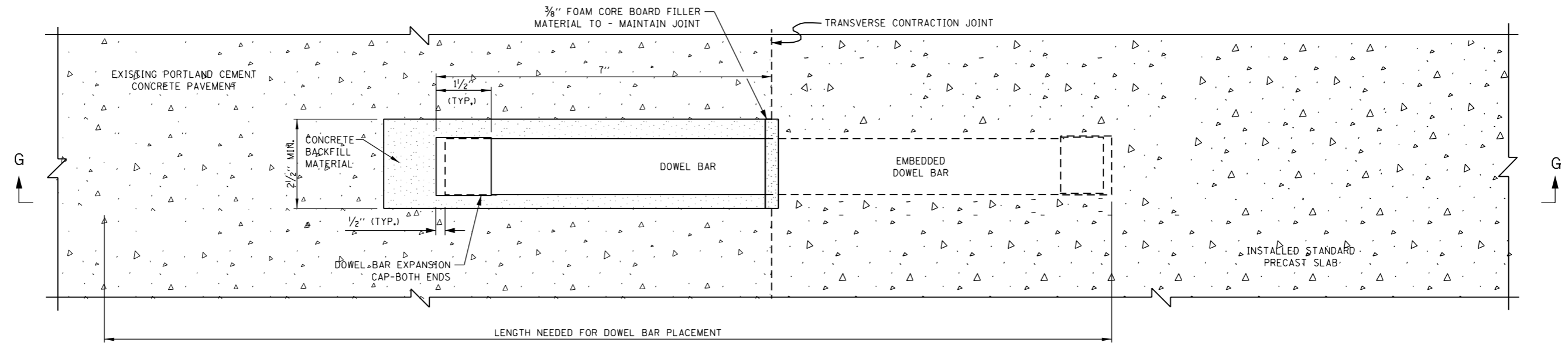
- NOTES:**
1. PLACE FOAM CORE BOARDS TO THE TOP OF PATCH.
 2. UPON COMPLETION, THE FINISHED SURFACE OF THE CONCRETE BACKFILL MATERIAL SHALL NOT BE BELOW EXISTING CONCRETE SURFACE.



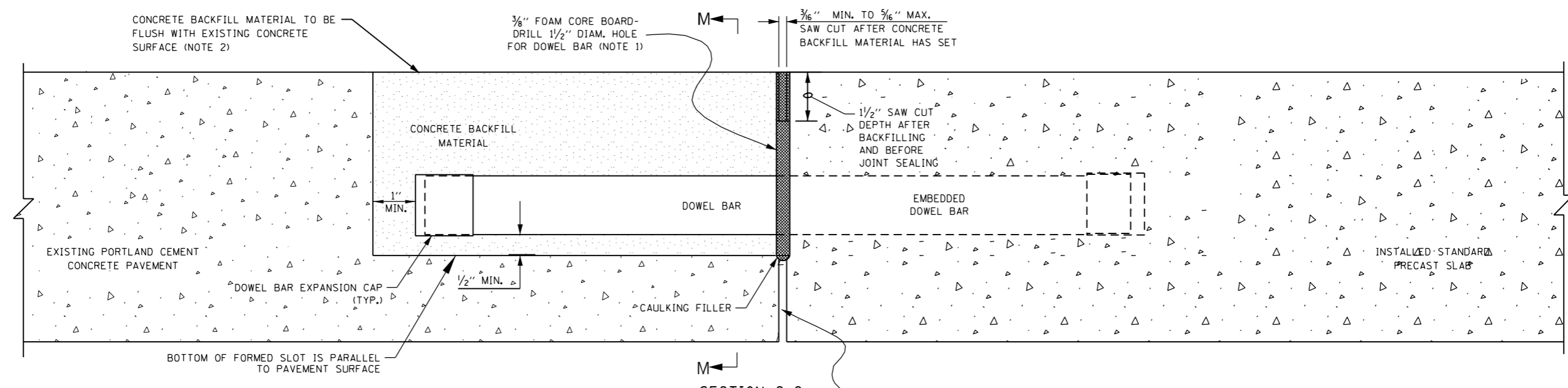
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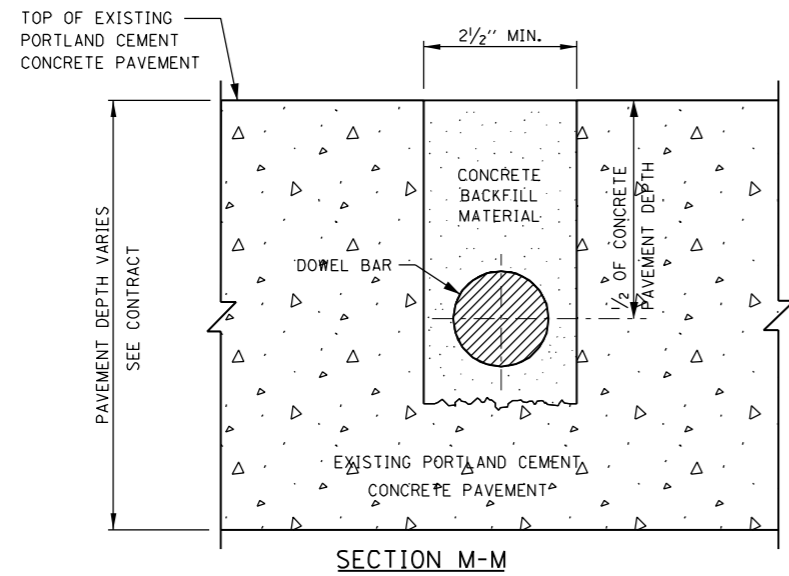


PLAN VIEW



SECTION G-G

DETAIL E - DOWEL BAR PLACEMENT DETAIL FOR CONSECUTIVE STANDARD PRECAST PANELS



SECTION M-M

NOTES:

1. PLACE FOAM CORE BOARDS TO THE TOP OF PATCH.
2. UPON COMPLETION, THE FINISHED SURFACE OF THE CONCRETE BACKFILL MATERIAL SHALL NOT BE BELOW THE EXISTING CONCRETE SURFACE.

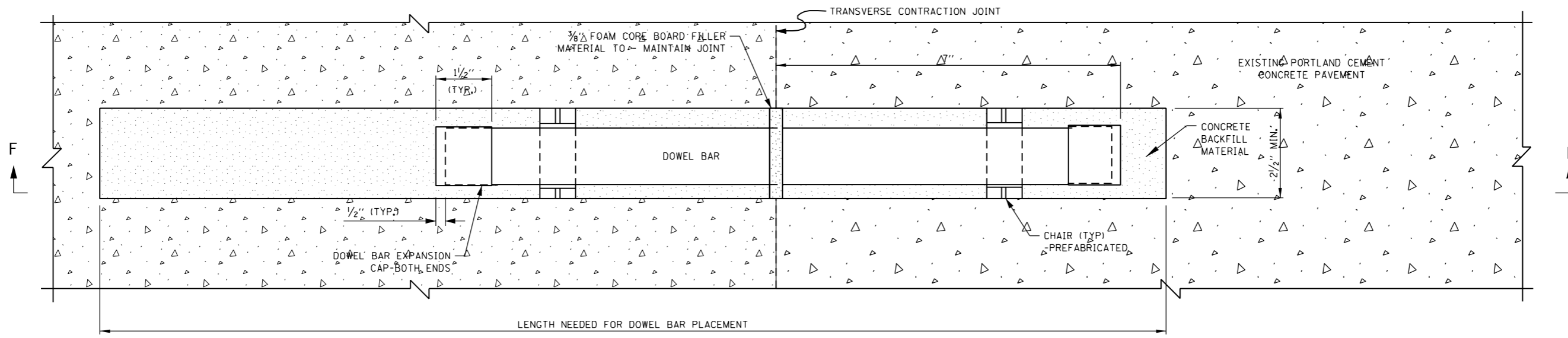


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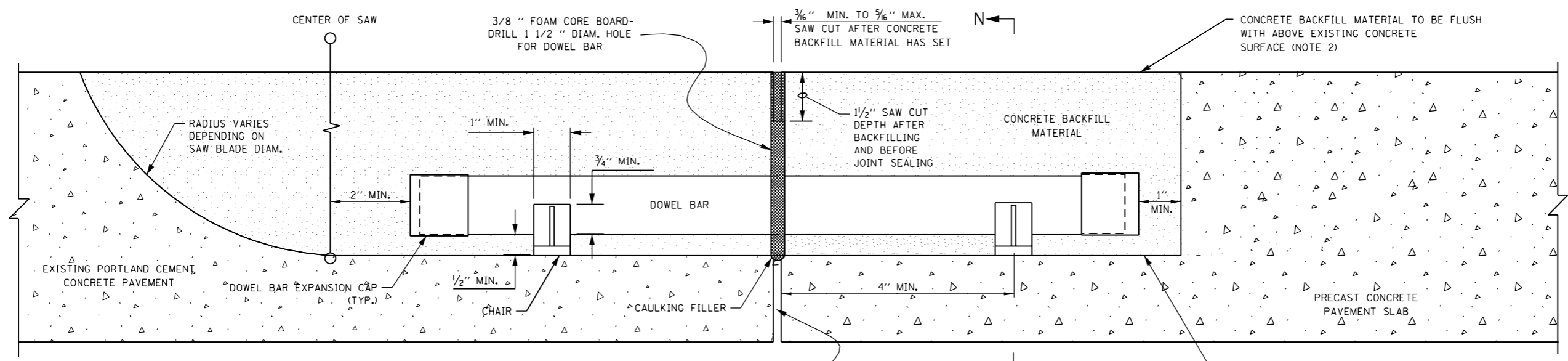
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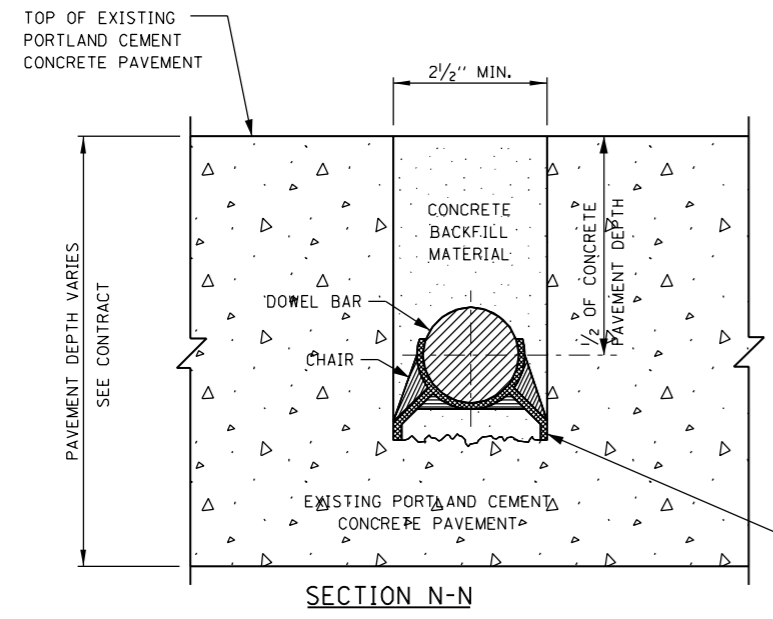


PLAN VIEW

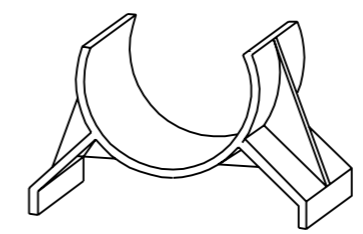


SECTION F-F

DETAIL-F, DOWEL BAR PLACEMENT DETAIL FOR THE LAST TRANSFER JOINT OF CONSECUTIVELY PLACED STANDARD PRECAST PANELS



SECTION N-N



CHAIR DETAIL

NOTES:

1. PLACE FOAM CORE BOARDS TO THE TOP OF PATCH.
2. UPON COMPLETION, THE FINISHED SURFACE OF THE CONCRETE BACKFILL MATERIAL SHALL NOT BE BELOW THE EXISTING CONCRETE SURFACE.



DATE	REVISIONS

PRECAST PAVEMENT SLABS

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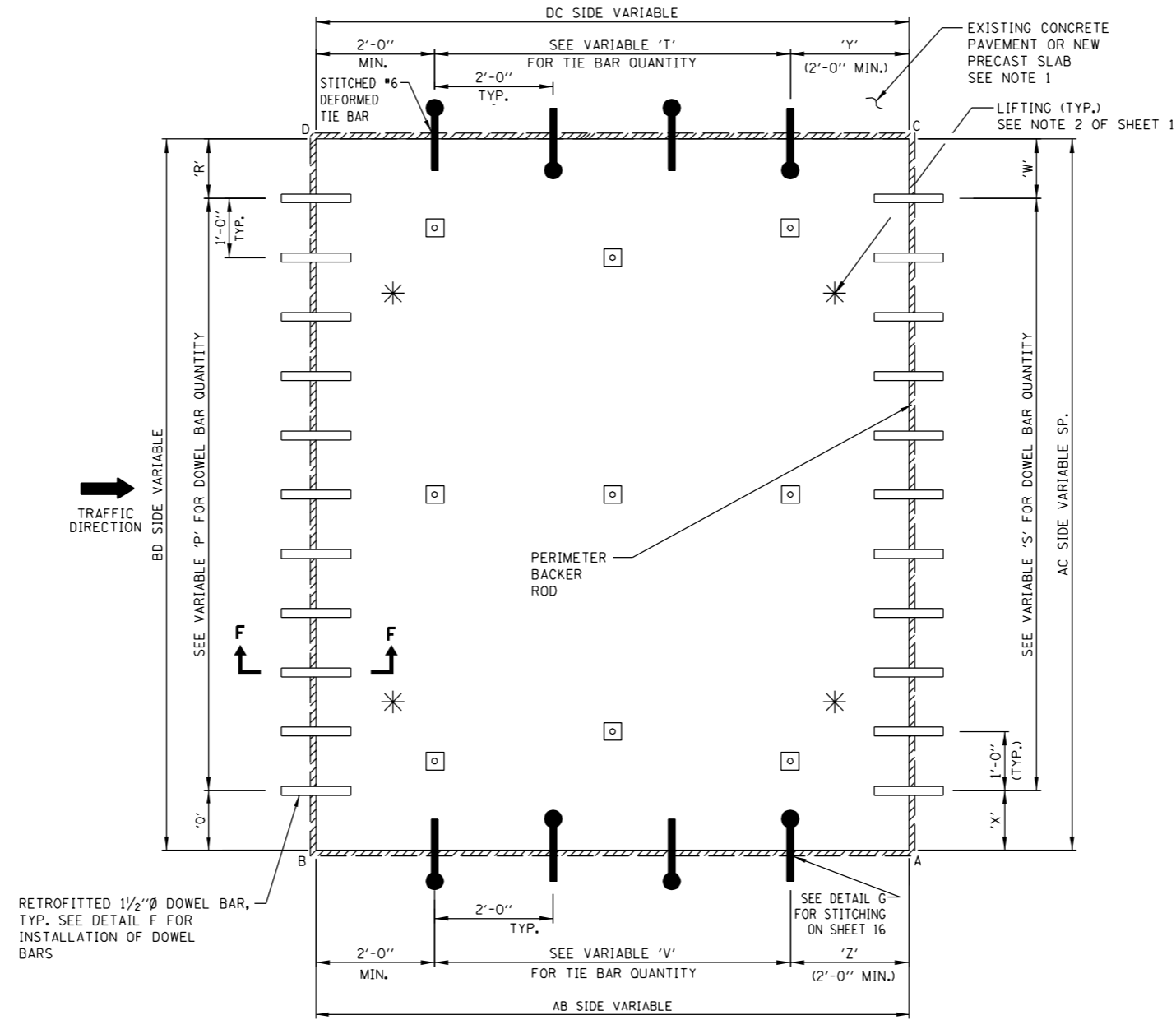

 APPROVED CHIEF ENGINEER DATE 5-1-2009

FOR NON STANDARD SLABS, UPON COMPLETION BY THE CONTRACTOR A SLAB LAYOUT WILL BE ADDED WITH SLAB DIMENSIONS TO INCLUDE BUT NOT BE LIMITED TO THE TABLE SHOWN BELOW.

EXAMPLE	CORRIDOR	STATION NUMBER	MAINLINE LANE NO.	RAMP ID.	RAMP LANE NO.	PLAZA NO.	PLAZA LANE NO.	MARK NO.	LANE TYPE	VARIABLES										AB* SIDE	BD* SIDE	CD* SIDE	AC* SIDE	AREA (SQ.FT.)	VOLUME (CU. FT.)	WEIGHT (TONS)	DIAGONALS (FT.)						
										AB (FT.)	AC (FT.)	BD (FT.)	CD (FT.)	P (NO.)	Q (FT.)	R (FT.)	S (NO.)	T (NO.)	V (NO.)								W (FT.)	X (FT.)	Y (FT.)	Z (FT.)	AD	BC	

MAINLINE LANE NO.: LANE NO. 1 IS ADJACENT TO MEDIAN SHOULDER.
 RAMP LANE NO.: LANE NO. 1 IS ADJACENT TO THE BUILDING.
 PLAZA LANE NO.: LANE NO. 1 IS ADJACENT TO THE BUILDING.
 MARK NO.: EACH PANEL SHALL BE INDIVIDUALLY MARKED FOR CORRECT PLACEMENT.
 LANE TYPE: "OUT" IN THIS COLUMN INDICATES OUTSIDE LANE.
 "MID" IN THIS COLUMN INDICATES MIDDLE LANE.
 "IN" IN THIS COLUMN INDICATES INSIDE LANE.
 "PLAZA" IN THIS COLUMN INDICATES PLAZA LANE.

*** LEGEND**
 DB= DOWEL BAR EMBEDDED
 DS= DOWEL SLOT
 ST= SLOT OR HOLE FOR STITCHED TIE BAR
 RD= FIELD RETROFITTED DOWEL BARS



INSTALLATION DETAIL FOR CUSTOM SLABS

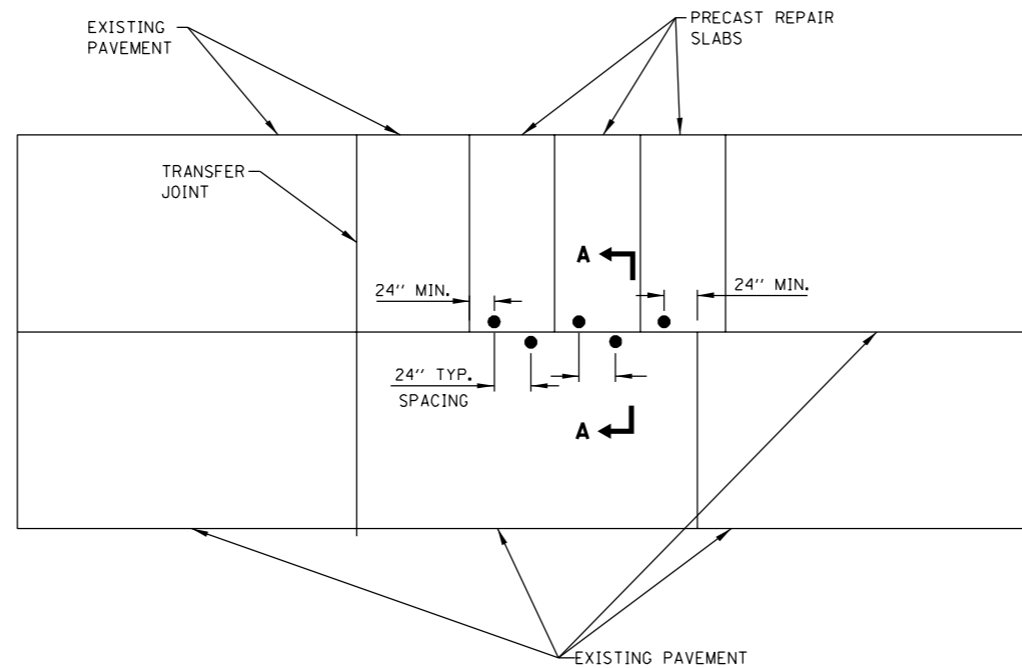
- NOTES:**
1. NO STITCHING OF DEFORMED TIE BARS IS REQUIRED WHEN PRECAST SLAB IS PLACED ADJACENT TO HMA SHOULDER OR PLAZA ISLAND.
 2. TIE BAR STITCHING SHALL BE REQUIRED WHEN THE REPAIR AREA LENGTH EXCEEDS 20 FT. OR WHEN MORE THAN 3 PRECAST SLABS ARE PLACED IN SEQUENCE.
 3. SHOP DRAWINGS SHALL BE REQUIRED FOR ALL CUSTOM PLAZA SLABS.



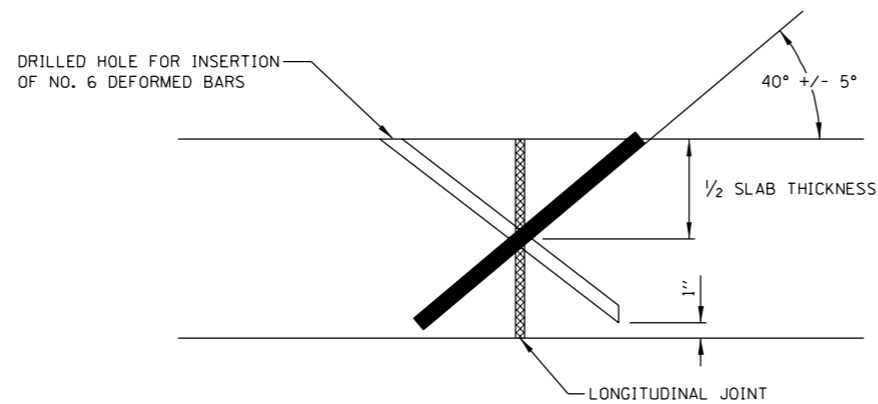
APPROVED *Paul Kovacs*
 CHIEF ENGINEER DATE 5-1-2009

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PRECAST PAVEMENT SLABS
 STANDARD A18-00



**DETAIL G - LONGITUDINAL TIE BAR
STITCHING FOR PRECAST PANELS**



SECTION A-A

NOTES FOR TIE BAR STITCHING:

1. DRILL HOLES THAT ARE ORIENTED AT $40^\circ \pm 5^\circ$ ANGLE TO THE PAVEMENT SURFACE SO THAT THEY INTERSECT THE LONGITUDINAL CRACK OR JOINT AT ABOUT MID-DEPTH. (IT IS IMPORTANT TO START DRILLING THE HOLE AT A CONSISTENT DISTANCE FROM THE JOINT, IN ORDER TO CONSISTENTLY CROSS AT THE MID-DEPTH OF THE SLAB.)
2. HOLE CENTERLINES ARE PERPENDICULAR TO THE JOINT (IN PLAN VIEW) AT EACH LOCATION BEING DRILLED.
3. SELECT A DRILL THAT MINIMIZES DAMAGE TO THE CONCRETE SURFACE, SUCH AS A HYDRAULIC POWERED DRILL. SELECT A DRILL DIAMETER NO MORE THAN 0.375 IN. LARGER THAN THE TIE-BAR DIAMETER. CHOOSE A GANG-MOUNTED DRILL IF A HIGHER PRODUCTIVITY IS NEEDED.
4. DRILL HOLES WITH NO LESS THAN A 24 INCH BAR SPACING. ADJACENT HOLES ARE DRILLED IN OPPOSITE DIRECTIONS ACROSS THE JOINT. THE HOLES AND INSERTED TIE BAR SHALL BE NO LESS THAN 24 INCHES FROM ANY EXISTING TRANSVERSE JOINT OR ANY PRECAST OR REPAIR TRANSFER JOINT.
5. HOLE BOTTOMS ARE NO MORE THAN 1 INCH FROM THE SLAB BOTTOM.
6. AIR BLOW THE HOLES TO REMOVE DUST AND DEBRIS AFTER DRILLING.
7. INJECT ADHESIVE INTO THE HOLE, LEAVING SOME VOLUME FOR THE BAR TO OCCUPY THE HOLE. (POURING THE ADHESIVE IS ACCEPTABLE FOR SMALL QUANTITIES.)
8. INSERT THE NO. 6 EPOXY COATED DEFORMED TIE BAR INTO THE HOLE, LEAVING ABOUT 1 IN. FROM THE TOP OF BAR TO THE PAVEMENT SURFACE. DEFORMED TIE BARS SHALL BE EPOXY COATED.
9. REMOVE EXCESS ADHESIVE AND FINISH FLUSH WITH THE PAVEMENT SURFACE.



DATE	REVISIONS

PRECAST PAVEMENT SLABS

STANDARD A18-00

APPROVED *Paul Kovacs* CHIEF ENGINEER DATE 5-1-2009