6	TEXAS	45-4229(015 MA-M K377(2)	1
12	GALVESTON	0500-04-066 1607-01-025	DIV 45 FM 1764

STATE OF TEXAS
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

INDEX OF SHEETS

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT

I45-1(229)015 CSJ 0500-04-066: 3700 FT = 0.700 MI { ROADWAY 3700 FT = 0.700 MI; BRIDGE 0.00 FT = 0.00 MI }

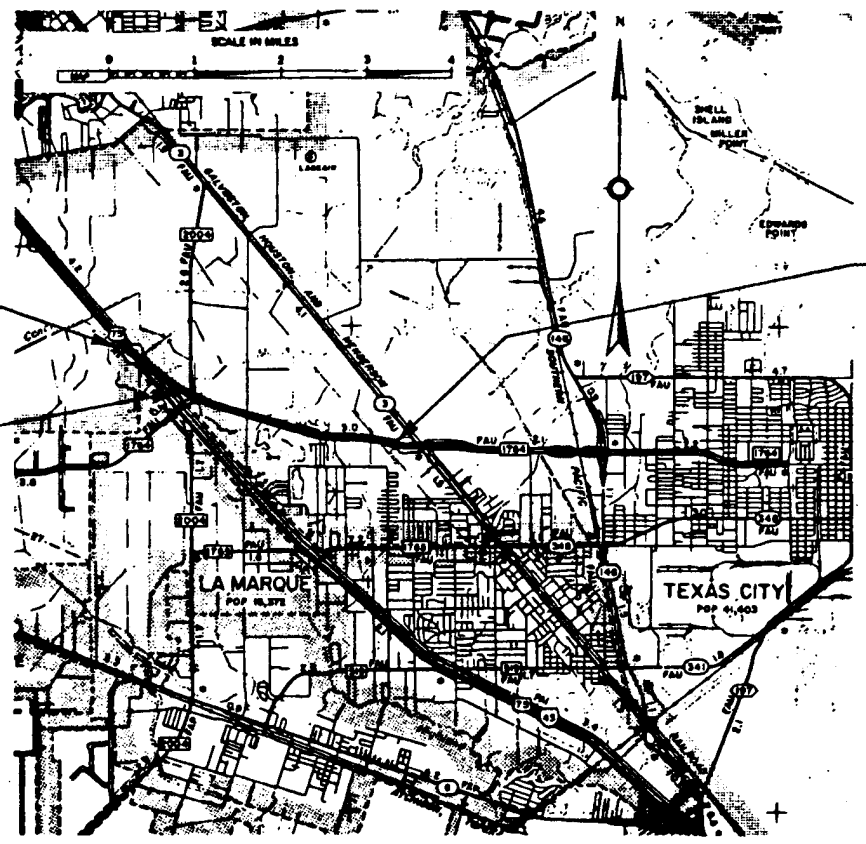
MA-M K377(2) CSJ 1607-01-025: 14,093.31 FT = 2.668 MI { ROADWAY 13,094.31 FT = 2.479 MI; BRIDGE 999 FT = 0.189 MI }

GALVESTON COUNTY
I.H. 45 and F.M. 1764

Net Length of Contract = 17,793.31 FT = 3.366 MI

LIMITS: I.H. 45: AT F.M. 1764
F.M.1764: From I.H. 45 to S.H. 3

TYPE: Grading, Structures, Lime Treated Subgrade, Cement Stabilized Base, Concrete Pavement, Signing, Pavement Markings, and Lighting.



BEGIN PROJECT
I 45-1(229)015
CONTROL 500-04-066
'G' STA. 60+00

'G' STA. 97+00
END PROJECT
I 45-1(229)015
CONTROL 500-04-066
BEGIN PROJECT
MA-M K377(2)
CONTROL 1607-01-025

END PROJECT
MA-M K377(2)
CONTROL 1607-01-025
'G' STA. 238+00

FM 1764
IH 45 to SH 3

NOTES: THE CONTRACTOR SHALL PROVIDE AND ERECT BARRICADES AND WARNING SIGNS IN ACCORDANCE WITH [illegible] AT POINTS INDICATED AND AT OTHER POINTS AS DIRECTED BY THE ENGINEER.

FINAL PLANS

CITY OF TEXAS CITY

MAYOR _____ DATE 1-3-86

NOTE:
SPECIFICATIONS ADOPTED BY THE STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION OF TEXAS, SEPTEMBER 1, 1982, AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FORM PR-1273, SEPTEMBER, 1975).

NO RAILROAD CROSSINGS
NO EXCEPTIONS
EQUATIONS: 228+66.22 BK = 228+72.91 FWD. = - 6.69 FT.

Harold E. Comer 2-4-86
ENGINEER OF GEOMETRIC DESIGN

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

CORRECT: 1-3, 1986
Raj K. Syal
ENGINEER DIST. 12

APPROVED: 2-5-86
BRIDGE ENGINEER

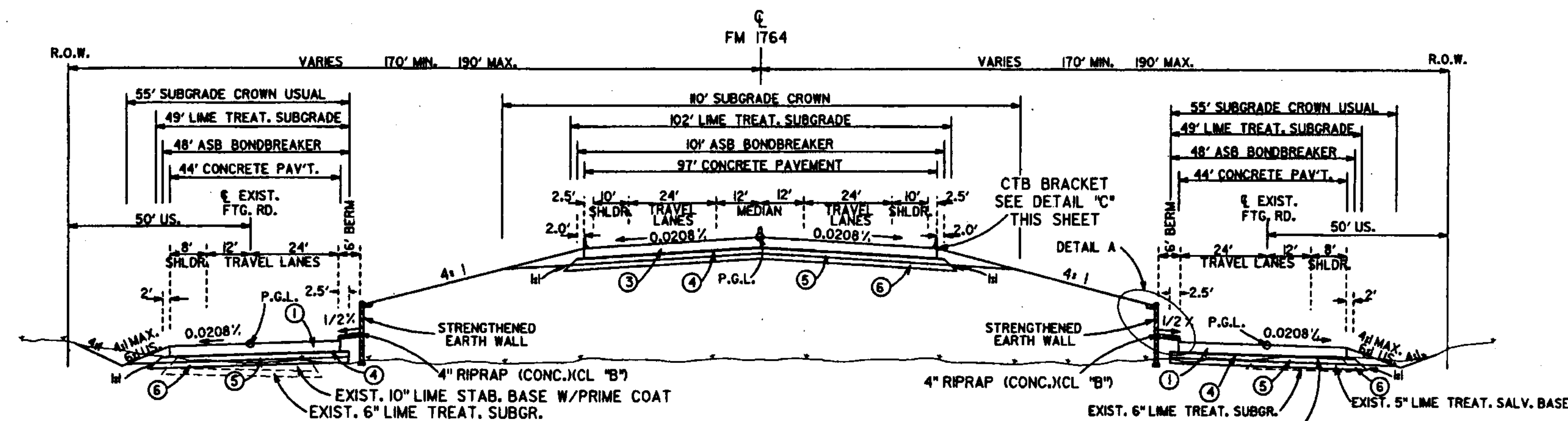
RECOMMENDED FOR APPROVAL: 1/21, 1986
DISTRICT ENGINEER DIST. 12

APPROVED FOR ISSUE:
FOR CHIEF ENGINEER, HIGHWAY DESIGN

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED:
DIVISION ADMINISTRATOR DATE

Galveston

0544(80)0037641TITLE

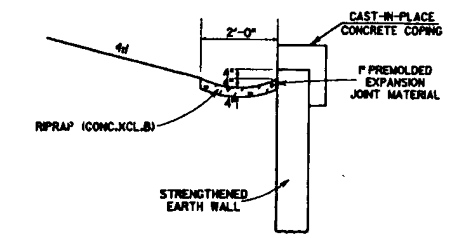


"C" STA. 134+00 TO 156+00
187+50 TO 211+70

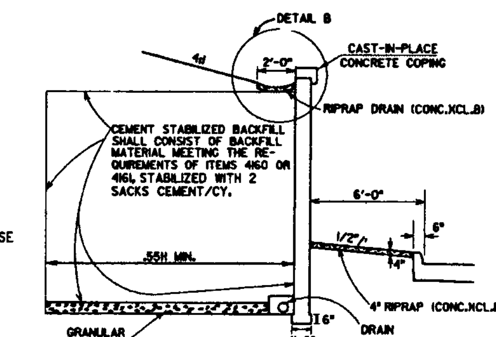
TYPICAL SECTION WITHIN INTERCHANGES

"G" STA. 136+50 TO 141+70.99
145+15.99 TO 150+00
192+00 TO 196+94
200+34 TO 205+00

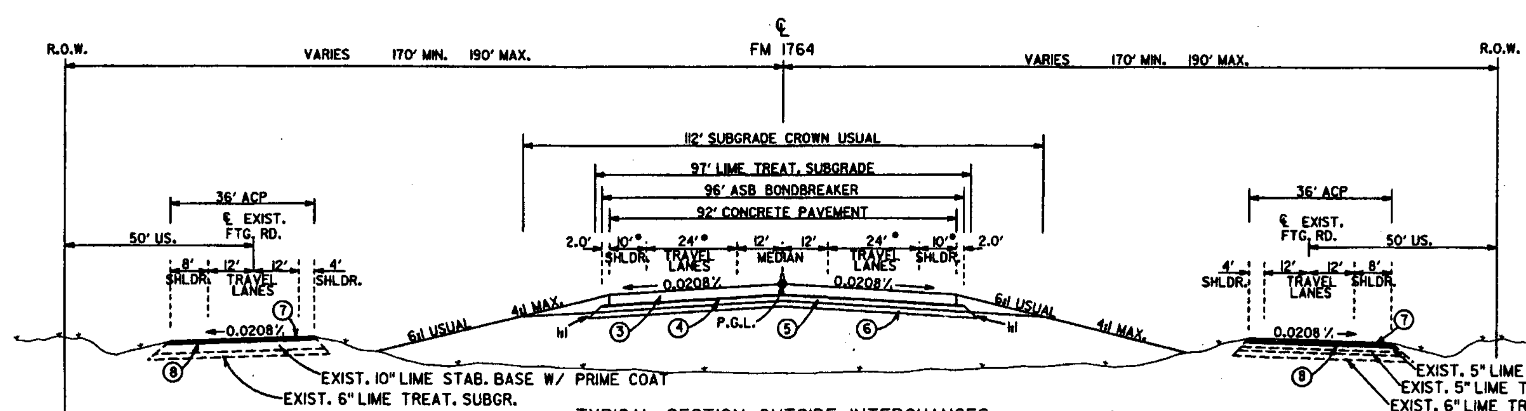
"D" STA. 10131+50 TO 10153+70
10179+40 TO 10211+50



DETAIL B



DETAIL A
STRENGTHENED EARTH WALL
EXCAV AND BKFL



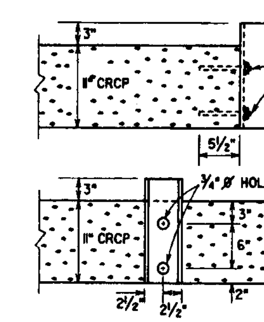
"C" STA. 156+00 TO 187+50
211+70 TO 236+00

TYPICAL SECTION OUTSIDE INTERCHANGES

"G" STA. 100+00 TO 104+22.08
107+36.08 TO 136+50
150+00 TO 192+00
205+00 TO 231+00

*36' TRAVEL LANES AND 6' SHOULDERS FROM STA. 215+00 TO STA. 229+00

"D" STA. 10153+70 TO 10179+40
10211+50 TO 10237+50



GALV. CHANNEL 5" X 1¾" X 9.0 #/'

2 - ⅝"Ø CONC. ANCHORS (AS MANUFACTURED BY PARABOLT, HILTI KWIK BOLT OR HVA ADHESIVE BOLT OR APPROVED EQUIVALENT) WITH GALVANIZED ⅝"Ø BOLTS, NUTS AND WASHERS

NOTE:
THESE CTB BRACKETS WILL BE PLACED 2½ FEET FROM EACH END OF EACH SECTION OF CTB. THEY WILL NOT BE PAID FOR DIRECTLY BUT WILL BE INCIDENTAL TO OTHER BID ITEMS.

DETAIL C
CTB BRACKET

LEGEND
PROPOSED ITEMS

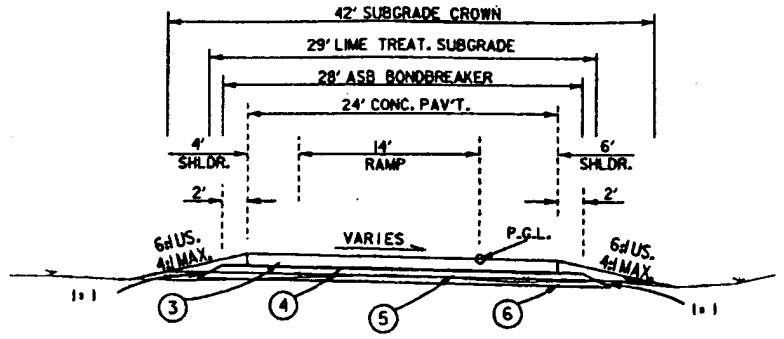
1. 8" CRCP
2. 9" CRCP
3. 11" CRCP
4. 3/4" ASB BONDBREAKER
5. 6" CEMENT STABILIZED BASE
6. 6" LIME TREATED SUBGRADE
7. 1½" TY D ACP SURFACE
8. 1½" TY D ACP LEVEL-UP

TYPICAL SECTIONS

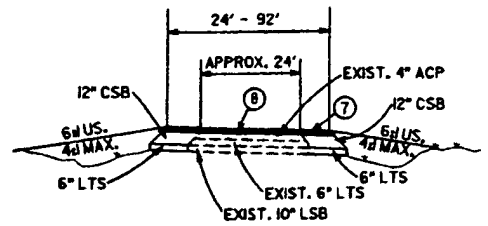
FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.			SHEET NO.
6	TEXAS	145-K229(015),etc.			2
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
12	GALVESTON	500	4	86, etc.	FM 1764

AD-79-47

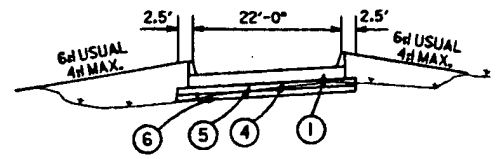
QSA4:[110,100]1764TYSEC



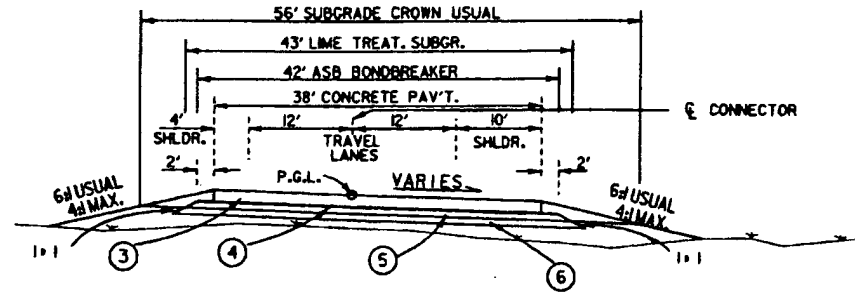
TYPICAL RAMP SECTION



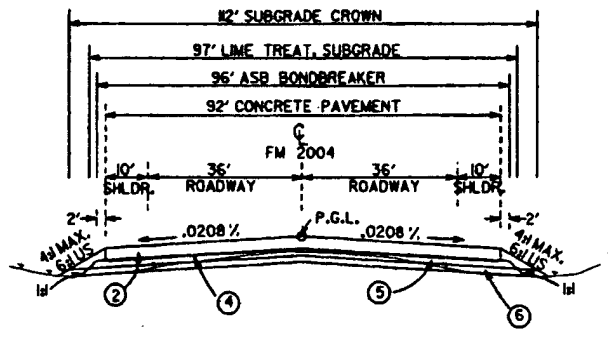
TYPICAL SECTION FOR ACP TRANSITION ON FM 2004 AND JOHNNY PALMER RD.



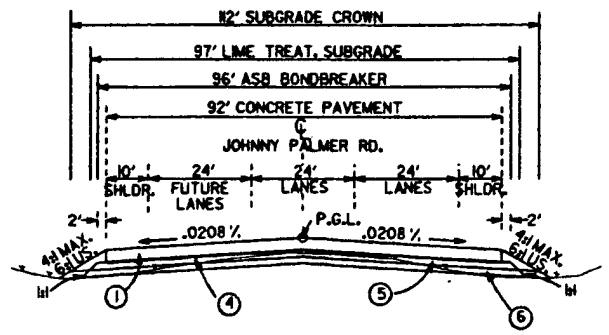
TYPICAL SECTION FOR U-TURNS (FM 2004, JOHNNY PALMER RD. & AMBURN RD.)



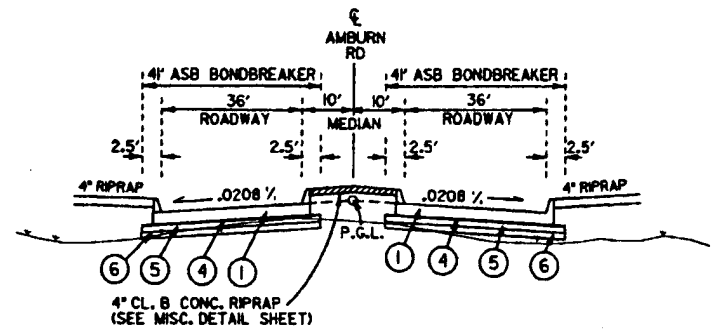
TYPICAL SECTION FOR F.M. 1764 CONNECTIONS TO I.H. 45



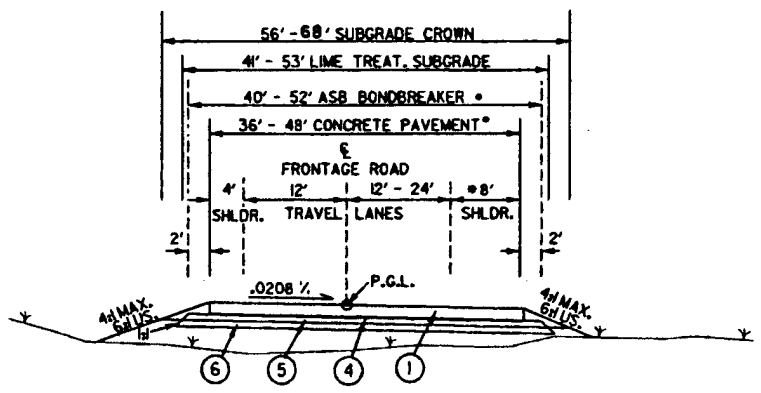
TYPICAL SECTION FOR F.M. 2004 (ALIGN. "I")



TYPICAL SECTION FOR JOHNNY PALMER ROAD (ALIGN. "J")



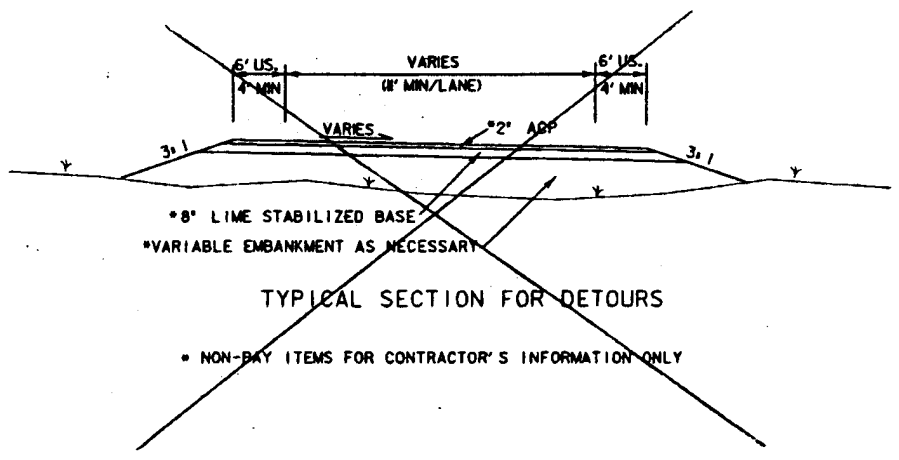
TYPICAL SECTION FOR AMBURN ROAD (COLLEGE OF THE MAINLAND - ALIGN. "M")



TYPICAL FRONTAGE ROAD SECTION AT I.H. 45

- 6' RIGHT SHOULDER FOR I.H. 45 SOUTHBOUND FRONTAGE ROAD (ALIGN. "D" STA. 410+33.53 TO 440+00)

"C" STA. 63+60 TO 134+00
"D" STA. 410+33 TO 440+00
10106+00 TO 10131+50



TYPICAL SECTION FOR DETOURS

- NON-PAY ITEMS FOR CONTRACTOR'S INFORMATION ONLY

LEGEND
PROPOSED ITEMS

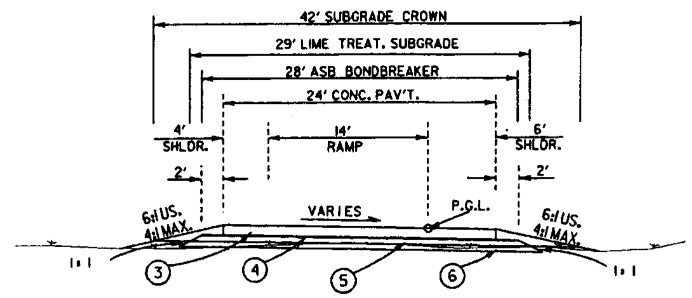
1. 8" CRCP
2. 9" CRCP
3. 11" CRCP
4. ¾" ASB BONDBREAKER
5. 6" CEMENT STABILIZED BASE
6. 6" LIME TREATED SUBGRADE
7. 1½" TY D ACP SURFACE
8. 1½" TY D ACP LEVEL-UP

TYPICAL SECTIONS

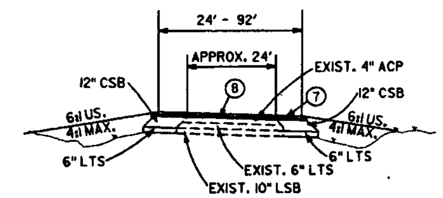
FED. RD. DIV. NO.	STATE	FEDERAL PROJECT NO.				SHEET NO.
6	TEXAS	145-1(299)015, etc.				3
STATE DIST. NO.	COUNTY		CONT.	SECT.	JOB	HIGHWAY NO.
12	GALVESTON		500	4	66 etc.	FM764

AD-79-47

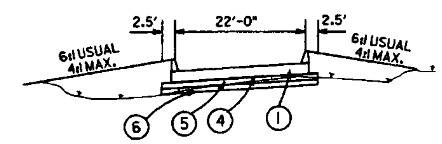
QSA4=I110, 1001764TYSEC



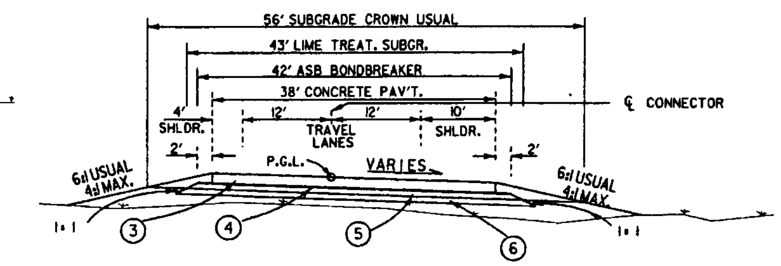
TYPICAL RAMP SECTION



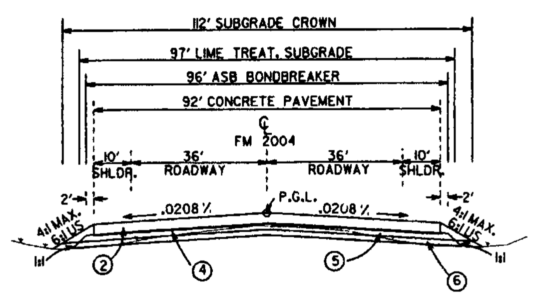
TYPICAL SECTION FOR ACP TRANSITION ON FM 2004 AND JOHNNY PALMER RD.



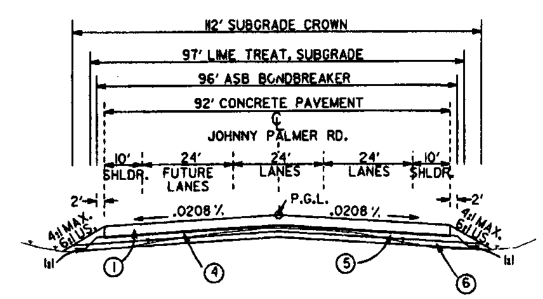
TYPICAL SECTION FOR U-TURNS (FM 2004, JOHNNY PALMER RD. & AMBURN RD.)



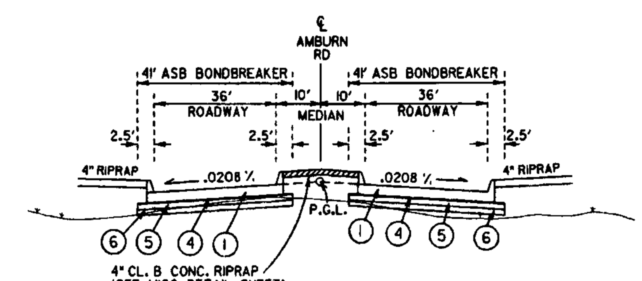
TYPICAL SECTION FOR F.M. 1764 CONNECTIONS TO I.H. 45



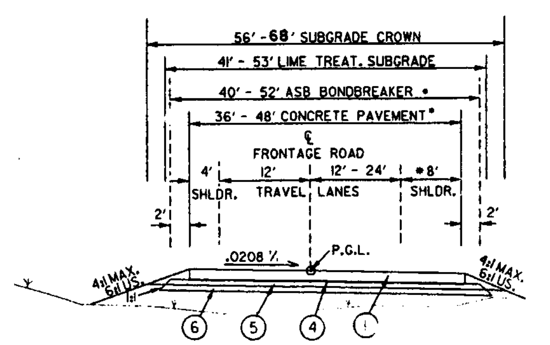
TYPICAL SECTION FOR F.M. 2004 (ALIGN. "I")



Δ TYPICAL SECTION FOR JOHNNY PALMER ROAD (ALIGN. "J")
STA. 11+72.71 TO 12+65±
STA. 15+35± TO 16+27.29



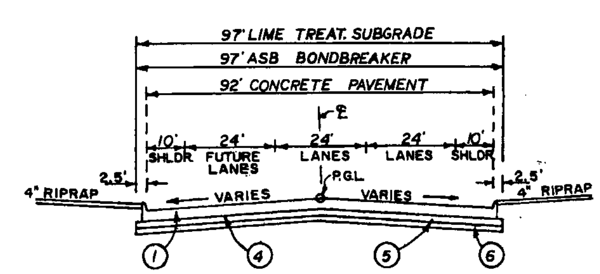
TYPICAL SECTION FOR AMBURN ROAD (COLLEGE OF THE MAINLAND - ALIGN. "M")



TYPICAL FRONTAGE ROAD SECTION AT I.H. 45

• 6' RIGHT SHOULDER FOR I.H. 45 SOUTHBOUND FRONTAGE ROAD (ALIGN. "D" STA. 410+33.53 TO 440+00)

"C" STA. 63+60 TO 134+00
"D" STA. 410+33 TO 440+00
10106+00 TO 10131+50



Δ TYPICAL SECTION FOR JOHNNY PALMER ROAD (ALIGN. "J")
STA. 12+65± TO 15+35±

LEGEND
PROPOSED ITEMS

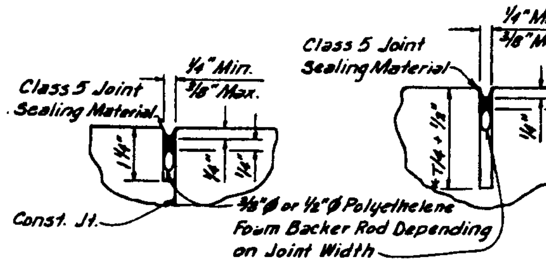
1. 8" CRCP
2. 9" CRCP
3. 11" CRCP
4. ¾" ASB BONDBREAKER
5. 6" CEMENT STABILIZED BASE
6. 6" LIME TREATED SUBGRADE
7. 1½" TY D ACP SURFACE
8. 1½" TY D ACP LEVEL-UP

Δ TO ACCOMPANY FIELD CHANGE NO. 1

TYPICAL SECTIONS

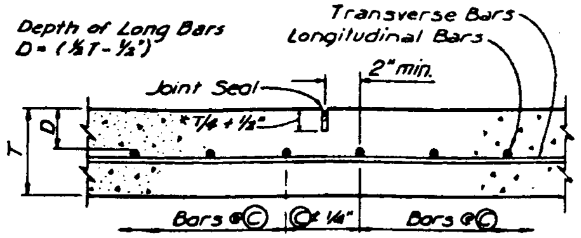
6	TEXAS	I45-1(299)015, etc.			3A
12	GALVESTON	500	4	65 etc.	FM1764

QSA4:[110,100]1764TYSEC



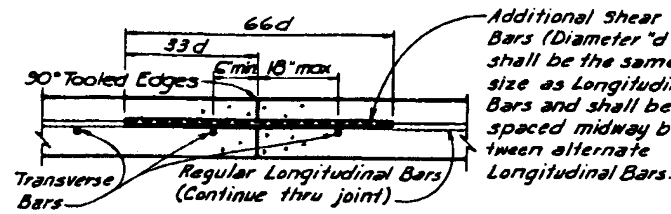
CONSTRUCTION JOINT — GROOVED JOINT

JOINT SEALING DETAILS



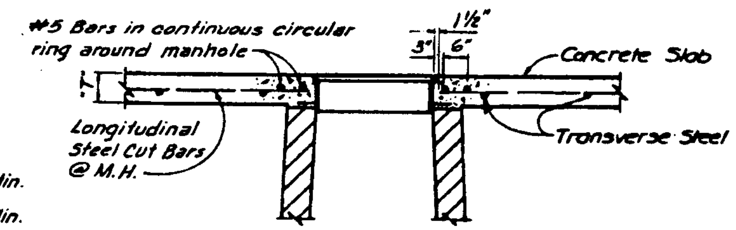
LONGITUDINAL GROOVED JOINTS

*If Siliceous River Gravel is used as the coarse aggregate, the depth of sawcut shall be T/3.



SECTION X-X

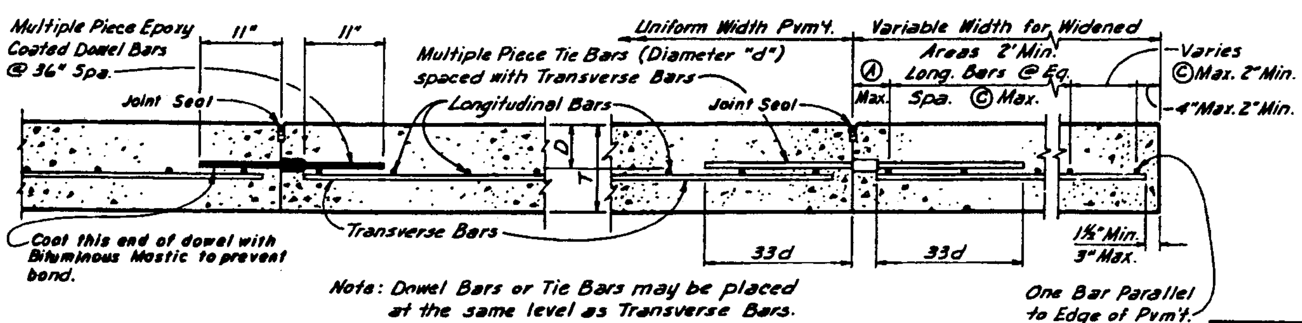
TRANSVERSE CONSTRUCTION JOINT



SECTION THRU MANHOLE

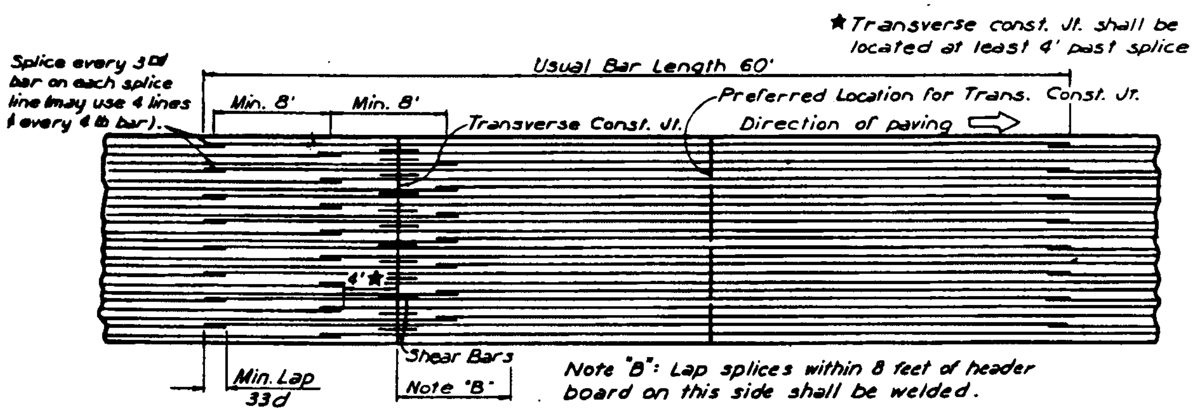
SHOWING ADDED REINFORCING STEEL IN SLAB

NOTE: Manholes may be located in freeway medians or shoulders but must be at least one foot clear of the traffic lanes. Manholes may also be located in frontage street paving but must be at least one foot clear of the edge of pavement. Manholes will not be permitted in freeway lanes.

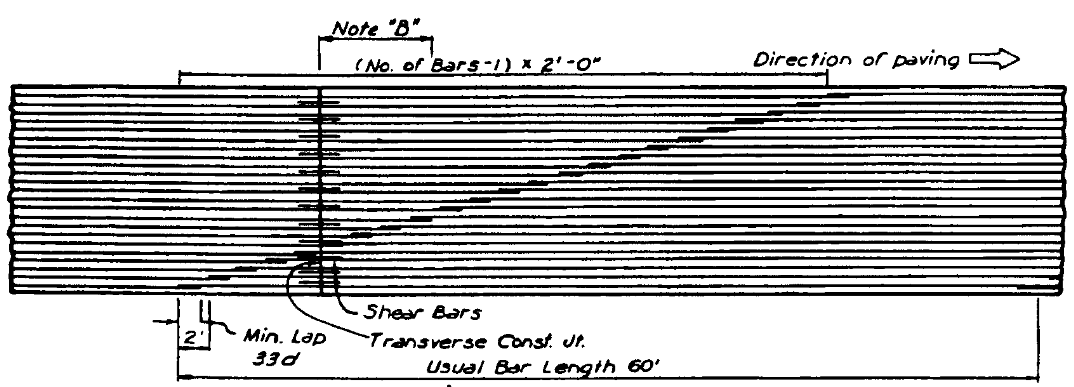


DOWEL BAR — TIE BAR

LONGITUDINAL CONSTRUCTION JOINTS



8' STAGGER PATTERN



2' SKEW PATTERN

ALTERNATE SPLICE PATTERNS

OPTIONAL TWO LAYER STEEL PLACEMENT

(FOR 11 IN. AND 12 IN. THICKNESSES ONLY)

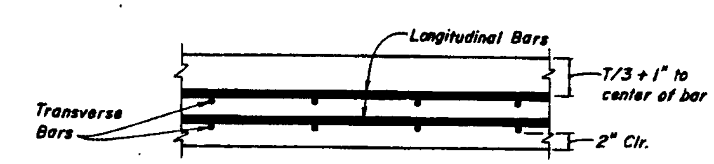
T (IN.)	LONGITUDINAL BAR SIZE	SPACING C (IN.)	TRANSVERSE BAR SIZE	MAXIMUM ALLOWABLE PAVEMENT WIDTH (FT.) FOR GIVEN TRANS. STEEL SPAC. (IN.)		
				12	24	36
11	4	6	4	174	87	58
			5	270	135	90
			6	384	192	128
12	5	9	4	160	80	53
			5	248	124	82
			6	352	176	117

NOTES FOR OPTIONAL STEEL PLACEMENT:

1. *For pavements 11 in. or 12 in. in thickness, the Contractor will have the option of placing two layers of reinforcing steel. Bar sizes and spacings given in the table are for each layer of reinforcing. Maximum allowable pavement widths given in the table are based on two layers of transverse steel.*
2. *Transverse bar spacing shall not be less than 12 in. nor greater than 36 in. To determine the allowable pavement width for intermediate bar spacings, interpolate between values given in the table.*
3. *Spacings given in the table for longitudinal bars are approximate. For a given placement width the spacing shall be adjusted to result in a steel percentage of 0.6% or slightly greater.*
4. *If the Contractor elects to use the two layer steel placement, he shall be required to submit, for the approval of the Engineer, drawings which show his proposed arrangement of reinforcing. These drawings shall be similar to those in the plans for single layer reinforcing.*
5. *Chairs will be required to support both layers of steel unless the "Double Strike-Off" procedure is used.*

GENERAL NOTES

1. DETAILS AS TO PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS SLOPE SHALL BE AS SHOWN ELSEWHERE IN THE PLANS. GENERALLY, PAVEMENT THICKNESS FOR CONNECTIONS AND RAMPS SHALL BE THE SAME AS THE FREEWAY, EXCEPT THAT A TRANSITION IN THICKNESS SHALL BE MADE TO MEET THE FRONTAGE STREET AS DIRECTED BY THE ENGINEER. REINFORCING STEEL THRU THE TRANSITION IN THICKNESS SHALL BE THE SAME AS IN THE THICKER SLAB.
2. ALL LONGITUDINAL AND TRANSVERSE REINFORCING BARS, INCLUDING TIE BARS AND DOWEL BARS, SHALL BE "HIGH YIELD" STEEL CONFORMING TO ASTM DESIGNATION A615 OR A616, GRADE 60. LONGITUDINAL STEEL SHALL BE FURNISHED IN CONVENIENT EQUAL LENGTHS. SCRAP STEEL SHALL NOT BE USED. DOWEL BARS AND TIE BARS SHALL NOT BE BENT. ALL REINFORCING STEEL, EXCEPT FOR DOWEL BARS, SHALL BE DEFORMED BARS.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS TO INSURE THAT THE FINAL POSITION OF STEEL IS WITHIN A VERTICAL AND HORIZONTAL TOLERANCE OF 1/2" FROM THE THEORETICAL POSITION SHOWN.
4. WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY PLACE THE LONGITUDINAL CONSTRUCTION JOINT AT ANY OF THE LANE LINES TO GIVE A WIDER (MAXIMUM 3 LANES) OR DIFFERENT PLACEMENT. GROOVED JOINTS SHALL BE USED AT ALL INTERMEDIATE LANE LINES. IN WIDENED AREAS GROOVED JOINTS SHALL BE PLACED AS DIRECTED BY THE ENGINEER. LONGITUDINAL CONSTRUCTION AND/OR GROOVED JOINTS SHALL NOT BE MORE THAN 17 FEET APART ON FREEWAY PAVEMENT AND FRONTAGE STREET PAVEMENT AS MEASURED TRANSVERSELY UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
5. LONGITUDINAL JOINTS SHALL BE SAWED AS SOON AS SAWING CAN BE ACCOMPLISHED WITHOUT DAMAGE TO THE PAVEMENT AND BEFORE 24 HOURS AFTER THE CONCRETE HAS BEEN PLACED, THE EXACT TIME TO BE APPROVED BY THE ENGINEER. THE SAW CUT SHALL BE MADE WITH ONE PASS OF THE CONCRETE SAW.
6. EXPANSION JOINTS SHALL BE USED ONLY AT THOSE LOCATIONS DESIGNATED IN THE PLANS. SEE CRCP DETAILS (TERMINAL ANCHORAGE).
7. BAR SPLICES SHALL BE A MINIMUM OF 33 TIMES THE NOMINAL DIAMETER ("d") OF THE BAR.
8. SEE "GUTTER DEPRESSION DETAILS FOR STORM SEWER INLETS" FOR PAVING DETAILS ADJACENT TO CURB INLETS.
9. THE NUMBER OF TRANSVERSE CONSTRUCTION JOINTS INSTALLED SHALL BE KEPT TO AN ABSOLUTE MINIMUM. WHEN PLACEMENT IS STOPPED AT THE END OF THE DAY OR FOR OTHER REASONS, SET ADDITIONAL STEEL FOR TRANSVERSE JOINT AND PLACE BOARD HEADER. THERE SHALL BE NO PAVING AGAINST JOINT FOR 12 HOURS MINIMUM. REMOVE BOARD HEADER BEFORE COMMENCING NEW PLACEMENT. VIBRATION WITH HAND MANIPULATED MECHANICAL VIBRATORS WILL BE REQUIRED ADJACENT TO ALL TRANSVERSE CONSTRUCTION JOINTS. WELDED LAP SPLICES WILL BE REQUIRED AT ALL POINTS WHERE NEW PAVEMENT MEETS EXISTING CONTINUOUSLY REINFORCED PAVEMENT. WELDING OF LAP SPLICES SHALL CONFORM TO THE REQUIREMENTS OF STANDARD SPECIFICATION ITEM 448 FOR WELDING REINFORCING STEEL.
10. THE CHAIRS USED TO SUPPORT THE BAR MAT SHALL BE OF SUFFICIENT STRUCTURAL QUALITY AND NUMBER TO HOLD THE MAT WITHIN THE PLACEMENT HEIGHT TOLERANCES, AND SHALL BE OF A TYPE APPROVED BY THE ENGINEER. GALVANIZING OF CHAIRS WILL NOT BE REQUIRED. CHAIR SPACING SHALL NOT EXCEED 34" IN THE TRANSVERSE AND 48" IN THE LONGITUDINAL DIRECTION. PLACEMENT MAY BE STAGGERED SO THAT CHAIRS IN ALTERNATE ROWS ARE CENTERED BETWEEN THE CHAIRS IN ADJACENT ROWS. WHEN MACHINE PLACING OF STEEL REINFORCEMENT IS USED, BAR CHAIRS WILL NOT BE REQUIRED, AND THE TRANSVERSE STEEL MAY BE PLACED EITHER ABOVE OR BELOW THE LONGITUDINAL STEEL. VIBRATION OF THE STEEL INTO POSITION SHALL NOT BE PERMITTED.
11. "LEAVE-OUTS" IN CONTINUOUSLY REINFORCED PAVEMENT SHALL BE KEPT TO A MINIMUM. BEFORE PAVING A SECTION WHERE A "LEAVE-OUT" WAS NECESSARY, SUCH AS AT A STREET CROSSING, THE TEMPERATURE OF THE FREE ENDS OF THE EXISTING PAVEMENTS SHALL BE STABILIZED BY PLACING WET COTTON MATS FOR A DISTANCE OF 200' ON EACH SIDE OF THE "LEAVE-OUT" 24 HOURS PRIOR TO CONCRETE PLACEMENT AND CONTINUED UNTIL 60 HOURS AFTER PLACEMENT.
12. MULTIPLE PIECE TIE BARS AND DOWEL BARS SHALL BE REQUIRED AT THE LONGITUDINAL CONSTRUCTION JOINTS. THE MULTIPLE PIECE TIE BAR/DOWEL BAR ASSEMBLIES SHALL HAVE STOP TYPE COUPLINGS AND SHALL HAVE ROLLED THREADS ON THE BARS. THE MULTIPLE PIECE TIE BAR ASSEMBLIES SHALL DEVELOP A MINIMUM ULTIMATE TENSILE STRENGTH EQUAL TO 1-1/2 TIMES THE MINIMUM YIELD STRENGTH OF THE TRANSVERSE BARS BEING JOINED. THE MULTIPLE PIECE DOWEL BAR ASSEMBLIES SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 50.0 KIPS. TIE BARS SHALL BE DEFORMED REINFORCING BARS AND DOWEL BARS SHALL BE SMOOTH, EPOXY COATED BARS. TIE BAR ASSEMBLIES MADE FROM STEELS OTHER THAN ASTM GRADE 60 AND WITH DEFORMATIONS OTHER THAN ASTM STD. MAY BE USED PROVIDED IT CAN BE PROVEN TO THE SATISFACTION OF THE ENGINEER THAT THEY ARE IN EVERY RESPECT THE EQUAL OF THE ASSEMBLIES SPECIFIED. LABORATORY TESTING OF THE PROPOSED ASSEMBLIES, AT THE CONTRACTOR'S EXPENSE, MAY BE REQUIRED.
13. TIE BARS AND DOWEL BARS OMITTED OR LOST SHALL BE REPLACED BY DRILLING AND GROUTING AT THE CONTRACTOR'S EXPENSE.



OPTIONAL STEEL PLACEMENT

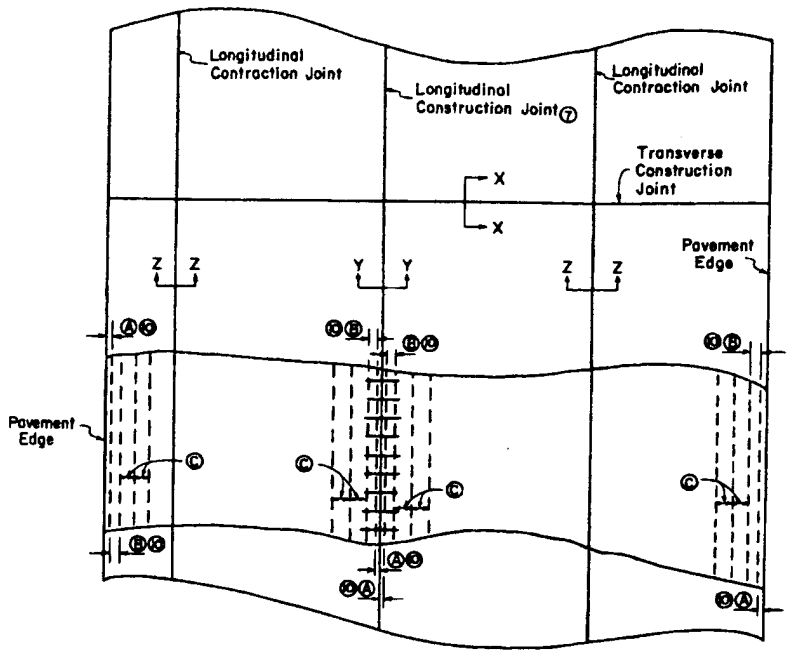
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT DETAILS

MISCELLANEOUS DETAILS AND GENERAL NOTES

ORIGINAL — JUNE 1987 — 6 — TEXAS — 12

DR 5F SH 2



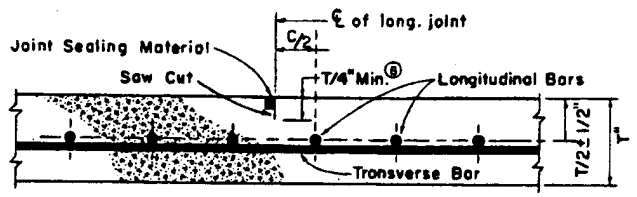
TWO LANE PAVEMENT PLAN
(38' PLACEMENT OR 16' & 22' PLACEMENT ⑦)

Spacing C (in.)	Number of bars required for various typical placement widths (ft.) ⑩						
	12	16	22	24	27	34	38
6	24	32	44	48	54	68	76
7	21	27	37	41	46	58	65
8	18	24	33	36	41	51	57
9	16	22	30	32	36	46	51

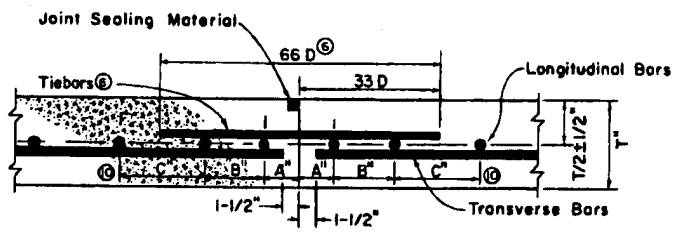
Z①	T (in.)	Longitudinal Bar Size	Spacing C (in.)	Trans. Bar Size	Maximum Allowable ③ Pavement Width (ft.) For Given Transverse Steel Spacings (in.)			B_sW ④ (in.-ft.)
					12	24	36	
0.6	8	6	9	4	120	60	40	120.0
				5	186	93	62	186.0
				6	264	132	88	264.0
	9	6	8	4	106	53	35	106.7
				5	165	82	55	165.3
				6	234	117	78	234.7
	10	6	7	4	96	48	32	96.0
				5	148	74	49	148.8
				6	211	105	70	211.2
	11	6	7	4	87	43	29	87.3
				5	135	67	45	135.3
		4②	6	6	192	96	64	192.0
	12	6	6	4	80	40	26	80.0
				5	124	62	41	124.0
		5③	9	6	176	88	58	176.0
	13	7	8	4	73	36	24	73.8
				5	114	57	38	114.5
		5②	8	6	162	81	54	162.5
	14	7	7	4	68	34	22	68.6
				5	106	53	35	106.3
		5②	7.5	6	150	75	50	150.9
	15	7	7	4	64	32	21	64.0
				5	99	49	33	99.2
		5④	7	6	140	70	46	140.8

GENERAL NOTES

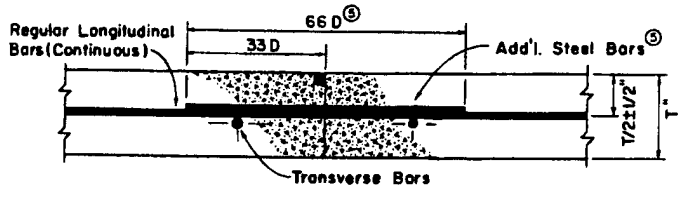
1. No expansion joints will be used except at structure ends or fixed objects as shown elsewhere in the plans.
2. For further information regarding the placement of concrete and reinforcement refer to the governing specifications for "Concrete Pavements."
3. Details as to pavement width, pavement thickness and the crown cross-slope shall be as shown elsewhere in the plans.
4. Within any area bounded by two feet of pavement length measured parallel to the centerline and twelve feet of pavement width measured perpendicular to the pavement centerline, not over 33% of the regular longitudinal steel shall be spliced.
5. The longitudinal steel shall be placed at the vertical slab center with a tolerance of 1/2 inch. Transverse steel shall be placed directly above or below the longitudinal steel.
6. Splices shall be a minimum of 33 times the nominal steel diameter ("D").
7. Bars that require bending shall be grade 40 steel conforming to requirements of ASTM designation: A 615. Spacings for grade 40 steel shall be 2/3 of that specified for grade 60 steel.
8. At transverse construction joints the regular longitudinal steel shall extend a minimum of four feet on either side of the joint.
9. Vibration with hand-manipulated mechanical vibrators will be required adjacent to all transverse construction joints.
10. The chairs used to support the steel shall be of sufficient structural quality and number to hold the steel mat within the placement height tolerances. Chairs shall be of a type approved by the Engineer.
11. With the approval of the Engineer, multiple piece tiebars (threaded coupling or other adequate device) may be used to facilitate construction provided the system develops a force equal to 1-1/2 times the minimum yield strength of the tiebar shown. The spacing for the system shall be less than or equal to that of the tiebars shown.
12. Joint, groove and seal details shall be as shown elsewhere in the plans.
13. Longitudinal and transverse steel spacing shall not vary more than one-twelfth of the spacing shown hereon.
14. If widths occur, other than the typical widths shown, individual bars (wires) of the size specified hereon may be added or removed to obtain the appropriate width. Spacing requirements shall not be exceeded, however.



LONGITUDINAL CONTRACTION JOINT
Section Z–Z



LONGITUDINAL CONSTRUCTION JOINT
Section Y–Y



TRANSVERSE CONSTRUCTION JOINT
Section X–X

NOTE: ① Longitudinal and Transverse Bars shall be deformed steel conforming to ASTM A-615 or ASTM A-616 (Grade 60) as noted in the Standard Specifications and therefore the percentage of steel required is higher than that for wire mats. (Grade 70 steel).

② For pavements greater than 11" in thickness, contractors may have the option of placing two layers of steel. The smaller longitudinal bar sizes indicated are only to be used when two layers of steel are placed. For transverse bars, if all other variables are held constant, the maximum allowable pavement width may be doubled when two layers of steel are used.

When the "Double Strike-Off" procedure is not used chairs will be required to support both layers of steel.

③ Pavement width shall be measured at right angles to the centerline and shall include all mainlanes, connectors, ramps and concrete shoulders that are tied together. Transverse steel requirements and the maximum allowable pavement width were determined using subgrade drag theory (see Appendix F, Section 109 of the Highway Design Division Operations and Procedures Manual) with a coefficient of sliding resistance (F of 1.5, and an allowable steel stress (F_s) of 45.0 ksi.

④ To determine the maximum allowable pavement width (W) for spacing other than those given, divide "B_sW" (for the given bar size) by the desired transverse bar spacing (B_s). Transverse bar spacing shall not be less than 12" nor greater than 36".

⑤ Additional steel at the transverse construction joints shall be bars of equal diameter; and a spacing of double that specified for the longitudinal steel of the given thickness. The length of the bars shall be 66 times the bar diameter ("D").

⑥ Transverse tiebars at the longitudinal construction joints shall be bars of equal diameter and spacing to those specified for the transverse steel of the given thickness. The length of the bars shall be 66 times the bar diameter ("D").

⑦ The longitudinal construction joint can be relocated or may be replaced by a longitudinal contraction joint depending on the placement width.

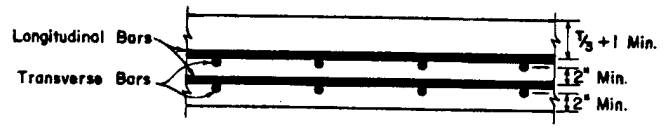
⑧ If siliceous river gravel is used as a coarse aggregate, a cut of T/3 shall be required.

⑨ When machine-placing of steel reinforcement is used, the use of chairs shall not be required, and the transverse steel may be placed above or below the longitudinal steel.

⑩ The number of bars required for the various placement widths (indicated in the Table) includes 2 bars at "B" spacing on both sides with an overhang "A".

"A" spacing shall be between 3" and 4".
"B" spacing shall be between 3" and 9".

The two spacings combined ("A" and "B"), located at both longitudinal edges of the pour, shall provide for the remaining space and steel location to round out the placement width.



OPTIONAL STEEL PLACEMENT ②

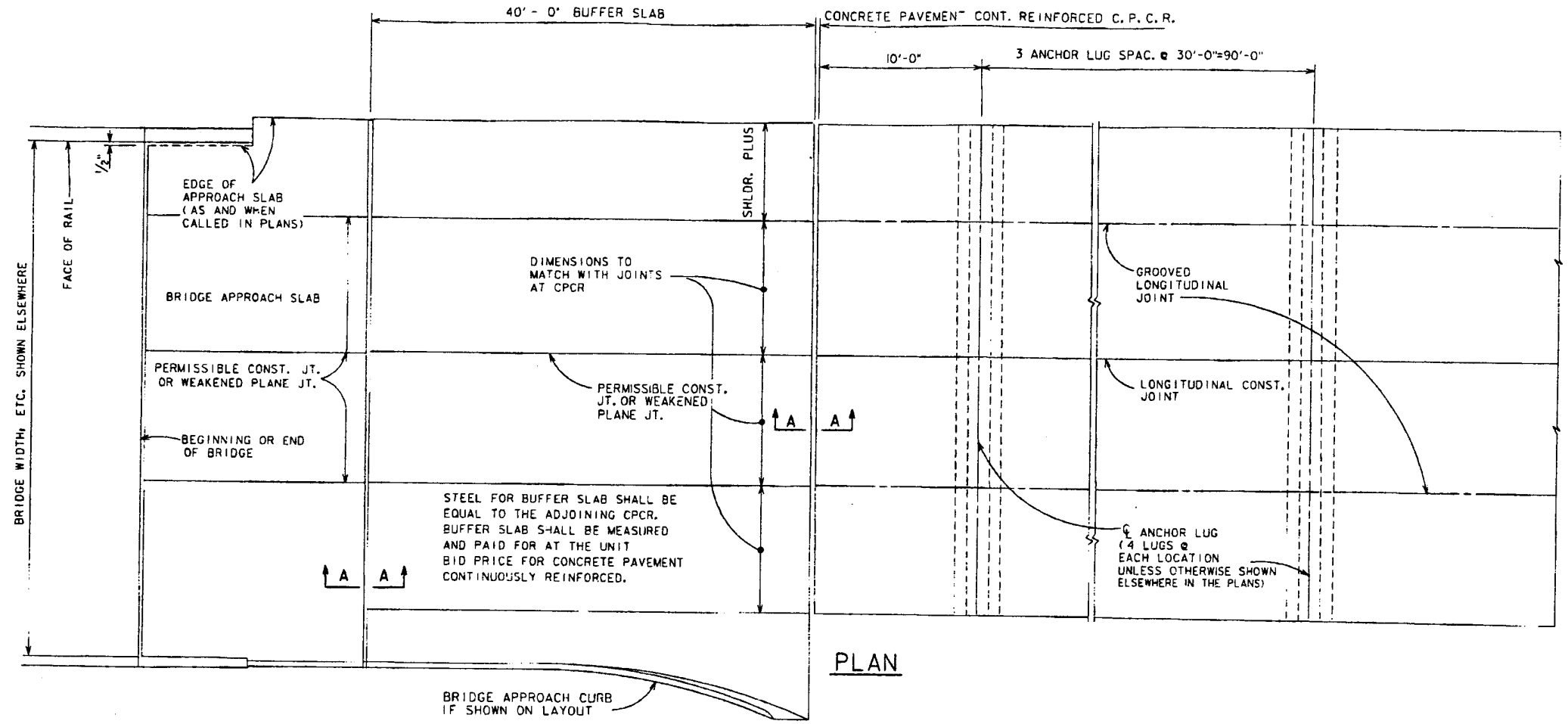
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

CONCRETE PAVEMENT DETAILS

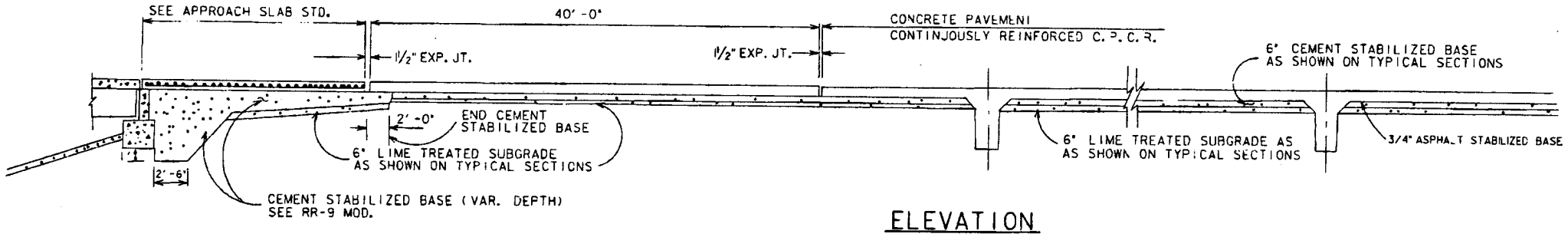
CONTINUOUSLY REINFORCED STEEL BARS

CRCP (B) - 85

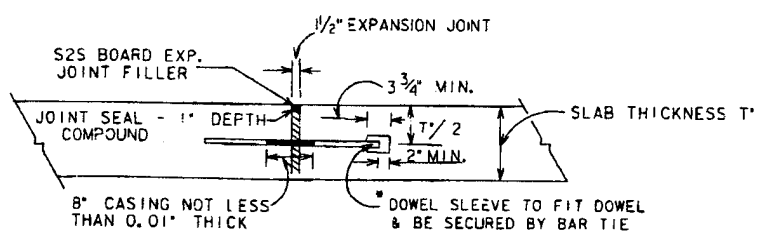
DN	DRAWING	DATE	FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO.				SHEET NO.
CK. DN.	ORIGINAL								
DW	REVISED		6	TEXAS	I45-1(229)015,etc				90
CK. DW	REVISED		STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB		HIGHWAY NO.
TR			12	Galveston	300	4	65,etc		IH45
CK. TR									



PLAN



ELEVATION



SECTION A-A

EXPANSION JT. DETAIL

DOWEL BAR DATA •				
SLAB THICKNESS	8"	9"	11"	13"
DOWEL SIZE	1"	1 1/8"	1 1/4"	1 1/4"
DOWEL LENGTH	14"	16"	18"	18"
DOWEL BAR SPACING	12"	12"	12"	9"

NOTE:

DOWEL BARS SHALL BE MODIFIED TO 1¼"X36" @ 12"± CC FOR ALL SKEWED PAVEMENTS.

GENERAL NOTES

1. DETAILS AS TO PAVEMENT WIDTHS, THICKNESS, CROWN CROSS-SLOPE AND LOCATION AND TYPE OF LONGITUDINAL & GROOVED LONGITUDINAL JOINT SHALL BE AS SHOWN ELSEWHERE ON THE PLANS.
2. ALL CONCRETE, REINFORCING STEEL AND REQUIRED EXCAVATION FOR THE LUG ANCHORS SHALL BE MEASURED AND PAID FOR UNDER THE ITEM "TERMINAL ANCHORAGE (CONCRETE PAVEMENT)".
3. THE LOCATION OF THE TERMINAL ANCHORAGE SYSTEMS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
4. AT THE PERMISSIBLE LONGITUDINAL CONSTRUCTION JOINT, IF THE CONTRACTOR ELECTS TO CONTINUE THE REGULAR TRANSVERSE STEEL THROUGH THE JOINT, THE #4 TIE BARS SHOWN HEREON MAY BE DELETED.
5. DOWEL BARS SHALL BE TIGHTLY ENCASED IN STAINLESS STEEL OR MONEL METAL. THE CASING SHALL CONFORM TO THE REQUIREMENTS OF ONE OF THE GRADES OF ASTM A167-70 OR A176-71 AND SHALL BE NOT LESS THAN 0.01 INCH THICK. THE CASING SHALL BE AT LEAST 8 INCHES LONG AND SHALL COVER THE MIDDLE 8 INCHES OF THE DOWEL.
6. DOWELS SHALL BE SECURED PARALLEL TO THE PAVEMENT SURFACE AND PERPENDICULAR TO THE JOINT WITH THE AID OF APPROVED WELDED WIRE BASKET ARRANGEMENTS. WELDED WIRE BASKET ARRANGEMENTS SHALL NOT CROSS THE EXPANSION JOINT. DOWELS SHALL BE UNIFORMLY COATED WITH A THIN COAT OF OIL ASPHALT.
7. BOARDS FOR EXPANSION JOINT FILLER SHALL BE OBTAINED FROM REDWOOD TIMBER.
8. SEE CRCP(B)-85 FOR ADDITIONAL JOINT DETAILS.
9. THE CONCRETE PAVEMENT SLAB SHALL CONTINUE ACROSS THE ANCHOR LUGS AS SHOWN. ALL REQUIREMENTS AS TO CONSTRUCTION, MEASUREMENT, AND PAYMENT FOR THE PAVEMENT SLABS SHALL BE MADE UNDER THE ITEM "CONCRETE PAVEMENT (CONTINUOUSLY REINFORCED)".

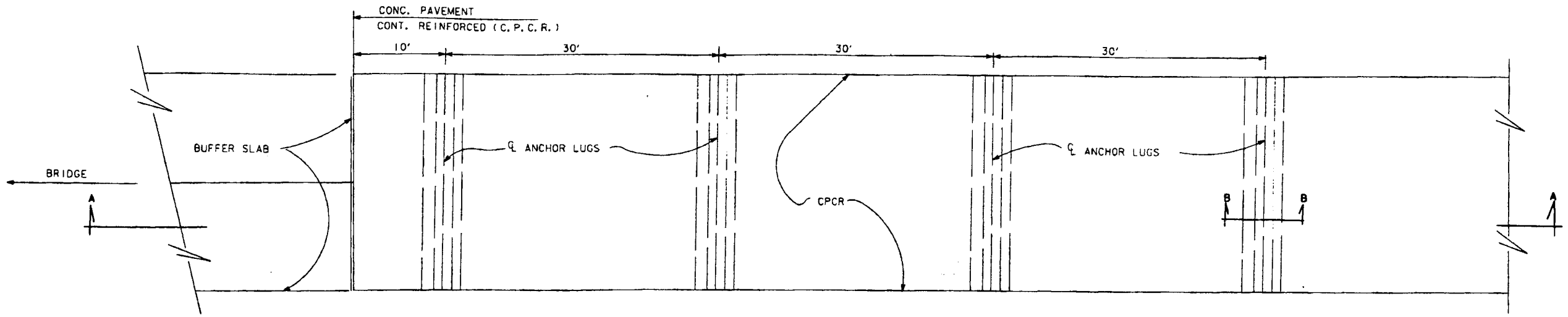
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
DISTRICT 12

TERMINAL ANCHORAGE FOR CONCRETE PAVEMENT CONTINUOUSLY REINFORCED CPCR(MOD)

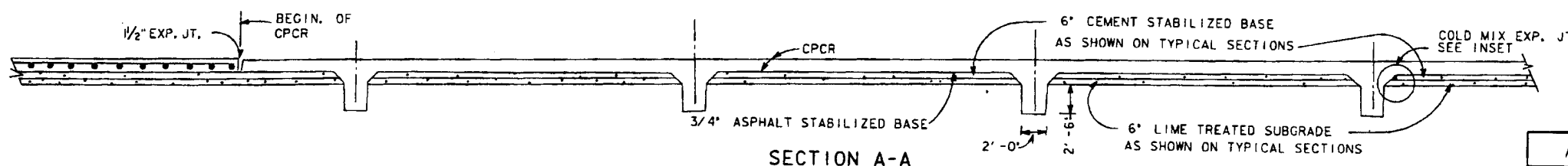
FED. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
6	TEXAS	I 45-1(229)015, etc.				FM 270 etc
STATE DIST. NO.	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
12	GALVESTON		500	4	66 etc	97

OSA4: I 314, 1313STD08. DGN

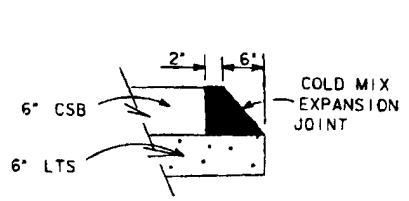
AD-76-0



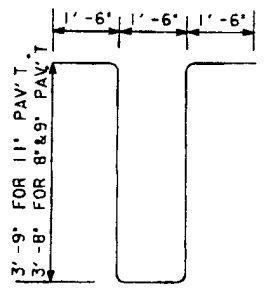
PLAN



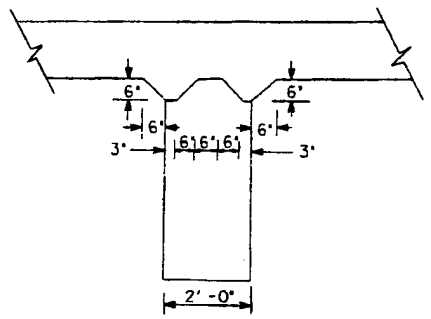
SECTION A-A



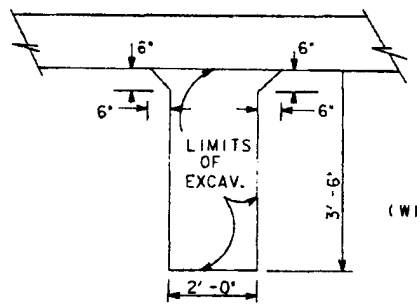
INSET



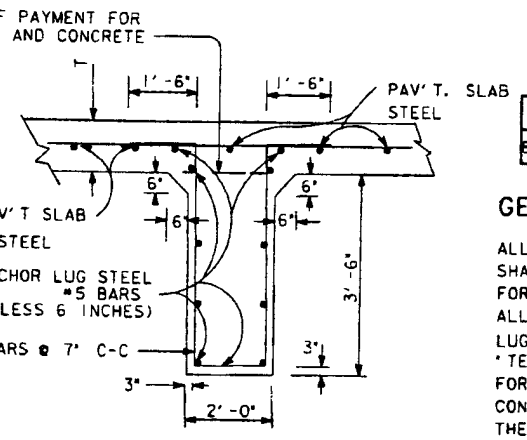
REINFORCING STEEL DETAIL



PERMISSIBLE CONSTRUCTION JOINT FOR ANCHOR LUGS



EXCAVATION DIAGRAM FOR ANCHOR LUGS

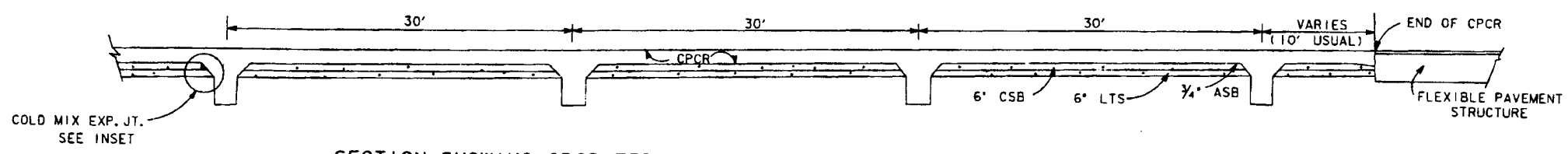


SECTION B-B

APPROXIMATE QUANTITIES ONE ANCHOR LUG (ONE FT. LONG)			
	CONCRETE C. Y.	STEEL LBS.	EXCAVATION C. Y.
11"	0.2685	31.886	0.2685
8"&9"	0.2685	31.588	0.2685

GENERAL NOTES

ALL REINFORCING STEEL SIZE AND PLACEMENT NOT SHOWN SHALL CONFORM TO CONCRETE PAVEMENT CONTINUOUSLY REINFORCED SHOWN ELSEWHERE IN THE PLANS.
ALL REINFORCING STEEL, CONCRETE AND EXCAVATION FOR LUGS WILL BE MEASURED AND PAID FOR UNDER ITEM 368 "TERMINAL ANCHORAGE (CONCRETE PAVEMENT)".
FOR DETAILS NOT SHOWN SEE TERMINAL ANCHORAGE, AND CONCRETE PAVEMENT STANDARDS.
THE COLD MIX EXPANSION JOINT WILL BE USED AT LOCATIONS SHOWN ON THIS SHEET.



SECTION SHOWING CPCR TERMINAL ANCHORAGE & JUNCTURE WITH FLEXIBLE TYPE PAVEMENT

(4 LUGS AT EACH LOCATION, UNLESS OTHERWISE SHOWN ELSEWHERE IN THE PLANS)
CPCR TERMINAL TO BE INSTALLED AT ALL FREE ENDS OF PAVEMENT

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
DISTRICT 12

ANCHOR LUG DETAILS FOR CONCRETE PAVEMENT CONTINUOUSLY REINFORCED CPCR (MOD)

FED. AID DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6	TEXAS	I 45-1(229)015, etc.	IH 45, etc.
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
12	GALVESTON	500	4	56 ETC.	92

QSA4: [314, 1313STD10. DGN

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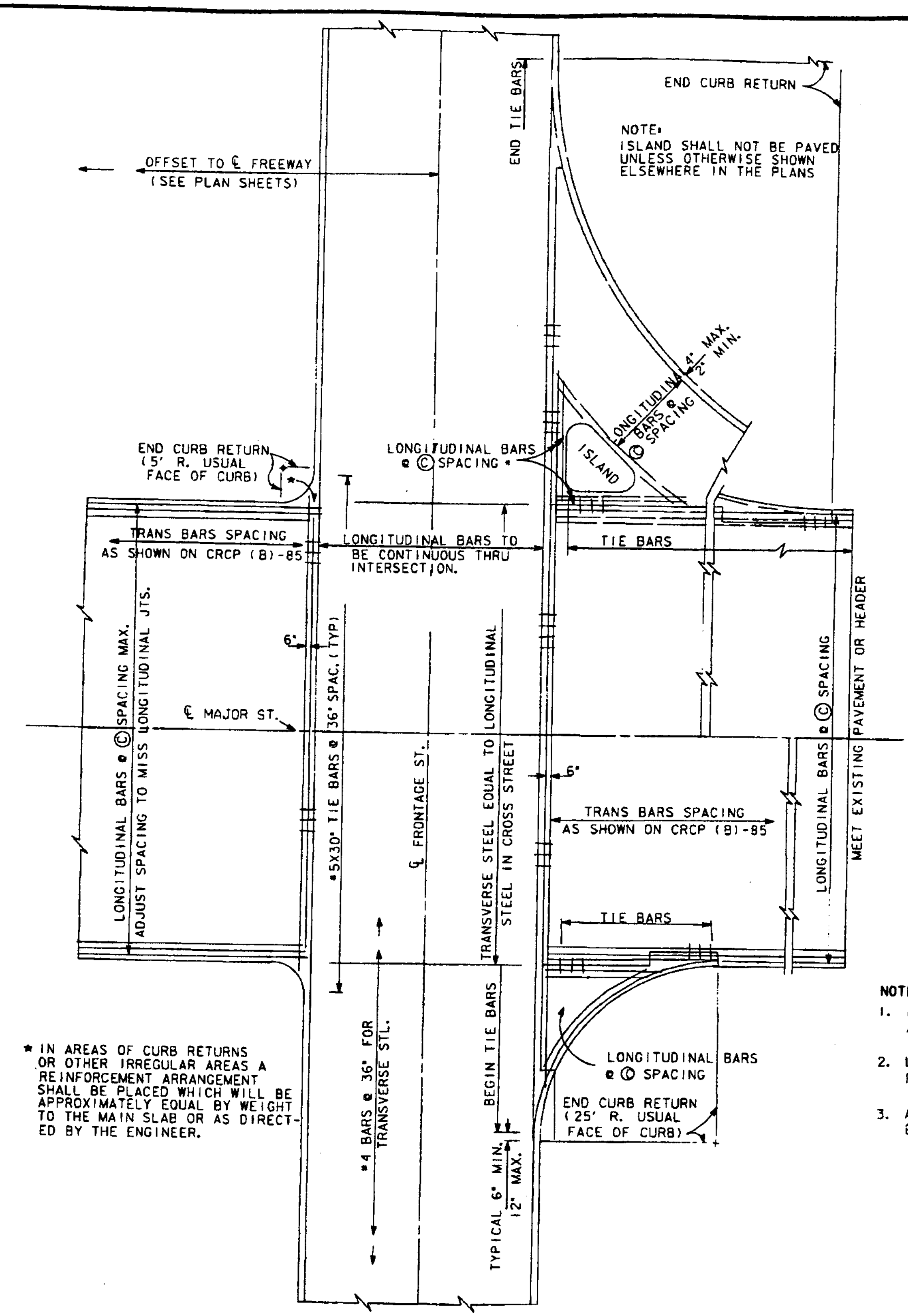

NOTE:

1. FOR CONSTRUCTION AND GROOVED JOINT DETAILS, LONGITUDINAL SPLICES, TIE BARS, © SPACING, AND GENERAL NOTES, SEE CRCP (B)-85.
2. LONGITUDINAL STEEL FOR THE FRONTAGE STREET SHALL BE CARRIED THROUGH THE INTERSECTION REGARDLESS OF WHICH STREET IS PLACED FIRST.
3. ANCHOR LUGS WILL NOT BE REQUIRED AT INTERSECTION STUB-OUTS, UNLESS OTHERWISE SHOWN ELSEWHERE IN THE PLANS.

* SEE TYPICAL CROSS SECTIONS, CONTOUR GRADING SHEETS, AND/OR FRONTAGE STREET PROFILES FOR CROSS SLOPE VARIATIONS.

INTERSECTION ØF MAJOR ST. WITH FRONTAGE ST.
TYPICAL REINFORCING PLAN

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
DISTRICT 12

INTERSECTION OF CONTINUOUSLY REINFORCED CONCRETE PAVEMENTS

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
6	TEXAS	I 45-1(229)015, etc.			IH 45
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
12	GALVESTON	500	4	[illegible]	93

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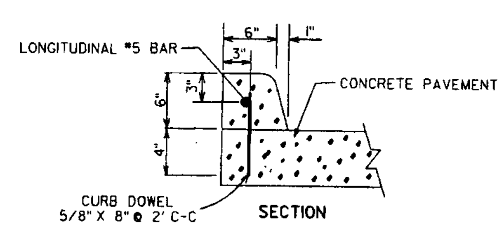


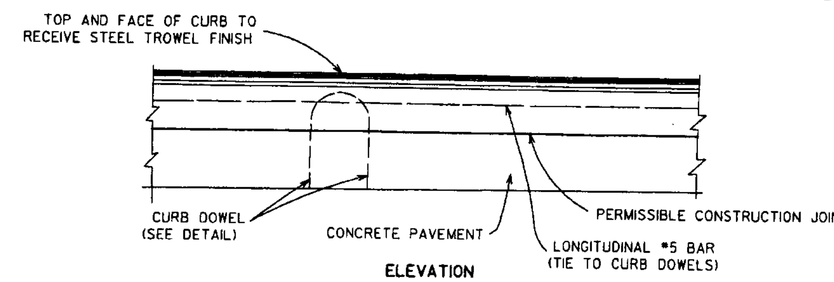
SECTION

NOTE:

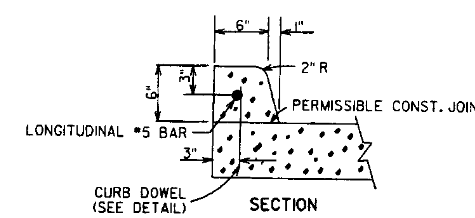
CONCRETE DOWEL TO BE DRILLED A MINIMUM OF 1/2" DIA. BY 4" DEEP. DOWELS TO BE GROUTED IN PLACE WITH A MIXTURE OF 1 PART CEMENT AND 3 PARTS SAND.

PROVIDE 3/4" EXPANSION JOINTS AT SPACING TO MATCH EXISTING EXPANSION JOINTS AND 1/4" JOINT MATERIAL AT EXISTING TRANSVERSE WEAKENED PLANE JOINTS.

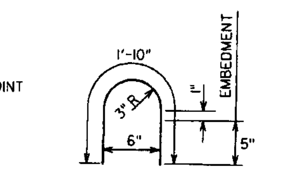
DOWEL CURB FOR CONCRETE PAVEMENT



ELEVATION



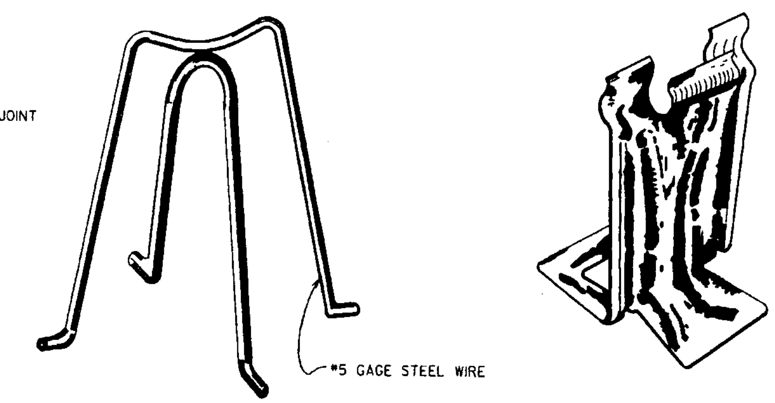
SECTION



NO. 3 BARS ON 2'-6" CTRS. SHALL BE OF INTERMEDIATE GRADE STEEL.

CURB DOWEL

TYPICAL 6" CURB (MONOLITHIC)



BAR MAT CHAIRS OF THESE TYPES OR EQUAL AS APPROVED BY THE ENGINEER, MAY BE USED TO SUPPORT REINFORCING STEEL TO DIMENSIONS SHOWN. CHAIR SPACING SHALL NOT EXCEED 34" C-C (TRANSVERSE) AND 48" (LONGITUDINAL). GALVANIZING OF CHAIRS WILL NOT BE REQUIRED.

SUGGESTED CHAIR DETAILS

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
DISTRICT 12

CONCRETE PAVEMENT DETAILS
CONTINUOUSLY REINFORCED

STEEL BARS

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.				HIGHWAY NO.
6	TEXAS	I 45-1(229)015, etc.				I45, etc.
STATE DIST. NO.	COUNTY		CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
12	GALVESTON		500	4	66 etc.	94

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