STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FINAL PLANS

DISTRICT	FED. AID PROJ. NO.			SHEET NO.
6				1
STATE	STATE DIST.	COUNTY		
TEXAS	12	GALVESTON		
CONT.	SECT.	JOB	HIGHWAY NO.	
0500	04	092	IH 45	

PLANS OF ~~PROPOSED~~ FINAL
STATE HIGHWAY IMPROVEMENT

STATE PROJECT
C 500-4-92

NET LENGTH OF PROJECT = 4716.000m = 4.717 km
ROADWAY = 4617.360m = 4.617 km
BRIDGE = 89.640m = 0.089 km
10.200m = 0.010 km
99.840m = 0.099 km

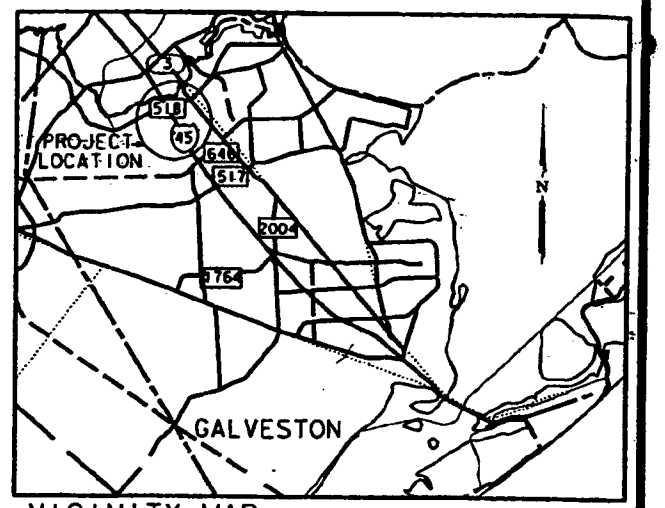
GALVESTON COUNTY
IH-45(S)

LIMITS: FROM 0.547 km N. OF FM646 TO .553 km N. OF FM518 (IN SECTIONS)
FOR THE CONSTRUCTION OF: MISCELLANEOUS WORK (RAISE ROADWAY DUE TO FLOODING)
CONSISTING OF: GRADING, STRUCTURES, CONCRETE PAVEMENT, ASPHALT STABILIZED BASE, CEMENT STABILIZED BASE, LIME TREATED SUBGRADE, TRAFFIC MANAGEMENT SYSTEM, PAVEMENT MARKINGS, LIGHTING, SIGNING, TRAFFIC SIGNALS, TRAFFIC CONTROL, STORM SEWER AND STORM WATER POLLUTION PREVENTION.

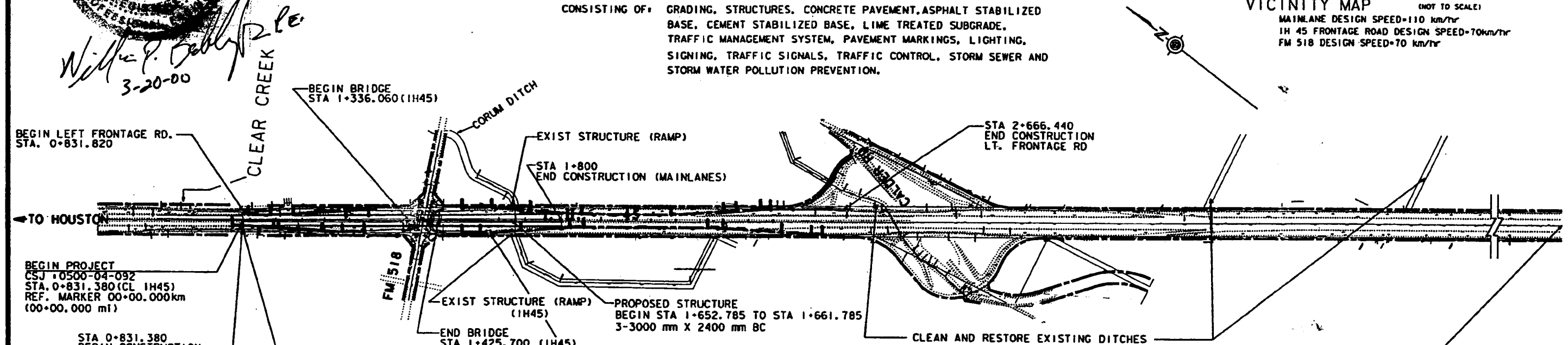
INDEX OF SHEETS

SHEET NO.	DESCRIPTION
SEE DETAILED INDEX SHEET 2	

STATE OF TEXAS
WILLIAM P. BABBINGTON
66511
REGISTERED
PROFESSIONAL ENGINEER
William P. Babbington P.E.
3-20-00



VICINITY MAP (NOT TO SCALE)
MAINLANE DESIGN SPEED=110 km/hr
IH 45 FRONTAGE ROAD DESIGN SPEED=70km/hr
FM 518 DESIGN SPEED=70 km/hr



LOCATION MAP
NOT TO SCALE

CONTRACTOR: J.D. ABRAMS INC.
LETTING DATE: 07-97
CONTRACT BEGIN: 09-04-97
WORK COMPLETED: 09-30-99
ACCEPTANCE: 09-30-99

C 500-4-92
Galveston

COUNTY
PROJ. NO.
HWY. NO.
LETTING DATE
DATE ACCEPTED

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, MARCH 1, 1995 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT.
SPECIAL LABOR PROVISIONS FOR STATE PROJECTS. (000---011)

EXCEPTIONS: NONE
EQUATIONS: NONE
RAIL ROAD CROSSING: NONE

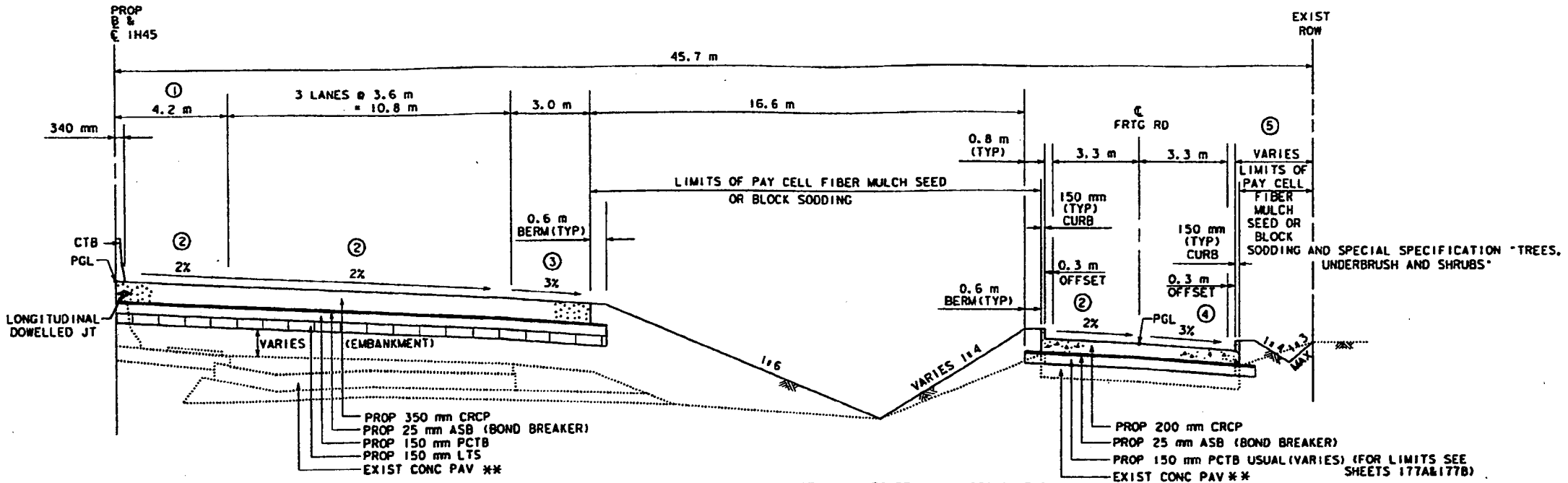
TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING: 4-7 1997
Wm Bentley
SUPERVISING DESIGN ENGINEER

APPROVED FOR LETTING:
DIRECTOR, TRAFFIC OPERATIONS DIVISION

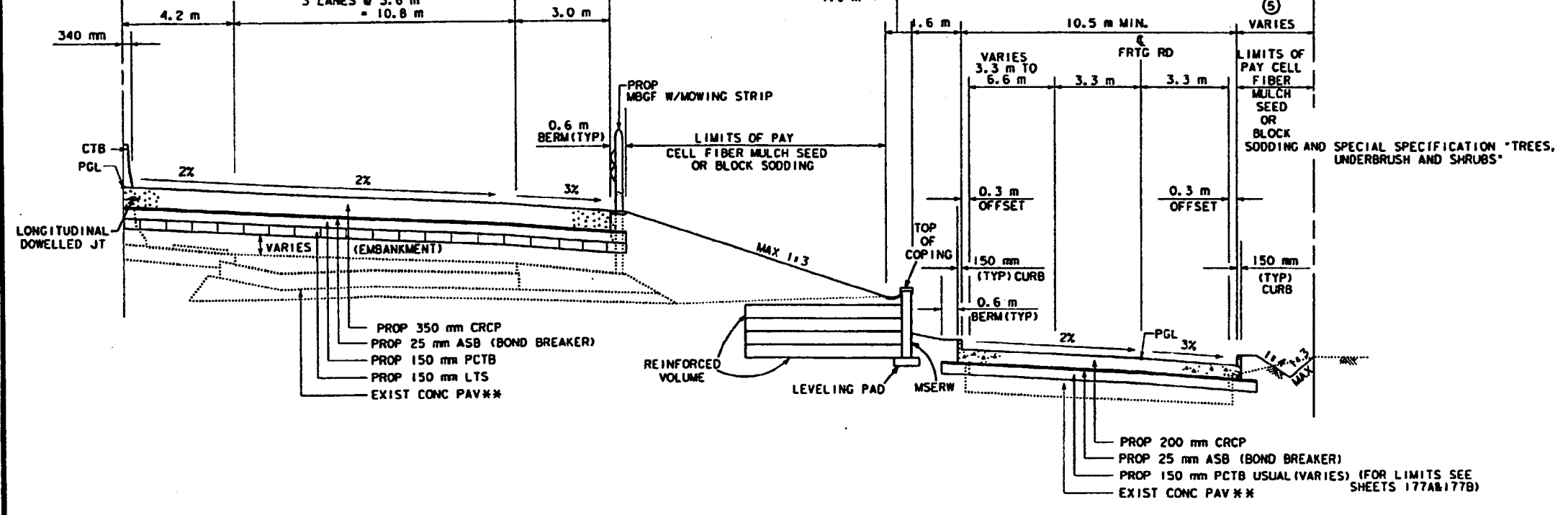
RECOMMENDED FOR LETTING: 4-9 1997
For John C. Newton
DISTRICT ENGINEER

APPROVED FOR LETTING: 6-11-97
FOR Mariely Bryant P.E.
DIRECTOR, DESIGN DIVISION



	FROM STA	TO STA	DESCRIPTION
①	0+568.637	0+668.637	TRANSITION FROM 4.2 m TO 3.34 m
	0+668.637	1+140.000	3.34 m
	1+140.000	1+240.000	TRANSITION FROM 3.34 m TO 4.20 m
②	END OF EX. BRIDGE	0+860.000	CROSS SLOPE TRANSITION FROM 1.5% TO 2%
③	END OF EX. BRIDGE	0+860.000	CROSS SLOPE TRANSITION FROM 2% TO 3%
④	END OF EX. BRIDGE	0+860.000	CROSS SLOPE TRANSITION FROM 1.5% TO 3%
⑤			3.000 m SOUTH OF FM 518 4.200 m NORTH OF FM 518

FROM STA	TO STA	DESCRIPTION
0+860.000	1+100.000	MAINLANE AND LEFT FRTG RD
0+860.000	1+140.000	MAINLANE AND RIGHT FRTG RD
1+585.000	1+800.000	MAINLANE ONLY



FROM STA	TO STA	DESCRIPTION
1+100.000	1+300.000	MAINLANE AND LEFT FRTG RD
1+140.000	1+300.000	MAINLANE AND RIGHT FRTG RD
1+300.000	1+330.000	TRANSITION FROM 3% TO 2% ON SHOULDER
1+431.700	1+460.000	TRANSITION FROM 2% TO 3% ON SHOULDER
1+460.000	1+520.000	MAINLANE AND LEFT FRTG RD
1+460.000	1+585.000	MAINLANE AND RIGHT FRTG RD

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 20 30 31 32 33 34 35 36
37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165

ACC: 481@IA:/usr/d129001
FILE: IHTS01.DGN

STATE OF TEXAS
JORGE A. GARCIA-DURAN
80550
REGISTERED PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by Jorge A. Garcia-Duran, P.E. 80550, on 05/19/1997

LEGEND:
ASB =ASPHALT STABILIZED BASE (BOND BREAKER)
CRCP=CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
PCTB=PORTLAND CEMENT TREATED BASE
CTB =CONCRETE TRAFFIC BARRIER
LTS =LIME TREATED SUBGRADE
PGL =PROFILE GRADE LINE
MSERW=MECHANICALLY STABILIZED EARTH RETAINING WALL
MBGF=METAL BEAM GUARD FENCE

NOTES:

* * SEE EXISTING TYPICAL SECTION FOR DETAIL EXISTING PAVEMENT TO REMAIN UNLESS AS SHOWN ON THE PLANS.

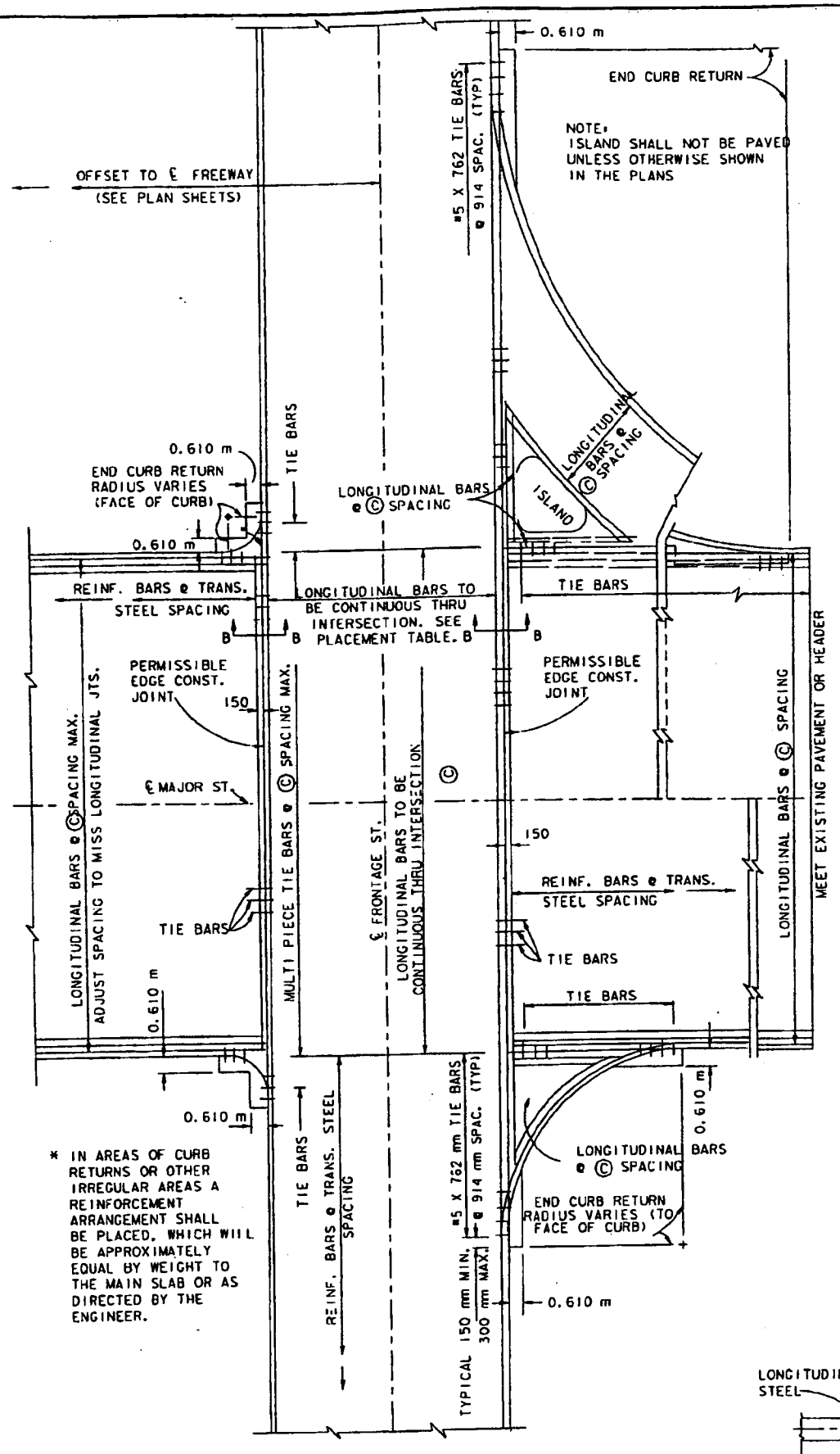
IH 45 PROPOSED TYPICAL SECTION

SCALE = NTS

SHEET 1 OF 1 SHEET

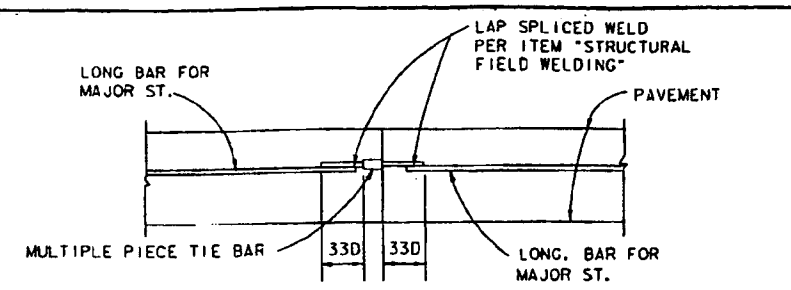
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	C500-4-92		7
STATE	DIST.	COUNTY	
TEXAS	12	GALVESTON	
CONT.	SECT.	JOB	HIGHWAY NO.
0500	04	092	IH 45

5-14-97

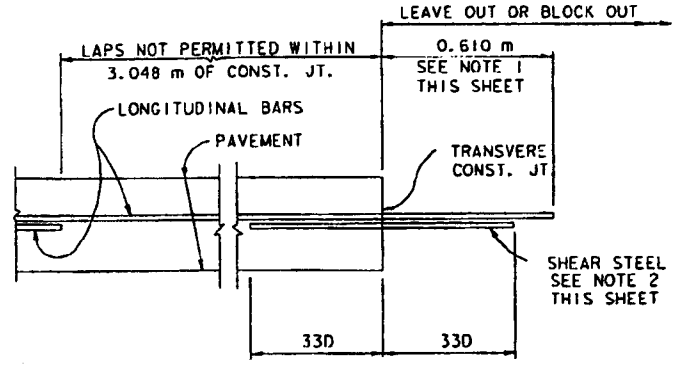


INTERSECTION OF MAJOR ST. WITH FRONTAGE ST.

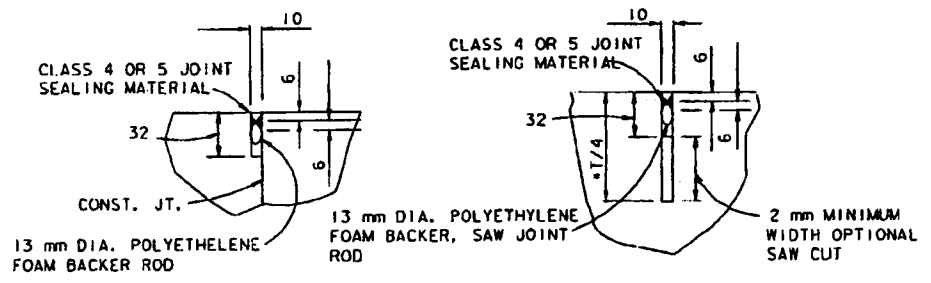
TYPICAL REINFORCING PLAN



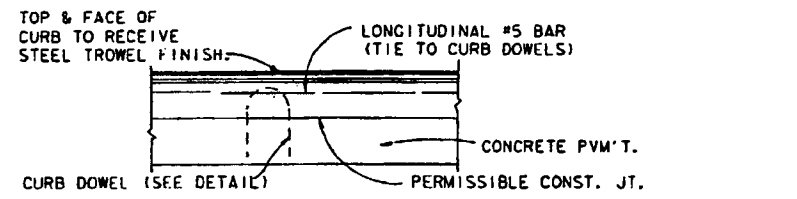
SECTION B-B



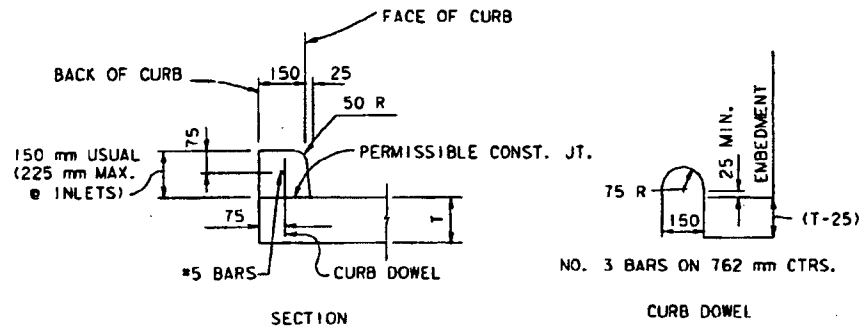
TRANSVERSE CONST. JT. & LEAVE-OUT DETAIL



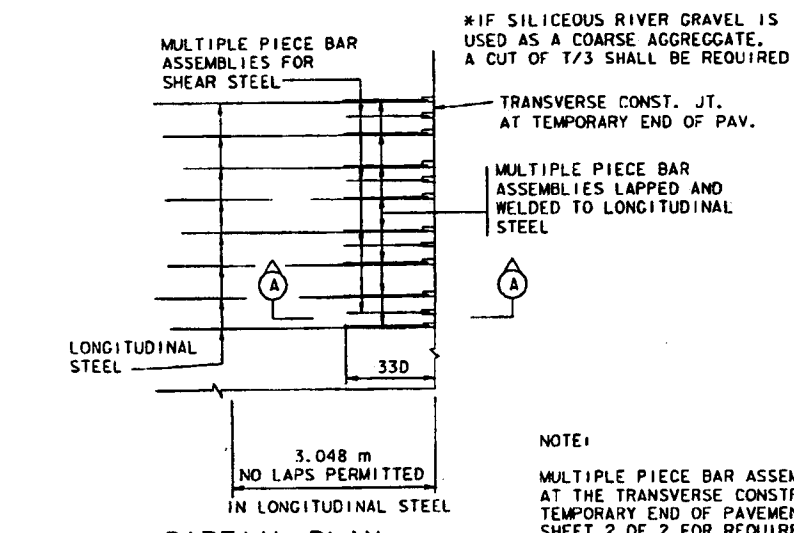
JOINT SEALING DETAILS



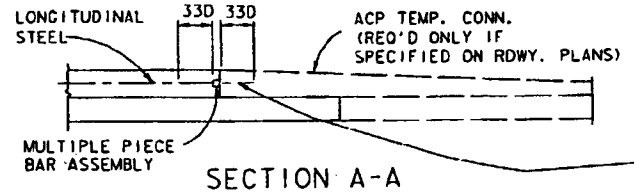
ELEVATION



TYPICAL 150 mm CURB (DETAIL)



PARTIAL PLAN



SECTION A-A

TRANSVERSE CONSTRUCTION JOINT AT TEMPORARY END OF CRCP BETWEEN ADJACENT PROJECTS

NOTES:

1. WHERE TRAFFIC MUST BE CARRIED ON THE MAJOR STREET DURING CONSTRUCTION, "LEAVE OUTS" WILL BE PERMITTED TO FACILITATE TRAFFIC CONTROL, IF DIRECTED BY THE ENGINEER. LONGITUDINAL STEEL FOR THE FRONTAGE STREET OR MAJOR STREET MAY EXTEND PAST THE TRANSVERSE CONSTRUCTION JOINT INTO THE BLOCKED OUT AREA A DISTANCE OF 0.610 m . WHEN THE BLOCKED OUT AREA IS TO BE COMPLETED, THE LONGITUDINAL STEEL FOR THE FRONTAGE STREET WILL BE LAP SPLICED AND WELDED IN ACCORDANCE WITH ITEM "STRUCTURAL FIELD WELDING." THE BARS TO BE SPLICED MUST BE PLACED IN A VERTICAL MANNER, ONE ABOVE THE OTHER, TO FACILITATE WELDING. THE WELDING MUST OCCUR ON EACH SIDE OF THE SPLICE. LAPS IN THE LONGITUDINAL STEEL WILL NOT BE PERMITTED WITHIN 3.048 m OF THE TRANSVERSE CONSTRUCTION JOINT FORMED BY THE LEAVE OUT.
2. ADDITIONAL SHEAR BARS (DIAMETER "D") SHALL BE THE SAME SIZE AS LONGITUDINAL BARS AND SHALL BE SPACED MIDWAY BETWEEN ALTERNATE LONGITUDINAL BARS ALONG THE TRANSVERSE CONSTRUCTION JOINT FORMED AT THE LEAVE OUT.
3. TRANSVERSE BARS FOR THE FRONTAGE STREET WILL NOT BE REQUIRED WHERE LONGITUDINAL BARS FOR THE MAJOR STREET ARE PRESENT. SIMILARLY, TRANSVERSE BARS FOR THE MAJOR STREET WILL NOT BE REQUIRED WHERE LONGITUDINAL BARS FOR THE FRONTAGE STREET ARE PRESENT.
4. SEE SHEET 2 OF 2 FOR C SPACING.
5. LONGITUDINAL STEEL FOR THE FRONTAGE STREET SHALL BE CONTINUOUS THROUGH THE INTERSECTION REGARDLESS OF WHICH STREET IS PLACED FIRST.
6. IF AN EXISTING STREET IS TO REMAIN, THIS PLAN DOES NOT APPLY. INSTEAD ANCHOR LUGS SHALL BE CONSTRUCTED ON THE FRONTAGE STREET APPROACHES AS DETAILED ELSEWHERE.
7. WITHIN FIVE (5) MINUTES OF SAWING, THE RESULTING SLURRY SHALL BE COMPLETELY REMOVED FROM THE JOINT BY FLUSHING WITH HIGH-PRESSURE WATER. THE JOINT SHALL THEN BE ALLOWED TO DRY FOR A MINIMUM OF 48 HOURS BEFORE SANDBLASTING THE JOINT.
8. WHEN CURB IS PLACED SEPARATELY FROM THE CONCRETE PAVEMENT, THE REINFORCING STEEL SHALL BE PROVIDED AS SHOWN IN THE CURB DETAIL. THE CURB REINFORCING STEEL MAY BE OMITTED WHEN THE CURB IS PLACED MONOLITHICALLY.

NOTE:

MULTIPLE PIECE BAR ASSEMBLIES SHALL BE REQUIRED AT THE TRANSVERSE CONSTRUCTION JOINT AT THE TEMPORARY END OF PAVEMENT. REFER TO NOTE 12 ON SHEET 2 OF 2 FOR REQUIREMENTS RELATING TO MULTIPLE PIECE BAR ASSEMBLIES. MULTIPLE PIECE BAR ASSEMBLIES SHALL BE LAP SPLICED AND WELDED TO THE LONGITUDINAL STEEL BARS AS SHOWN. THE WELD SHALL BE IN ACCORDANCE WITH ITEM "STRUCTURAL FIELD WELDING." ADDITIONAL SHEAR STEEL SHALL ALSO CONSIST OF THE SAME MULTIPLE LONGITUDINAL STEEL.

WHEN TYING ONTO EXISTING CRCP, THE CONTRACTOR SHALL FURNISH THE NECESSERY STEEL ASSEMBLIES TO MEET THE REQUIREMENTS AS SHOWN HEREON.

R = RADIUS
D = DIAMETER

ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE SHOWN

COUNTY

REV: 10/93 UPDATE TO NEW SPECS.
REV: 7/92 ADD CL.6 JT. SEAL
REV: 12/91 ADD NOTE 8

TEXAS DEPARTMENT OF TRANSPORTATION
HOUSTON DISTRICT

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

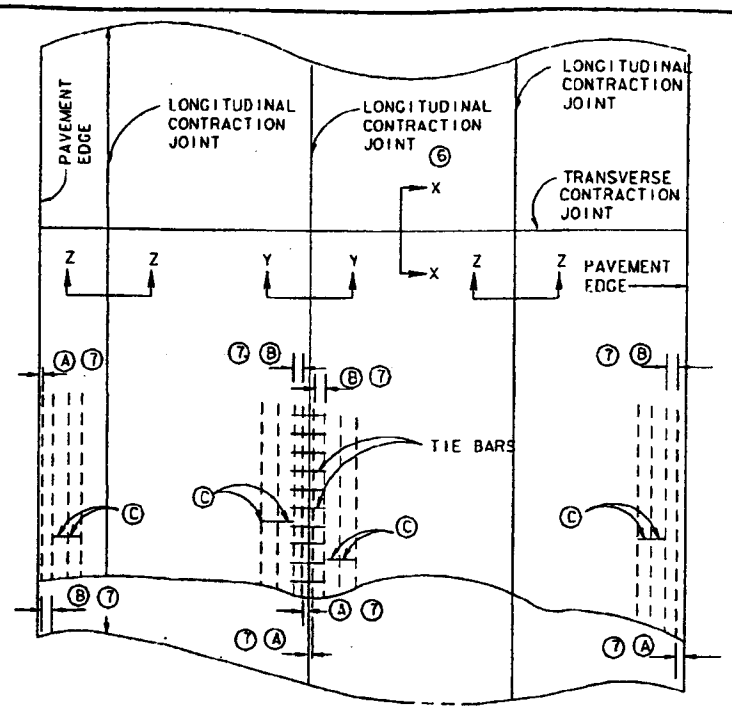
DETAILS (M)

CRCP - 89 HOUSTON DIST. (1)

DN	CK	DW	CK	TR	CK
DRAWING CORRECTION	DATE 5/91				

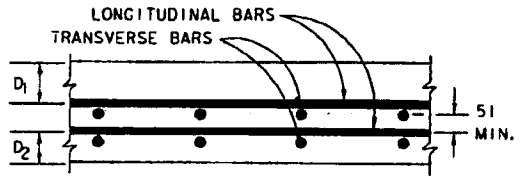
FED. ROAD DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
6	TEXAS	C500-4-92			IH45
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
HOU	GALVESTON	0500	04	092	2 of 2

STD B - 1m



TWO LANE PAVEMENT PLAN

(11.58 m PLACEMENT OR 4.88 m & 6.71 m PLACEMENT ⑥)



OPTIONAL STEEL PLACEMENT

LONGITUDINAL REINFORCING

SPACING C (mm)	NUMBER OF BARS REQUIRED FOR VARIOUS TYPICAL PLACEMENT WIDTHS (m) ⑦						
	3.658	4.877	6.706	7.315	8.230	10.363	11.582
152	24	32	44	48	54	68	76
165	23	30	41	45	50	63	70
179	21	27	37	41	46	58	65
203	18	24	33	36	41	51	57
216	17	23	31	34	38	48	54
229	16	22	30	32	36	46	51
241	16	21	28	31	34	43	48

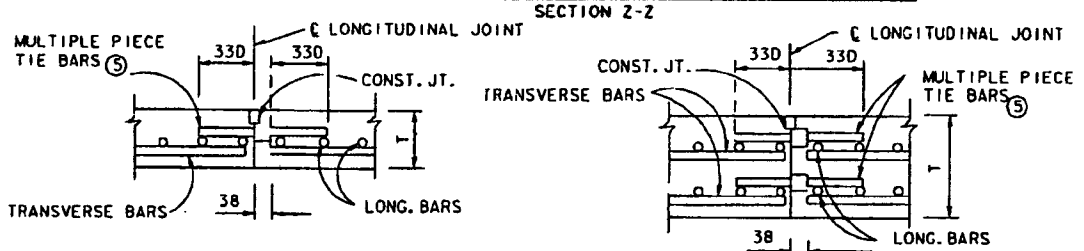
①	SLAB THK. "T" (mm)	LONG. REINFORCING BAR SIZE	LONG. REINFORCING SPACING C (mm)	TRANSVERSE REINFORCING BAR SIZE	TRANSVERSE REINFORCING MAXIMUM ALLOWABLE ② PAVEMENT WIDTH (W) (m) FOR GIVEN TRANSVERSE STEEL SPACING (B_S) 305	610	914	B_SW ③ (m^2)
SINGLE MAT REINFORCING	200	#5	229	#5	56.693	28.346	18.898	17.3
				#6	80.467	40.234	26.822	24.5
	225	#6	241	#5	50.292	24.994	16.764	15.4
				#6	71.323	35.662	23.774	21.8
	250	#6	216	#5	45.110	22.555	14.935	13.8
				#6	64.313	32.004	21.336	19.6
	275	#6	178	#5	41.148	20.422	13.716	12.6
				#6	58.522	29.261	19.507	17.8
	300	#6	152	#5	37.795	18.898	12.497	11.5
				#6	53.645	26.822	17.678	16.4
DOUBLE MAT REINFORCING	275	#4	178	#5	82.296	41.148	27.432	25.1
				#6	117.043	58.522	39.014	35.7
	300	#5	229	#5	75.590	37.795	24.994	23.0
				#6	107.290	53.645	35.662	32.7
	325	#5	203	#5	69.799	34.747	23.165	21.3
				#6	98.755	49.378	32.918	30.2
	350	#5	178	#5	64.618	32.309	21.336	19.8
				#6	91.440	45.720	30.480	28.0
	375	#5	165	#5	60.350	30.175	20.117	18.4
				#6	85.344	42.672	28.346	26.2

LONGITUDINAL BAR PLACEMENT (DOUBLE MAT)		
LENGTH	D_1	D_2
275	120	75
300	125	100
325	140	100
350	150	100
375	150	125

MULTIPLE PIECE TIEBAR PULL TEST LOAD	
#5	70.46 kN
#6	49.64 kN

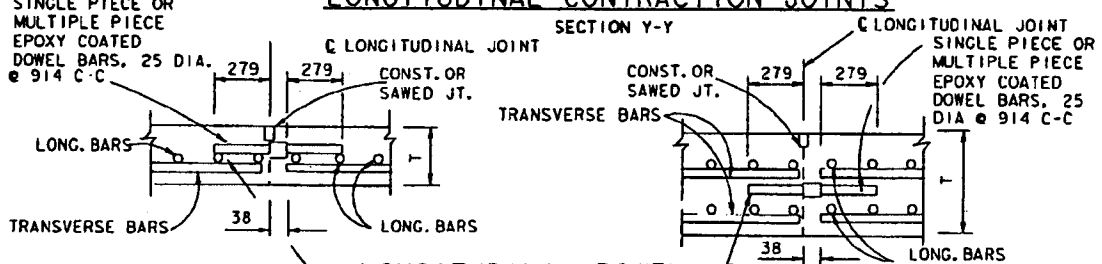
LONGITUDINAL CONTRACTION JOINTS

SECTION Z-Z

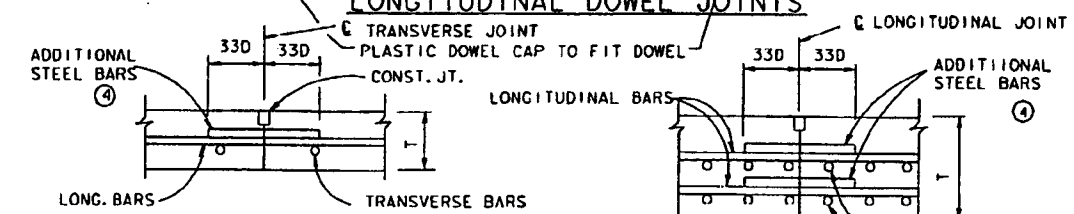


LONGITUDINAL CONTRACTION JOINTS

SECTION Y-Y



LONGITUDINAL DOWEL JOINTS

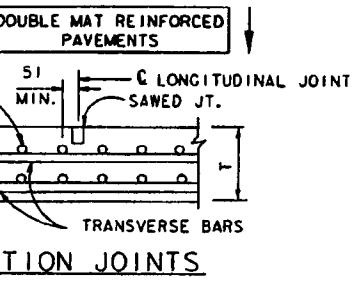


*COAT THIS END OF BAR WITH BITUMINOUS MASTIC TO PREVENT BOND

TRANSVERSE CONSTRUCTION JOINTS

SECTION X-X

JOINT DETAILS



NOTES:

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 SPECIFICATION.

② 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 IF OF 1.5, AND AN ALLOWABLE STEEL STRESS (F_S) OF 310.3 MPa .

③ TO DETERMINE THE MAXIMUM ALLOWABLE PAVEMENT WIDTH (W) FOR SPACING OTHER THAN THOSE GIVEN, DIVIDE "BsW" (FOR THE GIVEN BAR SIZE) BY THE DESIRED TRANSVERSE BAR SPACING(B_S). TRANSVERSE BAR SPACING SHALL NOT BE LESS THAN 305 mm NOR GREATER THAN 914 mm.

④ 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. (B_S) THE LENGTH OF THE BARS SHALL BE 66 TIMES THE BAR DIAMETER ("D").

⑤ MULTIPLE PIECE TIE BARS SPACING SHALL BE EQUAL TO OR LESS THAN THAT OF THE TRANSVERSE BARS.

⑥ THE LONGITUDINAL CONSTRUCTION JOINT CAN BE RELOCATED OR MAY BE REPLACED BY A LONGITUDINAL CONTRACTION JOINT DEPENDING ON THE PLACEMENT WIDTH AND PLACED 102 mm MIN. FROM THE LANE LINE OR AS DIRECTED BY THE ENGINEER.

⑦ 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 OVERHAND "A". "A" SPACING SHALL BE BETWEEN 76 mm AND "B" SPACING SHALL BE BETWEEN 76 mm AND 229 mm. 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.

(CONT'D) GENERAL NOTES

15. WHEN THE ENGINEER HAS DETERMINED THAT THIS METHOD IS SATISFACTORY, THE TESTING MAY BE DISCONTINUED. WHEN TIE BARS ARE VIBRATED INTO PLACE, MEASURES SHALL BE TAKEN TO PREVENT THE PAVEMENT EDGE FROM SAGGING OR SLUMPING. THE TIE BARS SHALL BE ACCURATELY POSITIONED PARALLEL TO THE SURFACE AND PERPENDICULAR TO THE PAVEMENT EDGE.

16. FOR LEAVE-OUT REQUIREMENTS SEE SHEET 1 OF 2 CRCP-89 HOUSTON DISTRICT.

17. DOWEL BAR JOINT SHALL BE INSTALLED ONLY WHERE CALLED FOR IN THE PLANS. DOWEL BAR EPOXY COATING SHALL CONFORM TO THE COATING FOR REINFORCING STEEL AS SPECIFIED IN ARTICLE 440.9. "EPOXY COATING OF REINFORCING STEEL".

18. CONCRETE SHALL BE 335 kg OF CEMENT PER CUBIC METER (MIN.)

19. ANY LONG. REINF. WHICH IS OR HAS BEEN BENT SHALL BE REPLACED. IF THERE IS NOT SUFFICIENT EXPOSED REINFORCING TO PROVIDE A MINIMUM OF A 33 BAR DIAMETER LAP WHEN THE EXISTING PAVEMENT SHALL BE REMOVED AND THE EXISTING REINFORCING SUFFICIENTLY EXPOSED TO PROVIDE A 33 BAR DIAMETER LAP. AS SHEAR BARS THAT ARE DISTURBED SHALL BE REPLACED BY DRILLING AND GROUTING AS REQUIRED BY NOTE 2 ON SHEET 1 OF 2. THE CONTRACTOR SHALL BEAR THE ENTIRE EXPENSE FOR THIS CORRECTIVE ACTION.

20. SHEAR CUTTING OF DOWEL BARS IS PROHIBITED.

R = RADIUS
D = DIAMETER

ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE SHOWN

GENERAL NOTES

1. NO EXPANSION JOINTS WILL BE USED EXCEPT AT STRUCTURE ENDS OR FIXED OBJECTS AS SHOWN ELSEWHERE IN THE PLANS.
2. 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.
3. 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. SAWED JOINTS SHALL BE USED AT ALL INTERMEDIATE LANE LINES. IN WIDENED AREAS SAWED JOINTS SHALL BE PLACED AS DIRECTED BY THE ENGINEER. LONGITUDINAL CONSTRUCTION AND/OR SAWED JOINTS SHALL NOT BE MORE THAN 5.18 m APART ON FREEWAY PAVEMENT AND FRONTAGE STREET PAVEMENT AS MEASURED TRANSVERSELY UNLESS DIRECTED BY THE ENGINEER.
4. 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 IS TO BE APPROVED BY THE ENGINEER.
5. WITHIN ANY AREA BOUNDED BY 0.610 m OF PAVEMENT LENGTH MEASURED PARALLEL TO THE CENTERLINE AND 3.66 m OF PAVEMENT WIDTH MEASURED PERPENDICULAR TO THE PAVEMENT CENTERLINE, NOT OVER 33% OF THE REGULAR LONGITUDINAL STEEL SHALL BE SPLICED.
6. THE LONGITUDINAL BARS IN SINGLE MAT PLACEMENT SHALL BE PLACED AT THE VERTICAL SLAB CENTER WITH A TOLERANCE OF 13 mm. TRANSVERSE STEEL SHALL BE PLACED DIRECTLY ABOVE OR BELOW THE LONGITUDINAL STEEL. LONGITUDINAL AND TRANSVERSE STEEL SPACING SHALL NOT VARY MORE THAN ONE TWELFTH OF THE SPACING SHOWN HEREON.

6A. THE LONGITUDINAL BARS IN DOUBLE MAT PLACEMENT SHALL BE PLACED WITH A TOLERANCE OF 13 mm.

7. SPLICES SHALL BE A MINIMUM OF 33 TIMES THE NOMINAL STEEL DIAMETER("D")
8. 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 762 mm IN THE TRANSVERSE AND 1219 mm 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. WHEN THE "DOUBLE STRIKE-OFF" PROCEDURE IS USED FOR DOUBLE MAT REINFORCING, CHAIRS WILL NOT BE REQUIRED.
9. AT TRANSVERSE CONSTRUCTION JOINTS THE REGULAR LONGITUDINAL STEEL SHALL EXTEND A MINIMUM OF 1219 mm ON EITHER SIDE OF THE JOINT, EXCEPT AS SHOWN ON SHEET 1 OF 2.
10. VIBRATION OF CONCRETE WITH HAND-MANIPULATED MECHANICAL VIBRATORS WILL BE REQUIRED ADJACENT TO ALL TRANSVERSE CONSTRUCTION JOINTS.
11. IF WIDTHS OCCUR, OTHER THAN THE TYPICAL WIDTHS SHOWN, INDIVIDUAL BARS OF THE SIZE SPECIFIED HEREON MAY BE ADDED OR REMOVED TO OBTAIN THE APPROPRIATE WIDTH. SPACING REQUIREMENTS SHALL NOT BE EXCEEDED HOWEVER.
12. MULTIPLE PIECE TIE BARS, OR MULTIPLE PIECE 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 THREADS ON THE BARS. THE MULTIPLE PIECE TIE BAR ASSEMBLIES SHALL DEVELOP A MINIMUM ULTIMATE TENSILE STRENGTH EQUAL TO 1.25 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 222 kN . 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 A 615 GRADE 60N 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 THESE PROPOSED ASSEMBLIES, AT THE CONTRACTOR'S EXPENSE, MAY BE REQUIRED. SHOULD THE CONTRACTOR ELECT TO USE THE SAW CUT METHOD TO FORM LONGITUDINAL DOWEL JOINTS THEN HE SHALL USE SINGLE PIECE OR MULTIPIECE DOWELS.
13. TIE BARS AND DOWEL BARS OMITTED, LOST OR DAMAGED SHALL BE REPLACED BY DRILLING AND EPOXY GROUTING AT THE CONTRACTOR'S EXPENSE.
14. MULTIPLE PIECE TIE BARS MAY BE PLACED BY ATTACHING TO THE REINFORCING STEEL MAT PRIOR TO PLACING CONCRETE, OR THEY MAY BE INSERTED INTO THE CONCRETE PAVING BY VIBRATING THEM INTO PLACE IF THIS METHOD OF PLACING IS APPROVED BY THE ENGINEER. IF THE BARS ARE VIBRATED INTO PLACE, THEY SHALL BE PULL TESTED AFTER THE CONCRETE HAS CURED AND SHALL WITHSTAND TENSILE LOADING EQUAL TO 1.5 TIMES THE DESIGN STRESS FOR NOT LESS ONE MINUTE. (DESIGN STRESS = 165474 kPa FOR GRADE 60 STEEL.) SEE "MULTIPLE PIECE TIE-BAR PULL TEST LOAD" CHART FOR REQUIREMENTS. PULL TESTS SHALL CONSIST OF NOT LESS THAN TWO TESTS OF FIVE BARS EACH FOR EACH DAY'S POUR.

REVISIONS

REV. GEN. NOTES 12 & 14 10-31-89
REV. GEN. NOTES 6A & 15 AND LONGITUDINAL BARS 01-18-90
REV. GEN. NOTES 6B AND TRANS. REINF. SHEET REINF. 05-29-90
REV. ADDED NOTE 19. 08-91
REV. ITEM NUMBER, 06/27/91
REV. ADDED DOWEL BAR CAP 11/92
REV. UPDATED TO NEW SPECS. 11/93
REV. IDENTIFIED DIA. OF DOWEL BARS AS 25mm. 11/96

TEXAS DEPARTMENT OF TRANSPORTATION
HOUSTON DISTRICT

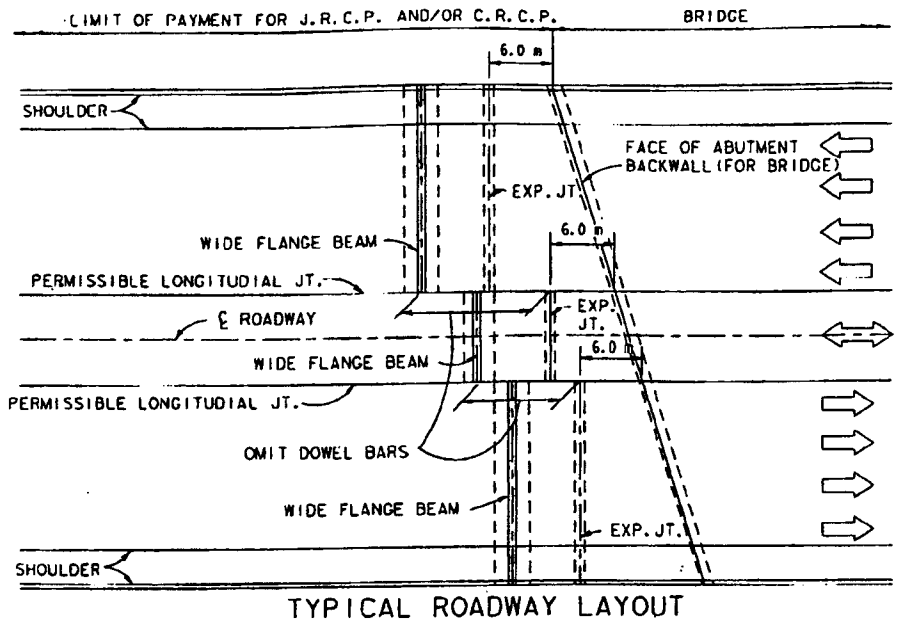
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

DETAILS (M)

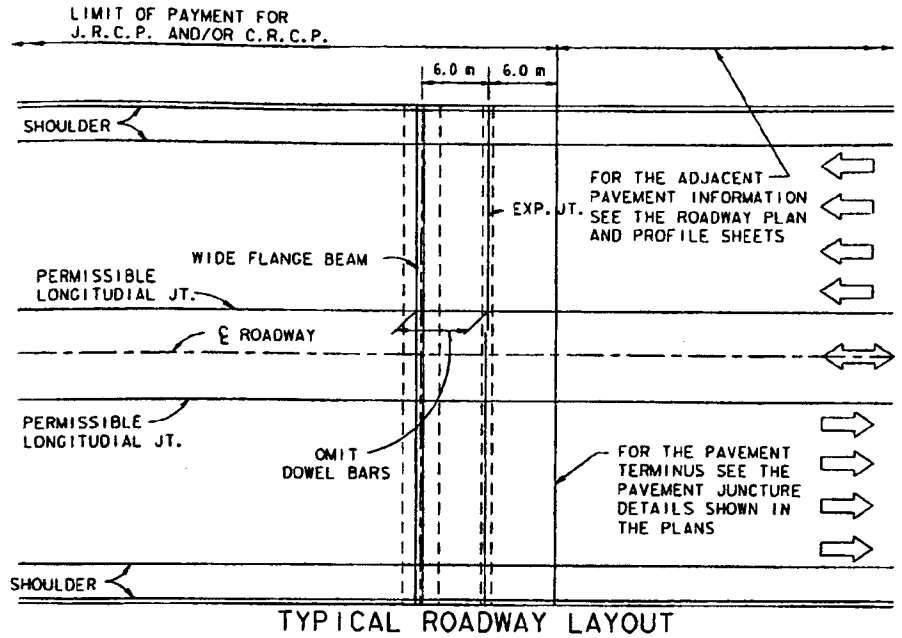
CRCP - 89 HOUSTON DIST. (2) SHEET 2 OF 2

DN	DRAWING	DATE	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.			HIGHWAY NO.
CK DN	ORIGINAL	5/89						
DW	REVISED	2/91	6	TEXAS	C500-4-92			IH45
CK DW			STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
TR			HOU	GALVESTON	0500	04	092	326
CK TR								

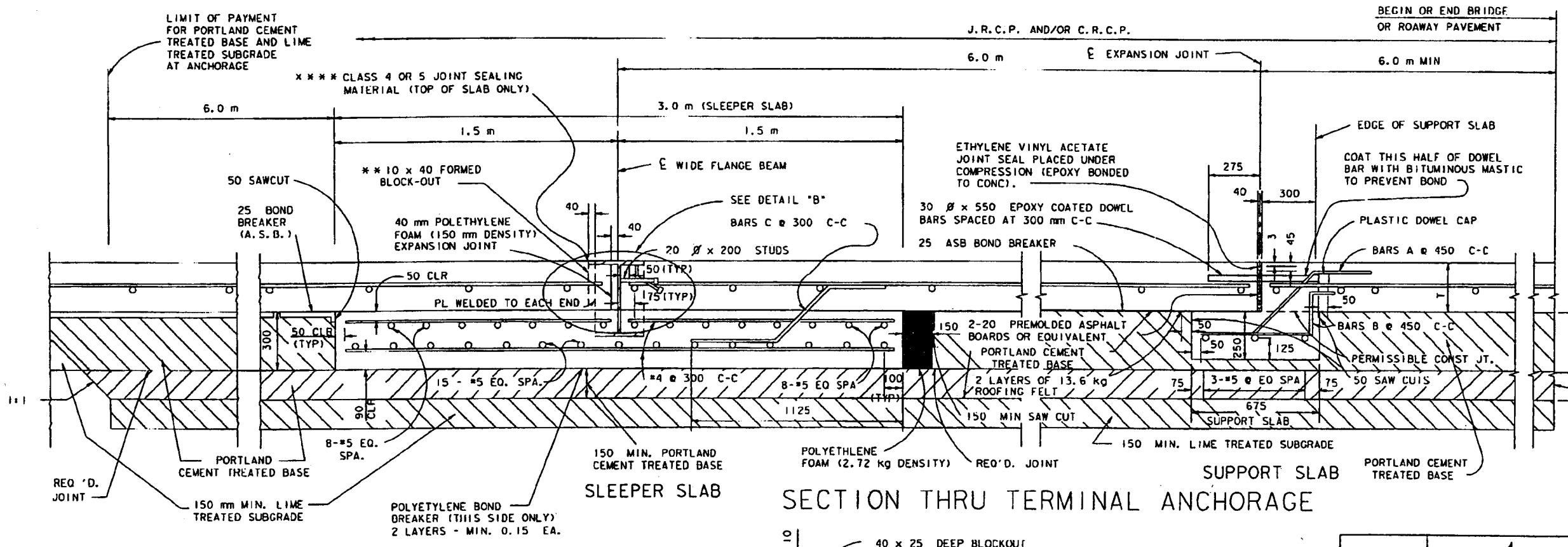
STD B - 2m



TYPICAL ROADWAY LAYOUT
CONCRETE MEDIAN AND SHOULDERS
(AT BRIDGES)



TYPICAL ROADWAY LAYOUT
CONCRETE MEDIAN AND SHOULDERS

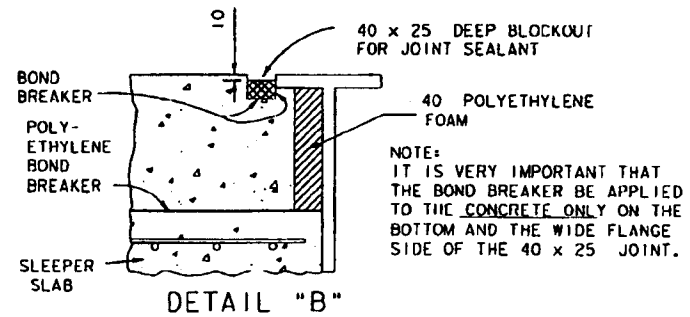


SECTION THRU TERMINAL ANCHORAGE

**NOTE

1. BLOCK-OUT REQUIRED AT EACH END OF WIDE FLANGE BEAM ADJACENT TO 10 END PLATE WHERE BLOCK-OUT IS PLACED ABUTTING CONCRETE PAVEMENT, RIPRAP OR STAB. BASE. THE BLOCKED OUT AREA SHALL BE FILLED WITH POLYETHYLENE FOAM (2.72 kg DENSITY).

2. FOR ADDITIONAL DETAILS ON REINFORCEMENT MEMBER QUANTITIES AND THE WIDE FLANGE BEAM SEE SHEET 2 OF 2.



DETAIL "B"

NOTE:
IT IS VERY IMPORTANT THAT THE BOND BREAKER BE APPLIED TO THE CONCRETE ONLY ON THE BOTTOM AND THE WIDE FLANGE SIDE OF THE 40 x 25 JOINT.

R = RADIUS
D = DIAMETER

ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE SHOWN

REV. 10/91 ADD USE FOR ROADWAY ANCHORAGE
REV. 12/91 ADD FLANGE BLOCKOUT DETAIL, AND ADD ADDITIONAL NOTES AND SPECIFICATIONS
REV. 1/93 ADDED LAYOUT FOR ROW USE, ADDITIONAL CSB LAYER, LTS LAYER, CHANGED TO TXDOT REFERENCE, CHANGED JOINT SEAL MATERIAL TO CLASS 5 OR 6
REV. 5/93 MISC. CHANGES TO DETAIL B AND OTHER LABELS.
REV. 11/93 UPDATED TO 1993 SPECS.

TEXAS DEPARTMENT OF TRANSPORTATION
HOUSTON DISTRICT

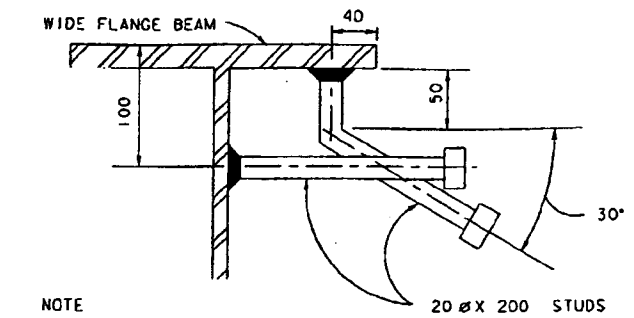
CONTINUOUSLY & JOINTED REINFORCED CONCRETE PAVEMENT DETAILS (M)

WIDE FLANGE TERMINAL ANCHORAGE SYSTEM

(FOR USE AT BRIDGE END OR PAVEMENT TERMINUS) SHEET 1 OF 2

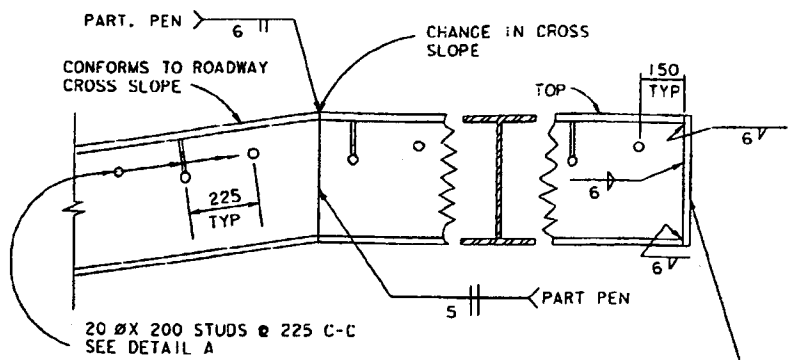
DN	CK	DW	CK	DRAWING	DATE	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.	HIGHWAY NO.
					JAN., 1993	6	TEXAS	C500-4-92	IH45
						COUNTY			
						HOU	GALVESTON	0500 04 092	337

STD 8 --5A



NOTE

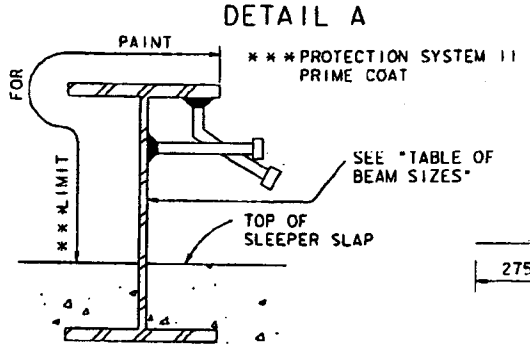
STUDS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION. ANY STUD WHICH IS DISLODGED IN SHIPPING OR CAN BE DISLODGED BY HAMMER SHALL BE REPLACED.



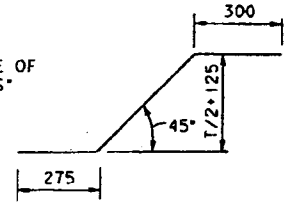
WIDE FLANGE DETAIL

10 PLATE WELDED TO EACH END OF WIDE FLANGE BEAM AT PAVEMENT EDGES ONLY. SHAPE TO FIT CONFIGURATION OF END OF WIDE FLANGE BEAM.

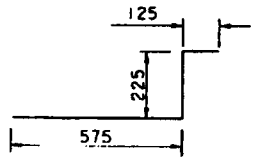
DETAIL A



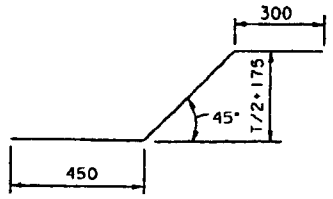
WIDE FLANGE PAINTING DETAIL



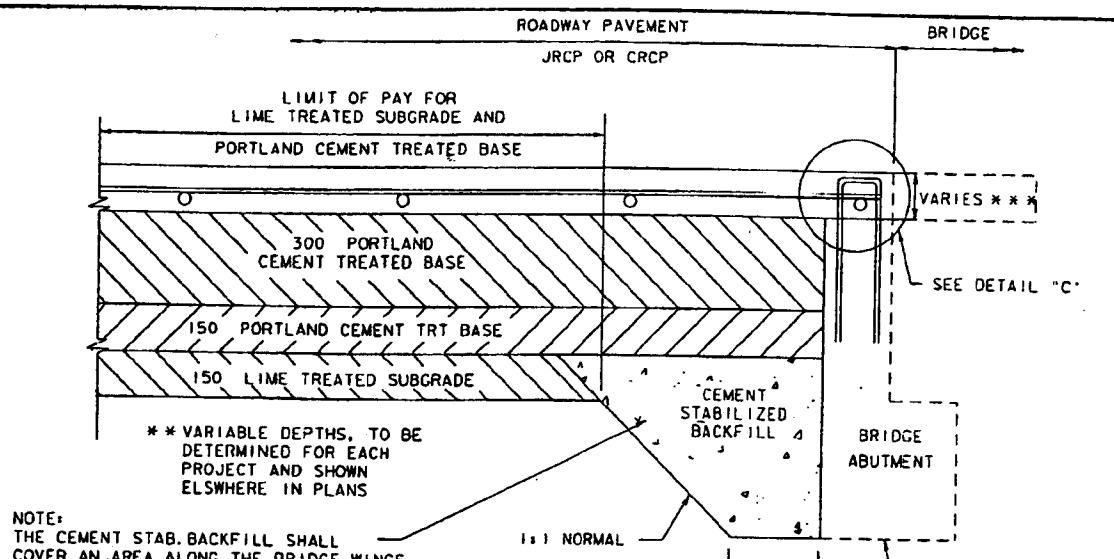
BARS A (=4)



BARS B (=4)



BARS C (=4)



NOTE:
THE CEMENT STAB. BACKFILL SHALL COVER AN AREA ALONG THE BRIDGE WINGS AND ABUTMENT BACKWALL UNLESS OTHERWISE SHOWN IN THE PLANS.

BACKFILL DIAGRAM

ESTIMATED QUANTITIES

	ITEM	PAVEMENT THICKNESS (mm) 200	225	250	275	300	325	350	375
SLEEPER SLAP	CONC (WIDE FLNG ANCH)	0.93 m³/m	0.93 m³/m	0.93 m³/m	0.93 m³/m	0.93 m³/m	0.93 m³/m	0.93 m³/m	0.93 m³/m
	REINF STL (WIDE FLNG ANCH)	72.92 kg/m	73.07 kg/m	73.22 kg/m	73.36 kg/m	73.65 kg/m	73.82 kg/m	73.95 kg/m	74.11 kg/m
SUPPORT SLAP	CONC (WIDE FLNG ANCH)	0.18 m³/m	0.18 m³/m	0.18 m³/m	0.18 m³/m	0.18 m³/m	0.18 m³/m	0.18 m³/m	0.18 m³/m
	REINF STL (WIDE FLNG ANCH)	9.23 kg/m	9.38 kg/m	9.38 kg/m	9.52 kg/m	9.68 kg/m	9.68 kg/m	9.81 kg/m	9.81 kg/m
	EXCAV (WIDE FLNG ANCH)	6.04 m³/m	6.04 m³/m	6.04 m³/m	6.04 m³/m	6.04 m³/m	6.04 m³/m	6.04 m³/m	6.04 m³/m
	STR STL (HYC)	* 103.44 kg/m +2 PLATES @ 6.74 kg EA	* 103.44 kg/m +2 PLATES @ 6.74 kg EA	* 134.69 kg/m +2 PLATES @ 8.37 kg EA	* 134.69 kg/m +2 PLATES @ 8.37 kg EA	* 146.60 kg/m +2 PLATES @ 9.98 kg EA	* 146.60 kg/m +2 PLATES @ 9.98 kg EA	* 167.43 kg/m +2 PLATES @ 12.82 kg EA	* 167.43 kg/m +2 PLATES @ 12.82 kg EA
SEE NOTE 8	PORTLAND CMT TRTD BASE	7.85 m ²/m	7.85 m ²/m	7.85 m ²/m	7.85 m ²/m	7.85 m ²/m	7.85 m ²/m	7.85 m ²/m	7.85 m ²/m
	LIME TREATED SUBGRADE	19.8 m²/m	19.8 m²/m	19.8 m²/m	19.8 m²/m	19.8 m²/m	19.8 m²/m	19.8 m²/m	19.8 m²/m
	LIME	0.30 mg/m	0.30 mg/m	0.30 mg/m	0.30 mg/m	0.30 mg/m	0.30 mg/m	0.30 mg/m	0.30 mg/m

* INCLUDES WEIGHT OF WIDE FLANGE BEAM AND STUDS

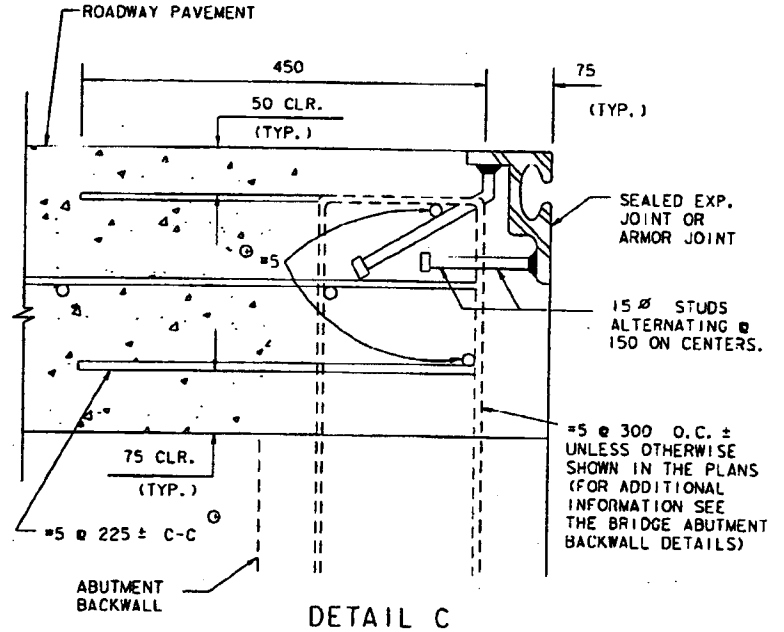
TABLE OF BEAM SIZES	
PAVEMENT THICKNESS	WIDE FLANGE BEAM DESIGNATION
200	W14X68
225	W14X68
250	W16X89
275	W16X89
300	W18X97
325	W18X97
350	W21X111
375	W21X111

NOTES:

1. POLYETHYLENE FOAM (2.72 kg DENSITY), SAW CUTS, EXPANSION JOINTS, EPOXY COATED DOWEL BARS, AND EXPANSION JOINT MATERIALS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE ITEM "CONCRETE PAVEMENT".
2. SUPPORT SLAB AND SLEEPER SLAB SHALL BE PAID FOR IN ACCORDANCE WITH SPECIAL SPECIFICATION ITEM "WIDE FLANGE TERMINAL ANCHORAGE SYSTEM".
3. WIDE FLANGE BEAM SHALL BE PAID FOR IN ACCORDANCE WITH ITEM "METAL FOR STRUCTURES".
4. SHEAR CUTTING OF DOWEL BARS IS PROHIBITED.
5. DOWEL BAR EPOXY COATING SHALL CONFORM TO THE SECTION "EPOXY COATING OF REINFORCING STEEL" UNDER ITEM "REINFORCING STEEL".
6. JOINT SEAL MATERIAL MEETS ASTM D-1056, "STANDARD SPECIFICATION FOR FLEXIBLE CELLULAR MATERIALS-SPONGE OR EXPANDED RUBBER" AS GRADE 2B2.
7. CEMENT STABILIZED BACKFILL IS REQUIRED AT ALL ABUTMENTS.
8. QUANTITIES SHOWN ARE BASED ON ALL JOINTS BEING NORMAL TO THE PAVEMENT. FOR SKEWED JOINTS THE QUANTITIES MUST BE ADJUSTED.
9. THE PLACEMENT OF PORTLAND CEMENT TREATED BASE VARIES FROM 150 TO 450 WITHIN THE WIDE FLANGE ANCHORAGE SYSTEM AND THIS REQUIRES THAT PAYMENT BE MADE OF THE STRENGTH, FLEXIBLE BASE TYPE, GRADE, COMPACTION METHOD SPECIFIED AT CLASS 6 MEASUREMENT AND PAYMENT OF "VARIABLE DEPTH".
10. THIS STANDARD WILL BE USED WITH THE SPECIAL SPECIFICATION "WIDE FLANGE TERMINAL ANCHORAGE SYSTEM".

R = RADIUS
D = DIAMETER

ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS OTHERWISE SHOWN



DETAIL C

(SHOWING ADDITIONAL REINFORCEMENT FOR ROADWAY PAVEMENT WITH SEALED EXPANSION JOINTS OR ARMOR JOINTS AT ABUTMENTS.)

Ⓒ THE ADDITIONAL STEEL REQUIRED BY THE ABOVE DETAIL "C" SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE INCLUDED IN THE PAYMENT OF ITEMS FOR CONCRETE PAVEMENT.

REV. 3/93 CRCP/JRCP & SUPPORT SLAB PAY
REV. 12/94 ADD ADDITIONAL NOTES AND SPECIFICATIONS
REV. 1/95 ADDED BACKFILL DETAILS, CSS & LTS, AND ESTIMATED QUANTITIES CHANGED TO THIS01 REFERENCE
REV. 3/95 ADDED NOTE 10 AND OMIT LABELS.
REV. 11/95 UPDATED TO 1993 SPECS.
REV. 5/96 DETAIL DIAGRAM AND DETAIL C.
REV. 3/97 REVISED QUANTITY FOR LIME TREATED SUBGRADE

TEXAS DEPARTMENT OF TRANSPORTATION
HOUSTON DISTRICT

CONTINUOUSLY & JOINTED REINFORCED CONCRETE PAVEMENT DETAILS (M)

WIDE FLANGE TERMINAL ANCHORAGE SYSTEM

(FOR USE AT BRIDGE END OR PAVEMENT TERMINUS) SHEET 2 OF 2

DN	CK	DW	CK	TK	DATE	FED. RD. DIV. NO.	STATE	STATE PROJECT NO.	HIGHWAY NO.
					JAN. 1995	6	TEXAS	C500-4-92	IH45
						DIST.	COUNTY	CONTROL NO.	SECT. NO.	JOB NO.	SHEET NO.
						HOU	GALVESTON	0500	04	092	246

STD B - 58