

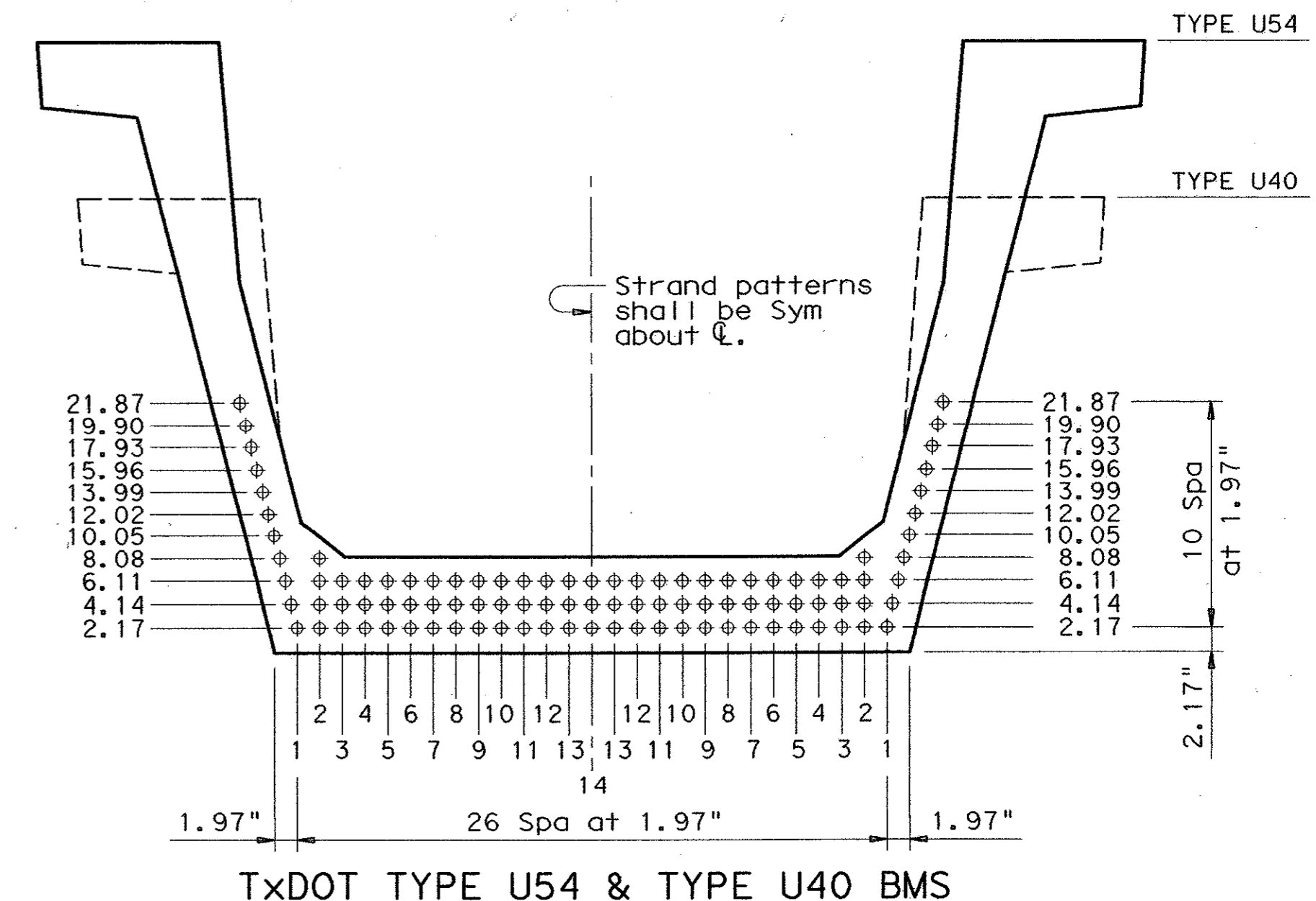
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LEVELS DISPLAYED	ACC:
1 2	20
	44
	63
	(LV=1, 2 for English)

DESIGNED BEAMS (STRAIGHT STRANDS)

OPTIONAL DESIGN

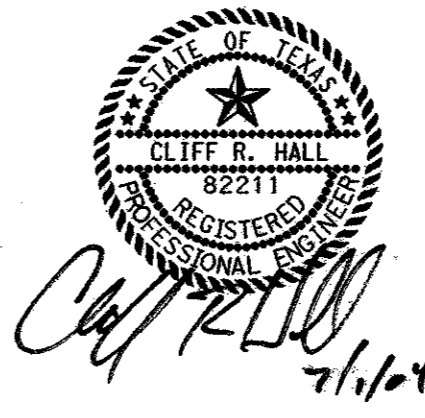
STRUCTURE	SPAN	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS											DEBONDED STRAND PATTERN PER ROW											CONCRETE		OPTIONAL DESIGN													
				STRAND PATTERN NO.	TOT NO.	SIZE	STRGTH f's (ksi)	e e (in.)	TOT NO. DEB	DIST FROM BOTTOM (in.)	NO. OF STRANDS		NUMBER OF STRANDS DEBONDED TO (ft from end)											MINIMUM RELEASE STRGTH f'ci (psi)	MINIMUM 28 DAY COMP STRGTH f'c (psi)	DESIGN e TOP COMP STRESS fct (psi)	DESIGN e BOTT TENSILE STRESS fcb (psi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (Ft-Kips)	LIVE LOAD DISTRIB FACTOR	COMP DEAD LOAD											
											TOTAL	DE-BONDED	3	6	9	12	15																								
																															f'ci (psi)	f'c (psi)	(Trk/Bm)	(k lf)							
ARAPAHO ROAD	1	ALL	U54	62	1/2	270K	18.82	18.16	28	2.17	27	20	2	8	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4848	6539	3754	-3398	9428	1.035	0.159
	2 - 7	1	U54	62	1/2	270K	18.82	18.16	28	2.17	27	20	2	8	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4848	6539	3754	-3398	9428	1.035	0.159
	2 - 7	2 - 4	U54	58	1/2	270K	19.00	18.42	28	2.17	27	20	2	8	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4537	5937	3509	-3211	9064	1.067	0.141
	8	1	U54	56	1/2	270K	19.10	18.55	26	2.17	27	20	2	8	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4412	5891	3420	-3145	8872	1.091	0.159
	8	2 - 4	U54	51	1/2	270K	19.26	18.73	24	2.17	27	20	4	8	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4000	5303	3175	-2932	8358	1.067	0.141
	9	ALL	U54	25	1/2	270K	22.36	22.36	0	2.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5000	6000					
	10	1	U54	56	1/2	270K	19.10	18.55	26	2.17	27	20	2	8	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4412	5891	3420	-3145	8872	1.091	0.159
	10	2 - 4	U54	51	1/2	270K	19.26	18.73	24	2.17	27	20	4	8	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4000	5303	3175	-2932	8358	1.067	0.141
	11 - 13	1	U54	72	1/2	270K	18.47	17.65	34	2.17	27	20	0	8	8	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5605	7565	4259	-3822	10502	1.047	0.159
	11 - 13	2 - 4	U54	68	1/2	270K	18.60	17.84	32	2.17	27	20	0	8	8	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5296	6887	3983	-3605	10049	1.067	0.141
	14	ALL	U54	72	1/2	270K	18.47	17.65	34	2.17	27	20	0	8	8	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5605	7565	4259	-3822	10502	1.047	0.159



GENERAL NOTES:

- Designed in accordance with current AASHTO Standard and Interim Specifications.
- All concrete shall be Class H. All reinforcing bars shall be Grade 60.
- When shown on this sheet, the Fabricator has the option of furnishing either the designed straight strand beam or an approved optional beam design. All optional design submittals and shop drawings shall be signed, sealed and dated by a registered Professional Engineer.
- Optional designs shall have a calculated residual camber equal to or greater than that of the designed beam.
- Prestress losses for the designed beams have been calculated for a relative humidity of 70 percent. Optional designs shall likewise conform.
- Strands for the designed beam shall be located as low as possible on the 1.97" grid system. Fill row "2.17", then row "4.14", then row "6.11", etc., beginning each row in the "1" position and, distributing uniformly as practical, working inward until the required number of strands is reached. All strands, including those in the web, shall be adequately tied to reinforcing steel, bar supports, or other devices to prevent displacement during concrete placement.
- Strands in position "1" shall not be debonded. Debonded strands shall be distributed equally about the vertical centerline. Debonded lengths shall decrease working inward, with debonding staggered in each row.
- Strands shall be encased in plastic tubing along entire debonded length, and ends of tubing shall be sealed with waterproof tape. Split plastic tubing may be used provided the seam of the tubing is sufficiently sealed with waterproof tape to prohibit grout infiltration. Wrapping of strands with tape to provide debonding will not be permitted.
- Full-length debonding of strands shall be permitted only as approved by the Engineer and shall be done on an individual basis. Full-length debonding, when permitted, shall be symmetrical about the vertical centerline of the beam and shall be limited to ten (10) percent of the total number of strands or a maximum of six (6) strands, whichever is less. Full-length debonding of strands in position "1" is not permitted.
- Strands for the designed beam shall be 1/2" 270 ksi low relaxation strands pretensioned to 31.0 k each.

① THE LIVE LOAD DISTRIBUTION FACTORS (LLDF) SHOWN IN THE TABLE FOR SPANS 1-7 & 14 AND BEAM #1 ON SPANS 8 & 10-13 WERE DETERMINED PER AASHTO FOR HS-20 TRUCK LOADING AND MODIFIED TO ACCOUNT FOR THE ADDITIONAL PEDESTRIAN LIVE LOAD. FOR BEAMS 2-4 ON SPAN 8 & 10-13, THE LLDF REPORTED WAS DETERMINED BY THE STANDARD TxDOT METHOD.



HS20 LOADING 298

Texas Department of Transportation
Design Division (Bridge)

PRESTRESSED CONCRETE U-BEAMS (DESIGN DATA)

UBNS

FILE: ubstd005.dgn DN: CK: DW: CK: STD: B543
 ORIG DATE: DIST FED REG FEDERAL AID PROJECT SHEET
 REVISIONS 6 BR-60
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