

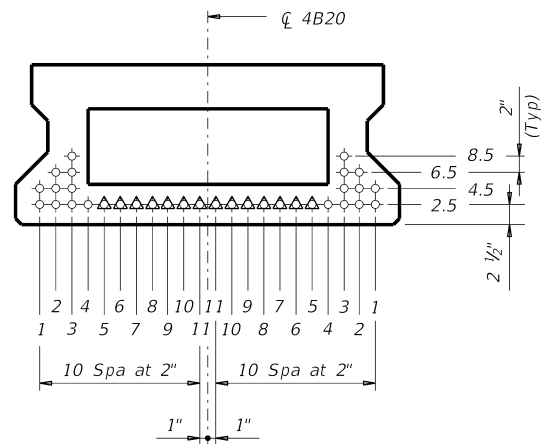
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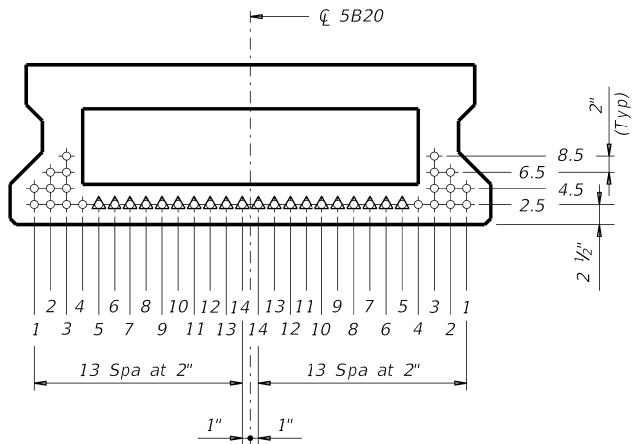
STANDARD SBBS-B20-24	DESIGNED BEAMS (STRAIGHT STRANDS)																	OPTIONAL DESIGN							
	SPAN LENGTH (ft)	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS							DEBONDED STRAND PATTERN PER ROW					CONCRETE		DESIGN LOAD COMP STRESS (TOP ϵ) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOTT ϵ) (SERVICE III)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR				
				NON- STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH f_{pu} (ksi)	"e" \bar{c} (in)	"e" END (in)	TOT NO. DEB	DIST FROM BOTTOM (in)	NO. OF STRANDS		NUMBER OF STRANDS DEBONDED TO (ft from end)							RELEASE STRGTH f'_{ci} (ksi)	MINIMUM 28 DAY COMP STRGTH f'_c (ksi)	②		
												TOTAL	DE- BONDED	3	6	9	12						15	Moment	Shear
24' Roadway 5" Slab	30	1&6	5B20		8	0.6	270	7.38	7.38	0	2.50	8	0	0	0	0	0	0	4.000	5.000	0.640	-0.808	704	0.454	0.691
	30	2-5	4B20		6	0.6	270	7.31	7.31	0	2.50	6	0	0	0	0	0	0	4.000	5.000	0.693	-0.860	601	0.379	0.511
	35	1&6	5B20		8	0.6	270	7.38	7.38	0	2.50	8	0	0	0	0	0	0	4.000	5.000	0.838	-1.041	795	0.440	0.680
	35	2-5	4B20		6	0.6	270	7.31	7.31	0	2.50	6	0	0	0	0	0	0	4.000	5.000	0.911	-1.111	615	0.367	0.498
	40	1&6	5B20		10	0.6	270	7.38	7.38	0	2.50	10	0	0	0	0	0	0	4.000	5.000	1.061	-1.297	889	0.427	0.671
	40	2-5	4B20		8	0.6	270	7.31	7.31	0	2.50	8	0	0	0	0	0	0	4.000	5.000	1.156	-1.388	712	0.356	0.488
	45	1&6	5B20		10	0.6	270	7.38	7.38	0	2.50	10	0	0	0	0	0	0	4.000	5.000	1.316	-1.590	960	0.417	0.663
	45	2-5	4B20		10	0.6	270	7.31	7.31	0	2.50	10	0	0	0	0	0	0	4.000	5.000	1.437	-1.706	824	0.348	0.481
	50	1&6	5B20		12	0.6	270	7.38	7.38	0	2.50	12	0	0	0	0	0	0	4.000	5.000	1.606	-1.927	1147	0.408	0.655
	50	2-5	4B20		12	0.6	270	7.31	7.31	0	2.50	12	0	0	0	0	0	0	4.000	5.000	1.755	-2.070	985	0.340	0.476
	55	1&6	5B20		16	0.6	270	7.38	7.38	0	2.50	16	0	0	0	0	0	0	4.000	5.000	1.921	-2.289	1344	0.400	0.649
	55	2-5	4B20		14	0.6	270	7.31	7.31	0	2.50	14	0	0	0	0	0	0	4.000	5.000	2.104	-2.464	1157	0.334	0.471
	60	1&6	5B20		18	0.6	270	7.38	7.38	0	2.50	18	0	0	0	0	0	0	4.000	5.000	2.262	-2.677	1551	0.393	0.643
	60	2-5	4B20		18	0.6	270	7.31	7.31	2	2.50	18	2	0	2	0	0	0	4.000	5.000	2.487	-2.899	1347	0.333	0.467
	65	1&6	5B20		24	0.6	270	7.38	7.38	6	2.50	24	6	2	2	0	2	0	4.000	5.000	2.627	-3.091	1769	0.387	0.638
	65	2-5	4B20		20	0.6	270	7.31	7.31	4	2.50	20	4	0	2	0	2	0	4.000	5.800	2.903	-3.368	1551	0.333	0.463

DESIGN NOTES:
 Designed in accordance with AASHTO LRFD Bridge Design Specifications.
 Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.
 Beam designs are applicable for 5" concrete slabs without overlay and 0 degree skew.

FABRICATION NOTES:
 Provide Class H concrete.
 Provide Grade 60 reinforcing steel bars.
 Use low relaxation strands, each pretensioned to 75 percent of f_{pu} .
 When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.
 Locate strands for the designed beam as low as possible on the 2" grid system unless a non-standard stand pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc. Place strands within a row as follows:
 1) Locate a strand in each "1" position.
 2) Place strand symmetrically about vertical centerline of box.
 3) Space strands as equally as possible across the entire width.
 Strand debonding must comply with Item 424.4.2.2.4.
 Do not debond strands in position "1". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with debonding staggered in each row.
 Full-length debonded strands are only permitted in positions marked Δ .



TxDOT 4B20 BOX BEAM



TxDOT 5B20 BOX BEAM

① Based on the following allowable stresses (ksi):
 Compression = $0.65 f'_{ci}$
 Tension = $0.24 \sqrt{f'_{ci}}$
 Optional designs must likewise conform.
 ② Portion of full HL93.

HL93 LOADING

		Bridge Division Standard	
PRESTR CONC BOX BEAM STANDARD DESIGNS TYPE B20 24' RDWY (WITH SLAB)			
BBSDBS-B20-24			
FILE: BB-SDB2024-16.dgn	DN: SRW	CK: BMP	DW: SFS
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REVISIONS		HIGHWAY	
04-11: f'_{ci} and LLDF.	DIST	COUNTY	SHEET NO.
01-16: Notes, 0.6" strand designs.			