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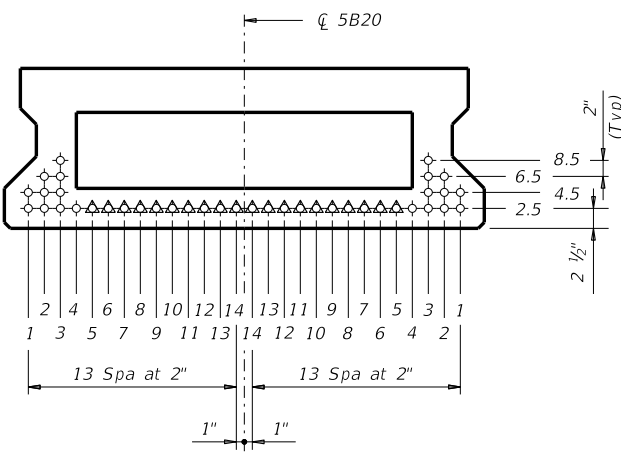
DATE: FILE:

STANDARD SBBS-B20-28	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 fpu (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 $\textcircled{1}$ f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)	$\textcircled{2}$		
												TOTAL	DE- BONDED	3	6	9	12						15	Moment	Shear
28' Roadway 5" Slab	30	ALL	5B20		8	0.6	270	7.38	7.38	0	2.50	8	0	0	0	0	0	4.000	5.000	0.654	-0.828	715	0.454	0.691	
	35	ALL	5B20		8	0.6	270	7.38	7.38	0	2.50	8	0	0	0	0	0	4.000	5.000	0.861	-1.069	796	0.440	0.680	
	40	ALL	5B20		10	0.6	270	7.38	7.38	0	2.50	10	0	0	0	0	0	4.000	5.000	1.092	-1.335	890	0.427	0.671	
	45	ALL	5B20		10	0.6	270	7.38	7.38	0	2.50	10	0	0	0	0	0	4.000	5.000	1.356	-1.638	980	0.417	0.663	
	50	ALL	5B20		14	0.6	270	7.38	7.38	0	2.50	14	0	0	0	0	0	4.000	5.000	1.658	-1.988	1172	0.408	0.655	
	55	ALL	5B20		16	0.6	270	7.38	7.38	0	2.50	16	0	0	0	0	0	4.000	5.000	1.985	-2.364	1374	0.400	0.649	
	60	ALL	5B20		20	0.6	270	7.38	7.38	2	2.50	20	2	2	0	0	0	4.000	5.000	2.339	-2.766	1587	0.393	0.643	
	65	ALL	5B20		24	0.6	270	7.38	7.38	6	2.50	24	6	2	2	0	2	0	4.000	5.000	2.720	-3.197	1811	0.387	0.638

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 fpu.
 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 .

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



TxDOT 5B20 BOX BEAM

HL93 LOADING

		Bridge Division Standard	
PRESTR CONC BOX BEAM STANDARD DESIGNS			
TYPE B20		28' RDWY (WITH SLAB)	
BBSDS-B20-28			
FILE: bbstds25.dgn	DN: SRW	CK: BMP	DW: SFS
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REVISIONS		HIGHWAY	
04-11: f'ci and LLDF.	DIST		COUNTY
01-16: Notes, 0.6" strand designs.	SHEET NO.		