#### INFORMATIONAL NOTES

THESE NOTES MUST BE READ BEFORE USING THESE STANDARDS.

THESE STANDARDS SHALL BE USED FOR OVERHEAD STRUCTURES. SUBJECT TO LIMITATIONS AS SHOWN. THEY SHALL BE USED AS THE BASIS FOR THE PREPARATION OF STRUCTURE LAYOUTS AND CONTRACT PLANS. DETAILS SHOWN ON THESE STANDARDS NEED NOT BE COPIED, FOR REFERENCE TO THESE STANDARDS ON OVERHEAD SIGN STRUCTURE CONTRACT PLANS WILL BE PERMITTED, PROVIDING COORDINATING IN-FORMATION IS SHOWN ON THE CONTRACT PLANS.

DESIGN COMPUTATIONS ARE NOT REQUIRED FOR ANY PORTION OF A STRUCTURE FOR WHICH THE INFORMATION IS TAKEN DIRECTLY FROM THE DESIGN TABLES CONTAINED IN THESE STANDARDS. PROVIDING THE RESTRICTIONS RELATING TO THESE DESIGN TABLES ARE NOT EXCEEDED.

### GENERAL DESIGN INSTRUCTIONS

DESIGN TABLES INCLUDED IN THESE STANDARDS WERE DEVELOPED USING A COMPUTER PROGRAM AND ARE BASED ON THE DESIGN CRITERIA SHOWN ON THIS SHEET.

TOWERS SHALL BE SET AS FAR FROM EDGE OF ROADWAY PAVEMENT AS CROSS SECTION GEOMETRICS AND/OR RIGHT OF WAY WILL PERMIT, WITH THE MAXI-MUM DISTANCE TO CENTERLINE OF TOWER EQUAL TO 30 FEET. GUIDE RAIL PROTECTION SHALL BE PROVIDED FOR ALL TOWERS, REGARDLESS OF DISTANCE OF SETRACK

TOP OF FOUNDATION PEDESTAL SHALL BE SET A MINIMUM ABOVE SURROUNDING TERRAIN TO MINIMIZE HAZARD EFFECT OF CONCRETE PEDESTAL ABOVE GRADE. TOP OF FOUNDATION FOOTING TO BE SET A MINIMUM OF 2-6" BELOW TOP OF PEDESTAL WITH A 1-0" MINIMUM COVER MAINTAINED OVER FOOTING AT ALL POINTS. CARE SHALL BE TAKEN TO ATTEMPT TO KEEP TOP OF FOOTINGS BELOW BOTTOM OF GUIDE RAIL POSTS THAT MIGHT BE IN AREA OF FOOTING OR FREE OF ANY OTHER OBSTRUCTING UNIT SUCH AS A STORM SEWER. IF IT BECOMES NECESSARY TO LOWER A FOOTING TO THE EXTENT THAT THE HEIGHT OF PEDESTAL IS GREATER THAN 7 FEET, THE SCOPE OF THE DESIGN TABLES HAS BEEN EX-CEEDED AND IT WILL BE NECESSARY TO DESIGN A FOUNDATION PEDESTAL AND FOOTING FOR THIS SPECIAL CONDITION.

THE TRUSS, SIGNS, LIGHT FIXTURES (AND CATWALK, IF USED) SHALL BE SET TO AN ELEVATION THAT WILL PROVIDE 17-6" MINIMUM VERTICAL CLEAR ABOVE THE HIGHEST POINT OF THE ENTIRE WIDTH OF THE ROADWAY PAVEMENT AND SHOULDERS PASSING UNDER THE STRUCTURE. GENERALLY THE BOTTOM OF ALL SIGNS ON A STRUCTURE SHALL BE SET TO THE SAME ELEVATION. IN THE CASE OF A STRUCTURE SPANNING DUAL ROADWAYS, WHERE THE DIFFERENCE IN ELEVA-TION BETWEEN THE HIGHEST POINT ON EACH DUAL ROADWAY IS GREATER THAN , THE BOTTOM OF ALL SIGNS OVER EACH DUAL ROADWAY SHALL BE SET TO THE SAME ELEVATION, WITH THE ELEVATION DIFFERENCE OF BOTTOM OF SIGNS OVER EACH ROADWAY BEING EQUAL TO THE DIFFERENCE IN ELEVATION BETWEEN THE HIGHEST POINT ON EACH DUAL ROADWAY.

THE TRUSS SHALL BE SET TO AN ELEVATION THAT PLACES THE CENTER OF THE TRUSS AT MID-HEIGHT OF THE DEEPEST SIGN OR A MAXIMUM OF 6 FEET ABOVE THE BOTTOM OF THE SIGNS. IN THE INSTANCES WHERE THE ULTIMATE SIGN AREA CRI-TERIA IS TO BE USED, SET THE TRUSS TO AN ELEVATION THAT PLACES THE CENTER OF THE TRUSS AT 6 FEET ABOVE THE BOTTOM OF THE SIGNS. IN THE INSTANCES WHERE THE STRUCTURE IS SPANNING DUAL ROADWAYS WITH ELEVATION DIFFERENCES GREATER THAN 2-6", AS DESCRIBED PREVIOUSLY, SET THE TRUSS TO AN ELEVATION THAT PLACES THE CENTER OF THE TRUSS AT 8-6" ABOVE THE BOTTOM OF THE SIGNS OVER THE LOWER ROADWAY

THE DESIGN SIGN AREA TO BE USED FOR SELECTING MEMBER SIZES FOR EACH STRUCTURE SHALL BE DETERMINED FROM ONE OF THE FOLLOWING TWO CONDITIONS. THE FIRST CONDITION IS THE ACTUAL SIGN AREA TO BE PLACED ON THE STRUCTURE AT THE TIME OF ITS CONSTRUCTION. THE SECOND CONDITION IS FOR AN ULTIMATE SIGN AREA EQUAL TO THE WIDTH OF ROADWAY PAVEMENT UNDER THE STRUCTURE TIMES 12 FEET. THE TRAFFIC ENGINEER SHALL SPECIFY WHEN THE ULTIMATE SIGN AREA IS TO BE USED FOR DESIGN OF STRUCTURE. THE DESIGN SIGN AREA SHALL BE THE SIGN AREA COMPUTED FROM EITHER OF THE PREVIOUSLY DEFINED CONDITIONS, ROUNDED TO THE NEXT HIGHER AREA SHOWN IN THE DESIGN TABLES.

TOWER MEMBER SIZES, FOUNDATION PEDESTALS AND FOOTINGS SHALL BE SELECTED FROM THE APPROPRIATE DESIGN HEIGHT IN THE DESIGN TABLES. THERE ARE THREE DESIGN HEIGHTS (THE DIMENSION FROM TOP OF FOUNDATION PEDESTAL TO THE CENTER OF THE TRUSS) VARYING IN 5 FOOT INCREMENTS FROM 23 FEET TO 33 FEET. USE AS THE DESIGN HEIGHT, THE HEIGHT IN THE DESIGN TABLE NEXT LARGER THAN THE ACTUAL DIMENSION FROM THE TOP OF FOUNDATION PEDESTAL TO THE CENTER OF

OVERHEAD SIGN STRUCTURES MAY BE CONSTRUCTED WITH OR WITHOUT CATWALK. THE TRAFFIC ENGINEER SHALL SPECIFY WHEN A CATWALK IS TO BE INCLUDED AS PART OF THE STRUCTURE.

### DESIGN CRITERIA

DESIGN SPECIFICATIONS - DESIGN REQUIREMENTS OF 1975 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS EXCEPT AS NOTED HEREIN.

WIND SPEED - 80 MILES PER HOUR.

COEFFICIENT FOR HEIGHT ABOVE GROUND = 1.00

SHAPE COEFFICIENT - TRUSS CHORDS = 2.86 TRUSS WEBS = 2.86 SIGN CATWALK = 2.86 TOWER = 2.86

CONCRETE -

f'c = 3,000 P.S.I.

REINFORCEMENT BARS - fs = 20,000 P.S.I.

STRUCTURAL STEEL - Fy = 36,000 P.S.I.

FATIGUE LOADING USED EQUALS 0.71 x WIND LOADING DUE TO DESIGN WIND PRESSURE. FATIGUE STRENGTH EQUALS 100 PER CENT OF ALLOWABLE STRESS RANGE CONSIDERING 2,000,000 CYCLES OF LOADING.

MAXIMUM FOUNDATION BEARING PRESSURE - 1.5 TONS PER SQ.FT.

LOCATION OF RESULTANT CENTER OF PRESSURE UNDER FOOTING -WITHIN MIDDLE ONE-HALF OF FOOTING DIMENSION PERPENDICULAR TO CENTER OF TRUSS AND WITHIN MIDDLE ONE-THIRD OF FOOTING DIMENSION PERPENDICULAR TO CENTER OF TOWER.

DEAD LOAD AND WIND LOAD RESULTING FROM CATWALK HAVE BEEN INCLUDED IN THE DESIGNS SHOWN IN TABLES ON SHEET 2.

### Commonwealth of Pennsylvania DEPARTMENT OF TRANSPORTATION

BUREAU OF HIGHWAY SERVICES

### OVERHEAD SIGN STRUCTURES

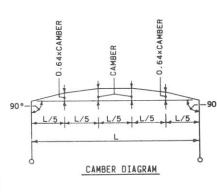
## STEEL SPANS GREATER THAN 120 FEET

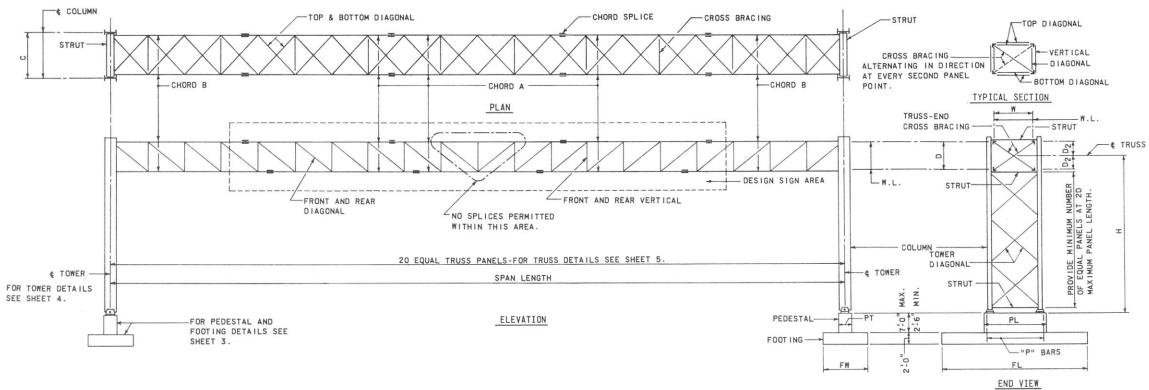
GENERAL INFORMATION DESIGN INSTRUCTIONS AND CRITERIA

Recommended 12/21/22 Recommended 12/20/22 Recommended 13/20/22 Sht. 1 Of 7
Chief Bridge Chief, Traffic Engineering Chief Highway 0 TC-7718 Chief Bridge and Operations Division | Engineer

TC-7718

DESIGN	W×D	DESIGN						TOWER MEMBERS			FOUNDATION PEDESTAL			FOOTING TYPE			DESIGN	DESIGN									
SPAN	1125	SIGN -	СНО	RDS		DIA	ONALS	VE	RTICALS		CROSS	BRACING	CAMBER	1	COLUMN					NUMBE	R OF "P"	BARS				AREA	SPAN
			A	В	FRON	IT &	TOP &	F	RONT &	INTE	RIOR	END		DES	IGN HEIGH	тн	DIAGONALS	STRUTS	PL×PT	A	ND SIZE		H=23 FT.	H=28 FT.	H=33 FT.	SQ.FT.	FT.
FT.	FT.	SQ.FT.	~	5	REAR	1	вотто	4 R	EAR		III TON		IN.	23 FT.	28 FT.	33 FT.			FT.	H=23 FT.	H=28 FT.	H=33 FT.					F1.
	7×5.25	300	L6×6×12	L6×6×12	L3 12 ×3	12 x 5 16	L3 2 ×3 2	516 L3 12	2 ×3 <sup>1</sup> 2 × <sup>5</sup> 16	L3 12 ×3	12 × 516	L3 12 ×3 12 ×51	6	W24×68	W24×68	W24×68	L4×4×58	C15×33.9	11×2.25	16#4	16#4	16#4	720	722	724	300	
130		700	L6×6× <sup>5</sup> 8	L6×6×12		1	<b>†</b>		†		1	†	3.56	W24×68	W24×68	W24×76	†	1	1	16#4	16#4	16#5	821	824	727	700	130
		1100	L6×6×3 <sub>4</sub>	L6×6×1										W24×76	W24×76	W24×84				16#4	16#5	16#5	922	826	730	1100	
		300	L6×6×9 <sub>16</sub>	L6×6×1										W24×68	W24×68	W24×76				16#4	16#4	16#4	720	722	724	300	
140	7×5.25	700	L6×6×34	L6×6×12									4.19	W24×76	W24×76	W24×84				16#4	16#4	16#5	821	824	728	700	140
		1100	L6×6×7 <sub>8</sub>	L6×6×916										W24×84	W24×84	W27×94			11×2.25	16#5	16#5	16#5	923	826	731	1100	
		300	L6×6×58	L6×6×12										W24×68	W24×68	W24×76			12×2.25	16#4	16#4	16#4	720	723	725	300	
150	8×6.0	700	L6×6×3	L6×6×12									4.31	W24×76	W24×76	W24×84	4		1	16#4	16#4	16#5	822	824	728	700	150
		1100	L6×6×78	L6×6×1										W24×84	W24×84	W27×94				16#5	16#5	16#5	923	826	731	1100	
		300	L6×6×3 <sub>4</sub>	L6×6×12										W24×68	W24×76	W24×76				16#4	16#4	16#4	819	723	725	300	
		700	L6×6×78	L6×6×12		,								W24×76	W27×84	W27×94				16#4	16#4	16#5	822	825	827	700	160
160	8×6.0	1100	L6×6×78	L6×6×916	L3 12 ×3	12 x516							4.69	W27×84	W27×94	W27×102				16#5	16#5	16#5	923	926	928	1100	160
		1500	L6×6×1	L6×6×34	L3 2 ×3	12 ×38								W27×10	W27×102	W27×114			12×2.25	16#5	16#6	16#6	1123	928	930	1500	
		300	L6×6×3 <sub>4</sub>	L6×6×12	L3 12 ×3									W24×68	W24×76	W24×76			13×2.25	17#4	17#4	17#4	720	723	725	300	
170	0 75	700	L6×6×78	L6×6×12	L3 12 ×3	12 ×516							4.81	W24×76	W27×84	W27×94			1	17#4	17#4	17#5	921	825	827	700	
170	9×6.75	1100	L6×6×1	L6×6×916	L3 2 ×3								4.81	W27×84	W27×94	W27×102				17#4	17#5	17#5	1022	926	928	1100	170
		1500	L6×6×1	L6×6×5 <sub>8</sub>	L3 12 ×3									W27×10	2 W27×102	W27×114				17#5	17#5	17#5	1123	928	930	1500	7
		300	L6×6× <sup>7</sup> g	L6×6×12	L3 12 ×3									W24×76	W27×84	W27×94				17#4	17#4	17#4	820	822	824	300	
		700	L6×6×1	L6×6×916	L3 12 ×3				$\rightarrow$				$\neg$	W27×84	W27×94	W27×102				17#4	17#4	17#5	921	825	827	700	1
180	9×6.75	1100	L8×8×3	L8×8×5 <sub>p</sub>	L4×4			L3 1	2 ×3 12 ×516				5.44	W27×94		W27×114				17#5	17#5	17#5	1022	926	928	1100	180
		1500	L8×8×3	L8×8×5		†			2 ×3 12 ×38	L3 2 ×3	12 x 516		$\neg$	W27×11		W30×124			13×2.25	17#6	17#6	17#6	1123	1027	1030	1500	7
		300	L6×6× <sup>7</sup> g	L6×6× 12					-4×4× <sup>3</sup> 8	L4×4				W24×76		W27×94			14×2.25	18#4	18#4	18#4	820	823	825	300	1
		700	L6×6×1	L6×6×9 <sub>16</sub>					†		†		5.63	W27×94	W27×94	W27×102			1	18#4	18#4	18#5	921	924	827	700	1
190	10×7.5	1100	L8×8×3	L8×8×5 <sub>p</sub>									5.63	W27×10		W27×114				18#5	18#5	18#5	1022	926	928	1100	190
		1500	L8×8×3	L8×8× <sup>5</sup> 8									$\neg$	W30×11		W30×124				18#5	18#5	18#5	1123	1028	1030	1500	7
		300	L6×6×1	L6×6×9 <sub>L6</sub>										W27×84	W27×94	W27×102				18#4	18#4	18#4	919	823	825	300	
		700	L8×8×34	L8×8×5				_						W27×94	-	W27×114				18#4	18#5	18#5	922	925	927	700	7
200	10×7.5	1100	L8×8×34	L8×8×5				_		<u> </u>			6.3	W27×11		W30×116			1	18#5	18#5	18#5	1122	1026	1028	1100	200
		1500	L8×8×7 <sub>R</sub>	L8×8×5 <sub>p</sub>	L4×4	4 - 3.	L3 2 ×3 2	x5, c	L4×4×30	L4×4	1 3	L3 12 ×3 12 ×5			W30x 124		L4×4× <sup>5</sup> 8	C15×33.9	14×2.25		18#5	18#5	1124	1028	1030	1500	7





### NOTES:

FOR GENERAL INFORMATION, DESIGN INSTRUCTIONS AND CRITERIA SEE SHEET I.

FOR GENERAL NOTES SEE SHEET 3.

FOOTING TYPE DENOTES SIZE OF FOOTING. FOR EXAMPLE, TYPE 825 IS A FOOTING 8  $^{\prime}$  (FW)  $\times$  25  $^{\prime}$  (FL).

W.L. DENOTES WORKING LINE.

SEE TOWER ELEVATION ON SHEET 4 FOR METHOD OF COMPUTING DIMENSION C.

SPLICES MAY BE RELOCATED, ADDED OR ELIMINATED WITH APPROVAL OF THE TRAFFIC ENGINEER. RELATIVE LOCATIONS OF SPLICES IN TOP AND BOTTOM CHORDS SHALL BE MAINTAINED AS INDICATED IN THESE STANDARDS. CHORD A SIZES SHALL BE EXTENDED TOWARD TOWERS, IF A SPLICE IS RELOCATED NEARER TO TOWER THAN SHOWN IN THESE STANDARDS.

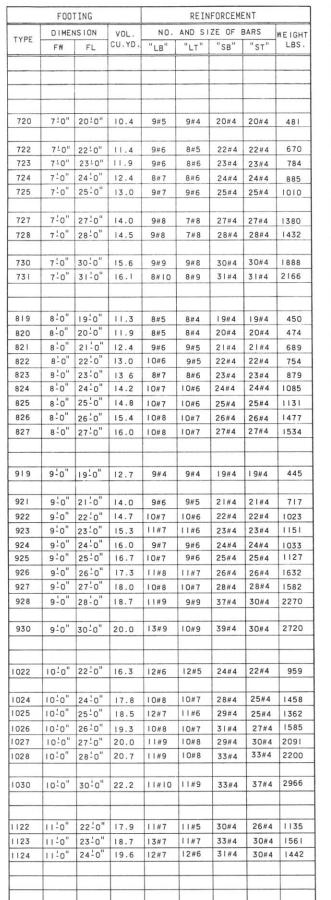
# Commonwealth of Pennsylvania DEPARTMENT OF TRANSPORTATION

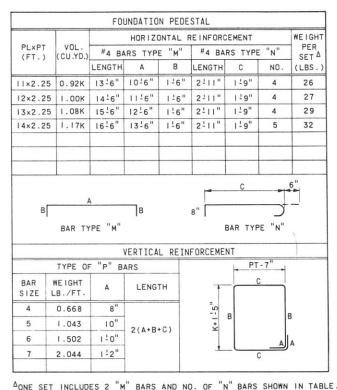
BUREAU OF HIGHWAY SERVICES

## OVERHEAD SIGN STRUCTURES STEEL SPANS GREATER THAN 120 FEET

DESIGN TABLES

Recommended 12/23/82	Recommended [2/2/62] Recommended [2/2/62]	Sht2 Of 7
Chief Bridge		TC- 7718





L"LB"BARS

FOOTING

PEDESTAL

LIMIT OF PAYMENT FOR CLASS 3 EXCAVATION

PLAN

FINISHED GROUND LINE

SECTION CC

FOOTING EXCAVATION DETAILS

### 2 FL 5 FL \*SEE TOWER ELEVATION ON SHEET 4 PL PL FOR VALUE OF C. ¢ COLUMN ¢ COLUMN 2 C ONE SET OF "N" BARS IN ALTERNATE ROWS - ¢ TOWER -2 L"M" BARS +-¢ SIGN STRUCTURE EQUAL SPACES 4 SPA 3"CL @ 5 @ 5" PLAN OF FOUNDATION SECTION BB TOTAL NUMBER AND SIZE OF "P" BARS "P" BARS REQUIRED ARE GIVEN IN THE DESIGN TABLE \_"P" BARS A ON SHEET 2. -3"CL.-TYP. "ST" BARS 3"CL.-TYF K = 2-6" & 7-0" BARS OPTIONAL CONSTR.JT-\_"LT"BARS F"ST" BARS NE IS

A

ELEVATION

GENERAL NOTES:

\_3"CL.

"SR" BARS

"LB" BARS

SECTION AA

FOR GENERAL DESIGN INSTRUCTIONS SEE SHEET I.

MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH SPECIFICATION PUB. 408.

MATERIALS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:

STRUCTURAL SHAPES, BARS, PLATES, U-BOLTS, BENT BOLTS AND ANCHOR BOLTS A36

NUTS FOR ANCHOR BOLTS A307

H.S.BOLTS, NUTS AND WASHERS A325

OTHER BOLTS A307

REINFORCEMENT BARS A615, GRADE 40

ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IS

CLASS A CEMENT CONCRETE SHALL BE USED IN FOOTINGS AND IN FOUNDATION PEDESTALS.

EXPOSED CONCRETE EDGES SHALL BE CHAMFERED I" XI" EXCEPT AS NOTED.

MAXIMUM DESIGN FOUNDATION BEARING PRESSURE EQUALS 1.5 TONS PER SQUARE FOOT. THE FOOTING MAY BE ORDERED BY THE ENGINEER TO BE AT ANY ELEVATION OR OF ANY DIMENSIONS NECESSARY TO PROVIDE A PROPER FOUNDATION.

REINFORCEMENT BARS SHALL CONFORM TO THE DIMENSIONS SHOWN ON THE DRAWINGS AND WITHIN FABRICATING TOLERANCES AS SHOWN IN THE CURRENT "MANUAL OF STANDARD PRACTICE FOR REINFORCED CONCRETE CONSTRUCTION" AS PUBLISHED BY THE CONCRETE REINFORCING STEEL INSTITUTE.

BARS SHALL NOT BE SPLICED EXCEPT AS PROVIDED ON THESE DRAWINGS OR AUTHORIZED BY THE ENGINEER. WHEN SPLICING IS APPROVED, THE REINFORCEMENT BARS SHALL BE LAPPED FOR A LENGTH OF AT LEAST 30 DIAMETERS AND SHALL BE SECURELY WIRED TOGETHER.

"P" BARS FOR PEDESTAL DIMENSIONS AND REINFORCEMENT, AND FOOTING TYPE, SEE DESIGN TABLES ON SHEET 2

FOOTING SIZES SHOWN ARE MINIMUM REQUIRED FOR STABILITY.

ALL BOLTED CONNECTIONS SHALL BE MADE WITH  $7_8^{\rm m}\,^{\rm p}$  H.S. BOLTS UNLESS OTHERWISE NOTED.

## Commonwealth of Pennsylvania DEPARTMENT OF TRANSPORTATION

BUREAU OF HIGHWAY SERVICES

# OVERHEAD SIGN STRUCTURES STEEL SPANS GREATER THAN 120 FEET

FOUNDATION DESIGN AND DETAILS

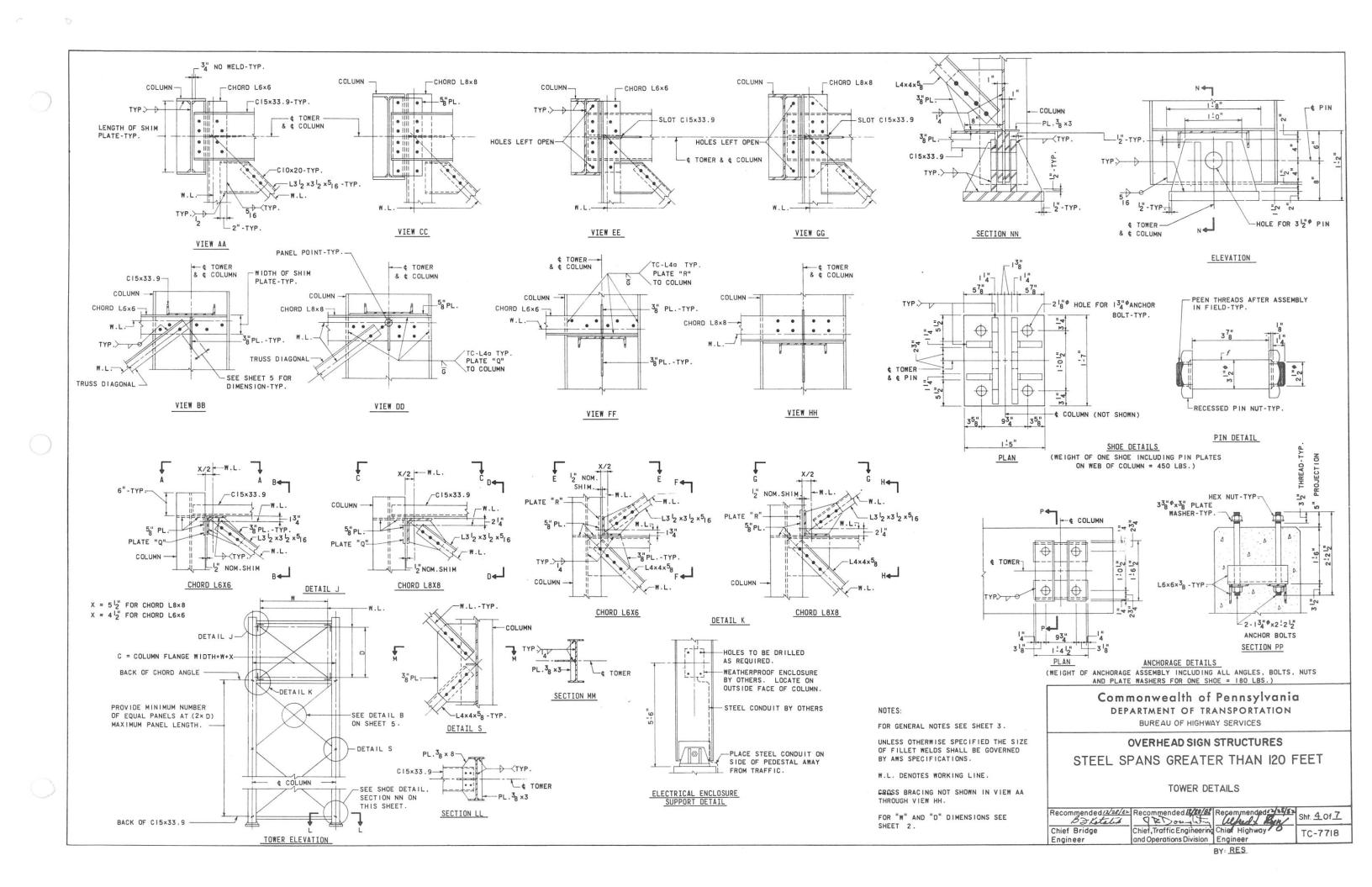
Recommended 1/22/22

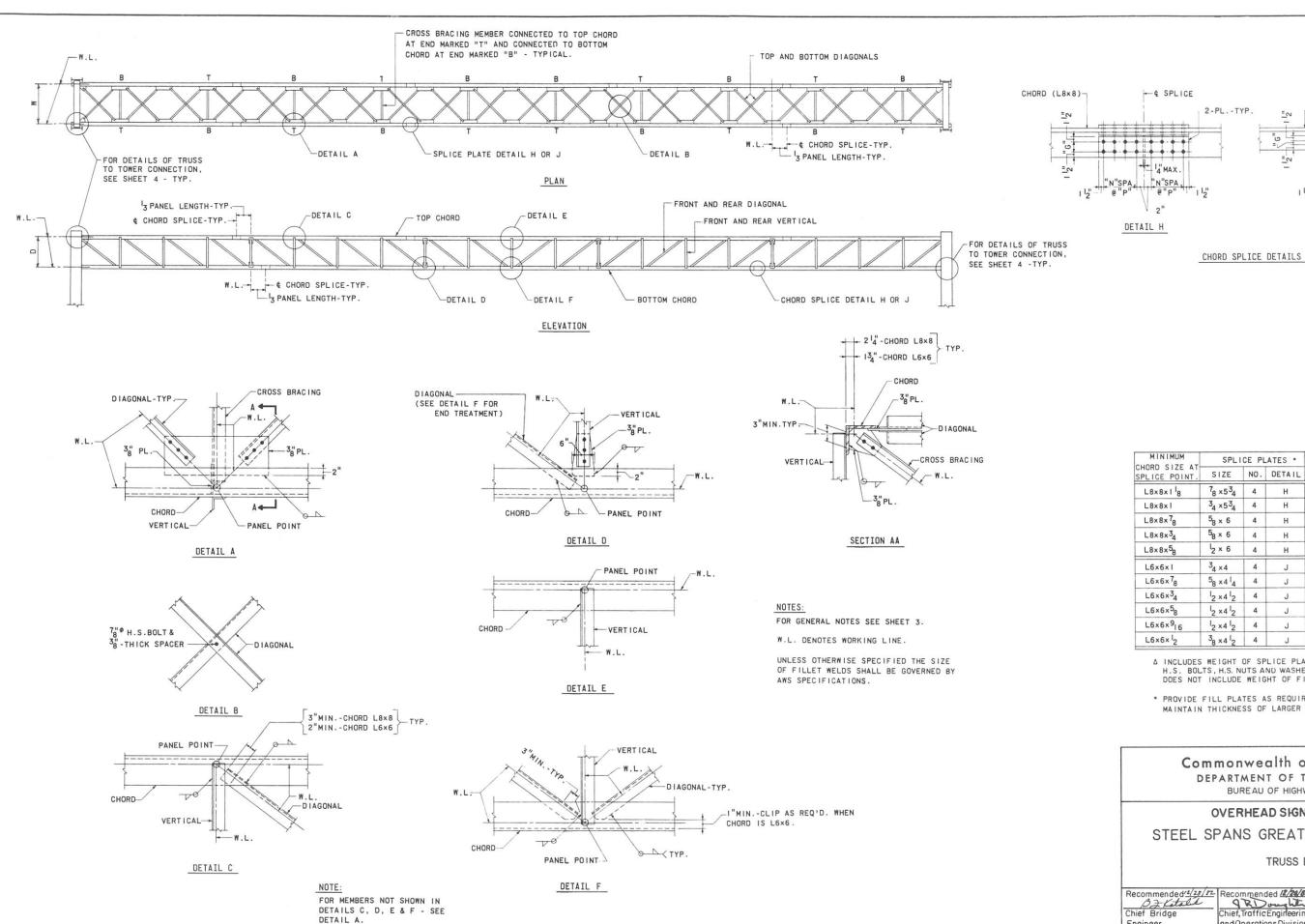
B = Kulatus

Chief Bridge
Fingineer

Chief, Troffic Engineering Chief Highway

TC-7718





MINIMUM	SPLI	CE PL	ATES *	"g"	"N"	"p"	WEIGHT	
CHORD SIZE AT- SPLICE POINT.	SIZE	NO.	DETAIL	(IN.)		(IN.)	Δ (LBS.)	
L8×8×1 18	7 <sub>8 × 5</sub> 3 <sub>4</sub>	4	н	234	3	3	162	
L8×8×1	3 <sub>4</sub> ×53 <sub>4</sub>	4	н	234	3	3	142	
L8×8×7 <sub>8</sub>	5 <sub>8 × 6</sub>	4	н	3	2	3	95	
L8×8×3 <sub>4</sub>	<sup>5</sup> 8 × 6	4	н	3	2	3	95	
L8×8×5 <sub>8</sub>	l <sub>2</sub> × 6	4	н	3	2	3	79	
L6×6×1	3 <sub>4 × 4</sub>	4	J	1	5	212	123	
L6×6×7 <sub>8</sub>	58 ×4 14	4	J	114	4	212	93	
L6×6×3 <sub>4</sub>	12 ×4 12	4	J	112	4	214	81	
L6×6×5 <sub>8</sub>	12 ×4 12	4	J	11/2	3	214	62	
L6×6×916	1 <sub>2 ×4</sub> 1 <sub>2</sub>	4	J	11/2	3	214	62	
L6×6×1 <sub>2</sub>	38 ×4 12	4	J	11/2	2	214	38	

¢ SPLICE→ 2-PL.-TYP¬

DETAIL J

MAX.

-CHORD (L6x6)

-2=

Δ INCLUDES WEIGHT OF SPLICE PLATES, H.S. BOLTS, H.S. NUTS AND WASHERS.
DOES NOT INCLUDE WEIGHT OF FILL PLATES.

2-PL.-TYP.

\* PROVIDE FILL PLATES AS REQUIRED TO MAINTAIN THICKNESS OF LARGER CHORD.

### Commonwealth of Pennsylvania DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY SERVICES

### OVERHEAD SIGN STRUCTURES

STEEL SPANS GREATER THAN 120 FEET

TRUSS DETAILS

Recommended 2/28/82	Chief, Traffic Engineering	Recommended 44/82	Sht. <u>5</u> Of <u>7</u> ,
	Chief, Traffic Engineering and Operations Division		TC-7718

