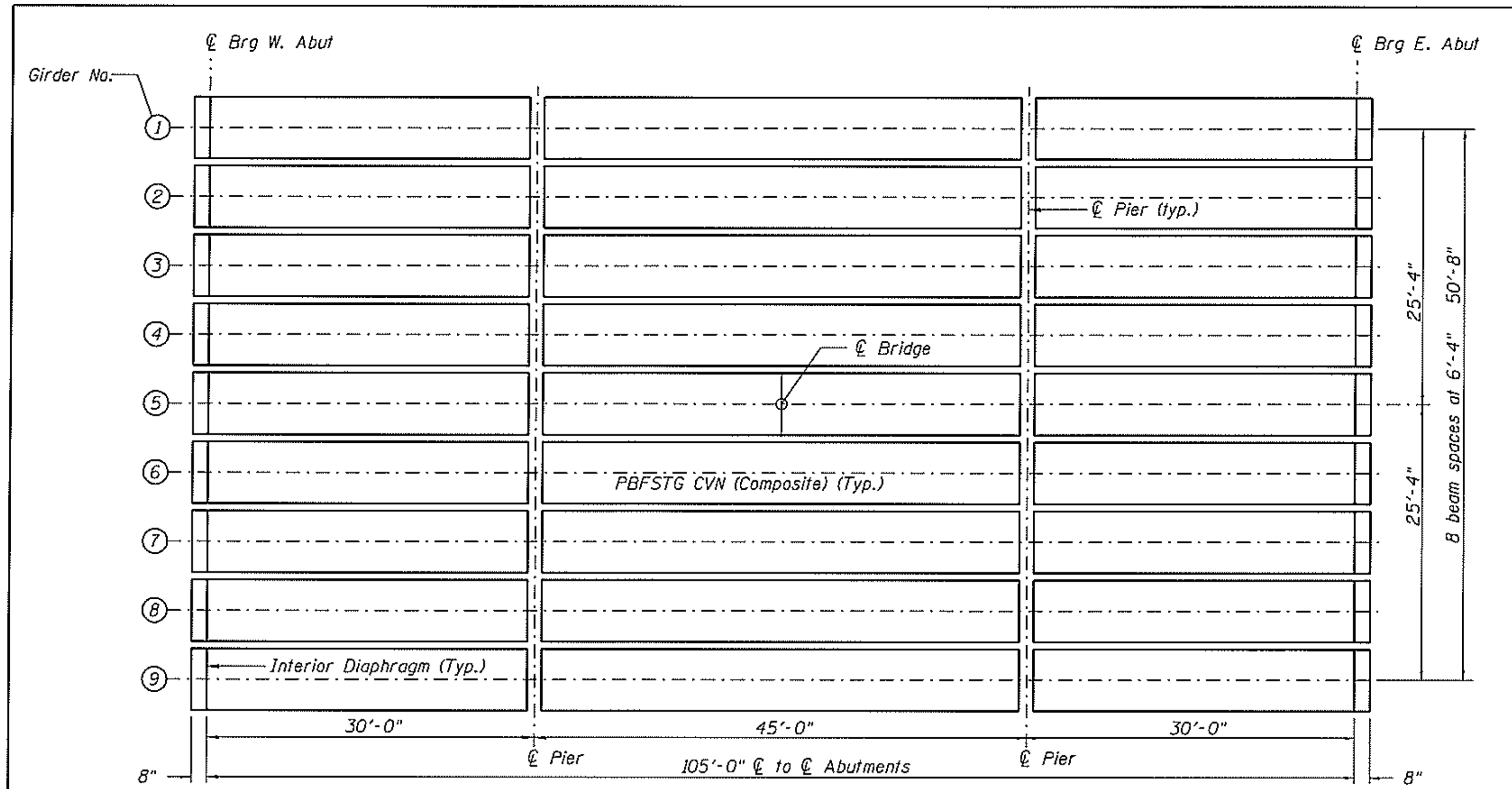
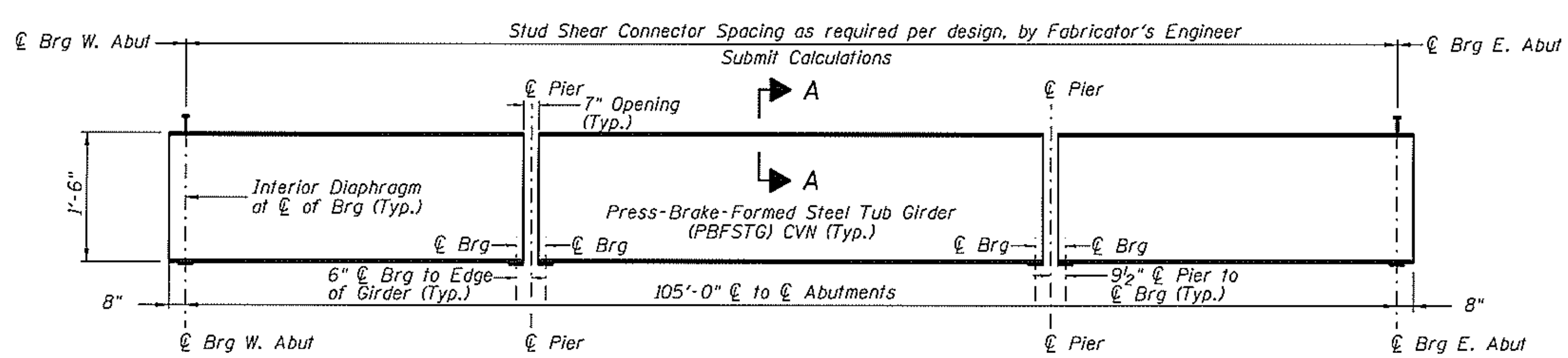
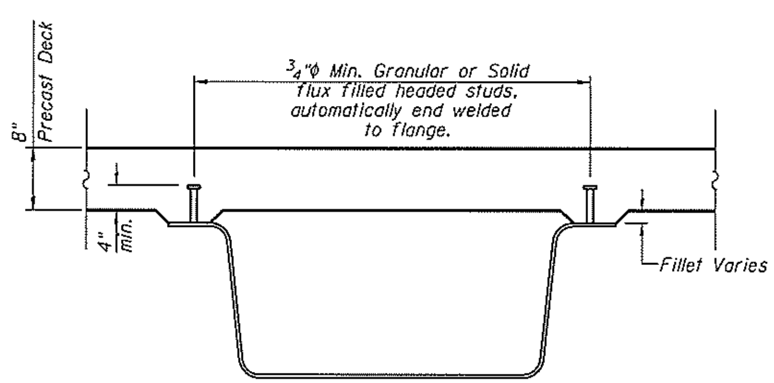


PLAN



GIRDER ELEVATION

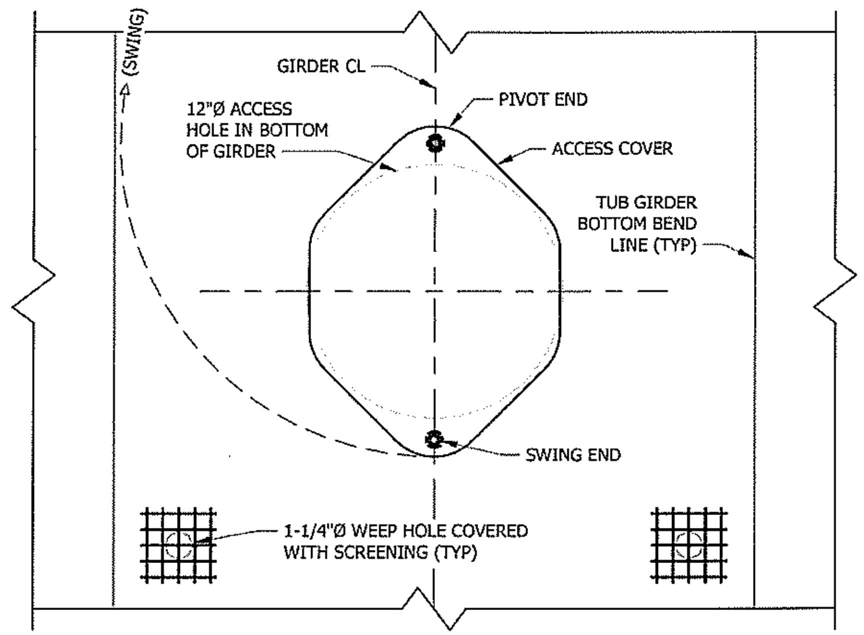
"CVN" denotes Charpy V-Notch impact energy requirements, Zone 2



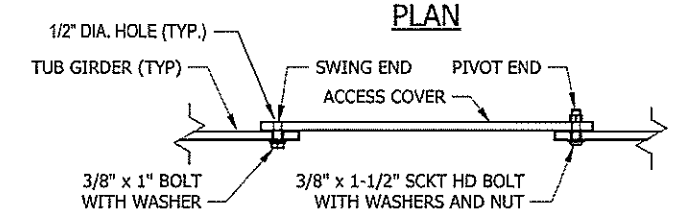
SECTION A-A

NOTES:

All primary members (Tub Girders) shall be A572 grade 65. All secondary members shall be M270 grade 50.
For additional structural steel details see sheet 11 of 16.
All girders shall be braced for stability during girder installation as required per Manufacturer.
"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2. All Structural Steel and H.S. Bolts shall be galvanized according to the Special Provisions.



PLAN



SECTION

INSPECTION HATCH DETAIL

NOTES:

Hatch cover shall be oriented on the inside girder so that the cover plate fits over the hole.

Tighten bolt, but allow for movement.

Every Tub Girder shall have two inspection hatches, one each end at ±3' from end of Tub Girder.

TOP OF WEB ELEVATIONS				
	℄ Brg. E. Abut.		℄ Brg. W. Abut.	
Location	℄ of Top Flange Pointing North	℄ of Top Flange Pointing South	℄ of Top Flange Pointing North	℄ of Top Flange Pointing South
Girder 1	643.59	643.66	643.59	643.66
Girder 2	643.69	643.75	643.69	643.75
Girder 3	643.79	643.85	643.79	643.85
Girder 4	643.89	643.95	643.89	643.95
Girder 5	643.98	643.98	643.98	643.98
Girder 6	643.95	643.89	643.95	643.89
Girder 7	643.85	643.79	643.85	643.79
Girder 8	643.75	643.69	643.75	643.69
Girder 9	643.66	643.59	643.66	643.59

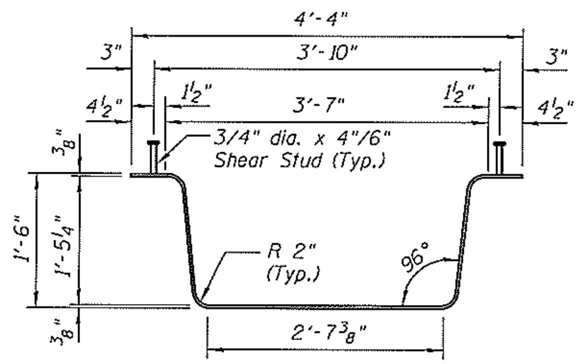
TOP OF WEB ELEVATIONS

(For fabrications only)

(Does not include Dead Load Deflection)
Top of Web Elevations to be determined/filled out by Designer/Manufacturer if required.

NOTE:

Top of Web Elevations Table to be filled out by fabricator's engineer & shall provide calculations & information to Chastain & Associates LLC as part of the Shop Drawing Submittals.



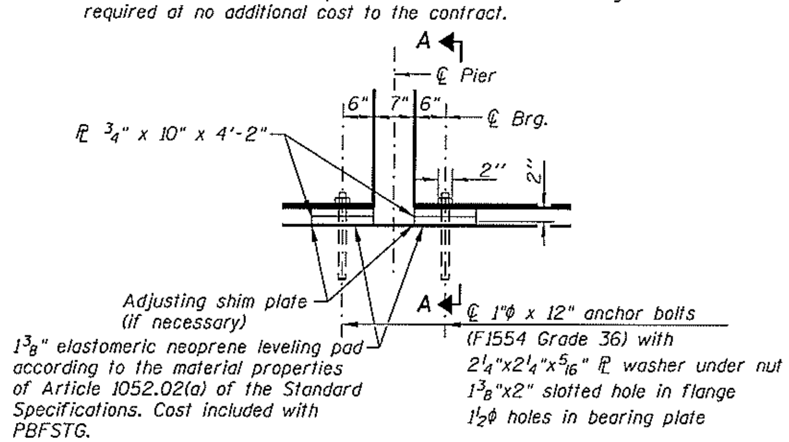
ESTIMATED STEEL SECTION

Notes:
Two ½ in. adjusting shims shall be provided for each bearing in addition to all other plates or shims and places as shown on bearing details.
Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
Anchor bolts at fixed bearings may be either cast in place or installed in holes drilled after the supported member is in place.
Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.
The structural steel plates of the fixed bearings, including pintles (if applicable), shall conform to the requirements of AASHTO M270 Grade 50.
Anchor bolts at all supports shall be installed as each member is erected unless an equivalent temporary means of lateral restraint is used.
"CVN" denotes Charpy-V-Notch impact energy requirements, Zone 2.
All primary members (Tub Girders) shall be A572 Grade 65. All secondary members shall be M270 Grade 50.
All structural steel and H.S. bolts shall be galvanized according to the Special Provisions.

* Bearing plate width is based on plate layout along the ℄ of bearing. Abutment width allows for bearing plate aligned perpendicular to girder. Adjustment is allowed if needed for design of PBFSTG.

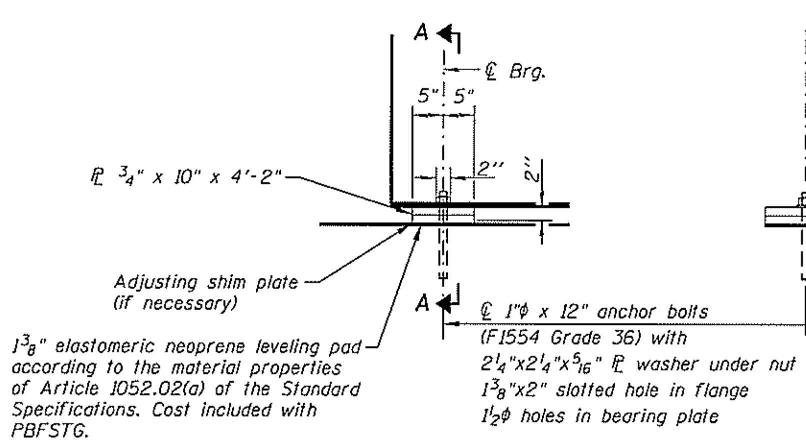
** Chastain and & Associates LLC design includes substructure elements only. Abutment design and details are based on assumed typical reactions and dimensions. Contractor shall verify that final design and details are compatible with the selected superstructure prior to construction. The contractor shall employ a Structural Engineer licensed in the State of Illinois to provide alternate abutment designs as required at no additional cost to the contract.

Fabricator's Structural Engineer shall provide information for all table spaces and shall provide calculations & information to Chastain & Associates LLC as part of the shop drawing submittals.

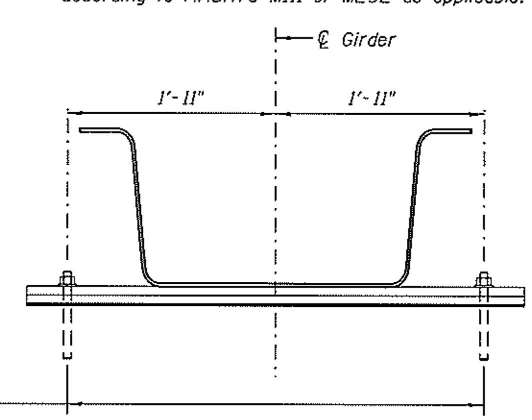


ELEVATION AT PIER

Notes:
All bearing plates, anchor bolts, nuts, washers, and pintles (if applicable) shall be galvanized according to AASHTO M111 or M232 as applicable.



ELEVATION AT ABUTMENT



SECTION A-A

(Horiz. dimensions at Rt. ∠'s to ℄ Girder)

FIXED BEARINGS AT ABUTMENTS

(18 required)

GIRDER MOMENT TABLE

		Interior		Exterior	
		0.5 End Span	0.5 Ctr. Span	0.5 End Span	0.5 Ctr. Span
Is	(in⁴)	1475	1475	1475	1475
Ic (n)	(in⁴)	8835	8835	8835	8835
Ic (3n)	(in⁴)	6204	6204	6204	6204
Ss	(in³)	224.88	224.88	224.88	224.88
Sc (n)	(in³)	451	451	451	451
Sc (3n)	(in³)	408	408	408	408
DC1	(k/')	0.81587	0.81587	1.01431	1.01431
MDC1	('k)	87.01	192.24	108.17	239
DC2	(k/')	0.02222	0.02222	0.02222	0.02222
MDC2	('k)	2.37	5.24	2.37	5.24
DW	(k/')	0.31667	0.31667	0.24167	0.24167
MDW	('k)	33.77	74.61	25.77	56.94
LLDF		0.675	0.675	0.54	0.54
MLL+IM	('k)	330.3	560.1	264.2	448.1
MU (Strength I)	('k)	740.32	1338.97	639.18	1174.87
φf Mn	('k)	2157	2157	2157	2157
fs DC1	(ksi)	4.64	10.26	5.77	12.75
fs DC2	(ksi)	0.07	0.154	0.07	0.154
fs DW	(ksi)	0.99	2.2	0.99	2.2
fs (LL+IM)	(ksi)	8.79	14.9	7.03	11.92
fs (Service II)	(ksi)	17.13	31.98	15.74	30.08
0.95Rh Fyf	(ksi)	47.5	47.5	47.5	47.5
fs (Total)(Strength I)	(ksi)	22.76	42.39	20.74	39.51
φf Fn	(ksi)	50	50	50	50
Vf	(k)	299.776	299.776	299.776	299.776

INTERIOR GIRDER REACTION TABLE

		Abutment		Pier	
		Interior	Exterior	Interior	Exterior
LLDF		0.675	0.54	0.675	0.54
OCF		1	1	1	1
RDC1	(k)	12.39	15.4	18.12	22.53
RDC2	(k)	0.34	0.34	0.49	0.49
RDW	(k)	4.81	3.67	7.03	5.37
RLL	(k)	39.38	31.51	47.58	38.07
RIM	(k)	10.915	8.732	12.608	10.086
RTotal	(k)	67.835	59.652	85.828	76.546

*** Information to be provided by PBFSTG manufacturer. See Special Provisions.

ESTIMATED GIRDER REACTION TABLE

		Abutment	Pier
		Interior/Exterior	Interior/Exterior
RDC1	(k)	12.39/15.4	18.12/22.53
RDC2	(k)	0.34/0.34	0.49/0.49
RDW	(k)	4.81/3.67	7.03/5.37
RLL	(k)	39.38/31.51	47.58/38.07
RIM	(k)	10.915/8.732	10.086
RTotal	(k)	67.835/59.652	76.456

I_s, S_s: Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total-Strength I, and Service II) due to non-composite dead loads (in.⁴ and in.³).
$I_c(n)$, $S_c(n)$: Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads (in.⁴ and in.³).
$I_c(3n)$, $S_c(3n)$: Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in.⁴ and in.³).
$I_c(cr)$, $S_c(cr)$: Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing f_s (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in.⁴ and in.³).
DC1: Un-factored non-composite dead load (kips/ft.).
M_{DC1}: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
M_{DC2}: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
M_{DW}: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
M_{LL+IM}: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
M_u (Strength I): Factored design moment (kip-ft.).
$1.25\,(M_{DC1} + M_{DC2}) + 1.5\,M_{DW} + 1.75\,M_{LL+IM}$
$\phi_f M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft).
f_s DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
M_{DC1} / S_{nc}
f_s DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
$M_{DC2} / S_c(3n)$ or $M_{DC2} / S_c(cr)$ as applicable.
f_s DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
$M_{DW} / S_c(3n)$ or $M_{DW} / S_c(cr)$ as applicable.
f_s (LL+IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
$M_{LL+IM} / S_c(n)$ or $M_{DW} / S_c(cr)$ as applicable.
f_s (Service II): Sum of stresses as computed below (ksi).
$f_{sDC1} + f_{sDC2} + f_{sDW} + 1.3\,f_s(_{LL+IM})$
$0.95 R_h F_y f$: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
f_s (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
$1.25\,(f_{sDC1} + f_{sDC2}) + 1.5\,f_{sDW} + 1.75\,f_s(_{LL+IM})$
$\phi_f F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).
V_f: Maximum factored shear range in span computed according to Article 6.10.10.
LLDF: Live Load Distribution Factor
OCF: Obtuse Correction Factor

Information is provided on this sheet that is not applicable to Erecting Superstructure

CHASTAIN & ASSOCIATES LLC CONSULTING ENGINEERS 184-001397	USER NAME = / PLOT TIME = AM / PLOT SCALE = / PLOT DATE =	DESIGNED KEB / DRAWN JDM / CHECKED JMB / DATE 02/15/2023	REVISED - 03/24/2023 / REVISED - / REVISED - / REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	STRUCTURAL STEEL DETAILS STRUCTURE NO. 098-3079 SHEET NO. 11 OF 16 SHEETS

F.A.U. RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
5560	17-00228-00-BR	WHITESIDE	39	22
		CONTRACT NO. 85734		

ILLINOIS FED. AID PROJECT