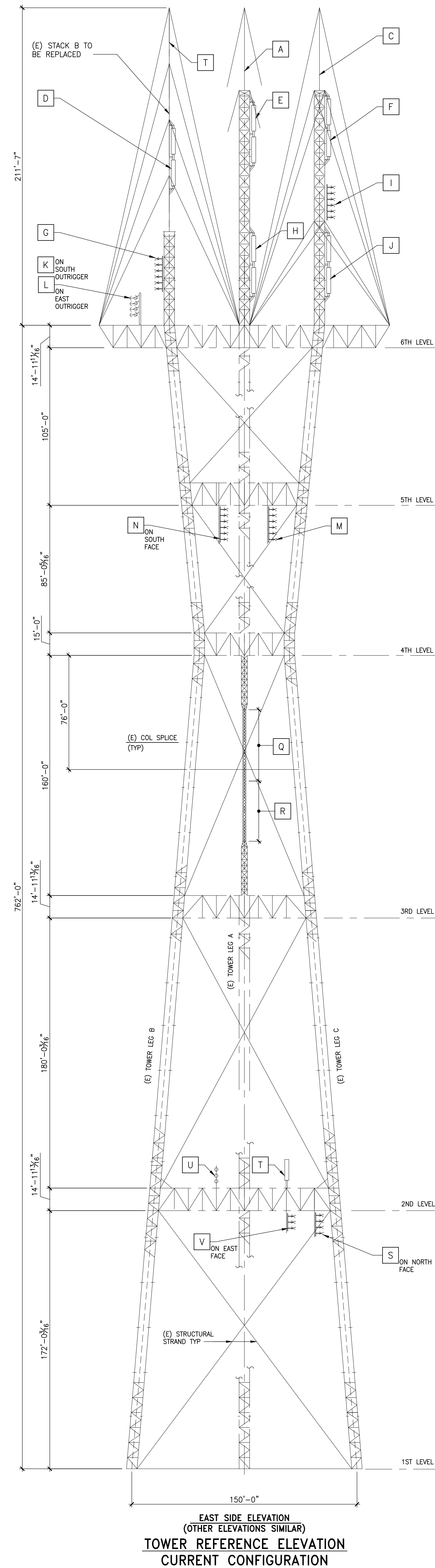
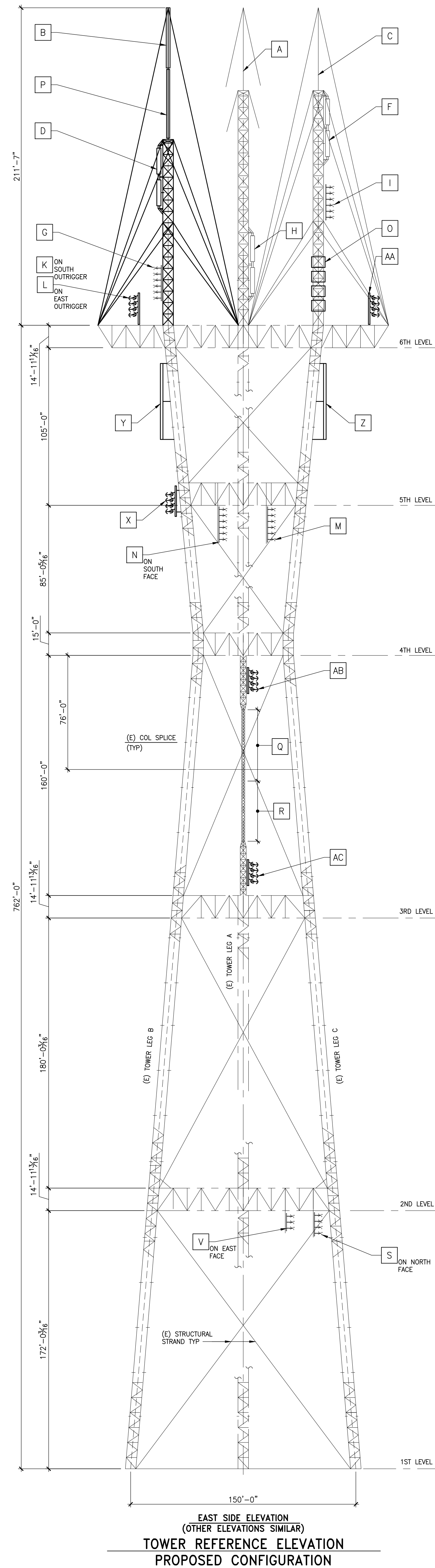
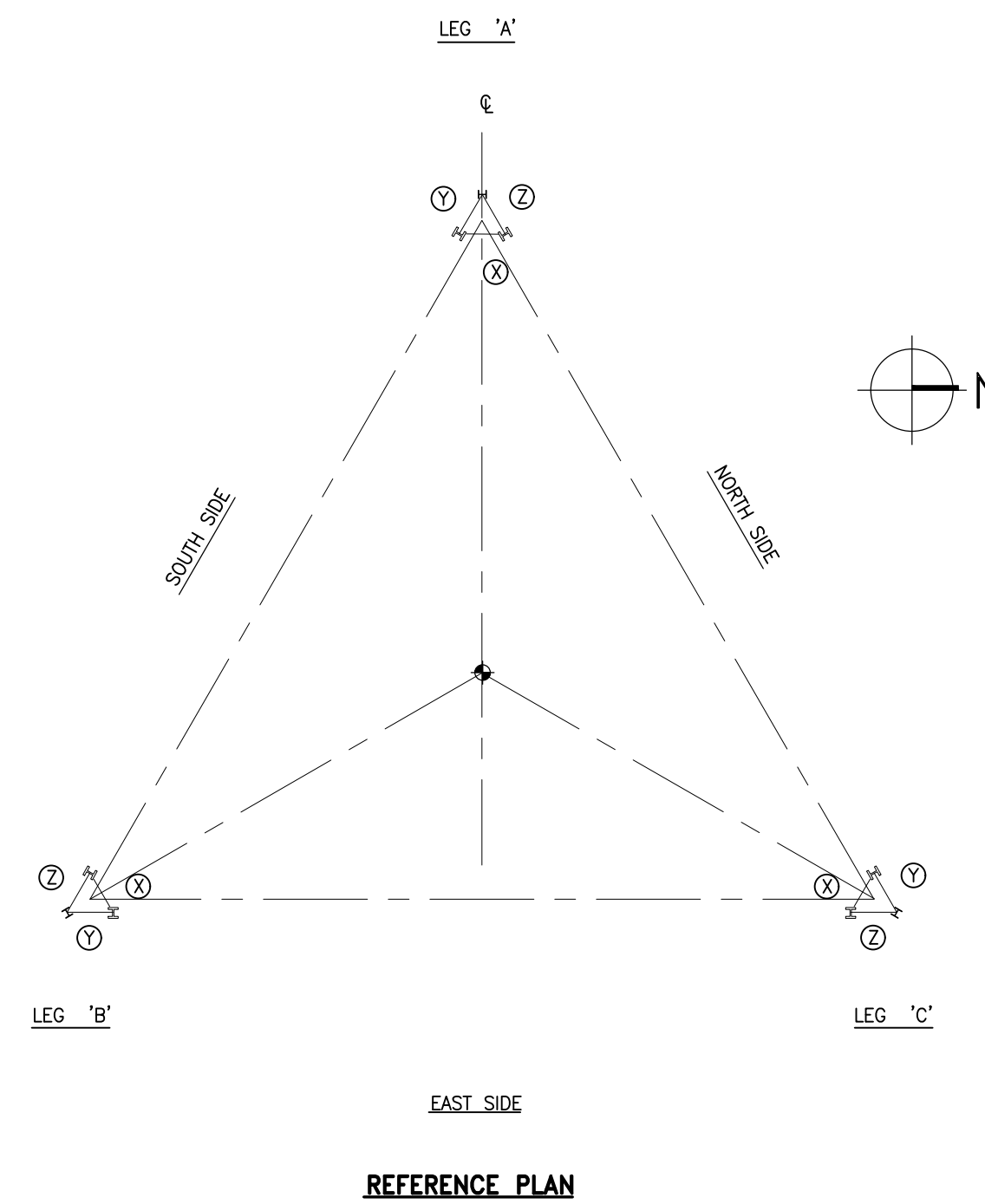


F:\SFA\Projects\2006\067199-24-STKB\Drawings\Working_Sets\STKB_S100.dwg



NOTES:
THIS SHEET ONLY PRESENTS A SUMMARY OF BROADCAST ANTENNAS. IT DOES NOT INCLUDE OTHER PERMITTED POINT-TO-POINT MICROWAVE ANTENNAS, BROADBAND ANTENNAS, DISH ANTENNAS, TWO-WAY RADIO ANTENNAS, ETC.

INDICATES BROADCAST ANTENNA REFERENCE ID. REFER TO THE TABLE



Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

**BROADCAST CHANNEL
REPACKING PROJECT**

**1 LA AVANZADA ST.
SAN FRANCISCO
CALIFORNIA**

Project

**TOWER REFERENCE
PLAN
&
ELEVATION**

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale N.T.S.

Drawing No.

S1.0

REGISTRED PROFESSIONAL ENGINEER
FRANK O. HAMBURGER
No. 2951
STRUCTURAL
STATE OF CALIFORNIA

Summary of New Repack Antennas

Antenna Reference	Post-Repacking Station	New, Replace, or Existing	Antenna Type	Center Elevation Above Ground (ft)	Weight	Antenna Dimensions--Height (ft)	Antenna Dimensions--Diameter or Width (ft)	Configuration	Main RF Emission	Auxiliary RF Emission	Main ERP (KW)	Aux ERP (KW)	SF Building Permit #
P	TV Broadcast--KRON (7)	New	Die THV-6A77/VP-R 4C160	907.9	17,800	44.0	3.50	Cylindrical	Yes		50.0		New
O	TV Broadcast--KRCB (5)	New	CBR-C2-04MBA/8H-1	792.0	3,170	48.0	12.00	Panel array	Yes		25.0		New
X	FM Auxiliary--KFOG	New	ERI MPX4CW	642.6	348	41.9	n/a	Rototiller		Yes		7.5	New
Z	TV Auxiliary--KRON (7)	New	Die TLS-V8/VP-R C160	707.1	1,550	41.5	2.00	Cylindrical				70.0	New
AB	TV Auxiliary--KRCB (5)	New	Die DCRQ450	526.0	1,000	24.0	n/a	Rototiller		Yes		12.5	New
AC	TV Auxiliary--LPTV (3 & 4)	New	Die DCRQ450	398.0	1,000	24.0	n/a	Rototiller		Yes		3.0	New
Total Weight					24,868								

Summary of Replacement Repack Antennas

Antenna Reference	Post-Repacking Station	New, Replace, or Existing	Antenna Type	Center Elevation Above Ground (ft)	Weight	Antenna Dimensions--Height (ft)	Antenna Dimensions--Diameter or Width (ft)	Configuration	Main RF Emission	Auxiliary RF Emission	Main ERP (KW)	Aux ERP (KW)	SF Building Permit #
B	TV Broadcast--KGO (12)	Replace	Die THV-6A12/CP-R 4C160	953.8	12,200	37.9	3.00	Cylindrical	Yes		47.0		New
D	TV Broadcast--KBCW (28)	Replace	Die TFU-24DSC/VP-R C140 DC	861.9	1,420	47.9	2.00	Cylindrical	Yes		1000.0		New
L	FM Broadcast--KFOG	Replace	ERI MPX4CW	774.3	348	41.9	n/a	Rototiller	Yes		7.1		New
Total Weight					13,968								

List of All Post Repack Broadcast Antennas

Antenna Reference	Post Repacking Station	Existing, Replaced, or Deactivate	Antenna Type	Center Elevation Above Ground (ft)	Weight	Antenna Dimensions--Height (ft)	Antenna Dimensions--Diameter or Width (ft)	Configuration	Main RF Emission	Auxiliary RF Emission	Main ERP (KW)	Aux ERP (KW)	SF Building Permit #	
A	TV Broadcast--KCSM (27)	Existing	Die TUM-C5SP-14/60H-2-T-R	945.7	35,000	54.5	6	Cylindrical	Yes		465		2007-12-20-09735	
	TV Broadcast--KPIX (29)	Existing	Die TUM-C5SP-14/60H-2-T-R	945.7	35,000	54.5	6	Cylindrical	Yes		1000		2007-12-20-09735	
	TV Broadcast--KTVU (31)	Existing	Die TUM-C5SP-14/60H-2-T-R	945.7	35,000	54.5	6	Cylindrical	Yes		1,000		2007-12-20-09735	
B	TV Broadcast--KGO (12)	Replace	Die THV-6A12/CP-R 4C160	953.8	12,200	37.9	3	Cylindrical	Yes		47.0		2007-12-20-09735	
	TV Broadcast--KQED (30)	Existing	Die TUM-C5SP-14/60H-2-T-R	945.7	35,000	54.5	6	Cylindrical	Yes		1,000		2007-12-20-09735	
	TV Broadcast--KCNS (32)	Existing	Die TUM-C5SP-14/60H-2-T-R	945.7	35,000	54.5	6	Cylindrical	Yes		1,000		2007-12-20-09735	
	TV Broadcast--KMTP (33)	Deactivate							No		N/A	N/A		
D	TV Broadcast--KBCW (28)	Replace	Die TFU-24DSC/VP-R C140 DC*	861.9	1,420	47.9	2	Cylindrical	Yes		1,000		2007-12-20-09735	
F	TV Broadcast--KFSF (34)	Existing	Die TFU-24DSC/VP-R P190	864.2	1,000	48.4	2	Cylindrical	Yes		850		2007-12-20-09735	
G	FM Broadcast--KQED	Existing	Die DCRS-30S09F10	782.2	1,800	40.0	n/a	Rototiller	Yes		22		201304124452-F	
H	TV Broadcast--KQTA-CD (14)	Existing	Die TFU-16WB C160	800.2	1,650	28.9**	2	Cylindrical	Yes		15		201304124452-F	
I	FM Broadcast--KOIT	Existing	ERI MPX-6C-HW	843.2	510	30.0	n/a	Rototiller	Yes		24		9823350	
K	FM Broadcast--KOSF	Existing	ERI LPX-4E-HW	782.2	248	15.0	n/a	Rototiller	Yes		1.2		9823350	
L	FM Broadcast--KFOG	Existing	ERI LPX-2E-HW	774.3	156	20.0	n/a	Rototiller	Yes		7.1		9823350	
M	FM Broadcast--KSOL	Existing	ERI LPX-3-HW	610.3	186	25.0	n/a	Rototiller	Yes		6.1		9823350	
N	FM Auxiliary--KOIT	Existing	ERI SHP-6AC-HW	620.1	510	30.0	n/a	Rototiller	Yes		36H/24V		201304124452-F	
P	TV Broadcast--KRON (7)	New	Die THV-6A77/VP-R 4C160	907.9	17,800	44.0	40.19	Cylindrical	Yes		50		New	
AA	TV Broadcast--LPTV (3 & 4)	New	Die DCRQ450	783.9	1,000	23.0		Rototiller	Yes		3.0		New	
Q	TV Auxiliary--KQTA-CD (14)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	400		201304124452-F	
	TV Auxiliary--KCSM (27)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	250		2007-12-20-09735	
	TV Auxiliary--KPIX (29)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	500		2007-12-20-09735	
	TV Auxiliary--KTVU (31)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	427.9		2007-12-20-09735	
	TV Auxiliary--KBCW (28)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	500		2007-12-20-09735	
	TV Auxiliary--KQED (30)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	500		2007-12-20-09735	
	TV Auxiliary--KCNS (32)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	500		2007-12-20-09735	
	TV Auxiliary--KFSF (34)	Existing	TUA-C4SP-12/40U-1-S	485.8	14,900	47.6	5	Panel Array		Yes	185		2007-12-20-09735	
S	FM Auxiliary--KOSF	Existing	ERI LPX-4E-HW	157.5	248	20.0	n/a	Rototiller	Yes		10		392685	
V	FM Auxiliary--KSOL	Existing	SHI 6813-NP (3 bay)	157.0	147	20.0	n/a	Rototiller	Yes		6.1		392685	
X	FM Auxiliary--KFOG	New	ERI MPX-4C-W	642.6	348	41.5	n/a	Rototiller	Yes		7.5		392685	
Y	TV Auxiliary--KGO (12)	New	Die TLS-V8/VP-R C160	707.1	1,350	43.8	2.0	Cylindrical					70.0	New
Z	TV Auxiliary--KRON (7)	New	Die TLS-V8/VP-R C160	707.1	1,550	41.5	2.0	Cylindrical					70.0	New
AB	TV Auxiliary--KRCB (5)	New	Die DCRQ450	526	1,000	23.0	n/a	Rototiller		Yes			12.5	New
AC	TV Auxiliary--LPTV (3 & 4)	New	Die DCRQ450	398	1,000	23.0	n/a	Rototiller		Yes			3.0	New
Total Weight					143,923									

List of Antennas Being Removed

Antenna Reference	Post Repacking Station	Existing, Replaced, or Deactivate	Antenna Type	Center Elevation Above Ground (ft)	Weight	Antenna Dimensions--Height (ft)	Antenna Dimensions--Diameter or Width (ft)	Configuration	Main RF Emission	Auxiliary RF Emission	Main ERP (KW)	Aux ERP (KW)	SF Building Permit #
E	TV Broadcast--KOFY (19)	Remove	Die TFU-30DSC/VP-R		-1,800	n/a	n/a	Cylindrical	Yes		100		2007-12-20-09735
J	TV Broadcast--KEMO (32)	Remove	RFS RD24-D-578/704-FR		-5,851	n/a	n/a	n/a	No		N/A	N/A	2007-12-20-09735
T	TV Auxiliary--KGO (7)	Remove	Die THV-5A7-R C170		-9,750	n/a	n/a	Cylindrical		No	N/A	N/A	2007-12-20-09735
U	FM Auxiliary--KFOG	Remove	ERI LPX-1/2		-62	n/a	n/a	Rototiller		No	N/A	N/A	392685

Summary of Ancillary Antenna Additions

Antenna Reference	Client	New, Replace, or Existing	Quantity	Antenna Type	Frequency	Center Elevation Above Ground (ft)	Location	Weight each	#	Site (diameter or height ft)	RF Emission (ERP in watts each)	Comments
1	KGO-TV	New	1	CommScopeHP8-65	6425-7125 MHz	767.0	N Stack	500.0	8.0	39,018		Pointed east
2	KQED-FM	New	1	Radiowaves HPD4-18	18 GHz	185.0	E Face	85.0	4.0	29,512		Pointed south
3	KQED-FM	New	1	Mark P-9A72GN-U	950 MHz	185.0	E Face	100 est	6.0	1,660		Pointed east
4	KRCB-TV	New	1	CommScope HP6-65	6425-7125 MHz	185.0	N Leg	254.0	6.0	20,943		Pointed north
5A 5B	KTVU-TV	New	2	Telewave ANT450F6	450 MHz	557.0	Top of L4	44.0	8.0	200		omni two-way radio
6	Skyriver	New	1	Ibiquiti AM-SAC21	5.8 GHz	403.0	N Leg	10.5	3.5	18		6 x antenna array pointed east
7	Skyriver	New	1	Ibiquiti AM-SAC21	5.8 GHz	403.0	S Leg	10.5	3.5	18		6 X antenna array pointed NW
8	Skyriver	New	1	Ibiquiti AM-SAC21	5.8 GHz	403.0	W leg	10.5	3.5	18		6 X antenna array pointed SW
9	Puloli	New	1	Kathrein 80010666V01	Dual Band Panel 694 - 960 MHz / 3400 - 3600 MHz	533.0	N Leg	210.0	9.0	11		3 X antenna array pointed east
10	Puloli	New	1	Kathrein 80010666V01	Dual Band Panel 694 - 960 MHz / 3400 - 3600 MHz	533.0	S Leg	210.0	9.0	11		3 X antenna array pointed NW
11	Puloli	New	1	Kathrein 80010666V01	Dual Band Panel 694 - 960 MHz / 3400 - 3600 MHz	533.0	W leg	210.0	9.0	11		3 X antenna array pointed SW
12	Unwired	New	1	Ibiquiti PBE500	5.8 GHz	337.0	N Leg	7.0	1.8	126		5 X antenna array pointed east
13	Unwired	New	1	Ibiquiti PBE500	5.8 GHz	337.0	S Leg	7.0	1.8	126		5 X antenna array pointed NW
14	Unwired	New	1	Ibiquiti PBE500	5.8 GHz	337.0	W leg	7.0	1.8	126		5 X antenna array pointed SW
15	CommSites West	New	1	Ibiquiti AM-SAC21	5.8 GHz	503.0	N Leg	10.5	3.5	18		6 X antenna array pointed east
16	CommSites West	New	1	Ibiquiti AM-SAC21	5.8 GHz	503.0	S Leg	10.5	3.5	18		6 X antenna array pointed NW
17	CommSites West	New	1	Ibiquiti AM-SAC21	5.8 GHz	503.0	W leg	10.5	3.5	18		6 X antenna array pointed SW
18	CommSites West	New	1	Ibiquiti PBE500	5.8 GHz	482.0	N Leg	7.0	1.8	126		5 X antenna array pointed east
19	CommSites West	New	1	Ibiquiti PBE500	5.8 GHz	482.0	S Leg	7.0	1.8	126		5 X antenna array pointed NW
20	CommSites West	New	1	Ibiquiti PBE500	5.8 GHz	482.0	W leg	7.0	1.8	126		5 X antenna array pointed SW
Total			21									

1 ANTENNA CHANGES

12/18/18	ISSUED FOR PERMIT	ROH
9/21/17	ISSUED FOR PLANNING REVIEW	ROH
No.	Date	Description
		By

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
SAN FRANCISCO
CALIFORNIA

Project

ANTENNA CHANGES

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale N.T.S.



S1.1

Dielectric
 Proposal #: C-02113-3 Antenna Type: TUMD-CSSP-1466H-3-T-R Channel: 29 DTW
 Call Letters: KPIX-DT Location: San Francisco, CA

Electrical Specifications	Value		Remarks
	Ratio	dB	
RMS Gain at Main Lobe over HalfWave Dipole	E d	21.65 13.24	
	V d	4.25 6.33	
RMS Gain at Horizontal over HalfWave Dipole	E d	11.70 10.68	
	V d	2.40 3.80	
Peak Directional Gain over HalfWave Dipole	E d	18.31 15.83	
	V d	8.46 9.29	
Peak Directional Gain at Horizontal over HalfWave Dipole	E d	21.30 13.28	
	V d	4.70 6.72	
Circularity	Directional	dB	
Axis Ratio	dB		
Beam Tilt	0.75 deg	19.83 dB	
Average Power	90 kW	50.0 dBm	HAADCA
Antenna Input: TIL	2 x 6-1/8 in	50.0 ohm	Type: HAADCA
Maximum Antenna Input VSWR	Channel	1.10:1	Note: 5 psi dry air or Nitrogen required.
Patterns	Antenna	TUMD-CSSP-5600 TUMD-CSSP-5500	
	Elevation	141.263075 141.263075-90	
Mechanical Specifications			
Height with Lightning Protector	H4	17.8 m 58.4 ft	
Height Less Lightning Protector	H2	16.6 m 54.5 ft	
Height of Center of Radiation	H3	8.0 m 26.2 ft	
Basic Wind Speed	V	136.8 km/h 85 mph	
Structure Class	IV	Exposure Category C	Topographic Category 1 TIA/IIA-222-G
Effective Projected Area	(EPA)h	24.5 m ² 264.1 ft ²	
Moment Arm	D1	m ft	
Effective Projected Area	(EPA)h	m ² ft ²	
Moment Arm	D1	m ft	
Weight	W	15.0 t 33000.0 lbs	
Radome	Full Cylindrical		

Antenna designed in accordance with ASBC specifications for design of structural steel for building as prescribed by TIA/IIA-222-G.
 NOTE:
 Prepared By: SWB Approved By: KP
 Original Date: 24-Sep-07 Revision: 3 Rev. Date: 12-Sep-08
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 Keith L. Palteier

Dielectric

MECHANICAL SPECIFICATIONS

Proposal No. C-70541-5
 Date: 31-Aug-17
 Call Letters: KGO
 Channel: 12
 Frequency: 207 MHz
 Antenna Type: THV-6A12/CP-R 4C160

Preliminary Specifications

Top of Stack

Without ice TIA-222-G
 Height AGL(z): 955 ft (291.1 m)
 Basic Wind Speed: 85 mph (136.8 km/h)

Structure Class: IV
 Exposure Category: C
 Topography Category: 1

Mechanical Specifications

	antenna only	full stack
Height with Lightning Protector	H4 41.9 ft (12.8m)	90.9 ft (27.7m)
Height less Lightning Protector	H2 37.9 ft (11.6m)	86.9 ft (26.5m)
Height of Center of Radiation	H3 19.8 ft (6.0m)	18 ft (5.5m)
Effective Projected Area	(EPA)g 71 ft ² (6.6m ²)	174.5 ft ² (16.2m ²)
Moment Arm	D1 20 ft (6.1m)	43.2 ft (13.2m)

Weight W 12200 lb (5.5t) 32000 lb (14.5t)

Antenna designed in accordance with ASBC specifications for design of structural steel as prescribed by TIA-222-G.
 NOTE:
 Prepared By: JBC Date: 9-May-17 ME: EE:
 Rev. No. 5 by: CAB Date: 31-Aug-17
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Consultant

6 ANTENNA REFERENCE A

8 ANTENNA REFERENCE B

Dielectric
 Proposal #: C-02114-3 Antenna Type: TUMD-CSSP-1466H-2-R-T Channel: 30 DTW
 Call Letters: KQED-DT Location: San Francisco, CA

Electrical Specifications	Value		Remarks
	Ratio	dB	
RMS Gain at Main Lobe over HalfWave Dipole	E d	21.50 13.32	
	V d	3.79 5.80	
RMS Gain at Horizontal over HalfWave Dipole	E d	11.80 10.72	
	V d	2.10 3.22	
Peak Directional Gain over HalfWave Dipole	E d	18.50 15.85	
	V d	7.55 8.69	
Peak Directional Gain at Horizontal over HalfWave Dipole	E d	21.10 13.24	
	V d	4.00 6.02	
Circularity	Directional	dB	
Axis Ratio	dB		
Beam Tilt	0.75 deg	19.83 dB	
Average Power	90 kW	50.0 dBm	HAADCA
Antenna Input: TIL	2 x 6-1/8 in	50.0 ohm	Type: HAADCA
Maximum Antenna Input VSWR	Channel	1.10:1	Note: 5 psi dry air or Nitrogen required.
Patterns	Antenna	TUMD-CSSP-5600 TUMD-CSSP-5000	
	Elevation	141.263075 141.263075-90	
Mechanical Specifications			
Height with Lightning Protector	H4	17.8 m 58.5 ft	
Height Less Lightning Protector	H2	16.6 m 54.5 ft	
Height of Center of Radiation	H3	8.0 m 26.2 ft	
Basic Wind Speed	V	136.8 km/h 85 mph	
Structure Class	IV	Exposure Category C	Topographic Category 1 TIA/IIA-222-G
Effective Projected Area	(EPA)h	24.5 m ² 264.1 ft ²	
Moment Arm	D1	10.4 m 34.0 ft	
Effective Projected Area	(EPA)h	m ² ft ²	
Moment Arm	D1	m ft	
Weight	W	15.0 t 33000.0 lbs	
Radome	Full Cylindrical		

Antenna designed in accordance with ASBC specifications for design of structural steel for building as prescribed by TIA/IIA-222-G.
 NOTE:
 Prepared By: SWB Approved By: KP
 Original Date: 18-Sep-07 Revision: 3 Rev. Date: 12-Sep-08
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 Keith L. Palteier

16 ANTENNA REFERENCE C

18 ANTENNA REFERENCE D

Dielectric

MECHANICAL SPECIFICATIONS

Proposal No. C-70770-2
 Date: 19-Jun-17
 Call Letters: KBCW
 Channel: 28
 Frequency: 557 MHz
 Antenna Type: TFU-24DSCVP-R C140 DC

Preliminary Specifications

Side Mounted

Without ice TIA-222-G
 Height AGL(z): 900 ft (274.3 m)
 Basic Wind Speed: 85 mph (136.8 km/h)

Structure Class: II
 Exposure Category: C
 Topography Category: 3

Mechanical Specifications

Height	H2	47.9 ft (14.6m)	
Height of Center of Radiation	H3	24 ft (7.3m)	
Effective Projected Area	(EPA)h	52.9 ft ² (4.9m ²)	Mounts Excluded
Weight	W	1420 lb (650)	Mounts Excluded

Antenna designed in accordance with ASBC specifications for design of structural steel as prescribed by TIA-222-G.
 NOTE:
 Prepared By: JBC Date: 10-May-17 ME: EE:
 Rev. No. 2 by: js Date: 19-Jun-17
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12/18/16	ISSUED FOR PERMIT	ROH
9/21/17	ISSUED FOR PLANNING REVIEW	ROH
No.	Date	Description
		By

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
 SAN FRANCISCO
 CALIFORNIA

Project

ANTENNA REFERENCES

Drawing Title

Commission	Checked	Date
067199_24	BW	09/06/17
Drawn	Approved	Scale
GPN	ROH	N.T.S.

Drawing No.

REGISTRED PROFESSIONAL ENGINEER
 KENNETH O. HAMBERGER
 No. 2951
 STRUCTURAL
 STATE OF CALIFORNIA

\$1.2

Seal

Dielectric		Proposal #: C-02886	Antenna Type: TFU-26DSCVP-R F190	Channel: 34 DTW	
Call Letters: KFSF-DT		Location: San Francisco, CA	Chassis: 135' Mod.		
Electrical Specifications					
RMS Gain at Main Lobe over Halfwave Dipole	Hpol	Ratio	Value	Remarks	
	Vpol				
RMS Gain at Horizontal over Halfwave Dipole	Hpol				
	Vpol				
Peak Directional Gain over Halfwave Dipole	Hpol	35.12	15.45		
	Vpol	5.62	7.48		
Peak Directional Gain at Horizontal over Halfwave Dipole	Hpol	25.1	14.00		
	Vpol	4.0	6.02		
Circularity	Directional	dB			
Beam Tilt	DTW	0.75 deg			
Average Power	DTW	22 kW	13.44 dBm		
Antenna Input	VOL	6-16 in	95.0 ohm	EIA/DCA	
Maximum Antenna Input VSWR	Channel	1.08:1			
Patterns	Antenna Elevation	TFU-F190 36Q225975	TFU-F190-VF 26Q225975-90		
Mechanical Specifications					
Height with Lightning Protector	H4	m	ft	Side mounted	
Height Less Lightning Protector	H2	14.8 m	48.4 ft		
Height of Center of Radiation	H3	7.0 m	24.2 ft		
Basic Wind Speed	V	136.8 km/h	85 mph		
Structure Class	IV	Exposure Category	C	Topographic Category	I
Effective Projected Area	(EPA)A	3.4 m ²	36.2 ft ²	Excludes Mounts	1
Moment Arm	D1	m	ft		
Effective Projected Area	(EPA)A	m ²	ft ²		
Moment Arm	D1	m	ft		
Peak Bury Length	L2	m	ft		
Weight	W	0.5 t	1,000 lbs	Excludes Mounts	
Antenna designed in accordance with AISI specifications for design of structural steel for building as prescribed by TIA/EIA-222-F. Mechanical Loads Exclude Mounts.					
NOTE: Prepared By: SWB Date: 23-Sep-08 Approved By: Terry Bartock					

Dielectric		Proposal #: C-06217	Antenna Type: DCRSSD50F10	Frequency: 93.1 MHz
Call Letters:		Location: San Francisco, CA		
Electrical Specifications				
RMS Gain at Main Lobe over Halfwave Dipole	Hpol	Ratio	Value	Remarks
	Vpol			
RMS Gain at Horizontal over Halfwave Dipole	Hpol	2.30	3.62	
	Vpol	2.30	3.62	
Peak Directional Gain over Halfwave Dipole	Hpol			
	Vpol			
Peak Directional Gain at Horizontal over Halfwave Dipole	Hpol			
	Vpol			
Circularity	Directional	dB		
Beam Tilt	DTW	0.00 deg		
FM Power Rating	50 kW Ave	16.99 dBk		
Antenna Input	T/L	4-1/16 in	50.0 ohm	EIA/DCA
Maximum Antenna Input VSWR	Channel	1.15:1		Note: 88-98 MHz
Patterns	Antenna Elevation	ORC046000	ORC046000-90	
Mechanical Specifications				
Height with Lightning Protector	H4	m	ft	Side mounted
Height Less Lightning Protector	H2	11.3 m	37.0 ft	
Height of Center of Radiation	H3	6.0 m	19.5 ft	
Basic Wind Speed	V	112.7 km/h	70 mph	
Force Coeff. x Projected Area	CaK	6.5 m ²	700 ft ²	
Moment Arm	D1	m	ft	
Force Coeff. x Projected Area	CaAc			
Moment Arm	D1	m	ft	
Peak Bury Length	L2	m	ft	
Weight	W	0.8 t	1800 lbs	
Antenna designed in accordance with AISI specifications for design of structural steel for building as prescribed by TIA/EIA-222-F. Preliminary Specifications.				
NOTE: Prepared By: CAB Date: 18-Feb-15 Approved By: JLS				

6 ANTENNA REFERENCE F

8 ANTENNA REFERENCE G

Dielectric TFU-WB

The TFU-WB Series antenna is designed as a broadband, low-cost, low-windload alternative to UHF panel antennas.

Key Features:

- Broadband: Channels 14-51
- Economical alternative to panel antennas
- Low weight and 75% less windload than panels
- Input powers up to 60 kW
- Includes standard mounting brackets
- Quick delivery
- Available in HPOL or EPOL (other options available)
- Designed for side mounting on existing structures
- ATSC 3.0 & DVB-T2 ready
- 8, 16 and 24 bays
- Cardiod azimuth pattern

Specifications:

- Polarization: Horizontal or Elliptical
- Beam Tilt: 1 degree standard (other options available)
- Input Size: 4 1/2" EIA (others available)
- VSWR (Max 470-698 MHz): < 1.15:1
- Input Power: 20 kW per 8 bay section
- Azimuth Gain: 1.5 or 2.3
- Weight: 410 lbs per 8 bay section
- Windload: 27.4 FT² per 8 bay section

AVAILABLE TODAY

Manufactured in Maine, USA

TFU-WB Azimuth patterns

AZ Gain = 1.5

AZ Gain = 2.3

TFU-WB-8 RMS Gain: 8 • Peak Gain: 12 / 18.4

TFU-WB-16 RMS Gain: 15.6 • Peak Gain: 23.4 / 35.9

TFU-WB-24 RMS Gain: 22.7 • Peak Gain: 34.1 / 52.2

16 ANTENNA REFERENCE H

ROTTILLER®
Circularly Polarized FM Antenna

MP Model - Medium Power

Mechanical Specifications

Type Number	Weight											
	Antenna				Antenna & radome				Antenna, radome, & % in. radiation			
	Beam	kg	lbm	Beam	kg	lbm	kg	lbm	RF	RF	RF	RF
MP-1E	7.00	14.02	31.00	22.01	47.96	105.9	29.25	64.5	0.99	2.16	4.73	10.4
MP-2E	16.00	34.37	75.00	49.00	107.28	236.0	65.91	145.8	1.28	2.81	6.14	13.6
MP-3E	15.00	33.00	72.00	46.00	101.60	225.0	59.23	130.0	1.12	2.47	5.41	11.8
MP-4E	22.00	48.50	107.00	66.00	145.50	320.0	88.00	193.0	1.58	3.48	7.66	16.8
MP-5E	27.00	59.50	130.00	80.00	176.00	385.0	107.00	236.0	1.72	3.79	8.36	18.4
MP-6E	34.00	74.90	164.00	100.00	220.00	484.0	133.00	293.0	2.08	4.58	10.1	22.4
MP-7E	39.00	86.00	189.00	114.00	251.00	552.0	152.00	335.0	2.24	4.93	10.9	23.9
MP-8E	47.00	104.00	229.00	137.00	300.00	660.0	183.00	404.0	2.40	5.28	11.6	25.6
MP-9E	55.00	121.00	276.00	162.00	357.00	785.0	217.00	478.0	2.56	5.62	12.3	27.2
MP-10E	63.00	139.00	303.00	187.00	414.00	900.0	250.00	551.0	2.72	5.97	13.0	28.8
MP-11E	71.00	156.00	349.00	213.00	470.00	1025.0	283.00	624.0	2.88	6.32	13.7	30.4
MP-12E	79.00	174.00	395.00	239.00	526.00	1150.0	316.00	697.0	3.04	6.67	14.4	32.0
MP-13E	87.00	191.00	441.00	265.00	582.00	1275.0	349.00	770.0	3.20	7.02	15.1	33.6
MP-14E	95.00	209.00	487.00	291.00	638.00	1400.0	382.00	843.0	3.36	7.37	15.8	35.2
MP-15E	103.00	227.00	533.00	317.00	694.00	1525.0	415.00	916.0	3.52	7.72	16.5	36.8
MP-16E	111.00	245.00	579.00	343.00	750.00	1650.0	448.00	989.0	3.68	8.07	17.2	38.4
MP-17E	119.00	263.00	625.00	369.00	806.00	1775.0	481.00	1062.0	3.84	8.42	17.9	40.0
MP-18E	127.00	281.00	671.00	395.00	862.00	1900.0	514.00	1135.0	4.00	8.77	18.6	41.6
MP-19E	135.00	299.00	717.00	421.00	918.00	2025.0	547.00	1208.0	4.16	9.12	19.3	43.2
MP-20E	143.00	317.00	763.00	447.00	974.00	2150.0	580.00	1281.0	4.32	9.47	20.0	44.8
MP-21E	151.00	335.00	809.00	473.00	1030.00	2275.0	613.00	1354.0	4.48	9.82	20.7	46.4
MP-22E	159.00	353.00	855.00	499.00	1086.00	2400.0	646.00	1427.0	4.64	10.17	21.4	48.0
MP-23E	167.00	371.00	901.00	525.00	1142.00	2525.0	679.00	1500.0	4.80	10.52	22.1	49.6
MP-24E	175.00	389.00	947.00	551.00	1198.00	2650.0	712.00	1573.0	4.96	10.87	22.8	51.2
MP-25E	183.00	407.00	993.00	577.00	1254.00	2775.0	745.00	1646.0	5.12	11.22	23.5	52.8
MP-26E	191.00	425.00	1039.00	603.00	1310.00	2900.0	778.00	1719.0	5.28	11.57	24.2	54.4
MP-27E	199.00	443.00	1085.00	629.00	1366.00	3025.0	811.00	1792.0	5.44	11.92	24.9	56.0
MP-28E	207.00	461.00	1131.00	655.00	1422.00	3150.0	844.00	1865.0	5.60	12.27	25.6	57.6
MP-29E	215.00	479.00	1177.00	681.00	1478.00	3275.0	877.00	1938.0	5.76	12.62	26.3	59.2
MP-30E	223.00	497.00	1223.00	707.00	1534.00	3400.0	910.00	2011.0	5.92	12.97	27.0	60.8
MP-31E	231.00	515.00	1269.00	733.00	1590.00	3525.0	943.00	2084.0	6.08	13.32	27.7	62.4
MP-32E	239.00	533.00	1315.00	759.00	1646.00	3650.0	976.00	2157.0	6.24	13.67	28.4	64.0
MP-33E	247.00	551.00	1361.00	785.00	1702.00	3775.0	1009.00	2230.0	6.40	14.02	29.1	65.6
MP-34E	255.00	569.00	1407.00	811.00	1758.00	3900.0	1042.00	2303.0	6.56	14.37	29.8	67.2
MP-35E	263.00	587.00	1453.00	837.00	1814.00	4025.0	1075.00	2376.0	6.72	14.72	30.5	68.8
MP-36E	271.00	605.00	1500.00	863.00	1870.00	4150.0	1108.00	2449.0	6.88	15.07	31.2	70.4
MP-37E	279.00	623.00	1546.00	889.00	1926.00	4275.0	1141.00	2522.0	7.04	15.42	31.9	72.0
MP-38E	287.00	641.00	1592.00	915.00	1982.00	4400.0	1174.00	2595.0	7.20	15.77	32.6	73.6
MP-39E	295.00	659.00	1638.00	941.00	2038.00	4525.0	1207.00	2668.0	7.36	16.12	33.3	75.2
MP-40E	303.00	677.00	1684.00	967.00	2094.00	4650.0	1240.00	2741.0	7.52	16.47	34.0	76.8
MP-41E	311.00	695.00	1730.00	993.00	2150.00	4775.0	1273.00	2814.0	7.68	16.82	34.7	78.4
MP-42E	319.00	713.00	1776.00	1019.00	2206.00	4900.0	1306.00	2887.0	7.84	17.17	35.4	80.0

Notes:
 (1) Antenna weight and wind load are approximate values for a typical structure assembly using steel. Full details load will vary for specific projects and should be verified by an EIR representative.
 (2) Wind loads are calculated in accordance with the ASCE/TIA/EIA 222-F standard. Weight and effective area (EPA) includes antenna, tower transmission feed and typical support mast and mounting brackets with nuts.

18 ANTENNA REFERENCE I

SIMPSON GUMPERTZ & HEGER
Engineering of Structures and Building Enclosures

Simpson Gumpertz & Heger Inc.
100 Pine Street, Suite 1600
San Francisco, California 94111
Phone: 415.495.3700 Fax: 415.495.3550
www.sgh.com

Boston
Chicago
Houston
Los Angeles
New York
San Francisco
Washington, DC

Consultant

Antenna Reference I

12/18/16	ISSUED FOR PERMIT	ROH
9/21/17	ISSUED FOR PLANNING REVIEW	ROH
No.	Date	Description
		By

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
SAN FRANCISCO
CALIFORNIA

Project

ANTENNA REFERENCES

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale N.T.S.

Drawing No.

\$1.3

Seal

REGISTERED PROFESSIONAL ENGINEER
FRANK D. HAMBERGER
No. 2951
STATE OF CALIFORNIA
STRUCTURAL ENGINEER

ROTOTILLER®
Circularly Polarized FM Antenna

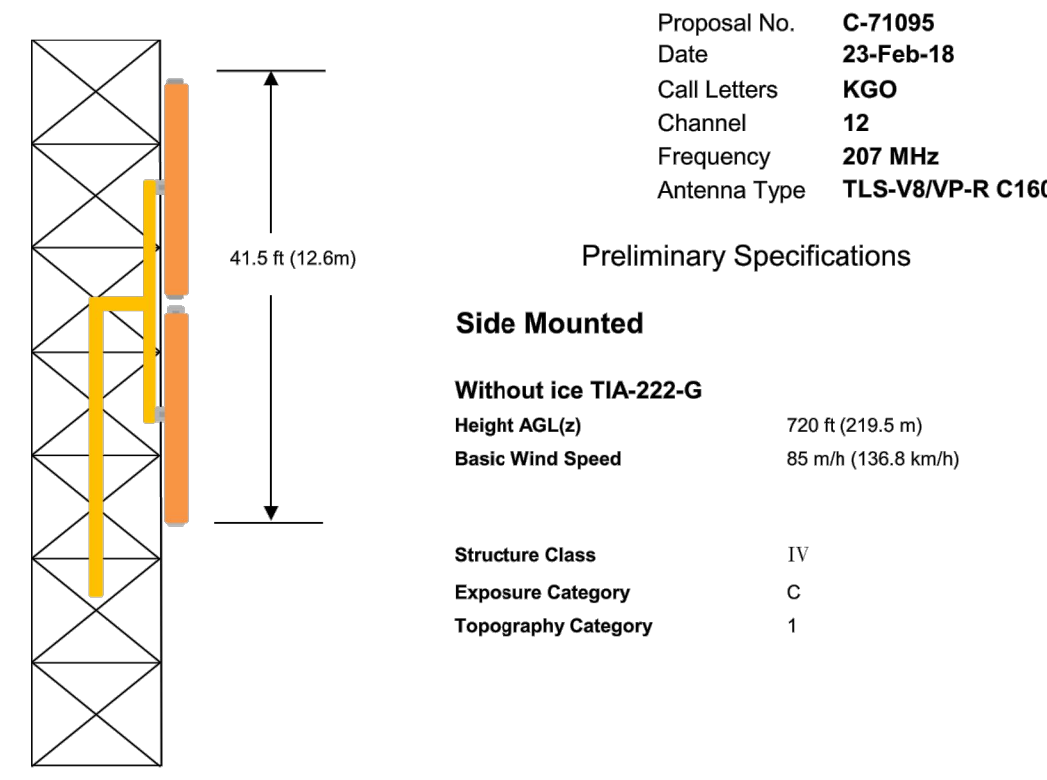
LP Model - Low Power

Mechanical Specifications

Type Number	Antenna			Antenna & % In. radials			Antenna, radome, & % In. radials			Antenna			Antenna & % In. radials			Antenna, radome, & % In. radials		
	Item	kg	lbm	Item	kg	lbm	Item	kg	lbm	Item	kg	lbm	Item	kg	lbm	Item	kg	lbm
LP-1E	62.08	26.12	102.08	48.27	166.80	176.80	79.83	1.68	8.29	4.59	6.41	6.51	6.51	7.24	6.07			
LP-2C	162.00	72.94	254.00	116.12	251.80	111.85	496.80	104.16	8.40	8.78	12.00	1.11	11.45	1.20	17.30	1.61		
LP-3E	154.00	70.24	246.00	112.50	247.00	112.40	478.00	103.11	8.11	8.24	11.28	1.21	11.41	1.21	17.16	1.58		
LP-4C	222.00	102.06	358.00	162.39	357.80	161.93	842.00	204.99	11.69	11.69	17.82	1.58	18.26	1.79	24.86	2.32		
LP-5E	180.00	84.17	308.00	138.80	318.00	144.24	528.00	239.00	9.67	8.96	14.62	1.36	17.24	1.60	22.56	2.10		
LP-6C	207.00	100.18	400.00	498.00	418.00	218.01	728.00	342.00	14.09	13.39	22.61	2.05	23.80	2.31	32.82	3.03		
LP-7E	248.00	112.48	480.00	183.67	424.00	193.32	764.00	339.33	12.97	12.38	18.64	1.82	21.86	2.14	30.23	2.81		
LP-8C	318.00	158.50	542.00	254.82	589.00	268.89	994.00	423.66	18.29	17.29	25.84	2.51	30.90	2.87	40.38	3.71		
LP-9E	318.00	164.61	550.00	251.33	538.00	244.40	880.00	399.56	16.27	15.51	24.65	2.29	28.88	2.68	37.99	3.52		
LP-10C	411.00	186.43	664.00	381.39	675.80	336.17	1130.00	503.49	21.58	2.08	32.86	2.98	38.72	3.41	47.55	4.45		
LP-11E	473.00	214.53	766.00	347.45	791.00	354.50	1286.00	583.52	24.87	23.17	33.98	3.44	42.54	3.96	55.62	5.17		
LP-12C	525.00	242.67	840.00	393.72	897.00	402.34	1462.00	683.50	28.17	2.62	42.89	3.95	48.36	4.49	62.37	5.89		
LP-13E	501.00	45.81	154.00	69.85	145.80	45.77	238.00	104.33	5.11	6.49	7.41	6.49	7.84	6.71	10.05	6.93		
LP-14C	620.00	280.02	1072.00	486.25	1099.00	488.50	1814.00	822.82	34.77	32.12	44.44	40.80	5.52	57.60	7.30			
LP-15E	620.00	302.06	1208.00	162.39	1070.00	101.80	2038.00	919.01	11.91	13.14	18.62	1.80	19.48	1.81	25.28	2.26		
LP-16C	783.00	355.16	1276.00	578.78	1311.80	594.66	2166.00	982.48	41.36	3.84	62.15	5.77	71.64	6.66	91.93	8.71		
LP-17E	873.00	411.21	1424.00	242.81	1113.00	397.60	2488.00	1238.00	7.28	6.79	10.88	6.88	13.01	11.27	15.59	14.67		
LP-18C	1180.00	532.10	1908.00	484.31	1666.00	1314.00	3358.00	1552.00	14.62	13.32	19.87	19.87	23.67	21.60	28.82	27.02		
LP-19E	2110.00	964.20	3408.00	154.22	1341.80	104.80	2558.80	181.12	8.94	14.23	13.32	17.89	1.64	22.17	2.06			
LP-20C	2110.00	789.89	3408.00	169.69	1388.00	118.80	2718.00	217.37	8.11	8.78	12.85	11.22	13.75	14.6	20.80	1.86		
LP-21E	2400.00	1222.00	4108.00	196.41	1448.00	105.80	3118.00	124.66	11.88	17.96	1.67	22.75	2.11	28.55	2.65			
LP-22C	2400.00	1308.00	4516.00	212.80	1516.00	112.80	3376.00	132.80	12.80	18.80	1.80	24.80	2.10	30.80	2.80			
LP-23E	2400.00	1412.00	4716.00	215.80	1536.00	115.80	3416.00	135.80	13.20	19.20	1.82	25.80	2.12	31.80	2.92			
LP-24C	2810.00	1272.00	4938.00	280.77	1652.00	120.77	3652.00	140.77	17.73	16.51	2.36	32.87	3.08	41.32	3.84			
LP-25E	2810.00	1272.00	5138.00	283.77	1672.00	123.77	3672.00	143.77	18.13	17.91	2.36	33.27	3.08	41.72	3.84			
LP-26C	3220.00	1412.00	5560.00	312.80	1712.00	132.80	3912.00	152.80	19.12	21.12	2.36	34.27	3.08	42.72	3.84			
LP-27E	3220.00	1412.00	5760.00	315.80	1732.00	135.80	3932.00	155.80	19.52	21.52	2.36	34.67	3.08	43.12	3.84			
LP-28C	3630.00	1652.00	6182.00	344.80	1862.00	144.80	4262.00	164.80	20.52	22.52	2.36	35.67	3.08	44.12	3.84			
LP-29E	3630.00	1652.00	6382.00	347.80	1882.00	147.80	4282.00	167.80	20.92	22.92	2.36	36.07	3.08	44.52	3.84			
LP-30C	4040.00	1892.00	6804.00	376.80	1992.00	156.80	4572.00	176.80	21.92	23.92	2.36	37.07	3.08	45.52	3.84			
LP-31E	4040.00	1892.00	7004.00	379.80	2012.00	159.80	4592.00	179.80	22.32	24.32	2.36	37.47	3.08	45.92	3.84			
LP-32C	4450.00	2132.00	7426.00	408.80	2102.00	168.80	4882.00	188.80	23.32	25.32	2.36	38.47	3.08	46.92	3.84			
LP-33E	4450.00	2132.00	7626.00	411.80	2122.00	171.80	4902.00	191.80	23.72	25.72	2.36	38.87	3.08	47.32	3.84			
LP-34C	4860.00	2372.00	8048.00	440.80	2212.00	180.80	5192.00	201.80	24.72	26.72	2.36	39.87	3.08	48.32	3.84			
LP-35E	4860.00	2372.00	8248.00	443.80	2232.00	183.80	5212.00	204.80	25.12	27.12	2.36	40.27	3.08	48.72	3.84			
LP-36C	5270.00	2612.00	8670.00	472.80	2322.00	192.80	5502.00	214.80	26.12	28.12	2.36	41.27	3.08	49.72	3.84			
LP-37E	5270.00	2612.00	8870.00	475.80	2342.00	195.80	5522.00	217.80	26.52	28.52	2.36	41.67	3.08	50.12	3.84			
LP-38C	5680.00	2852.00	9092.00	501.80	2432.00	204.80	5812.00	224.80	27.52	29.52	2.36	42.67	3.08	51.12	3.84			
LP-39E	5680.00	2852.00	9292.00	504.80	2452.00	207.80	5832.00	227.80	27.92	29.92	2.36	43.07	3.08	51.52	3.84			
LP-40C	6090.00	3092.00	9514.00	530.80	2542.00	216.80	6122.00	236.80	28.92	30.92	2.36	44.07	3.08	52.52	3.84			
LP-41E	6090.00	3092.00	9714.00	533.80	2562.00	219.80	6142.00	239.80	29.32	31.32	2.36	44.47	3.08	52.92	3.84			
LP-42C	6500.00	3332.00	9936.00	560.80	2652.00	228.80	6432.00	248.80	30.32	32.32	2.36	45.47	3.08	53.92	3.84			
LP-43E	6500.00	3332.00	10136.00	563.80	2672.00	231.80	6452.00	251.80	30.72	32.72	2.36	45.87	3.08	54.32	3.84			
LP-44C	6910.00	3572.00	10358.00	590.80	2762.00	240.80	6742.00	260.80	31.72	33.72	2.36	46.87	3.08	55.32	3.84			
LP-45E	6910.00	3572.00	10558.00	593.80	2782.00	243.80	6762.00	263.80	32.12	34.12	2.36	47.27	3.08	55.72	3.84			
LP-46C	7320.00	3812.00	10780.00	620.80	2872.00	252.80	7052.00	272.80	33.12	35.12	2.36	48.27	3.08	56.72	3.84			
LP-47E	7320.00	3812.00	10980.00	623.80	2892.00	255.80	7072.00	275.80	33.52	35.52	2.36	48.67	3.08	57.12	3.84			
LP-48C	7730.00	4052.00	11202.00	650.80	2982.00	264.80	7362.00	284.80	34.52	36.52	2.36	49.67	3.08	58.12	3.84			
LP-49E	7730.00	4052.00	11402.00	653.80	3002.00	267.80	7382.00	287.80	34.92	36.92	2.36	50.07	3.08	58.52	3.84			
LP-50C	8140.00	4292.00	11624.00	680.80	3092.00	276.80	7672.00	296.80	35.92	37.92	2.36	51.07	3.08	59.52	3.84			
LP-51E	8140.00	4292.00	11824.00	683.80	3112.00	279.80	7692.00	299.80	36.32	38.32	2.36	51.47	3.08	59.92	3.84			
LP-52C	8550.00	4532.00	12046.00	710.80	3202.00	288.80	7982.00	308.80	37.32	39.32	2.36	52.47	3.08	60.92	3.84			
LP-53E	8550.00	4532.00	12246.00	713.80	3222.00	291.80	8002.00	311.80	37.72	39.72	2.36	52.87	3.08	61.32	3.84			
LP-54C	8960.00	4772.00	12468.00	740.80	3312.00	300.80	8292.00	320.80	38.72	40.72	2.36	53.87	3.08	62.32	3.84			
LP-55E	8960.00	4772.00	12668.00	743.80	3332.00	303.80	8312.00	323.80	39.12	41.12	2.36	54.27	3.08	62.72	3.84			
LP-56C	9370.00	5012.00	12890.00	770.80	3422.00	312.80	8602.00	332.80	40.12	42.12	2.36	55.27	3.08	63.72	3.84			
LP-57E	9370.00	5012.00	13090.00	773.80	3442.00	315.80	8622.00	335.80	40.52	42.52	2.36	55.67	3.08	64.12	3.84			
LP-58C	9780.00	5252.00	13312.00	800.80	3532.00	324.80	8912.00	344.80	41.52	43.52	2.36	56.67	3.08	65.12	3.84			
LP-59E	9780.00	5252.00	13512.00															



MECHANICAL SPECIFICATIONS



Proposal No. C-71095
Date 23-Feb-18
Call Letters KGO
Channel 12
Frequency 207 MHz
Antenna Type TLS-V8VP-R C160
Preliminary Specifications
Side Mounted
Without ice TIA-222-G
Height AGL(ft) 720 ft (219.5 m)
Basic Wind Speed 85 m/h (190.8 km/h)
Structure Class IV
Exposure Category C
Topography Category 1

Mechanical Specifications
Height H2 41.5 ft (12.6m)
Height of Center of Radiation H3 20.2 ft (6.16m)
Effective Projected Area (EPA)A 71.25 ft^2 (6.6m^2) Mounts Excluded
Weight W 1350 lb (0.6t) Mounts Excluded

Antenna designed in accordance with ASBC specifications for design of structural steel as prescribed by TIA-222-G

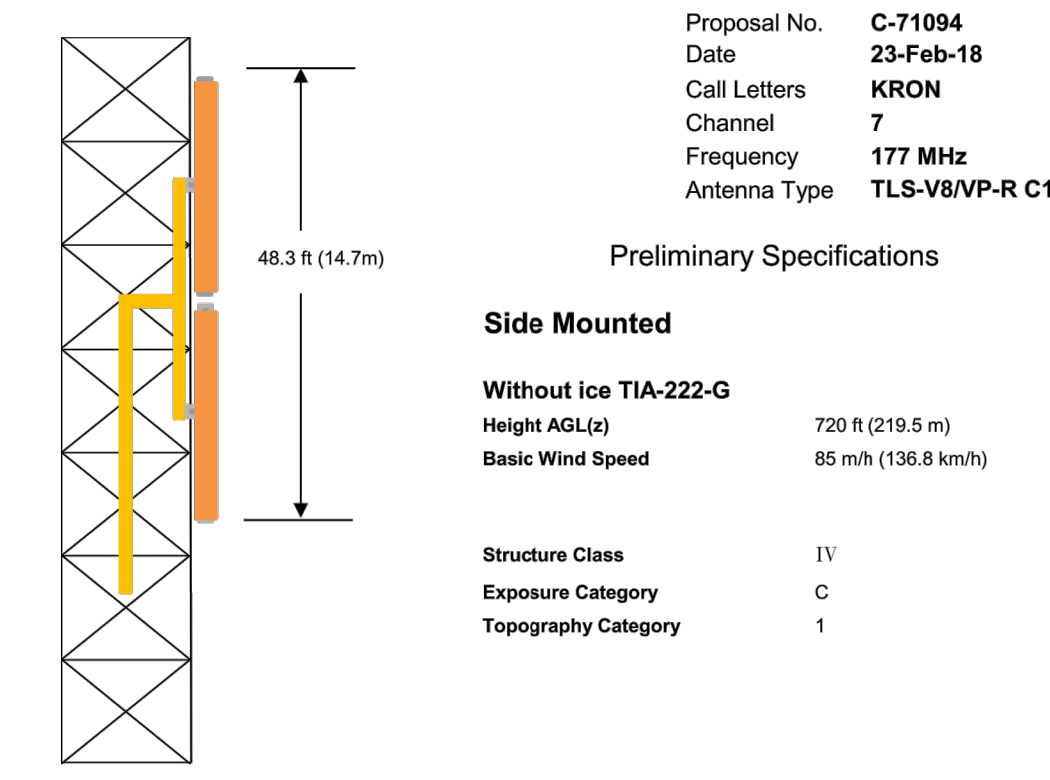
Prepared by: JBC Date: 23-Feb-18 ME: JBC EE:

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MECHANICAL SPECIFICATIONS



Proposal No. C-71094
Date 23-Feb-18
Call Letters KRON
Channel 7
Frequency 177 MHz
Antenna Type TLS-V8VP-R C160
Preliminary Specifications
Side Mounted
Without ice TIA-222-G
Height AGL(ft) 720 ft (219.5 m)
Basic Wind Speed 85 m/h (190.8 km/h)
Structure Class IV
Exposure Category C
Topography Category 1

Mechanical Specifications
Height H2 48.3 ft (14.7m)
Height of Center of Radiation H3 24.2 ft (7.4m)
Effective Projected Area (EPA)A 96.5 ft^2 (8.9m^2) Mounts Excluded
Weight W 1550 lb (0.7t) Mounts Excluded

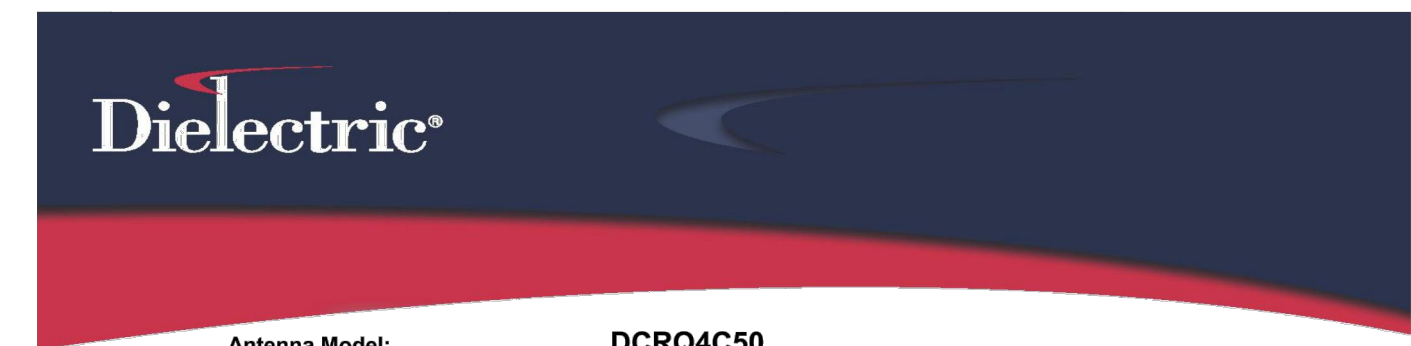
Antenna designed in accordance with ASBC specifications for design of structural steel as prescribed by TIA-222-G

Prepared by: JBC Date: 23-Feb-18 ME: JBC EE:

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6 ANTENNA REFERENCE Y



Antenna Model: DCRQ4C50
Proposal Number: C-71046-2
Date: 2-Jan-18
Customer: Sutro Tower Inc.
Location: San Francisco, CA

Electrical Specifications
Polarization: Circular
Azimuth Pattern: Omni
Antenna Input: 3-1/8"
Channel: 50 Ohm EIA/DCA
Band: 1.10 : 1
VSWR: 1.10 : 1
Bandwidth: 12 MHz
Rated Input Power: 30 kW (14.77 dBk) Maximum combined average power

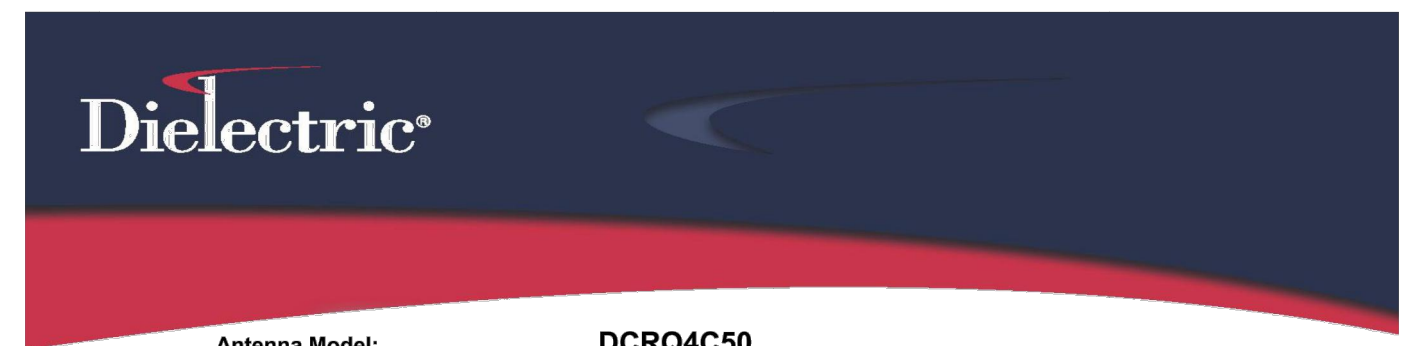
Mechanical Specifications
Mounting: Side Mounted
Environmental Protection: Feed Point
Height: 23.4 ft (7.1m)
Weight: 1000 to (0.5t) Excludes Mounts
Effective Projected Area: 42 ft^2 (3.9m^2) TIA-222-G Basic Wind Speed: 85 m/h (136.8 km/h)

Channel Specifications table with columns: Call, CH, Freq, Hpol ERP, Vpol ERP, TPO, RMS Main Lobe Hpol Gain, RMS Main Lobe Vpol Gain, RMS at Horizontal Hpol Gain, RMS at Horizontal Vpol Gain

Andre J Skalina
I have reviewed this document
0005-135944-2018.01.05

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16 ANTENNA REFERENCE AA



Antenna Model: DCRQ4C50
Proposal Number: C-71046-2
Date: 2-Jan-18
Customer: Sutro Tower Inc.
Location: San Francisco, CA

Electrical Specifications
Polarization: Circular
Azimuth Pattern: Omni
Antenna Input: 3-1/8"
Channel: 50 Ohm EIA/DCA
Band: 1.10 : 1
VSWR: 1.10 : 1
Bandwidth: 12 MHz
Rated Input Power: 30 kW (14.77 dBk) Maximum combined average power

Mechanical Specifications
Mounting: Side Mounted
Environmental Protection: Feed Point
Height: 23.4 ft (7.1m)
Weight: 1000 to (0.5t) Excludes Mounts
Effective Projected Area: 42 ft^2 (3.9m^2) TIA-222-G Basic Wind Speed: 85 m/h (136.8 km/h)

Channel Specifications table with columns: Call, CH, Freq, Hpol ERP, Vpol ERP, TPO, RMS Main Lobe Hpol Gain, RMS Main Lobe Vpol Gain, RMS at Horizontal Hpol Gain, RMS at Horizontal Vpol Gain

Andre J Skalina
I have reviewed this document
0005-135944-2018.01.05

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18 ANTENNA REFERENCE AC

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Boston Chicago Houston Los Angeles New York San Francisco Washington, DC
Simpson Gumpertz & Heger Inc.
100 Pine Street, Suite 1600
San Francisco, California 94111
Phone: 415.495.3700 Fax: 415.495.3550
www.sgh.com

Consultant

Revision table with columns: No., Date, Description, By

Revision table with columns: No., Date, Description, By

BROADCAST CHANNEL REPACKING PROJECT
1 LA AVANZADA ST.
SAN FRANCISCO CALIFORNIA

ANTENNA REFERENCES

Commission 067199_24 Checked BW Date 09/06/17
Drawn GPN Approved ROH Scale N.T.S.
Professional Engineer Seal No. 2951
Drawing No. S1.6

F:\SFA\Projects\2006\067199_24-STK6\Drawings\Working_Sets\STK6_S106.dwg



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New York
San Francisco
Washington, DC

Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

**1 LA AVANZADA ST.
SAN FRANCISCO
CALIFORNIA**

Project

VIEW OF TOWER BEFORE AND AFTER REPACK

Drawing Title

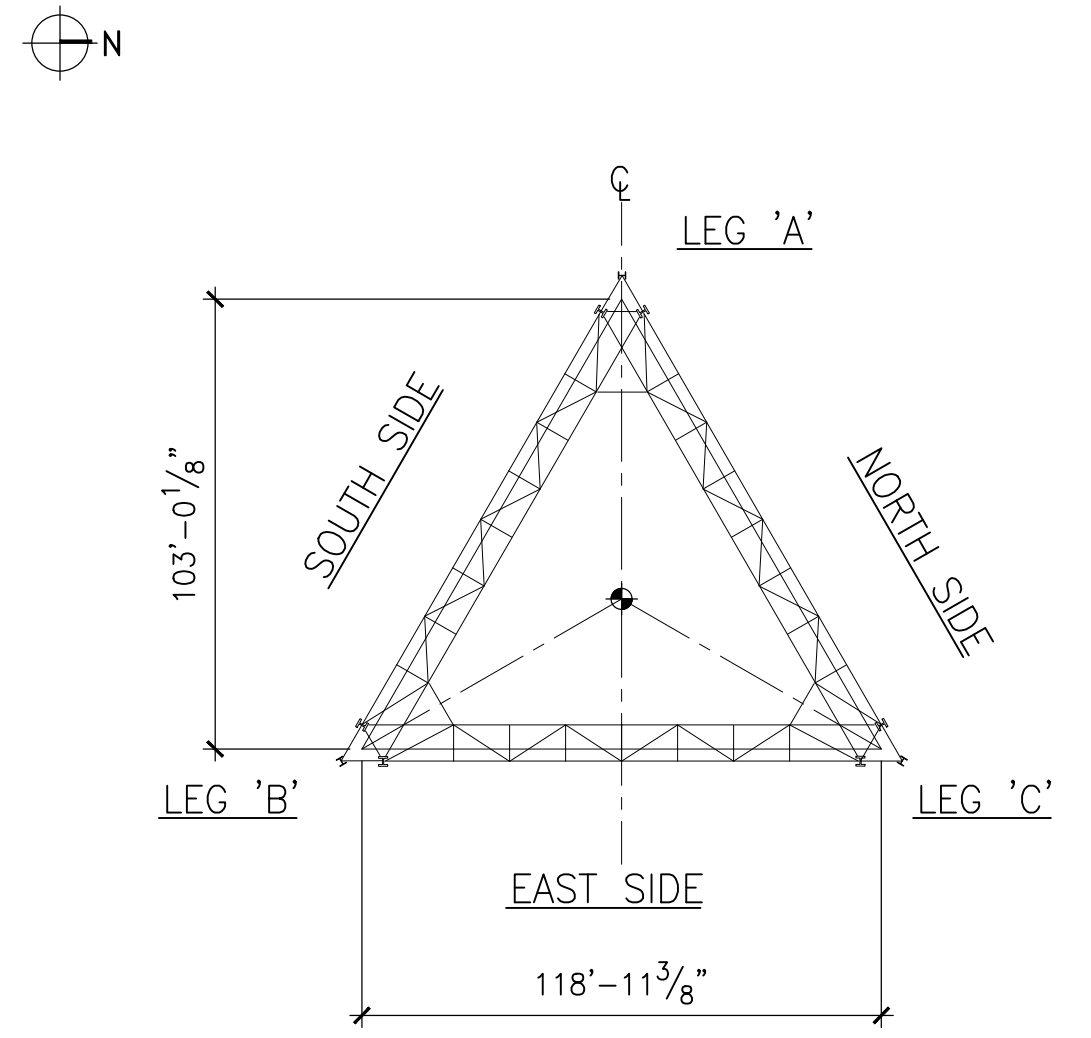
Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale NONE



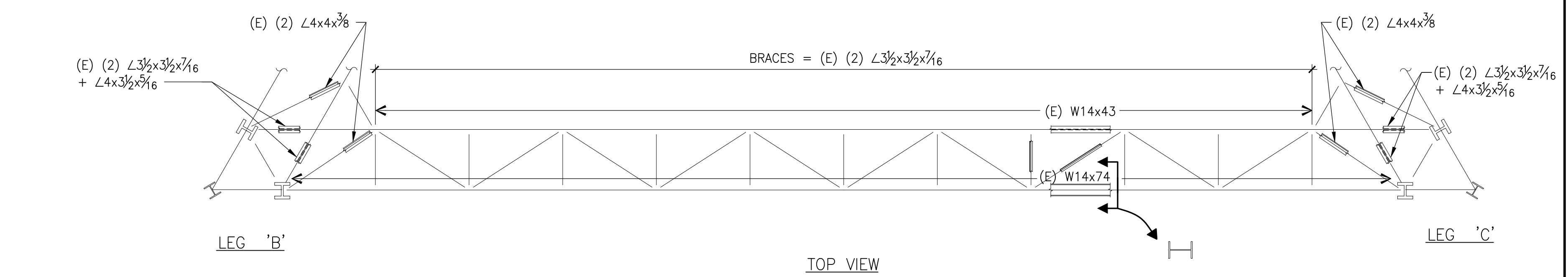
Drawing No.
S1.7

1 VIEW OF TOWER BEFORE REPACK

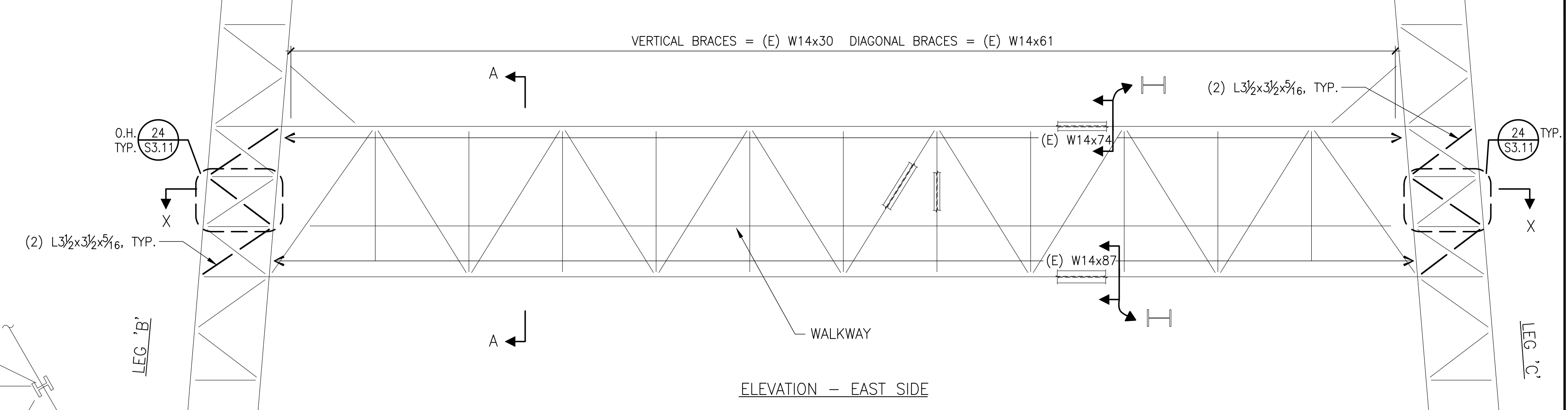
2 VIEW OF TOWER AFTER REPACK



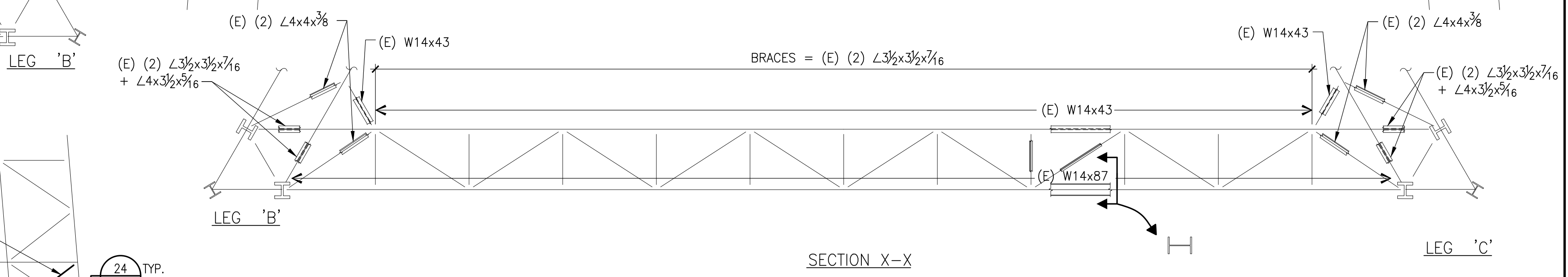
KEY PLAN - 2ND LEVEL



TOP VIEW



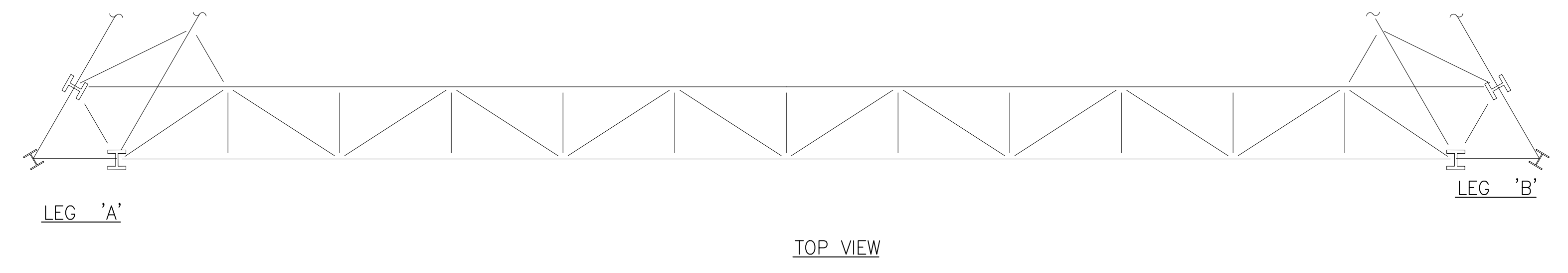
ELEVATION - EAST SIDE



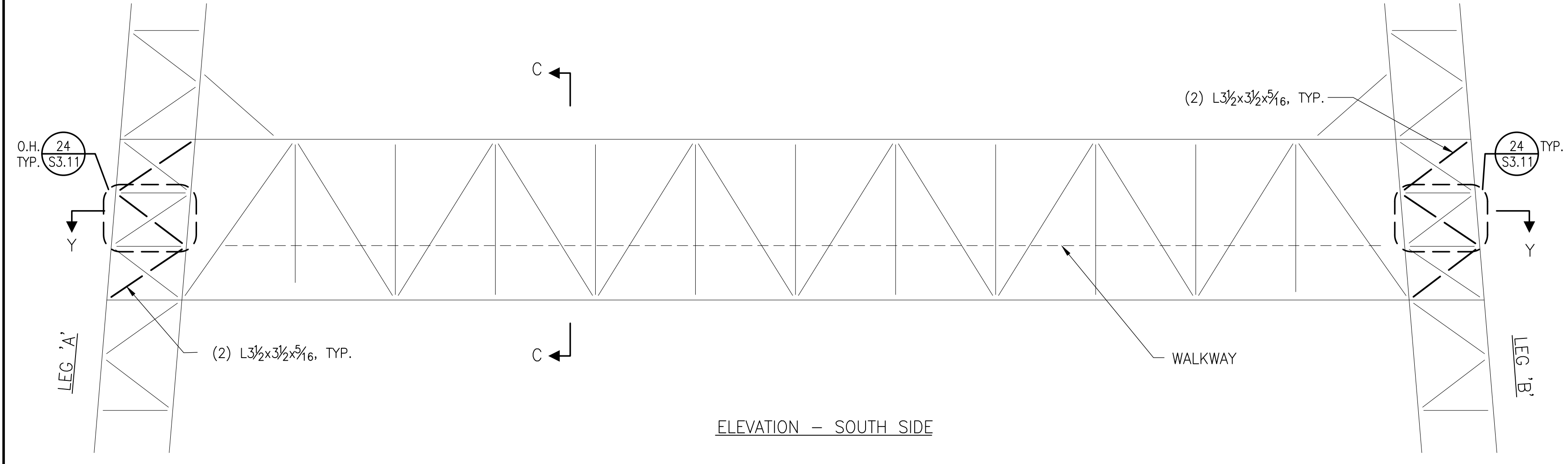
SECTION X-X

2ND LEVEL - EAST SIDE

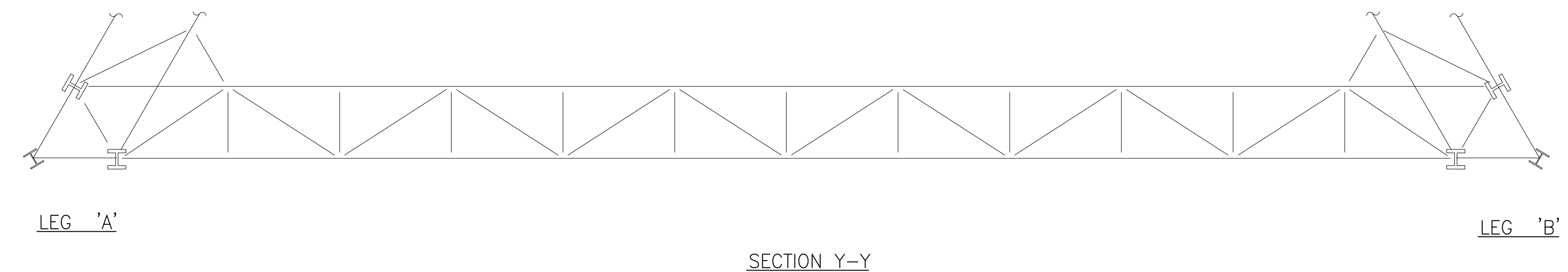
* NOTE:
 MEMBER SHAPES ARE THE SAME
 FOR NORTH AND SOUTH SIDE



TOP VIEW



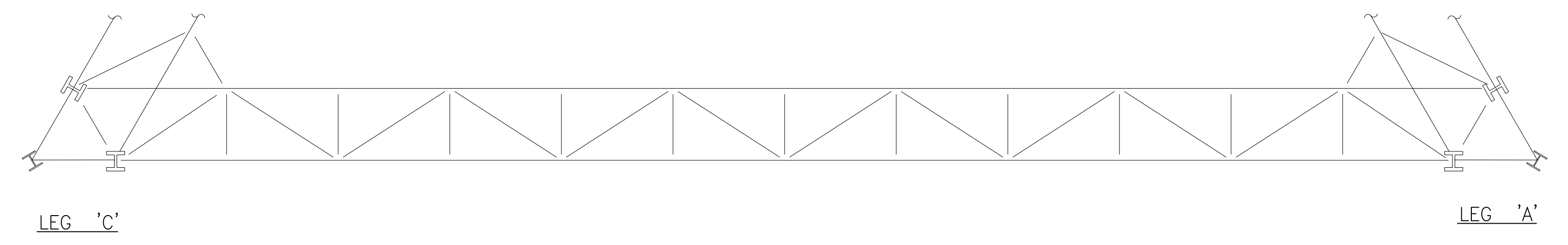
ELEVATION - SOUTH SIDE



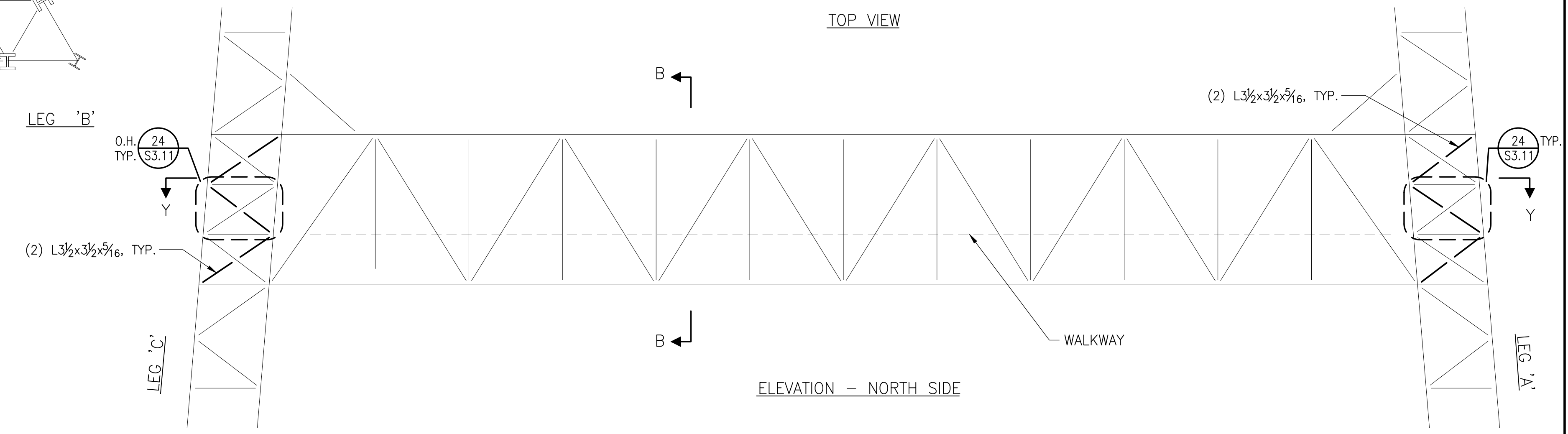
SECTION Y-Y

2ND LEVEL - SOUTH SIDE

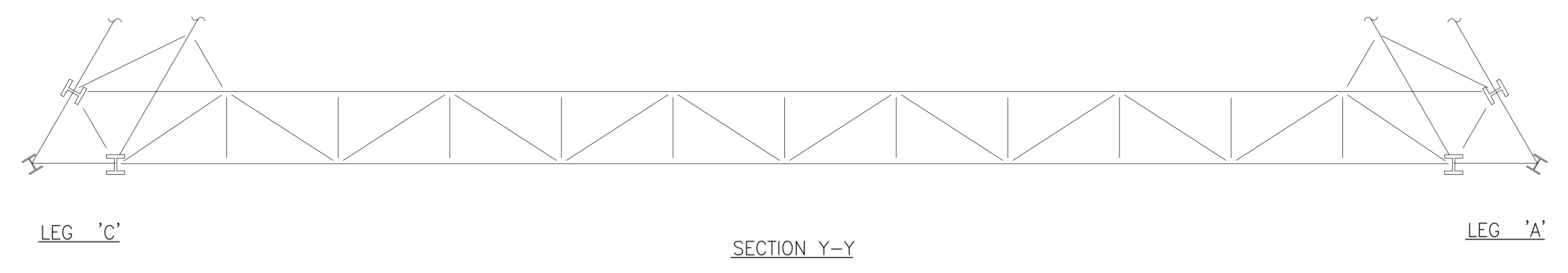
* NOTE:
 SEE EAST SIDE FOR MEMBER SHAPES.



TOP VIEW



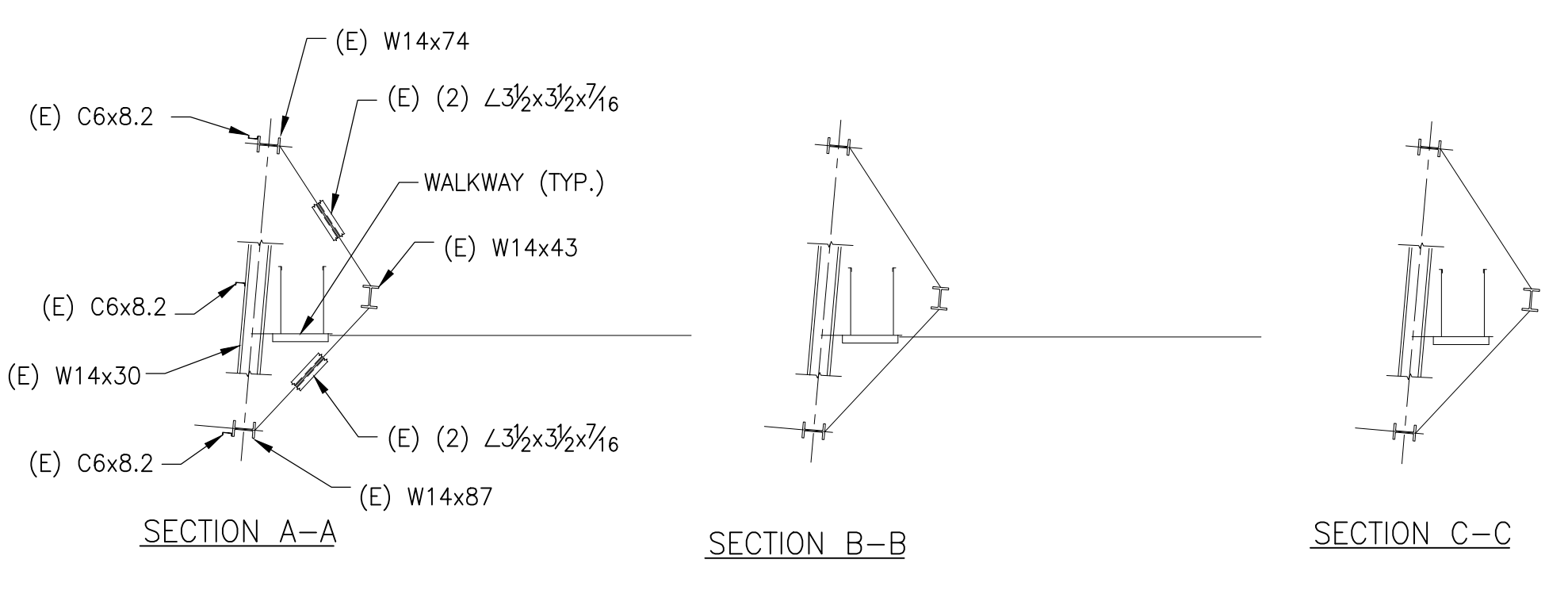
ELEVATION - NORTH SIDE



SECTION Y-Y

2ND LEVEL - NORTH SIDE

* NOTE:
 SEE EAST SIDE FOR MEMBER SHAPES.



SECTION A-A

SECTION B-B

SECTION C-C

Consultant

SHEET NOTES:
 1. THIS DRAWING IS FOR RECORD ONLY. NO WORK
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No.	Date	Description	By
12/18/16		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

**BROADCAST
 CHANNEL
 REPACKING PROJECT**

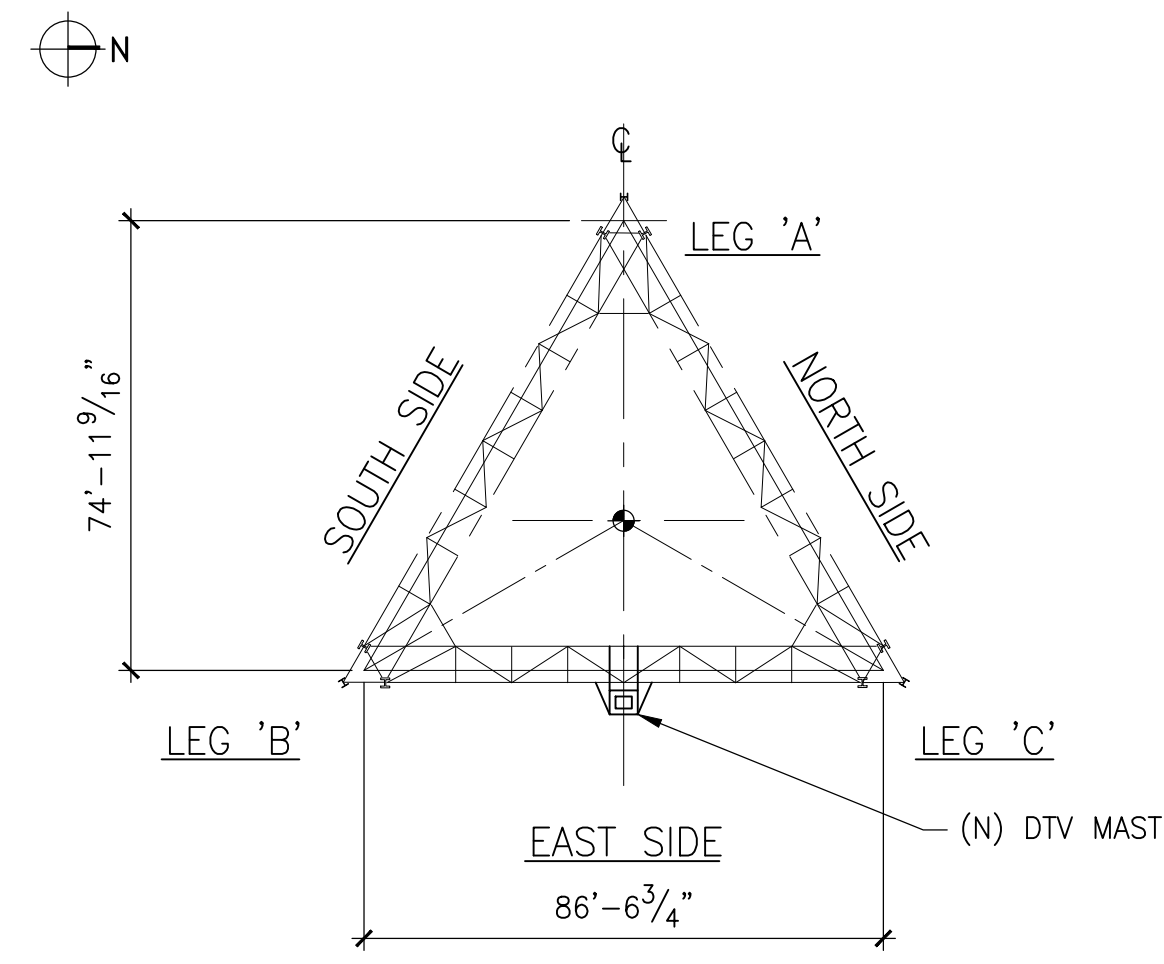
**1 LA AVANZADA ST.
 SAN FRANCISCO
 CALIFORNIA**

**2ND LEVEL
 FRAMING**

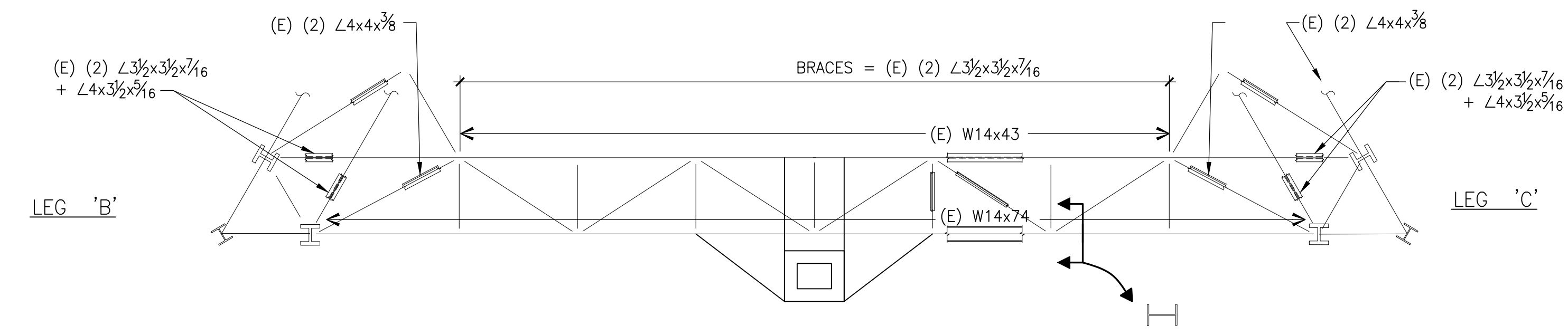
Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale 1/8" = 1'-0"

Professional Engineer
 No. 2951
 State of California

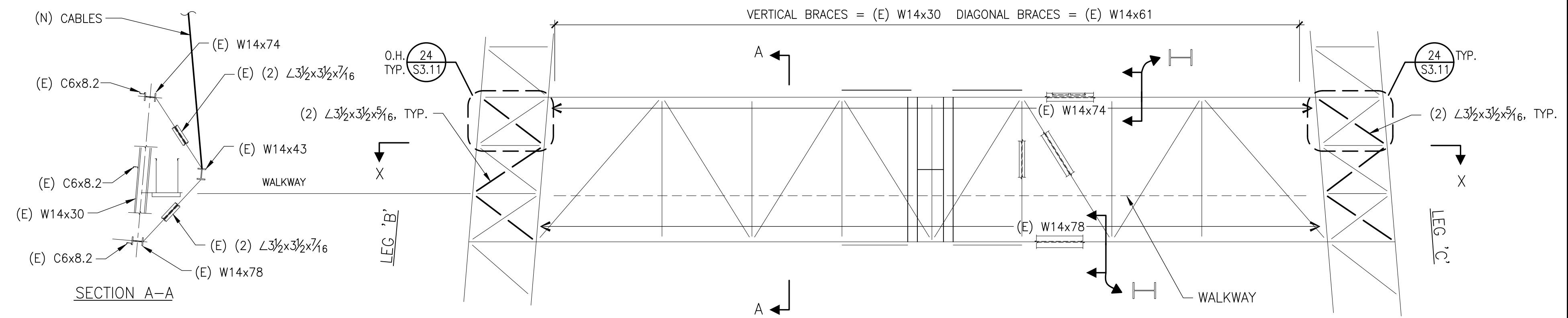
S2.1



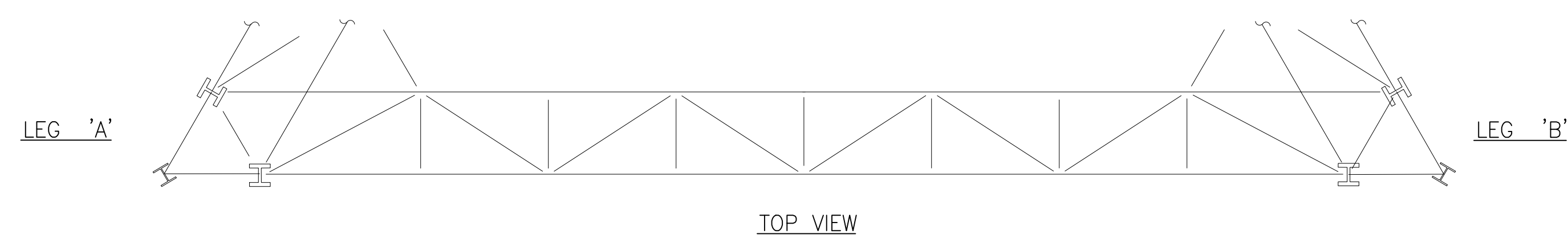
KEY PLAN - 3RD LEVEL



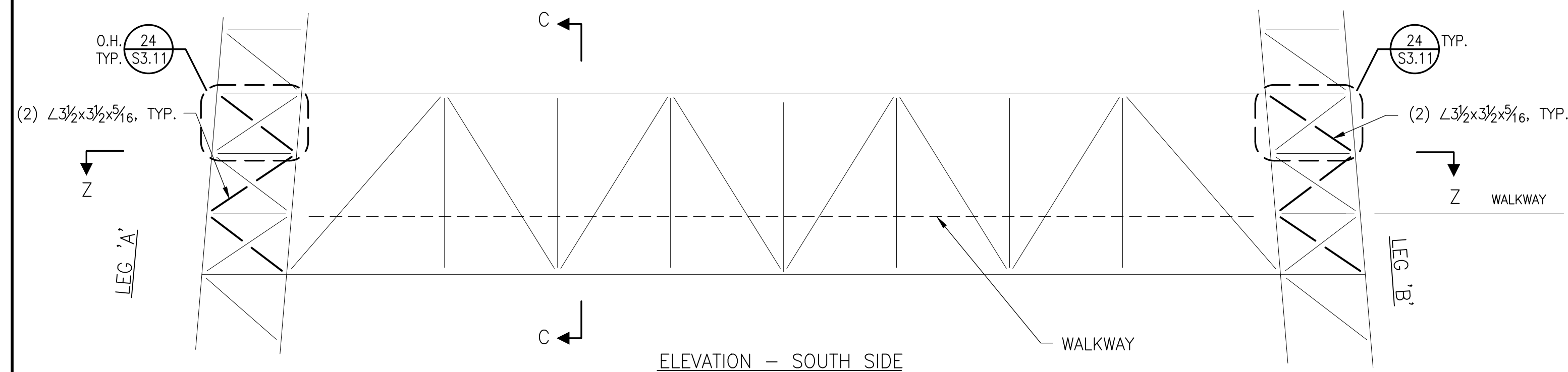
TOP VIEW



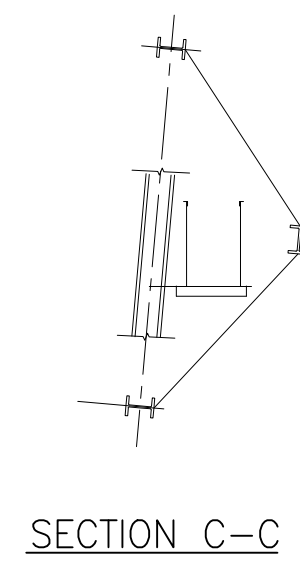
SECTION A-A



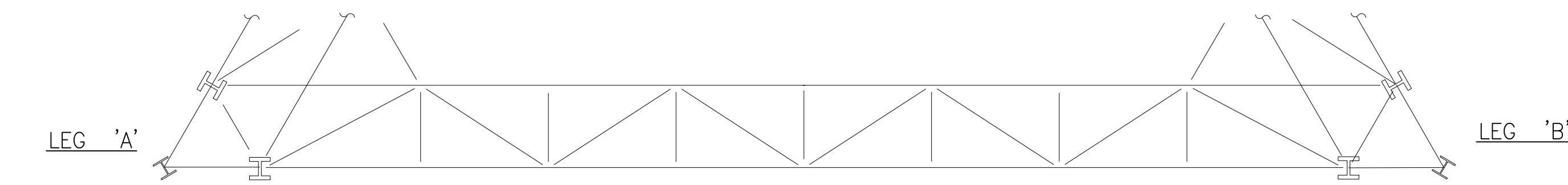
TOP VIEW



ELEVATION - SOUTH SIDE



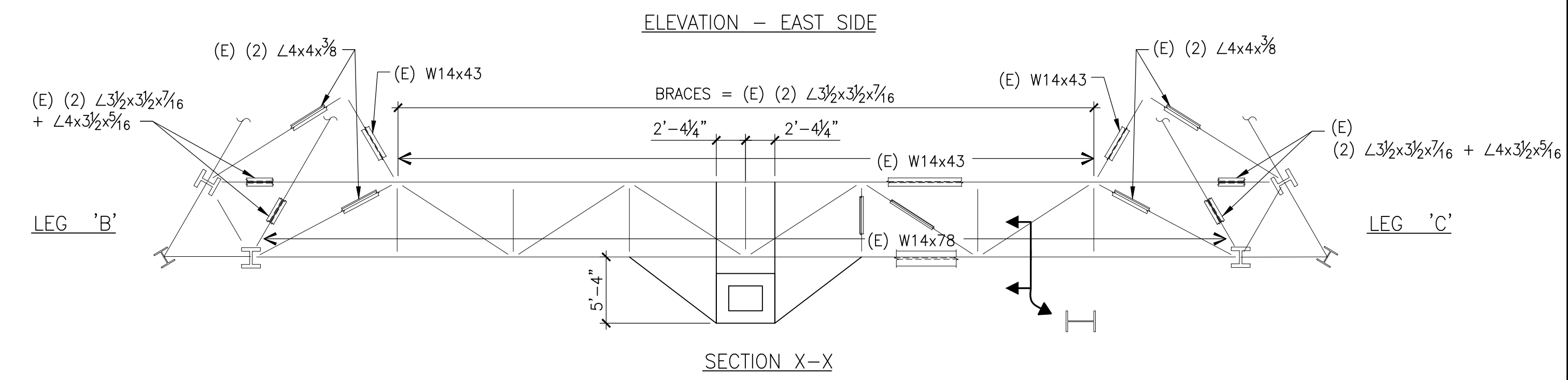
SECTION C-C



SECTION Z-Z

3RD LEVEL - SOUTH SIDE

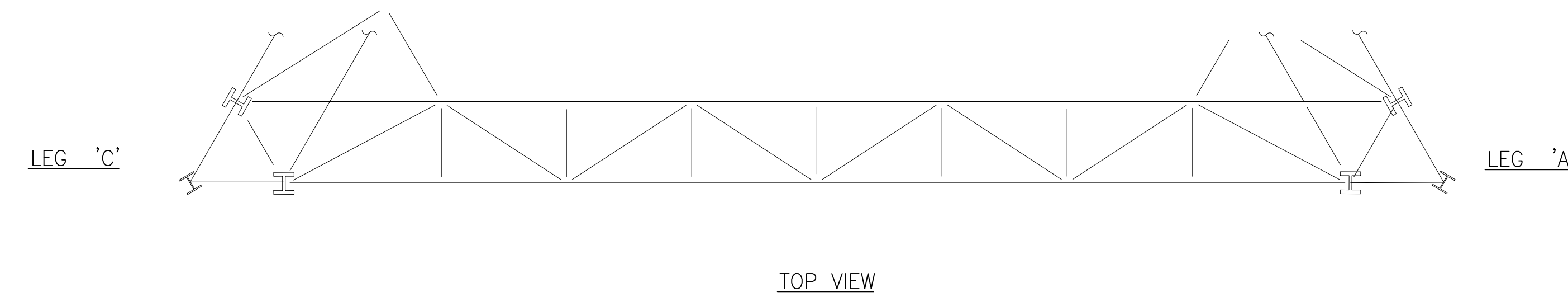
* NOTE: SEE EAST SIDE FOR MEMBER SHAPES.



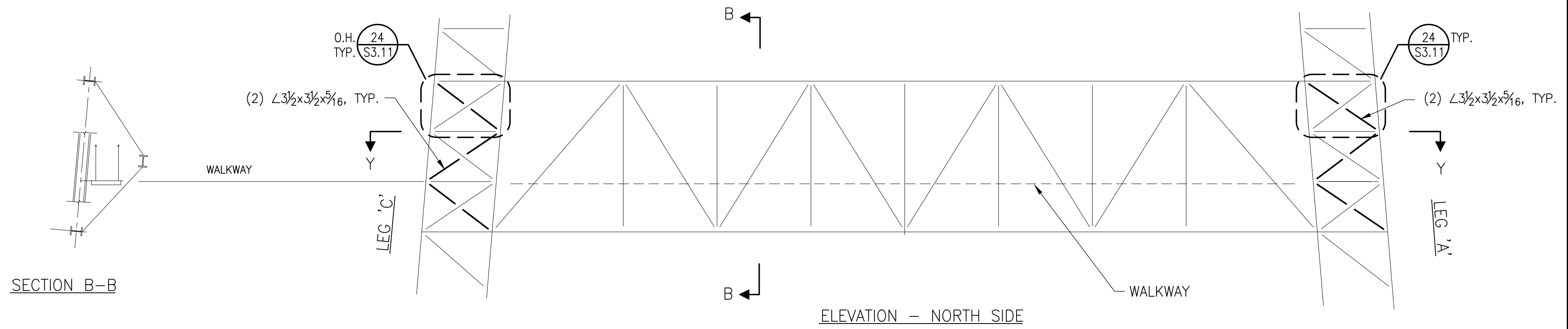
ELEVATION - EAST SIDE

3RD LEVEL - EAST SIDE

* NOTE: MEMBER SHAPES ARE THE SAME FOR NORTH AND SOUTH SIDE



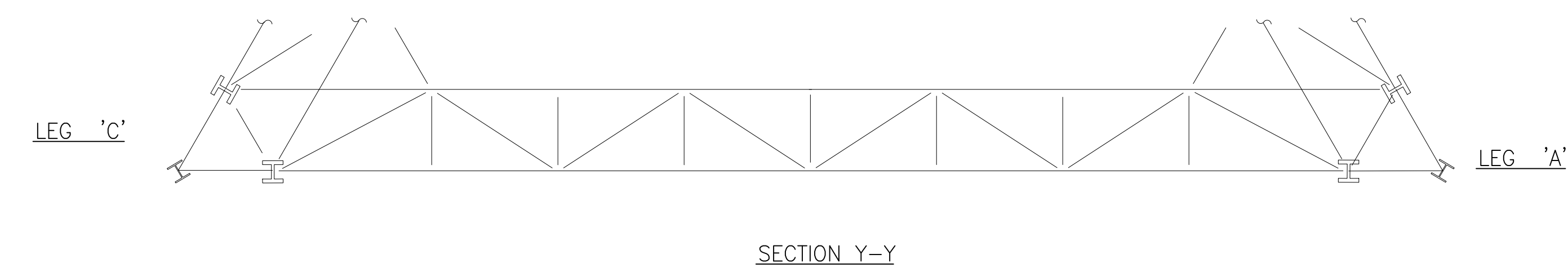
TOP VIEW



ELEVATION - NORTH SIDE

3RD LEVEL - NORTH SIDE

* NOTE: SEE EAST SIDE FOR MEMBER SHAPES.



SECTION Y-Y

Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
SAN FRANCISCO
CALIFORNIA

Project

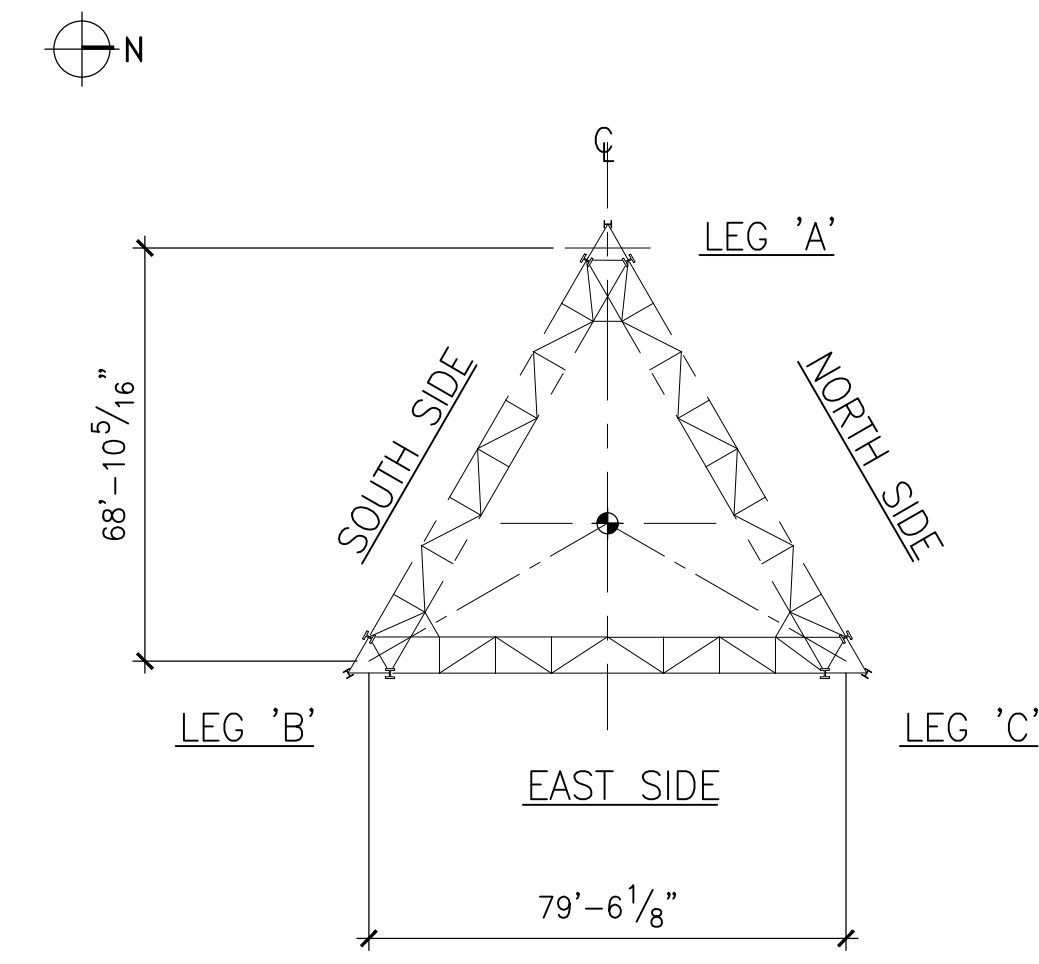
3RD LEVEL FRAMING

Drawing Title

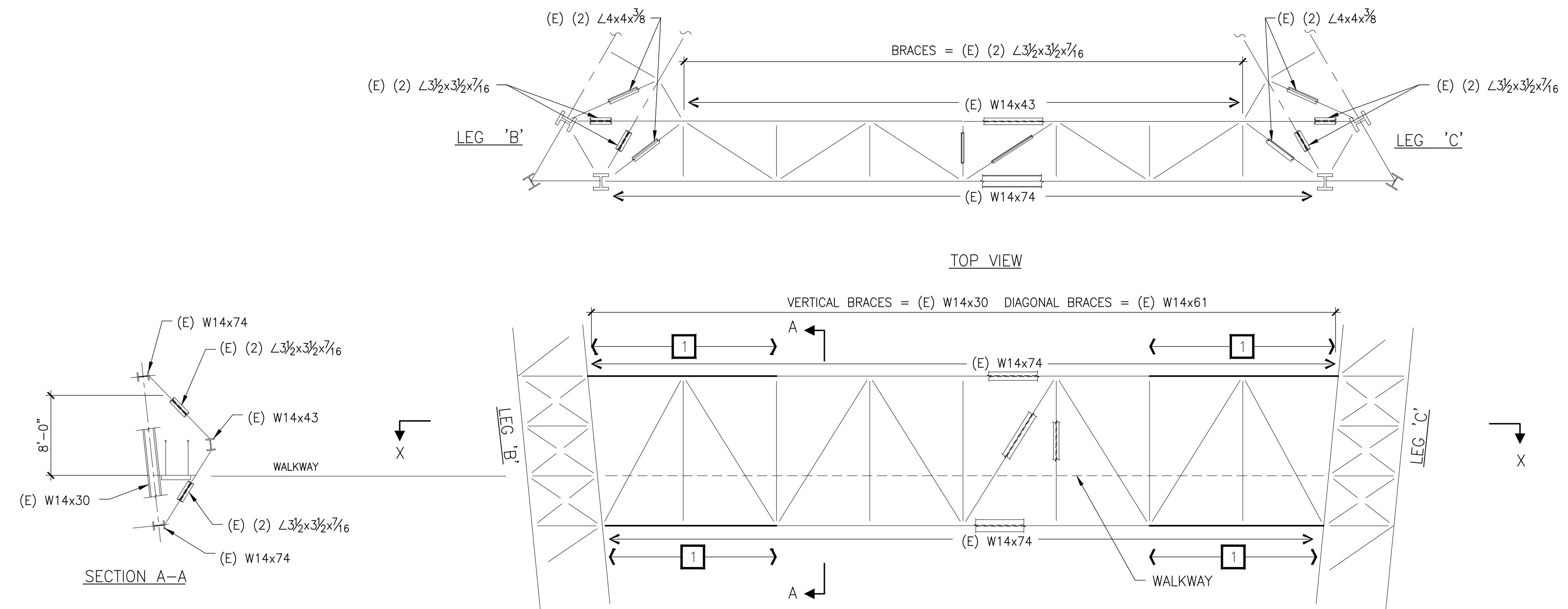
Commission	Checked	Date
067199.24	BW	09/06/17
Drawn	Approved	Scale
GPN	ROH	1/8" = 1'-0"



S2.2



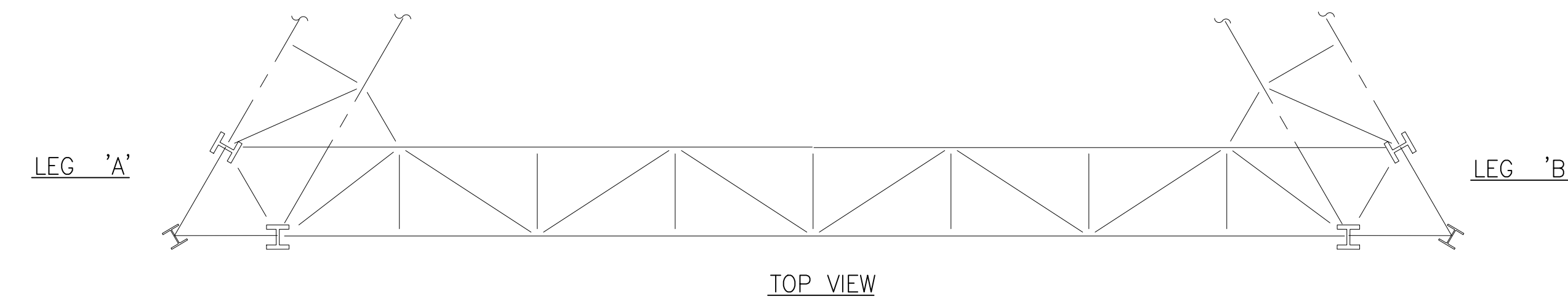
KEY PLAN - 5TH LEVEL



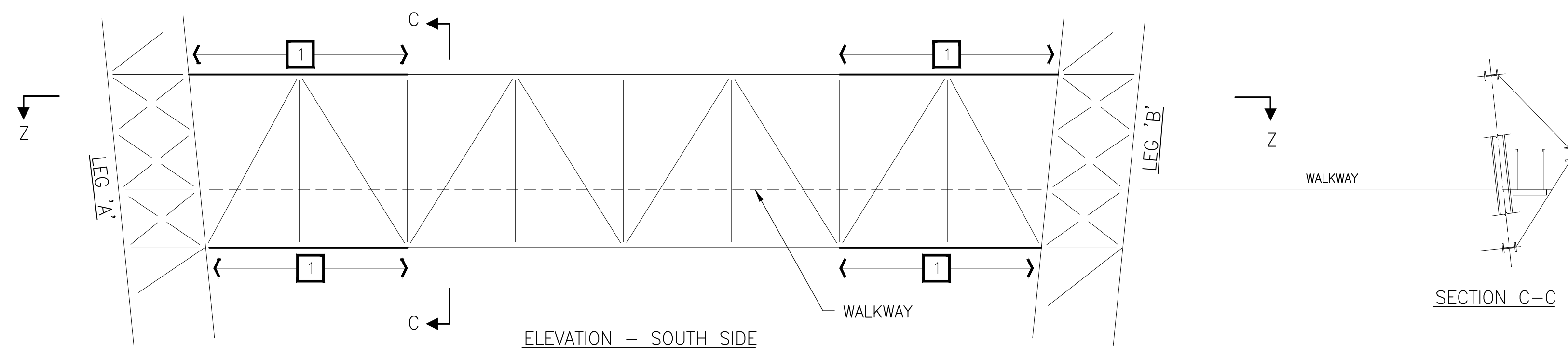
ELEVATION - EAST SIDE

5TH LEVEL - EAST SIDE

* NOTE: MEMBER SHAPES ARE THE SAME FOR NORTH AND SOUTH SIDE

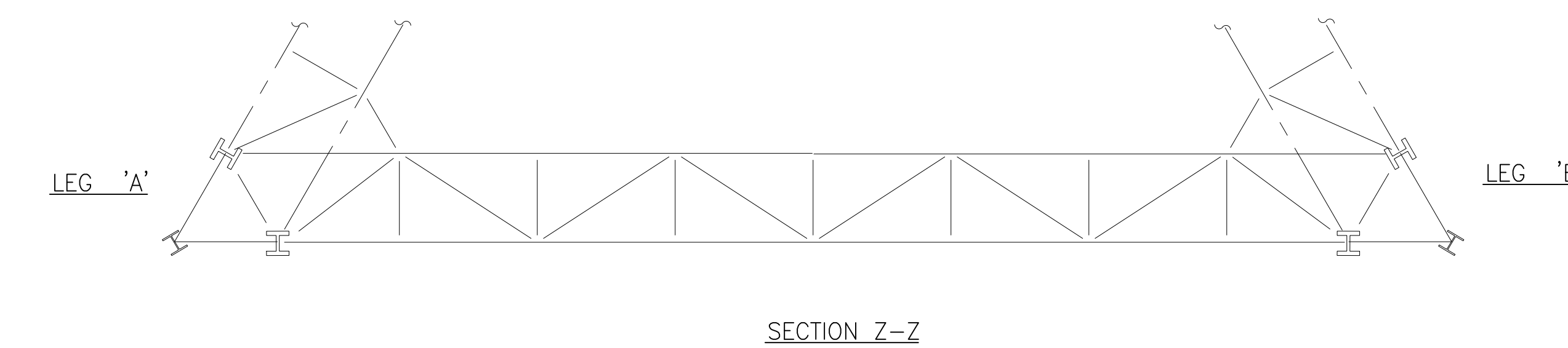


TOP VIEW



ELEVATION - SOUTH SIDE

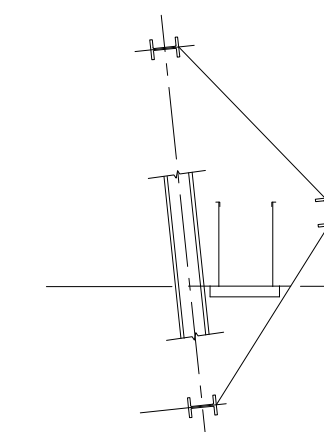
SECTION C-C



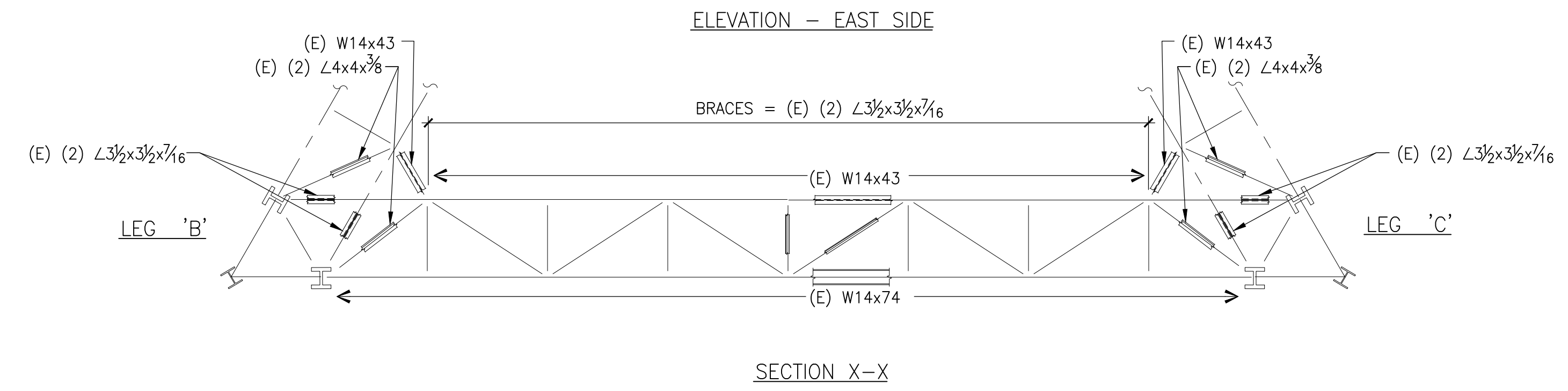
SECTION Z-Z

5TH LEVEL - SOUTH SIDE

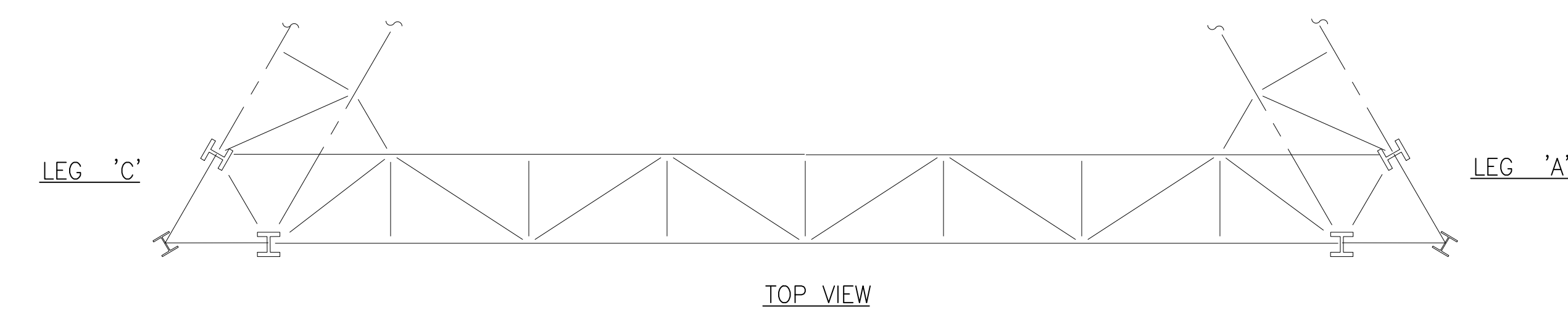
* NOTE: SEE EAST SIDE FOR MEMBER SHAPES.



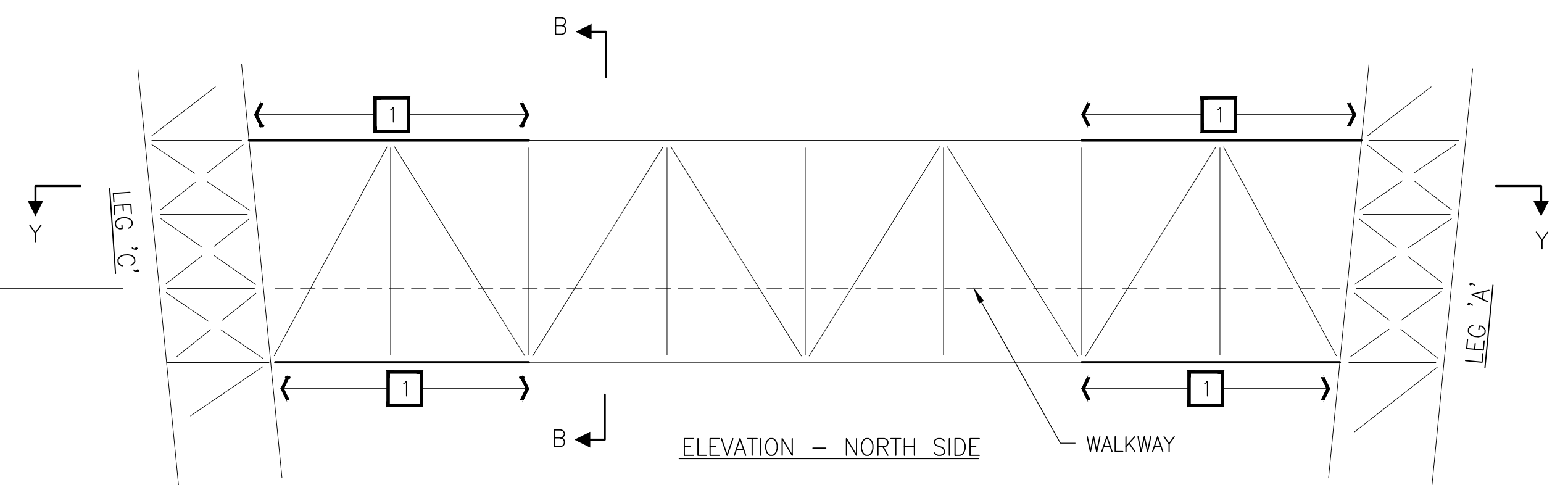
SECTION B-B



SECTION X-X



TOP VIEW



ELEVATION - NORTH SIDE

SECTION Y-Y

5TH LEVEL - NORTH SIDE

* NOTE: SEE EAST SIDE FOR MEMBER SHAPES.

KEYNOTE:

1 STRENGTHEN (E) W14x74 PER 18 S3.12, TYP.

Consultant

SHEET NOTES:
1. THIS DRAWING IS FOR RECORD ONLY. NO WORK REQUIRED FOR THIS SHEET.

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
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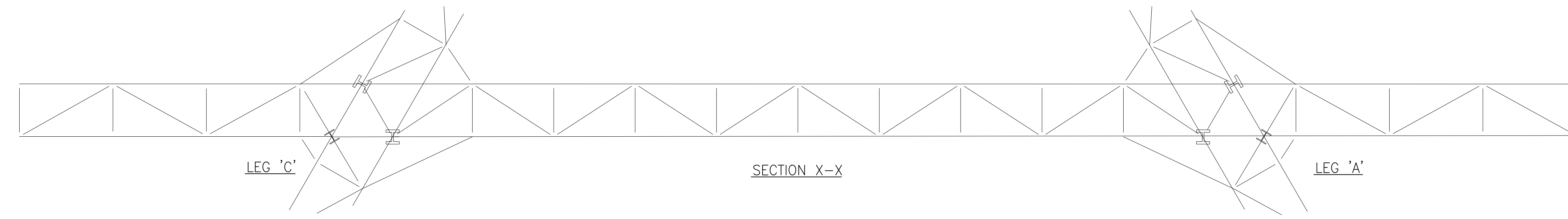
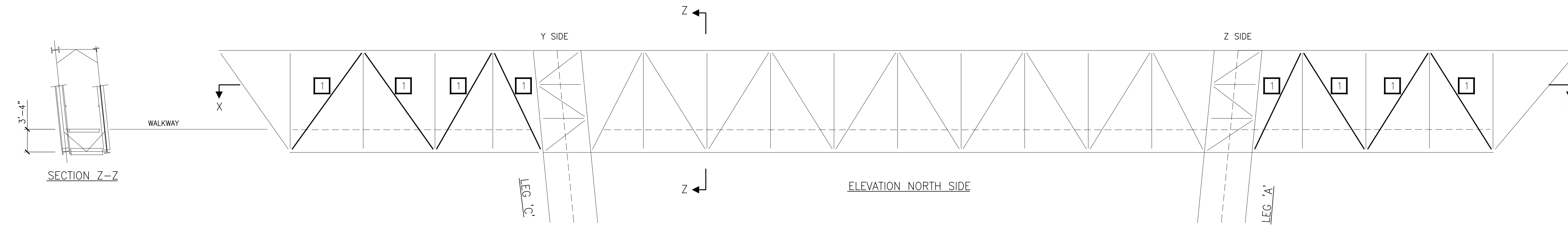
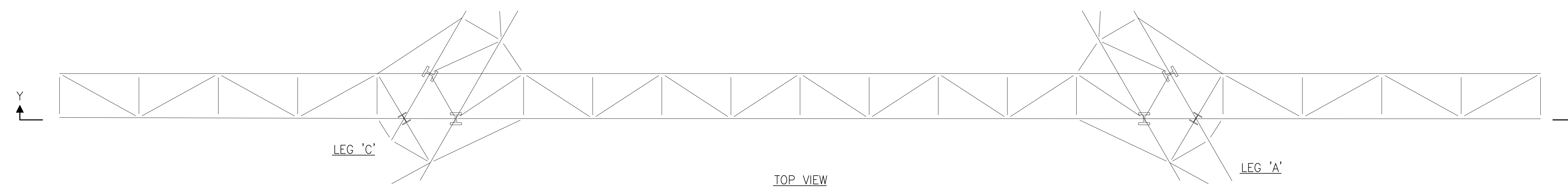
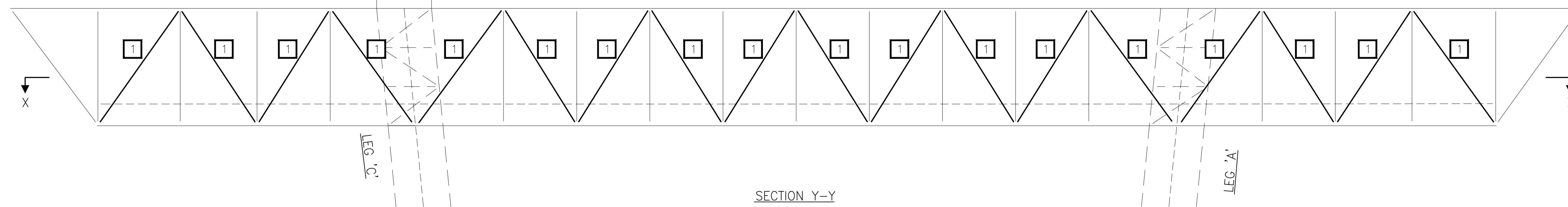
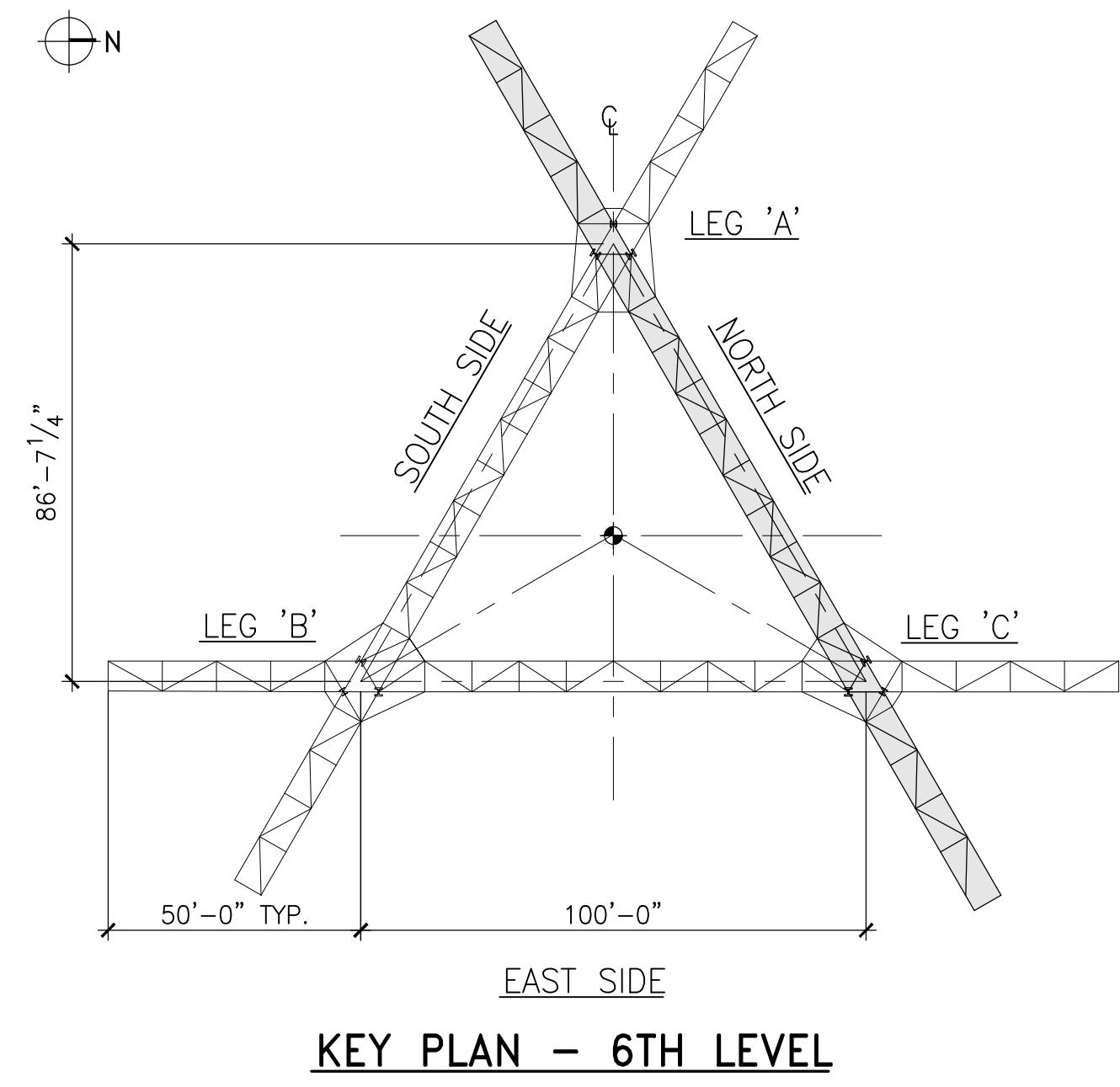
5TH LEVEL FRAMING

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale 1/8"=1'-0"



S2.4



6TH LEVEL - NORTH SIDE

* NOTE: MEMBER SHAPES ARE THE SAME AS EAST SIDE. SEE DRAWING S2.5

KEYNOTE:
 1 STRENGTHEN (E) L6x6 BRACES PER 13 (S3.11), TYP.

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 Engineering of Structures and Building Enclosures

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 San Francisco, California 94111
 main: 415.495.3700 fax: 415.495.3550
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Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST. SAN FRANCISCO CALIFORNIA

Project

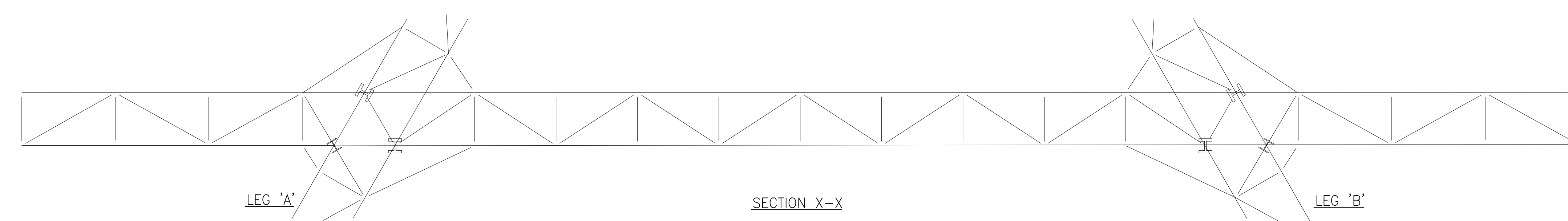
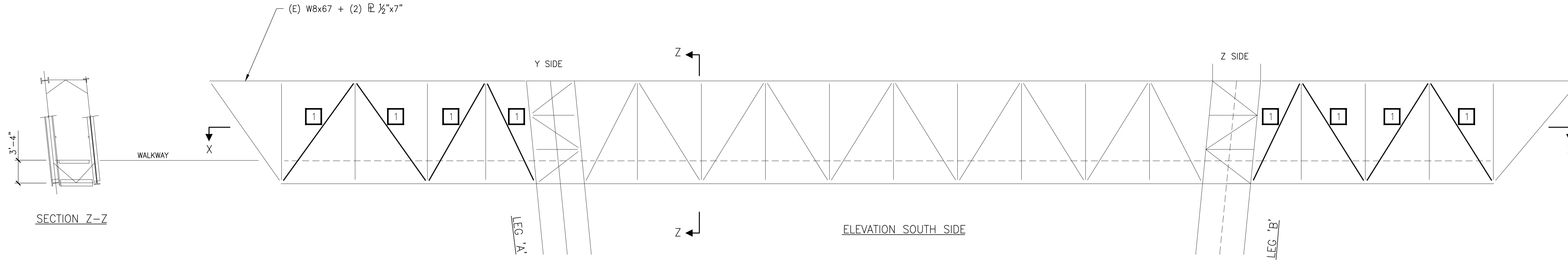
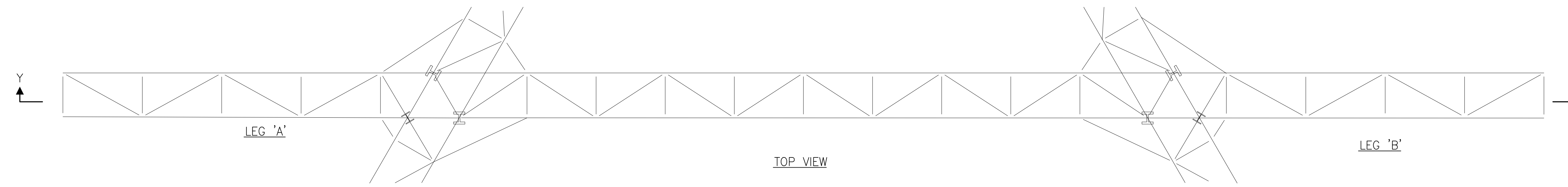
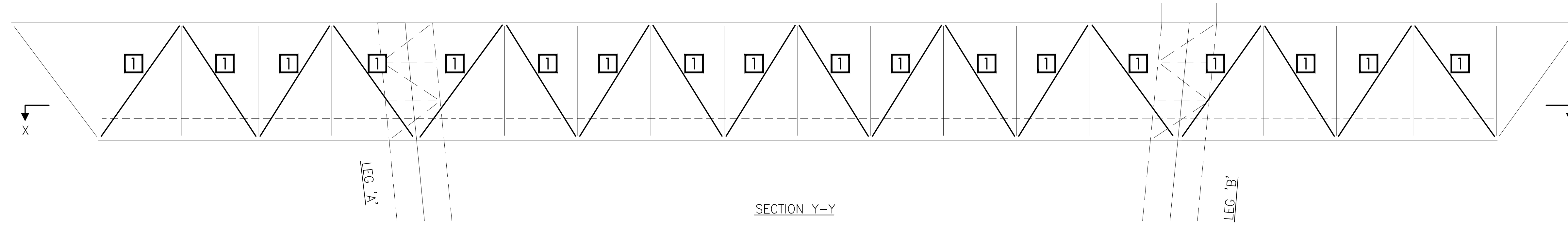
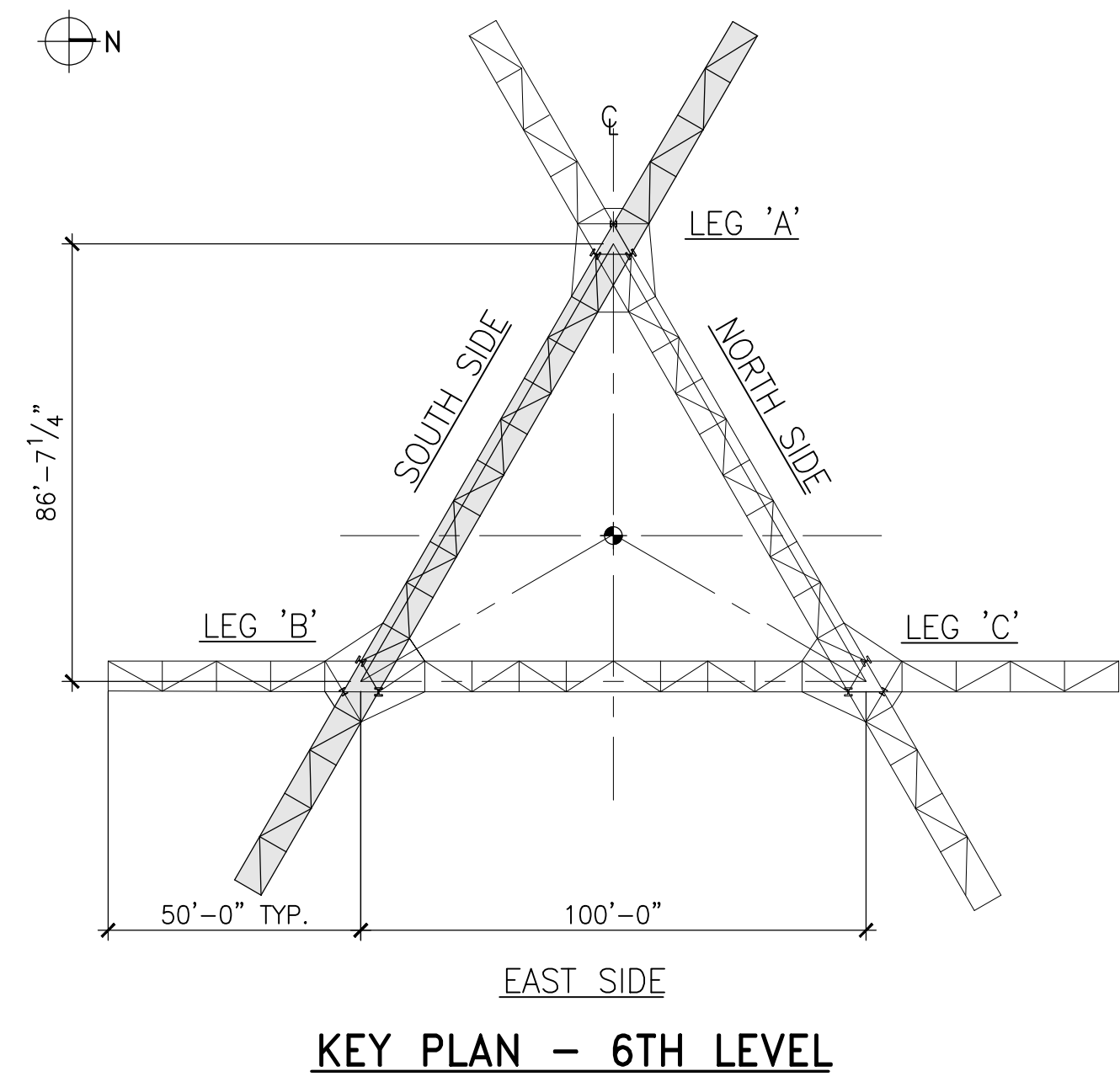
6TH LEVEL FRAMING NORTH SIDE

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale 1/8"=1'-0"

Drawing No. **S2.6**

I:\SFA\Projects\2006\067199.24-STKB\Drawings\Working_Set\STKB_S206.dwg



6TH LEVEL - SOUTH SIDE
 * NOTE: MEMBER SHAPES ARE THE SAME AS EAST SIDE. SEE DRAWING S2.5

KEYNOTE:
 1 STRENGTHEN (E) L6x6 BRACES PER 13 (S3.11), TYP.

SIMPSON GUMPERTZ & HEGER
 Engineering of Structures
 and Building Enclosures

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 Houston
 Los Angeles
 New York
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 www.sgh.com

Consultant

No.	Date	Description	By
12/18/16		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

**BROADCAST CHANNEL
 REPACKING PROJECT**

**1 LA AVANZADA ST.
 SAN FRANCISCO
 CALIFORNIA**

Project

**6TH LEVEL
 FRAMING
 SOUTH SIDE**

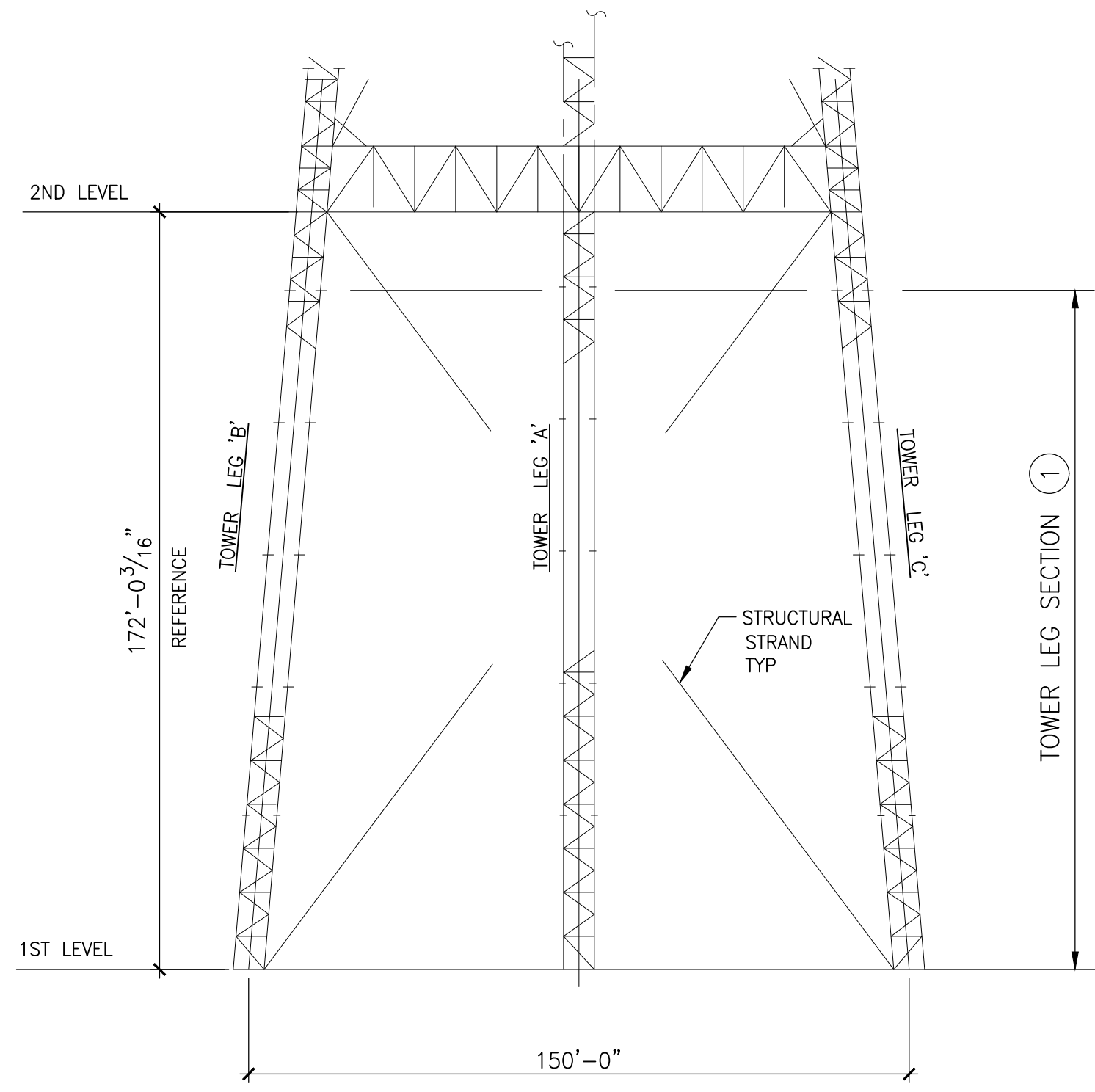
Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale 1/8"=1'-0"

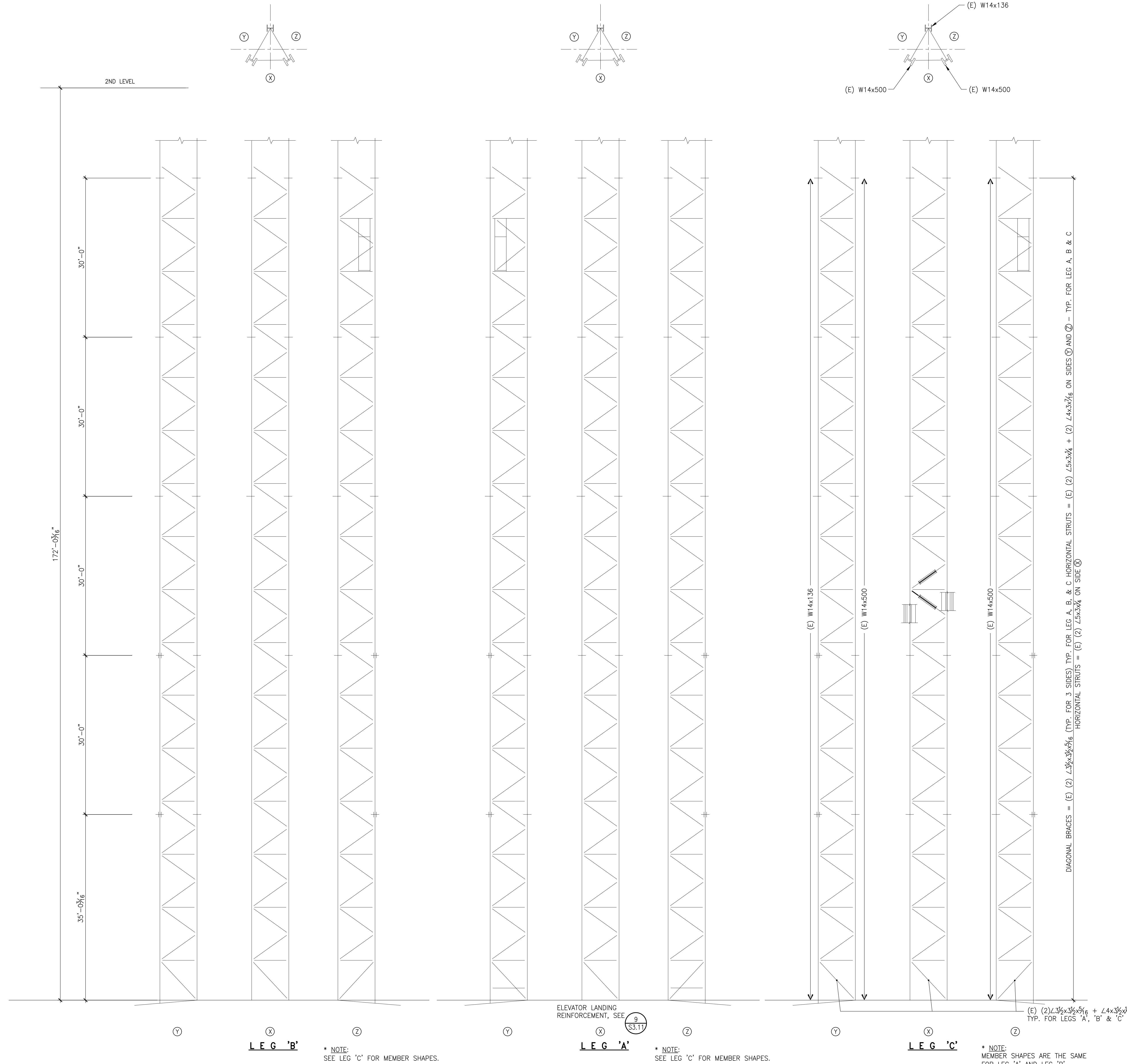


S2.7

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TOWER WORK POINT ELEVATION
SCALE: 1/32" = 1'-0"



1 TOWER LEGS SECTION
SCALE: 1/8" = 1'-0"

Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
SAN FRANCISCO
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Project

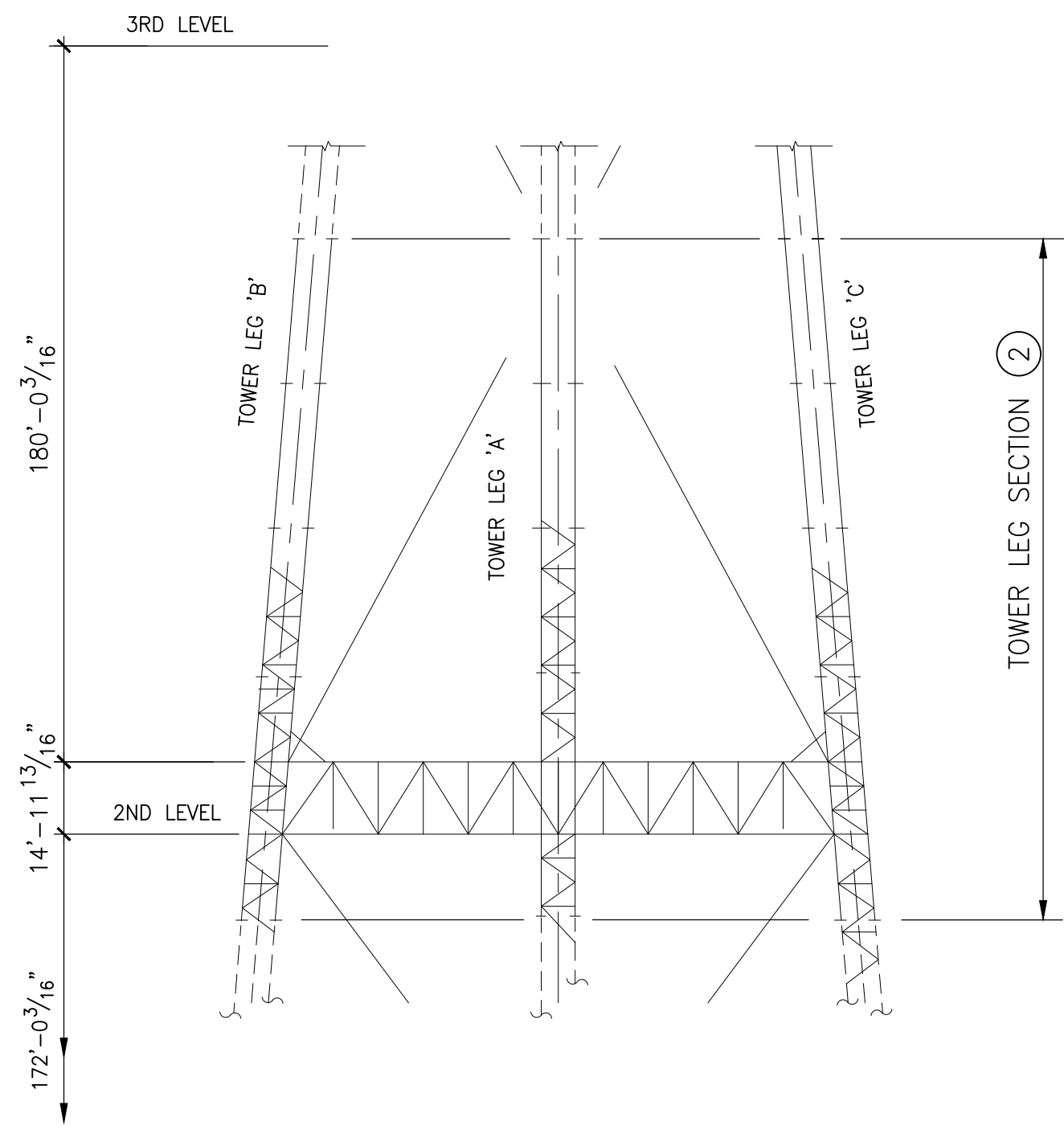
TOWER SECTION - 1 LEG FRAMING LEVEL 1 TO LEVEL 2

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Drawing No.
S3.1

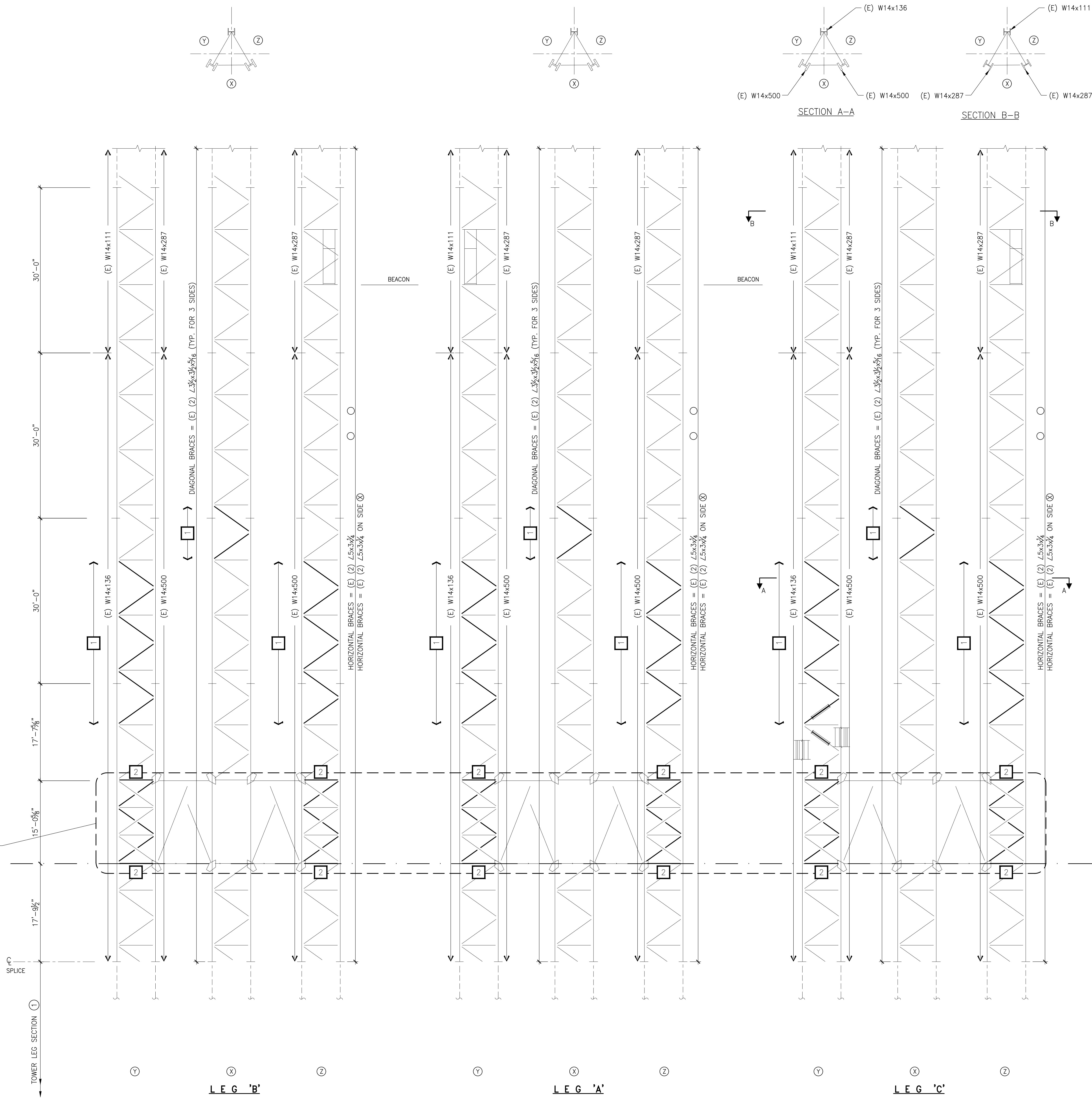
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EAST SIDE ELEVATION
TOWER WORK POINT ELEVATION
 SCALE: 1/32" = 1'-0"

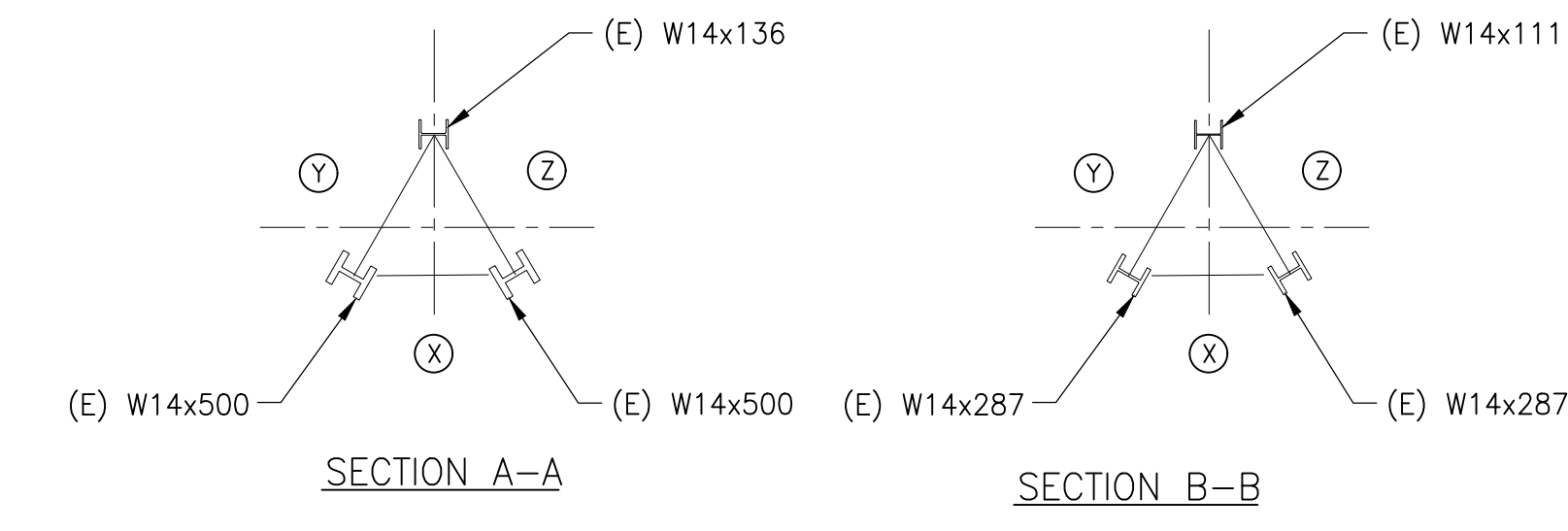
STRENGTHEN (E) DIAGONAL BRACES
 W/ WT4x7.5 PER

FOR NEW MEMBERS & DETAILING
 ON TRUSS LEVEL 2, SEE S2.1



- KEYNOTE:
- 1 STRENGTHEN (E) DIAGONAL BRACES W/ WT4x20 PER TYP. WHERE OCCURS
 - 2 STRENGTHEN (E) HORIZ. BRACES W/ WT4x20 PER TYP. WHERE OCCURS

2 TOWER LEGS SECTION
 SCALE: 1/8"=1'-0"



Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
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BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
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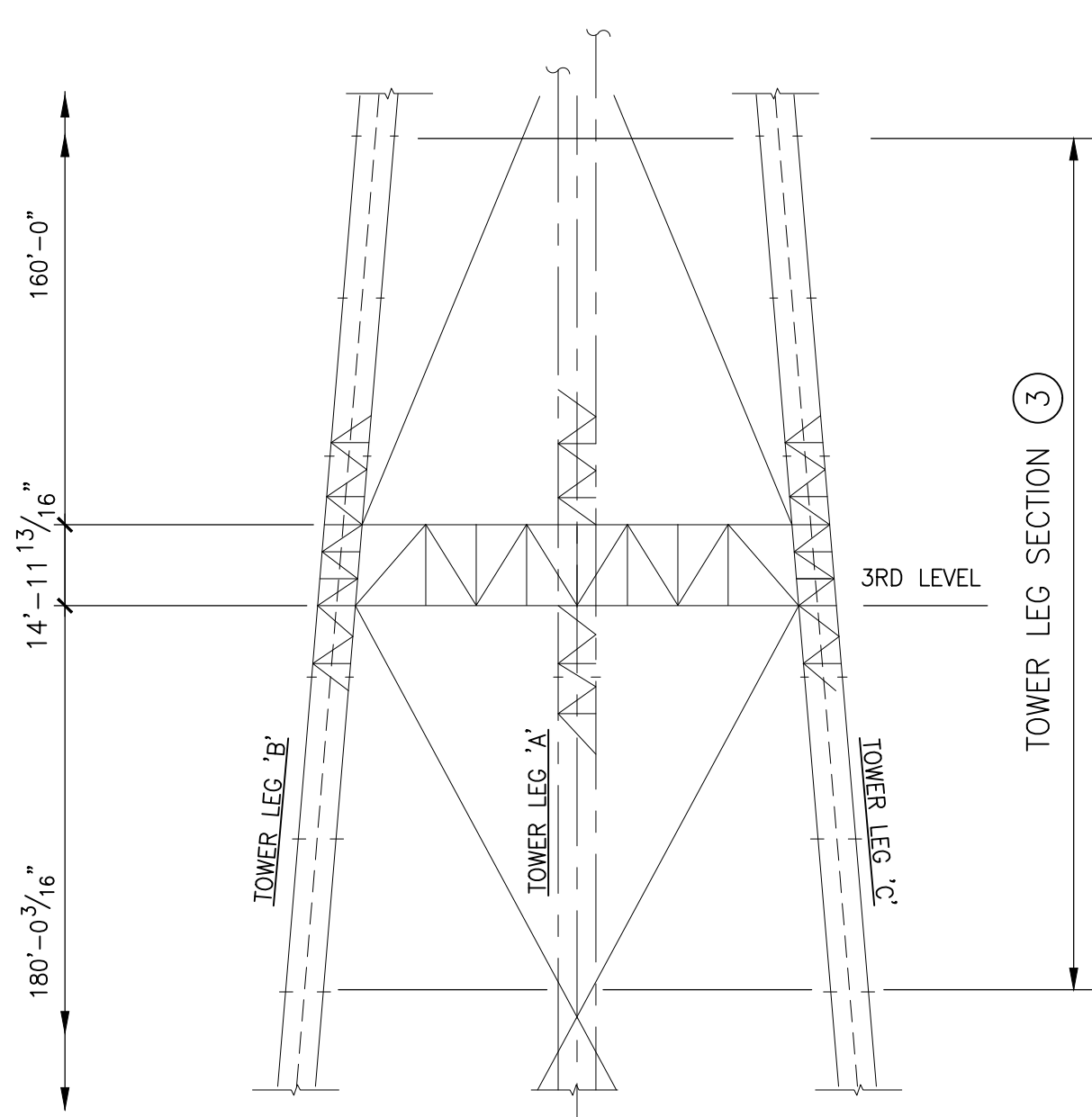
TOWER SECTION - 2 LEG FRAMING LEVEL 2 TO LEVEL 3

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

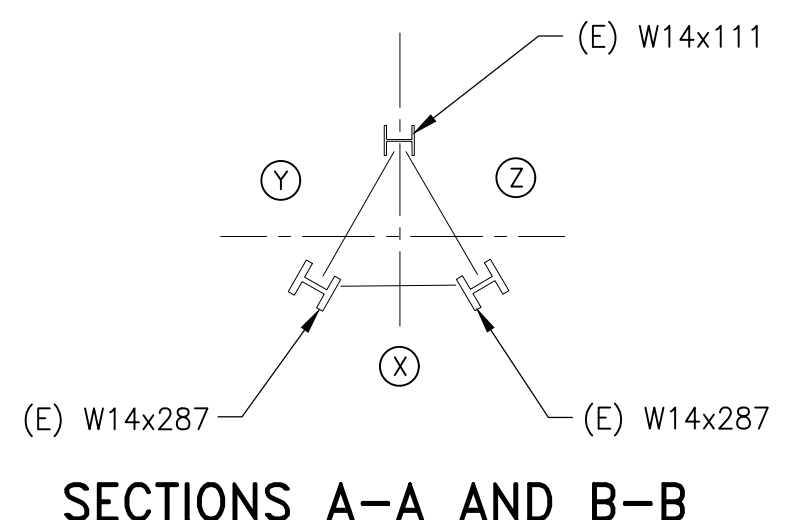
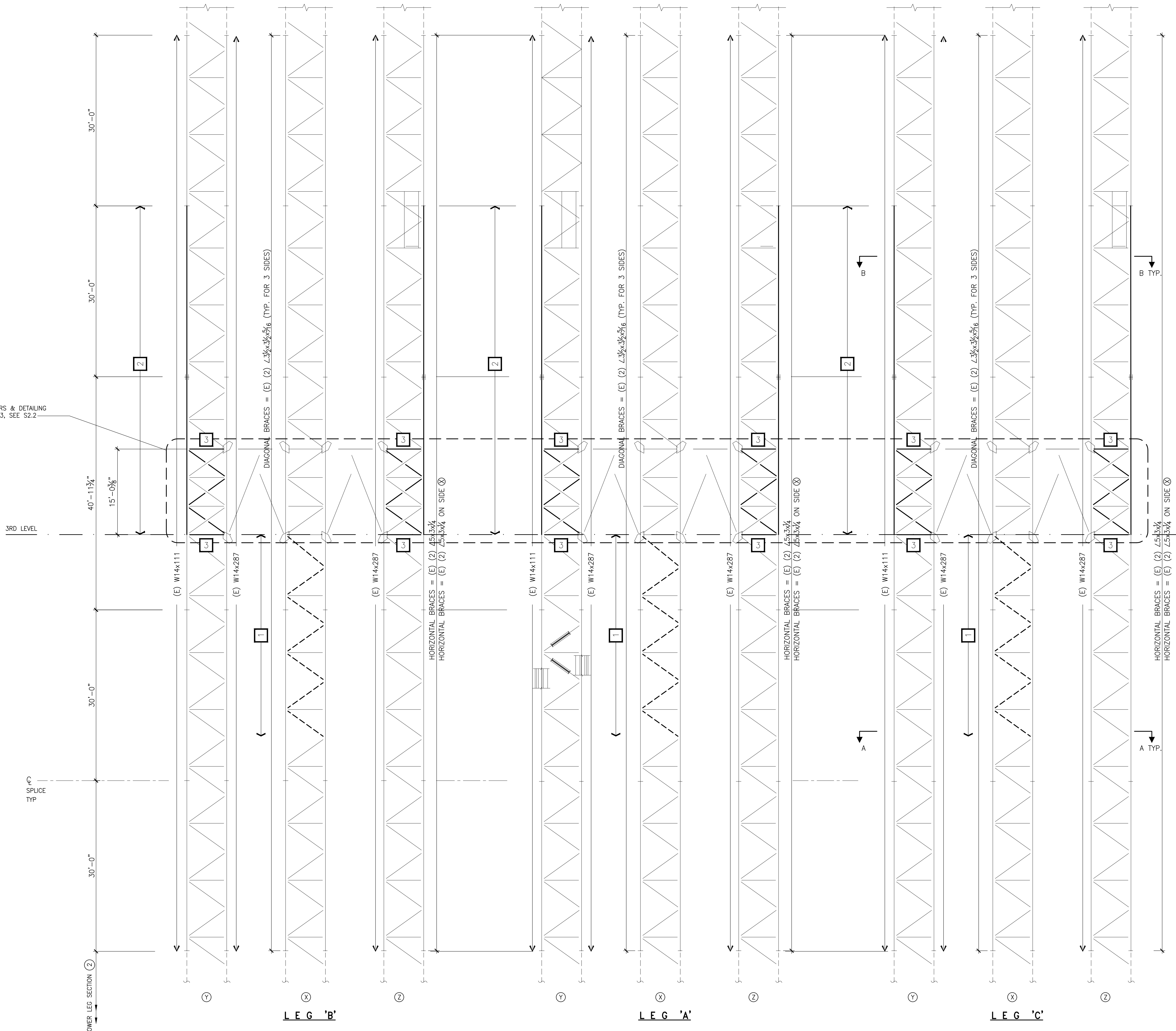
REGISTRED PROFESSIONAL ENGINEER
 FRANCIS D. HAMBURGER
 No. 2951
 STATE OF CALIFORNIA

Drawing No.
S3.2



EAST SIDE ELEVATION
TOWER WORK POINT ELEVATION
 SCALE: 1/32" = 1'-0"

FOR NEW MEMBERS & DETAILING
 @ TRUSS LEVEL 3, SEE S2.2



SECTIONS A-A AND B-B

- KEYNOTE:
- 1 STRENGTHEN (E) DIAGONAL BRACES W/ WT4x20 PER TYP. WHERE OCCURS
 - 2 STRENGTHEN (E) W14x111 PER TYP.
 - 3 STRENGTHEN (E) HORIZ. BRACES W/ WT4x20 PER TYP. WHERE OCCURS

3 TOWER LEGS SECTION
 SCALE: 1/8"=1'-0"

No.	Date	Description	By
12/18/16		ISSUED FOR PERMIT	ROH
9/2/17		ISSUED FOR PLANNING REVIEW	ROH

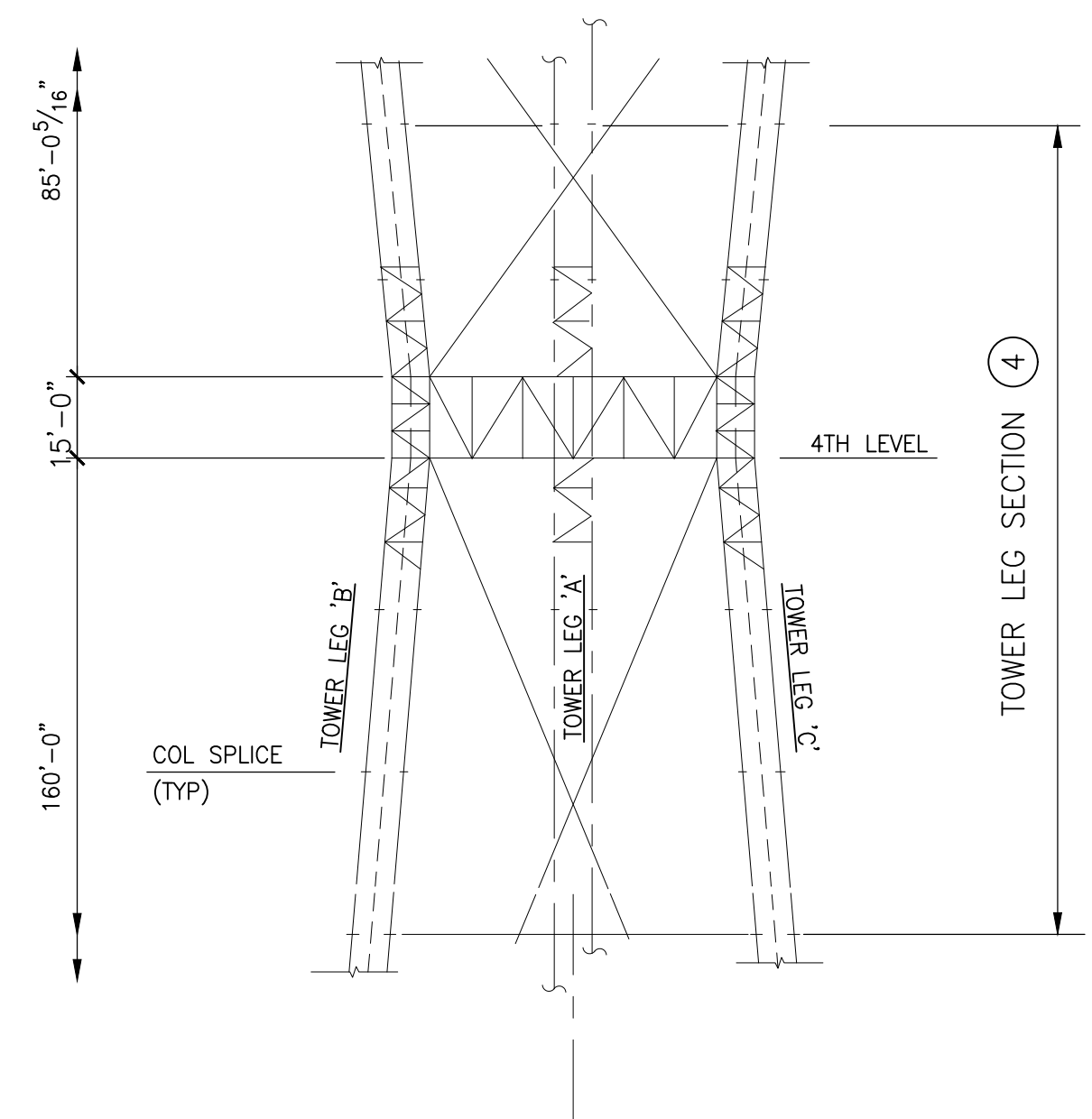
BROADCAST CHANNEL REPACKING PROJECT

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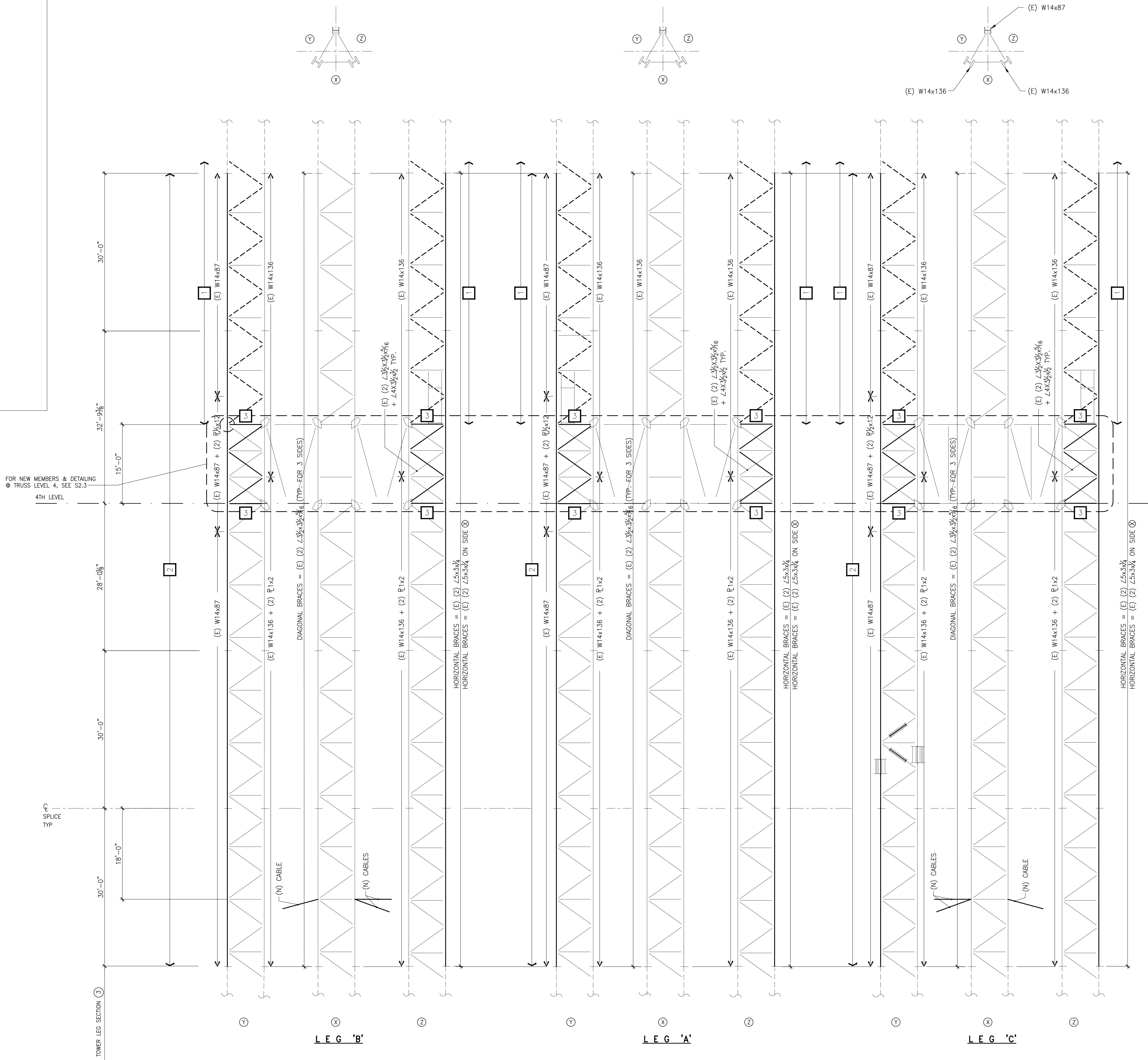
TOWER SECTION - 3 LEG FRAMING LEVEL 3 TO LEVEL 4

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Drawing No. **S3.3**



EAST SIDE ELEVATION
TOWER WORK POINT ELEVATION
 SCALE: 1/32" = 1'-0"



FOR NEW MEMBERS & DETAILING
 SEE TRUSS LEVEL 4, SEE S2.3

- KEYNOTE:**
- 1 STRENGTHEN (E) DIAGONAL BRACES W/ WT4x20 PER TYP. WHERE OCCURS
 - 2 STRENGTHEN (E) W14x87 PER TYP. WHERE OCCURS
 - 3 STRENGTHEN (E) HORIZ. BRACES W/ WT4x20 PER TYP. WHERE OCCURS

4 TOWER LEGS SECTION
 SCALE: 1/8" = 1'-0"

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

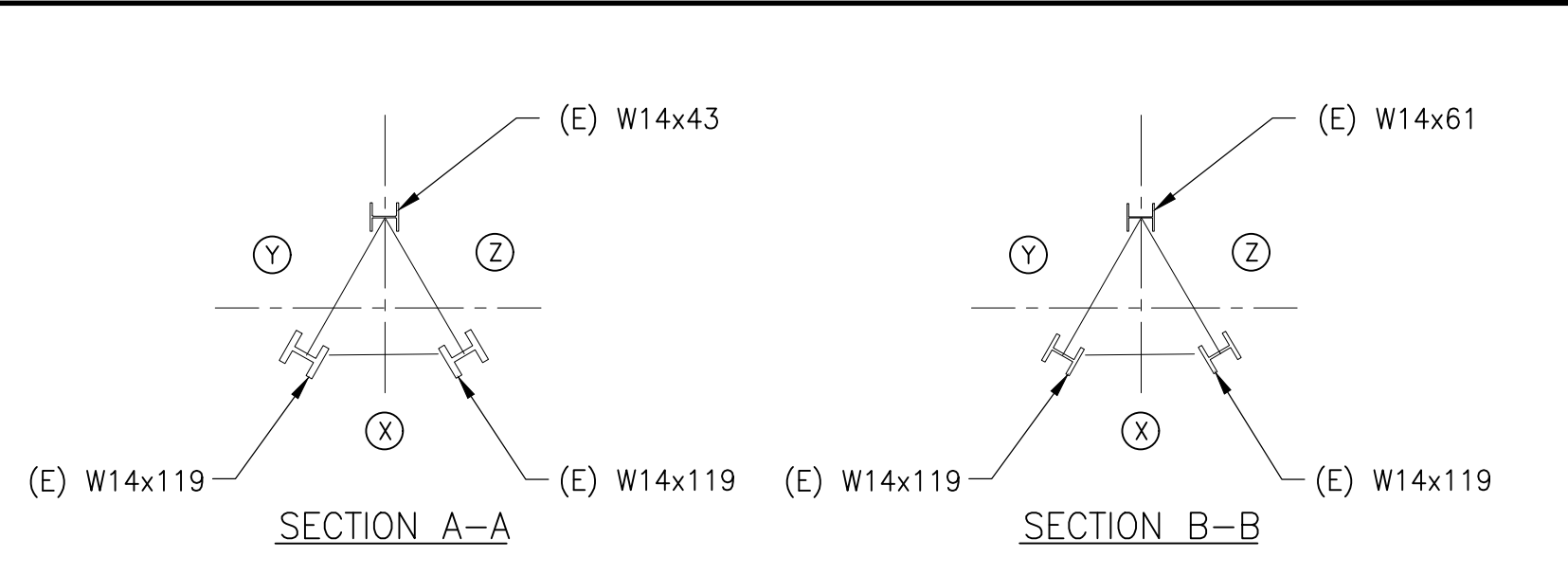
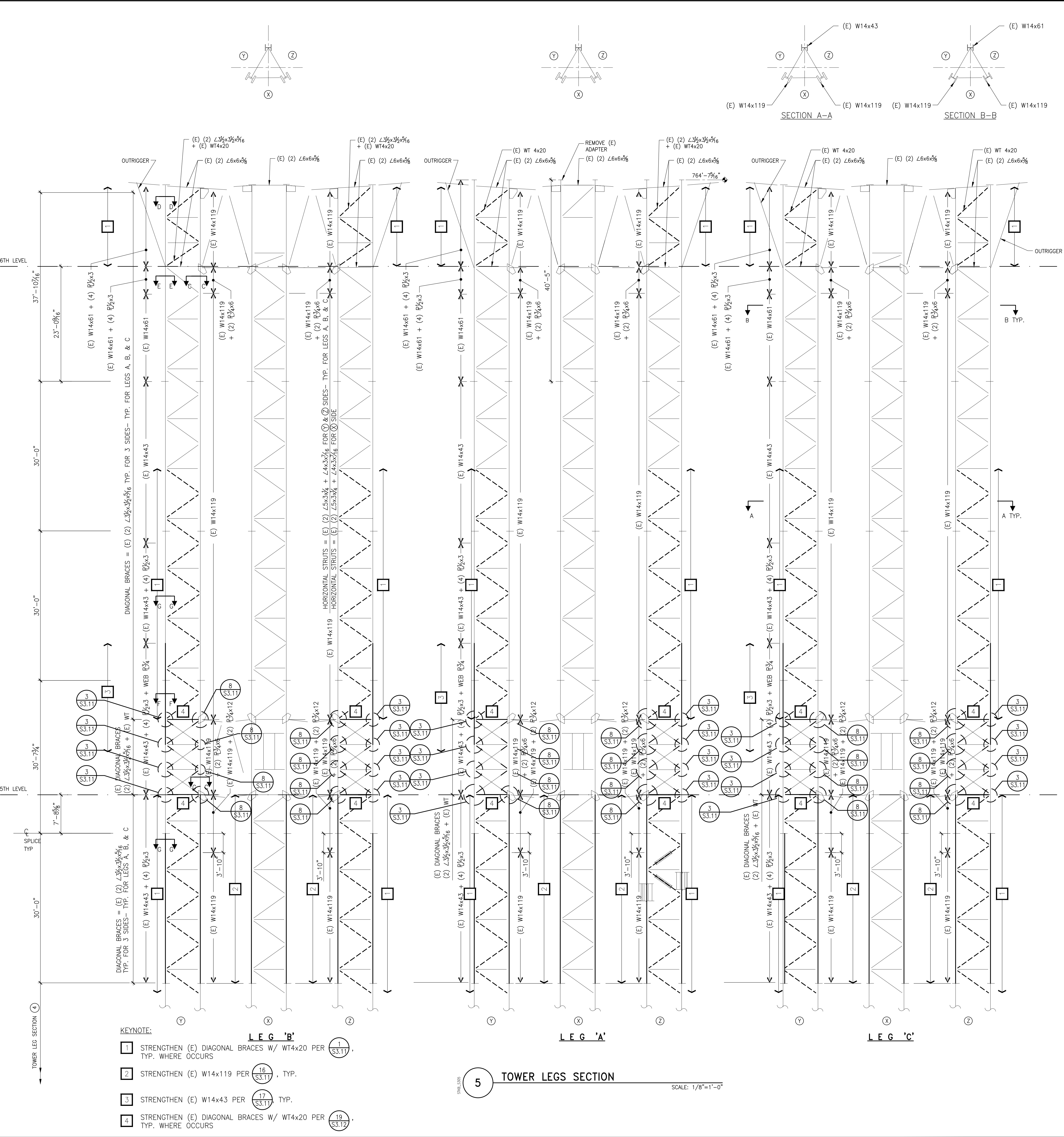
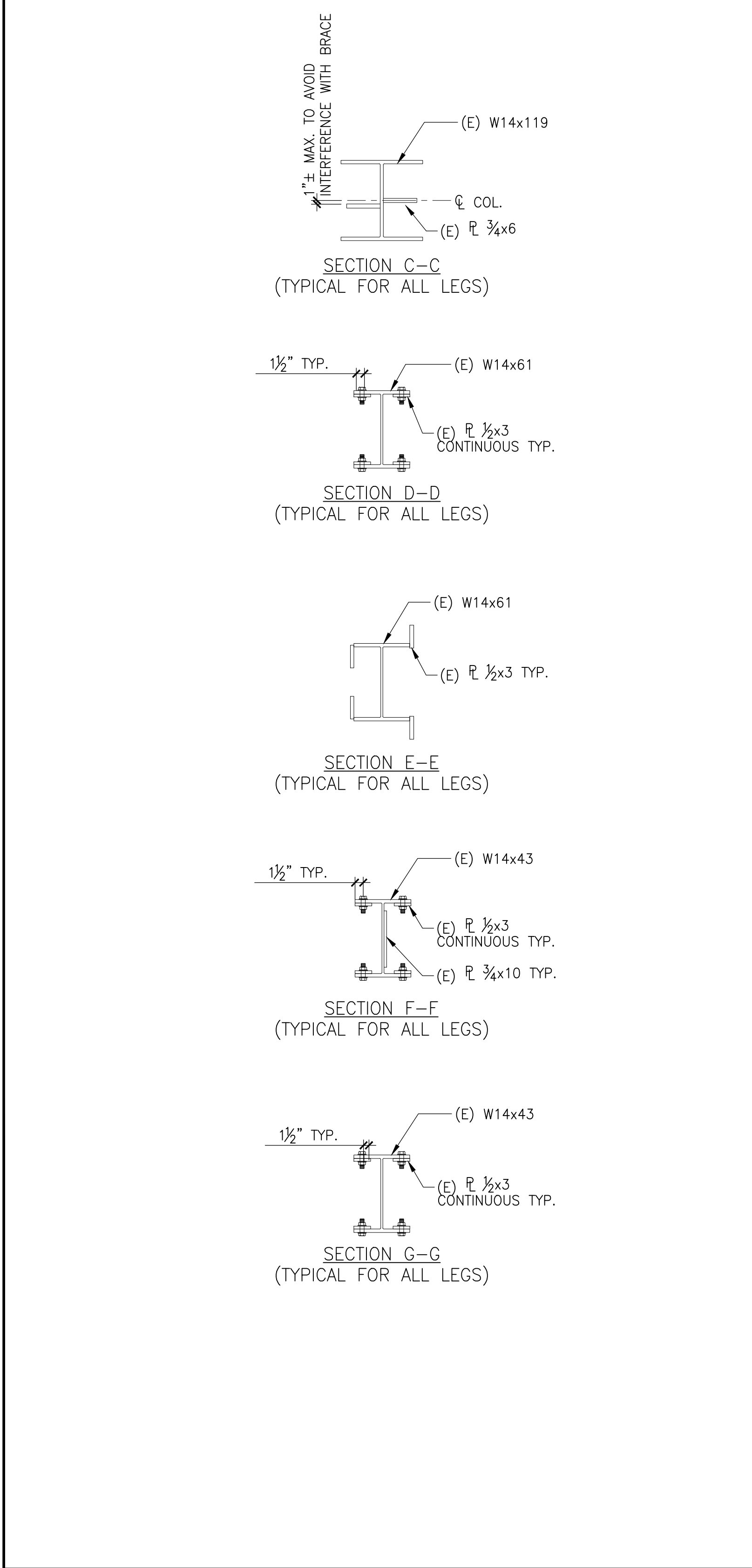
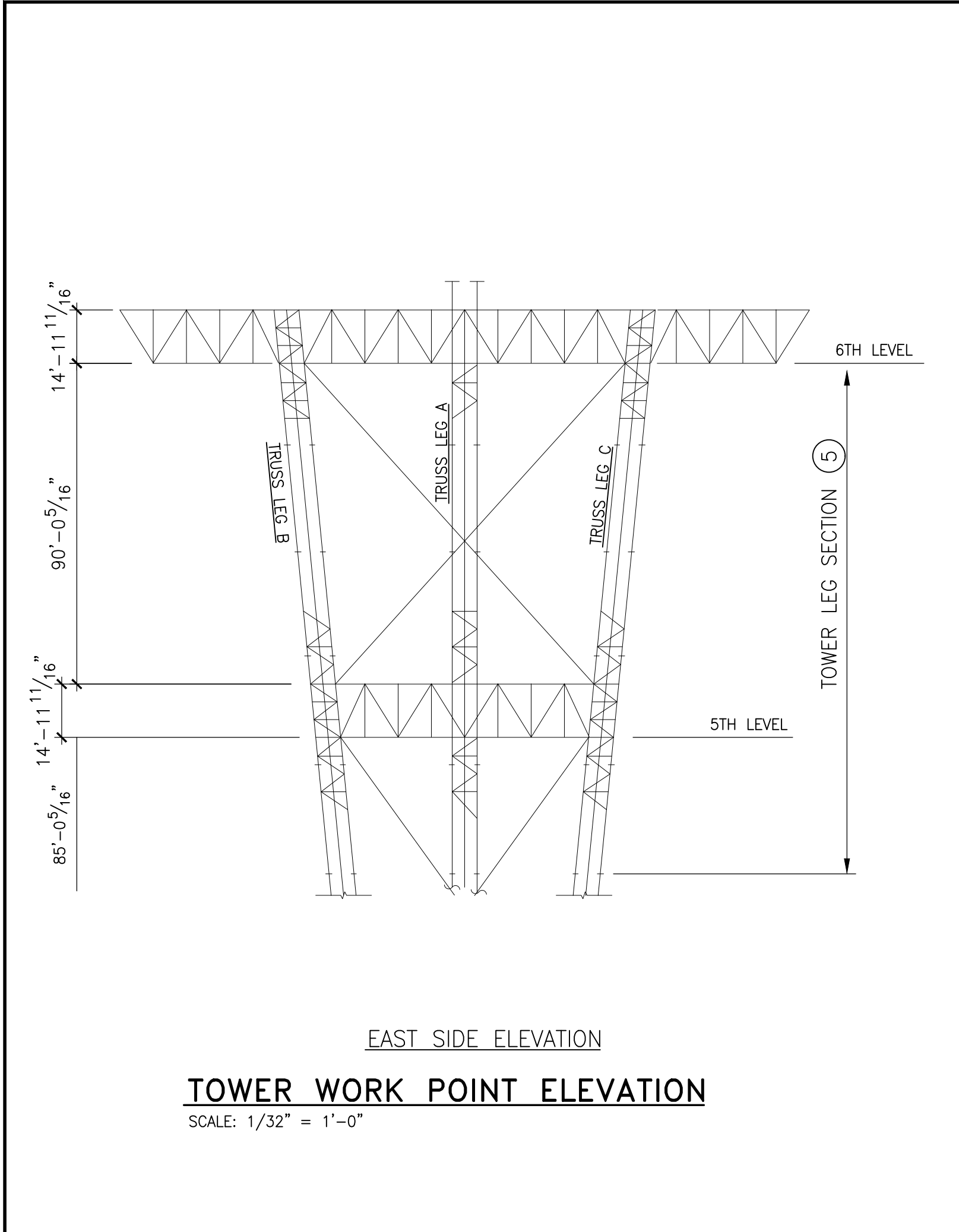
1 LA AVANZADA ST.
 SAN FRANCISCO
 CALIFORNIA

TOWER SECTION - 4 LEG FRAMING LEVEL 4 TO LEVEL 5

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Drawing No. **S3.4**

F:\SFA\Projects\2006\067199-24-STKB\Drawings\Working_Sett\STKB_S305.dwg



Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST. SAN FRANCISCO CALIFORNIA

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TOWER SECTION - 5 LEG FRAMING LEVEL 5 TO LEVEL 6

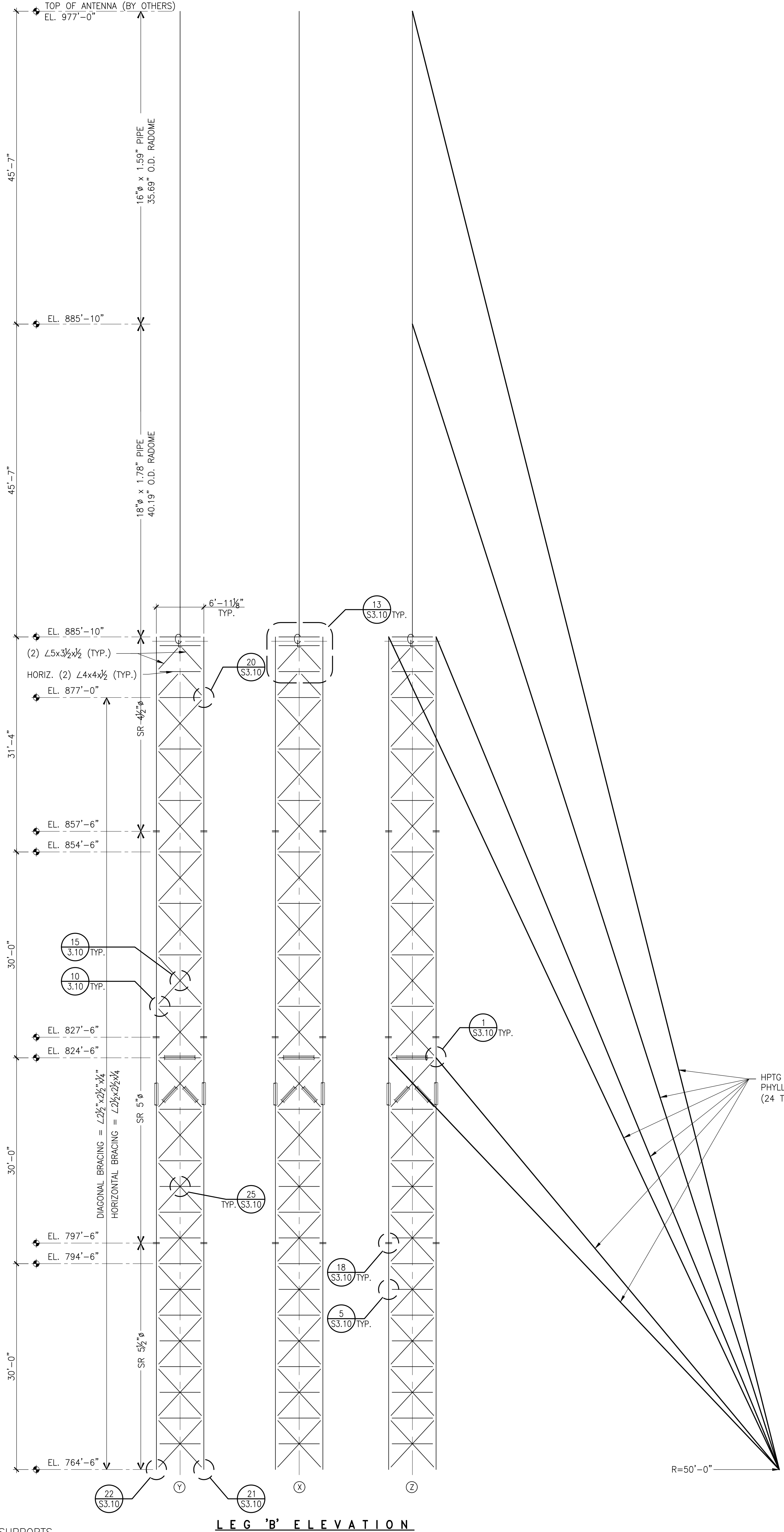
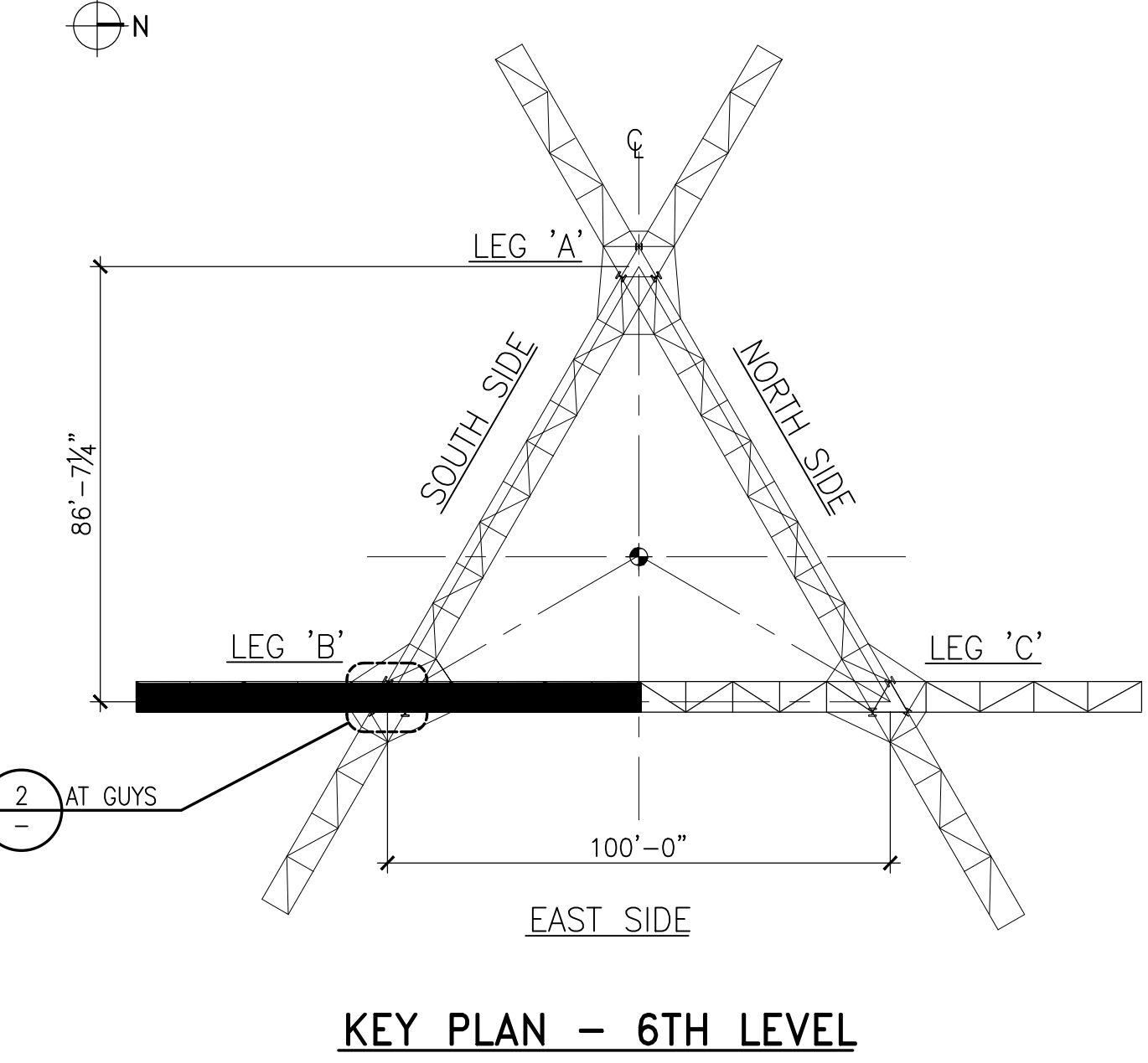
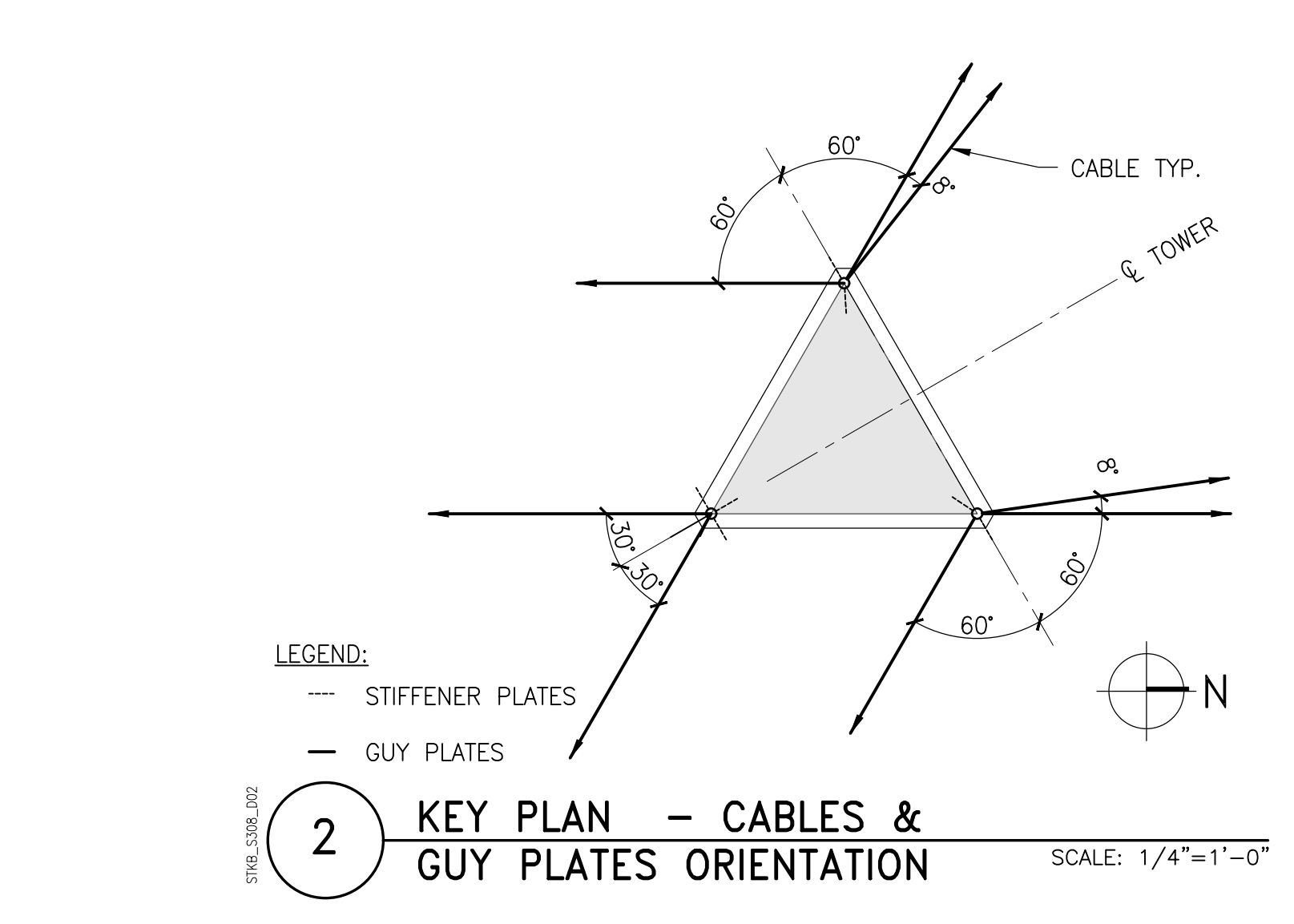
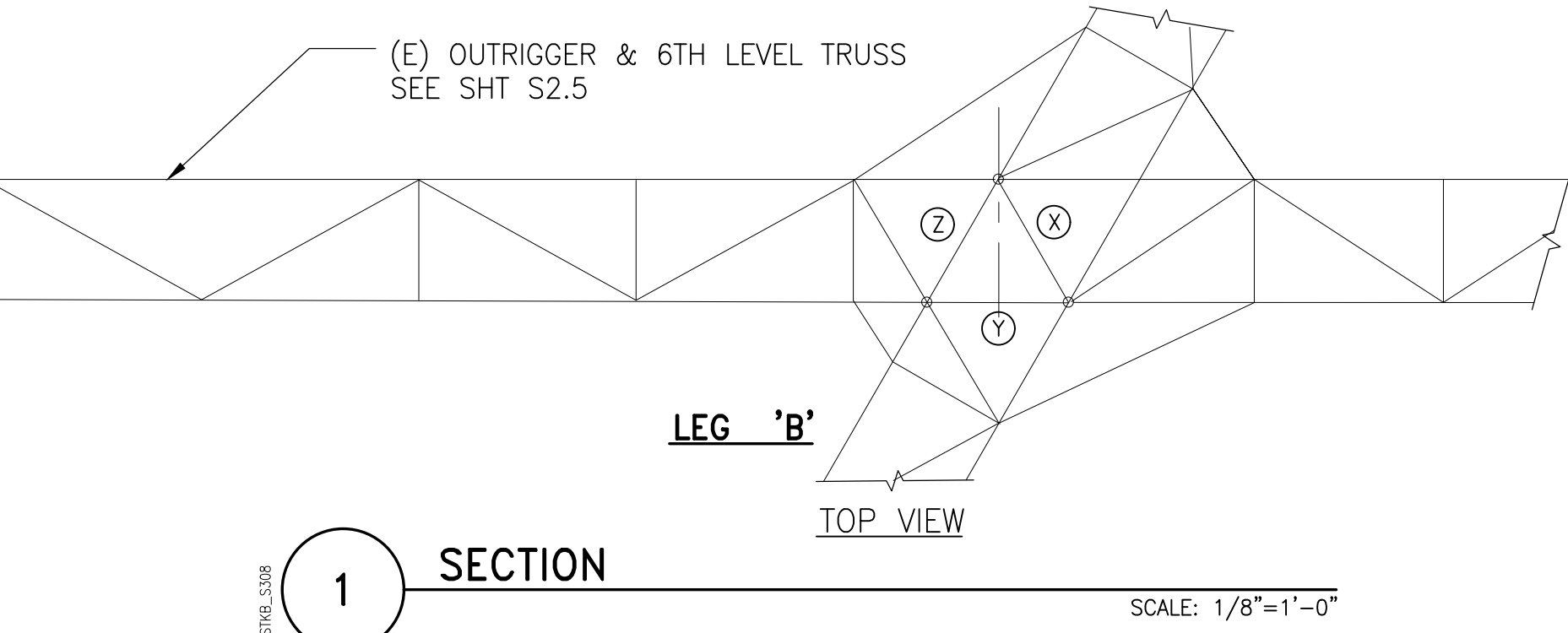
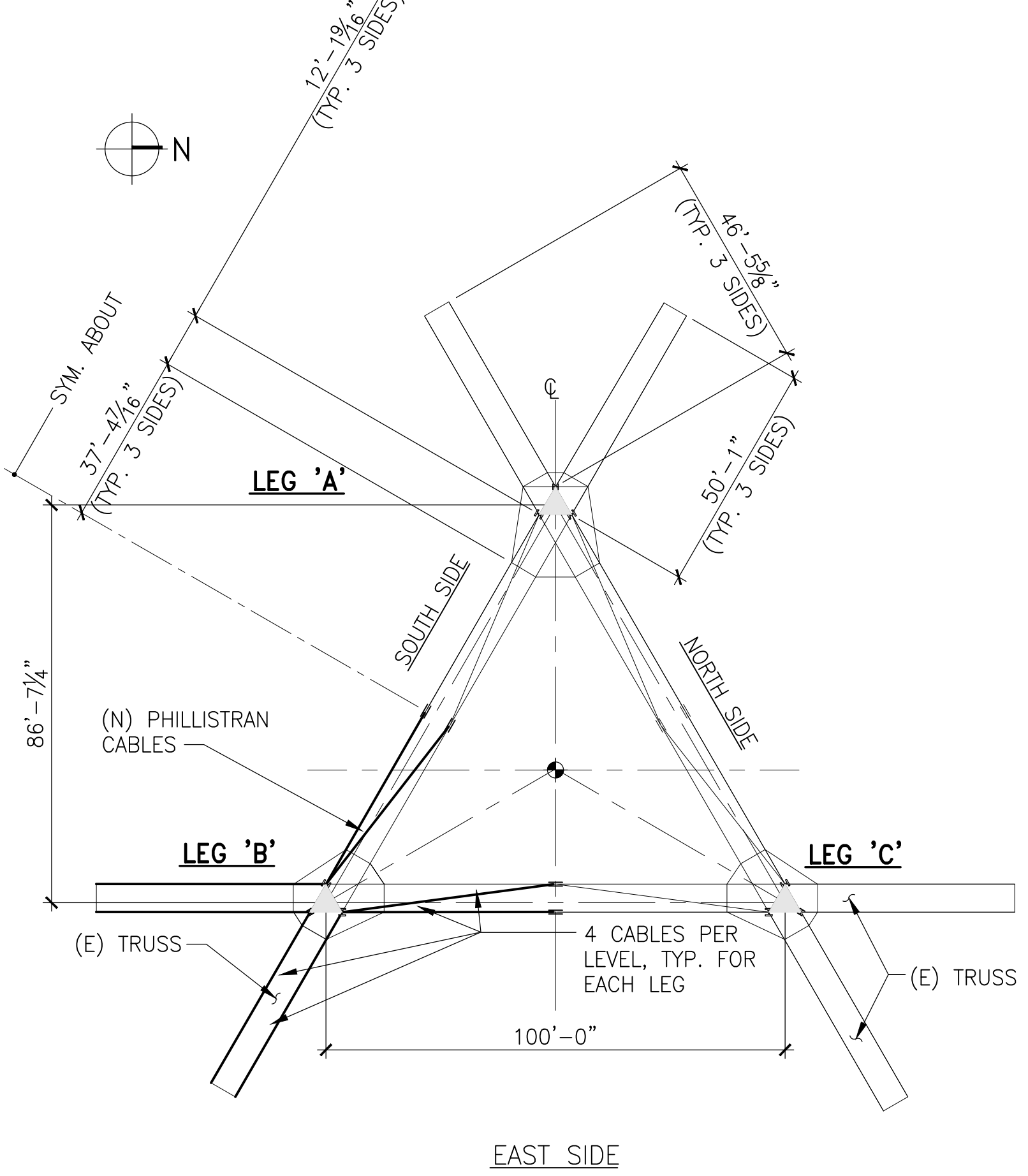
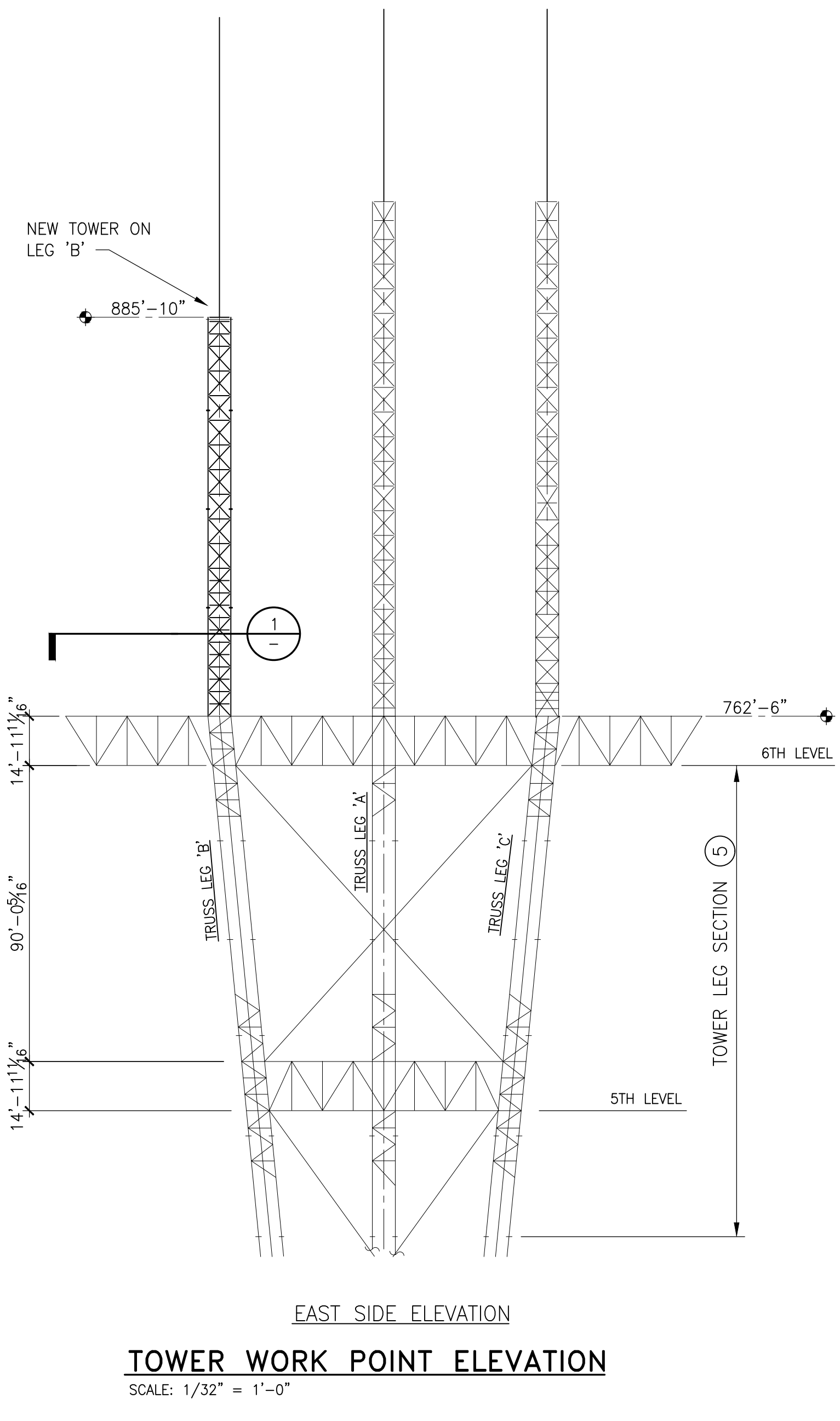
Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Drawing No.

S3.5

REGISTERED PROFESSIONAL ENGINEER
FRANK D. HAMBURGER
No. 2951
STATE OF CALIFORNIA



- S.R. INDICATE SOLID ROUND CONFORMING TO ASTM A572-GR.50
- HEAVY LINES REPRESENT NEW ELEMENTS

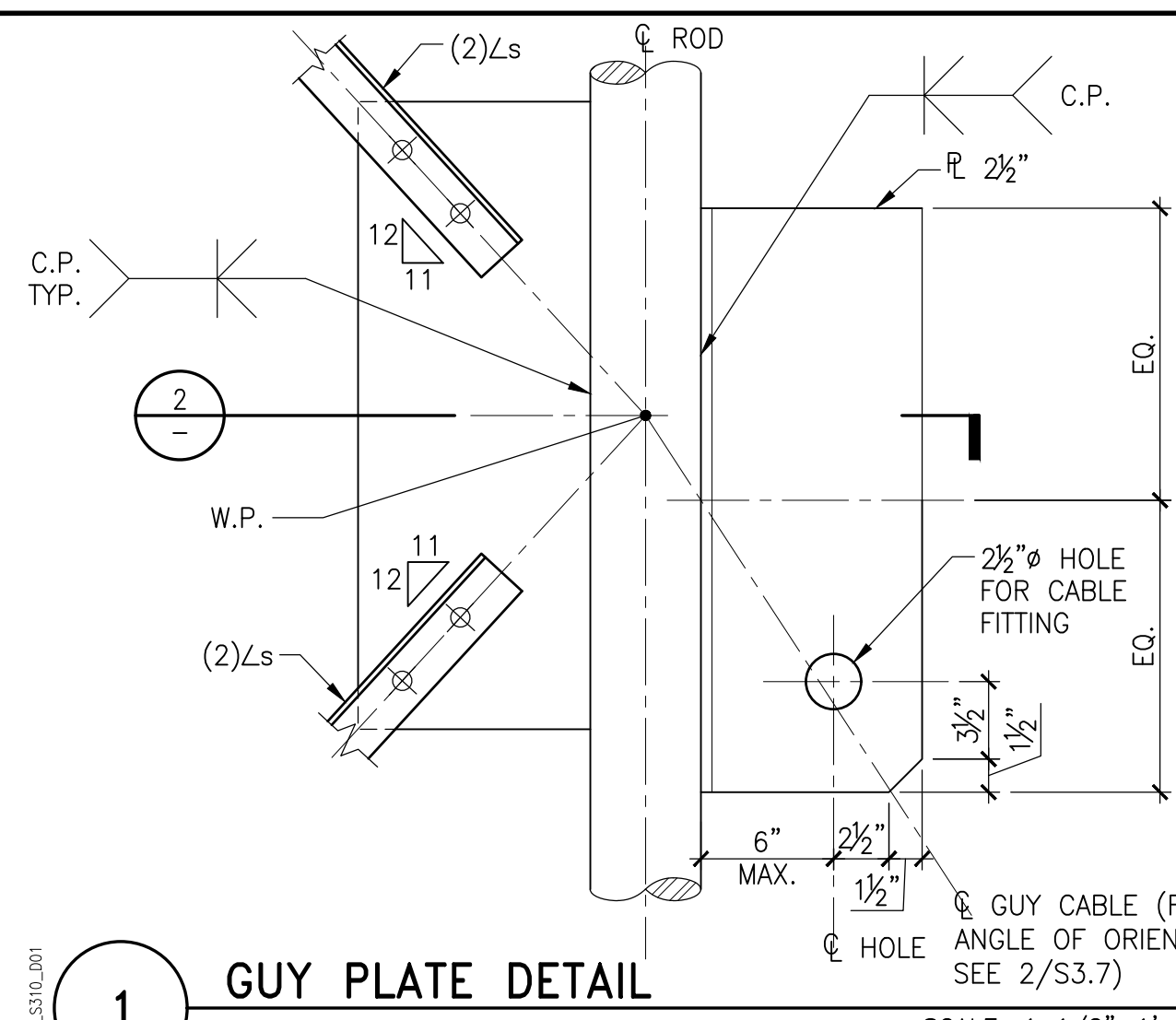
No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

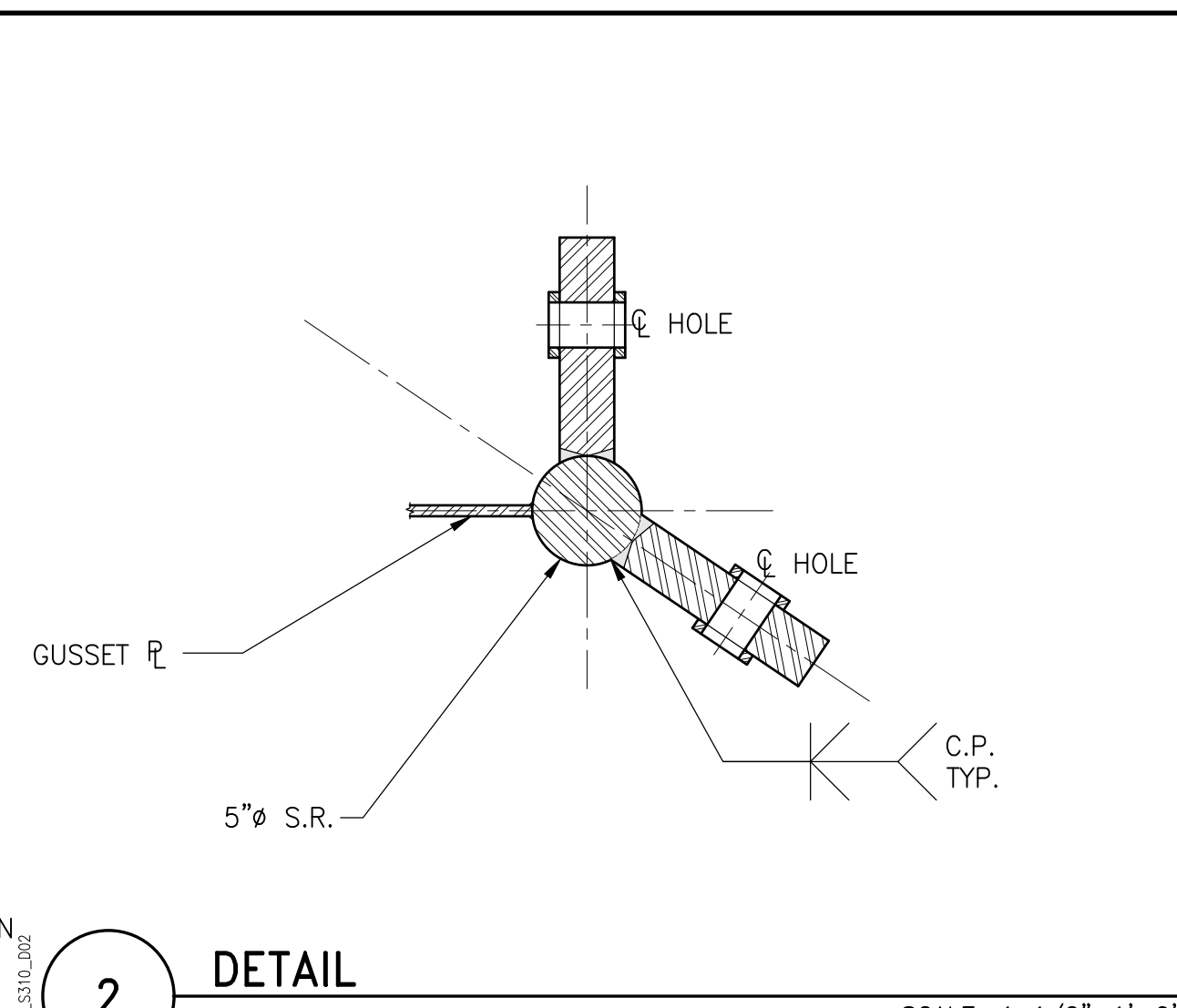
1 LA AVANZADA ST.
SAN FRANCISCO
CALIFORNIA

ANTENNA STACK SUPPORTS LEG B

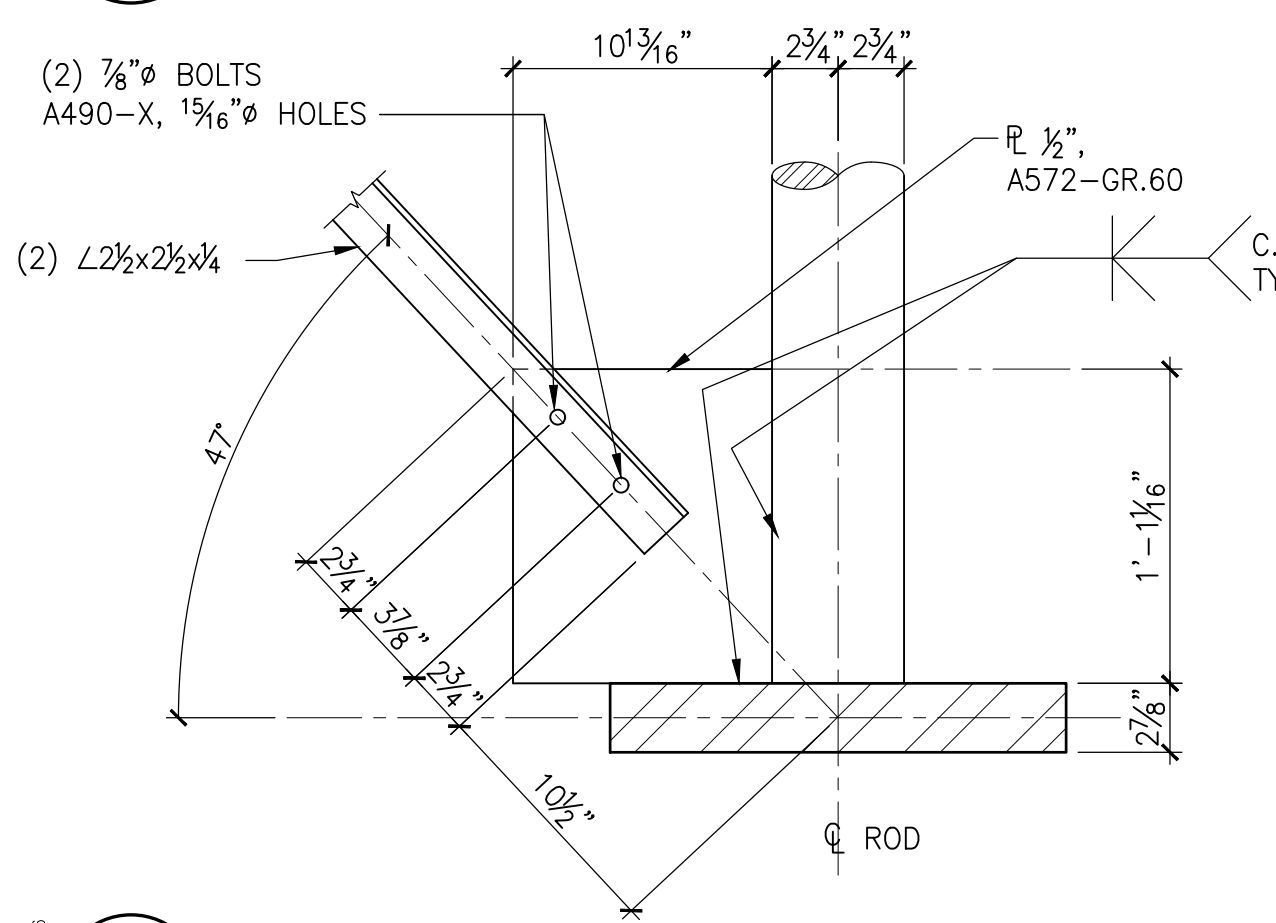
Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED
		Drawing No. S3.8



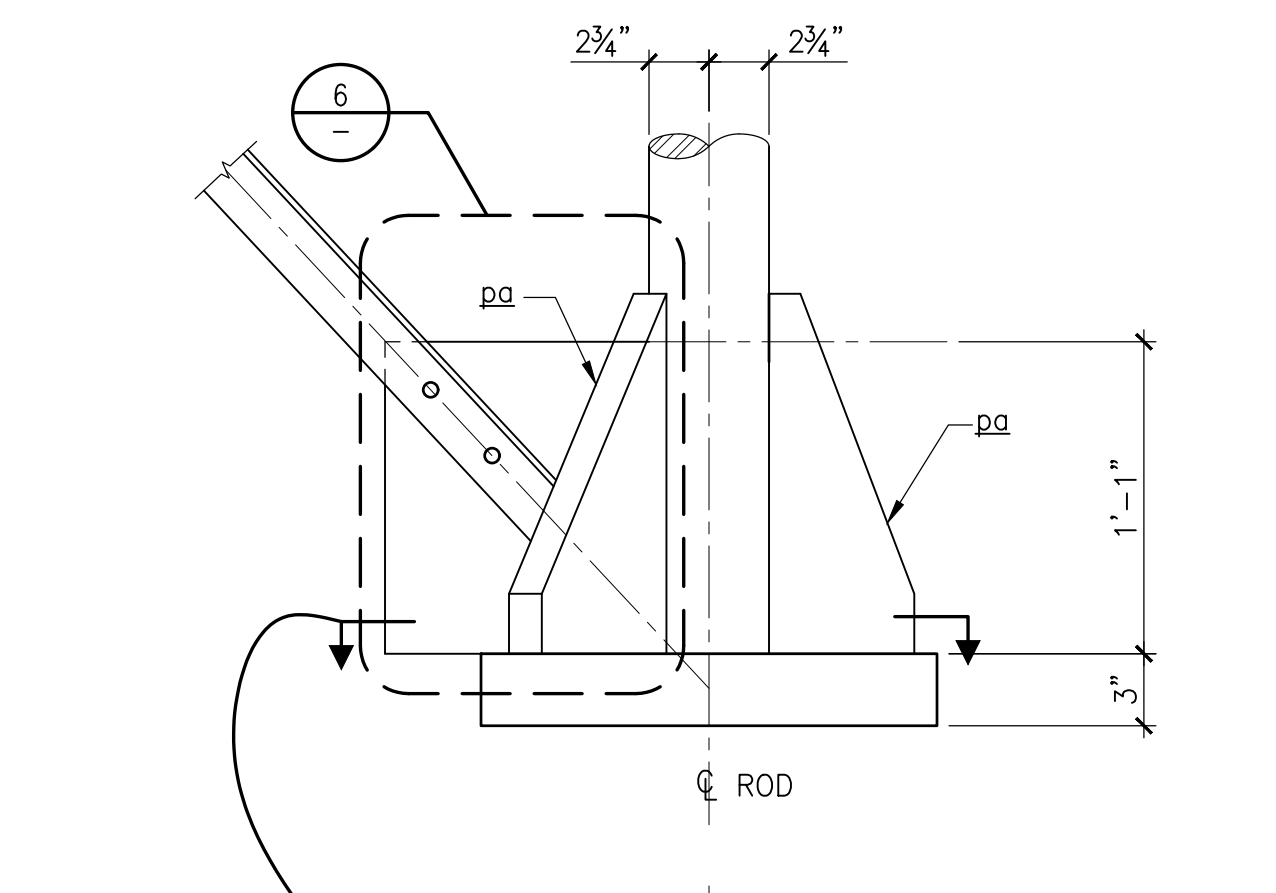
1 GUY PLATE DETAIL SCALE: 1 1/2"=1'-0"



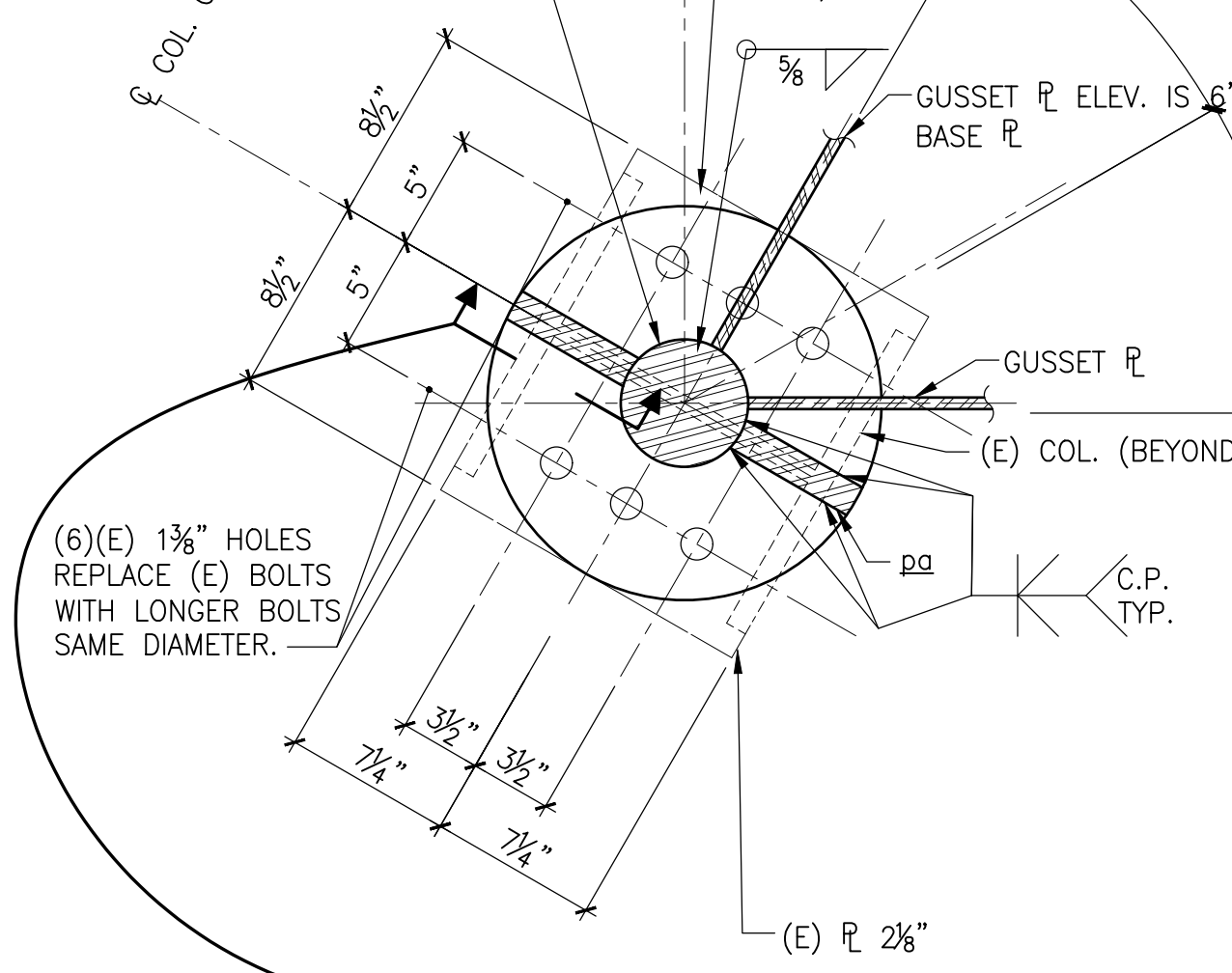
2 DETAIL SCALE: 1 1/2"=1'-0"



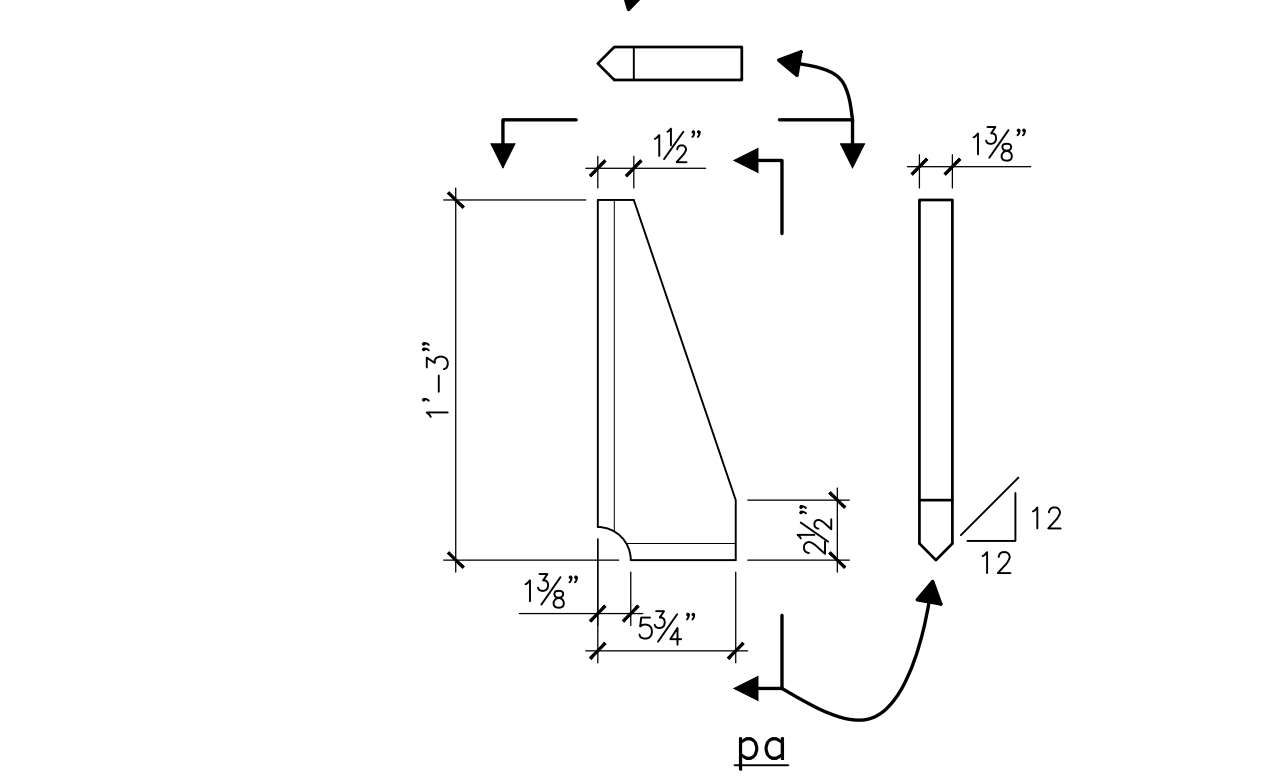
6 DETAIL SCALE: 1 1/2"=1'-0"



12 DETAIL SCALE: 1 1/2"=1'-0"



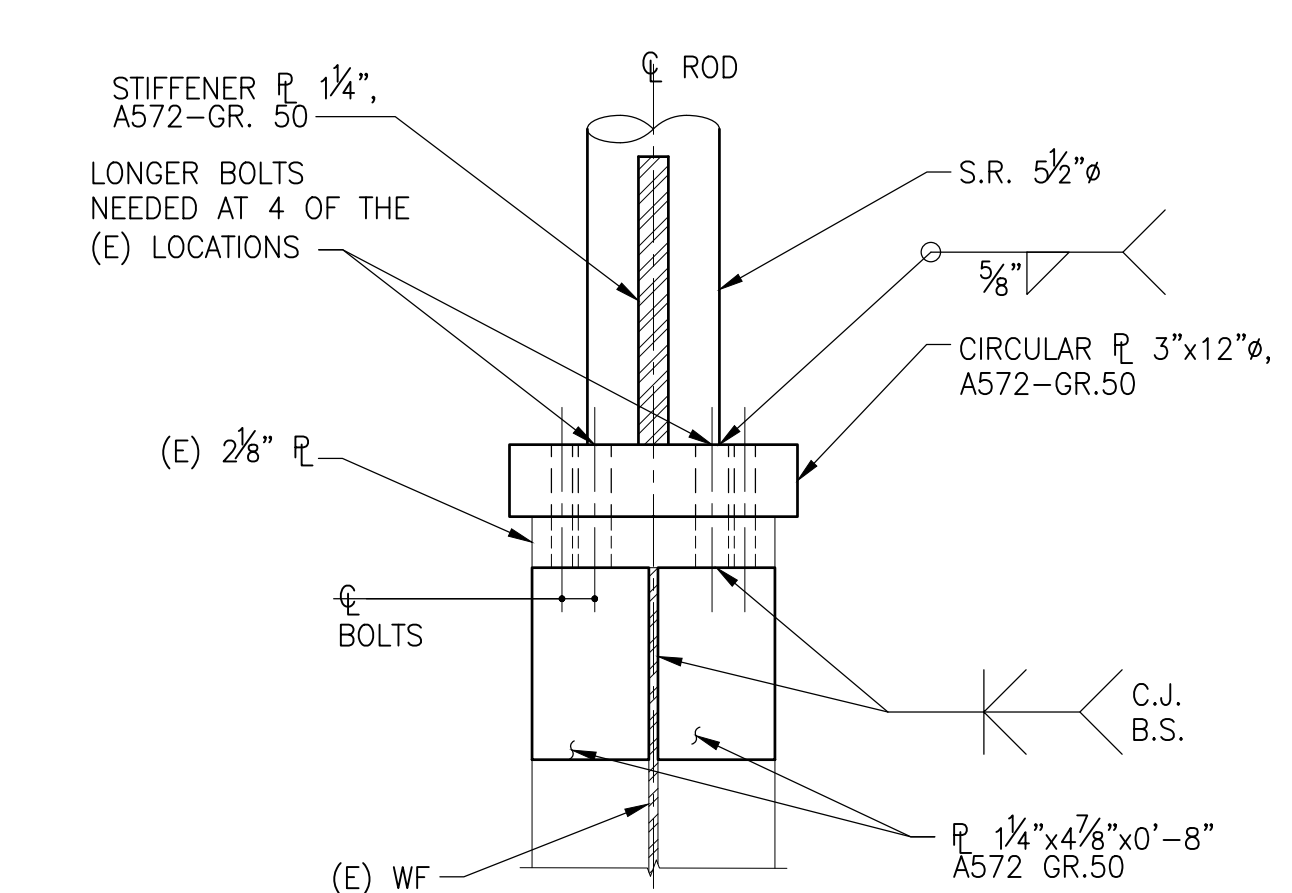
12 DETAIL SCALE: 1 1/2"=1'-0"



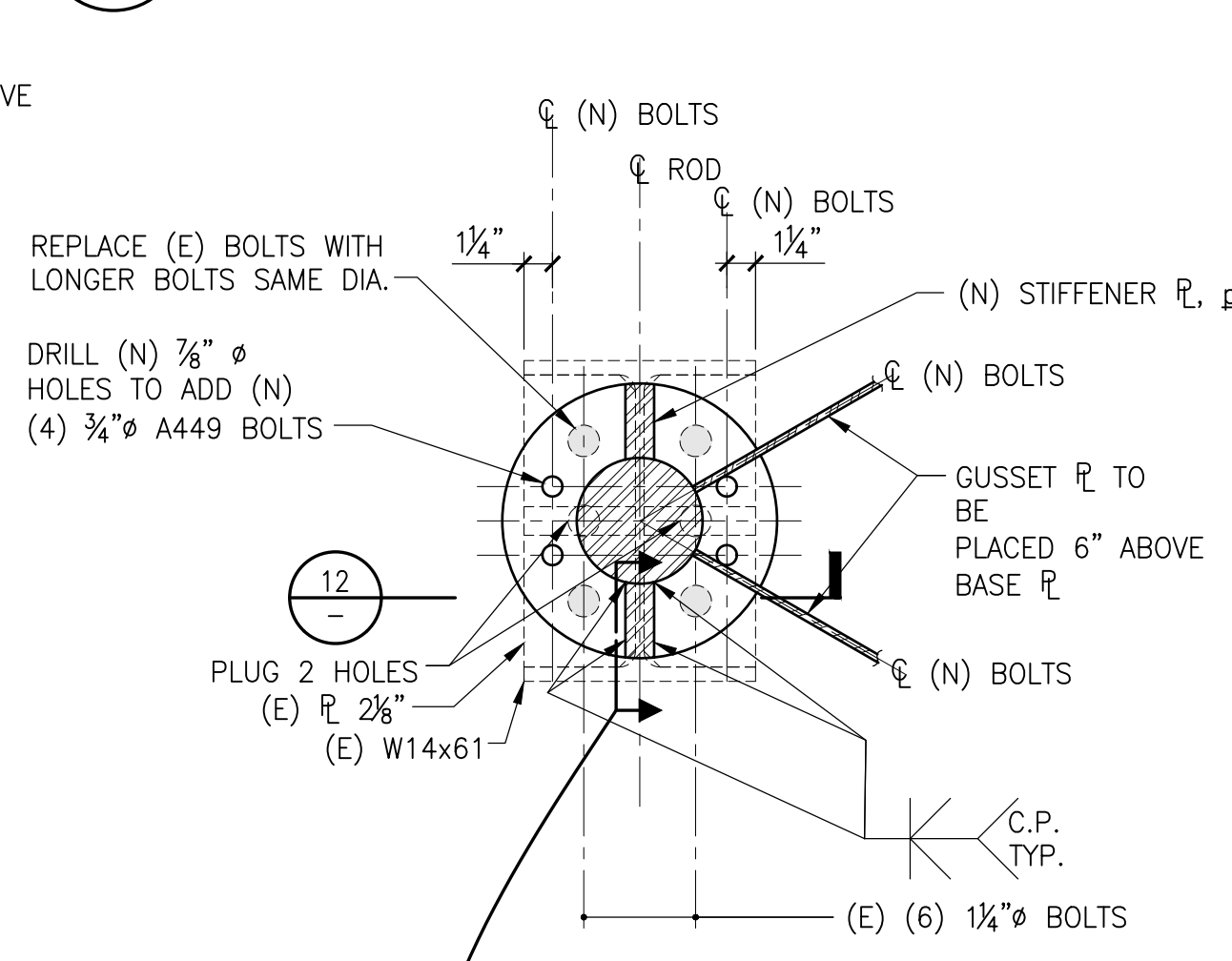
21 BASE PLATE AT STRONG COLUMN SCALE: 1 1/2"=1'-0"



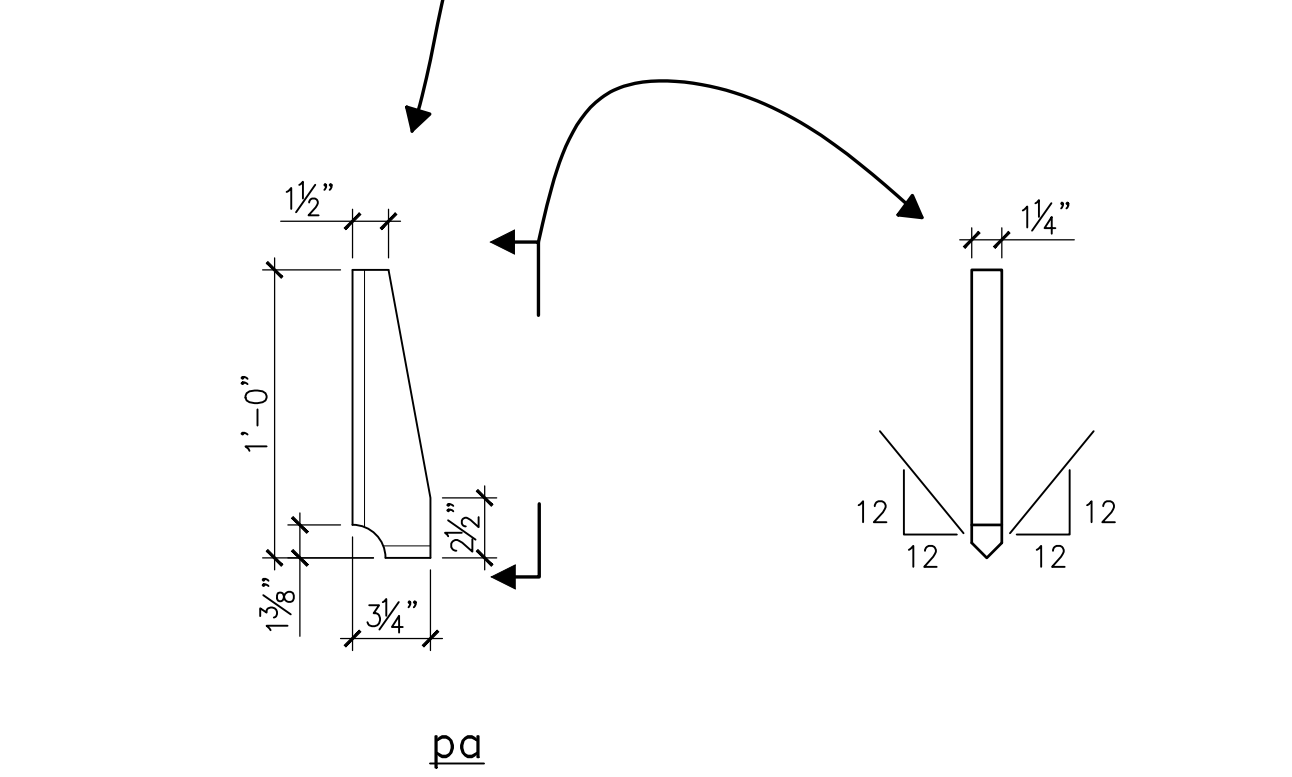
6 DETAIL SCALE: 1 1/2"=1'-0"



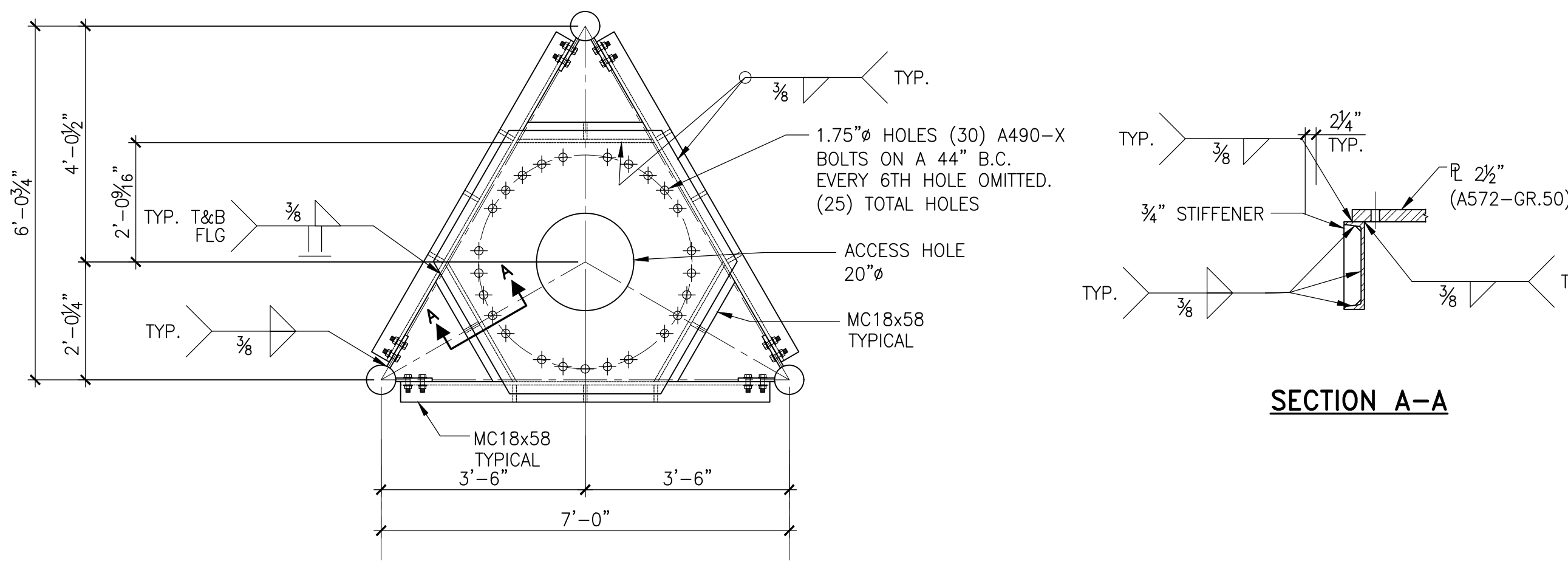
12 DETAIL SCALE: 1 1/2"=1'-0"



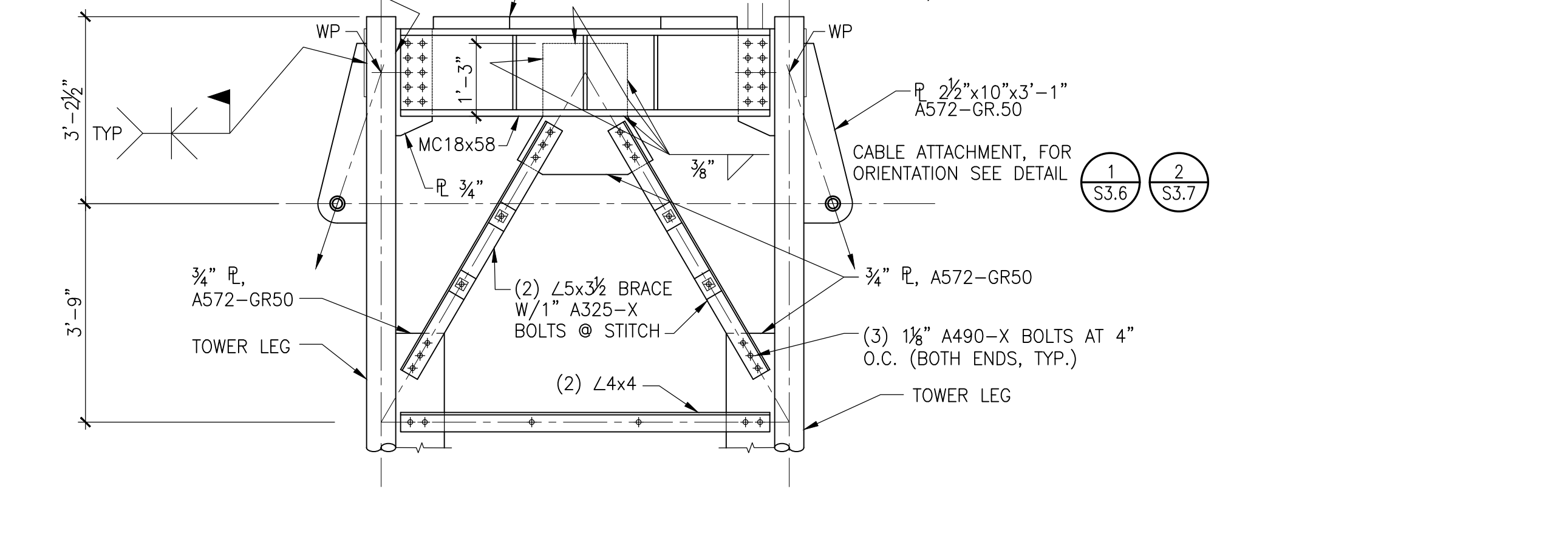
12 DETAIL SCALE: 1 1/2"=1'-0"



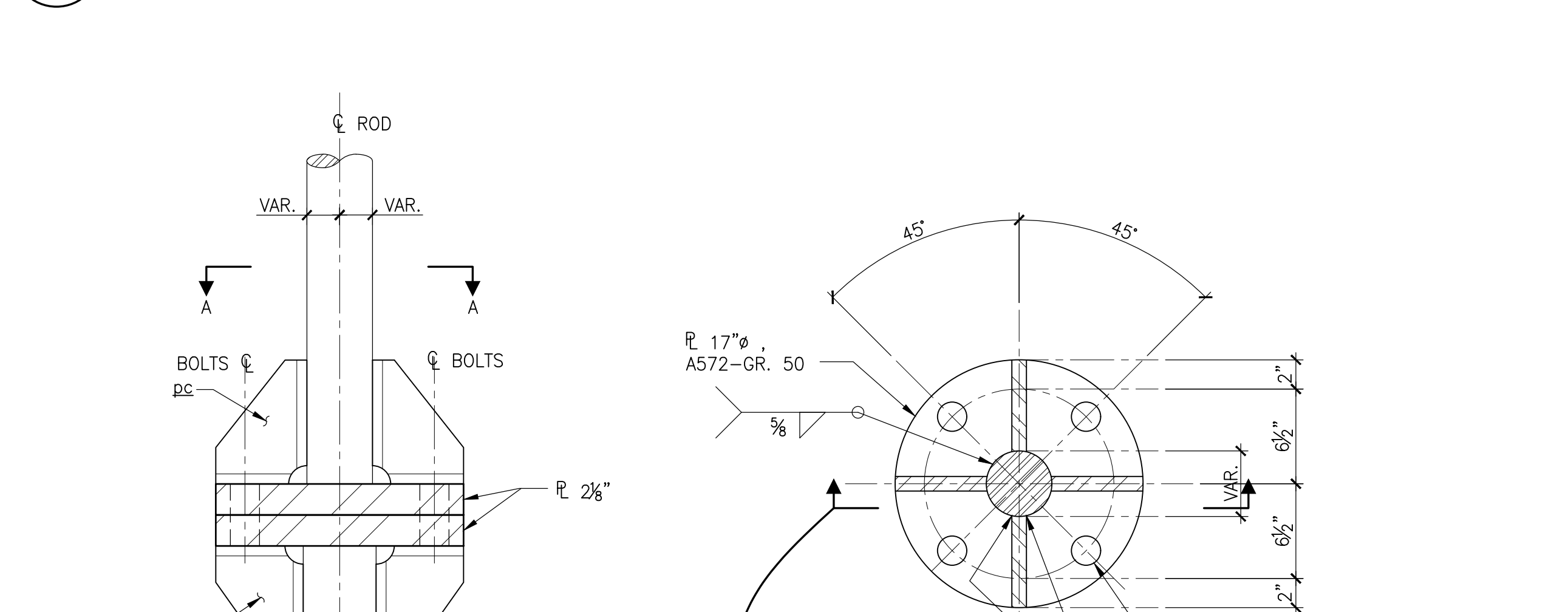
22 BASE PLATE AT WEAK COLUMN SCALE: 1 1/2"=1'-0"



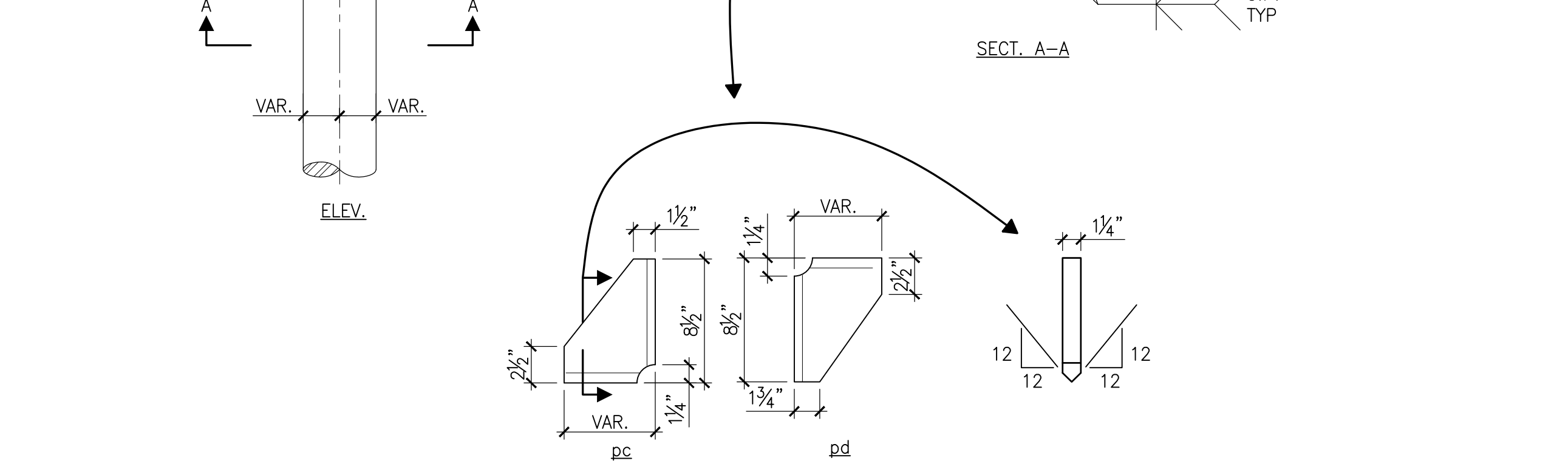
8 ANTENNA BASE CONFIGURATION SCALE: 1/2"=1'-0"



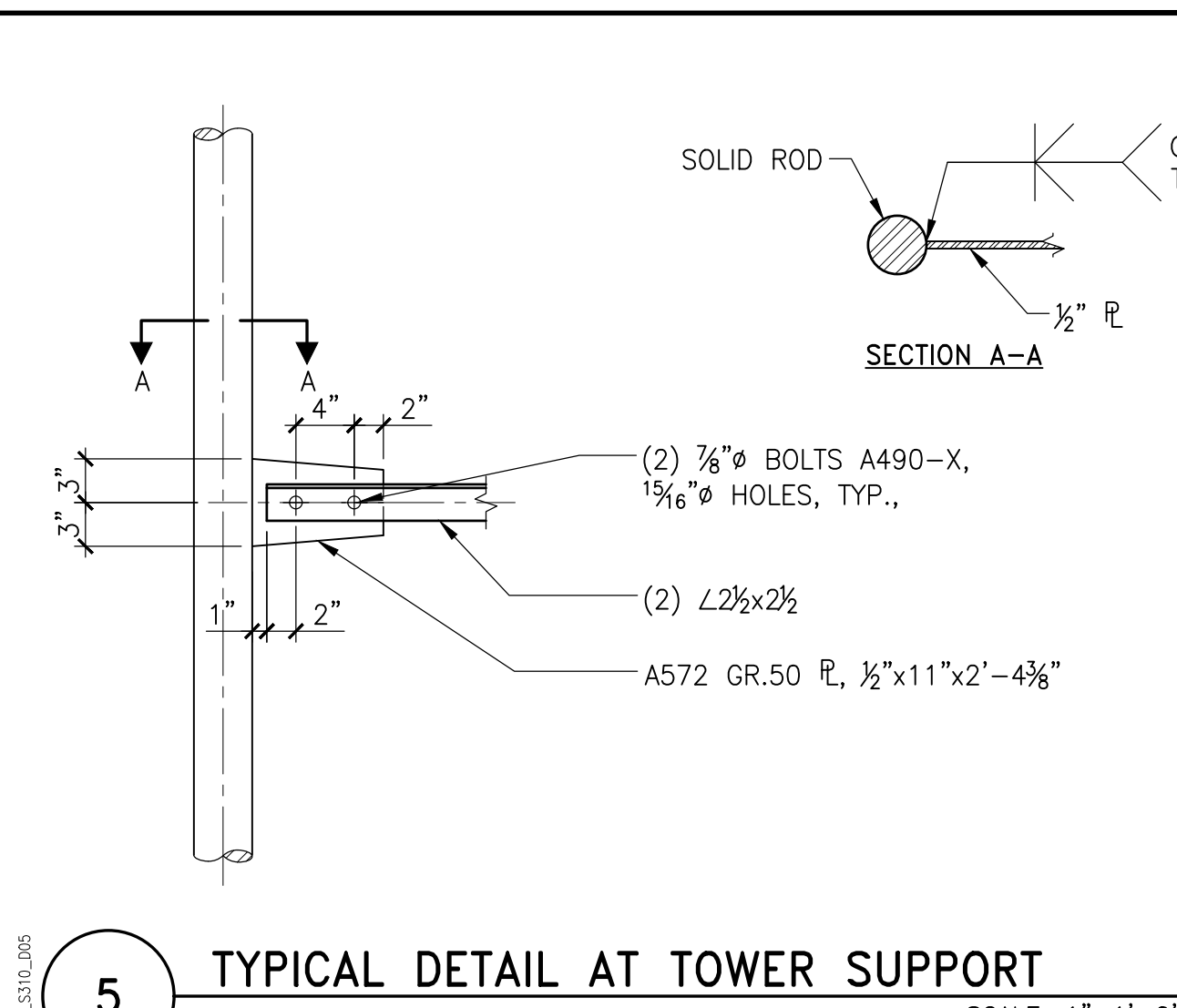
13 ANTENNA BASE CONFIGURATION SCALE: 1/2"=1'-0"



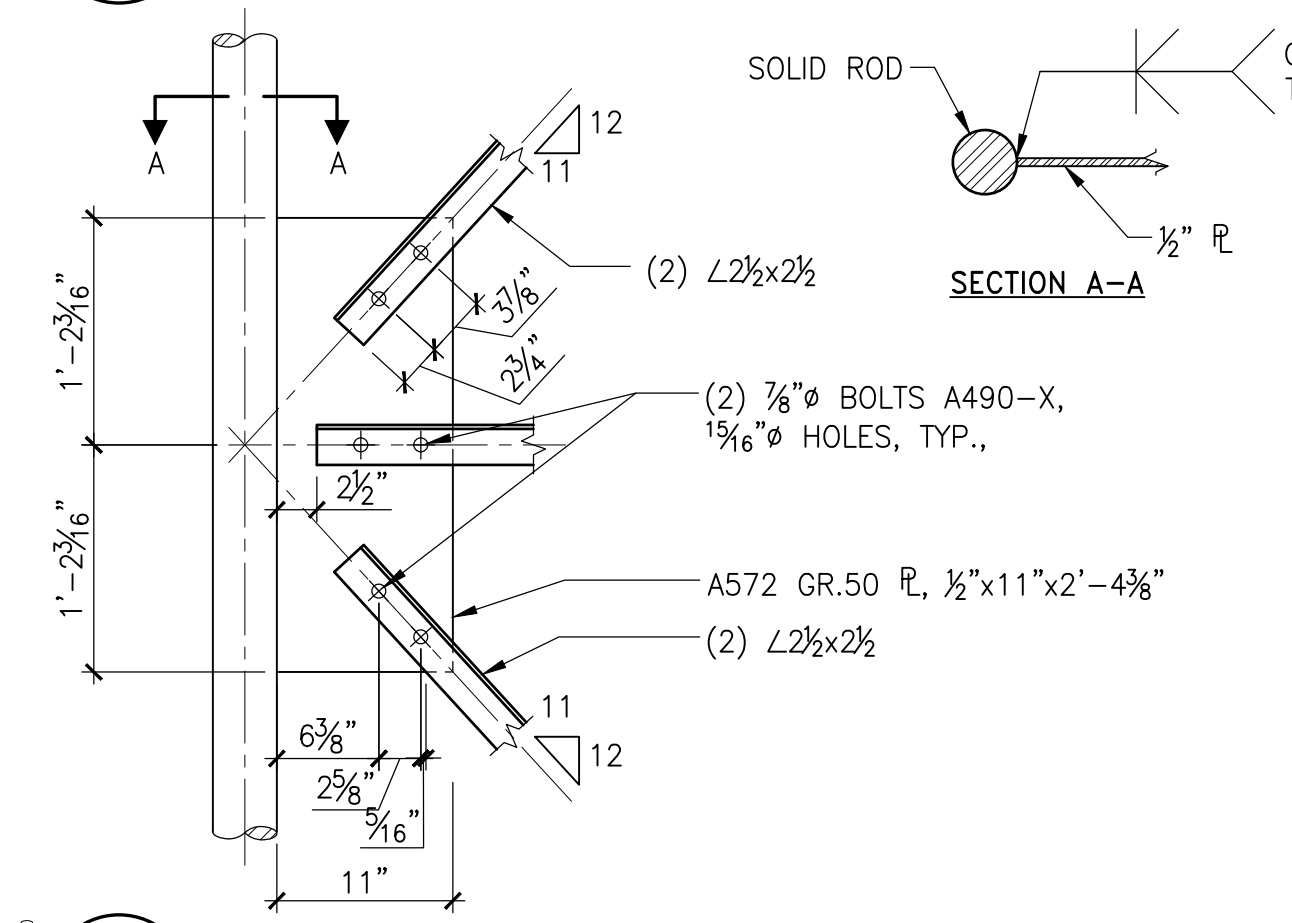
13 ANTENNA BASE CONFIGURATION SCALE: 1/2"=1'-0"



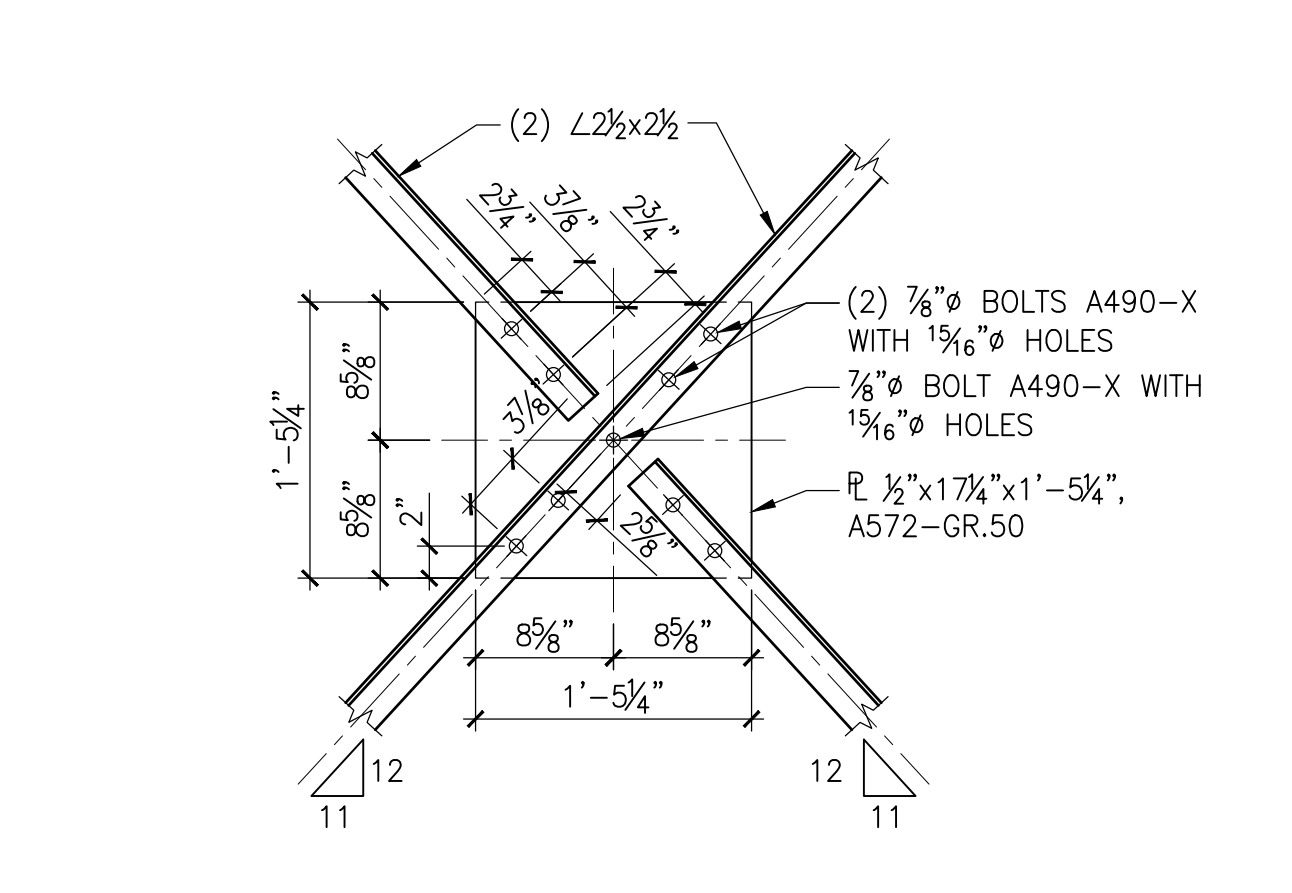
23 TYPICAL SPLICE BEARING PLATE SCALE: 1 1/2"=1'-0"



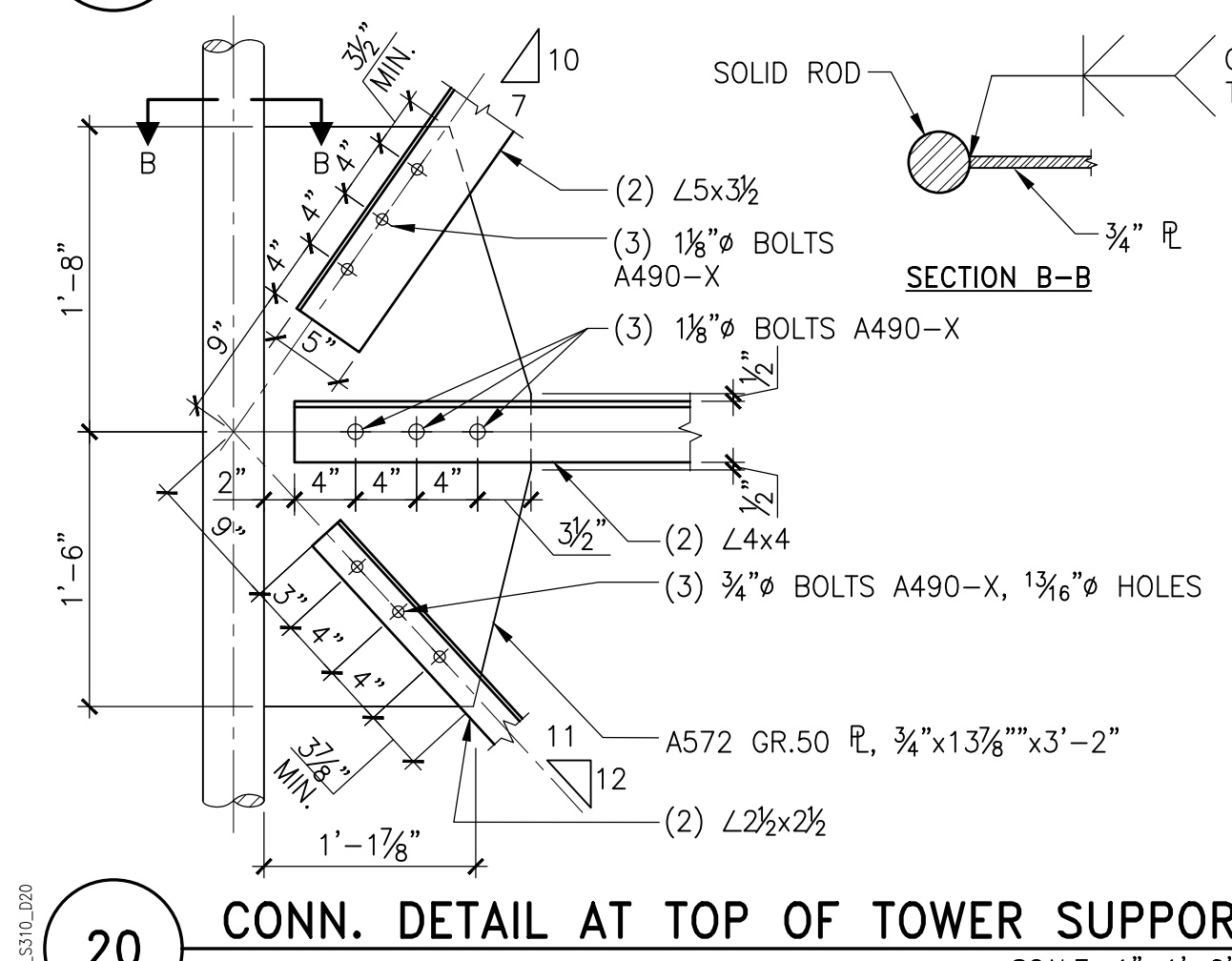
5 TYPICAL DETAIL AT TOWER SUPPORT SCALE: 1"=1'-0"



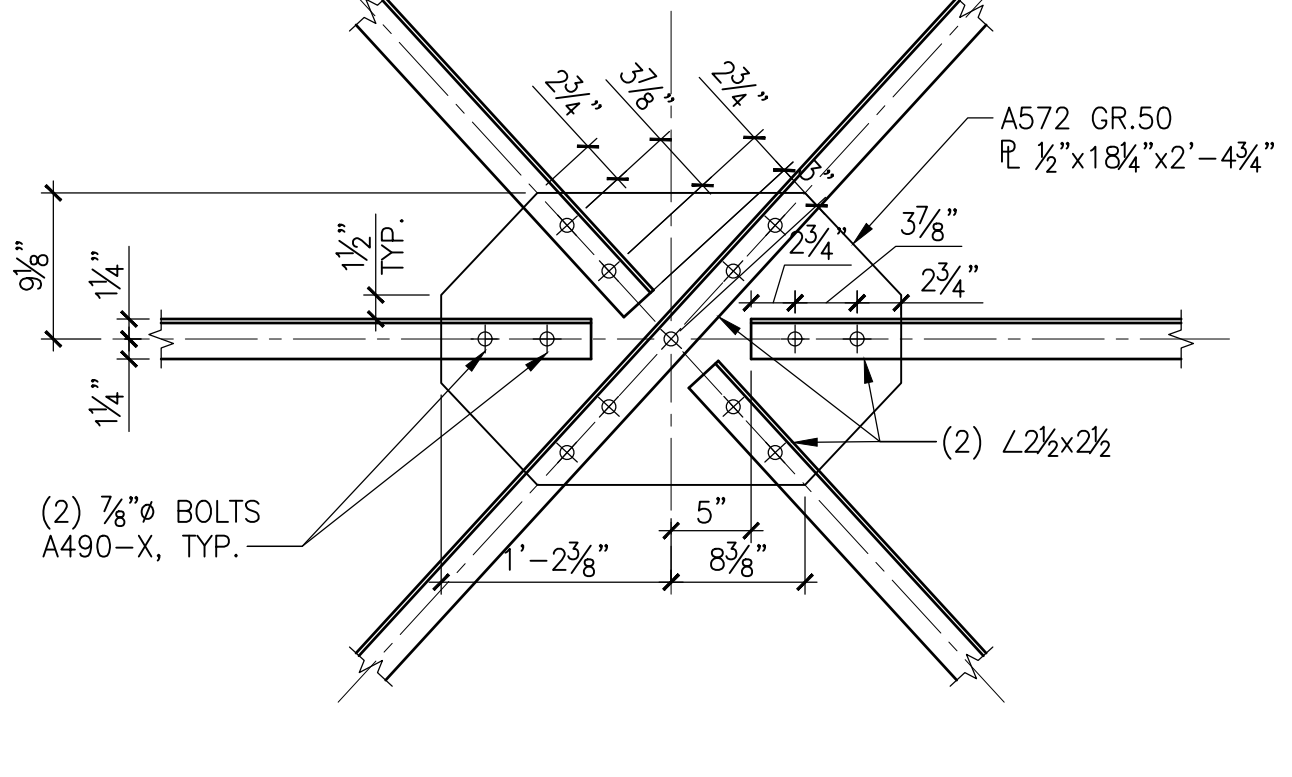
10 TYPICAL DETAIL AT TOWER SUPPORT SCALE: 1"=1'-0"



15 BRACE CONNECTING PLATE DETAIL AT TOWER SUPPORT SCALE: 1"=1'-0"



20 CONN. DETAIL AT TOP OF TOWER SUPPORT SCALE: 1"=1'-0"



25 CONNECTING PLATE DETAIL AT TOWER SUPPORT SCALE: 1"=1'-0"

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NOTE:
1. ALL PLATES ARE ASTM A572 GR.50 U.O.N.

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST.
SAN FRANCISCO
CALIFORNIA

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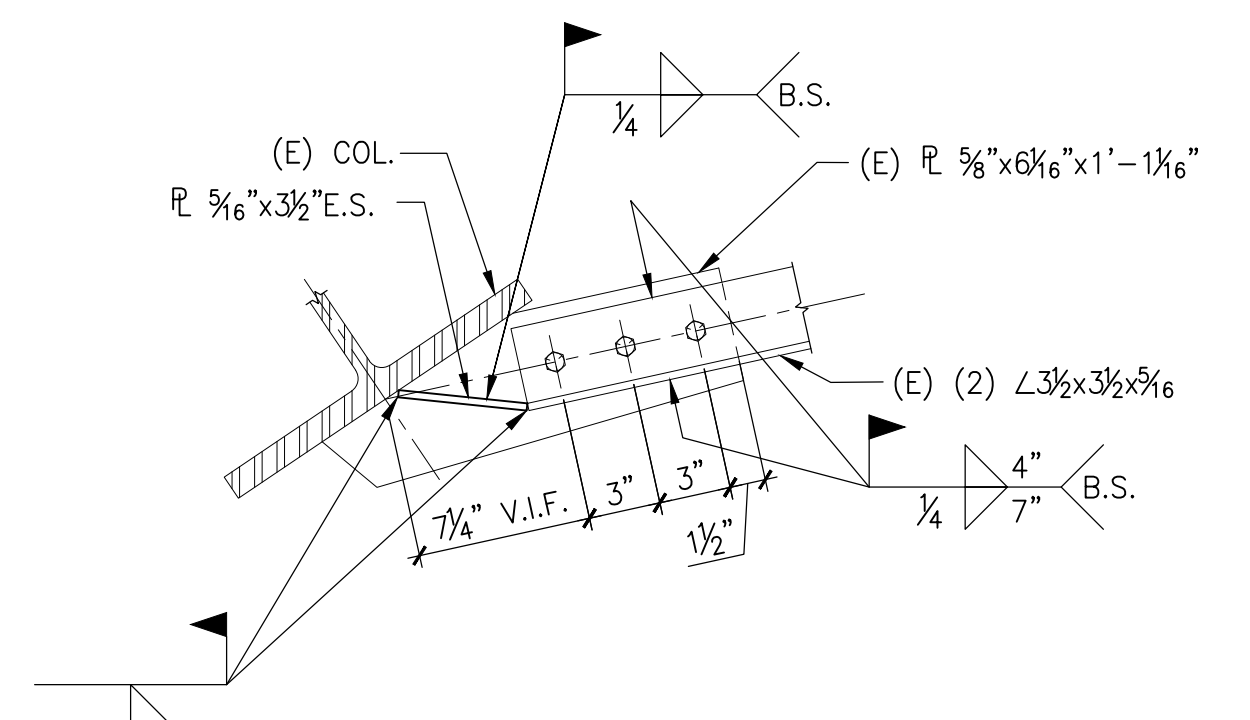
DETAILS FOR STACK B

Drawing Title

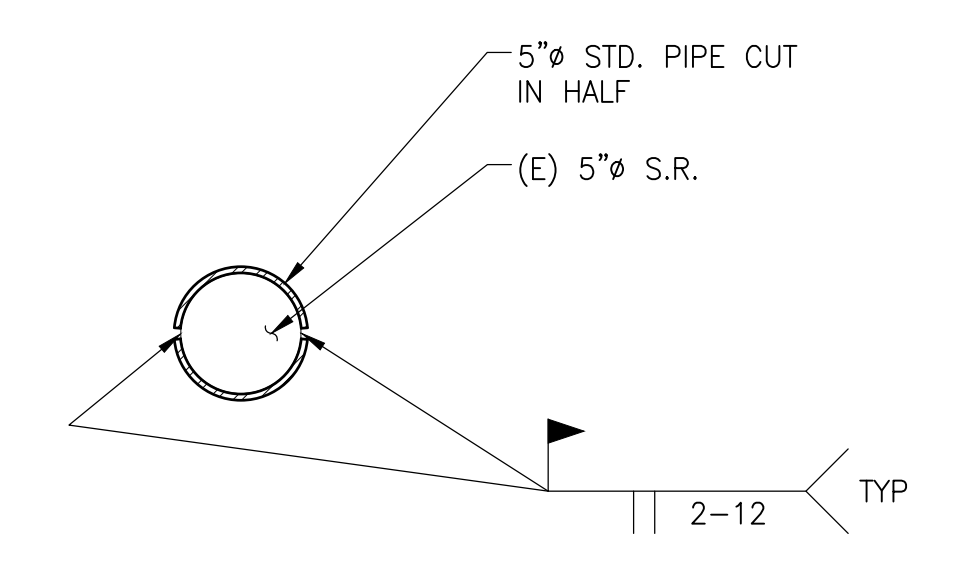
Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Drawing No. **S3.10**

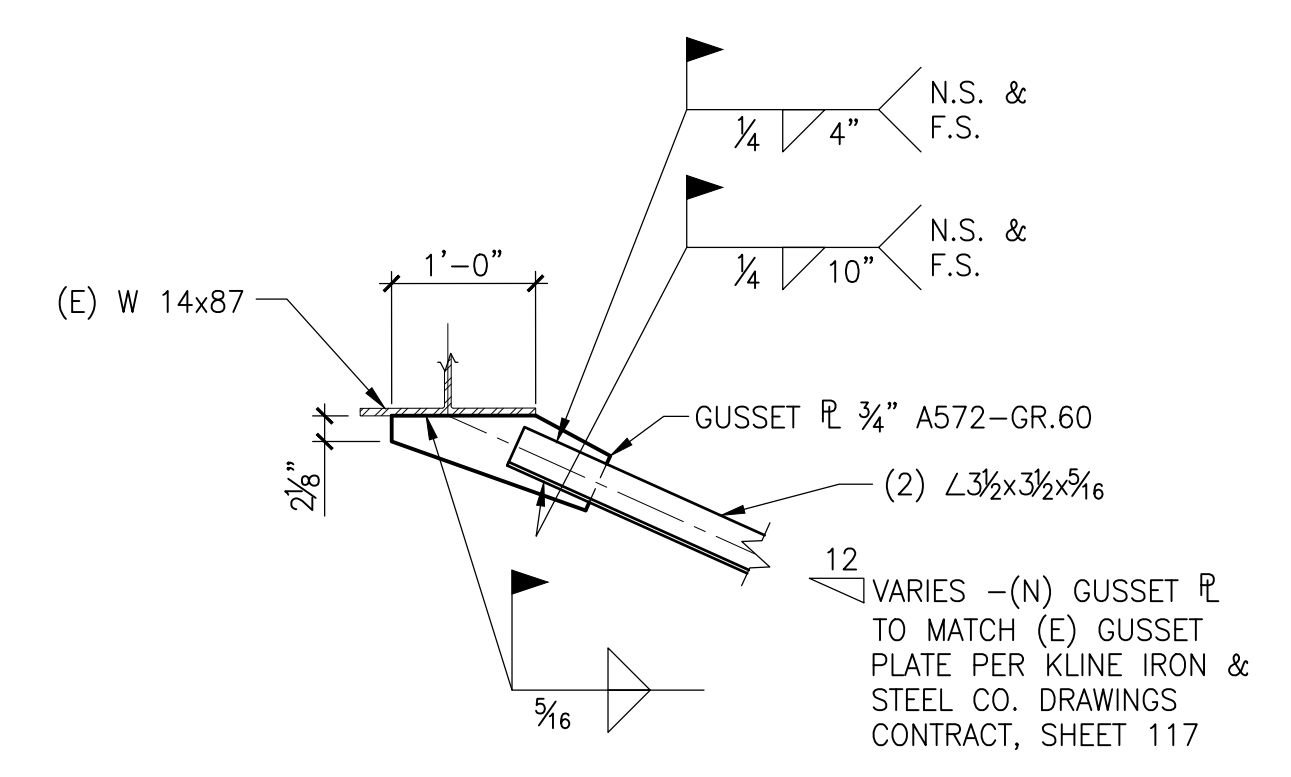
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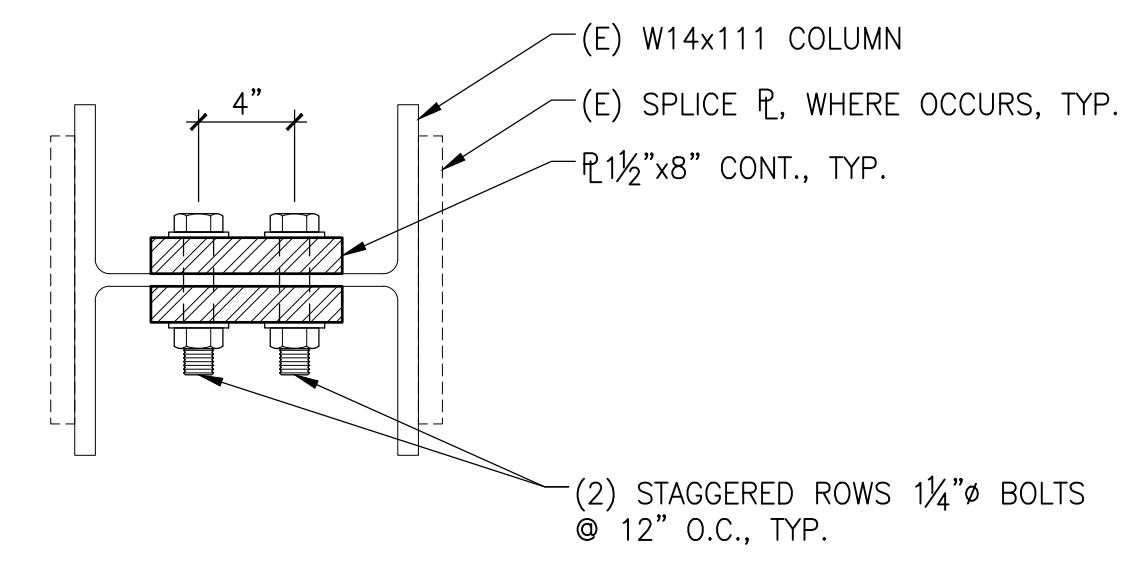
3 CONNECTION STRENGTHENING
SCALE: 1 1/2"=1'-0"



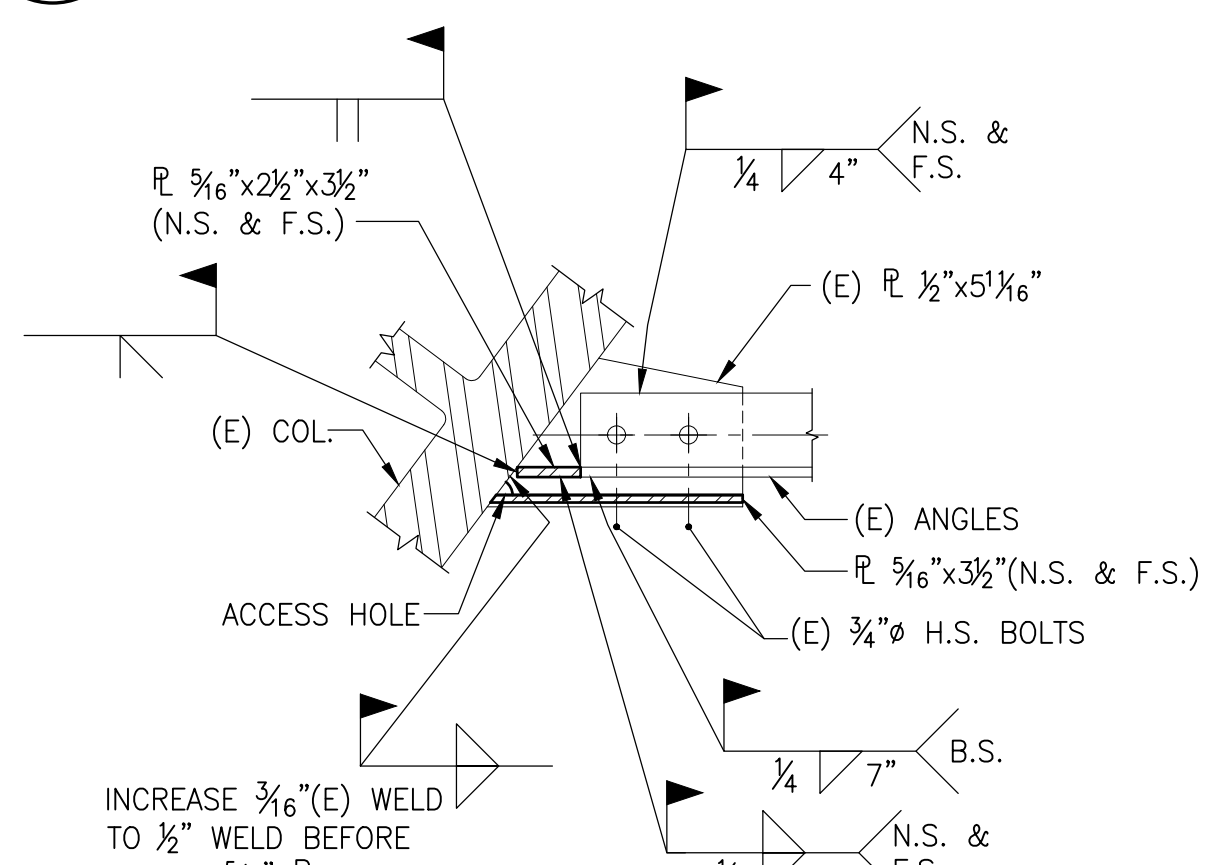
4 CONNECTION STRENGTHENING
SCALE: 1 1/2"=1'-0"



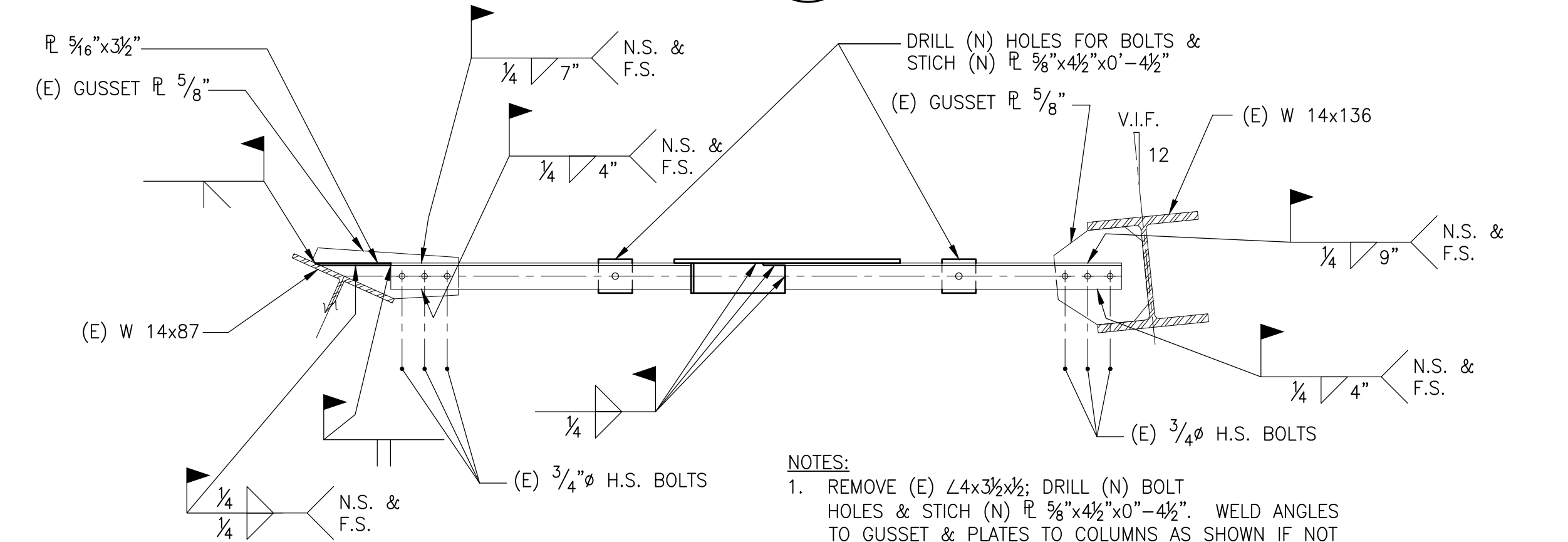
5 CONNECTION STRENGTHENING
SCALE: 3/4"=1'-0"



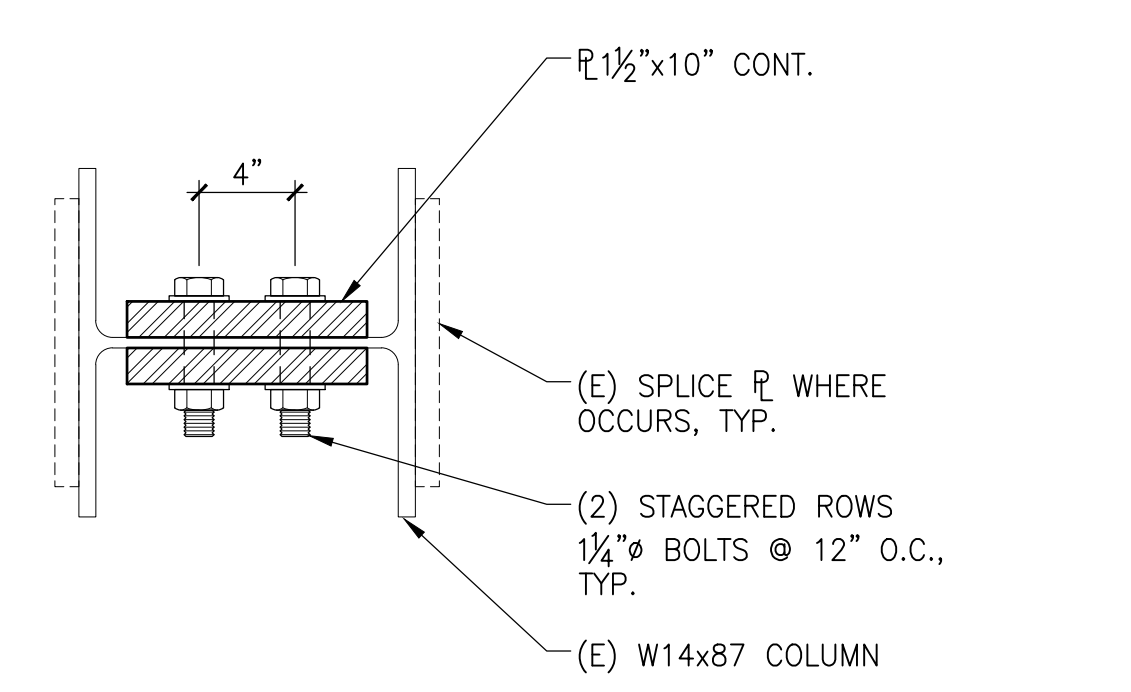
7 WEAK COLUMN STRENGTHENING
SCALE: 1 1/2"=1'-0"



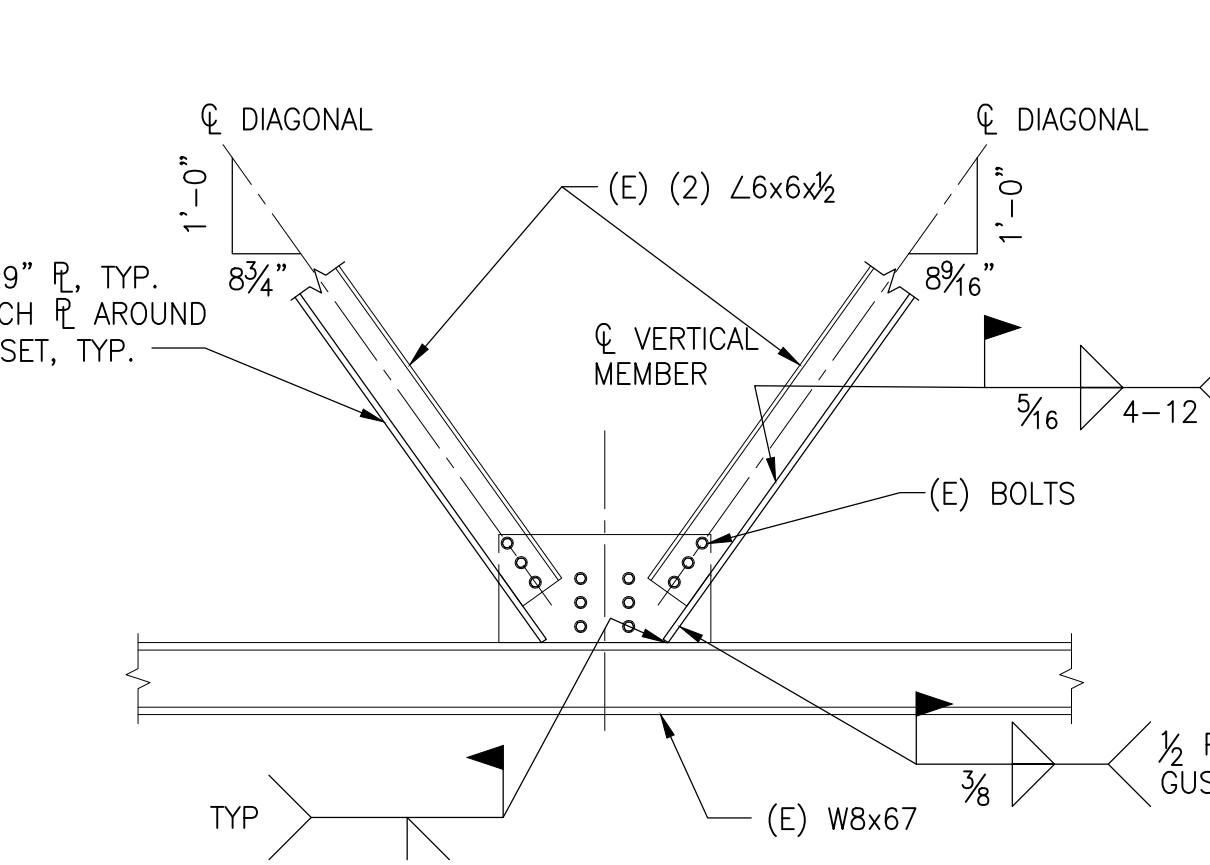
8 CONNECTION STRENGTHENING
SCALE: 1 1/2"=1'-0"



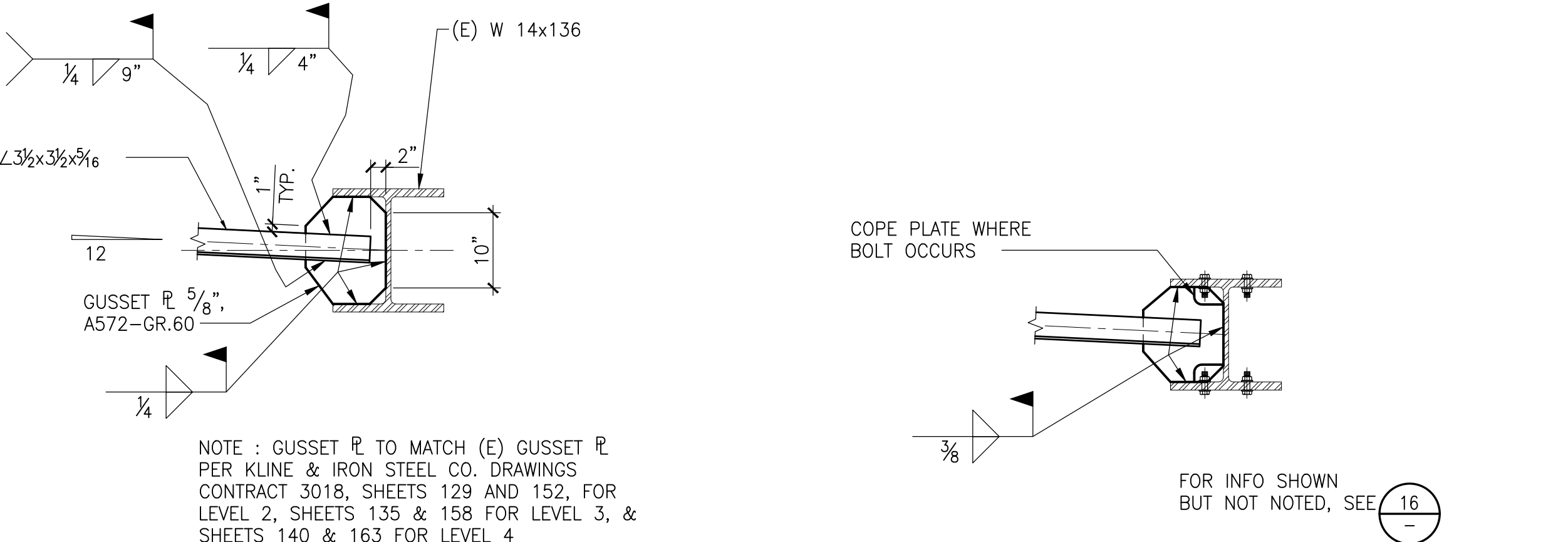
9 CONNECTION STRENGTHENING
SCALE: 3/4"=1'-0"



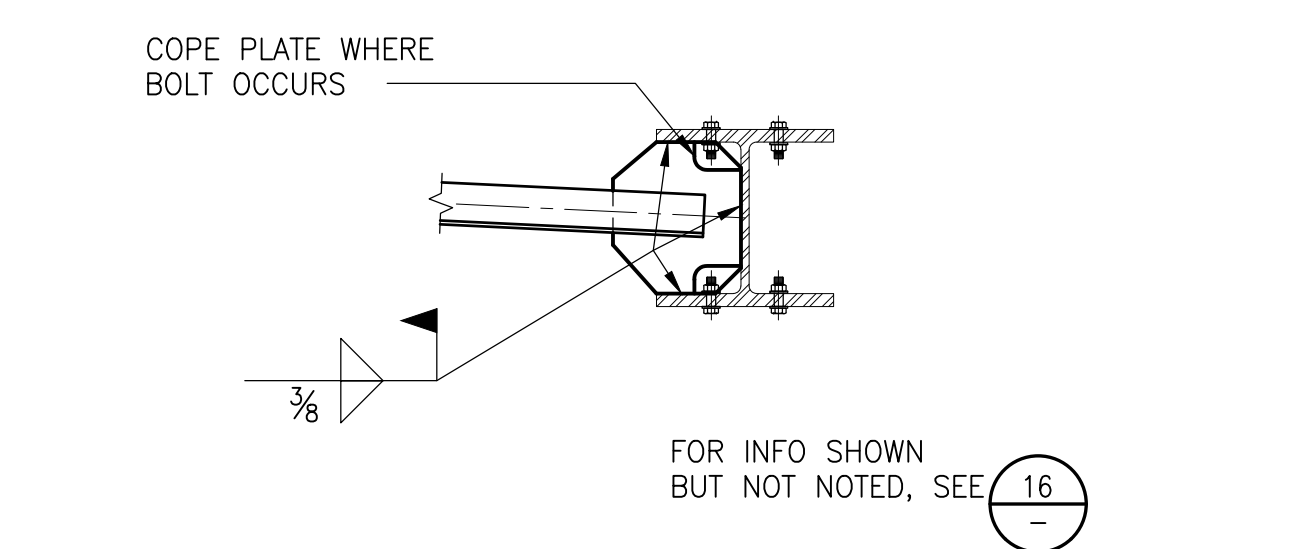
12 WEAK COLUMN STRENGTHENING
SCALE: 1 1/2"=1'-0"



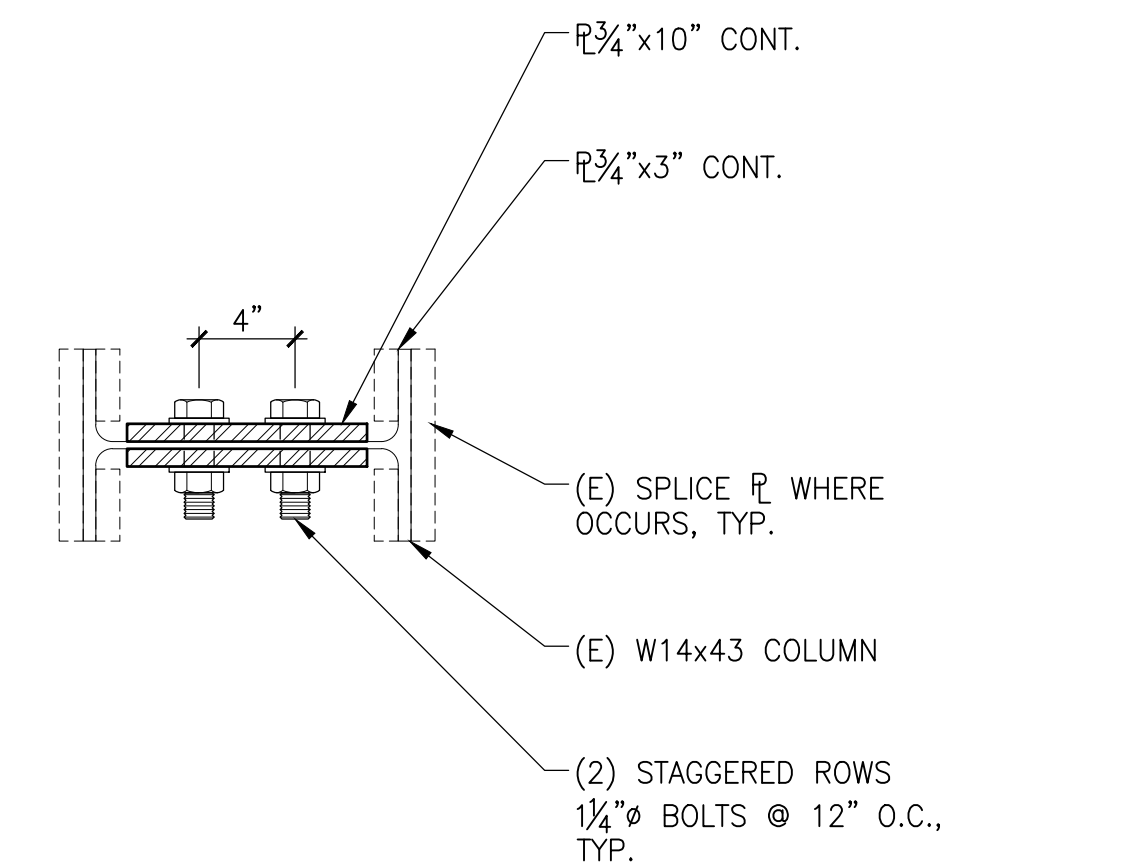
13 CONNECTION STRENGTHENING
SCALE: 1/2"=1'-0"



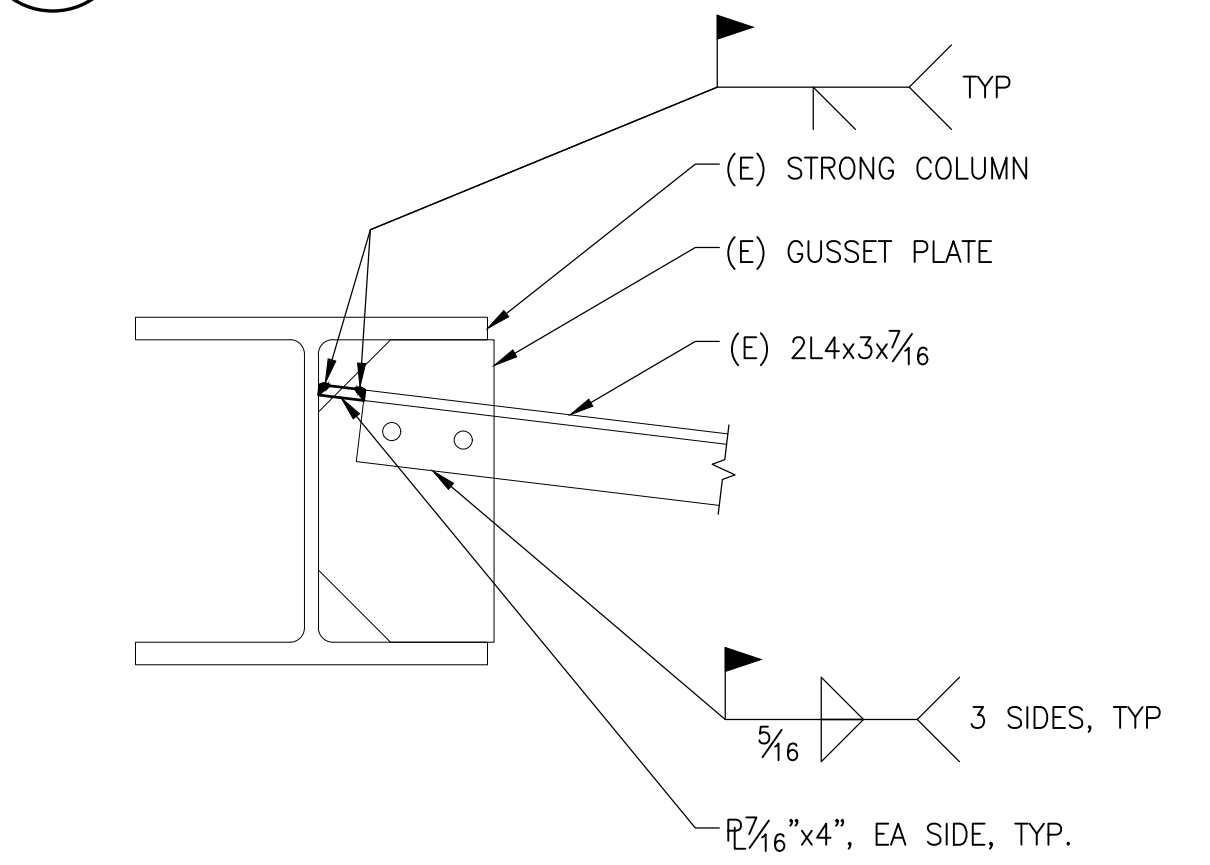
14 CONNECTION STRENGTHENING
SCALE: 3/4"=1'-0"



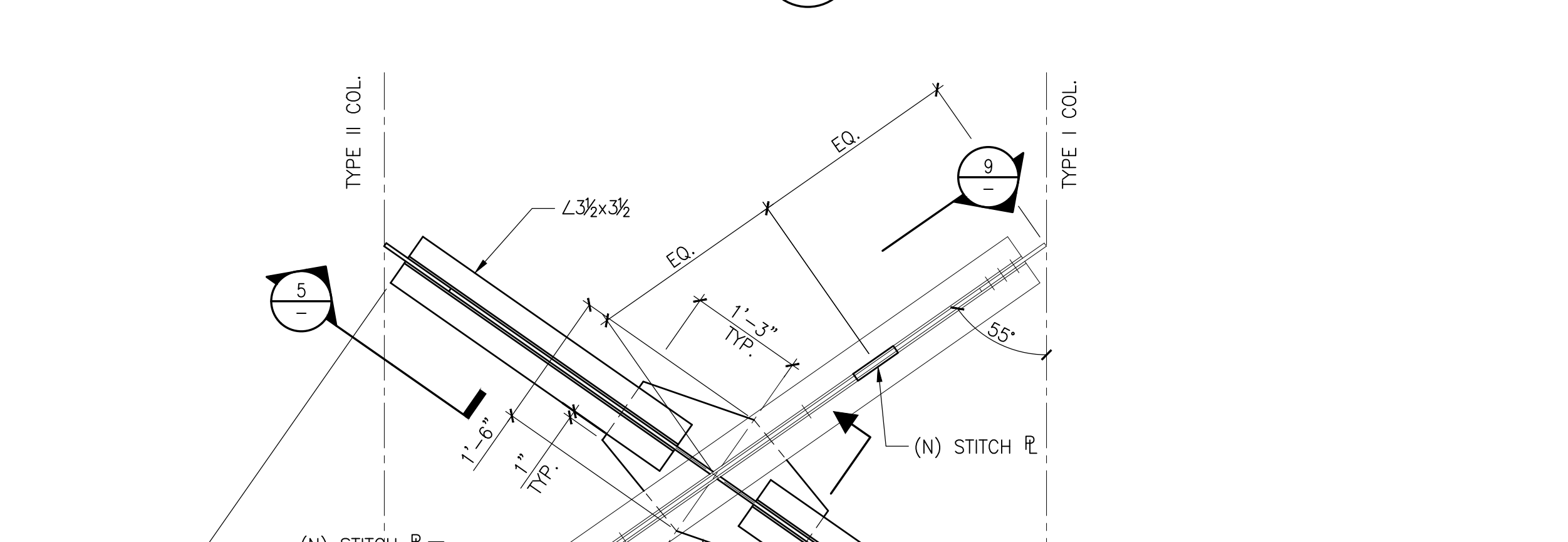
16 CONNECTION STRENGTHENING
SCALE: 3/4"=1'-0"



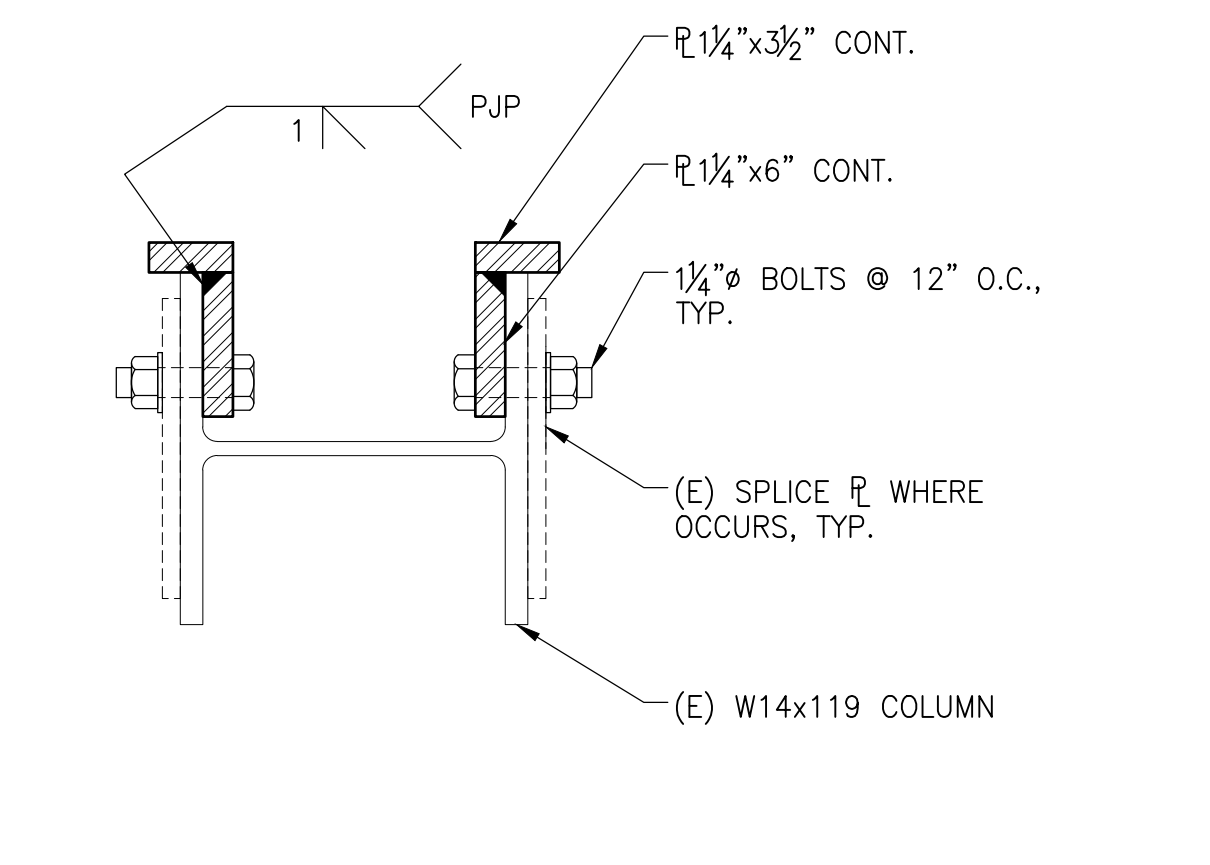
17 WEAK COLUMN STRENGTHENING
SCALE: 1 1/2"=1'-0"



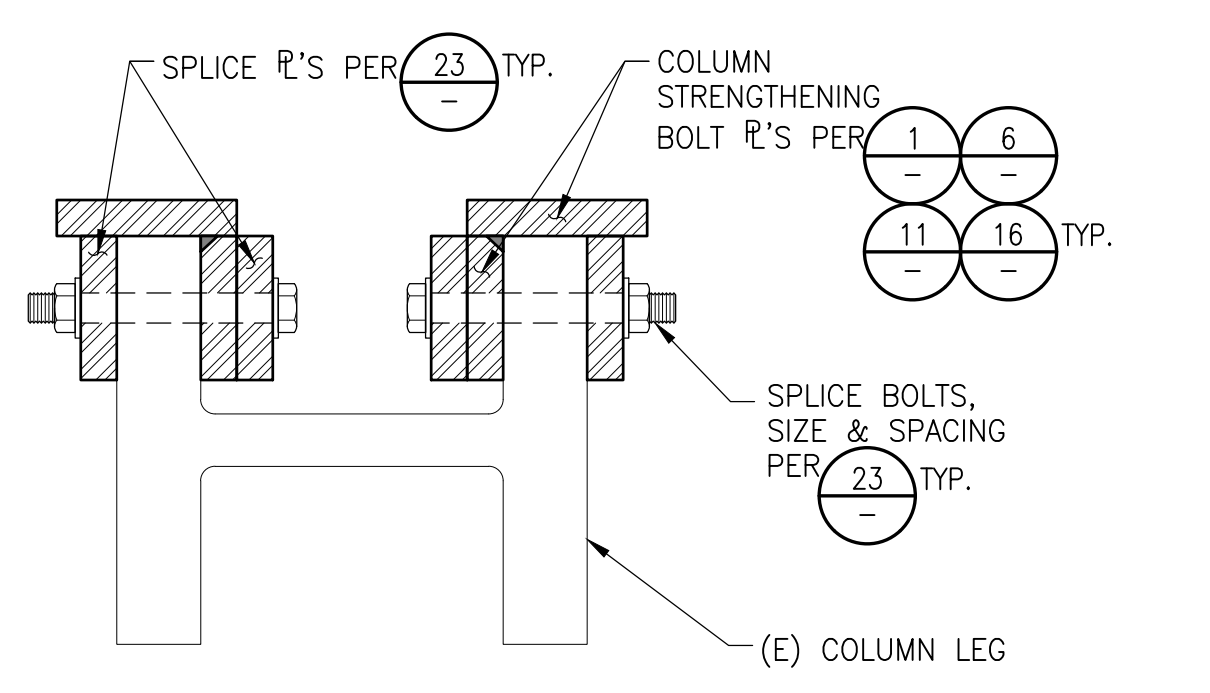
18 CONNECTION STRENGTHENING
SCALE: 1 1/2"=1'-0"



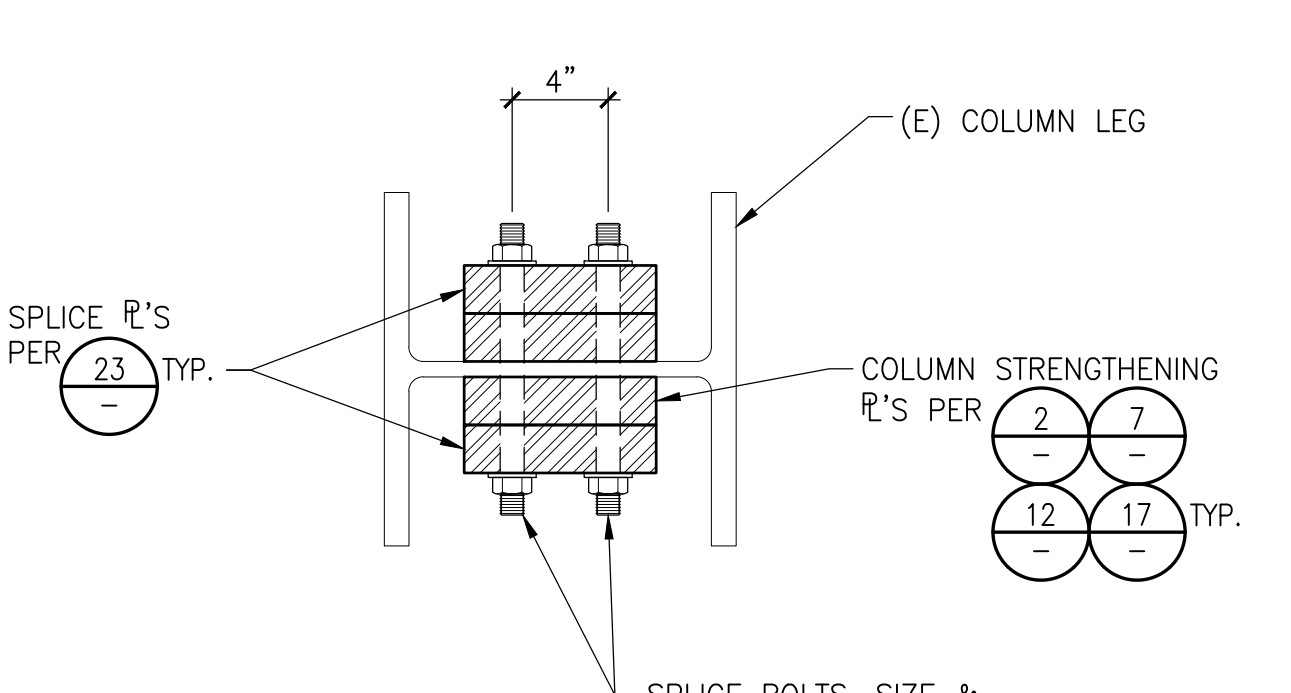
15 CONNECTION STRENGTHENING
SCALE: 3/4"=1'-0"



16 CONNECTION STRENGTHENING
SCALE: 3/4"=1'-0"



21 STRONG COLUMN SPLICE
SCALE: 1 1/2"=1'-0"



22 WEAK COLUMN - SPLICE
SCALE: 1 1/2"=1'-0"

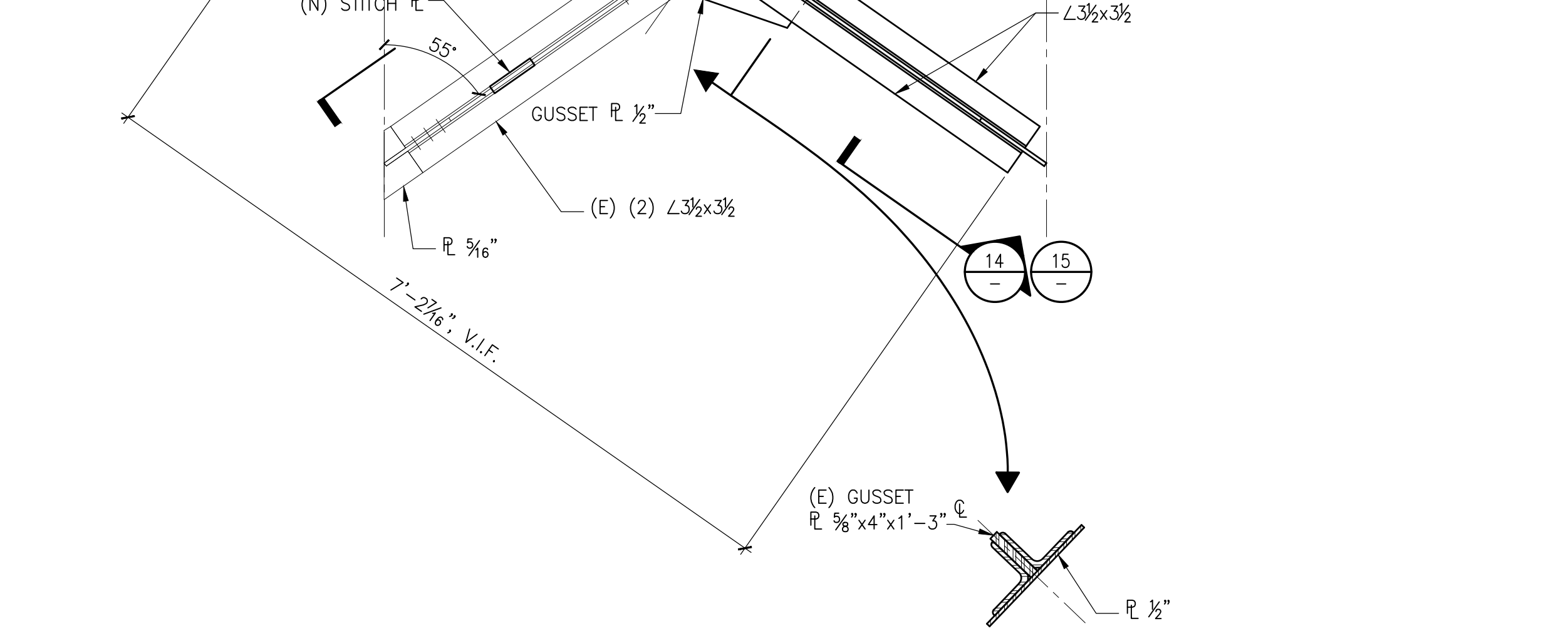
STRONG COLUMN SPLICE PER 21

COLUMN SIZE	SPLICE R SIZE	SPLICE R LENGTH	SPLICE BOLTS SIZE	SPLICE BOLTS SPACING	# BOLTS EA. SIDE OF SPLICE
W14x500	1 1/2" x 6"	80"	1 1/2"	4"	10
W14x287	2" x 6"	64"	1 1/2"	4"	8
W14x136	2" x 6"	64"	1 1/2"	4"	8
W14x119	1" x 6"	48"	1"	4"	6

WEAK COLUMN SPLICE PER 22

COLUMN SIZE	SPLICE R SIZE	SPLICE R LENGTH	SPLICE BOLTS SIZE	SPLICE BOLTS SPACING	# ROWS EA. SIDE OF SPLICE
W14x136	2" x 8"	40"	1 1/2"	4"	5
W14x111	1 1/2" x 8"	32"	1 1/2"	4"	4
W14x87	1 1/2" x 10"	32"	1"	4"	4
W14x43	3/4" x 10"	24"	1"	4"	3

23 SPLICE SCHEDULE
SCALE: FULL SCALE



24 CONNECTION STRENGTHENING
SCALE: 3/4"=1'-0"

Consultant

NOTE:
1. ALL PLATES ARE ASTM A572 GR.50 U.O.N.

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST. SAN FRANCISCO CALIFORNIA

DETAILS FOR MEMBER STRENGTHENING

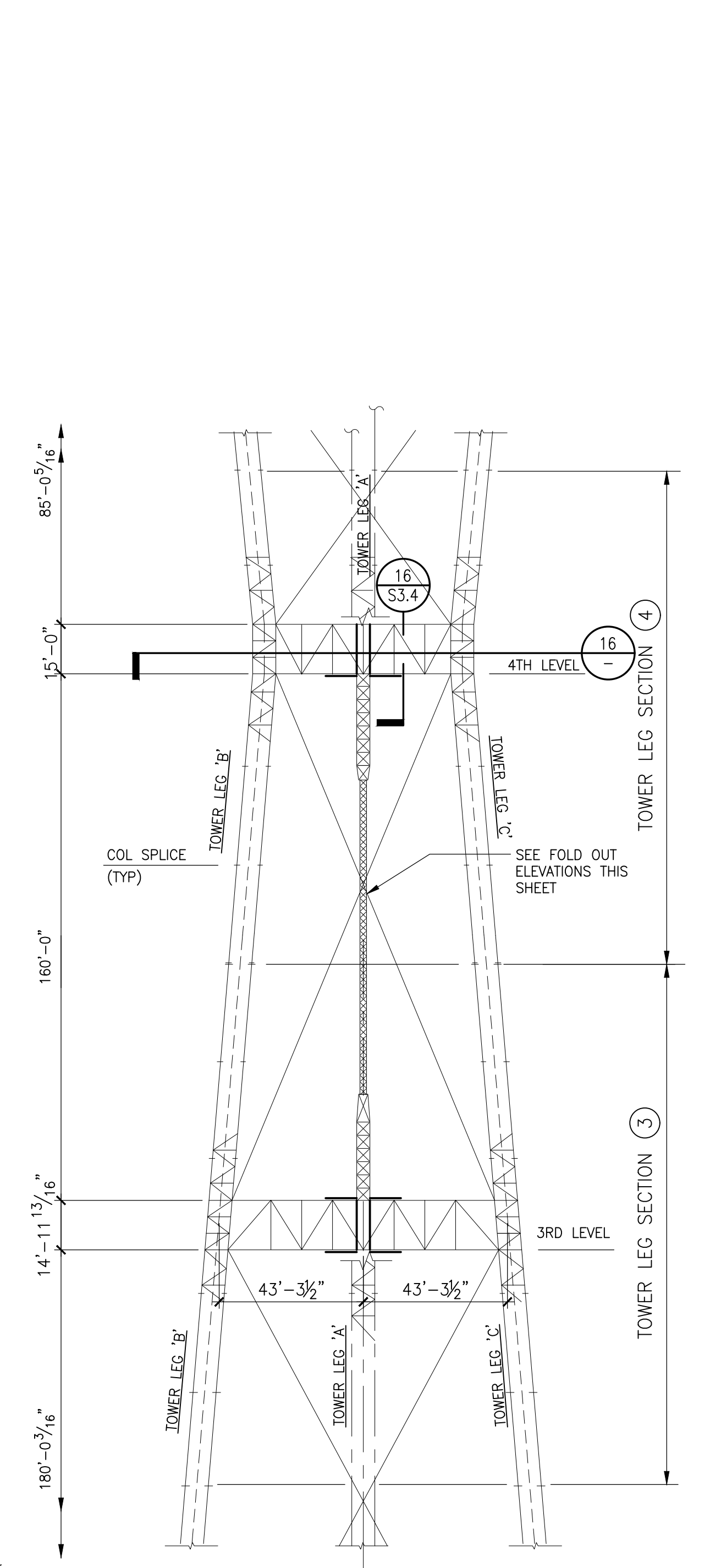
Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Drawing Title: **DETAILS FOR MEMBER STRENGTHENING**

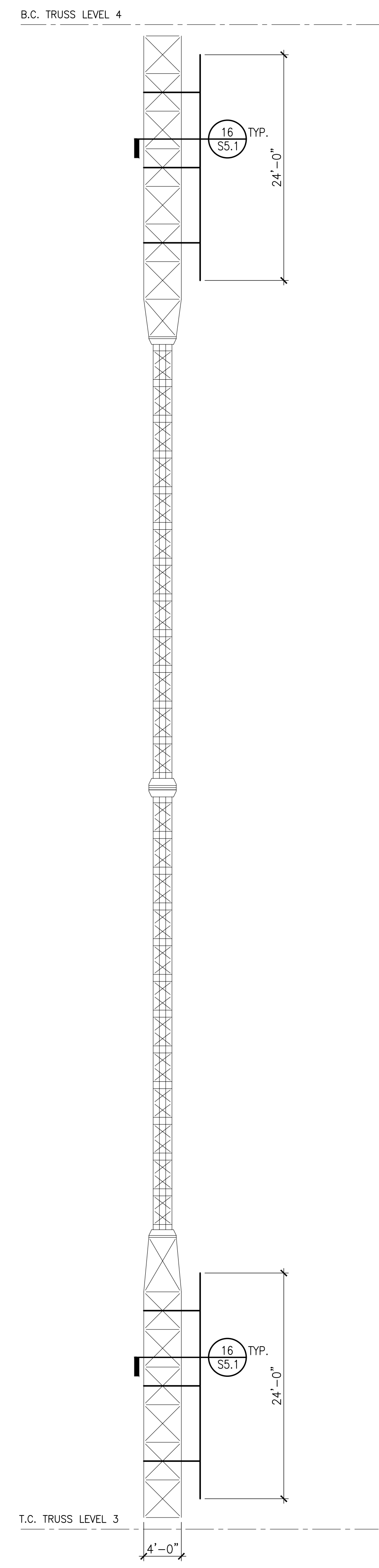
Project: **BROADCAST CHANNEL REPACKING PROJECT**

Scale: **S3.11**

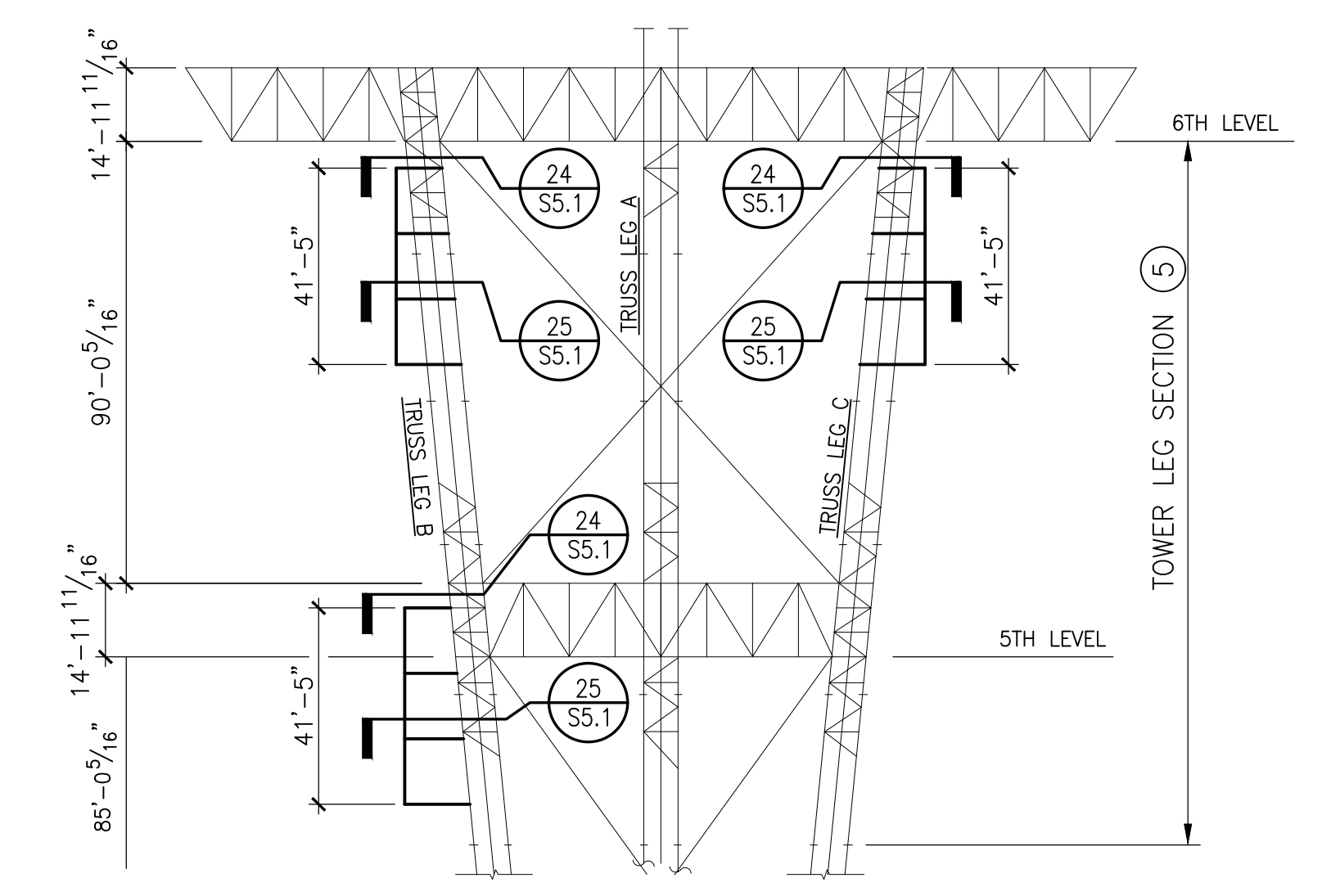
Consultant



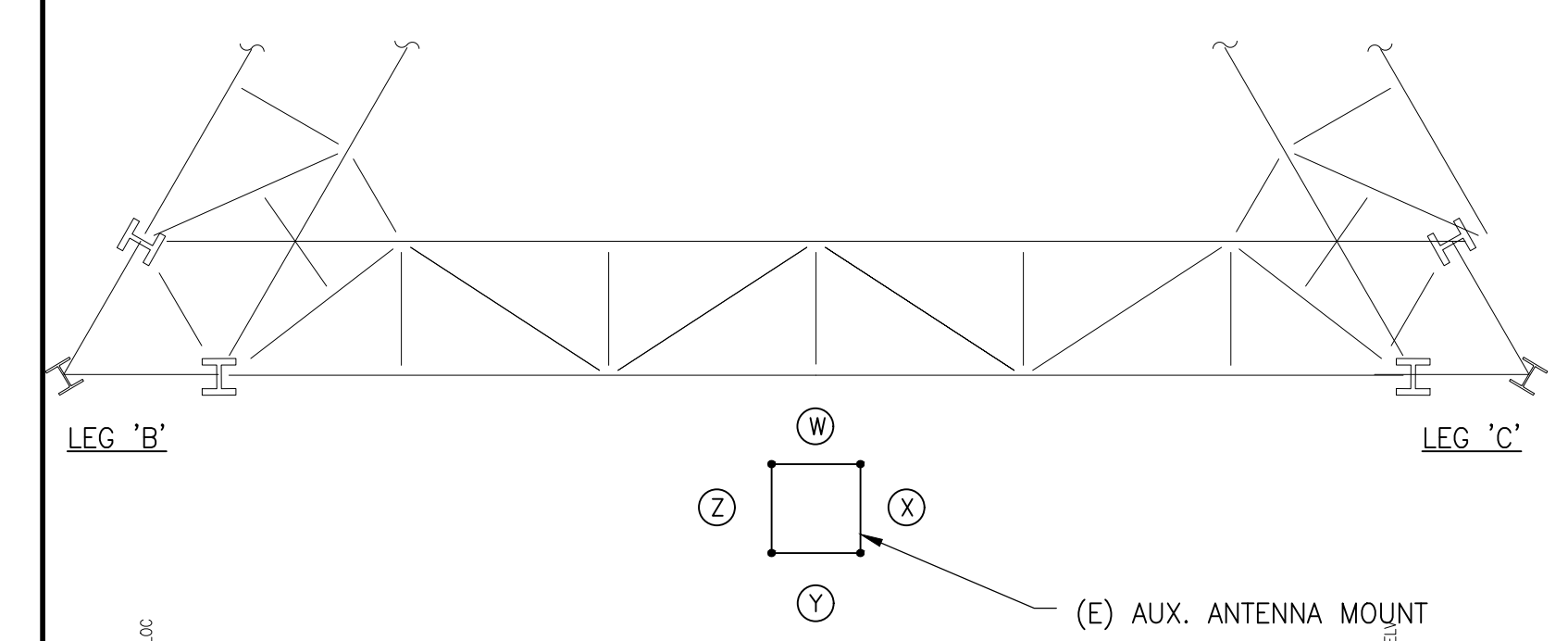
11 TOWER WORK POINT ELEVATION
 SCALE: 1/32"=1'-0"



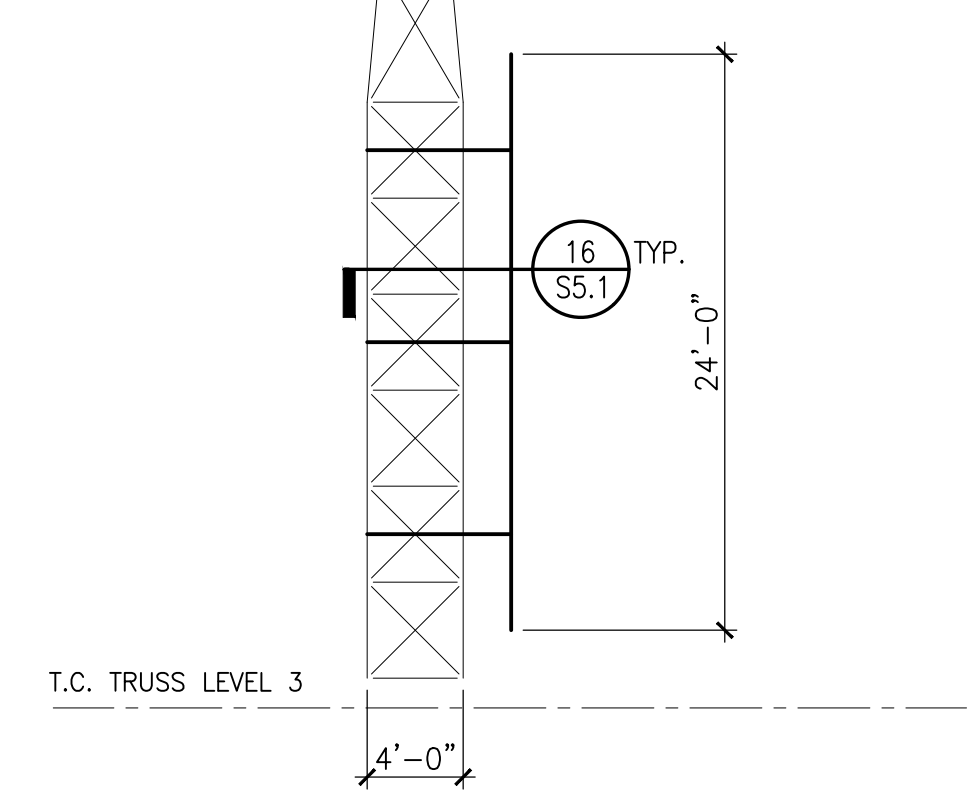
13 TOWER WORK POINT ELEVATION
 SCALE: 1/32"=1'-0"



EAST SIDE ELEVATION



16 AUXILIARY ANTENNA LOCATION
 SCALE: 1/8"=1'-0"



17 AUXILIARY ANTENNA ELEVATION
 SCALE: 1/8"=1'-0"

No.	Date	Description	By
12/18/16		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST. SAN FRANCISCO CALIFORNIA

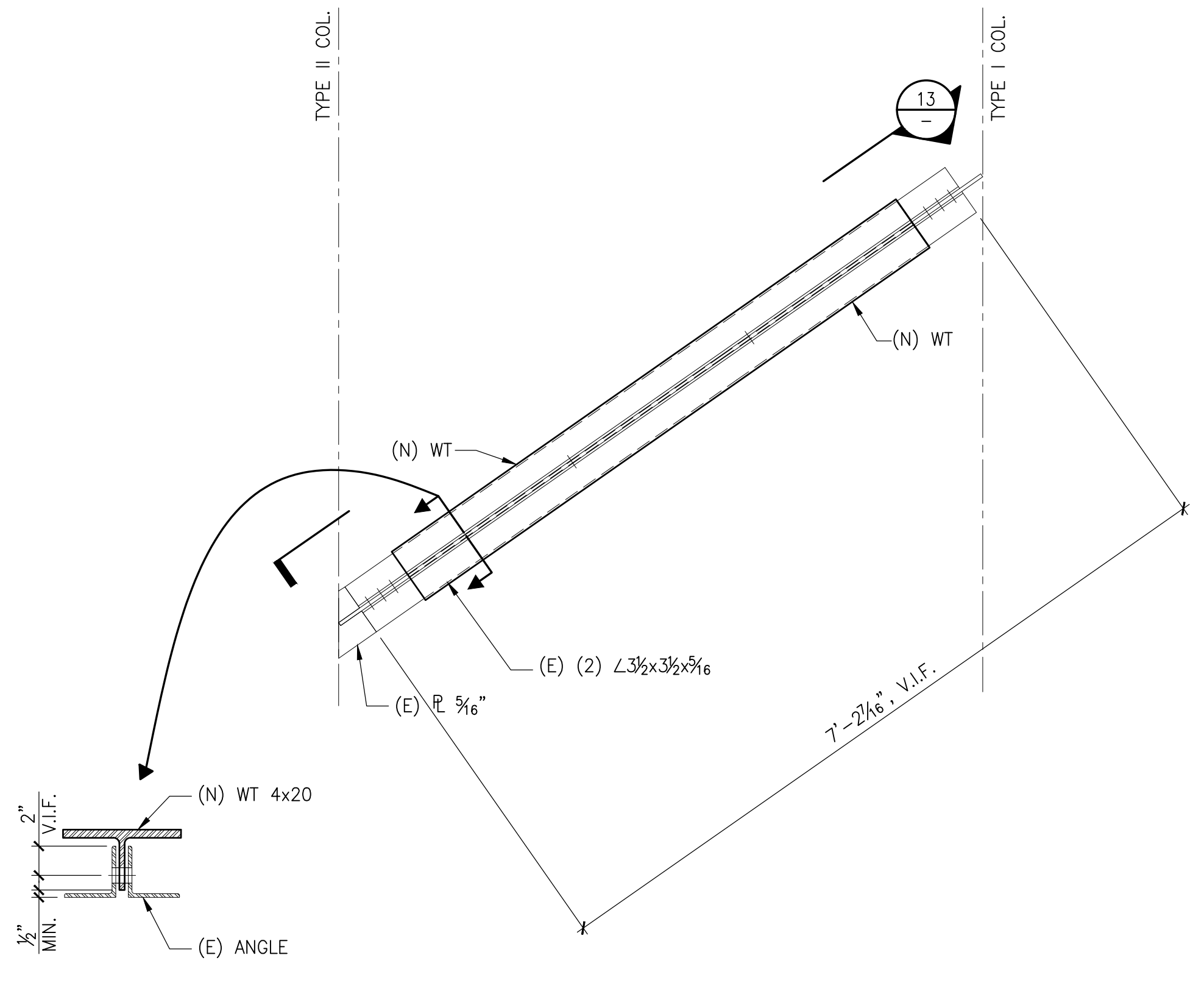
Project

NDTV AUXILIARY ANTENNA ELEVATION & SECTIONS

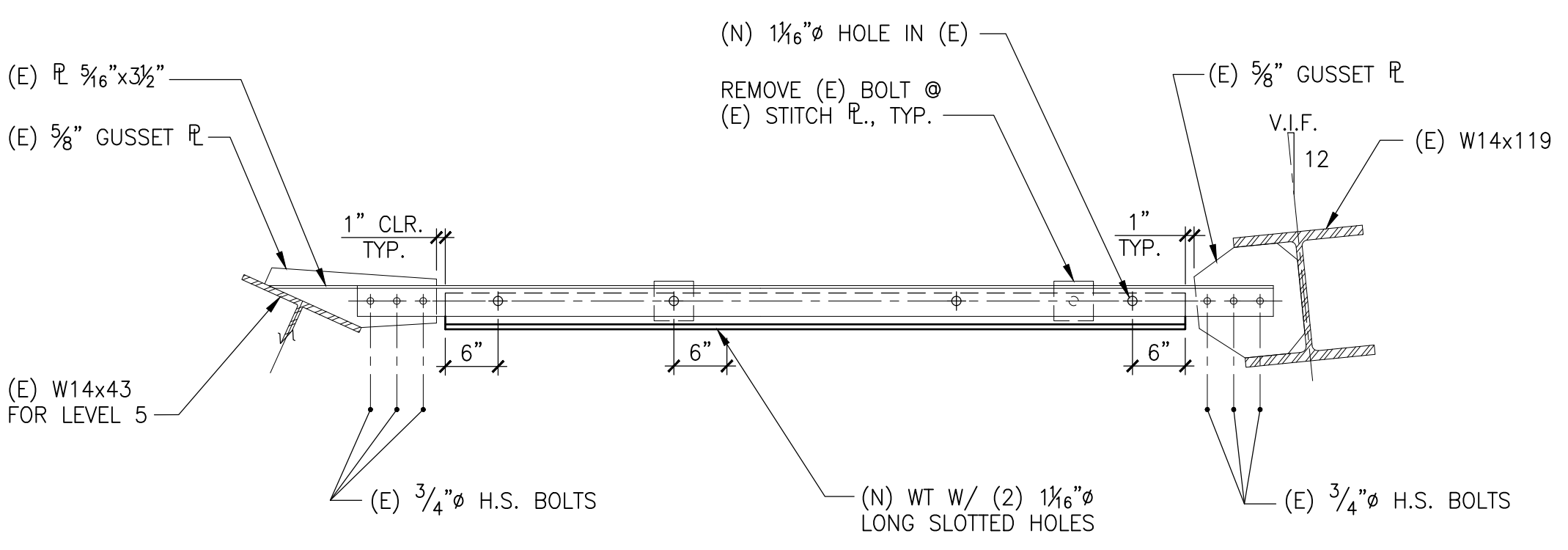
Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

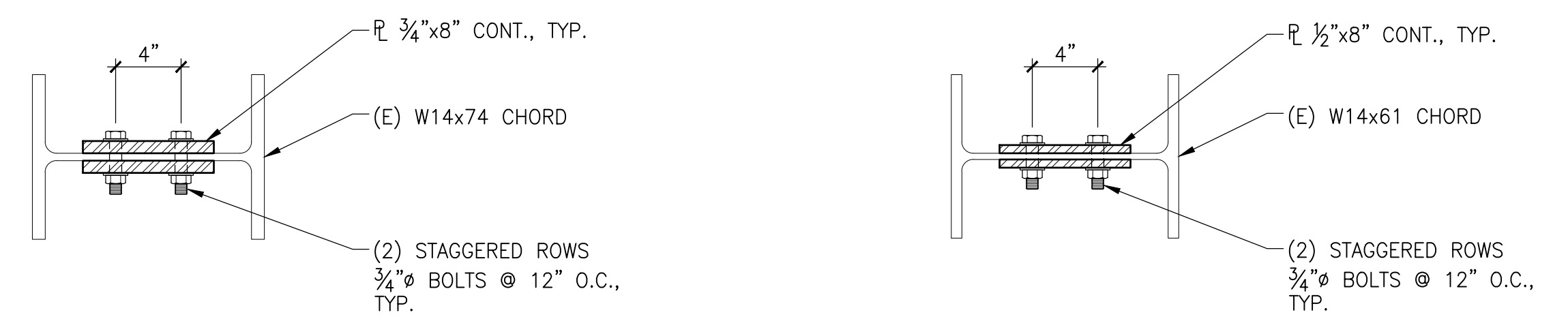
Drawing No. **S3.13**



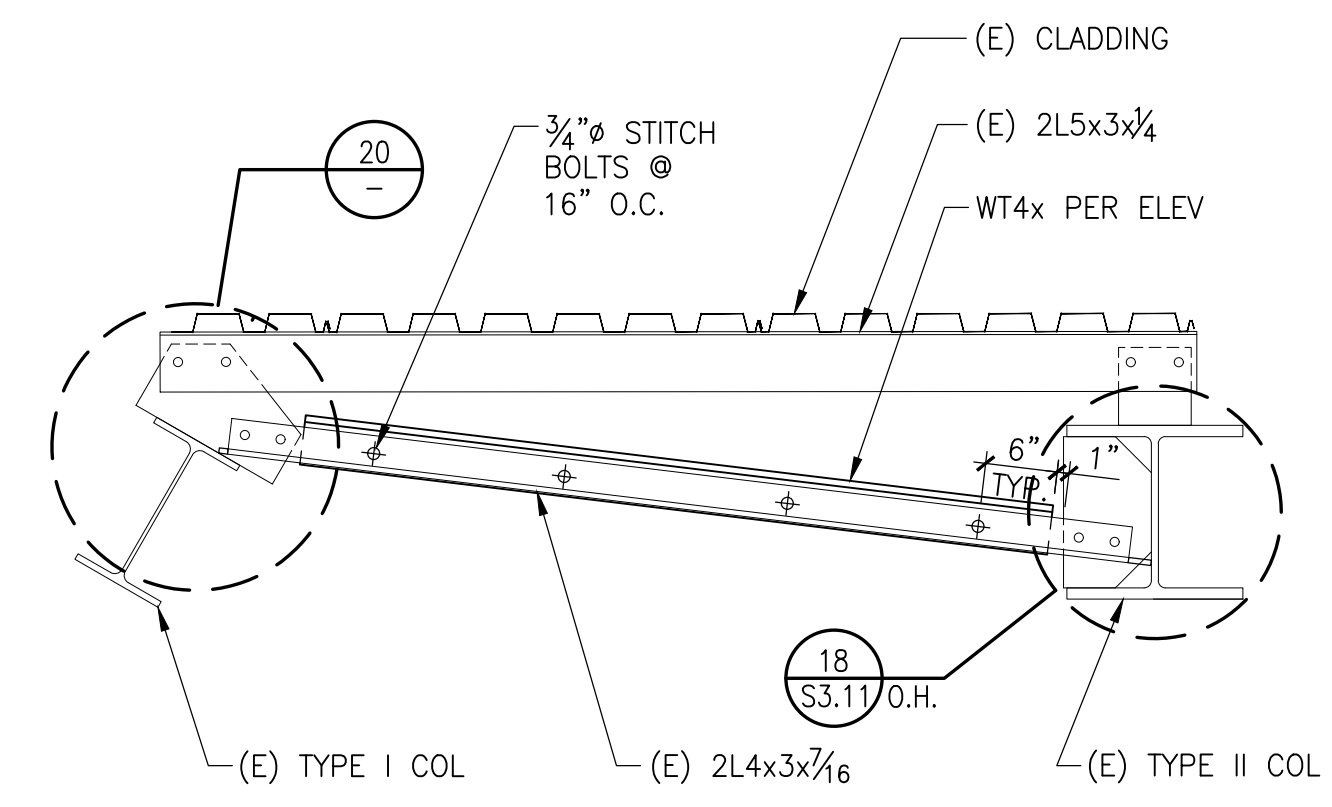
6 DETAIL SCALE: 3/4"=1'-0"



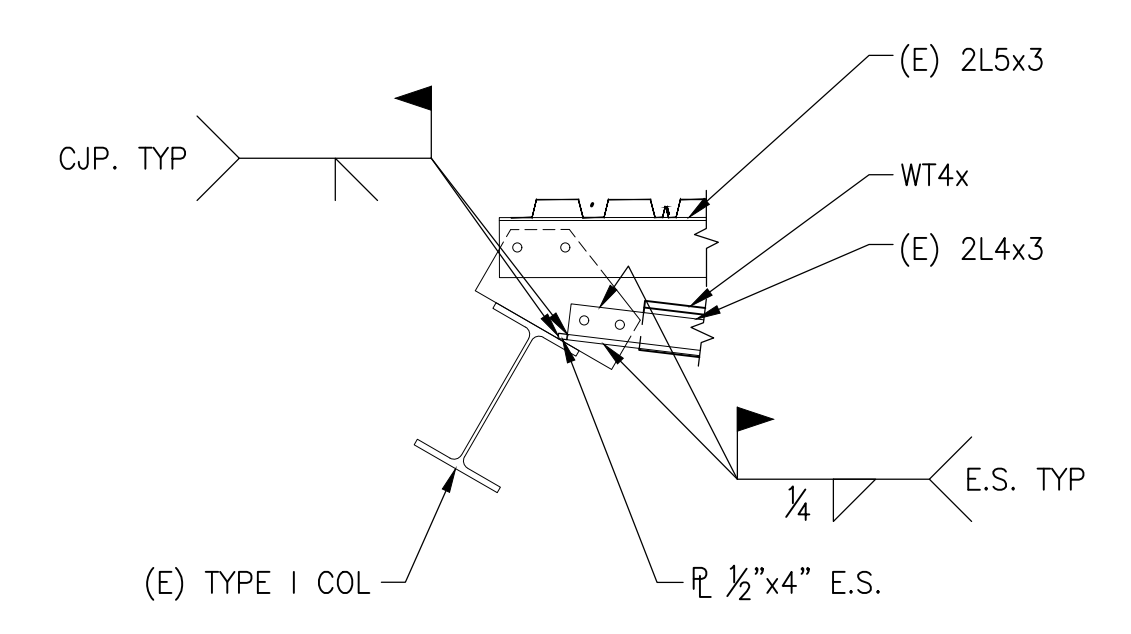
11 DETAIL SCALE: 3/4"=1'-0"



16 CHORD STRENGTHENING SCALE: 1 1/2"=1'-0" **17 CHORD STRENGTHENING** SCALE: 1 1/2"=1'-0"



19 DETAIL SCALE: 3/4"=1'-0"



20 DETAIL SCALE: 3/4"=1'-0"

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT

1 LA AVANZADA ST. SAN FRANCISCO CALIFORNIA

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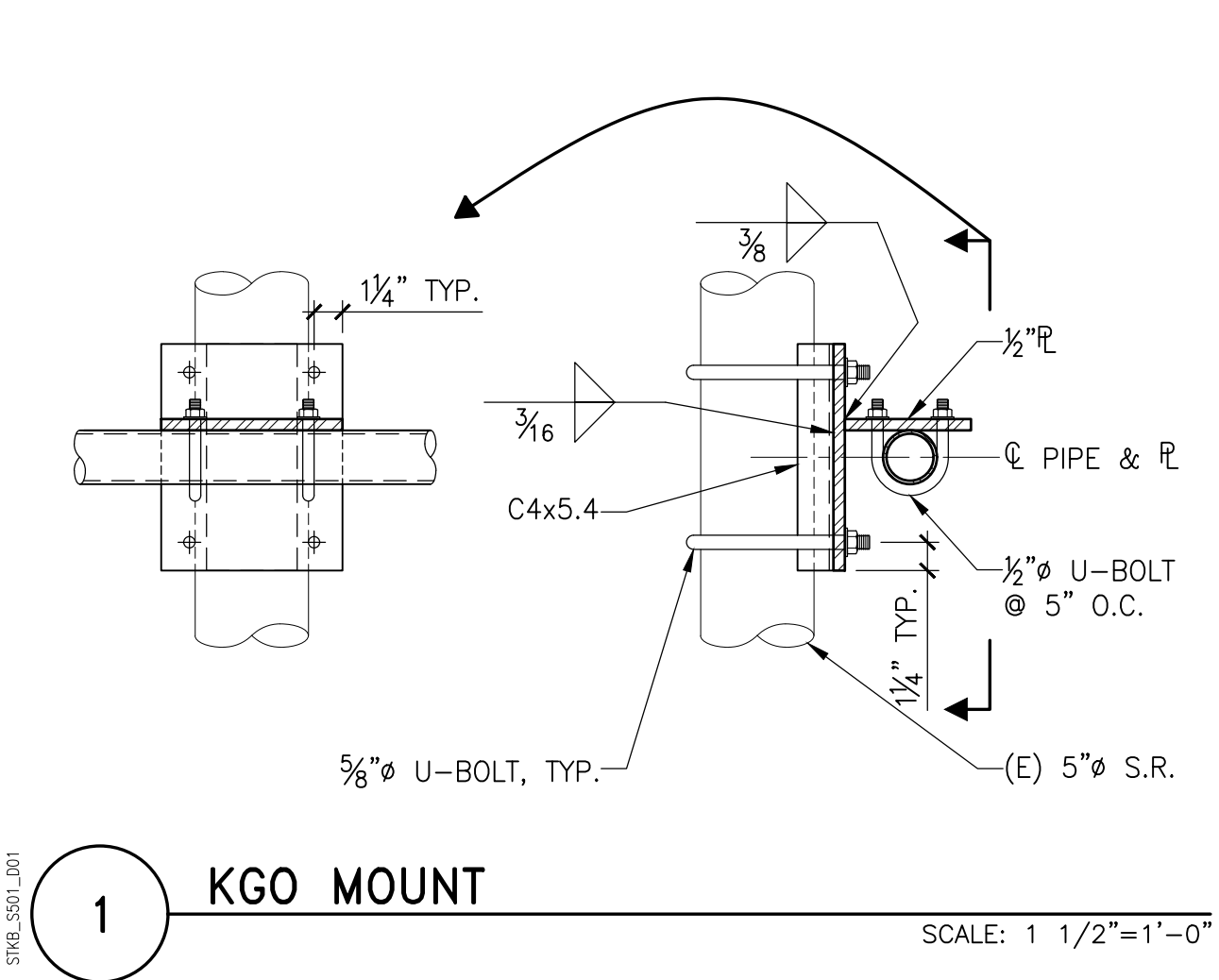
DETAILS FOR MEMBER STRENGTHENING

Drawing Title

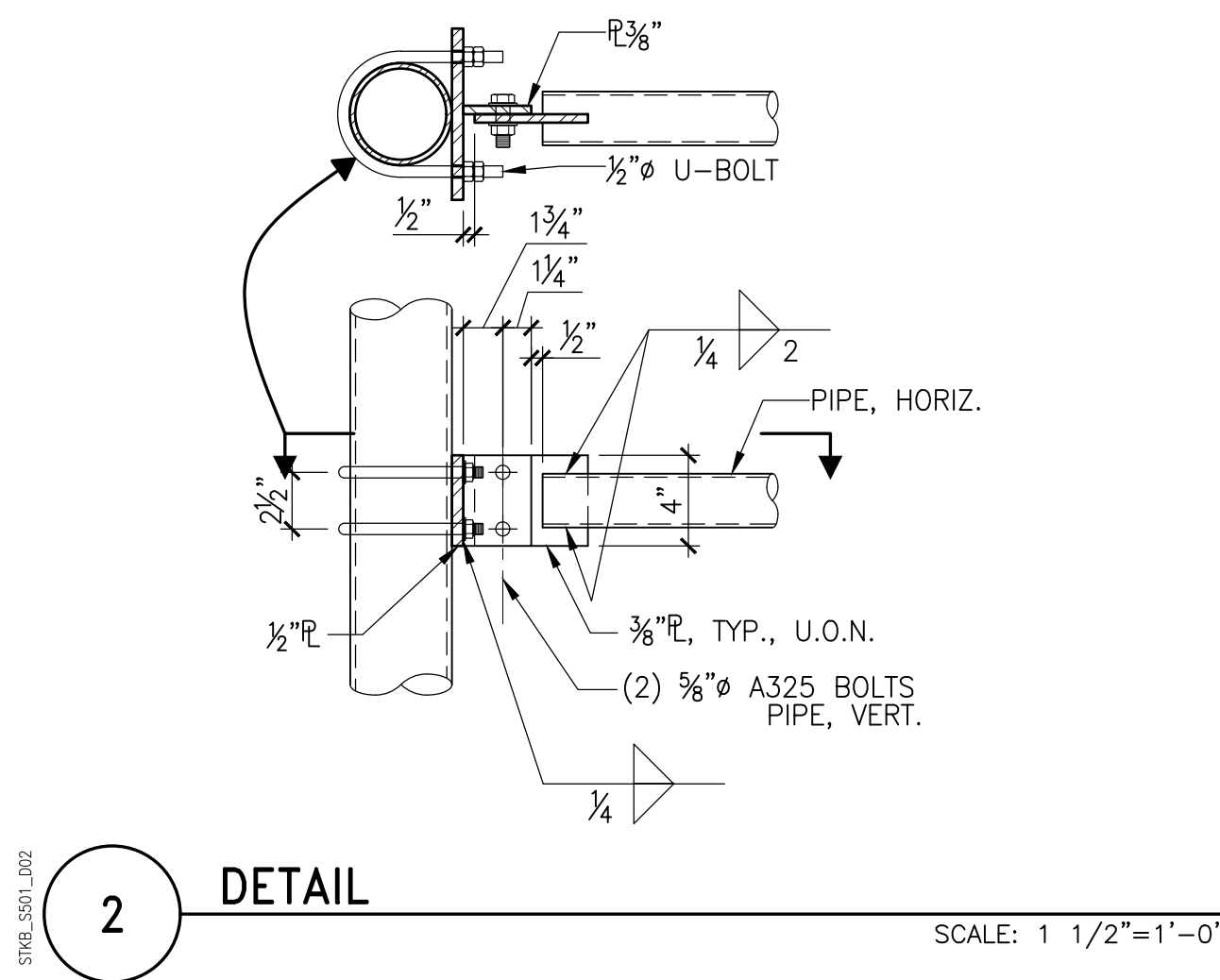
Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Professional Engineer Seal: **FRANK O. HAMBURGER**, No. 2951, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA

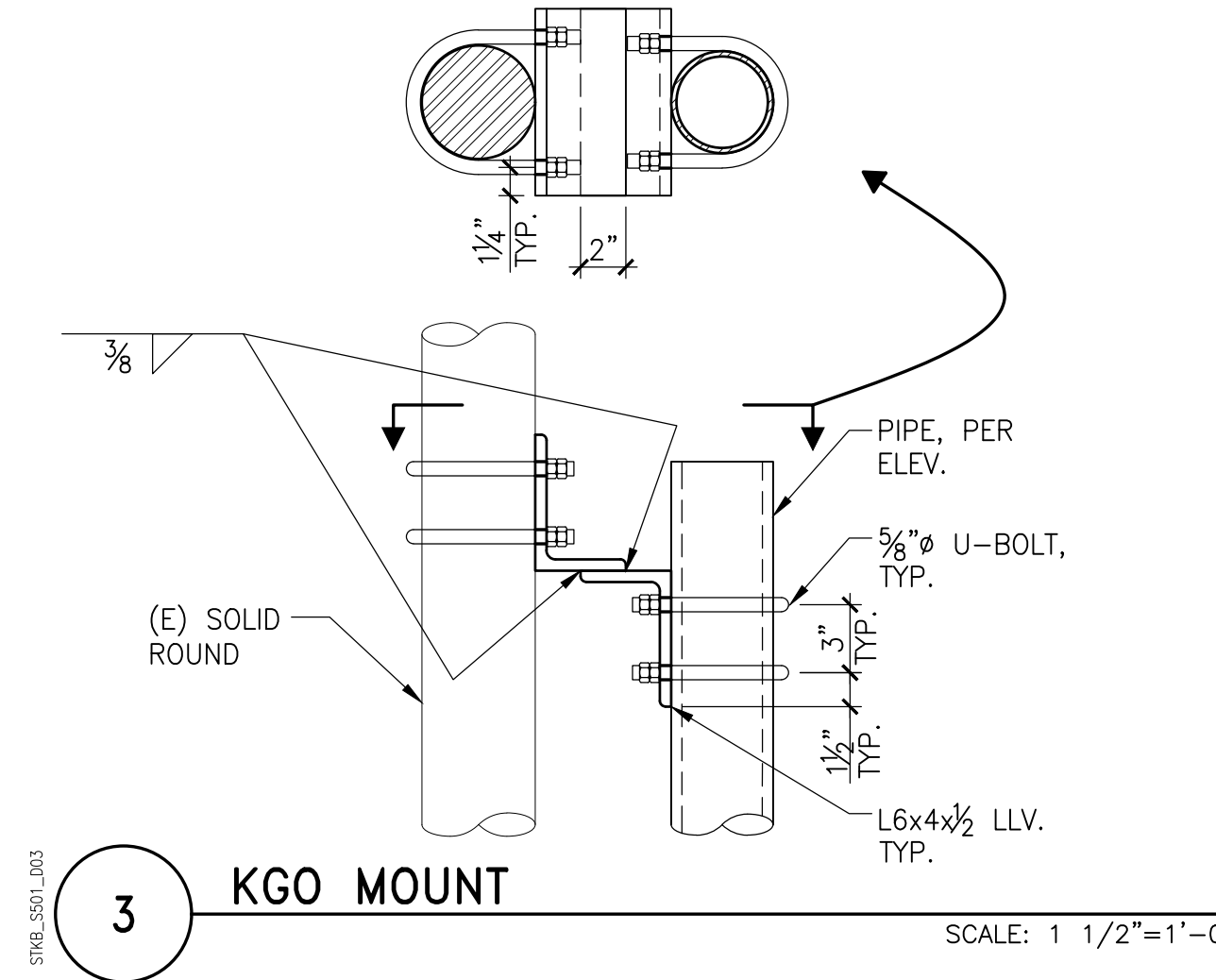
S3.14



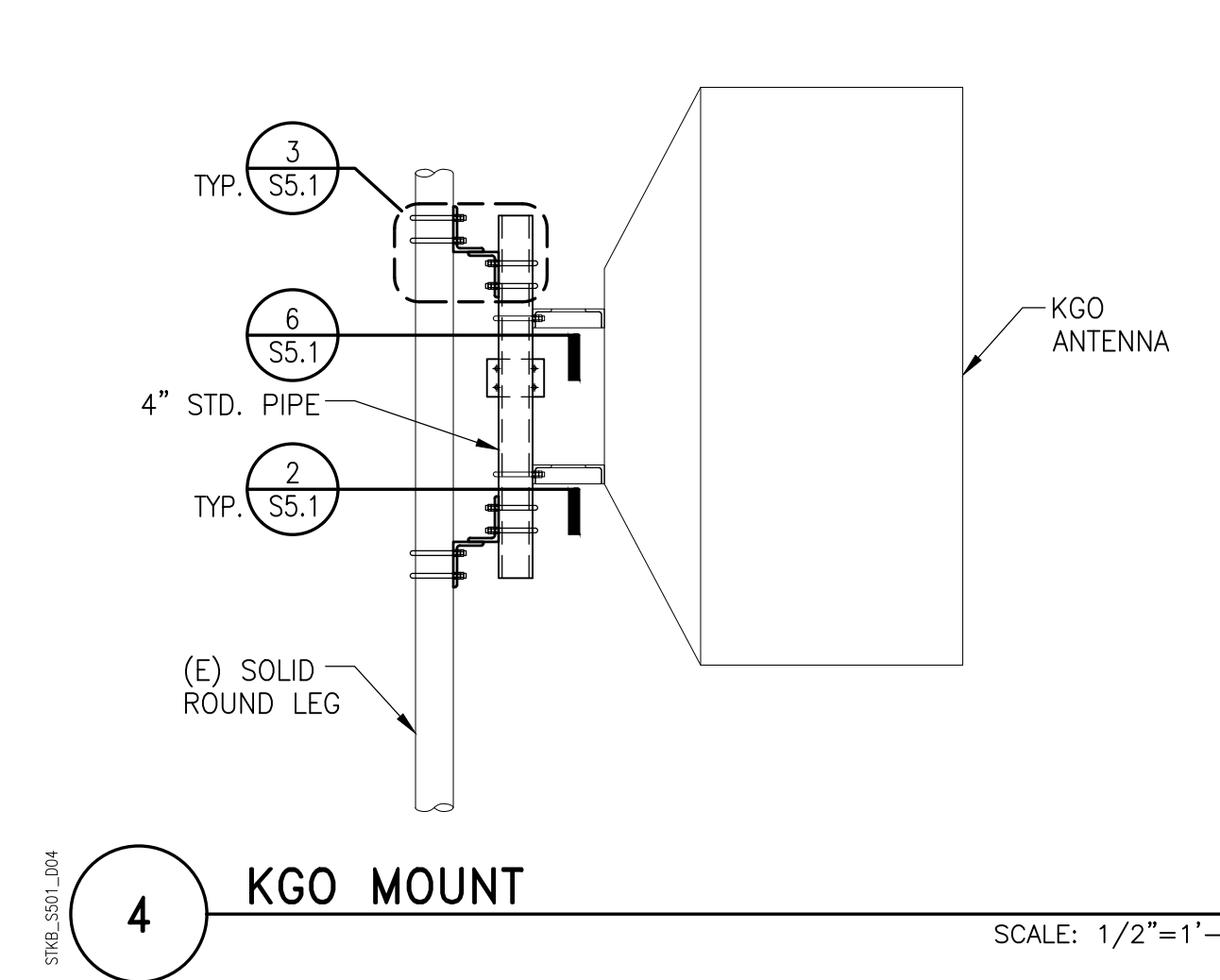
1 KGO MOUNT SCALE: 1 1/2"=1'-0"



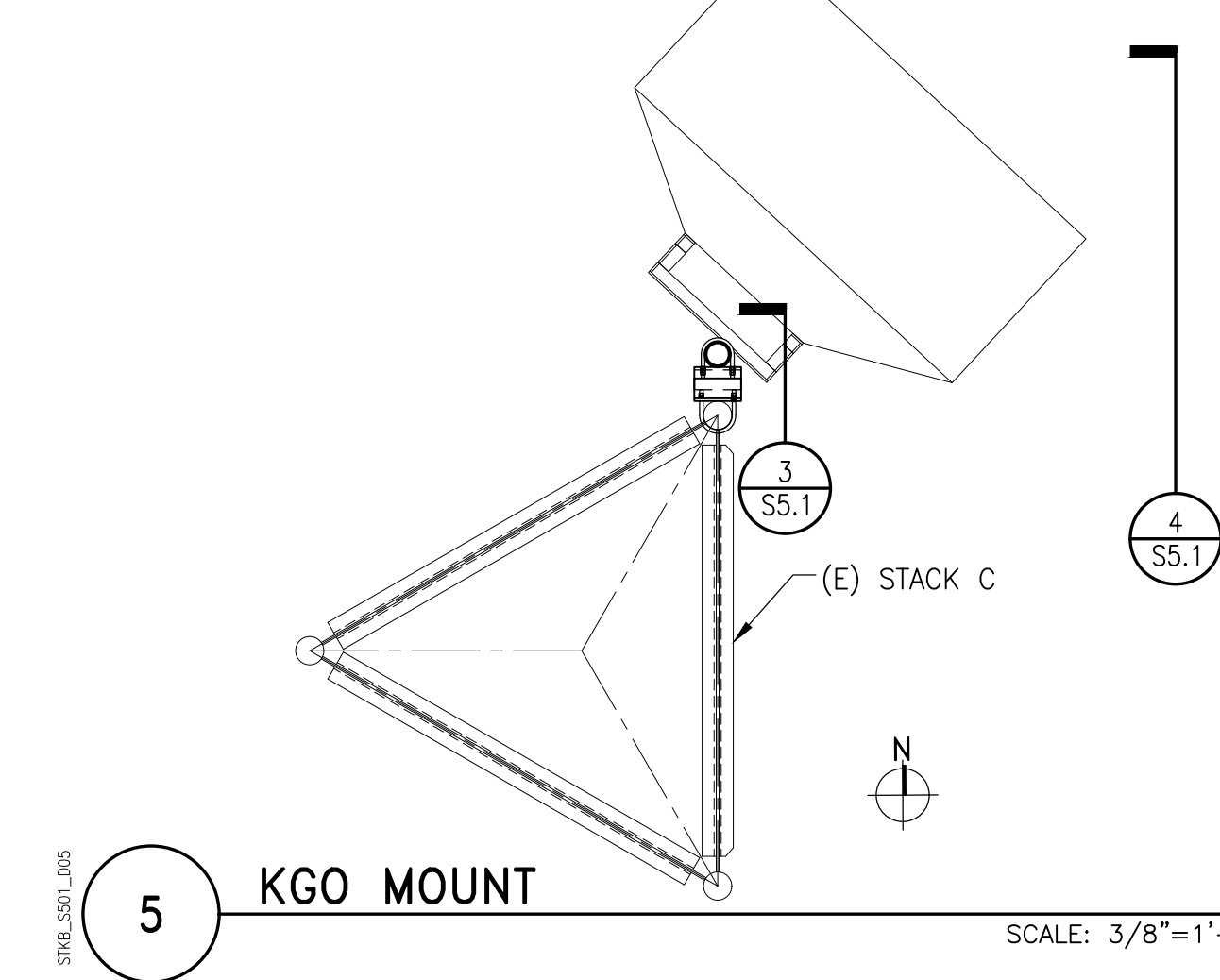
2 DETAIL SCALE: 1 1/2"=1'-0"



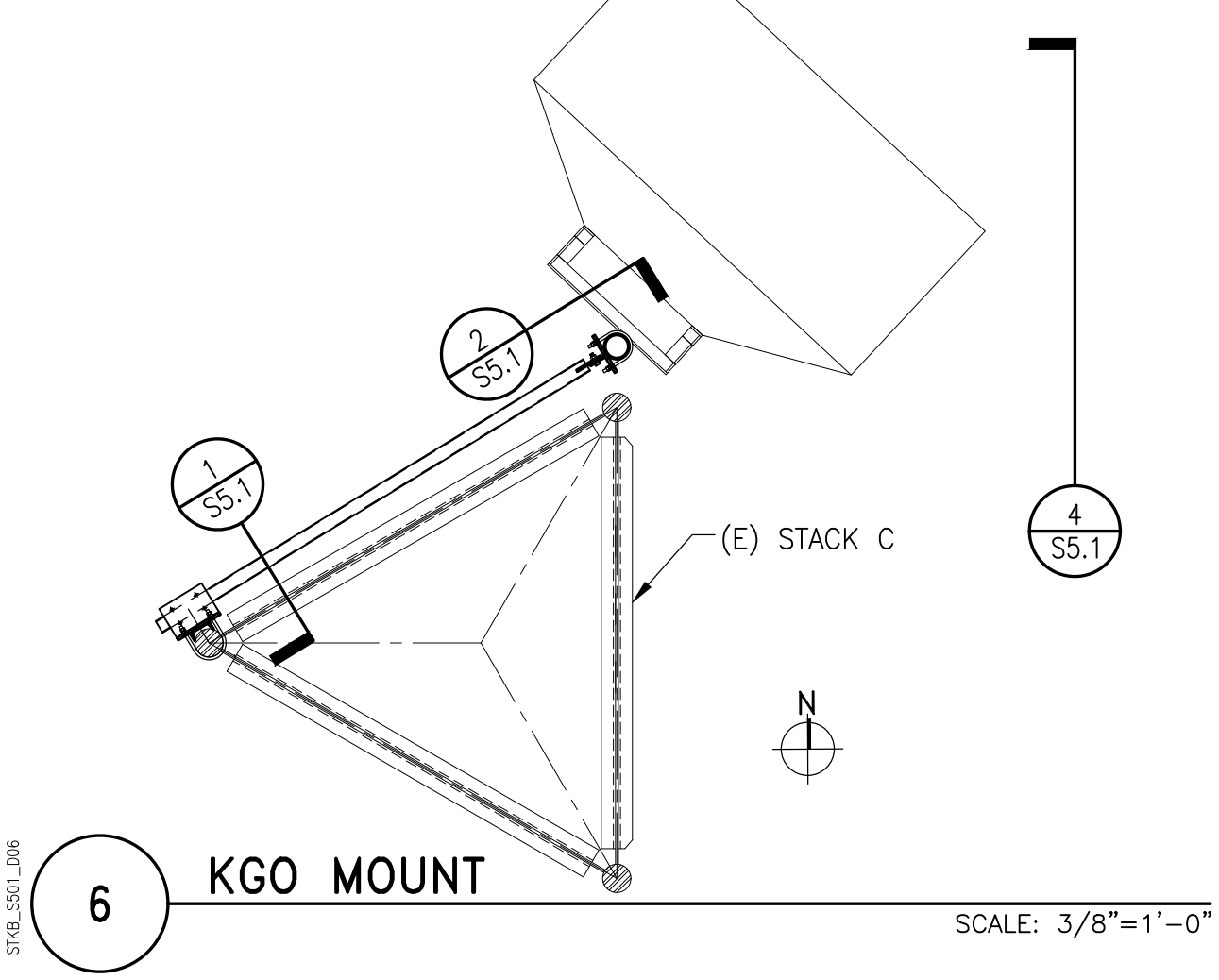
3 KGO MOUNT SCALE: 1 1/2"=1'-0"



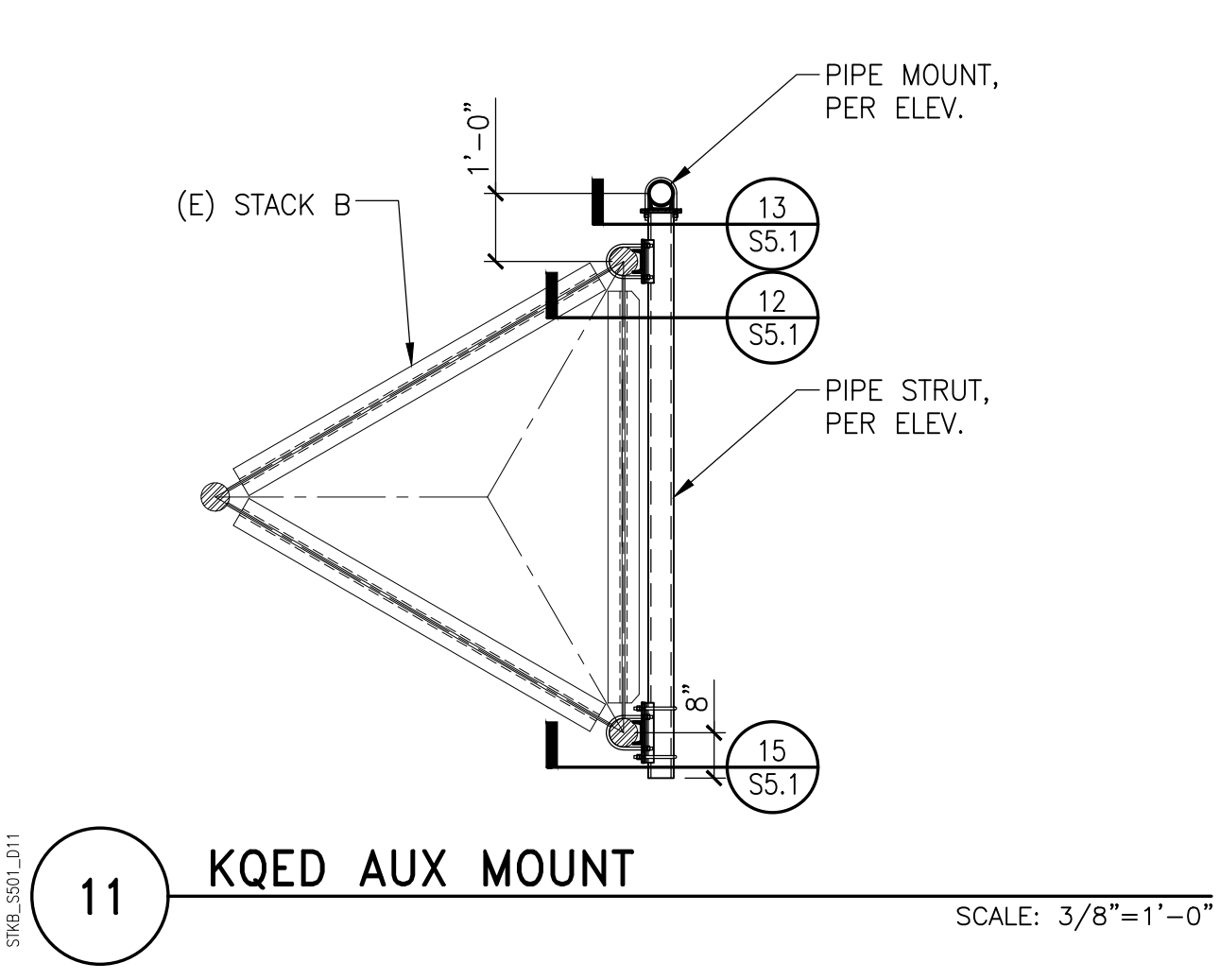
4 KGO MOUNT SCALE: 1/2"=1'-0"



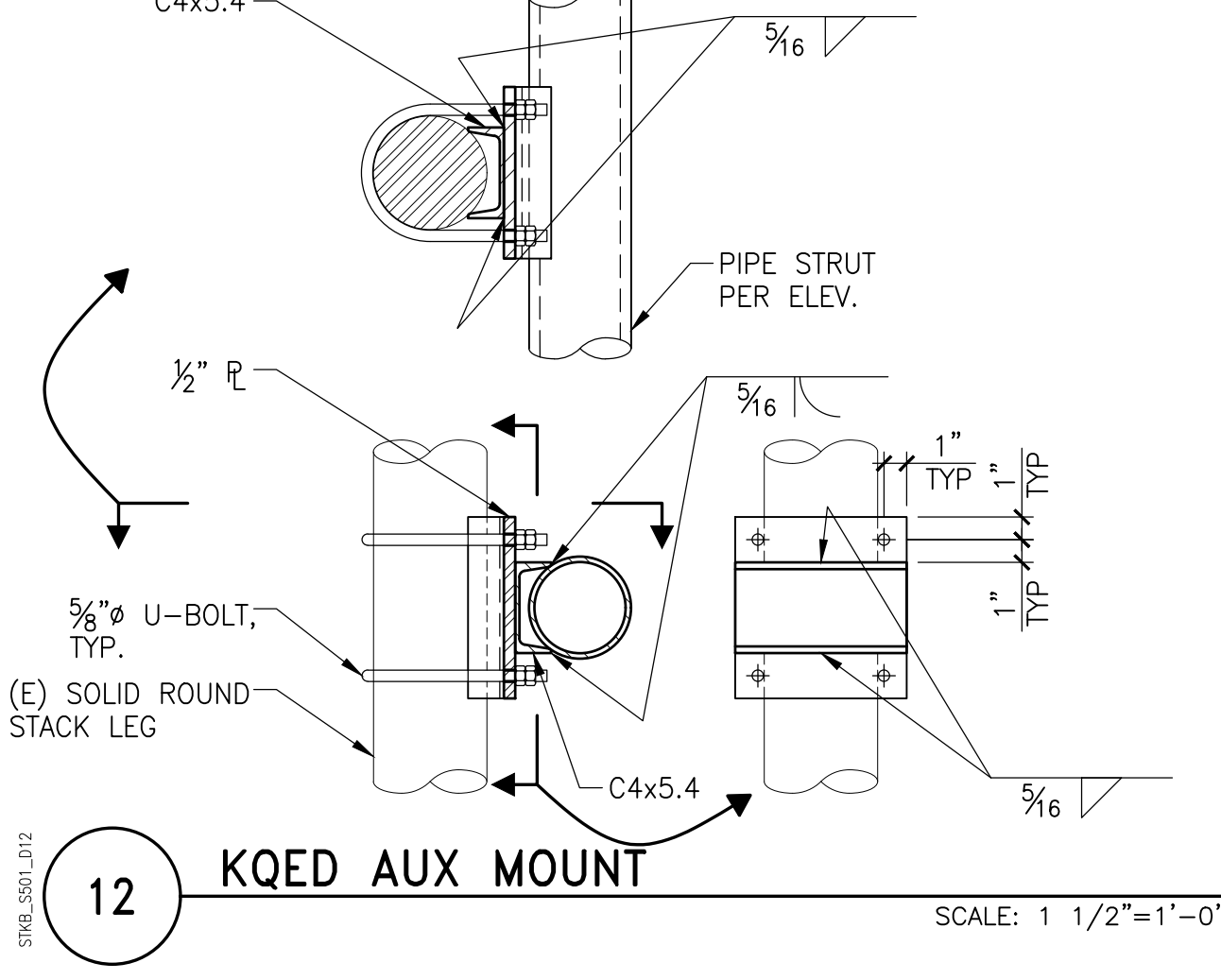
5 KGO MOUNT SCALE: 3/8"=1'-0"



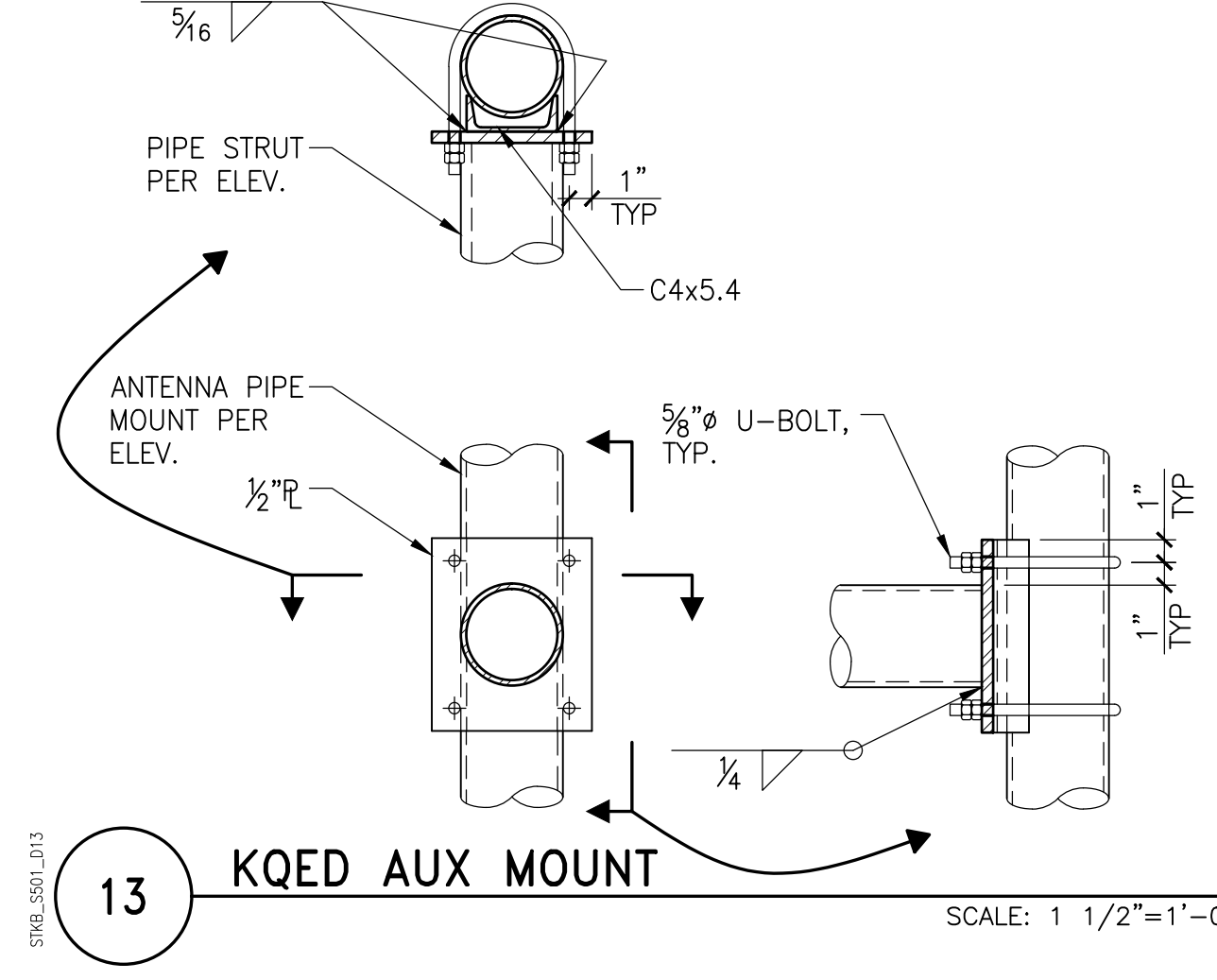
6 KGO MOUNT SCALE: 3/8"=1'-0"



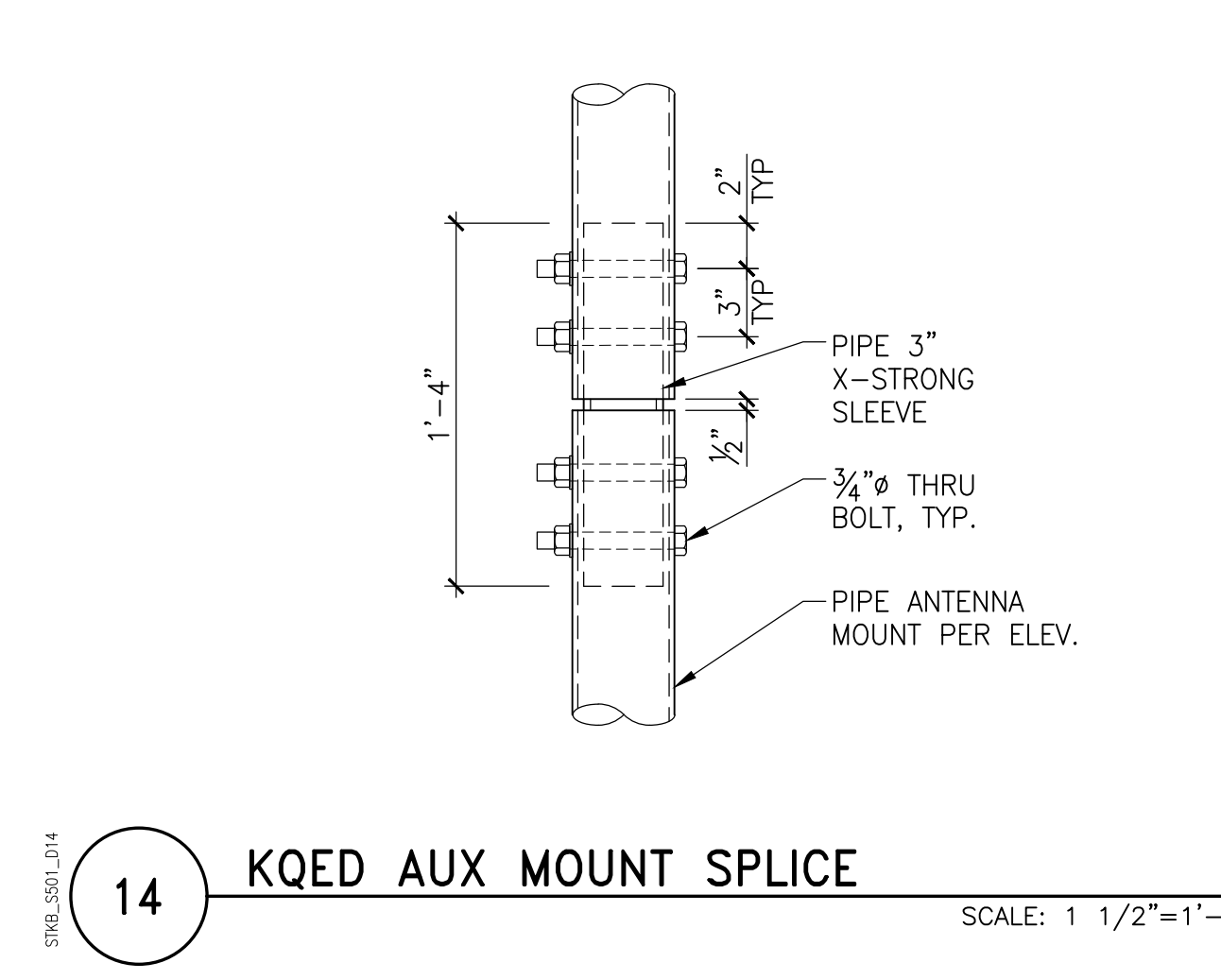
11 KQED AUX MOUNT SCALE: 3/8"=1'-0"



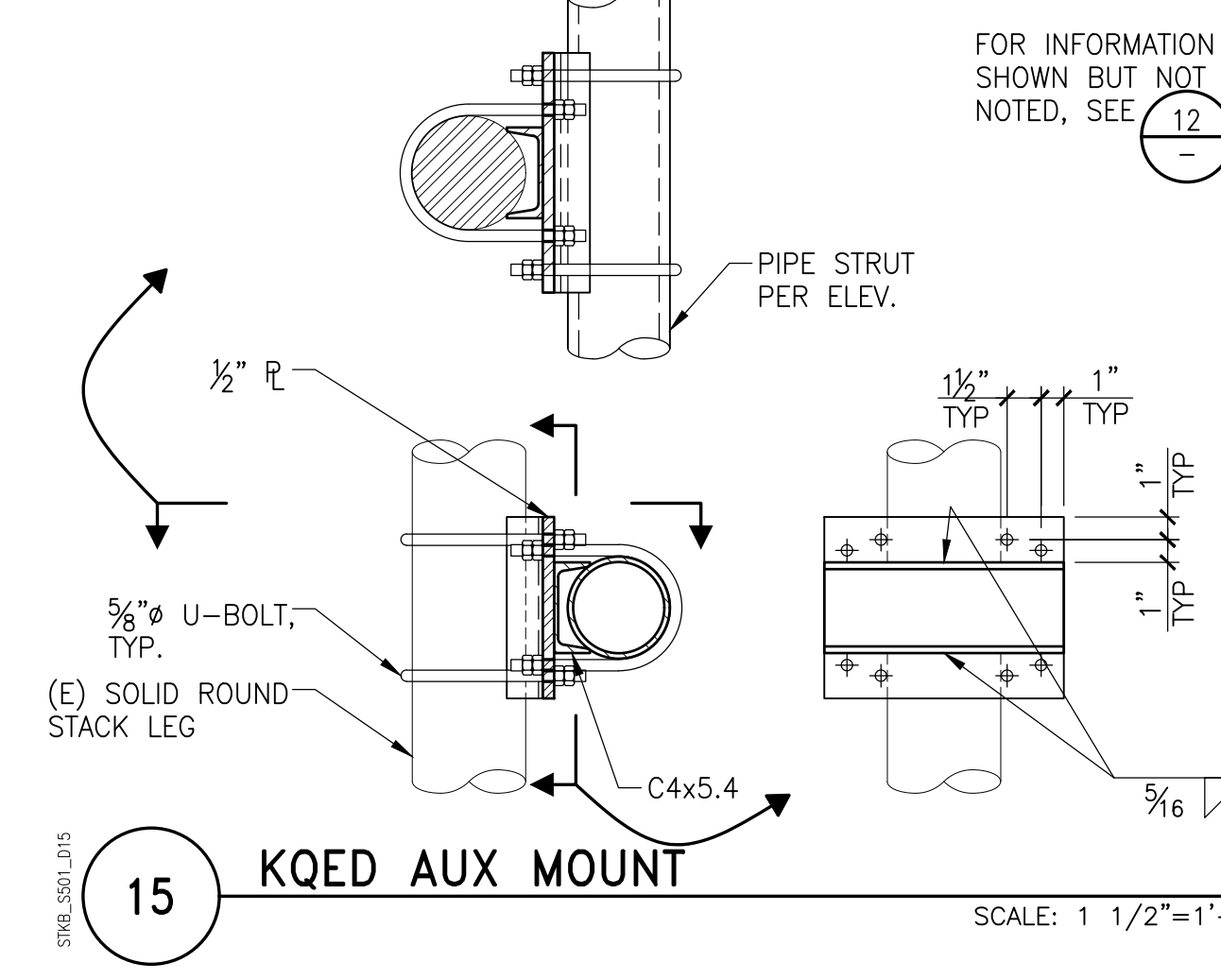
12 KQED AUX MOUNT SCALE: 1 1/2"=1'-0"



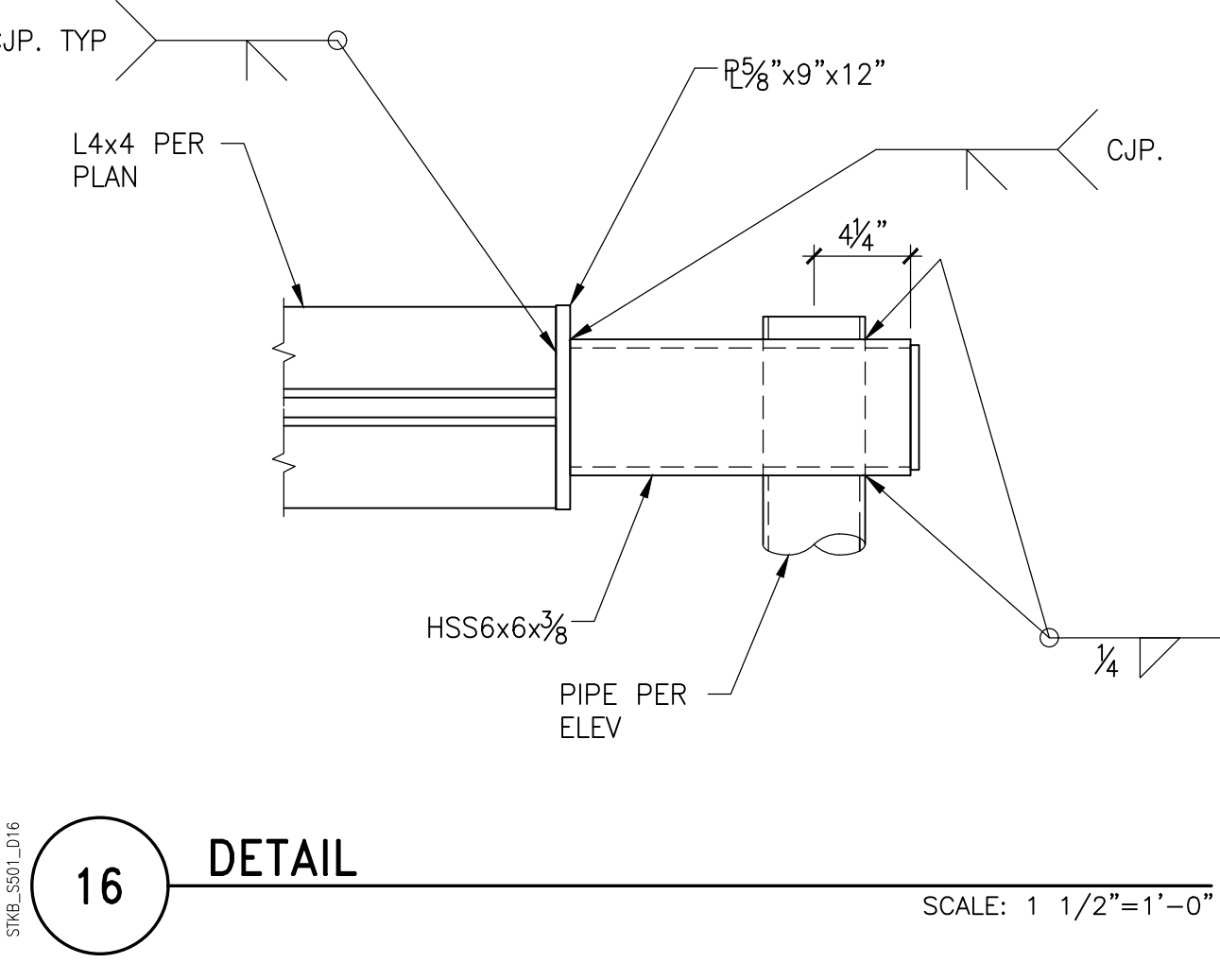
13 KQED AUX MOUNT SCALE: 1 1/2"=1'-0"



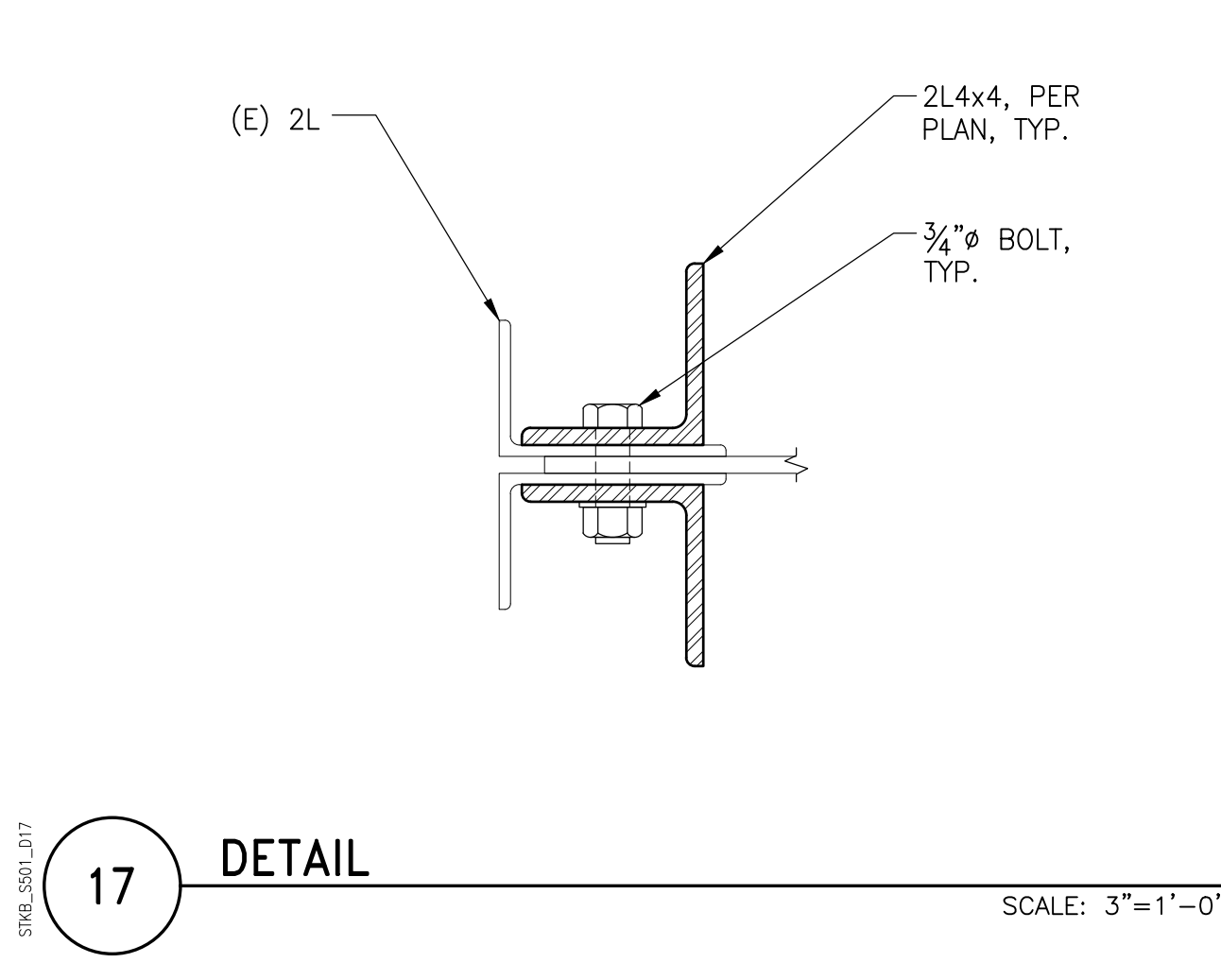
14 KQED AUX MOUNT SPLICE SCALE: 1 1/2"=1'-0"



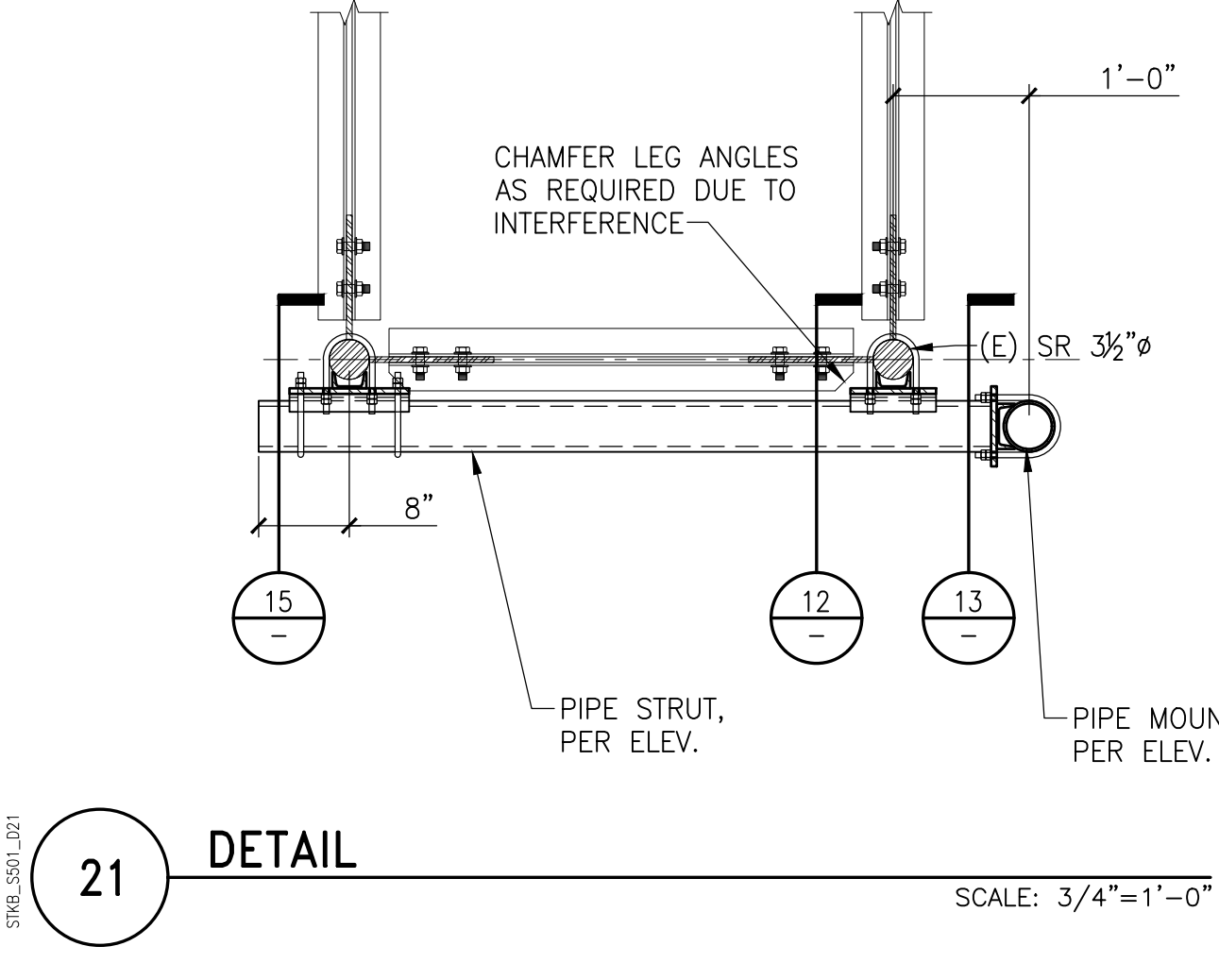
15 KQED AUX MOUNT SCALE: 1 1/2"=1'-0"



16 DETAIL SCALE: 1 1/2"=1'-0"



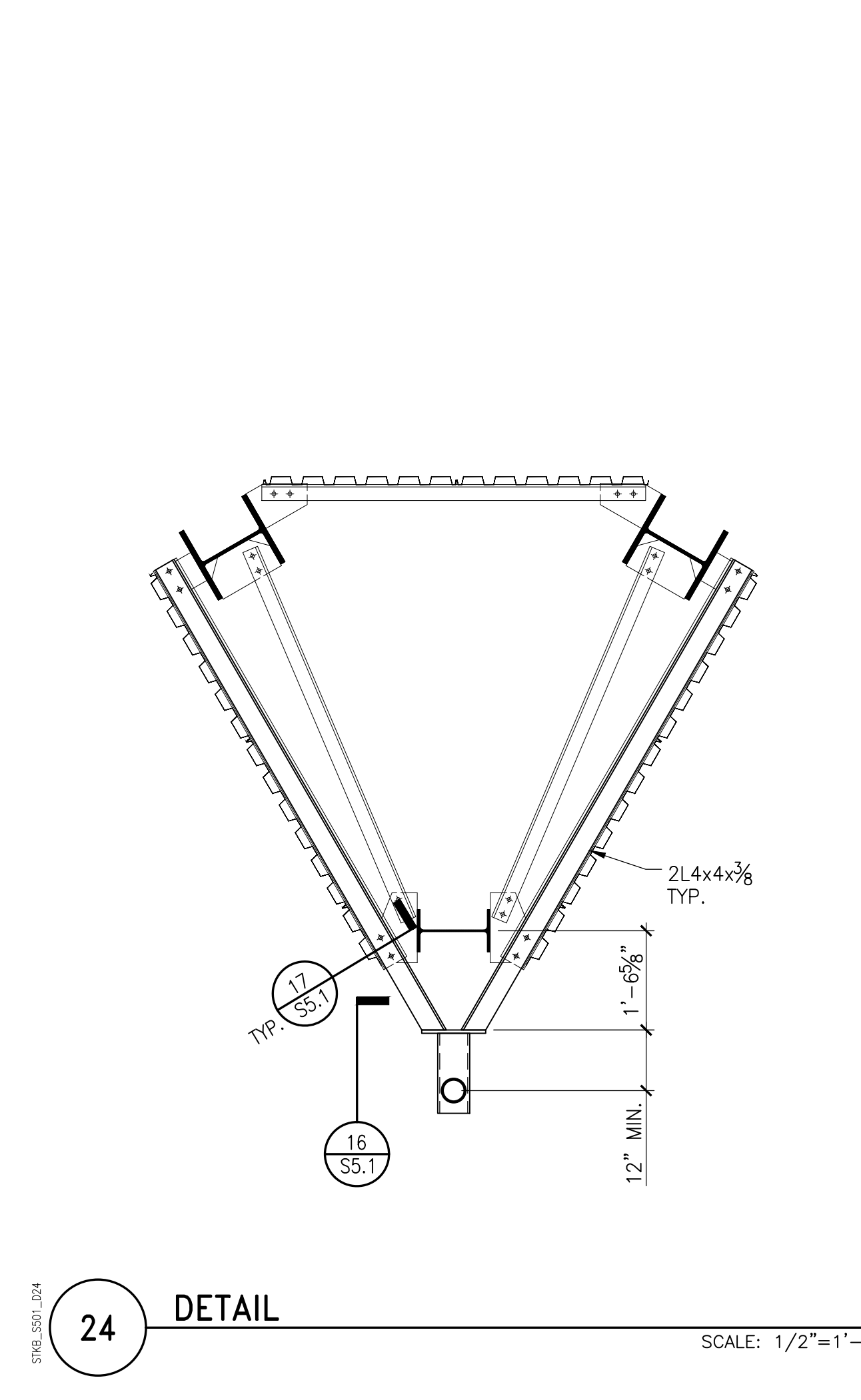
17 DETAIL SCALE: 3"=1'-0"



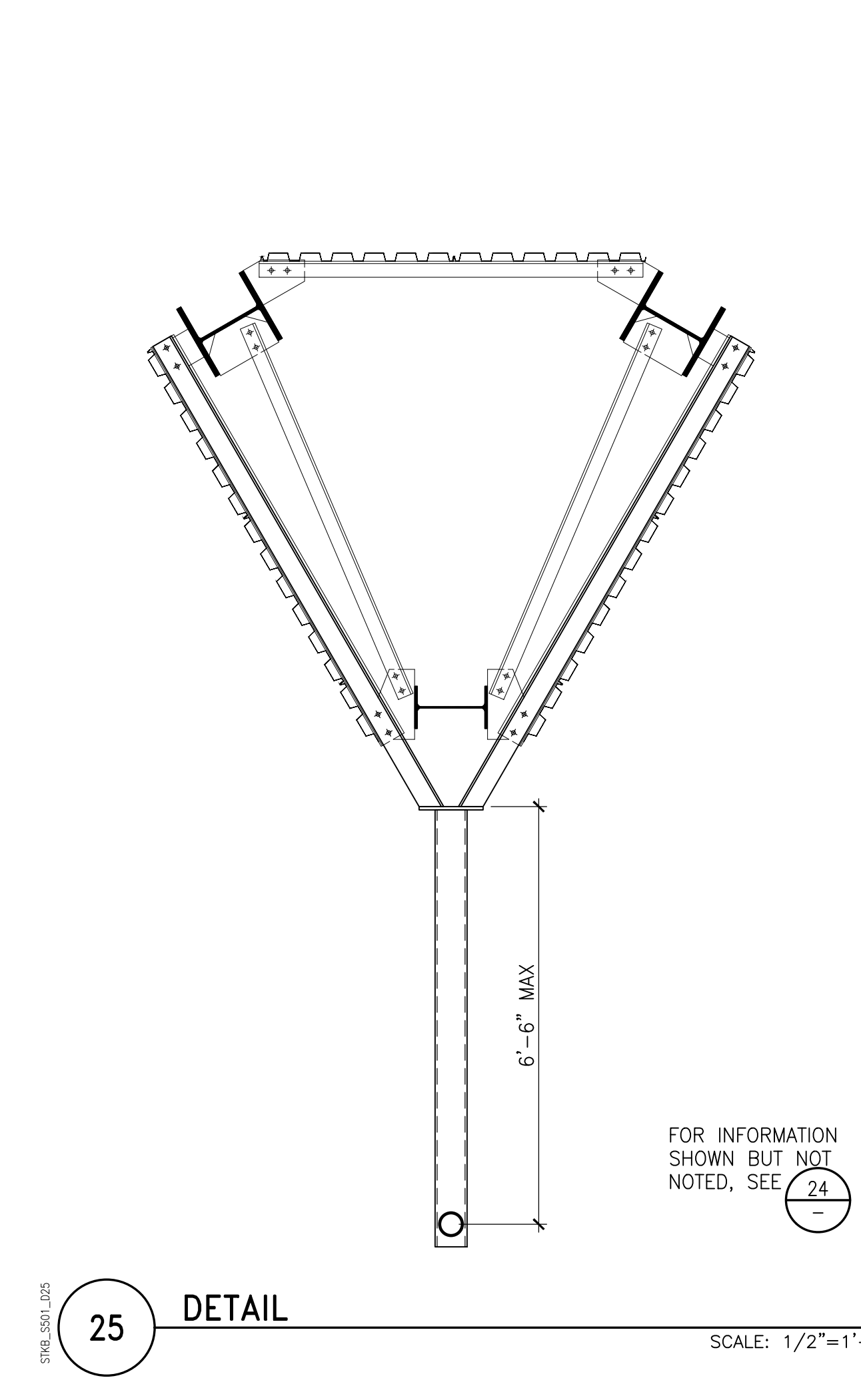
21 DETAIL SCALE: 3/4"=1'-0"



24 DETAIL SCALE: 1/2"=1'-0"



25 DETAIL SCALE: 1/2"=1'-0"



27 DETAIL SCALE: 1/2"=1'-0"

Consultant

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

BROADCAST CHANNEL REPACKING PROJECT		
1 LA AVANZADA ST. SAN FRANCISCO CALIFORNIA		
Project		

BROADCAST CHANNEL REPACKING PROJECT

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Project

DETAILS

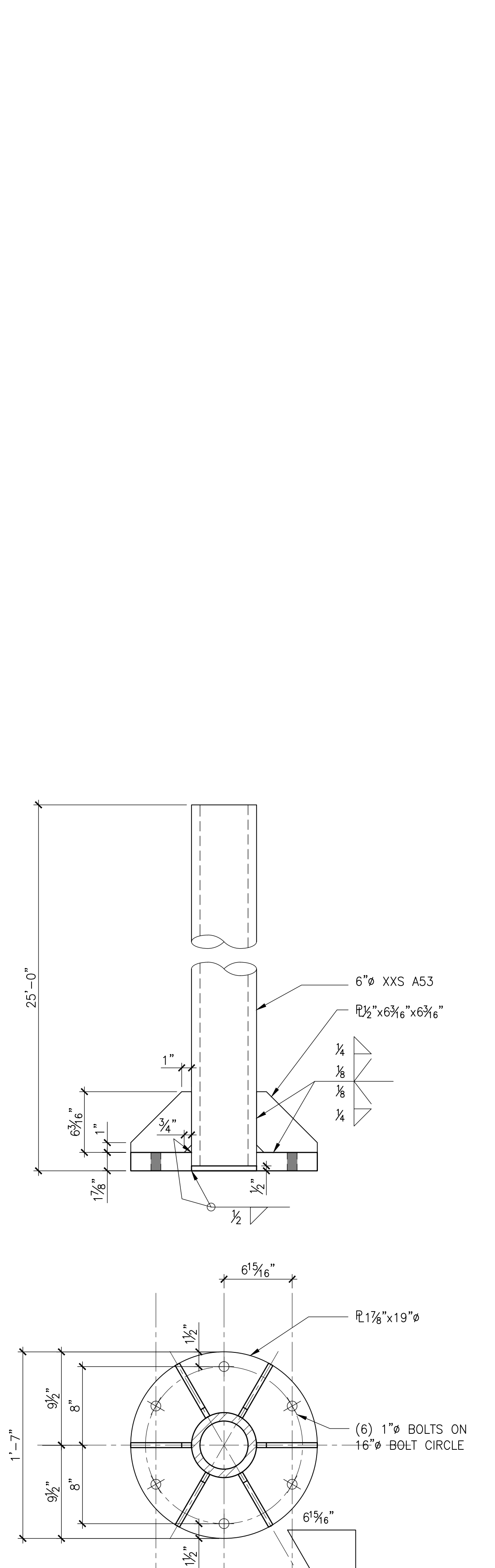
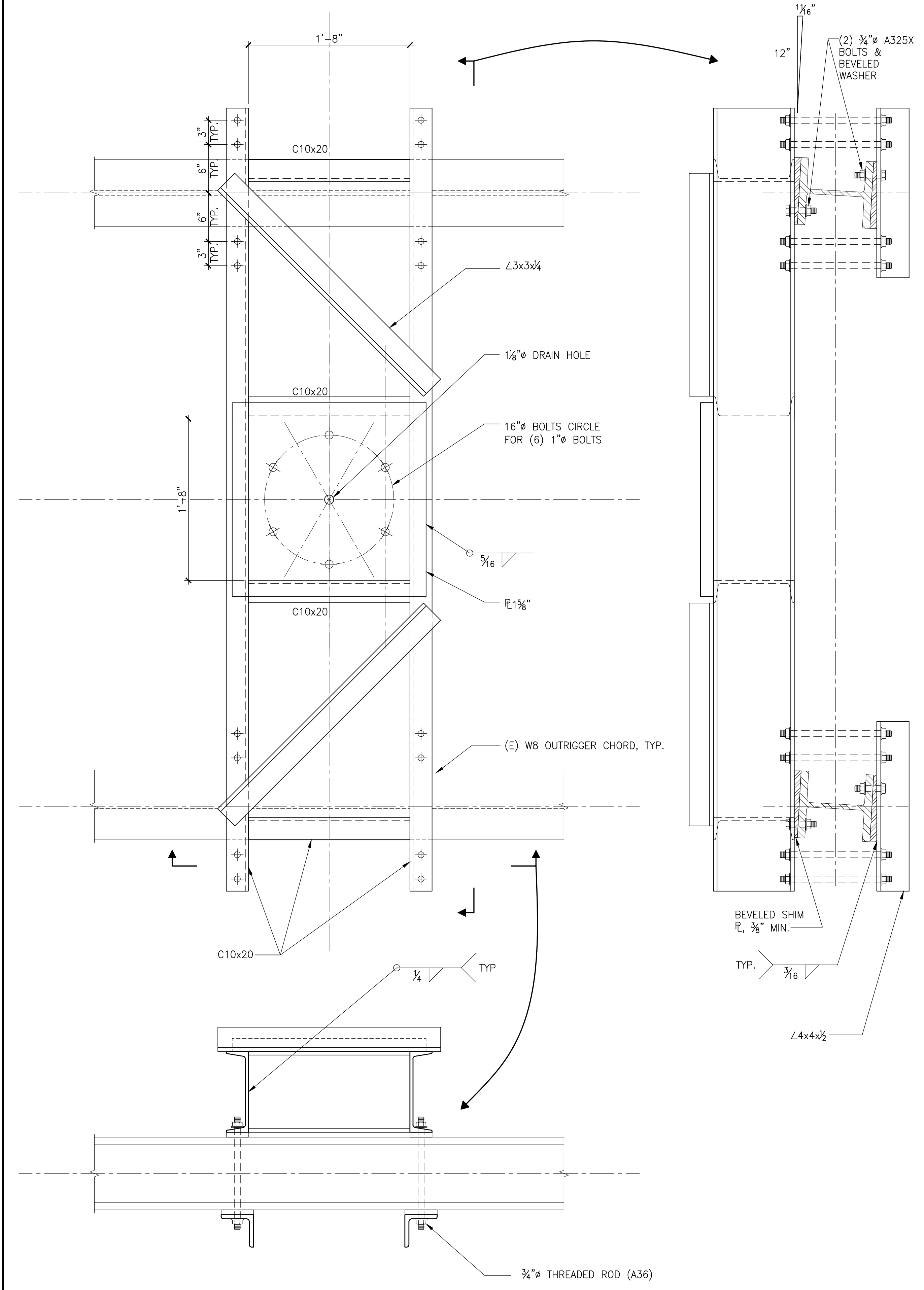
Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

Professional Engineer
 RICHARD O. HAMBERGER
 No. 2951
 REGISTERED PROFESSIONAL ENGINEER
 STATE OF CALIFORNIA

Drawing No. **S5.1**

Consultant



21 ANTENNA MOUNT

SCALE: 1 1/2"=1'-0"

23 ANTENNA MOUNT

SCALE: 1 1/2"=1'-0"

No.	Date	Description	By
12/18/18		ISSUED FOR PERMIT	ROH
9/21/17		ISSUED FOR PLANNING REVIEW	ROH

**BROADCAST CHANNEL
 REPACKING PROJECT**

**1 LA AVANZADA ST.
 SAN FRANCISCO
 CALIFORNIA**

Project

DETAILS

Drawing Title

Commission 067199.24	Checked BW	Date 09/06/17
Drawn GPN	Approved ROH	Scale AS NOTED

REGISTERED PROFESSIONAL ENGINEER
 FRANCIS D. HAMBERGER
 No. 2951
 STATE OF CALIFORNIA

Drawing No.
S5.2

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21

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