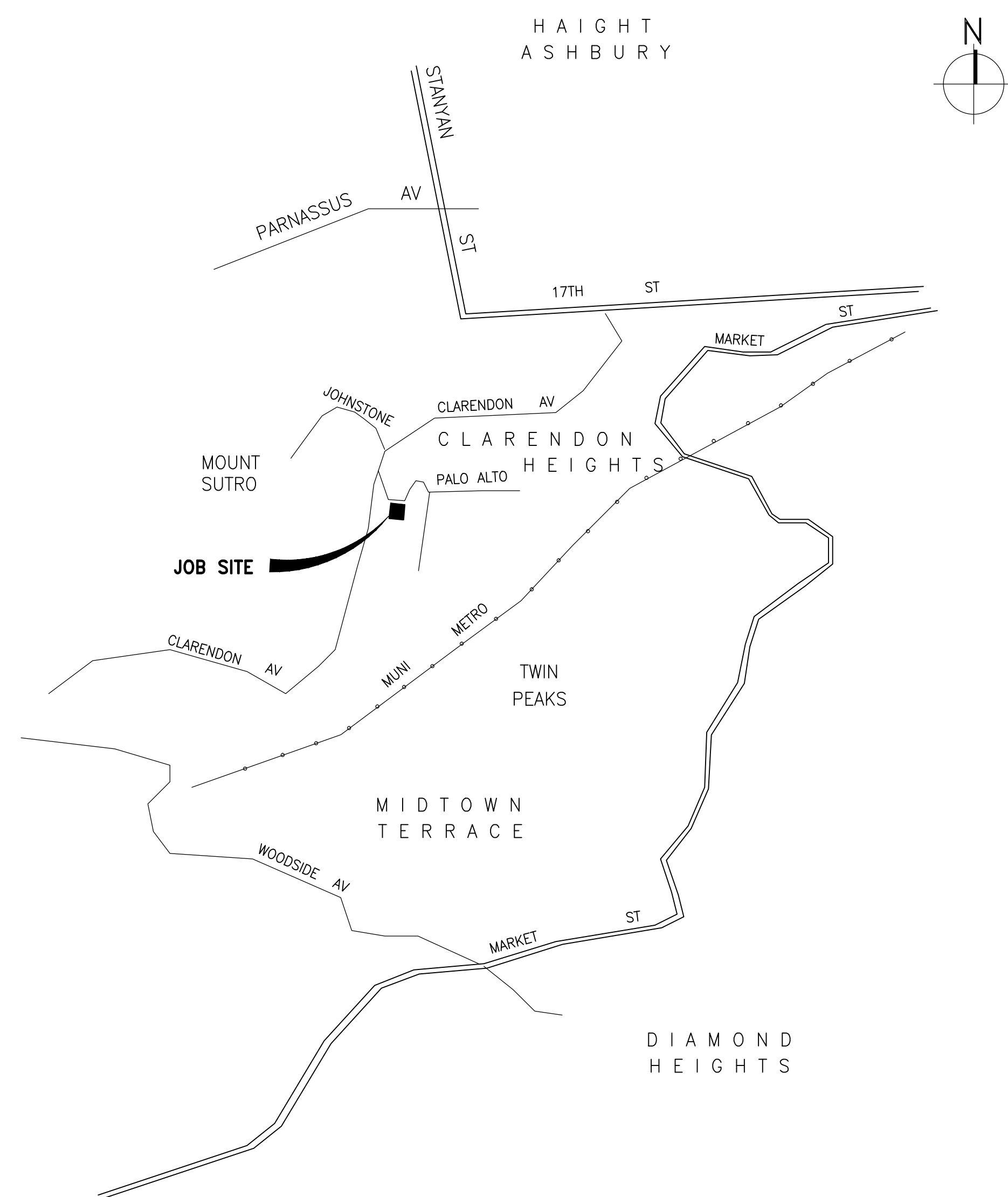


TOWER ANTENNA ADDITIONS SUTRO TOWER SAN FRANCISCO, CALIFORNIA

Consultant

VICINITY MAP



PROJECT SCOPE:

INSTALLATION OF NEW ANTENNAS AND OTHER EQUIPMENT ON SUTRO TOWER. A LIST OF ALL EQUIPMENT IS PROVIDED ON SHEET S1.0

LIST OF DRAWINGS

- S0.0 TITLE SHEET, VICINITY MAP & LIST OF DRAWINGS
- S0.1 GENERAL NOTES, ABBREVIATIONS & LEGEND
- S1.0 TOWER REFERENCE PLAN & ELEVATION
- S1.1 ANTENNA CUT SHEETS
- S1.2 ANTENNA CUT SHEETS
- S1.3 ANTENNA CUT SHEETS
- S1.4 ANTENNA CUT SHEETS
- S1.5 ANTENNA CUT SHEETS
- S2.1 2ND LEVEL FRAMING
- S2.2 3RD LEVEL FRAMING
- S2.3 4TH LEVEL FRAMING
- S2.4 5TH LEVEL FRAMING
- S2.5 6TH LEVEL FRAMING
- S3.1 ANTENNA MOUNTS, STACKS "A", "B", AND "C"
- S3.2 ANTENNA MOUNTS, STACKS "A", "B", AND "C"
- S3.3 NDTV AUXILIARY ANTENNA ELEVATIONS AND SECTIONS
- S3.4 AUXILIARY ANTENNA TOP MOUNT LEVEL 4 DETAILS
- S5.1 DETAILS

No.	Date	Description	By
0		ISSUED FOR PERMIT	ROH

**TOWER ANTENNA
ADDITIONS
SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO
CALIFORNIA
94131**

Project

**TITLE SHEET
VICINITY MAP
&
LIST OF DRAWINGS**

Drawing Title

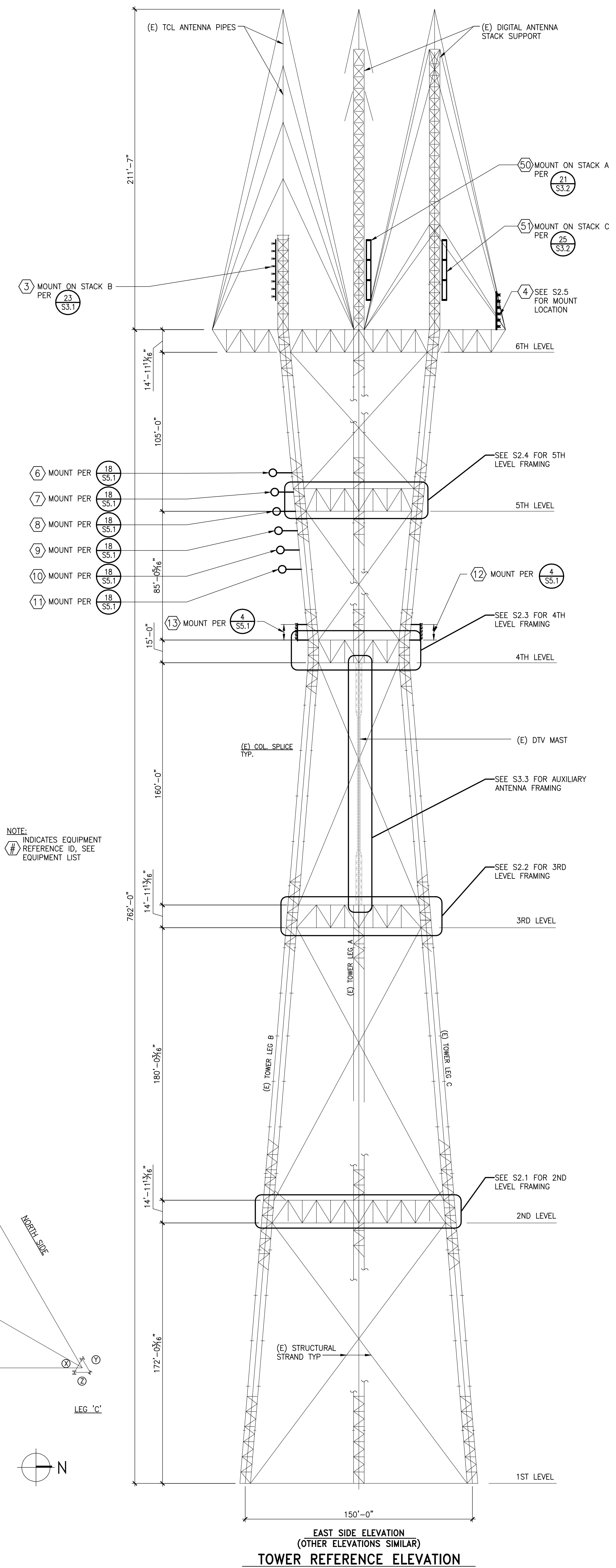
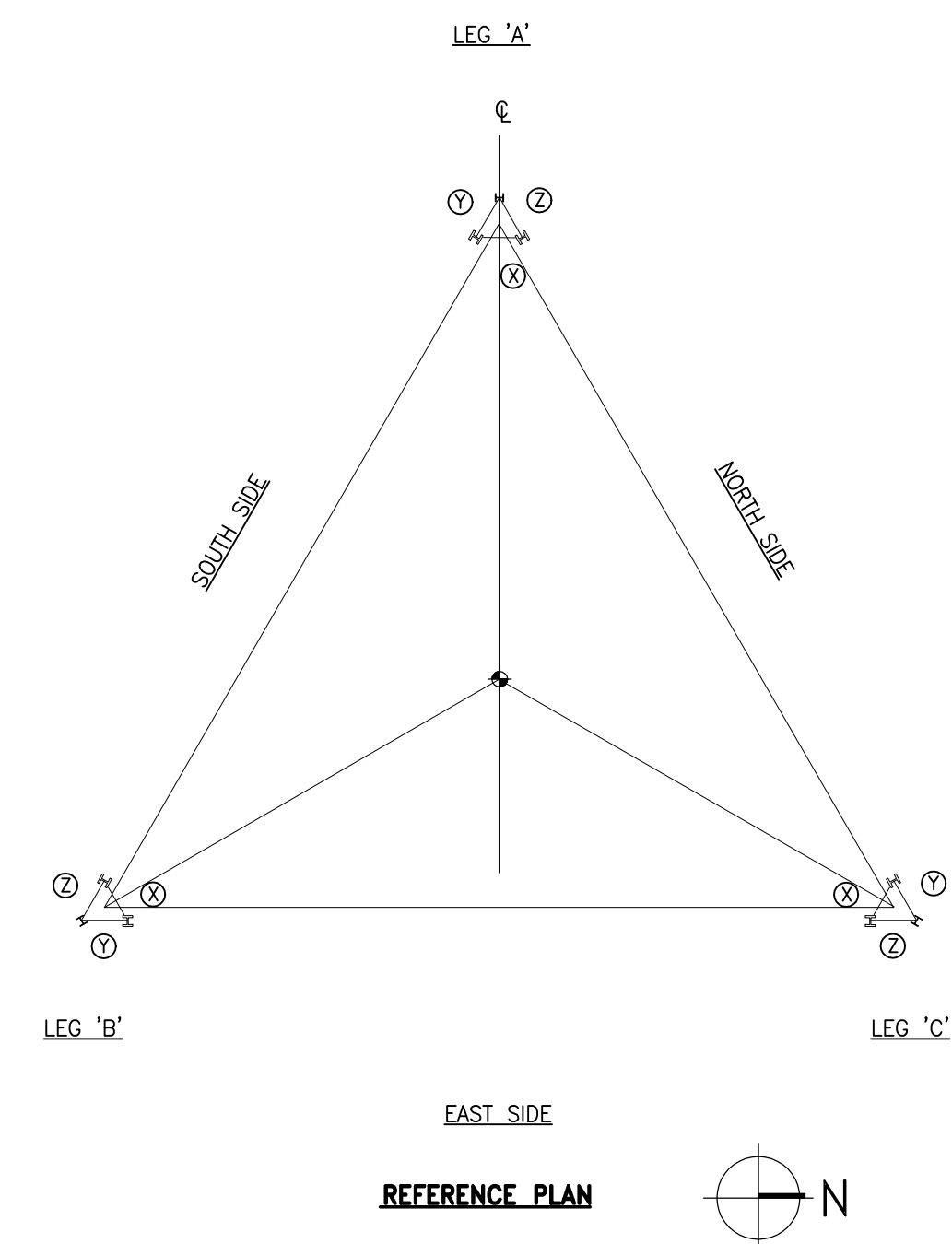
Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale NONE

Professional Engineer
No. 2951
STATE OF CALIFORNIA
Structural

Drawing No.
S0.0

Ref #	Description	Height	Weight	Equipment Type	Emission	ERP (KW)	Customer	Purpose
Replace Existing Equipment								
2	Move KOIT Aux Antenna to Level 5	642	2500	ERI SHPX-6C installed on pole hanging from Level 5	Yes	Need to calc	KOIT-FM	Relocate for better coverage--Also reduces neighborhood RFR
Add New Equipment								
4	KREV Main FM Antenna	762	1000	Antenna Concepts AT16M on northeast outrigger	Yes	Class A equiv.	KREV FM Radio	Moves main antenna to higher location
5	KREV 950 MHz STL Receive	650	50	Andrew KP4F-820 on east face	no	None	KREV FM Radio	Studio to transmitter relay
6	Second ENG Receive Antenna for KTVU	670	200	NSI Superquad or Eq.--South Leg	No	None	KTVU-TV	Adds southeast news truck coverage
7	Second ENG Receive Antenna for KRON	650	200	NSI Superquad or Eq.--South Leg	No	None	KRON Television	Adds southeast news truck coverage
8	Second ENG Receive Antenna for KPIX	640	200	NSI Superquad or Eq.--South Leg	No	None	KPIX Television	Adds southeast news truck coverage
9	Second ENG Receive Antenna for KGO	630	200	NSI Superquad or Eq.--South Leg	No	None	KGO Television	Adds southeast news truck coverage
10	Second ENG Receive Antenna for KNTV	620	200	NSI Superquad or Eq.--South Leg	No	None </td <td>KNTV Television</td> <td>Adds southeast news truck coverage</td>	KNTV Television	Adds southeast news truck coverage
11	Second ENG Receive Antenna for KFSF	610	200	NSI Superquad or Eq.--South Leg	No	None	KFSF Television	Adds southeast news truck coverage
12	North Leg Weather Camera Mount	590	40	Canon BU-46H or Eq.--North Leg	No	None	All 6 TV News stations	Adds mounts for weather coverage to North leg
13	South Leg Weather Camera Mount	595	40	Canon BU-46H or Eq.--South Leg	No	None	All 6 TV News stations	Adds mounts for weather coverage to South leg
14	Microwave Dish for KMTP	187	400	Andrew 6 foot UHX6-65--South Leg	No	None	KMTP Television	Adds microwave STL receiver for KMTP
15	Microwave Dish for KCSM	187	400	Andrew 6 foot UHX6-65--South Leg	No	None	KCSM Television	Adds microwave STL receiver for KCSM
16	136-174 MHz Receive	657	32	Bird Technologies BA40-41-DIN	No	None	Level 3 and 4 customers	Technology change--Splits receivers from transmitters on Level 3 and 4
17	330-420 MHz Receive	657	11	Bird Technologies BA40-57-DIN	No	None	Level 3 and 4 customers	Technology change--Splits receivers from transmitters on Level 3 and 4
18	400-520 MHz Receive	657	18	Bird Technologies BA8080-67-DIN	No	None	Level 3 and 4 customers	Technology change--Splits receivers from transmitters on Level 3 and 4
19	746-806 MHz Receive	657	8	Bird Technologies COL811-806	No	None	Level 3 and 4 customers	Technology change--Splits receivers from transmitters on Level 3 and 4
20	806-860 MHz Receive	657	5	Bird Technologies COL85-870	No	None	Level 3 and 4 customers	Technology change--Splits receivers from transmitters on Level 3 and 4
21	Bay Bridge Receive	187	200	Andrew 6 foot VHP6-180A--East Face	Yes	+26dBm TPO	All 6 TV News stations	Technology change--New bridge camera feed for all stations to share
22	San Mateo Bridge Receive	187	200	Andrew 6 foot VHP6-180A--East Face	Yes	+26dBm TPO	All 6 TV News stations	Technology change--New bridge camera feed for all stations to share
23	Richmond San Rafael Receive	187	200	Andrew 6 foot VHP6-180A--East Face	Yes	+26dBm TPO	All 6 TV News stations	Technology change--New bridge camera feed for all stations to share
24	Dumbarton Bridge Receive	187	200	Andrew 6 foot VHP6-180A--East Face	Yes	+26dBm TPO	All 6 TV News stations	Technology change--New bridge camera feed for all stations to share
25	Carquiniis Bridge Receive	657	200	Andrew 6 foot VHP6-180A--East Face	Yes	+26dBm TPO	All 6 TV News stations	Technology change--New bridge camera feed for all stations to share
26	Airport Camera Receive	187	200	Andrew 6 foot VHP6-180A--East Face	Yes	+26dBm TPO	All 6 TV News stations	Technology change--New bridge camera feed for all stations to share
27	Dish Antenna for BAYWEB Project	550	200	Andrew 6 foot VHP6-180A--East Face	Yes	+30 dBm TPO	Bayweb	Technology change. Public safety agency request.
28	Dish Antenna for BAYWEB Project	550	200	Andrew 6 foot VHP6-180A--East Face	Yes	+30 dBm TPO	Bayweb	Technology change. Public safety agency request.
29	Dish Antenna for BAYWEB Project	550	200	Andrew 6 foot VHP6-180A--SW Face	Yes	+30 dBm TPO	Bayweb	Technology change. Public safety agency request.
30	Dish Antenna for BAYWEB Project	550	200	Andrew 6 foot VHP6-180A--SW Face	Yes	+30 dBm TPO	Bayweb	Technology change. Public safety agency request.
31	Dish Antenna for BAYWEB Project	550	200	Andrew 6 foot VHP6-180A--NW Face	Yes	+30 dBm TPO	Bayweb	Technology change. Public safety agency request.
32	Dish Antenna for BAYWEB Project	550	200	Andrew 6 foot VHP6-180A--NW Face	Yes	+30 dBm TPO	Bayweb	Technology change. Public safety agency request.
33	Golden Gate Bridge Receive	187	50	Andrew 30 inch dish East Face	Yes	+23 dBm TPO	All 6 TV News stations	New bridge camera feed for all stations to share
34	WiFi Antenna, East Face	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
35	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
36	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
37	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
38	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
39	WiFi Antenna, Northwest Face	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
40	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
41	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
42	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
43	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
44	WiFi Antenna, Southeast Face	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
45	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
46	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
47	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
48	WiFi Antenna	375	50	Ubiquiti Networks M5 MINO Bridge	Yes	+27 dBm TPO	Dept. of Technology, City and County of San Francisco	WiFi for low income San Francisco residents
49	FM Translator Antenna, EMF Radio	375	200	Scala CLFM/2 pointed at 42 and 162 degrees--Face mounted	yes	.070 H&V	Educational Media Foundation--KLOVE	Translator on 88.9 MHz to improve coverage in San Francisco
50	TV Broadcast Antenna, KTNC, Channel 14	800	2000	Dielectric TFU-24DSC/VP-R 4C190	Yes	1,000	KTNC Television, Concord	Improve Bay Area Coverage
51	TV Broadcast Antenna, KEMO, Channel 32	800	2000	RFS DX24D-FR	Yes	8 KW TPO	KEMO Television, Santa Rosa	Booster to improve San Francisco Coverage
52	TV Broadcast Auxiliary Antenna, KEMO Channel 14	525	1000	Dielectric TFU-10DSC/VP-R 4C190	Yes	250	KTNC Television, Concord	Improve Bay Area Coverage

EQUIPMENT LIST



TOWER REFERENCE ELEVATION

SIMPSON GUMPERTZ & HEGER
 Engineering of Structures and Building Enclosures
 Simpson Gumpertz & Heger Inc.
 The Landmark @ One Market, Suite 600
 San Francisco, California 94105
 415.495.3700 fax: 415.495.3550
 www.sgh.com

Boston
Los Angeles
New York
San Francisco
Washington, DC

0			
No.	Date	Description	ROH By

TOWER ANTENNA ADDITIONS SUTRO TOWER
1 LA AVANZADA ST SAN FRANCISCO CALIFORNIA 94131

TOWER REFERENCE PLAN & ELEVATION

Drawing Title

Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale 1"=40'-0"

Drawing No.

S1.0

TOWER REFERENCE PLAN & ELEVATION

Drawing Title

Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale 1"=40'-0"

Drawing No.

S1.0

Consultant

ROTOTILLER™ Axiom™ Series
Circularly Polarized Broadband FM Antenna

SHPKA Model

Model	Number of Bays	Frequency Range (MHz)	Gain (dBS)	Impedance	Feed Configuration	Beam Response
SHPKA 400-SP	4	1.17 - 40.00	1.12 - 0.80	50 Ohm	Center	Null/Flat
SHPKA 800-SP	8	1.17 - 40.00	1.12 - 0.80	50 Ohm	Center	Null/Flat
SHPKA 1600-SP	16	1.17 - 40.00	1.12 - 0.80	50 Ohm	Center	Null/Flat
SHPKA 3200-SP	32	1.17 - 40.00	1.12 - 0.80	50 Ohm	Center	Null/Flat

Mechanical Specifications

Antenna Size	Weight (lbs)	Dimensions (in)	Material
SHPKA 400-SP	40	24.0 x 24.0 x 24.0	Aluminum
SHPKA 800-SP	80	48.0 x 48.0 x 48.0	Aluminum
SHPKA 1600-SP	160	96.0 x 96.0 x 96.0	Aluminum
SHPKA 3200-SP	320	192.0 x 192.0 x 192.0	Aluminum

Ordering Information

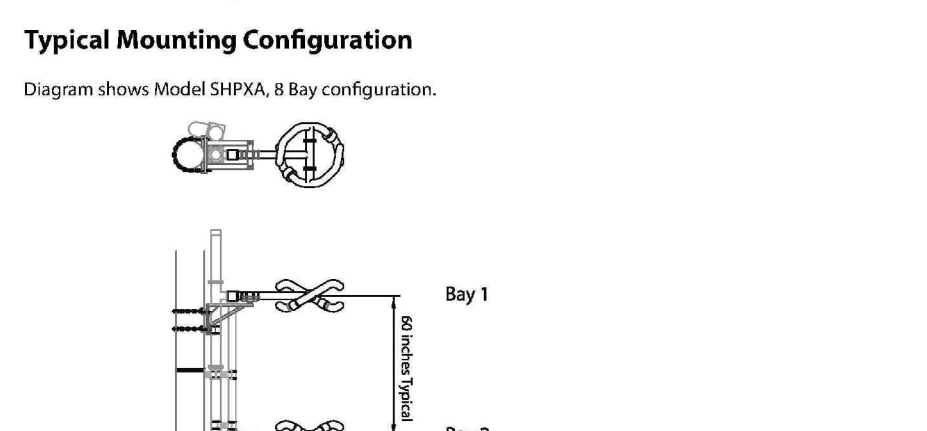
Type Number Definition

Example: SHPKA 400-SP

Options:

- Beam tilt (center feed antennas only)
- First null fill (center feed antennas only)
- Second null fill (center feed antennas only)
- Beam tilt and first null fill (center feed antennas only)
- Radomes
- Diodes (SDW/220V)
- Storm headers (SDW/220V)
- Export packing

ROTOTILLER™ Axiom™ Series
Circularly Polarized Broadband FM Antenna



Ordering Information

Type Number Definition

Example: SHPKA 400-SP

Options:

- Beam tilt (center feed antennas only)
- First null fill (center feed antennas only)
- Second null fill (center feed antennas only)
- Beam tilt and first null fill (center feed antennas only)
- Radomes
- Diodes (SDW/220V)
- Storm headers (SDW/220V)
- Export packing

FMS Antennas http://www.sveef.com/products/fms.html#FMS_Antennas

SWR

About Us

History

Timeline

Projects

Products

Frequency Range: 20-100 MHz

Polarization: Circular

Power Rating: 100W

Impedance: 50 Ohm

Gain: 1.12 - 0.80

Beam Response: Null/Flat

Construction: Durable corrosion resistant construction. The antenna system is fabricated from rugged heavy wall copper and steel. All joints are TIG welded.

Online Catalog

Engineering

Installation

Shipping

Home

Employment

Help

Government

Education

1999 AAS Booth Exhibit

International Language Translations

SWR, Inc. maintains a continuous program of product improvement, and therefore reserves the right to change specifications without notice.

Back to FMS Antennas

FMS DATA

Model	Gain	Power Rating	F/W dB	1/2-Wave	1/2-Wave	Power Rating	Pub. Weight
FM301	1	0.45	-2.20	0.30	-4.5	3.00	3.00
FM302	2	1	0	0.76	-1.19	6.00	10.00
FM303	3	1.5	1.76	1.24	-0.57	9.00	20.00
FM304	4	2.1	3.22	1.82	0.02	12.00	30.00
FM305	5	2.7	4.31	1.9	0.79	15.00	40.00
FM306	6	3.2	5.00	2.20	1.50	18.00	50.00
FM307	7	3.8	5.8	2.46	2.15	21.00	60.00
FM308	8	4.3	6.20	2.64	2.83	24.00	70.00
FM309	10	5.4	7.46	3.4	3.8	30.00	90.00
FM310	12	6.7	8.26	4.60	4.60	35.00	110.00

1 ANTENNA REF #2 AND #3

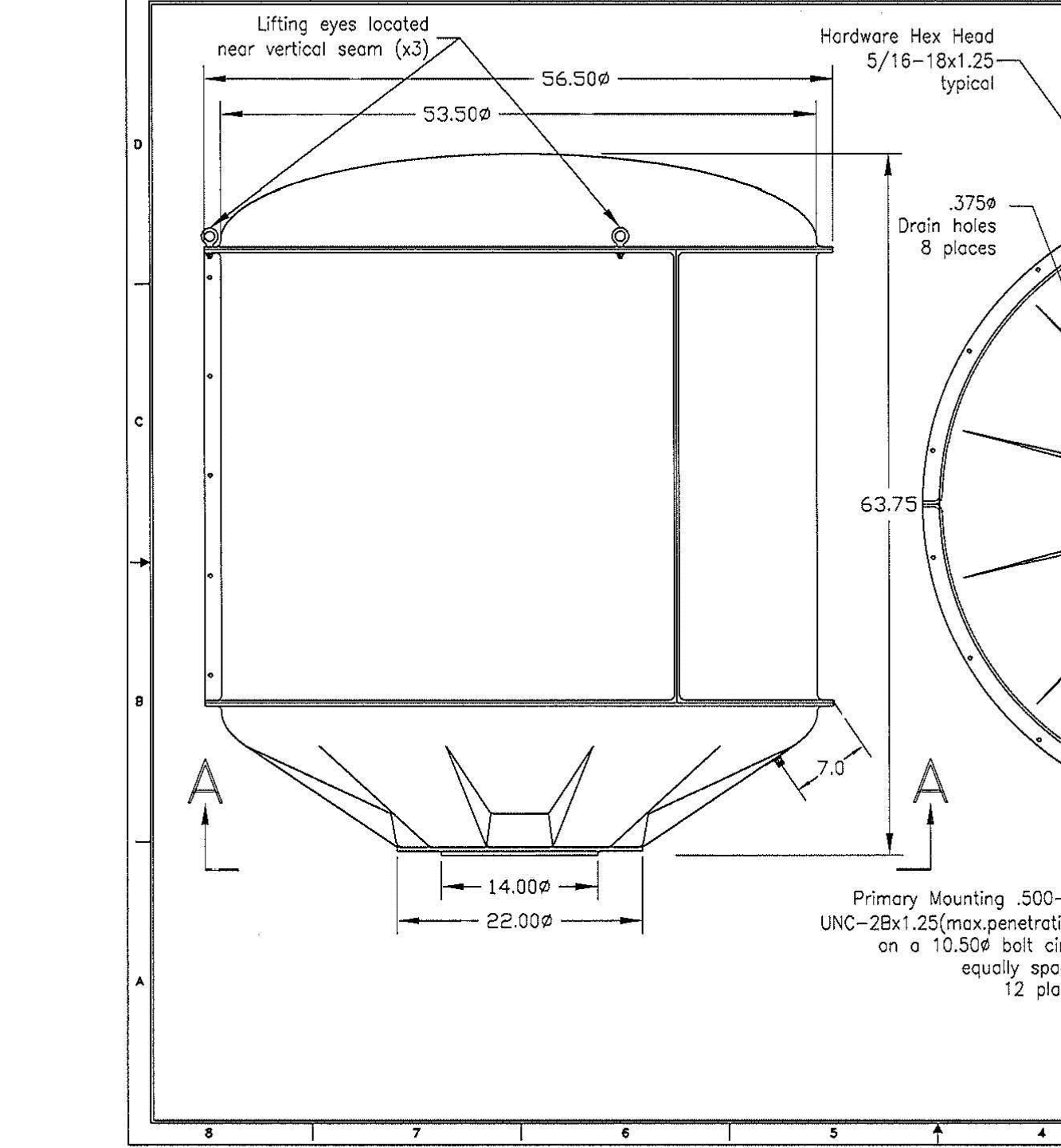
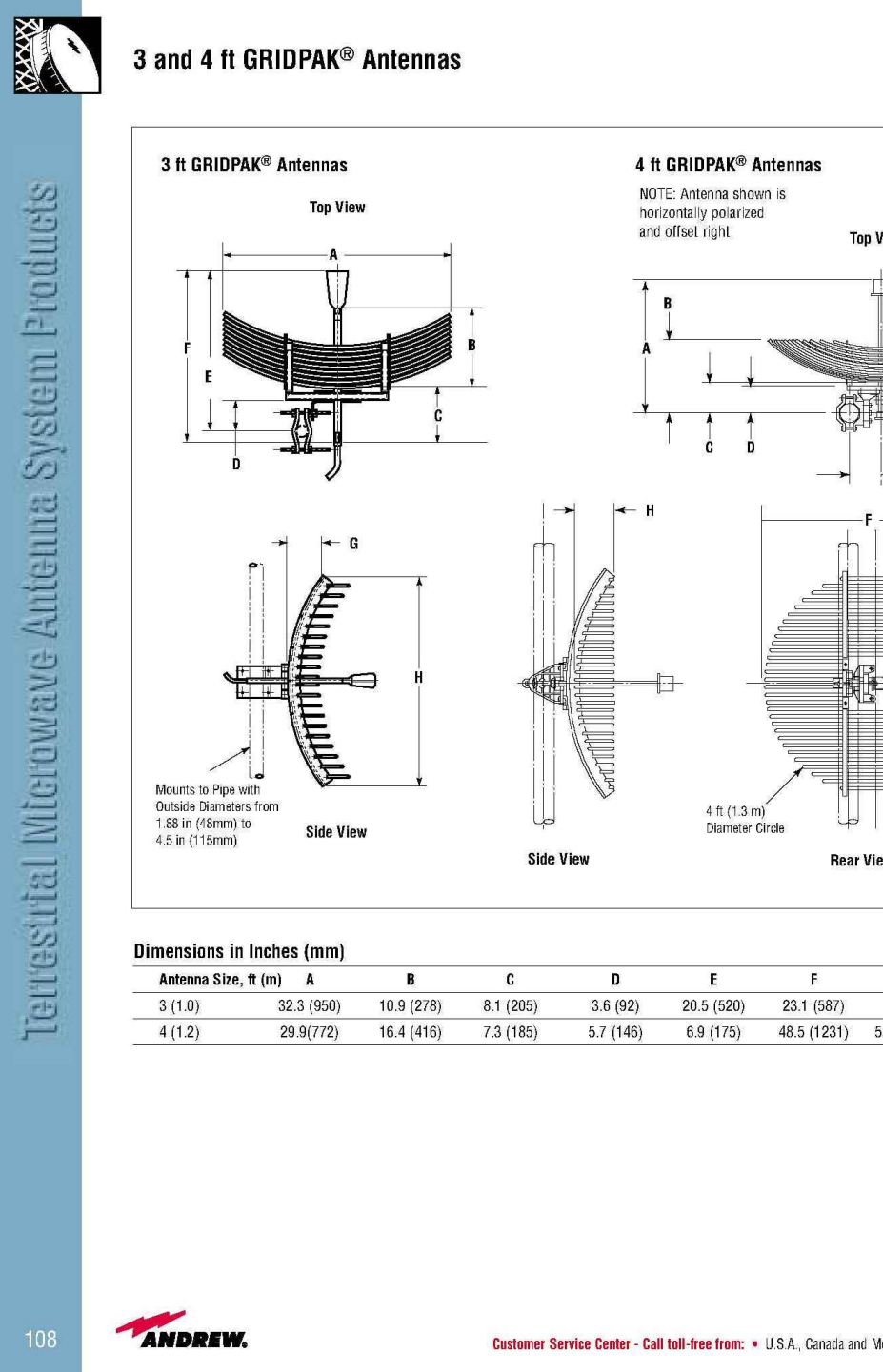
8 ANTENNA REF #4

3 and 4 ft GRIDPAK™ Antennas

3 ft GRIDPAK™ Antennas

4 ft GRIDPAK™ Antennas

Type	Model	Frequency Range (MHz)	Gain (dBS)	Impedance	Beam Response	Weight (lbs)	Dimensions (in)
RF	RF301	1.17 - 40.00	1.12 - 0.80	50 Ohm	Center	3	36.0 x 36.0 x 36.0
RF	RF302	1.17 - 40.00	1.12 - 0.80	50 Ohm	Center	4	48.0 x 48.0 x 48.0



3 ANTENNA REF #5

4 ANTENNA REF #6 TO #11

TOWER ANTENNA ADDITIONS SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO
CALIFORNIA
94131

ANTENNA CUT SHEETS

Commission: 06/19/06
Checked: BW
Date: 09/26/11
Drawn: GV
Approved: ROH
Scale: AS NOTED

Drawing Title: ANTENNA CUT SHEETS

Project: TOWER ANTENNA ADDITIONS SUTRO TOWER

Professional Engineer Seal: No. 2951

\$1.1

Part 700 Section

Manufacturer	Andrew	Model	UH6-65-D3A/F
Frequency Range	135 - 174 MHz	Power	200 W (100 W max)
Gain	19.5 dBi	Dimensions	1.8 m (5.9 ft) Dia. x 1.8 m (5.9 ft) H
Beamwidth	30°	Weight	145 kg (320 lb)
Mounting	Standard pack	Wind Velocity	120 mph

General Specifications


Beamwidth, Horizontal	1.7°
Beamwidth, Vertical	1.7°
Cross Polarization Discrimination (XPD)	30 dB
Electrical Compliance	ETSI Class 3 US FCC Part 101A US FCC Part 74A
Front-to-Back Ratio	70 dB
Gain, Low Band	39.5 dBi
Gain, Mid Band	39.5 dBi
Gain, High Band	40.5 dBi
Operating Frequency Band	6.425 - 7.125 GHz
Radiation Pattern Envelope Reference (RPE)	1717E 1718E
Return Loss	30.2 dB
VSWR	1.06

Mechanical Specifications

Beamwidth, Horizontal	1.7°
Beamwidth, Vertical	1.7°
Cross Polarization Discrimination (XPD)	30 dB
Electrical Compliance	ETSI Class 3 US FCC Part 101A US FCC Part 74A
Front-to-Back Ratio	70 dB
Gain, Low Band	39.5 dBi
Gain, Mid Band	39.5 dBi
Gain, High Band	40.5 dBi
Operating Frequency Band	6.425 - 7.125 GHz
Radiation Pattern Envelope Reference (RPE)	1717E 1718E
Return Loss	30.2 dB
VSWR	1.06

Product Specifications

UH6-65-D3A/F
1.8 m (5.9 ft) Ultra High Performance Parabolic Shaded Antenna, dual polarized, 6.425-7.125 GHz, PD70, gray antenna, enhanced white radome with flush, standard jack—one piece reflector



CHARACTERISTICS

General Specifications

Packing	Standard pack
Radome Color	White
Radome Material	Enhanced
Reflector Construction	One piece reflector
Antenna Input	PD70
Antenna Color	Gray
Antenna Type	UH6 - Ultra High Performance Parabolic Shaded Antenna, dual polarized
Diameter, nominal	1.8 m (5.9 ft)
Flush Included	Yes
Polarization	Dual

Electrical Specifications

Beamwidth, Horizontal	1.7°
Beamwidth, Vertical	1.7°
Cross Polarization Discrimination (XPD)	30 dB
Electrical Compliance	ETSI Class 3 US FCC Part 101A US FCC Part 74A
Front-to-Back Ratio	70 dB
Gain, Low Band	39.5 dBi
Gain, Mid Band	39.5 dBi
Gain, High Band	40.5 dBi
Operating Frequency Band	6.425 - 7.125 GHz
Radiation Pattern Envelope Reference (RPE)	1717E 1718E
Return Loss	30.2 dB
VSWR	1.06

Mechanical Specifications

Beamwidth, Horizontal	1.7°
Beamwidth, Vertical	1.7°
Cross Polarization Discrimination (XPD)	30 dB
Electrical Compliance	ETSI Class 3 US FCC Part 101A US FCC Part 74A
Front-to-Back Ratio	70 dB
Gain, Low Band	39.5 dBi
Gain, Mid Band	39.5 dBi
Gain, High Band	40.5 dBi
Operating Frequency Band	6.425 - 7.125 GHz
Radiation Pattern Envelope Reference (RPE)	1717E 1718E
Return Loss	30.2 dB
VSWR	1.06

Product Specifications

UH6-65-D3A/F

Wind Forces At Wind Velocity Survival Rating

Angle or for 90° Wind	330°
Axial Force (FA)	7744 N 1743 lbf
Side Force (FS)	3876 N 862 lbf
Tweaking Moment (MT)	2955 Nm
Weight with 1.2 m (3.9 ft) Radial Ice	285 kg 628 lb
Zog with 1.2 m (3.9 ft) Radial Ice	460 mm 18 in
Zog with Ice	466 mm 18 in

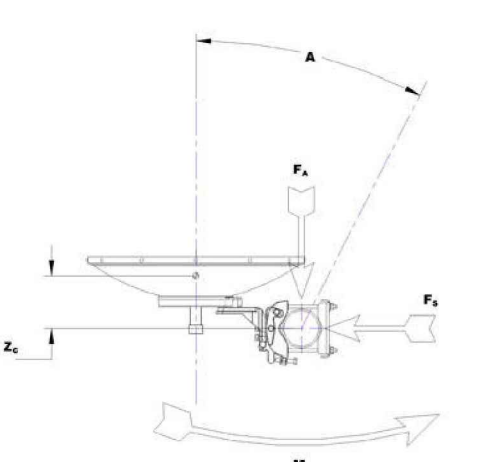
Wind Forces At Wind Velocity Survival Rating

Angle or for 90° Wind	330°
Axial Force (FA)	7744 N 1743 lbf
Side Force (FS)	3876 N 862 lbf
Tweaking Moment (MT)	2955 Nm
Weight with 1.2 m (3.9 ft) Radial Ice	285 kg 628 lb
Zog with 1.2 m (3.9 ft) Radial Ice	460 mm 18 in
Zog with Ice	466 mm 18 in

Product Specifications

UH6-65-D3A/F

Wind Forces At Wind Velocity Survival Rating



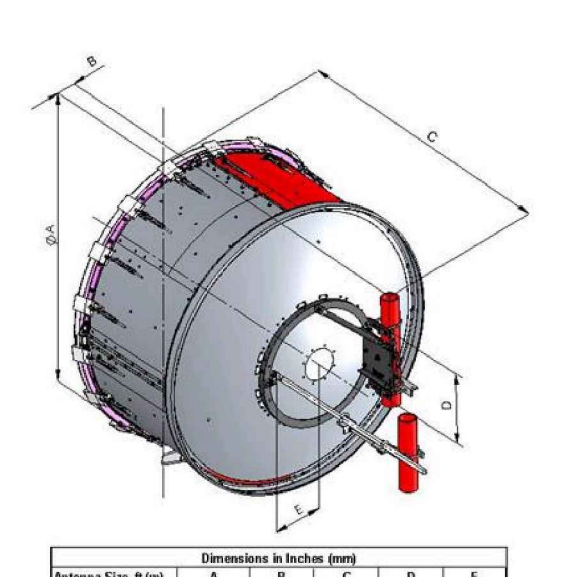
Packed Dimensions

Gross Weight, Packed Antenna	308.0 kg 679.0 lb
Height	2130 mm 83.5 in
Length	2070 mm 81.5 in
Volume	3.9 m³
Width	880 mm 34.6 in

Product Specifications

UH6-65-D3A/F

Antenna Dimensions And Mounting Information



Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

*** Footnotes**

Antenna Force (FA)
Maximum forces exerted on a supporting structure as a result of wind from the most critical direction for this parameter. The individual maximums specified may not occur simultaneously. All forces are referenced to the mounting point.

Cross Polarization Discrimination (XPD)
The difference between the peak of the co polarized main beam and the maximum cross polarized signal over an angle twice the 3 dB beamwidth of the co polarized main beam.

Front to Back Ratio
Denotes highest radiation relative to the main beam, at 180° ±40°, across the band. Production antennas do not exceed rated values by more than 2 dB unless stated otherwise.

Gain, Mid Band
For a given frequency band, gain is primarily a function of antenna size. The gain of Andrew antennas is determined by either gain by comparison or by computer integration of the measured antenna patterns.

Operating Frequency Band
Bands correspond with CCR recommendations or common allocations used

1 ANTENNA REF #12 AND #13

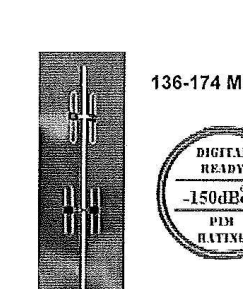
2 ANTENNA REF #14 AND #15

Bird Technologies Group - Item # BA40-41-DIN, 136-174 MHz, VHF Omnidirectional ... Page 1 of 2

Bird Technologies Group
2023 Aurora St
Solon, Ohio 44139
Phone: 440-248-1200
FAX: (440) 248-5420
Email: sales@birdtechnologies.com
Website: www.birdtechnologies.com

All Categories > Antennas > 136-174 MHz Antennas > Item # BA40-41-DIN

Item # BA40-41-DIN, 136-174 MHz, VHF Omnidirectional Dipole Arrays, 3 dBd



136-174 MHz, VHF Omnidirectional Dipole Arrays, 3 dBd

VHF Omnidirectional Dipole Arrays
BA40-41-DIN = Single antenna, 2 pairs of dipoles

These high performance VHF dipole arrays are ideal for highly populated radio sites requiring broad beam omnidirectional coverage. They operate over entire bands and offer gain of 3, 6 or 9 dBd (depending on model), enabling a VSWR of <1.5:1 across the band. The arrays offer an internal phasing network in PTFE based double shielded coaxial cable with phasing lines laid to all wavelengths and are immune to directional changes. The use of a unique phasing arrangement provides extensive side lobe suppression and null characteristics. VHF arrays will accept an input power level of 150 watts, making them ideal for high power mobile transmitter applications.

For more information about VHF Antennas Click [here](#)

Specifications

PIM Rated	Yes
Gain (dB)	3
Frequency Band (MHz)	135 - 174
Beamwidth (MHz)	Entire Band
VSWR (Return Loss)	<1.5:1 (14dB)
Impedance (Ω)	50
Downlink	Not offered

Bird Technologies Group - Item # BA40-41-DIN, 136-174 MHz, VHF Omnidirectional ... Page 2 of 2

Vertical Beamwidth	30°
Horizontal Beamwidth	Omnidirectional
Input Power (Watts)	750
Relative IM 3rd order (2x20W)	-150

Construction & Configuration

4 dipoles (2 bays), Turnstile stacked, Single section support

Length (inches)
 138 |

Weight (lbs.)
 32 |

Shipping Weight (lbs)
 192 |

Shipping Dimensions (inches)
 20 x 20 x 140 |

Termination
 716" DIN female with 20' 9142 cable tail |

Mounting Area
 20" x 20" dia. aluminum |

Suggested Clamps
 91-00-104 (not included) |

Projected Area (ft²)
 No Ice - 4.5, With Ice - 7.7 |


Labrot Thrust @ 100 mph lbs.
 111 |

Wind Gust Rating mph
 No Ice - 140, With Ice - 115 |

Torque @ 100 mph ft-lbs.
 425 |

RHIS Compliant
 Yes |

Item # BA40-57-DIN, 330-420 MHz, UHF Omnidirectional Exposed Dipole Antenna, 3 ... Page 1 of 2



YOU'RE HEARD, LOUD AND CLEAR.

330-420 MHz, UHF Omnidirectional Exposed Dipole Antenna, 3 dBd

UHF Omnidirectional Dipole Array
BA40-57-DIN = 4 dipoles (2 bays), Turnstile stacked, single section support

These high performance UHF dipole arrays are ideal for highly populated radio sites requiring broad beam omnidirectional coverage. They operate over entire bands and offer gain of 3, 6 or 9 dBd (depending on model), enabling a VSWR of <1.5:1 across the band. The arrays offer an internal phasing network in PTFE based double shielded coaxial cable with phasing lines laid to all wavelengths and are immune to directional changes. The use of a unique phasing arrangement provides extensive side lobe suppression and null characteristics. UHF arrays will accept an input power level of 150 watts, making them ideal for high power mobile transmitter applications.

For more information about VHF Antennas Click [here](#)

Specifications

PIM Rated	Yes
Gain (dB)	3
Frequency Band (MHz)	330-420
Beamwidth (MHz)	Entire Band
VSWR (Return Loss)	<1.5:1 (14dB)
Impedance (Ω)	50
Downlink	Not offered
Vertical Beamwidth	30°
Horizontal Beamwidth	Omnidirectional
Input Power (Watts)	500

Item # BA40-57-DIN, 330-420 MHz, UHF Omnidirectional Exposed Dipole Antenna, 3 ... Page 2 of 2

Relative IM 3rd order (2x20W)	-150
Construction & Configuration	4 dipoles (2 bays), Turnstile stacked, Single section support
Length (inches)	82
Weight (lbs.)	12
Shipping Weight (lbs)	76
Shipping Dimensions (inches)	17 x 17 x 87
Termination	716" DIN female with 20' 9142 cable tail
Mounting Area	20" x 20" dia. aluminum
Suggested Clamps	91-00-104 (not included)
Projected Area (ft²)	No Ice - 1.1, With Ice - 3.4
Labrot Thrust @ 100 mph lbs.	51
Wind Gust Rating mph	No Ice - 140, With Ice - 115
Torque @ 100 mph ft-lbs.	88
RHIS Compliant	Yes

3 ANTENNA REF #16

4 ANTENNA REF #17

SIMPSON GUMPERTZ & HEGER
Engineering of Structures and Building Enclosures

Simpson Gumpertz & Heger Inc.
The Landmark @ One Market, Suite 600
San Francisco, California 94105
415.495.3700 fax: 415.495.3550
www.sgh.com

Boston
Los Angeles
New York
San Francisco
Washington, DC

Consultant

Regulatory Compliance/Certifications

0	ISSUED FOR PERMIT	ROH
No.	Date	Description

TOWER ANTENNA ADDITIONS SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO CALIFORNIA
94131

Project

ANTENNA CUT SHEETS

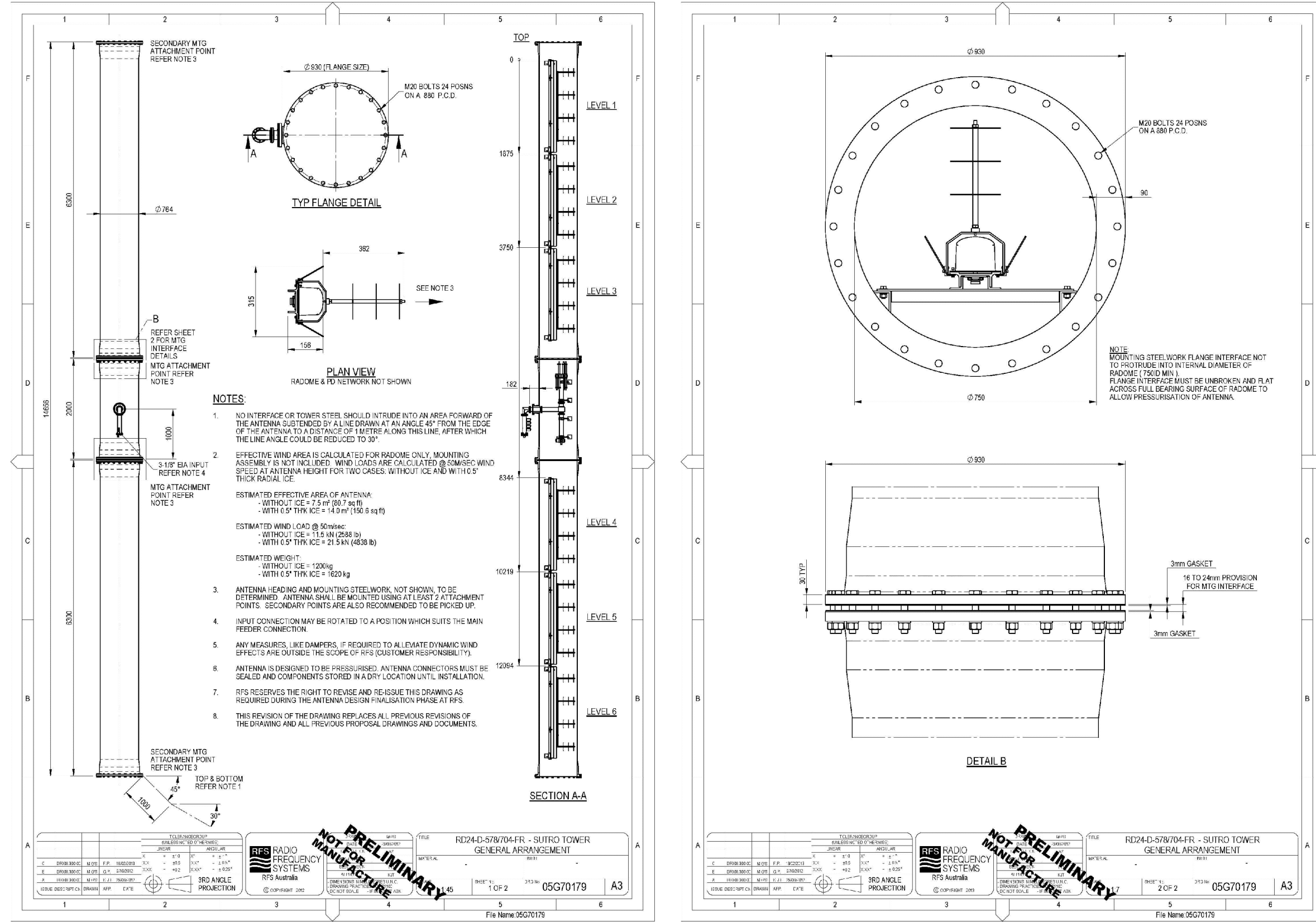
Drawing Title

Commission	Checked	Date
06/19/06	BW	09/26/11
Drawn	Approved	Scale
GV	ROH	AS NOTED

Drawing No.

\$1.2

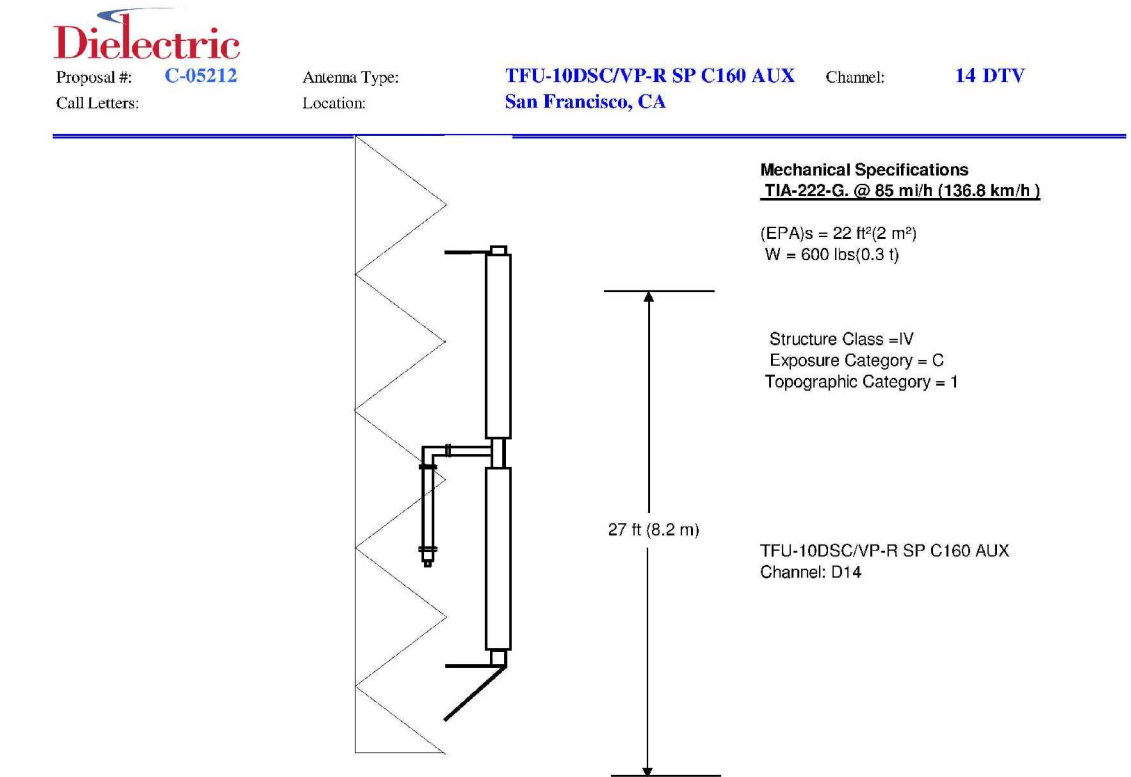
REGISTRED PROFESSIONAL ENGINEER
No. 2951
STATE OF CALIFORNIA



1 ANTENNA REF #2 AND #3

Dielectric
Proposal #: C-05212
Call Letters: TFU-10DSCVPR-SP C160 AUX
Location: San Francisco, CA
Channel: 14 DTV

Electrical Specifications	Value	Units	Remarks
RMS Gain at Max. Loss over Halfwave Dipole	Typ		
RMS Gain at Horizontal over Halfwave Dipole	Typ		
Peak Directional Gain over Halfwave Dipole	13.3	11.24	
Peak Directional Gain at Horizontal over Halfwave Dipole	13.3	8.99	
Peak Directional Gain at Vertical over Halfwave Dipole	13.4	10.89	
Circularity	48	dB	
Return Loss	35	dB	
Average Power	30 kW	14.31 dBm	
Admitted Power	0.33	26.51 dBm	100W/300V
Maximum Antenna Input VSWR	Channel	1.08 : 1	
Pattern	Antenna	120° x 120°	120° x 120°
	Element	120° x 120°	120° x 120°
	Element	120° x 120°	120° x 120°
Mechanical Specifications	Metric	English	Particulars
Height with Lightning Protection	161	ft	Not needed
Height Less Lightning Protection	155	ft	257.0 ft
Height of Center of Radiation	155	ft	155.0 ft
Basic Wind Speed	130	mph	85 mph
Structure Class	II	Exposure Category	II
Effective Windward Area	872.5	sq ft	80.6 sq ft
Effective Downwind Area	113	sq ft	10.5 sq ft
Effective Crosswind Area	113	sq ft	10.5 sq ft
Peak Body Length	10	ft	10.0 ft
Weight	33.1	100 lbs	Excludes Mounts
Radius			Excludes Mounts



JEG-060025-2
Not to Scale
This document contains proprietary and confidential information of Dielectric Communications and FCC Commission. It is to be used solely for the project for which it is prepared. No disclosure, reproduction, or use of this document or any part of it may be made without the written permission of Dielectric Communications or FCC Commission.

Dielectric
Proposal Number: C-05212
Date: 24-Jan-13
Call Letters: TFU-10DSCVPR-SP C160 AUX
Location: San Francisco, CA
Channel: 14
Customer: San Francisco
Antenna Type: TFU-10DSCVPR-SP C160 AUX

SYSTEM SUMMARY

Antenna:

Type:	TFU-10DSCVPR-SP C160 ERP:	400 kW (26.02 dBk)	100 kW (20.00 dBk)
Channel:	14	Peak Gain:	13.3 (11.22 dB)
Location:	San Francisco, CA	Input Power:	30 kW (14.79 dBk)

Transmission Line:

Type:	EIA/DCA	Attenuation:	76.7%	1.15 dB
Size:	6-1/8 in			
Impedance:	75 ohm			
Length:	1,100 ft			

Transmitter:

Power Required:	30 kW (15.94 dBk)
-----------------	-------------------

2 ANTENNA REF #52

0	ISSUED FOR PERMIT	ROH
No.	Date	Description
		By

TOWER ANTENNA ADDITIONS SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO CALIFORNIA
94131

ANTENNA CUT SHEETS

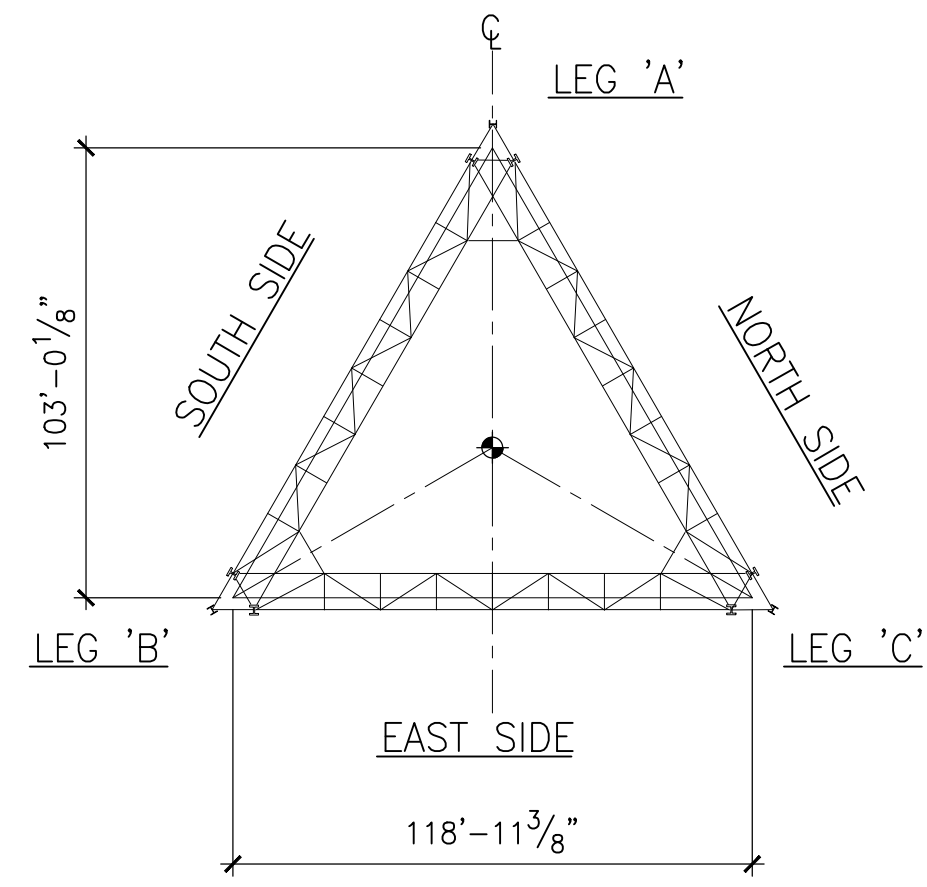
Drawing Title

Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale AS NOTED

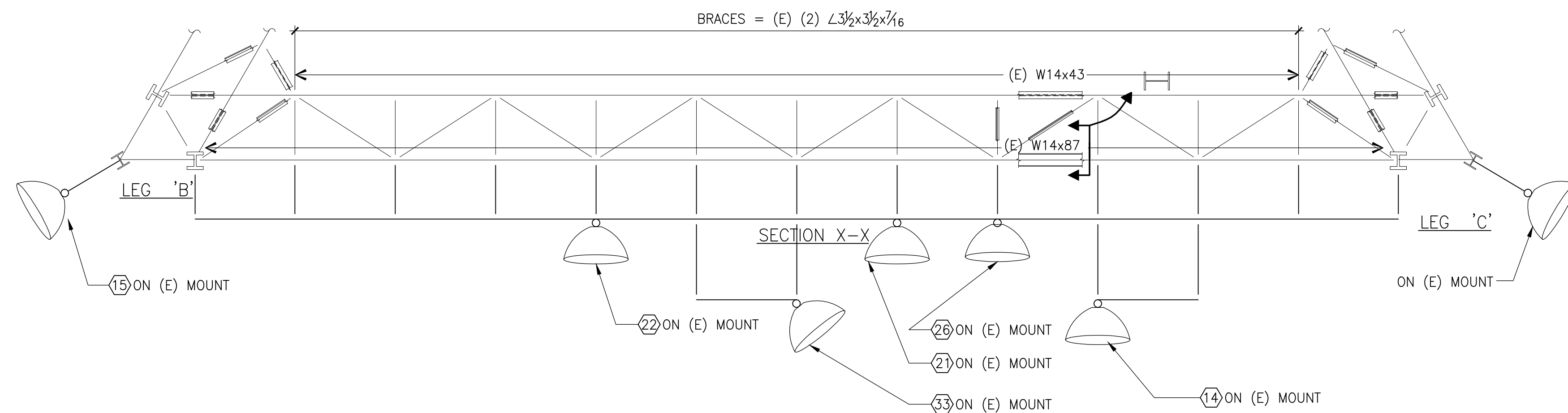
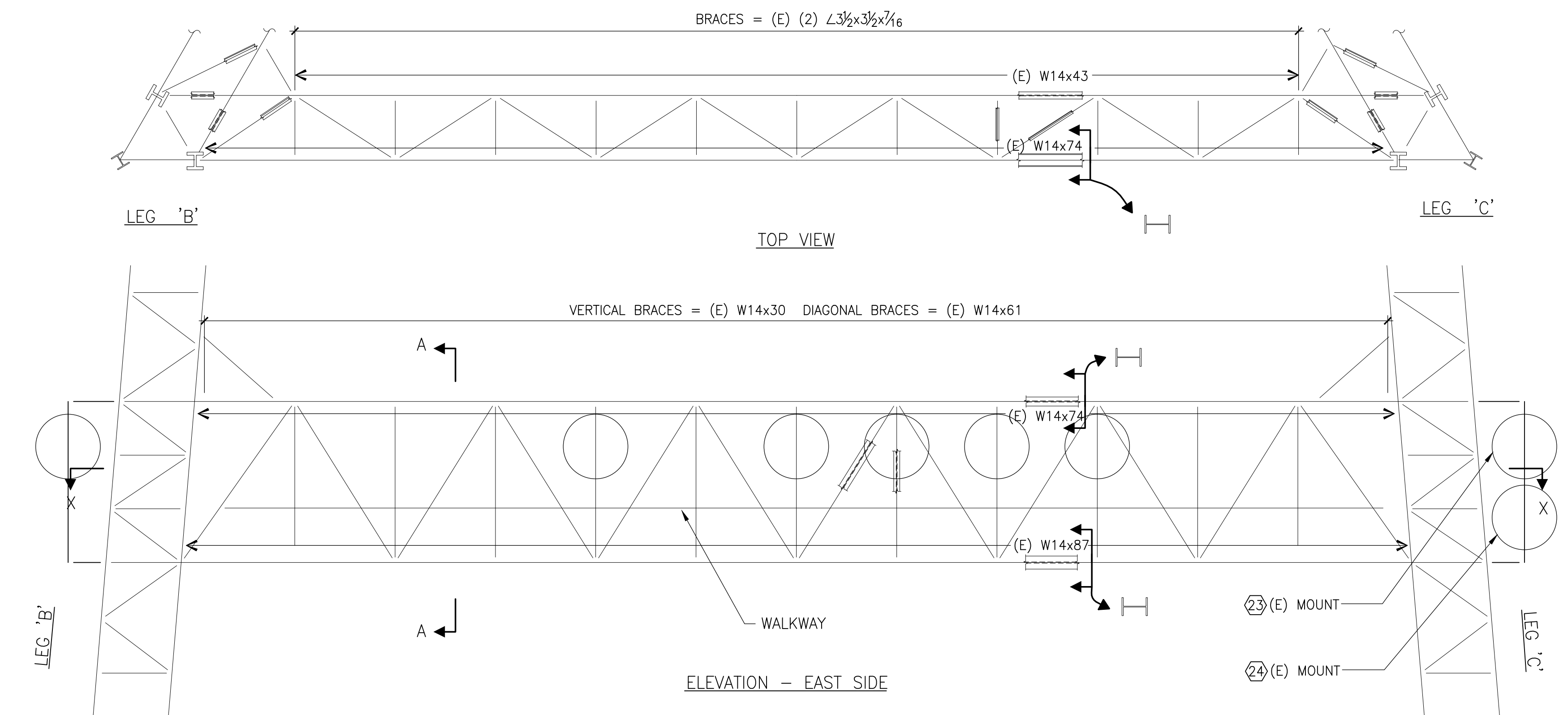
Professional Engineer
No. 2951
State of California

Drawing No.

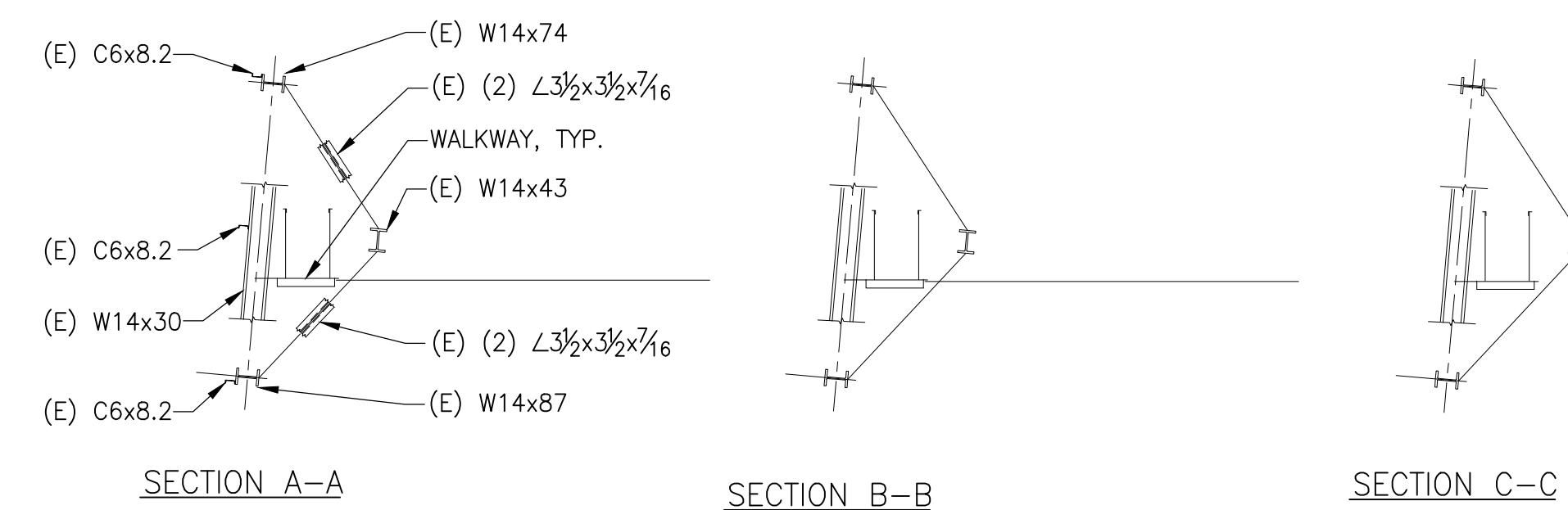
\$1.5



KEY PLAN - 2ND LEVEL



2ND LEVEL - EAST SIDE



Consultant

No.	Date	ISSUED FOR PERMIT Description	ROH By
0			

**TOWER ANTENNA
ADDITIONS
SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO
CALIFORNIA
94131**

Project

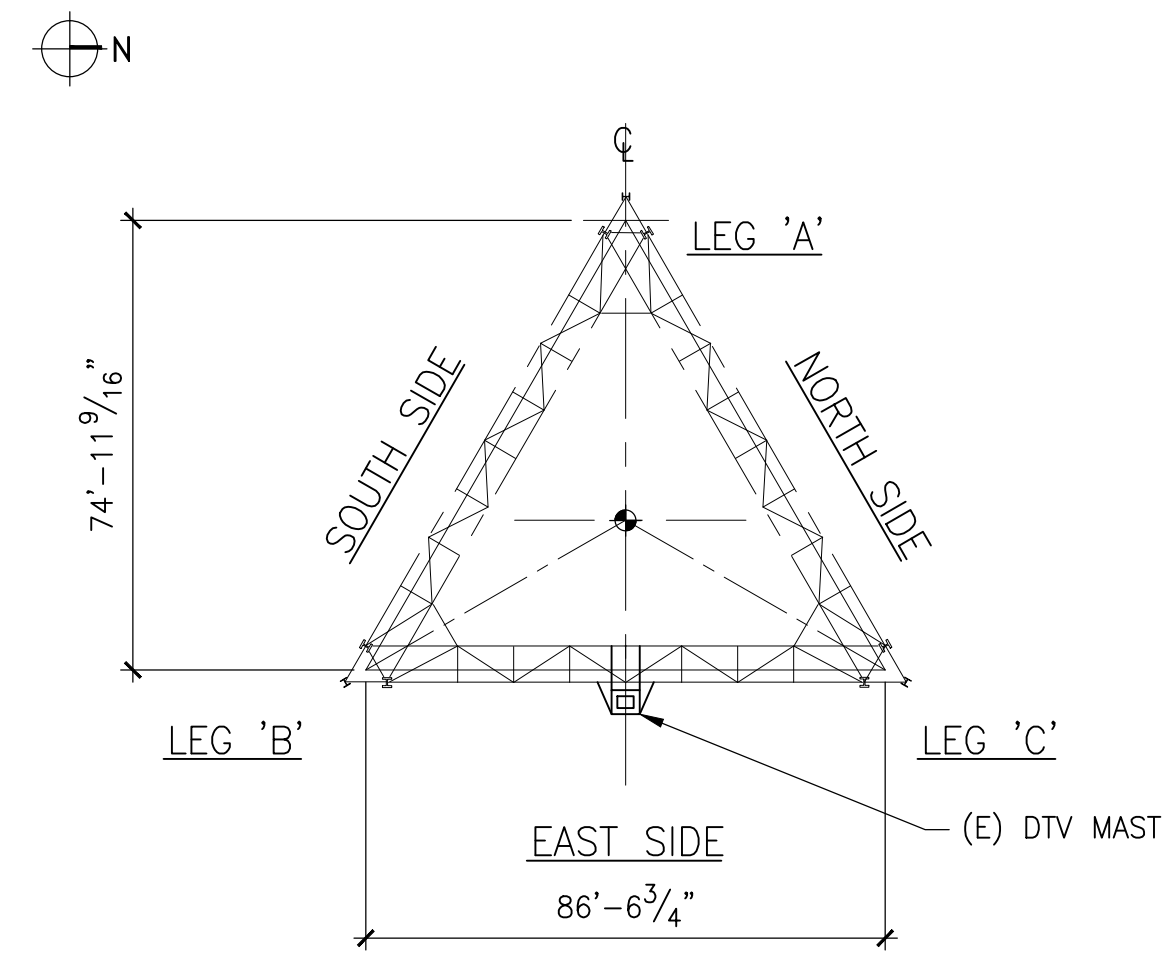
**2ND LEVEL
FRAMING**

Drawing Title

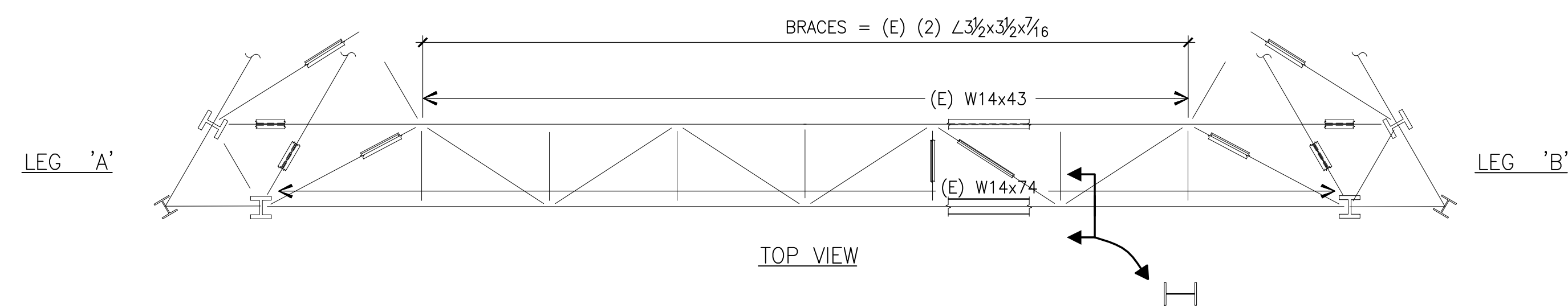
Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale 1/8" = 1'-0"

Professional Engineer
No. 2951
State of California
Structural

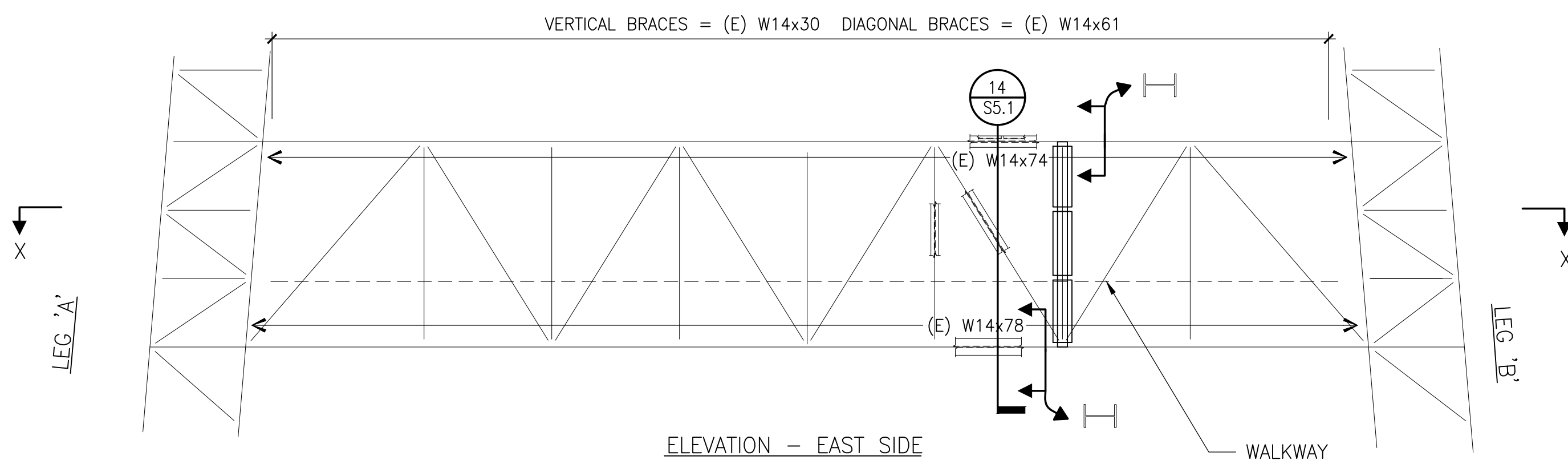
Drawing No.
S2.1



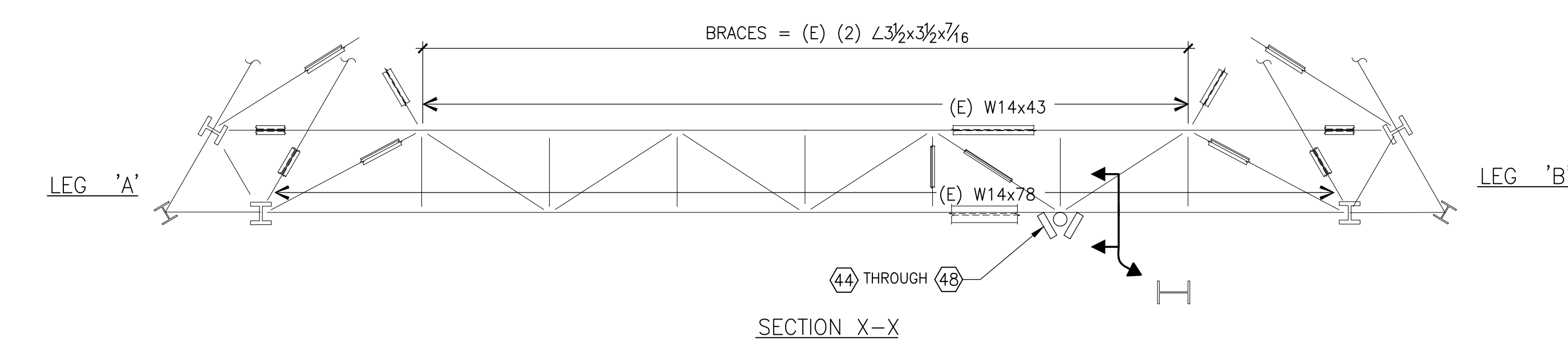
KEY PLAN - 3RD LEVEL



TOP VIEW



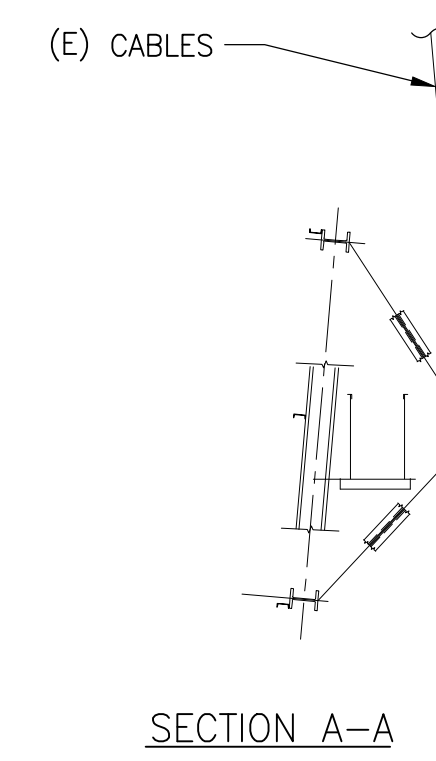
ELEVATION - EAST SIDE



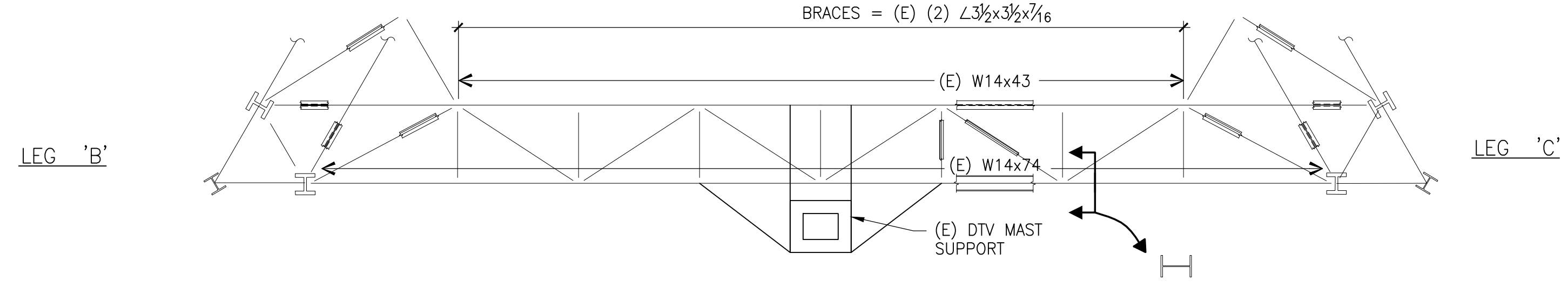
SECTION X-X

3RD LEVEL - SOUTH SIDE

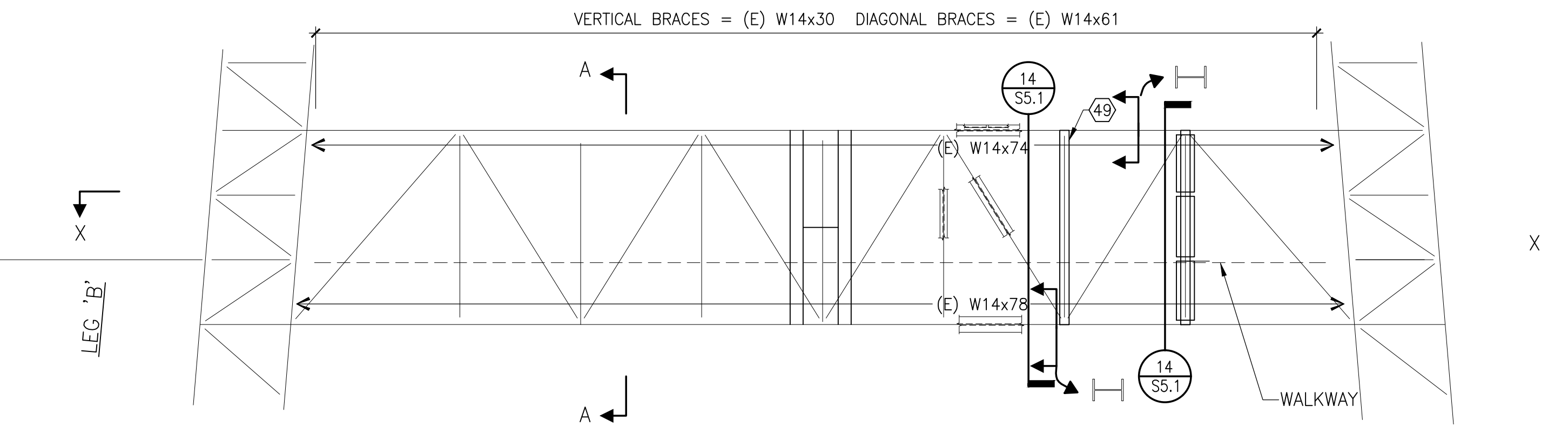
NOTE:
Ⓜ INDICATES EQUIPMENT REFERENCE ID.
SEE EQUIPMENT LIST, SHEET S1.0



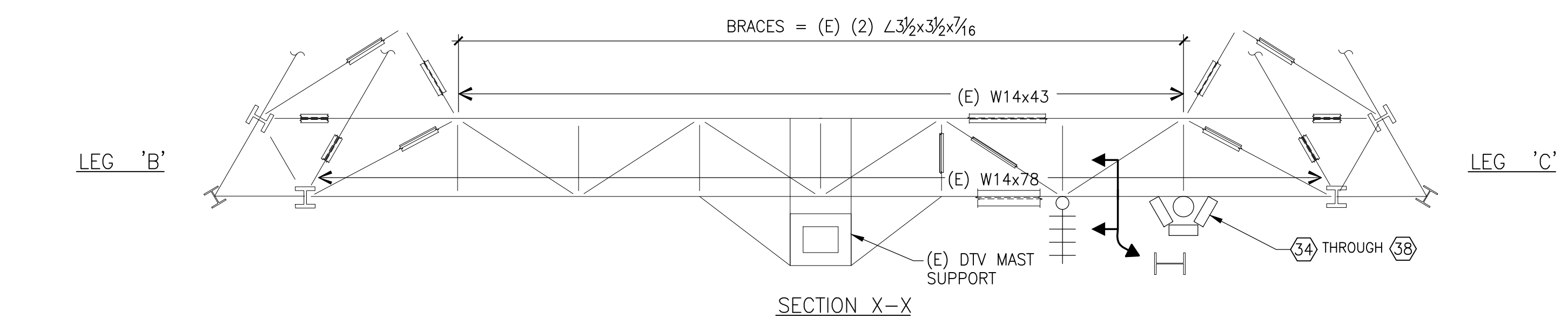
SECTION A-A



TOP VIEW



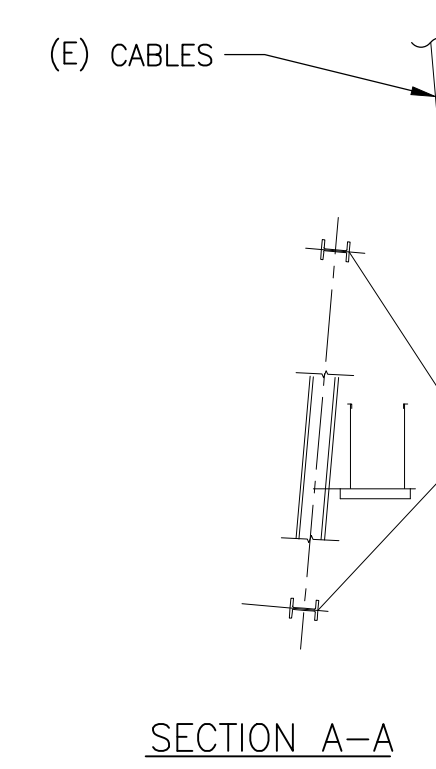
ELEVATION - EAST SIDE



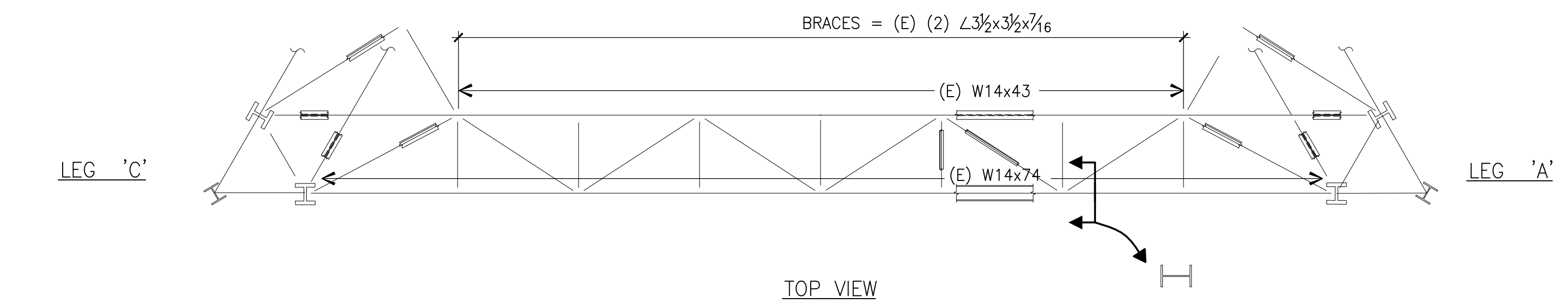
SECTION X-X

3RD LEVEL - EAST SIDE

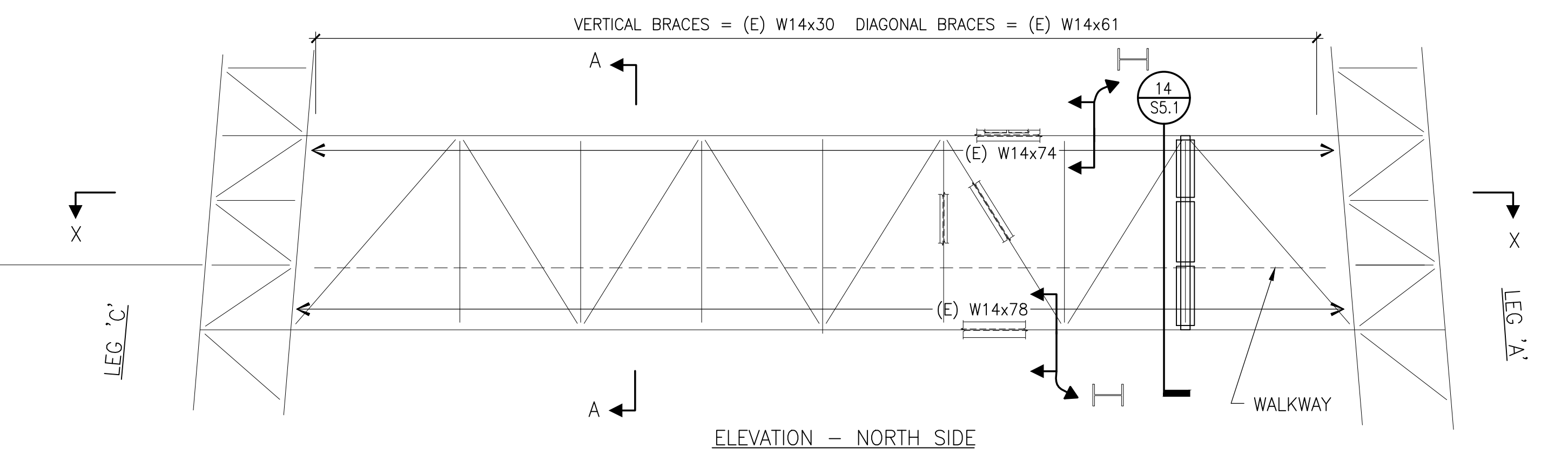
NOTE:
Ⓜ INDICATES EQUIPMENT REFERENCE ID.
SEE EQUIPMENT LIST, SHEET S1.0



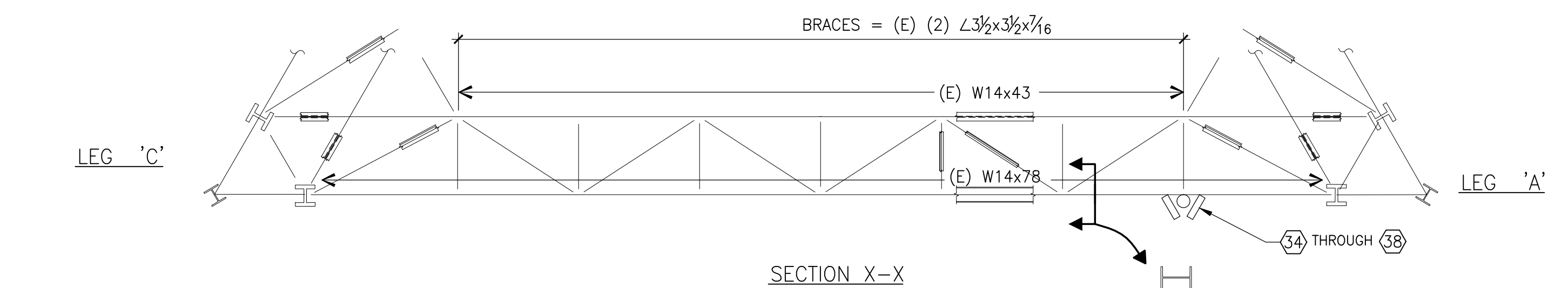
SECTION A-A



TOP VIEW



ELEVATION - NORTH SIDE



SECTION X-X

3RD LEVEL - NORTH SIDE

* NOTE:
SEE EAST SIDE FOR MEMBER SHAPES.

Consultant

No.	Date	ISSUED FOR PERMIT Description	ROH By
0			

**TOWER ANTENNA
ADDITIONS
SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO
CALIFORNIA
94131**

Project

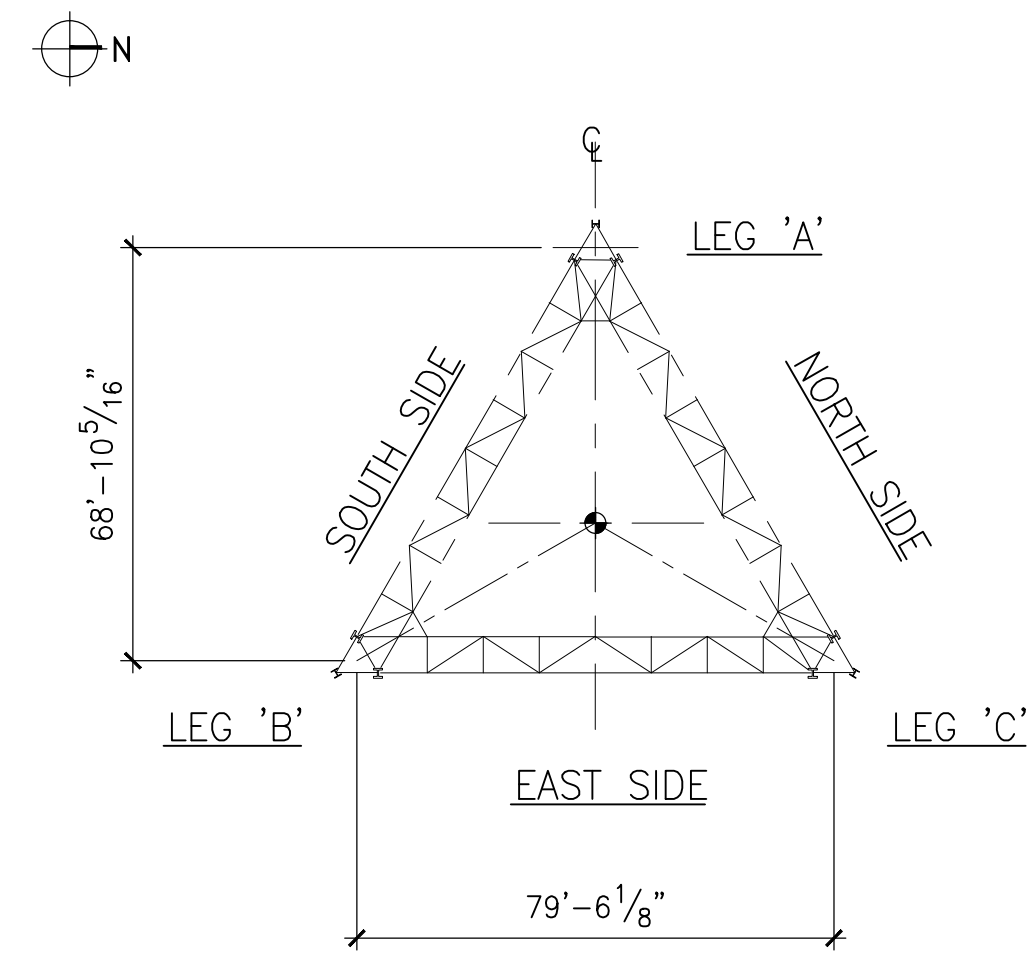
**3RD LEVEL
FRAMING**

Drawing Title

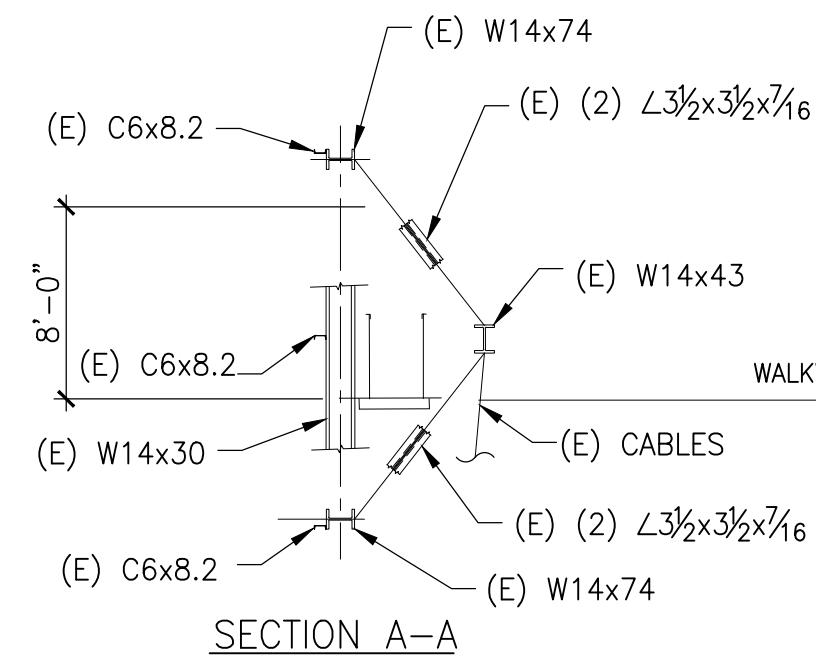
Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale 1/8" = 1'-0"

Professional Engineer
No. 2951
Structural
State of California

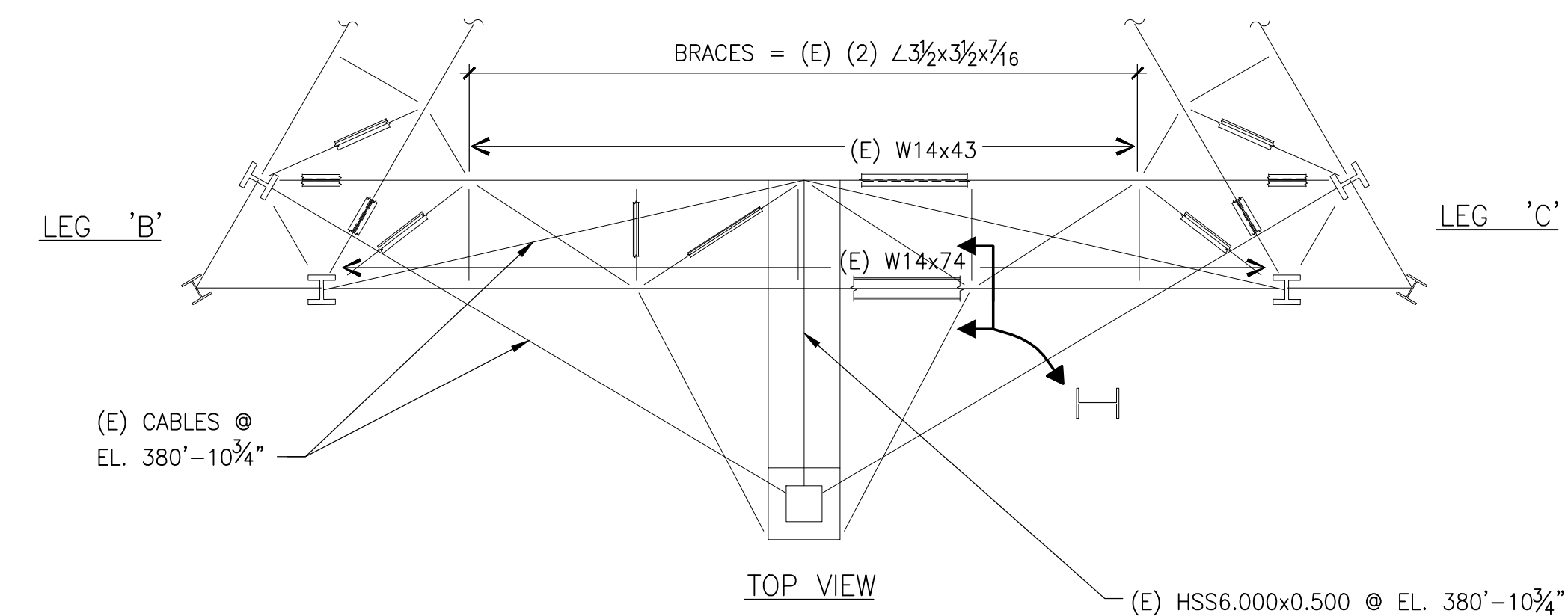
Drawing No.
S2.2



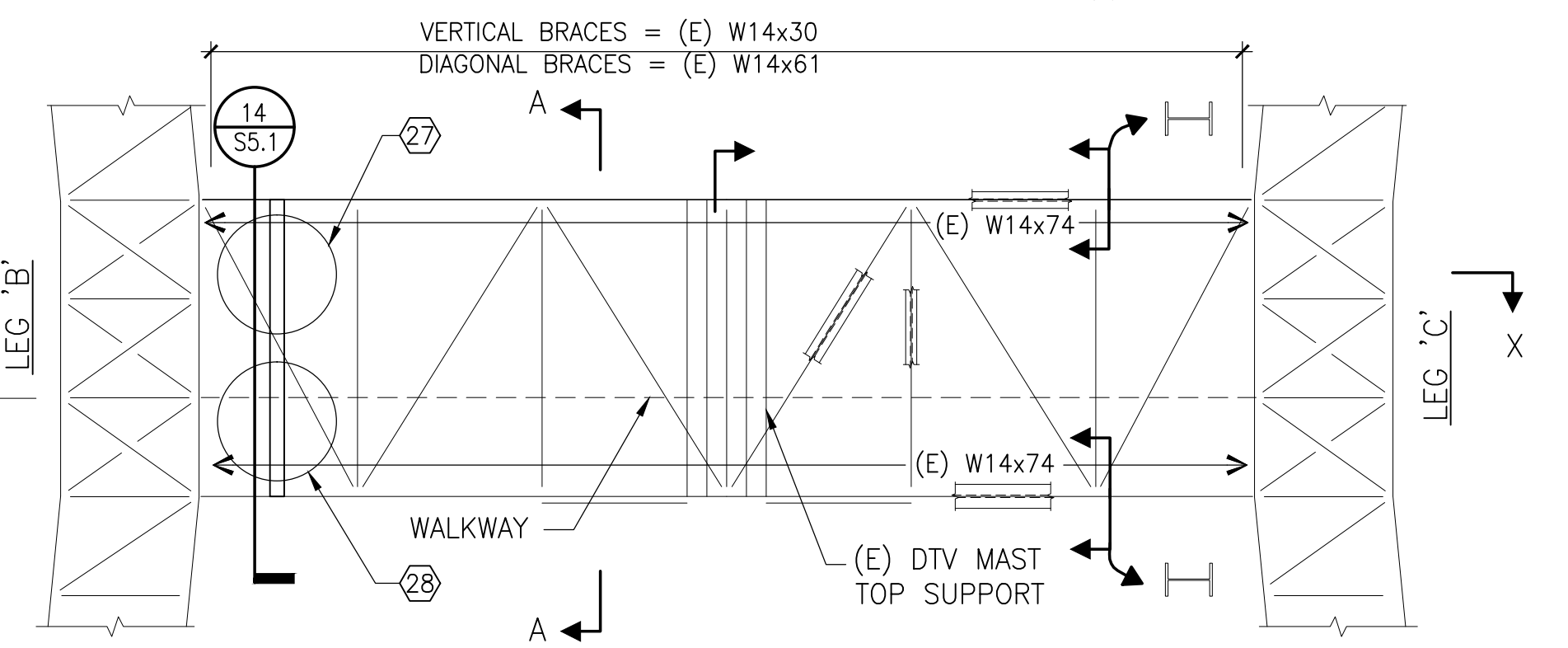
KEY PLAN - 5TH LEVEL



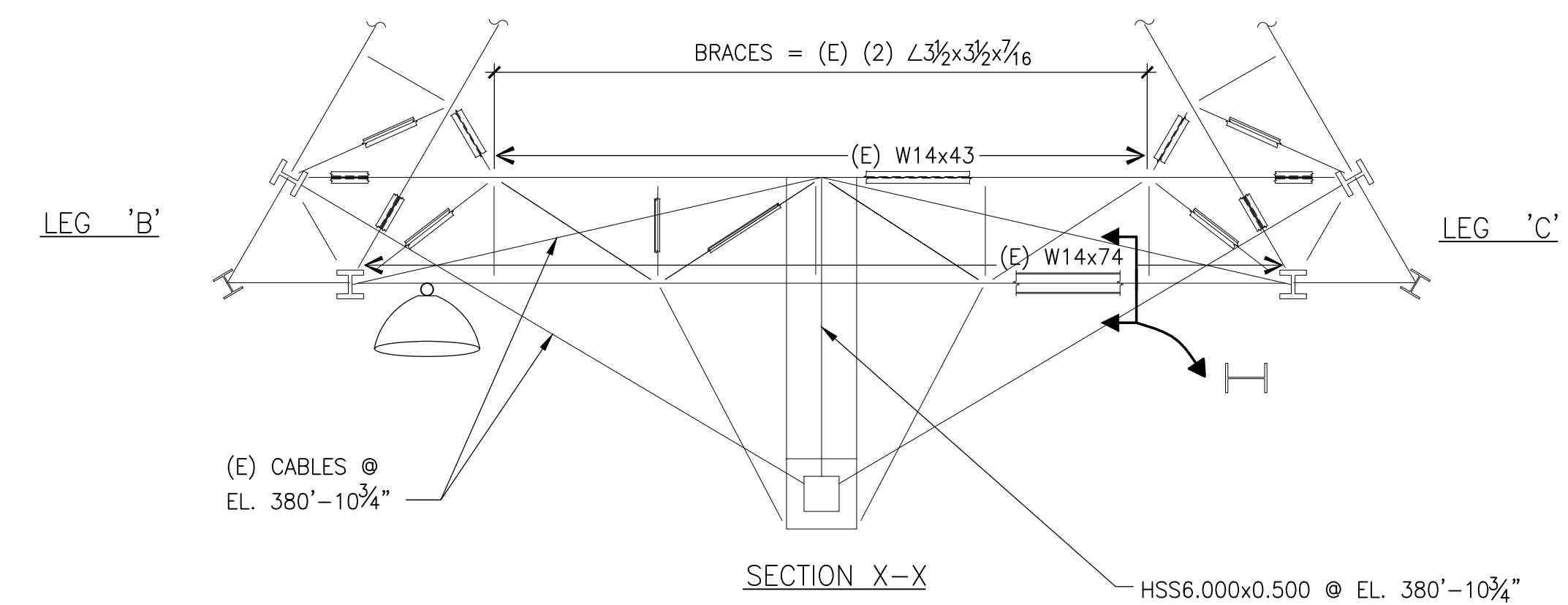
SECTION A-A



TOP VIEW



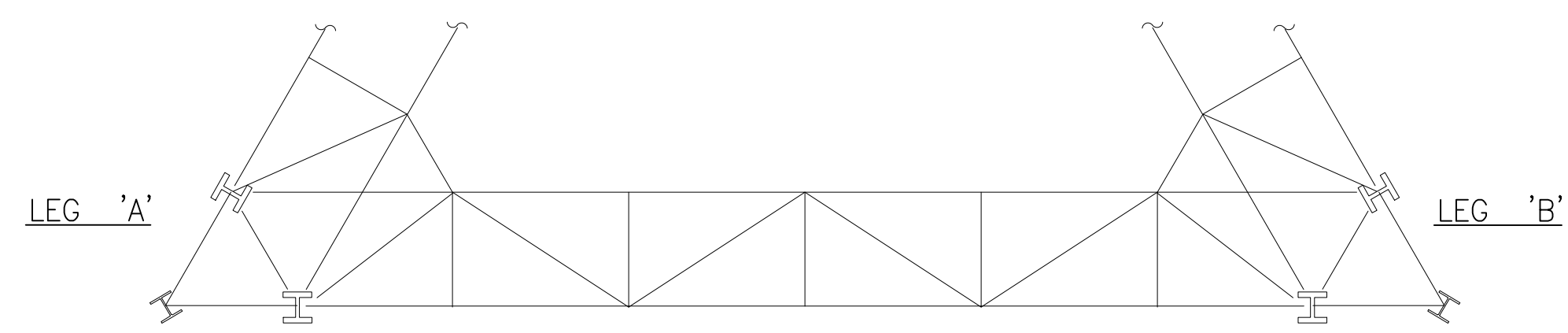
ELEVATION - EAST SIDE



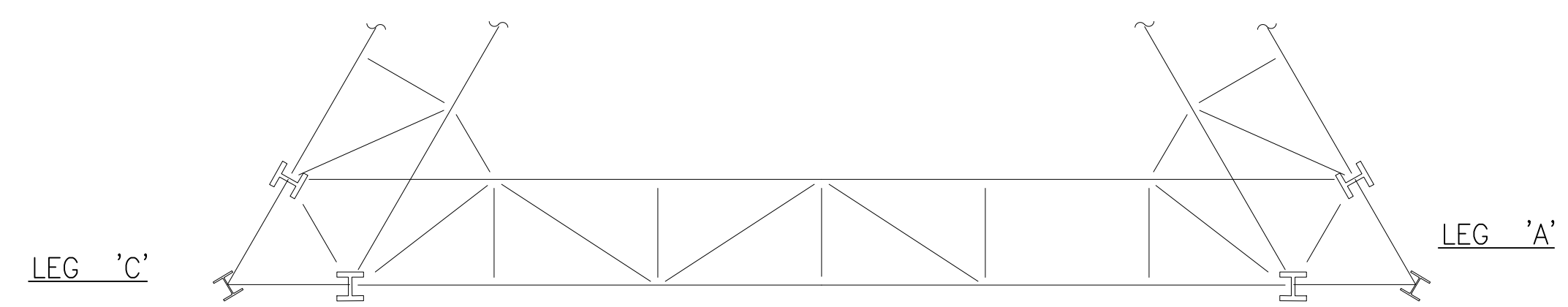
SECTION X-X

4TH LEVEL - EAST SIDE

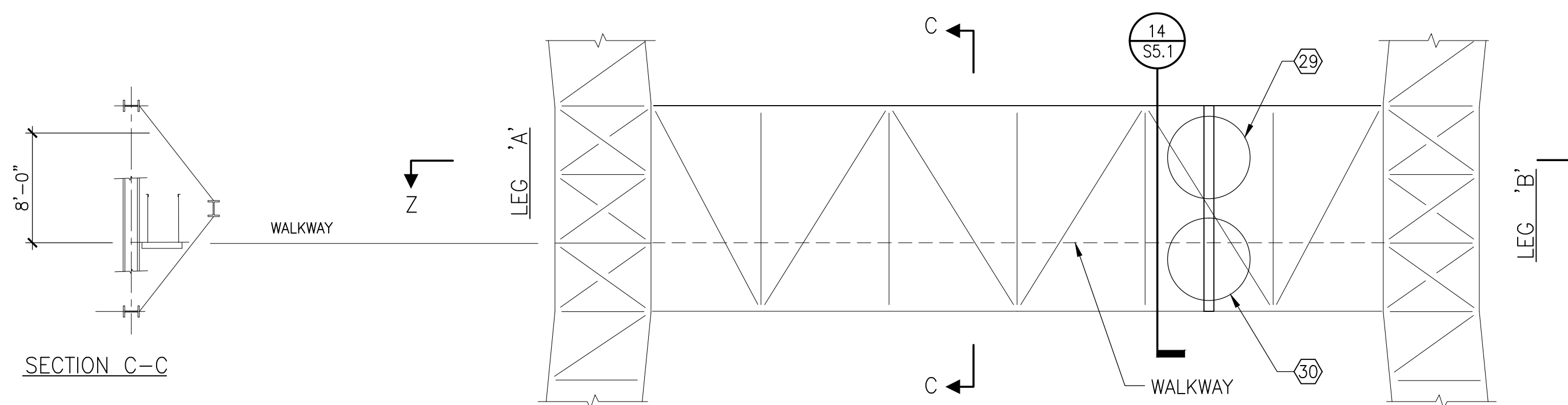
* NOTE: MEMBER SHAPES ARE THE SAME FOR NORTH AND SOUTH SIDE



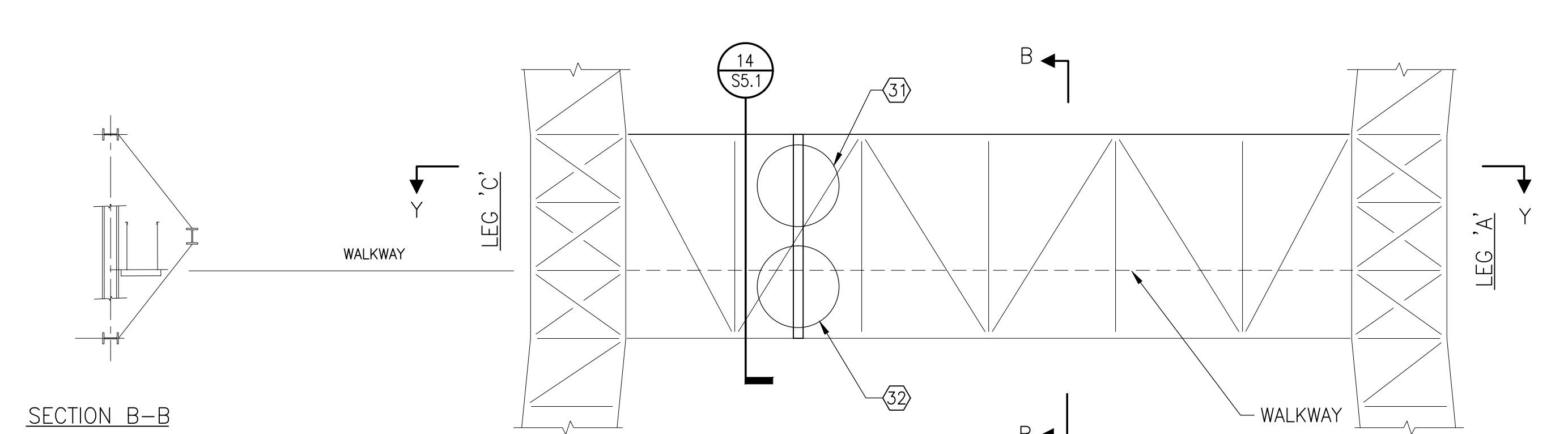
TOP VIEW



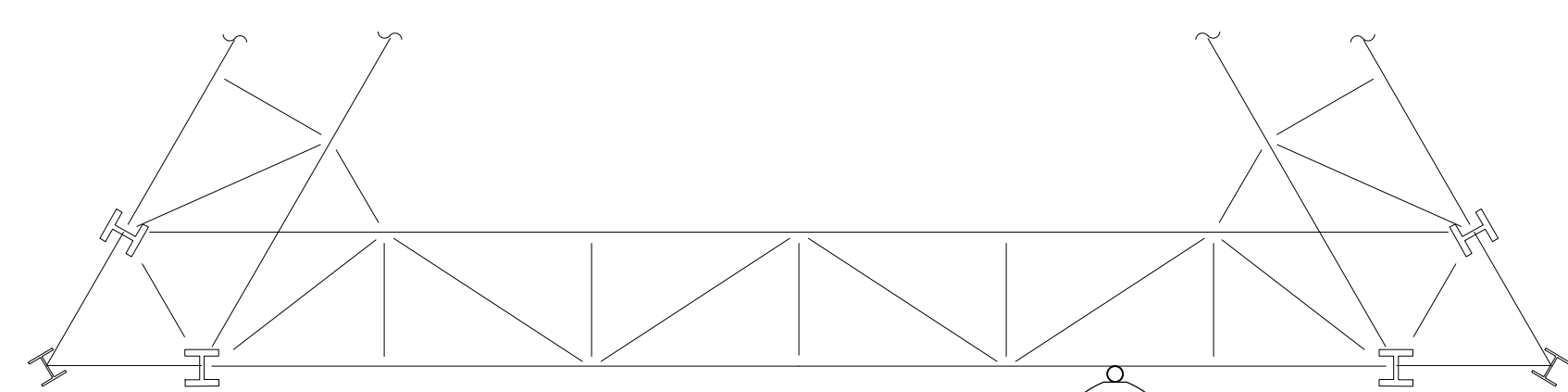
TOP VIEW



ELEVATION - SOUTH SIDE



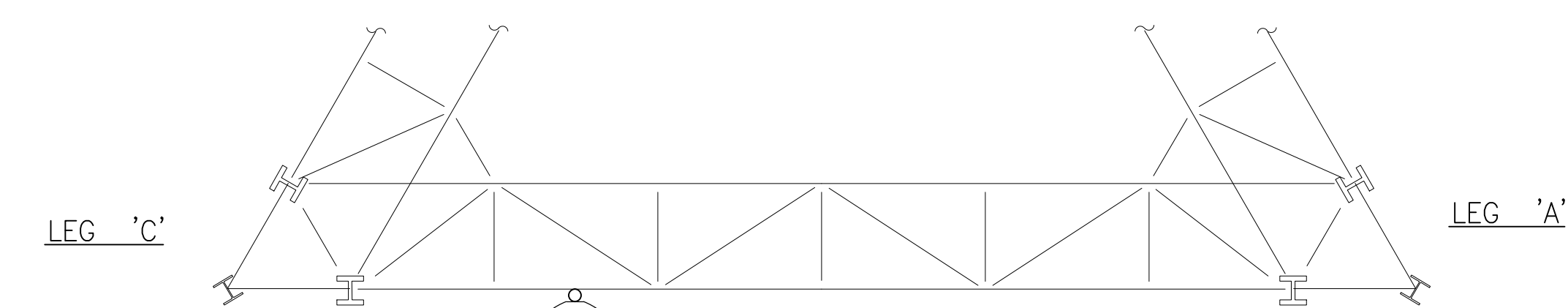
ELEVATION - NORTH SIDE



SECTION Z-Z

4TH LEVEL - SOUTH SIDE

* NOTE: SEE EAST SIDE FOR MEMBER SHAPES.



SECTION Y-Y

4TH LEVEL - NORTH SIDE

* NOTE: SEE EAST SIDE FOR MEMBER SHAPES.

Consultant

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

No.	Date	ISSUED FOR PERMIT Description	ROH By

TOWER ANTENNA ADDITIONS SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO CALIFORNIA
94131

Project

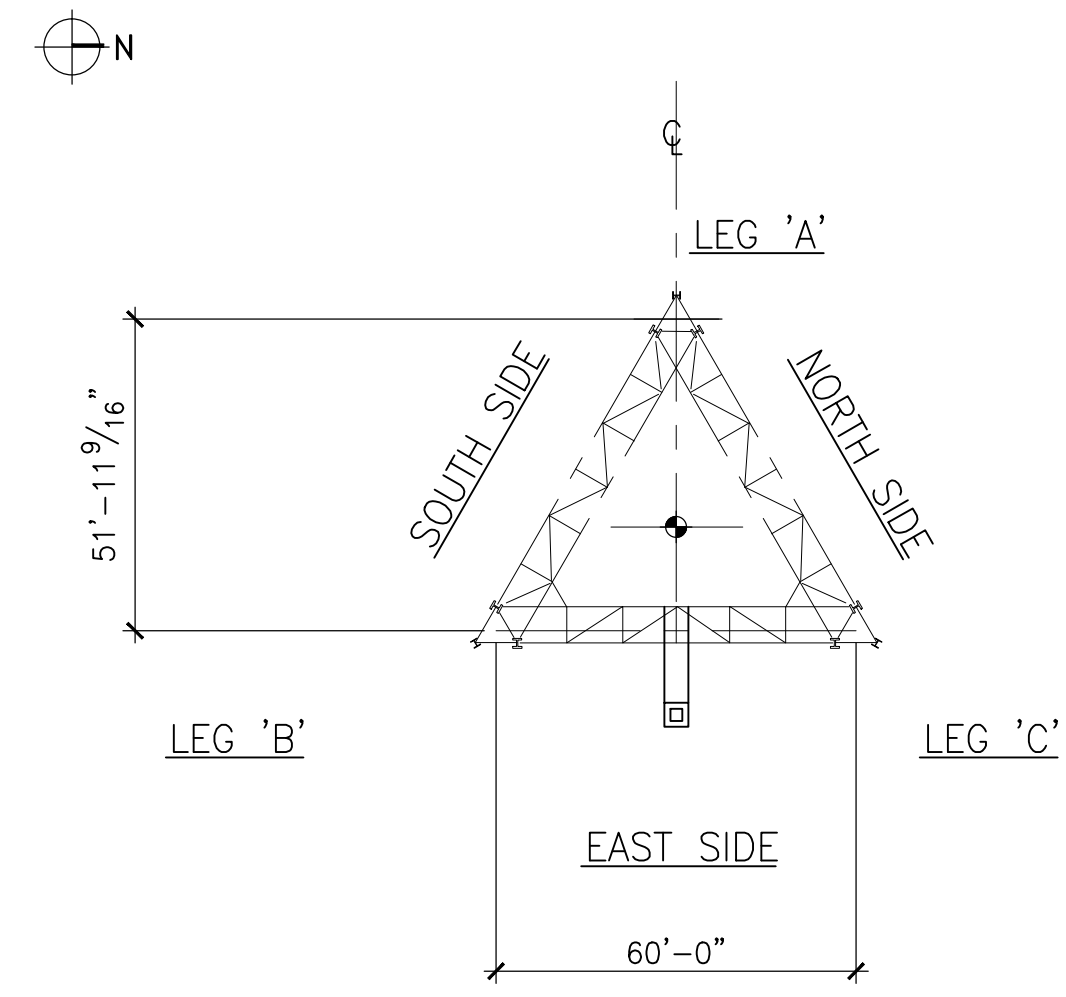
4TH LEVEL FRAMING

Drawing Title

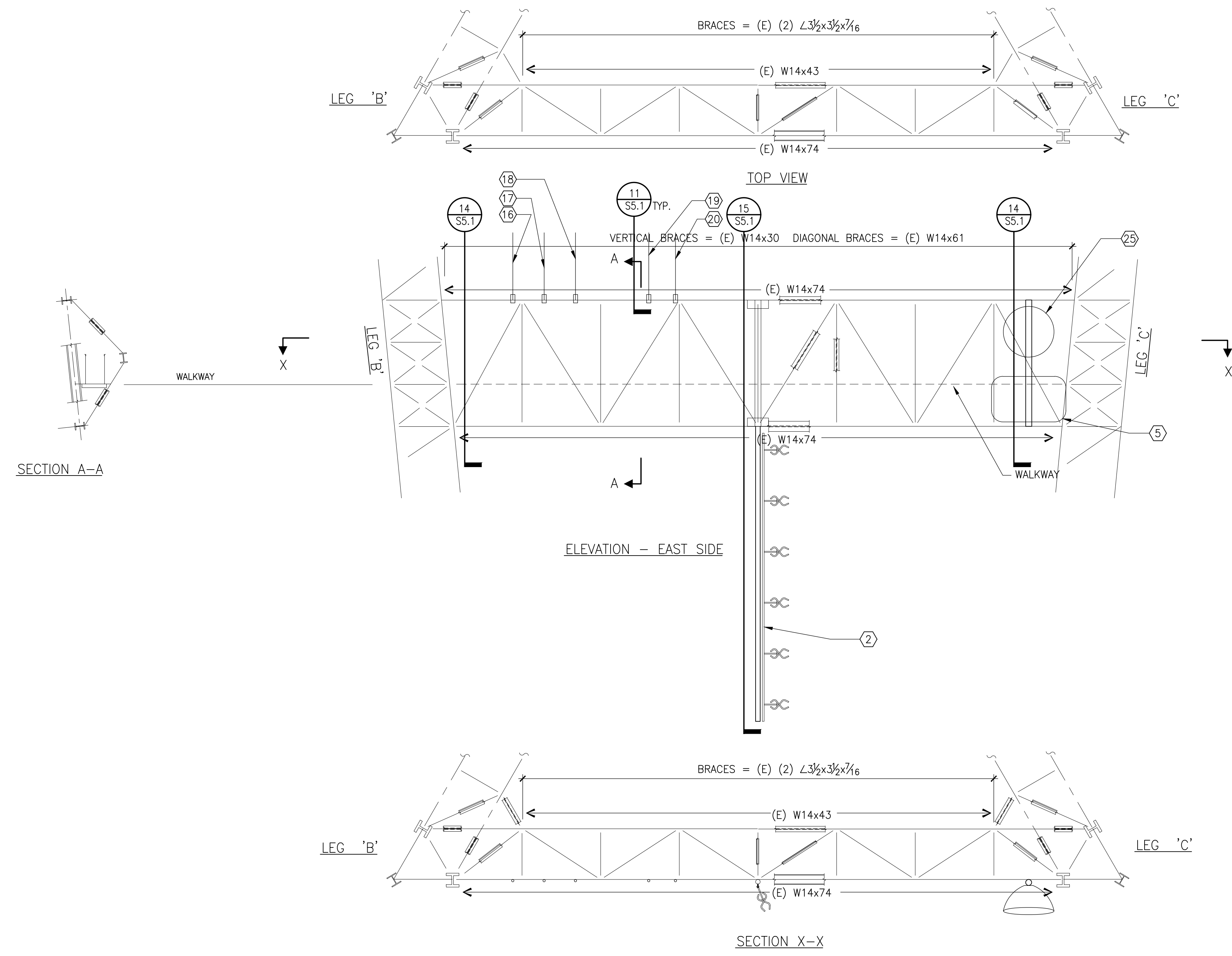
Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale 1/8"=1'-0"



S2.3



KEY PLAN - 4TH LEVEL



5TH LEVEL - EAST SIDE

SIMPSON GUMPERTZ & HEGER
 Engineering of Structures
 and Building Enclosures

Simpson Gumpertz & Heger Inc.
 The Landmark @ One Market, Suite 600
 San Francisco, California 94105
 415.495.3700 fax: 415.495.3550
 www.sgh.com

Boston
 Los Angeles
 New York
 San Francisco
 Washington, DC

Consultant

SHEET NOTES:

No.	Date	ISSUED FOR PERMIT Description	ROH By
0		ISSUED FOR PERMIT	ROH

**TOWER ANTENNA
 ADDITIONS
 SUTRO TOWER
 1 LA AVANZADA ST
 SAN FRANCISCO
 CALIFORNIA
 94131**

Project

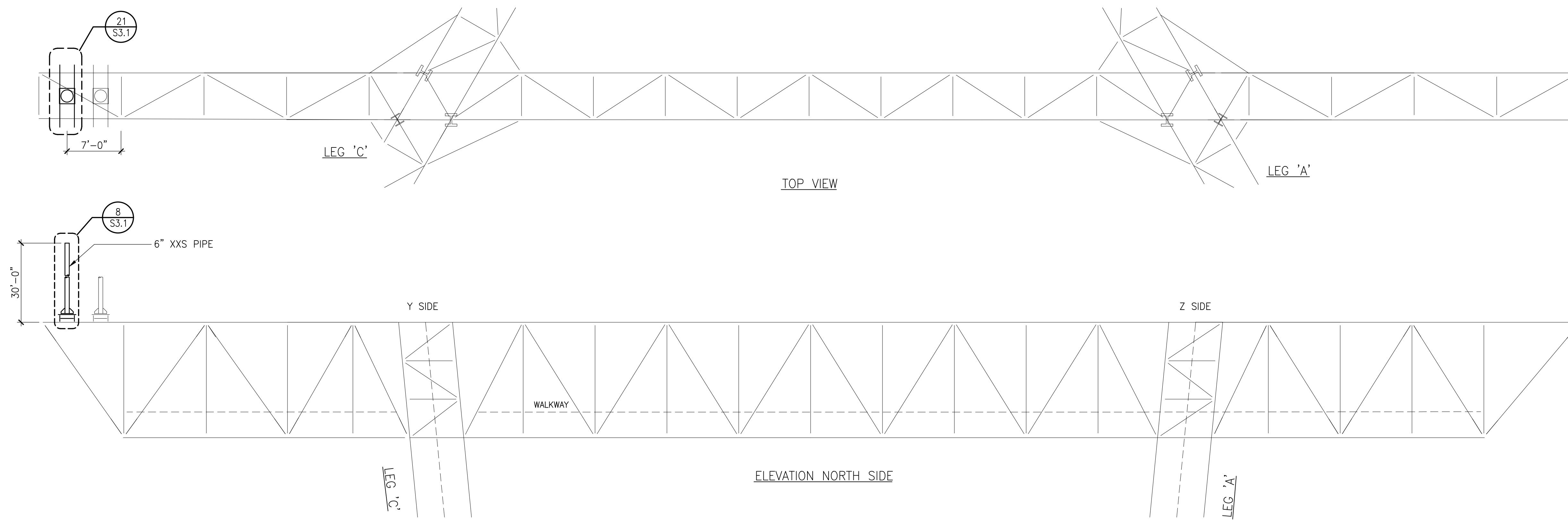
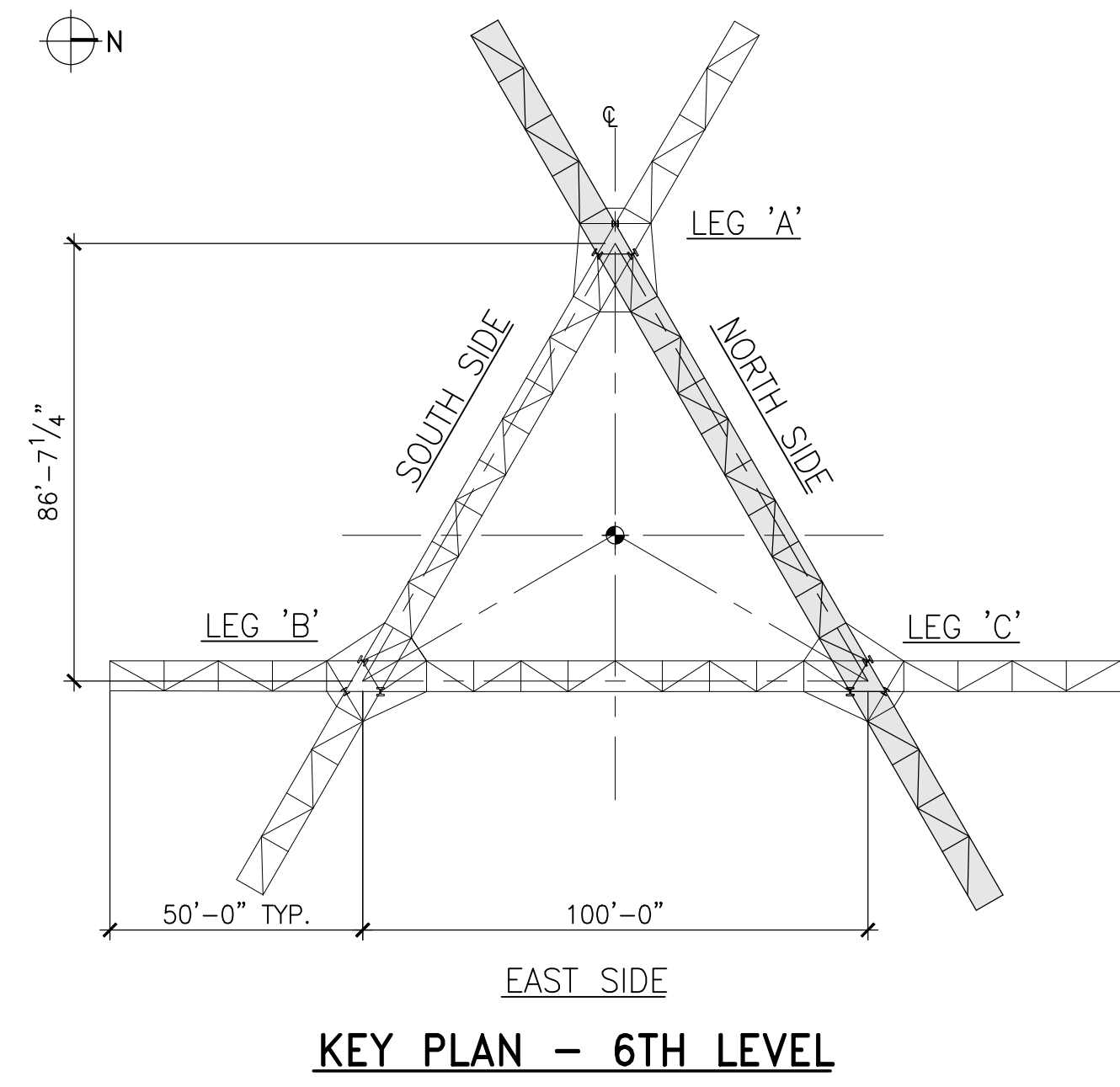
**5TH LEVEL
 FRAMING**

Drawing Title

Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale 1/8" = 1'-0"

Professional Engineer Seal: **RONALD D. HAMBURGER**, No. 2951, State of California, Structural Engineering.

Drawing No. **S2.4**



Consultant

No.	Date	Description	By
0		ISSUED FOR PERMIT	ROH

**TOWER ANTENNA
 ADDITIONS
 SUTRO TOWER
 1 LA AVANZADA ST
 SAN FRANCISCO
 CALIFORNIA
 94131**

Project

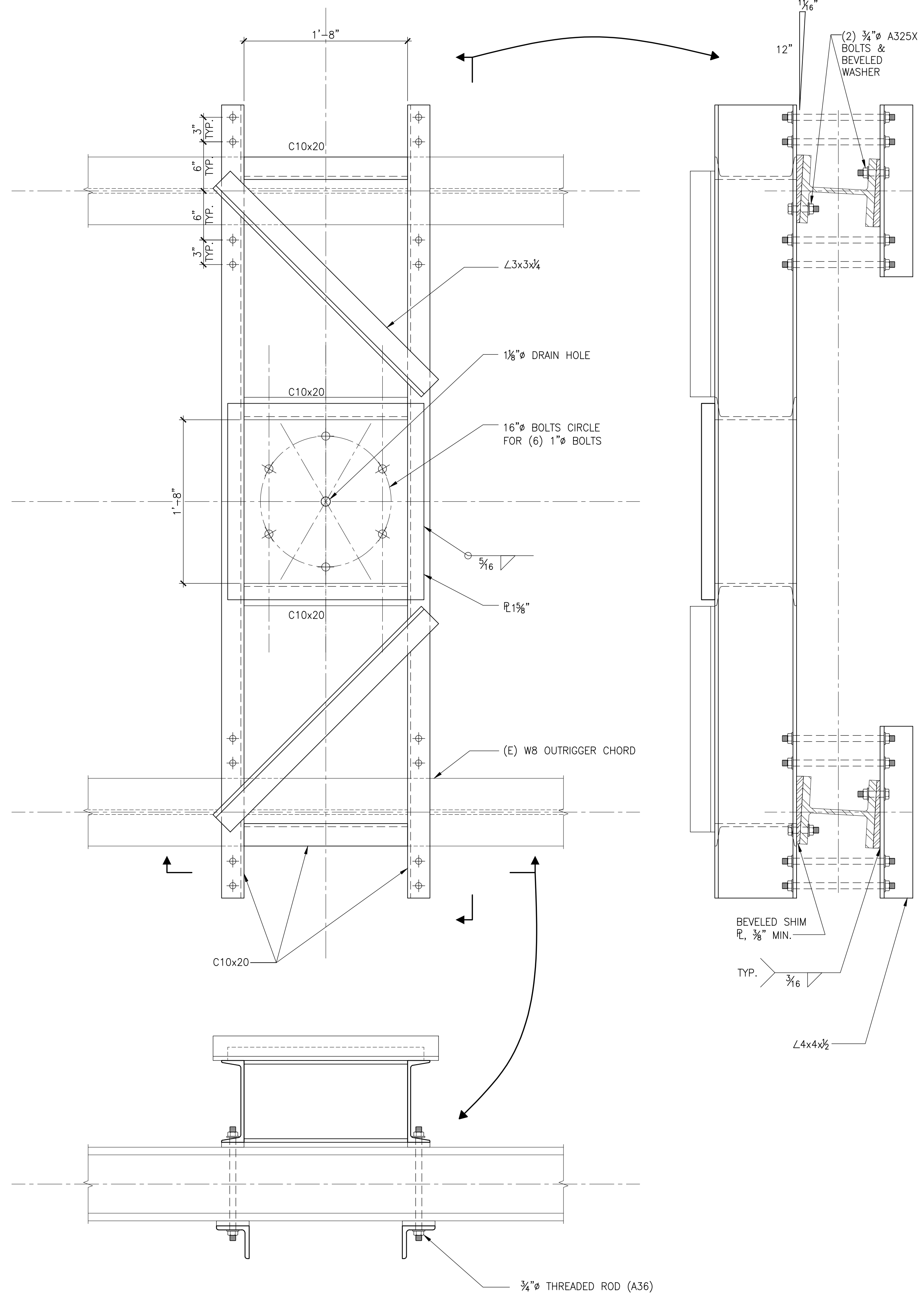
**6TH LEVEL
 FRAMING
 NORTH SIDE**

Drawing Title

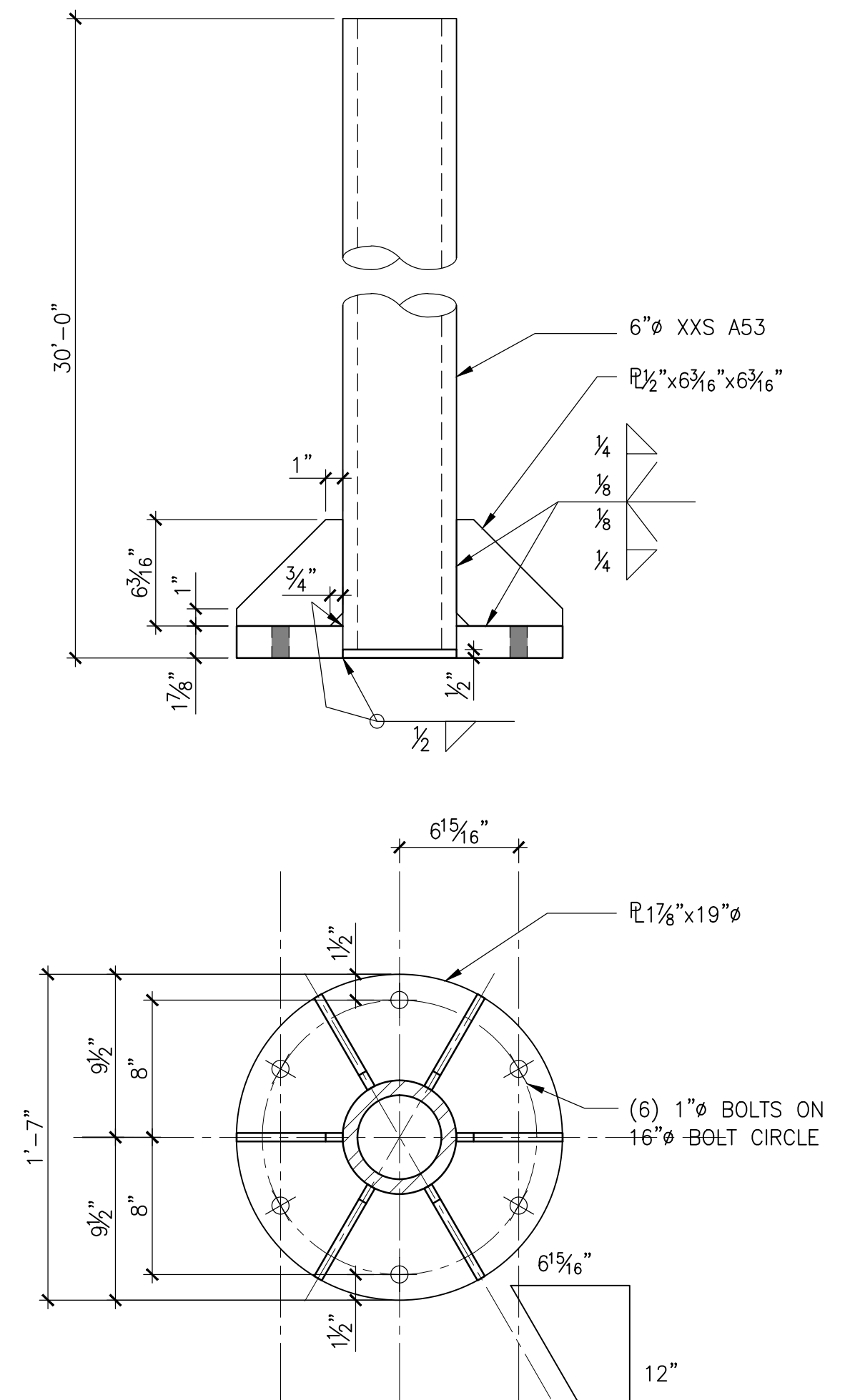
Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale 1/8" = 1'-0"

Professional Engineer Seal: **PROFESSIONAL ENGINEER**
RONALD D. HAMBURGER
 No. 2951
 STATE OF CALIFORNIA
 STRUCTURAL

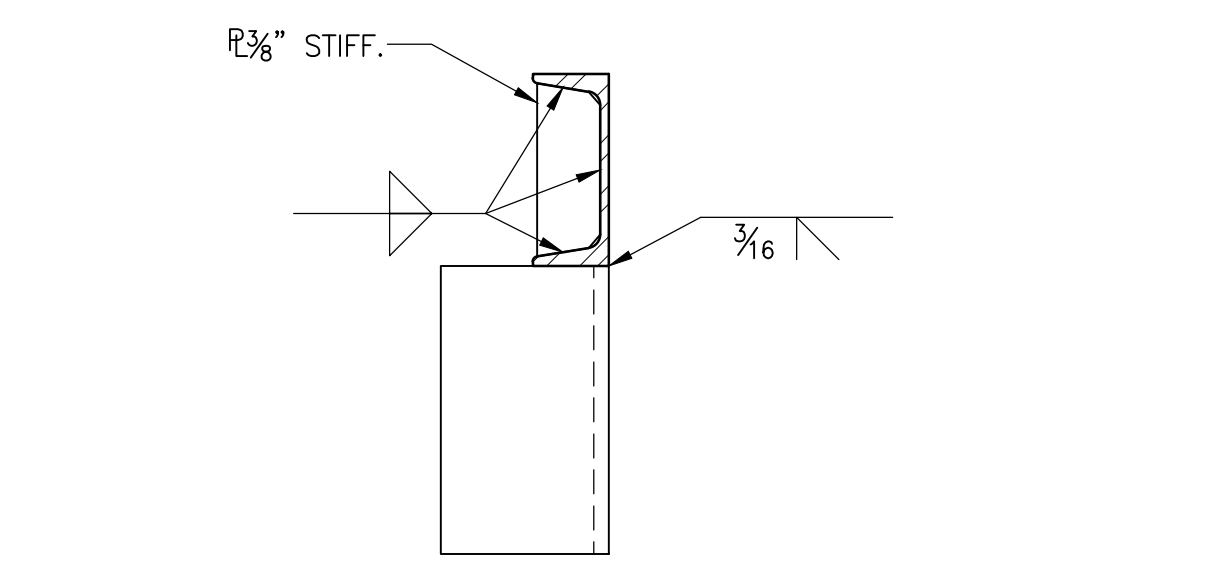
Drawing No. **S2.5**



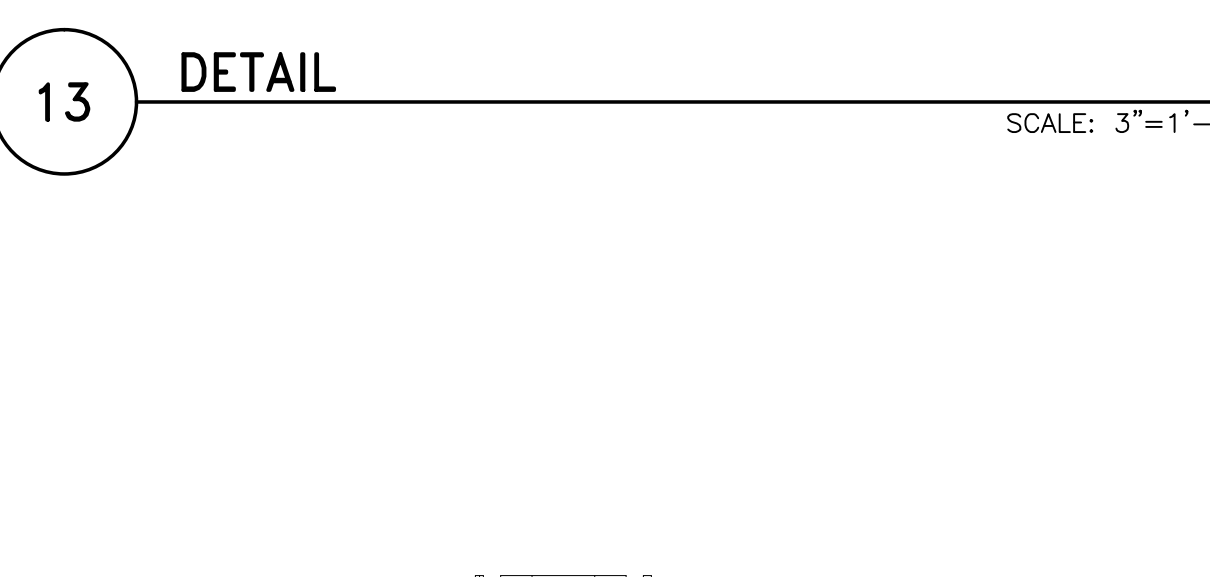
21 KREV-FM ANTENNA MOUNT
 SCALE: 1 1/2"=1'-0"



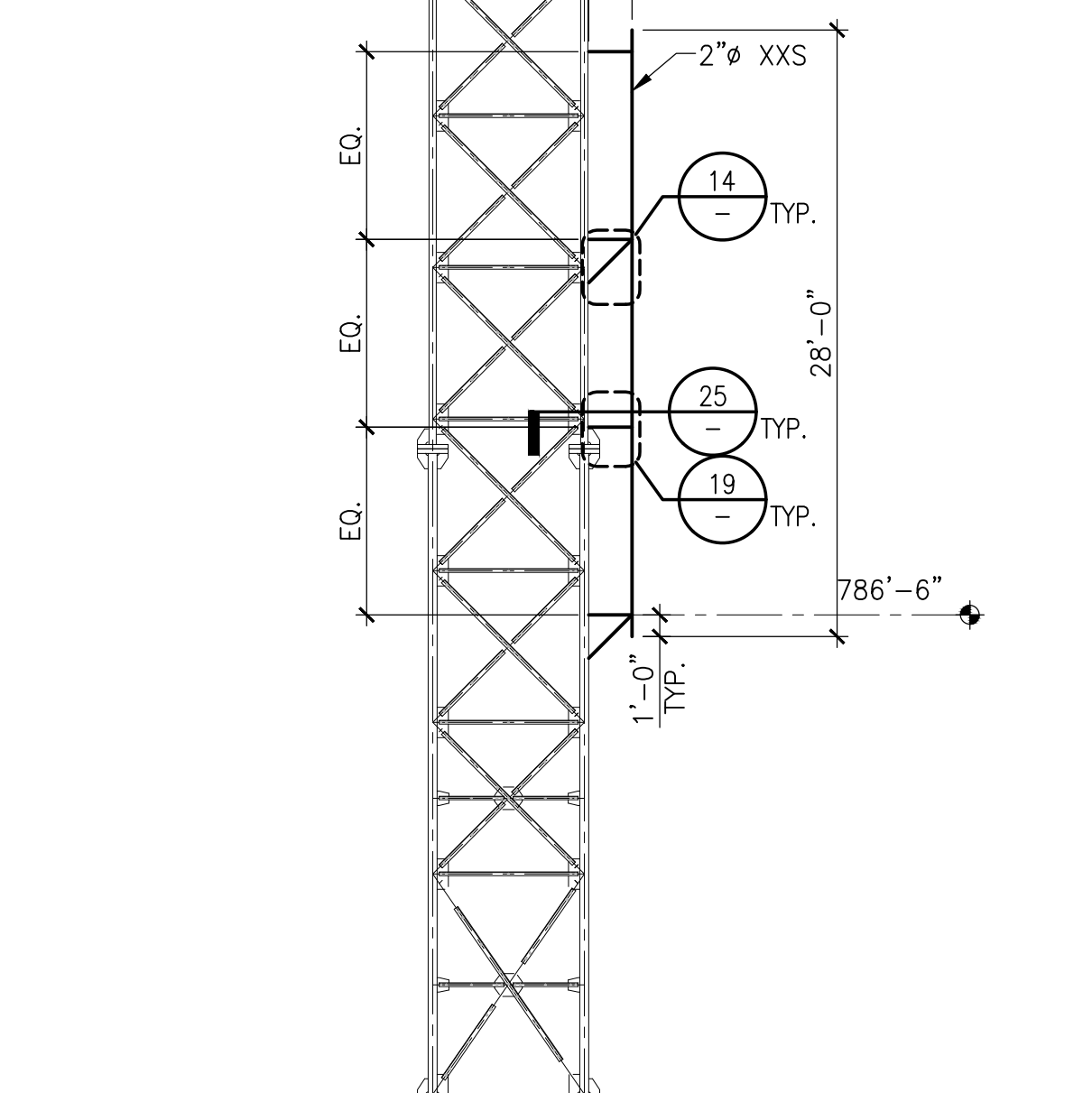
8 KREV-FM BASE FLANGE
 SCALE: 1 1/2"=1'-0"



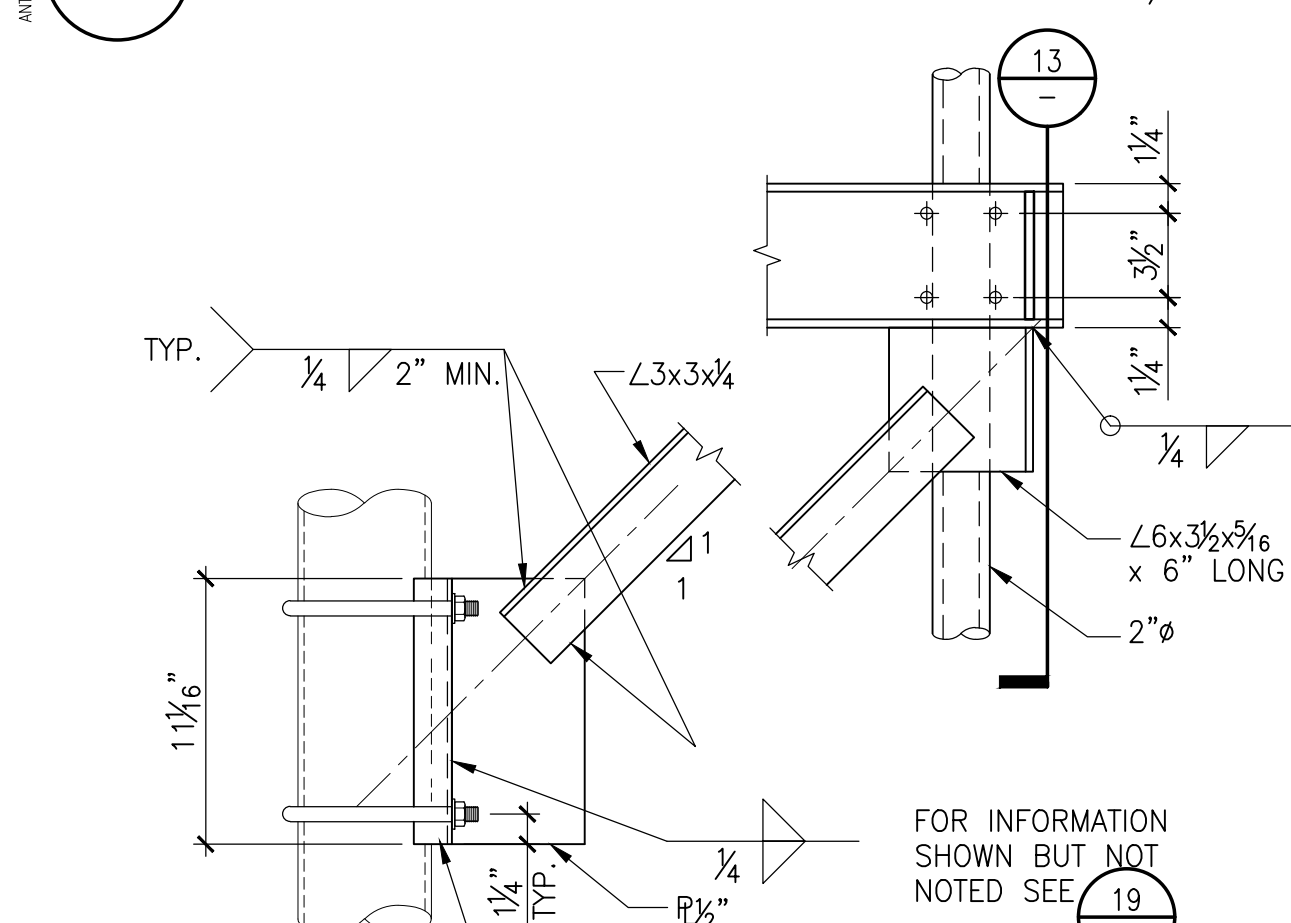
9 DETAIL
 SCALE: 1 1/2"=1'-0"



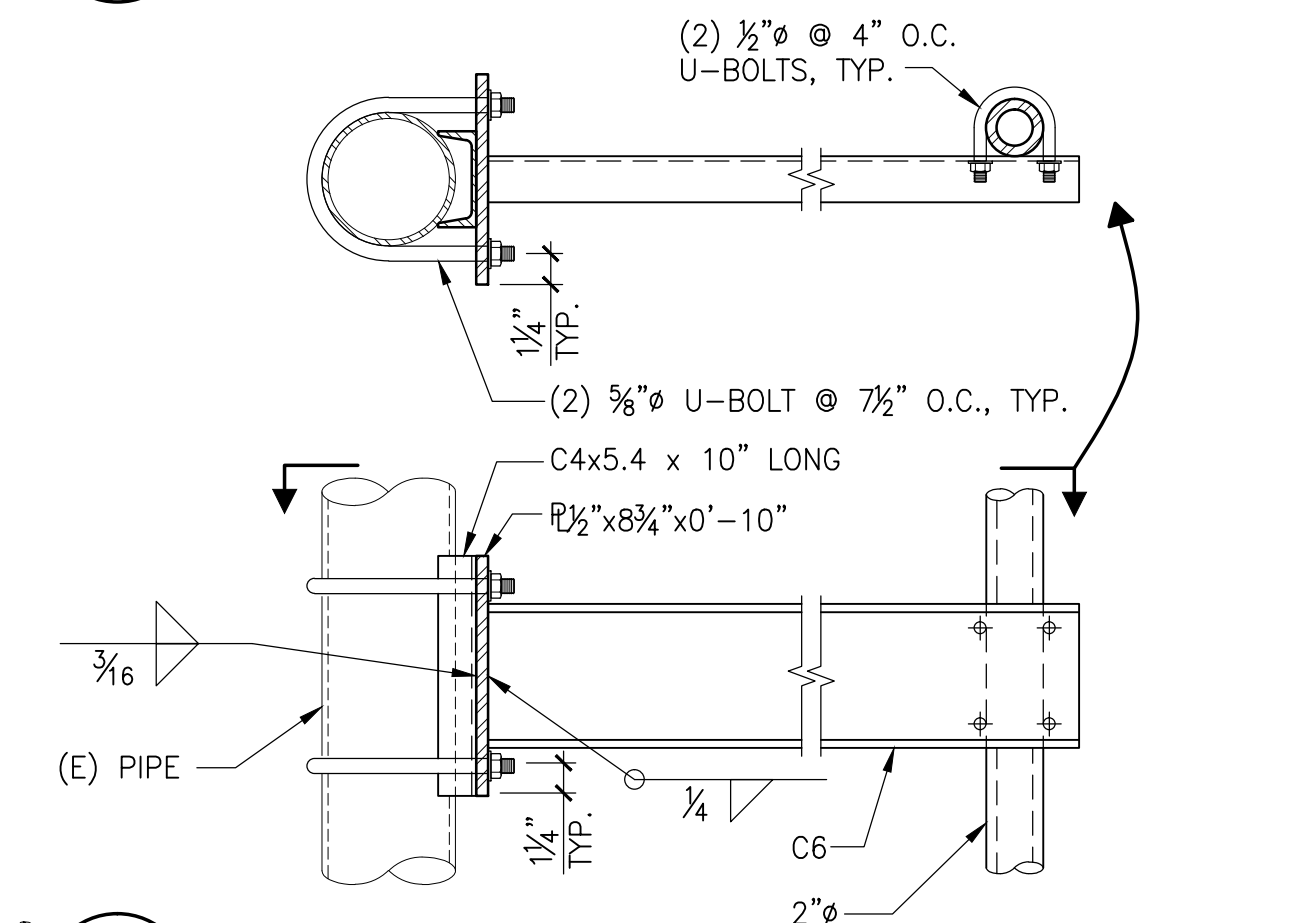
13 DETAIL
 SCALE: 3"=1'-0"



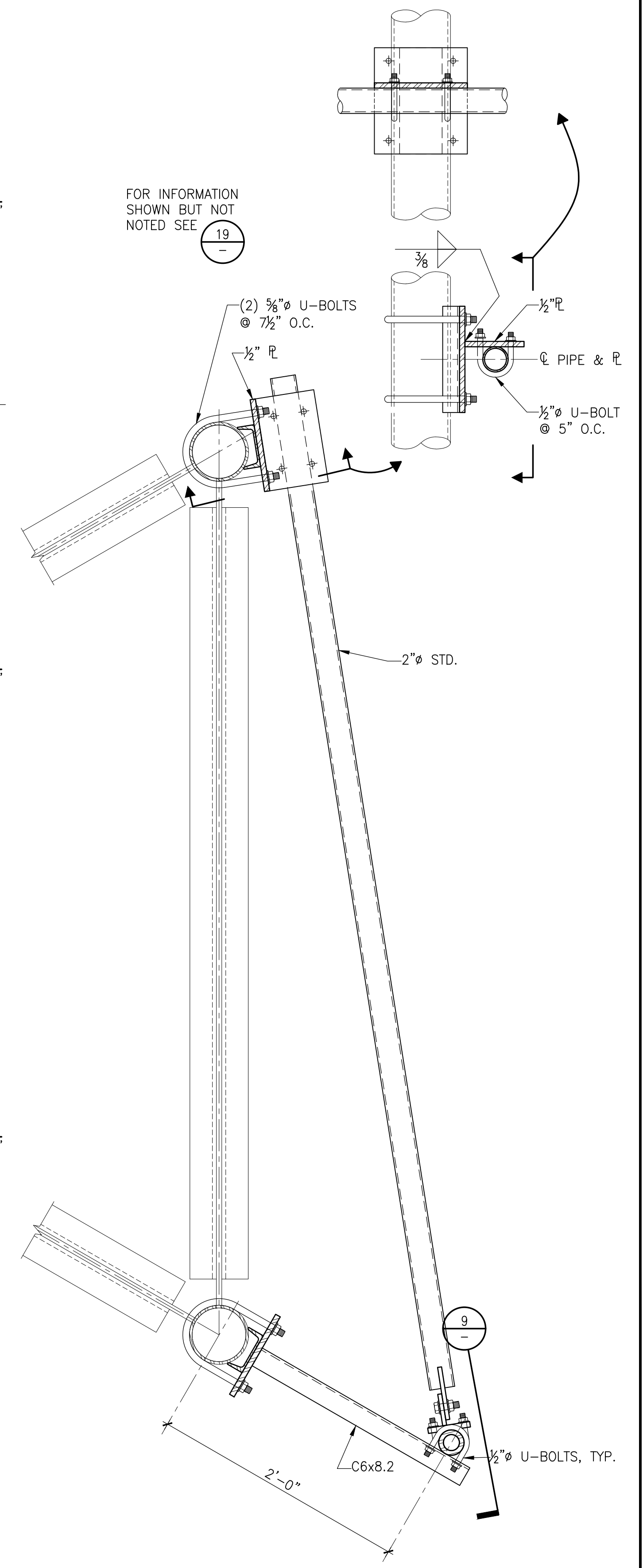
23 ANTENNA MOUNT STACK "B"
 SCALE: 1/8"=1'-0"



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



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



25 STIFF ARM TOP & BOTTOM AND AT KNEE BRACE
 SCALE: 1 1/2"=1'-0"

No.	Date	ISSUED FOR PERMIT Description	ROH By

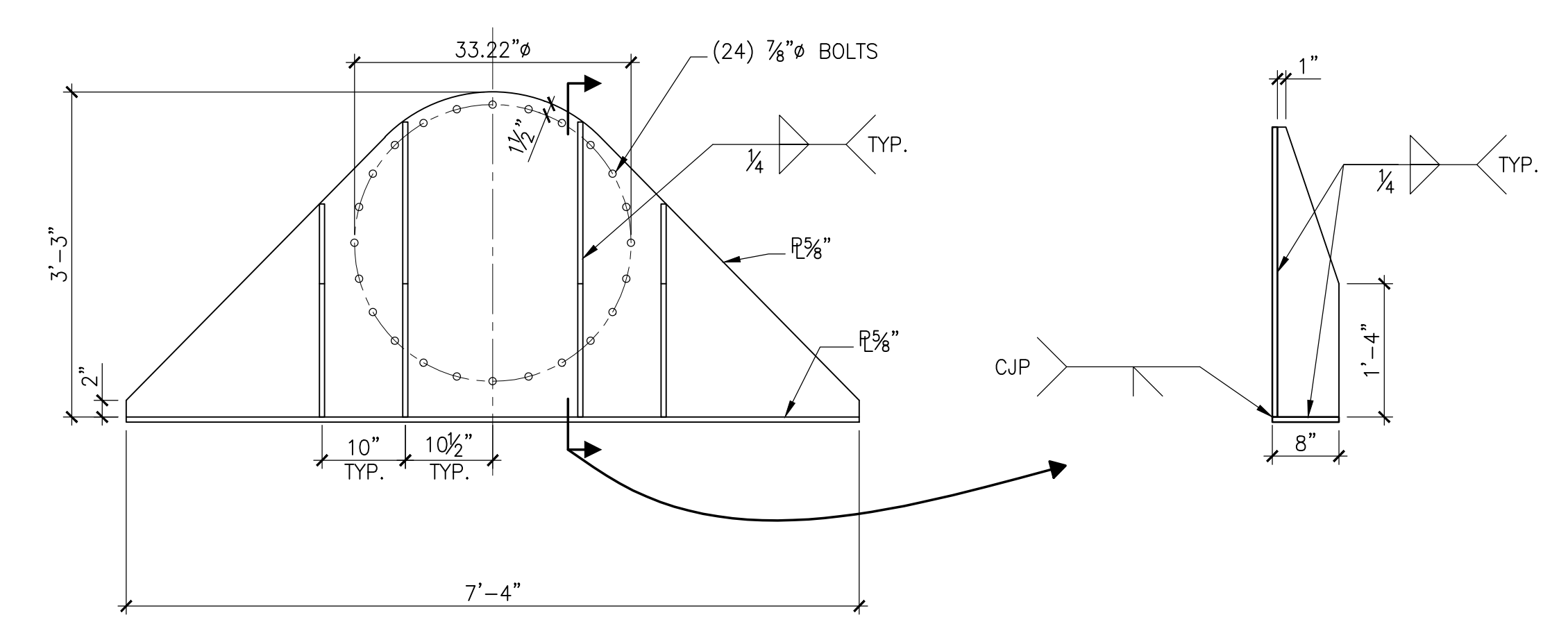
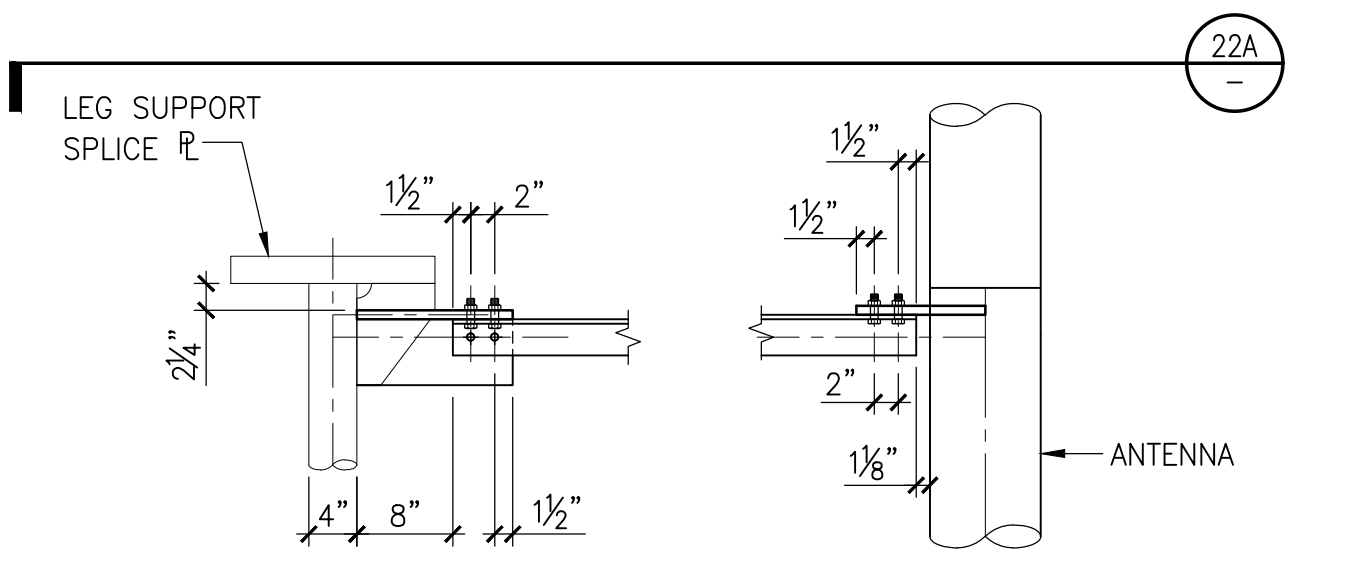
TOWER ANTENNA ADDITIONS SUTRO TOWER
 1 LA AVANZADA ST
 SAN FRANCISCO CALIFORNIA
 94131

ANTENNA MOUNTS STACKS "A" "B" & "C"

Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale AS NOTED

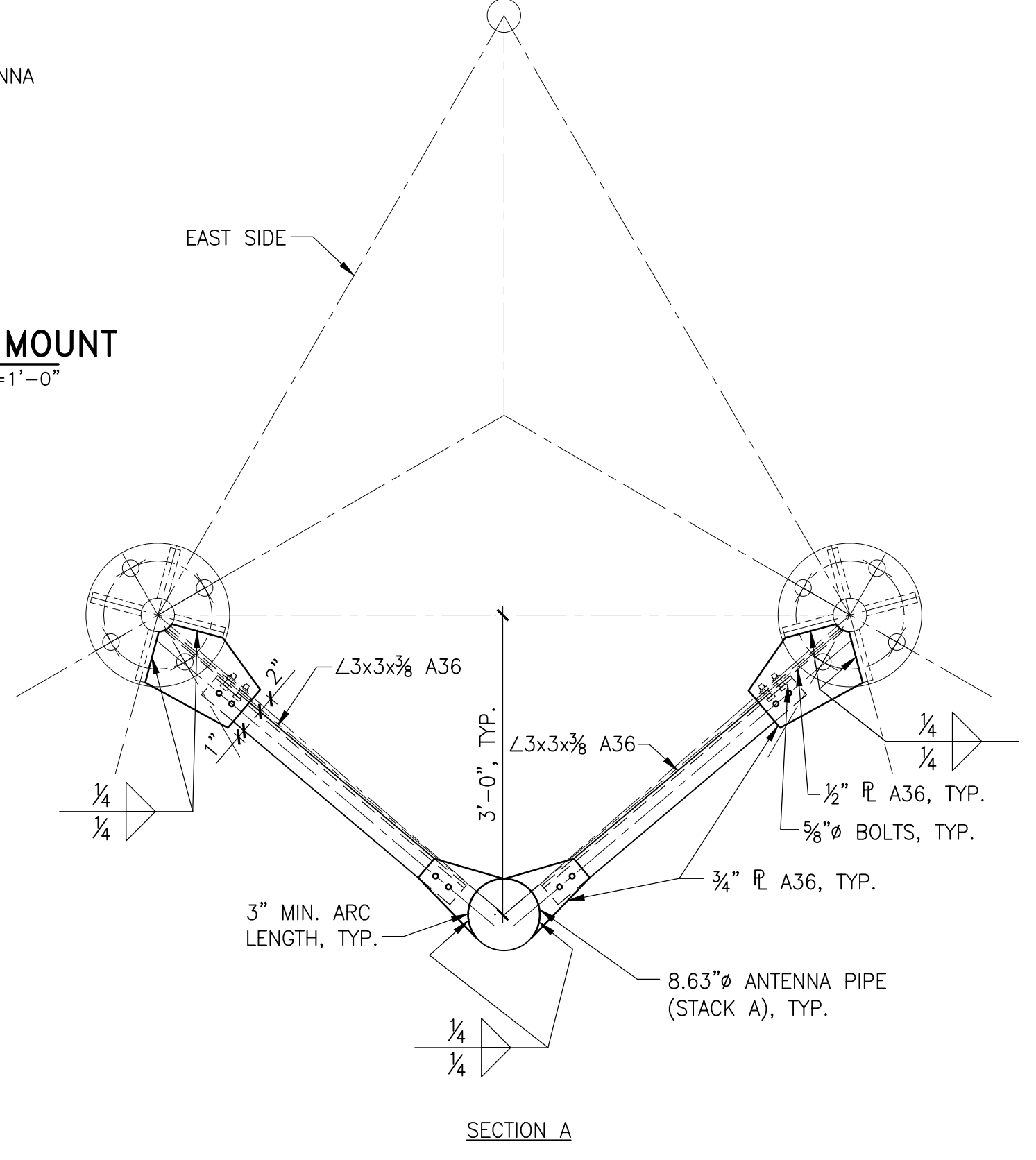
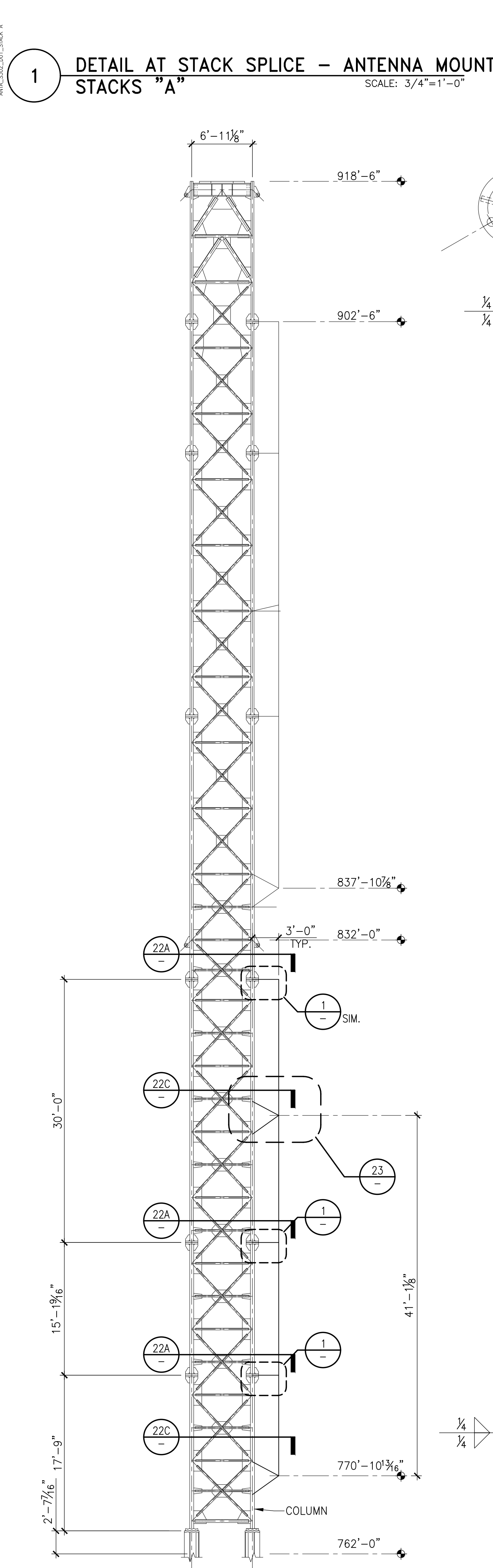
Professional Engineer
 No. 2951
 State of California

S3.1

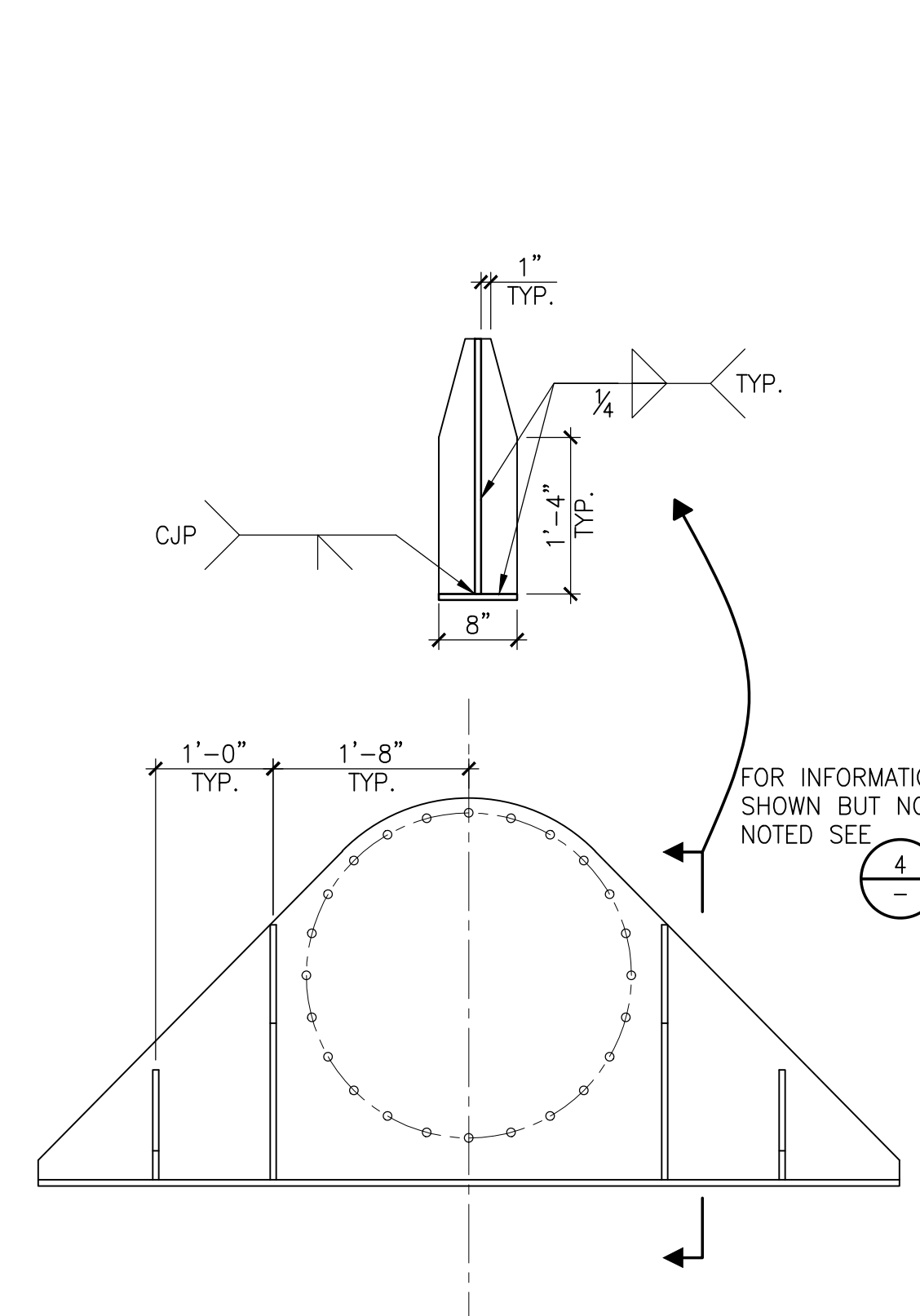


1 DETAIL AT STACK SPLICE - ANTENNA MOUNT STACKS "A" SCALE: 3/4"=1'-0"

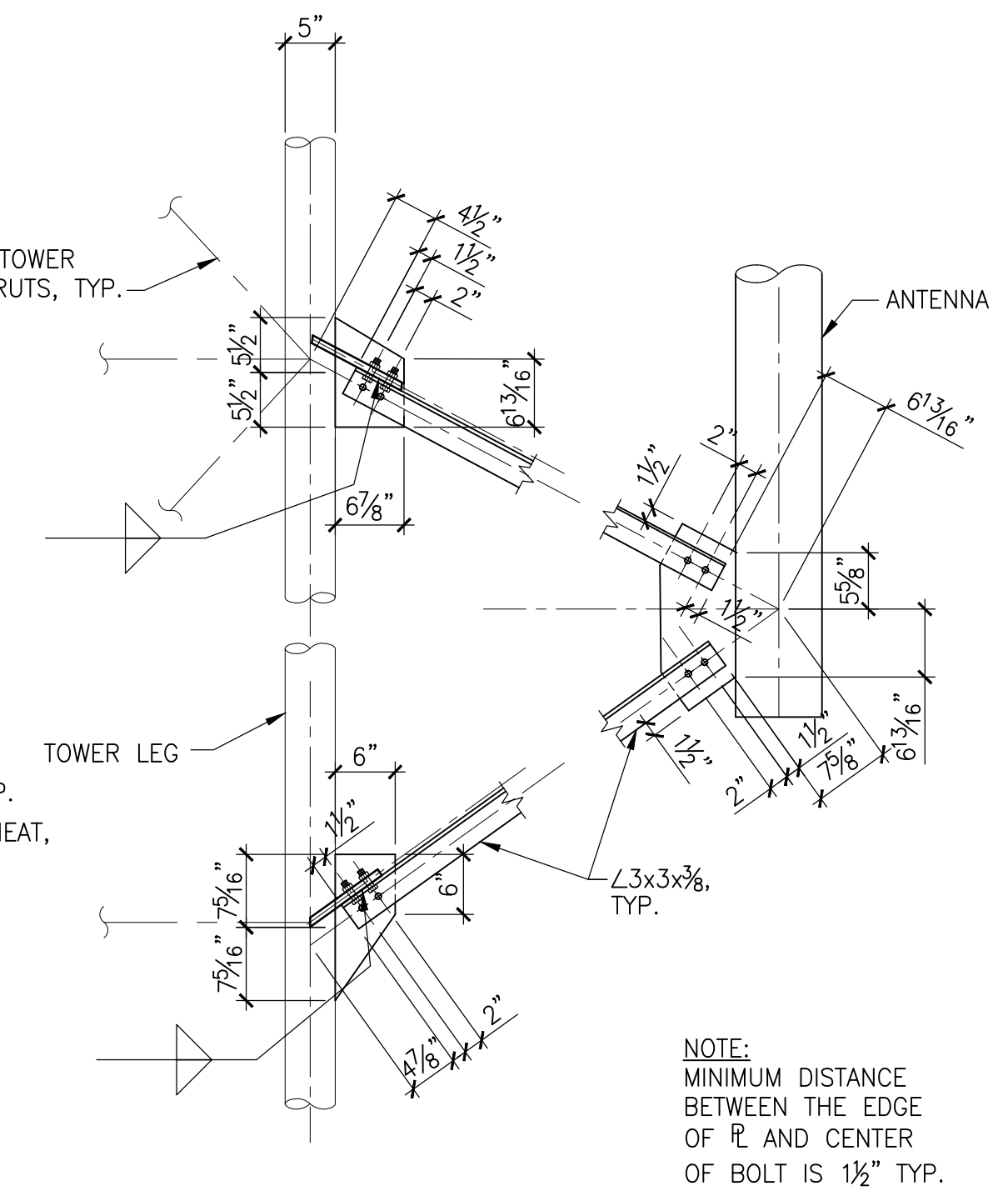
4 TOP AND BOTTOM ANTENNA MOUNT PLATE SCALE: 3/4"=1'-0"



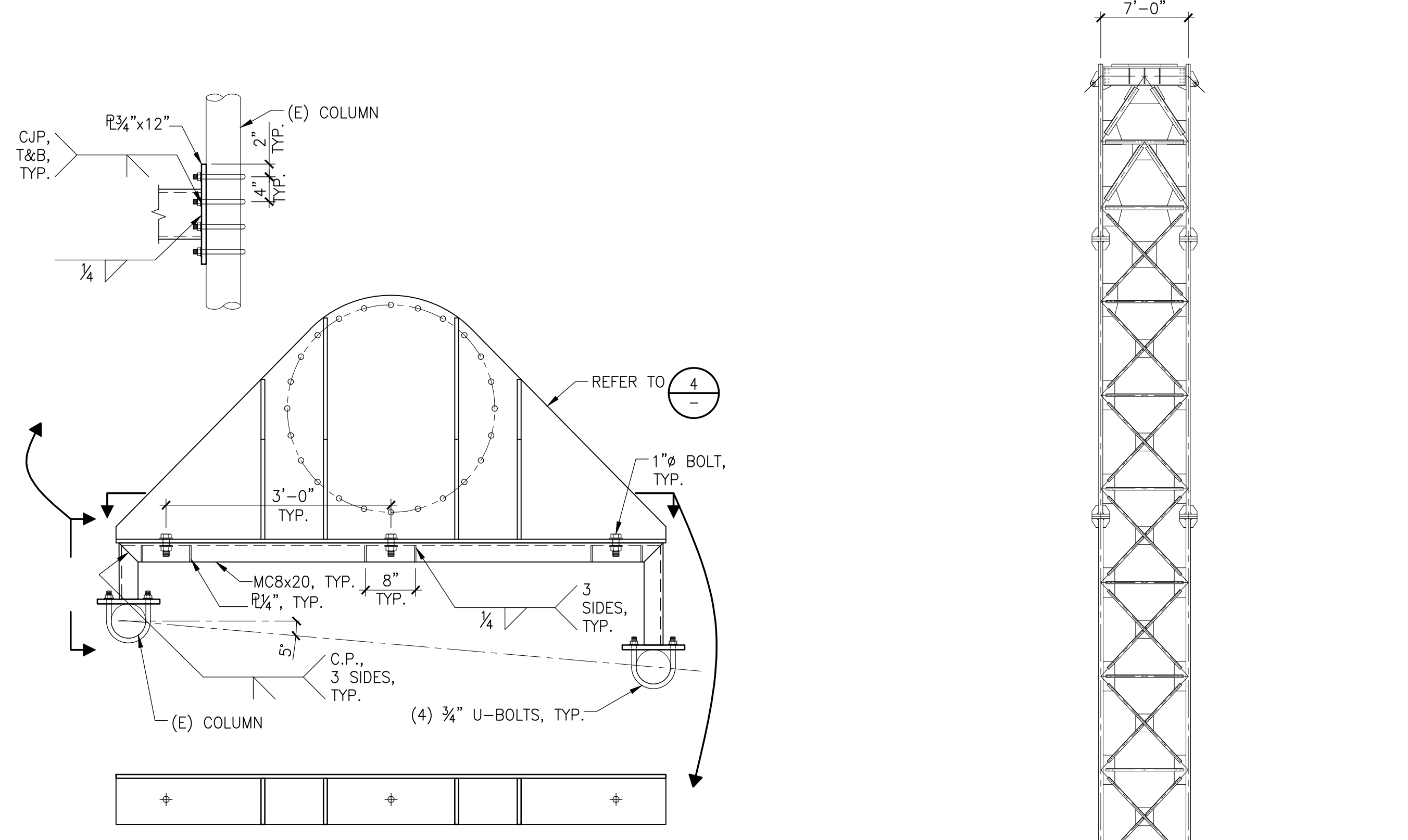
22 SECTIONS ANTENNA STACK "A" SCALE: 3/4"=1'-0"



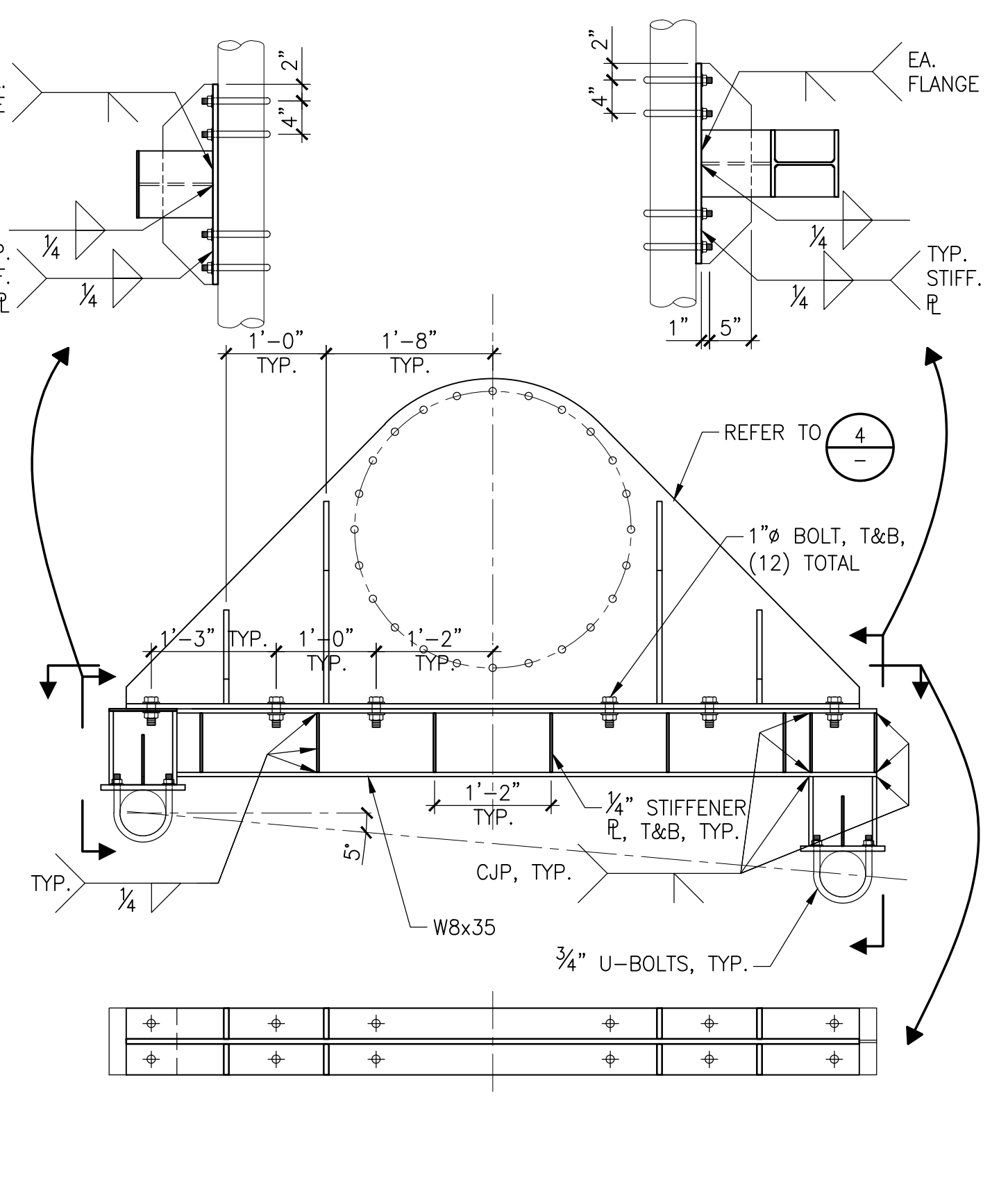
13 MIDDLE ANTENNA MOUNT PLATE SCALE: 3/4"=1'-0"



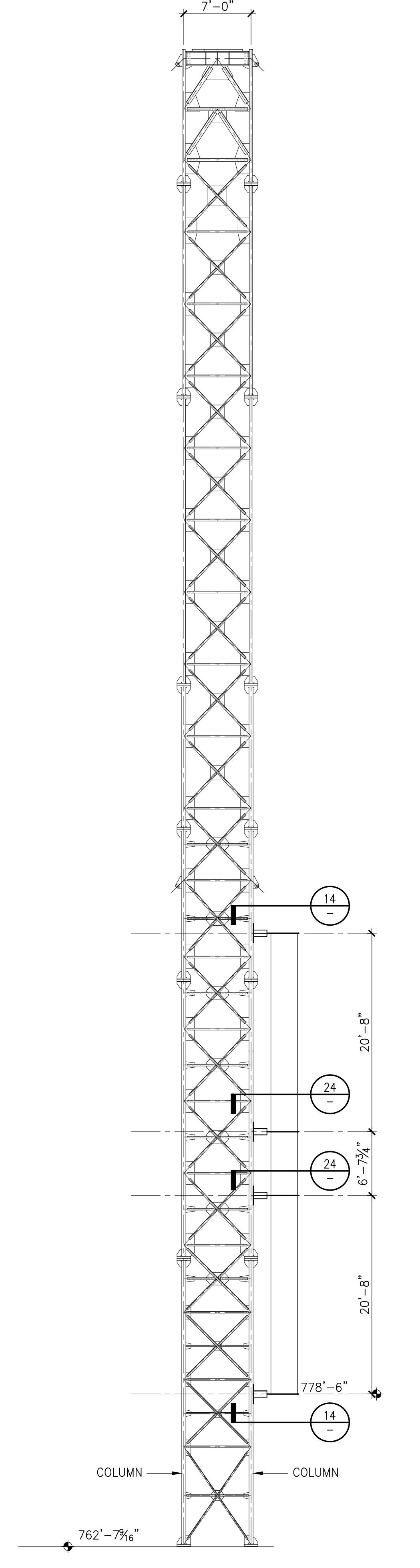
23 DETAIL ANTENNA MOUNT - STACK "A" SCALE: 3/4"=1'-0"



14 TOP AND BOTTOM ANTENNA MOUNT SCALE: 3/4"=1'-0"



24 MIDDLE ANTENNA MOUNT 2 REQUIRED SCALE: 3/4"=1'-0"



25 ANTENNA MOUNT STACK "C" SCALE: 1/8"=1'-0"

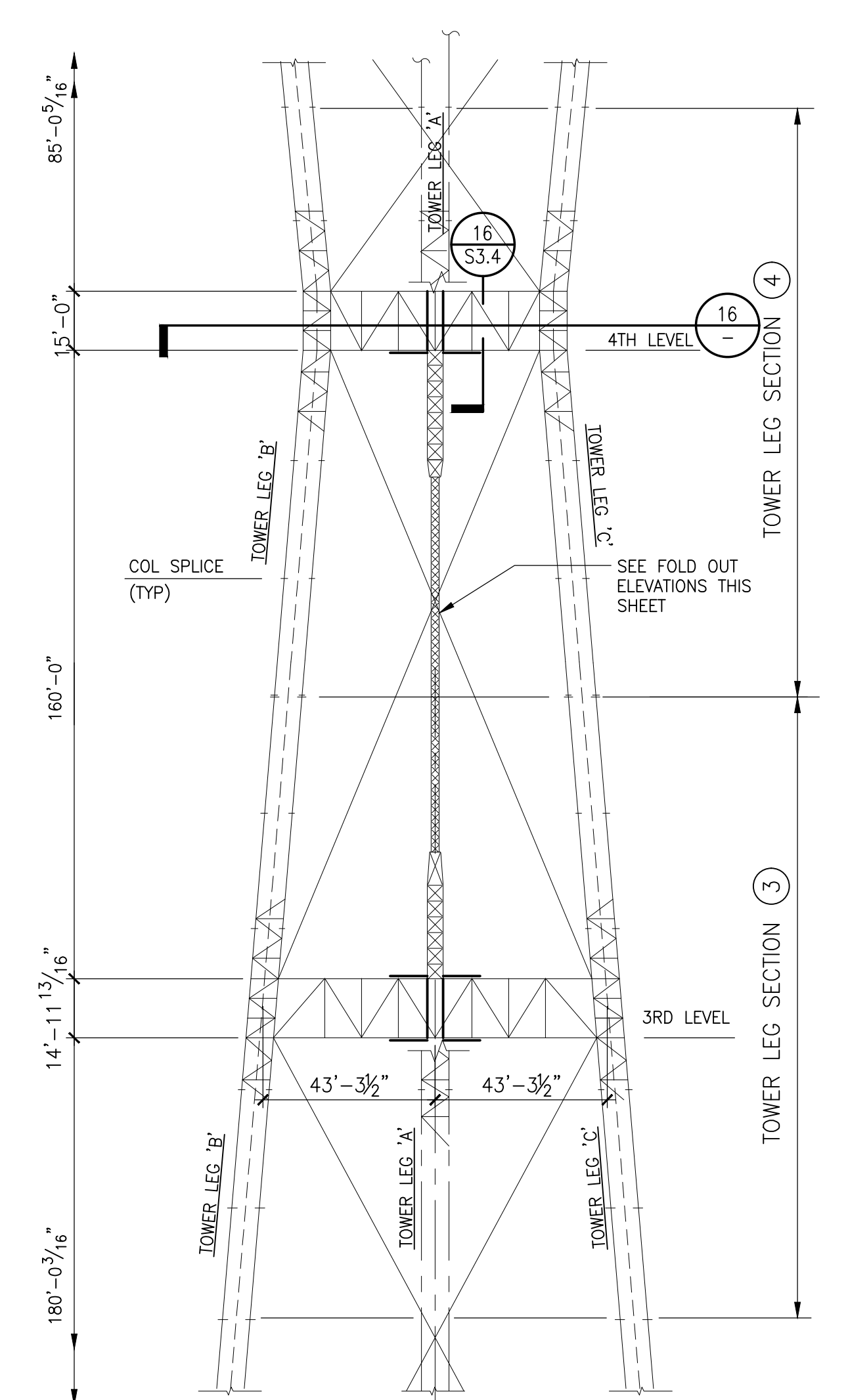
No.	Date	ISSUED FOR PERMIT Description	ROH By

TOWER ANTENNA ADDITIONS SUTRO TOWER
1 LA AVANZADA ST SAN FRANCISCO CALIFORNIA 94131

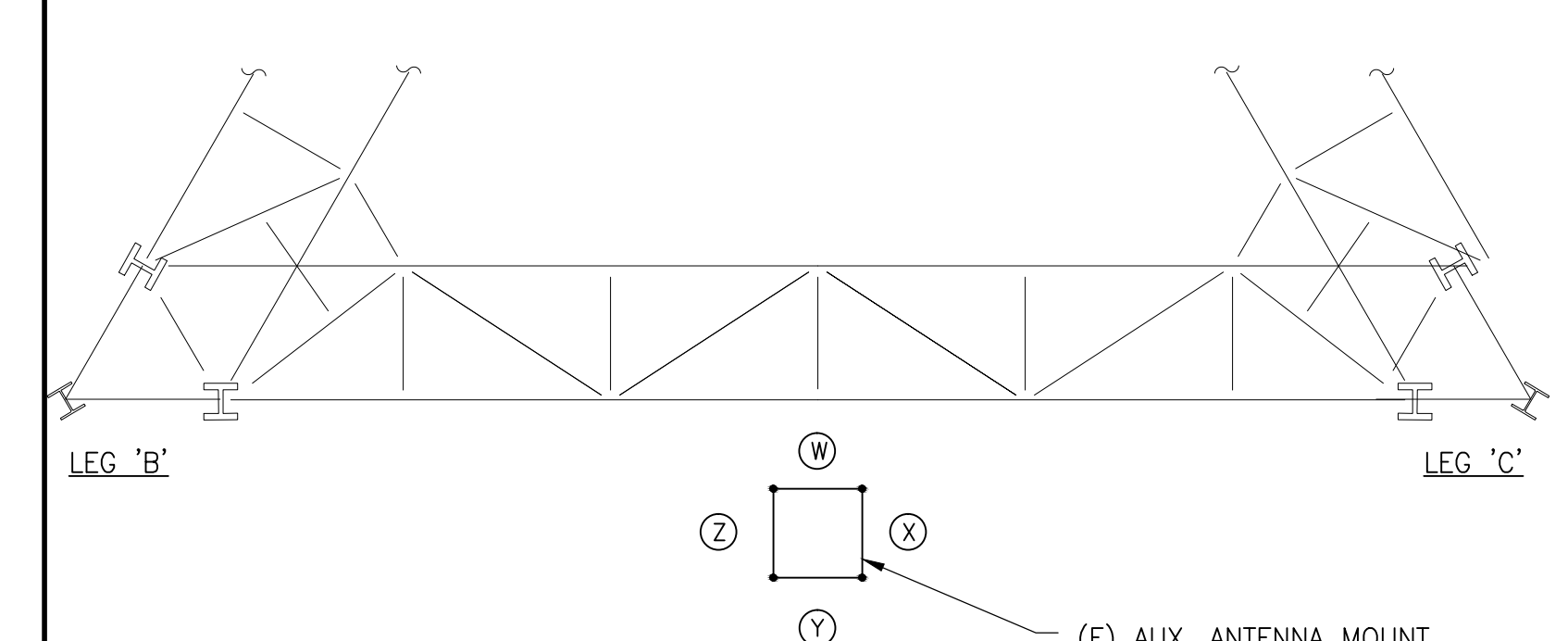
ANTENNA MOUNTS STACKS "A" "B" & "C"

Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale AS NOTED

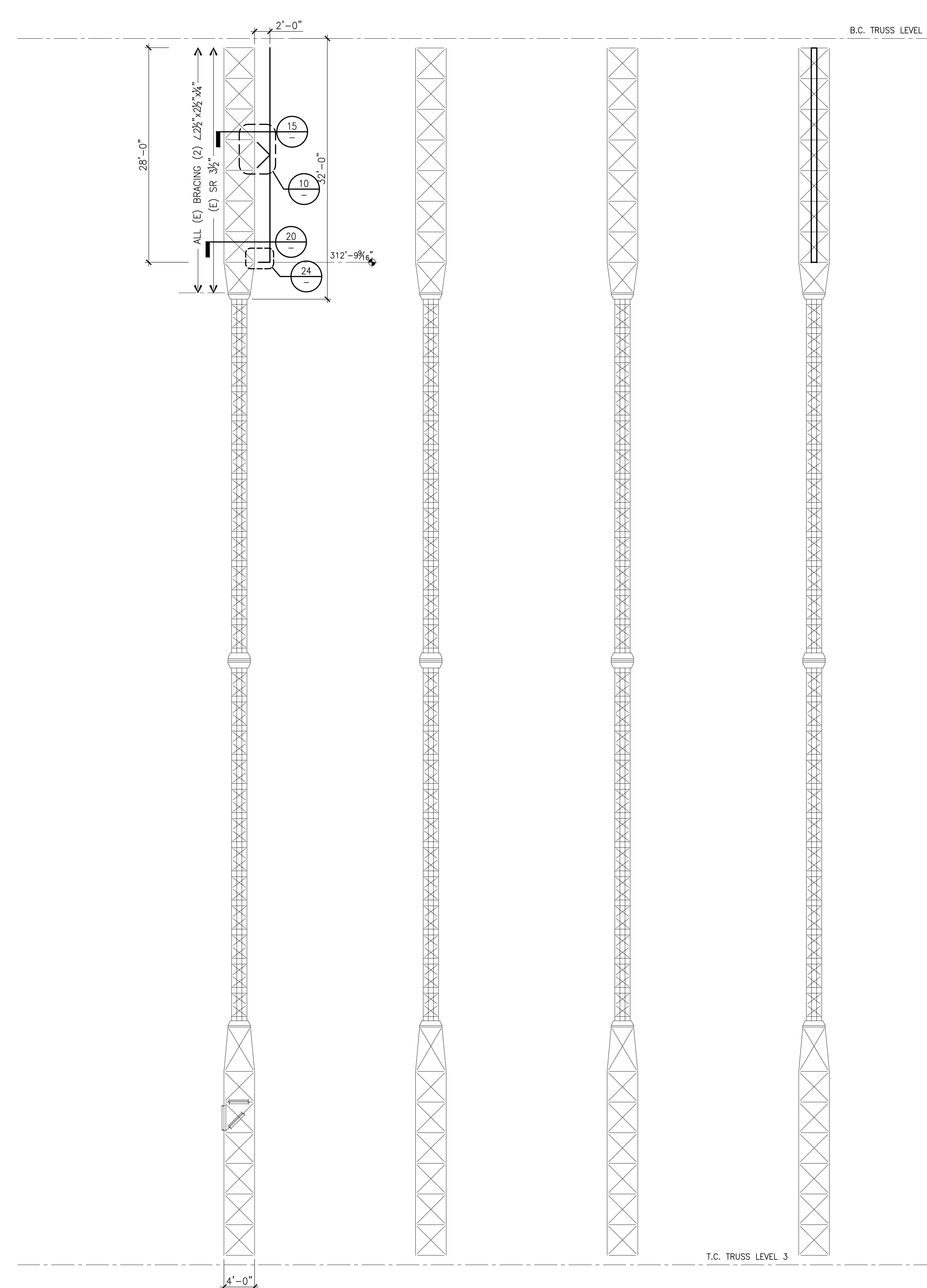
Drawing Title
 Drawing No.
 SCALE OF CALIFORNIA PROFESSIONAL ENGINEER
 No. 2951
S3.2



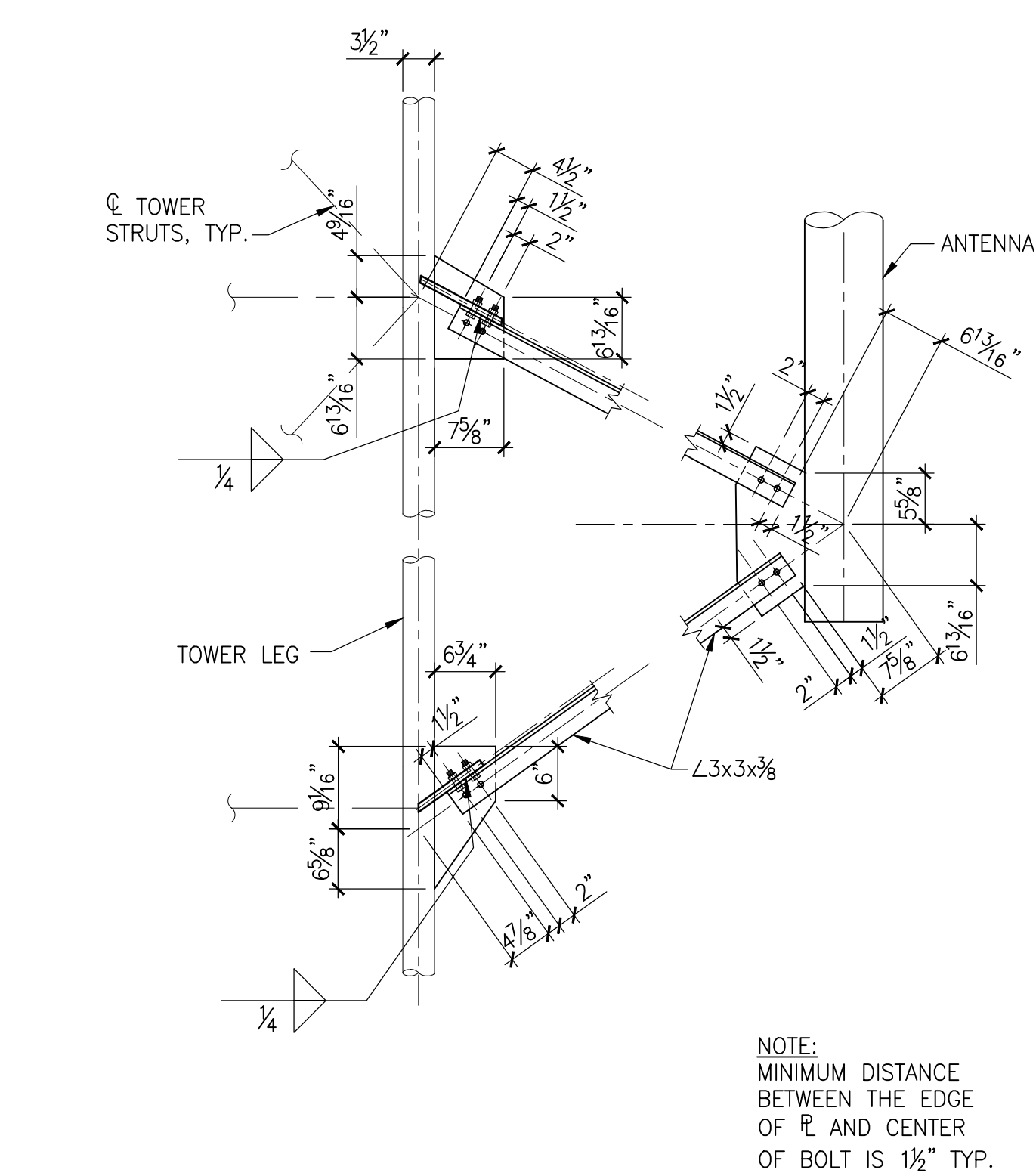
11 TOWER WORK POINT ELEVATION
 SCALE: 1/32"=1'-0"



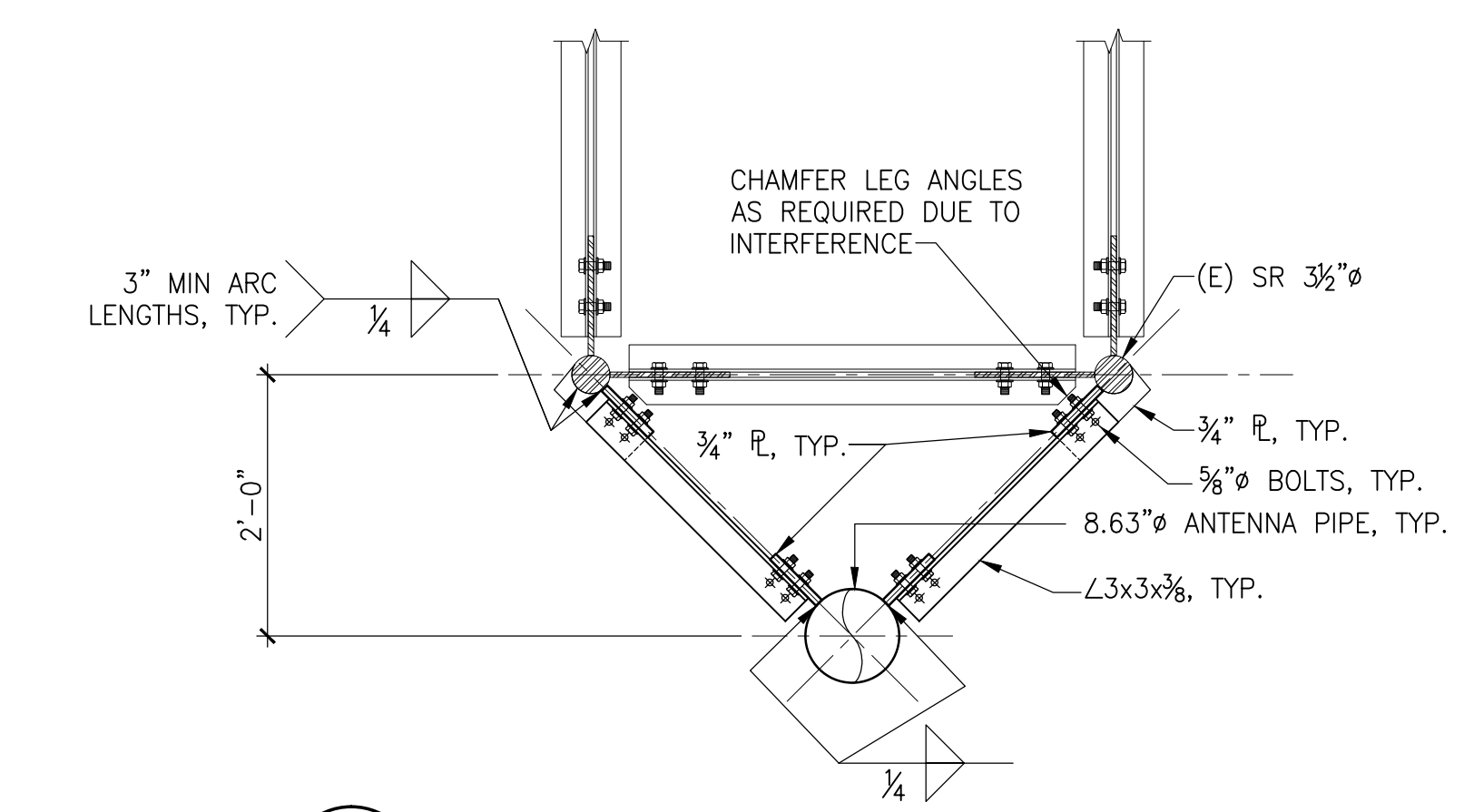
16 AUXILIARY ANTENNA LOCATION
 SCALE: 1/8"=1'-0"



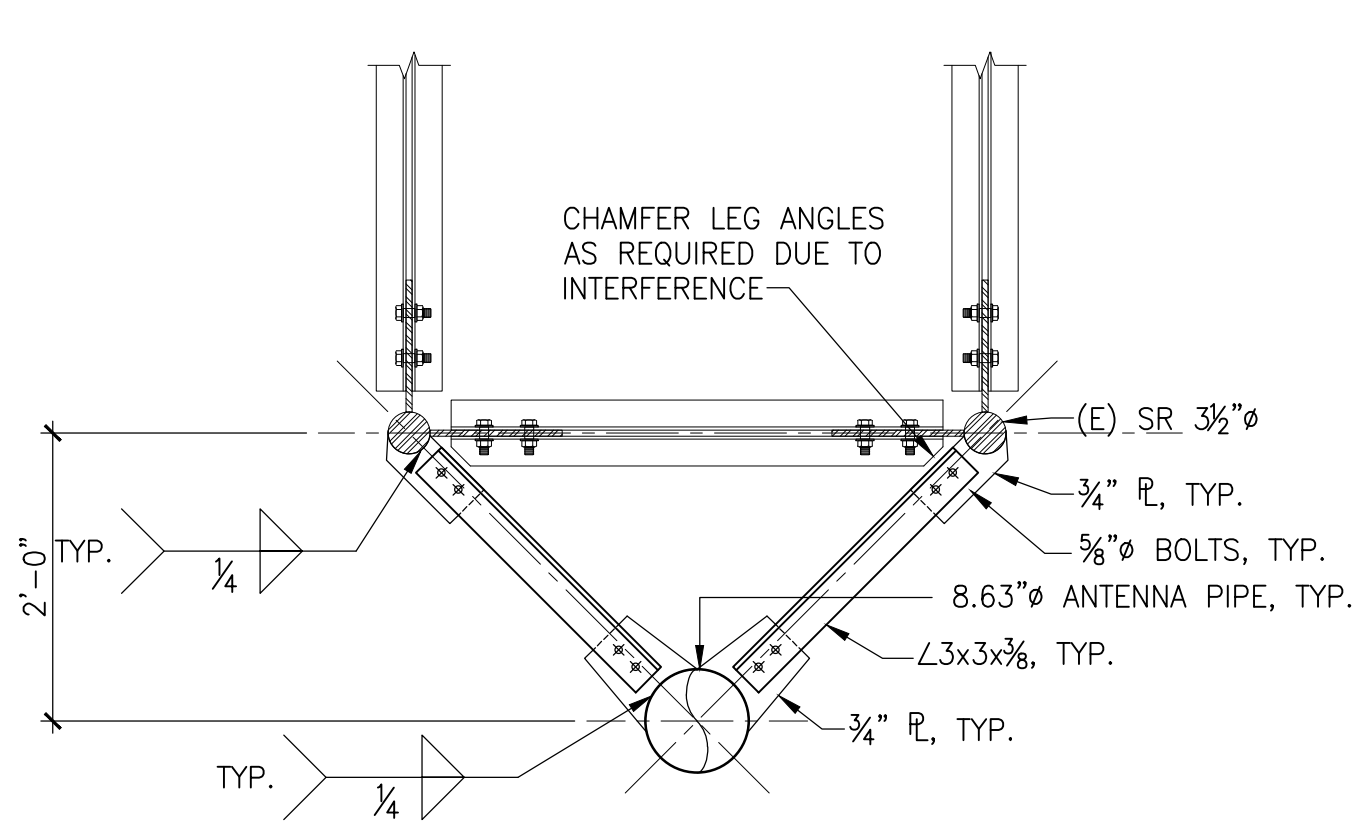
17 AUXILIARY ANTENNA ELEVATION
 SCALE: 1/8"=1'-0"



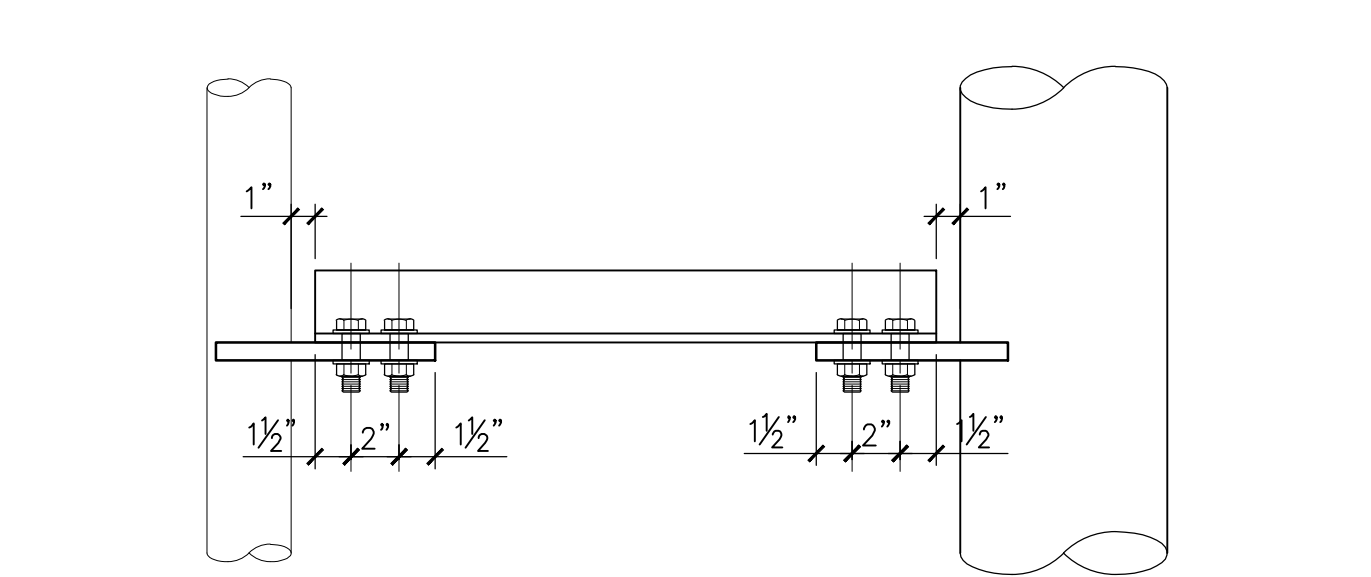
10 DETAIL ANTENNA MOUNT - STACK "A"
 SCALE: 3/4"=1'-0"



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



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



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

Consultant

No.	Date	ISSUED FOR PERMIT Description	ROH By

TOWER ANTENNA ADDITIONS SUTRO TOWER
 1 LA AVANZADA ST
 SAN FRANCISCO
 CALIFORNIA
 94131

NDTV AUXILIARY ANTENNA ELEVATION & SECTIONS

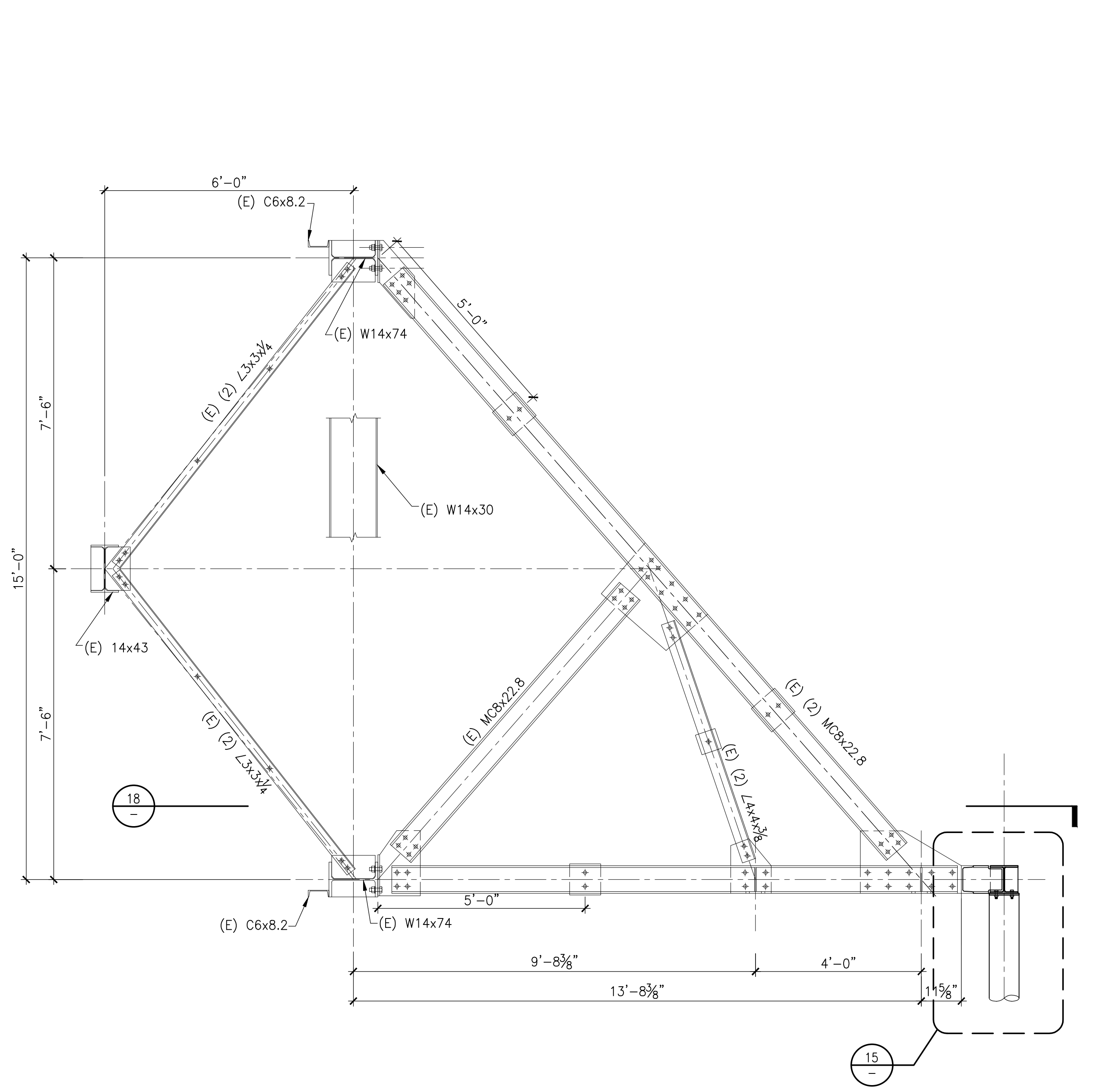
Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale AS NOTED

Professional Engineer Seal for Ronald D. Hamburger, No. 2951, State of California. Drawing No. **S3.3**

Consultant

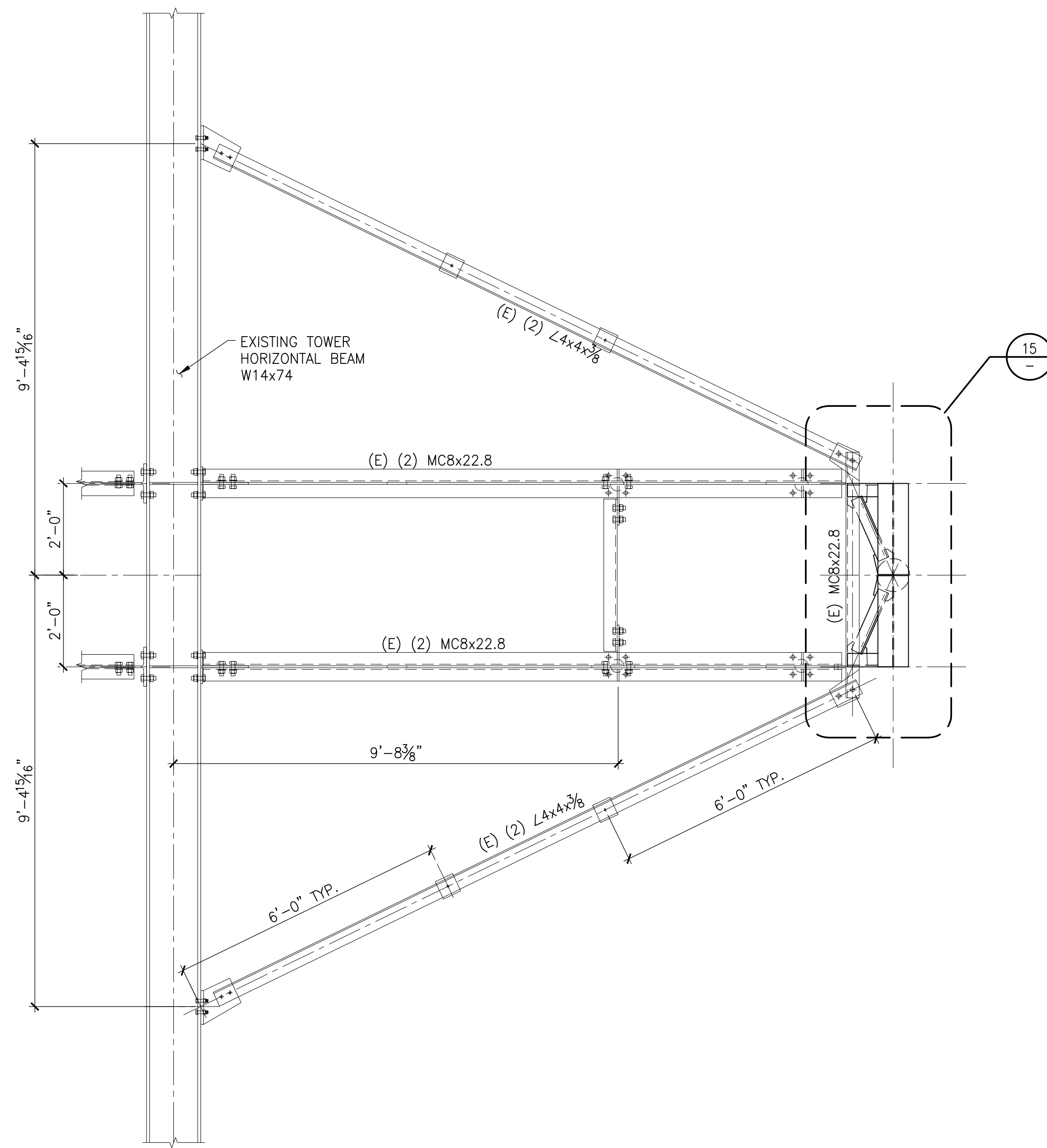
NOTES:
1. BOLTS ARE 3/8" A490-X (GALV.) U.O.N.
W/ (1) ANCO LOCKNUT AND (1)
STANDARD WASHER EACH.

1



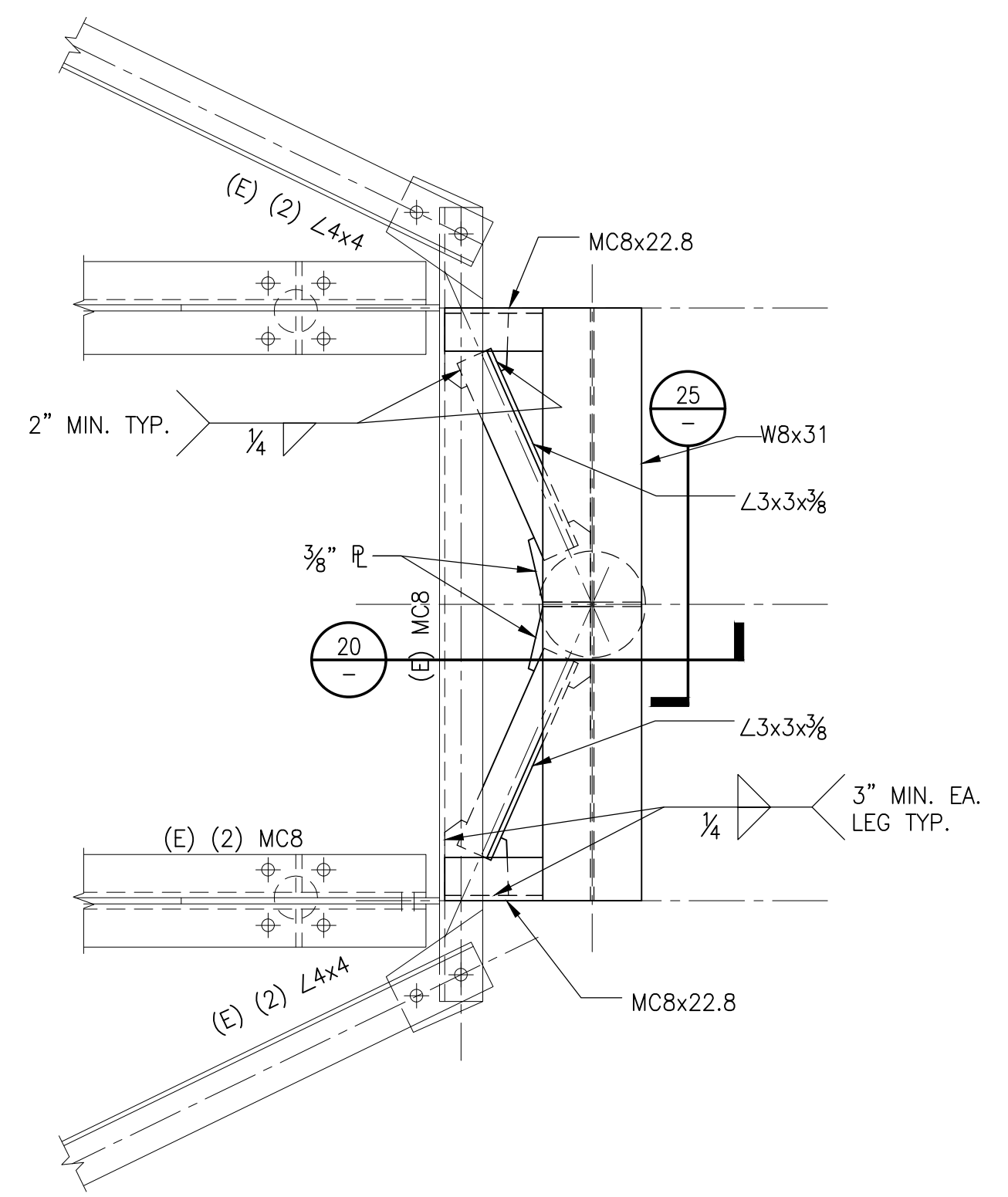
16 DTV TOP MOUNT
ELEVATION

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



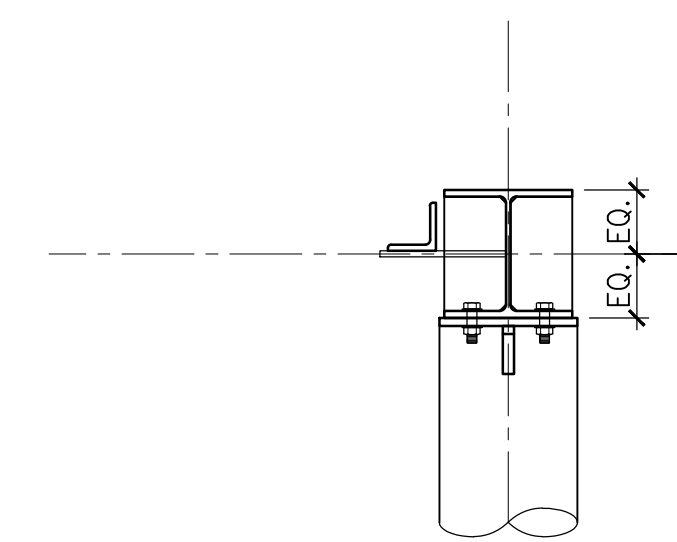
18 DTV TOP MOUNT
ELEVATION

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



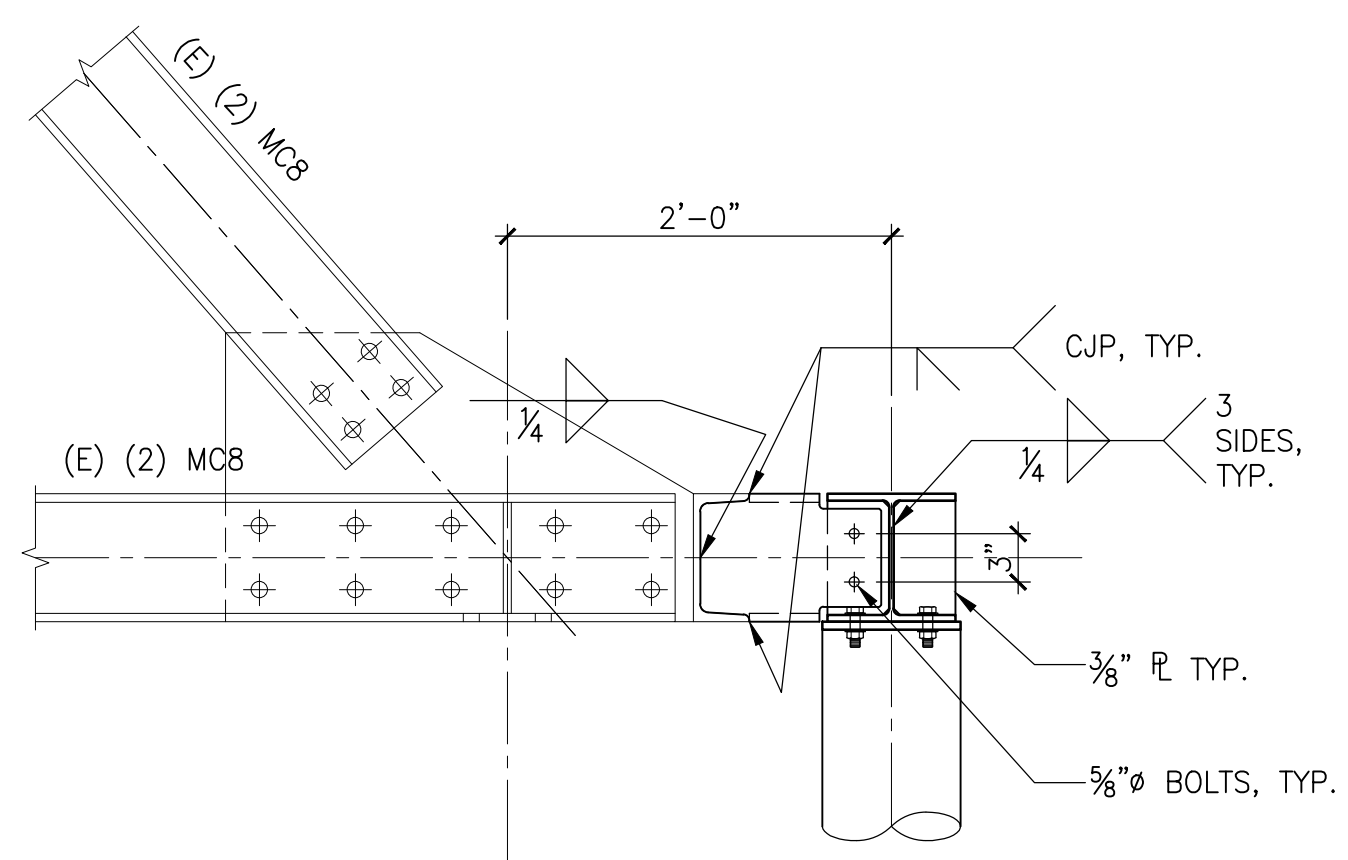
15 DETAIL

SCALE: 1"=1'-0"



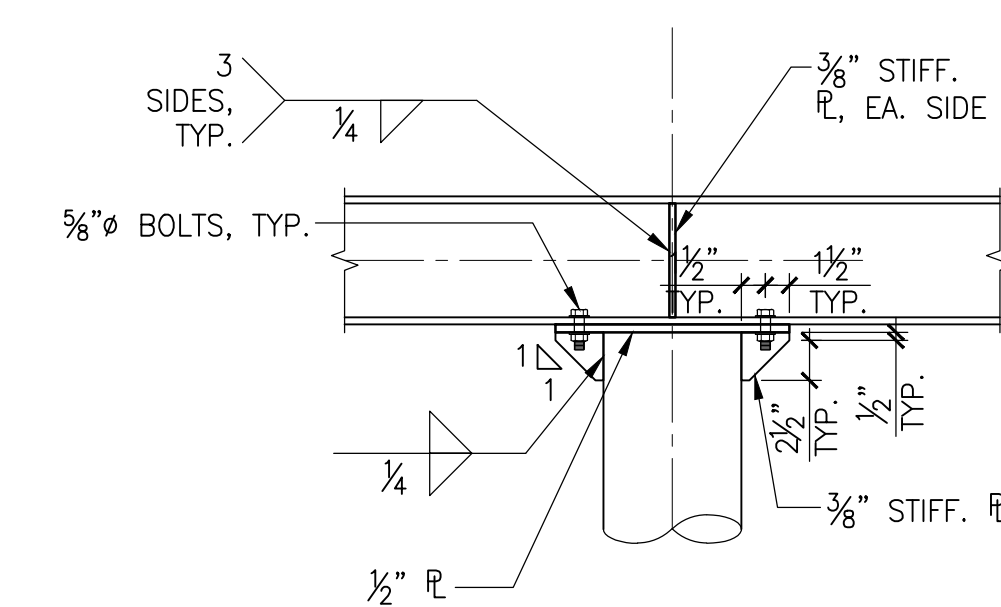
20 DETAIL

SCALE: 1"=1'-0"



22 DETAIL

SCALE: 1"=1'-0"



25 DETAIL

SCALE: 1"=1'-0"

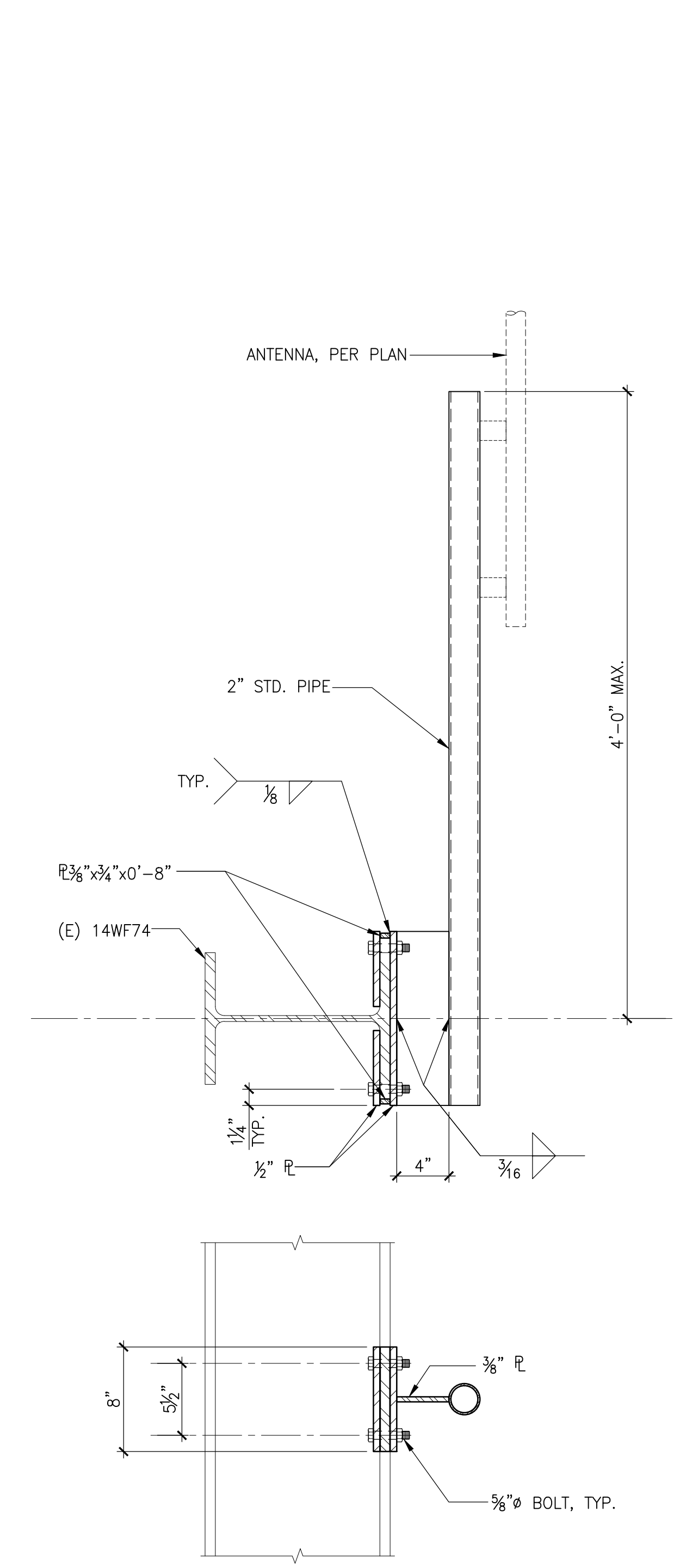
**TOWER ANTENNA
ADDITIONS
SUTRO TOWER
1 LA AVANZADA ST
SAN FRANCISCO
CALIFORNIA
94131**

**AUXILIARY ANTENNA
TOP MOUNT
LEVEL 4
DETAILS**

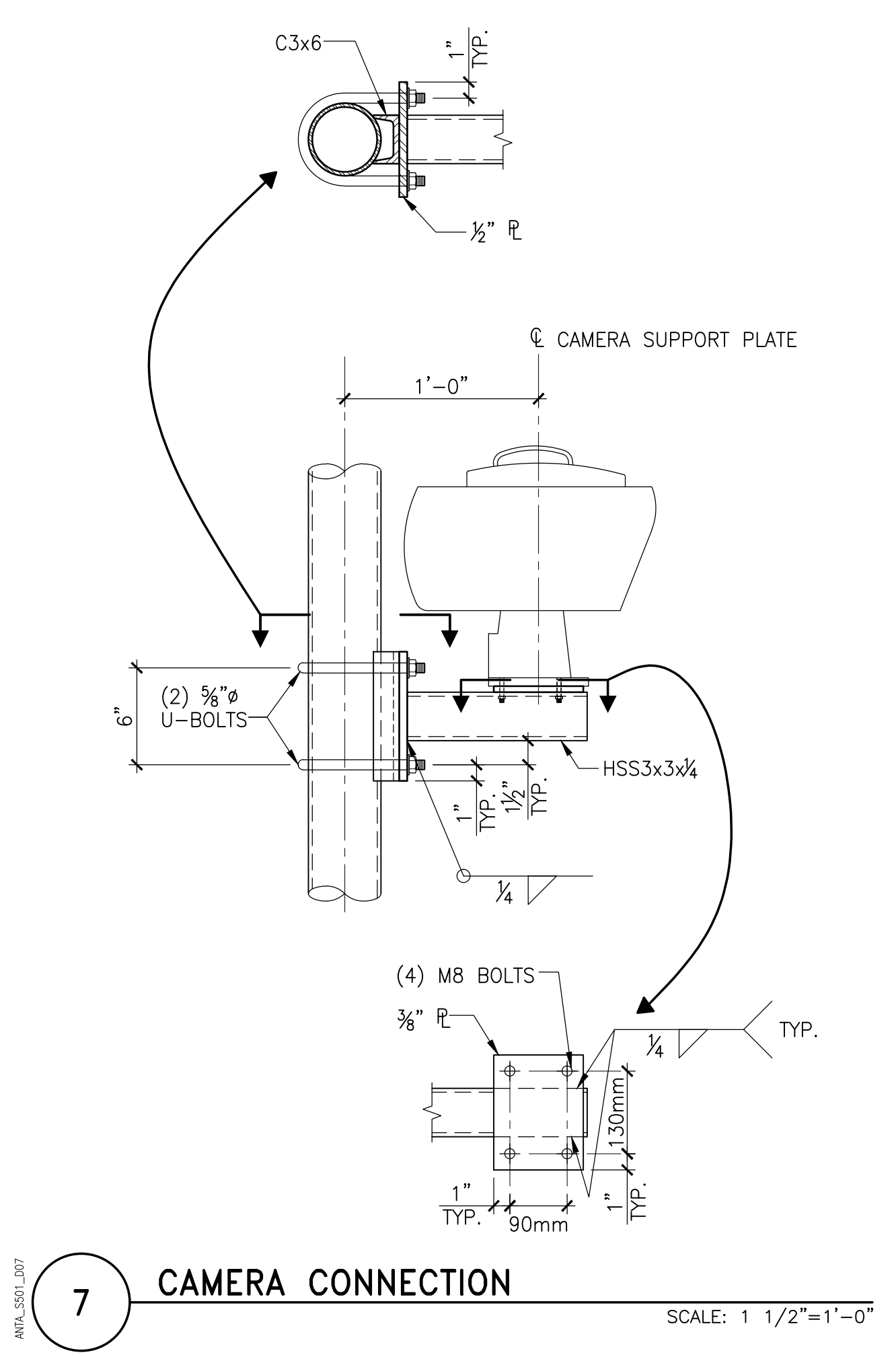
Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale AS NOTED

Drawing No.
S3.4

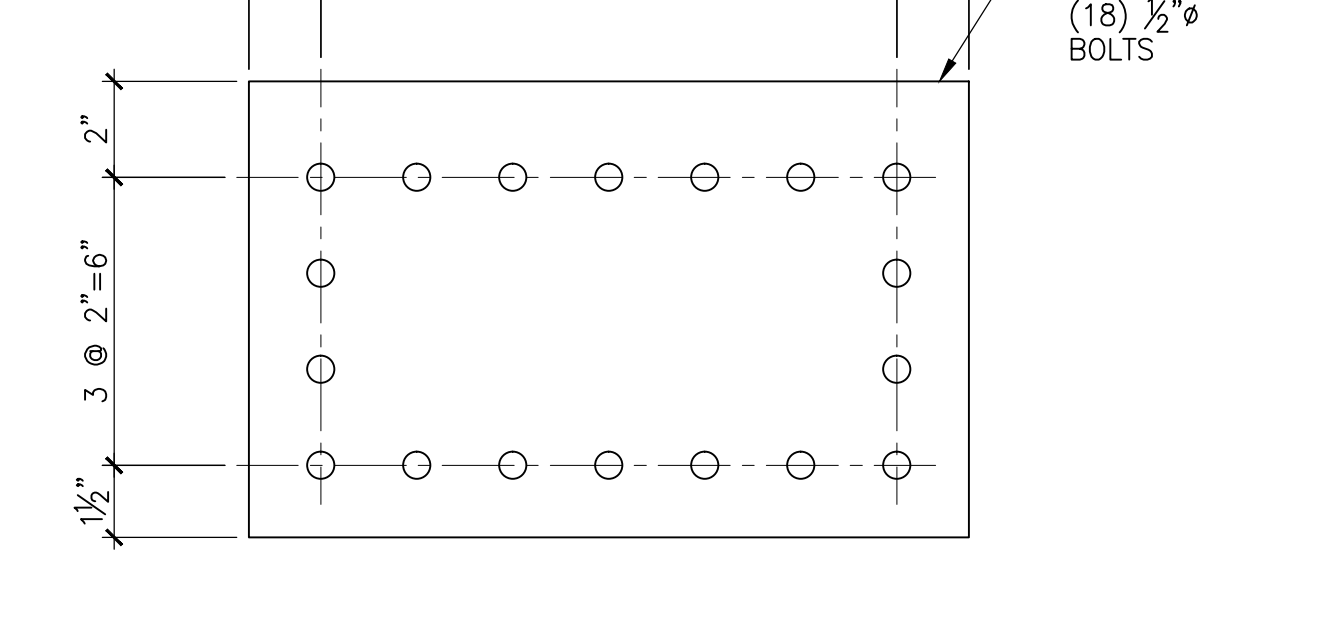
Professional Engineer
No. 2951
STATE OF CALIFORNIA



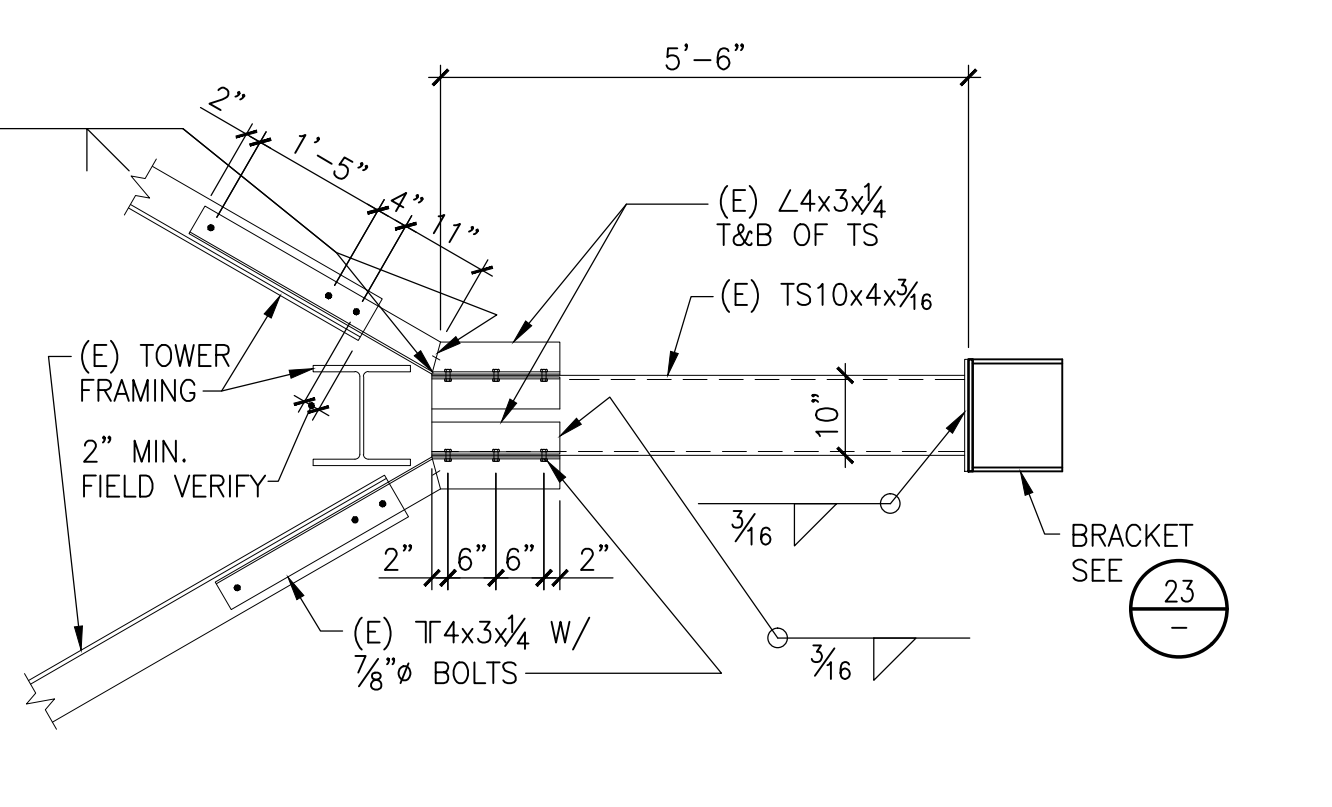
11 DETAIL SCALE: 1 1/2"=1'-0"



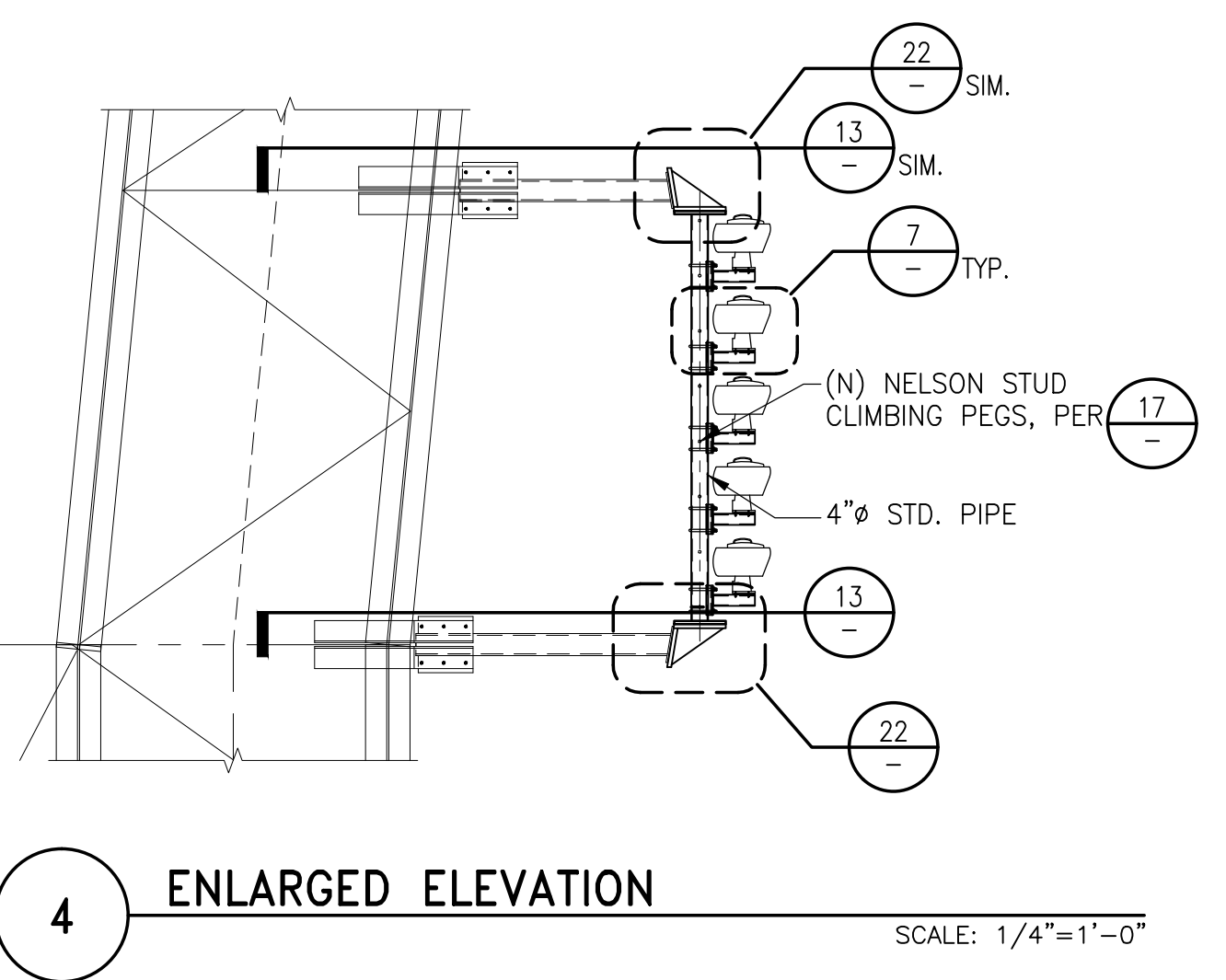
7 CAMERA CONNECTION SCALE: 1 1/2"=1'-0"



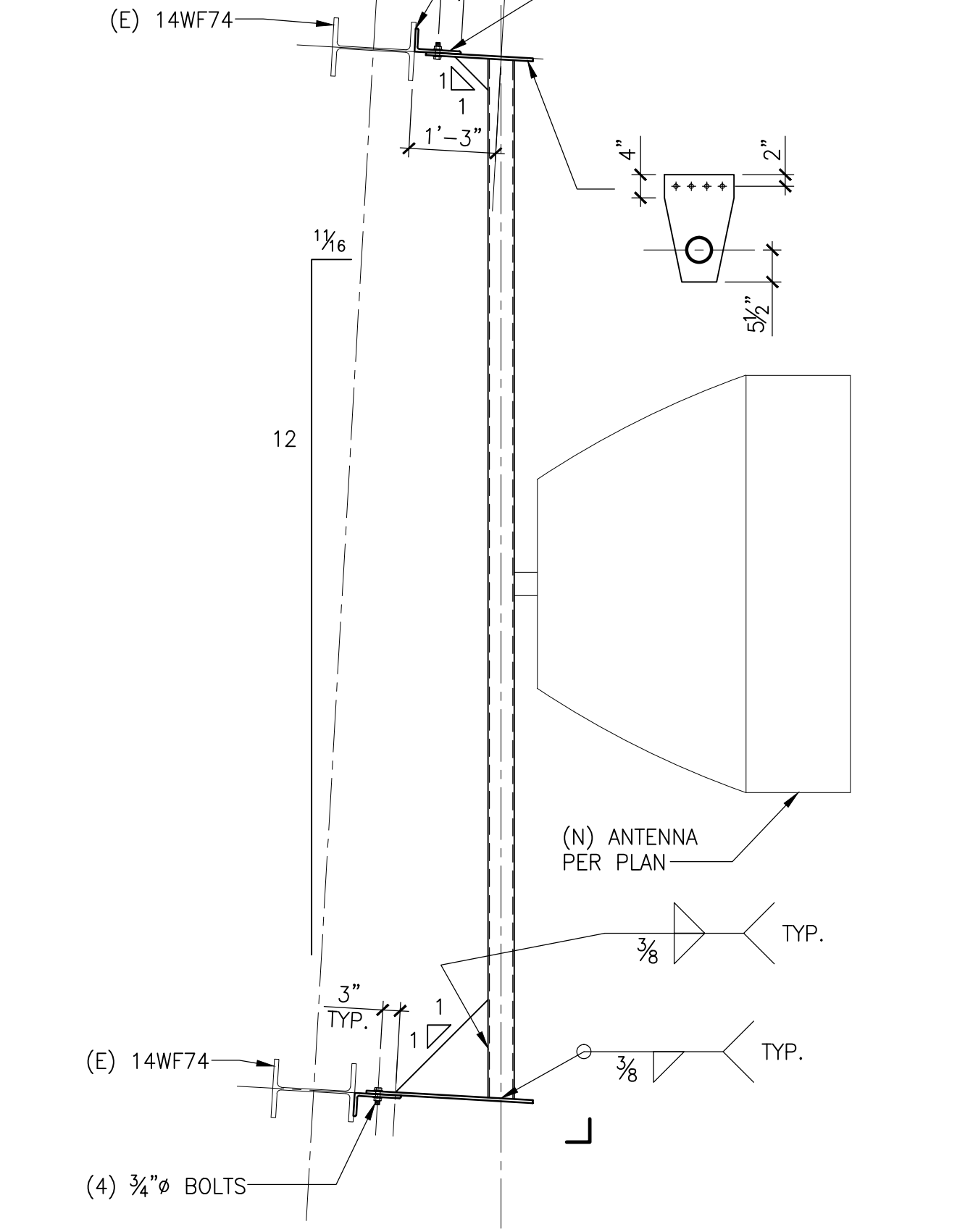
12 CONNECTION PLATE SCALE: 3"=1'-0"



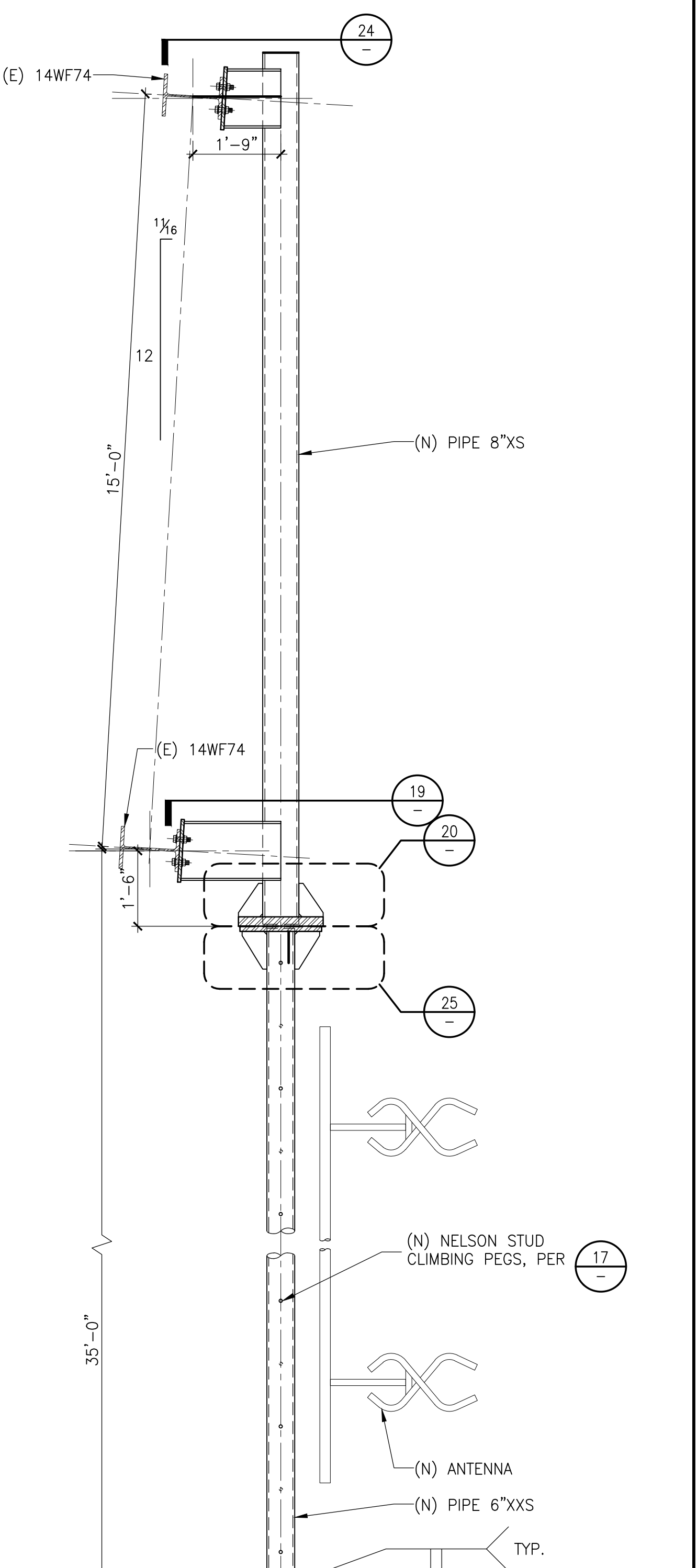
13 PLAN VIEW SCALE: 1/2"=1'-0"



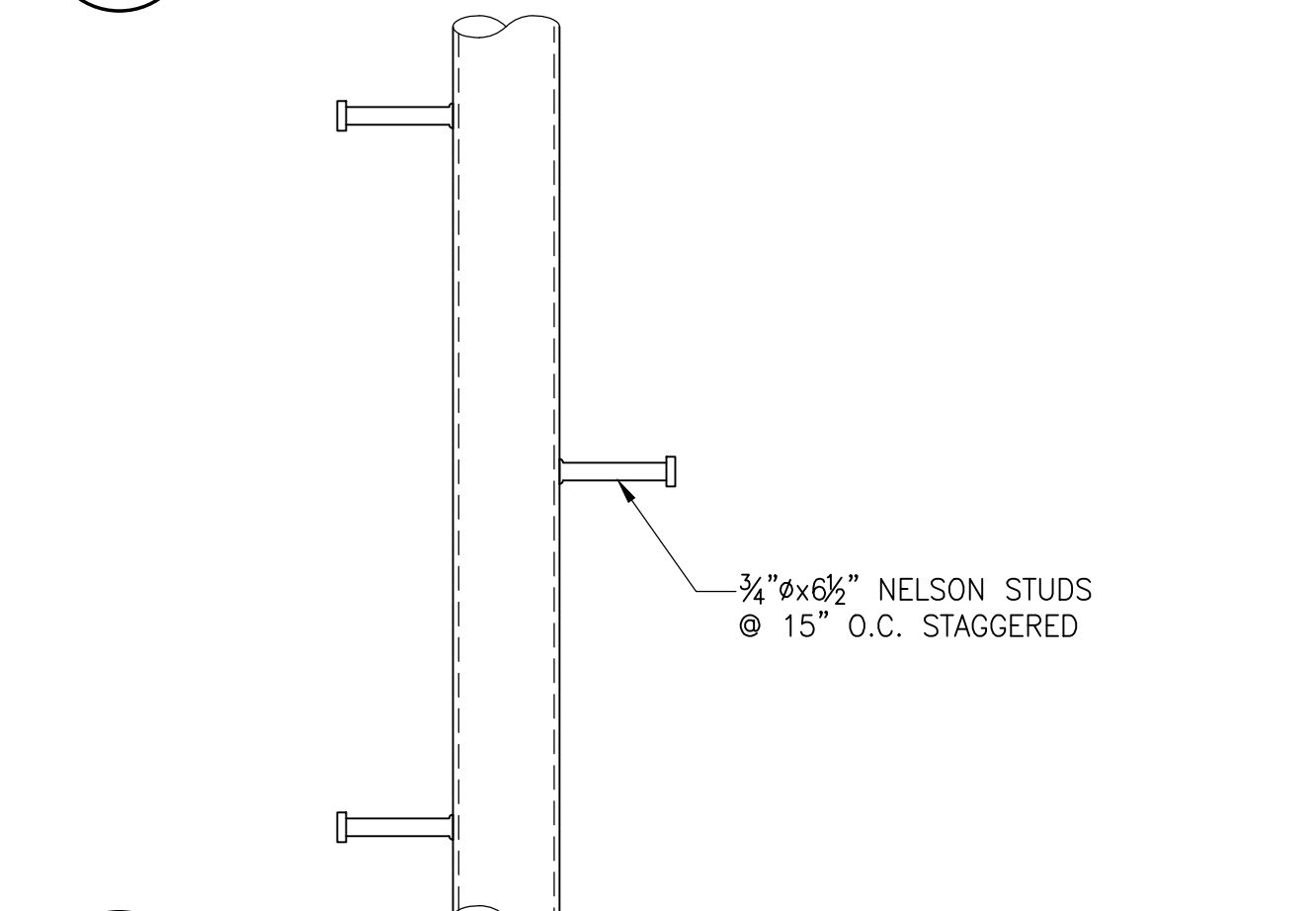
4 ENLARGED ELEVATION SCALE: 1/4"=1'-0"



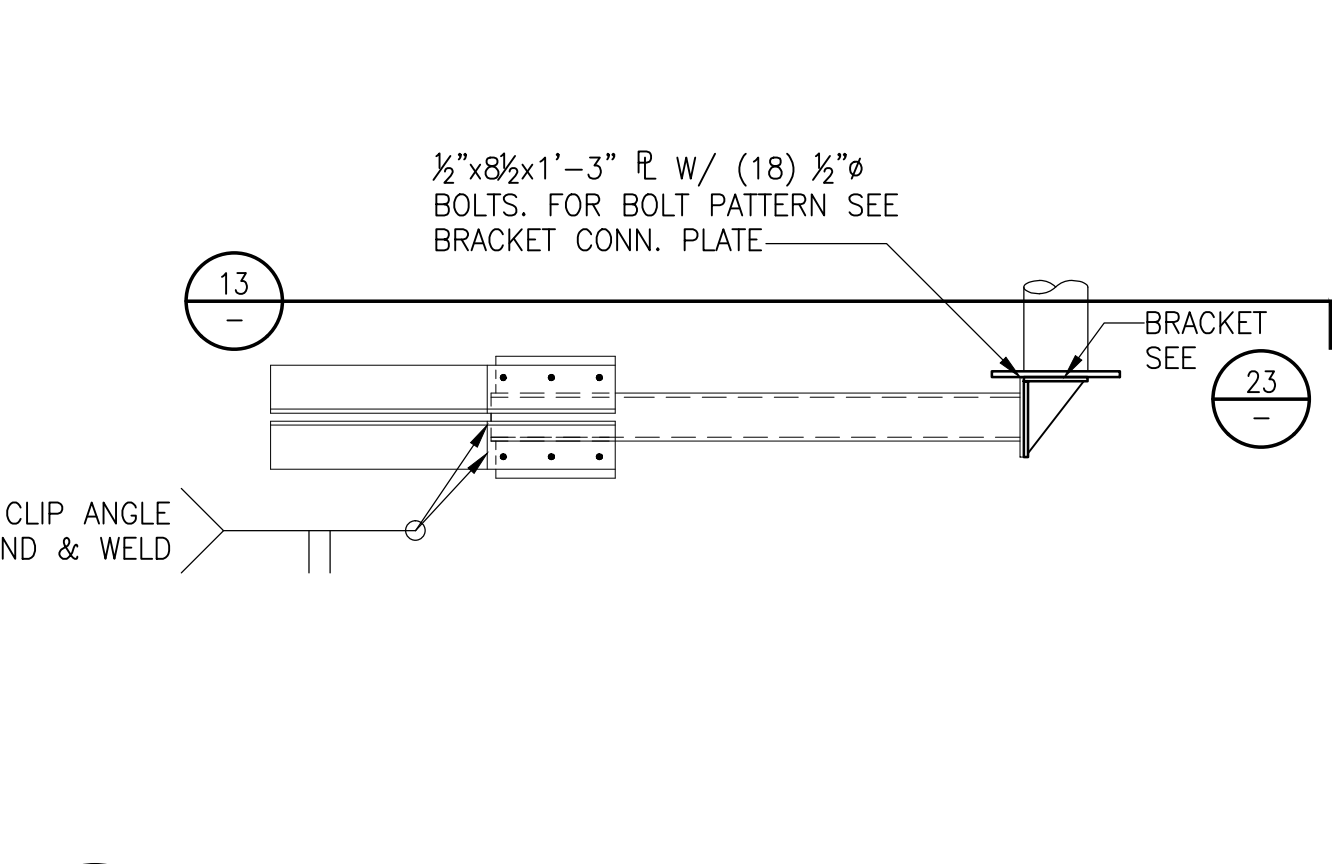
14 ELEVATION SCALE: 1/2"=1'-0"



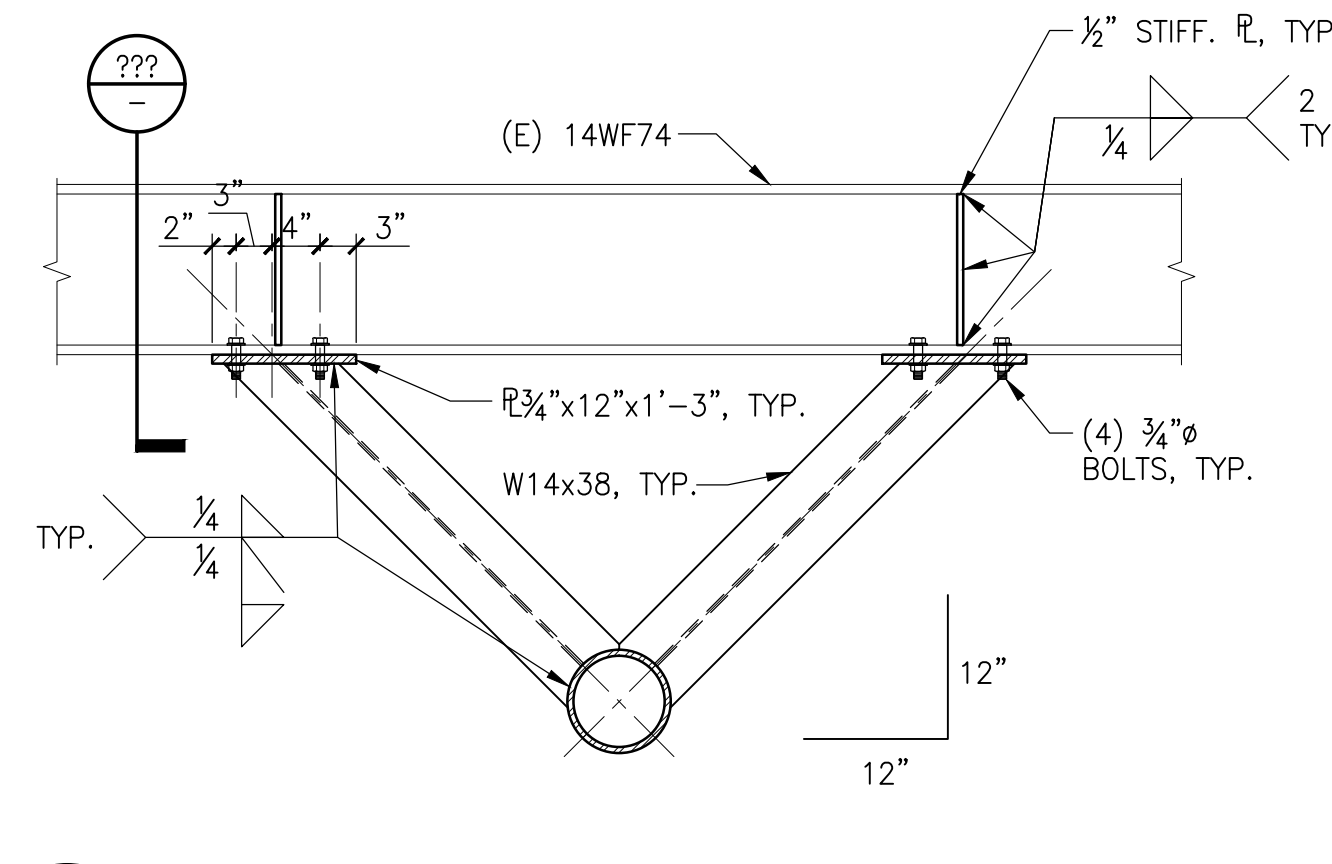
15 ELEVATION SCALE: 1/2"=1'-0"



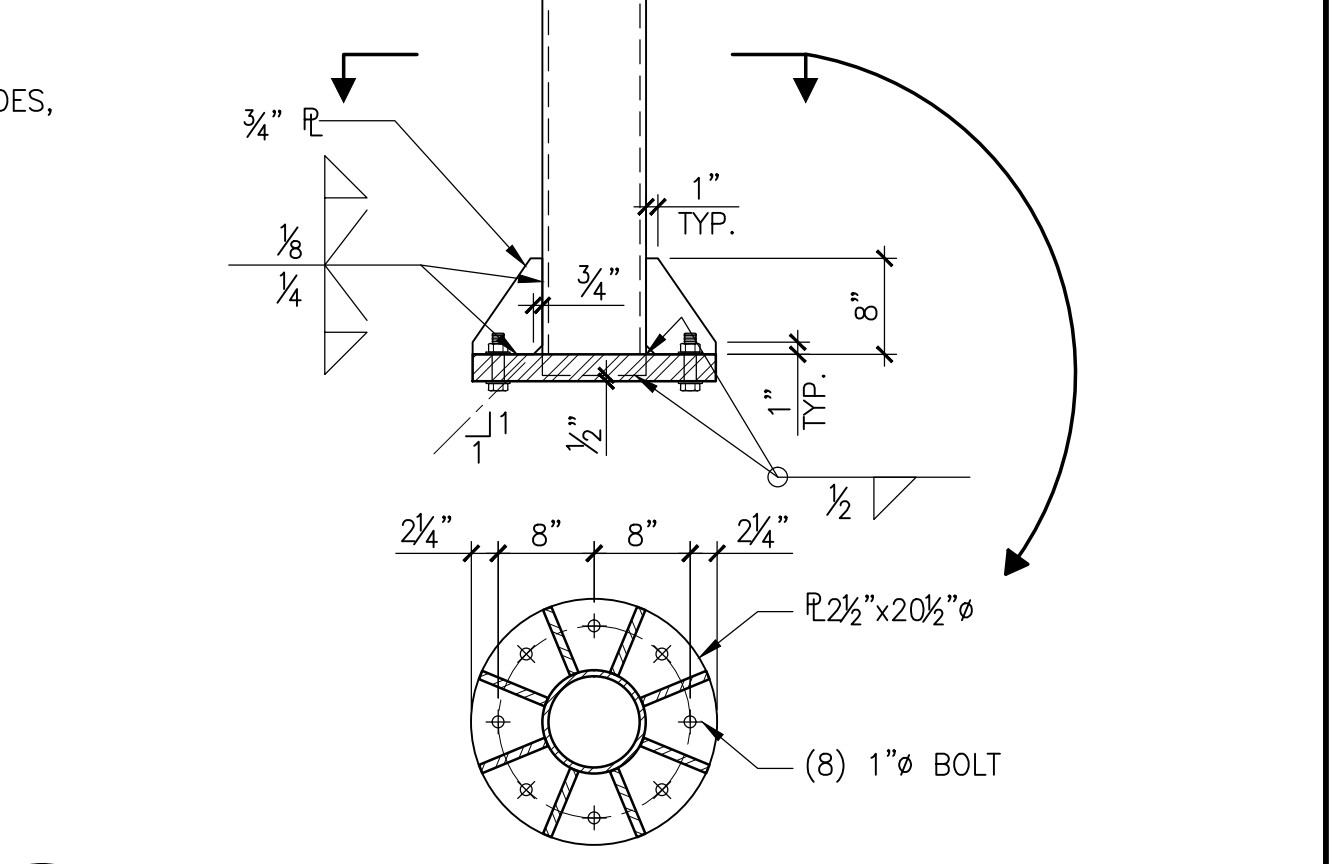
17 DETAIL SCALE: 1 1/2"=1'-0"



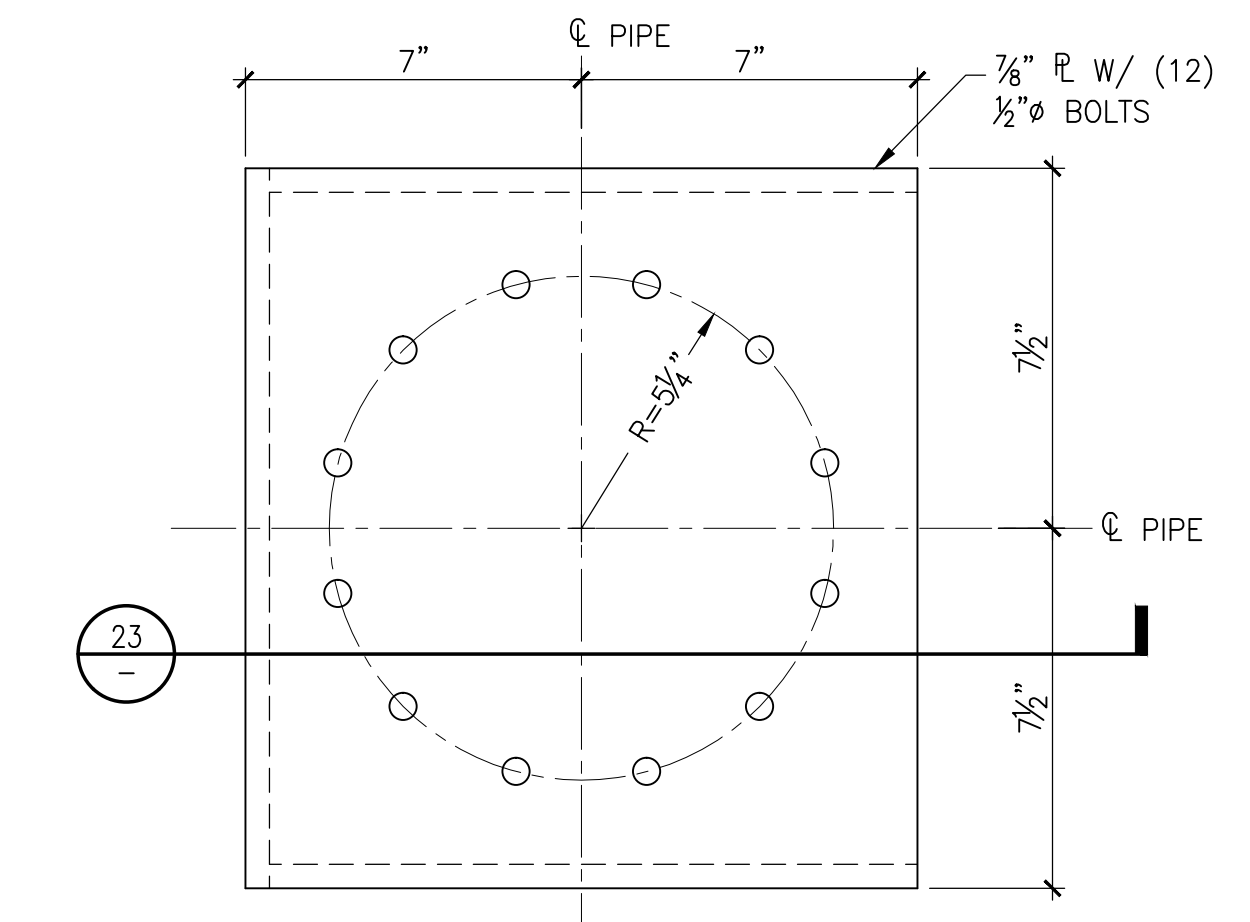
18 SIDE ELEVATION SCALE: 1/2"=1'-0"



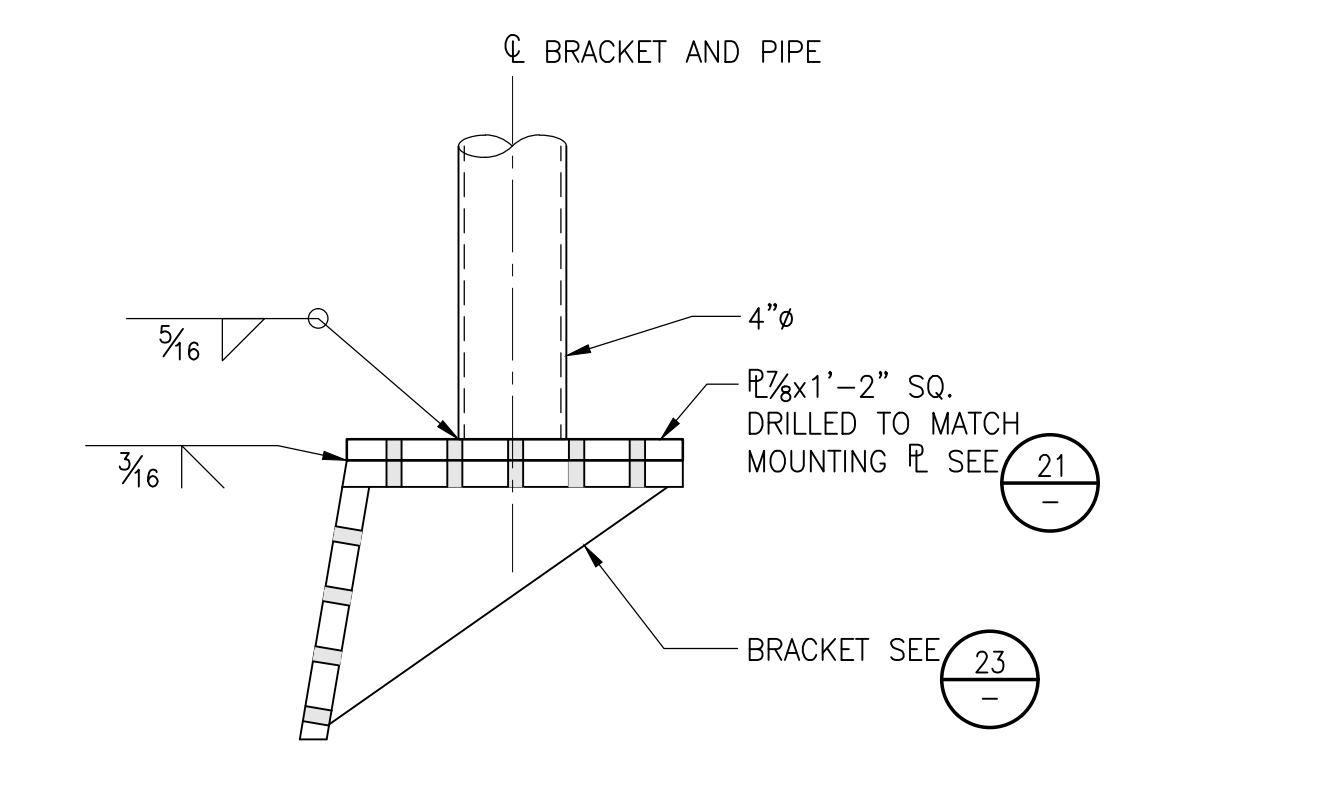
19 DETAIL SCALE: 3/4"=1'-0"



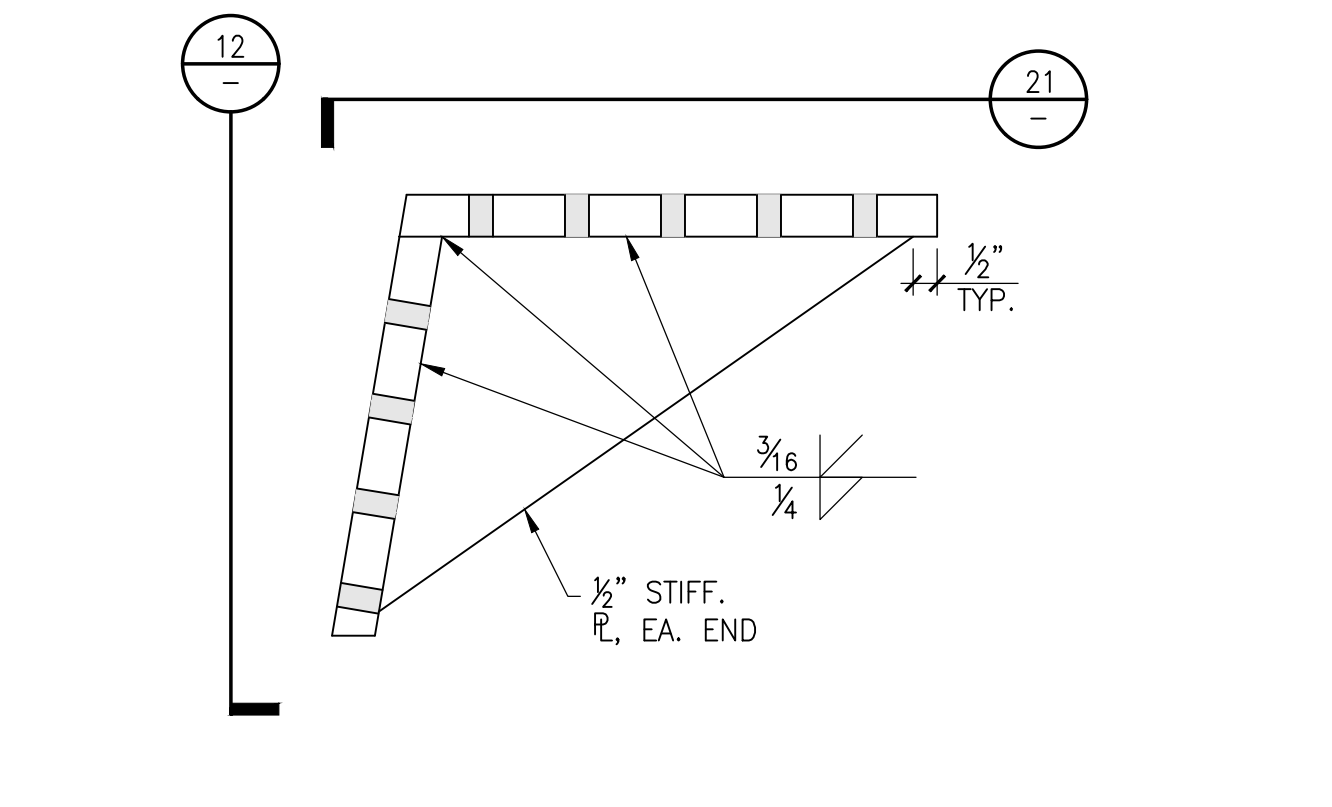
20 DETAIL SCALE: 3/4"=1'-0"



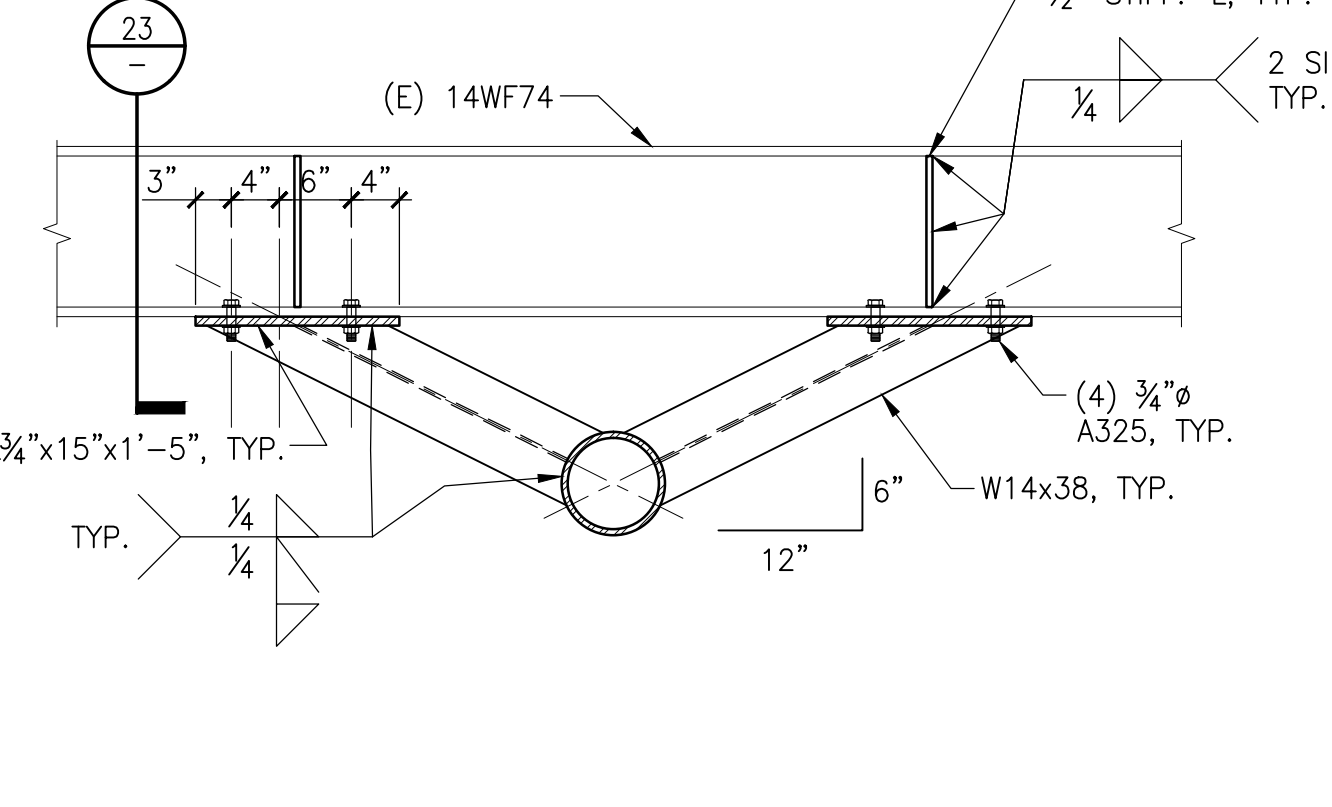
21 MOUNTING PLATE SCALE: 3"=1'-0"



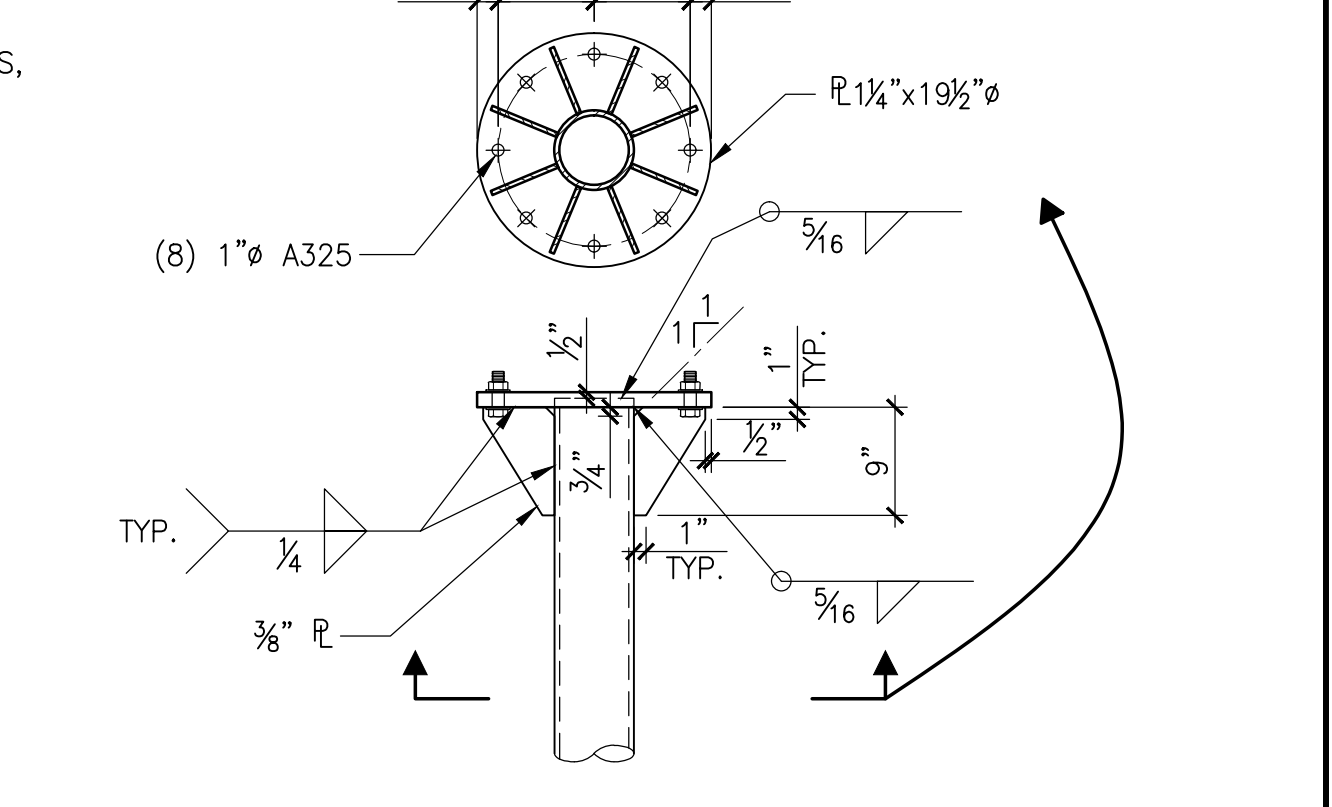
22 PIPE BASE SCALE: 1 1/2"=1'-0"



23 DETAIL - BRACKET SCALE: 3"=1'-0"



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



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

No.	Date	ISSUED FOR PERMIT Description	ROH

**TOWER ANTENNA
 ADDITIONS
 SUTRO TOWER
 1 LA AVANZADA ST
 SAN FRANCISCO
 CALIFORNIA
 94131**

DETAILS

Commission 067199.06	Checked BW	Date 09/26/11
Drawn GV	Approved ROH	Scale AS NOTED

Drawing No. **S5.1**