ERI TECHNICAL MANUAL

TOP MOUNTED ANTENNA

ATW19H4-HTCX-24H TRASAR® UHF ANTENNA

& TRANSMISSION LINE SYSTEM

CH. 24, WKPI-DT, PIKEVILLE, KY

#34039

FINAL TECHNICAL MANUAL: 6 December 2015

Technical Manual #	Date
CH24 HTCX DTV STEEL	6 December 2015

Electronics Research
7777 Gardner Road
Chandler, Indiana U.S.A. 47610

TABLE 1-1

Electrical Specifications - DTV

Parameter	**Value**
Channel	24
Frequency Range	530-536 MHZ
Azimuth Pattern No.	H-Pol: CH24AZH
Elevation Pattern No.	H-Pol: CH24ELH
Azimuthal Directivity	H-Pol: 2.10(3.22 dBd)
Elevation Directivity	H-Pol: 19.00 (12.79 dBd)
Peak Power Gain	H-Pol: 39.90 (16.01 dbd)
Gain at Horizontal	H-Pol: 27.49 (14.39 dBd)
Electrical Beam Tilt	1.00 degree
Input Type	6-1/8" EIA 75 OHM
Maximum Input Power Rating	25 KW Average Power Digital
MAX VSWR	1.10 over 6 MHz channel

NOTE: Measured VSWR provided.

TABLE 1-2
Mechanical Specifications

Antenna Parameters	**Value**
Antenna Height Including 3.5 ft. Lightning Spurs	40.28 ft.
Antenna Height	36.78 ft.
Radiation Center above Antenna Base	19.88 ft.
Radome Diameter – Aviation Orange	16.4 in. OD
Antenna Input Type	6-1/8" EIA 75 OHM
Antenna Pressurization(not to exceed 5 PSIG)	Pressurized Radome
Antenna Measured Weight(No Ice):	4,500 lbs.
Antenna Area EPA(Rev.G No Ice):	43.79 Sq. Ft.
Antenna Area EPA(Rev.G 0.50" Ice):	89.24 Sq. Ft.
Antenna Moment Arm(Rev.G No Ice):	21.41 Ft.
Antenna Moment Arm (Rev.G 0.50" Ice):	20.72 Ft.

REV G: Based on a wind speed of 90 MPH (fastest mile) no ice and 30 MPH with 0.50" base ice (1.467" actual) with a height above ground level (HAGL) of 101 ft. per TIA-222-G Structure Class II, Exposure Category C & Topographic Category 3 with a crest height of 1260 ft.

NOTE: Specified loads include antenna, climbing device, beacon and lightning protection. Antenna input adaptors & mounting brackets are NOT included

NOTE: The antenna is designed to be supported by a structure that can resist the antenna base reactions and provide a support that is rigid in the three translational and three rotational degrees of freedom.

NOTE: See Installation Drawings provided for further details.

ANTENNA CONNECTIONS-A325

For proper performance after installation, plumb the antenna to within 0.1° from vertical (5/8 inch in 30 feet). A kit of shims is included with the antenna. As required for proper plumb, gaps between antenna mounting flange and tower top plate must be filled using the supplied shim kit or suitable steel shim stock.

Antenna mounting flange bolted connection shall be brought to a snug-tight condition where joint tightness is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench to bring the plies into “firm” contact, and then an additional 1/2 turn (180° ± 30°) applied to the nut or bolt head for final bolt tightening. A systematic approach shall be used when tightening the bolts starting with the most rigid part of the joint. The part not turned by the wrench shall be prevented from rotating during this operation.

It is ERI’s intention that an ANCO locknut be provided for all high strength ASTM A325 bolt connections, unless otherwise noted. Flat washers are required on mounting flange connection.

Unless otherwise noted, all antenna mounting flange hardware grades are as follows:

COMPONENT	DESCRIPTION
Structural Bolt	ASTM A325 Galvanized
ANCO Locknut	ASTM A563 Grade DH Galvanized Heavy Hex Nut With Stainless Pin
Flat Washer	ASTM F436 Type 1 Galvanized

The following table provides applicable socket sizes for various ASTM A325 bolts.

ASTM A325 BOLTS	
BOLT DIAMETER	**SOCKET SIZE**
3/4”	1-1/4”
7/8”	1-7/16”
1”	1-5/8”
1-1/8”	1-13/16”
1-1/4”	2”
1-3/8”	2-3/16”
1-1/2”	2-3/8”

INFORMATION

1.1.1 This section provides patterns, VSWR and drawings necessary for the proper installation and maintenance of the TRASAR® antenna.

1.1.2 Please contact ERI Technical Service at 812-925-6000, for further information.

CH24 Measured VSWR	
CH24AZH	Horizontal Azimuth Pattern
CH24ELH	Horizontal Elevation Pattern
LD34039-1	Truck Removal/Lift Illustrations
PM34039-1	Antenna Mechanical Parameters/Installation Drawings
MACX675B-WLPKY	Transmission Line System Drawings

MEASURED VSWR

ATW19H4-HTCX-24H TRASAR® UHF ANTENNA

CH. 24, WKPI-DT, PIKEVILLE, KY

#34039

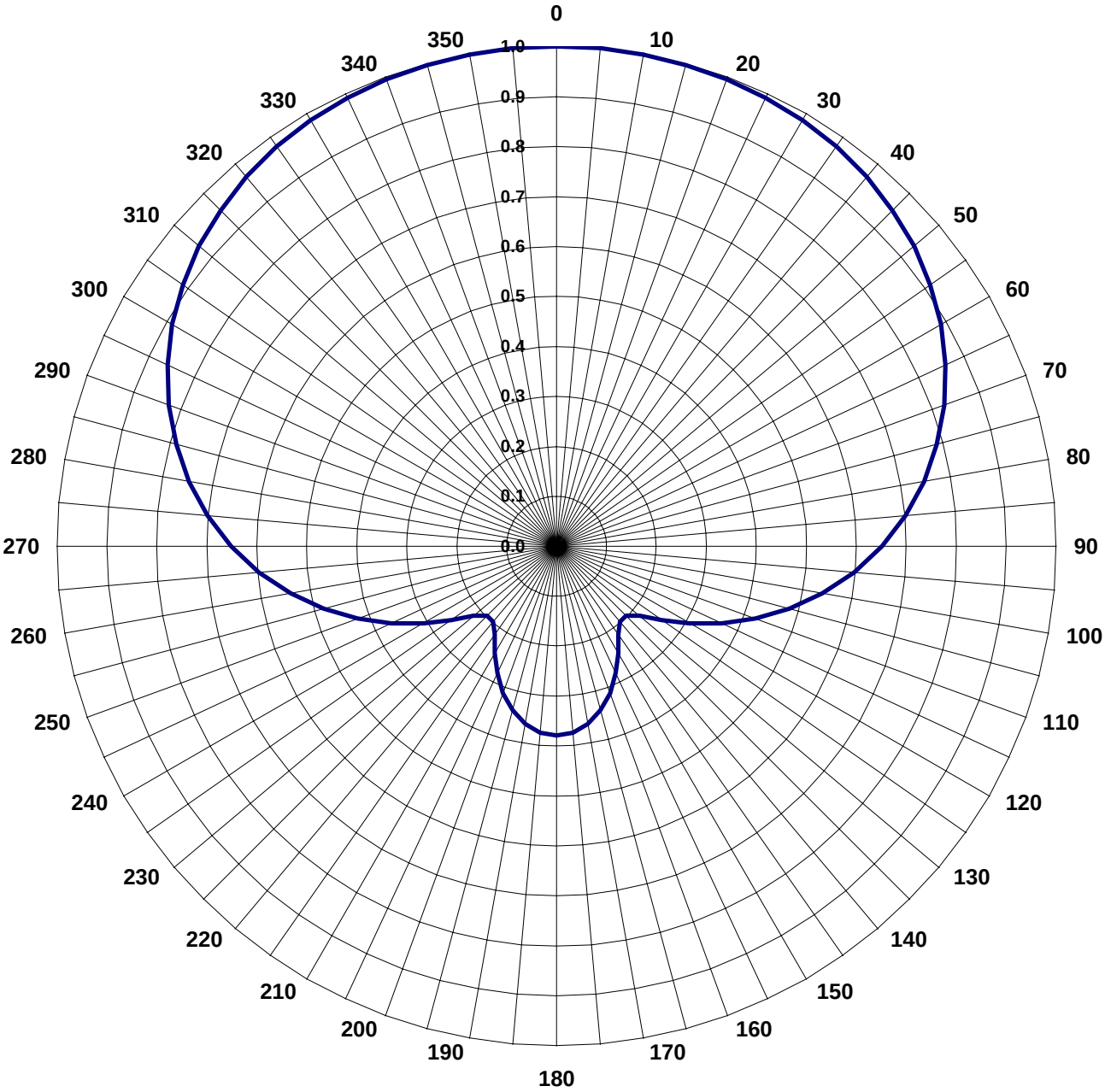
Final Slotted Line Measurements

CH24 – DTV

Frequency (MHZ)	VSWR
530.00	1.04
531.00	1.03
532.00	1.03
533.00	1.02
534.00	1.04
535.00	1.04
536.00	1.05

AZIMUTH PATTERN

TYPE:	CH24AZH		Frequency:	24 (DTV)
	Numeric	dB	Location:	Pikeville, KY
Directivity:	2.10	3.22	Polarization:	Horizontal
Peak(s) at:				



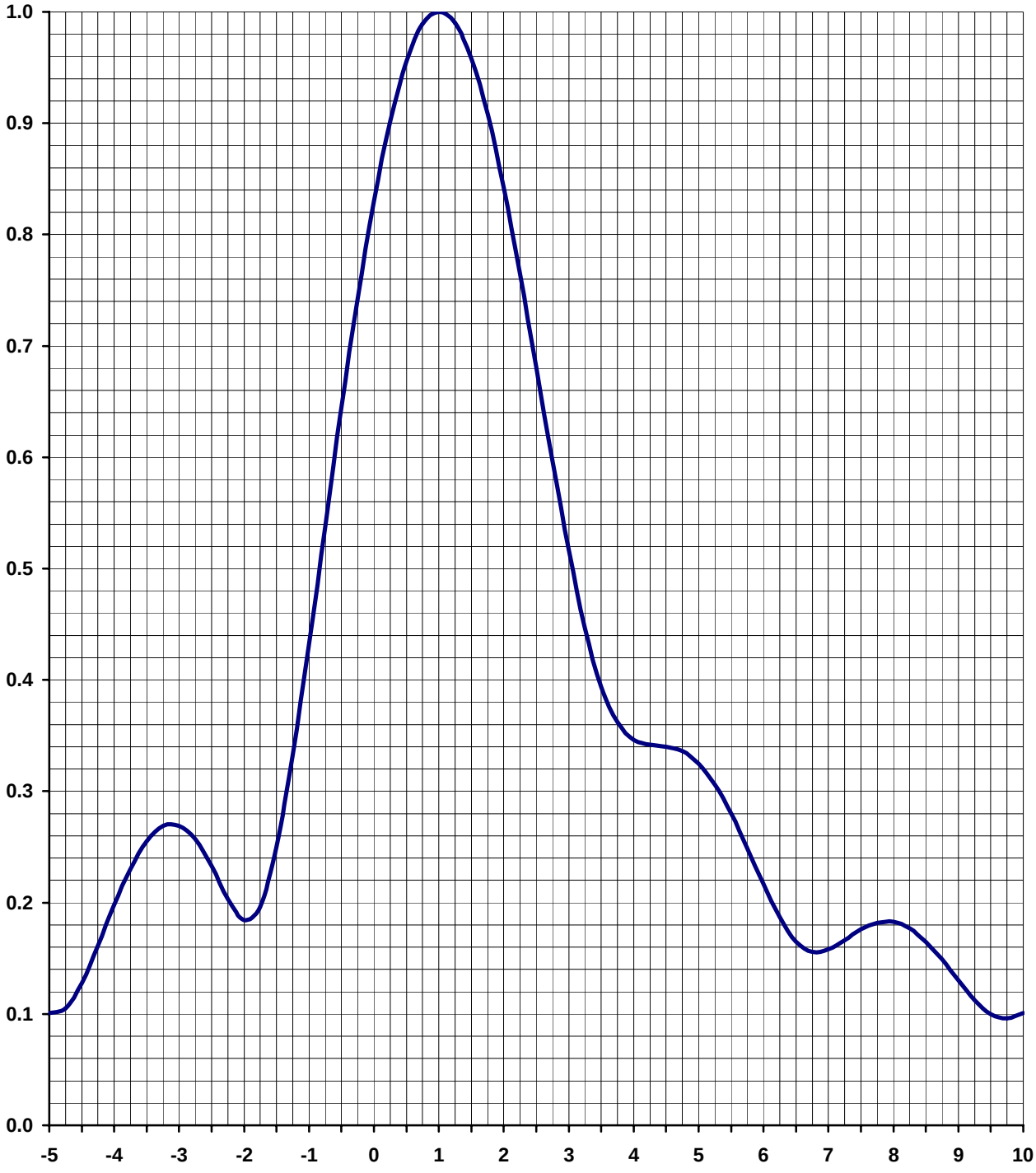
TABULATED DATA FOR AZIMUTH PATTERN

TYPE: CH24AZH

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
0	1.000	0.00	92	0.630	-2.01	184	0.376	-4.25	276	0.710	-1.49
2	1.000	0.00	94	0.608	-2.16	186	0.372	-4.29	278	0.728	-1.38
4	1.000	0.00	96	0.586	-2.32	188	0.367	-4.35	280	0.746	-1.27
6	1.000	0.00	98	0.564	-2.49	190	0.361	-4.42	282	0.764	-1.17
8	0.999	0.00	100	0.541	-2.67	192	0.354	-4.51	284	0.780	-1.08
10	0.999	0.00	102	0.518	-2.86	194	0.345	-4.62	286	0.796	-0.99
12	0.998	-0.01	104	0.494	-3.06	196	0.335	-4.75	288	0.811	-0.91
14	0.997	-0.01	106	0.471	-3.27	198	0.324	-4.89	290	0.826	-0.83
16	0.997	-0.01	108	0.447	-3.50	200	0.313	-5.04	292	0.840	-0.76
18	0.995	-0.02	110	0.423	-3.74	202	0.300	-5.23	294	0.853	-0.69
20	0.994	-0.03	112	0.399	-3.99	204	0.287	-5.42	296	0.865	-0.63
22	0.993	-0.03	114	0.376	-4.25	206	0.274	-5.62	298	0.877	-0.57
24	0.991	-0.04	116	0.352	-4.53	208	0.260	-5.85	300	0.888	-0.52
26	0.989	-0.05	118	0.329	-4.83	210	0.247	-6.07	302	0.899	-0.46
28	0.987	-0.06	120	0.307	-5.13	212	0.234	-6.31	304	0.909	-0.41
30	0.984	-0.07	122	0.286	-5.44	214	0.222	-6.54	306	0.918	-0.37
32	0.981	-0.08	124	0.266	-5.75	216	0.211	-6.76	308	0.926	-0.33
34	0.978	-0.10	126	0.248	-6.06	218	0.203	-6.93	310	0.934	-0.30
36	0.974	-0.11	128	0.231	-6.36	220	0.197	-7.06	312	0.941	-0.26
38	0.970	-0.13	130	0.217	-6.64	222	0.194	-7.12	314	0.948	-0.23
40	0.965	-0.15	132	0.206	-6.86	224	0.194	-7.12	316	0.954	-0.20
42	0.960	-0.18	134	0.198	-7.03	226	0.198	-7.03	318	0.960	-0.18
44	0.954	-0.20	136	0.194	-7.12	228	0.206	-6.86	320	0.965	-0.15
46	0.948	-0.23	138	0.194	-7.12	230	0.217	-6.64	322	0.970	-0.13
48	0.941	-0.26	140	0.197	-7.06	232	0.231	-6.36	324	0.974	-0.11
50	0.934	-0.30	142	0.203	-6.93	234	0.248	-6.06	326	0.978	-0.10
52	0.926	-0.33	144	0.211	-6.76	236	0.266	-5.75	328	0.981	-0.08
54	0.918	-0.37	146	0.222	-6.54	238	0.286	-5.44	330	0.984	-0.07
56	0.908	-0.42	148	0.234	-6.31	240	0.307	-5.13	332	0.987	-0.06
58	0.899	-0.46	150	0.247	-6.07	242	0.329	-4.83	334	0.989	-0.05
60	0.888	-0.52	152	0.260	-5.85	244	0.352	-4.53	336	0.991	-0.04
62	0.877	-0.57	154	0.274	-5.62	246	0.376	-4.25	338	0.993	-0.03
64	0.865	-0.63	156	0.287	-5.42	248	0.399	-3.99	340	0.994	-0.03
66	0.853	-0.69	158	0.300	-5.23	250	0.423	-3.74	342	0.995	-0.02
68	0.840	-0.76	160	0.313	-5.04	252	0.447	-3.50	344	0.997	-0.01
70	0.826	-0.83	162	0.324	-4.89	254	0.471	-3.27	346	0.997	-0.01
72	0.811	-0.91	164	0.335	-4.75	256	0.494	-3.06	348	0.998	-0.01
74	0.796	-0.99	166	0.345	-4.62	258	0.518	-2.86	350	0.999	0.00
76	0.780	-1.08	168	0.354	-4.51	260	0.541	-2.67	352	0.999	0.00
78	0.764	-1.17	170	0.361	-4.42	262	0.564	-2.49	354	1.000	0.00
80	0.746	-1.27	172	0.367	-4.35	264	0.586	-2.32	356	1.000	0.00
82	0.728	-1.38	174	0.372	-4.29	266	0.608	-2.16	358	1.000	0.00
84	0.710	-1.49	176	0.376	-4.25	268	0.630	-2.01	360	1.000	0.00
86	0.691	-1.61	178	0.378	-4.23	270	0.651	-1.86			
88	0.671	-1.73	180	0.379	-4.21	272	0.671	-1.73			
90	0.651	-1.86	182	0.378	-4.23	274	0.691	-1.61			

ELEVATION PATTERN

TYPE:	**CH24ELH**		**Frequency:**	**24 (DTV)**
Directivity:	**Numeric**	**dBd**	**Location:**	**Pikeville, KY**
Main Lobe:	**19.00**	**12.79**	**Beam Tilt:**	**1.00**
Horizontal:			**Polarization:**	**Horizontal**



TABULATED DATA FOR ELEVATION PATTERN

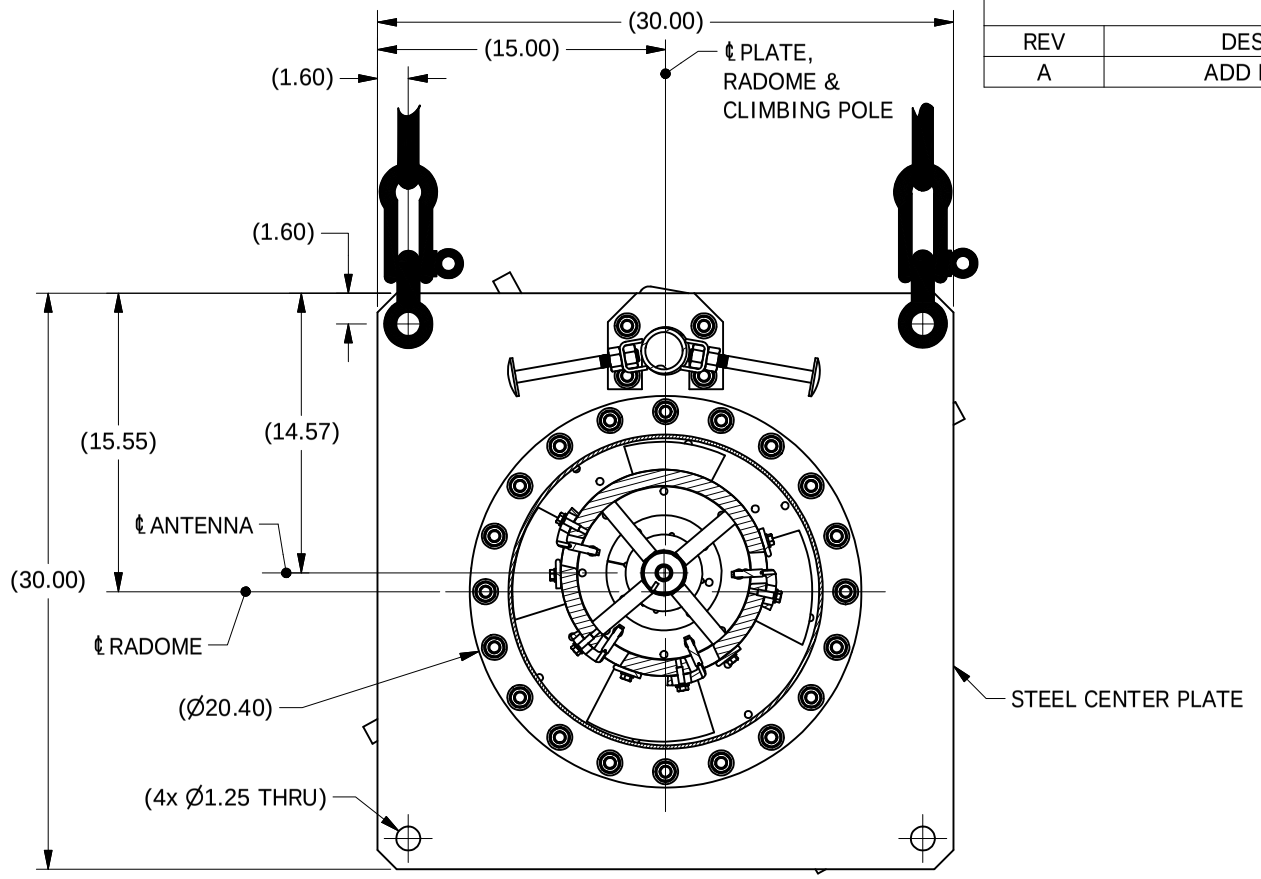
CH24ELH ***-5 to 10 degrees in 0.25 increments*** ***10 to 90 degrees in 0.50 increments***

ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB	ANGLE	FIELD	dB
-5.000	0.101	-19.91	6.75	0.156	-16.14	27.00	0.056	-25.04	50.50	0.033	-29.63	74.00	0.056	-25.04
-4.750	0.105	-19.58	7.00	0.158	-16.03	27.50	0.046	-26.74	51.00	0.026	-31.70	74.50	0.056	-25.04
-4.500	0.128	-17.86	7.25	0.166	-15.60	28.00	0.035	-29.12	51.50	0.023	-32.77	75.00	0.055	-25.19
-4.250	0.161	-15.86	7.50	0.176	-15.09	28.50	0.033	-29.63	52.00	0.029	-30.75	75.50	0.053	-25.51
-4.000	0.198	-14.07	7.75	0.182	-14.80	29.00	0.041	-27.74	52.50	0.037	-28.64	76.00	0.050	-26.02
-3.750	0.230	-12.77	8.00	0.183	-14.75	29.50	0.051	-25.85	53.00	0.045	-26.94	76.50	0.047	-26.56
-3.500	0.255	-11.87	8.25	0.177	-15.04	30.00	0.054	-25.35	53.50	0.049	-26.20	77.00	0.043	-27.33
-3.250	0.269	-11.40	8.50	0.165	-15.65	30.50	0.049	-26.20	54.00	0.050	-26.02	77.50	0.039	-28.18
-3.000	0.269	-11.40	8.75	0.149	-16.54	31.00	0.039	-28.18	54.50	0.046	-26.74	78.00	0.035	-29.12
-2.750	0.257	-11.80	9.00	0.130	-17.72	31.50	0.031	-30.17	55.00	0.040	-27.96	78.50	0.030	-30.46
-2.500	0.233	-12.65	9.25	0.112	-19.02	32.00	0.032	-29.90	55.50	0.032	-29.90	79.00	0.026	-31.70
-2.250	0.203	-13.85	9.50	0.100	-20.00	32.50	0.041	-27.74	56.00	0.025	-32.04	79.50	0.022	-33.15
-2.000	0.184	-14.70	9.75	0.096	-20.35	33.00	0.049	-26.20	56.50	0.023	-32.77	80.00	0.018	-34.89
-1.750	0.196	-14.15	10.00	0.101	-19.91	33.50	0.051	-25.85	57.00	0.028	-31.06	80.50	0.014	-37.08
-1.500	0.250	-12.04	10.50	0.120	-18.42	34.00	0.046	-26.74	57.50	0.036	-28.87	81.00	0.012	-38.42
-1.250	0.333	-9.55	11.00	0.128	-17.86	34.50	0.037	-28.64	58.00	0.044	-27.13	81.50	0.010	-40.00
-1.000	0.433	-7.27	11.50	0.118	-18.56	35.00	0.028	-31.06	58.50	0.049	-26.20	82.00	0.009	-40.92
-0.750	0.539	-5.37	12.00	0.094	-20.54	35.50	0.029	-30.75	59.00	0.052	-25.68	82.50	0.009	-40.92
-0.500	0.644	-3.82	12.50	0.072	-22.85	36.00	0.038	-28.40	59.50	0.052	-25.68	83.00	0.009	-40.92
-0.250	0.742	-2.59	13.00	0.075	-22.50	36.50	0.046	-26.74	60.00	0.048	-26.38	83.50	0.010	-40.00
0.000	0.830	-1.62	13.50	0.091	-20.82	37.00	0.049	-26.20	60.50	0.042	-27.54	84.00	0.010	-40.00
0.250	0.902	-0.90	14.00	0.100	-20.00	37.50	0.046	-26.74	61.00	0.035	-29.12	84.50	0.011	-39.17
0.500	0.956	-0.39	14.50	0.093	-20.63	38.00	0.038	-28.40	61.50	0.027	-31.37	85.00	0.011	-39.17
0.750	0.989	-0.10	15.00	0.074	-22.62	38.50	0.029	-30.75	62.00	0.022	-33.15	85.50	0.011	-39.17
1.000	1.000	0.00	15.50	0.057	-24.88	39.00	0.026	-31.70	62.50	0.023	-32.77	86.00	0.010	-40.00
1.250	0.990	-0.09	16.00	0.059	-24.58	39.50	0.033	-29.63	63.00	0.029	-30.75	86.50	0.010	-40.00
1.500	0.958	-0.37	16.50	0.073	-22.73	40.00	0.042	-27.54	63.50	0.037	-28.64	87.00	0.009	-40.92
1.750	0.908	-0.84	17.00	0.082	-21.72	40.50	0.048	-26.38	64.00	0.044	-27.13	87.50	0.008	-41.94
2.000	0.843	-1.48	17.50	0.078	-22.16	41.00	0.048	-26.38	64.50	0.050	-26.02	88.00	0.006	-44.44
2.250	0.765	-2.33	18.00	0.063	-24.01	41.50	0.043	-27.33	65.00	0.054	-25.35	88.50	0.005	-46.02
2.500	0.681	-3.34	18.50	0.048	-26.38	42.00	0.034	-29.37	65.50	0.055	-25.19	89.00	0.003	-50.46
2.750	0.596	-4.50	19.00	0.048	-26.38	42.50	0.026	-31.70	66.00	0.055	-25.19	89.50	0.002	-53.98
3.000	0.516	-5.75	19.50	0.061	-24.29	43.00	0.026	-31.70	66.50	0.052	-25.68	90.00	0.000	---
3.250	0.447	-6.99	20.00	0.071	-22.97	43.50	0.033	-29.63	67.00	0.047	-26.56			
3.500	0.394	-8.09	20.50	0.070	-23.10	44.00	0.042	-27.54	67.50	0.041	-27.74			
3.750	0.362	-8.83	21.00	0.059	-24.58	44.50	0.047	-26.56	68.00	0.034	-29.37			
4.000	0.346	-9.22	21.50	0.045	-26.94	45.00	0.048	-26.38	68.50	0.027	-31.37			
4.250	0.342	-9.32	22.00	0.041	-27.74	45.50	0.043	-27.33	69.00	0.021	-33.56			
4.500	0.340	-9.37	22.50	0.050	-26.02	46.00	0.035	-29.12	69.50	0.019	-34.42			
4.750	0.336	-9.47	23.00	0.061	-24.29	46.50	0.027	-31.37	70.00	0.021	-33.56			
5.000	0.325	-9.76	23.50	0.063	-24.01	47.00	0.024	-32.40	70.50	0.027	-31.37			
5.250	0.306	-10.29	24.00	0.056	-25.04	47.50	0.030	-30.46	71.00	0.033	-29.63			
5.500	0.280	-11.06	24.50	0.044	-27.13	48.00	0.038	-28.40	71.50	0.039	-28.18			
5.750	0.249	-12.08	25.00	0.035	-29.12	48.50	0.045	-26.94	72.00	0.045	-26.94			
6.000	0.217	-13.27	25.50	0.041	-27.74	49.00	0.048	-26.38	72.50	0.049	-26.20			
6.250	0.187	-14.56	26.00	0.052	-25.68	49.50	0.047	-26.56	73.00	0.053	-25.51			
6.500	0.165	-15.65	26.50	0.058	-24.73	50.00	0.042	-27.54	73.50	0.055	-25.19			

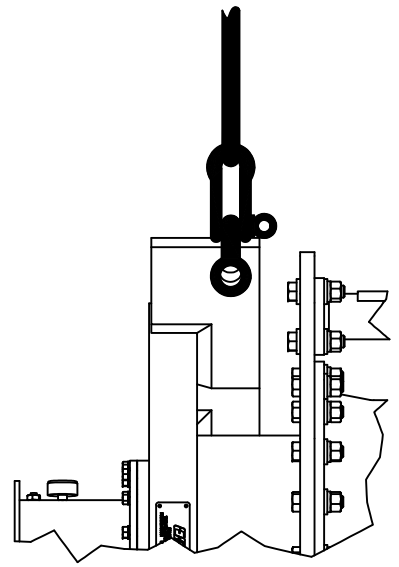
FIGURE #1
REMOVAL FROM TRUCK

LIFT ANTENNA FROM THE TRUCK BED USING STEEL CENTER PLATE AND MAIN LIFTING LUGS AT BASE, NOT THE RADOMES, AT THE LOCATIONS INCIDCATED. TO PREVENT FROM ROLLING, LIFT FROM THE CENTER PLATE AS SHOWN IN VIEW "X-X". DO NOT LIFT ANTENNA BY FIBERGLASS RADOMES, **DAMAGE WILL OCCUR**.

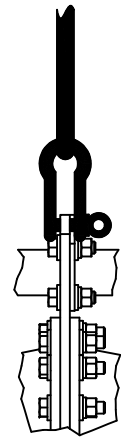
REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
A	ADD FINAL DATA	12/4/2015	K. SCHARP



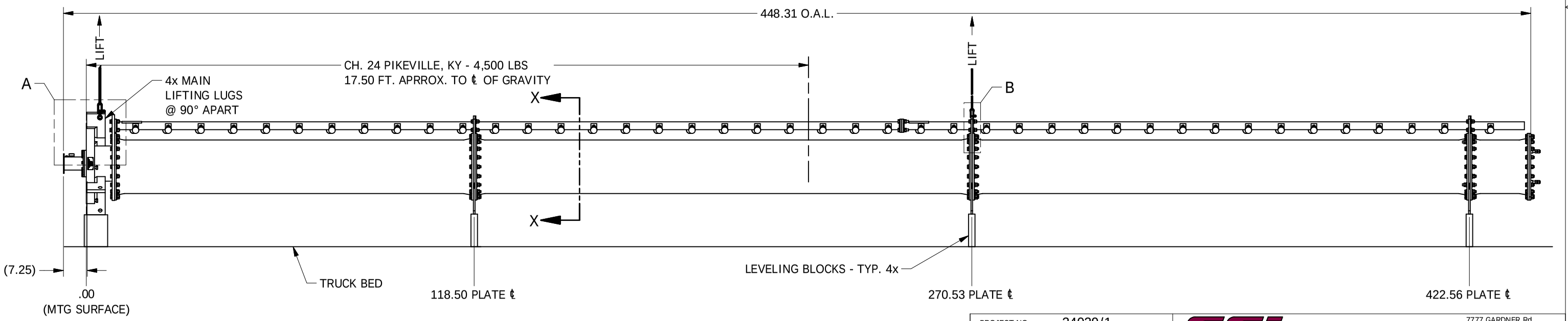
SECTION X-X



DETAIL A



DETAIL B



THIRD ANGLE PROJECTION

MATERIAL

FINISH

TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND APPLICABLE AT 20°C (68°F)
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

1 PLACE DECIMAL ± .1
2 PLACE DECIMAL ± .03
3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"

PROJECT NO.	34039/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	G.A.G.	11/11/2015
DRAFTING		
DESIGN MGR.	K. SCHARP	11/12/2015
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERCEDES PART NO.		
FILE NAME: LD34039-1.1.idw		

ELECTRONICS RESEARCH INC.
ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

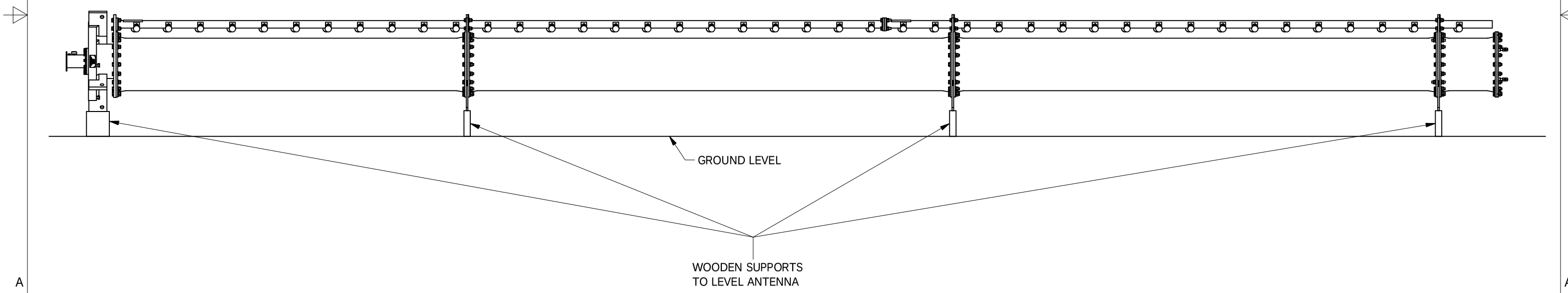
TITLE:
LIFTING DETAILS
34039 - PIKEVILLE, KY - CH. 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	LD34039-1	A
SCALE: 1:35	WEIGHT: N/A	SHEET: 1 OF 4	

C:\Workspace\Designs\34039\1\LD34039-1.1.idwG.A.G.11/11/2015

FIGURE #2

PLACE ALL ANTENNA RADOME JOINTS WITH THE STEEL CENTER PLATES ON WOODEN SUPPORTS AS SHOWN. ANTENNA SHOULD BE LEVEL TO PREVENT DAMAGE. USE SUPPORTS HIGH ENOUGH TO AVOID DAMAGING THE RADOMES AND TO ALLOW FOR ELECTRICAL GROUND TEST OF THE ANTENNA. PLATE RESTING 6.0 INCHES ABOVE THE GROUND IS SUFFICIENT.



PROJECT NO.	34039/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	G.A.G.	11/11/2015
DRAFTING		
DESIGN MGR.	K. SCHARP	11/12/2015
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERCEDES PART NO.		
FILE NAME: LD34039-1.2.idw		

ELECTRONICS RESEARCH INC.
ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

TITLE:
LIFTING DETAILS
34039 - PIKEVILLE, KY - CH. 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	LD34039-1	

SCALE :	WEIGHT:	SHEET:
1:35	4298.18 lbmass	2 OF 4

AISC CERTIFIED FABRICATOR

THIRD ANGLE PROJECTION

MATERIAL

FINISH

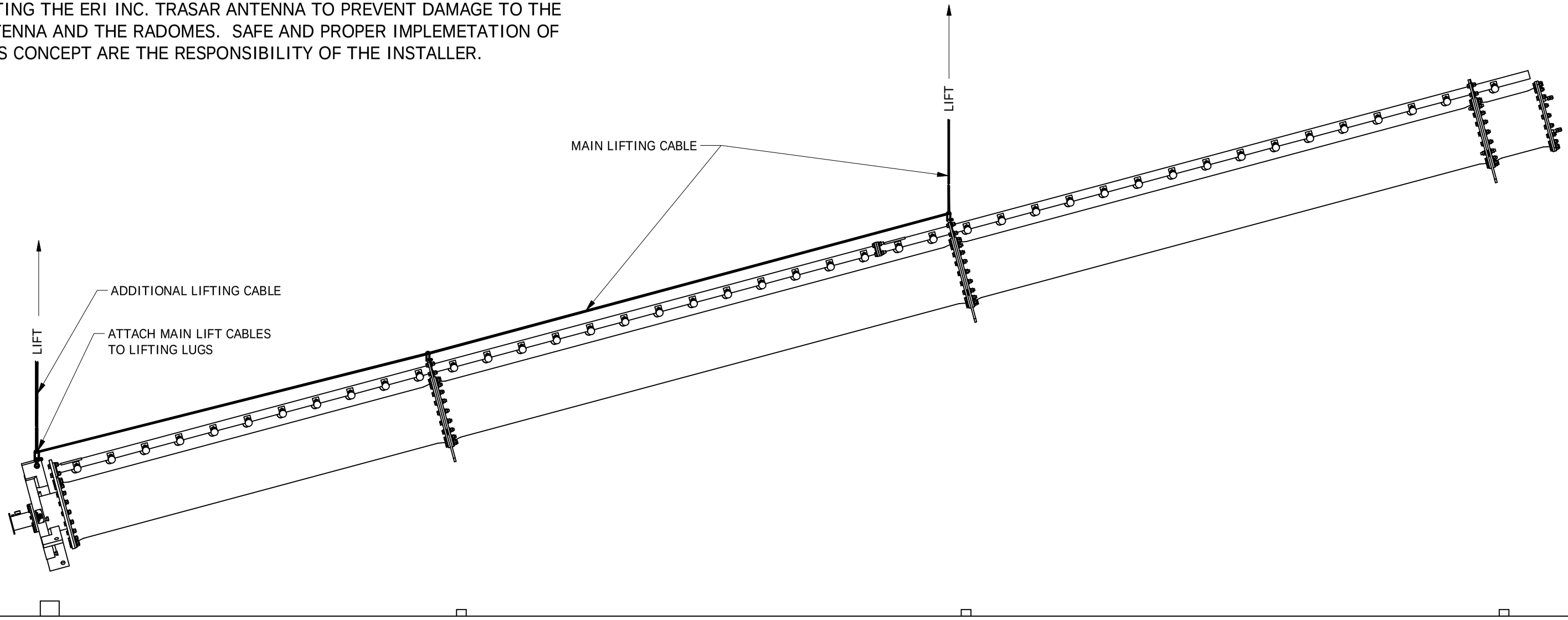
TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND APPLICABLE AT 20°C (68°F)
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

1 PLACE DECIMAL ± .1
2 PLACE DECIMAL ± .03
3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"

FIGURE #3A

WHEN LIFTING THE ANTENNA FOR INSTALLATION, LIFT AS SHOWN TO PREVENT DAMAGE TO THE BASE OF THE ANTENNA. WHEN THE ANTENNA IS VERTICAL, THE ADDITIONAL BASE LIFTING CABLE CAN BE REMOVED. (SEE FIGURE #3B)

NOTE: THIS ILLUSTRATION IS INTENDED TO SHOW A CONCEPT FOR LIFTING THE ERI INC. TRASAR ANTENNA TO PREVENT DAMAGE TO THE ANTENNA AND THE RADOMES. SAFE AND PROPER IMPLEMETATION OF THIS CONCEPT ARE THE RESPONSIBILITY OF THE INSTALLER.



THIRD ANGLE PROJECTION

MATERIAL

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ANGULAR ± .5°
FRACTIONAL ± 1/16"

PROJECT NO.	34039/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	G.A.G.	11/11/2015
DRAFTING		
DESIGN MGR.	K. SCHARP	11/12/2015
ENG.		
MANUF.		
EXT. APPROVAL		

SUPERCEDES PART NO.

FILE NAME: LD34039-1.3.idw

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ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

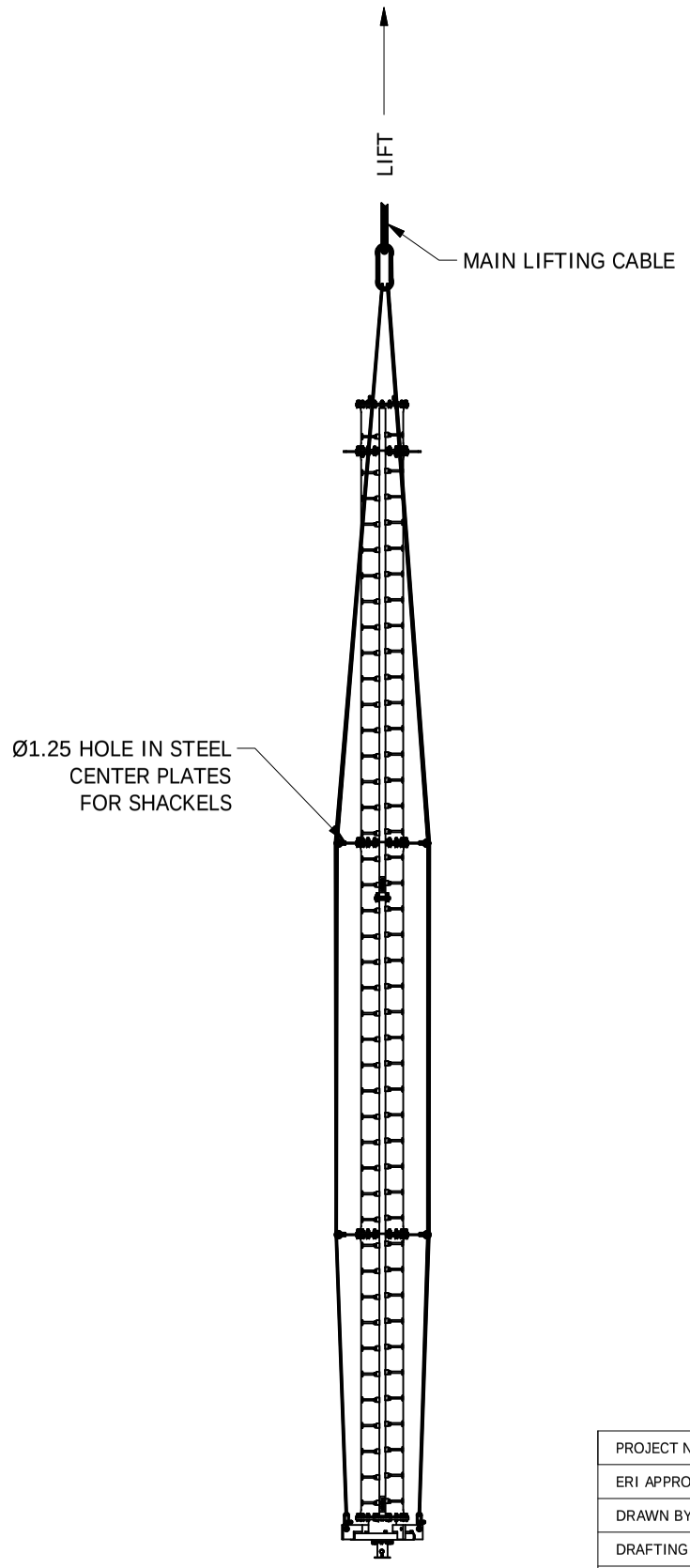
TITLE:
LIFTING DETAILS
34039 - PIKEVILLE, KY - CH. 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	LD34039-1	

SCALE :	WEIGHT:	SHEET:
1:30	4298.18 lbmass	3 OF 4

FIGURE #3B

NOTE: THIS ILLUSTRATION IS INTENDED TO SHOW A CONCEPT FOR LIFTING THE ERI INC. TRASAR ANTENNA TO PREVENT DAMAGE TO THE ANTENNA AND THE RADOMES. SAFE AND PROPER IMPLEMENTATION OF THIS CONCEPT ARE THE RESPONSIBIILTY OF THE INSTALLER.



AISC CERTIFIED FABRICATOR

THIRD ANGLE PROJECTION

MATERIAL

FINISH

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OVERALL-NOT CUMULATIVE
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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

1 PLACE DECIMAL ± .1
2 PLACE DECIMAL ± .03
3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"

PROJECT NO.	34039/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	G.A.G.	11/11/2015
DRAFTING		
DESIGN MGR.	K. SCHARP	11/12/2015
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERCEDES PART NO.		
FILE NAME: LD34039-1.4.idw		

ELECTRONICS RESEARCH INC.
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7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

TITLE:
LIFTING DETAILS
34039 - PIKEVILLE, KY - CH. 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	LD34039-1	
SCALE: 1:70	WEIGHT: 4298.18 lbmass	SHEET: 4 OF 4	

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
A	ITEM #2 WAS INPUT-6.25-1.711, ITEM #3 WAS STUB-6.25, ITEM #4 WAS RLA600-21, ADDED ITEM #18	11/30/2015	K. SCHARP

NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.
2. LOC-TITE ALL THREADS PER BOP 2.02.01.
3. TORQUE ALL 5/8" SST HARDWARE TO 60-65 FT/LBS.
4. TORQUE ALL 1/2" SST HARDWARE TO 50-55 FT/LBS.
5. TORQUE ALL 3/8" SST HARDWARE TO 28 FT/LBS.
6. ALL EXTERIOR HARDWARE TO BE ASSEMBLED WITH THE HEAD OF BOLT TOWARDS THE BOTTOM OF THE ANTENNA.
7. USE SMALL ERI SHIPPING LABEL AND PLACE WHERE NOTED.
8. USING BLACK PAINT, STENCIL AS SHOWN. USING MIN. 1/2" HIGH CHARACTERS.
9. APPLY TEFLON TAPE TO THREADS ON TOP CLIMBING POLE SECTION.

CONNECTION NOTES:

1. FOR PROPER PERFORMANCE AFTER INSTALLATION, PLUMB THE ANTENNA TO WITHIN 0.5° FROM VERTICAL (5/8 INCH IN 30 FEET). A KIT OF SHIMS IS INCLUDED WITH THE ANTENNA. AS REQUIRED FOR PROPER PLUMB, GAPS BETWEEN ANTENNA MOUNTING FLANGE AND TOWER TOP PLATE MUST BE FILLED USING THE SUPPLIED SHIM KIT OR SUITABLE STEEL SHIM STOCK.

2. ANTENNA MOUNTING FLANGE BOLTED CONNECTION SHALL BE BROUGHT TO A SNUG-TIGHT CONDITION WHERE JOINT TIGHTNESS IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE PILES INTO "FIRM" CONTACT, AND THEN AN ADDITIONAL 1/2 TURN (180° ± 30°) APPLIED TO THE NUT OR BOLT HEAD FOR FINAL BOLT TIGHTING. A SYSTEMATIC APPROACH SHALL BE USED WHEN TIGHTENING THE BOLTS STARTING WITH THE MOST RIGID PART OF THE JOINT. THE PART NOT TURNED BY THE WRENCH SHALL BE PREVENTED FROM ROTATING DURING THIS OPERATION.

3. IT IS ERI'S INTENTION THAT AN ANCO LOCKNUT BE PROVIDED FOR ALL HIGH STRENGTH ASTM A325 BOLTED CONNECTIONS, UNLESS OTHERWISE NOTED. FLAT WASHERS ARE REQUIRED ON MOUNTING FLANGE CONNECTIONS.

4. UNLESS OTHERWISE NOTED, ALL ANTENNA MOUNTING FLANGE HARDWARE GRADES ARE AS FOLLOWS:

TABLE	
COMPENENT	DESCRIPTION
STRUCTURAL BOLT	ASTM A325 GALVANIZED
ANCO LOCKNUT	ASTM A563 GRADE DH GALVVANIZED HEAVY HEX NUT WITH STAINLESS PIN
FLAT WASHER	ASTM F436 TYPE 1 GALVANIZED

ITEM	QTY	PART NUMBER	DESCRIPTION
18	2	184422	6" STUB SUPPORT
17	16	NLA1807GA	1 1/8-7 GALV. ANCO LOCK NUT
16	32	WF18GA	1 1/8 in, GALV. FLAT WASHER
15	16	PURCHASED	1 1/8-7 UNC x 6.00 in A325 Galv. Hex Bolt
14	1	RLA675-16	6-1/8", 75 OHM GAS BARRIER
13	1	ACX675-10SE	6 1/8" 90 DEG EQUAL LENGTH ELBOW
12	1	69039	CLIMBING POLE GROUNDING KIT
11	1	9885-500	2" THREADED PIPE CAP
10	12	LR0075-N003	LIGHTNING ROD ARRESTOR TIP
9	4	LR0062-4800GA-N001	5/8"-11 X 48" 30 DEG BENT GALV W/2 NUT
8	4	LRK0007-KIT	LIGHTNING SPUR HARDWARE KIT
7	1	167423-20	SHIM KIT
6	1	38296-61	TRASAR LABEL
5	1	68157	6" INPUT HARDWARE KIT
4			
3			
2	1	34039_STRINPUT- 1	STRIGHT INPUT Ø6.25-1.711
1	1	TA34039-1	TOP LEVEL ASSEMBLY

BILL OF MATERIAL

PROJECT NO.		
ERI APPROVAL	NAME	DATE
DRAWN BY	G.A.G.	11/11/2015
DRAFTING		
DESIGN MGR.	K. SCHARP	11/13/2015
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERSEDES PART NO.		
FILE NAME: PM34039-1.1.idw		

ELECTRONICS RESEARCH INC.
ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

TITLE:
MECH. PARAMETER / INSTALLATION ASS'Y
34039 - PIKEVILLE, KY - CH. 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	PM34039-1	A
SCALE : AS NOTED	WEIGHT: 4451.58 lbmass	SHEET: 1 OF 3	

AISC CERTIFIED FABRICATOR

THIRD ANGLE PROJECTION

MATERIAL

FINISH

TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND APPLICABLE AT 20°C (68°F)
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

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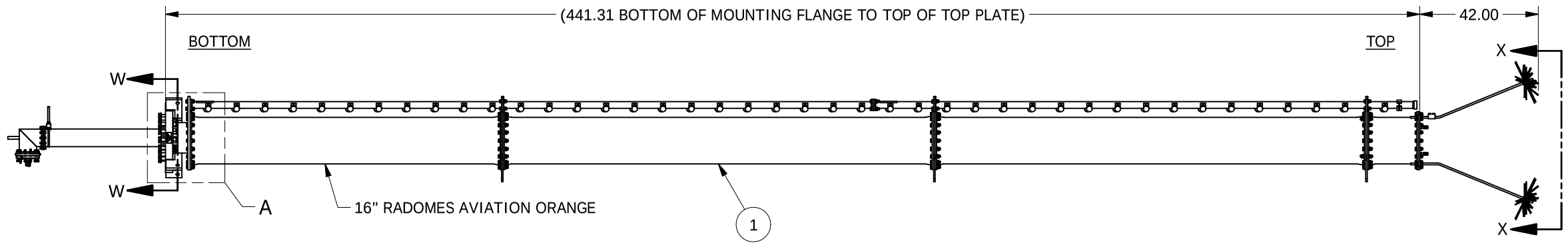
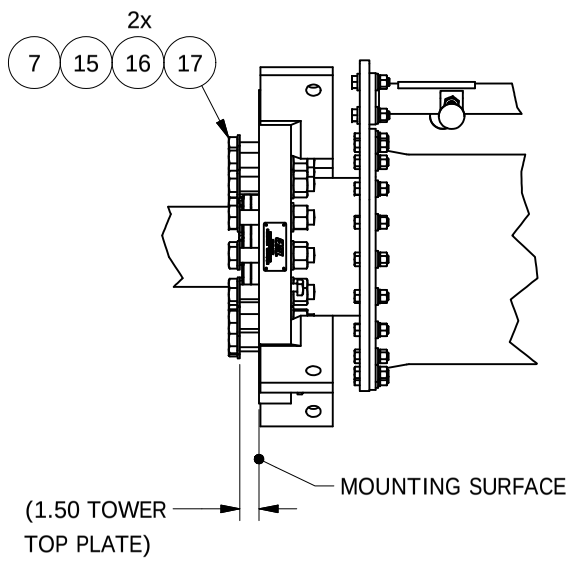
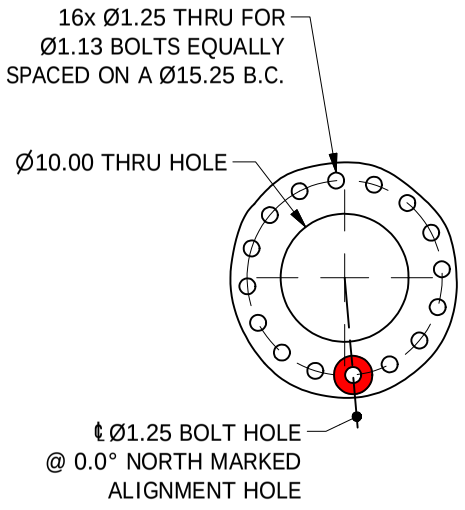
2 PLACE DECIMAL ± .03
3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
A	ITEM #2 WAS INPUT-6.25-1.711, ITEM #3 WAS STUB-6.25, ITEM #4 WAS RLA600-21, ADDED ITEM #18	11/30/2015	K. SCHARP

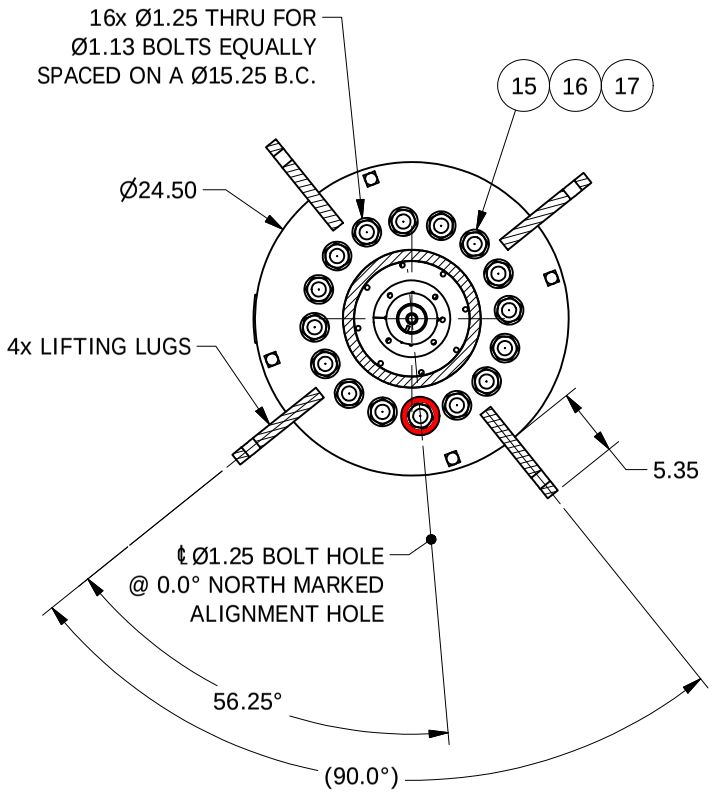




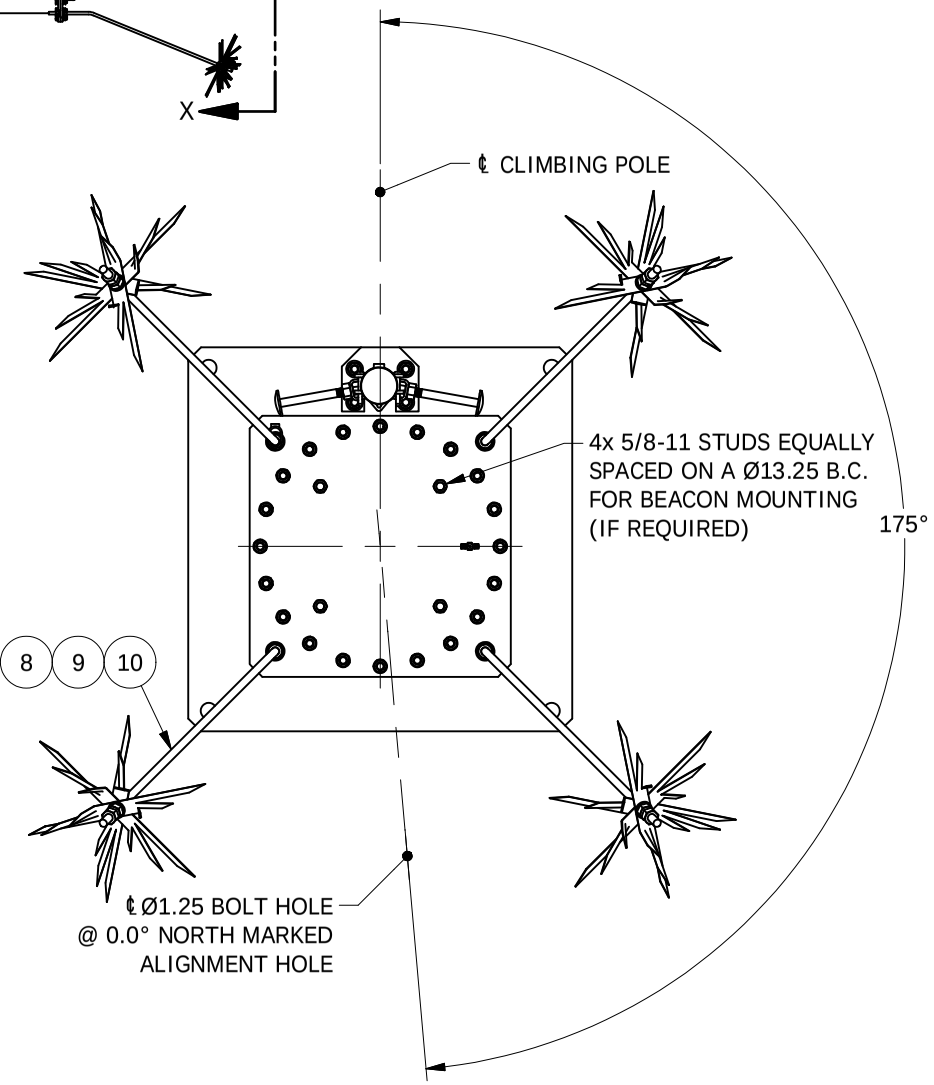
DETAIL A



VIEW OF TOP MOUNT PLATE ONE Ø1.25 BOLT HOLE IS LOCATED AT 0.0° NORTH



SECTION W-W



VIEW X-X

PROJECT NO.	34039/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	G.A.G.	11/11/2015
DRAFTING		
DESIGN MGR.	K. SCHARP	11/16/2015
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERSEDES PART NO.		
FILE NAME: PM34039-1.2.idw		

ELECTRONICS RESEARCH INC.
ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

TITLE:
MECH. PARAMETER / INSTALLATION ASS'Y
34039 - PIKEVILLE, KY - CH. 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	PM34039-1	A
SCALE : 1:45	WEIGHT: 4451.58 lbmass	SHEET: 2 OF 3	

AISC CERTIFIED FABRICATOR

THIRD ANGLE PROJECTION

MATERIAL

FINISH

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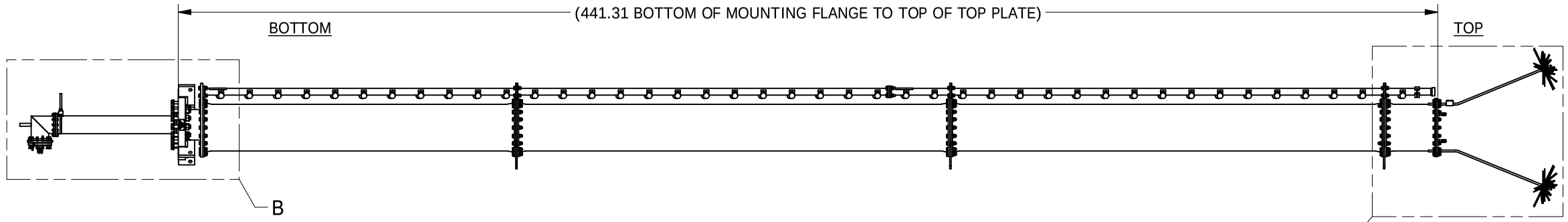
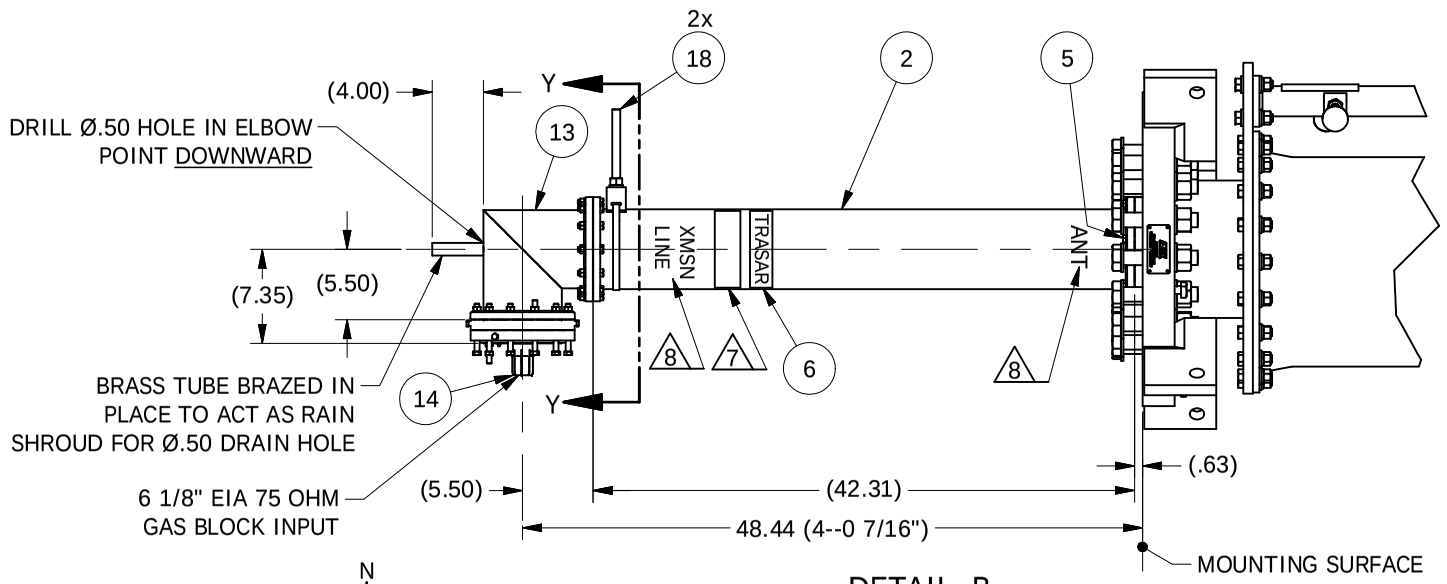
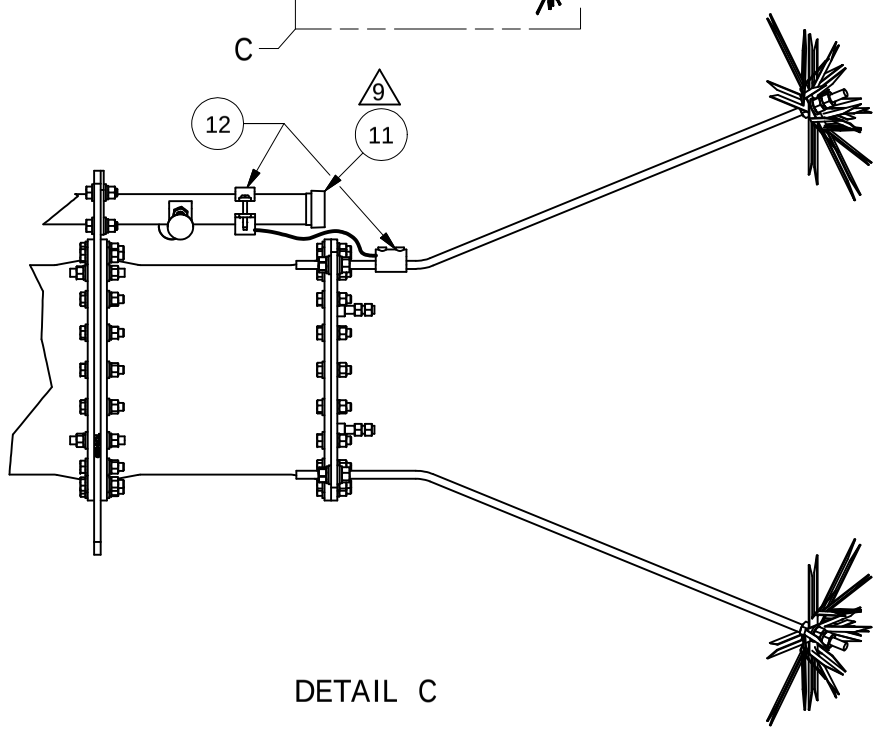
REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
A	ITEM #2 WAS INPUT-6.25-1.711, ITEM #3 WAS STUB-6.25, INTEM #4 WAS RLA600-21, ADDED ITEM #18	11/30/2015	K. SCHARP
B	UPDATED SECTION Y-Y	12/2/2015	K. SCHARP

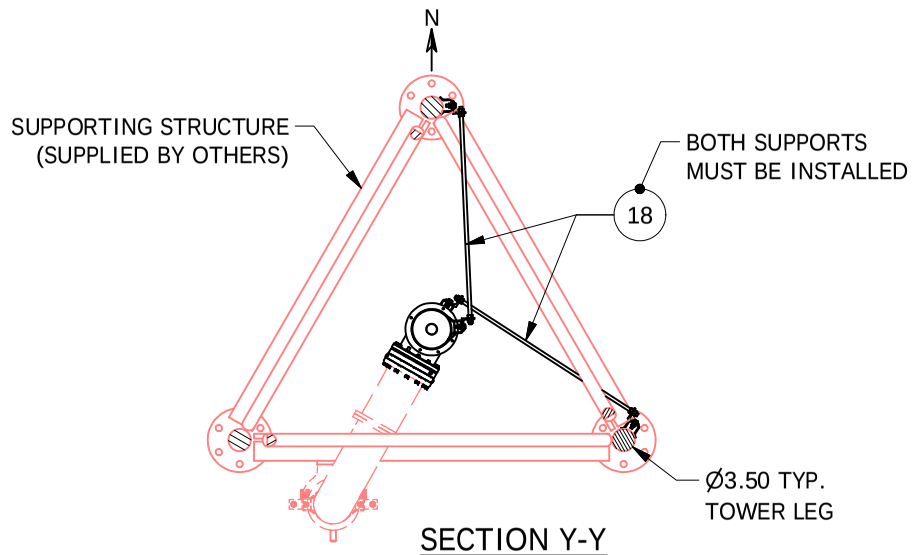




DETAIL B



DETAIL C



SECTION Y-Y
SCALE 1:30

THIRD ANGLE PROJECTION

MATERIAL

FINISH

TOLERANCES
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3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"

PROJECT NO.	34039/1	
ERI APPROVAL	NAME	DATE
DRAWN BY	G.A.G.	11/11/2015
DRAFTING		
DESIGN MGR.	K. SCHARP	11/13/2015
ENG.		
MANUF.		
EXT. APPROVAL		

SUPERSEDES PART NO.

FILE NAME: PM34039-1.3.idw

ELECTRONICS RESEARCH INC.
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PHONE: (812) 925-6000
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TITLE:
MECH. PARAMETER / INSTALLATION ASS'Y
34039 - PIKEVILLE, KY - CH. 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	PM34039-1	B

SCALE :	WEIGHT:	SHEET:
1:45	4451.58 lbmass	3 OF 3

NOTES:

1. THIS TRANSMISSION LINE LAYOUT IS ONLY INTENDED TO PROVIDE ROUTING AND SUPPORT GUIDANCE TO FACILITATE PROPER INSTALLATION AND TO DEVELOP THE BILL OF MATERIALS. ANY ADDITIONAL SUPPORT MATERIALS, CUSTOM BRACKETS, CLIP ANGLES, HANGERS, DROP PLATES, ETC., REQUIRED TO ADAPT TO THE TOWER, BRIDGE, & INSIDE THE TRANSMITTER BUILDING, OR ANY ADDITIONAL FIELD DRILLING OR HOLE PUNCHING TO ATTACH THE NECESSARY MATERIALS, WILL BE SUPPLIED BY OTHERS UNLESS SPECIFICALLY INCLUDED BY CONTRACT IN ERI'S SCOPE OF WORK.

2. EXISTING SLIP HANGERS & UNISTRUT MATERIALS SHALL BE USED TO INSTALL THE NEW 6-1/8" AND 3-1/8" LINE INSIDE THE TRANSMITTER BUILDING. THE PORT CONSTRUCTION & ANY ADDITIONAL HANGERS AND/OR UNISRUT MATERIALS NECESSARY TO HANG SAID LINE SHALL BE THE RESPONSIBILITY OF THE INSTALLER.

3. THE TRANSMISSION LINE SHALL BE INITIALLY PURGED AND THEN MAINTAINED AT A POSITIVE 3-5 PSIG DRY GAS PRESSURE.

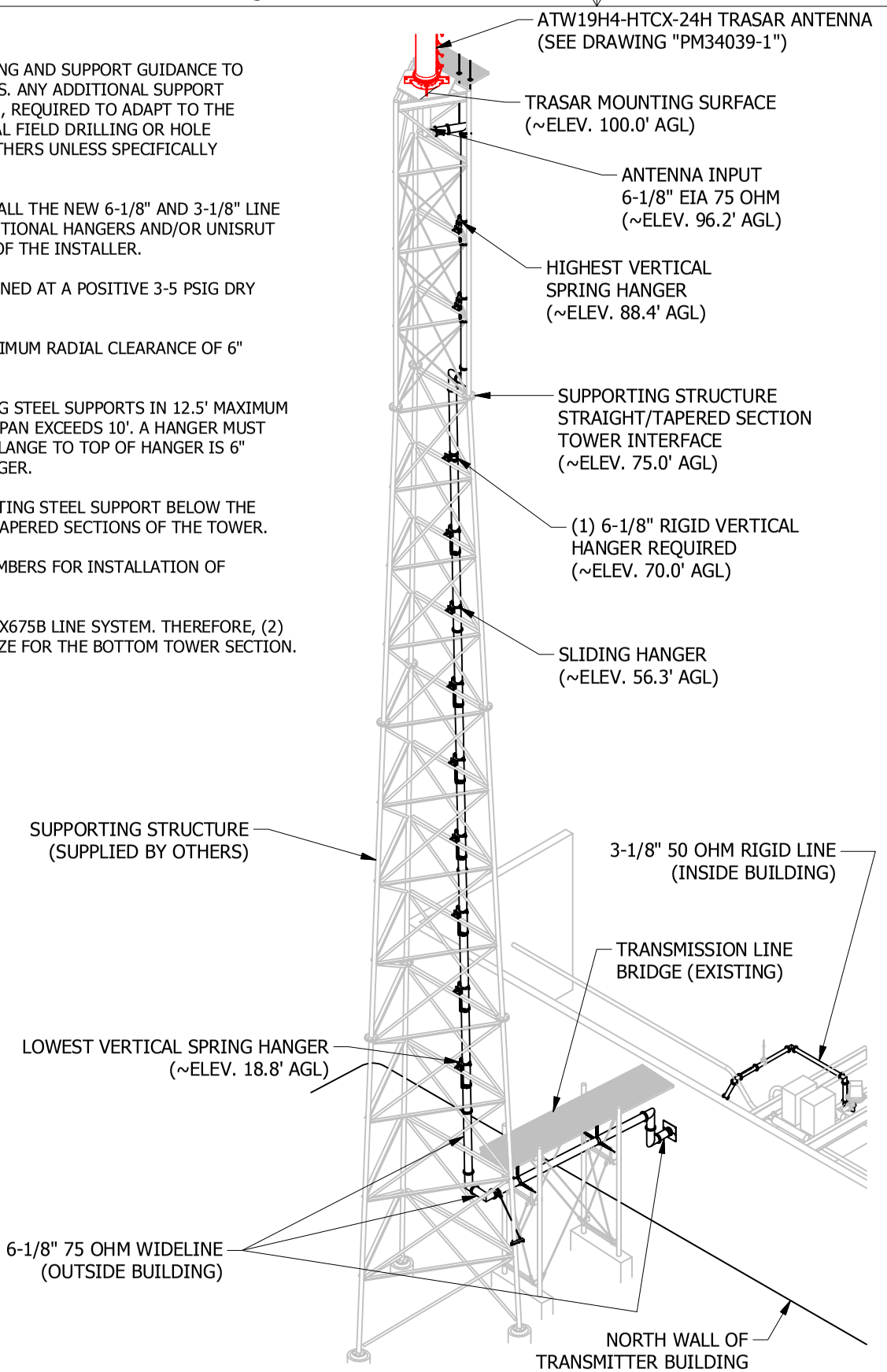
4. THE TOWER ENTRANCE FOR 6-1/8" TRANSMISSION LINE MUST HAVE A MINIMUM RADIAL CLEARANCE OF 6" TO TOWER MEMBERS AND ALL OTHER EXISTING STRUCTURES.

5. THE VERTICAL SPRING HANGERS SHALL BE INSTALLED USING THE EXISTING STEEL SUPPORTS IN 12.5' MAXIMUM INTERVALS AND EXISTING HORIZONTAL SUPPORTS MUST BE RELOCATED IF SPAN EXCEEDS 10'. A HANGER MUST NOT STRADDLE A FLANGED CONNECTION. THE MINIMUM CLEARANCE FROM FLANGE TO TOP OF HANGER IS 6" FOR THERMAL EXPANSION. EACH LINE MUST HAVE AT LEAST (1) SPRING HANGER.

6. (1) 6-1/8" VERTICAL FIXED HANGER SHALL BE INSTALLED AT THE 2nd EXISTING STEEL SUPPORT BELOW THE MIDDLE ELBOW COMPLEX OF VERTICAL RUN, BETWEEN THE STRAIGHT AND TAPERED SECTIONS OF THE TOWER.

7. FIELD DRILLING MAY BE REQUIRED THROUGH TOWER AND/OR BRIDGE MEMBERS FOR INSTALLATION OF VERTICAL SPRING HANGERS AND HORIZONTAL SPRING HANGERS.

8. TYPICAL TOWER DETAILS WERE NOT PROVIDED PRIOR TO DESIGN OF MACX675B LINE SYSTEM. THEREFORE, (2) Ø1/2" U-BOLTS WERE PROVIDED TO ACCOMODATE THE APPROXIMATE LEG SIZE FOR THE BOTTOM TOWER SECTION.



ITEM	QTY	PART NUMBER	DESCRIPTION
37	1	RLA600B-50	6-1/8" END CAP (NOT SHOWN)
36	2	RLA600-21	6-1/8" HARDWARE KIT (NOT SHOWN)
35	2	RLA300-21	3-1/8" HARDWARE KIT (NOT SHOWN)
34	1	ACX675-20	6-1/8" 75 OHM STANDARD INNER CONNECTOR (NOT SHOWN)
33	1	ACX350-20	3-1/8" 50 OHM STANDARD INNER CONNECTOR (NOT SHOWN)
32	4	NU1011GA	5/8"-11 NUT HDG A563 DH TYPE 1
31	4	WL10GA	5/8 in, GALV. LOCK WASHER
30	4	WF10GA	5/8" FLAT WASHER F436 HDG STRUCTURAL
29	4	SC1011H0200GA	5/8-11 UNC x 2.00 in A325 Galv. Hex Bolt
28	4	WF08GA-N001	SPACER WASHER, 1/2"
27	2	NU0616CP	3/8-16 SS COUPLING NUT
26	16.00 in	SSQ0616	3/8-16 STAINLESS STEEL THREADED ROD, (2 @ 8.00" LONG)
25	1	UB0813-0462GA	1/2-13 x 4-1/8" C-C GALV. UBOLT
24	1	UB0813-0412GA	1/2-13 x 4-1/8" C-C GALV. UBOLT
23	2	184422	STUB SUPPORT ASSEMBLY
22	2	34039-MA1	MOUNT ADAPTER PLATE, 5/8"
21	1	RLA675-16	6-1/8" 75 OHM HEAVY DUTY GAS BARRIER
20	1	RLA650B-350	6-1/8" TO 3-1/8" 50 OHM REDUCER
19	1	RLA600-19	6-1/8" SLIDING HANGER
18	1	RLA600-15A	6-1/8" WALL/ROOF FEED THRU ASSEMBLY
17	1	RLA600-14	6-1/8" LATERAL BRACE
16	1	RLA600-13L	6-1/8" LIGHT DUTY FIXED VERTICAL HANGER
15	2	RLA600-12	6-1/8" HORIZONTAL SPRING HANGER, 3 POINT
14	9	RLA600-11-H	6-1/8" VERTICAL SPRING HANGER
13	1	RLA001-01	LATERAL BRACE MOUNT
12	1	34039-FT1	6-1/8" 75 OHM CUSTOM UHF FINE MATCHER, 226.99"
11	2	STD350A-FT	3-1/8" 50 OHM UHF FINE MATCHER
10	1	ACX675B-17-1426	6-1/8" 75 OHM TO 50 OHM IMPEDANCE TRANSFORMER, CH 14-26
9	7	ACX675B-10SU	6-1/8" 75 OHM 90° UNEQUAL LEG ELBOW
8	6	ACX350-10SE	3-1/8" 50 OHM 90° EQUAL LEG ELBOW
7	3	MACX675B-20-237.00	6-1/8" 75 OHM MACXLINE SECTION, 237.00"
6	1	MACX675B-20-160.44	6-1/8" 75 OHM CUSTOMER SPECIFIED SECTION, 160.44"
5	1	MACX675B-5-TBD	6-1/8" 75 OHM CUSTOMER SPECIFIED SECTION, 6"-60"
4	1	MACX675B-5-60.00	6-1/8" 75 OHM CUSTOM MACXLINE SECTION, 60.00"
3	1	MACX675B-5-44.00	6-1/8" 75 OHM MACXLINE CUSTOMER SPECIFIED SECTION, 44.00"
2	1	MACX350A-5-51.96	3-1/8" 50 OHM CUSTOM LENGTH SECTION, 51.96"
1	3	MACX350A-41	3-1/8" 50 OHM MACXLINE FIELD CUT SECTION, UP TO 60"

BILL OF MATERIAL

PROJECT NO.	34039/21	
ERI APPROVAL	NAME	DATE
DRAWN BY	MAP	11/25/2015
DRAFTING		
DESIGN MGR.	K.SCHARP	12/2/2015
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERSEDES PART NO.		
FILE NAME:	MACX675B-24WLPKY.idw	

ELECTRONICS RESEARCH INC.
ESTABLISHED 1943
7777 GARDNER Rd.
CHANDLER, IN
47610-9219
PHONE: (812) 925-6000
FAX: (812) 925-4030

TITLE:
6-1/8" 75 OHM WIDELINE SYSTEM LAYOUT
PIKEVILLE, KY (PIKE COUNTY)
WKPI - CHANNEL 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	MACX675B-24WLPKY	

SCALE :	WEIGHT:	SHEET:
AS NOTED	N/A	1 OF 3

AISC CERTIFIED FABRICATOR

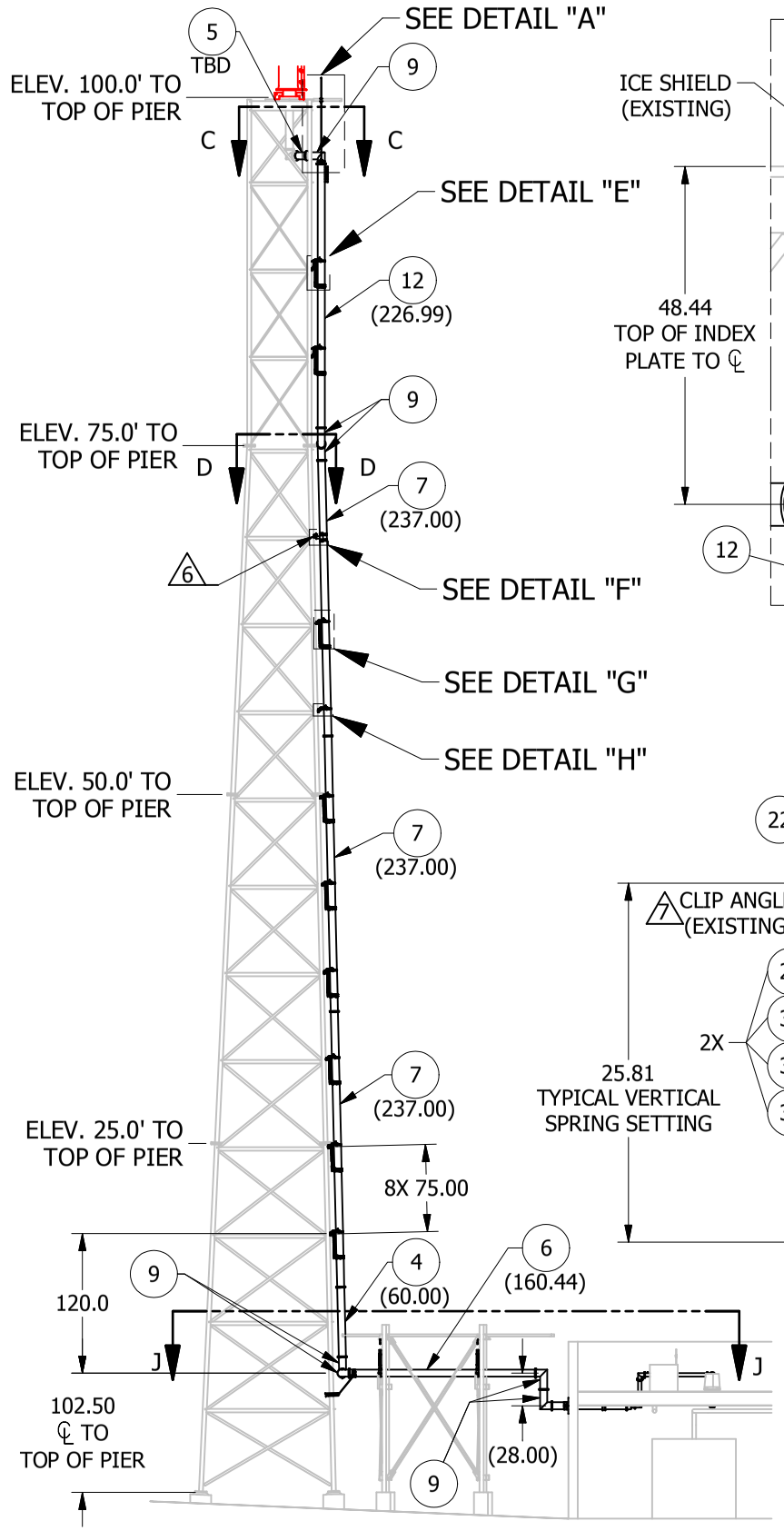
THIRD ANGLE PROJECTION

MATERIAL

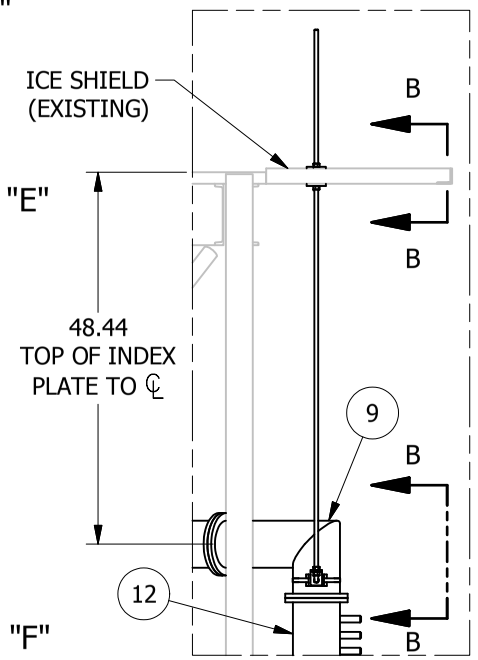
FINISH

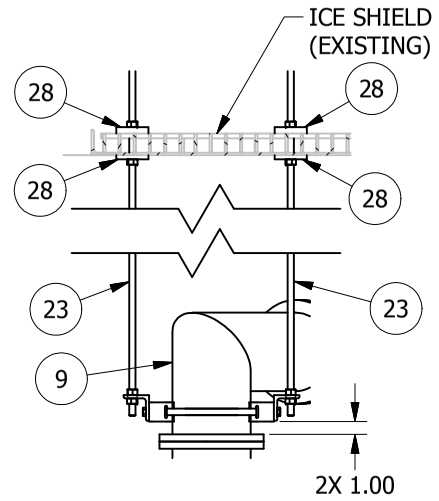
TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND APPLICABLE AT 20°C (68°F)
INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994

1 PLACE DECIMAL ± .1
2 PLACE DECIMAL ± .03
3 PLACE DECIMAL ± .010
ANGULAR ± .5°
FRACTIONAL ± 1/16"

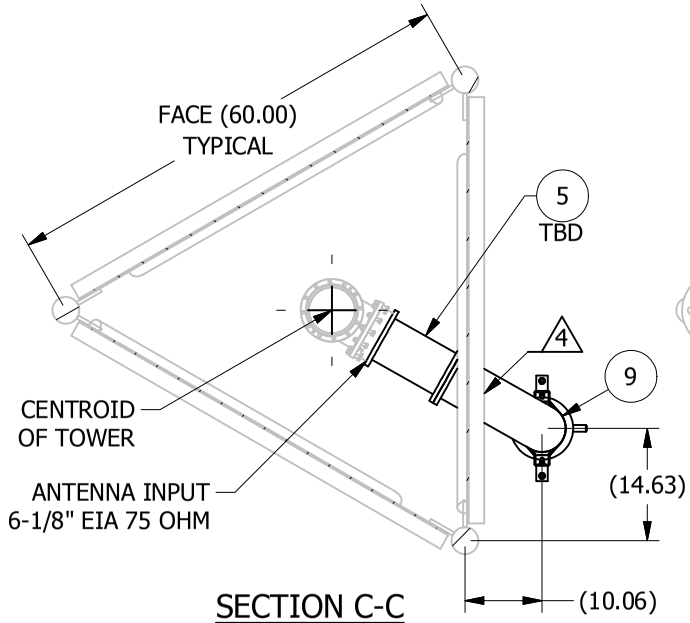


DETAIL A
SCALE 1 / 25

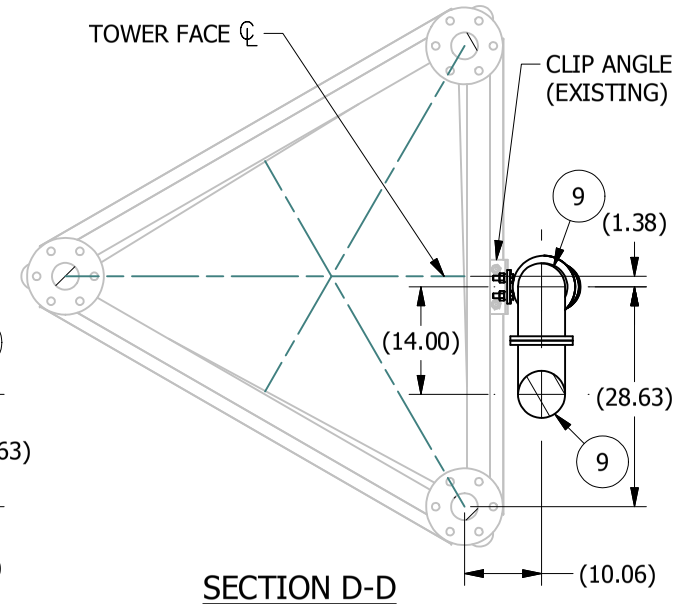




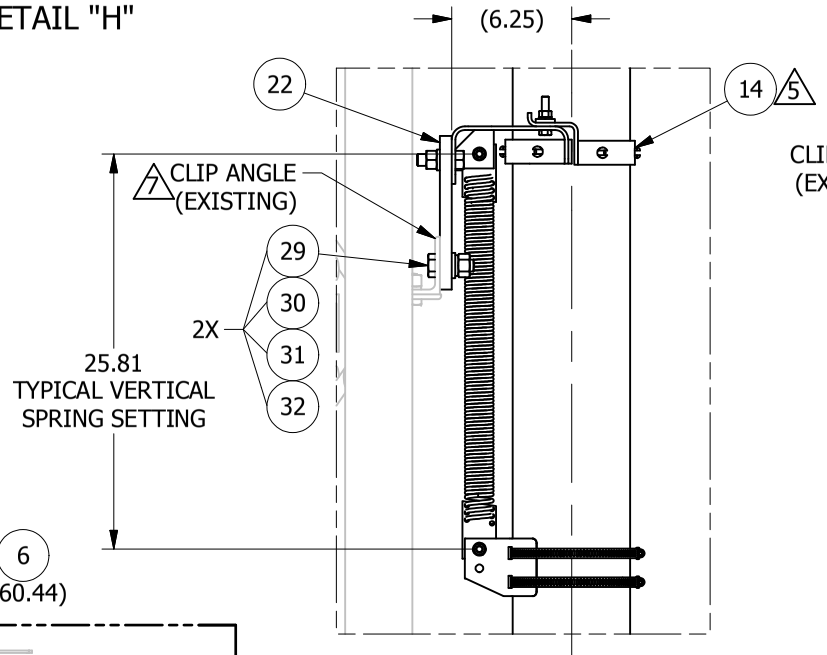
VIEW B-B
SCALE 1 / 15



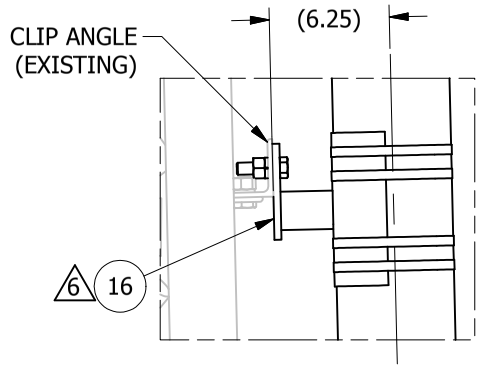
SECTION C-C
SCALE 1 / 25



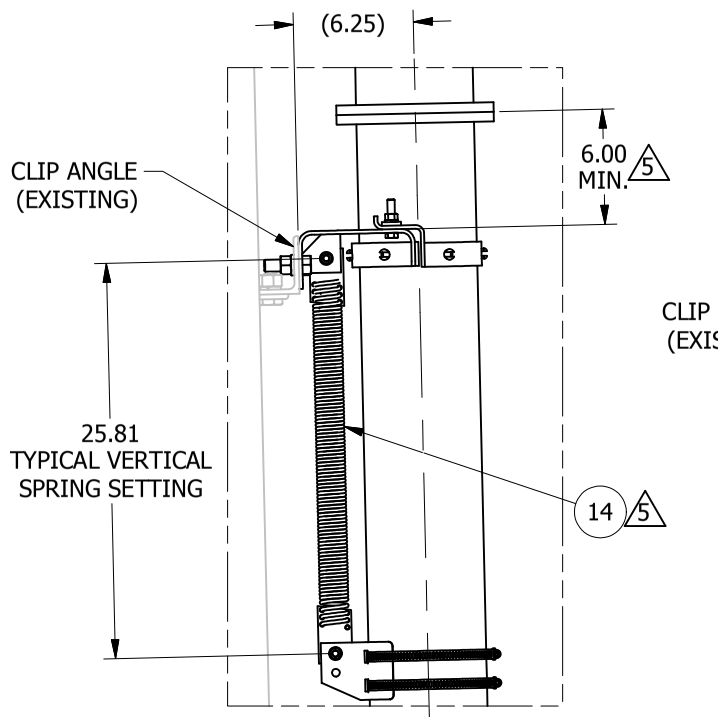
SECTION D-D
SCALE 1 / 25



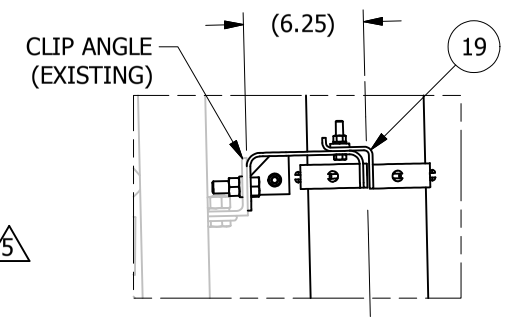
DETAIL E
2X TYPICAL CONNECTION
SCALE 1 / 10



DETAIL F
SCALE 1 / 10



DETAIL G
7X TYPICAL CONNECTION
SCALE 1 / 10



DETAIL H
SCALE 1 / 10

PROJECT NO.	34039/21	
ERI APPROVAL	NAME	DATE
DRAWN BY	MAP	11/25/2015
DRAFTING		
DESIGN MGR.	K.SCHARP	12/2/2015
ENG.		
MANUF.		
EXT. APPROVAL		
SUPERSEDES PART NO.		
FILE NAME: MACX675B-24WLPKY.idw		

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PIKEVILLE, KY (PIKE COUNTY)
WKPI - CHANNEL 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	MACX675B-24WLPKY	
SCALE : AS NOTED	WEIGHT: N/A	SHEET: 2 OF 3	

AISC CERTIFIED FABRICATOR

THIRD ANGLE PROJECTION

MATERIAL

FINISH

TOLERANCES
OVERALL-NOT CUMULATIVE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND APPLICABLE AT 20°C (68°F)
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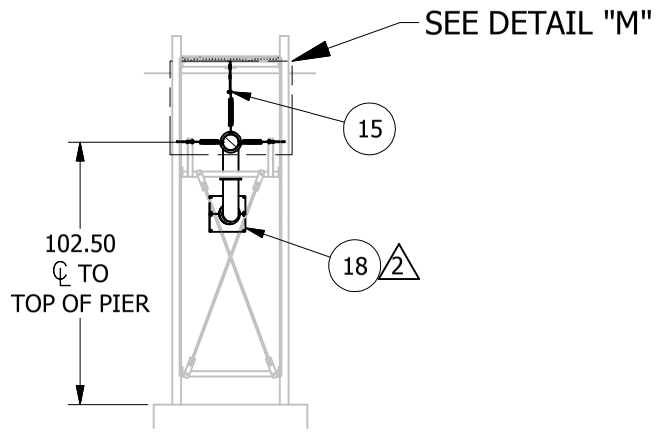
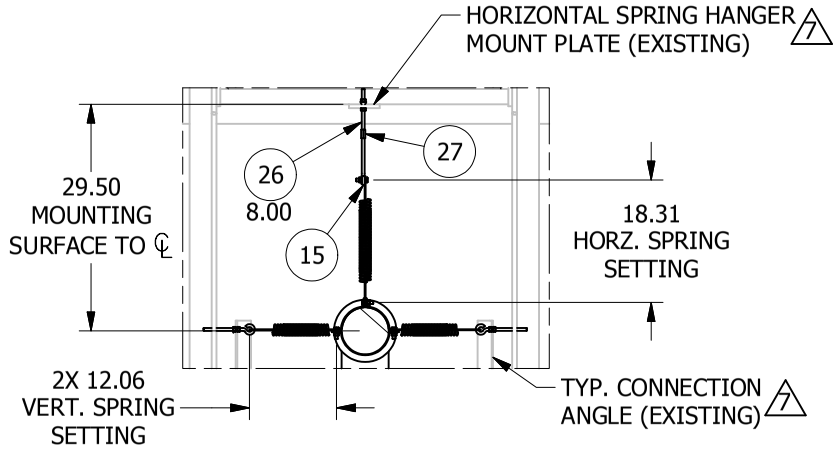
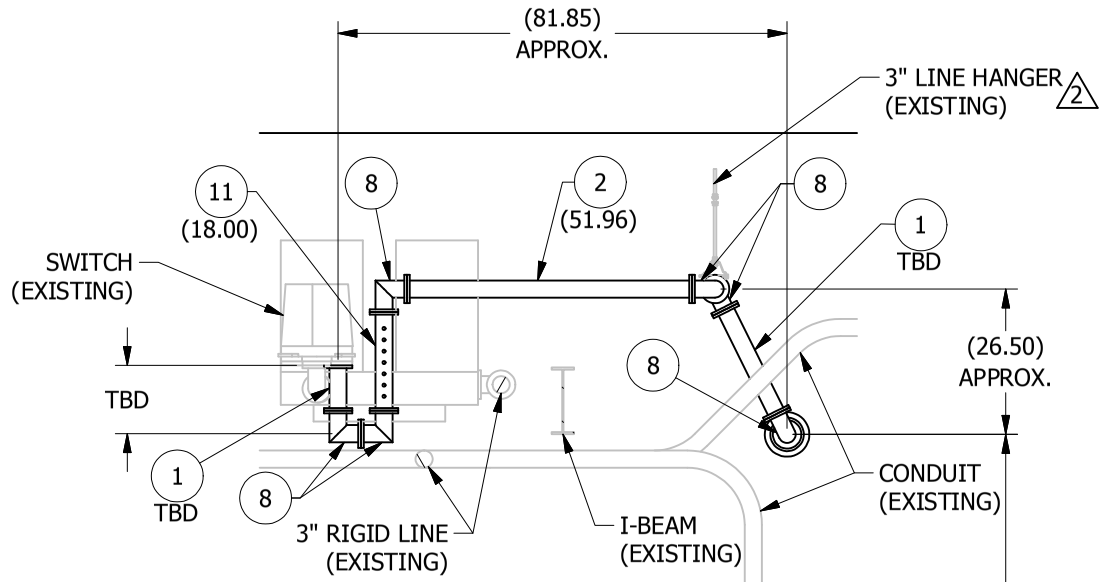


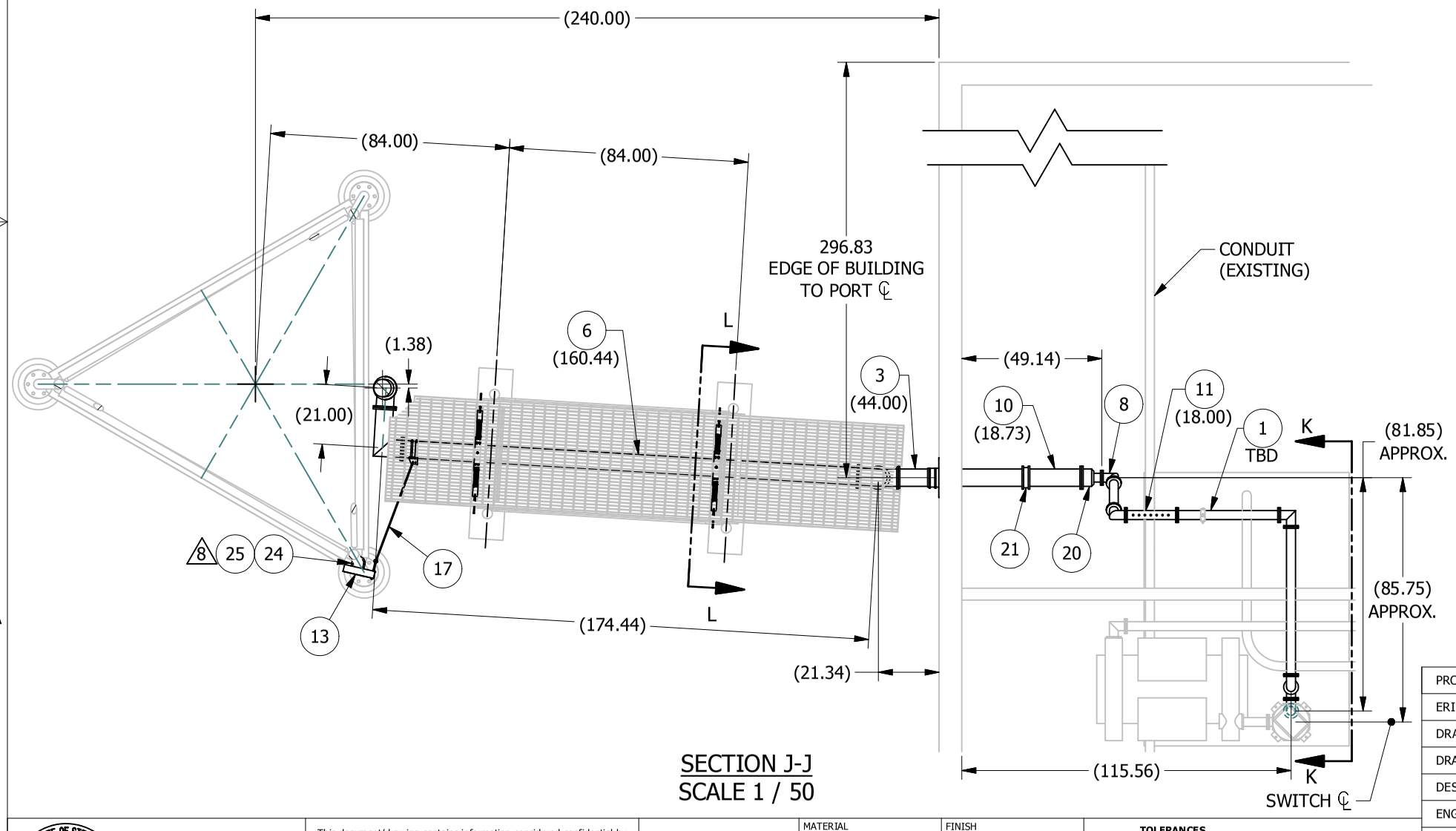
SECTION L-L
SCALE 1 / 75



DETAIL M
2X TYPICAL CONNECTION
SCALE 1 / 25



SECTION K-K
SCALE 1 / 35



SECTION J-J
SCALE 1 / 50

THIRD ANGLE PROJECTION

MATERIAL

FINISH

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FRACTIONAL ± 1/16"

PROJECT NO.	34039/21	
ERI APPROVAL	NAME	DATE
DRAWN BY	MAP	11/25/2015
DRAFTING		
DESIGN MGR.	K.SCHARP	12/2/2015
ENG.		
MANUF.		
EXT. APPROVAL		

SUPERSEDES PART NO.

FILE NAME: MACX675B-24WLPKY.idw

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PIKEVILLE, KY (PIKE COUNTY)
WKPI - CHANNEL 24

SIZE	CAGE CODE	DWG NO.	REV.
B	OZNS1	MACX675B-24WLPKY	

SCALE :	WEIGHT:	SHEET:
AS NOTED	N/A	3 OF 3