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Antenna Model: **TFU-31ETT/VP-R O6**

Proposal Number:	**C-71193-3**
Date:	**23-May-19**
Customer:	**Nexstar**
Location:	**Lubbock, TX**

Electrical Specifications

Polarization:	**Elliptical**		
Azimuth Pattern:	**Omni**		
Antenna Input:	**6-1/8"**	**75 Ohm**	**EIA/DCA**
VSWR:	Channel	**1.08 : 1**	
Bandwidth:	**6 MHz**		
Rated Input Power:	**50 kW**	**(16.99 dBk)**	**Maximum Average Power**

Mechanical Specifications

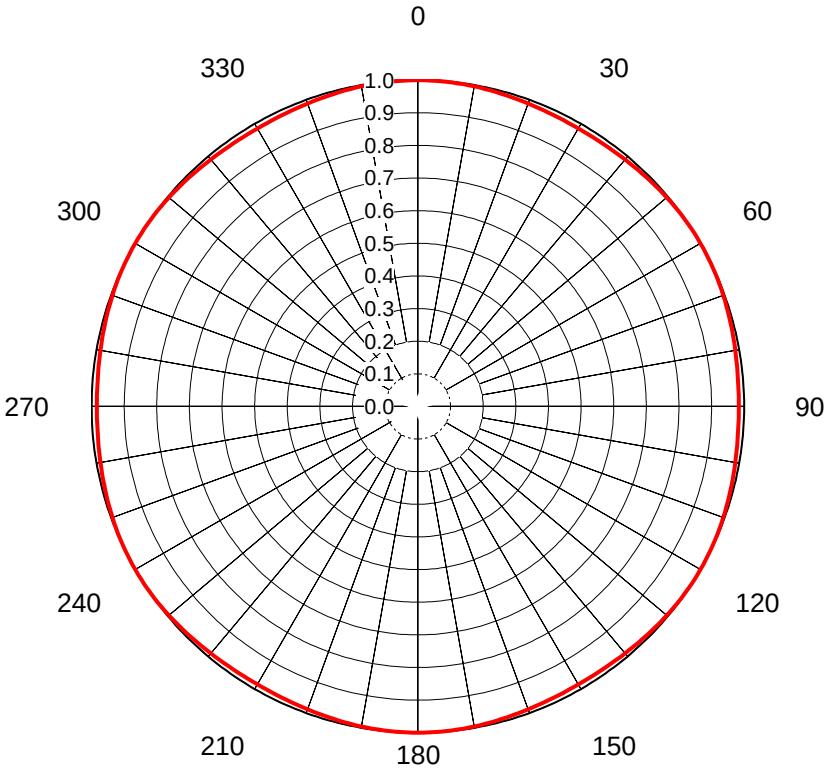
Mounting:	**Bottom of Stack**			
Environmental Protection:	**Full Radome**			
Height:	**57.9 ft (17.6m)**	less Lightning Protector		
Weight:	**12000 lb (5.4t)**			
Effective Projected Area:	**68.8 ft² (6.4m²)**	**TIA-222-G**	Basic Wind Speed:	**90 m/h (144.8 km/h)**

Channel Specifications

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
KLBK	31	575 MHz	400 kW (26.02 dBk)	100.0 kW (20.00 dBk)	23.3 kW (13.67 dBk)	22.00 (13.42dB)	5.50 (7.40dB)	13.25 (11.22dB)	3.31 (5.20dB)

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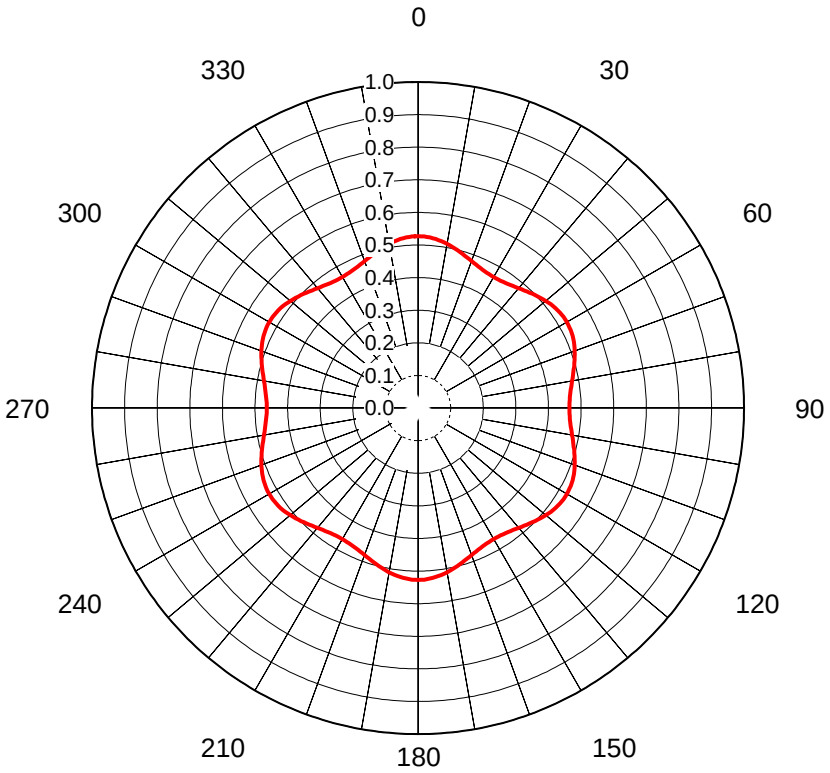
AZIMUTH PATTERN
Horizontal Polarization

Proposal No.	**C-71193-3**
Date	**23-May-19**
Call Letters	**KLBK**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-31ETT/VP-R O6**
Gain	**1.02 (0.07dB)** Calculated
Circularity	**+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.985	72	0.994	108	0.994	144	0.985	180	1.000	216	0.985	252	0.994	288	0.994	324	0.985
1	1.000	37	0.986	73	0.994	109	0.995	145	0.985	181	1.000	217	0.986	253	0.994	289	0.995	325	0.985
2	1.000	38	0.986	74	0.993	110	0.996	146	0.984	182	1.000	218	0.986	254	0.993	290	0.996	326	0.984
3	1.000	39	0.987	75	0.992	111	0.997	147	0.984	183	1.000	219	0.987	255	0.992	291	0.997	327	0.984
4	0.999	40	0.988	76	0.991	112	0.997	148	0.984	184	0.999	220	0.988	256	0.991	292	0.997	328	0.984
5	0.999	41	0.989	77	0.990	113	0.998	149	0.984	185	0.999	221	0.989	257	0.990	293	0.998	329	0.984
6	0.998	42	0.989	78	0.989	114	0.998	150	0.984	186	0.998	222	0.989	258	0.989	294	0.998	330	0.984
7	0.998	43	0.990	79	0.989	115	0.999	151	0.984	187	0.998	223	0.990	259	0.989	295	0.999	331	0.984
8	0.997	44	0.991	80	0.988	116	0.999	152	0.984	188	0.997	224	0.991	260	0.988	296	0.999	332	0.984
9	0.997	45	0.992	81	0.987	117	1.000	153	0.984	189	0.997	225	0.992	261	0.987	297	1.000	333	0.984
10	0.996	46	0.993	82	0.986	118	1.000	154	0.984	190	0.996	226	0.993	262	0.986	298	1.000	334	0.984
11	0.995	47	0.994	83	0.986	119	1.000	155	0.985	191	0.995	227	0.994	263	0.986	299	1.000	335	0.985
12	0.994	48	0.994	84	0.985	120	1.000	156	0.985	192	0.994	228	0.994	264	0.985	300	1.000	336	0.985
13	0.994	49	0.995	85	0.985	121	1.000	157	0.986	193	0.994	229	0.995	265	0.985	301	1.000	337	0.986
14	0.993	50	0.996	86	0.984	122	1.000	158	0.986	194	0.993	230	0.996	266	0.984	302	1.000	338	0.986
15	0.992	51	0.997	87	0.984	123	1.000	159	0.987	195	0.992	231	0.997	267	0.984	303	1.000	339	0.987
16	0.991	52	0.997	88	0.984	124	0.999	160	0.988	196	0.991	232	0.997	268	0.984	304	0.999	340	0.988
17	0.990	53	0.998	89	0.984	125	0.999	161	0.989	197	0.990	233	0.998	269	0.984	305	0.999	341	0.989
18	0.989	54	0.998	90	0.984	126	0.998	162	0.989	198	0.989	234	0.998	270	0.984	306	0.998	342	0.989
19	0.989	55	0.999	91	0.984	127	0.998	163	0.990	199	0.989	235	0.999	271	0.984	307	0.998	343	0.990
20	0.988	56	0.999	92	0.984	128	0.997	164	0.991	200	0.988	236	0.999	272	0.984	308	0.997	344	0.991
21	0.987	57	1.000	93	0.984	129	0.997	165	0.992	201	0.987	237	1.000	273	0.984	309	0.997	345	0.992
22	0.986	58	1.000	94	0.984	130	0.996	166	0.993	202	0.986	238	1.000	274	0.984	310	0.996	346	0.993
23	0.986	59	1.000	95	0.985	131	0.995	167	0.994	203	0.986	239	1.000	275	0.985	311	0.995	347	0.994
24	0.985	60	1.000	96	0.985	132	0.994	168	0.994	204	0.985	240	1.000	276	0.985	312	0.994	348	0.994
25	0.985	61	1.000	97	0.986	133	0.994	169	0.995	205	0.985	241	1.000	277	0.986	313	0.994	349	0.995
26	0.984	62	1.000	98	0.986	134	0.993	170	0.996	206	0.984	242	1.000	278	0.986	314	0.993	350	0.996
27	0.984	63	1.000	99	0.987	135	0.992	171	0.997	207	0.984	243	1.000	279	0.987	315	0.992	351	0.997
28	0.984	64	0.999	100	0.988	136	0.991	172	0.997	208	0.984	244	0.999	280	0.988	316	0.991	352	0.997
29	0.984	65	0.999	101	0.989	137	0.990	173	0.998	209	0.984	245	0.999	281	0.989	317	0.990	353	0.998
30	0.984	66	0.998	102	0.989	138	0.989	174	0.998	210	0.984	246	0.998	282	0.989	318	0.989	354	0.998
31	0.984	67	0.998	103	0.990	139	0.989	175	0.999	211	0.984	247	0.998	283	0.990	319	0.989	355	0.999
32	0.984	68	0.997	104	0.991	140	0.988	176	0.999	212	0.984	248	0.997	284	0.991	320	0.988	356	0.999
33	0.984	69	0.997	105	0.992	141	0.987	177	1.000	213	0.984	249	0.997	285	0.992	321	0.987	357	1.000
34	0.984	70	0.996	106	0.993	142	0.986	178	1.000	214	0.984	250	0.996	286	0.993	322	0.986	358	1.000
35	0.985	71	0.995	107	0.994	143	0.986	179	1.000	215	0.985	251	0.995	287	0.994	323	0.986	359	1.000

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AZIMUTH PATTERN
Vertical Polarization

Proposal No.	**C-71193-3**
Date	**23-May-19**
Call Letters	**KLBK**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-31ETT/VP-R O6**
Gain	**1.13 (0.53dB)**
	Calculated
Circularity	**+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.527	36	0.470	72	0.505	108	0.505	144	0.470	180	0.527	216	0.470	252	0.505	288	0.505	324	0.470
1	0.527	37	0.472	73	0.502	109	0.508	145	0.468	181	0.527	217	0.472	253	0.502	289	0.508	325	0.468
2	0.527	38	0.475	74	0.499	110	0.511	146	0.467	182	0.527	218	0.475	254	0.499	290	0.511	326	0.467
3	0.526	39	0.477	75	0.496	111	0.514	147	0.466	183	0.526	219	0.477	255	0.496	291	0.514	327	0.466
4	0.524	40	0.480	76	0.492	112	0.517	148	0.465	184	0.524	220	0.480	256	0.492	292	0.517	328	0.465
5	0.523	41	0.483	77	0.489	113	0.519	149	0.464	185	0.523	221	0.483	257	0.489	293	0.519	329	0.464
6	0.521	42	0.486	78	0.486	114	0.521	150	0.464	186	0.521	222	0.486	258	0.486	294	0.521	330	0.464
7	0.519	43	0.489	79	0.483	115	0.523	151	0.464	187	0.519	223	0.489	259	0.483	295	0.523	331	0.464
8	0.517	44	0.492	80	0.480	116	0.524	152	0.465	188	0.517	224	0.492	260	0.480	296	0.524	332	0.465
9	0.514	45	0.496	81	0.477	117	0.526	153	0.466	189	0.514	225	0.496	261	0.477	297	0.526	333	0.466
10	0.511	46	0.499	82	0.475	118	0.527	154	0.467	190	0.511	226	0.499	262	0.475	298	0.527	334	0.467
11	0.508	47	0.502	83	0.472	119	0.527	155	0.468	191	0.508	227	0.502	263	0.472	299	0.527	335	0.468
12	0.505	48	0.505	84	0.470	120	0.527	156	0.470	192	0.505	228	0.505	264	0.470	300	0.527	336	0.470
13	0.502	49	0.508	85	0.468	121	0.527	157	0.472	193	0.502	229	0.508	265	0.468	301	0.527	337	0.472
14	0.499	50	0.511	86	0.467	122	0.527	158	0.475	194	0.499	230	0.511	266	0.467	302	0.527	338	0.475
15	0.496	51	0.514	87	0.466	123	0.526	159	0.477	195	0.496	231	0.514	267	0.466	303	0.526	339	0.477
16	0.492	52	0.517	88	0.465	124	0.524	160	0.480	196	0.492	232	0.517	268	0.465	304	0.524	340	0.480
17	0.489	53	0.519	89	0.464	125	0.523	161	0.483	197	0.489	233	0.519	269	0.464	305	0.523	341	0.483
18	0.486	54	0.521	90	0.464	126	0.521	162	0.486	198	0.486	234	0.521	270	0.464	306	0.521	342	0.486
19	0.483	55	0.523	91	0.464	127	0.519	163	0.489	199	0.483	235	0.523	271	0.464	307	0.519	343	0.489
20	0.480	56	0.524	92	0.465	128	0.517	164	0.492	200	0.480	236	0.524	272	0.465	308	0.517	344	0.492
21	0.477	57	0.526	93	0.466	129	0.514	165	0.496	201	0.477	237	0.526	273	0.466	309	0.514	345	0.496
22	0.475	58	0.527	94	0.467	130	0.511	166	0.499	202	0.475	238	0.527	274	0.467	310	0.511	346	0.499
23	0.472	59	0.527	95	0.468	131	0.508	167	0.502	203	0.472	239	0.527	275	0.468	311	0.508	347	0.502
24	0.470	60	0.527	96	0.470	132	0.505	168	0.505	204	0.470	240	0.527	276	0.470	312	0.505	348	0.505
25	0.468	61	0.527	97	0.472	133	0.502	169	0.508	205	0.468	241	0.527	277	0.472	313	0.502	349	0.508
26	0.467	62	0.527	98	0.475	134	0.499	170	0.511	206	0.467	242	0.527	278	0.475	314	0.499	350	0.511
27	0.466	63	0.526	99	0.477	135	0.496	171	0.514	207	0.466	243	0.526	279	0.477	315	0.496	351	0.514
28	0.465	64	0.524	100	0.480	136	0.492	172	0.517	208	0.465	244	0.524	280	0.480	316	0.492	352	0.517
29	0.464	65	0.523	101	0.483	137	0.489	173	0.519	209	0.464	245	0.523	281	0.483	317	0.489	353	0.519
30	0.464	66	0.521	102	0.486	138	0.486	174	0.521	210	0.464	246	0.521	282	0.486	318	0.486	354	0.521
31	0.464	67	0.519	103	0.489	139	0.483	175	0.523	211	0.464	247	0.519	283	0.489	319	0.483	355	0.523
32	0.465	68	0.517	104	0.492	140	0.480	176	0.524	212	0.465	248	0.517	284	0.492	320	0.480	356	0.524
33	0.466	69	0.514	105	0.496	141	0.477	177	0.526	213	0.466	249	0.514	285	0.496	321	0.477	357	0.526
34	0.467	70	0.511	106	0.499	142	0.475	178	0.527	214	0.467	250	0.511	286	0.499	322	0.475	358	0.527
35	0.468	71	0.508	107	0.502	143	0.472	179	0.527	215	0.468	251	0.508	287	0.502	323	0.472	359	0.527

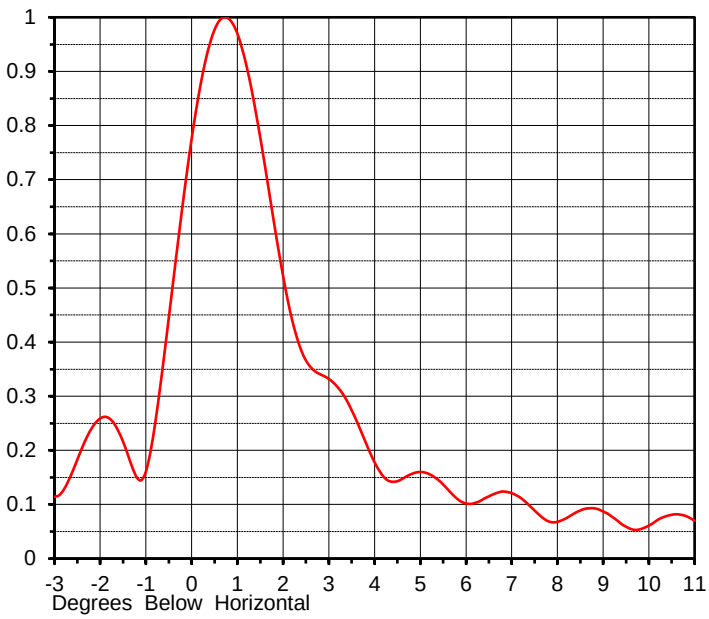
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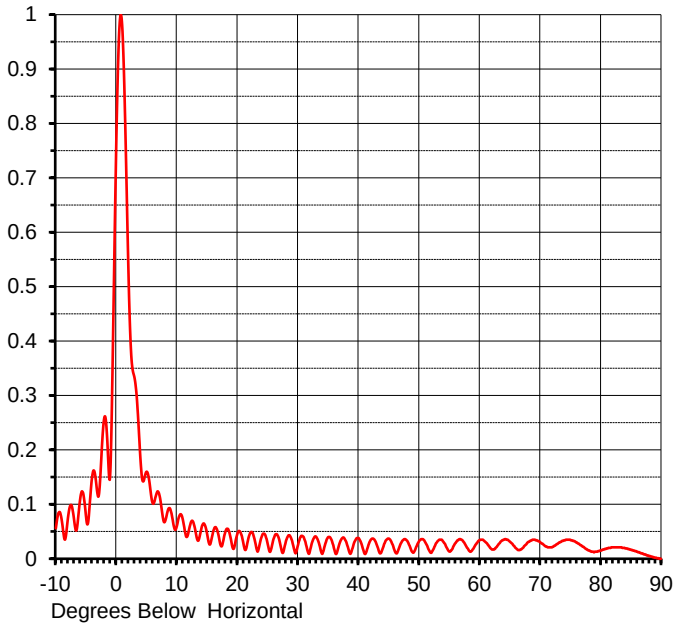
ELEVATION PATTERN

Proposal No.	**C-71193-3**
Date	**23-May-19**
Call Letters	**KLBK**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-31ETT/VP-R O6**

RMS Directivity at Main Lobe	**27.5 (14.39 dB)**	Beam Tilt	**0.75 deg**
RMS Directivity at Horizontal	**16.6 (12.20 dB)**	Pattern Number	**31E275075**

Calculated

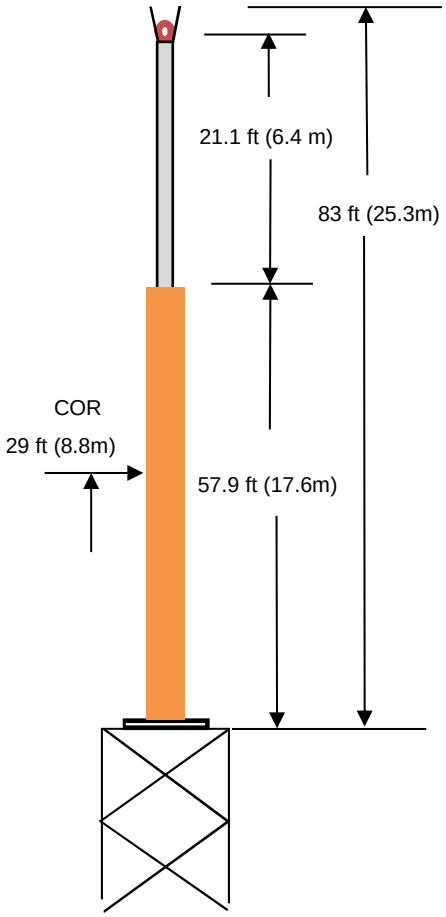




Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.056	10.0	0.061	30.0	0.026	50.0	0.033	70.0	0.030
-9.0	0.069	11.0	0.070	31.0	0.037	51.0	0.030	71.0	0.022
-8.0	0.075	12.0	0.054	32.0	0.017	52.0	0.011	72.0	0.022
-7.0	0.073	13.0	0.054	33.0	0.040	53.0	0.032	73.0	0.029
-6.0	0.108	14.0	0.054	34.0	0.009	54.0	0.031	74.0	0.034
-5.0	0.076	15.0	0.044	35.0	0.040	55.0	0.013	75.0	0.034
-4.0	0.151	16.0	0.051	36.0	0.016	56.0	0.029	76.0	0.030
-3.0	0.114	17.0	0.035	37.0	0.033	57.0	0.035	77.0	0.022
-2.0	0.259	18.0	0.050	38.0	0.029	58.0	0.019	78.0	0.015
-1.0	0.161	19.0	0.030	39.0	0.020	59.0	0.020	79.0	0.013
0.0	0.776	20.0	0.047	40.0	0.038	60.0	0.034	80.0	0.015
1.0	0.970	21.0	0.026	41.0	0.009	61.0	0.030	81.0	0.019
2.0	0.522	22.0	0.045	42.0	0.035	62.0	0.017	82.0	0.021
3.0	0.332	23.0	0.026	43.0	0.025	63.0	0.025	83.0	0.021
4.0	0.178	24.0	0.041	44.0	0.020	64.0	0.035	84.0	0.019
5.0	0.160	25.0	0.026	45.0	0.037	65.0	0.031	85.0	0.016
6.0	0.102	26.0	0.038	46.0	0.013	66.0	0.019	86.0	0.013
7.0	0.121	27.0	0.029	47.0	0.029	67.0	0.019	87.0	0.009
8.0	0.068	28.0	0.033	48.0	0.033	68.0	0.031	88.0	0.005
9.0	0.087	29.0	0.033	49.0	0.011	69.0	0.035	89.0	0.002
								90.0	0.000

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MECHANICAL SPECIFICATIONS



Proposal No.	**C-71193-3**
Date	**23-May-19**
Call Letters	**KLBK**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-31ETT/VP-R O6**

Preliminary Specifications

Bottom of Stack

With ice TIA-222-G

Height AGL(z)	900 ft (274.3 m)
Basic Wind Speed	90 m/h (144.8 km/h)
Structure Class	III
Exposure Category	D
Topography Category	1
Design Ice	0.75 in t_{iz} = 2.40 in
Wind Speed w/Ice	40 m/h (64.4 km/h)

Mechanical Specifications		**without ice**	**with ice**	**full stack**	**full stack with ice**
Height with Lightning Protector	H4	ft (m)		83 ft (25.3m)	
Height less Lightning Protector	H2	57.9 ft (17.6m)		79 ft (24.1m)	
Height of Center of Radiation	H3	29 ft (8.8m)		29 ft (8.8m)	
Effective Projected Area	$(EPA)_S$	68.8 ft² (6.4m²)	184.6 ft² (17.1m²)	72.9 ft² (6.8m²)	195.3 ft² (18.1m²)
Moment Arm	D1	30.4 ft (9.3m)	31.5 ft (9.6m)	36.8 ft (11.2m)	40.3 ft (12.3m)
Weight	W	12000 lb (5.4t)	17300 lb (7.8t)	13000 lb (5.9t)	19050 lb (8.6t)

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

Prepared by: JBC **Date:** 30-Jul-18 **ME:** **EE:**

Rev. No.3 by: JBC **Date:** 23-May-19

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Summary

Proposal No.	**C-71193-3**
Date	**23-May-19**
Call Letters	**KLBK**
Channel	**31**
Frequency	**575 MHz**
Antenna Type	**TFU-31ETT/VP-R O6**

Antenna

	Hpol		Vpol	
ERP:	**400 kW**	**(26.02 dBk)**	**100.0 kW**	**(20.00 dBk)**
RMS Gain*	22.00	(13.42 dB)	5.50	(7.40 dB)

Antenna Input Power

18.2 kW (12.60 dBk)

Transmission Line

Type:	**Rigid**	Attenuation:	**(1.07 dB)**
Size:	**6-1/8"**	Efficiency:	**78.2%**
Impedance:	**75 Ohm**		
Length:	**914 ft**	**278.6 m**	

Transmitter Output

23.3 kW (13.67 dBk)

Transmitter filter losses not included

* Directivity and Gain are with respect to half wave dipole. The gain includes feed system losses

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