

KSTS Application for Post-Repack Construction Permit

July 9, 2017

Engineering Exhibit

The purpose of this application is to request authority to construct a post-repack broadcast facility for operation on channel 19 for KSTS, San Jose, CA, Facility ID 64987, licensed to NBC Telemundo License LLC.

This application specifies a top mount antenna location at a radiation center height of 922.3m AMSL using an antenna in the same location as the current KSTS Channel 49 antenna. The TVStudy computed HAAT of 703m is significantly larger than the baseline database HAAT of 688m at the same radiation center. The effective radiated power had to be reduced to 120 kW to stay within a 1% extension of the replication contour. A TVStudy 2.2.2 analysis showed the contour of the proposed facility at 120 kW and radiation center of 922.3m AMSL will not exceed the authorized post-repack contour by more than 1% in any direction and will not cause new interference above 0.5% to any other station

Antenna System

The proposed facility will use a directional antenna with elliptical polarization and a combination of mechanical beam tilt of 0.4 degrees at 35 degrees from North and an electrical beam tilt of 0.75 degrees. The proposed vertically polarized ERP is 51.32 kW. The vertically polarized ERP will not exceed the horizontally polarized ERP (120.0 kW) in the main beam in any direction. Plots and tabulation of main beam azimuth and elevation data, plots and tabulation of horizontal plane azimuth data are attached. A table showing the depression angle to the radio horizon at radials around the antenna with calculated relative field and ERP in kilowatts and dBk at the horizontal plane and at the radio horizon as required by FCC Rules Section 73.625(c) is attached.

Environmental Statement

The requested facility will be installed on top an existing tower (ASR# 1044718). The proposed top mount antenna will not change the height of the tower.

Due to different elevation patterns for the two polarities, RF power density from the facility was calculated separately for horizontally and vertically polarized signals with the added mechanical tilt of 0.4 degrees using the procedures in FCC Office of Engineering and Technology Bulletin 65. The results were added to obtain the maximum power density for the combined polarities anywhere on the ground. The maximum power density around the site, allowing for 20m building height and terrain variation, and 2m person height, is calculated to be 0.002773 mW/cm² or 0.83% of the FCC maximum permissible exposure level of 0.335 mW/cm² at 503 MHz for an uncontrolled environment. At full power, RF power density from the proposed facility is calculated to be below occupational exposure levels in the main beam of the antenna at distances greater than 59m and below uncontrolled environment exposure levels at distances greater than 131m. There are towers within these distances but they are under 200' in height and the calculated maximum power density on these towers at maximum height is under 5% of the exposure limit for an uncontrolled environment. Access to the site is secured with a fence and locked gates. KSTS will coordinate with other users at the site and reduce power or shut off as required to protect workers on this tower from RF exposure above the limits specified in FCC rule §1.1310.

(continued on next page)

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Broadcast Facility

The facility proposed in this application provides similar coverage to the current authorized facility and matches, within the tolerances allowed, the post-repack facility assigned by the FCC.

Doug Lung,
July 9, 2017

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AZIMUTH PATTERN (H-Pol HORIZONTAL PLANE): ERI ATW20H3-ETCX-19H

Main beam axis of symmetry: 240° true

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak)	1.65	(2.17 dBd)
Maximum Main Beam H-Pol. Effective Radiated Power (ERP):	120.0 kW	20.79 dBk
Maximum Main Beam V-Pol. Effective Radiated Power (ERP):	51.32 kW	27.10 dBk

Tabulation of Horizontal Plane Azimuth Pattern (Horizontal polarization)

Angle	RF	dBk	ERP kW
0	0.517	15.1	32.1
10	0.370	12.2	16.4
20	0.239	8.4	6.9
30	0.143	3.9	2.5
40	0.111	1.7	1.5
50	0.128	2.9	2.0
60	0.159	4.8	3.0
70	0.165	5.1	3.3
80	0.185	6.1	4.1
90	0.244	8.5	7.1
100	0.287	9.9	9.9
110	0.374	12.2	16.8
120	0.507	14.9	30.8
130	0.663	17.2	52.7
140	0.801	18.9	77.0
150	0.906	19.9	98.5
160	0.968	20.5	112.4
170	0.996	20.8	119.0
180	0.995	20.7	118.8
190	0.982	20.6	115.7
200	0.967	20.5	112.2
210	0.970	20.5	112.9
220	0.978	20.6	114.8
230	0.982	20.6	115.7
240	0.983	20.6	116.0
250	0.971	20.5	113.1
260	0.955	20.4	109.4
270	0.943	20.3	106.7
280	0.937	20.2	105.4
290	0.939	20.2	105.8
300	0.944	20.3	106.9
310	0.937	20.2	105.4
320	0.903	19.9	97.8
330	0.858	19.5	88.3
340	0.767	18.5	70.6
350	0.654	17.1	51.3

Maximum

Angle	RF	dBk	ERP kW
67	0.166	5.2	3.3
174	1.000	20.8	120.0
235	0.985	20.7	116.4
301	0.945	20.3	107.2

Minimum

Angle	RF	dBk	ERP kW
41	0.110	1.6	1.5
71	0.164	5.1	3.2
204	0.965	20.5	111.7
286	0.935	20.2	104.9

AZIMUTH PATTERN (H-Pol HORIZONTAL PLANE): ERI ATW20H3-ETCX-19H

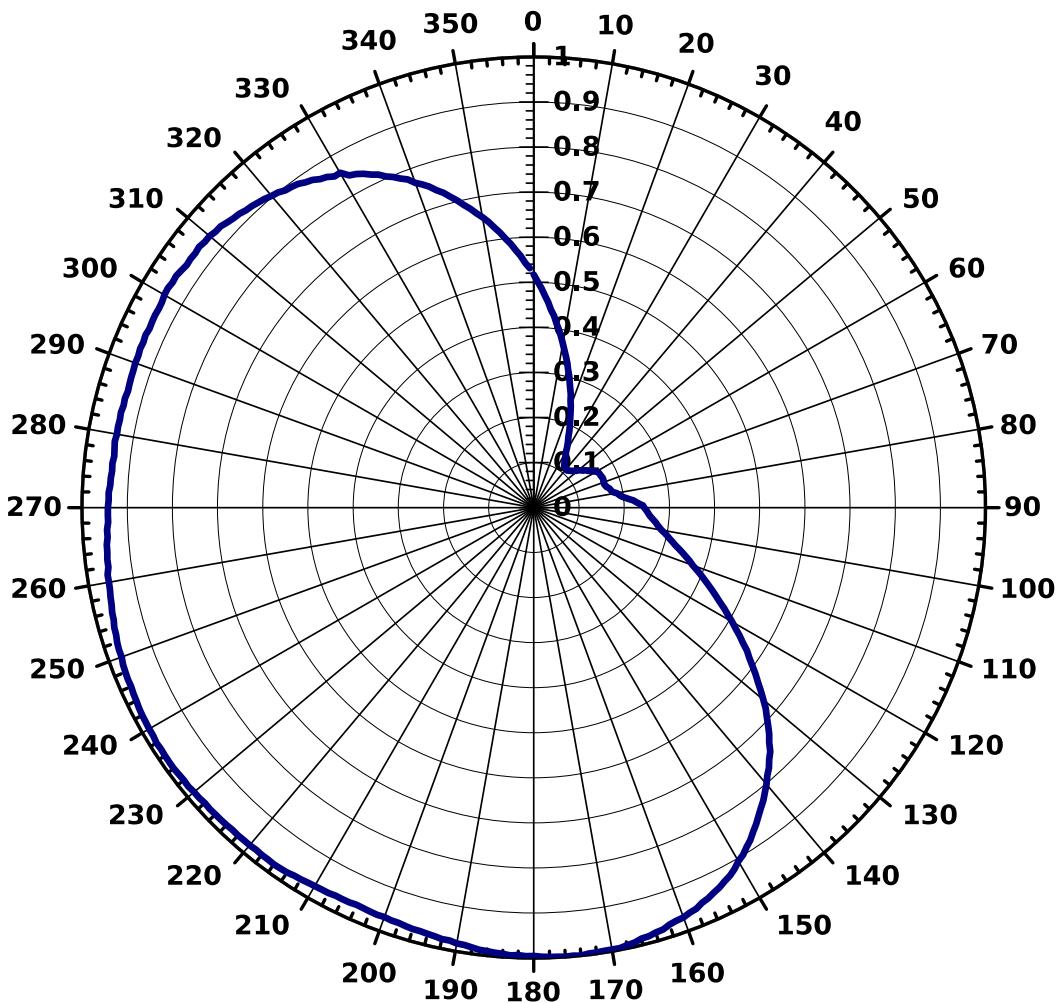
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Maximum Main Beam H-Pol. Effective Radiated Power (ERP): 120.0 kW 20.79 dBk

Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 51.32 kW 27.10 dBk

AZIMUTH PATTERN RELATIVE FIELD – HORIZONTAL PLANE

Blue plot shows horizontal plane azimuth pattern relative field at horizontal polarization

AZIMUTH PATTERN (H-Pol HORIZONTAL PLANE): ERI ATW20H3-ETCX-19H

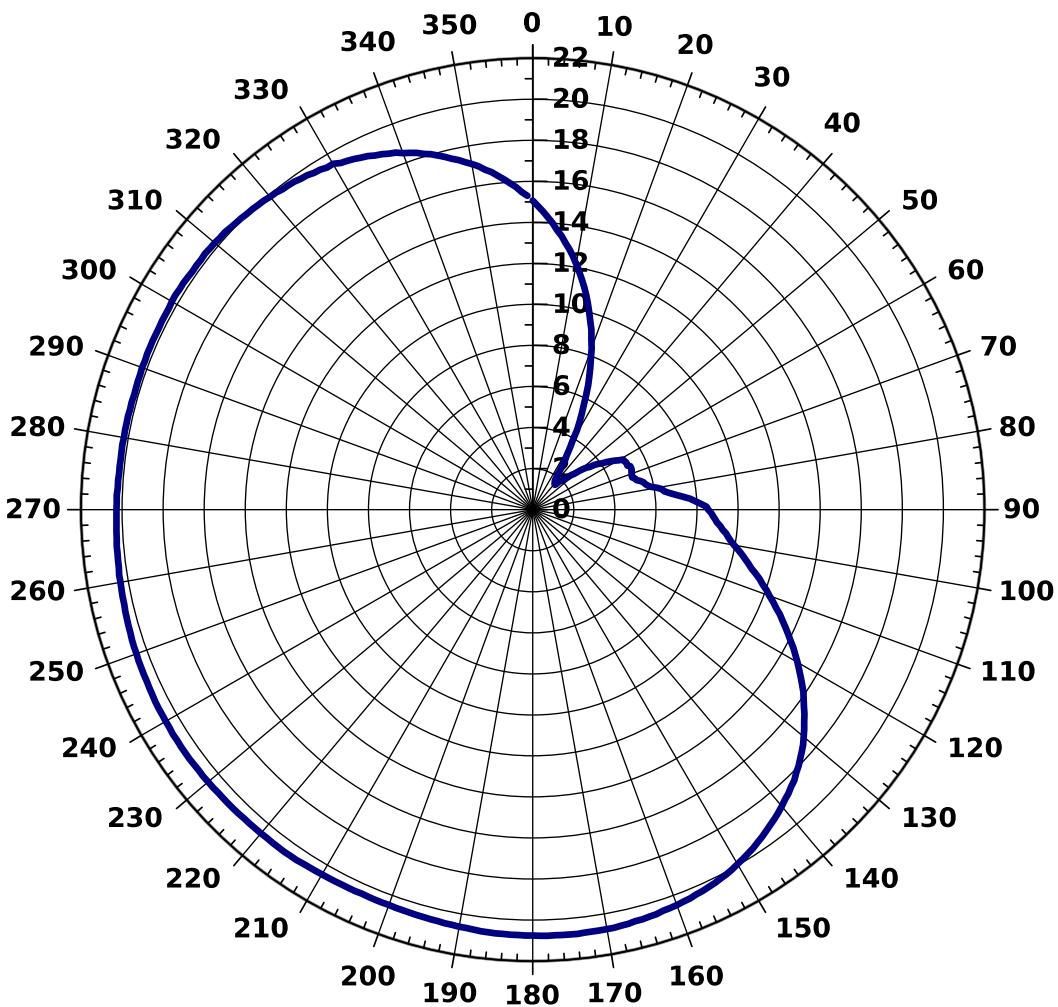
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Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 51.32 kW 27.10 dBk

AZIMUTH PATTERN ERP (dBk) – HORIZONTAL PLANE

Blue plot shows effective radiated power (dBk) at horizontal polarization

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AZIMUTH PATTERN (H-Pol MAIN BEAM): ERI ATW20H3-ETCX-19H

Main beam axis of symmetry: 240° true

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak)	1.65	(2.17 dBd)
Maximum Main Beam H-Pol. Effective Radiated Power (ERP):	120.0 kW	20.79 dBk
Maximum Main Beam V-Pol. Effective Radiated Power (ERP):	51.32 kW	27.10 dBk

Tabulation of Main Beam Azimuth Pattern (Horizontal polarization)

Angle	RF	dBk	ERP kW
0	0.604	16.41	43.8
10	0.443	13.72	23.5
20	0.292	10.10	10.2
30	0.180	5.90	3.9
40	0.139	3.65	2.3
50	0.157	4.71	3.0
60	0.191	6.41	4.4
70	0.193	6.50	4.5
80	0.212	7.32	5.4
90	0.276	9.61	9.1
100	0.318	10.84	12.1
110	0.407	12.98	19.9
120	0.541	15.46	35.1
130	0.698	17.67	58.5
140	0.832	19.19	83.1
150	0.931	20.17	104.0
160	0.981	20.63	115.5
170	0.998	20.77	119.5
180	0.987	20.68	116.9
190	0.965	20.48	111.7
200	0.944	20.29	106.9
210	0.939	20.25	105.8
220	0.947	20.32	107.6
230	0.958	20.42	110.1
240	0.966	20.49	112.0
250	0.963	20.46	111.3
260	0.957	20.41	109.9
270	0.956	20.40	109.7
280	0.963	20.46	111.3
290	0.975	20.57	114.1
300	0.994	20.74	118.6
310	1.000	20.79	120.0
320	0.983	20.64	116.0
330	0.950	20.35	108.3
340	0.866	19.54	90.0
350	0.751	18.30	67.7

Maximum

Angle	RF	dBk	ERP kW
170	0.998	20.77	119.5
240	0.966	20.49	112.0
310	1.000	20.79	120.0

Minimum

Angle	RF	dBk	ERP kW
41	0.138	3.59	2.3
207	0.939	20.25	105.8
267	0.956	20.40	109.7

AZIMUTH PATTERN (MAIN BEAM): ERI ATW20H3-ETCX-19H

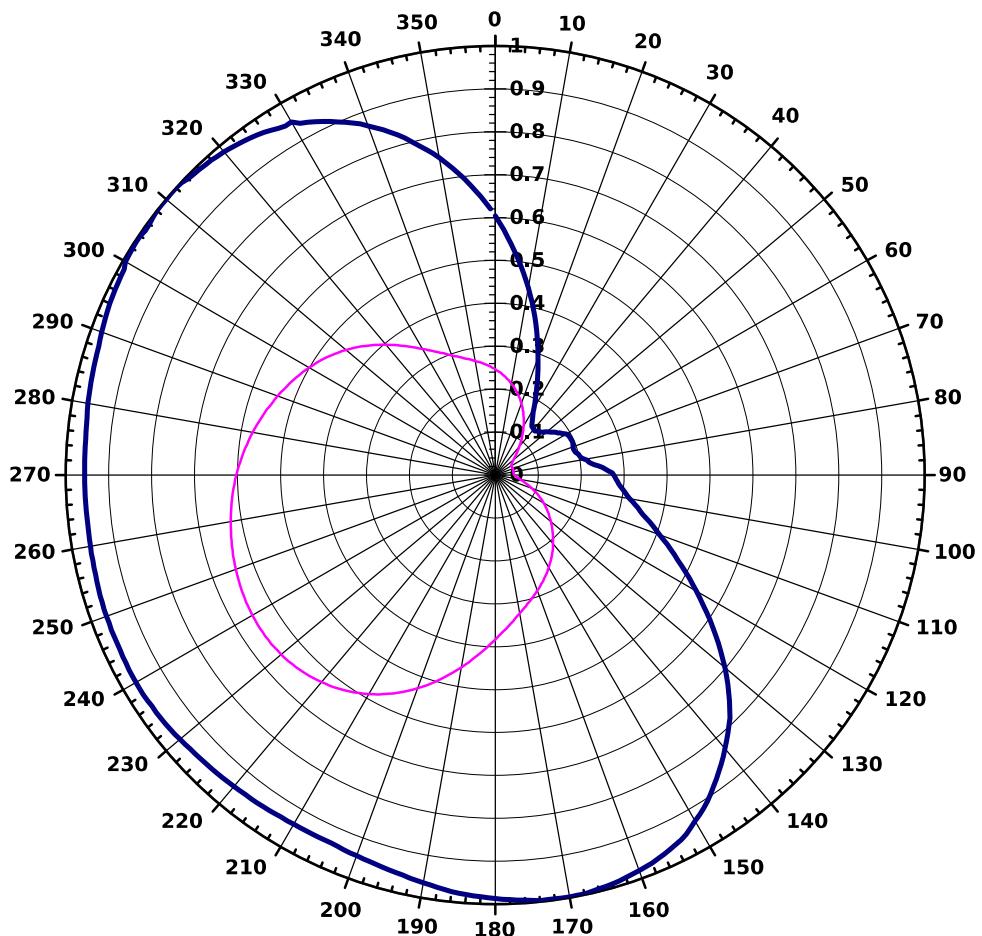
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AZIMUTH PATTERN MAIN BEAM RELATIVE FIELD

Blue plot shows azimuth pattern relative field for horizontal polarization
Red plot shows azimuth pattern relative field for vertical polarization

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AZIMUTH PATTERN (MAIN BEAM): ERI ATW20H3-ETCX-19H

Main beam axis of symmetry: 240° true

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Main Beam Calculated Max. H-pol Azimuth Pattern Gain (peak)

1.65 (2.17 dBd)

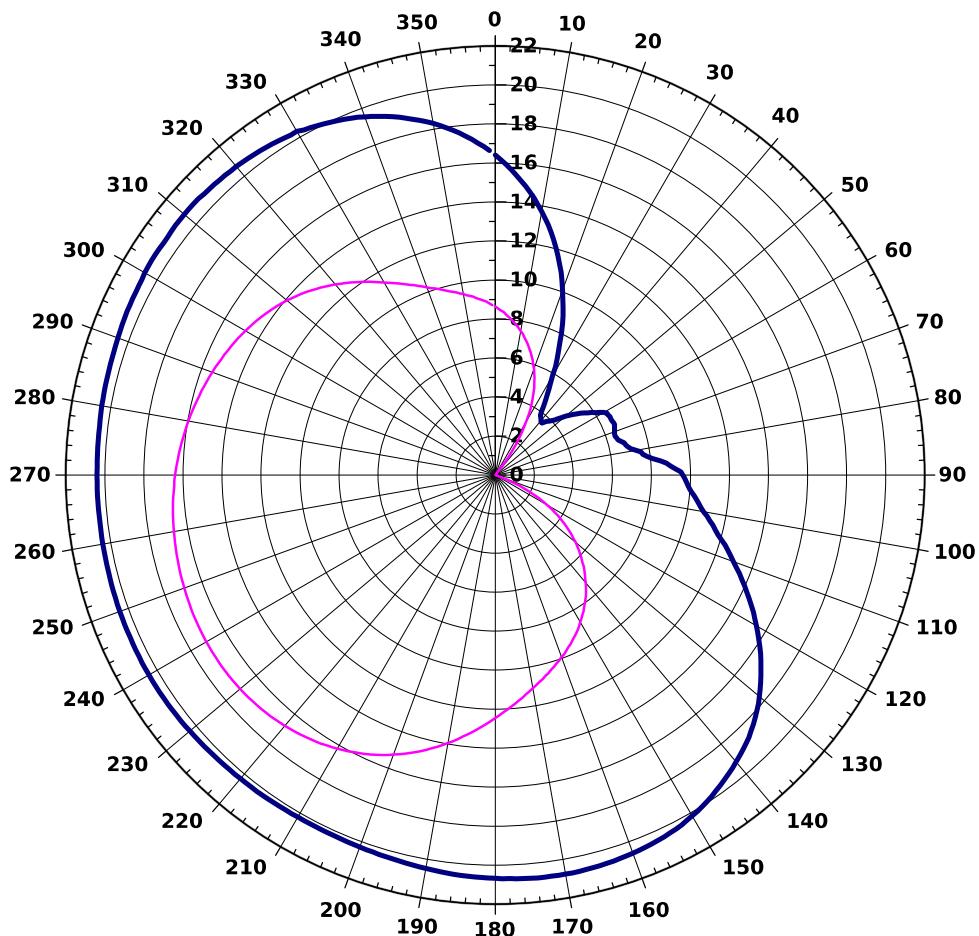
Maximum Main Beam H-Pol. Effective Radiated Power (ERP):

120.0 kW 20.79 dBk

Maximum Main Beam V-Pol. Effective Radiated Power (ERP):

51.32 kW 27.10 dBk

AZIMUTH PATTERN MAIN BEAM ERP (dBk)



Blue plot shows effective radiated power (dBk) for horizontal polarization
Red plot shows effective radiated power (dBk) for vertical polarization

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ELEVATION PATTERN (MAIN BEAM) ERI ATW20H3-ETCX-19H

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

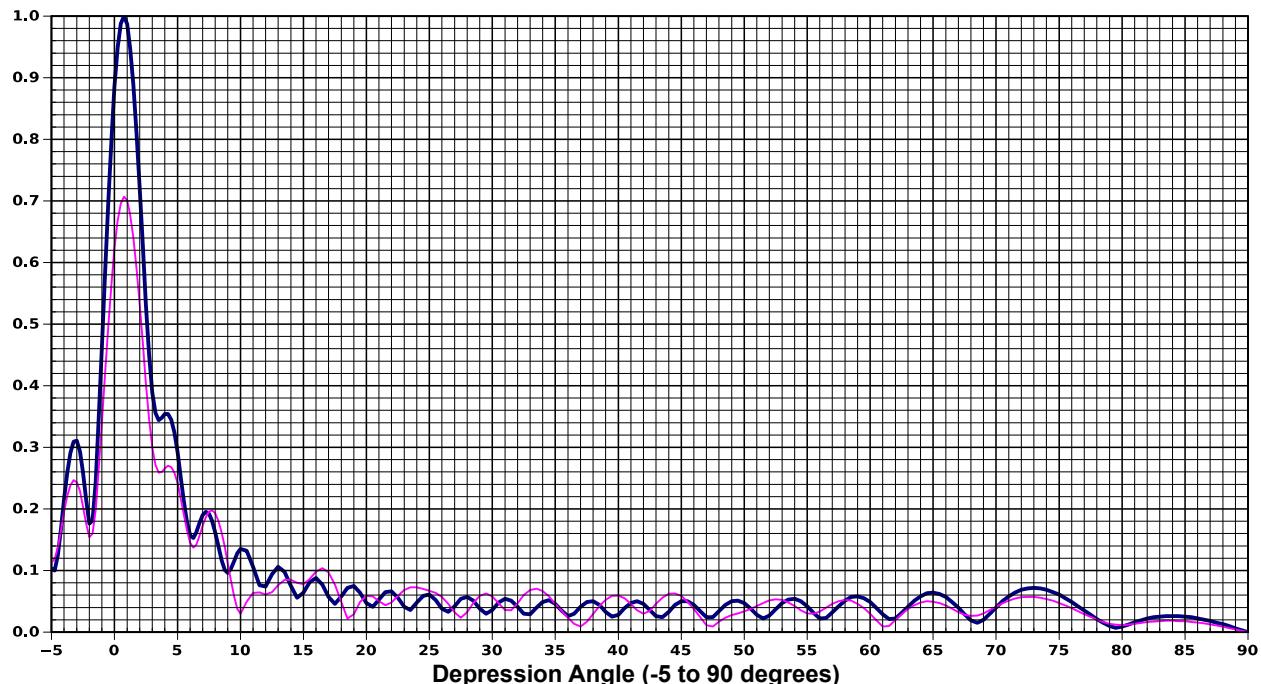
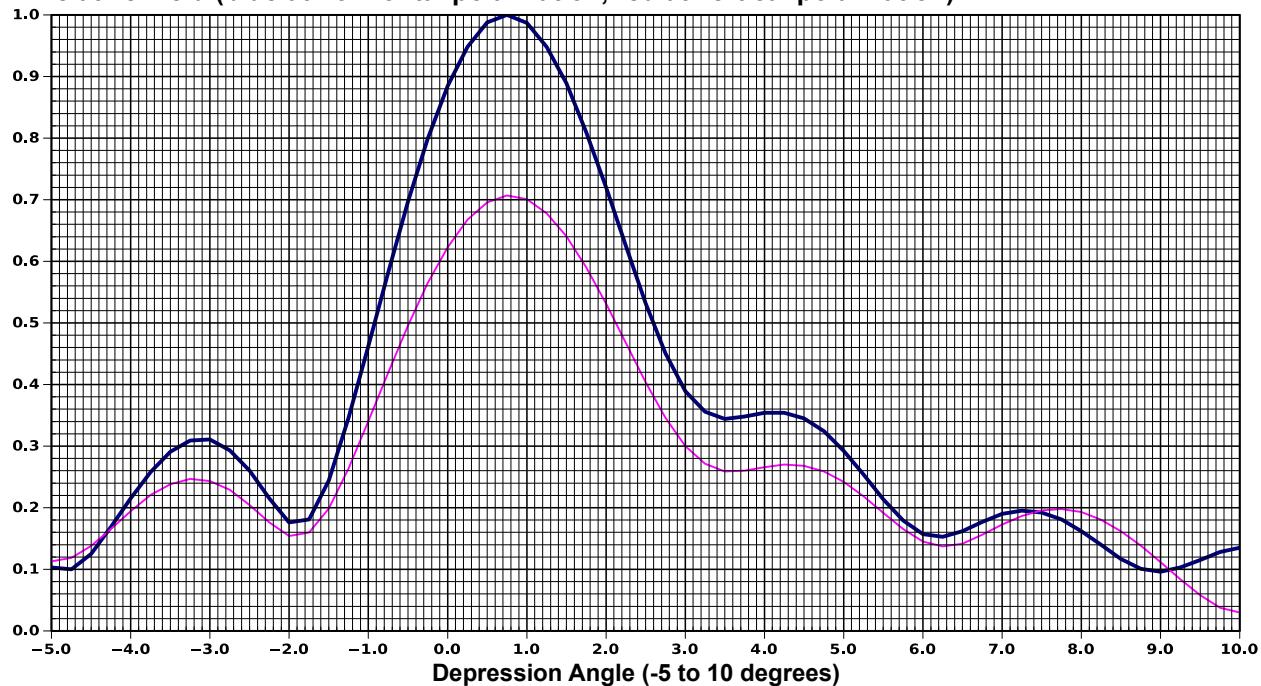
Calculated Maximum Elevation Gain (Horizontal polarization): 20.00 13.01 dBd

RMS Gain at Horizontal (Horizontal polarization): 15.66 11.95 dBd

Maximum Main Beam H-Pol. Effective Radiated Power (ERP): 120.0 kW 20.79 dBk

Maximum Main Beam V-Pol. Effective Radiated Power (ERP): 51.32 kW 27.10 dBk

Relative Field (blue at horizontal polarization, red at vertical polarization)



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ELEVATION PATTERN (MAIN BEAM) ERI ATW20H3-ETCX-19H

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

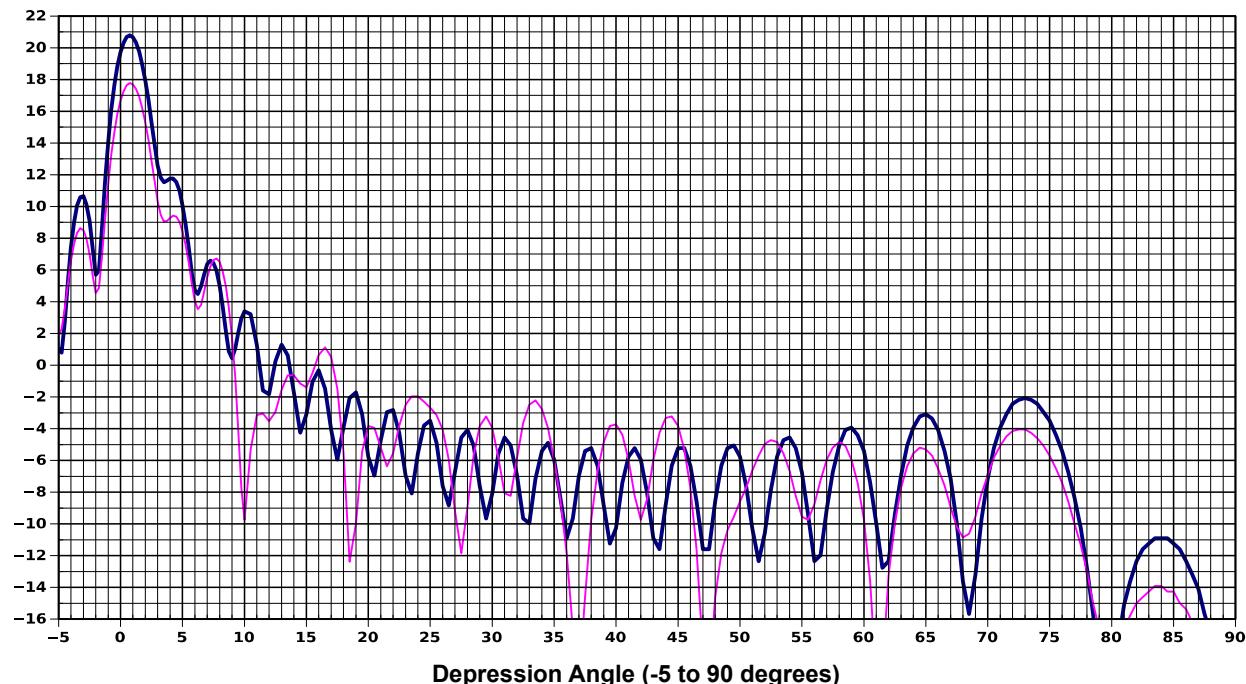
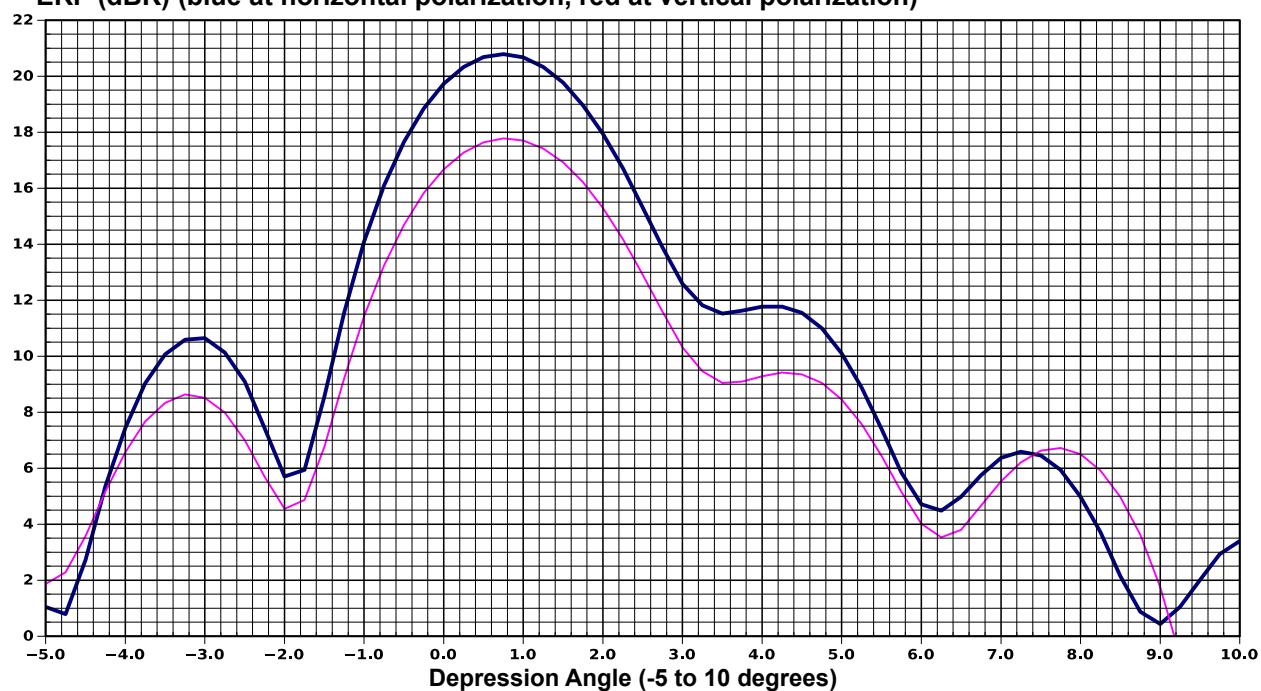
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ERP (dBK) (blue at horizontal polarization, red at vertical polarization)



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ELEVATION PATTERN (MAIN BEAM) ERI ATW20H3-ETCX-19H

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Maximum Main Beam V-Pol. Effective Radiated Power (ERP):	51.32 kW	27.10 dBk

Elevation pattern at horizontal polarization at main beam (without mechanical tilt)

Angle	Field												
-5.00	0.103	3.75	0.348	15.0	0.064	32.5	0.030	50.0	0.047	67.5	0.029	85.0	0.025
-4.75	0.100	4.00	0.354	15.5	0.081	33.0	0.029	50.5	0.038	68.0	0.019	85.5	0.024
-4.50	0.125	4.25	0.354	16.0	0.088	33.5	0.040	51.0	0.028	68.5	0.015	86.0	0.022
-4.25	0.169	4.50	0.345	16.5	0.077	34.0	0.049	51.5	0.022	69.0	0.020	86.5	0.020
-4.00	0.215	4.75	0.324	17.0	0.057	34.5	0.052	52.0	0.027	69.5	0.030	87.0	0.018
-3.75	0.258	5.00	0.292	17.5	0.046	35.0	0.046	52.5	0.037	70.0	0.040	87.5	0.015
-3.50	0.291	5.25	0.254	18.0	0.058	35.5	0.035	53.0	0.047	70.5	0.050	88.0	0.013
-3.25	0.309	5.50	0.214	18.5	0.072	36.0	0.026	53.5	0.053	71.0	0.058	88.5	0.010
-3.00	0.311	5.75	0.179	19.0	0.075	36.5	0.030	54.0	0.054	71.5	0.064	89.0	0.006
-2.75	0.293	6.00	0.157	19.5	0.064	37.0	0.041	54.5	0.050	72.0	0.069	89.5	0.003
-2.50	0.260	6.25	0.153	20.0	0.047	37.5	0.049	55.0	0.042	72.5	0.071	90.0	0.000
-2.25	0.215	6.50	0.162	20.5	0.041	38.0	0.05	55.5	0.031	73.0	0.072		
-2.00	0.176	6.75	0.177	21.0	0.053	38.5	0.044	56.0	0.022	73.5	0.071		
-1.75	0.181	7.00	0.190	21.5	0.065	39.0	0.033	56.5	0.023	74.0	0.069		
-1.50	0.244	7.25	0.195	22.0	0.066	39.5	0.025	57.0	0.032	74.5	0.065		
-1.25	0.346	7.50	0.192	22.5	0.056	40.0	0.028	57.5	0.042	75.0	0.061		
-1.00	0.462	7.75	0.181	23.0	0.041	40.5	0.039	58.0	0.051	75.5	0.055		
-0.75	0.582	8.00	0.162	23.5	0.036	41.0	0.047	58.5	0.057	76.0	0.049		
-0.50	0.697	8.25	0.140	24.0	0.048	41.5	0.050	59.0	0.058	76.5	0.042		
-0.25	0.799	8.50	0.117	24.5	0.059	42.0	0.046	59.5	0.055	77.0	0.035		
0.00	0.885	8.75	0.101	25.0	0.061	42.5	0.036	60.0	0.049	77.5	0.028		
0.25	0.948	9.00	0.096	25.5	0.052	43.0	0.026	60.5	0.039	78.0	0.021		
0.50	0.988	9.25	0.103	26.0	0.038	43.5	0.024	61.0	0.029	78.5	0.015		
0.75	1.000	9.50	0.115	26.5	0.033	44.0	0.033	61.5	0.021	79.0	0.010		
1.00	0.987	9.75	0.128	27.0	0.042	44.5	0.044	62.0	0.022	79.5	0.007		
1.25	0.948	10.0	0.135	27.5	0.054	45.0	0.050	62.5	0.031	80.0	0.009		
1.50	0.889	10.5	0.132	28.0	0.057	45.5	0.050	63.0	0.041	80.5	0.012		
1.75	0.810	11.0	0.106	28.5	0.051	46.0	0.044	63.5	0.051	81.0	0.016		
2.00	0.720	11.5	0.076	29.0	0.038	46.5	0.034	64.0	0.058	81.5	0.019		
2.25	0.625	12.0	0.074	29.5	0.030	47.0	0.024	64.5	0.063	82.0	0.022		
2.50	0.532	12.5	0.094	30.0	0.036	47.5	0.024	65.0	0.064	82.5	0.024		
2.75	0.451	13.0	0.106	30.5	0.048	48.0	0.034	65.5	0.062	83.0	0.025		
3.00	0.389	13.5	0.098	31.0	0.054	48.5	0.044	66.0	0.057	83.5	0.026		
3.25	0.356	14.0	0.075	31.5	0.051	49.0	0.050	66.5	0.049	84.0	0.026		
3.50	0.344	14.5	0.056	32.0	0.041	49.5	0.051	67.0	0.040	84.5	0.026		

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CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

0 to 44 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
0	765.4	0.77	0.604	0.598	42.9	16.32	0.517	32.1	15.06
1	764.9	0.77	0.588	0.582	40.6	16.08	0.501	30.1	14.79
2	759.4	0.76	0.572	0.565	38.4	15.84	0.487	28.5	14.55
3	755.1	0.76	0.555	0.548	36.1	15.57	0.471	26.6	14.24
4	755.4	0.76	0.539	0.533	34.0	15.32	0.457	25.1	13.99
5	752.6	0.76	0.522	0.515	31.8	15.03	0.440	23.3	13.67
6	748.3	0.76	0.507	0.500	30.0	14.77	0.428	21.9	13.41
7	743.4	0.76	0.491	0.484	28.1	14.48	0.412	20.4	13.09
8	737.2	0.75	0.475	0.467	26.2	14.18	0.399	19.1	12.80
9	729.3	0.75	0.459	0.451	24.4	13.88	0.385	17.8	12.50
10	727.5	0.75	0.443	0.435	22.7	13.56	0.370	16.4	12.15
11	725.0	0.75	0.427	0.419	21.1	13.24	0.356	15.3	11.83
12	721.4	0.74	0.412	0.403	19.5	12.90	0.342	14.1	11.48
13	718.1	0.74	0.396	0.387	18.0	12.56	0.329	13.0	11.13
14	716.4	0.74	0.381	0.372	16.6	12.21	0.315	11.9	10.75
15	718.8	0.74	0.365	0.357	15.3	11.83	0.302	10.9	10.38
16	716.0	0.74	0.350	0.341	14.0	11.46	0.288	9.9	9.97
17	710.1	0.74	0.335	0.327	12.8	11.07	0.275	9.1	9.59
18	707.3	0.74	0.321	0.313	11.8	10.70	0.264	8.4	9.22
19	705.6	0.74	0.306	0.298	10.7	10.27	0.250	7.5	8.75
20	711.8	0.74	0.292	0.284	9.7	9.87	0.239	6.8	8.35
21	712.5	0.74	0.278	0.270	8.8	9.43	0.226	6.1	7.87
22	713.5	0.74	0.266	0.259	8.0	9.04	0.216	5.6	7.49
23	709.1	0.74	0.254	0.246	7.3	8.63	0.205	5.1	7.04
24	709.2	0.74	0.242	0.235	6.6	8.21	0.196	4.6	6.62
25	702.6	0.73	0.230	0.222	5.9	7.74	0.185	4.1	6.13
26	707.6	0.74	0.218	0.211	5.4	7.29	0.175	3.7	5.67
27	707.9	0.74	0.208	0.202	4.9	6.88	0.167	3.4	5.26
28	703.4	0.73	0.199	0.192	4.4	6.46	0.159	3.0	4.83
29	694.6	0.73	0.190	0.183	4.0	6.06	0.152	2.8	4.43
30	686.9	0.73	0.180	0.174	3.6	5.58	0.143	2.5	3.91
31	680.0	0.72	0.172	0.166	3.3	5.17	0.137	2.3	3.52
32	675.3	0.72	0.166	0.159	3.1	4.85	0.131	2.1	3.16
33	670.7	0.72	0.160	0.154	2.8	4.53	0.127	1.9	2.84
34	662.5	0.71	0.155	0.148	2.6	4.22	0.122	1.8	2.52
35	654.4	0.71	0.150	0.144	2.5	3.94	0.118	1.7	2.23
36	646.7	0.70	0.145	0.139	2.3	3.63	0.114	1.6	1.94
37	640.9	0.70	0.142	0.136	2.2	3.46	0.112	1.5	1.80
38	637.8	0.70	0.141	0.135	2.2	3.40	0.112	1.5	1.74
39	627.7	0.69	0.140	0.134	2.2	3.34	0.111	1.5	1.73
40	619.7	0.69	0.139	0.133	2.1	3.28	0.111	1.5	1.67
41	613.7	0.69	0.138	0.132	2.1	3.23	0.110	1.5	1.65
42	602.6	0.68	0.138	0.132	2.1	3.21	0.110	1.5	1.65
43	592.5	0.67	0.140	0.134	2.2	3.34	0.113	1.5	1.82
44	574.0	0.66	0.142	0.136	2.2	3.45	0.114	1.6	1.95

KSTS Application for Post-Repack Construction Permit

73.625(c)
July 9, 2017

CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

45 to 89 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
45	565.2	0.66	0.143	0.137	2.2	3.51	0.115	1.6	2.01
46	564.2	0.66	0.145	0.139	2.3	3.64	0.117	1.7	2.17
47	566.0	0.66	0.147	0.141	2.4	3.76	0.119	1.7	2.29
48	553.7	0.65	0.150	0.144	2.5	3.94	0.122	1.8	2.52
49	538.8	0.64	0.153	0.146	2.6	4.09	0.124	1.9	2.69
50	516.4	0.63	0.157	0.150	2.7	4.32	0.128	2.0	2.96
51	501.9	0.62	0.160	0.153	2.8	4.47	0.131	2.1	3.12
52	485.5	0.61	0.163	0.156	2.9	4.63	0.134	2.2	3.33
53	473.6	0.60	0.166	0.158	3.0	4.77	0.136	2.2	3.49
54	465.2	0.60	0.170	0.162	3.2	4.98	0.140	2.3	3.70
55	454.4	0.59	0.173	0.165	3.3	5.13	0.143	2.5	3.89
56	440.3	0.58	0.176	0.167	3.4	5.27	0.145	2.5	4.04
57	430.9	0.57	0.180	0.171	3.5	5.46	0.149	2.7	4.28
58	424.1	0.57	0.183	0.174	3.6	5.61	0.152	2.8	4.43
59	418.7	0.57	0.187	0.178	3.8	5.81	0.156	2.9	4.66
60	413.8	0.56	0.191	0.182	4.0	5.98	0.159	3.1	4.84
61	404.9	0.56	0.194	0.185	4.1	6.13	0.163	3.2	5.02
62	389.4	0.55	0.194	0.185	4.1	6.11	0.163	3.2	5.02
63	378.3	0.54	0.195	0.185	4.1	6.14	0.164	3.2	5.07
64	367.5	0.53	0.195	0.185	4.1	6.14	0.164	3.3	5.11
65	353.5	0.52	0.195	0.185	4.1	6.13	0.164	3.3	5.11
66	335.9	0.51	0.196	0.186	4.1	6.17	0.166	3.3	5.20
67	327.5	0.50	0.196	0.185	4.1	6.15	0.166	3.3	5.20
68	313.7	0.49	0.195	0.184	4.1	6.11	0.166	3.3	5.20
69	292.3	0.47	0.194	0.182	4.0	6.01	0.165	3.3	5.16
70	277.5	0.46	0.193	0.182	4.0	5.97	0.165	3.3	5.15
71	267.5	0.45	0.192	0.180	3.9	5.90	0.164	3.2	5.11
72	263.6	0.45	0.192	0.180	3.9	5.90	0.164	3.2	5.11
73	262.1	0.45	0.193	0.182	4.0	5.97	0.166	3.3	5.19
74	264.2	0.45	0.194	0.182	4.0	6.01	0.167	3.3	5.23
75	262.6	0.45	0.197	0.186	4.1	6.17	0.170	3.5	5.40
76	255.0	0.44	0.200	0.188	4.3	6.28	0.173	3.6	5.53
77	259.2	0.45	0.201	0.190	4.3	6.37	0.174	3.6	5.61
78	254.0	0.44	0.203	0.191	4.4	6.43	0.176	3.7	5.70
79	254.0	0.44	0.206	0.195	4.6	6.58	0.179	3.9	5.86
80	251.1	0.44	0.212	0.200	4.8	6.83	0.185	4.1	6.11
81	258.6	0.45	0.218	0.207	5.1	7.10	0.190	4.3	6.36
82	258.2	0.45	0.220	0.209	5.2	7.19	0.192	4.4	6.47
83	254.1	0.44	0.225	0.213	5.5	7.37	0.197	4.6	6.67
84	253.7	0.44	0.232	0.220	5.8	7.65	0.204	5.0	6.97
85	262.1	0.45	0.242	0.230	6.4	8.03	0.212	5.4	7.34
86	279.0	0.46	0.251	0.240	6.9	8.38	0.221	5.9	7.69
87	305.0	0.48	0.257	0.246	7.3	8.61	0.227	6.2	7.90
88	325.8	0.50	0.264	0.254	7.8	8.89	0.234	6.6	8.16
89	334.8	0.51	0.273	0.263	8.3	9.20	0.242	7.0	8.46

KSTS Application for Post-Repack Construction Permit

73.625(c)
July 9, 2017

CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

90 to 134 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
90	335.4	0.51	0.276	0.266	8.5	9.29	0.244	7.2	8.55
91	351.3	0.52	0.279	0.270	8.7	9.41	0.248	7.4	8.68
92	355.7	0.52	0.282	0.273	8.9	9.51	0.251	7.5	8.77
93	365.4	0.53	0.285	0.277	9.2	9.63	0.254	7.8	8.90
94	375.8	0.54	0.288	0.280	9.4	9.73	0.257	7.9	8.99
95	376.3	0.54	0.292	0.284	9.7	9.87	0.262	8.2	9.15
96	375.3	0.54	0.297	0.289	10.0	10.01	0.266	8.5	9.29
97	381.9	0.54	0.302	0.295	10.4	10.17	0.272	8.9	9.48
98	385.9	0.54	0.307	0.299	10.8	10.32	0.276	9.2	9.62
99	370.5	0.53	0.312	0.304	11.1	10.44	0.281	9.5	9.76
100	352.5	0.52	0.318	0.310	11.5	10.61	0.287	9.9	9.96
101	334.2	0.51	0.326	0.317	12.1	10.81	0.295	10.4	10.17
102	323.9	0.50	0.333	0.324	12.6	10.99	0.302	11.0	10.39
103	317.0	0.49	0.341	0.331	13.1	11.19	0.309	11.5	10.60
104	320.3	0.50	0.348	0.339	13.8	11.39	0.317	12.1	10.81
105	321.0	0.50	0.356	0.347	14.4	11.59	0.324	12.6	11.01
106	318.9	0.49	0.366	0.356	15.2	11.83	0.335	13.4	11.29
107	314.5	0.49	0.377	0.367	16.2	12.09	0.345	14.3	11.54
108	316.6	0.49	0.387	0.377	17.0	12.31	0.354	15.0	11.77
109	331.4	0.50	0.397	0.388	18.1	12.56	0.365	16.0	12.03
110	353.9	0.52	0.407	0.399	19.1	12.81	0.374	16.8	12.24
111	386.4	0.54	0.419	0.413	20.4	13.10	0.386	17.9	12.53
112	430.8	0.57	0.432	0.427	21.9	13.40	0.398	19.0	12.79
113	485.2	0.61	0.444	0.440	23.2	13.66	0.411	20.3	13.07
114	532.8	0.64	0.457	0.453	24.7	13.92	0.423	21.5	13.32
115	548.3	0.65	0.469	0.466	26.0	14.16	0.436	22.8	13.58
116	536.5	0.64	0.483	0.480	27.6	14.41	0.449	24.2	13.83
117	530.5	0.64	0.497	0.493	29.2	14.66	0.462	25.6	14.08
118	509.6	0.63	0.512	0.508	31.0	14.91	0.478	27.4	14.37
119	490.3	0.61	0.526	0.522	32.7	15.14	0.491	28.9	14.61
120	479.0	0.61	0.541	0.537	34.6	15.39	0.507	30.8	14.89
121	459.5	0.59	0.556	0.551	36.5	15.62	0.521	32.5	15.12
122	425.4	0.57	0.571	0.566	38.4	15.84	0.537	34.6	15.39
123	392.6	0.55	0.587	0.581	40.5	16.08	0.552	36.6	15.63
124	373.1	0.54	0.603	0.597	42.8	16.31	0.569	38.9	15.90
125	369.1	0.53	0.618	0.611	44.9	16.52	0.583	40.8	16.11
126	373.5	0.54	0.634	0.628	47.3	16.75	0.598	43.0	16.33
127	382.5	0.54	0.650	0.644	49.7	16.97	0.615	45.4	16.57
128	397.9	0.55	0.666	0.660	52.3	17.18	0.630	47.7	16.78
129	421.2	0.57	0.682	0.677	55.0	17.40	0.647	50.3	17.02
130	439.6	0.58	0.698	0.693	57.6	17.61	0.663	52.7	17.22
131	444.9	0.58	0.714	0.709	60.4	17.81	0.680	55.4	17.44
132	450.1	0.59	0.729	0.724	63.0	17.99	0.694	57.8	17.62
133	449.6	0.59	0.743	0.739	65.5	18.16	0.709	60.4	17.81
134	463.7	0.60	0.758	0.754	68.2	18.34	0.724	62.8	17.98

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73.625(c)
July 9, 2017

CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

135 to 179 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
135	471.4	0.60	0.772	0.768	70.8	18.50	0.737	65.2	18.14
136	479.2	0.61	0.787	0.784	73.7	18.67	0.753	68.1	18.33
137	475.4	0.60	0.798	0.794	75.7	18.79	0.764	70.0	18.45
138	479.1	0.61	0.810	0.807	78.1	18.93	0.778	72.6	18.61
139	470.1	0.60	0.821	0.817	80.2	19.04	0.788	74.5	18.72
140	444.7	0.58	0.832	0.828	82.3	19.15	0.801	77.0	18.86
141	429.0	0.57	0.844	0.840	84.6	19.27	0.813	79.2	18.99
142	446.5	0.59	0.855	0.852	87.1	19.40	0.825	81.8	19.13
143	452.8	0.59	0.865	0.862	89.1	19.50	0.835	83.7	19.23
144	467.8	0.60	0.876	0.873	91.5	19.61	0.846	85.8	19.34
145	471.8	0.60	0.886	0.883	93.7	19.72	0.858	88.3	19.46
146	495.8	0.62	0.897	0.895	96.2	19.83	0.868	90.5	19.57
147	486.3	0.61	0.907	1.000	120.0	20.79	0.880	93.0	19.69
148	483.3	0.61	0.916	1.000	120.0	20.79	0.889	94.9	19.77
149	481.2	0.61	0.924	1.000	120.0	20.79	0.899	97.1	19.87
150	490.3	0.61	0.931	1.000	120.0	20.79	0.906	98.6	19.94
151	506.2	0.62	0.939	1.000	120.0	20.79	0.917	100.8	20.04
152	528.8	0.64	0.948	1.000	120.0	20.79	0.925	102.8	20.12
153	551.3	0.65	0.954	1.000	120.0	20.79	0.931	104.1	20.17
154	570.9	0.66	0.958	1.000	120.0	20.79	0.938	105.5	20.23
155	594.0	0.68	0.963	1.000	120.0	20.79	0.943	106.6	20.28
156	617.9	0.69	0.967	1.000	120.0	20.79	0.949	108.1	20.34
157	639.8	0.70	0.971	1.000	120.0	20.79	0.953	109.0	20.37
158	664.5	0.71	0.975	1.000	120.0	20.79	0.960	110.5	20.43
159	680.8	0.72	0.978	1.000	120.0	20.79	0.963	111.2	20.46
160	693.7	0.73	0.981	1.000	120.0	20.79	0.968	112.5	20.51
161	707.7	0.74	0.983	1.000	120.0	20.79	0.970	112.9	20.53
162	716.3	0.74	0.986	1.000	120.0	20.79	0.973	113.6	20.55
163	725.6	0.75	0.989	1.000	120.0	20.79	0.979	114.9	20.60
164	736.5	0.75	0.991	1.000	120.0	20.79	0.981	115.4	20.62
165	748.1	0.76	0.993	1.000	120.0	20.79	0.985	116.5	20.66
166	759.3	0.76	0.994	1.000	120.0	20.79	0.986	116.7	20.67
167	771.2	0.77	0.996	1.000	120.0	20.79	0.991	117.8	20.71
168	781.1	0.77	0.998	1.000	120.0	20.79	0.993	118.3	20.73
169	791.0	0.78	0.998	1.000	120.0	20.79	0.996	119.0	20.75
170	800.6	0.78	0.998	1.000	120.0	20.79	0.996	119.0	20.75
171	807.1	0.79	0.998	1.000	120.0	20.79	0.996	119.0	20.75
172	814.0	0.79	0.997	1.000	120.0	20.79	0.997	119.4	20.77
173	821.4	0.79	0.997	1.000	120.0	20.79	0.997	119.4	20.77
174	828.2	0.80	0.997	1.000	120.0	20.79	1.000	120.0	20.79
175	833.7	0.80	0.995	1.000	120.0	20.79	0.998	119.5	20.77
176	837.4	0.80	0.993	1.000	120.0	20.79	0.999	119.7	20.78
177	841.1	0.80	0.992	1.000	120.0	20.79	0.998	119.4	20.77
178	845.1	0.81	0.990	1.000	120.0	20.79	0.998	119.6	20.78
179	849.9	0.81	0.989	1.000	120.0	20.79	0.997	119.4	20.77

KSTS Application for Post-Repack Construction Permit

73.625(c)
July 9, 2017

CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

180 to 224 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
180	854.1	0.81	0.987	1.000	120.0	20.79	0.995	118.9	20.75
181	857.6	0.81	0.985	1.000	120.0	20.79	0.996	119.0	20.76
182	861.1	0.81	0.983	1.000	120.0	20.79	0.994	118.5	20.74
183	863.9	0.81	0.982	1.000	120.0	20.79	0.995	118.7	20.74
184	866.8	0.82	0.980	1.000	120.0	20.79	0.993	118.2	20.73
185	869.7	0.82	0.978	1.000	120.0	20.79	0.992	118.1	20.72
186	872.3	0.82	0.976	1.000	120.0	20.79	0.990	117.6	20.71
187	873.8	0.82	0.973	1.000	120.0	20.79	0.989	117.3	20.69
188	875.3	0.82	0.970	1.000	120.0	20.79	0.986	116.6	20.67
189	876.4	0.82	0.967	1.000	120.0	20.79	0.983	115.9	20.64
190	877.1	0.82	0.965	1.000	120.0	20.79	0.982	115.8	20.64
191	878.3	0.82	0.962	1.000	120.0	20.79	0.979	115.1	20.61
192	880.0	0.82	0.960	1.000	120.0	20.79	0.979	115.0	20.61
193	882.5	0.82	0.957	1.000	120.0	20.79	0.976	114.3	20.58
194	884.5	0.82	0.955	1.000	120.0	20.79	0.975	114.2	20.58
195	886.2	0.82	0.953	1.000	120.0	20.79	0.973	113.7	20.56
196	888.1	0.83	0.951	1.000	120.0	20.79	0.973	113.6	20.55
197	889.7	0.83	0.949	1.000	120.0	20.79	0.971	113.1	20.53
198	891.5	0.83	0.947	1.000	120.0	20.79	0.969	112.6	20.52
199	892.0	0.83	0.946	1.000	120.0	20.79	0.969	112.8	20.52
200	892.8	0.83	0.944	1.000	120.0	20.79	0.967	112.3	20.50
201	893.8	0.83	0.943	1.000	120.0	20.79	0.968	112.4	20.51
202	895.2	0.83	0.942	1.000	120.0	20.79	0.967	112.2	20.50
203	895.8	0.83	0.940	1.000	120.0	20.79	0.966	112.1	20.50
204	896.5	0.83	0.939	1.000	120.0	20.79	0.965	111.8	20.49
205	897.3	0.83	0.939	0.899	97.0	19.87	0.967	112.2	20.50
206	898.1	0.83	0.939	0.899	97.0	19.87	0.967	112.2	20.50
207	898.5	0.83	0.939	0.899	97.0	19.87	0.967	112.2	20.50
208	899.0	0.83	0.939	0.897	96.7	19.85	0.969	112.6	20.51
209	899.6	0.83	0.939	0.897	96.7	19.85	0.969	112.6	20.51
210	900.2	0.83	0.939	0.896	96.3	19.84	0.970	113.0	20.53
211	900.8	0.83	0.940	0.897	96.6	19.85	0.971	113.2	20.54
212	901.2	0.83	0.940	0.896	96.2	19.83	0.973	113.6	20.55
213	901.8	0.83	0.941	0.896	96.4	19.84	0.974	113.8	20.56
214	902.5	0.83	0.942	0.896	96.3	19.84	0.977	114.4	20.59
215	903.2	0.83	0.943	0.897	96.5	19.85	0.978	114.7	20.59
216	903.6	0.83	0.944	0.898	96.7	19.86	0.979	114.9	20.60
217	904.2	0.83	0.945	1.000	120.0	20.79	0.978	114.8	20.60
218	904.6	0.83	0.945	1.000	120.0	20.79	0.978	114.8	20.60
219	904.7	0.83	0.946	1.000	120.0	20.79	0.977	114.7	20.59
220	904.5	0.83	0.947	1.000	120.0	20.79	0.978	114.9	20.60
221	904.4	0.83	0.948	1.000	120.0	20.79	0.978	114.8	20.60
222	904.4	0.83	0.949	1.000	120.0	20.79	0.979	115.0	20.61
223	904.2	0.83	0.950	1.000	120.0	20.79	0.978	114.9	20.60
224	905.8	0.83	0.951	1.000	120.0	20.79	0.979	115.1	20.61

KSTS Application for Post-Repack Construction Permit

73.625(c)
July 9, 2017

CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

225 to 269 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
225	905.3	0.83	0.952	1.000	120.0	20.79	0.980	115.3	20.62
226	905.4	0.83	0.953	1.000	120.0	20.79	0.980	115.2	20.61
227	906.3	0.83	0.954	1.000	120.0	20.79	0.981	115.5	20.62
228	907.1	0.83	0.955	1.000	120.0	20.79	0.980	115.3	20.62
229	906.9	0.83	0.957	1.000	120.0	20.79	0.982	115.8	20.64
230	906.8	0.83	0.958	1.000	120.0	20.79	0.982	115.6	20.63
231	906.2	0.83	0.960	1.000	120.0	20.79	0.984	116.1	20.65
232	906.3	0.83	0.961	1.000	120.0	20.79	0.983	116.0	20.64
233	906.5	0.83	0.962	1.000	120.0	20.79	0.984	116.2	20.65
234	906.8	0.83	0.963	1.000	120.0	20.79	0.985	116.5	20.66
235	906.6	0.83	0.964	1.000	120.0	20.79	0.985	116.3	20.66
236	906.3	0.83	0.964	1.000	120.0	20.79	0.985	116.3	20.66
237	906.7	0.83	0.965	1.000	120.0	20.79	0.984	116.2	20.65
238	908.1	0.83	0.966	1.000	120.0	20.79	0.985	116.4	20.66
239	909.0	0.84	0.966	1.000	120.0	20.79	0.983	116.0	20.65
240	909.5	0.84	0.966	1.000	120.0	20.79	0.983	116.0	20.65
241	909.8	0.84	0.966	1.000	120.0	20.79	0.982	115.6	20.63
242	910.1	0.84	0.966	1.000	120.0	20.79	0.982	115.6	20.63
243	909.6	0.84	0.965	1.000	120.0	20.79	0.981	115.4	20.62
244	909.0	0.84	0.965	1.000	120.0	20.79	0.979	115.0	20.61
245	909.4	0.84	0.964	1.000	120.0	20.79	0.978	114.8	20.60
246	909.7	0.84	0.964	1.000	120.0	20.79	0.976	114.4	20.58
247	910.0	0.84	0.964	1.000	120.0	20.79	0.976	114.4	20.58
248	910.5	0.84	0.964	1.000	120.0	20.79	0.975	114.0	20.57
249	911.0	0.84	0.963	1.000	120.0	20.79	0.974	113.8	20.56
250	911.5	0.84	0.963	1.000	120.0	20.79	0.971	113.2	20.54
251	911.8	0.84	0.963	1.000	120.0	20.79	0.971	113.2	20.54
252	911.5	0.84	0.962	1.000	120.0	20.79	0.970	112.9	20.53
253	911.2	0.84	0.962	1.000	120.0	20.79	0.967	112.3	20.50
254	911.0	0.84	0.961	1.000	120.0	20.79	0.966	112.1	20.50
255	910.5	0.84	0.960	1.000	120.0	20.79	0.963	111.3	20.46
256	910.4	0.84	0.959	1.000	120.0	20.79	0.962	111.0	20.45
257	910.6	0.84	0.959	1.000	120.0	20.79	0.959	110.4	20.43
258	910.6	0.84	0.958	1.000	120.0	20.79	0.958	110.2	20.42
259	910.4	0.84	0.958	1.000	120.0	20.79	0.956	109.6	20.40
260	910.4	0.84	0.957	1.000	120.0	20.79	0.955	109.4	20.39
261	910.4	0.84	0.957	1.000	120.0	20.79	0.955	109.4	20.39
262	910.4	0.84	0.956	1.000	120.0	20.79	0.951	108.6	20.36
263	910.5	0.84	0.956	1.000	120.0	20.79	0.951	108.6	20.36
264	910.3	0.84	0.956	1.000	120.0	20.79	0.949	108.0	20.33
265	909.5	0.84	0.956	1.000	120.0	20.79	0.949	108.0	20.33
266	908.7	0.83	0.956	1.000	120.0	20.79	0.946	107.4	20.31
267	908.5	0.83	0.956	1.000	120.0	20.79	0.946	107.4	20.31
268	909.0	0.84	0.956	1.000	120.0	20.79	0.943	106.8	20.29
269	909.4	0.84	0.956	1.000	120.0	20.79	0.943	106.8	20.29

KSTS Application for Post-Repack Construction Permit

73.625(c)
July 9, 2017

CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

270 to 314 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
270	909.0	0.84	0.956	1.000	120.0	20.79	0.943	106.8	20.29
271	908.3	0.83	0.956	1.000	120.0	20.79	0.941	106.2	20.26
272	907.9	0.83	0.957	1.000	120.0	20.79	0.942	106.5	20.27
273	907.2	0.83	0.957	1.000	120.0	20.79	0.939	105.9	20.25
274	906.8	0.83	0.957	1.000	120.0	20.79	0.939	105.9	20.25
275	906.5	0.83	0.957	1.000	120.0	20.79	0.937	105.3	20.22
276	906.3	0.83	0.958	1.000	120.0	20.79	0.938	105.5	20.23
277	906.1	0.83	0.959	1.000	120.0	20.79	0.936	105.2	20.22
278	905.7	0.83	0.960	1.000	120.0	20.79	0.937	105.4	20.23
279	905.2	0.83	0.962	1.000	120.0	20.79	0.939	105.8	20.25
280	904.6	0.83	0.963	1.000	120.0	20.79	0.937	105.5	20.23
281	904.0	0.83	0.964	1.000	120.0	20.79	0.938	105.7	20.24
282	903.5	0.83	0.965	1.000	120.0	20.79	0.937	105.3	20.22
283	902.2	0.83	0.966	1.000	120.0	20.79	0.938	105.5	20.23
284	900.2	0.83	0.967	1.000	120.0	20.79	0.936	105.2	20.22
285	899.0	0.83	0.968	1.000	120.0	20.79	0.937	105.4	20.23
286	897.7	0.83	0.969	1.000	120.0	20.79	0.935	105.0	20.21
287	896.9	0.83	0.970	1.000	120.0	20.79	0.936	105.2	20.22
288	895.8	0.83	0.971	1.000	120.0	20.79	0.937	105.4	20.23
289	894.6	0.83	0.973	1.000	120.0	20.79	0.937	105.3	20.22
290	892.7	0.83	0.975	1.000	120.0	20.79	0.939	105.7	20.24
291	890.3	0.83	0.977	1.000	120.0	20.79	0.938	105.6	20.24
292	887.8	0.83	0.979	1.000	120.0	20.79	0.940	106.0	20.25
293	884.6	0.82	0.981	1.000	120.0	20.79	0.939	105.8	20.25
294	881.6	0.82	0.983	1.000	120.0	20.79	0.941	106.3	20.26
295	880.1	0.82	0.984	1.000	120.0	20.79	0.939	105.9	20.25
296	881.7	0.82	0.985	1.000	120.0	20.79	0.940	106.1	20.26
297	878.5	0.82	0.986	1.000	120.0	20.79	0.941	106.3	20.27
298	877.8	0.82	0.987	1.000	120.0	20.79	0.940	105.9	20.25
299	876.9	0.82	0.988	1.000	120.0	20.79	0.941	106.2	20.26
300	875.6	0.82	0.994	1.000	120.0	20.79	0.944	106.8	20.29
301	875.6	0.82	0.995	1.000	120.0	20.79	0.945	107.1	20.30
302	876.0	0.82	0.996	1.000	120.0	20.79	0.943	106.7	20.28
303	876.5	0.82	0.997	1.000	120.0	20.79	0.944	106.9	20.29
304	874.9	0.82	0.997	1.000	120.0	20.79	0.941	106.3	20.26
305	873.6	0.82	0.994	1.000	120.0	20.79	0.938	105.6	20.24
306	872.1	0.82	0.995	1.000	120.0	20.79	0.939	105.8	20.25
307	870.5	0.82	0.998	1.000	120.0	20.79	0.938	105.7	20.24
308	867.8	0.82	1.000	1.000	120.0	20.79	0.940	106.1	20.26
309	866.4	0.82	1.000	1.000	120.0	20.79	0.937	105.3	20.22
310	864.7	0.81	1.000	1.000	120.0	20.79	0.937	105.3	20.22
311	861.8	0.81	1.000	1.000	120.0	20.79	0.933	104.4	20.19
312	857.3	0.81	1.000	1.000	120.0	20.79	0.933	104.4	20.19
313	843.1	0.80	0.999	1.000	120.0	20.79	0.928	103.4	20.15
314	833.0	0.80	0.994	1.000	120.0	20.79	0.924	102.4	20.10

KSTS Application for Post-Repack Construction Permit

73.625(c)
July 9, 2017

CALCULATIONS REQUIRED BY SECTIONS 73.625(b) and 73.625(c)

Calculated depression angle, relative field and effective radiated power at radio horizon

Electrical Beam Tilt: 0.75° Mechanical Tilt: 0.40° at 35° True

270 to 359 degrees azimuth

Azimuth	HAAT (meters)	Depression angle to radio horiz.	Main beam relative field	At Radio Horizon			Horizontal plane		
				Rel. Field	ERP (kw)	ERP (dBk)	Rel. Field	ERP (kw)	ERP (dBk)
315	814.4	0.79	0.992	1.000	120.0	20.79	0.922	102.0	20.08
316	795.7	0.78	0.991	1.000	120.0	20.79	0.917	101.0	20.04
317	767.2	0.77	0.989	1.000	120.0	20.79	0.915	100.6	20.02
318	740.7	0.75	0.988	1.000	120.0	20.79	0.911	99.6	19.98
319	723.6	0.75	0.985	1.000	120.0	20.79	0.908	98.9	19.95
320	711.6	0.74	0.983	1.000	120.0	20.79	0.903	97.8	19.90
321	691.4	0.73	0.980	1.000	120.0	20.79	0.900	97.2	19.88
322	671.9	0.72	0.977	1.000	120.0	20.79	0.893	95.8	19.81
323	665.3	0.71	0.974	1.000	120.0	20.79	0.891	95.2	19.79
324	666.2	0.71	0.971	1.000	120.0	20.79	0.888	94.6	19.76
325	658.4	0.71	0.967	1.000	120.0	20.79	0.881	93.1	19.69
326	656.4	0.71	0.963	1.000	120.0	20.79	0.877	92.3	19.65
327	643.5	0.70	0.958	1.000	120.0	20.79	0.869	90.6	19.57
328	627.5	0.69	0.953	1.000	120.0	20.79	0.865	89.7	19.53
329	633.9	0.70	0.949	1.000	120.0	20.79	0.857	88.2	19.46
330	643.8	0.70	0.950	1.000	120.0	20.79	0.858	88.4	19.47
331	632.0	0.70	0.937	1.000	120.0	20.79	0.843	85.3	19.31
332	636.8	0.70	0.931	1.000	120.0	20.79	0.838	84.2	19.25
333	621.2	0.69	0.924	1.000	120.0	20.79	0.831	83.0	19.19
334	626.9	0.69	0.917	1.000	120.0	20.79	0.822	81.0	19.09
335	625.1	0.69	0.909	1.000	120.0	20.79	0.815	79.6	19.01
336	626.6	0.69	0.901	0.892	95.6	19.80	0.804	77.6	18.90
337	633.3	0.70	0.893	0.885	94.0	19.73	0.797	76.2	18.82
338	632.6	0.70	0.885	0.877	92.2	19.65	0.787	74.3	18.71
339	627.0	0.69	0.877	0.868	90.4	19.56	0.780	72.9	18.63
340	609.7	0.68	0.866	0.856	88.0	19.45	0.767	70.5	18.48
341	594.4	0.68	0.856	0.847	86.0	19.34	0.758	68.9	18.38
342	597.3	0.68	0.846	0.837	84.0	19.24	0.749	67.3	18.28
343	612.8	0.69	0.835	0.826	81.8	19.13	0.736	65.0	18.13
344	628.3	0.69	0.825	0.816	79.9	19.02	0.727	63.5	18.03
345	647.3	0.70	0.813	0.804	77.6	18.90	0.714	61.1	17.86
346	658.8	0.71	0.800	0.792	75.2	18.76	0.702	59.2	17.72
347	665.5	0.71	0.788	0.779	72.9	18.63	0.689	56.9	17.55
348	681.6	0.72	0.776	0.768	70.7	18.50	0.678	55.2	17.42
349	695.8	0.73	0.764	0.756	68.6	18.36	0.665	53.1	17.25
350	713.9	0.74	0.751	0.743	66.3	18.22	0.654	51.3	17.10
351	729.8	0.75	0.737	0.730	63.9	18.06	0.642	49.4	16.94
352	743.2	0.76	0.723	0.716	61.5	17.89	0.627	47.1	16.73
353	750.9	0.76	0.709	0.702	59.2	17.72	0.615	45.3	16.56
354	762.5	0.76	0.695	0.688	56.8	17.54	0.600	43.2	16.35
355	773.2	0.77	0.680	0.673	54.4	17.36	0.587	41.3	16.16
356	779.8	0.77	0.665	0.658	52.0	17.16	0.572	39.2	15.93
357	780.6	0.77	0.650	0.643	49.7	16.96	0.559	37.5	15.73
358	775.6	0.77	0.635	0.628	47.4	16.76	0.543	35.4	15.50
359	771.2	0.77	0.620	0.613	45.2	16.55	0.531	33.8	15.29