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3				
2	9/30/20	MARSH	BURLISON	GRAHAM
1	7/31/17	KATIGBAK	BURLISON	ADCOCK
0	6/30/16	KATIGBAK	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

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SLACK SPAN SAG TABLE NESC LIGHT LOADING ZONE.	05.06-100
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3				
2				
1	12/31/21	MARSH	BURLISON	GRAHAM
0	6/30/16	KATIGBAK	BURLISON	ADCOCK
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SECTION 5 - CONDUCTORS, OVERHEAD
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GENERAL:

THE SPECIFICATIONS FOR DUKE ENERGY DISTRIBUTION OVERHEAD CONDUCTORS AND CABLE WERE COMBINED AND UPDATED IN 2013 TO HARMONIZE THE SPECIFICATIONS ACROSS THE DUKE ENERGY SYSTEM. ALL ACSR CONDUCTOR, INCLUDING NEUTRALS IN DUPLEX, TRIPLEX AND QUADRUPLX CABLES HAVE BEEN CHANGED TO EITHER AAAC OR AAC CONDUCTORS.

AAAC CONDUCTORS ARE REFERENCED AS MCM IN SIZE BY THE MANUFACTURER/INDUSTRY. FOR PRACTICAL PURPOSES, THESE CONDUCTORS WILL CONTINUE TO BE REFERENCED IN THE DUKE ENERGY SYSTEM BY THEIR EQUIVALENT ACSR SIZE. FOR ALL PRACTICAL PURPOSES, THE AAAC CONDUCTORS ARE EQUIVALENT TO THE ACSR SIZES IN ALL ASPECTS. THE SPLICES, CONNECTORS AND TERMINAL LUGS PREVIOUSLY USED ON ACSR CONDUCTORS ARE TO BE USED ON THE AAAC CONDUCTORS AS WELL.

SECTION 5 CONTAINS COMPANY ITEM NUMBERS, TECHNICAL DATA, MAXIMUM CONDUCTOR LOADING AND NEW SAG AND TENSION TABLES DEVELOPED FOR ALL OVERHEAD CONDUCTORS AND CABLES USED IN EACH REGION.

NESC LOADING ZONES

DUE TO DIFFERENT WEATHER CONDITIONS IN THE UNITED STATES, THE NESC HAS DEFINED THREE WEATHER LOADINGS THAT ARE DIVIDED INTO ZONES AS FOLLOWS:

LIGHT LOADING ZONE - STRUCTURES AND EQUIPMENT MUST HAVE THE STRENGTH TO WITHSTAND 9 LBS. OF WIND AT 30°F

MEDIUM LOADING ZONE - STRUCTURES AND EQUIPMENT MUST HAVE THE STRENGTH TO WITHSTAND 4 LBS. OF WIND AND 1/4 INCH ICE AT 15°F

HEAVY LOADING ZONE - STRUCTURES AND EQUIPMENT MUST HAVE THE STRENGTH TO WITHSTAND 4 LBS. OF WIND AND 1/2 INCH ICE AT 0°F

THE DUKE ENERGY SERVICE TERRITORY SPANS ALL THREE OF THE NESC LOADING ZONES. THE INDIANA SERVICE AREA IS LOCATED IN THE NESC HEAVY LOADING ZONE. THE FLORIDA SERVICE AREA IS LOCATED IN THE NESC LIGHT LOADING ZONE. THE REMAINING SERVICE AREAS ARE IN THE MEDIUM LOADING ZONE. ALL THE APPROPRIATE SAG AND TENSION TABLES ARE INCLUDED IN THE CORRESPONDING SERVICE AREA MANUAL.

NORMAL SAG AND TENSION TABLES FOR OVERHEAD BARE CONDUCTORS

NORMAL SAG AND TENSION TABLES ARE USED FOR STANDARD DESIGNS AND INSTALLATION OF PRIMARY PHASE AND NEUTRAL CONDUCTORS. PRIMARY CONDUCTORS MAY BE INSTALLED WITH GREATER TENSIONS THAN NEUTRAL CONDUCTORS IN ORDER TO OBTAIN THE DESIRED CONDUCTOR ELECTRICAL LOADING WHILE MAINTAINING MINIMUM NESC CLEARANCES BETWEEN UPPER AND LOWER CONDUCTORS THROUGHOUT MAXIMUM LOADING CONDITIONS FOR THE APPROPRIATE NESC LOADING ZONE. WITH THE EXCEPTION OF FLORIDA, ALL NORMAL SAG AND TENSION TABLES ARE DIVIDED INTO THREE RULING SPAN TABLES, 150, 280 AND 400 FOOT. FLORIDA RULING SPAN TABLES ARE 150 AND 200 FOOT FOR THE LARGER CONDUCTORS. ALL OVERHEAD CONSTRUCTION STANDARDS (SPACING ON THE POLE) AND MAXIMUM CONDUCTOR LOADING IS BASED ON THE 280 FOOT RULING SPAN TABLES AND FLORIDA'S 200 FOOT RULING SPAN TABLES FOR THE LARGER CONDUCTORS. FOR SPANS BEYOND MAXIMUM LENGTHS IN THE NORMAL RULING SPAN TABLES, TABLES ARE PROVIDED FOR REQUIRED INCREASED SPACING ON THE POLE AND GUYING REQUIREMENTS AGAINST THE DIFFERENCE IN TENSION TO ENSURE PROPER CLEARANCES ARE MAINTAINED THOUGHT-OUT LINE LOADING CONDITIONS.

LINES DESIGNS WITH CONTINUOUS SPAN LENGTHS FOUND IN THE 400 FOOT RULING SPAN TABLES WILL REQUIRE EVALUATIONS IN POLE FOREMAN TO ENSURE SPACING ON THE POLE MEETS NESC CLEARANCE REQUIREMENT.



								
3					DISTRIBUTION OVERHEAD CONDUCTORS AND CABLE			
2								
1	9/30/20	BURLISON	BENDER	GRAHAM				
0	6/30/16	ROBESON	BURLISON	ADCOCK				
REVISED		BY	CHK'D	APPR.	05.00-100A			

DISTRIBUTION OVERHEAD CONDUCTORS AND CABLE

20220050-DEF-000056

LONG SPAN (500-800 FEET) SAG AND TENSION TABLES FOR OVERHEAD BARE CONDUCTORS

THESE LONG SPAN SAG AND TENSION TABLES ARE PROVIDED FOR UNUSUAL SITUATIONS WHERE INDIVIDUAL SPANS LONGER THAN NORMAL CONSTRUCTION SPANS ARE NEEDED. AREAS SUCH AS RIVER CROSSINGS, LONG SPANS ACROSS INTERSTATE HIGHWAYS, ETC. THESE SAG AND TENSION TABLES ARE TO BE COORDINATED WITH SPECIFIC POLE FRAMING REQUIREMENTS FOUND IN SECTION 3 OF THE MANUAL. THESE POLE FRAMING DESIGNS ARE ONLY FOR SINGLE SPANS THAT ARE DEAD-ENDED AND GUYED AT EACH END.

SAG AND TENSION TABLES FOR OVERHEAD TRIPLEX AND QUADRUPLX

POLE TO POLE AND POLE TO BUILDING SAG AND TENSION TABLES ARE PROVIDED FOR STANDARD SIZES OF DUPLEX, TRIPLEX AND QUADRUPLX CABLES.

THE POLE TO POLE TABLES ARE DESIGNED WITH TENSIONS THAT REQUIRE GUYING AT THE END OF EACH SPAN. THE POLE TO BUILDING TENSIONS ARE DESIGNED TO LIMIT MAXIMUM TENSION ON STANDARD OVERHEAD SERVICE RISERS FOUND ON MOST RESIDENTIAL HOMES.

SLACK SPAN CONSTRUCTION

SLACK SPAN CONSTRUCTION SHOULD BE AVOIDED WHEREVER POSSIBLE. HOWEVER, IT IS RECOGNIZED THAT CONGESTION SOMETIMES LIMIT THE ABILITY TO GUY FULL TENSION SPANS OF CONDUCTOR AND CABLE. TABLES ARE PROVIDED FOR SLACK SPAN CONSTRUCTION WITH REQUIREMENTS OF MAXIMUM SPAN LENGTHS AND REQUIRED POLE CLASSES. THE SPAN LIMITS AND POLE CLASSES PROVIDED IS INTENDED TO LIMIT STRESS ON POLES THAT CAUSE POLE TO LEAN OVER, AND CAUSE EXCESSIVE POLE TOP DEFLECTION.

► CONDUCTOR AMPACITY

THE AMPACITY VALUES IN TABLES ON DWGS. 05.01-100 AND 05.01-105 ENSURE THAT THE CONDUCTOR DOES NOT EXCEED A TEMPERATURE OF 185°F (167°F FOR COVERED CONDUCTORS). MAINTAINING THE OPERATING TEMPERATURE AT OR BELOW 185°F WILL PREVENT EXCESSIVE CONDUCTOR ANNEALING. THESE VALUES SHOULD NOT BE EXCEEDED AND SHALL BE UTILIZED FOR ALL NEW CONSTRUCTION BUILT TO THE DUKE ENERGY ENTERPRISE WIDE CONSTRUCTION SPECIFICATIONS ISSUED IN 2016.

FOR LEGACY LINES BUILT TO CONSTRUCTION STANDARDS PRIOR TO THE 2016 SPECIFICATIONS:

- LEGACY AMPACITIES BASED ON 185° F OR LESS SHALL CONTINUE TO BE USED.
- THESE LINES MAY BE RE-RATED TO THE 185°F VALUES THROUGH EVALUATION AND MODIFICATIONS SUCH AS INCREASED SPACING OR SPAN LENGTH REDUCTION.
- • LEGACY AMPACITIES BASED ON AN OPERATING TEMPERATURE GREATER THAN 185°F - USE TABLES SHOWN ON DWGS. 05.01-100 AND 05.01-105.
- DO NOT OPERATE LINES IN EXCESS OF 185°F.
- • IF SITUATIONS ARE ENCOUNTERED WHERE AMPACITIES LISTED IN TABLES SHOWN ON DWGS. 05.01-100 OR 05.01-105 NEED TO BE EXCEEDED OR THE LINE NEEDS TO BE OPERATED ABOVE 185°F, CONTACT LOCAL ENGINEERING IMMEDIATELY FOR GUIDANCE.

3				
2				
1	7/31/17	BURLISON	WHITE	ADCOCK
0	6/30/16	ROBESON	BURLISON	ADCOCK
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DISTRIBUTION OVERHEAD CONDUCTORS AND CABLE



DEC	DEM	DEP	DEF
			X
05.00-100B			

20220050-DEF-000057

CONDUCTOR SIZE	CODE NAME	STRANDING	OUTSIDE DIAMETER (INCHES)	WEIGHT (LBS PER FT)	BREAKING STRENGTH (LBS)	AMPACITY RATINGS							
						SUMMER	INTERMEDIATE AMBIENT TEMPERATURES				NESC WINTER LOADING ZONE TEMPERATURES		
							104°F	80°F	60°F	40°F	LIGHT 30°F	MEDIUM 15°F	HEAVY 0°F
ALL ALUMINUM ALLOY CONDUCTOR (AAAC) BARE													
#2	AMES	7	0.316	0.0722	2800	179	206	225	243	252	264	276	
#1/0	AZUSA	7	0.398	0.1157	4460	239	277	303	326	338	354	370	
#4/0	ALLIANCE	7	0.563	0.2302	8560	370	430	471	507	524	550	574	
559.5	DARIEN	19	0.858	0.5252	18,800	621	718	789	854	884	927	967	
ALL ALUMINUM CONDUCTOR (AAC) BARE													
#1/0	POPPY	7	0.368	0.0090	1990	231	277	303	315	325	341	356	
#2/0	ASTER	7	0.414	0.1250	2510	267	308	337	365	377	395	413	
#3/0	PHLOX	7	0.464	0.1575	3040	309	356	390	422	437	458	478	
#4/0	OXLIP	7	0.522	0.1980	3830	358	412	452	489	506	530	554	
336.4	TULIP	19	0.666	0.3150	6150	480	558	611	654	681	714	745	
397.5	CANNA	19	0.723	0.3720	7110	533	616	677	731	757	794	829	
477	COSMOS	19	0.792	0.4770	8360	597	695	762	821	838	891	930	
556.5	DAHLIA	19	0.856	0.5210	9750	658	766	840	904	924	982	1025	
795	ARBUTUS	37	1.026	0.7450	13,900	822	854	1047	1132	1172	1229	1284	
COVERED LINE CONDUCTOR													
#4 AAC	APRICOT	7	0.285	0.0510	790	109	N/A	N/A	N/A	N/A	N/A	N/A	
#2 AAC	PEACH	7	0.373	0.0840	1220	140	170	186	201	209	219	229	
#1/0 AAC	QUINCE	7	0.477	0.1360	1790	190	229	251	270	283	293	307	
#4/0 AAC	OLIVE	7	0.626	0.2530	3440	306	356	390	420	434	456	476	
#1/0 HWLW	ALMOND	6/1	0.518	0.1910	4160	189	229	251	270	283	293	307	
336.4 HWLW	NONE	18/1	0.765	0.6350	8950	404	463	507	542	572	592	618	
556.5 HWLW	NONE	19	0.992	0.7580	8775	548	635	697	750	766	815	850	
ALUMINUM CONDUCTOR STEEL REINFORCED (ACSR) BARE													
#6	TURKEY	6/1	0.198	0.0360	1190	97	112	122	132	136	143	148	
#4	SWAN	6/1	0.250	0.0570	1860	129	148	162	175	181	190	198	
#2	SPARROW	6/1	0.316	0.0913	2850	170	196	215	232	240	251	263	
#1/0	RAVEN	6/1	0.398	0.1452	4380	224	259	283	306	317	332	347	
#2/0	QUAIL	6/1	0.477	0.1831	5310	257	296	325	351	363	381	398	
#3/0	PIGEON	6/1	0.502	0.2309	6620	295	340	373	403	417	437	456	
#4/0	PENGUIN	6/1	0.563	0.2911	8350	337	389	427	462	478	501	523	
266.8	WAXWING	18/1	0.609	0.2890	6880	415	480	527	569	589	618	645	
336.4	MERLIN	18/1	0.684	0.3653	8680	485	561	616	665	689	722	754	
336.4	LINNET	26/7	0.720	0.4639	14,100	492	571	628	678	702	736	769	
397.5	IBIS	26/7	0.783	0.5469	16,300	546	635	698	754	781	819	855	
477	HAWK	26/7	0.858	0.6550	19,500	616	713	783	847	877	920	960	
556.5	PARAKEET	24/7	0.914	0.7170	19,800	674	781	858	928	961	1008	1052	
795	DRAKE	26/7	1.107	1.0930	31,500	849	984	1083	1171	1213	1272	1328	

NOTES:

1. THESE AMPACITIES ARE FOR CONDUCTORS IN SPANS. FOR EQUIPMENT LEAD WIRES SEE DWG. 05.01-107.

2. AAAC, AAC AND ACSR BARE CONDUCTOR AMPACITIES ARE BASED ON THE FOLLOWING:

- MAXIMUM CONDUCTOR OPERATING TEMPERATURE= 85°C/185°F
- WIND SPEED = 2 FT/SEC

3. COVERED CONDUCTOR AMPACITIES ARE BASED ON THE FOLLOWING:

- MAXIMUM CONDUCTOR OPERATING TEMPERATURE= 75°C/167°F
- WIND SPEED = 2 FT/SEC

THE AMPACITY VALUES IN THESE TABLES ENSURE THAT THE CONDUCTOR DOES NOT EXCEED A TEMPERATURE OF 185°F. MAINTAINING THE OPERATING TEMPERATURE AT OR BELOW 185°F WILL PREVENT EXCESSIVE CONDUCTOR ANNEALING. THESE VALUES SHOULD NOT BE EXCEEDED AND SHALL BE UTILIZED FOR ALL NEW CONSTRUCTION BUILT TO THE DUKE ENERGY ENTERPRISE WIDE CONSTRUCTION SPECIFICATIONS ISSUED IN 2016.

FOR LEGACY LINES BUILT TO CONSTRUCTION STANDARDS PRIOR TO THE 2016 SPECIFICATIONS:

- LEGACY AMPACITIES BASED ON 185°F OR LESS SHALL CONTINUE TO BE USED.
- THESE LINES MAY BE RE-RATED TO THE 185°F VALUES THROUGH EVALUATION AND MODIFICATIONS SUCH AS INCREASED SPACING OR SPAN LENGTH REDUCTION.
- LEGACY AMPACITIES BASED ON AN OPERATING TEMPERATURE GREATER THAN 185°F - USE TABLES SHOWN ABOVE AND ON DWG. 05.01-105.
- DO NOT OPERATE LINES IN EXCESS OF 185°F.
- IF SITUATIONS ARE ENCOUNTERED WHERE AMPACITIES LISTED IN TABLES SHOWN ABOVE OR ON DWG. 05.01-105 NEED TO BE EXCEEDED OR THE LINE NEEDS TO BE OPERATED ABOVE 185°F, CONTACT LOCAL ENGINEERING IMMEDIATELY FOR GUIDANCE.



3				
2	4/30/21	BENDER	BURLISON	GRAHAM
1	7/31/17	BURLISON	WHITE	ADCOCK
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

ALUMINUM WIRE PHYSICAL DATA AND AMPACITY RATINGS/SPAN WIRES

DEC	DEM	SEP	DEF
X	X	X	X
05.01-100			

20220050-DEF-000058

CONDUCTOR SIZE	CODE NAME	STRANDING	OUTSIDE DIAMETER (INCHES)	WEIGHT (LBS PER FT)	BREAKING STRENGTH (LBS)	AMPACITY RATINGS							
						SUMMER	INTERMEDIATE AMBIENT TEMPERATURES				NESC WINTER LOADING ZONE TEMPERATURES		
							104°F	80°F	60°F	40°F	LIGHT 30°F	MEDIUM 15°F	HEAVY 0°F
BARE COPPER - HARD DRAWN CONDUCTOR													
#8	-	1	0.129	0.049	826	89	103	113	122	126	133	139	
#6	-	1	0.162	0.079	1280	119	137	151	163	169	177	185	
#4	-	1	0.204	0.126	1970	159	184	202	218	226	237	248	
#4	-	7	0.232	0.129	1940	163	188	207	224	232	243	254	
#2	-	1	0.258	0.201	3003	213	246	271	292	303	318	332	
#2	-	3	0.320	0.202	2913	224	259	285	307	318	334	349	
#2	-	7	0.292	0.205	3045	218	252	277	299	310	325	340	
#1	-	3	0.360	0.255	3620	259	299	329	355	368	386	403	
#1	-	7	0.328	0.258	3800	252	291	320	346	358	376	392	
#1/0	-	7	0.368	0.325	4750	291	336	370	399	413	434	453	
#2/0	-	7	0.414	0.419	5927	337	389	428	462	479	503	525	
#3/0	-	7	0.464	0.518	7366	390	450	495	535	554	582	607	
#4/0	-	7	0.522	0.653	9154	451	521	573	619	641	673	702	
250	-	19	0.574	0.772	11,360	502	580	638	689	713	749	782	
300	-	19	0.692	0.926	13,510	563	650	715	772	799	839	876	
350	-	19	0.679	1.080	15,590	619	715	787	849	879	923	964	
500	-	37	0.813	1.544	21,950	773	894	983	1062	1099	1154	1206	
750	-	61	0.998	2.316	34,090	990	1147	1262	1363	1411	1481	1547	
1000	-	61	1.152	3.080	45,030	1174	1362	1498	1621	1678	1760	1838	
BARE COPPER - SOFT DRAWN CONDUCTOR													
#6	-	1	0.162	0.079	763	119	137	151	163	169	177	185	
500	-	37	0.813	1.544	14,530	773	894	983	1062	1099	1154	1205	
750	-	61	0.998	2.316	21,790	990	1147	1262	1363	1411	1481	1547	
1000	-	61	1.152	3.080	30,500	1174	1362	1498	1621	1678	1760	1838	
WEATHERPROOF/COVERED CONDUCTOR													
#6	-	1	0.238	0.087	1060	98	113	125	136	140	147	154	
#4	-	1 & 7	0.285	0.143	1872	131	156	167	181	187	197	206	
#2	-	1 & 7	0.373	0.230	2893	180	209	224	243	251	270	282	
#1/0	-	7	0.477	0.368	4513	241	279	307	331	343	360	376	
#2/0	-	7	0.522	0.458	5631	280	323	355	384	397	417	436	
#3/0	-	7	0.570	0.572	6103	324	374	410	444	460	483	504	
#4/0	-	7	0.626	0.715	8696	374	432	475	514	532	558	583	
300	-	19	0.729	0.996	11,057	467	540	593	640	663	697	727	
500	-	37	0.950	1.648	15,260	642	742	815	882	913	958	1000	
750	-	61	1.128	2.481	22,880	822	952	1047	1131	1171	1229	1284	
1000	-	61	1.307	3.260	30,500	974	1130	1243	1345	1393	1461	1526	

NOTES:

1. THESE AMPACITIES ARE FOR CONDUCTORS IN SPANS. FOR EQUIPMENT LEAD WIRES SEE DWG. 05.01-107.
2. COPPER HD BARE CONDUCTOR AMPACITIES ARE BASED ON THE FOLLOWING:
 - MAXIMUM CONDUCTOR OPERATING TEMPERATURE= 85° C/185°F
 - WIND SPEED = 2 FT/SEC
3. COVERED CONDUCTOR AMPACITIES ARE BASED ON THE FOLLOWING:
 - MAXIMUM CONDUCTOR OPERATING TEMPERATURE= 75° C/167° F
 - WIND SPEED = 2 FT/SEC

THE AMPACITY VALUES IN THESE TABLES ENSURE THAT THE CONDUCTOR DOES NOT EXCEED A TEMPERATURE OF 185°F. MAINTAINING THE OPERATING TEMPERATURE AT OR BELOW 185°F WILL PREVENT EXCESSIVE CONDUCTOR ANNEALING. THESE VALUES SHOULD NOT BE EXCEEDED AND SHALL BE UTILIZED FOR ALL NEW CONSTRUCTION BUILT TO THE DUKE ENERGY ENTERPRISE WIDE CONSTRUCTION SPECIFICATIONS ISSUED IN 2016.

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- THESE LINES MAY BE RE-RATED TO THE 185°F VALUES THROUGH EVALUATION AND MODIFICATIONS SUCH AS INCREASED SPACING OR SPAN LENGTH REDUCTION.
- LEGACY AMPACITIES BASED ON AN OPERATING TEMPERATURE GREATER THAN 185°F - USE TABLES SHOWN ABOVE AND ON DWG. 05.01-100.
- DO NOT OPERATE LINES IN EXCESS OF 185°F.
- IF SITUATIONS ARE ENCOUNTERED WHERE AMPACITIES LISTED IN TABLES SHOWN ABOVE OR ON DWG. 05.01-100 NEED TO BE EXCEEDED OR THE LINE NEEDS TO BE OPERATED ABOVE 185°F, CONTACT LOCAL ENGINEERING IMMEDIATELY FOR GUIDANCE.

3				
2				
1				
0	7/31/17	BURLISON	WHITE	ADCOCK
REVISED	BY	CK'D	APPR.	

**COPPER WIRE PHYSICAL DATA AND
AMPACITY RATINGS/SPAN WIRES**

			
DEC	DEM	DEP	DEF
X	X	X	X
05.01-105			

20220050-DEF-000059

- ANY NEW 3 PHASE EXTENSION, HIGHWAY RELOCATION, OR RECONDUCTORING PROJECT THAT IS DIRECTLY PROTECTED BY A 200AMP RECLOSER OR LARGER (FEEDER BACKBONE) SHALL UTILIZE A MINIMUM CONDUCTOR SIZE OF 795 AAC.

APPROVED FOR NEW CONSTRUCTION			
CONDUCTOR SIZE	COMPATIBLE UNIT	ITEM NUMBER	DESCRIPTION
ALL ALUMINUM ALLOY CONDUCTOR (AAC) BARE ➤			
#2	WIRE-PRI-2-AAAC-F	4022240	#2 AAAC, 7 STR, AMES
#1/0	WIRE-PRI-1/0-AAAC-F	4033009	#1/0 AAAC, 7 STR, AZUSA
ALL ALUMINUM CONDUCTOR (AAC) BARE			
336.4	WIRE-PRI-336-AAC-F	235001	336.4 AAC, 19 STR, TULIP
795	WIRE-PRI-795-AAC-F	4192430	795 AAC, 37 STR, ARBUTUS

SIZING THE PRIMARY NEUTRAL (NEW CONSTRUCTION)	
PRIMARY WIRE SIZE	PRIMARY NEUTRAL SIZE
#2 AAAC	#2 AAAC
#1/0 AAAC	#1/0 AAAC
336.4 AAC	#1/0 AAAC
795 AAC	336.4 AAC
795 AAC DOUBLE CKT	336.4 AAC

LEGACY CONDUCTORS - NOT APPROVED FOR NEW CONSTRUCTION			
CONDUCTOR SIZE	COMPATIBLE UNIT	ITEM NUMBER	DESCRIPTION
ALL ALUMINUM ALLOY CONDUCTOR (AAAC) BARE			
#4	WIRE-PRI-4-AAAC-F	4022240	#4 AAAC, 7 STR, ALTON
#4/0	WIRE-PRI-4/0-AAAC-F	1507882	#4/0 AAAC, 7 STR, ALLIANCE
ALUMINUM CONDUCTOR STEEL REINFORCED (ACSR) BARE			
795	WIRE-PRI-795-ACSR-F	1523270	795 ACSR, 26/7 STR, DRAKE
BARE COPPER - HARD DRAWN CONDUCTOR			
#6	WIRE-PRI-6-CUHD-F	4022251	#6 HARD DRAWN BARE COPPER, SOLID
#4	WIRE-PRI-4-CUHD-F	4022252	#4 HARD DRAWN BARE COPPER, SOLID
#2	WIRE-PRI-2-CUHD-F	4022254	#2 HARD DRAWN BARE COPPER, SOLID
#2/0	WIRE-PRI-2/0-CUHD-F	4022284	#2/0 HARD DRAWN BARE COPPER, 7 STR
#4/0	WIRE-PRI-4/0-CUHD-F	4022267	#4/0 HARD DRAWN BARE COPPER, 7 STR

NOTES:

1. LEGACY CONDUCTOR SHOWN ARE FOR MAINTENANCE OR REMOVAL AND SUPPORTED BY THE WORK MANAGEMENT SYSTEM FOR USE IN PREPARING WORK REQUESTS.
- 2. FOR UNDERBUILDING A LEGACY CONDUCTOR DISTRIBUTION CIRCUIT, CONSULT SYSTEM PLANNING FOR NEUTRAL SIZE.

3	3/31/21	BENDER	BURLISON	GRAHAM
2	10/7/20	BURLISON	BENDER	GRAHAM
1	9/30/20	BURLISON	BENDER	GRAHAM
0	11/13/17	BURLISON	BENDER	ADCOCK
REVISED	BY	CHK'D	APPR.	

COMMON PRIMARY/NEUTRAL CONDUCTORS
COMPATIBLE UNITS AND ITEM NUMBERS



DEC	DEM	DEP	DEF
			X
05.01-106			

20220050-DEF-000060

CONDUCTOR SIZE	STRANDING	COVER THICKNESS (INCHES)	COVER RATINGS °C/°F)	AMPACITY		COMPATIBLE UNIT	ITEM NUMBER
				SUMMER @ AMBIENT 104°F	WINTER @ AMBIENT 32°F		
COVERED ALUMINUM							
#4/0 AAC	19	0.800	90/194	366	505	LEAD-EQ-4/0-AL-COVER-F	4003569
500 AAC	37	0.075	90/194	623	862	LEAD-EQ-500-AL-COVER-F	4003570
COVERED COPPER							
#6	SOLID	0.030	75/167	108	164	LEAD-EQ-6-CU-COVER-F	4192427
#4	SOLID	0.030	75/167	143	218	LEAD-EQ-4-CU-COVER-F	4022282
#2	SOLID	0.045	75/167	188	290	LEAD-EQ-2-CU-COVER-F	4192428

LEAD WIRE SELECTION TABLE			
DEVICE	EQUIPMENT RATING	PRIMARY CONDUCTOR	SIZE/TYPE
TRANSFORMERS/ CAPACITORS	-	-	#6 CU
FUSED TAP/ TRIPSAVERS	140A AND LESS	-	#2 CU
	200A	-	4/0 AL
RECLOSERS	140A AND LESS	1/0A, #4 CU	#2 CU
	200A	4/0 AL, 2/0 CU	4/0 AL
	>200A	>4/0 AL, >2/0 CU	500 AL

NOTES:

1. EQUIPMENT LEADS ARE COVERED FOR ANIMAL PROTECTION.
2. MAXIMUM OPERATING TEMPERATURE EQUAL TO COVER RATING.
3. AMBIENT TEMPERATURE: 40°C/104°F SUMMER, 0°C/32°F WINTER.
4. WIND: 2FT/SEC AT 90 DEGREES, SUN: 98.62 WATTS/SQ FT, ATMOSPHERE: CLEAR
5. NORTH LATITUDE: 35 DEGREES, AZIMUTH OF THE SUN: 90 DEGREES (E-W), ALTITUDE: 900 FT.
6. COEFFICIENT OF EMISSIVITY: 0.8, COEFFICIENT OF ABSORPTION: 0.8.

3				
2				
1	9/30/21	BRUINS	BURLISON	GRAHAM
0	11/13/17	BURLISON	BENDER	ADCOCK
REVISED	BY	CHK'D	APPR.	

AVAILABLE LEAD WIRES AND THEIR AMPACITIES



DEC	DEM	DEP	DEF
			X
05.01-107			

20220050-DEF-000061

MULTIPLEX CABLE SIZES	MESSENGER/ NEUTRAL SIZE	AMPACITY BELOW IS BASED ON 104°F AMBIENT AND CONDUCTOR TEMPERATURE ON 194°	WEIGHT PER 1000 FOOT (LBS.)	BREAKING STRENGTH (LBS.)
DUPLEX (XLPE)				
6	6	85	65	1110
4	4	115	103	1760
TRIPLEX (XLPE)				
6	6	85	107	1110
4	4	115	160	1760
2	2	150	243	2800
1/0	1/0	205	390	4460
2/0	1/0	235	483	4460
4/0	1/0	315	728	4460
350	1/0	432	992	4460
500	4/0	535	1454	8560
QUADRUPLX				
1/0	1/0	161	567	4460
4/0	1/0	274	918	4460
350	1/0	378	1576	4460
500	4/0	510	2065	8560
1000	336 AAC	726	3747	6150

AMBIENT TEMPERATURE CORRECTION FACTORS	
AMBIENT TEMPERATURE °F	MULTIPLIER
32	1.34
50	1.26
68	1.18
86	1.10
104	1.00
122	0.90

NOTES:

- 1. 350 AND LARGER CABLES MAY BE AVAILABLE AS SINGLE CABLE ONLY REQUIRING THE TRIPLEX OR QUADRUPLX TO BE BUNDLED AND WRAPPED TO THE APPROPRIATE MESSENGER/NEUTRAL.

3				
2	1/31/19	BENDER	BURLISON	ADCOCK
1	3/31/18	BENDER	BURLISON	ADCOCK
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

OVERHEAD CABLE DATA -
600 VOLT PHYSICAL DATA



DEC	DEM	DEP	DEF
X	X	X	X
05.01-108			

20220050-DEF-000062

APPROVED FOR NEW CONSTRUCTION				
CONDUCTOR		COMPATIBLE UNIT	ITEM NUMBER	DESCRIPTION
PHASE(S)	NEUTRAL			
DUPLEX CABLES				
#6 AAC	#6 AAAC	WIRE-SEC-6-AL-DX-F, WIRE-SVC-6-AL-DX-F, WIRE-LGT-6-AL-DX-F	1506243	#6 DUPLEX, VIZSLA
#4 AAC	#4 AAAC	WIRE-SEC-4-AL-DX-F, WIRE-SVC-4-AL-DX-F, WIRE-LGT-4-AL-DX-F	4003562	#4 DUPLEX, WHIPPET
#1/0 AAC	#1/0 AAAC	WIRE-SEC-1/0-AL-DX-RT-F, WIRE-SVC-1/0-AL-DX-F, WIRE-LGT-1/0-AL-DX-RT-F	4003561	#1/0 DUPLEX, AFGHAN, AERIAL, WITH MOUSING
TRIPLEX CABLES				
#2 AAC	#2 AAAC	WIRE-SEC-2-AL-TX-F, WIRE-SVC-2-AL-TX-F, WIRE-LGT-2-AL-TX-F	4205787	#2 TRIPLEX, SHRIMP
#1/0 AAC	#1/0AAAC	WIRE-SEC-1/0-AL-TX-F, WIRE-SVC-1/0-AL-TX-F, WIRE-LGT-1/0-AL-TX-F	4205783	#1/0 TRIPLEX, GAMMARUS
#1/0 AAC	#1/0AAAC	WIRE-SEC-1/0-AL-TX-RT-F, WIRE-SVC-1/0-AL-TX-RT-F WIRE-LGT-1/0-AL-TX-RT-F	4003563	#1/0 TRIPLEX, AUBURN, AERIAL, WITH MOUSING
#4/0 AAC	#4/0 AAC	WIRE-SEC-4/0-AL-TX-F, WIRE-SVC-4/0-AL-TX-F, WIRE-LGT-4/0-AL-TX-F	4003489	#4/0 TRIPLEX, PORTUNAS
#4/0 AAC	#1/0 AAAC	WIRE-SEC-4/0-AL-TX-RT-F, WIRE-SVC-4/0-AL-TX-RT-F	4003564	#4/0 TRIPLEX, AERIAL, WITH MOUSING
QUADRUPLUX CABLE				
#1/0 AAC	#1/0 AAAC	WIRE-SEC-1/0-AL-QX-RT-F, WIRE-SVC-1/0-AL-QX-F	4003565	1/0 QUADRUPLUX, GALLEY, AERIAL, WITH MOUSING
#4/0 AAC	#1/0 AAAC	WIRE-SEC-4/0-AL-QX-RT-F, WIRE-SVC-4/0-AL-QX-RT-F	4003566	4/0 QUADRUPLUX, AERIAL WITH MOUSING

LEGACY CONDUCTORS- NOT APPROVED FOR NEW CONSTRUCTION			
CONDUCTOR SIZE	COMPATIBLE UNIT	ITEM NUMBER	DESCRIPTION
ALUMINUM			
#4	WIRE-SEC-4-AL-F, WIRE-SVC-4-AL-F	-	REM ONLY-OPEN WIRE SERVICE #4
#2	WIRE-SEC-2-AL-1/C-F, WIRE-SVC-2-AL-F	4022240	OPEN WIRE SECONDARY/SERVICE #2 AAAC
#2	WIRE-SEC-2-AL-QX-F, WIRE-SVC-2-AL-QX-F	-	REM ONLY #2 QUADRUPLUX
#1/0	WIRE-SEC-1/0-AL-F, WIRE-SVC-1/0-AL-F	4033009	OPEN WIRE SECONDARY/SERVICE #1/0 AAAC
336.4	WIRE-SEC-336-AL-F, WIRE-SVC-336-AL-F	4022243	OPEN WIRE SERVICE 336.4 ACSR
336.4	WIRE-SEC-336-AL-QX-F, WIRE-SVC-336-AL-QX-F	4003492	336.4 QUADRUPLUX, AERIAL, WITH MOUSING
COPPER			
#6	WIRE-SEC-6-CUHD-F, WIRE-SVC-6-CUHD-F	4022251	OPEN WIRE SECONDARY/SERVICE #6 CU
#4	WIRE-SEC-4-CUHD-F, WIRE-SVC-4-CUHD-F	4022252	OPEN WIRE SECONDARY/SERVICE #4 CU
#2	WIRE-SEC-2-CUHD-F, WIRE-SVC-2-CUHD-F	4022254	OPEN WIRE SECONDARY/SERVICE/LIGHTING #2 CU
#4/0	WIRE-SEC-4/0-CUHD-F, WIRE-SVC-4/0-CUHD-F	4022267	OPEN WIRE SECONDARY/LIGHTING #4/0 CU



3				
2				
1				
O	11/13/17	BURLISON	BENDER	ADCOCK
REVISED	BY	CHK'D	APPR.	

OVERHEAD WIRE AND CABLE INFORMATION

DEC	DEM	DEP	DEF
			X
05.01-112			

20220050-DEF-000063

GENERAL

THE INFORMATION ON THIS PAGE APPLIES TO PRIMARY, SECONDARY AND SERVICE CONDUCTOR/CABLE SAG CHARTS.

BARE OVERHEAD CONDUCTORS

EACH CONDUCTOR CHART IS FORMATTED AS AN "A" AND A "B" DRAWING.

INITIAL SAGS (DRAWING "A"):

THESE SAGS VALUES ARE USED DURING CONSTRUCTION FOR THE INITIAL INSTALLATION OF CONDUCTORS.

FINAL SAGS AND HORIZONTAL SWINGS (DRAWING "B"):

THESE ARE DESIGN SAG VALUES USED TO DETERMINE GROUND CLEARANCES, CLEARANCES FROM OTHER CONDUCTORS AND OBJECTS.

ALL SAG VALUES LISTED IN CHARTS ARE IN INCHES UNLESS NOTED; TENSION VALUES ARE IN POUNDS.

- ▶ THE RULING SPANS USED ARE 150 FT. (SHORT SPANS), 280 FT. (MEDIUM SPANS), AND 400 FT. OR 450 FT. (LONG SPANS) WHICH VARIES WITH CONDUCTOR SIZE. THERE IS AN EXCEPTION TO THESE RULING SPANS FOR DEF. THE 336.4 AAC, 795 AAC AND REDUCED TENSION #1/0 AAAC NEUTRAL SAG AND TENSION TABLES HAVE RULING SPANS OF 150, 200, 300 AND 440 FEET. NOTE: #1/0 IS NO LONGER USED FOR A NEUTRAL FOR NEW CONSTRUCTION OF 795 AAC FEEDER. USE 336 AAC INSTEAD.

LLT (LIGHT LOADING TENSION), MLT (MEDIUM LOADING TENSION) AND HLT (HEAVY LOADING TENSION) IN THE CHARTS REFER TO THE MAXIMUM DESIGN TENSION USED FOR THE NESC LOADING ZONES.

SECONDARY AND SERVICE CABLE

SECONDARY CABLES:

SECONDARY CABLE SAG AND TENSION CHARTS ARE SHOWN AT THE TOP OF EACH DRAWING PER CABLE SIZE. THESE SAG AND TENSIONS ARE DESIGNED TO BE USED BETWEEN POLES THAT ARE GUYED ON EACH END OF THE CABLE RUN.

SERVICE CABLE:

SERVICE CABLE SAG AND TENSION CHARTS ARE SHOWN AT THE BOTTOM OF EACH DRAWING PER CABLE SIZE. THESE SAG AND TENSIONS ARE DESIGNED TO BE USED BETWEEN LIFT POLES AND POLE TO BUILDING WITHOUT GUYING. TENSION IS LIMITED TO MAXIMUM TENSION PERMITTED ON A TYPICAL SERVICE MAST.

FOR CONDUCTOR SAG CHARTS NOT SHOWN IN THE SPECIFICATIONS, CONTACT DISTRIBUTION STANDARDS.

NOTES

1. SAG CONDUCTORS PER DWG. 05.02-104.
2. WHEN SELECTING SAGS FROM CHARTS, ENTER THE CHART AT THE CALCULATED CLOSEST RULING SPAN AND INTERPOLATE TO DETERMINE VALUES THAT ARE BETWEEN THE ACTUAL TEMPERATURE AND SPAN.
3. DO NOT INTERPOLATE FOR SPANS BETWEEN 340 FT. AND 360 FT. THE MEDIUM SPANS AND LONG SPANS HAVE DIFFERENT RULING SPANS. FOR THE 350 FT. SAG, ADD ONE HALF OF THE DIFFERENCE BETWEEN THE 320 FT. SAG AND THE 340 FT. SAG TO THE 340 FT. SAG.

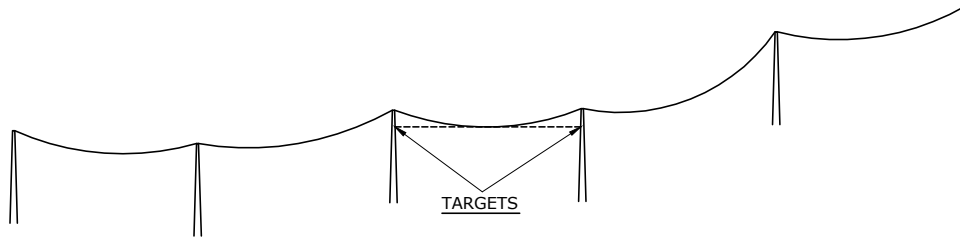
3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

SAG AND TENSION GENERAL NOTES



DEC	DEM	DEP	DEF
X	X	X	X
05.02-100			

20220050-DEF-000064



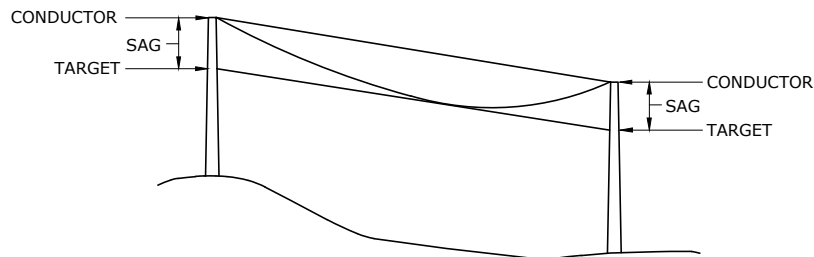
SELECT SPAN NEAR CENTER OF SECTION BEING SAGGED. SELECT SPAN WHOSE SUPPORTS ARE NEAR THE SAME ELEVATION.

FIVE SPANS OR LESS



SELECT AT LEAST TWO SPANS, ONE NEAR EACH END OF SECTION BEING SAGGED. MEASURE ONLY SPANS OF AVERAGE LENGTH IN SECTION BEING SAGGED.

OVER FIVE SPANS



NOTES:

1. INSTALL CONDUCTOR IN FREE-RUNNING ADEQUATE SIZE BLOCKS. SAG THE CONDUCTOR TO APPROXIMATE SAG WHILE INSTALLING, ADJUST GUYS AS NEEDED, THEN SAG TO EXACT SAG USING PROPER TABLE, CONDUCTOR TEMPERATURE AND SPAN LENGTH. THEN TIE IN. OBSERVE CLEARANCES, MEASURE ANY THAT ARE CLOSE TO MINIMUM AND ADVISE ENGINEER OF DETAILS OF TEMPERATURE AND SAG OF ANY SPAN WHICH HAS QUESTIONABLE CLEARANCE.
2. USE SAG TABLES IN SECTION 05 UNLESS OTHERWISE SPECIFIED. USE SHORT SPAN SAGS FOR LINES UNDER 200' MAXIMUM SPAN. USE MEDIUM SPAN SAGS FOR LINES AVERAGING 200' - 350' SPANS WITH 350' MAXIMUM SPAN. USE LONG SPAN FOR LENGTHS WITH MAXIMUM SPANS ABOVE 350'.
3. IF NECESSARY TO USE SECTION OF LINE OR DEAD-END SPAN WITH SHORTER SPANS THAN IN SAG TABLE, DETERMINE SAG BY USING DOUBLE SPAN LENGTH AND DIVIDING BY 4. OR USE SAG OF QUADRUPLE SPAN DIVIDED BY 16. AVOID INSTALLING SUCH SHORT SPANS WHENEVER POSSIBLE.



3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

SELECTING SPANS AND MEASURING SAGS

DEC	DEM	DEP	DEF
X	X	X	X
05.02-104			

3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

CONDUCTOR SAG AND TENSION - TREE WIRE



DEC	DEM	DEP	DEF
			X
05.02-108			

20220050-DEF-000066

1/0 AAAC TREE WIRE												
WIRE SIZE	STRINGING CONDITIONS	TEMP. IN °F	SAG AND TENSION FOR VARIOUS RULING SPANS									
			50' SPAN		100' SPAN		150' SPAN		200' SPAN		250' SPAN	
			TENSION	SAG	TENSION	SAG	TENSION	SAG	TENSION	SAG	TENSION	SAG
# 1/0 AAAC	INITIAL	30°	1450	1"	1450	2"	1450	5"	1450	10"	1450	1'3"
		60°	1190	1"	1190	3"	1190	7"	1190	1'0"	1190	1'7"
		90°	895	1"	895	4"	895	9"	895	1'4"	895	2'0"
		120°	660	1"	660	5"	660	1'0"	660	1'10"	660	2'10"
NOTE:			# 1/0 AAAC 10/64" HDPE - MAXIMUM TENSION FROM LIGHT LOADING PER 1984 EDITION OF NESC (9 LBS. WIND AND CONSTANT AT 30°F.) = 1,030 LBS. SAG DATA BASED ON RULING SPAN OF 200 FT.									

336.4 TREE WIRE												
WIRE SIZE	STRINGING CONDITIONS	TEMP. IN °F	SAG AND TENSION FOR VARIOUS RULING SPANS									
			50' SPAN		100' SPAN		150' SPAN		200' SPAN		250' SPAN	
			TENSION	SAG	TENSION	SAG	TENSION	SAG	TENSION	SAG	TENSION	SAG
			336.4	INITIAL	30°	1882	1"	1882	4"	1882	9"	1882
60°	1460	1"	460		5"	1460	11"	1460	1'7"	1460	2'6"	
90°	1035	2"	1035		7"	1035	1'4"	1035	2'4"	1035	3'7"	
AAC		120°	795	2"	795	9"	795	1'8"	795	3'0"	795	4'8"
NOTE:			336 MCM AAC 10/64" HDPE. MAXIMUM TENSION FROM LIGHT LOADING PER 1984 EDITION OF NESC (9 LBS. WIND AND CONSTANT AT 30°F.) = 2,155 LBS. SAG DATA BASED ON RULING SPAN OF 200 FT.									

NOTES:

- SEE DWG. 05.02-100 FOR GENERAL NOTES.

NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION - #2 AAAC AMES

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN						
		100	120	140	150	160	180	200
30° F	746	1	2	3	3	4	5	6
40° F	689	2	2	3	4	4	5	6
50° F	633	2	2	3	4	4	6	7
60° F	577	2	3	4	4	5	6	7
70° F	522	2	3	4	5	5	7	8
80° F	468	2	3	5	5	6	7	9
90° F	416	3	4	5	6	7	8	10
104° F	346	3	4	6	7	8	10	12

CONDUCTOR TEMPERATURE	TENSION LBS	280 FOOT RULING SPAN							
		200	220	240	260	280	300	320	340
30° F	898	5	6	7	8	9	11	12	14
40° F	842	5	6	7	9	10	12	13	15
50° F	786	6	7	8	9	11	12	14	16
60° F	730	6	7	9	10	12	13	15	17
70° F	675	6	8	9	11	13	14	16	18
80° F	621	7	8	10	12	14	16	18	20
90° F	569	8	9	11	13	15	17	19	22
104° F	497	9	11	13	15	17	20	22	25

CONDUCTOR TEMPERATURE	TENSION LBS	450 FOOT RULING SPAN								
		360	380	400	420	440	450	460	480	500
30° F	900	16	17	19	21	23	24	25	28	30
40° F	846	17	18	20	23	25	26	27	29	32
50° F	792	18	20	22	24	26	28	29	31	34
60° F	739	19	21	23	26	28	30	31	34	37
70° F	687	20	23	25	28	30	32	33	36	39
80° F	637	22	24	27	30	33	34	36	39	42
90° F	588	24	27	29	32	36	37	39	42	46
104° F	524	27	30	33	36	40	42	44	47	52

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.

3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE
INITIAL CONDUCTOR SAG AND TENSION -
#2 AAAC AMES



DEC	DEM	SEP	DEF
			X

05.02-112A

20220050-DEF-000067

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION - 2 AAAC AMES

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-800 LBS.)						
		100	120	140	150	160	180	200
30° F, 9 PSF WIND	683	7	9	13	15	17	21	26
30° F, NO WIND	592	2	3	4	4	5	6	7
32° F	578	2	3	4	4	5	6	7
40° F	523	2	3	4	5	5	7	8
50° F	455	2	3	5	5	6	8	10
60° F	389	3	4	5	6	7	9	11
60° F, 6PSF WIND	449	6	8	11	13	15	19	23
70° F	325	3	5	7	7	9	11	13
80° F	267	4	6	8	9	10	13	16
90° F	216	5	7	10	11	13	16	20
104° F	161	7	10	13	15	17	22	27
120° F	123	9	13	17	20	23	28	35
185° F	68	16	23	31	36	41	52	64
HORIZONTAL SWING	449	3	5	6	6	8	10	12

CONDUCTOR TEMPERATURE	TENSION LBS	280 FOOT RULING SPAN (LLT-1015 LBS.)							
		200	220	240	260	280	300	320	340
30° F, 9 PSF WIND	885	20	24	29	34	40	45	52	58
30° F, NO WIND	700	6	7	9	10	12	14	16	18
32° F	687	6	8	9	11	12	14	16	18
40° F	633	7	8	10	12	13	15	17	20
50° F	568	8	9	11	13	15	17	19	22
60° F	505	9	10	12	14	17	19	22	25
60° F, 6PSF WIND	613	17	21	24	29	33	38	44	49
70° F	444	10	12	14	16	19	22	25	28
80° F	388	11	13	16	19	22	25	29	32
90° F	337	13	16	18	22	25	29	33	37
104° F	277	16	19	22	26	31	35	40	45
120° F	226	19	23	28	32	38	43	49	55
185° F	131	33	40	48	56	65	74	85	96
HORIZONTAL SWING	613	15	19	22	26	30	35	40	45

CONDUCTOR TEMPERATURE	TENSION LBS	450 FOOT RULING SPAN (LLT-1134 LBS.)								
		360	380	400	420	440	450	460	480	500
30° F, 9 PSF WIND	1036	56	62	69	76	83	87	91	99	108
30° F, NO WIND	700	20	22	25	27	30	31	33	36	39
32° F	688	20	23	25	28	30	32	33	36	39
40° F	639	22	24	27	30	33	34	36	39	42
50° F	580	24	27	30	33	36	38	39	43	47
60° F	525	27	30	33	36	40	42	44	47	51
60° F, 6PSF WIND	714	47	53	58	64	71	74	77	84	91
70° F	474	30	33	36	40	44	46	48	52	57
80° F	428	33	36	40	45	49	51	53	58	63
90° F	387	36	40	45	49	54	57	59	64	70
104° F	338	41	46	51	56	62	65	68	74	80
120° F	293	48	53	59	65	71	75	78	85	92
185° F	194	72	80	89	98	108	113	118	128	139
HORIZONTAL SWING	714	43	48	53	58	65	67	70	76	83

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.



3				
2				
1				
0	6/30/16	ROBESON	ROBESON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION - 2 AAAC AMES

DEC	DEM	SEP	DEF
			X
05.02-112B			

20220050-DEF-000068

**NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION 1/0 AAAC AZUZA FEEDER NEUTRAL
➤ (FOR MAINTENANCE ONLY)**

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-642 LBS.)										
		100	110	120	130	140	150	160	170	180	190	200
30° F	474	4	4	5	6	7	8	9	11	12	13	15
40° F	405	4	5	6	7	8	10	11	12	14	15	17
50° F	344	5	6	7	8	10	11	13	14	16	18	20
60° F	292	6	7	9	10	12	13	15	17	19	21	24
70° F	249	7	8	10	12	14	16	18	20	22	25	28
80° F	215	8	10	12	14	16	18	21	23	26	29	32
90° F	188	9	11	13	16	18	21	23	27	30	33	37
95° F	177	10	12	14	16	19	22	25	28	32	35	39
104° F	161	11	13	15	18	21	24	27	31	35	39	43

CONDUCTOR TEMPERATURE	TENSION LBS	200 FOOT RULING SPAN- (LLT-720 LBS.)										
		150	160	170	180	190	200	210	220	230	240	250
30° F	489	8	9	10	11	13	14	16	17	19	20	22
40° F	426	9	10	12	13	15	16	18	20	21	23	25
50° F	370	10	12	13	15	17	19	21	23	25	27	29
60° F	323	12	14	15	17	19	21	24	26	28	31	33
70° F	284	14	16	18	20	22	24	27	29	32	35	38
80° F	252	15	18	20	22	25	27	30	33	36	39	43
90° F	226	17	20	22	25	28	31	34	37	40	44	48
95° F	215	18	21	23	26	29	32	35	39	42	46	50
104° F	198	20	22	25	28	31	35	38	42	46	50	54

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.
- 2. 1/0 AAAC IS NO LONGER USED ON NEW FEEDER CONSTRUCTION. USE 336 AAC AS THE NEUTRAL INSTEAD.



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

**NESC LIGHT LOADING ZONE
INITIAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION 1/0 AAAC AZUZA FEEDER NEUTRAL**

DEC	DEM	DEP	DEF
			X
05.02-120A			

20220050-DEF-000069

**NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION 1/0 AAAC AZUZA FEEDER NEUTRAL
➤ (FOR MAINTENANCE ONLY)**

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-642 LBS.)										
		100	110	120	130	140	150	160	170	180	190	200
30° F, 9 PSF WIND	632	9	11	13	15	17	20	22	25	28	32	35
30° F, NO WIND	413	4	5	6	7	8	9	11	12	14	15	17
32° F	396	4	5	6	7	9	10	11	13	14	16	17
40° F	334	5	6	7	9	10	12	13	15	17	19	21
50° F	272	6	8	9	11	12	14	16	18	21	23	25
60° F	225	8	9	11	13	15	17	20	22	25	28	31
60° F, 6PSF WIND	356	10	12	14	16	19	22	25	28	31	35	39
70° F	192	9	11	13	15	18	20	23	26	29	32	36
80° F	169	10	12	15	17	20	23	26	30	33	37	41
90° F	151	11	14	16	19	22	26	29	33	37	41	46
95° F	144	12	15	17	20	24	27	31	35	39	43	48
104° F	133	13	16	19	22	25	29	33	38	42	47	52
120° F	118	15	18	21	25	29	33	37	42	47	53	59
HORIZONTAL SWING	356	9	10	12	14	16	19	22	24	27	30	34

CONDUCTOR TEMPERATURE	TENSION LBS	200 FOOT RULING SPAN (LLT-720 LBS.)										
		150	160	170	180	190	200	210	220	230	240	250
30° F, 9 PSF WIND	704	18	20	23	26	28	32	35	38	42	45	49
30° F, NO WIND	413	9	11	12	14	15	17	18	20	22	24	26
32° F	399	10	11	13	14	16	17	19	21	23	25	27
40° F	347	11	13	14	16	18	20	22	24	26	29	31
50° F	295	13	15	17	19	21	23	26	28	31	34	36
60° F	256	15	17	19	22	24	27	30	33	36	39	42
60° F, 6PSF WIND	414	19	21	24	27	30	33	37	40	44	48	52
70° F	226	17	20	22	25	28	30	34	37	40	44	48
80° F	203	19	22	25	27	31	34	37	41	45	49	53
90° F	186	21	24	27	30	34	37	41	45	49	54	58
95° F	178	22	25	28	31	35	39	43	47	51	56	61
104° F	166	23	27	30	34	37	42	46	50	55	60	65
120° F	150	26	30	33	37	42	46	51	56	62	66	72
HORIZONTAL SWING	414	16	18	21	23	26	29	32	35	38	42	45

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.

➤ 2. 1/0 AAAC IS NO LONGER USED ON NEW FEEDER CONSTRUCTION. USE 336 AAC AS THE NEUTRAL INSTEAD.



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

**NESC LIGHT LOADING ZONE
FINAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION 1/0 AAAC AZUZA FEEDER NEUTRAL**

DEC	DEM	DEP	DEF
			X
05.02-120B			

20220050-DEF-000070

NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION - 1/0 AAAC AZUZA

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN						
		100	120	140	150	160	180	200
30° F	920	2	3	4	4	5	6	8
40° F	833	2	3	4	5	5	7	8
50° F	747	2	3	5	5	6	7	9
60° F	664	3	4	5	6	7	8	10
70° F	584	3	4	6	7	8	10	12
80° F	508	3	5	7	8	9	11	14
90° F	437	4	6	8	9	10	13	16
104° F	348	5	7	10	11	13	16	20

CONDUCTOR TEMPERATURE	TENSION LBS	280 FOOT RULING SPAN							
		200	220	240	260	280	300	320	340
30° F	1355	5	6	7	9	10	11	13	15
40° F	1265	5	7	8	9	11	12	14	16
50° F	1177	6	7	8	10	11	13	15	17
60° F	1089	6	8	9	11	12	14	16	18
70° F	1003	7	8	10	12	13	15	18	20
80° F	918	8	9	11	13	15	17	19	22
90° F	836	8	10	12	14	16	19	21	24
104° F	726	10	11	14	16	19	21	24	27

CONDUCTOR TEMPERATURE	TENSION LBS	400 FOOT RULING SPAN							
		360	380	400	420	440	460	480	500
30° F	1342	17	19	21	23	25	27	30	32
40° F	1255	18	20	22	24	27	29	32	34
50° F	1170	19	21	24	26	29	31	34	37
60° F	1086	21	23	25	28	31	34	37	40
70° F	1004	22	25	27	30	33	36	40	43
80° F	925	24	27	30	33	36	39	43	47
90° F	849	26	29	33	36	39	43	47	51
104° F	749	30	33	37	41	45	49	53	58

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.



3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE
INITIAL CONDUCTOR SAG AND TENSION -
1/0 AAAC AZUZA

DEC	DEM	DEP	DEF
			X
05.02-124A			

20220050-DEF-000071

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION - 1/0 AAAC AZUZA

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-1000 LBS.)						
		100	120	140	150	160	180	200
30° F, 9 PSF WIND	879	6	9	12	14	16	20	25
30° F, NO WIND	752	2	3	5	5	6	7	9
32° F	731	2	3	5	6	6	8	9
40° F	646	3	4	5	6	7	9	11
50° F	543	3	5	6	7	8	10	13
60° F	448	4	6	8	9	10	12	15
60° F, 6PSF WIND	542	6	9	12	14	16	21	25
70° F	363	5	7	9	10	12	15	19
80° F	294	6	8	12	13	15	19	23
90° F	242	7	10	14	16	18	23	29
104° F	192	9	13	18	20	23	29	36
120° F	157	11	16	22	25	28	36	44
185° F	99	17	25	34	39	45	57	70
HORIZONTAL SWING	542	5	8	10	12	14	18	22

CONDUCTOR TEMPERATURE	TENSION LBS	280 FOOT RULING SPAN (LLT-1483 LBS.)							
		200	220	240	260	280	300	320	340
30° F, 9 PSF WIND	1269	17	21	25	30	34	39	45	51
30° F, NO WIND	1059	7	8	9	11	13	15	17	19
32° F	1037	7	8	10	11	13	15	17	19
40° F	953	7	9	10	12	14	16	19	21
50° F	851	8	10	12	14	16	18	21	23
60° F	752	9	11	13	16	18	21	23	27
60° F, 6PSF WIND	881	16	19	23	26	31	35	40	45
70° F	660	10	13	15	18	21	24	27	30
80° F	574	12	15	17	20	24	27	31	35
90° F	499	14	17	20	23	27	31	35	40
104° F	412	17	20	24	28	33	38	43	48
120° F	339	20	25	29	34	40	46	52	59
185° F	202	34	41	49	58	67	77	87	99
HORIZONTAL SWING	881	14	16	20	23	27	30	35	39

CONDUCTOR TEMPERATURE	TENSION LBS	400 FOOT RULING SPAN (LLT-1571 LBS.)							
		360	380	400	420	440	460	480	500
30° F, 9 PSF WIND	1391	52	58	64	70	77	84	92	100
30° F, NO WIND	1047	21	24	26	29	32	35	38	41
32° F	1027	22	24	27	30	33	36	39	42
40° F	949	24	26	29	32	35	38	42	45
50° F	856	26	29	32	36	39	43	46	50
60° F	768	29	32	36	40	43	58	52	56
60° F, 6PSF WIND	968	46	51	57	63	69	75	82	89
70° F	688	33	36	40	43	48	53	58	63
80° F	615	36	40	45	49	54	59	65	70
90° F	552	40	45	50	55	60	66	72	78
104° F	479	47	52	58	64	70	76	83	90
120° F	413	54	60	67	74	81	88	96	104
185° F	272	82	92	101	112	123	134	146	158
HORIZONTAL SWING	968	40	44	49	55	60	65	71	77

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.



3				
2				
1	11/29/16	ROBESON	BURLISON	ADCOCK
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION - 1/0 AAAC AZUZA

DEC	DEM	DEP	DEF
			X
05.02-124B			

20220050-DEF-000072

**NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION, #1/0 AAAC AZUZA FEEDER NEUTRAL
➤ (FOR MAINTENANCE ONLY)**

CONDUCTOR TEMPERATURE	TENSION LBS	300 FOOT RULING SPAN (MLT - 965 LBS.)						
		250	270	290	310	330	350	370
30° F	662	16	19	22	25	28	32	36
40° F	594	18	21	24	28	32	36	40
50° F	533	20	24	27	31	35	40	44
60° F	477	23	26	30	35	39	44	49
70° F	429	25	29	34	39	44	49	55
80° F	387	28	32	37	43	49	55	61
90° F	352	31	36	41	47	53	60	67
104° F	311	35	40	47	53	60	68	76

CONDUCTOR TEMPERATURE	TENSION LBS	440 FOOT RULING SPAN (MLT - 1101 LBS.)						
		380	400	420	440	460	480	500
30° F	644	39	43	47	52	57	62	67
40° F	591	42	47	51	57	62	67	73
50° F	544	46	51	56	61	67	73	79
60° F	501	50	55	61	67	73	79	86
70° F	464	54	59	66	72	79	86	93
80° F	432	58	64	70	77	85	92	100
90° F	404	62	68	75	83	90	99	107
104° F	370	67	75	82	90	99	107	117

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.
- 2. 1/0 AAAC IS NO LONGER USED ON NEW FEEDER CONSTRUCTION. USE 336 AAC AS THE NEUTRAL INSTEAD.



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

**NESC LIGHT LOADING ZONE
INITIAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION
#1/0 AAAC AZUZA FEEDER NEUTRAL**

DEC	DEM	DEP	DEF
			X
05.02-126A			

20220050-DEF-000073

**NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION, #1/0 AAAC AZUZA FEEDER NEUTRAL
➤ (FOR MAINTENANCE ONLY)**

CONDUCTOR TEMPERATURE	TENSION LBS	300 FOOT RULING SPAN- (LLT-965 LBS.)						
		250	270	290	310	330	350	370
30° F, 9 PSF WIND	922	38	44	51	58	66	74	82
30° F, NO WIND	539	20	23	27	31	35	39	44
32° F	525	21	24	28	32	36	40	45
40° F	472	23	27	31	35	40	45	50
50° F	416	26	30	35	40	45	51	57
60° F	370	29	34	39	45	51	57	64
60° F, 6PSF WIND	576	37	44	50	58	65	73	82
70° F	332	32	38	44	50	57	64	71
80° F	302	36	42	48	55	62	70	78
90° F	278	39	45	52	60	68	76	85
104° F	250	43	50	58	66	75	84	94
120° F	226	48	56	64	73	83	93	104
185° F	169	64	74	86	98	111	125	140
HORIZONTAL SWING	576	32	38	43	50	56	63	71

CONDUCTOR TEMPERATURE	TENSION LBS	440 FOOT RULING SPAN- (LLT-1101 LBS.)						
		380	400	420	440	460	480	500
30° F, 9 PSF WIND	1062	75	84	92	101	111	120	131
30° F, NO WIND	531	47	52	57	63	69	75	81
32° F	522	48	53	58	64	70	76	83
40° F	485	51	57	63	69	75	82	89
50° F	446	56	62	68	75	82	89	97
60° F	412	60	67	74	81	89	96	105
60° F, 6PSF WIND	678	73	81	90	99	108	117	127
70° F	384	65	72	79	87	95	104	112
80° F	360	69	77	85	93	101	110	120
90° F	339	73	81	90	99	108	117	127
104° F	314	79	88	97	106	116	127	137
120° F	291	86	95	105	115	125	137	148
185° F	230	108	120	133	145	159	173	188
HORIZONTAL SWING	678	63	70	78	86	94	101	110

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.

➤ 2. 1/0 AAAC IS NO LONGER USED ON NEW FEEDER CONSTRUCTION. USE 336 AAC AS THE NEUTRAL INSTEAD.



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

**NESC LIGHT LOADING ZONE
FINAL CONDUCTOR SAG AND TENSION -
REDUCED TENSION
#1/0 AAAC AZUZA FEEDER NEUTRAL**

DEC	DEM	DEP	DEF
			X
05.02-126B			

20220050-DEF-000074

NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION - 336.4-AAC TULIP
► FOR PRIMARY AND FEEDER NEUTRAL

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-2243 LBS.)										
		100	110	120	130	140	150	160	170	180	190	200
30° F	2153	2	3	3	4	4	5	6	6	7	8	9
40° F	1950	2	3	3	4	5	5	6	7	8	9	10
50° F	1745	3	3	4	5	5	6	7	8	9	10	11
60° F	1539	3	4	4	5	6	7	8	9	10	11	12
70° F	1335	4	4	5	6	7	8	9	10	11	13	14
80° F	1140	4	5	6	7	8	9	11	12	13	15	17
90° F	959	5	6	7	8	10	11	13	14	16	18	20
95° F	877	5	7	8	9	11	12	14	16	17	19	22
104° F	747	6	8	9	11	12	14	16	18	20	23	25

CONDUCTOR TEMPERATURE	TENSION LBS	200 FOOT RULING SPAN- (LLT-2301 LBS.)										
		150	160	170	180	190	200	210	220	230	240	250
30° F	2152	5	6	6	7	8	9	10	11	12	13	14
40° F	1956	5	6	7	8	9	10	11	12	13	14	15
50° F	1758	6	7	8	9	10	11	12	13	14	15	17
60° F	1562	7	8	9	10	11	12	13	15	16	17	19
70° F	1371	8	9	10	11	12	14	15	17	18	20	22
80° F	1192	9	10	11	13	14	16	17	19	21	23	25
90° F	1031	10	12	13	15	17	18	20	22	24	26	29
95° F	958	11	13	14	16	18	20	22	24	26	28	31
104° F	842	13	14	16	18	20	22	25	27	30	32	35

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.

► 2. USE 336.4 AAC FOR FEEDER NEUTRAL ON NEW OR REBUILD FEEDER CONSTRUCTION,



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

► NESC LIGHT LOADING ZONE
 INITIAL CONDUCTOR SAG AND TENSION -
 336.4-AAC TULIP PRIMARY AND FEEDER NEUTRAL

DEC	DEM	DEP	DEF
			X

05.02-136A

20220050-DEF-000075

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION - 336.4 AAC-TULIP
► FOR PRIMARY AND FEEDER NEUTRAL

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-2243 LBS.)										
		100	110	120	130	140	150	160	170	180	190	200
30° F, 9 PSF WIND	1661	6	7	8	10	11	13	15	17	19	21	23
30° F, NO WIND	1439	3	4	5	6	6	7	8	9	11	12	13
32° F	1387	3	4	5	6	7	8	9	10	11	12	14
40° F	1188	4	5	6	7	8	9	10	12	13	14	16
50° F	966	5	6	7	8	10	11	13	14	16	18	20
60° F	785	6	7	9	10	12	14	15	17	20	22	24
60° F, 6PSF WIND	947	7	9	10	12	14	16	19	21	24	26	29
70° F	649	7	9	10	12	14	16	19	21	24	26	29
80° F	550	9	10	12	15	17	19	22	25	28	31	34
90° F	479	10	12	14	17	19	22	25	29	32	36	39
95° F	451	10	13	15	18	21	24	27	30	34	38	42
104° F	410	12	14	17	20	23	26	30	33	37	42	46
185° F	247	19	23	28	32	37	43	49	55	62	69	77
HORIZONTAL SWING	947	5	7	7	9	10	12	14	15	17	19	21

CONDUCTOR TEMPERATURE	TENSION LBS	200 FOOT RULING SPAN (LLT-2301 LBS.)										
		150	160	170	180	190	200	210	220	230	240	250
30° F, 9 PSF WIND	1729	13	14	16	18	20	22	25	27	29	32	35
30° F, NO WIND	1392	8	9	10	11	12	14	15	16	18	20	21
32° F	1346	8	9	10	11	13	14	15	17	19	20	22
40° F	1173	9	10	12	13	15	16	18	20	21	23	25
50° F	988	11	12	14	16	17	19	21	23	25	28	30
60° F	840	13	14	16	18	20	23	25	27	30	32	35
60° F, 6PSF WIND	1044	15	17	19	21	24	26	29	32	35	38	41
70° F	726	15	17	19	21	24	26	29	32	34	38	41
80° F	639	17	18	21	24	27	30	33	36	39	43	46
90° F	572	19	21	24	27	30	33	36	40	44	48	52
95° F	545	20	22	25	28	31	35	38	42	46	50	54
104° F	503	21	24	27	30	34	38	41	46	50	54	59
185° F	320	33	38	43	48	53	59	65	72	78	85	92
HORIZONTAL SWING	1044	11	12	14	15	17	19	21	23	25	28	30

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.

► 2. USE 336.4 AAC FOR FEEDER NEUTRAL ON NEW OR REBUILD FEEDER CONSTRUCTION.



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

► NESC LIGHT LOADING ZONE
 FINAL CONDUCTOR SAG AND TENSION -
 336.4 AAC-TULIP PRIMARY AND FEEDER NEUTRAL

DEC	DEM	DEP	DEF
			X
05.02-136B			

20220050-DEF-000076

**NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION - 336.4-AAC TULIP
➤ FOR PRIMARY AND FEEDER NEUTRAL**

CONDUCTOR TEMPERATURE	TENSION LBS	300 FOOT RULING SPAN- (LLT-2351 LBS.)						
		250	270	290	310	330	350	370
30° F	2048	14	17	19	22	25	28	32
40° F	1866	16	18	21	24	28	31	35
50° F	1688	17	20	24	27	30	34	38
60° F	1519	19	23	26	30	34	38	43
70° F	1362	22	25	29	33	38	42	47
80° F	1221	24	28	33	37	42	47	53
90° F	1097	27	31	36	41	47	53	59
104° F	952	31	36	42	48	54	61	68

CONDUCTOR TEMPERATURE	TENSION LBS	440 FOOT RULING SPAN- (LLT-2548 LBS.)						
		380	400	420	440	460	480	500
30° F	2048	33	37	41	45	49	53	58
40° F	1890	36	40	44	48	53	58	62
50° F	1742	39	43	48	53	57	63	68
60° F	1603	43	47	52	57	62	68	74
70° F	1476	46	51	56	62	68	74	80
80° F	1363	50	55	61	67	73	80	87
90° F	1262	54	60	66	73	79	86	94
104° F	1141	60	66	73	80	88	95	104

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.
- 2. USE 336.4 AAC FOR FEEDER NEUTRAL ON NEW OR REBUILD FEEDER CONSTRUCTION.



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

➤ NESC LIGHT LOADING ZONE
INITIAL CONDUCTOR SAG AND TENSION -
336.4-AAC TULIP PRIMARY AND FEEDER NEUTRAL

DEC	DEM	DEP	DEF
			X
05.02-137A			

20220050-DEF-000077

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION - 336.4 AAC-TULIP
➤ FOR PRIMARY AND FEEDER NEUTRAL

CONDUCTOR TEMPERATURE	TENSION LBS	300 FOOT RULING SPAN- (LLT-2351 LBS.)						
		250	270	290	310	330	350	370
30° F, 9 PSF WIND	1840	33	38	44	50	57	64	72
30° F, NO WIND	1294	23	27	31	35	40	45	50
32° F	1261	23	27	32	36	41	46	51
40° F	1141	26	30	35	40	45	51	57
50° F	1016	29	34	39	45	51	57	64
60° F	914	32	38	43	50	56	63	71
60° F, 6PSF WIND	1186	36	42	49	56	63	71	79
70° F	832	36	41	48	55	62	70	78
80° F	764	39	45	52	59	67	76	85
90° F	708	42	49	56	64	73	82	91
104° F	645	46	53	62	70	80	90	100
120° F	588	50	59	68	77	87	98	110
185° F	449	66	77	89	101	115	129	144
HORIZONTAL SWING	1186	26	31	36	41	46	52	57

CONDUCTOR TEMPERATURE	TENSION LBS	440 FOOT RULING SPAN- (LLT-2548 LBS.)						
		380	400	420	440	460	480	500
30° F, 9 PSF WIND	2073	67	74	82	90	98	107	116
30° F, NO WIND	1328	51	57	63	69	75	82	89
32° F	1306	52	58	64	70	77	83	91
40° F	1222	56	62	68	75	82	89	97
50° F	1131	60	67	74	81	88	96	105
60° F	1054	65	72	79	87	95	103	112
60° F, 6PSF WIND	1398	71	79	87	95	104	113	123
70° F	987	69	77	84	93	101	110	120
80° F	930	73	81	90	98	108	117	127
90° F	881	77	86	95	104	114	124	134
104° F	822	83	92	101	111	122	133	144
120° F	765	89	99	109	120	131	142	154
185° F	613	111	124	136	149	163	178	193
HORIZONTAL SWING	1398	52	57	63	69	76	82	89

NOTES:

- ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.
- USE 336.4 AAC FOR FEEDER NEUTRAL ON NEW OR REBUILD FEEDER CONSTRUCTION.



3				
2				
1	9/30/20	BURLISON	BENDER	GRAHAM
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CHK'D	APPR.	

➤ **NESC LIGHT LOADING ZONE**
FINAL CONDUCTOR SAG AND TENSION -
336.4 AAC-TULIP PRIMARY AND FEEDER NEUTRAL

DEC	DEM	SEP	DEF
			X
05.02-137B			

20220050-DEF-000078

NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION -795 AAC ARBUTUS

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-4500 LBS)										
		100	110	120	130	140	150	160	170	180	190	200
30° F	4387	3	3	4	4	5	6	7	7	8	9	10
40° F	3936	3	3	4	5	6	6	7	8	9	10	11
50° F	3481	3	4	5	5	6	7	8	9	10	12	13
60° F	3029	4	4	5	6	7	8	9	11	12	13	15
70° F	2952	4	5	6	7	8	10	11	12	14	16	17
80° F	2187	5	6	7	9	10	12	13	15	17	18	20
90° F	1834	6	7	9	10	12	14	16	18	20	22	24
95° F	1683	7	8	10	11	13	15	17	19	22	24	27
104° F	1452	8	9	11	13	15	17	20	22	25	28	31

CONDUCTOR TEMPERATURE	TENSION LBS	200 FOOT RULING SPAN- (LLT-5005 LBS)										
		150	160	170	180	190	200	210	220	230	240	250
30° F	4849	5	6	7	7	8	9	10	11	12	13	14
40° F	4419	6	6	7	8	9	10	11	12	13	15	16
50° F	3985	6	7	8	9	10	11	12	14	15	16	18
60° F	3553	7	8	9	10	11	13	14	15	17	18	20
70° F	3133	8	9	10	12	13	14	16	17	19	21	22
80° F	2734	9	10	12	13	15	16	18	20	22	24	26
90° F	2372	11	12	14	15	17	19	21	23	25	27	29
95° F	2209	11	13	15	16	18	20	22	24	27	29	32
104° F	1948	13	15	17	19	21	23	25	28	30	33	36

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.



3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE
INITIAL CONDUCTOR SAG AND TENSION -
795 AAC ARBUTUS

DEC	DEM	DEP	DEF
			X

05.02-184A

20220050-DEF-000079

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION -795 AAC ARBUTUS

CONDUCTOR TEMPERATURE	TENSION LBS	150 FOOT RULING SPAN- (LLT-4500 LBS.)										
		100	110	120	130	140	150	160	170	180	190	200
30° F, 9 PSF WIND	3487	5	6	7	8	9	11	12	14	16	17	19
30° F, NO WIND	3239	3	4	5	6	7	8	9	10	11	12	14
32° F	3124	4	4	5	6	7	8	9	10	12	13	14
40° F	2685	4	5	6	7	8	9	11	12	13	15	17
50° F	2200	5	6	7	9	10	11	13	15	16	18	20
60° F	1803	6	8	9	10	12	14	16	18	20	22	25
60° F, 6PSF WIND	1985	7	8	10	12	13	15	18	10	22	25	27
70° F	1502	7	9	11	13	15	17	19	22	24	27	30
80° F	1282	9	11	13	15	17	20	22	25	28	31	35
90° F	1121	10	12	14	17	20	22	26	29	32	36	40
95° F	1057	11	13	15	18	21	24	27	31	34	38	42
104° F	962	12	14	17	20	23	26	30	34	38	42	47
185° F	584	19	23	28	32	38	43	49	55	62	69	77
HORIZONTAL SWING	1985	4	5	6	7	7	9	10	11	12	14	15

CONDUCTOR TEMPERATURE	TENSION LBS	200 FOOT RULING SPAN (LLT-5005 LBS)										
		150	160	170	180	190	200	210	220	230	240	250
30° F, 9 PSF WIND	3824	10	11	13	14	16	18	19	21	23	25	28
30° F, NO WIND	3475	7	8	9	10	12	13	14	16	17	19	20
32° F	3367	7	9	10	11	12	13	15	16	18	19	21
40° F	2956	9	10	11	12	14	15	17	18	20	22	24
50° F	2504	10	11	13	14	16	18	20	22	24	26	28
60° F	2129	12	13	15	17	19	21	23	25	28	30	33
60° F, 6PSF WIND	2352	13	15	17	19	21	23	25	28	31	33	36
70° F	1832	14	16	18	20	22	24	27	30	32	35	38
80° F	1603	16	18	20	23	25	28	31	34	37	40	44
90° F	1427	18	20	23	25	28	31	35	38	41	45	49
95° F	1354	19	21	24	27	30	33	36	40	44	48	52
104° F	1243	20	23	26	29	32	36	40	44	48	52	56
185° F	774	33	37	42	47	52	58	64	70	76	83	90
HORIZONTAL SWING	2352	7	9	10	11	12	13	14	16	18	19	20

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.



3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE
FINAL CONDUCTOR SAG AND TENSION -
795 AAC ARBUTUS

DEC	DEM	DEP	DEF
			X
05.02-184B			

20220050-DEF-000080

NESC LIGHT LOADING ZONE INITIAL CONDUCTOR SAG AND TENSION - #795 AAC ARBUTUS

CONDUCTOR TEMPERATURE	TENSION LBS	300 FOOT RULING SPAN (MLT - 5173 LBS.)						
		250	270	290	310	330	350	370
30° F	4865	14	17	19	22	25	28	31
40° F	4465	16	18	21	24	27	31	34
50° F	4072	17	20	23	26	30	34	38
60° F	3690	19	22	25	29	33	37	41
70° F	3328	21	24	28	32	37	41	46
80° F	2995	23	27	31	36	41	46	51
90° F	2695	26	30	35	40	45	51	57
104° F	2340	30	35	40	46	52	59	65

CONDUCTOR TEMPERATURE	TENSION LBS	440 FOOT RULING SPAN (MLT - 5341 LBS.)						
		380	400	420	440	460	480	500
30° F	4864	33	37	41	44	49	53	57
40° F	4515	36	40	44	48	52	57	62
50° F	4180	39	43	47	52	57	62	67
60° F	3864	42	46	51	56	61	67	72
70° F	3570	45	50	55	61	66	72	78
80° F	3302	49	54	60	66	72	78	85
90° F	3061	53	58	64	71	77	84	91
104° F	2767	58	65	71	78	85	93	101

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.



3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE
INITIAL CONDUCTOR SAG AND TENSION -
#795 AAC ARBUTUS

DEC	DEM	DEP	DEF
			X
05.02-188A			

20220050-DEF-000081

NESC LIGHT LOADING ZONE FINAL CONDUCTOR SAG AND TENSION - #795 AAC ARBUTUS

CONDUCTOR TEMPERATURE	TENSION LBS	300 FOOT RULING SPAN- (LLT-5173 LBS.)						
		250	270	290	310	330	350	370
30° F, 9 PSF WIND	3989	26	31	35	41	46	52	58
30° F, NO WIND	3388	21	24	28	32	36	40	45
32° F	3303	21	25	28	33	37	41	46
40° F	2988	23	27	31	36	41	46	51
50° F	2649	26	31	35	41	46	52	58
60° F	2368	29	34	40	45	51	58	65
60° F, 6PSF WIND	2674	32	37	43	49	55	62	70
70° F	2138	33	38	44	50	57	64	72
80° F	1950	36	42	48	55	62	70	78
90° F	1795	39	45	52	60	68	76	85
104° F	1621	43	50	58	66	75	84	94
120° F	1467	48	56	64	73	83	93	104
185° F	1097	64	74	86	98	111	125	140
HORIZONTAL SWING	2674	18	21	24	28	31	35	40

CONDUCTOR TEMPERATURE	TENSION LBS	440 FOOT RULING SPAN- (LLT-5409 LBS.)						
		380	400	420	440	460	480	500
30° F, 9 PSF WIND	4278	57	63	69	76	83	91	98
30° F, NO WIND	3402	47	53	58	64	70	76	82
32° F	3342	48	54	59	65	71	77	84
40° F	3117	52	57	63	69	76	83	90
50° F	2874	56	62	69	75	82	90	97
60° F	2665	61	67	74	81	89	97	105
60° F, 6PSF WIND	3059	64	71	78	86	94	102	111
70° F	2486	65	72	79	87	95	104	112
80° F	2332	69	77	85	93	101	110	120
90° F	2199	73	81	90	98	108	117	127
104° F	2041	79	88	97	106	116	126	137
120° F	1892	85	95	104	114	125	136	148
185° F	1494	108	120	132	145	158	173	187
HORIZONTAL SWING	3059	36	40	44	49	53	58	63

NOTES:

1. ALL SAG VALUES LISTED ON CHART ARE IN INCHES; TENSION IS IN POUNDS.



3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

NESC LIGHT LOADING ZONE
FINAL CONDUCTOR SAG AND TENSION -
#795 AAC ARBUTUS

DEC	DEM	DEP	DEF
			X
05.02-188B			

20220050-DEF-000082

SERVICE	ITEM NUMBER	SAGS FOR OVERHEAD AERIAL CABLE USED AS SERVICES (INCHES)																			* TENSION
		SPAN (FEET)																			
		0-20'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'	160'	170'	180'	190'	195'	
1/0 DPX	201102	24	24	24	24	24	26	39	49	59	72	-	-	-	-	-	-	-	-	-	70
1/0 TPX AUBURN	201106	24	24	24	24	24	28	45	56	68	84	-	-	-	-	-	-	-	-	-	85
1/0 QPX GALLEY	201109	24	24	24	24	33	42	54	68	-	-	-	-	-	-	-	-	-	-	-	104
4/0 TPX	201107	24	24	24	24	36	47	-	-	-	-	-	-	-	-	-	-	-	-	-	108
4/0 QPX	201111	24	24	24	28	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	122

* INDICATES LONGEST SPAN STRINGING TENSION (LBS.)

NOTES:

1. SAGS ARE STRINGING SAGS FOR NORMAL STRINGING TEMPERATURES. WHEN STRUNG AS ABOVE, SAGS GIVEN MAY ALSO BE USED AS APPROXIMATE 60° FINAL SAGS AT MID-SPAN. FOR SLOPED SPANS, CABLE IS LOWER NEAR LOW END OF SPAN THAN AT MID-SPAN. SEE DWG. 05.02-104.
2. THESE STANDARD SAGS ARE BASED ON 200 LB. CONDUCTOR TENSION, WHICH IS ALLOWABLE PULL ON 2" STEEL SERVICE MAST OF **4 FT. OR LESS LENGTH ABOVE** SOLID SUPPORT (ROOF). GREATER LENGTHS OF MAST REQUIRE MAST GUYING OR BRACING, LARGER MAST OR SPECIAL SAG.

THE SAGS ARE BASED ON THE 200 LB. LIMIT APPLIED AT LIGHT LOAD TENSION.

3. USE SPECIAL SAGS WHEN SPECIFIED ON WORK ORDER BY ENGINEER.

3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

SAGS FOR OVERHEAD AERIAL CABLE
USED AS SERVICES



DEC	DEM	DEP	DEF
			X
05.04-100			

20220050-DEF-000083

2 CONDUCTOR ALUMINUM ASC													
PHASE WIRE SIZE	STRINGING CONDITIONS	TEMP °F	SAG FOR VARIOUS SPANS										TENSION
			50	100	150	200	250	300	350	400	450	500	
4	INITIAL	30	1"	3"	6"	11"	1'5"	2'0"	2'9"	3'7"	4'7"	5'7"	555
		60	1"	3"	7"	1'1"	1'8"	2'5"	3'3"	4'4"	5'6"	6'8"	460
		90	1"	4"	9"	1'4"	2'1"	3'0"	4'1"	5'4"	6'11"	8'5"	373
		120	1"	5"	11"	1'7"	2'6"	3'8"	4'11"	6'5"	8'3"	10'0"	304
4	FINAL	30	1"	3"	8"	1'2"	1'9"	2'7"	3'6"	4'7"	5'10"	7'2"	436
		60	1"	4"	10"	1'6"	2'3"	3'3"	4'5"	5'10"	7'5"	9'1"	342
		90	1"	5"	1'0"	1'10"	2'10"	4'1"	5'1"	7'4"	9'3"	11'5"	371
		120	2"	7"	1'3"	2'3"	3'6"	5'0"	6'9"	8'11"	11'4"	13'11"	223
1/0	INITIAL	30	1"	3"	6"	10"	1'4"	1'11"	2'8"	3'5"	4'4"	5'5"	1453
		60	1"	3"	7"	1'1"	1'8"	2'5"	3'4"	4'4"	5'5"	6'9"	1165
		90	1"	4"	10"	1'6"	2'4"	3'4"	4'7"	6'0"	7'7"	9'4"	838
		120	1"	6"	1'1"	2'0"	3'1"	4'5"	6'0"	7'11"	10'0"	12'4"	636
1/0	FINAL	30	1"	3"	8"	1'1"	1'9"	2'6"	3'5"	4'5"	5'8"	6'11"	1128
		60	1"	4"	10"	1'5"	2'2"	3'2"	4'4"	5'8"	7'2"	8'10"	891
		90	1"	6"	1'1"	1'11"	3'0"	4'3"	5'10"	7'3"	9'7"	11'10"	661
		120	2"	7"	1'4"	2'4"	3'8"	5'4"	7'3"	9'6"	12'0"	14'10"	529

NOTE: #4 BARE NEUTRAL AAAC WITH #4 AAC PHASE CONDUCTOR AND 1/0 AAAC NEUTRAL WITH 1/0 AAC PHASE CONDUCTOR.

MAXIMUM TENSION FROM LIGHT LOADING PER SIXTH EDITION OF NESC (9 LBS WIND + CONSTANT @ 30°F). SAG DATA BASED ON 300 FOOT RULING SPAN. TENSIONS SHOWN ASSUME NO ICE OR WIND. MAXIMUM TENSIONS: #4 - 902 POUNDS, 1/0 - 2,230 POUNDS.

3				
2				
1				
0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

SAGS FOR OVERHEAD
TWO CONDUCTOR AERIAL CABLE



DEC	DEM	DEP	DEF
			X
05.04-104			

20220050-DEF-000084

3 CONDUCTOR ALUMINUM ASC											
PHASE WIRE SIZE	STRINGING CONDITIONS	TEMP °F	SAG FOR VARIOUS SPANS								TENSION
			50	100	150	200	250	300	350	400	
1/0	INITIAL	30	1"	4"	9"	1'5"	2'2"	3'1"	4'2"	5'6"	1435
		60	1"	5"	11"	1'8"	2'7"	3'9"	5'2"	6'9"	1190
		90	2"	6"	1'2"	2'0"	3'2"	4'7"	6'2"	8'1"	972
		120	2"	7"	1'5"	2'6"	3'11"	5'7"	7'7"	9'11"	800
1/0	FINAL	30	1"	5"	1'0"	1'10"	2'10"	4'1"	5'6"	7'2"	1104
		60	2"	7"	1'3"	2'3"	3'6"	5'0"	6'10"	8'11"	885
		90	2"	8"	1'7"	2'10"	4'5"	6'4"	8'8"	11'4"	708
		120	3"	10"	1'11"	3'5"	5'4"	7'8"	10'5"	13'7"	589
4/0	INITIAL	30	2"	7"	1'3"	2'3"	3'6"	-	-	-	1375
		60	2"	8"	1'5"	2'7"	4'0"	-	-	-	1184
		90	2"	9"	1'8"	3'0"	4'8"	-	-	-	1012
		120	3"	10"	1'11"	3'5"	5'5"	-	-	-	881
4/0	FINAL	30	2"	8"	1'6"	2'9"	4'3"	-	-	-	1104
		60	2"	10"	1'10"	3'3"	5'0"	-	-	-	937
		90	3"	11"	2'1"	3'9"	4'3"	-	-	-	809
		120	3"	1'1"	2'5"	4'3"	6'8"	-	-	-	710

NOTE: 1/0 AAAC BARE NEUTRAL WITH TWO 1/0 OR TWO 4/0 AAC PHASE CONDUCTORS. MAXIMUM TENSION FROM LIGHT LOADING PER SIXTH EDITION OF NESC (9 LBS WIND + CONSTANT @ 30°F). SAG DATA BASED ON 300 FOOT RULING SPAN. TENSIONS SHOWN ASSUME NO ICE OR WIND. MAXIMUM TENSIONS: 1/0 - 1,767 POUNDS, 4/0 - 1,679 POUNDS.

3				
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0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

SAGS FOR OVERHEAD
THREE CONDUCTOR AERIAL CABLE



DEC	DEM	DEP	DEF
			X
05.04-106			

20220050-DEF-000085

4 CONDUCTOR ALUMINUM ASC											
PHASE WIRE SIZE	STRINGING CONDITIONS	TEMP °F	SAG FOR VARIOUS SPANS								TENSION
			50	100	150	200	250	300	350	400	
1/0	INITIAL	30	3"	6"	1'1"	1'10"	3'0"	4'6"	6'7"	9'7"	1390
		60	3"	7"	1'4"	2'3"	3'6"	5'1"	7'6"	10'10"	1190
		90	3"	8"	1'6"	2'7"	4'0"	5'10"	8'3"	11'6"	1000
		120	4"	10"	1'10"	3'2"	4'7"	6'4"	8'7"	12'3"	850
1/0	FINAL	30	3"	7"	1'5"	2'5"	3'9"	5'5"	7'8"	11'5"	1110
		60	3"	10"	1'8"	2'10"	4'4"	6'1"	8'6"	12'2"	920
		90	6"	1'1"	2'1"	3'5"	5'0"	6'10"	9'3"	13'0"	780
		120	9"	1'5"	2'6"	4'0"	5'7"	7'6"	10'0"	14'1"	680
4/0	INITIAL	30	2"	10"	1'10"	3'2"	5'0"	-	-	-	1312
		60	3"	11"	2'0"	3'7"	5'8"	-	-	-	1171
		90	3"	12"	2'3"	4'1"	6'4"	-	-	-	1048
		120	3"	1'1"	2'6"	4'6"	7'	-	-	-	946
4/0	FINAL	30	3"	12"	2'2"	3'10"	6'0"	-	-	-	1104
		60	3"	1'1"	2'5"	4'4"	6'9"	-	-	-	985
		90	4"	1'2"	2'8"	4'9"	7'5"	-	-	-	893
		120	4"	1'4"	2'11"	5'2"	8'2"	-	-	-	820

NOTE: 1/0 AAAC BARE NEUTRAL WITH THREE 1/0 OR THREE 4/0 AAC PHASE CONDUCTORS. MAXIMUM TENSION FROM LIGHT LOADING PER SIXTH EDITION OF NESC (9 LBS WIND + CONSTANT @ 30°F). SAG DATA BASED ON 300 FOOT RULING SPAN. TENSIONS SHOWN ASSUME NO ICE OR WIND. MAXIMUM TENSIONS: 1/0 - 1,880 POUNDS, 4/0 - 1,706 POUNDS.

3				
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0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

SAGS FOR OVERHEAD
FOUR CONDUCTOR AERIAL CABLE



DEC	DEM	DEP	DEF
			X

05.04-107

20220050-DEF-000086

SECONDARY - POLE TO POLE, GUYED

CONDUCTOR TEMPERATURE IN °F	TENSION (LBS)	200 FOOT RULING SPAN SAG IS IN INCHES AT GIVEN SPAN LENGTHS											
		INITIAL STRINGING SAGS - POLE TO POLE											
		50'	75'	100'	125'	150'	175'	200'	225'	250'	275'	300'	
0°	1053	1	2	3	5	8	11	14	18	22	26	31	
15°	974	1	2	4	6	8	11	15	19	23	28	34	
30°	896	1	2	4	6	9	12	16	21	25	31	37	
40°	846	1	2	4	7	10	13	17	22	27	33	39	
60°	748	1	2	5	8	11	15	20	25	30	37	44	
80°	657	1	3	6	9	12	17	22	28	35	42	50	
100°	574	2	4	6	10	14	19	25	32	40	48	57	
120°	502	2	4	7	11	16	22	29	37	45	55	65	

CONDUCTOR TEMPERATURE IN °F	TENSION (LBS)	200 FOOT RULING SPAN SAG IS IN INCHES AT GIVEN SPAN LENGTHS											
		FINAL SAGS - POLE TO POLE											
		50'	75'	100'	125'	150'	175'	200'	225'	250'	275'	300'	
0°	873	1	2	4	7	9	13	17	21	26	32	38	
15°	748	1	3	5	7	10	14	19	24	29	35	42	
30°	700	1	3	5	8	12	16	21	26	33	39	47	
40°	648	1	3	6	9	13	17	23	29	35	43	51	
60°	553	2	4	7	10	15	20	26	33	41	50	59	
80°	475	2	4	8	12	17	24	31	39	48	58	69	
100°	412	2	5	9	14	20	27	35	45	55	67	80	
120°	363	3	6	10	16	23	31	40	51	63	76	90	
167°	285	3	7	13	20	29	39	51	65	80	97	115	
185°	265	3	8	14	22	31	42	55	70	86	104	124	
FINAL SAG AND TENSION - LIGHT LOADING ZONE WITH WIND													
30°, 9 LBS WIND	1023	3	6	10	16	23	32	41	52	64	78	93	

NESC CABLE LOADING LIMIT: FINAL TENSION, 25%, 30°, NO WIND (700 LBS)

NOTES:

1. #6 AL THROUGH #4/0 AL DUPLEX, TRIPLEX AND QUADRUPLX CABLES (MULTIPLEX) ARE SUPPORTED BY THEIR BARE NEUTRALS.
2. MULTIPLEX CABLES MAY BE PULLED TO FULL ALLOWED TENSION AS SHOWN IN THE CHART ABOVE.
3. MULTIPLEX CABLES PULLED TO FULL TENSION MUST BE GUYED ON BOTH ENDS OR THEIR TENSION OFFSET BY THE NEUTRAL THAT CONTINUES FOR TANGENT LINES. ALSO, THERE MUST BE SUFFICIENT POLE STRENGTH/CAPACITY.
4. POLEFOREMAN CAN VERIFY ADEQUATE STRENGTH OF A STRUCTURE.
5. DESIGNERS SHOULD TAKE INTO CONSIDERATION THE EXPECTED SAG WHEN THE SECONDARY IS CARRYING RATED LOAD AND AT THE OPERATING TEMPERATURE OF 185°F, MAKING SURE THERE ARE ADEQUATE CLEARANCES.
6. LINE TECHS SHOULD ADHERE TO THE INSTALLATION SAG REQUIREMENTS FOR THE CONDUCTOR/AMBIENT TEMPERATURE AT INSTALLATION AS SHOWN ABOVE.



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0	12/31/21	ROBBINS	BURLISON	GRAHAM
REVISED	BY	CHK'D	APPR.	

#2 TRIPLEX FULL NEUTRAL (SHRIMP) GUYED
SECONDARY AND SERVICE SAG AND TENSION DATA
NESC LIGHT LOADING ZONE

DEC	DEM	SEP	DEF
			X
05.04-108A			

20220050-DEF-000087

SECONDARY/SERVICE - UNGUYED

CONDUCTOR TEMPERATURE IN °F	TENSION (LBS)	INITIAL SAG AND TENSION SERVICE DROP DISTANCE (FT) POLE TO BUILDING							
		50'	60'	70'	80'	90'	100'	110'	120'
0°	188	5	7	10	12	16	19	24	28
15°	168	5	8	11	14	18	22	26	31
30°	153	6	9	12	15	19	24	29	34
40°	144	6	9	12	16	21	25	31	36
60°	130	7	10	14	18	23	28	34	40
80°	119	8	11	15	20	25	31	37	44
100°	110	8	12	16	21	27	33	40	48
120°	103	9	13	17	23	29	35	43	51
167°	91	10	15	20	26	33	40	49	58
185°	87	11	15	21	27	34	42	51	61
FINAL SAG AND TENSION - LIGHT LOADING ZONE WITH WIND									
30°, 9 LBS WIND	349	8	11	15	19	24	30	37	43

MAXIMUM LOADING AT 30°, 9 LBS WIND. MAXIMUM LOAD IS LIMITED TO 350 LBS;
THE RECOMMENDED MAXIMUM TENSION ON A 2 INCH SERVICE MAST. IF GREATER
CABLE TENSION, LESS SAG IS REQUIRED, THE SERVICE MAST MUST BE BRACED
AGAINST THE INCREASED TENSION.

NOTES:

1. SINCE LONGER SPANS REQUIRE MORE SAG, THERE COMES A POINT WHERE THE REQUIRED SAG FOR A SPAN BECOMES IMPRACTICAL. THEREFORE, THE TABLE PLACES A LIMIT ON THE MAXIMUM RECOMMENDED SPAN/SERVICE DROP LENGTH. HIGHLIGHTED SPANS ARE NOT RECOMMENDED.
2. THIS TABLE ASSUMES MAXIMUM LOADING AT 30°F AND 9 LBS WIND. MAXIMUM LOAD IS LIMITED TO 350 LBS, WHICH IS THE MAXIMUM RECOMMENDED TENSION ON A 2" SERVICE MAST.
3. UNGUYED SECONDARIES ARE OFTEN ASSOCIATED WITH LIFT POLES WHERE GUYING BOTH ENDS IS NOT PRACTICAL. THIS REQUIRES THE POLES TO SUPPORT ALL THE TENSION IN THE SPAN AND/OR SERVICE DROP.
4. UNGUYED SPANS ARE OFTEN CALLED "SLACK SPANS" HOWEVER, THERE IS ALWAYS SOME TENSION IN THE WIRE.
5. TENSION IS NOT A FUNCTION OF SPAN LENGTH; HOWEVER, SPAN LENGTH DOES DICTATE THE REQUIRED SAG.
6. IN GENERAL, A 30/6 POLE WILL HAVE SUFFICIENT STRENGTH FOR A SINGLE SPAN OF SECONDARY OR SERVICE DROP.
7. POLEFOREMAN CAN VERIFY ADEQUATE STRENGTH OF A STRUCTURE.
8. USE POLEFOREMAN FOR ANALYSIS FOR MULTIPLE CONDUCTOR SCENARIOS.
9. DESIGNERS SHOULD TAKE INTO CONSIDERATION THE EXPECTED SAG SHOWN ABOVE AT THE OPERATING TEMPERATURE OF 185°F, MAKING SURE THERE ARE ADEQUATE CLEARANCES.
10. LINE TECHS SHOULD ADHERE TO THE INSTALLATION SAG REQUIREMENTS FOR THE CONDUCTOR/AMBIENT TEMPERATURE AT INSTALLATION.
11. FAILURE TO PROPERLY SAG THE CABLE AT INSTALLATION CAN RESULT IN THE POLE BENDING OR LEANING CAUSING THE SPAN TO LOSE PROPER CLEARANCE.
12. THE MAXIMUM TENSION OF 350 LBS. WILL NOT OCCUR AT INSTALLATION. THAT OCCURS WHEN THE CONDUCTOR IS SUBJECT TO NESC ZONE CONDITIONS OF WIND, TEMPERATURE, AND ICE.



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0	12/31/21	ROBBINS	BURLISON	GRAHAM
REVISED	BY	CHK'D	APPR.	

#2 TRIPLEX FULL NEUTRAL (SHRIMP) UNGUYED
SECONDARY AND SERVICE SAG AND TENSION DATA
NESC LIGHT LOADING ZONE

DEC	DEM	SEP	DEF
			X
05.04-108B			

20220050-DEF-000088

SECONDARY - POLE TO POLE, GUYED

CONDUCTOR TEMPERATURE IN °F	TENSION (LBS)	200 FOOT RULING SPAN SAG IS IN INCHES AT GIVEN SPAN LENGTHS											
		INITIAL STRINGING SAGS - POLE TO POLE											
		50'	75'	100'	125'	150'	175'	200'	225'	250'	275'	300'	
0°	1613	1	2	4	6	8	11	15	18	23	27	33	
15°	1489	1	2	4	6	9	12	16	20	25	30	35	
30°	1367	1	2	4	7	10	13	17	22	27	32	39	
40°	1288	1	3	5	7	10	14	18	23	28	34	41	
60°	1136	1	3	5	8	12	16	21	26	32	39	46	
80°	996	1	3	6	9	13	18	24	30	37	44	53	
100°	871	2	4	7	11	15	21	27	34	42	51	60	
120°	763	2	4	8	12	17	23	31	39	48	58	69	

CONDUCTOR TEMPERATURE IN °F	TENSION (LBS)	200 FOOT RULING SPAN SAG IS IN INCHES AT GIVEN SPAN LENGTHS											
		FINAL SAGS - POLE TO POLE											
		50'	75'	100'	125'	150'	175'	200'	225'	250'	275'	300'	
0°	1338	1	2	4	7	10	13	17	22	27	33	39	
15°	1199	1	3	5	8	11	15	20	25	30	37	44	
30°	1070	1	3	5	9	12	17	22	28	34	41	49	
40°	990	1	3	6	9	13	18	24	30	37	45	53	
60°	847	2	4	7	11	16	21	28	35	43	52	62	
80°	729	2	5	8	13	18	25	32	41	50	61	72	
100°	636	2	5	9	14	21	28	37	47	58	70	83	
120°	563	3	6	10	16	23	32	42	53	65	79	94	
167°	636	3	7	13	20	29	39	51	65	80	97	115	
185°	563	4	8	14	22	31	42	55	70	86	104	124	
FINAL SAG AND TENSION - LIGHT LOADING ZONE WITH WIND													
30°, 9 LBS WIND	1456	2	5	9	15	21	29	38	48	59	71	85	

NESC CABLE LOADING LIMIT: FINAL TENSION, 25%, 30°, NO WIND (1070 LBS)

NOTES:

- #6 AL THROUGH #4/0 AL DUPLEX, TRIPLEX AND QUADRUPLX CABLES (MULTIPLEX) ARE SUPPORTED BY THEIR BARE NEUTRALS.
- MULTIPLEX CABLES MAY BE PULLED TO FULL ALLOWED TENSION AS SHOWN IN THE CHART ABOVE.
- MULTIPLEX CABLES PULLED TO FULL TENSION MUST BE GUYED ON BOTH ENDS OR THEIR TENSION OFFSET BY THE NEUTRAL THAT CONTINUES FOR TANGENT LINES. ALSO, THERE MUST BE SUFFICIENT POLE STRENGTH/CAPACITY.
- POLEFOREMAN CAN VERIFY ADEQUATE STRENGTH OF A STRUCTURE.
- DESIGNERS SHOULD TAKE INTO CONSIDERATION THE EXPECTED SAG WHEN THE SECONDARY IS CARRYING RATED LOAD AND AT THE OPERATING TEMPERATURE OF 185°F, MAKING SURE THERE ARE ADEQUATE CLEARANCES.
- LINE TECHS SHOULD ADHERE TO THE INSTALLATION SAG REQUIREMENTS FOR THE CONDUCTOR/AMBIENT TEMPERATURE AT INSTALLATION AS SHOWN ABOVE.



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0	12/31/21	ROBBINS	BURLISON	GRAHAM
REVISED	BY	CHK'D	APPR.	

#1/0 TRIPLEX FULL NEUTRAL (GAMMARUS) GUYED
SECONDARY AND SERVICE SAG AND TENSION DATA
NESC LIGHT LOADING ZONE

DEC	DEM	SEP	DEF
			X
05.04-116A			

20220050-DEF-000089

SECONDARY/SERVICE - UNGUYED

CONDUCTOR TEMPERATURE IN °F	TENSION (LBS)	INITIAL SAG AND TENSION SERVICE DROP DISTANCE (FT) POLE TO BUILDING							
		50'	60'	70'	80'	90'	100'	110'	120'
0°	177	8	12	16	21	27	33	40	48
15°	168	9	13	17	22	28	35	42	50
30°	160	9	13	18	23	30	37	44	53
40°	156	9	14	18	24	30	38	46	54
60°	148	10	14	19	25	32	40	48	57
80°	141	10	15	20	27	34	42	50	60
100°	134	11	16	21	28	35	44	53	63
120°	129	11	16	22	29	37	45	55	66
167°	118	12	18	24	32	40	50	60	71
185°	115	13	18	25	33	41	51	62	74
FINAL SAG AND TENSION - LIGHT LOADING ZONE WITH WIND									
30°, 9 LBS WIND	348	10	14	19	25	32	39	48	57

MAXIMUM LOADING AT 30°, 9 LBS WIND. MAXIMUM LOAD IS LIMITED TO 350 LBS;
THE RECOMMENDED MAXIMUM TENSION ON A 2 INCH SERVICE MAST. IF GREATER
CABLE TENSION, LESS SAG IS REQUIRED, THE SERVICE MAST MUST BE BRACED
AGAINST THE INCREASED TENSION.

NOTES:

1. SINCE LONGER SPANS REQUIRE MORE SAG, THERE COMES A POINT WHERE THE REQUIRED SAG FOR A SPAN BECOMES IMPRACTICAL. THEREFORE, THE TABLE PLACES A LIMIT ON THE MAXIMUM RECOMMENDED SPAN/SERVICE DROP LENGTH. HIGHLIGHTED SPANS ARE NOT RECOMMENDED.
2. THIS TABLE ASSUMES MAXIMUM LOADING AT 30°F AND 9 LBS WIND. MAXIMUM LOAD IS LIMITED TO 350 LBS, WHICH IS THE MAXIMUM RECOMMENDED TENSION ON A 2" SERVICE MAST.
3. UNGUYED SECONDARIES ARE OFTEN ASSOCIATED WITH LIFT POLES WHERE GUYING BOTH ENDS IS NOT PRACTICAL. THIS REQUIRES THE POLES TO SUPPORT ALL THE TENSION IN THE SPAN AND/OR SERVICE DROP.
4. UNGUYED SPANS ARE OFTEN CALLED "SLACK SPANS" HOWEVER, THERE IS ALWAYS SOME TENSION IN THE WIRE.
5. TENSION IS NOT A FUNCTION OF SPAN LENGTH; HOWEVER, SPAN LENGTH DOES DICTATE THE REQUIRED SAG.
6. IN GENERAL, A 30/6 POLE WILL HAVE SUFFICIENT STRENGTH FOR A SINGLE SPAN OF SECONDARY OR SERVICE DROP.
7. POLEFOREMAN CAN VERIFY ADEQUATE STRENGTH OF A STRUCTURE.
8. USE POLEFOREMAN FOR ANALYSIS FOR MULTIPLE CONDUCTOR SCENARIOS.
9. DESIGNERS SHOULD TAKE INTO CONSIDERATION THE EXPECTED SAG SHOWN ABOVE AT THE OPERATING TEMPERATURE OF 185°F, MAKING SURE THERE ARE ADEQUATE CLEARANCES.
10. LINE TECHS SHOULD ADHERE TO THE INSTALLATION SAG REQUIREMENTS FOR THE CONDUCTOR/AMBIENT TEMPERATURE AT INSTALLATION.
11. FAILURE TO PROPERLY SAG THE CABLE AT INSTALLATION CAN RESULT IN THE POLE BENDING OR LEANING CAUSING THE SPAN TO LOSE PROPER CLEARANCE.
12. THE MAXIMUM TENSION OF 350 LBS. WILL NOT OCCUR AT INSTALLATION. THAT OCCURS WHEN THE CONDUCTOR IS SUBJECT TO NESC ZONE CONDITIONS OF WIND, TEMPERATURE, AND ICE.



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0	12/31/21	ROBBINS	BURLISON	GRAHAM
REVISED	BY	CHK'D	APPR.	

**#1/0 TRIPLEX FULL NEUTRAL (GAMMARUS) UNGUYED
SECONDARY AND SERVICE SAG AND TENSION DATA
NESC LIGHT LOADING ZONE**

DEC	DEM	SEP	DEF
			X
05.04-116B			

20220050-DEF-000090

**SINGLE, TWO AND THREE-PHASE
SLACK SPAN POLE CLASS AND SAG REQUIRMENTS**

MAXIMUM SPAN LENGTH (FT)	CONDUCTORS	MINIMUM POLE CLASS REQUIRED				INITIAL STRINGING SAGS (INCHES)
		40 FOOT	45 FOOT	50 FOOT	55 FOOT	
25	336 AND SMALLER	5	4	3	3	12
	795 PRI - #1/0 NEU	4	3	3	3	
50	#1/0 PRI - #1/0 NEU AND SMALLER	5	4	3	3	
	336 PRI - #1/0 NEU	4	4	3	3	
	795 PRI - #1/0 NEU	4	3	2	2	36
75	#1/0 PRI - #1/0 NEU AND SMALLER	4	4	3	3	
	336 PRI - #1/0 NEU	3	3	2	2	
	795	NOT PERMITTED				
100	#1/0 PRI - #1/0 NEU AND SMALLER	4	4	3	2	
	336 - 795	NOT PERMITTED				

NOTES:

1. THE POLES IN THESE TABLES ARE DESIGNED TO BE SELF-SUPPORTING STRUCTURES AT THE END OF A SINGLE SPAN. IF THE TAKE-OFF POLE CANNOT BE SUPPORTED WITH DOWN GUYS AND ANCHORS, IT MUST BE EVALUATED AS A SELF-SUPPORTING STRUCTURE. IF ADDITIONAL LOAD IS ADDED TO THE POLES IN THESE TABLES, THE POLES MUST BE RE-EVALUATED FOR STRENGTH REQUIREMENTS TO PREVENT POLE DEFLECTION OVER TIME.
2. SAGS ARE AT 60° F. SAGS WILL NOT VARY MORE THAN 2 INCHES BETWEEN 30° F AND 90° F.
3. POLE CLASSES DESIGNED FOR NO MORE THAT 1.5% DEFLECTION AT 60° F.
4. SOME POLE CLASSES LISTED MAY EXCEED THE CLASS POLE REQUIRED FOR STRENGTH BECAUSE A LOWER CLASS POLE IS NOT A STOCK ITEM.
5. DO NOT USE AUTOMATIC SPLICES IN SLACK SPANS.



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0	6/30/16	ROBESON	BURLISON	ADCOCK
REVISED	BY	CK'D	APPR.	

**SLACK SPAN SAG TABLE
NESC LIGHT LOADING ZONE**

DEC	DEM	DEP	DEF
			X
05.06-100			

20220050-DEF-000091