ALUMINUM COMPANY OF AMERICA SAG AND TENSION DATA
SEGTEL FIBER OPTIC CABLE OVER MERRIMACK RIVER, HOOKSETT, NH
FEB 8, 2011
HES Proj. No.: 1120012

Conductor Nominal Diameter: 1/2" x 7 Strand Steel EHS
Area = 0.1497 Sq. In. Dia. = 0.495 In. Weight = 0.517 Lbs/Ft

Data from Chart No. 1-1293 RTS = 26,900 Lbs
English Units

Span= 639.0 Feet NESC Heavy Load Zone

Creep is NOT a factor

Design Points					Final		Initial	
Temp (F)	Ice (In)	Wind (Psf)	K (Lbs/Ft)	Weight (Lbs/Ft)	Sag (Ft)	Tension (Lbs)	Sag (Ft)	Tension (Lbs)
-20	0.00	0.00	0.00	0.517			2.96	8,913
0	0.00	0.00	0.00	0.517			3.11	8,493
30	0.00	0.00	0.00	0.517			3.36	7,864
60	0.00	0.00	0.00	0.517			3.65	7,240
90	0.00	0.00	0.00	0.517			3.98	6,626
120	0.00	0.00	0.00	0.517			4.38	6,028
167	0.00	0.00	0.00	0.517			5.14	5,139
212	0.00	0.00	0.00	0.517			6.04	4,369
Above: Initial Data Prior to Cable Installation								
Below: 2 Non-Supporting Cable(s) Added, Dia = .790 In, Wt= .117 Lbs/Ft + .010 Lbs/Ft								
0	0.50	4.00	0.30	4.330	16.16	13723	16.16	13723 *
32	0.50	0.00	0.00	2.984	13.69	11156	13.32	11458
-20	0.00	0.00	0.00	0.761	4.65	8354	4.26	9121
0	0.00	0.00	0.00	0.761	4.89	7933	4.45	8721
30	0.00	0.00	0.00	0.761	5.31	7317	4.78	8127
60	0.00	0.00	0.00	0.761	5.77	6725	5.15	7542
90	0.00	0.00	0.00	0.761	6.30	6162	5.57	6973
120	0.00	0.00	0.00	0.761	6.89	5634	6.04	6426
167	0.00	0.00	0.00	0.761	7.94	4890	6.90	5625
212	0.00	0.00	0.00	0.761	9.08	4282	7.86	4941

* Design Condition 51.0% of rated strength

The table above shows sag and tension data for cable mounting points at the same elevation resulting in a sag point at mid-span and equal tension at each attachment point. Due to different ground elevations at either end of the actual span, the attachment point elevations will be approximately 2.5 feet different. The new poles will be 50 feet in length, imbedded 7’-6” into the ground, with attachment points 38’-4” above ground at both poles. Adjusting for this difference in elevation, the sag and tension values will be as follows (refer to attached plan for graphic representation):

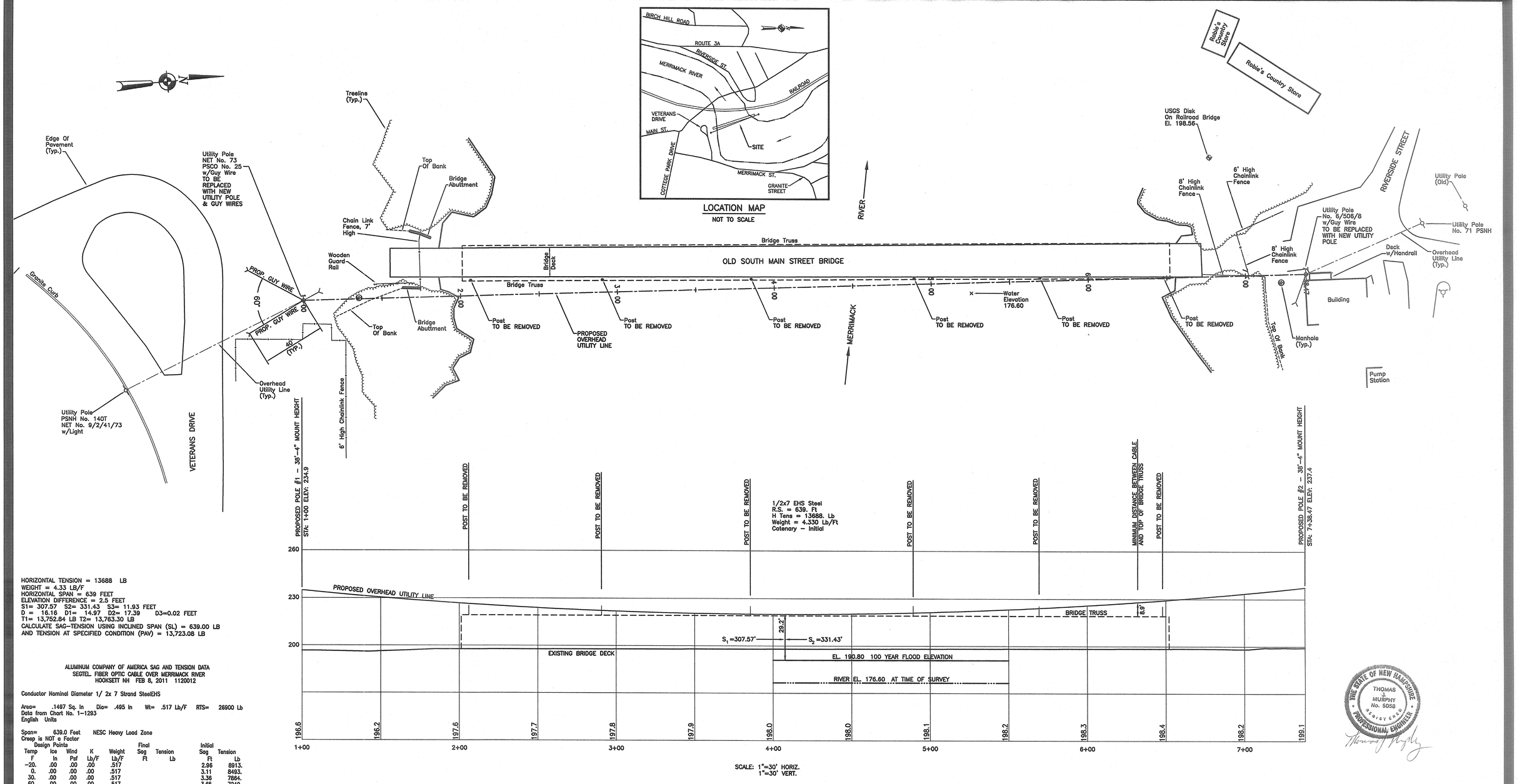
Pole #1 – PSCO No. 25 Located off Veterans Drive
Pole #2 – 6/506/8: Located on Riverside Street

Distance from Pole #1 to Sag Point = S1 = 307.57 ft.
Distance from Pole #2 to Sag Point = S2 = 331.43 ft.

Tension at Pole #1 = 13,752.8 Lbs, which is 51.0% of the rated strength of the messenger cable.
Tension at Pole #2 = 13,763.3 Lbs, which is 51.2% of the rated strength of the messenger cable.
NESC guidelines recommend tension not exceed 60% of rated cable strength.

Elevation of Sag Point = 220.0, which is 29.2 feet above the 100 Year flood elevation of the Merrimack River at this location.

This crossing is located adjacent to the Old South Main Street Bridge, which is currently unused having been replaced by a vehicular bridge farther downstream. The crossing is on the upstream side of the Old South Main Street Bridge. The proposed crossing is above the bridge truss at the northeast corner of the bridge, the minimum distance between the cable and the top of the bridge truss is 8.9 feet.



SCALE: 1"=30' HORIZ.
1"=30' VERT.

HORIZONTAL TENSION = 13688 LB
WEIGHT = 4.33 LB/F
HORIZONTAL SPAN = 639 FEET
ELEVATION DIFFERENCE = 2.5 FEET
S1= 307.57 S2= 331.43 S3= 11.93 FEET
D = 16.16 D1= 14.97 D2= 17.39 D3=0.02 FEET
T1= 13,752.84 LB T2= 13,763.30 LB
CALCULATE SAG-TENSION USING INCLINED SPAN (SL) = 639.00 LB
AND TENSION AT SPECIFIED CONDITION (PAV) = 13,723.08 LB

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HOOKSETT NH FEB 8, 2011 1120012

Conductor Nominal Diameter 1/ 2x 7 Strand SteelEHS

Area= .1497 Sq. In Dia= .495 In Wt= .517 Lb/F RTS= 26900 Lb
Data from Chart No. 1-1293
English Units

Span= 639.0 Feet NESC Heavy Load Zone
Creep is NOT a Factor

Design Points Temp F	Ice In	Wind Psf	K Lb/F	Weight Lb/F	Final Sag Ft	Final Tension Lb	Initial Sag Ft	Initial Tension Lb
-20.	.00	.00	.00	.517			2.96	8913.
0.	.00	.00	.00	.517			3.11	8493.
30.	.00	.00	.00	.517			3.36	7884.
60.	.00	.00	.00	.517			3.65	7240.
90.	.00	.00	.00	.517			3.98	6626.
120.	.00	.00	.00	.517			4.38	6028.
167.	.00	.00	.00	.517			5.14	5139.
212.	.00	.00	.00	.517			6.04	4369.

Above: Initial Data Prior to Cable Installation

Below: 2 Non-Supporting Cable(s) Added, Dia= .790 In ,Wt= .117Lb/F+ .010Lb/F								
0.	.50	4.00	.30	4.330	16.16	13723.	16.16	13723.
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212.	.00	.00	.00	.761	9.08	4282.	7.86	4941.

* Design Condition

THE REFERENCE PARCEL LIES IN THE ZONE X FLOOD INSURANCE RATE MAPS, COMMUNITY-PANEL NUMBER 330013C0677E LAST REVISED APRIL 19 2010

THE STATE OF NEW HAMPSHIRE
THOMAS R MURPHY No. 5058
REGIST. ENGR.
PROFESSIONAL ENGINEER

SCALE: 1" = 30'
30 0 30 60 90

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY AND HAS A MAX. ERROR OF CLOSURE OF 1:10,000 ON ALL PROPERTY LINES WITHIN AND BORDERING THE SUBJECT PROPERTY.

FEB 11 2011

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR NO. 588 PETER D. HOLDEN SIGNATURE

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PLAN VIEW AND PROFILE
SEGTEL FIBER OPTIC CABLE
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Date:	Revisions Description	Dr. By	Chk. By

Book | Page

Date: 02-08-11
Scale: 1"=30'
Dr. By: DS Ck By: BT
Job No. 1120012
Sheet no 1 of 1

XBASE