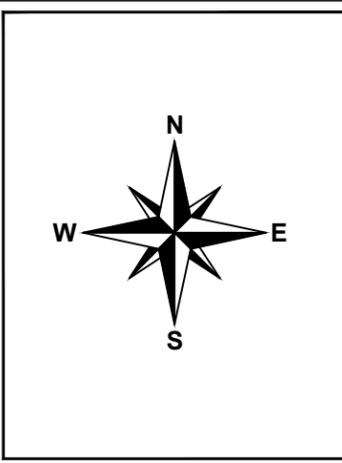


NHOS
New Hampshire Optical Systems

New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

Proposed Crossing
Wild Ammonoosuc
River, Bath, NH



Project # TID-109-PRI-15
Drawing # AC-BAT-RIV-1

Date: 11/8/2011
Revision #

Proposed Crossing
Wild Ammonoosuc River
Bath, NH

Location:
Rum Hill Rd - Rt 10, Bath, NH
Nearest cross street: Wild Ammonoosuc Rd

Sheet 1 of 2



LOCUS MAP
(Not to Scale)



Spanmaster® Release 3.1 Sag / Tension Computations
09/01/11 Waveguide

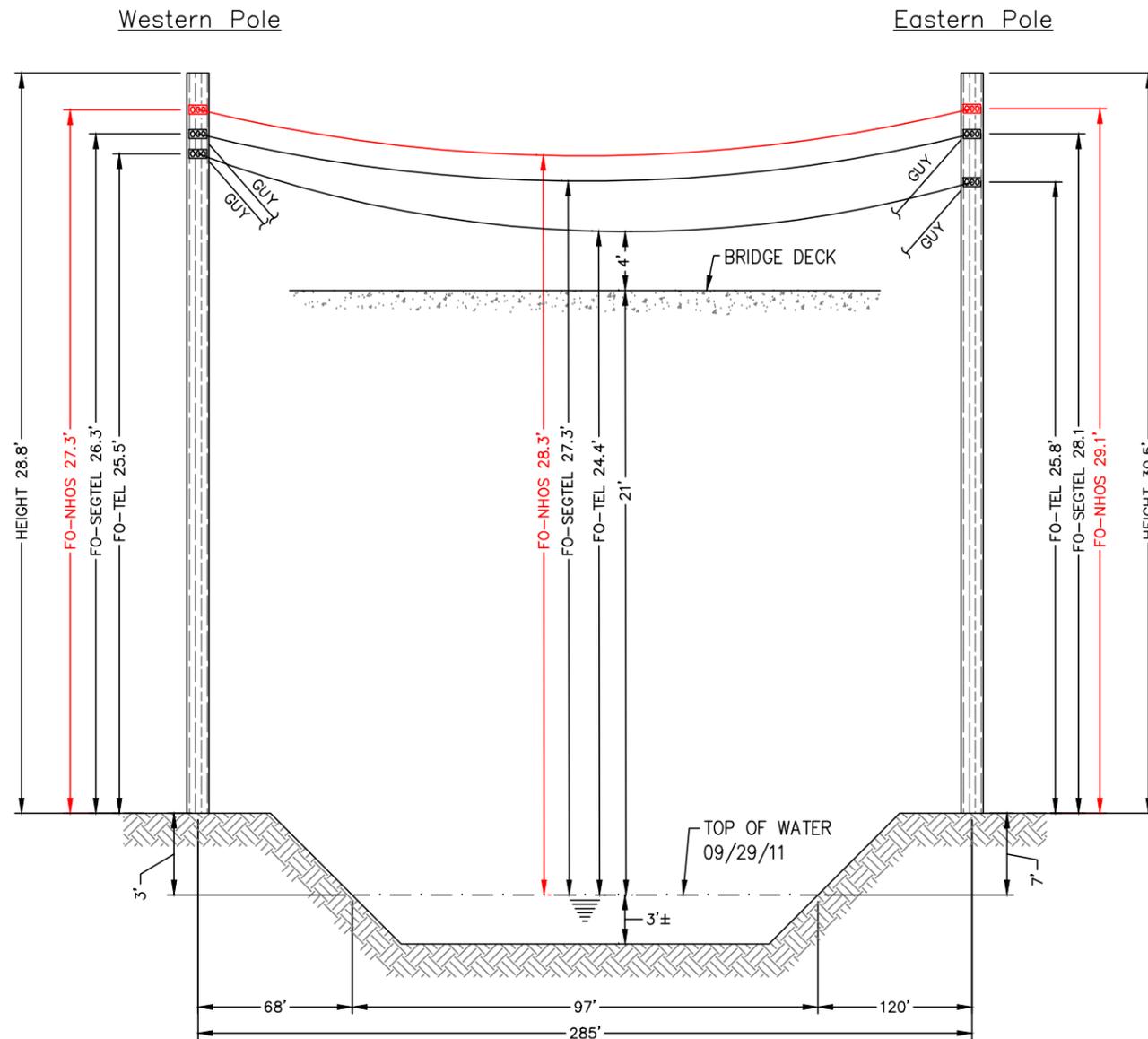
Waveguide
River and Rail Crossings

Selected Cables	X-SECT AREA (sq.in)	EFF MODULUS (psi)	NOMINAL DIAM (in)	EFF.EXP. COEFF. (1/F)	CABLE WEIGHT (lb/ft)	E*A LOAD BEARING CAPACITY (lbs)	MAX. RATED LOAD (lbs)
1/4"6.6mEHS	0.0352	2.60E+07	0.250	5.60E-06	0.1210	914940	6650
ORF-O-288-LN Bundle	0.5782	2.70E+05	0.858	1.13E-05	0.1960	155982	651
			1.108		0.3170		

NESC RESULTS

Loading Condition	Temp. (F)	Ice Load lb/ft	Ice Thick in	Wind Const lb/ft	Result Wind Load lb/ft	Sag ft	Tension lb	% Len Chg From Input Conditions	Sag @ Point 142.5 ft	Horz Sag Comp ft	Vert Sag Comp ft	Vector Angle Deg	
Rule 251 - Heavy	0.0	1.000	.50	.3	4.0	1.793	6.85	2649	0.13	6.87	3.23	6.04	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	3.34	963	0.01	3.34	0.00	3.34	0.0

Span Length = 285.00 ft	Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
Span Sag = 2.85 ft (34.2 in)	-40.0	2.04	1,570	-0.01	N/A
Span Tension = 1,129 lb	-30.0	2.10	1,527	-0.01	N/A
Max Load = 6,650 lb	-20.0	2.16	1,483	-0.01	N/A
Usable load (60%) = 3,990 lb	-10.0	2.23	1,441	-0.01	N/A
Catenary Length = 285.076 ft	.0	2.29	1,399	-0.01	N/A
Stress Free Length @ Installed Temperature = 284.725 ft	10.0	2.36	1,358	-0.01	N/A
	20.0	2.44	1,317	-0.01	N/A
Unloaded Strand	30.0	2.51	1,277	-0.01	N/A
Sag = 1.31 ft (15.7 in) 0.46 %	40.0	2.59	1,238	0.00	N/A
Tension = 937 lb	50.0	2.68	1,200	0.00	N/A
	60.0	2.76	1,163	0.00	N/A
	70.0	2.85	1,127	0.00	N/A
	80.0	2.94	1,092	0.00	N/A
	90.0	3.04	1,058	0.00	N/A
	100.0	3.13	1,025	0.01	N/A
	110.0	3.24	993	0.01	N/A
	120.0	3.34	963	0.01	N/A
	130.0	3.45	933	0.01	N/A
	140.0	3.55	905	0.01	N/A



E-NT - T-374/50
(Existing jointly owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)

Not to Scale

E-NT - T-374/51
(Existing jointly owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)



E-NT - T-374/50

Construction Notes:

NHOS proposes to install a 1/4 inch metal supporting strand between the existing utility poles shown above that will traverse the brook. The strand will be installed at the proposed height (see above). The supporting strand will be secured to each pole using double dead end attachments to prevent any sag in the wire and maintain proper clearances. NHOS will lash a one inch diameter fiber optic cable (PVC jacket) to the strand using a dual lash method to provide security of the fiber over the right of way. The fiber will be tagged with twenty four hour contact information at each pole clamp. NHOS will employ the proper safety personnel during the crossing installation. The proposed install will meet all proper clearances from other Utilities. (see above). Additional pole guys will be added per NESC Rule 264 and as directed by pole owners.



E-NT - T-374/51



New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

**Proposed Crossing
Wild Ammonoosuc
River, Bath, NH**

Notes:

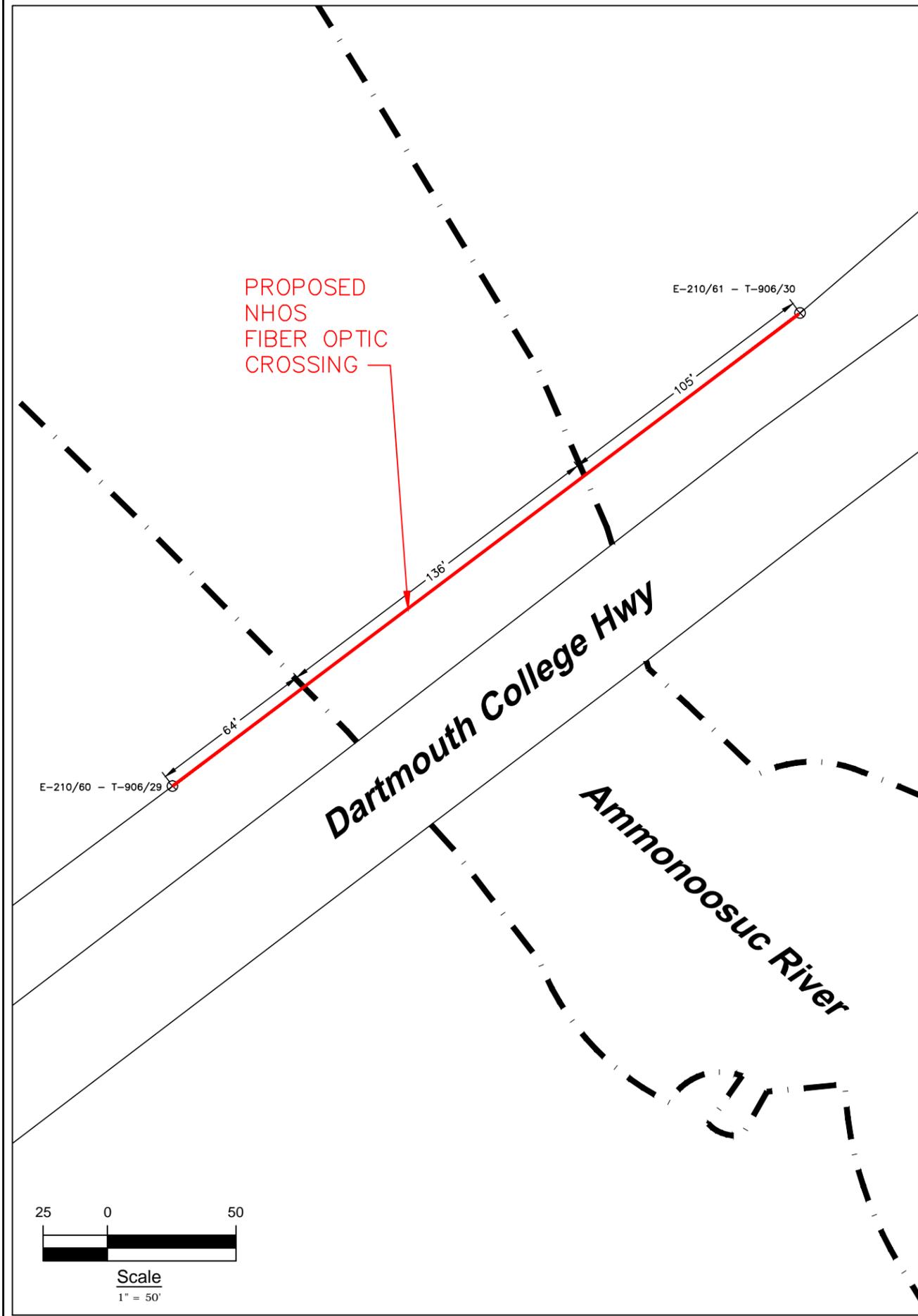
- The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 09/29/11.
- The horizontal distance between the nearest bridge edge and the existing overhead wires is approximately 67'.
- The smallest vertical distance from the top of existing bridge deck to the lowest existing overhead wires is approximately 4'.
- The vertical distance between the top of water and bridge deck is approximately 21'.
- The waterway is classified as not suitable for sail boating and per NESC Table 232-1 a vertical clearance of 14' must be maintained between the lowest conductor and 10 year floodplain.
- Based on the FEMA Flood Insurance Rate Map for Grafton County (County Map Number 33009C0240E Panel 240 of 1185) dated 02/20/08 there is currently no FEMA Flood Profile information available for the Wild Ammonoosuc River in this area. A 10 year flood elevation could not be determined.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-109-PRI-15
Drawing # AC-BAT-RIV-1

Date: 11/8/2011
Revision #

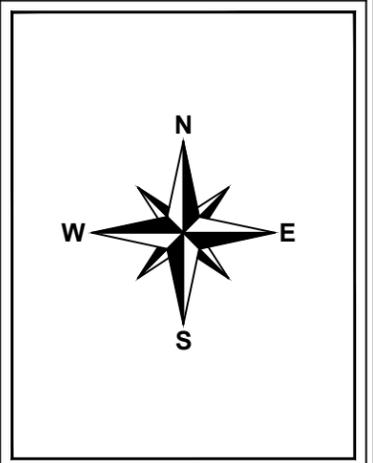
**Proposed Crossing
Wild Ammonoosuc River
Bath, NH**

Location:
Rum Hill Rd - Rt 10, Bath, NH
Nearest cross street: Wild Ammonoosuc Rd



New Hampshire Optical Systems, Inc.
 99 Pine Hill Rd.
 Nashua, NH 03063
 (603-821-6467)

**Proposed Crossing
 Ammonoosuc
 River, Lisbon, NH**



Project # TID-113-PRI-5
 Drawing # AC-LIS-RIV-1

Date: 04/09/12
 Revision # 1

**Proposed Crossing
 Ammonoosuc River
 Lisbon, NH**

Location:
 Dartmouth College Rd - Rt 10, Lisbon, NH
 Nearest cross street: Sugar Hill Rd



LOCUS MAP
(Not to Scale)



Spanmaster® Release 3.1 Sag / Tension Computations
09/01/11 Waveguide

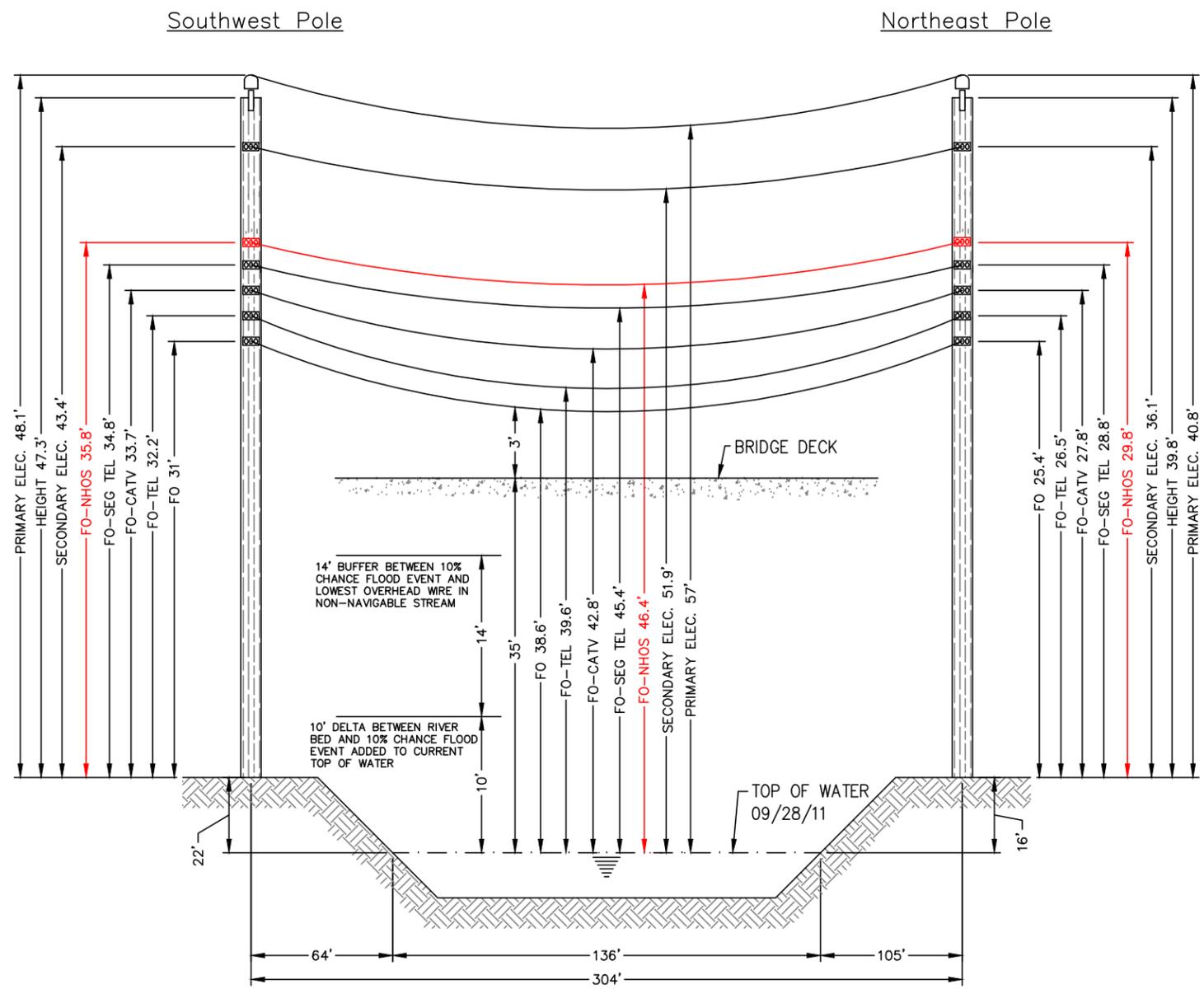
Waveguide
River and Rail Crossings

Selected Cables	X-SECT AREA (sq.in)	EFF MODULUS (psi)	NOMINAL DIAM (in)	EFF.EXP. COEFF. (1/F)	CABLE WEIGHT (lb/ft)	E*A LOAD BEARING CAPACITY (lbs)	MAX. RATED LOAD (lbs)
1/4"6.6mEHS	0.0352	2.60E+07	0.250	5.60E-06	0.1210	914940	6650
ORF-O-288-LN	0.5782	2.70E+05	0.858	1.13E-05	0.1960	155982	651
Bundle			1.108		0.3170		

NEC RESULTS

Loading Condition	Temp. (F)	Ice Load lb/ft	Ice Thick in	Wind Const. lb/ft	Horz Wind Load lb/ft	Result Load + Const lb/ft	Sag ft	Tension lb	% Len Chg From Input Conditions	Sag @ 152 ft	Horz Sag Comp ft	Vert Sag Comp ft	Vector Angle Deg
Rule 251 - Heavy	0.0	1.000	.50	.3	4.0	1.793	7.44	2775	0.13	7.46	3.50	6.56	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	3.54	1033	0.01	3.54	0.00	3.54	0.0

	Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
Span Length = 304.00 ft					
Span Sag = 3.04 ft (36.5 in)					
Span Tension = 1,205 lb					
Max Load = 6,650 lb					
Usable load (60%) = 3,990 lb					
Catenary Length = 304.081 ft					
Stress Free Length @ Installed Temperature = 303.681 ft					
Unloaded Strand					
Sag = 1.38 ft (16.6 in) 0.45 %					
Tension = 1,011 lb					
	10.0	2.54	1,435	-0.01	N/A
	20.0	2.62	1,394	-0.01	N/A
	30.0	2.70	1,354	-0.01	N/A
	40.0	2.78	1,315	0.00	N/A
	50.0	2.86	1,277	0.00	N/A
	60.0	2.95	1,239	0.00	N/A
	70.0	3.04	1,202	0.00	N/A
	80.0	3.13	1,166	0.00	N/A
	90.0	3.23	1,131	0.00	N/A
	100.0	3.33	1,098	0.01	N/A
	110.0	3.43	1,065	0.01	N/A
	120.0	3.54	1,033	0.01	N/A
	130.0	3.65	1,003	0.01	N/A
	140.0	3.76	973	0.01	N/A



E-210/60 - T-906/29
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)

Not to Scale

E-210/61 - T-906/30
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)



E-210/60 - T-906/29

Construction Notes:

NHOS proposes to install a 1/4 inch metal supporting strand between the existing utility poles shown above that will traverse the river. The strand will be installed at the proposed height (see above). The supporting strand will be secured to each pole using double dead end attachments to prevent any sag in the wire and maintain proper clearances. NHOS will lash a one inch diameter fiber optic cable (PVC jacket) to the strand using a dual lash method to provide security of the fiber over the right of way. The fiber will be tagged with twenty four hour contact information at each pole clamp. NHOS will employ the proper safety personnel during the crossing installation. The proposed install will meet all proper clearances from other Utilities. (see above). Additional pole guys will be added per NEC Rule 264 and as directed by pole owners.



E-210/61 - T-906/30



New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

Proposed Crossing
Ammonoosuc
River, Lisbon, NH

Notes:

- The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 09/29/11.
- The horizontal distance between the nearest bridge edge and the existing overhead wires is approximately 31'.
- The smallest vertical distance from the top of existing bridge deck to the lowest existing overhead wires is approximately 3'.
- The vertical distance between the top of water and bridge deck is approximately 35'.
- The waterway is classified as not suitable for sail boating and per NESC Table 232-1 a vertical clearance of 14' must be maintained between the lowest conductor and 10 year floodplain.
- Based on the FEMA Flood Insurance Rate Map for Grafton County (County Map Number 33009C0235E Panel 235 of 1185) dated 02/20/08, and the FEMA cross section data for the Ammonoosuc River (page 08P), the elevation of the stream bed is 591' and the elevation of the 10 year flood event is 601'. A conservative 10 year flood elevation was calculated by adding the delta between the river bed elevation and the 10 year flood elevation to the surveyed water level. A 14' buffer (non-navigable streams) was added to that.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-113-PRI-5
Drawing # AC-LIS-RIV-1

Date: 04/09/12
Revision # 1

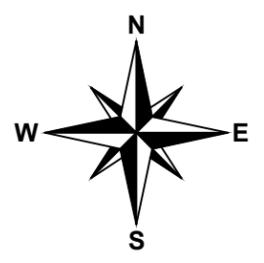
Proposed Crossing
Ammonoosuc River
Lisbon, NH

Location:
Dartmouth College Rd - Rt 10, Lisbon, NH
Nearest cross street: Sugar Hill Rd



New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

Proposed Crossing Jacobs Brook, Orford, NH



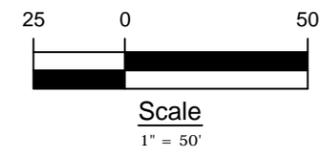
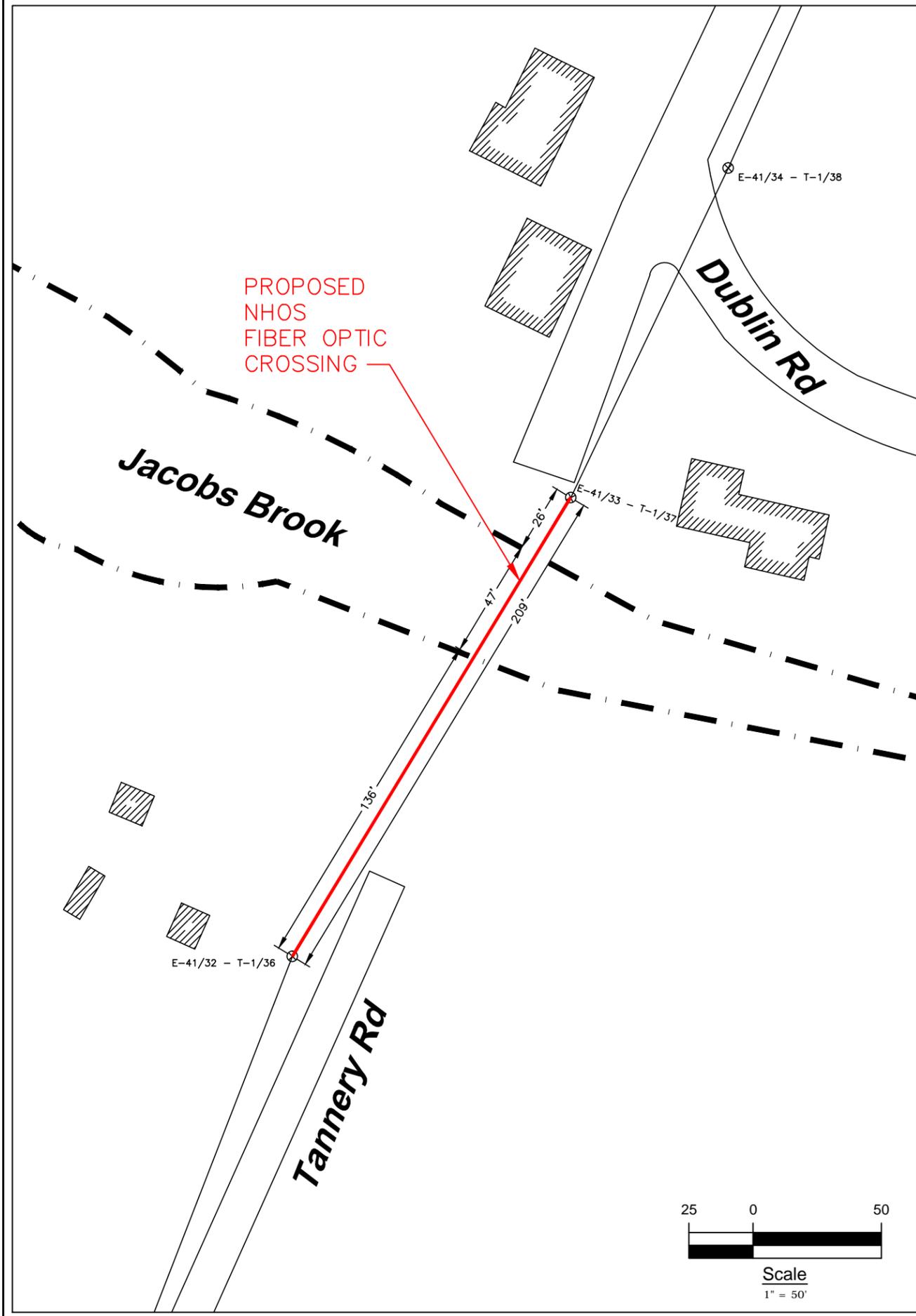
Project # TID-267-PRI-5
Drawing # AC-ORF-RIV-1

Date: 02/01/12
Revision # 1

Proposed Crossing Jacobs Brook, Orford, NH

Location:
Tannery Rd, Orford, NH
Nearest cross street: Dublin Rd

Sheet 1 of 2





LOCUS MAP
(Not to Scale)



Spanmaster® Release 3.1 Sag / Tension Computations

Waveguide
River and Rail Crossings
09/01/11 Waveguide

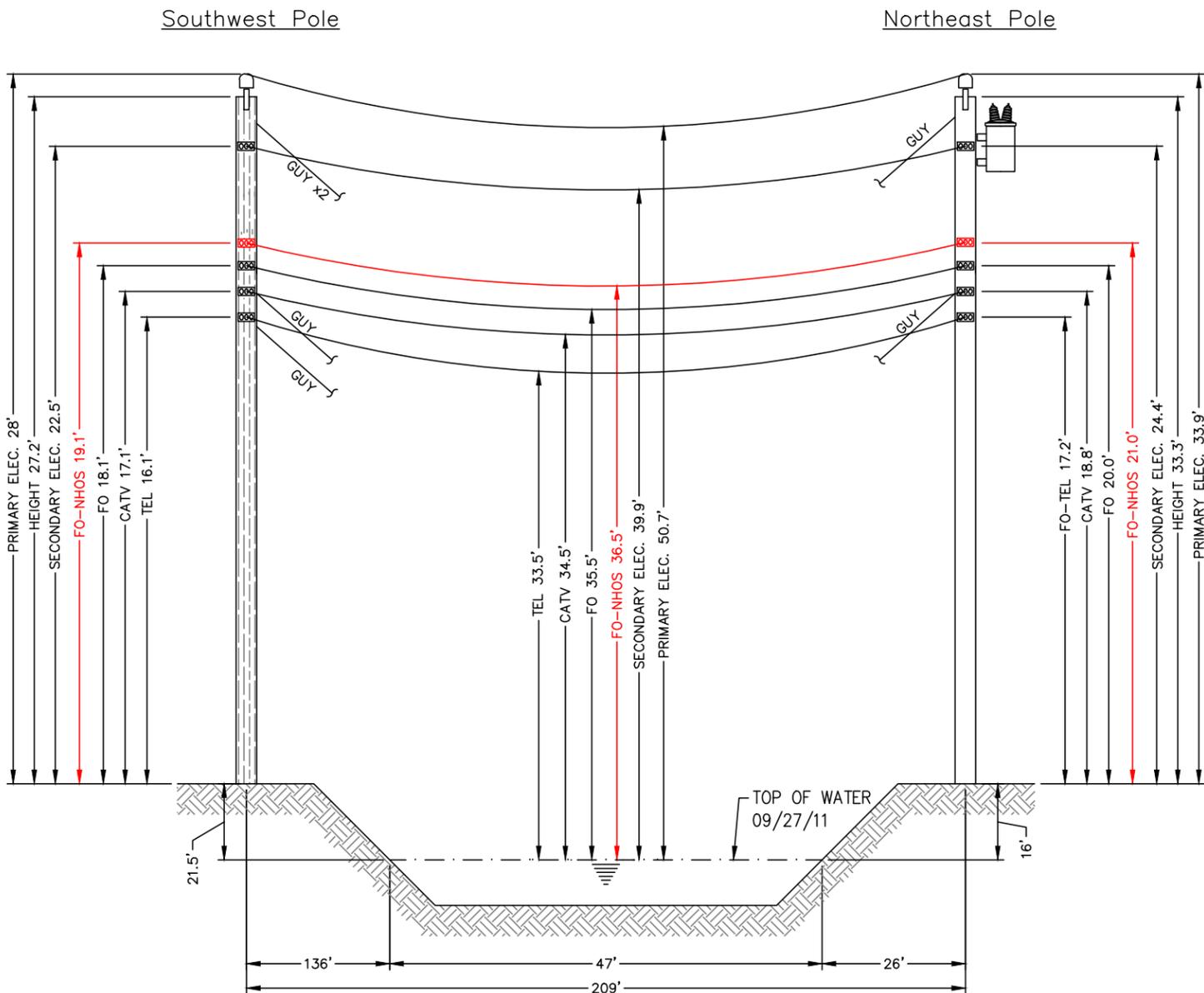
Selected Cables	X-SECT AREA (sq.in)	EFF MODULUS (psi)	NOMINAL DIAM (in)	EFF.EXP. COEFF. (1/F)	CABLE WEIGHT (lb/ft)	E*A LOAD BEARING CAPACITY (lbs)	MAX. RATED LOAD (lbs)
1/4"6.6mEHS	0.0352	2.60E+07	0.250	5.60E-06	0.1210	914940	6650
ORF-O-288-LN Bundle	0.5782	2.70E+05	0.858	1.13E-05	0.1960	155982	651
			1.108		0.3170		

NESC RESULTS

Loading Condition	Temp. (F)	Ice Load lb/ft	Ice Thick in	Wind Constant lb/ft	Horz Wind Load lb/sq ft	Result Load + Const lb/ft	Sag ft	Tension lb	% Len Chg From Input Conditions	Sag @ Point 104.5 ft	Horz Sag Comp ft	Vert Sag Comp ft	Vector Angle Deg
Rule 251 - Heavy	0.0	1.000	.50	.3	4.0	1.793	4.60	2123	0.10	4.61	2.17	4.06	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	2.53	684	0.01	2.53	0.00	2.53	0.0

Span Length = 209.00 ft	Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
Span Sag = 2.09 ft (25.1 in)	-40.0	1.38	1,252	-0.02	N/A
Span Tension = 828 lb	-30.0	1.43	1,208	-0.01	N/A
Max Load = 6,650 lb	-20.0	1.48	1,166	-0.01	N/A
Usable load (60%) = 3,990 lb	-10.0	1.54	1,124	-0.01	N/A
Catenary Length = 209.056 ft	.0	1.59	1,083	-0.01	N/A
Stress Free Length @ Installed Temperature = 208.867 ft	10.0	1.66	1,043	-0.01	N/A
	20.0	1.72	1,004	-0.01	N/A
	30.0	1.79	966	-0.01	N/A
	40.0	1.86	930	-0.01	N/A
	50.0	1.93	894	0.00	N/A
	60.0	2.01	860	0.00	N/A
	70.0	2.09	827	0.00	N/A
	80.0	2.17	796	0.00	N/A
	90.0	2.26	766	0.00	N/A
	100.0	2.35	737	0.01	N/A
	110.0	2.44	710	0.01	N/A
	120.0	2.53	684	0.01	N/A
	130.0	2.62	660	0.02	N/A
	140.0	2.72	637	0.02	N/A

Unloaded Strand
Sag = 1.03 ft (12.3 in) 0.49 %
Tension = 643 lb



E-41/32 - T-1/36
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)

Not to Scale

E-41/33 - T-1/37
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)



E-41/32 - T-1/36

Construction Notes:

NHOS proposes to install a 1/4 inch metal supporting strand between the existing utility poles shown above that will traverse the brook. The strand will be installed at the proposed height (see above). The supporting strand will be secured to each pole using double dead end attachments to prevent any sag in the wire and maintain proper clearances. NHOS will lash a one inch diameter fiber optic cable (PVC jacket) to the strand using a dual lash method to provide security of the fiber over the right of way. The fiber will be tagged with twenty four hour contact information at each pole clamp. NHOS will employ the proper safety personnel during the crossing installation. The proposed install will meet all proper clearances from other Utilities. (see above). Additional pole guys will be added per NESC Rule 264 and as directed by pole owners.



E-41/33 - T-1/37



New Hampshire Optical Systems, Inc.

New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

**Proposed Crossing
Jacobs Brook,
Orford, NH**

Notes:

- The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 09/27/11.
- The vertical distance between the top of water and lowest existing overhead wire is approximately 35'.
- At the time of the site survey there was no bridge located at this crossing location.
- The waterway is classified as not suitable for sail boating and per NESC Table 232-1 a vertical clearance of 14' must be maintained between the lowest conductor and 10 year floodplain.
- Based on the FEMA Flood Insurance Rate Maps for Grafton County (County Maps Numbered 33009C0565E & 33009C0545E) both dated 02/20/08 there is no FEMA flood profile data available for Jacobs Brook in this area. A 100 year flood elevation could not be determined. The 100 year (1%) flood elevation is approximately 408'.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-267-PRI-5
Drawing # AC-ORF-RIV-1

Date: 02/01/12
Revision # 1

**Proposed Crossing
Jacobs Brook,
Orford, NH**

Location:
Tannery Rd, Orford, NH
Nearest cross street: Dublin Rd