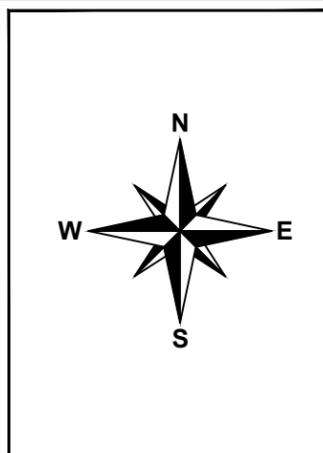


New Hampshire Optical Systems

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

**Proposed
 River Crossing
 Windham, NH**



Project # TID-236 - Primary 18
 Drawing # AC-HAM-RIV-1

Date: 11/19/12
 Revision #

**Proposed
 River Crossing
 Hudson/Windham, NH**

Location:
 Haverhill Rd., Windham, NH
 Nearest cross street- Central St.



LOCUS MAP
(Not to Scale)



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

Waveguide
River and Rail Crossings

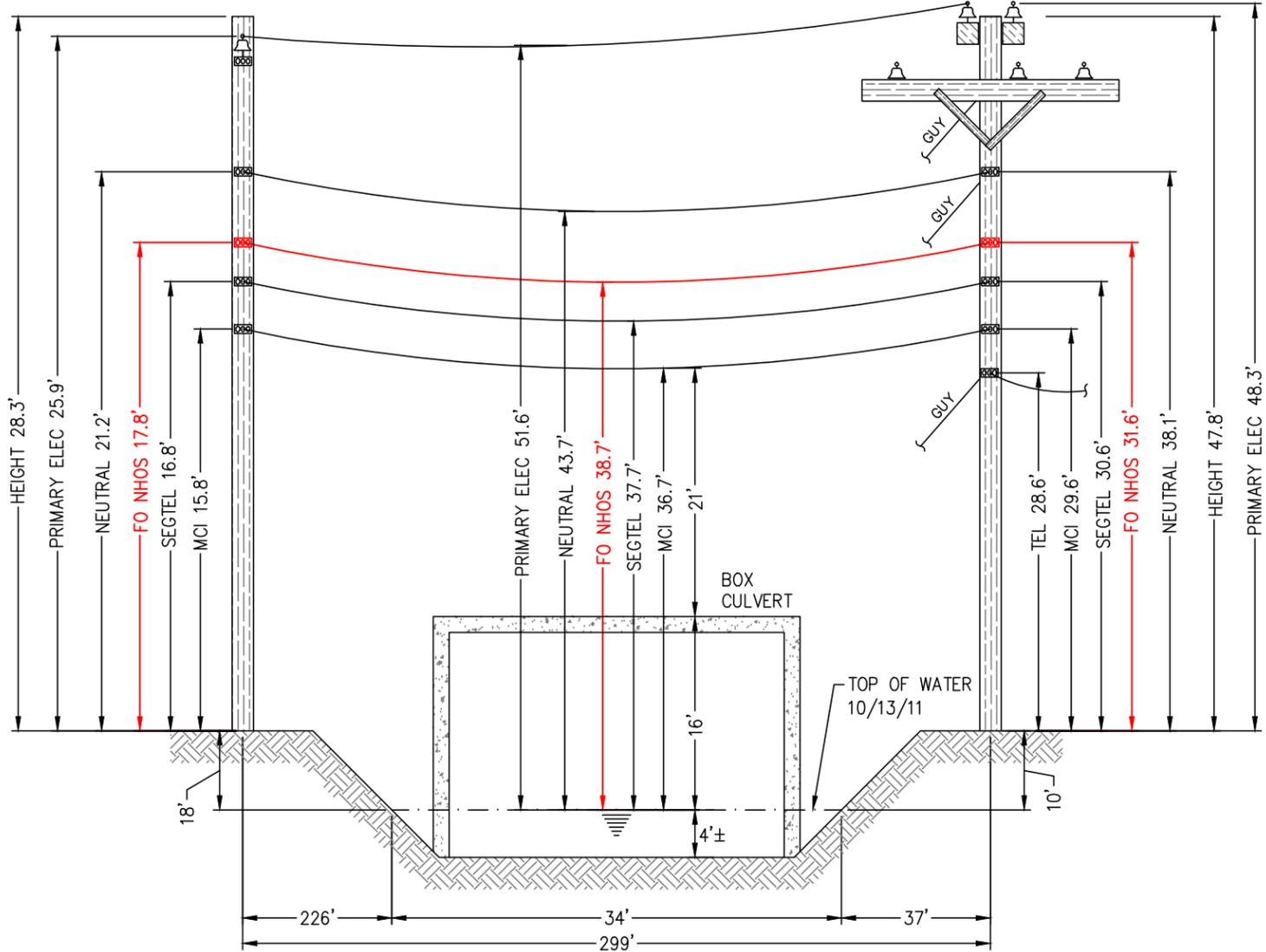
Selected Cables	X-SECT AREA (sq.in)	EFF MODULUS (psi)	NOMINAL DIAM (in)	EFF.EXP. COEFF. (1/F)	CABLE WEIGHT (lb/ft)	E*A LOAD BEARING CAPACITY (lbs)	MAX. RATED LOAD (lbs)
1/4*6mEHS	0.0352	2.60E+07	0.250	5.60E-06	0.1210	914940	6650
ORF-O-288-LN Bundle	0.5782	2.70E+05	0.858	1.13E-05	0.1960	155982	651

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 @ 150 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	7.32	2749	0.13	7.34	3.44	6.45	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	3.50	1018	0.01	3.50	0.00	3.50	0.0

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	2.18	1,632	-0.01	N/A
-30.0	2.24	1,589	-0.01	N/A
-20.0	2.30	1,545	-0.01	N/A
-10.0	2.37	1,503	-0.01	N/A
.0	2.43	1,461	-0.01	N/A
10.0	2.51	1,419	-0.01	N/A
20.0	2.58	1,378	-0.01	N/A
30.0	2.66	1,338	-0.01	N/A
40.0	2.74	1,299	0.00	N/A
50.0	2.82	1,261	0.00	N/A
60.0	2.91	1,223	0.00	N/A
70.0	3.00	1,186	0.00	N/A
80.0	3.09	1,151	0.00	N/A
90.0	3.19	1,116	0.00	N/A
100.0	3.29	1,082	0.01	N/A
110.0	3.39	1,050	0.01	N/A
120.0	3.50	1,018	0.01	N/A
130.0	3.60	988	0.01	N/A
140.0	3.71	959	0.01	N/A

Span Length = 300.00 ft
Span Sag = 3.00 ft (36.0 in)
Span Tension = 1,189 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 300.080 ft
Stress Free Length @ Installed Temperature = 299.691 ft
Unloaded Strand Sag = 1.37 ft (16.4 in) 0.46 % Tension = 995 lb



E-3A/57 - T-3136/6
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)
(Incorrectly labeled in make ready notes as E-3A/57 - T-NT)
Windham, NH

E-236/56 - T-3136/5
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)
(Incorrectly labeled in make ready notes as E-236/56 - T-3136/6)
Hudson, NH



E-3A/57 - T-3136/6

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 NESC Rule 264 and as directed by pole owners.



E-236/56 - T-3136/5



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

**Proposed River Crossing
Windham, NH**

Notes:

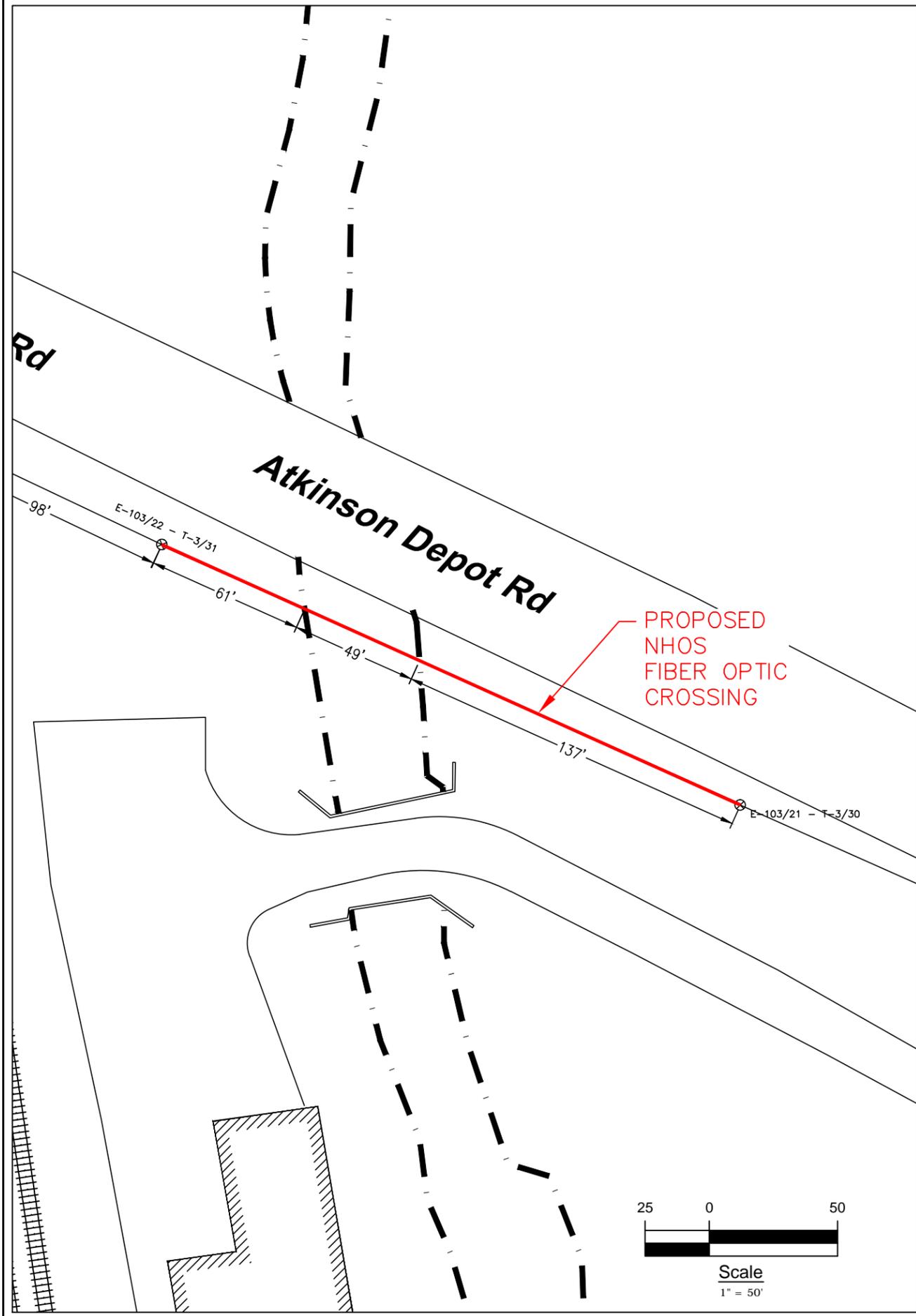
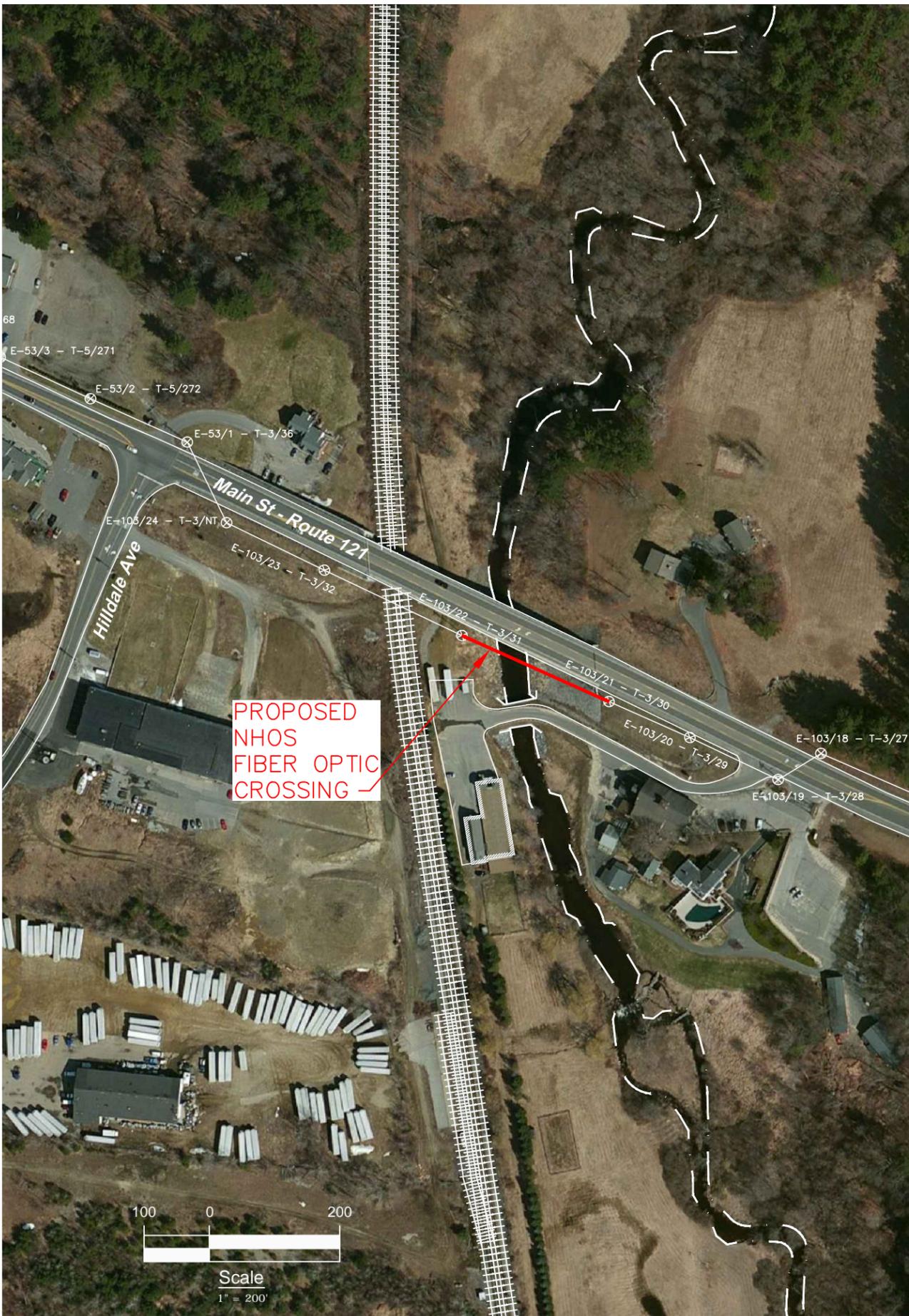
- The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 10/18/11.
- The horizontal distance between the nearest box culvert and the existing overhead wires is approximately 10'.
- Because of the close horizontal proximity to the existing box culvert, the simplified drawing is submitted with vertical distances measured to the structure. This process simplifies the preparation and review of the crossing without jeopardizing its intent to protect the safe usage of the waterway
- The smallest vertical distance from the top of existing box culvert to the lowest existing overhead wires is 21'.
- The vertical distance between the top of water and top of box culvert is approximately 16'.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-236 - Primary 18
Drawing # AC-HAM-RIV-1

Date: 11/19/12
Revision #

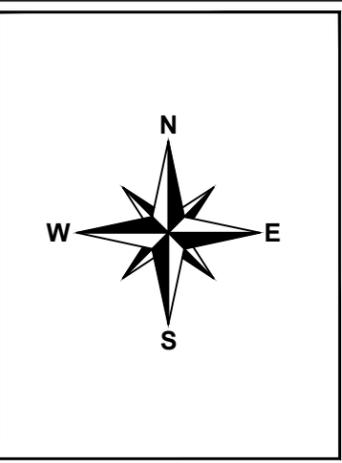
**Proposed River Crossing
Hudson/Windham, NH**

Location:
Haverhill Rd., Windham, NH
Nearest cross street- Central St.



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

**Proposed
 River Crossing
 Plaistow, NH**



Project # TID-243 - Primary 18
 Drawing # AC-PLA-RIV-1

Date: 02/01/12
 Revision # 1

**Proposed
 River Crossing
 Plaistow, NH**

Location:
 Main St., Plaistow, NH
 Nearest cross street- Hilldale Ave.



LOCUS MAP
(Not to Scale)



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

Waveguide
River and Rail Crossings

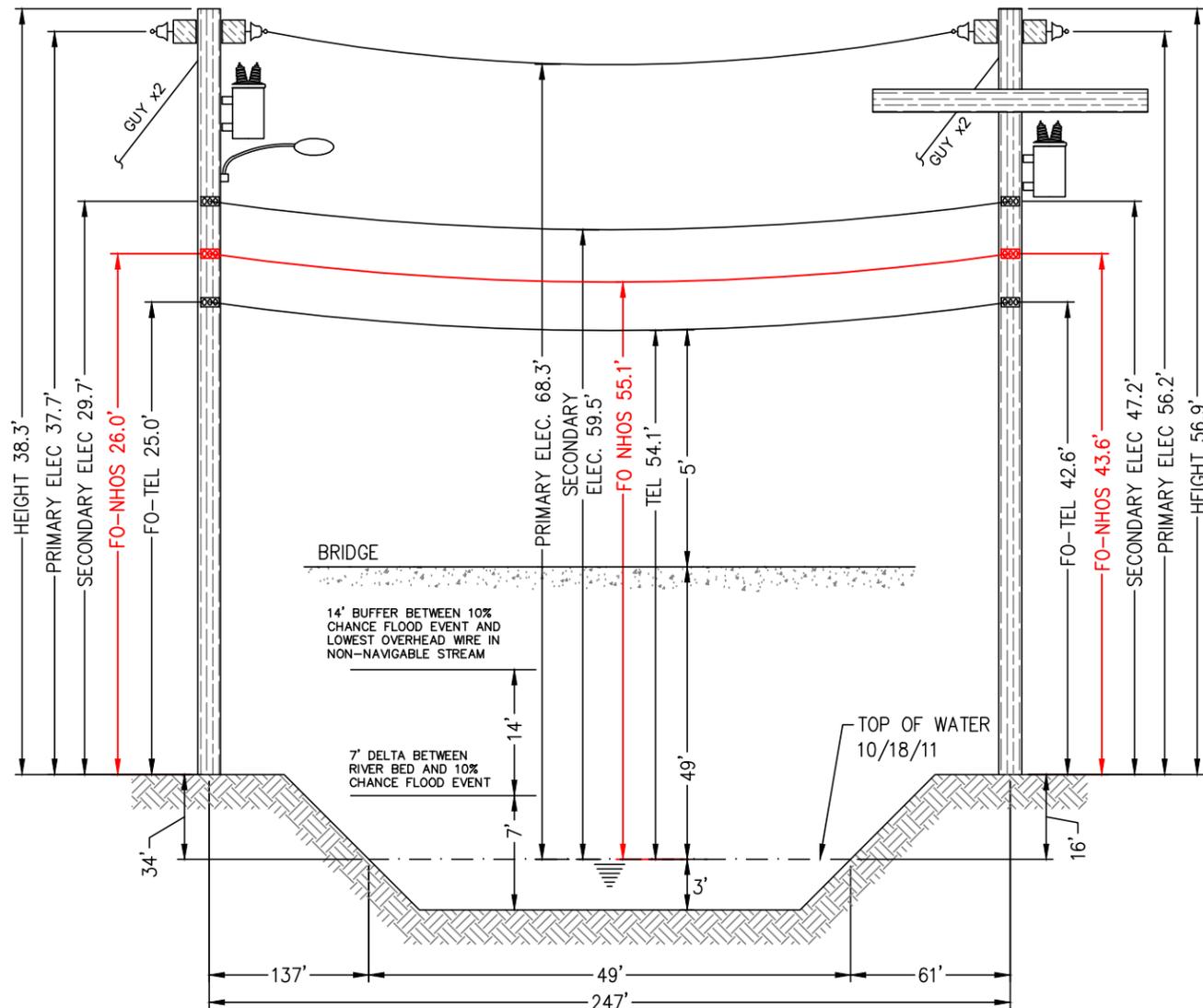
Selected Cables	X-SECT AREA (sq.in)	EFF MODULUS (psi)	NOMINAL DIAM (in)	EFF.EXP. COEFF. (1/F)	CABLE WEIGHT (lb/ft)	E*A LOAD BEARING CAPACITY (lbs)	MAX. RATED LOAD (lbs)
1/4"6.6mEHS	0.0352	2.60E+07	0.250	5.60E-06	0.1210	914940	6650
ORF-O-288-LN Bundle	0.5762	2.70E+05	0.858	1.13E-05	0.1960	155982	651
			1.108		0.3170		

NESC RESULTS

Loading Condition	Temp. (F)	Ice Load lb/ft	Ice Thick in	Wind Const lb/ft	Horz Load lb/ft	Result Load + Const lb/ft	Sag ft	Tension lb	% Len Chg From Input Conditions	Sag @ 125.5 ft	Horz Sag Comp ft	Vert Sag Comp ft	Vector Angle Deg
Rule 251 - Heavy 232A1	0.0	1.000	.50	.3	4.0	1.793	5.70	2391	0.12	5.72	2.69	5.03	28.1
	120.0	0.000	.00	.0	0.0	0.317	2.94	822	0.01	2.94	0.00	2.94	0.0

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	1.71	1,412	-0.01	N/A
-30.0	1.76	1,368	-0.01	N/A
-20.0	1.82	1,325	-0.01	N/A
-10.0	1.88	1,283	-0.01	N/A
.0	1.94	1,242	-0.01	N/A
10.0	2.01	1,201	-0.01	N/A
20.0	2.08	1,161	-0.01	N/A
30.0	2.15	1,122	-0.01	N/A
40.0	2.22	1,084	-0.01	N/A
50.0	2.30	1,048	0.00	N/A
60.0	2.39	1,012	0.00	N/A
70.0	2.47	977	0.00	N/A
80.0	2.56	944	0.00	N/A
90.0	2.65	911	0.00	N/A
100.0	2.74	881	0.01	N/A
110.0	2.84	851	0.01	N/A
120.0	2.94	822	0.01	N/A
130.0	3.04	795	0.01	N/A
140.0	3.14	769	0.02	N/A

Span Length = 247.00 ft
Span Sag = 2.47 ft (29.6 in)
Span Tension = 979 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 247.066 ft
Stress Free Length @ Installed Temperature = 246.802 ft
Unloaded Strand Sag = 1.17 ft (14.0 in) 0.47 % Tension = 789 lb



E-103/21 - T-3/30
(Existing joint owned utility pole (UNITIL/Fairpoint) in existing Right-of-Way)

E-103/22 - T-3/31
(Existing joint owned utility pole (UNITIL/Fairpoint) in existing Right-of-Way)



E-103/21 - T-3/30

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 NESC Rule 264 and as directed by pole owners.



E-103/22 - T-3/31



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

Proposed River Crossing Plaistow, NH

Notes:

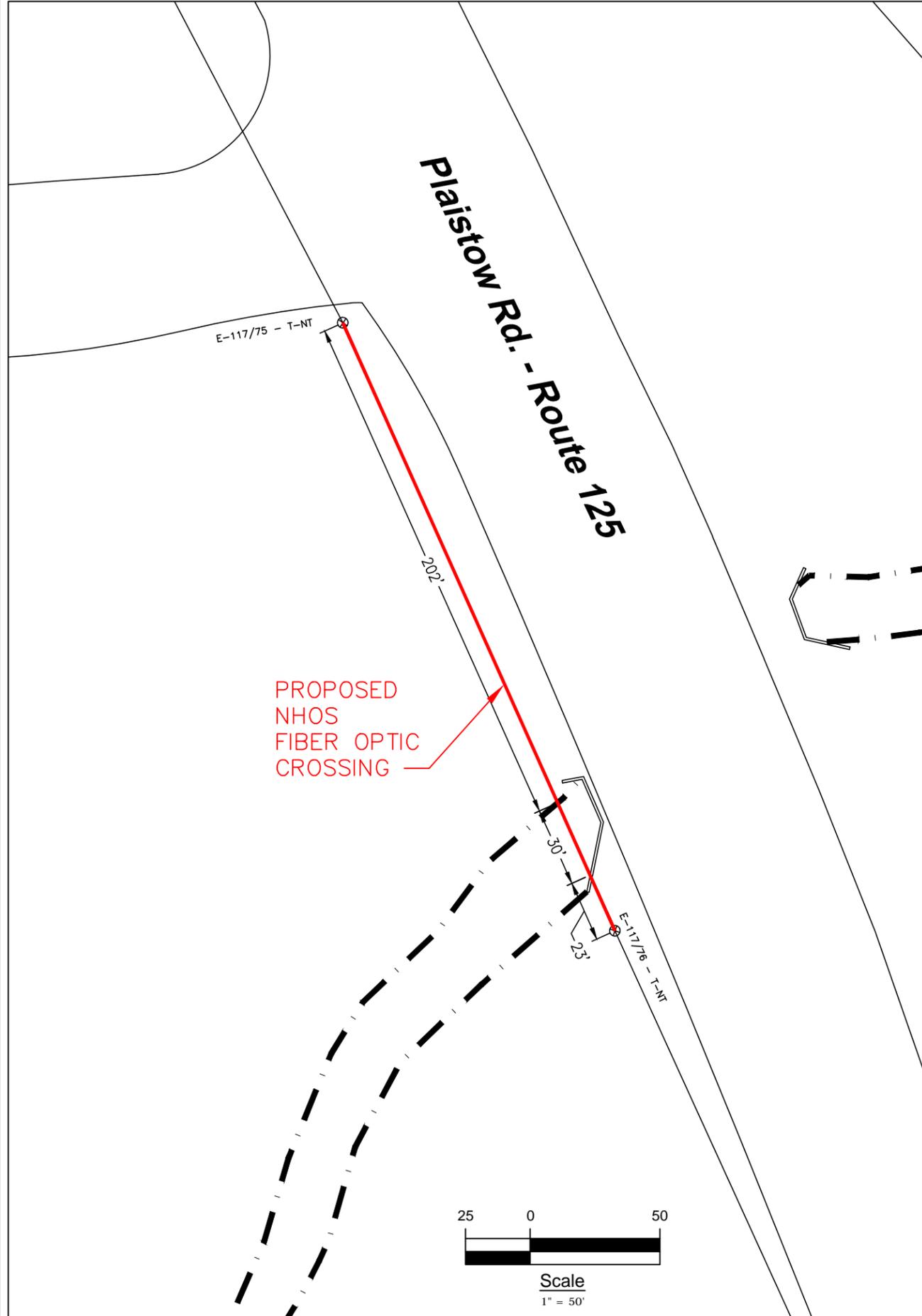
- The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 10/18/11.
- The horizontal distance between the nearest bridge edge and the existing overhead wires ranges from 15' to 16'.
- The smallest vertical distance from the top of existing bridge deck to the lowest existing overhead wires is 5'.
- The vertical distance between the top of water and bridge deck is approximately 49'.
- 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 Profile for the Little River (Page 103P) and the Flood Insurance Rate Map for Rockingham County (Map Number 33015C0578E) dated May 17, 2005 the delta between the river bed and the 10 year flood elevation is approximately 7'. A 14' buffer (for non-navigable streams) was added to that. Based on the FEMA Flood Profile the stream bed elevation is 31.5' and the 10 year flood elevation is 38.5'.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.
- The poles are mislabeled in the field. The poles shown hereon are located on electrical route 103, not route 130 as the labels on the the pole indicate.

Project # TID-243 - Primary 18
Drawing # AC-PLA-RIV-1

Date: 02/01/12
Revision # 1

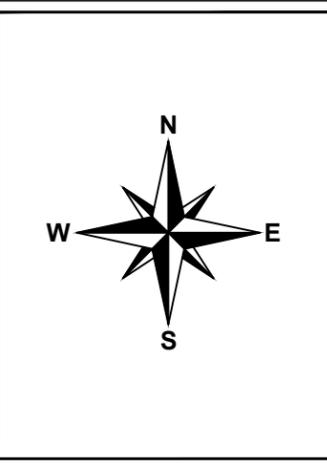
Proposed River Crossing Plaistow, NH

Location:
Main St., Plaistow, NH
Nearest cross street- Hillsdale Ave.



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

**Proposed
 River Crossing
 Plaistow, NH**

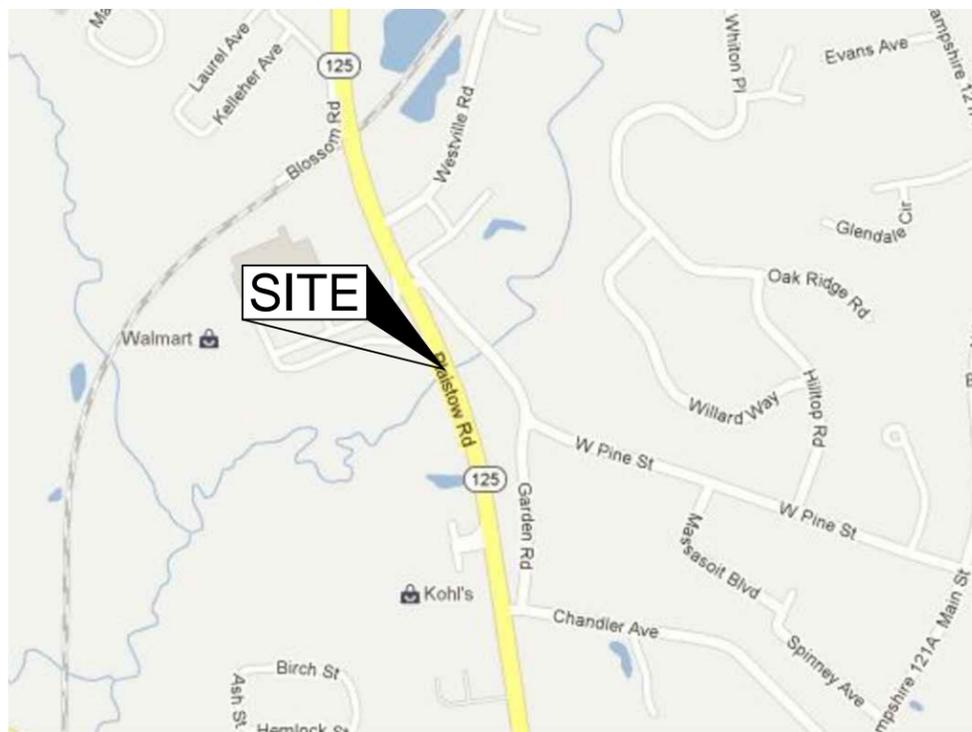


Project # TID-244 - Primary 18
 Drawing # AC-PLA-RIV-2

Date: 02/01/12
 Revision # 1

**Proposed
 River Crossing
 Plaistow, NH**

Location:
 Plaistow Rd., Plaistow, NH
 Nearest cross street- Garden Rd.



LOCUS MAP
(Not to Scale)



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

Waveguide
River and Rail Crossings

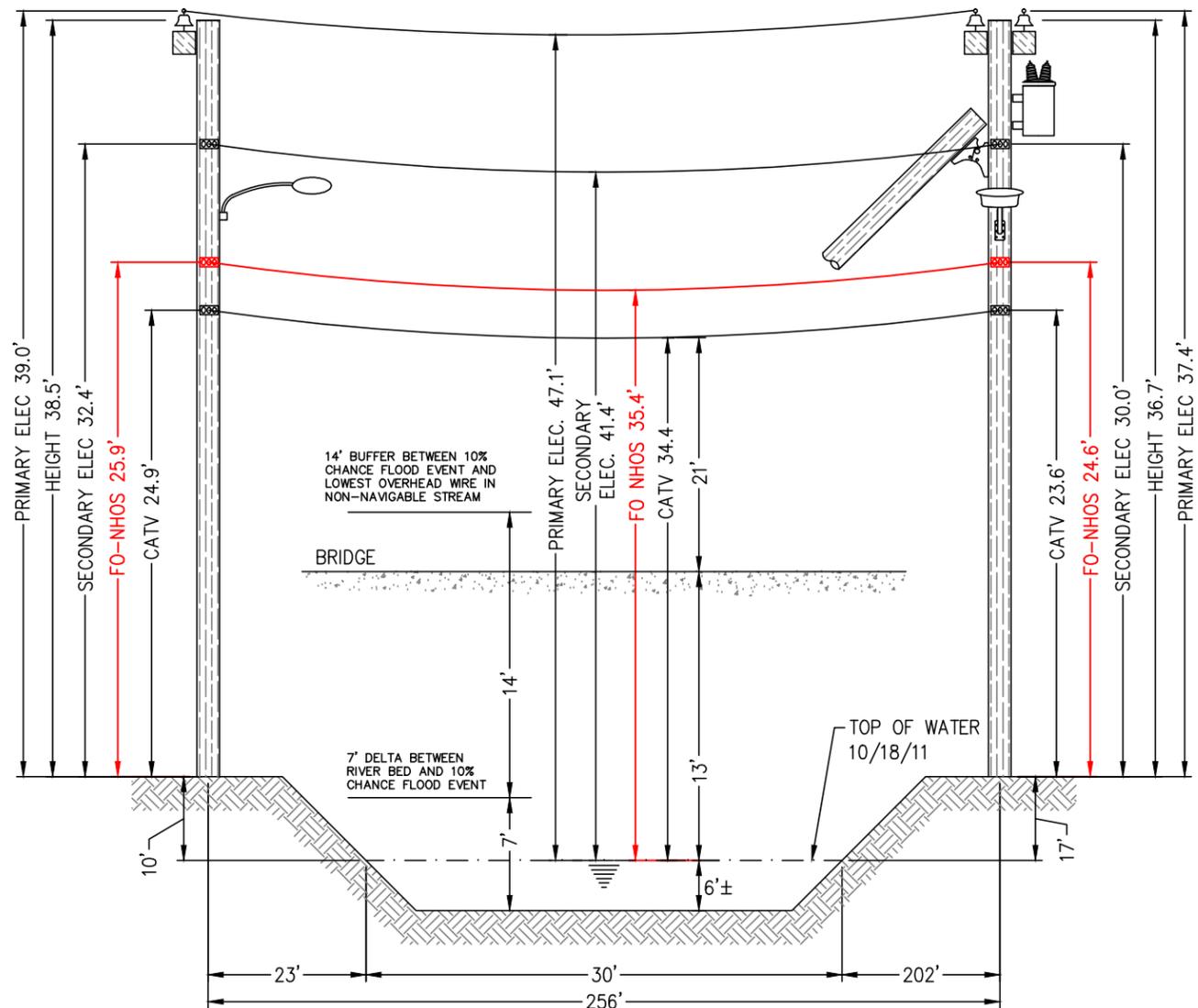
Selected Cables	X-SECT AREA (sq.in)	EFF MODULUS (psi)	NOMINAL DIAM (in)	EFF.EXP. COEFF. (1/F)	CABLE WEIGHT (lb/ft)	E*A LOAD BEARING CAPACITY (lbs)	MAX. RATED LOAD (lbs)
1/4"6.6mEHS	0.0352	2.60E+07	0.250	5.60E-06	0.1210	914940	6650
ORF-O-288-LN Bundle	0.5782	2.70E+05	0.858	1.13E-05	0.1960	155982	651
			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)	Resultant Load (lb/ft)	Sag (ft)	Tension (lb)	% Len Orig From Conditions	Sag @ Point 128 ft	Horz Sag (ft)	Vert Sag (ft)	Vector Angle (Deg)
Rule 251 - Heavy 232A1	0.0	1.000	.50	.3	4.0	1.793	5.97	2453	0.12	5.99	2.81	5.27	28.1
	120.0	0.000	.00	.0	0.0	0.317	3.03	855	0.01	3.04	0.00	3.03	0.0

Temp (F)	Midsag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	1.79	1,449	-0.01	N/A
-30.0	1.84	1,406	-0.01	N/A
-20.0	1.90	1,363	-0.01	N/A
-10.0	1.96	1,321	-0.01	N/A
.0	2.03	1,279	-0.01	N/A
10.0	2.09	1,238	-0.01	N/A
20.0	2.16	1,198	-0.01	N/A
30.0	2.24	1,159	-0.01	N/A
40.0	2.31	1,121	0.00	N/A
50.0	2.39	1,084	0.00	N/A
60.0	2.47	1,048	0.00	N/A
70.0	2.56	1,013	0.00	N/A
80.0	2.65	979	0.00	N/A
90.0	2.74	946	0.00	N/A
100.0	2.84	915	0.01	N/A
110.0	2.93	884	0.01	N/A
120.0	3.03	855	0.01	N/A
130.0	3.13	828	0.01	N/A
140.0	3.24	801	0.02	N/A

Span Length = 256.00 ft
Span Sag = 2.56 ft (30.7 in)
Span Tension = 1,014 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 256.068 ft
Stress Free Length @ Installed Temperature = 255.785 ft
Unloaded Strand
Sag = 1.20 ft (14.4 in) 0.47 %
Tension = 824 lb



E-117/76 - T-NT
(Existing joint owned utility pole (UNITIL/Fairpoint) in existing Right-of-Way)

E-117/75 - T-NT
(Existing joint owned utility pole (UNITIL/Fairpoint) in existing Right-of-Way)



E-117/76 - T-NT

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 NESC Rule 264 and as directed by pole owners.



E-117/75 - T-NT

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

Proposed River Crossing Plaistow, NH

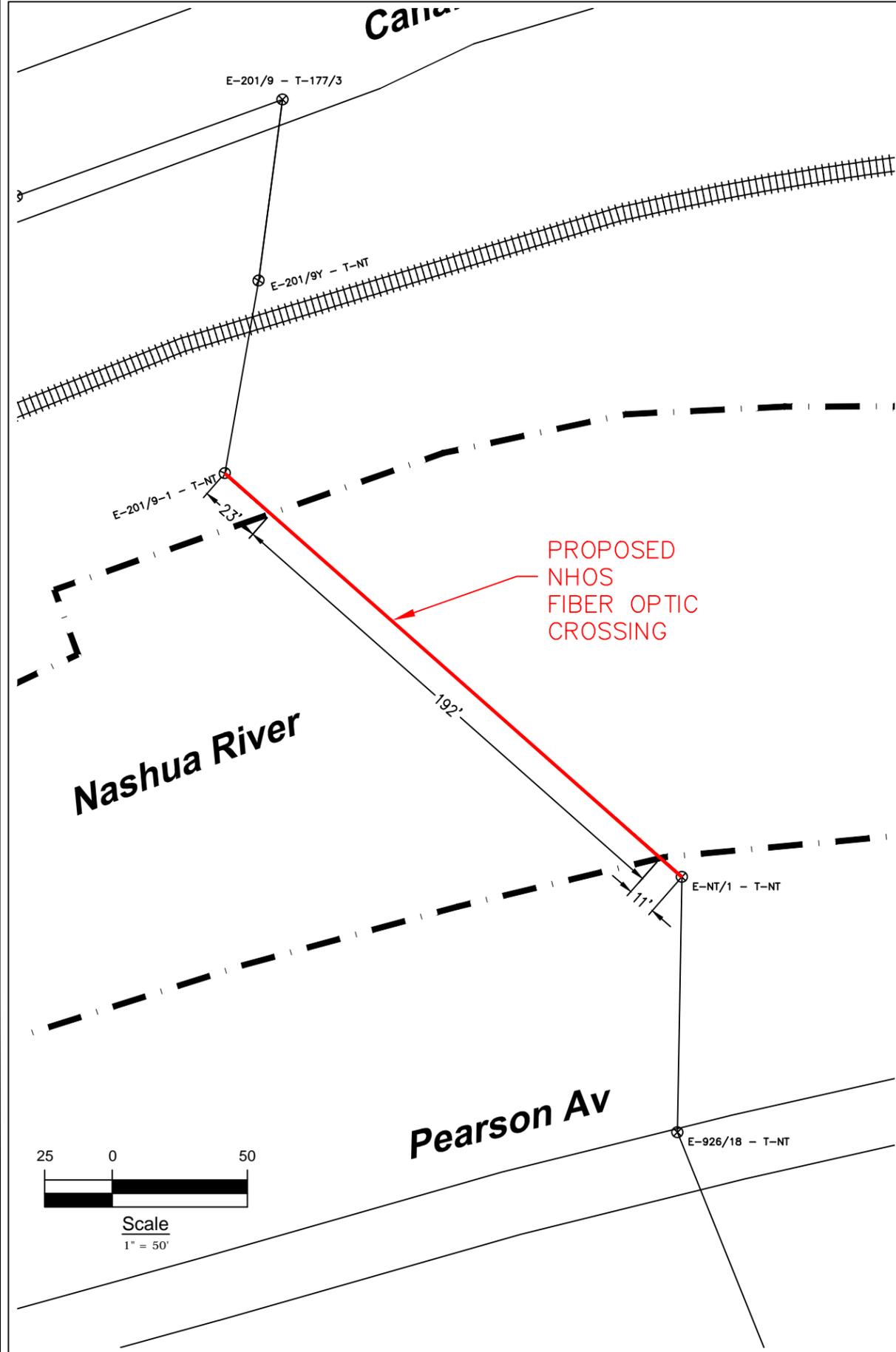
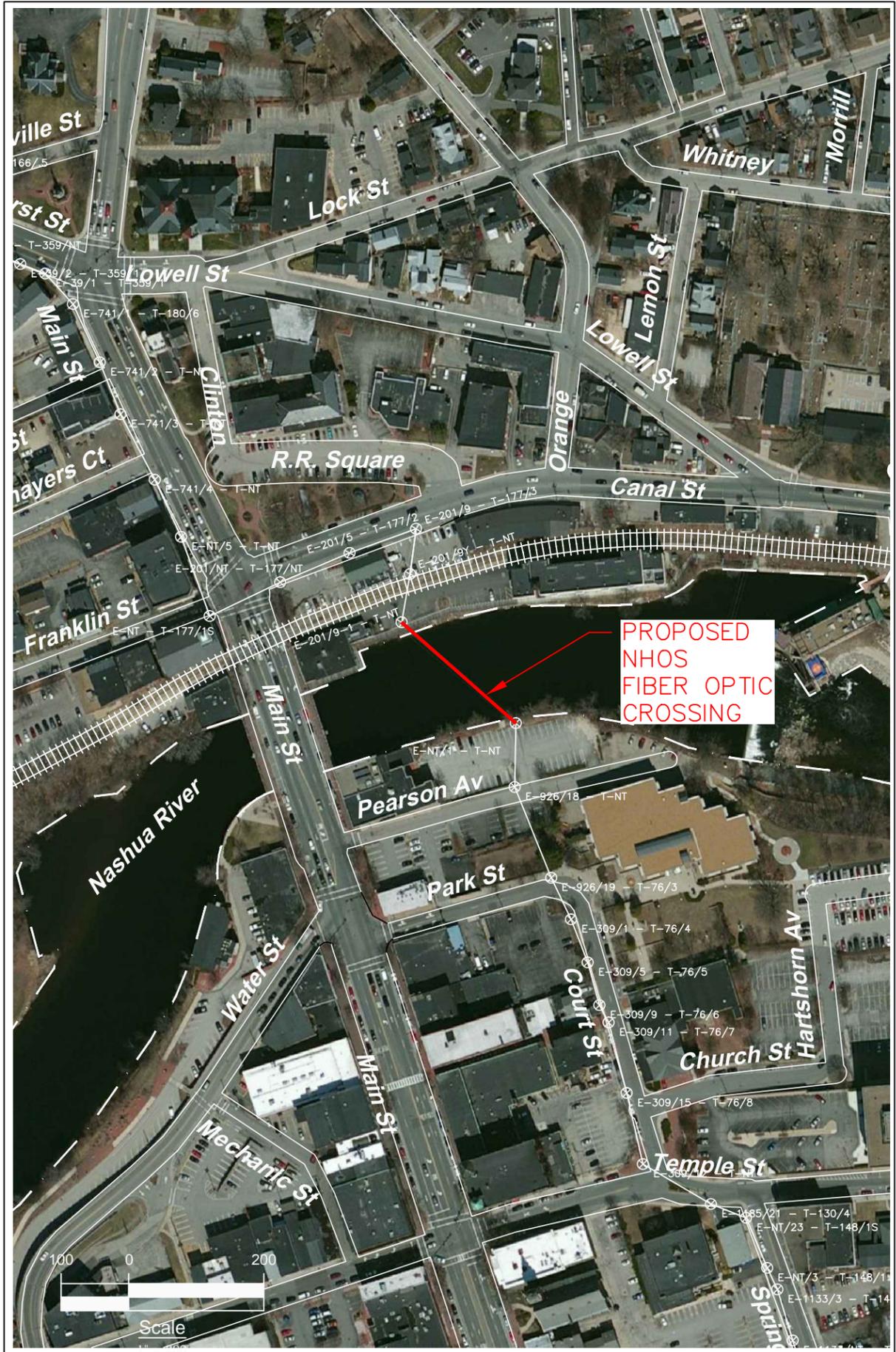
- Notes:**
- The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 10/18/11.
 - The horizontal distance between the nearest bridge edge and the existing overhead wires is approximately 12'.
 - The smallest vertical distance from the top of existing bridge deck to the lowest existing overhead wires is 21'.
 - The vertical distance between the top of water and bridge deck is approximately 13'.
 - 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 Profile for the Little River (Page 103P) and the Flood Insurance Rate Map for Rockingham County (Map Number 33015C0578E) dated May 17, 2005 the delta between the river bed and the 10 year flood elevation is approximately 7'. A 14' buffer (for non-navigable streams) was added to that. Based on the FEMA Flood Profile the stream bed elevation is 38' and the 10 year flood elevation is 45'.
 - Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-244 - Primary 18
Drawing # AC-PLA-RIV-2

Date: 02/01/12
Revision # 1

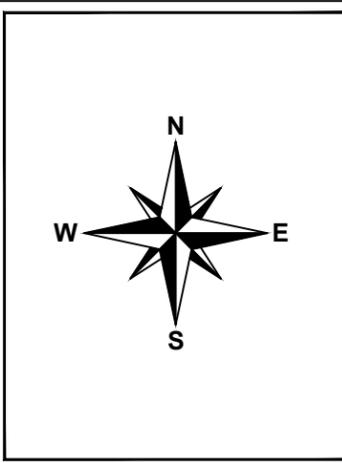
Proposed River Crossing Plaistow, NH

Location:
Plaistow Rd., Plaistow, NH
Nearest cross street- Garden Rd.



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

**Proposed
 River Crossing
 Nashua, NH**

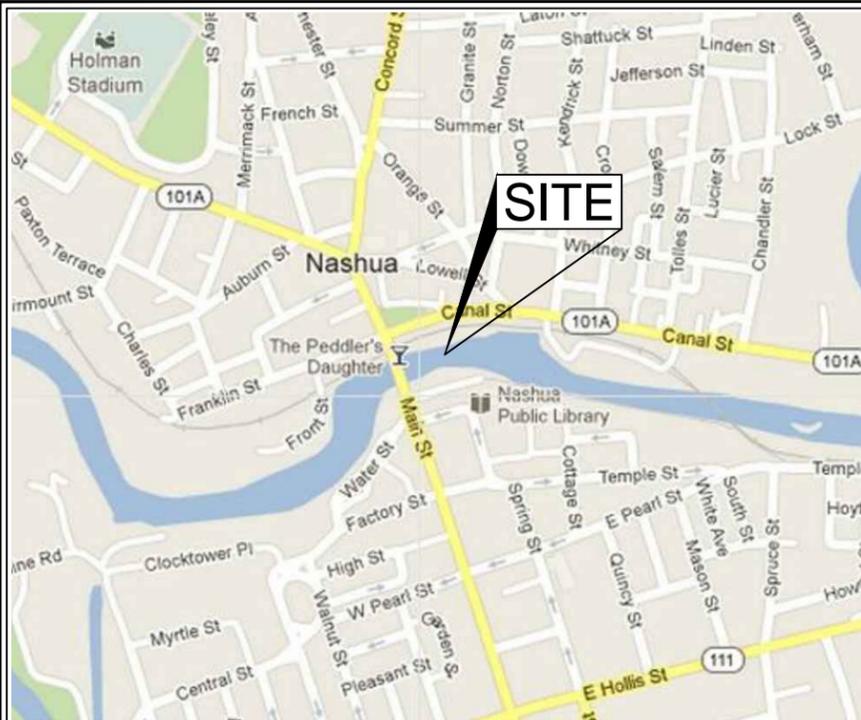


Project # TID-310 - Primary 18
 Drawing # AC-NAS-RIV-4

Date: 06/13/12
 Revision #

**Proposed
 River Crossing
 Nashua, NH**

Location:
 Canal St., Nashua, NH
 Nearest cross street- Main St.



LOCUS MAP
(Not to Scale)



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

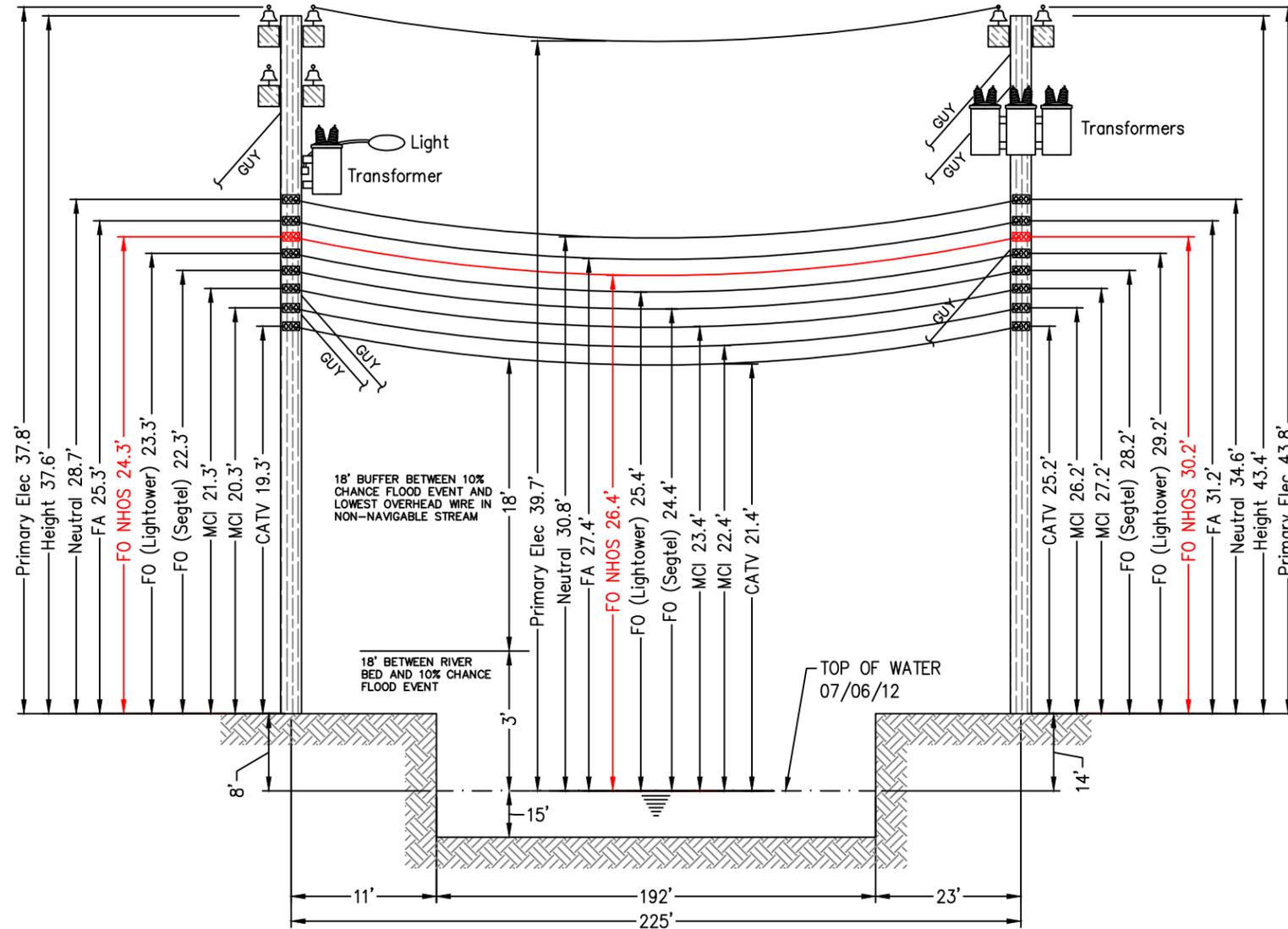
Waveguide
River and Rail Crossings

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 Constant (lb/ft)	Horz Wind Load (lb/sq ft)	Resultant Load + Const (lb/ft)	Sag (ft)	Tension (lb)	% Len Chg From Input Conditions	Sag @ Point 117.5 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	5.35	2307	0.11	5.36	2.52	4.72	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	2.81	779	0.01	2.81	0.00	2.81	0.0

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
Span Length = 235.00 ft				
Span Sag = 2.35 ft (28.2 in)				
Span Tension = 931 lb				
Max Load = 6,650 lb	-40.0	1,361	-0.01	N/A
Usable load (60%) = 3,990 lb	-30.0	1,318	-0.01	N/A
Catenary Length = 235.063 ft	-20.0	1,275	-0.01	N/A
Stress Free Length @	-10.0	1,233	-0.01	N/A
Installed Temperature = 234.824 ft	.0	1,192	-0.01	N/A
Unloaded Strand	10.0	1,151	-0.01	N/A
Sag = 1.12 ft (13.5 in) 0.48 %	20.0	1,112	-0.01	N/A
Tension = 743 lb	30.0	1,073	-0.01	N/A
	40.0	1,036	-0.01	N/A
	50.0	999	0.00	N/A
	60.0	964	0.00	N/A
	70.0	930	0.00	N/A
	80.0	897	0.00	N/A
	90.0	865	0.00	N/A
	100.0	835	0.01	N/A
	110.0	806	0.01	N/A
	120.0	779	0.01	N/A
	130.0	752	0.01	N/A
	140.0	727	0.02	N/A



E-NT/1 - T-NT
(PSNH owned utility pole in existing Right-of-Way)

E-201/9-1 - T-NT
(PSNH owned utility pole in existing Right-of-Way)



E-NT/1 - T-NT

Construction Notes:

NHOS proposes to install a ¼ 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 NESC Rule 264 and as directed by pole owners.



E-201/9-1 - T-NT



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

Proposed River Crossing Nashua, NH

Notes:

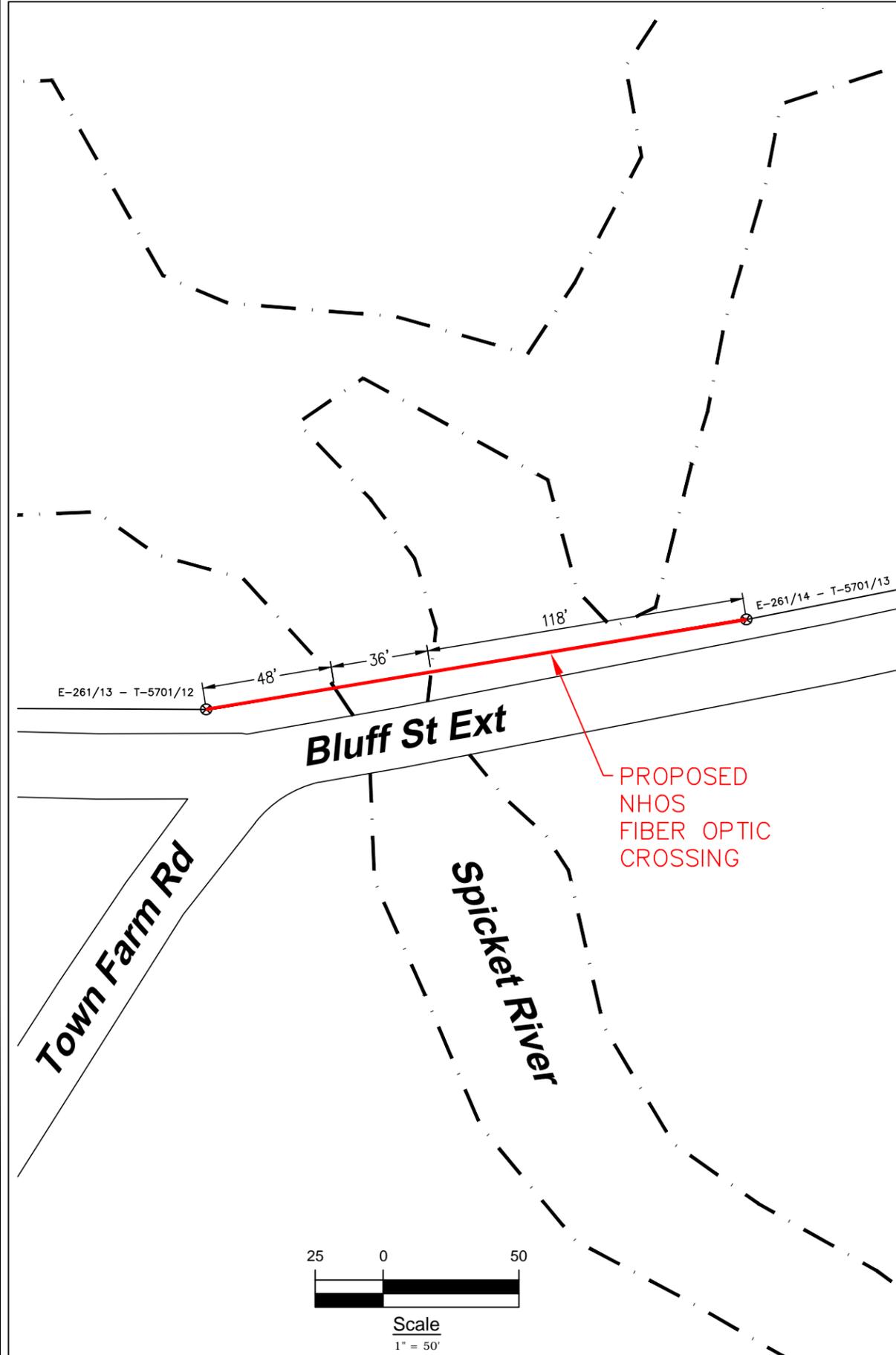
- The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 07/06/12.
- The horizontal distance between the nearest bridge edge and the existing overhead wires is over 200' away.
- The smallest vertical distance between the lowest wire and the 10% chance flood event is 18'.
- 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 Profile for the Nashua River (Page 161P) and the Flood Insurance Rate Map for Hillsborough County (Map Number 33011C0514E) dated April 18, 2011, the delta between the river bed and the 10 year flood elevation is 18'. Based on the Flood Profile for the Nashua River (page 161P) the elevation of the stream bed is 103' and the elevation of the 10% Chance Flood event is 121'.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-310 - Primary 18
Drawing # AC-NAS-RIV-4

Date: 06/13/12
Revision #

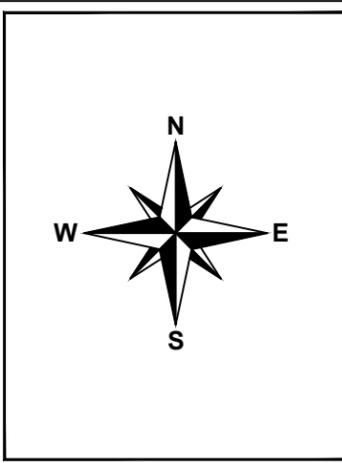
Proposed River Crossing Nashua, NH

Location:
Canal St., Nashua, NH
Nearest cross street- Main St.



NHOS
 New Hampshire Optical Systems
 New Hampshire Optical Systems, Inc.
 99 Pine Hill Rd.
 Nashua, NH 03063
 (866-983-4237)

**Proposed
 River Crossing
 Salem, NH**

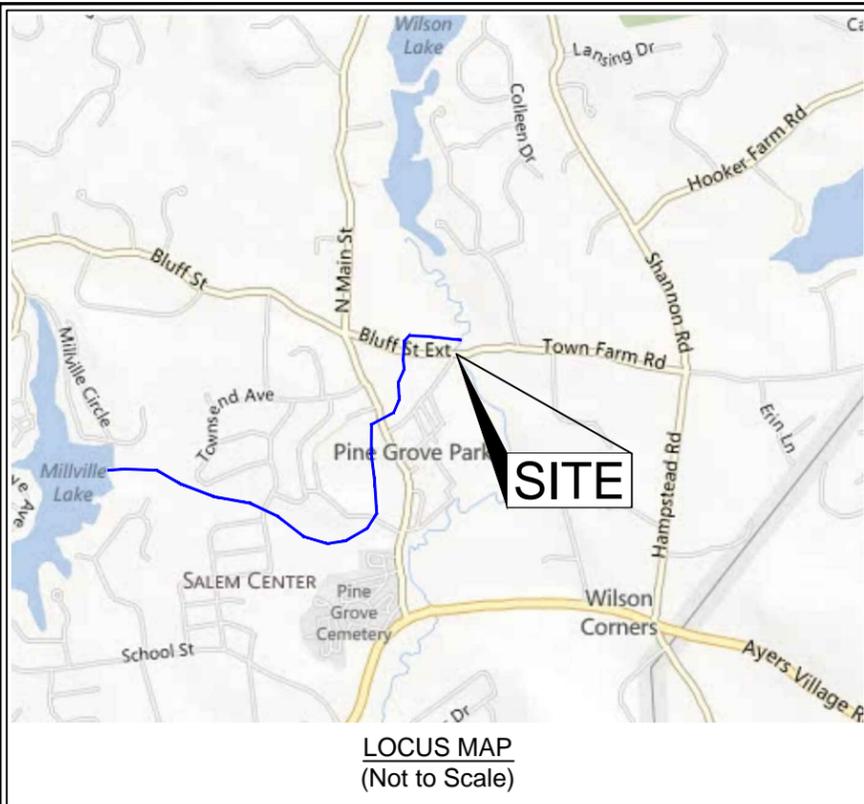


Project # TID-318 - Primary 18
 Task ID # AC-SAL-RIV-2

Date: 12/12/12
 Revision #

**Proposed
 River Crossing
 Salem, NH**

Location:
 Bluff St. Ext., Salem, NH
 Nearest cross street- Town Farm Rd.



LOCUS MAP
(Not to Scale)



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

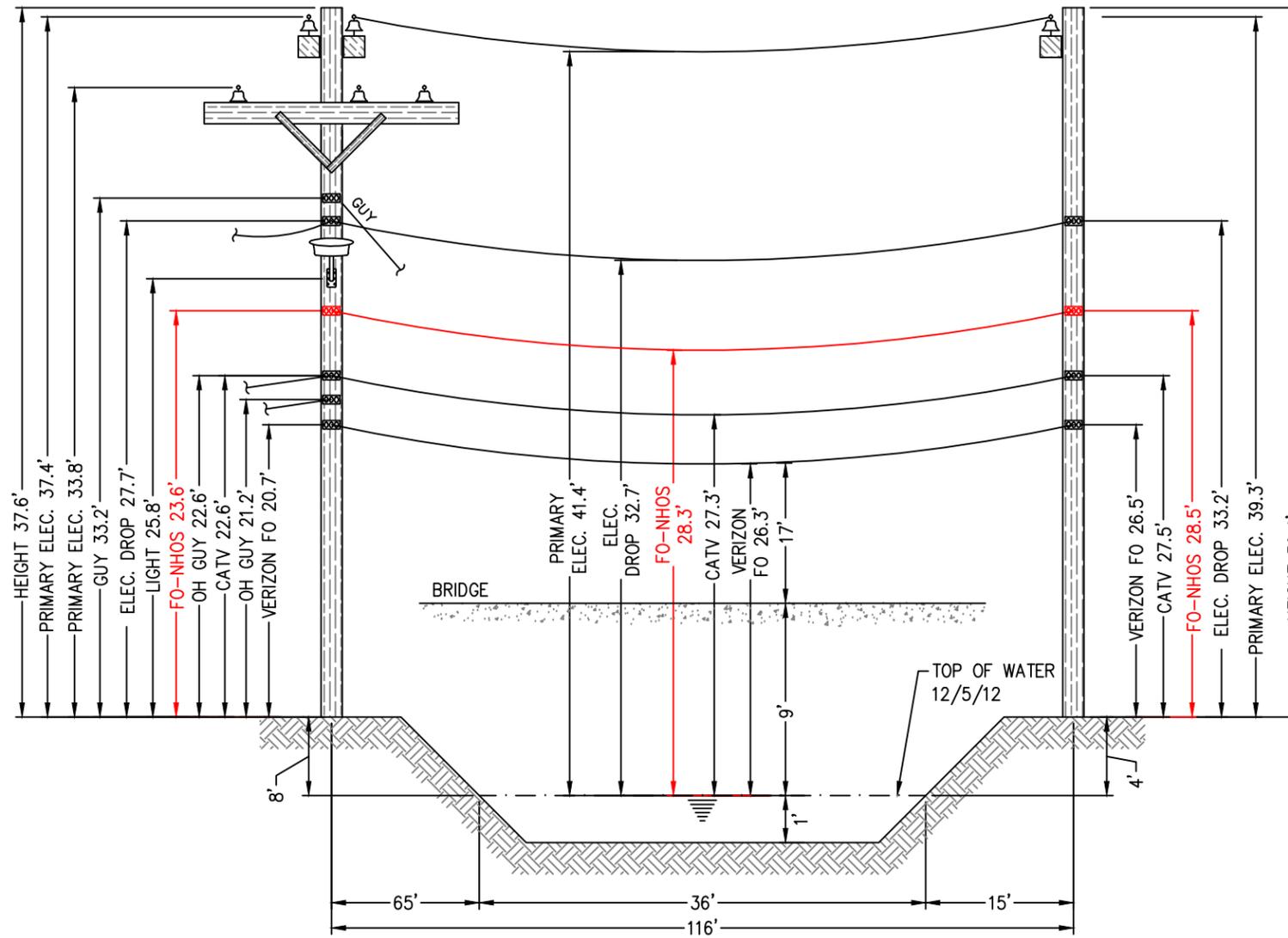
Waveguide
River and Rail Crossings

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		

NESC RESULTS

Loading Condition	Temp. (F)	Ice Load (lb/ft)	Ice Thick (in)	Wind Constant (lb/ft)	Horz. Wind Load (lb/ft)	Result Load + Const (lb/ft)	Sag (ft)	Tension (lb)	% Len Chg From Input Conditions	Sag @ Point 101 (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	4.40	2072	0.10	4.41	2.07	3.89	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	2.45	659	0.01	2.45	0.00	2.45	0.0

	Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
Span Length = 202.00 ft					
Span Sag = 2.02 ft (24.2 in)					
Span Tension = 800 lb	-40.0	1.32	1,222	-0.02	N/A
Max Load = 6,650 lb	-30.0	1.37	1,179	-0.01	N/A
Usable load (60%) = 3,990 lb	-20.0	1.42	1,136	-0.01	N/A
Catenary Length = 202.054 ft	-10.0	1.47	1,094	-0.01	N/A
Stress Free Length @ Installed Temperature = 201.877 ft	.0	1.53	1,054	-0.01	N/A
Unloaded Strand					
Sag = 1.00 ft (12.0 in) 0.50 % Tension = 616 lb	10.0	1.59	1,014	-0.01	N/A
	20.0	1.66	975	-0.01	N/A
	30.0	1.72	937	-0.01	N/A
	40.0	1.79	901	-0.01	N/A
	50.0	1.86	866	0.00	N/A
	60.0	1.94	832	0.00	N/A
	70.0	2.02	799	0.00	N/A
	80.0	2.10	768	0.00	N/A
	90.0	2.19	739	0.00	N/A
	100.0	2.27	711	0.01	N/A
	110.0	2.36	684	0.01	N/A
	120.0	2.45	659	0.01	N/A
	130.0	2.54	635	0.02	N/A
	140.0	2.64	613	0.02	N/A



E-261/13 - T-5701/12
(Existing joint owned utility pole (Fairpoint/National Grid) in existing Right-of-Way)

E-261/14 - T-5701/13
(Existing joint owned utility pole (Fairpoint/National Grid) in existing Right-of-Way)



E-261/13 - T-5701/12

Construction Notes:

NHOS proposes to install a 3/4 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 NESC Rule 264 and as directed by pole owners.



E-261/14 - T-5701/13



New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(866-983-4237)

Proposed River Crossing Salem, 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 12/5/12.
- The horizontal distance between the nearest bridge edge and the existing overhead wires is approximately 7'.
- Because of the close horizontal proximity to the existing bridge structure, the simplified drawing is submitted with vertical distances measured to the structure. This process simplifies the preparation and review of the crossing without jeopardizing its intent to protect the safe usage of the waterway.
- The smallest vertical distance from the top of existing bridge deck to the lowest existing overhead wires is approximately 17'.
- The vertical distance between the top of water and bridge deck is approximately 9'.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-318 - Primary 18
Task ID # AC-SAL-RIV-2

Date: 12/12/12
Revision #

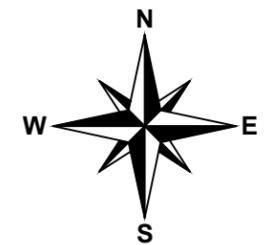
Proposed River Crossing Salem, NH

Location:
Bluff St. Ext., Salem, NH
Nearest cross street- Town Farm Rd.



New Hampshire Optical Systems
 New Hampshire Optical Systems, Inc.
 99 Pine Hill Rd.
 Nashua, NH 03063
 (866-983-4237)

Proposed
 River Crossing
 Salem, NH

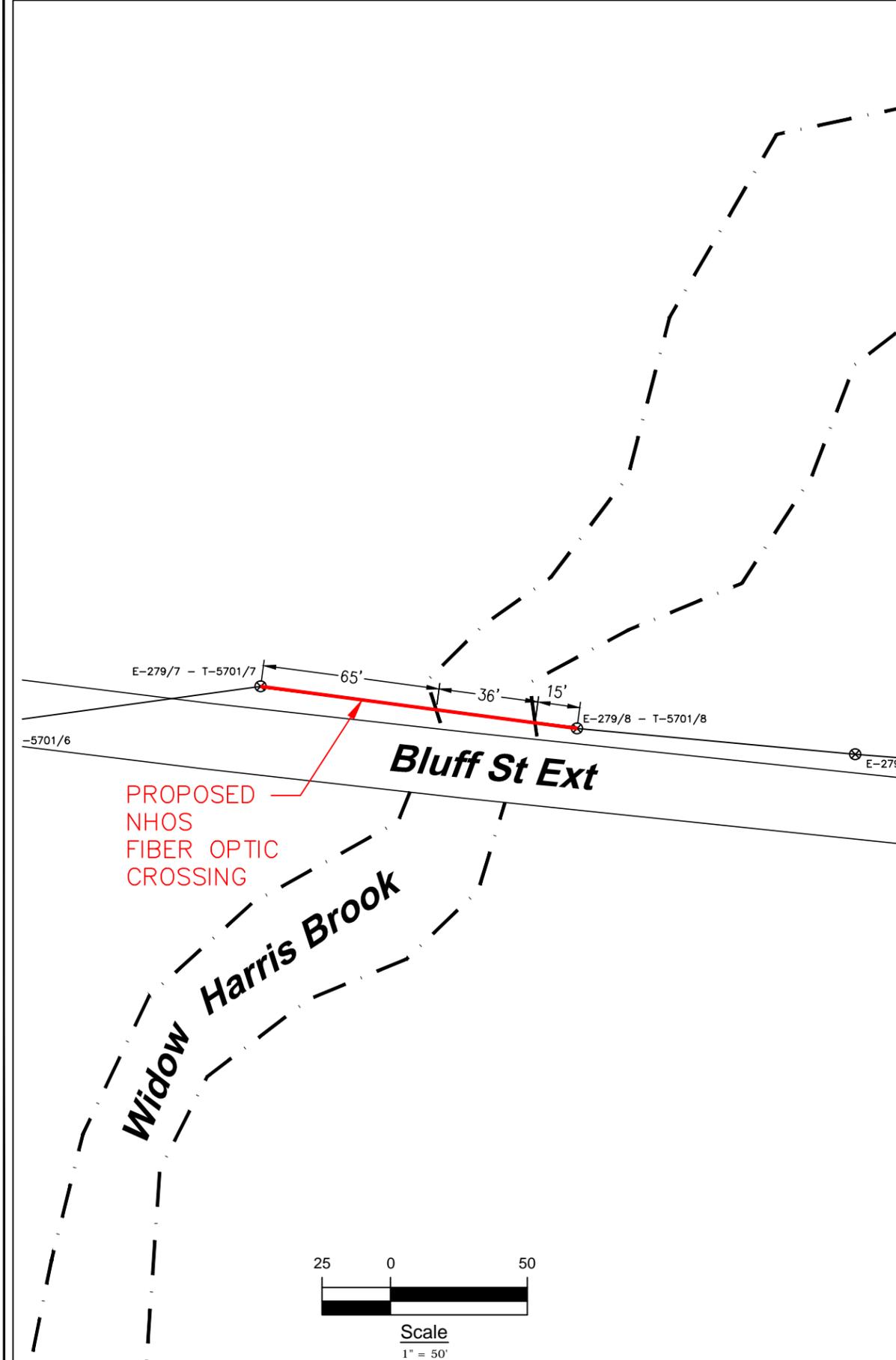
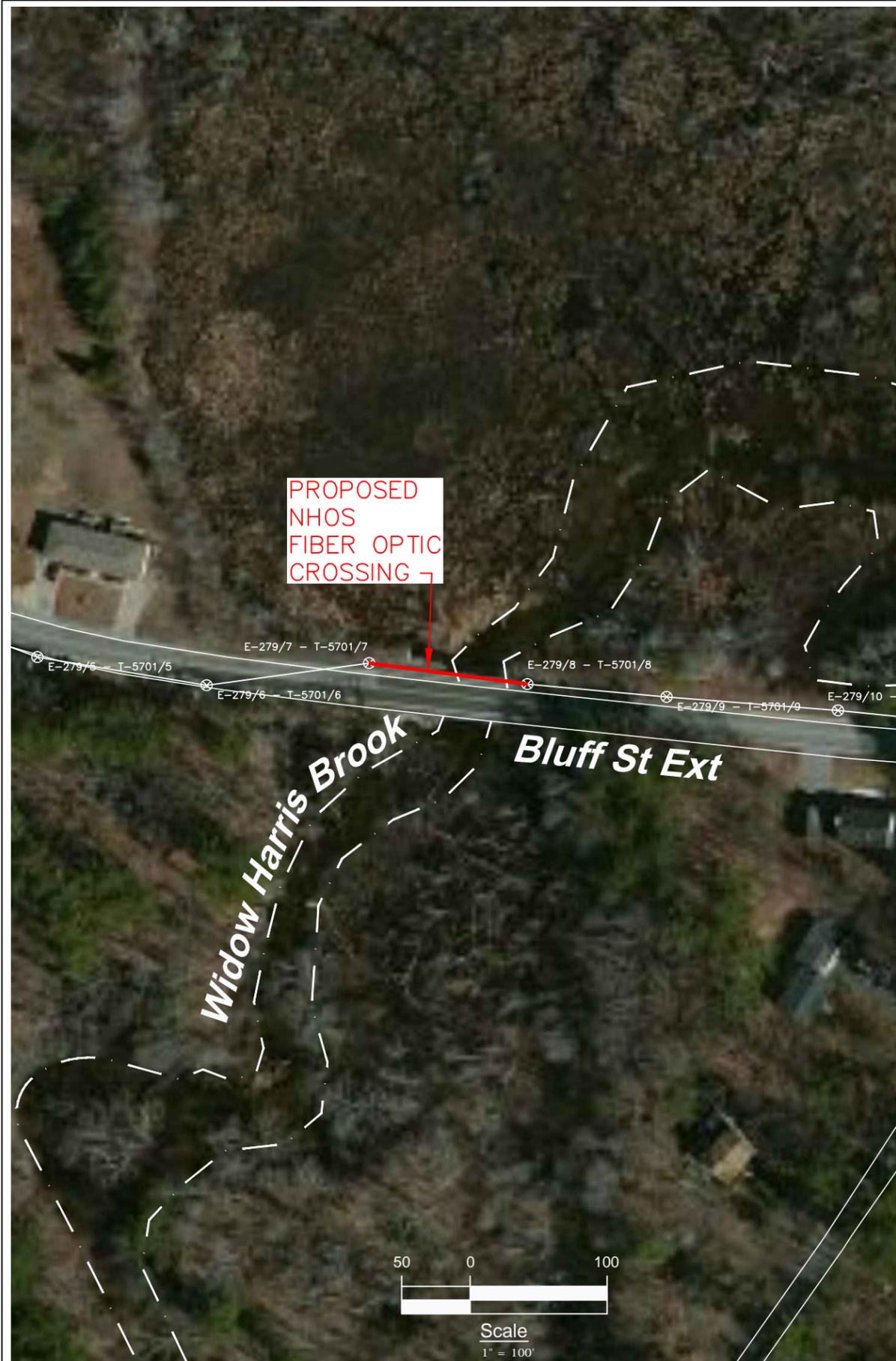


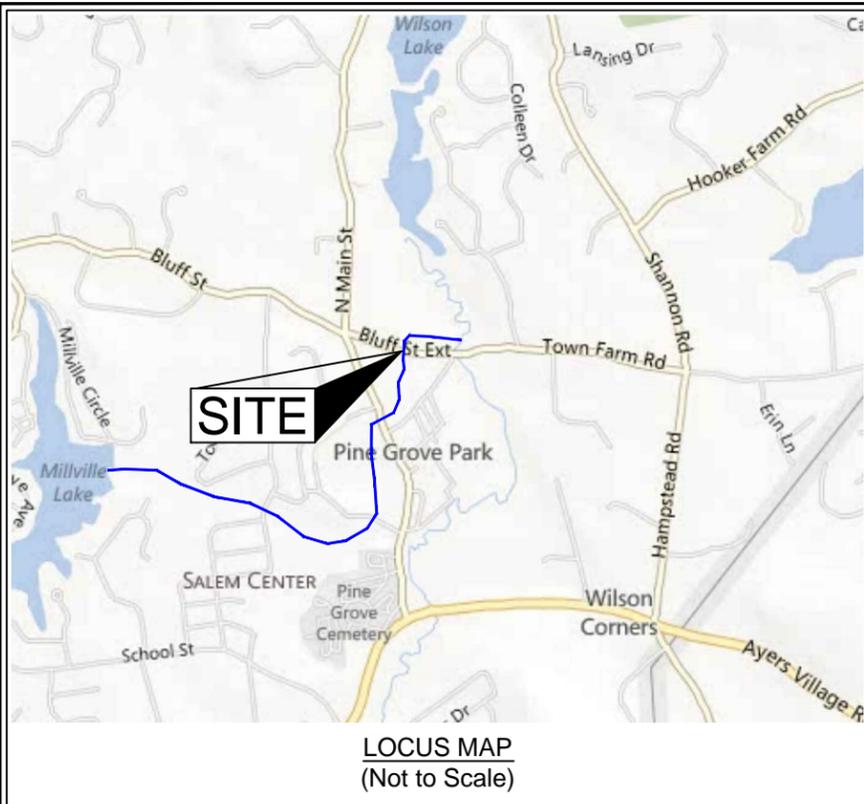
Project # TID-319 - Primary 18
 Task ID # AC-SAL-RIV-3

Date: 12/11/12
 Revision #

Proposed
 River Crossing
 Salem, NH

Location:
 Bluff St. Ext., Salem, NH
 Nearest cross street- Town Farm Rd.





LOCUS MAP
(Not to Scale)



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

Waveguide
River and Rail Crossings

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

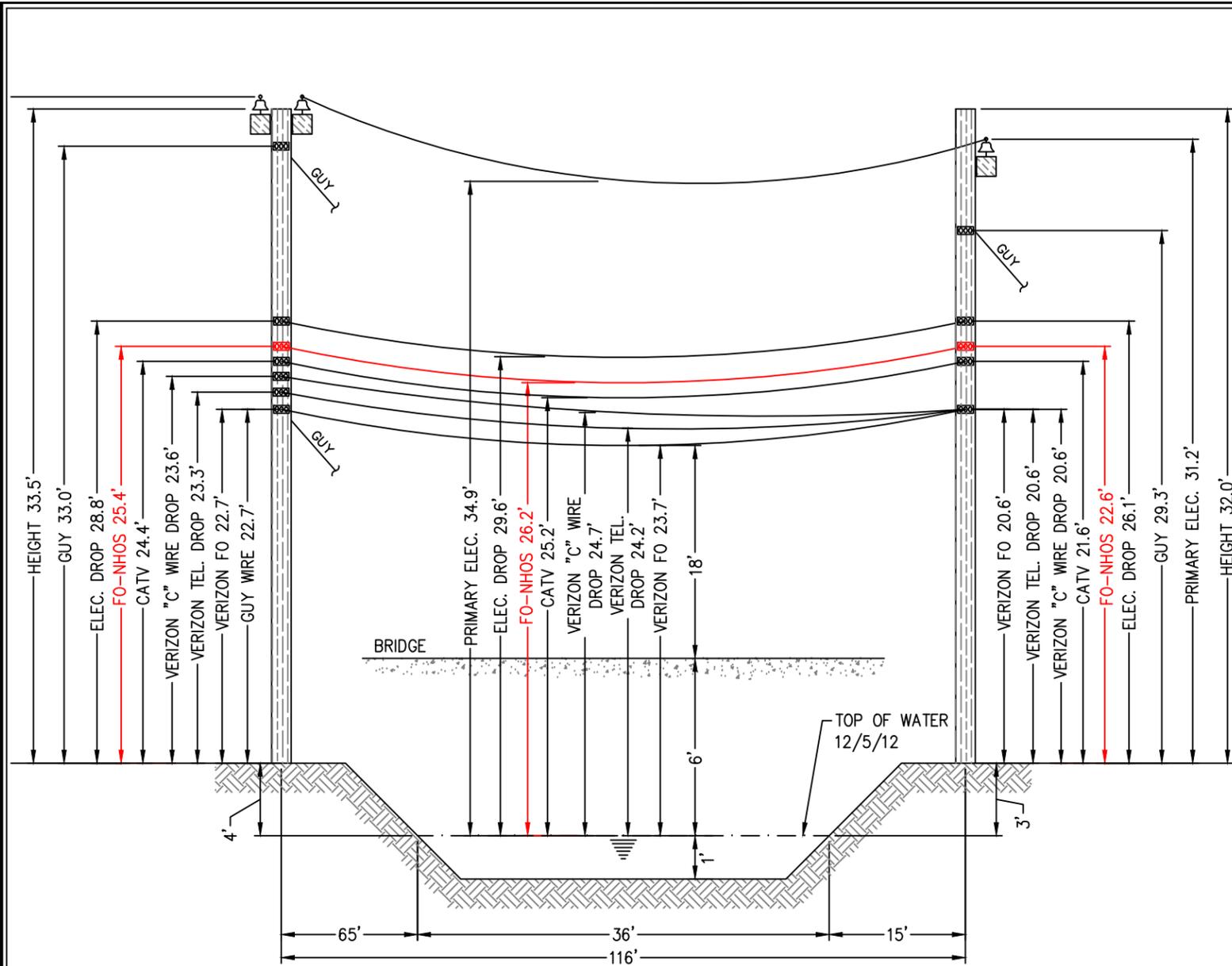
NESC RESULTS

Loading Condition	Temp. (F)	Ice Load (lb/ft)	Ice Thick (in)	Wind Constant (lb/ft)	Horz Wind Load (lb/sq ft)	Resultant Load + Const (lb/ft)	Sag (ft)	Tension (lb)	% Len Chg From Input Conditions	Sag @ 98 ft (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	2.14	1406	0.06	2.15	1.01	1.89	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	1.48	359	0.02	1.48	0.00	1.48	0.0

Span Length = 116.00 ft
Span Sag = 1.16 ft (13.9 in)
Span Tension = 460 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 116.031 ft
Stress Free Length @ Installed Temperature = 115.973 ft

Unloaded Strand
Sag = .68 ft (8.2 in) 0.59 %
Tension = 299 lb

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	.63	850	-0.02	N/A
-30.0	.66	806	-0.02	N/A
-20.0	.70	764	-0.02	N/A
-10.0	.74	723	-0.02	N/A
.0	.78	684	-0.01	N/A
10.0	.82	646	-0.01	N/A
20.0	.87	610	-0.01	N/A
30.0	.93	576	-0.01	N/A
40.0	.98	543	-0.01	N/A
50.0	1.04	513	-0.01	N/A
60.0	1.10	485	0.00	N/A
70.0	1.16	459	0.00	N/A
80.0	1.22	436	0.00	N/A
90.0	1.29	414	0.01	N/A
100.0	1.35	394	0.01	N/A
110.0	1.42	376	0.01	N/A
120.0	1.48	359	0.02	N/A
130.0	1.55	344	0.02	N/A
140.0	1.62	330	0.03	N/A



E -279/7 - T- 5701/7
(Existing joint owned utility pole (Fairpoint/National Grid) in existing Right-of-Way)

E -279/8 - T- 5701/8
(Existing joint owned utility pole (Fairpoint/National Grid) in existing Right-of-Way)



E -279/7 - T- 5701/7

Construction Notes:

NHOS proposes to install a 3/4 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 NESC Rule 264 and as directed by pole owners.



E -279/8 - T- 5701/8



New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(866-983-4237)

Proposed River Crossing Salem, 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 12/5/12.
- The horizontal distance between the nearest bridge edge and the existing overhead wires is approximately 4'.
- Because of the close horizontal proximity to the existing bridge structure, the simplified drawing is submitted with vertical distances measured to the structure. This process simplifies the preparation and review of the crossing without jeopardizing its intent to protect the safe usage of the waterway.
- The smallest vertical distance from the top of existing bridge deck to the lowest existing overhead wires is approximately 18'.
- The vertical distance between the top of water and bridge deck is approximately 6'.
- Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-319 - Primary 18
Task ID # AC-SAL-RIV-3

Date: 12/11/12
Revision #

Proposed River Crossing Salem, NH

Location:
Bluff St. Ext., Salem, NH
Nearest cross street- Town Farm Rd.