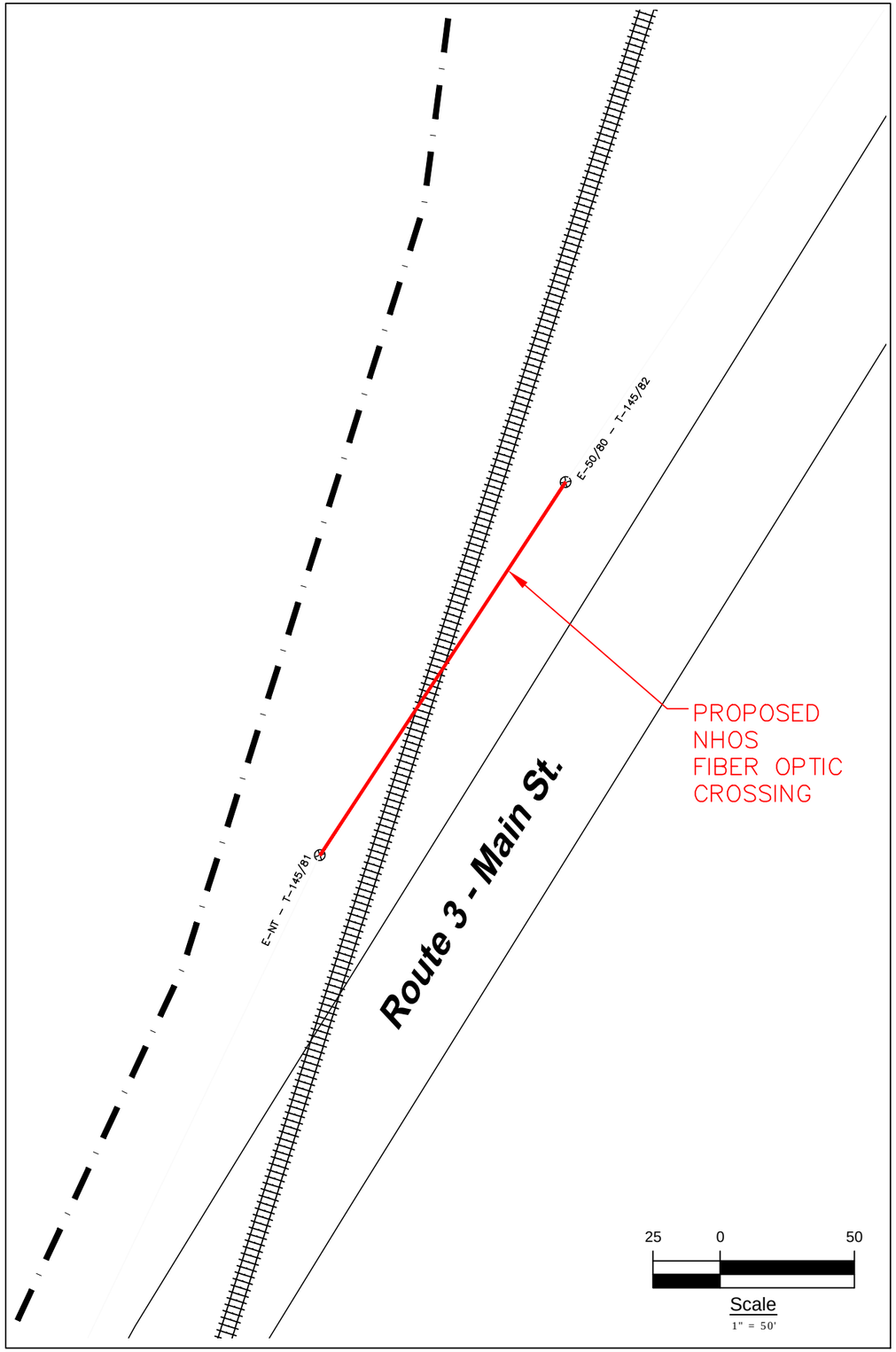

NHOS
New Hampshire Optical Systems
New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

Proposed Railroad Crossing Lancaster, NH

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Project # TID-304 - Primary 16
Drawing # AR-LAN-RR-1

Date: 04/24/12
Revision #

Proposed
Railroad Crossing
Lancaster, NH

Location:
Route 3 (Lancaster Rd.), Lancaster, NH
Nearest cross street- Industrial Park Dr.

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LOCUS MAP
(Not to Scale)

CommScope®

Spanmaster ® Release 3.1 Sag / Tension Computations

Waveguide 09/01/11 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		

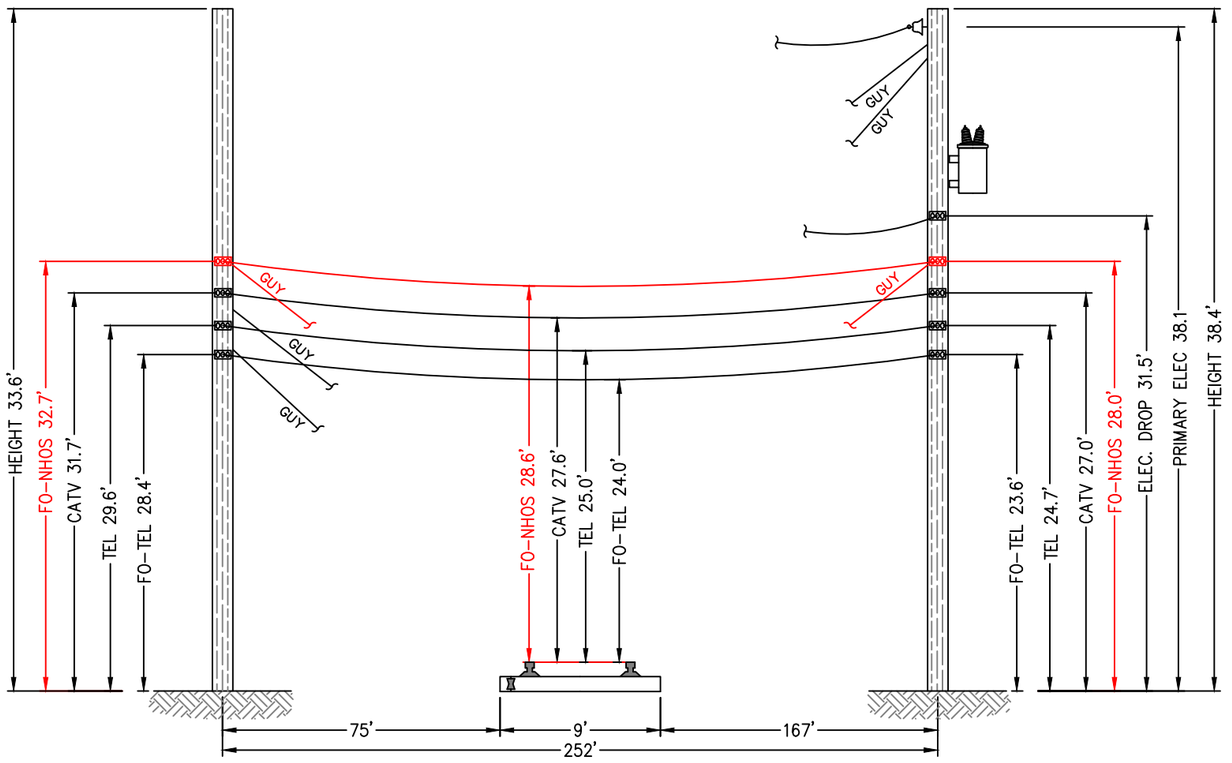
NESC RESULTS

Loading Condition	Temp. (F)	Ice Load lb/ft	Ice Thick in	Wind Constant lb/ft	Horz Wind Load lb/sq ft	Result Load + Const lb/ft	Sag ft	Tension lb	% Len Chg From Input Conditions	Sag @ Point 83 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	3.42	1804	0.09	3.42	1.61	3.01	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	2.05	531	0.01	2.06	0.00	2.05	0.0

Span Length = 166.00 ft
Span Sag = 1.66 ft (19.9 in)
Span Tension = 658 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 166.044 ft
Stress Free Length @
Installed Temperature = 165.925 ft

Unloaded Strand
Sag = .87 ft (10.4 in) 0.52 %
Tension = 480 lb

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	1.02	1,068	-0.02	N/A
-30.0	1.06	1,025	-0.02	N/A
-20.0	1.11	982	-0.01	N/A
-10.0	1.16	941	-0.01	N/A
.0	1.21	901	-0.01	N/A
10.0	1.26	862	-0.01	N/A
20.0	1.32	824	-0.01	N/A
30.0	1.38	788	-0.01	N/A
40.0	1.45	753	-0.01	N/A
50.0	1.52	719	0.00	N/A
60.0	1.59	687	0.00	N/A
70.0	1.66	657	0.00	N/A
80.0	1.74	629	0.00	N/A
90.0	1.81	602	0.01	N/A
100.0	1.89	577	0.01	N/A
110.0	1.97	553	0.01	N/A
120.0	2.05	531	0.01	N/A
130.0	2.14	511	0.02	N/A
140.0	2.22	492	0.02	N/A



E–NT – T–145/81
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right–of–Way)

E–50/80 – T–145/82
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right–of–Way)

E–NT – T–145/81

Construction Notes:

NHOS proposes to install a ¼ inch metal supporting strand between the existing utility poles shown above that will traverse the railroad. 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–50/80 – T–145/82

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

Proposed Railroad Crossing Lancaster, NH

Notes:

1. The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 04/24/12.
2. Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-304 - Primary 16
Drawing # AR-LAN-RR-1

Date: 04/24/12
Revision #

Proposed
Railroad Crossing
Lancaster, NH

Location:
Route 3 (Lancaster Rd.), Lancaster, NH
Nearest cross street- Industrial Park Dr.

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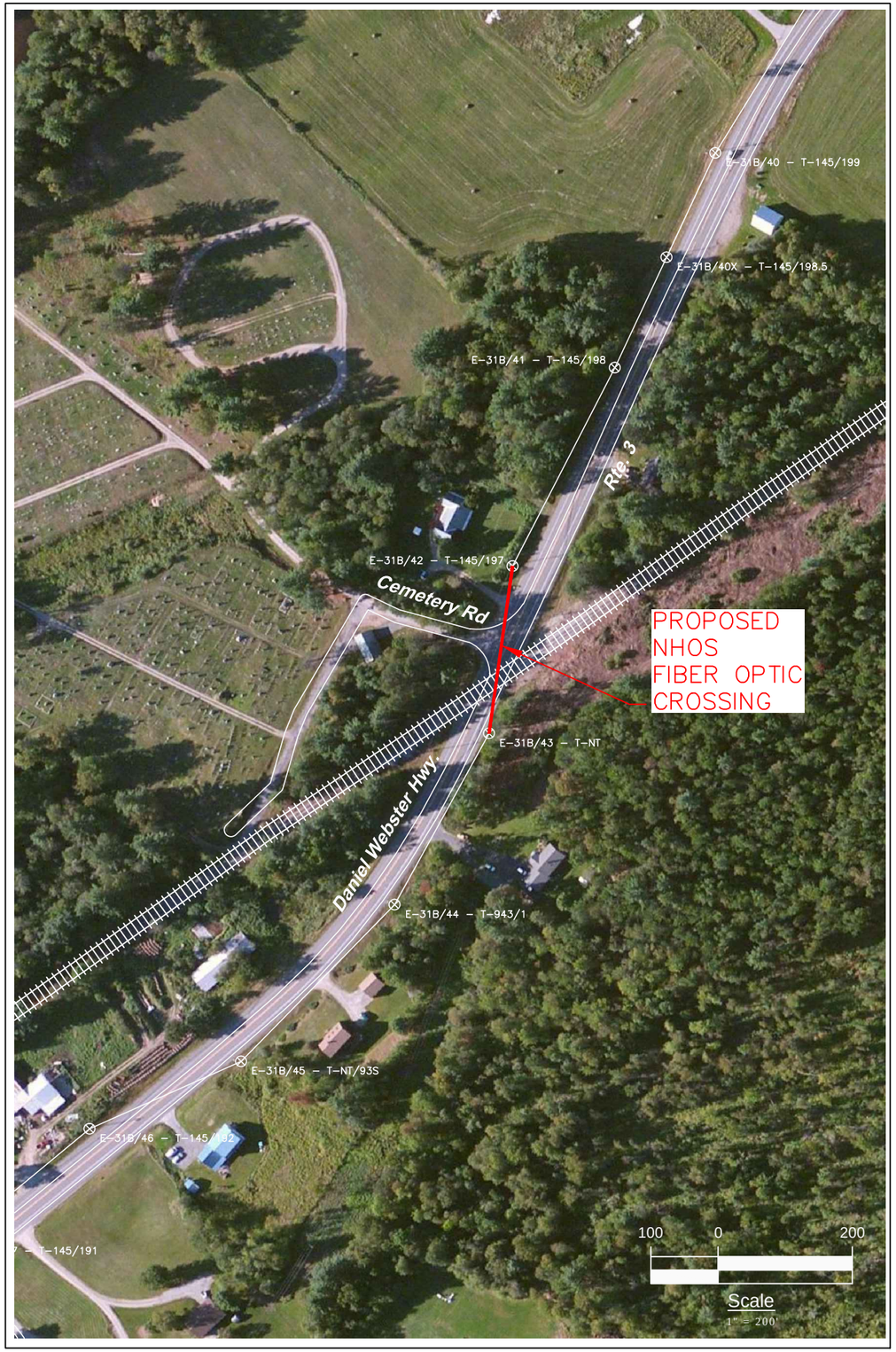

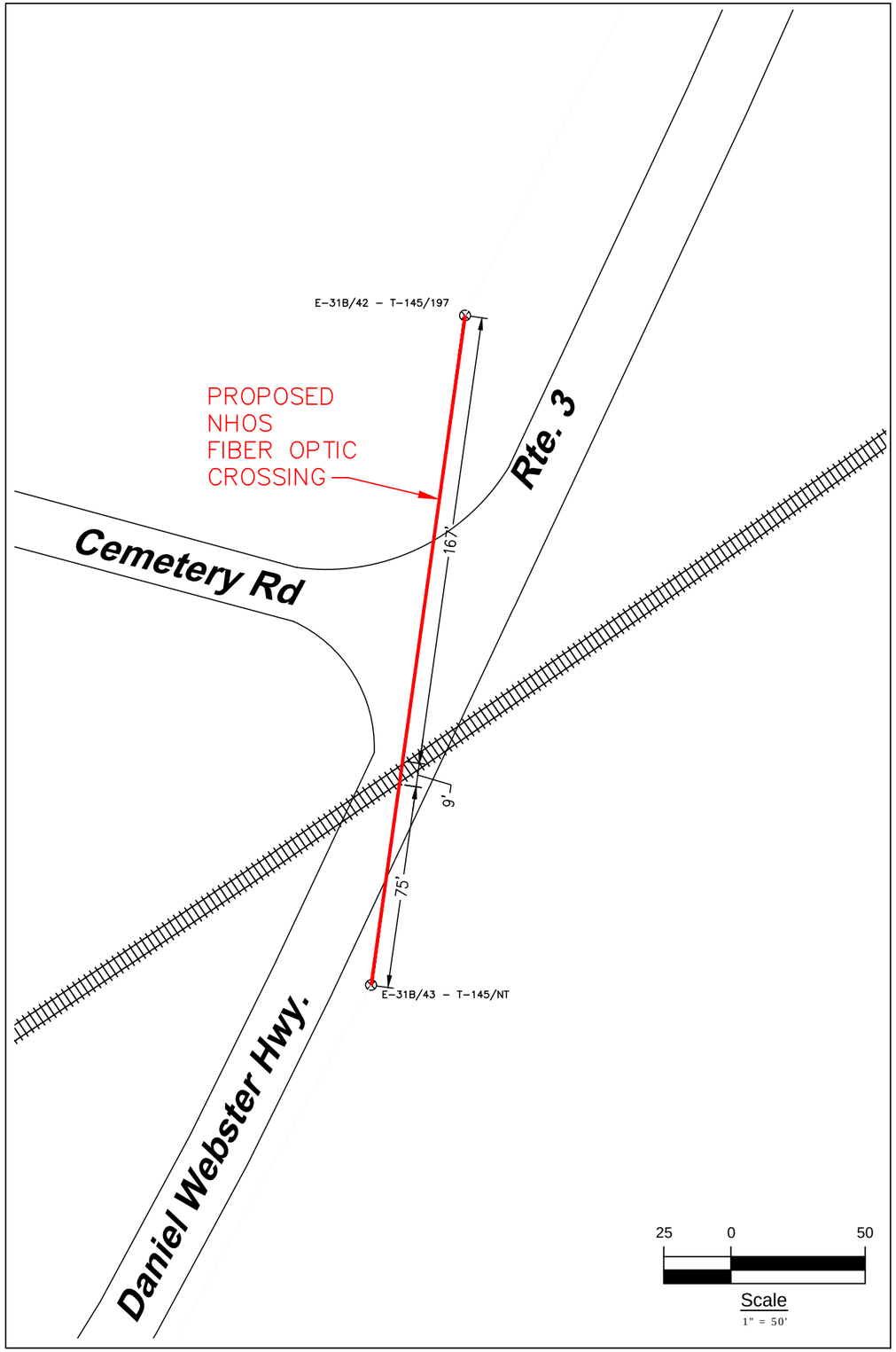

NHOS
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New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

Proposed
Railroad Crossing
Northumberland, NH

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Project # TID-305 - Primary 16
Drawing # AR-NUM-RR-1

Date: 04/19/12
Revision #

Proposed
Railroad Crossing
Northumberland, NH

Location:
Route 3, Northumberland, NH
Nearest cross street- Guild Hall Rd.

Sheet 1 of 2

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LOCUS MAP
(Not to Scale)

CommScope®

Spanmaster ® Release 3.1 Sag / Tension Computations

Waveguide 09/01/11 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		

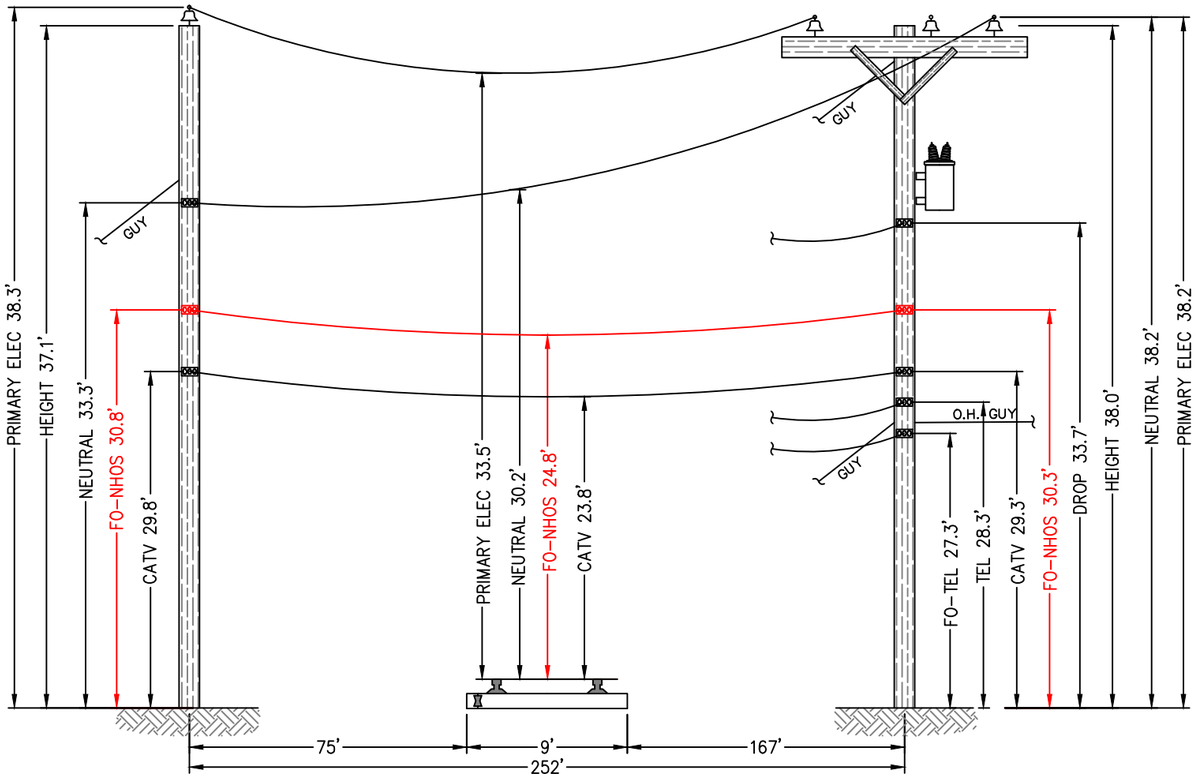
NESC RESULTS

Loading Condition	Temp. (F)	Ice Load lb/ft	Ice Thick in	Wind Constant lb/ft	Horz Wind Load lbs/sq ft	Result Load + Const lb/ft	Sag ft	Tension lb	% Len Chg From Input Conditions	Sag @ Point 126 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	5.85	2425	0.12	5.87	2.76	5.16	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	2.99	841	0.01	2.99	0.00	2.99	0.0

Span Length = 252.00 ft
Span Sag = 2.52 ft (30.2 in)
Span Tension = 999 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 252.067 ft
Stress Free Length @
Installed Temperature = 251.792 ft

Unloaded Strand
Sag = 1.19 ft (14.3 in) 0.47 %
Tension = 809 lb

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	1.75	1,433	-0.01	N/A
-30.0	1.81	1,389	-0.01	N/A
-20.0	1.86	1,346	-0.01	N/A
-10.0	1.92	1,304	-0.01	N/A
.0	1.99	1,262	-0.01	N/A
10.0	2.05	1,222	-0.01	N/A
20.0	2.12	1,182	-0.01	N/A
30.0	2.20	1,143	-0.01	N/A
40.0	2.27	1,105	0.00	N/A
50.0	2.35	1,068	0.00	N/A
60.0	2.43	1,032	0.00	N/A
70.0	2.52	997	0.00	N/A
80.0	2.61	963	0.00	N/A
90.0	2.70	931	0.00	N/A
100.0	2.79	899	0.01	N/A
110.0	2.89	869	0.01	N/A
120.0	2.99	841	0.01	N/A
130.0	3.09	813	0.01	N/A
140.0	3.19	787	0.02	N/A



E-31B/43 – T-145/NT
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)

E-31B/42 – T-145/197
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)

E-31B/43 – T-145/NT

Construction Notes:

NHOS proposes to install a ¼ inch metal supporting strand between the existing utility poles shown above that will traverse the Railroad. 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-31B/42 – T-145/197

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

Proposed Railroad Crossing Northumberland, NH

Notes:

1. The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 04/17/12.
2. Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-305 - Primary 16
Drawing # AR-NUM-RR-1

Date: 04/19/12
Revision #

Proposed Railroad Crossing Northumberland, NH

Location:
Route 3, Northumberland, NH
Nearest cross street- Guild Hall Rd.

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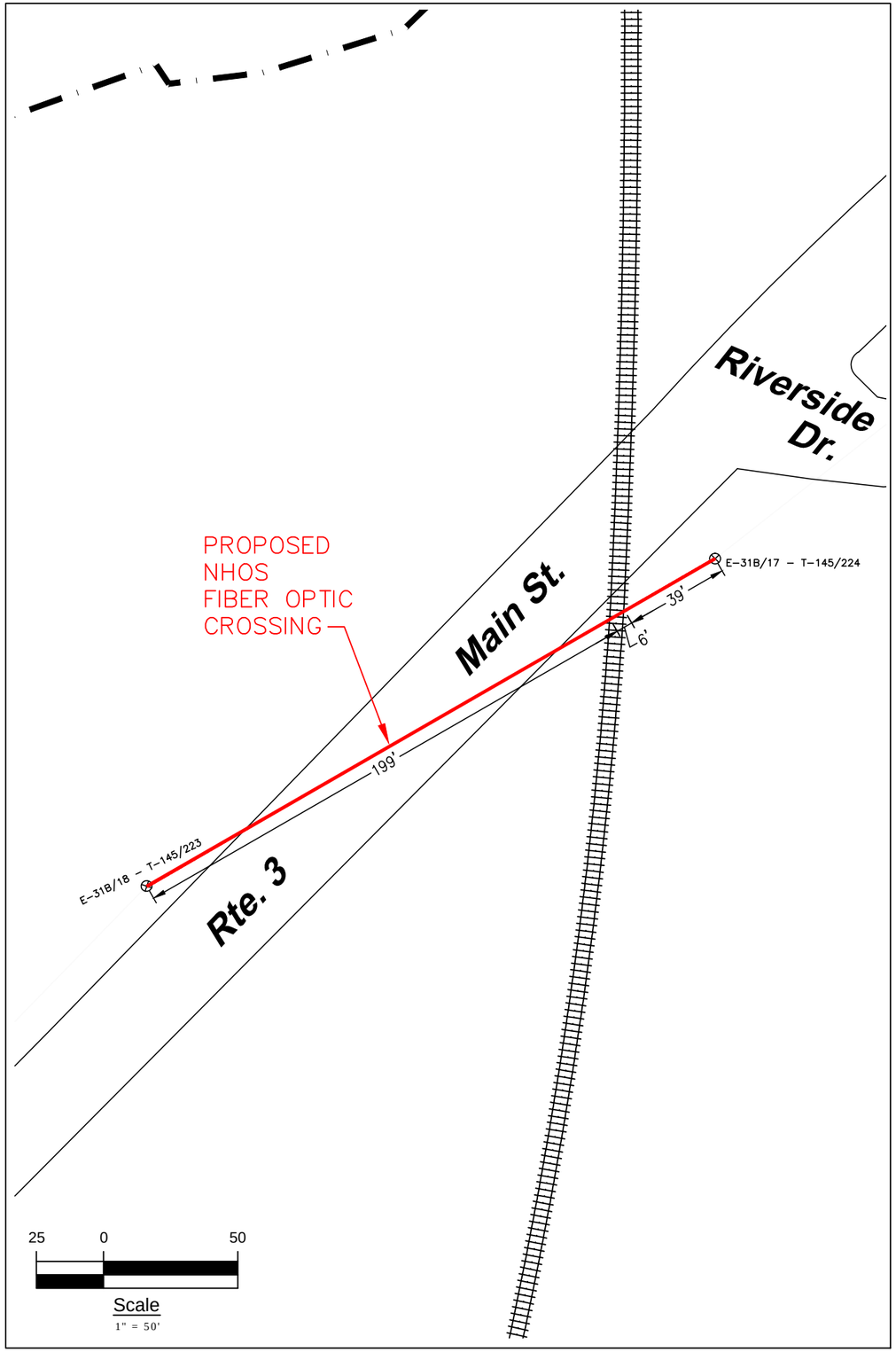

NHOS
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New Hampshire Optical Systems, Inc.
99 Pine Hill Rd.
Nashua, NH 03063
(603-821-6467)

Proposed
Railroad Crossing
Northumberland, NH

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Project # TID-306 - Primary 16
Drawing # AR-NUM-RR-2

Date: 04/19/12
Revision #

Proposed
Railroad Crossing
Northumberland, NH

Location:
Main St. (Route 3), Northumberland, NH
Nearest cross street- Riverside Dr.

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LOCUS MAP
(Not to Scale)

CommScope®

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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	0.5782	2.70E+05	0.858	1.13E-05	0.1960	155982	651
Bundle			1.108		0.3170		

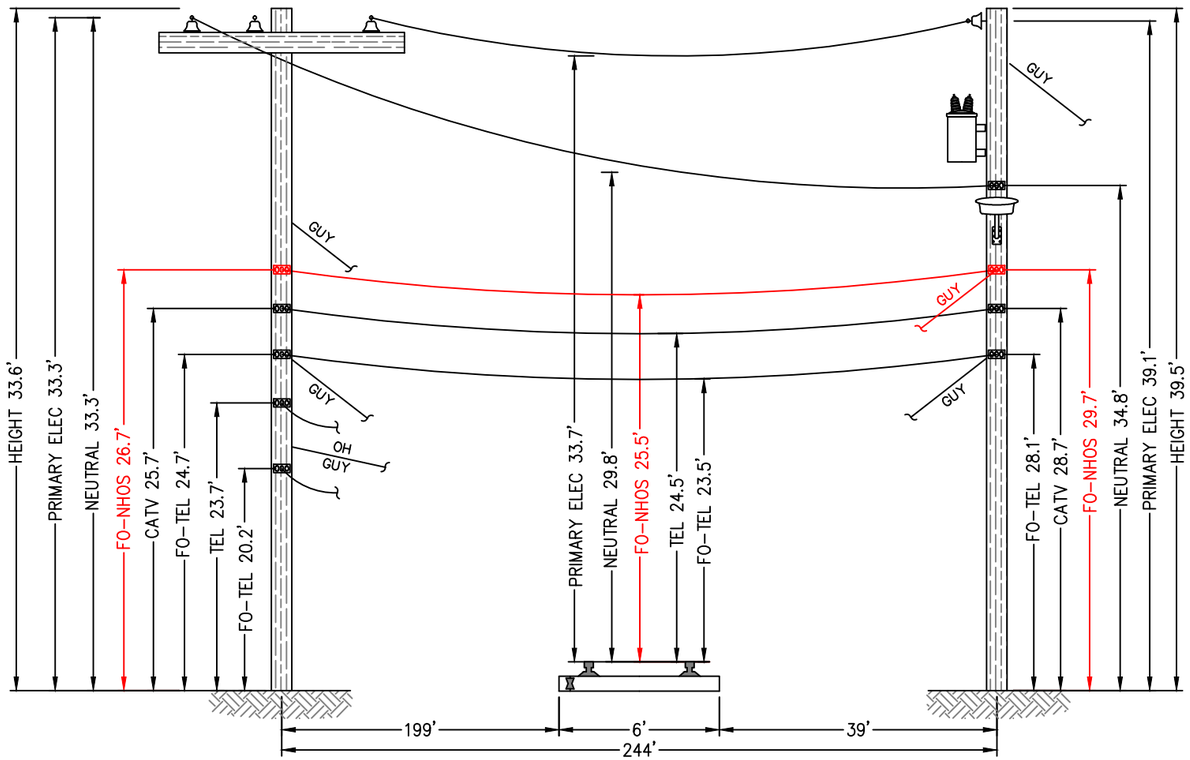
NESC RESULTS

Loading Condition	Temp. (F)	Ice Load lb/ft	Ice Thick in	Wind Constant lb/ft	Horz Wind Load lb/sq ft	Result Load + Const lb/ft	Sag ft	Tension lb	% Len Chg From Input Conditions	Sag @ Point 122 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	5.62	2370	0.11	5.63	2.64	4.95	28.1
232A1	120.0	0.000	.00	.0	0.0	0.317	2.90	811	0.01	2.91	0.00	2.90	0.0

Span Length = 244.00 ft
Span Sag = 2.44 ft (29.3 in)
Span Tension = 967 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 244.065 ft
Stress Free Length @
Installed Temperature = 243.807 ft

Unloaded Strand
Sag = 1.16 ft (13.9 in) 0.47 %
Tension = 778 lb

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	1.68	1,399	-0.01	N/A
-30.0	1.74	1,356	-0.01	N/A
-20.0	1.79	1,313	-0.01	N/A
-10.0	1.85	1,271	-0.01	N/A
.0	1.91	1,229	-0.01	N/A
10.0	1.98	1,189	-0.01	N/A
20.0	2.05	1,149	-0.01	N/A
30.0	2.12	1,110	-0.01	N/A
40.0	2.20	1,072	-0.01	N/A
50.0	2.27	1,036	0.00	N/A
60.0	2.36	1,000	0.00	N/A
70.0	2.44	965	0.00	N/A
80.0	2.53	932	0.00	N/A
90.0	2.62	900	0.00	N/A
100.0	2.71	869	0.01	N/A
110.0	2.81	840	0.01	N/A
120.0	2.90	811	0.01	N/A
130.0	3.00	784	0.01	N/A
140.0	3.11	759	0.02	N/A



E-31B/18 – T-145/223
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)

E-31B/17 – T-145/224
(Existing joint owned utility pole (PSNH/Fairpoint) in existing Right-of-Way)

E-31B/18 – T-145/223

Construction Notes:

NHOS proposes to install a ¼ inch metal supporting strand between the existing utility poles shown above that will traverse the Railroad. 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-31B/17 – T-145/224

NHOS
New Hampshire Optical Systems

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

Proposed Railroad Crossing Northumberland, NH

Notes:

1. The heights of structures shown hereon are based on field measurements taken with a Nikon 362 total station during a site survey on 04/17/12.
2. Vertical distances are representative of attachment heights after utility make ready moves are completed.

Project # TID-306 - Primary 16
Drawing # AR-NUM-RR-2

Date: 04/19/12
Revision #

Proposed
Railroad Crossing
Northumberland, NH

Location:
Main St. (Route 3), Northumberland, NH
Nearest cross street- Riverside Dr.

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