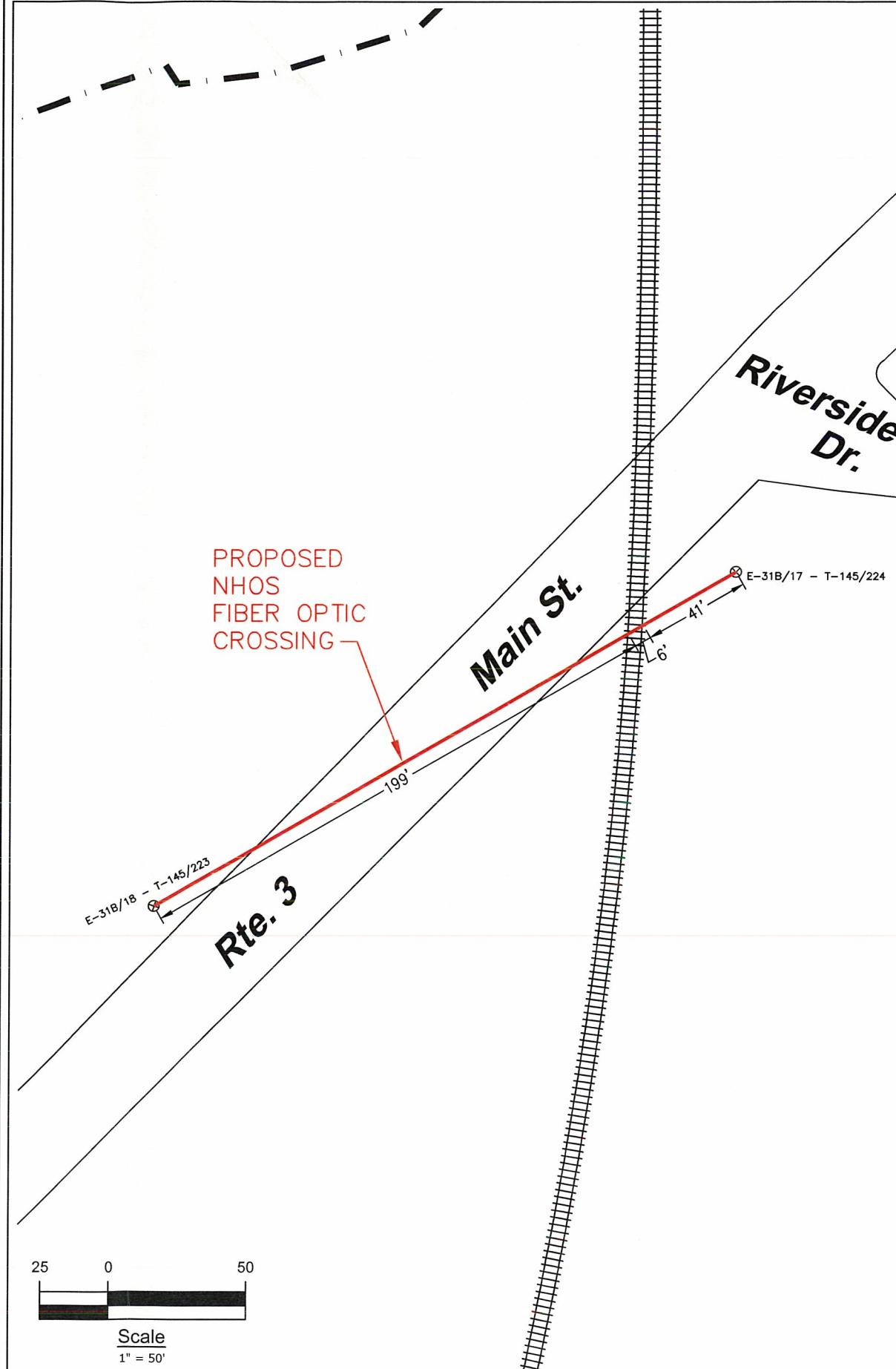
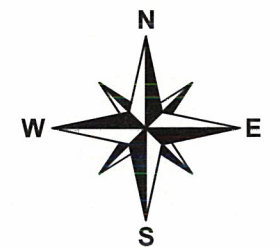




NHOS
 New Hampshire Optical Systems
 New Hampshire Optical Systems, Inc.
 10 N Southwoods Drive
 Nashua, NH 03063
 (603-821-6467)

Proposed
 Railroad Crossing
 Northumberland, NH



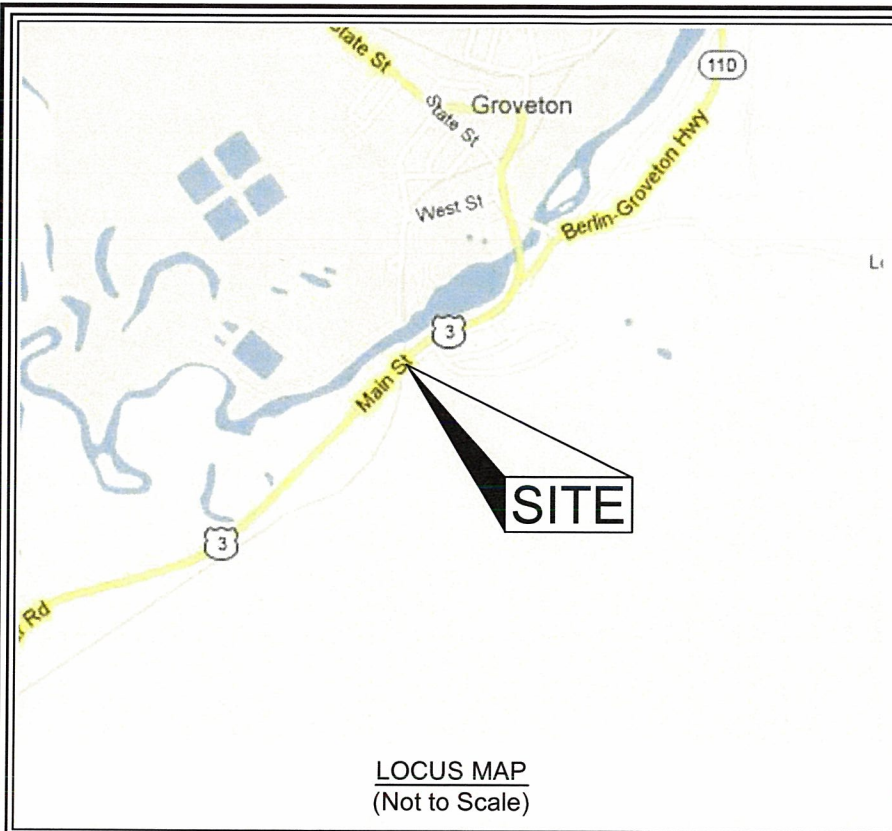
Project # TID-306 - Primary 16
 Drawing # AR-NUM-RR-2

Date: 12/05/13
 Revision # 2

Proposed
 Railroad Crossing
 Northumberland, NH

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

Sheet 1 of 2



Spanmaster® Release 3.1 Sag / Tension Computations
12/05/13 TID 306

Waveguide

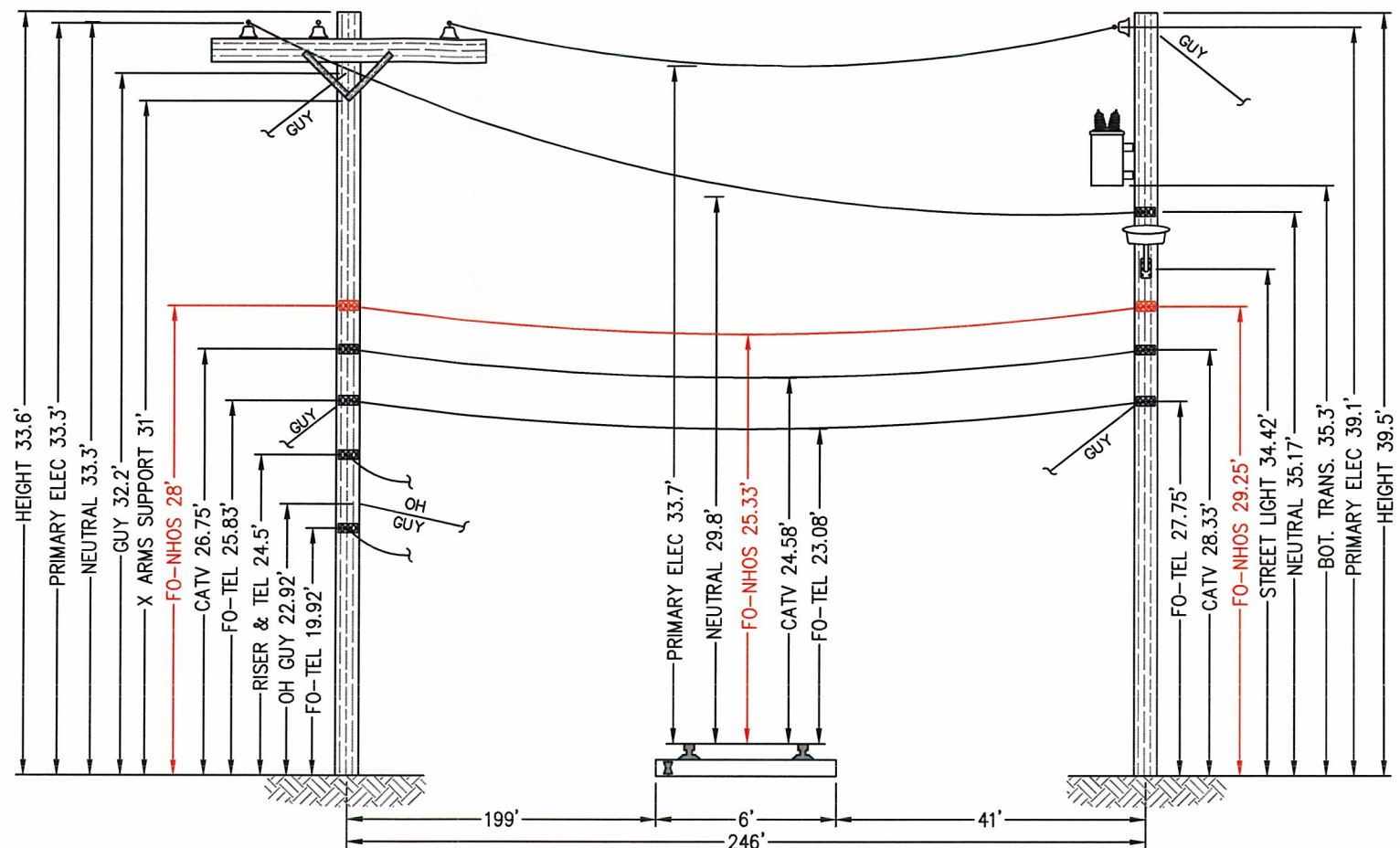
Selected Cables	X-SECT AREA (sq.in)	EFF MODULUS (psi)	NOMINAL DIAM (in)	EFF.EXP. COEFF. (1/F)	CABLE WEIGHT (lb/ft)	E*A LOAD BEARING CAPACITY (lbs)	MAX. RATED LOAD (lbs)
1/4"6.6mEHS	0.0352	2.60E+07	0.250	5.60E-06	0.1210	914940	6650
ORF-O-144-LN Bundle	0.4307	3.50E+05	0.741	1.09E-05	0.1520	150720	640
			0.991		0.2730		

NESC RESULTS

Loading Condition	Temp. (°F)	Ice Load (lb/ft)	Ice Thick (in)	Wind Constant	Horz Wind Load (lb/ft)	Result Load + Const (lb/ft)	Sag (ft)	Tension (lb)	% Len Chg From Input	Sag @ Point 50.00 (ft)	Horz Sag Comp (ft)	Vert Sag Comp (ft)	Vector Angle (deg)
Rule 251 - Heavy	0.0	0.927	.50	.3	4.0	1.671	5.63	2242	0.11	0.93	2.72	4.92	28.9
232A1	120.0	0.000	.00	.0	0.0	0.273	2.94	702	0.01	0.49	0.00	2.94	0.0

Span Length = 246.00 ft
Span Sag = 2.46 ft (29.5 in)
Span Tension = 839 lb
Max Load = 6,650 lb
Usable load (60%) = 3,990 lb
Catenary Length = 246.066 ft
Stress Free Length @
Installed Temperature = 245.840 ft
Unloaded Strand
Sag = 1.37 ft (16.4 in) 0.55 %
Tension = 670 lb

Temp (F)	Midspan Sag (ft)	Tension (lb)	% Length Change	Clearance
-40.0	1.61	1,277	-0.02	N/A
-30.0	1.67	1,233	-0.01	N/A
-20.0	1.73	1,190	-0.01	N/A
-10.0	1.79	1,148	-0.01	N/A
.0	1.86	1,107	-0.01	N/A
10.0	1.93	1,067	-0.01	N/A
20.0	2.01	1,028	-0.01	N/A
30.0	2.08	989	-0.01	N/A
40.0	2.17	952	-0.01	N/A
50.0	2.25	916	0.00	N/A
60.0	2.34	881	0.00	N/A
70.0	2.43	848	0.00	N/A
80.0	2.53	816	0.00	N/A
90.0	2.63	785	0.00	N/A
100.0	2.73	756	0.01	N/A
110.0	2.83	729	0.01	N/A
120.0	2.94	702	0.01	N/A
130.0	3.05	677	0.01	N/A
140.0	3.16	654	0.02	N/A



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

(Proposed Attachment Heights)

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

(Proposed Attachment Heights)



E-31B/18 - T-145/223

Construction Notes:

NHOS proposes to install a 1/4 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). 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).



E-31B/17 - T-145/224



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Proposed Railroad Crossing Northumberland, NH

Notes:

- Vertical distances are representative of attachment heights after utility make ready moves are completed.

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Proposed Railroad Crossing Northumberland, NH

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

Sheet 2 of 2