

# STATE OF NEW HAMPSHIRE

## Inter-Department Communication

**DATE:** October 23, 2012

**AT (OFFICE):** NHPUC

**FROM:** Kate Bailey *KMB*

**SUBJECT:** DT 12-013 New Hampshire Optical Systems, Inc.  
Petition for Authority to Construct and maintain Fiber Optic  
Communications Cable over and across three different waterways in  
four locations on Segment 4 from Keene to Manchester.

**TO:** Commission  
Debra Howland, Executive Director

On January 11, 2012, New Hampshire Optical Systems, Inc. (NHOS) filed a petition pursuant to RSA 371:17 seeking approval for licenses to construct and maintain fiber optic communications cables in four locations over and across three public waterways in a section of its cable line that begins in Keene and ends in Manchester. According to NHOS, the project is broken up into 17 segments across the state. The petition here seeks approval for crossings in Segment 4 of its project.

Staff completed its initial review of the petition on July 10, 2012, and notified NHOS of certain deficiencies. NHOS filed its revised petition on October 17, 2012. The locations of the crossings in this petition are as follows:

- Across Martin Brook, parallel to the east side of Route 32 in the vicinity of Blake Road in Swanzey, between utility poles E-383/246, T-128/129 and E-383/247, T-128/130. (Reference TID 56)
- Across Martin Brook, parallel to the east side of Route 32, in the vicinity of Swanzey Lake Road in Swanzey, between utility poles E-44/131, T-196/118 and E-44/132, T-196/127. (Reference TID 57)
- Across the South Branch Ashuelot River, parallel to the west side of Route 32, in Swanzey, between utility poles E-365/10, T-19642/10 and E-365/9, T-19642/9. (Reference TID 58)
- Across the Souhegan River, parallel to the west side of the Daniel Webster Highway between Woodbury Street and Railroad Avenue, in Merrimack, between utility poles E-1/352, T-109/185 and E-1/353, T-109/184. (Reference TID 266)

Each river crossing by the cables in this petition is listed as a public water in the Department of Environmental Services' official list of public waters and therefore requires a license pursuant to RSA 371:17.

**1. Review of public need and public impact.**

In its cover letter NHOS states that it has been contracted to construct and manage the Network New Hampshire Now (NH Now) middle mile fiber network, which will expand the availability of broadband to areas of NH with limited or no internet service. According to NHOS, construction of the fiber is necessary in order to meet reasonable requirements of service to the public. NHOS states in its petition, that no environmental permits are required of the crossings. NHOS states that the licenses petitioned for "may be exercised without affecting the rights of the public in the public waters of each river. Minimum safe line clearances above the water surface and affected shorelines will be maintained at all times. The use and enjoyment by the public of each waterway will not be diminished in any material respect as a result of the overhead line crossing."

**2. Review of NESC code requirements.**

According to the petition the crossings will be designed, constructed, maintained and operated according to the National Electrical Safety Code (NESC). Staff reviewed documents and data provided by NHOS, including detailed diagrams, descriptions, and maps of the crossings. Staff confirmed the information provided in the October 17, 2012, filing complies with the requirements of the NESC. The attached worksheets summarize Staff's review.

As noted on the worksheets, the information provided by NHOS did not verify a minimum clearance of 75 percent of the distance required at the supports at every point in the span (30 inches between electric neutral and the proposed attachment) required by NESC 235C2b, or a minimum 4 inch clearance between the proposed attachment and any conductor, cable or equipment of adjacent communications attachments at every point in the span required by NESC 235H. As these particular requirements of the NESC are not likely to affect the public rights in the waterway, rather than deny the license, Staff recommends these requirements be made conditions of the license to ensure there will be no adverse impact to adjacent utility facilities.

Additionally, Staff was unable to confirm whether other utility crossings at these locations are licensed and also comply with the NESC. To the extent other utilities or pole owners with attachments beneath the NHOS attachments seek a license in the future and it is discovered that those attachments do not meet NESC requirements, NHOS may be required to rearrange its attachments. In the event NHOS is required for any reason to relocate its attachments, it should be required to file the proposed alteration prior to making such alteration.

### **3. Recommendations and Conclusions.**

Based upon Staff's analysis, the proposed crossings will not substantially affect the public rights in the waters and lands and Staff concludes that NHOS has demonstrated a public need for the proposed crossings. Accordingly, Staff recommends that the Commission grant the licenses for the NHOS Segment 4 crossings in this petition, with the following conditions:

1. NHOS will file proposed alterations to these crossings prior to making any such alteration.
2. NHOS maintain proper clearances between its cables and those adjacent to it at all times across the entire span pursuant to NESC 235C2b and 235H.
3. NHOS construct, operate and maintain the attachments at all times in accordance with both the 2002 and 2007 editions of the NESC as required by NH Admin. Code Puc 433.01 and 1303.07.

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

## Telecommunications Fiber Optic Cable<sup>1</sup> Water Crossing Checklist

Docket #: DT 12-013

Applicant: NHOS Segment 4

Date: July 10, 2012, October 5, 2012

Analyst: Kate

Location: Martin Brook, crossing parallel to the east side of Route 32 in the vicinity of Blake Road in Swanzey, NH between E-383/246, T-128/129 and E-383/247, T-128/130 (TID 56),

1	yes	Is water body on DES list: <a href="http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf">http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf</a>
2	NA	If Merrimack River from the MA-NH State line to Concord, NH; Lake Umbagog within NH; or the Connecticut River to Pittsburg, NH., has Army Corps of Engineers approved?
3	Not needed	Does petition indicate DOT or DES approvals needed?
4	NA	If DOT or DES approvals needed, ask applicant for contact at applicable state agency and call to determine status of approvals. Are DOT or DES approvals expected?
5	ok	Compare facts stated in petition to "as built" drawings. Are facts consistent? Check things like pole numbers, span length, location, water body.
6	ok	Compare make ready requirements from pole owner to "as built" drawing. Confirm necessary appurtenances (e.g. guys) are included in drawing and all existing attachments are depicted.
7	yes	Does petition attest the proposed crossing is designed and will be built and maintained in accordance with the NESC?
8	Unknown	Are existing attachments licensed? If not, notify existing attachers in writing and request license application.

<sup>1</sup>As defined by NESC 230 F 1e and NESC 230 F 2

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

9	yes	If lowest attachment is not licensed, verify minimum water clearances plus one foot per attachment beneath proposed attachment are met under Heavy Load conditions and recommend conditional approval. (e.g if water is not suitable for sailing and there are 2 existing attachments below proposed, add 2 feet to 14 foot clearance requirement and determine if proposed attachment with maximum sag is greater than 16 feet from water surface). If water suitable for sailing, use 10 year flood elevation.
10	NA	If lowest attachment is licensed, does make ready indicate lowest attachment will be moved closer to water? (If no, skip to step 15. If yes, what is max sag of lowest attachment at 0 deg F, 0.5 inch ice, 4 psf wind?)
11	no	Is water suitable for sailing?
12	unkonwn	If not suitable for sailing is there <b>14 feet</b> clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions? (preferably measured from water surface at 10 year flood elevation, but not required)  NESC Table 232-1, 6
13	NA	If suitable for sailing is there appropriate clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions at 10 year flood elevation. Size of rivers and streams based upon largest surface area of any 1 mile segment that includes the crossing (circle applicable standard) <ul style="list-style-type: none"> <li>a. Less than 20 acres: <b>17.5 feet</b></li> <li>b. Over 20 to 200 acres: <b>25.5 feet</b></li> <li>c. Over 200 to 2000 acres: <b>31.5 feet</b></li> <li>d. Over 2000 acres: <b>37.5 feet</b></li> </ul> NESC Table 232-1, 7 and notes 18 and 19.
14	yes	Is there a minimum of <b>40 inches</b> between electric neutral and proposed attachment on each pole?  NESC Table 235-5 1a
15	Not provided	Is there a minimum 75% of distance required at supports at every point in the span ( <b>30 inches</b> between electric neutral and proposed attachment) under all conditions?  NESC 235C2b
16	3.32 ft	What is maximum sag of proposed attachment under Heavy Load Conditions?  NESC Table 250-1

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

17	ok	Run tension numbers to verify maximum sag calculation.
18	yes	Is there a minimum <b>12 inch</b> clearance between proposed attachment and adjacent communications attachments at each pole?  NESC 235H1
19	Not provided	Is there a minimum <b>4 inch</b> clearance between proposed attachment and any conductor, cable or equipment of adjacent communications attachments at every point in the span under Heavy Load conditions?  NESC 235H2

NOTE: If the crossing is within 10 feet horizontally of an existing bridge structure that may already limit use of the waterway, a simplified drawing may be submitted with vertical distances measured to the bridge deck. If bridge deck is 15 feet above water surface, water is not suitable for sailing, and height of lowest crossing is above the bridge deck, clearance to water does not need to be measured. In this instance, flood elevation information is not required.

NOTES:

15. no information provided

19. no information provided

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

## Telecommunications Fiber Optic Cable<sup>1</sup> Water Crossing Checklist

Docket #: DT 12-013

Applicant: NHOS Segment 4

Date: July 10, 2012, October 5, 2012, October 23, 2012

Analyst: Kate

Location: Martin Brook, crossing parallel to the east side of Route 32 in the vicinity of Swanzey Lake Rd in Swanzey, NH between utility poles E44/131, 196/118 and E44/132, T196/127 (TID 57)

1	yes	Is water body on DES list: <a href="http://des.nh.gov/organization/divisions/water/wetlands/cspa/fourth.htm">http://des.nh.gov/organization/divisions/water/wetlands/cspa/fourth.htm</a>
2	NA	If Merrimack River from the MA-NH State line to Concord, NH; Lake Umbagog within NH; or the Connecticut River to Pittsburg, NH., has Army Corps of Engineers approved?
3	Not needed	Does petition indicate DOT or DES approvals needed/not needed?
4	NA	If DOT or DES approvals needed, ask applicant for contact at applicable state agency and call to determine status of approvals. Are DOT or DES approvals expected?
5	ok	Compare facts stated in petition to "as built" drawings. Are facts consistent? Check things like pole numbers, span length, location, water body.
6	ok	Compare make ready requirements from pole owner to "as built" drawing. Confirm necessary appurtenances (e.g. guys) are included in drawing and all existing attachments are depicted.
7	yes	Does petition attest the proposed crossing is designed and will be built and maintained in accordance with the NESC?

<sup>1</sup>As defined by NESC 230 F 1e and NESC 230 F 2

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

8	unk	Are existing attachments licensed? If not, notify existing attachers in writing and request license application.
9	yes	If lowest attachment is not licensed, verify minimum water clearances plus one foot per attachment beneath proposed attachment are met under Heavy Load conditions and recommend conditional approval. (e.g if water is not suitable for sailing and there are 2 existing attachments below proposed, add 2 feet to 14 foot clearance requirement and determine if proposed attachment with maximum sag is greater than 16 feet from water surface). If water suitable for sailing, use 10 year flood elevation.
11	no	Is water suitable for sailing?
12	unk	If not suitable for sailing is there <b>14 feet</b> clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions? (preferably measured from water surface at 10 year flood elevation, but not required)  NESC Table 232-1, 6
13	NA	If suitable for sailing is there appropriate clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions at 10 year flood elevation. Size of rivers and streams based upon largest surface area of any 1 mile segment that includes the crossing (circle applicable standard) <ul style="list-style-type: none"> <li>a. Less than 20 acres: <b>17.5 feet</b></li> <li>b. Over 20 to 200 acres: <b>25.5 feet</b></li> <li>c. Over 200 to 2000 acres: <b>31.5 feet</b></li> <li>d. Over 2000 acres: <b>37.5 feet</b></li> </ul> NESC Table 232-1, 7 and notes 18 and 19.
14	yes	Is there required minimum clearance between electric conductor and fiber ( <b>40 inches</b> between electric neutral and proposed attachment) on each pole?  NESC Table 235-5 1a
15	See notes	Is there a minimum 75% of distance required at supports at every point in the span ( <b>30 inches</b> between electric neutral and proposed attachment) when proposed attachment is at 30 deg F, no ice, and neutral or electric conductor is under Heavy Load conditions?  NESC 235 C 2b
16	4.33 ft	What is maximum sag of proposed attachment under Heavy Load Conditions?  NESC Table 250-1
17	ok	Calculate sag to verify maximum sag calculation.



*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

18	yes	Is there a minimum <b>12 inch</b> clearance between proposed attachment and adjacent communications attachments at each pole?  NESC 235H1
19	See notes	Is there a minimum <b>4 inch</b> clearance between proposed attachment and any conductor, cable or equipment of adjacent communications attachments at every point in the span under Heavy Load conditions?  NESC 235H2

NOTE: If the crossing is within 10 feet horizontally of an existing bridge structure that may already limit use of the waterway, a simplified drawing may be submitted with vertical distances measured to the bridge deck. If bridge deck is 15 feet above water surface, water is not suitable for sailing, and height of lowest crossing is above the bridge deck, clearance to water does not need to be measured. In this instance, flood elevation information is not required.

NOTES:

15. no info provided

19. no info provided

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

## Telecommunications Fiber Optic Cable<sup>1</sup> Water Crossing Checklist

Docket #: DT 12-013

Applicant: NHOS Segment 4

Date: July 10, 2012, October 5, 2012, October 23, 2012

Analyst: Kate

Location: South Branch Ashuelot River, crossing parallel to west side of Route 32 in Swanzey, NH, between utility poles: E-365/9, T-19642/9 and E-365/10, T19642/10 (TID 58)

1	yes	Is water body on DES list: <a href="http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf">http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf</a>
2	NA	If Merrimack River from the MA-NH State line to Concord, NH; Lake Umbagog within NH; or the Connecticut River to Pittsburg, NH., has Army Corps of Engineers approved?
3	Not needed	Does petition indicate DOT or DES approvals needed?
4	NA	If DOT or DES approvals needed, ask applicant for contact at applicable state agency and call to determine status of approvals. Are DOT or DES approvals expected?
5	ok	Compare facts stated in petition to "as built" drawings. Are facts consistent? Check things like pole numbers, span length, location, water body.
6	ok	Compare make ready requirements from pole owner to "as built" drawing. Confirm necessary appurtenances (e.g. guys) are included in drawing and all existing attachments are depicted.
7	yes	Does petition attest the proposed crossing is designed and will be built and maintained in accordance with the NESC?
8	unk	Are existing attachments licensed? If not, notify existing attachers in writing and request license application.

<sup>1</sup>As defined by NESC 230 F 1e and NESC 230 F 2

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

9	ok	If lowest attachment is not licensed, verify minimum water clearances plus one foot per attachment beneath proposed attachment are met under Heavy Load conditions and recommend conditional approval. (e.g if water is not suitable for sailing and there are 2 existing attachments below proposed, add 2 feet to 14 foot clearance requirement and determine if proposed attachment with maximum sag is greater than 16 feet from water surface). If water suitable for sailing, use 10 year flood elevation.
10	NA	If lowest attachment is licensed, does make ready indicate lowest attachment will be moved closer to water? (If no, skip to step 15. If yes, what is max sag at 0 deg F, 0.5 inch ice, 4 psf wind, meet code?)
11	no	Is water suitable for sailing?
12	unk	If not suitable for sailing is there <b>14 feet</b> clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions? (preferably measured from water surface at 10 year flood elevation, but not required)  NESC Table 232-1, 6
13	NA	If suitable for sailing is there appropriate clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions at 10 year flood elevation. Size of rivers and streams based upon largest surface area of any 1 mile segment that includes the crossing (circle applicable standard) <ul style="list-style-type: none"> <li>a. Less than 20 acres: <b>17.5 feet</b></li> <li>b. Over 20 to 200 acres: <b>25.5 feet</b></li> <li>c. Over 200 to 2000 acres: <b>31.5 feet</b></li> <li>d. Over 2000 acres: <b>37.5 feet</b></li> </ul> NESC Table 232-1, 7 and notes 18 and 19.
14	yes	Is there a minimum of <b>40 inches</b> between electric neutral and proposed attachment on each pole?  NESC Table 235-5 1a
15	See notes	Is there a minimum 75% of distance required at supports at every point in the span ( <b>30 inches</b> between electric neutral and proposed attachment)?  NESC 235 C 2b
16	4.52 ft	What is maximum sag of proposed attachment under Heavy Load Conditions?  NESC Table 250-1
17	ok	Run tension numbers to verify maximum sag calculation.

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

18	yes	Is there a minimum <b>12 inch</b> clearance between proposed attachment and adjacent communications attachments at each pole?  NESC 235H1
19	See notes	Is there a minimum <b>4 inch</b> clearance between proposed attachment and any conductor, cable or equipment of adjacent communications attachments at every point in the span?  NESC 235H2

NOTE: If the crossing is within 10 feet horizontally of an existing bridge structure that may already limit use of the waterway, a simplified drawing may be submitted with vertical distances measured to the bridge deck. If bridge deck is 15 feet above water surface, water is not suitable for sailing, and height of lowest crossing is above the bridge deck, clearance to water does not need to be measured. In this instance, flood elevation information is not required.

**NOTES:**

15. no information provided

19. no information provided

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

## Telecommunications Fiber Optic Cable<sup>1</sup> Water Crossing Checklist

Docket #: DT 12-013

Applicant: NHOS Segment 4

Date: July 10, 2012, October 5, 2012

Analyst: Kate

Location: Souhegan River, crossing parallel to west side of DW Highway near the junction of Railroad Avenue in Merrimack, NH, between utility poles E1/352, T109/185 and E 1/353, T109/184 (TID 266)

1	yes	Is water body on DES list: <a href="http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf">http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/olpw.pdf</a>
2	NA	If Merrimack River from the MA-NH State line to Concord, NH; Lake Umbagog within NH; or the Connecticut River to Pittsburg, NH., has Army Corps of Engineers approved?
3	Not needed	Does petition indicate DOT or DES approvals needed/not needed?
4	NA	If DOT or DES approvals needed, ask applicant for contact at applicable state agency and call to determine status of approvals. Are DOT or DES approvals expected?
5	ok	Compare facts stated in petition to "as built" drawings. Are facts consistent? Check things like pole numbers, span length, location, water body.
6	See notes	Compare make ready requirements from pole owner to "as built" drawing. Confirm necessary appurtenances (e.g. guys) are included in drawing and all existing attachments are depicted.
7	yes	Does petition attest the proposed crossing is designed and will be built and maintained in accordance with the NESC?

<sup>1</sup>As defined by NESC 230 F 1e and NESC 230 F 2

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

8	unk	Are existing attachments licensed? If not, notify existing attachers in writing and request license application.
9	yes	If lowest attachment is not licensed, verify minimum water clearances plus one foot per attachment beneath proposed attachment are met under Heavy Load conditions and recommend conditional approval. (e.g if water is not suitable for sailing and there are 2 existing attachments below proposed, add 2 feet to 14 foot clearance requirement and determine if proposed attachment with maximum sag is greater than 16 feet from water surface). If water suitable for sailing, use 10 year flood elevation.
11	no	Is water suitable for sailing?
12	unk	If not suitable for sailing is there <b>14 feet</b> clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions? (preferably measured from water surface at 10 year flood elevation, but not required)  NESC Table 232-1, 6
13	NA	If suitable for sailing is there appropriate clearance from lowest point in sag of lowest attachment to water surface under Heavy Load conditions at 10 year flood elevation. Size of rivers and streams based upon largest surface area of any 1 mile segment that includes the crossing (circle applicable standard) <ul style="list-style-type: none"> <li>a. Less than 20 acres: <b>17.5 feet</b></li> <li>b. Over 20 to 200 acres: <b>25.5 feet</b></li> <li>c. Over 200 to 2000 acres: <b>31.5 feet</b></li> <li>d. Over 2000 acres: <b>37.5 feet</b></li> </ul> NESC Table 232-1, 7 and notes 18 and 19.
14	yes	Is there required minimum clearance between electric conductor and fiber ( <b>40 inches</b> between electric neutral and proposed attachment) on each pole?  NESC Table 235-5 1a
15	Unk	Is there a minimum 75% of distance required at supports at every point in the span ( <b>30 inches</b> between electric neutral and proposed attachment)?  NESC 235 C 2b
16	3.28 ft	What is maximum sag of proposed attachment under Heavy Load Conditions?  NESC Table 250-1

*Info provided is intended to be used in conjunction with the NESC and does not in any way supersede or replace the NESC. The NESC should always be considered as the primary basis for making clearance determinations.*

17	ok	Run tension numbers to verify maximum sag calculation.
18	No see notes	Is there a minimum <b>12 inch</b> clearance between proposed attachment and adjacent communications attachments at each pole?  NESC 235H1
19	unk	Is there a minimum <b>4 inch</b> clearance between proposed attachment and any conductor, cable or equipment of adjacent communications attachments at every point?  NESC 235H2

NOTE: If the crossing is within 10 feet horizontally of an existing bridge structure that may already limit use of the waterway, a simplified drawing may be submitted with vertical distances measured to the bridge deck. If bridge deck is 15 feet above water surface, water is not suitable for sailing, and height of lowest crossing is above the bridge deck, clearance to water does not need to be measured. In this instance, flood elevation information is not required.

NOTES:

6, 18. The distance between NHOS and segTEL on pole E1/353 T109/184 is not 12 inches. MR instructs TV to lower to 12 inches over FP. Drawing shows 42 inches. Drawing shows 10.8" between NHOS and ST, 14" between ST and MCI, 12" between MCI and CATV and 42" between CATV and FP. Does not appear to meet code. Please explain.

15. information not provided

19. information not provided