

**THE STATE OF NEW HAMPSHIRE  
BEFORE THE  
PUBLIC UTILITIES COMMISSION**

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR LICENSE TO CONSTRUCT AND MAINTAIN ELECTRIC LINES OVER AND ACROSS THE ASHUELOT RIVER IN THE TOWN OF SWANZEY, NEW HAMPSHIRE.

TO THE PUBLIC UTILITIES COMMISSION:

Public Service Company of New Hampshire (“PSNH”), a public utility engaged in the generation, transmission, distribution and sale of electricity in the State of New Hampshire, hereby petitions the Public Utilities Commission (“Commission”), pursuant to RSA 371:17, for a license to construct and maintain electric lines over and across the public waters of the Ashuelot River in the Town of Swanzeay, New Hampshire, and in support of its petition states as follows:

1. In order to meet the reasonable requirements of service to the public, PSNH has previously constructed and currently operates and maintains a three-phase 12.47 kV distribution line, designated as the 4W2 circuit, in Swanzeay, New Hampshire, which is an integral part of PSNH’s electric distribution system in the Swanzeay area. Without this facility, reliable electric service cannot be maintained in the Swanzeay area if another contingency were to occur. This line currently crosses over the Ashuelot River adjacent to Main Street and the Thompson Covered Bridge.

2. In order to accommodate the growth in demand that has reached the capacity of the current 4W2 line in the Swanzeay area, the existing crossing will be removed and replaced with a new upgraded 12.47 kV distribution line. The new line will have increased load carrying capacity over the existing conditions, and will keep the 4W2 line designation. The new line will run in the same location as the existing line, with the exception that the pole on the east side of the river will be relocated approximately 17’ further from the river. The 4W2 line crossing which is being replaced was apparently not previously licensed, due to either oversight or to the application of navigability or other crossing license criteria at the time of original construction.

3. The location of the proposed new 12.47 kV crossing of the Ashuelot River is shown on the attached location map, marked as Exhibit 1.

4. The design and proposed construction of the crossing is shown on the attached PSNH Distribution Business Plan and Profile Drawing entitled “4W2 LINE – 12.47 KV, ASHUELOT RIVER WATER CROSSING, SWANZEY, NEW HAMPSHIRE”, marked as Exhibit 2.

5. The required technical information provided in this petition is based on the 2007 National Electrical Safety Code (NESC) C2-2007. Additional review of the

proposed installation was performed per the special wind region identified in section 25 of the NESC code.

6. The proposed crossing will occur between two wood structures, one new, one existing, to be set and located approximately 215 feet apart. The existing structure on the north side of the Ashuelot River, number 10/15, will remain in place. This structure is a small angle tangent structure, constructed with a class 2, 55 foot tall pole, with a pole top bracket (as per Exhibit 3B). The structure on the south side of the river, number 10/14, will be a new tangent structure, constructed with a class 2, 50 foot tall pole. The line will be built with Hendrix attachments and spacers (as per Exhibit 3A, RTL-15). The conductor wires will be covered 795 kcmil all aluminum conductor (AAC) (19 strands) and the neutral wire will be 052 alumoweld aluminum (AWA) (5 strands of aluminum clad steel, 2 strands aluminum). Due to the Hendrix installation, the lowest conductor will be located one foot lower than the messenger cable throughout the span. The neutral wire will be sagged using the NESC Heavy Loading condition (0° F, 4 pounds psf wind loading, ½” radial ice). The assembled neutral and phase wire assembly will be sagged using a maximum tension of 3,640 lbs.

7. Flood water elevations for the Ashuelot River were based on information from the Flood Insurance Rate Map, Cheshire County, New Hampshire, Hillsborough County, Panel 402 of 610, Community Panel Number 330026 0402E, effective date May 23, 2006 issued by the Federal Emergency Management Agency (FEMA). The 100-year flood elevation for this location is approximately 463 feet. These elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29). For the purpose of this petition, the more conservative 100 year flood elevation was used as the basis for design of the conductor clearance over the Ashuelot River.

8. The area of the Ashuelot River as defined by NESC (note 19 to Table 232-1) is 24± acres. This was calculated by measuring the average width of the River over a one mile length that includes the crossing location. For this location the largest area is upstream of the project. The average width of the River for a length one mile upstream is 199'. Therefore the area =  $(199') \times (5,280') / (43,560 \text{ sf/ac}) = 24.12 \text{ acres} \sim 24 \text{ acres}$ .

9. Using the above design criteria, the maximum sags of the phase and neutral wires and minimum clearances for the crossing have been determined and designed as follows:

- A. NESC Heavy, Phase Wire – The maximum sag on the phase wires under this condition is 6.3'. The minimum clearance to land is 40.6'. The minimum clearance to the 100 year flood level is 42.7'.
- B. Minus 20° F, Phase Wire – The maximum sag on the phase wires under this condition is 4.0'. The minimum clearance to land is 41.4'. The minimum clearance to the 100 year flood level is 44.3'.
- C. 105° F, Phase Wire - The maximum sag on the phase wires under this condition is 4.9'. The minimum clearance to land is 41.3'. The minimum clearance to the 100 year flood level is 43.8'.

- D. NESC Heavy, Neutral Wire – The maximum sag on the neutral wire under this condition is 6.3'. The minimum clearance to land is 41.6'. The minimum clearance to the 100 year flood level is 43.7'.
- E. Minus 20° F, Neutral Wire – The maximum sag on the neutral wire under this condition is 4.0'. The minimum clearance to land is 42.4'. The minimum clearance to the 100 year flood level is 45.3'.
- F. 105° F, Neutral Wire - The maximum sag on the neutral wire under this condition is 4.9'. The minimum clearance to land is 42.3'. The minimum clearance to the 100 year flood level is 44.8'.
- G. Minimum Clearance, Phase Wire –NESC heavy conditions (item A above), results in the minimum clearance for phase conductors. The minimum clearances expected under those conditions are 40.6' to land and 42.7' to the 100 year flood level. The required minimum clearance from the phase wires to land based on NESC Table 232-1.2 is 18.5'. The required minimum clearance from phase wire to the water surface for a 100 year flood based on NESC Table 232-1.7.b, is 28.5'. The crossing design as proposed exceeds the NESC requirements.
- H. Minimum Clearance, Neutral Wire – NESC heavy conditions (item D above), results in the minimum clearance for the neutral wire. The minimum clearances expected under that condition is 41.6' to land and 43.7' to the 100 year flood level. The required minimum clearance from the neutral to land based on NESC Table 232-1.2 is 15.5'. The required minimum clearance from phase wire to the water surface for a 100 year flood based on NESC Table 232-1.7.b, is 25.5'. The crossing design as proposed exceeds the NESC requirements.
- I. Minimum Phase to Neutral Clearance – There are two different spacer configurations for the line at this crossing. For pole 10/14 and the entirety of the span, the spacer construction will be as per Exhibit 3A. As shown in the exhibit, the nearest distance between phase and neutral wires is 8-1/2". The second condition is as shown in Exhibit 3B. This construction will occur only at pole #10/15. In this configuration the nearest distance between phase and neutral wires is also 8-1/2". As per NESC 235.A.2, due to the spacer cable style construction, there is no applicable provision for this clearance.

10. There are no NHDES or NHDOT permits necessary specifically for the construction of this crossing.

11. The proposed crossing has been designed and will be constructed, maintained and operated by PSNH in accordance with the NESC.

12. The poles for this crossing are both located within the public street right-of-way of California Street and Main Street in Swanzey. Both new pole 10/14 to be set, and existing pole 10/15 which will remain, have been licensed for location in the public right-of-way by the Town of Swanzey in accordance with NHRSA 231:161.

13. PSNH submits that the license petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters of the Ashuelot River. Minimum safe line clearances above the River surface and affected shorelines will be maintained at all times. The use and enjoyment by the public of the River will not be diminished in any material respect as a result of the overhead line crossing.

WHEREFORE, PSNH respectfully requests that the Commission:

- a. Find that the license petitioned for herein may be exercised without substantially affecting the public rights in the public waters which are the subject of this petition;
- b. Grant PSNH a license to construct and maintain electric lines over and across the public waters of the Ashuelot River in Swanzey, New Hampshire, as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 6th day of June, 2008.

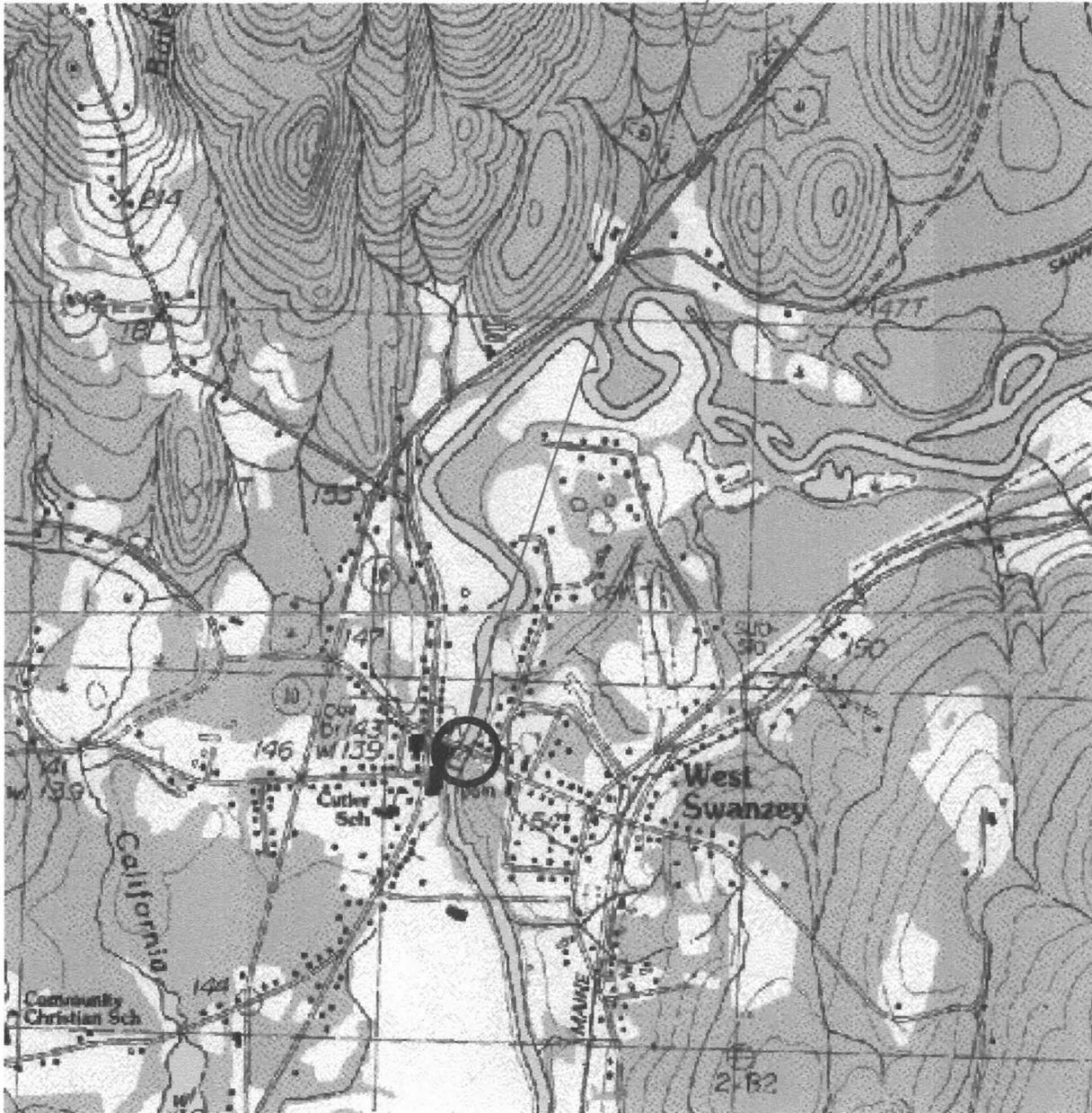
Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW  
HAMPSHIRE  
By Its Attorney

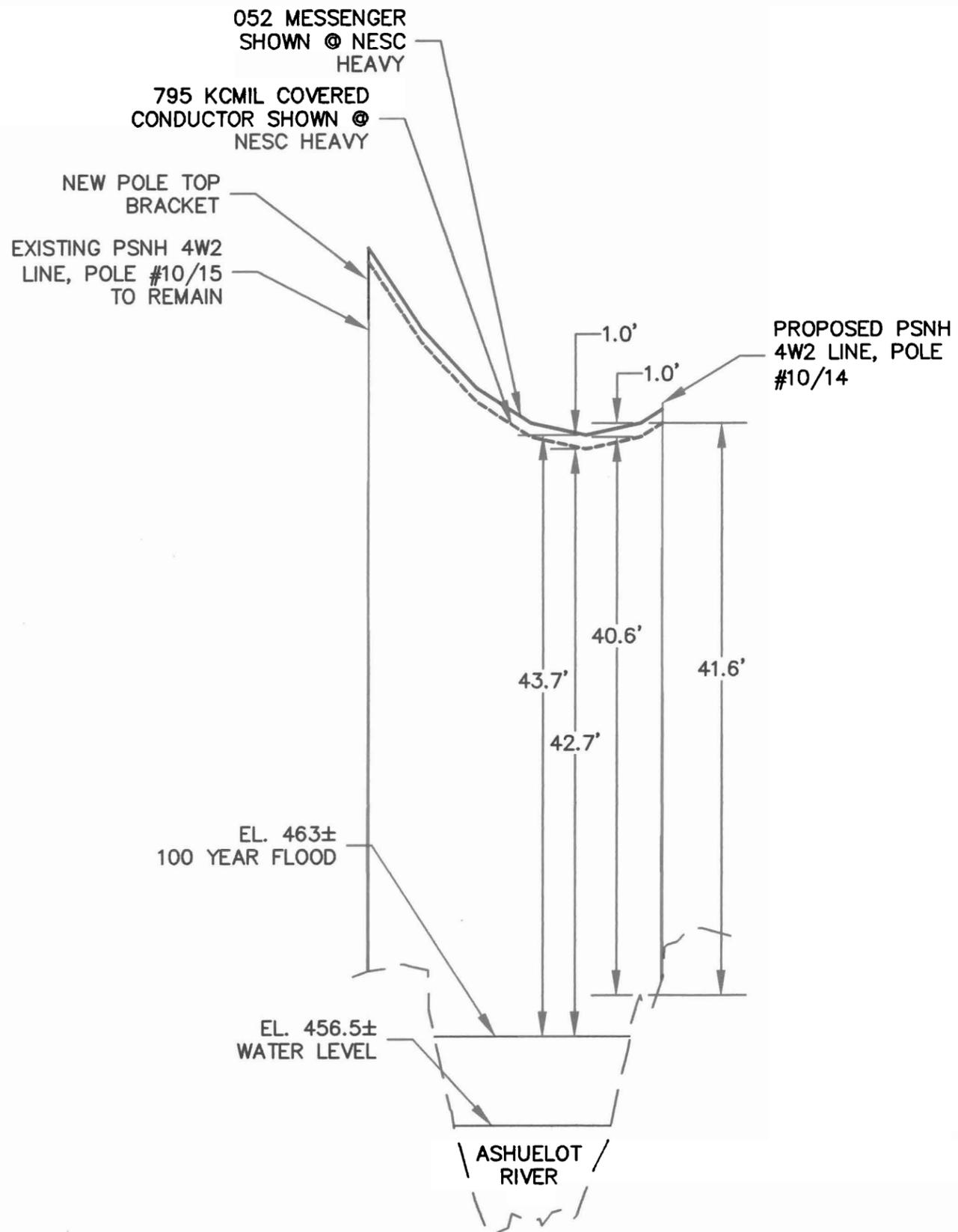


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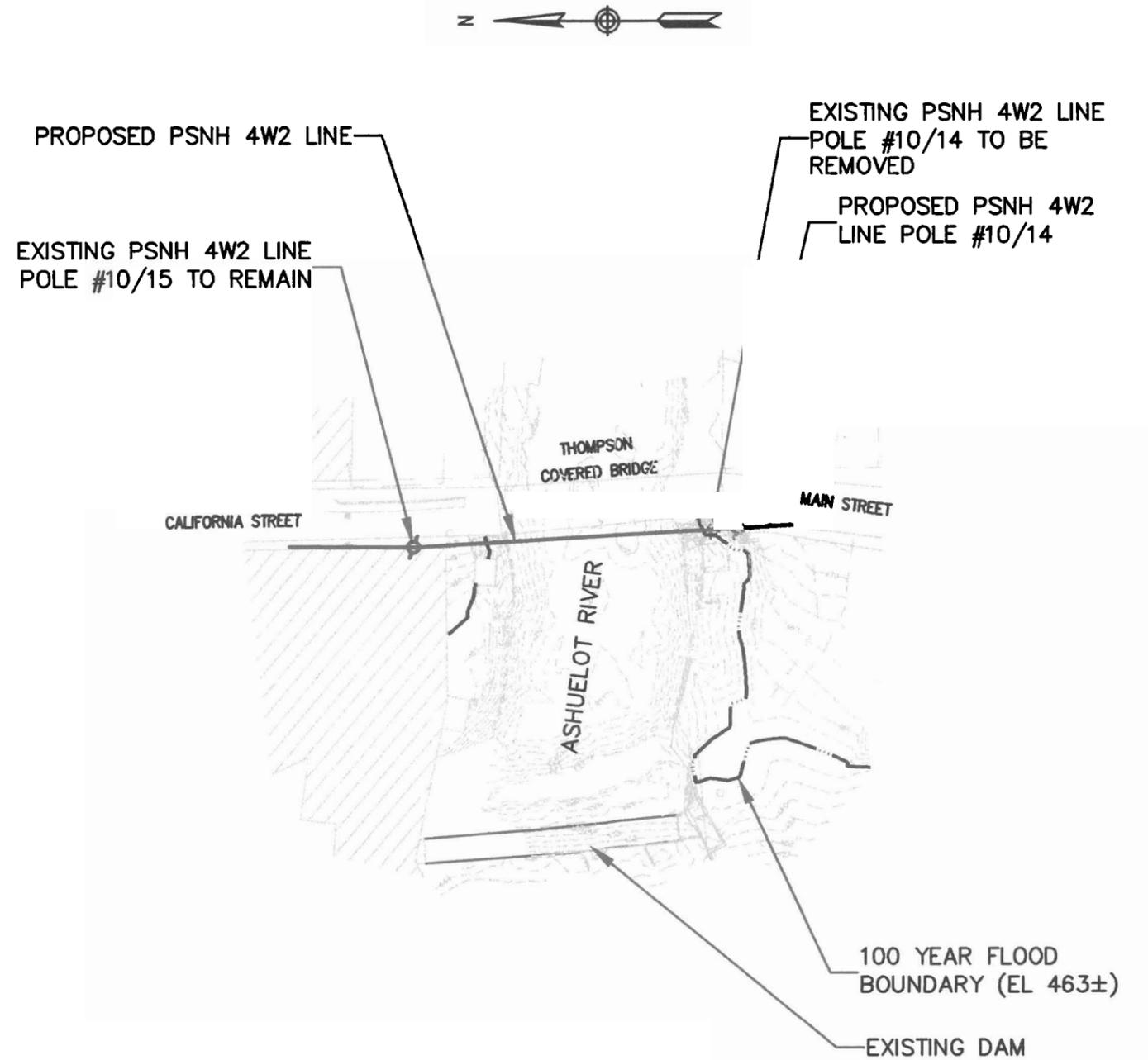
WATER CROSSING LOCATION



|     |          |      |      |                        |  |                                 |
|-----|----------|------|------|------------------------|--|---------------------------------|
|     |          |      |      | DRAWN<br><b>DRM</b>    | <b>Public Service<br/>of New Hampshire</b>                                   | <b>System<br/>Projects</b>      |
|     |          |      |      | DESIGNED<br><b>DMS</b> | <b>4W2 LINE - 12.47 KV<br/>ASHUELOT RIVER WATER CROSSING<br/>SWANZEY, NH</b> |                                 |
|     |          |      |      | CHECKED                |  |                                 |
|     |          |      |      | APPROVED               |  |                                 |
| NO. | REVISION | DATE | DRWN | CHK                    | APPR   | SCALE H: 1" = 5000' ±           |
|     |          |      |      |                        |  | DATE<br><b>5/16/08</b>          |
|     |          |      |      |                        |  | REVISION DATE                   |
|     |          |      |      |                        |  | SHEET<br>_ of _                 |
|     |          |      |      |                        |  | DRAWING NO.<br><b>EXHIBIT 1</b> |



**PROFILE**  
SCALE: 1"=100' HORIZ. 10' VERT.



**PLAN**  
SCALE: 1"=100'

|     |                         |         |      |     |      |                   |                 |  |                          |
|-----|-------------------------|---------|------|-----|------|-------------------|-----------------|--|--------------------------|
|     |                         |         |      |     |      | DRAWN<br>DMS      |                 | Public Service<br>of New Hampshire                                       |                          |
|     |                         |         |      |     |      | DESIGNED<br>DMS   |                 | 4W2 LINE - 12.47 KV<br>ASHUELOT RIVER CROSSING<br>SWANZEY, NEW HAMPSHIRE |                          |
|     |                         |         |      |     |      | CHECKED<br>DMS    |                 |  |                          |
|     |                         |         |      |     |      | APPROVED<br>DMS   |                 |  |                          |
| 1   | REVISED DIMENSION, TEXT | 5/20/08 | DMS  | DMS | DMS  | SCALE<br>AS SHOWN | DATE<br>5/14/08 | SHEET<br>-- OF --  | DRAWING NO.<br>EXHIBIT 2 |
| NO. | REVISION                | DATE    | DRWN | CHK | APPR |                   |                 |  |                          |

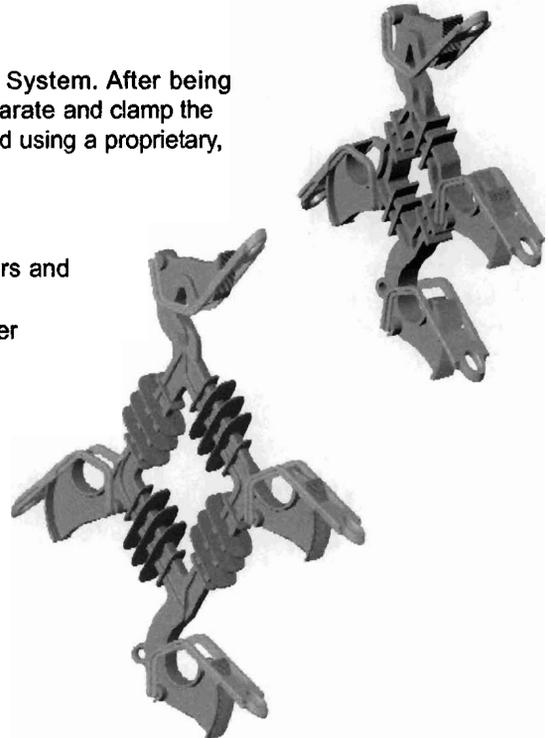
## RTL-15, RTL-46, RTL-GO95 Spacers

### Description:

The RTL Spacers are designed for use in the Hendrix Spacer Cable System. After being installed and clamped to the messenger, the spacers support, separate and clamp the phase conductors in a triangular configuration. The spacers are molded using a proprietary, gray, track resistant, high density polyethylene.

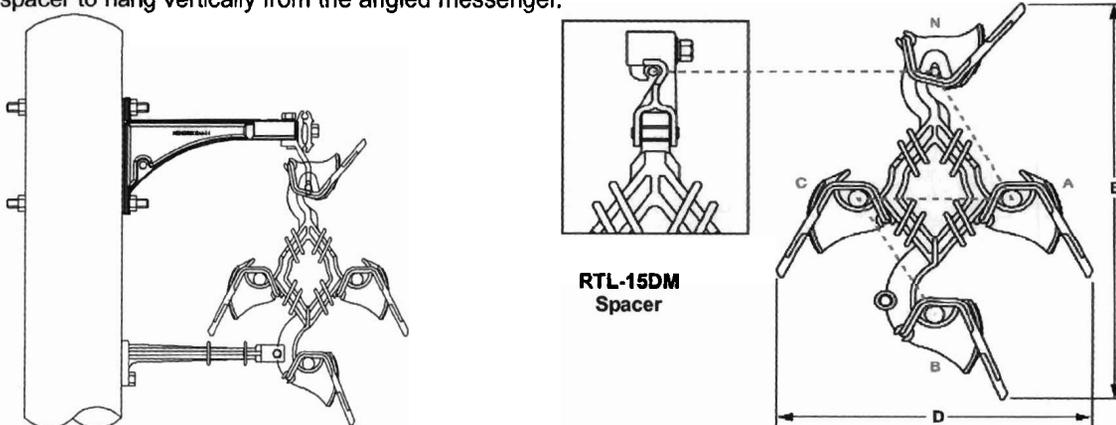
### Benefits:

- Quick, easy installation and removal. Integral clamps for conductors and messenger, no ring ties required
- Clamp design accommodates full range of conductor and messenger sizes
- Wedge-shaped messenger hook provides maximum grip
- Optimum dielectric compatibility with Hendrix Spacer Cable
- Excellent weather washing characteristics
- Long leakage distance resists flashovers
- Close phase spacing minimizes voltage drop
- Unique design provides high short circuit strength
- Highly resistant to shock/impact/rifle fire
- Open diamond design provides neat appearance
- Can be installed with hot line tools



### Application:

The RTL-15 is designed for use on distribution systems rated 5kV through 15kV. The RTL-46 is designed for use on distribution systems through 46kV. The RTL-GO95 can be used at any voltage through 46kV. It provides greater spacing for line crews that desire extra work area at tap locations or for applications where extra leakage distance is desired. It also meets the California and Hawaii GO-95 spacing requirements for system voltages up to and including 20 kV. All spacer designs include a hole for attachment of a BAS Anti-Sway Bracket, if required. Installation of the spacers should be made in accordance with Hendrix Installation Instructions. Spacers are installed at 30 foot intervals. For steep grade applications (greater than 20 degrees), specify the RTL-15DM or RTL-46DM or the RTL-GO95DM which is equipped with a metal clamp for fastening to the messenger. The clamp has a swivel which allows the spacer to hang vertically from the angled messenger.



| Catalog No.* | Dimensions (in) |        | Conductor Spacing (in) |        |        | Min. Leakage Distance (in) | Messenger Range (in) | Cable Range (in) | Max. System Voltage (kV) | Short Circuit Rating (kA) | Weight (lbs) |
|--------------|-----------------|--------|------------------------|--------|--------|----------------------------|----------------------|------------------|--------------------------|---------------------------|--------------|
|              | D               | E      | AN                     | AC     | BC     |                            |                      |                  |                          |                           |              |
| RTL-15       | 16 1/2          | 23 1/2 | 8 1/2                  | 8      | 8      | 10 3/4                     | .375 - .750          | .438 - 2.00      | 15                       | 13.5                      | 2.5          |
| RTL-46       | 20 1/2          | 29     | 12                     | 11 1/2 | 11 1/2 | 17 1/2                     | .375 - .750          | .438 - 2.00      | 46                       | 16**                      | 3.6          |
| RTL-GO95     | 27 1/8          | 39 1/4 | 18                     | 18     | 18     | 28 1/2                     | .375 - .750          | .438 - 2.00      | 46                       | 20**                      | 5.5          |

\*Specify Catalog No. RTL-15DM or RTL-46DM Spacer for steep grade or angle applications (greater than 20°).

\*\*Calculated value

