

**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 NORTH BRANCH RIVER IN THE TOWN OF ANTRIM, 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 North Branch River in the Town of Antrim, 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 7.2 kV distribution line, designated as the 3140 circuit, in Antrim, New Hampshire, which is an integral part of PSNH’s electric distribution system in the area. This line currently crosses over the North Branch River directly above the existing bridge deck and roadway of Old North Branch Road, and therefore was not previously licensed as a crossing over this public water body

2. In order to accommodate the replacement of the Old North Branch Road bridge under State Project No. 14944 (State Bridge Project # 130/149), Federal Project Number X-A000(927) it is necessary for PSNH to relocate the existing 3140 circuit. Funding for the bridge replacement project is being provided under the American Recovery and Reinvestment Act (ARRA) and the project has a very tight construction schedule. The proposed alignment of the circuit will be shifted approximately 50’ northeasterly on the north side of the River, with no significant change to the location on the south side. This shift will result in the relocated line crossing directly over the River, for which a water crossing license will now be required.

3. The location of the proposed new 7.2 kV crossing of the North Branch 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 “3140 LINE – 7.2 KV, NORTH BRANCH RIVER WATER CROSSING, ANTRIM, 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.

6. The proposed crossing will occur between two new wood structures, to be set and located approximately 115 feet apart. The proposed structure on the north side of the North Branch River, number 3, is a tangent/small angle structure, constructed with a single class 2, 45 foot tall pole. The structure on the south side of the River, number 4, will also be a tangent/small angle structure, constructed with a single class 2, 40 foot tall pole. The construction detail for a tangent/small angle structure is attached as Exhibit 3. The conductor wires will be #2 ACSR (Aluminum Clad Steel Reinforced) with 6/1 stranding, the neutral wire will be #2 ACSR with 6/1 stranding. The conductors and neutral will be sagged using the NESC Heavy Loading condition (0° F, 4 pounds psf wind loading, ½” radial ice) at a maximum tension of 1,395 pounds.

7. Flood water elevations for the North Branch River in this area, is identified on Flood Insurance Rate Map, Hillsborough County, New Hampshire, Panel 128 of 701, Map Number 33011C0128D, effective date September 25, 2009 issued by the Federal Emergency Management Agency (FEMA). The 100-year flood elevation for the River in this location is approximately 880 feet. This elevation is based on the National Geodetic Vertical Datum of 1929 (NGVD 29). The 100-year flood elevation is higher than the 10-year flood elevation required by NESC and provides a more conservative design.

8. The area of the North Branch River as defined by NESC (note 19 to Table 232-1) is 65± 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 – For the sag on the phase wires under this condition, the minimum clearance to land is 30.6’; the minimum clearance to the 100 year flood level is 42.2’.
- B. Minus 20° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 31.4’. The minimum clearance to the 100 year flood level is 43.1’.
- C. 212° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 30.4’. The minimum clearance to the 100 year flood level is 42.1’.
- D. NESC Heavy, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is 26.7’. The minimum clearance to the 100 year flood level is 36.0’.
- E. Minus 20° F, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is

27.3'. The minimum clearance to the 100 year flood level is 36.9'.

- F. 120° F, Neutral Wire - For the sag on the neutral wire under this condition, the minimum clearance to land is 27.0'. The minimum clearance to the 100 year flood level is 36.5'.
- G. Minimum Clearance, Phase Wire – The 212°F operating conditions (item C above), results in the minimum clearance for phase conductors. The minimum clearances expected under those conditions are 30.4' to land and 42.1' 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 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 – The NESC Heavy operating conditions (item D above), results in the minimum clearance for the neutral wire. The minimum clearances expected under that condition is 26.7' to land and 36.0' 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 the neutral wire to the water surface 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 –The conditions which would result in the minimum clearance between these lines is a winter condition with the phase wires at NESC Heavy Loading (item A above) and the neutral at - 20° F (item E above). This could occur after an ice storm if the neutral shed ice before the conductors. Under those conditions the phase to neutral clearance would be 5.0'. Based on NESC Table 235-6 section 2a, the minimum clearance should be 12.0 inches (1.0 feet)

10. There are no NH Department of Environmental Services or NH Department of Transportation 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 new pole on the south side of this crossing is located within the public street right of way. The license for this pole is Town of Antrim License #13450. The new pole on the north side of the crossing is located within property owned in fee by the



Town of Antrim, and the grant of an easement by the Town to PSNH for this pole location is pending.

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 North Branch 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 North Branch River in Antrim, New Hampshire, as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 29<sup>th</sup> day of July, 2010.

Respectfully submitted,

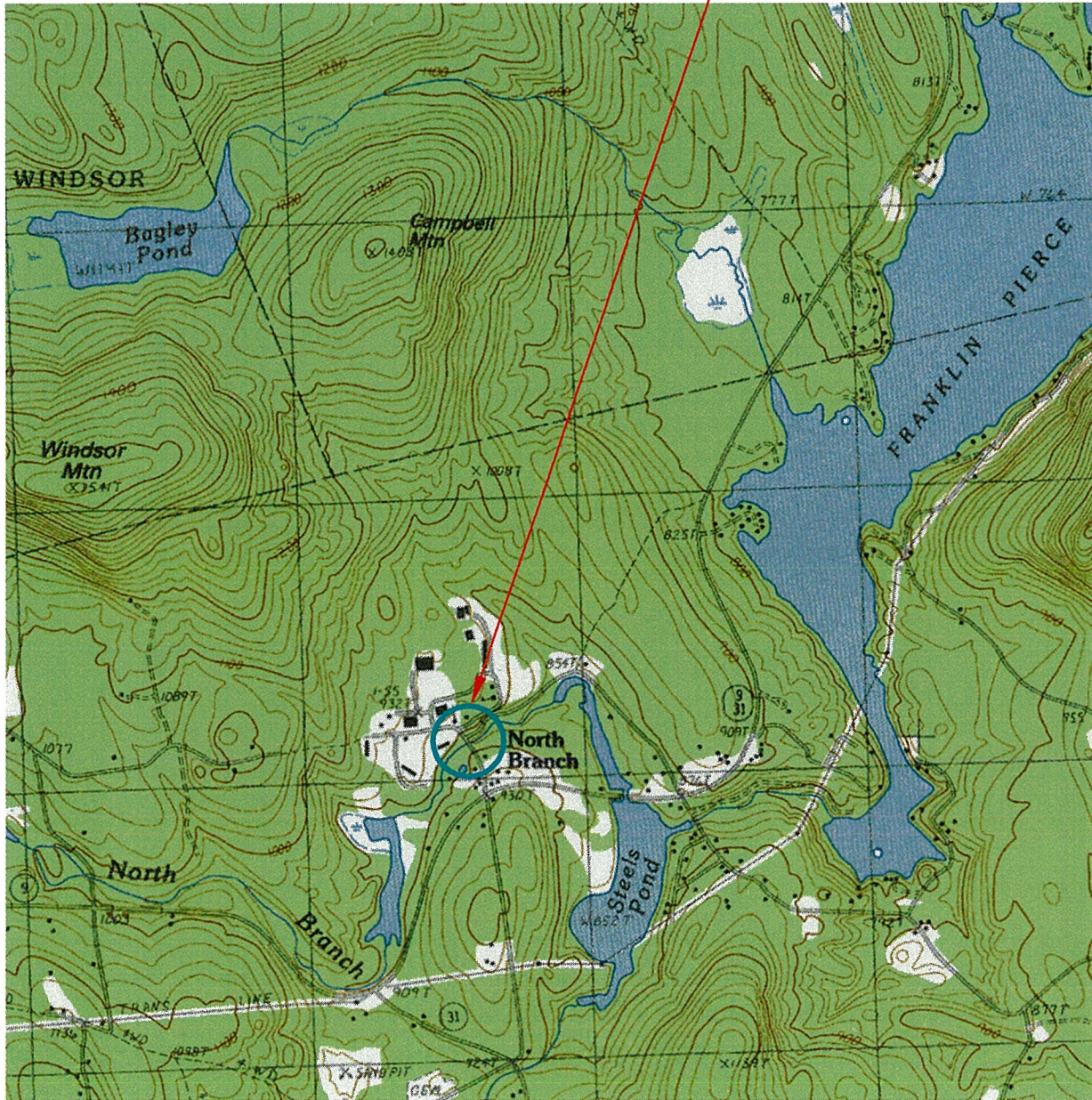
PUBLIC SERVICE COMPANY OF NEW  
HAMPSHIRE  
By Its Attorney



Christopher J. Allwarden  
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PSNH Energy Park  
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Manchester, NH 03101  
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WATER CROSSING LOCATION



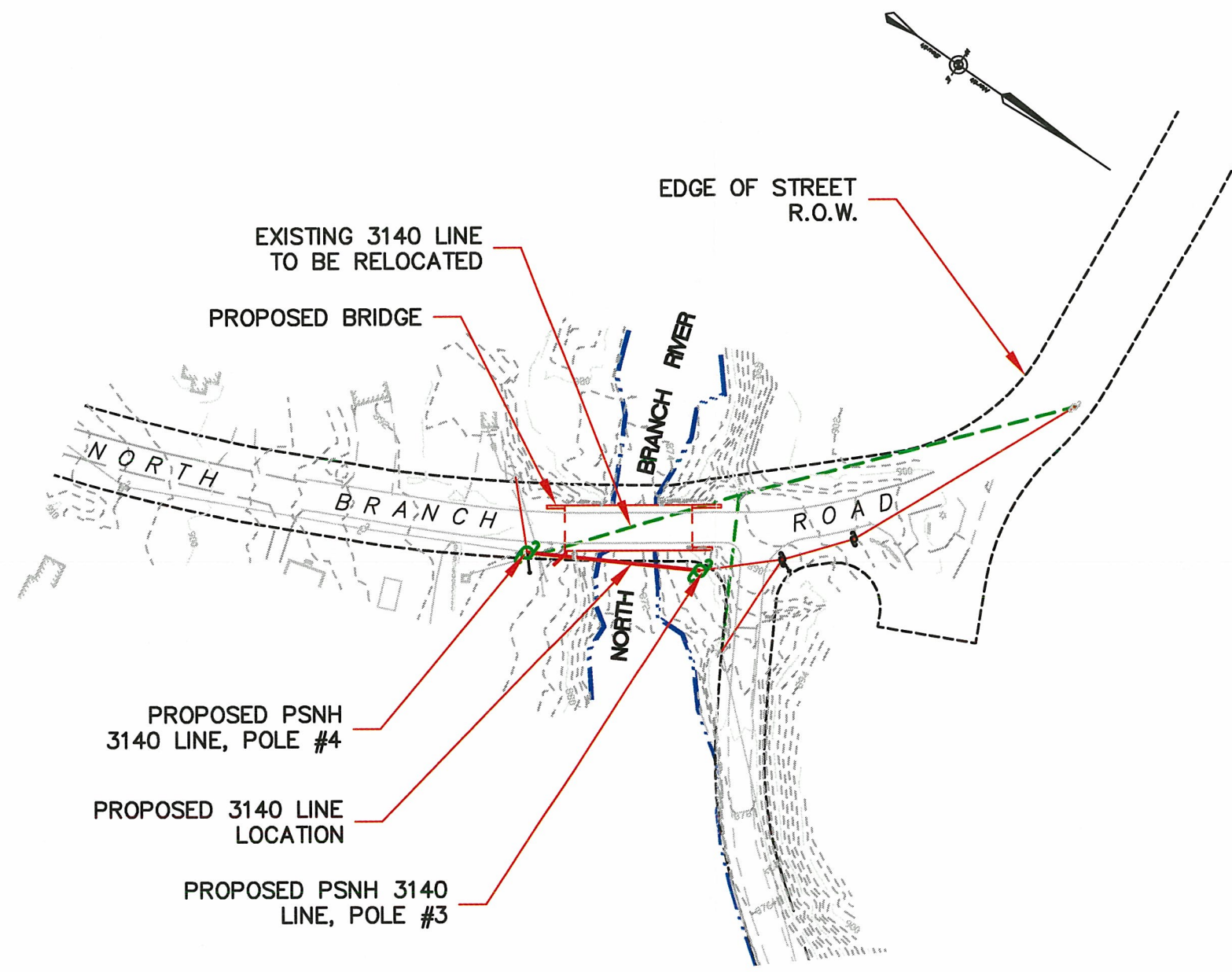
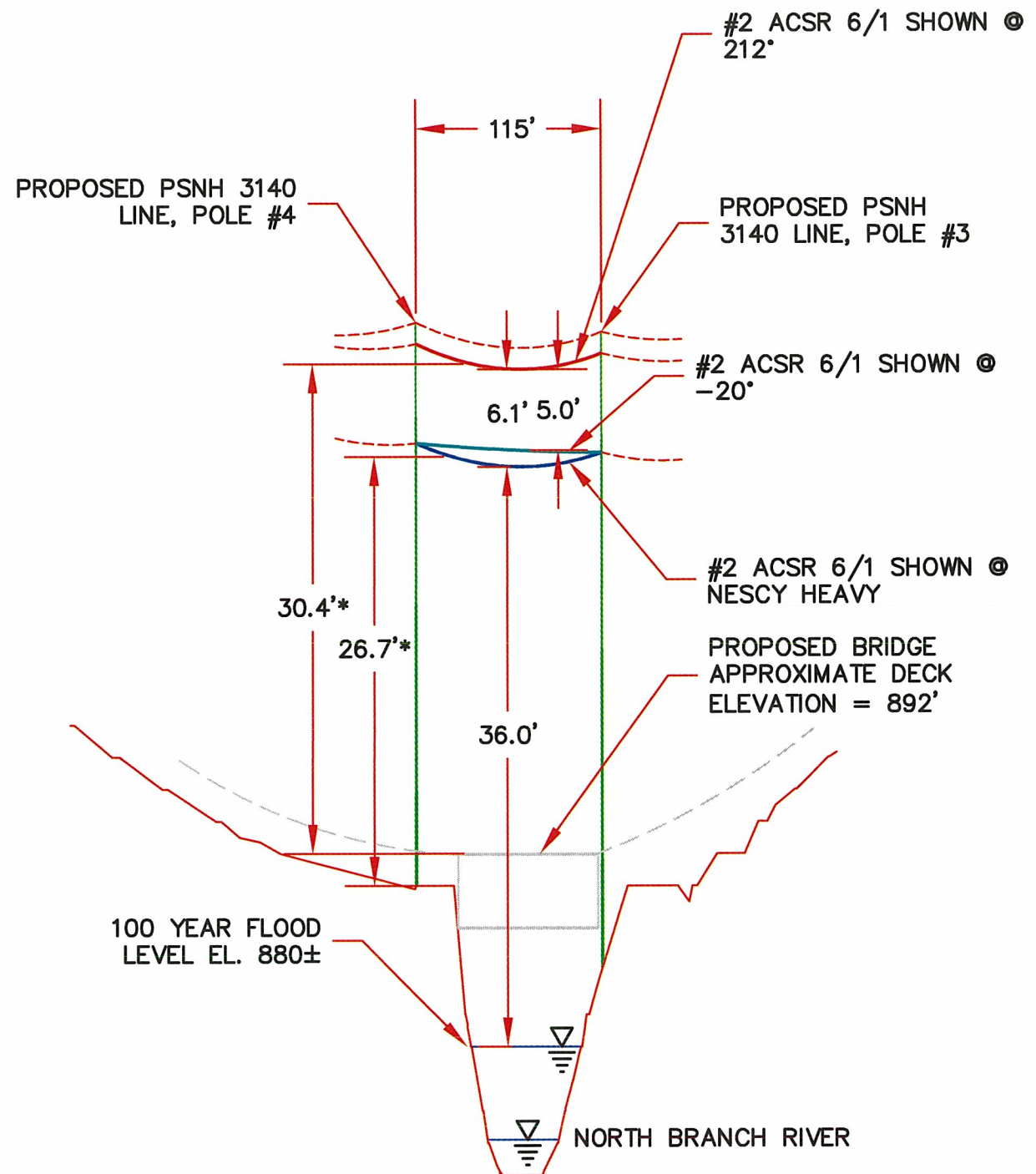
SCALE: 1"=2000'±



C:\Data\Energy\Delivery\System Projects\Transmission\11 - 3140 Line\Drawings\3140 WC LocUS.dwg 02/10/2010 11:19:51 AM EST

					DRAWN <b>DRM</b>	Public Service of New Hampshire		System Projects	
					DESIGNED <b>DMS</b>	<b>3140 CIRCUIT                  BETWEEN STRUCTURES 3 &amp; 4                  NORTH BRANCH WATER CROSSING                  ANTRIM, NEW HAMPSHIRE</b>			
					CHECKED _____				
					APPROVED _____				
NO.	REVISION	DATE	DRWN	CHKD	APPR	DATE	REVISION DATE	SHEET 1 of 3	DRAWING NO. <b>EXHIBIT 1</b>



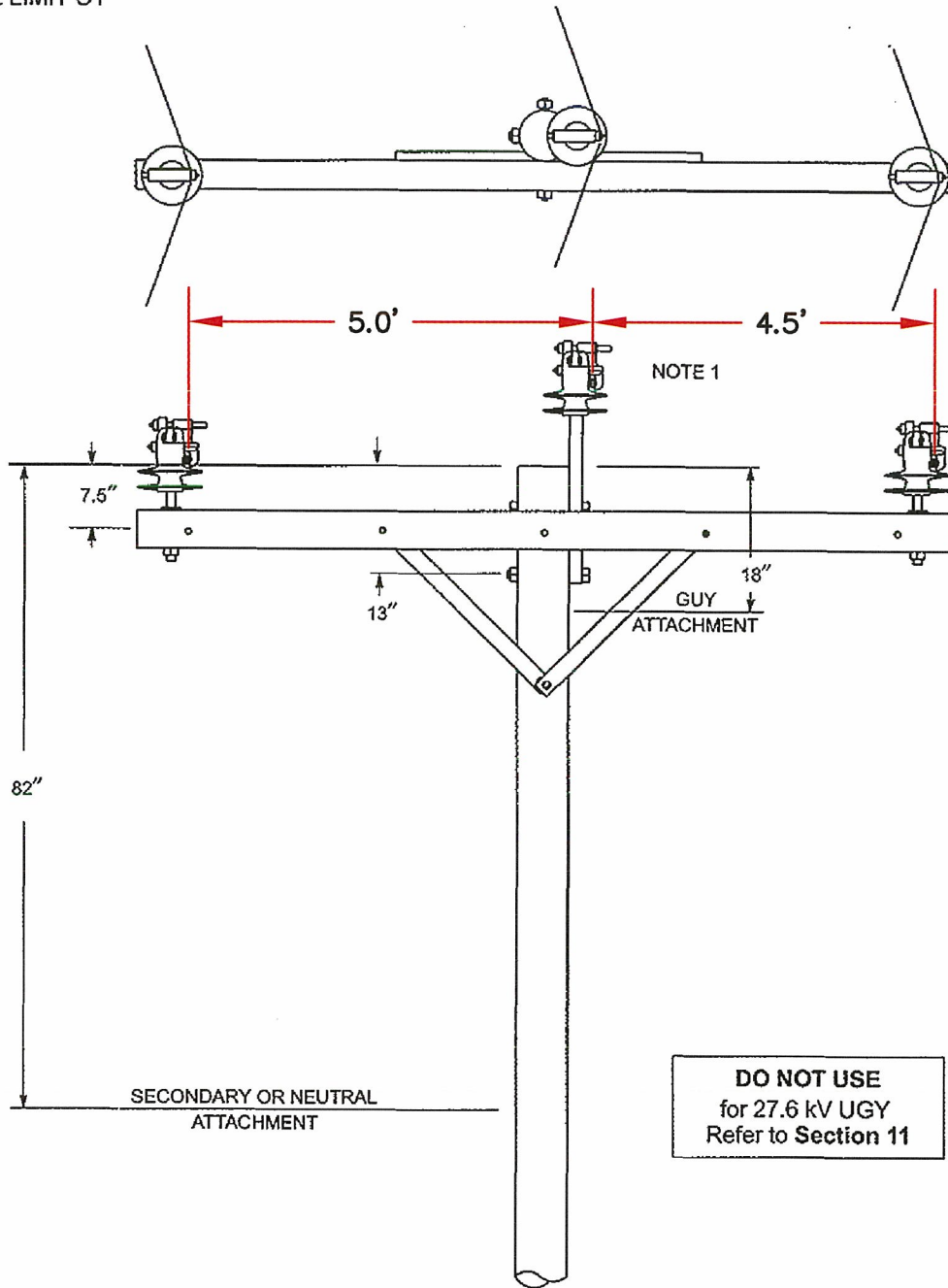


**PLAN**  
 SCALE: 1" = 100'

\* - THE LOCATION OF THE LOWEST CLEARANCE FOR THE PHASE WIRE IS NOT THE SAME AS THAT FOR THE NEUTRAL WIRE DUE TO THE LINE LOCATION REALTIVE TO THE NEW BRIDGE.

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

		Distribution Business	
DRAWN DMS	3140 CIRCUIT BETWEEN STRUCTURES 3 & 4 NORTH BRANCH WATER CROSSING ANTRIM, NEW HAMPSHIRE		
DESIGNED DMS	SCALE AS SHOWN	DATE 2/5/10	SHEET 2 of 3
CHECKED DMS	DRAWING NO. EXHIBIT 2		
APPROVED DMS	NO.	REVISION	DATE
DMS	DRWN	CHCK	APPR



**DO NOT USE**  
for 27.6 kV UGY  
Refer to Section 11

**Note**

1. For the *vice-top* insulator the range in feet of pull of a corner when installing a conductor in the *top position* is as follows: 1/0 ACSR bare and covered, 0-9; 336.4 Al bare and covered, 0-5; and 556.5 Al bare and covered, 0-4.

ORIGINAL	<b>35 KV MGY AND BELOW – CROSSARM CONSTRUCTION THREE-PHASE – TANGENT AND SMALL CORNER</b>			
5/24/89				
APPROVED				
11/2/99	NORTHEAST UTILITIES	CONSTRUCTION STANDARD	DTR 10.211	6

					DRAWN	Public Service of New Hampshire		System Projects	
					DMS				
					DESIGNED	<b>3140 CIRCUIT BETWEEN STRUCTURES 3 &amp; 4 NORTH BRANCH WATER CROSSING SCALE N.T.S. ANTRIM, NEW HAMPSHIRE</b>			
					DMS				
					CHECKED				
					APPROVED	DATE	REVISION DATE	SHEET	DRAWING NO.
						2/11/10		3 of 3	EXHIBIT 3
NO.	REVISION	DATE	DRWN	CHK	APPR				