

**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 NUBANUSIT BROOK IN THE TOWN OF PETERBOROUGH, 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 Nubanusit Brook in the Town of Peterborough, 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 is proposing to construct a new three-phase 34.5 kV distribution line, designated as the 313X4 circuit, in Peterborough, New Hampshire. The new line will help to accommodate the growth in demand and to obtain a greater level of reliability in the Peterborough area.
2. The new line will cross the Nubanusit Brook along the east side of Wilder Street, a Town of Peterborough public roadway, within the street right of way.
3. The location of the proposed crossing 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 "313X4 LINE – 35.4 KV, NUBANUSIT BROOK CROSSING, PETERBOROUGH, 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 single pole structures to be set and located approximately 221 feet apart. The proposed structure on the north side of the Nubanusit Brook, #2, will be a tangent structure constructed with a class 3, 45 foot tall pole. Pole #2 will be southern pine with a 10' crossarm and insulators. The proposed structure on the south side of the Brook, #3, will be a tangent structure constructed with a class 3, 45 foot tall pole. Pole #3 will be southern pine with a 10' crossarm and insulators. The line will be built with open wire construction as depicted in Exhibit 3, PSNH Construction Standard DTR 10.211, "35 KV MGY and Below – Crossarm Construction, Three-Phase – Tangent and Small Corner". The three

conductor wires will be 1/0 ACSR (6/1 stranding) and the neutral wire will also be 1/0 ACSR (6/1 stranding). The conductors and neutral wires will be sagged using the NESC Heavy Loading condition (0° F, 4 pounds psf wind loading, ½" radial ice) with a maximum tension of 2,000 lbs under that load.

7. The flood water elevation for the Nubanusit Brook is based on information from the Flood Insurance Rate Map ("FIRM"), Town of Peterborough, New Hampshire, Hillsborough County, Panel 4 of 12, Community Panel Number 330101 0004 A, effective date May 1, 1980 issued by the U.S. Department of Housing and Urban Development. The 100-year flood elevation for this location is approximately 862 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.

8. The area of the Nubanusit Brook as defined by NESC (note 19 to Table 232-1) is less than 6.7± acres. This was calculated by measuring the size of the limit of flood zone A as shown on the FIRM for the largest one mile stretch of the brook that includes the project area.

9. The project is not located within the special wind region identified in Figure 250-2(e) of the NESC.

10. 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 3.5'. The minimum clearance to land is 32.6'. The minimum clearance to the 100 year flood level is 46.4'.
- B. Minus 20° F, Phase Wire – The maximum sag on the phase wires under this condition is 0.6'. The minimum clearance to land is 35.5'. The minimum clearance to the 100 year flood level is 49.3'.
- C. 212° F, Phase Wire - The maximum sag on the phase wires under this condition is 3.2'. The minimum clearance to land is 32.8'. The minimum clearance to the 100 year flood level is 46.7'.
- D. NESC Heavy, Neutral Wire – The maximum sag on the neutral wire under this condition is 3.5'. The minimum clearance to land is 26.2'. The minimum clearance to the 100 year flood level is 40.1'.
- E. Minus 20° F, Neutral Wire – The maximum sag on the neutral wire under this condition is 0.6'. The minimum

clearance to land is 29.2'. The minimum clearance to the 100 year flood level is 42.9'.

- F. 120° F, Neutral Wire - The maximum sag on the neutral wire under this condition is 2.3'. The minimum clearance to land is 27.5'. The minimum clearance to the 100 year flood level is 41.3'.
- 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 32.6' to land and 46.4' 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.a, is 20.5'. 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 26.2' to land and 40.1' 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.a, is 17.5'. 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 3.4'. Based on NESC Table 235-6 section 2a, the minimum clearance should be 23.0 inches (1.92 feet).

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

12. The proposed crossing has been designed and will be constructed, maintained and operated by PSNH in accordance with the NESC C2-2007.

13. The poles at this crossing are both to be located within the public street right-of-way, for which PSNH has been granted a pole license from the Town of Peterborough, license #36-0585.

14. 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 Nubanusit Brook. 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 the Nubanusit Brook will not be diminished in any material respect as a result of the overhead line crossing.

WHEREFORE, PSNH respectfully requests that the Commission:

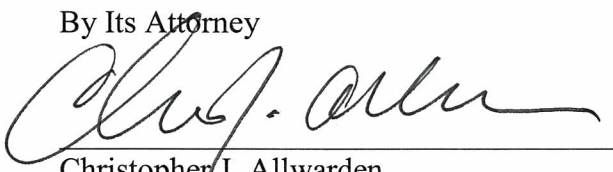
- a. Find that the license petitioned for herein may be exercised without substantially affecting the public rights in the public waters which are the subject of this petition;
- b. Grant PSNH a license to construct and maintain electric lines over and across the public waters of the Nubanusit Brook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

Dated at Manchester this 21st day of April, 2009.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW
HAMPSHIRE

By Its Attorney

A handwritten signature in black ink, appearing to read "Chris. Allwarden", is written over a horizontal line.

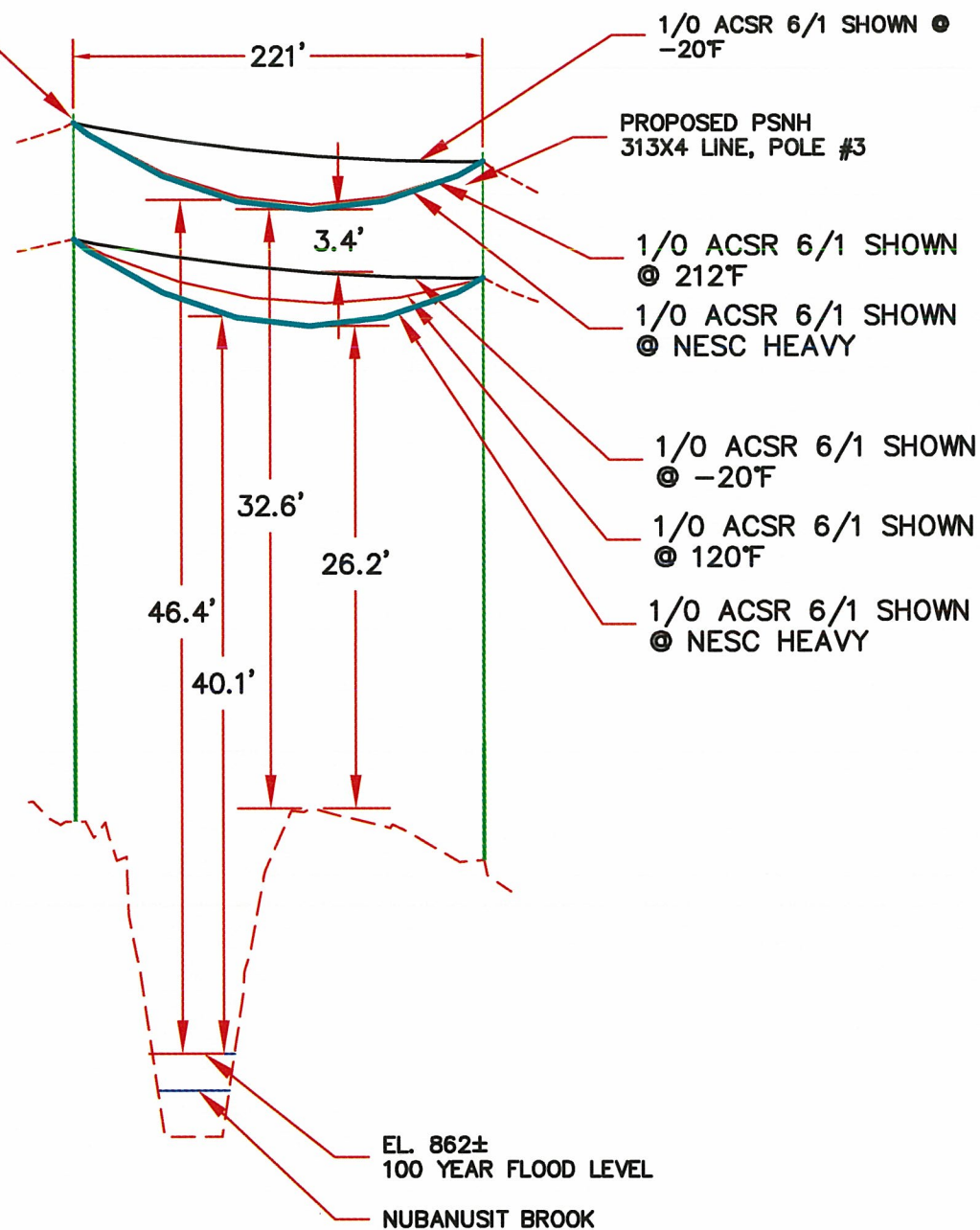
Christopher J. Allwarden
Senior Counsel, Legal Department
PSNH Energy Park
780 North Commercial Street
Manchester, NH 03101
(603) 634-2459

WATER CROSSING LOCATION



							DRAWN DRM	Public Service of New Hampshire	System Projects
							DESIGNED DMS	313X4 LINE - 34.5 KV NUBANUSIT WATER CROSSING WEST PETERBOROUGH, NH	
							CHECKED		
							APPROVED	SCALE H: 1"=2000'±	
								DATE 4/15/09	REVISION DATE
								SHEET 2 OF 2	DRAWING NO. EXHIBIT 1
NO.	REVISION	DATE	DRWN	CHK	APPR				

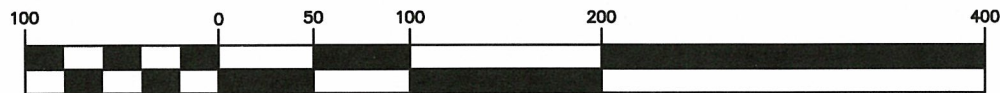
PROPOSED PSNH
313X4 LINE, POLE #2



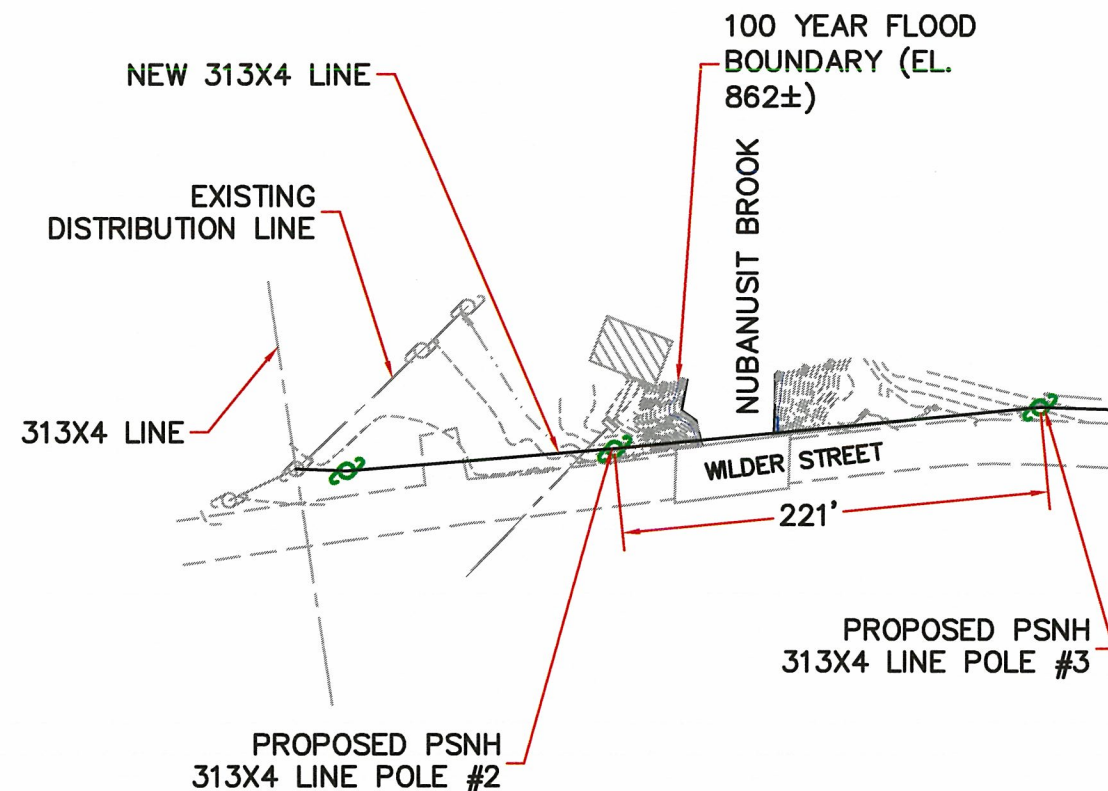
PROFILE

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

GRAPHIC SCALE



(IN FEET)
1 inch = 100 ft.

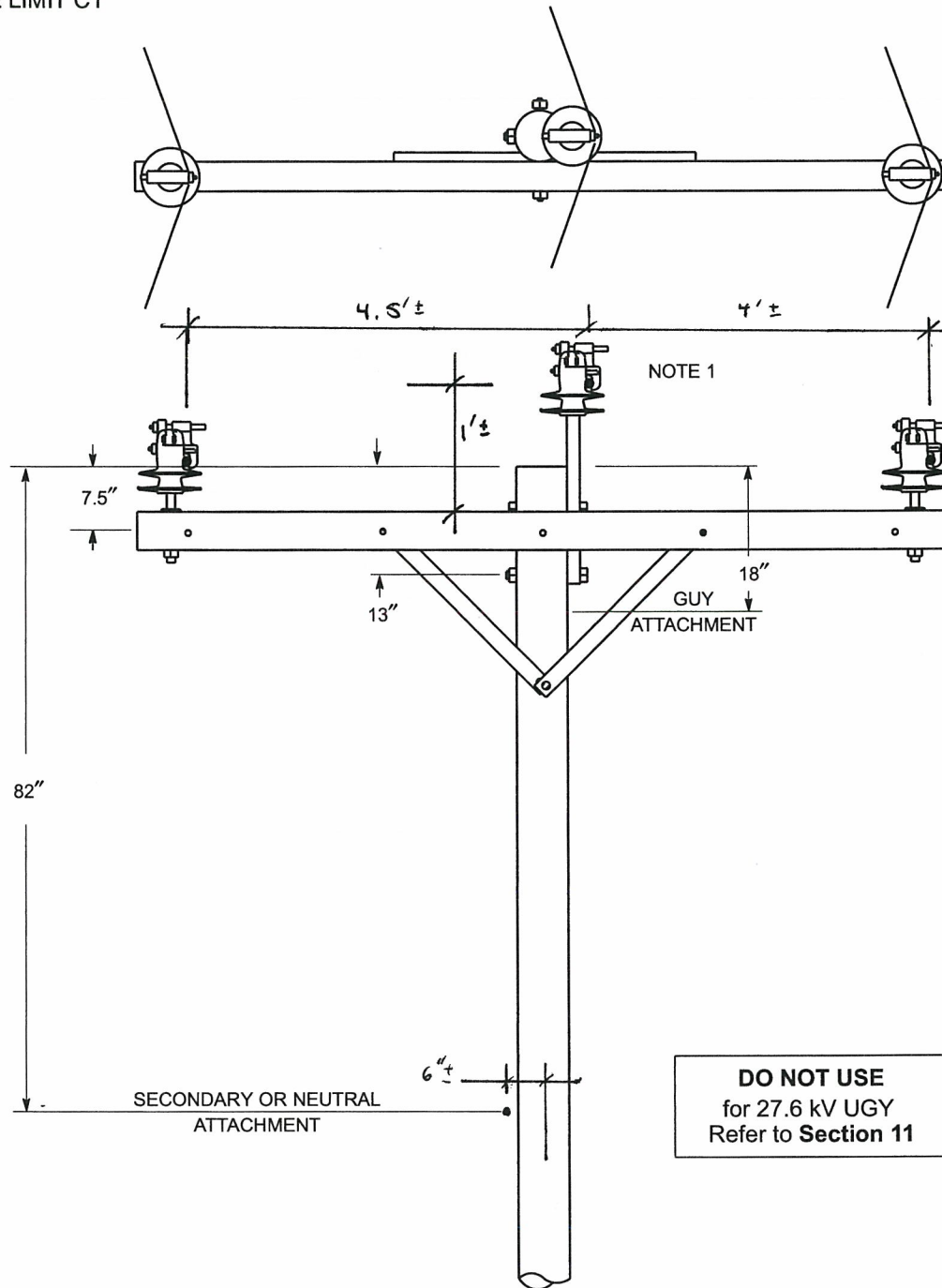


PLAN

SCALE: 1"=100'

										DRAWN DMS	Public Service of New Hampshire			Distribution Business		
										DESIGNED DMS	313X4 LINE – 34.5 KV NUBANUSIT BROOK CROSSING PETERBOROUGH, NEW HAMPSHIRE					
										CHECKED DMS						
										APPROVED DMS						
1	REVISED DIMENSION, TEXT						4/09	DMS	DMS	DMS		SCALE AS SHOWN	DATE 3/20/09	SHEET — OF —	DRAWING NO. EXHIBIT 2	
NO.	REVISION						DATE	DRWN	CHKD	APPR						

STRUCTURE LIMIT C1



Note

1. For the **vise-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	35 KV MGY AND BELOW – CROSSARM CONSTRUCTION THREE-PHASE – TANGENT AND SMALL CORNER			
5/24/89				
APPROVED				
11/2/99				
	NORTHEAST UTILITIES	CONSTRUCTION STANDARD	DTR 10.211	6