

**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 AINSWORTH POND IN THE TOWN OF JAFFREY, 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 two electric lines over and across the public waters of Ainsworth Pond (also known as Greene Wildlife Pond) in the Town of Jaffrey, 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 an existing three-phase 34.5 kV distribution line, designated as the 382 line, from the PSNH Monadnock Substation in Troy, New Hampshire, to the PSNH Jaffrey Substation in Jaffrey, New Hampshire, which line is an integral part of PSNH’s electric distribution system in the area. The 382 line, as presently constructed, crosses overhead across Ainsworth Pond in Jaffrey. The existing 382 line crossing at this location has not been previously licensed by the Commission.¹ To accommodate the relocation of an existing osprey nest on one of the existing 382 line crossing structures, PSNH intends to rebuild the existing 382 line crossing of Ainsworth Pond, in conjunction with the construction of the new 3235 line crossing (which is described in paragraph 2, below). PSNH is working with the New Hampshire Audubon Society on the nest relocation project. A summary of the project is provided in correspondence from PSNH to the New Hampshire Audubon Society, dated March 4, 2011, a copy of which is attached to this petition, and marked as Appendix A.

2. Additionally, in order to meet the reasonable requirements of service to the public, PSNH intends to construct and maintain a new three-phase 34.5 kV distribution line, designated as the 3235 line, from the Monadnock Substation to the Jaffrey Substation. PSNH has determined that the construction of a new 34.5 kV line from Monadnock Substation is needed to alleviate projected overload conditions on the existing 382 line and serve the distribution load in the Monadnock area in a reliable manner. As proposed, the new 3235 line will cross over Ainsworth Pond in the same right-of-way location as the 382 line.

¹ The crossing apparently was not previously licensed due to either oversight or to the application of navigability or other crossing license criteria at the time of original construction. The rebuild of the 382 line crossing at Ainsworth Pond will be newly licensed under this petition.

3. The location of the proposed crossings of Ainsworth Pond is shown on the attached Location Plan, marked as Exhibit 1.

4. The design and proposed construction of the crossings are shown on the attached PSNH Distribution Business Plan and Profile Drawings entitled “382 LINE BETWEEN STRUCTURES 140 & 141, AINSWORTH POND WATER CROSSING, PLAN & PROFILE”, marked as Exhibit 2 – 382, and “3235 LINE BETWEEN STRUCTURES 147 & 148, AINSWORTH POND WATER CROSSING, PLAN & PROFILE”, marked as Exhibit 2 - 3235.

5. The required technical information provided in this petition is based on the 2002 and 2007 National Electrical Safety Code (NESC).

6. The proposed new crossings for the 382 and 3235 lines will each occur between two new three-pole wood structures with span lengths of approximately 680 and 685 feet, respectively. The 382 line structure on the west side of the pond, number 140, is a dead end structure, constructed with two class H2, 80' poles and one class H2 85' pole (to accommodate the relocated nest). The structure on the east side of the pond, number 141, is a similar dead end structure except that all three poles are class H2, 80'. The 3235 line structure on the west side of the pond, number 147, is a dead end structure, constructed with three class H2, 75' foot tall poles. The structure on the east side of the pond, number 148, is an identical dead end structure. The construction detail for all of these dead end structures is attached as Exhibit 3. The proposed conductor and neutral for both crossings will be 477 ACSR with 26/7 stranding. The conductors and neutral will be sagged using NESC Heavy Loading conditions (0° F, 4 pounds psf wind loading, ½" radial ice) at a maximum tension of 5,500 pounds.

7. The flood water elevations for Ainsworth Pond were determined through consultation with Jim Webber of the New Hampshire Department of Environmental Services (NHDES) Dam Management Bureau. Based on NHDES review, the 10 year flood elevation for the pond is 2.7' below the crest of the dam which corresponds to a height of 1044.3'.

8. The area of Ainsworth Pond at the design flood level as defined by NESC (note 19 to Table 232-1) is 68.6± acres.

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

382 Line

- A. NESC Heavy, Phase Wire – For the sag on the phase wires under this condition the minimum clearance to land is 63.5', the minimum clearance to the 10 year flood level is 41.5'.
- B. Minus 20° F, Phase Wire – For the sag on the phase wires under this condition the minimum clearance to land is

- 63.9', the minimum clearance to the 10 year flood level is 44.3'.
- C. 212° F, Phase Wire – For the sag on the phase wires under this condition the minimum clearance to land is 62.6', the minimum clearance to the 10 year flood level is 35.7'.
 - D. NESC Heavy, Neutral Wire – For the sag on the neutral wire under this condition the minimum clearance to land is 54.2', the minimum clearance to the 10 year flood level is 29.3'.
 - E. Minus 20° F, Neutral Wire – For the sag on the neutral wire under this condition the minimum clearance to land is 56.8', the minimum clearance to the 10 year flood level is 33.6'.
 - F. 90° F, Neutral Wire - For the sag on the neutral wire under this condition the minimum clearance to land is 56.4', the minimum clearance to the 10 year flood level is 31.1'.
 - G. Minimum Clearance, Phase Wire – The 212°F operating conditions (item C above), results in the minimum clearance for phase conductors. The minimum clearance expected under that condition is 62.6' to land and 35.7' to the 10 year flood level. The required minimum clearance from the phase wires to land level based on NESC Table 232-1.4 is 18.5'. The required minimum clearance from the phase wires to the 10 year flood level 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 90° F operating conditions (item F above), results in the minimum clearance for the neutral wire. The minimum clearance expected under that condition is 56.4' to land and 31.1' to the 10 year flood level. The required minimum clearance from the neutral wire to land based on NESC Table 232-1.4 is 15.5'. The required minimum clearance from the neutral to the 10 year flood level 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 summer condition with the phase wires at 212° (item C above) and the neutral at 90° F (item F above). This could occur on a hot day if the line were operating with a very high load. Under those conditions the phase to neutral clearance would be 4.77'. Based on NESC Table 235-6 section 2a, the minimum clearance should be 16.9 inches (1.4 feet)

3235 Line

- J. NESC Heavy, Phase Wire – For the sag on the phase wires under this condition the minimum clearance to land is 60.7', the minimum clearance to the 10 year flood level is 35.8'.
- K. Minus 20° F, Phase Wire – For the sag on the phase wires under this condition the minimum clearance to land is 60.9', the minimum clearance to the 10 year flood level is 37.9'.
- L. 212° F, Phase Wire – For the sag on the phase wires under this condition the minimum clearance to land is 60.2', the minimum clearance to the 10 year flood level is 30.1'.
- M. NESC Heavy, Neutral Wire – For the sag on the neutral wire under this condition the minimum clearance to land is 54.2', the minimum clearance to the 10 year flood level is 29.3'.
- N. Minus 20° F, Neutral Wire – For the sag on the neutral wire under this condition the minimum clearance to land is 54.4', the minimum clearance to the 10 year flood level is 31.4'.
- O. 90° F, Neutral Wire - For the sag on the neutral wire under this condition the minimum clearance to land is 54.0', the minimum clearance to the 10 year flood level is 26.9'.
- P. Minimum Clearance, Phase Wire – The 212°F operating conditions (item C above), results in the minimum clearance for phase conductors. The minimum clearance expected under that condition is 60.2' to land and 30.1' to the 10 year flood level. The required minimum clearance from the phase wires to land level based on NESC Table 232-1.4 is 18.5'. The required minimum clearance from the phase wires to the 10 year flood level based on NESC Table 232-1.7.b, is 28.5'. The crossing design as proposed exceeds the NESC requirements.
- Q. Minimum Clearance, Neutral Wire – The 90° F operating conditions (item F above), results in the minimum clearance for the neutral wire. The minimum clearance expected under that condition is 54.0' to land and 26.9' to the 10 year flood level. The required minimum clearance from the neutral wire to land based on NESC Table 232-1.4 is 15.5'. The required minimum clearance from the neutral to the 10 year flood level based on NESC Table 232-1.7.b, is 25.5'. The crossing design as proposed exceeds the NESC requirements.
- R. Minimum Phase to Neutral Clearance –The conditions which would result in the minimum clearance between these lines is a summer condition with the phase wires at 212° (item C above) and the neutral at 90° F (item F above). This could occur on a hot day if the line were

operating with a very high load. Under those conditions the phase to neutral clearance would be 4.68'. Based on NESC Table 235-6 section 2a, the minimum clearance should be 16.9 inches (1.4 feet)

10. Permanent and temporary wetlands impacts associated with the construction on the entire project have already been permitted by the NHDES under wetlands permit: 2011-00021 and by the Army Corps of Engineers under permit number: NAE-2011-00187. These permits include the wetland impacts associated with installation of the new crossing structures for the 382 line and 3235 line water crossings at Ainsworth Pond.

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

12. The new crossing structures and line crossings are located entirely within a 100 foot wide PSNH right of way corridor established by easements already owned by PSNH on each side of Ainsworth Pond.

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 Ainsworth Pond. 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 pond will not be diminished in any material respect as a result of the overhead line crossings.

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 two electric lines over and across the public waters of Ainsworth Pond in Jaffrey, New Hampshire, as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 27th day of July, 2011.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW
HAMPSHIRE

By Its Attorney



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



**Public Service
of New Hampshire**

The Northeast Utilities System

March 4, 2011

Chris Martin, Senior Biologist
Audubon Society of New Hampshire
3 Silk Farm Road
Concord, NH 03301

Re: PSNH – 3235 Line
Osprey Nest Pole

Dear Mr. Martin,

This letter has been sent to describe our intended approach for the construction of the 3235 line and modification to the 382 line at Ainsworth/Wildlife Pond in Jaffrey, NH. This work will include existing structure #141 on the 382 line where an osprey nest is located. We understand and appreciate the significance of this nesting location and fully intend to maintain and enhance the nesting site while accommodating our new line project.

Project Background – PSNH currently operates a single 34.5 kV line (identified as the 382 line) in a utility corridor from the Monadnock Substation in Troy NH to the Jaffrey Substation in Jaffrey, NH. The alignment of this corridor is shown on the attached locus plan. In order to improve reliability and service in this area, PSNH intends to install a second 34.5 kV line in this same corridor (the 3235 line). The existing line was constructed in the early 1960s and is comprised typically of wood pole structures in the 35'-60' pole range. The new line will be constructed in 2011 and will also be comprised typically of wood pole structures. Height ranges on the new line will typically be in the 40'-85' pole range. At the Ainsworth/Wildlife Pond location, the span is significantly longer than typical for elsewhere on the line and taller more complex structures are needed.

Osprey Nest – Along the 382 line at structure #141, there is currently a well documented osprey nest. Some reference photos of the nest location are attached. Although it is not technically necessary to disturb that structure as part of the 3235 line project, we have determined that it would be prudent to rebuild the 382 line at that location during the construction of the 3235 line. The basis for that determination is as follows;

- The new line will be taller than the existing line due to a combination of changes to code requirements and geography differences at the crossing. The higher poles and wires on the new line could potentially represent a barrier to the birds movement around the nest location.
- The existing structures are built to an outdated construction standard. The newer standards provide greater strength and structural capacity for this type of crossing.

- Working in the area on the 3235 line provides an opportunity to access the area and make changes and minimize impacts and permitting compared to allowing the structures to remain and replace them on a future project.
- The current nest is located very close to live wires and poses a risk to both the birds and the line. The nest is located on cross arms that also attach to the insulators holding the open wire. With this configuration there is approximately 6" of vertical separation from the bottom of the nest to open wire.

Proposed Configuration – The proposed arrangement of poles and wires for the nest location is shown on the attached plan 3235-O-1, which represents the cross section of the corridor looking west from Ainsworth/Wildlife Pond. With this arrangement the 3235 line would be built on a three pole 'DA' type structure, with 75' poles. The 382 line would also be built on a three pole 'DA' structure, but utilizing two 80' and one 85' poles. The osprey nest would be relocated to the 85' pole on the northerly side of the corridor. With this arrangement there would be 10' of vertical clearance between the bottom of the nest and the nearest open wire. Additionally, due to the difference in the construction style, there would be 5' of vertical clearance from the cross arms to open wire.

Nest Relocation Process – As with the relocation that was done on the 3191 line, the plan is to keep the crossarms under the existing nest together and reattach them to the new pole location. This would be accomplished in the following sequence;

- Build the 3235 line, take the existing line out of service and transfer load to the 3235 line.
- Cut the existing crossarms approximately 1' beyond the nest on one side, and 3'-4' beyond the nest on the other side. Cut the pole below the cross arm braces
- Strap the nest to the crossarms, lower crossarms, pole top and nest assembly to the ground
- Loosen the bolts that attach the crossarms to the existing pole
- Add a short cross arm section along the edge nearest to the nest.
- Rebuild the 382 line.
- Raise the crossarms and nest assembly to the top of the 85' pole and reattach with the longer crossarms extending northerly.

Additionally, we would request that a representative from Audubon be on site during the nest transfer process. Please note that on the 3191 line the nest was located 10' above the top of the adjacent poles and 15' above the nearest live wire. As proposed the nest on the 382 line would be relocated 5' above the adjacent pole tops and 10' above the nearest live wire.

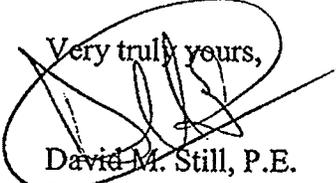
Schedule – There will be no work associated with this project in the area of the nest from April through September of 2011 or until after the osprey leave for the 2011 season. Pole setting will be limited in the vicinity to no closer than two spans away, structures #146 and #148 will not be installed during that time. After the birds have left, presumably around October of 2011, the work on the lines will be performed.

We believe that the process outline represents a reasonable approach to accommodate the use of the corridor and structures by the osprey along with our new line project. Since coordination of

this work has been included as conditions of approval on both our NHDES wetland permit and our Town of Jaffrey Planning Board approval we ask that you please confirm that our intended approach is satisfactory.

If you have any questions or comments please contact me at (603) 634-2078 or via email at stilldm@nu.com.

Very truly yours,



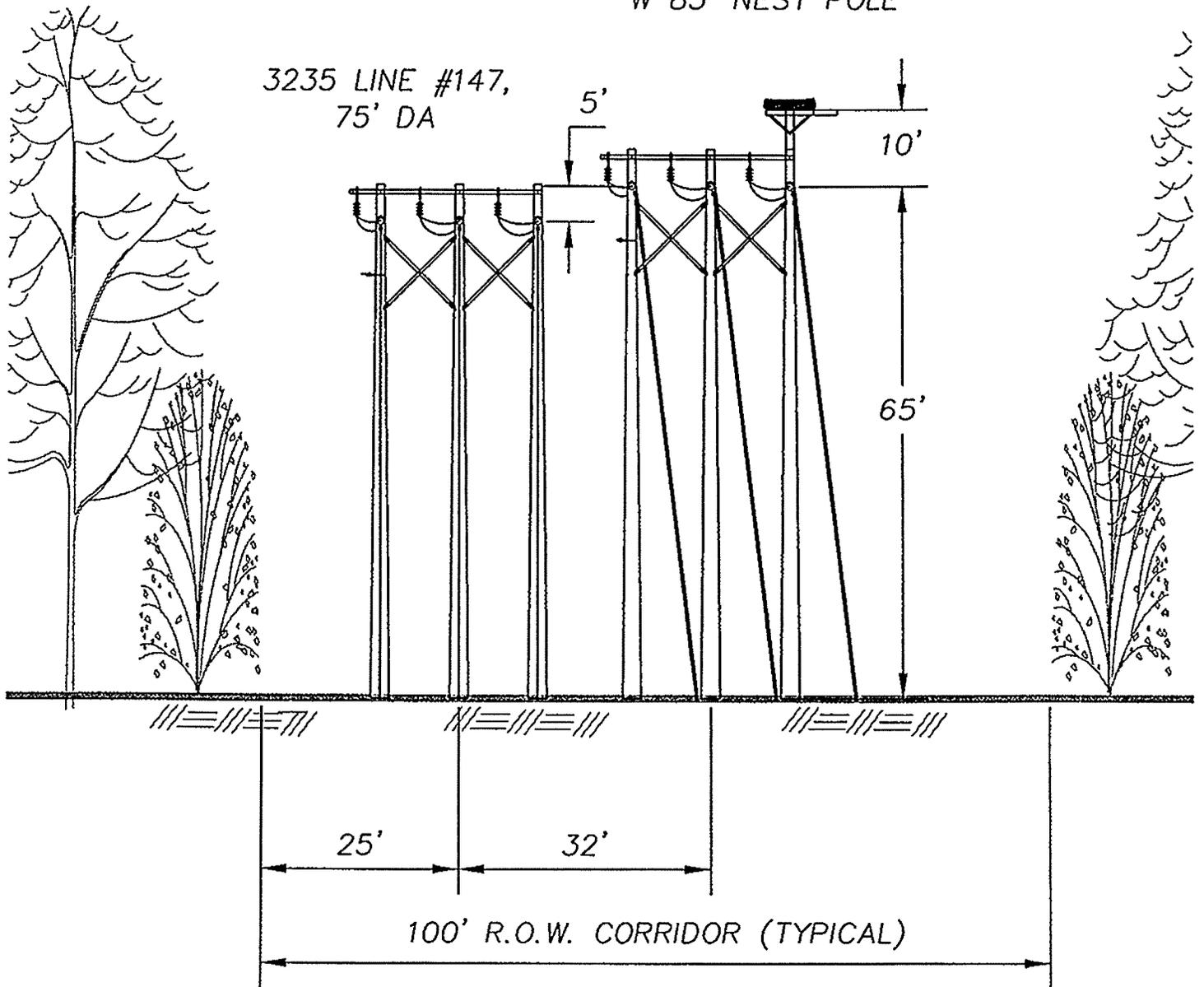
David M. Still, P.E.
Engineer

Enclosures

cc: NHDES – Kirsten Pulkkinen
NHFG – Kim Tuttle
Town of Jaffrey – Jo Anne Carr

382 LINE #141,
80' DA STR.
W 85' NEST POLE

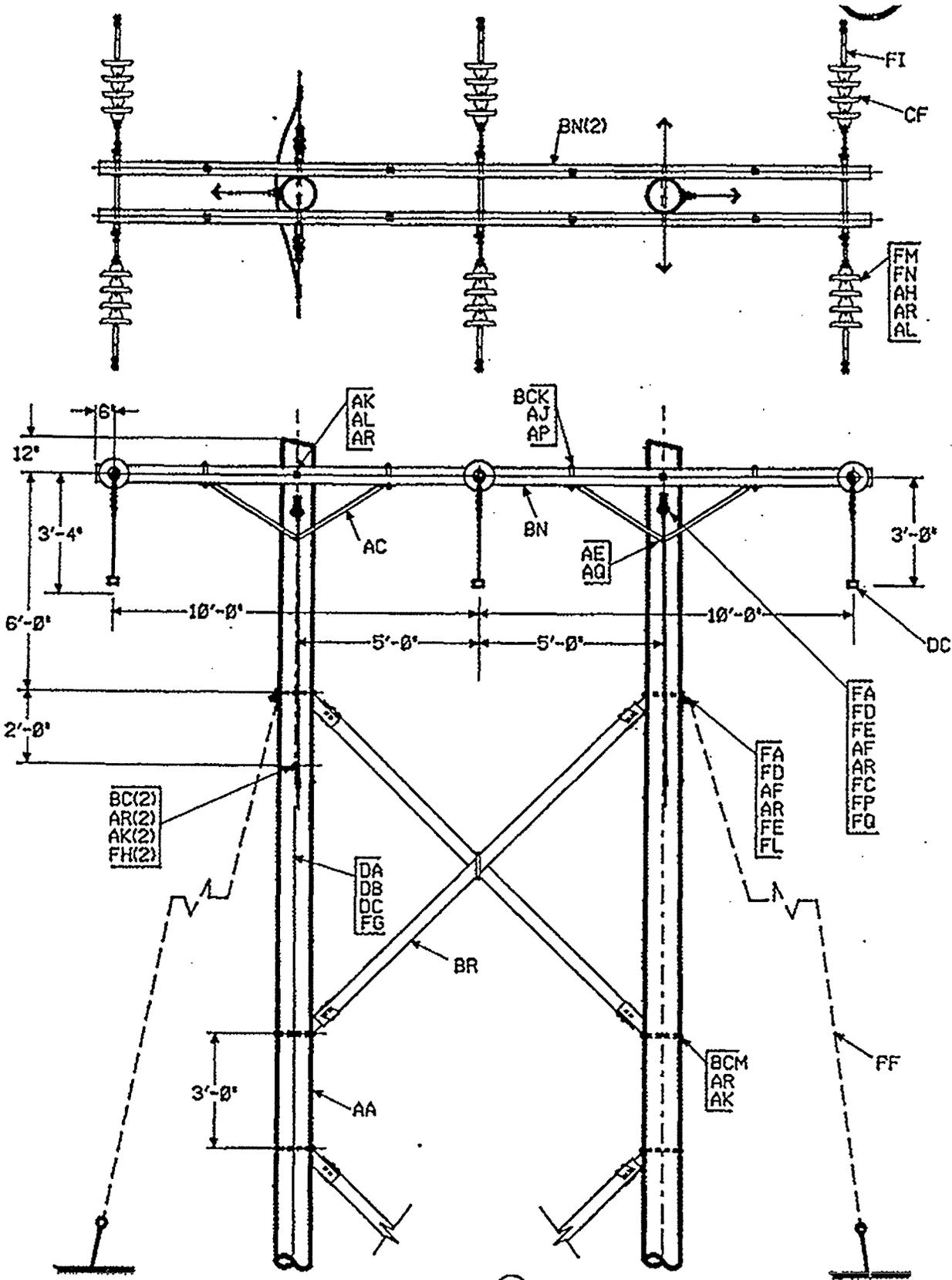
3235 LINE #147,
75' DA



PROPOSED SECTION

AINSWORTH POND LOOKING WEST
(100' ± CORRIDOR)

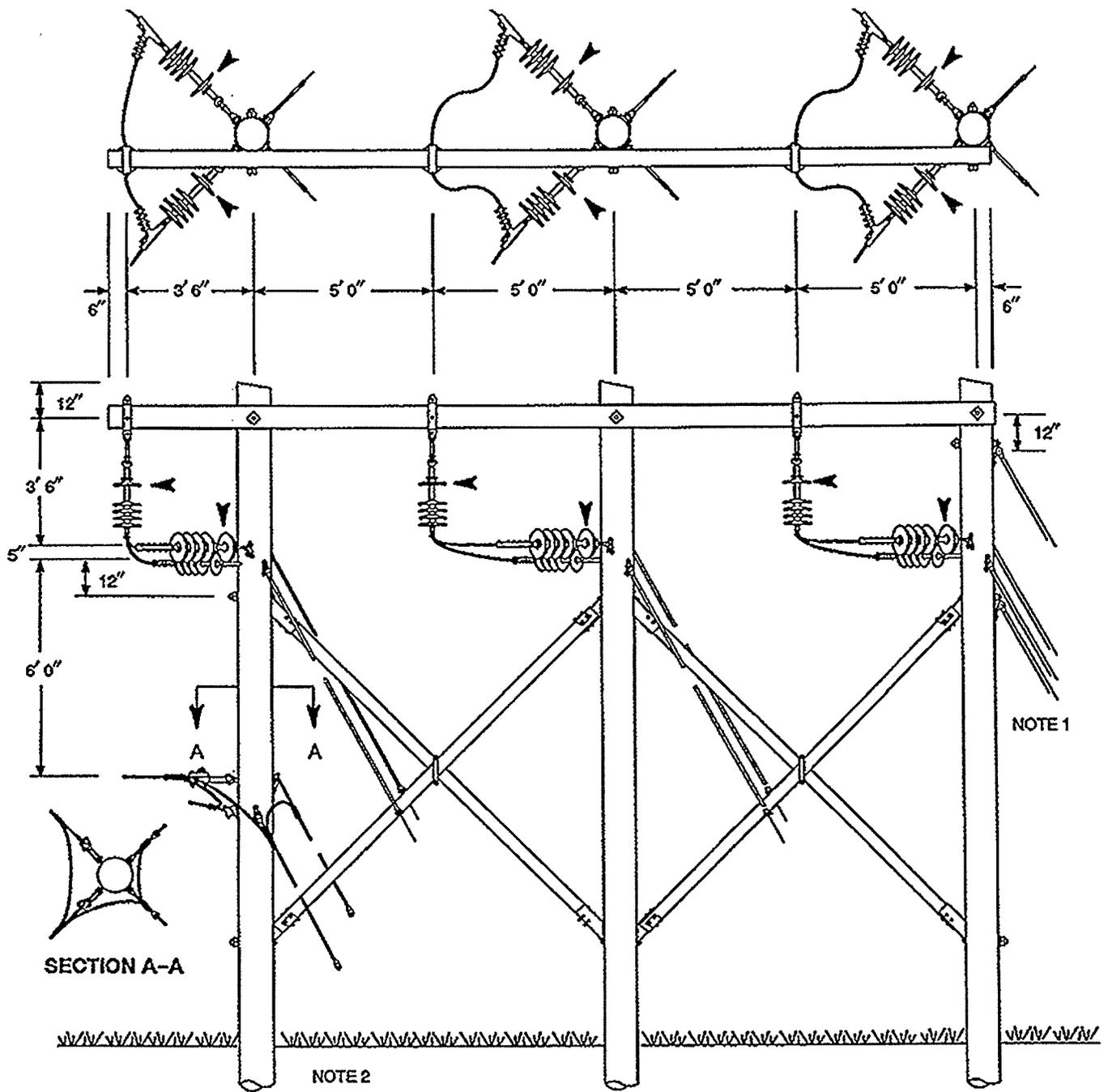
						DRAWN DMS	Public Service of New Hampshire	System Projects
						DESIGNED DMS	PSNH R.O.W. CORRIDOR AT AINSWORTH POND OSPREY NEST RELOCATION	
						CHECKED		
						APPROVED	SCALE 1" = 40'	
NO.	REVISION	DATE	DRWN	CHK	APPR	DATE	REVISION DATE	SHEET
						3/1/11		1 of 1
							DRAWING NO.	3235-0-1



NOTE: FOR GUYING DETAILS REFER TO STANDARDS (90) 110

(THIS DWG. IS AT 1/2" SCALE)

				DRAWN DMS	Public Service of New Hampshire		System Projects		
				DESIGNED DMS	EXISTING 382 LINE STRUCTURE DETAIL AT AINSWORTH POND OSPREY NEST RELOCATION				
				CHECKED					
				APPROVED	SCALE 1"=NTS				
NO.	REVISION	DATE	DRWN	CHK	APPR	DATE	REVISION DATE	SHEET	DRAWING NO.
						3/7/11		1 of 1	3235-0-2



Notes

1. Select guys and associated material from Section 06. Select variation with 78-inch guy strain insulators for attachments opposite primary conductors and bare guy wire only for guying opposite neutral conductors.
2. Grounding material used on every third pole. See DTR 16.211.

ORIGINAL 9/30/04	DEAD-END STRUCTURE TYPE 34.5 KV AND BELOW			
APPROVED 8/10/06	ANGLES ABOVE 50° - 200 KV BIL			
<i>[Signature]</i>	NORTHEAST UTILITIES	CONSTRUCTION STANDARD	DTR 10.615	1

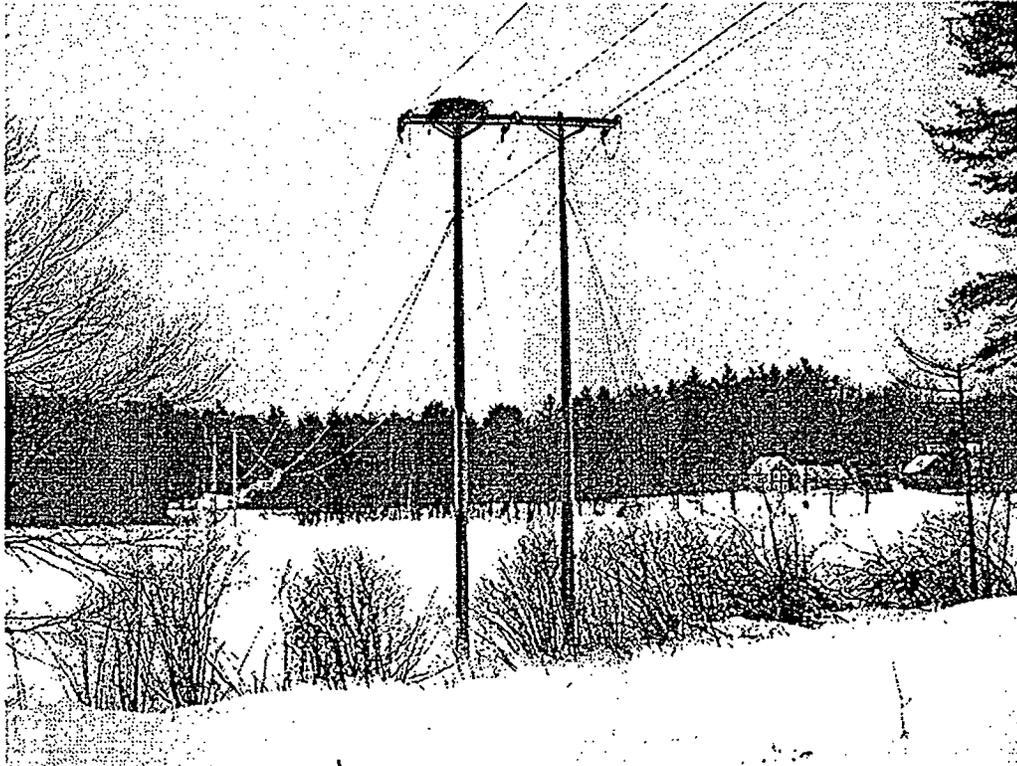
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					DESIGNED DMS	'DA' STRUCTURE DETAIL AT AINSWORTH POND OSPREY NEST RELOCATION			
					CHECKED				
					APPROVED	SCALE 1"=NTS			
NO.	REVISION	DATE	DRWN	CHK	APPR	DATE 3/7/11	REVISION DATE	SHEET 1 of 1	DRAWING NO. 3235-0-3

UTILITY CORRIDOR
ALIGNMENT

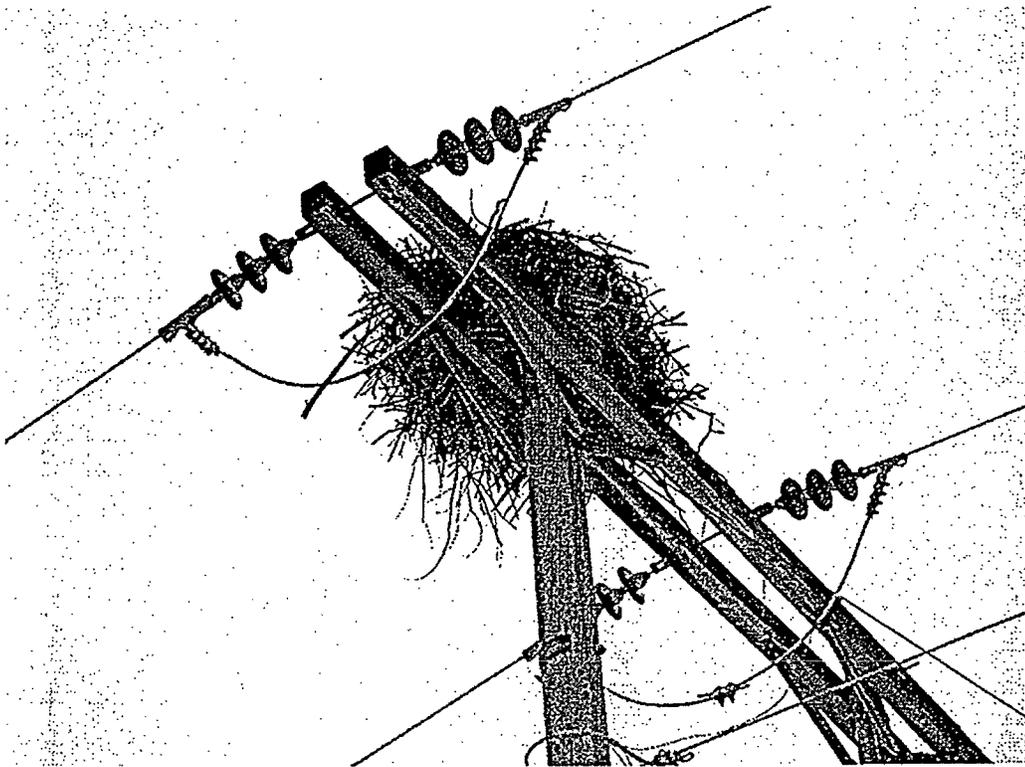
OSPREY NEST LOCATION



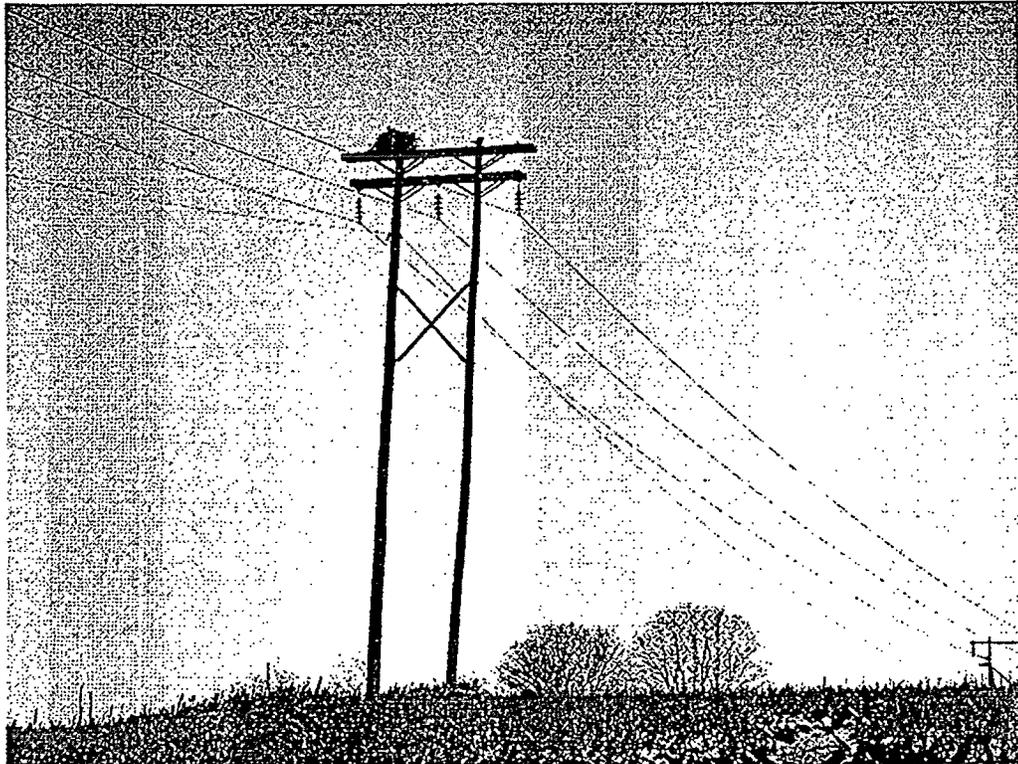
				DRAWN DMS	Public Service of New Hampshire	System Projects
				DESIGNED DMS	LOCUS PLAN 3235 LINE PROJECT OSPREY NEST RELOCATION	
				CHECKED		
				APPROVED		
1	ADDCO NORTHING, EASTING	12/20/10	DMS	DMS	DMS	
NO.	REVISION	DATE	DRWN	CHK	APPR	
				SCALE H: 1" = 2000' ±		
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		3/7/11		1 of 1	3235-0-L1	



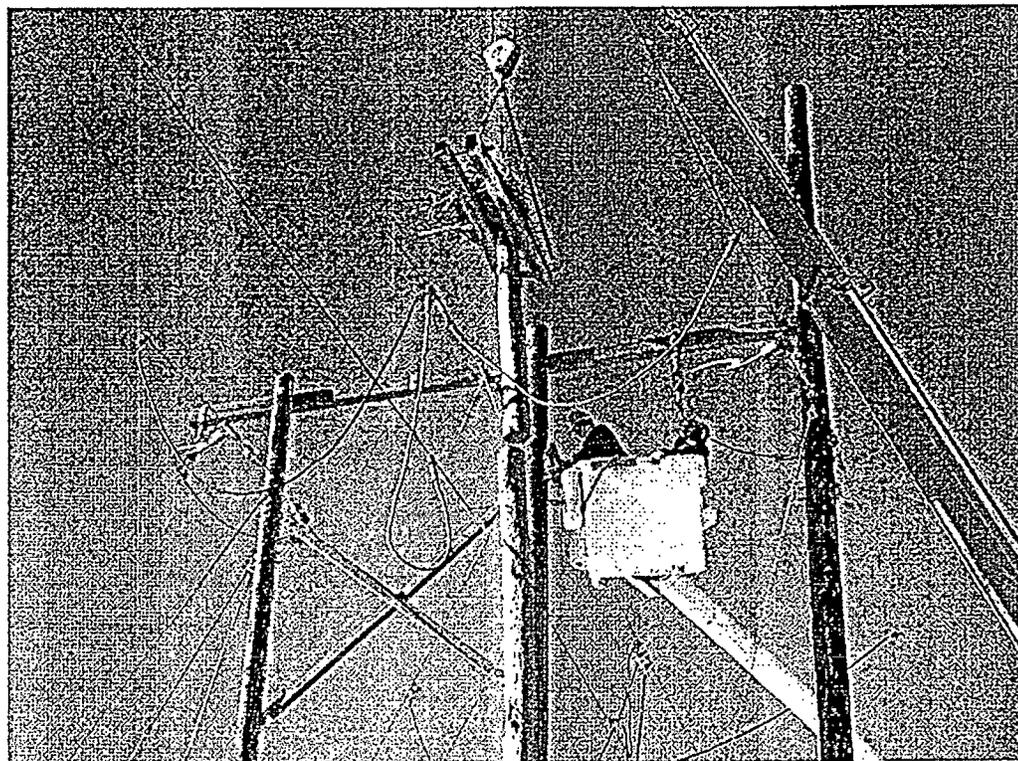
382 line – Structure #140 with osprey nest



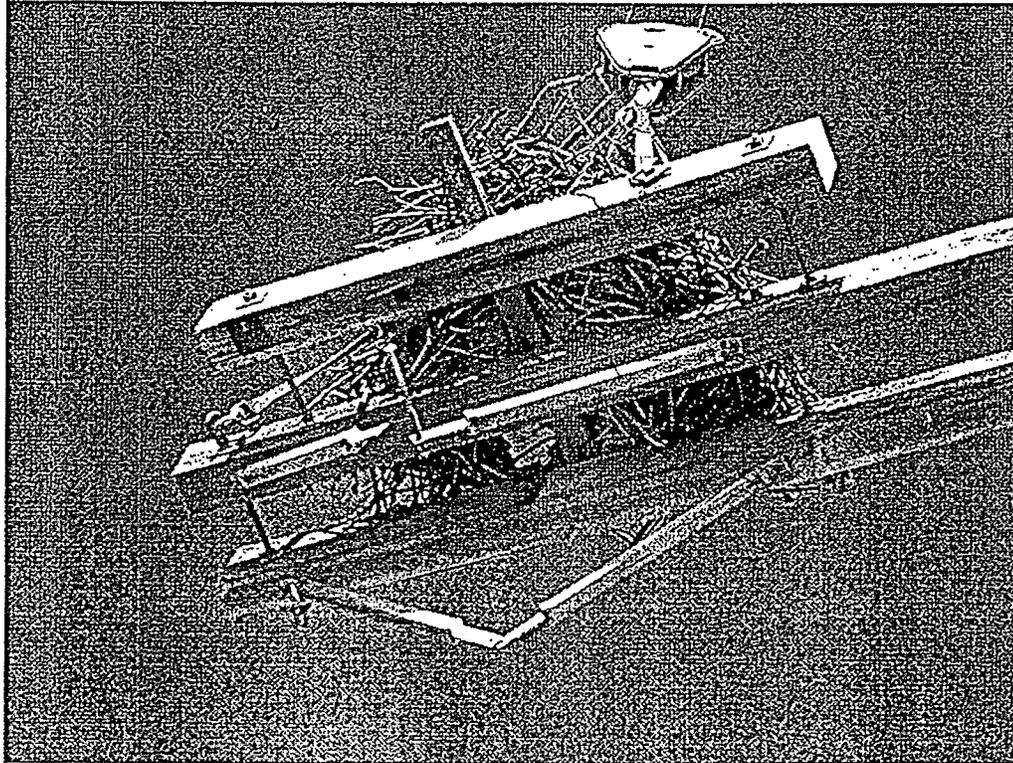
328 – Structure #140 nest close-up view



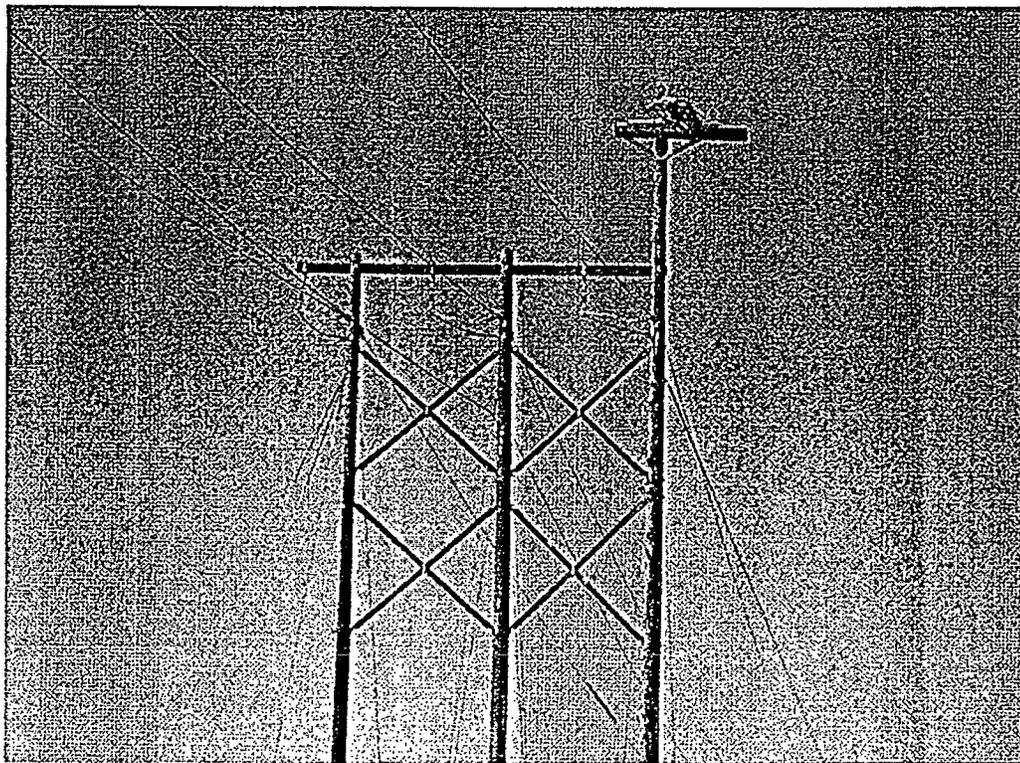
3191 Line – Structure #68 before nest relocation



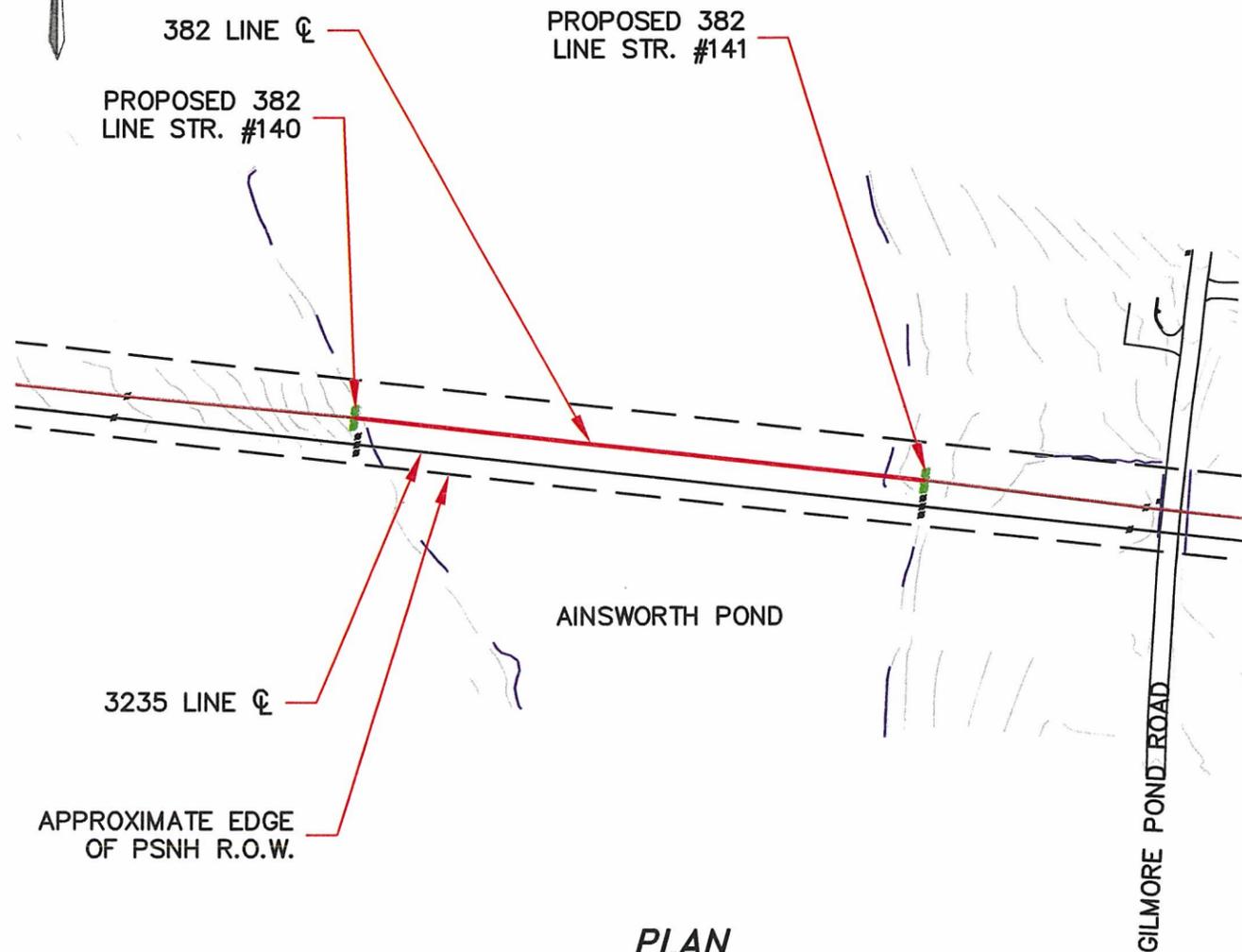
3191 Line – Cutting old pole, removing crossarms and nest



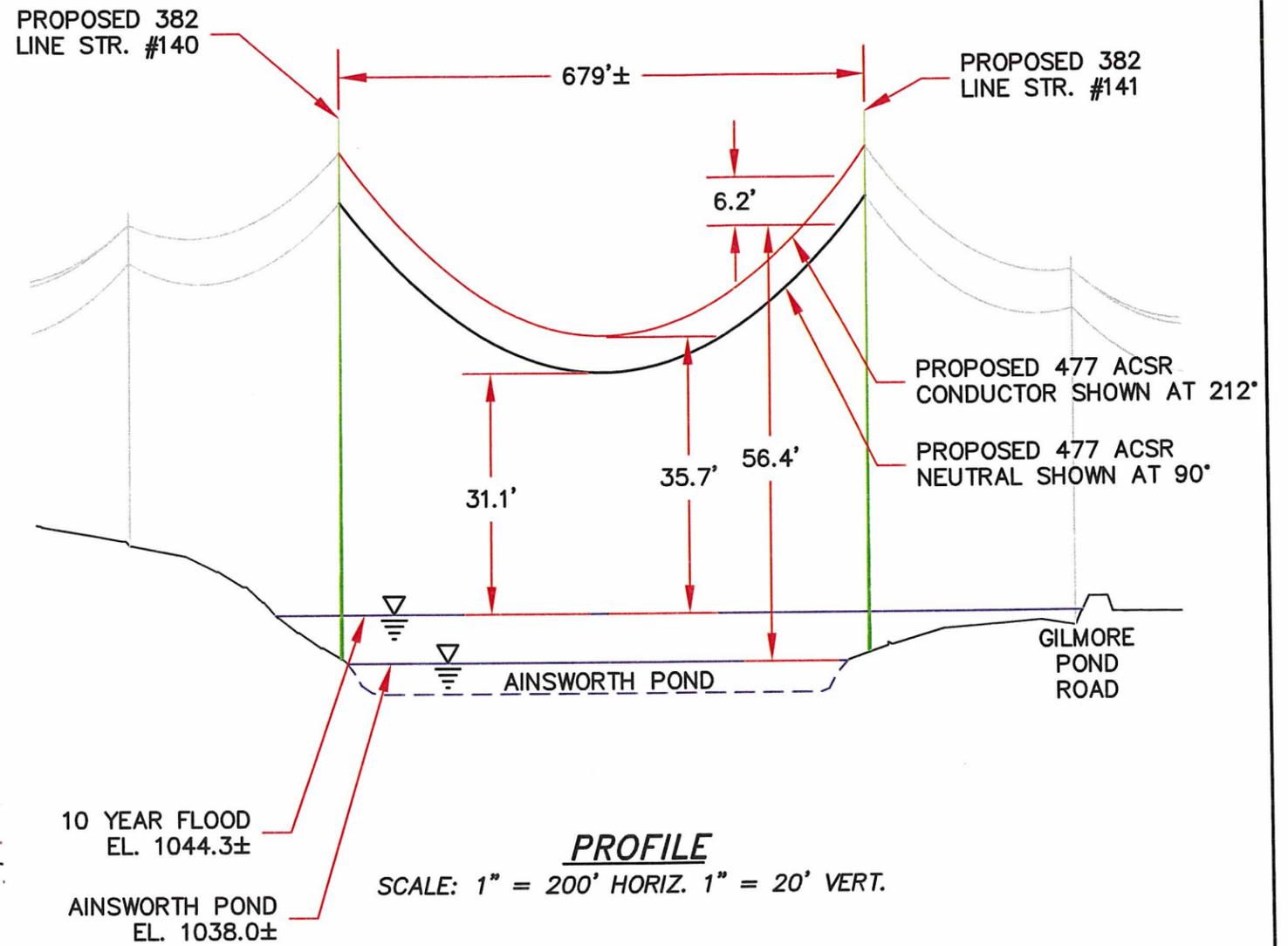
3191 Line – Old crossarms, nest and additional crossarm section



3191 Line – New pole with relocated nest

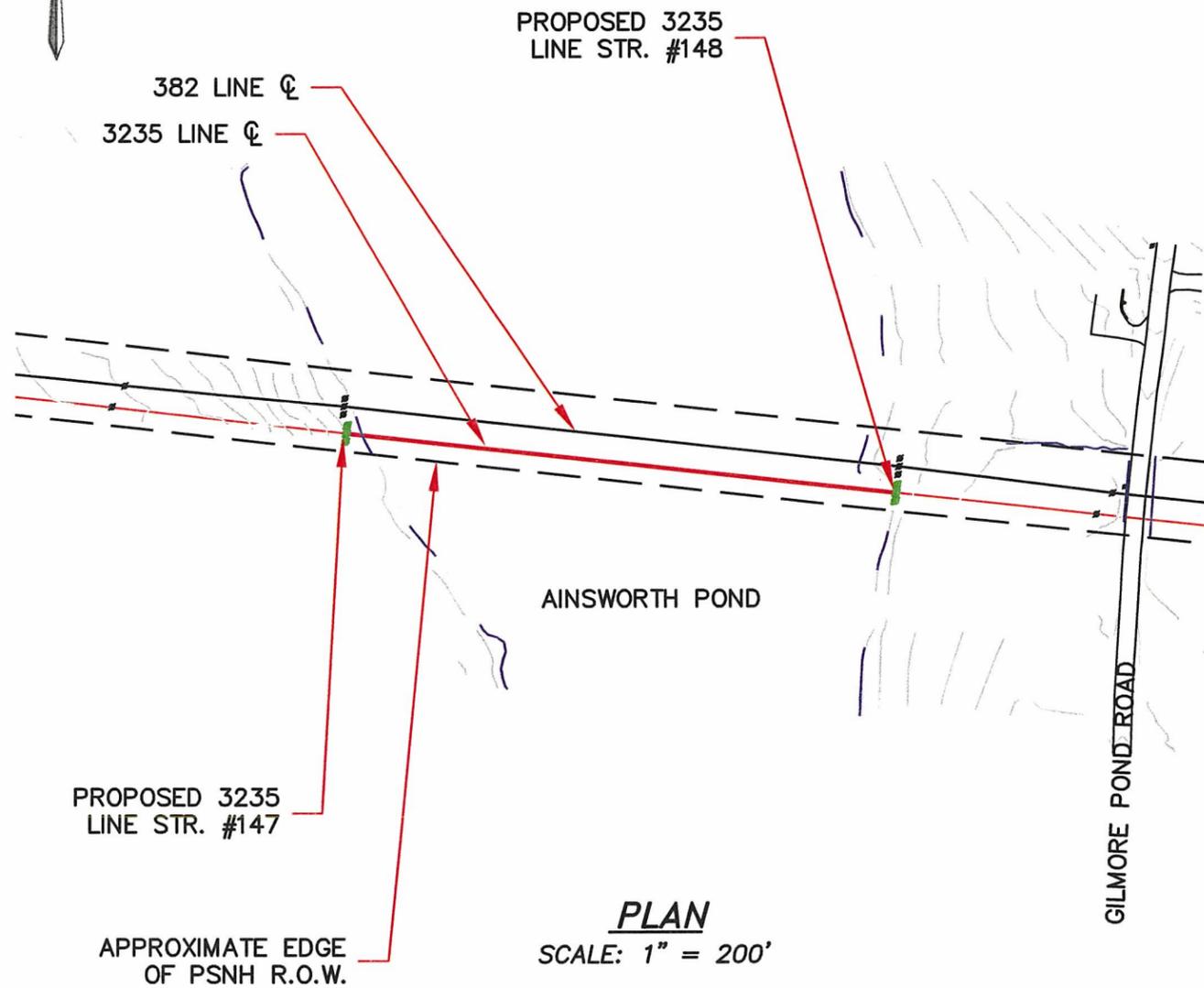


PLAN
SCALE: 1" = 200'

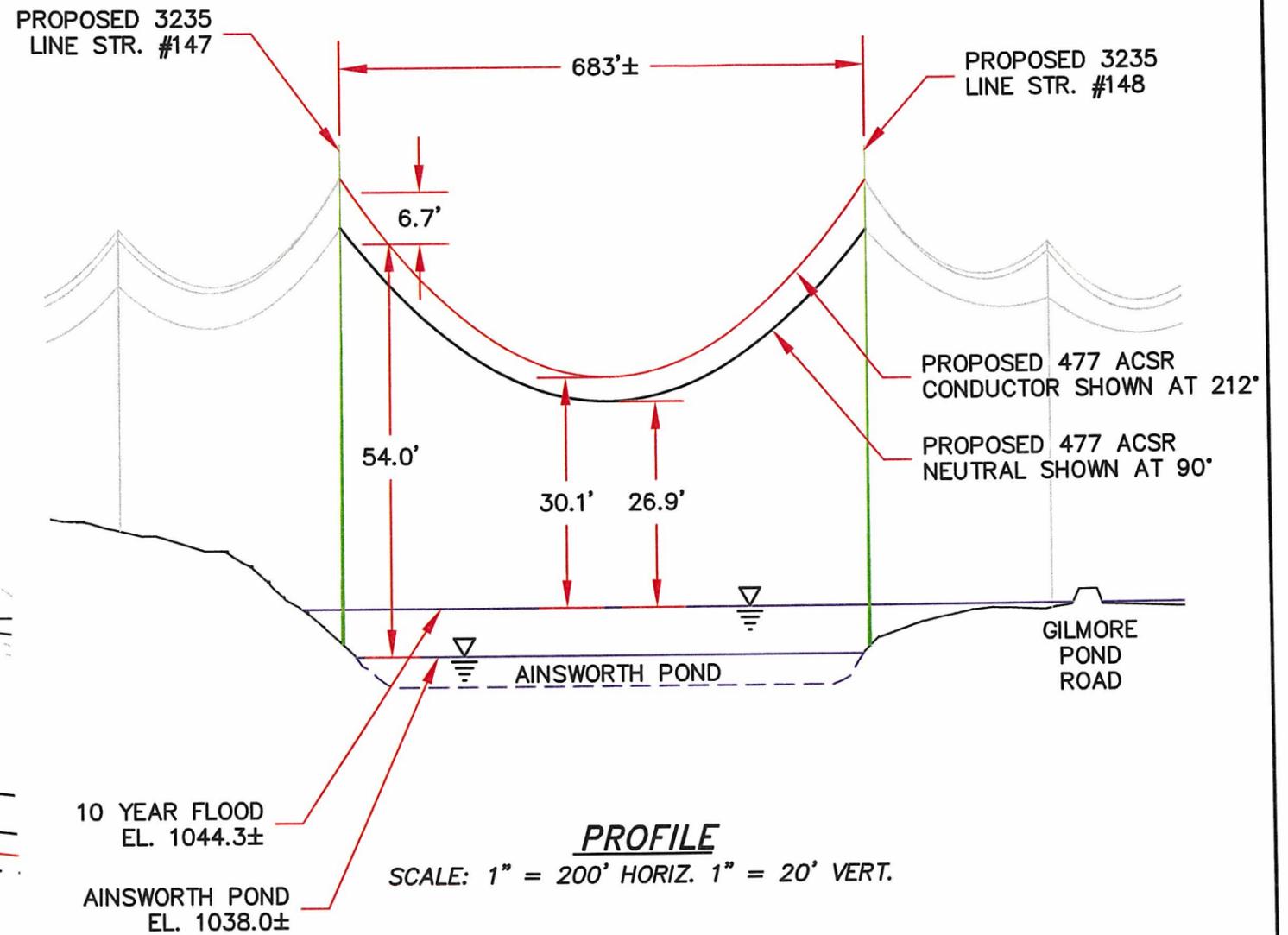


NO.	REVISION	DATE	DRWN	CHK	APPR
1	-	-	-	-	-

<p>Public Service of New Hampshire</p>	Distribution Business			
	<p>382 LINE BETWEEN STRUCTURES 140 & 141 AINSWORTH POND WATER CROSSING PLAN & PROFILE</p>			
<p>DRAWN DMS</p> <p>DESIGNED DMS</p> <p>CHECKED DMS</p> <p>APPROVED DMS</p>	<p>SCALE AS SHOWN</p>	<p>DATE 6/28/11</p>	<p>SHEET 2 OF 4</p>	<p>DRAWING NO. EXHIBIT 2 - 382</p>



PLAN
SCALE: 1" = 200'



PROFILE
SCALE: 1" = 200' HORIZ. 1" = 20' VERT.



Public Service
of New Hampshire

Distribution Business

3235 LINE
BETWEEN STRUCTURES 147 & 148
AINSWORTH POND WATER CROSSING
PLAN & PROFILE

NO.	REVISION	DATE	DRWN	CHK	APPR
1	-	-	-	-	-

DRAWN
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DESIGNED
DMS

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DMS

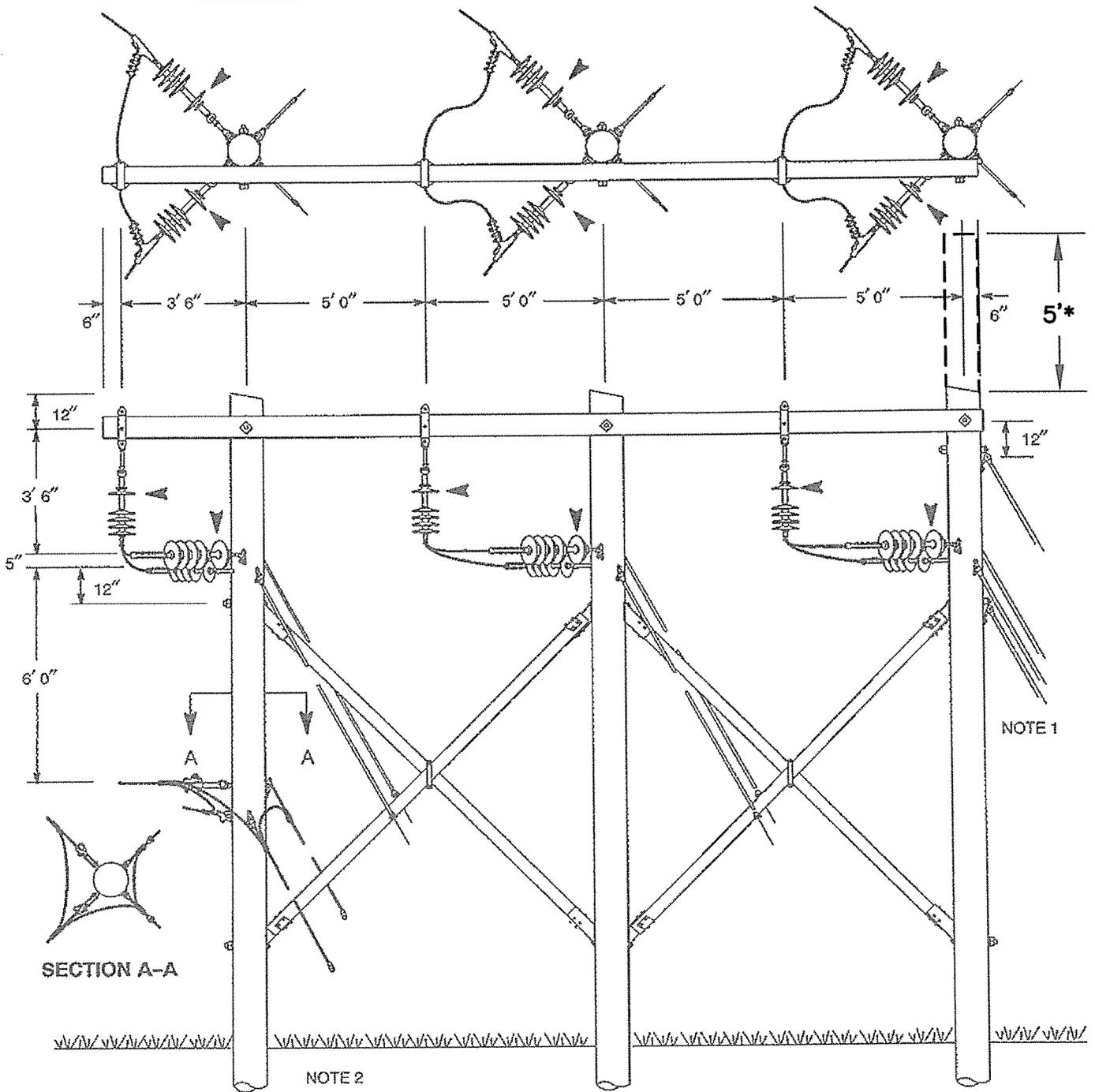
APPROVED
DMS

SCALE AS SHOWN

DATE 6/28/11

SHEET 3 OF 4

DRAWING NO. EXHIBIT 2 - 3235



Notes

1. Select guys and associated material from **Section 06**. Select variation with 78-inch guy strain insulators for attachments opposite primary conductors and bare guy wire only for guying opposite neutral conductors.
2. Grounding material used on every third pole. See **DTR 16.211**.

* THE THIRD POLE ON 382 LINE STR. #140 IS 5' TALLER TO ACCOMODATE THE RELOCATED OSPREY NEST.

	DRAWN DMS	Public Service of New Hampshire	System Projects
	DESIGNED DMS	382 LINE STR. #140, 141 3235 LINE STR. #147, 148	
	CHECKED	AINSWORTH POND WATER CROSSING	
	APPROVED	SCALE N.T.S. STANDARD STR. DETAIL	
1	-	DATE	REVISION DATE
NO.	REVISION	DATE	DRWN CHCK APPR
		6/28/11	SHEET 4 of 4
			DRAWING NO. Exhibit 3