

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

Docket DE 10-232

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR A
LICENSE TO CONSTRUCT AND MAINTAIN A FIBER OPTIC LINE CABLE OVER
AND ACROSS THE PUBLIC WATERS OF GLEN LAKE IN THE TOWN OF
GOFFSTOWN, 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 371:17-20, for a license to install a single fiber optic cable over and across the public waters of Glen Lake in the Town of Goffstown, 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 115 kV transmission line, designated as line C-196. The C-196 line runs between PSNH’s Merrimack Substation in Bow, New Hampshire and PSNH’s Greggs Substation in Goffstown, New Hampshire. It is also an integral part of the PSNH transmission system and the overall New England transmission grid. The C-196 line as presently constructed and licensed by the Commission, crosses Glen Lake with 3 phase wires and two static wires. PSNH proposes to replace one of the static wires with an optical ground wire (OPGW). This OPGW would serve the same functions as the existing static wire but would also add fiber optic capabilities. Use of OPGW cable instead of regular Alumoweld static wire will improve and enhance the reliability and capacity of the communications systems used in PSNH’s electric system operations. The in-service date for this project is November 18, 2010. To support this date, the C-196 Line will be removed from service between October 25, 2010 and November 18, 2010.

2. The existing H-frame structures (structures 143 and 144) will remain with no modifications to the existing phase wires or their heights. The clearances between the new fiber optic cable and the existing conductors have been verified and are discussed in Appendix A. The structures have also been determined to be able to accept the increased loads imparted by the larger cable diameter.

3. This crossing was previously licensed by the Commission on June 6, 1975 under Docket Number DE 75-106, Order number 11,856.

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

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5. All public water bodies will be spanned on existing round wood structures. These structures are a two-pole tangent structure (Type D) and a three-pole deadend structure (Type DA). A detail design specification for these structure types are attached to this petition as FIGURE 1 and FIGURE 2 respectively. As shown on FIGURE 1, the phase wires have a separation at the structure of 14-ft horizontally. The static wire (OPGW) is carried on the structure by a support bracket approximately 4-in down from the top of the bayonet and are attached approximately 6-ft 8-in horizontally and 6-ft 4-in vertically from the closest phase conductor. As shown in FIGURE 2, the phase wires have a separation at the structure of 14-ft horizontally. The static wire (OPGW) is carried on the structure by a support bracket at the top of the crossarm and is approximately 7-ft 6-in vertically and 4-ft 10-in horizontally from the closest phase wire. See Figures 1, 1A, and 2 for attachment distances and areas.

6. Appendix A and Exhibit 2 detail that the installation of OPGW meets 2007 NESC minimum clearances to phase wires (4.8 feet), land (25.5 feet), and during 100-year storm event (15.5 feet). These values were based on Table 235-6.2, Table 232-1.2, and Table 232-1.7 of the NESC 2007 respectively. The worst loading condition for the OPGW is 30°F with 1" of ice which is detailed in Exhibit 2. Other loading conditions not shown in Exhibit 2 were considered as well.

7. The OPGW cable will be sagged using a maximum tension of 6,500 pounds at NESC Heavy Load conditions.

8. No wetlands permits or any other permits will be required as part of this crossing.

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

10. PSNH owns permanent easements, not less than 375' wide, for its lines and facilities on both sides of Glen Lake. This crossing will be constructed within the limits of those easements.

11. PSNH submits that the license petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters listed in this petition. Minimum safe line clearances above all water surfaces and affected shorelines will be maintained at all times. The use and enjoyment by the public will not be diminished in any material respect as a result of the overhead line and cable crossings.

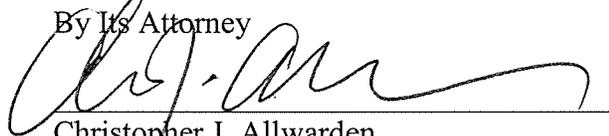
WHEREFORE, PSNH respectfully requests that the Commission:

- 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 a fiber optic cable over and across the public waters as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 30th day of SEPTEMBER, 2010.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW
HAMPSHIRE
By Its Attorney

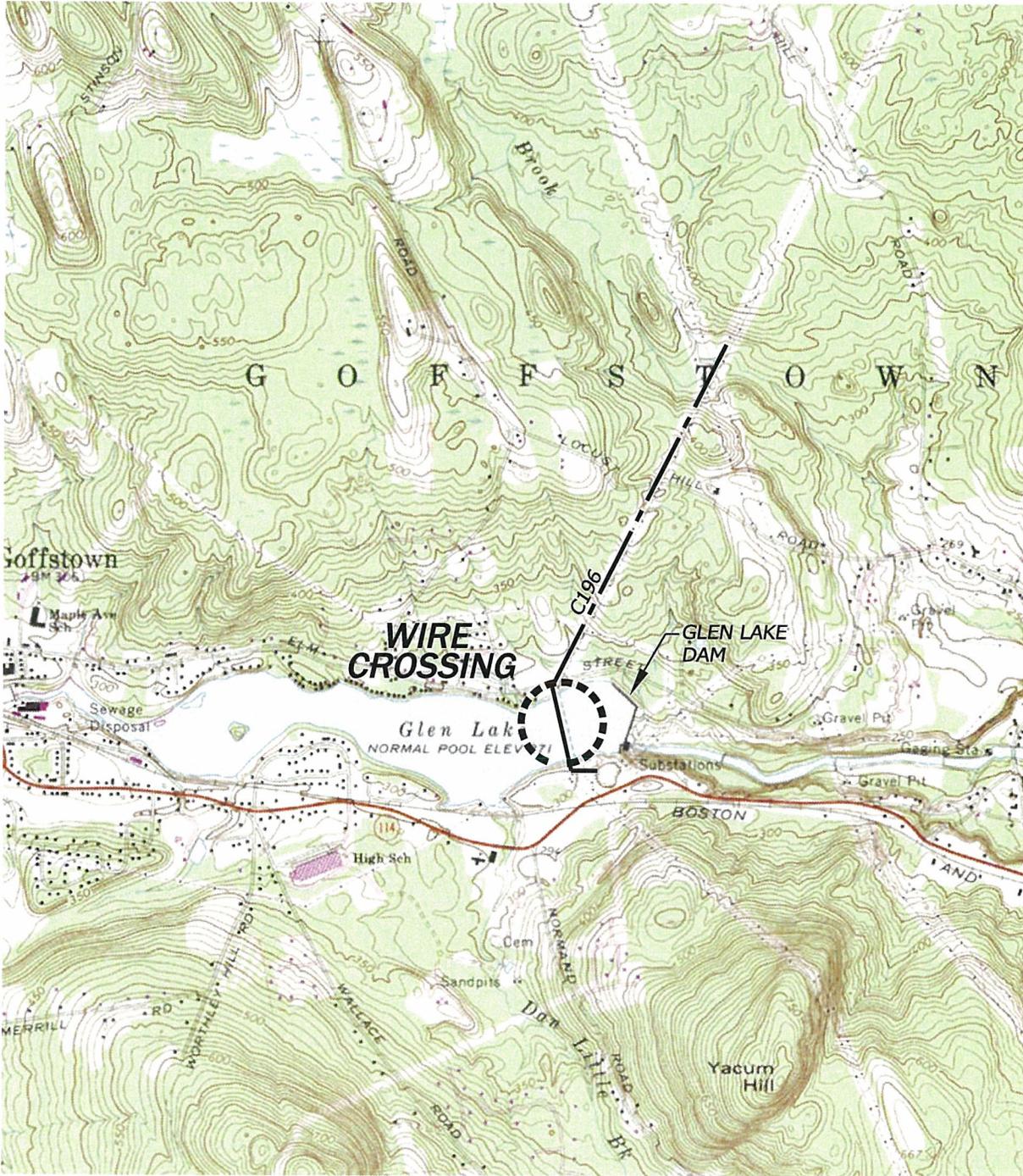


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APPENDIX A
C196
GLEN LAKE
GOFFSTOWN, NH

1. The location of this crossing is shown on the attached location map marked as Exhibit 1.
2. The design and proposed construction of this crossing is shown on the attached PSNH Transmission Drawing entitled “C-196 115 kV Line Crossing Glen Lake Goffstown, NH” (Drawing No. B-7649-130) marked as Exhibit 2.
3. Line C-196 will cross Glen Lake on a two pole 110’ type D structure (North) and one, three pole 85’ deadend Structure (South) with a span of 1180’. A detail of these structures have been provided with the petition as FIGURE 1 and FIGURE 2 respectively. As shown on FIGURE 1, the phase wires are spaced 14’ horizontally. The static wire is carried on the structures above the phase wires by support bolts approximately 6’-4” above and 6’-8” horizontally from the phase wires. As shown on FIGURE 2, the phase wires are spaced 14’ horizontally. The static wire is carried on the structures above the phase wires by a crossarm approximately 7’-6” above and 4’-10” horizontally to the closest phase wire.
4. Clearances to water surfaces, land, and phase wires were based on a worst case loading condition for the OPGW of 30°F with 1” of radial ice. Many other loading conditions, not shown in Exhibit 2, were also investigated for clearance issues as well.
5. This crossing was designed to safely exceed the 100-year flood elevation clearances required by the 2007 NESC. The 100-year flood water elevation for Glen Lake was based on information contained in a flood insurance rate map and Flood Insurance Study #33011C0214D Panel 0214D, effective September 25, 2009, provided by FEMA. The elevations are based on the North American Vertical Datum of 1988 (NAVD88). During a 100-year storm event, the water level at Glen Lake will rise from 272.6’, which is the dam elevation with flashboards installed, to 275.0’. Exhibit 2 details the minimum clearances from the 100-year flood water elevation to the OPGW. The area of the crossing, as required by the NESC (Table 232-1.7, Note 19), is approximately 165.1 acres. This is based on the total area of the lake for a 1-mile stretch in either direction of the crossing (1,362’ x 5,280’)/43,560 sf/ac = 165.1 ac). Based on Table 232-1.7 of the NESC 2007, for insulated communication conductors and cable, the minimum clearance over a water surface of 20-200 acres is 25.5’.

6. Since the poles are situated at the extreme edge of the Lake banks, it has been determined that the land underneath the OPGW is not traversable. However, Exhibit 2 still details that the OPGW will have at least a 71' +/- clearance over land, which is well above the NESC 2007 minimum clearance of 15.5' in traversable areas.
7. The sags and clearance to the phase wires under worst case scenarios are as follows;
 - Minimum phase to OPGW clearance – The weather case that would produce the minimum clearance between the phase wires and the OPGW wire would be a combination of winter weather factors. First, the phase wires would have to be at 30 deg. F just after an ice storm and would have just dropped their ice. The OPGW wire would also be at 30 deg. F and would still be iced with 1" of radial ice. Under these conditions the clearance would be approximately 3' vertically and 4'-10" horizontally from the fiber optic cable to the closest phase wire. Based on Section 235.C.2.a.1 and Table 235-6 section 2.a of the NESC, the minimum clearance required is 57.3", or approximately 4.8' [29" + (121 kV-50 kV) x 0.4"].
 - PSNH investigated various weather and loading conditions for this design. The conditions investigated include NESC C2-2007 Heavy Load Condition, minus 20 degrees F ambient temperature for the phase conductors and OPGW cable, 120 degrees F ambient temperature for the OPGW cable, and 285 degrees F at 50 degrees F ambient for the phase conductors. PSNH used these design conditions and combinations thereof to determine the minimum clearance of all OPGW cable to the water and land surfaces and between the phase conductors and the OPGW cable.

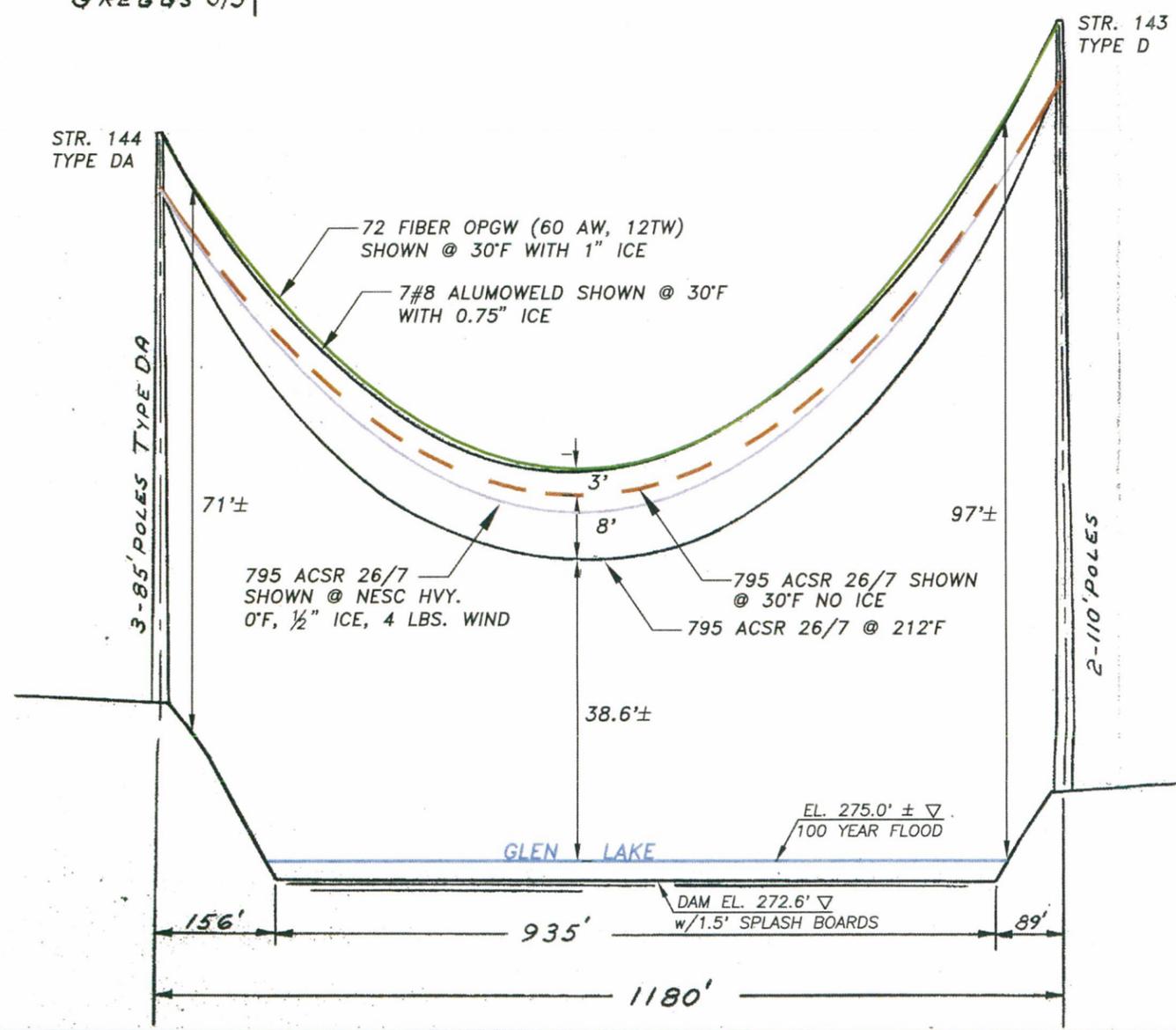
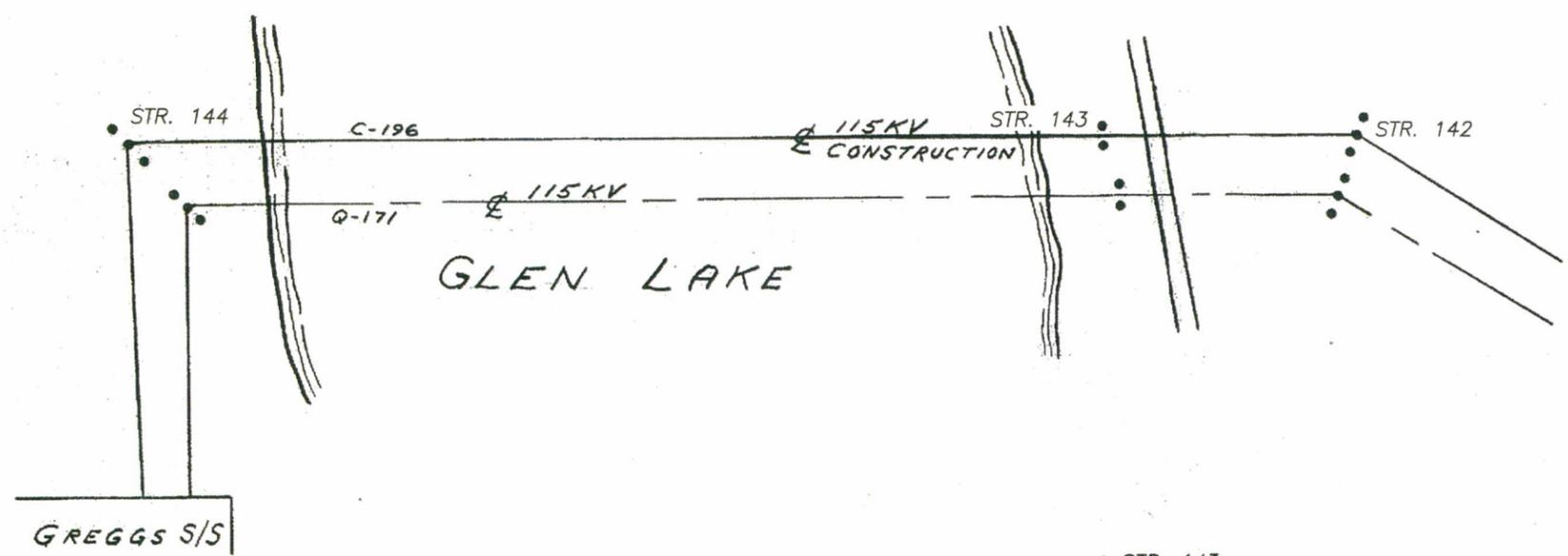


GRAPHIC SCALE
1" = 2000'

EXHIBIT 1 REVISED 09/30/10

NO.	REVISION	DATE	DRWN	CHKD	APPR

DRAWN <i>WNT</i>	Northeast Utilities			Transmission Business
DESIGNED <i>MTM</i>	LOCATION PLAN C196 LINE (115 KV) GLEN LAKE WATER CROSSING GOFFSTOWN, NEW HAMPSHIRE			
CHECKED <i>MTM</i>	SCALE 1" = 2000'	DATE 7/22/2010	SHEET 1 of 2	DRAWING NO. D-7649-130A
APPROVED <i>DSD</i>				



NOTES:

1. CONDUCTOR SAG INDICATED IS 212°F, THE MAXIMUM NORMAL OPERATING TEMPERATURE.
2. MINIMUM CLEARANCE FROM OPGW TO WATER SURFACE AND LAND SURFACES IS 25.5 FEET AND 15.5 FEET RESPECTIVELY.



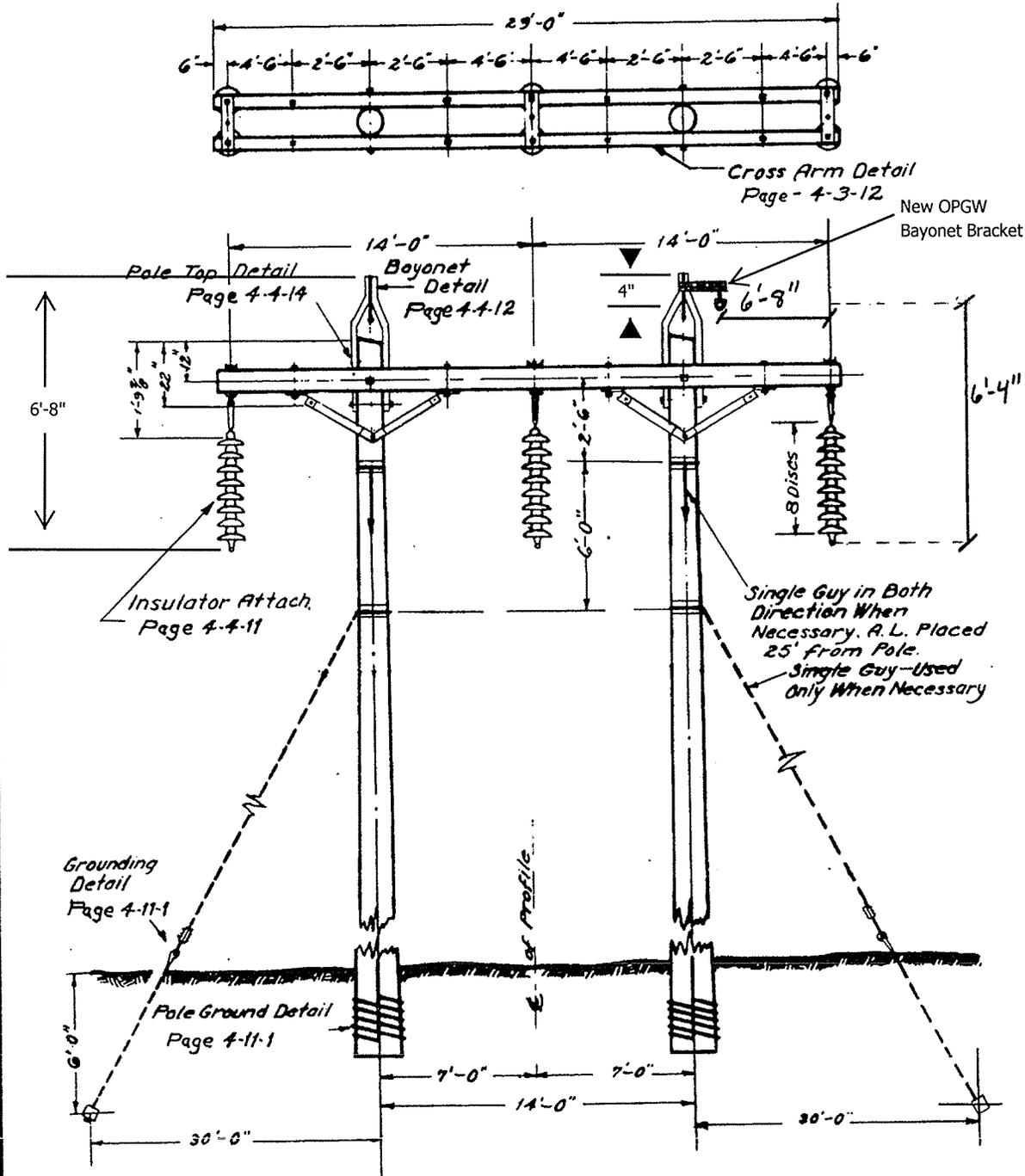
EXHIBIT 2 REVISED 09/30/10

DES. DJH	NO.	REVISION	DATE	BY
DR. ERP	1	ADD OPGW	7/2010	WNT
TR.	2			
CK.	3			
APPR.	4			
	5			
	6			

C196 115KV LINE CROSSING	
GLEN LAKE	
GOFFSTOWN, N.H.	
PUBLIC SERVICE CO. OF NEW HAMPSHIRE ENGINEERING DEPARTMENT	B-7649-130
SCALE 1"=20' VERT. 1"=200' HOR. DATE 9/15/75	

4-21-13

TYPE D STRUCTURE HIGHWAY & RAILROAD CROSSINGS



For Method of Pole Guying
See Page 4-10-15
For Method of Pole & Guy
Grounding See Page 4-11-2

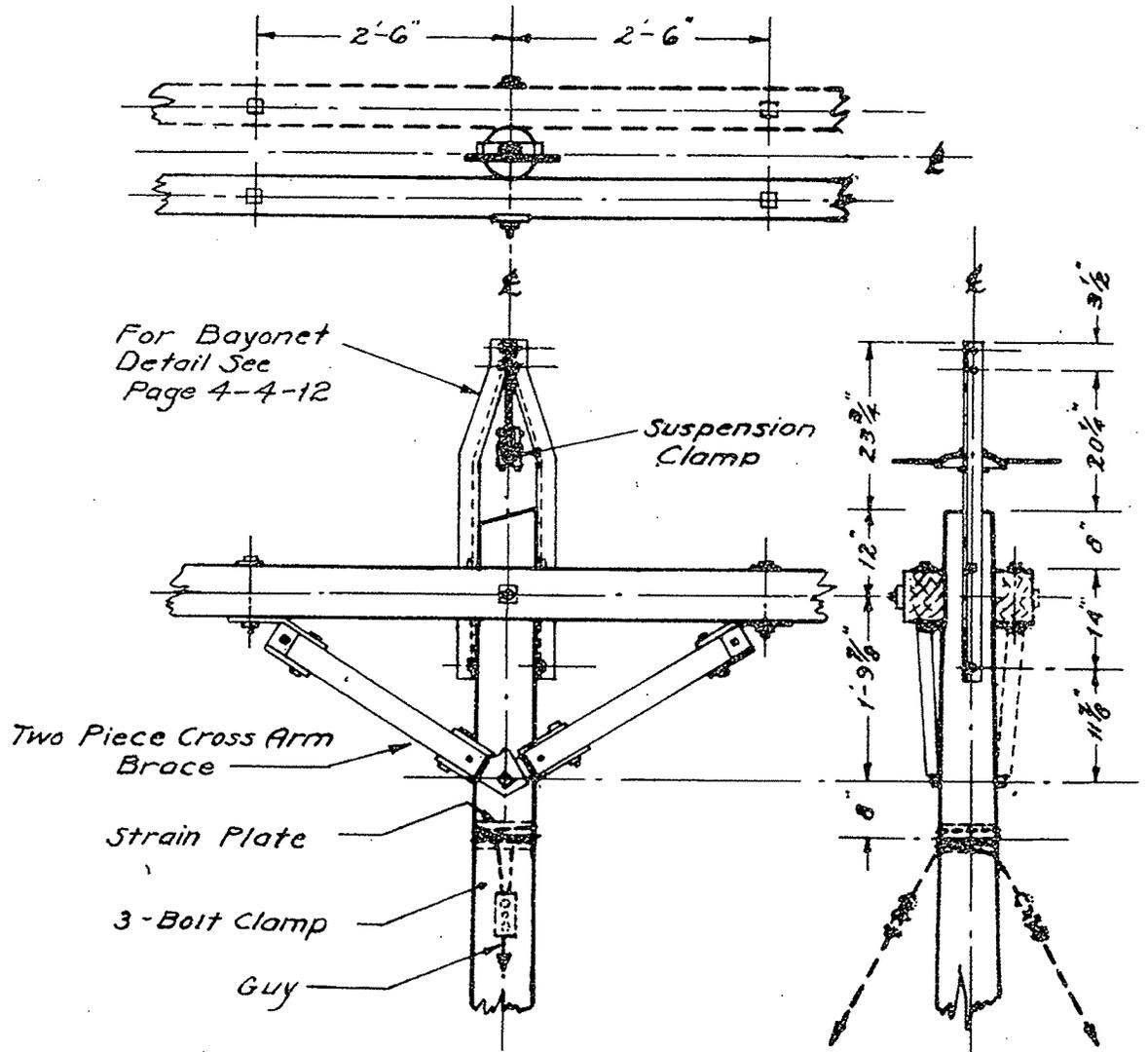
FIGURE 1 REVISED 09/30/10



**115 KV
TRANSMISSION STANDARDS**

ISSUE	DATE
ORIGINAL	

POLE TOP DETAILS TYPE A&D STRUCTURES



NOTE
1. Material Shown With Dashed Line Is Used Only On Type D Structure.

FIGURE 1A

REVISED 09/30/10

ISSUE	DATE

ORIGINAL

DEAD END STRUCTURE TYPE DA
 APPLICATION: ANGLES ABOVE 50°
 GENERAL ARRANGEMENT

110 141

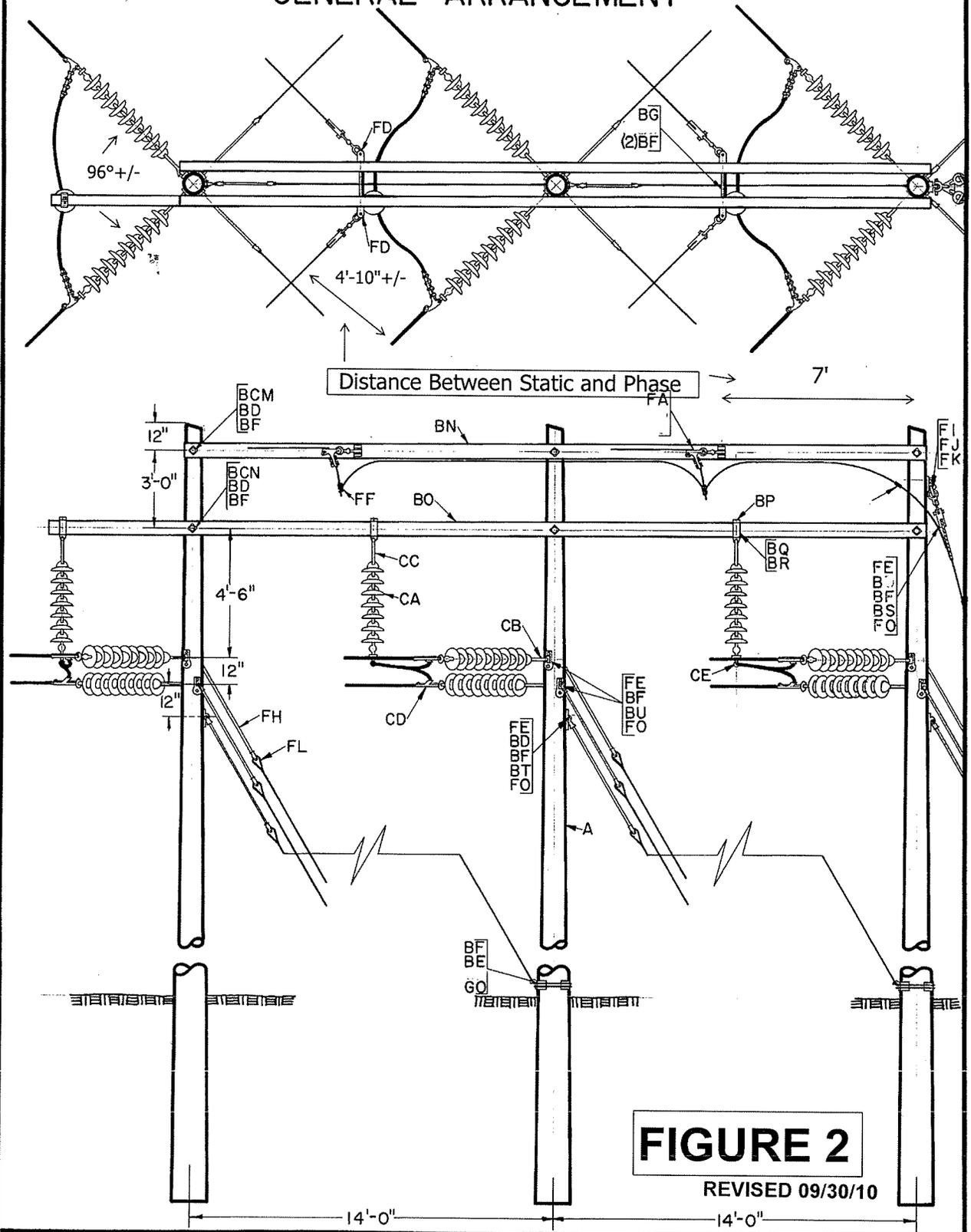


FIGURE 2

REVISED 09/30/10

ISSUE	DATE

ORIGINAL 03-31-80

MARKSPACE P-2404