ATTACHMENT A

verizon

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November 2, 2017

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BY EMAIL AND CERTIFIED MAIL

Dear Deanna,

Thank you for providing us a copy of Met-Ed's 2017 draft license agreement. Our purpose in originally requesting the draft back in early 2012 was to determine how the provisions of the draft license agreement, including the pole rental rate, compare to those being discussed in our ongoing effort to reach agreement on a new joint use agreement. Our review revealed that terms of the draft license agreement are not materially different from the terms of the parties' current Joint Use Agreements or the draft joint use agreement that we have been negotiating. In this respect, the draft license agreement confirms our view that Verizon has been entitled to the FCC's new telecom rental rate since the FCC issued its Pole Attachment Order back in 2011.

The Commission's recent Order in the Dominion pole attachment complaint proceeding fully supports our conclusion. The FCC's Enforcement Bureau vacated the rental rate in a "new" agreement because it was not just and reasonable and confirmed that Verizon was entitled to a refund of overpayments above the "just and reasonable' rate since the effective date of the Order. The Enforcement Bureau further confirmed that rate relief would also be warranted under an "existing" agreement if it, like the agreements here, was entered when the ILEC's pole ownership numbers placed it in an inferior bargaining position. In the Dominion proceeding, a 65% to 35% pole ownership disparity was sufficient to justify rate relief. Here, the disparity is even greater, with Met-Ed owning 81% of the joint use poles now and when the current rates were imposed on Verizon.

The Commission's Dominion Order and its pending Infrastructure NPRM confirm that the parties should be negotiating an appropriate new telecom rate for Verizon. Under our joint use arrangement, Verizon bears significant pole maintenance and replacement costs that are not imposed on our competitors. As such, Verizon does not enjoy any advantages that would justify a departure from the new telecom rate. Even under the draft joint use agreement, Verizon would not have an advantage over its competitors because we have worked to negotiate an agreement with modernized cost-causer terms and conditions.

While we appreciate Met-Ed's willingness to modify its rates, its series of offers all result in Verizon continuing to make a net annual pole payment in the $3 million dollar range. For example, in 2016, Met-Ed invoiced Verizon for about $3.03 million. Met-Ed's next rate offer, in April 2017, reduced that payment by $465. Similarly, its July offer would require Verizon to continue paying nearly $3 million in annual payments – about a 1.5% discount off the 2016 invoiced amount. In stark contrast, were Verizon and Met-Ed to pay properly calculated proportional new telecom rates, the limited data currently available to Verizon shows that Verizon's annual net payment, using 2016 cost data, should be about $795,000, and possibly lower.

The latest rate offered by Met-Ed is $27.65, which is over three times the $9.03 new telecom rate that Met-Ed charges Verizon's competitors. In addition to this rate not being calculated under the new telecom rate formula, it is inflated by Met-Ed assigning Verizon 3 feet of occupied space, even though Verizon does not use 3 feet of space on Met-Ed's poles (nor is Verizon even allocated 3 feet of space under the Joint Use Agreements). Met-Ed also uses an average of 3.33 attaching entities but has not provided any survey evidence that supports this number. Verizon also notes that the number is different from Met-Ed's earlier position that its poles average 4 attaching entities. In the absence of actual data, the FCC's presumptive inputs apply.

In the Dominion Order, the Commission found that it was unjust and unreasonable for a power company to demand that Verizon pay a higher rate than the power company is willing to pay for the use of more space on each joint use pole. In our case, while Met-Ed occupies significantly more space on each pole than Verizon, it proposes to pay Verizon $19.83 per pole for that space, while proposing to charge Verizon $27.65 per pole.

Despite our efforts for nearly six years to agree on a just and reasonable rate, we have not been successful. Therefore, Verizon requests that executives of the parties with sufficient authority meet as soon as possible to resolve this dispute. If we are unable to reach agreement on a just and reasonable rental rate at the face-to-face meeting, Verizon will have no other option than to seek rate relief at the FCC and refunds for the amounts it has overpaid.

Please let us know as soon as possible when Met-Ed is available to meet during the next four weeks. If it will facilitate scheduling, Verizon is amenable to meeting at a location of Met-Ed's choosing.

Sincerely,

Stephen Mills

ATTACHMENT B

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Verizon Pennsylvania LLC and Verizon North LLC, *Complainants,*	)	
v.	)	**Proceeding Number 19-354** **Bureau ID Number EB-19-MD-008**
Metropolitan Edison Company, Pennsylvania Electric Company, and Penn Power Company, *Defendants*	)	

DECLARATION OF STEPHEN F. SCHAFER

I, Stephen F. Schafer, declare as follows:

1. My name is Stephen F. Schafer. I am the Manager, Joint Use & Cable Locating for FirstEnergy Service Company.

2. I make this declaration in support of Metropolitan Edison Company, Pennsylvania Electric Company, and Penn Power Company's ("FirstEnergy") Answer to the Pole Attachment Complaint in the above-captioned proceeding.

3. I have been fully involved in negotiations with Verizon to modify the rates, terms and conditions of Verizon's joint use agreements with FirstEnergy.

4. All during these negotiations Verizon has insisted on FirstEnergy charging Verizon new rental rates based on the FCC's new telecom formula, but I am unaware of any effort by Verizon to establish that the rates, terms and conditions of its existing joint use agreements with FirstEnergy do not create advantages to Verizon over its cable company and CLEC competitors.

5. Instead, it appeared to me that Verizon's position insisted that all they needed to do was ask for the new telecom rate to make the burden shift to FirstEnergy to demonstrate that

Verizon was not similarly situated to existing cable and CLEC attachers and so should not get the new telecom rate.

6. I was disappointed that Verizon did not want to move off of its position that only the new telecom leasing rate could be an appropriate joint use rate, especially since the parties had spent a good amount of time having cordial negotiations to update and consolidate the multiple existing joint use agreements into a unified agreement.

7. The effort to consolidate these agreements was begun by both parties using a template agreement that Verizon offered.

8. The parties, in fact, had arrived at final terms and conditions for operational matters and simply needed to add a new agreed-upon joint use cost-sharing rate. Verizon's inability to move off of the new telecom rate, however, prevented those updated terms and conditions from ever taking effect.

9. FirstEnergy converted Met-Ed's rates into "reciprocal" per-pole rates that charge both parties the same per-pole rate for use of the other party's poles, because it is useful to compare Met-Ed's deficiency payment to per pole rental rates each party would charge the other. No suggestion was ever made by FirstEnergy to Verizon that this was a settlement proposal "to reduce Verizon's annual net rental obligations by just $465," as Verizon's witness Mr. Mills contends.

10. FirstEnergy offered to transition Verizon out of the pole owning business as part of its offer for Verizon to enter a standard CLEC agreement. Specifically, FirstEnergy offered to set all new poles and to set and take ownership every time a Verizon pole must be replaced due to storm damage, car-pole accidents, age, condition, or the need to increase capacity for new attachers. FirstEnergy described this as an "accelerated transition." Verizon, however, ignored repeated direct requests for a response to these offers.

11. During negotiations, FirstEnergy made several good-faith offers to significantly reduce Verizon's annual rental payments, including reductions of more than [redacted] per year under the existing agreements. Verizon's response was a flat rejection. Verizon's rate negotiations have been largely belligerent and completely lacking any hint of reaching a compromise. Verizon's lack of movement even when FirstEnergy yielded concessions gave no indication that we could find middle ground.

12. The advantages Verizon has in its joint use agreements over cable companies and CLECs that have third party pole attachment license agreements are numerous.

13. Verizon's joint use agreements have allowed Verizon to construct its communications systems unfettered by significant make-ready expense, while its competitors pay a substantial amount in make-ready to gain access to FirstEnergy's poles.

14. Attached at Exhibit SFS-1 is a chart that was prepared under my supervision that identifies the make-ready costs incurred by Verizon to attach to poles owned by Met-Ed, Penelec and Penn Power, and compares them to the make-ready costs incurred by some of Verizon's competitors. The Verizon competitors were identified as those which submitted the largest number of attachment applications during the past two years for each of the FirstEnergy operating utilities. The number of poles to which each of these entities is currently attached is also identified, and a calculation was performed to determine the make-ready costs these entities have incurred on a per attached pole basis.

15. This information indicates that:

    For Poles owned by Met-Ed:

    (1) Attachers pay on average [redacted] per existing attached pole per year in make-ready expenses.
    (2) Verizon pays on average [redacted] per existing attached pole per year in make-ready expenses.
    (3) Verizon's competitors thus incur every year, on average, [redacted] more in make-ready costs per attached pole than does Verizon.

    For Poles owned by Penelec:

    (1) Attachers pay on average [redacted] per existing attached pole per year in make-ready expenses.
    (2) Verizon pays on average [redacted] per existing attached pole per year in make-ready expenses.
    (3) Verizon's competitors thus incur every year, on average, [redacted] more in make-ready costs per attached pole than does Verizon.

    For Poles owned by Penn Power:

    (1) Attachers pay on average [redacted] per existing attached pole per year in make-ready expenses.
    (2) Verizon pays on average [redacted] per existing attached pole per year in make-ready expenses.
    (3) Verizon's competitors thus incur every year, on average, [redacted] more in make-ready costs per attached pole than does Verizon.

16. Verizon has not recently filed many applications to install new attachments to FirstEnergy's poles because it does not have to. Verizon already has attached to the vast majority of available FirstEnergy poles pursuant to the "built to order" joint use agreement system.

17. At this point, to reach new customers and to provide additional services to existing customers, all Verizon needs to do is overlash its existing facilities or light existing dark

fiber capacity to reach those new customers and to provide the additional services that its existing customers might require.

18. This time-saving advantage that Verizon has is not offset by having one-touch make-ready available on FirstEnergy's systems, since no attacher on FirstEnergy's systems is currently using the one-touch make-ready process due, in large part, to complex make-ready required in any given application proposal.

19. Verizon's relatively few applications to install new facilities require considerably less upfront work. When filing their applications, Verizon's competitors must submit pole profile sheets and photographs of the poles to which they seek to attach, but Verizon does not need to do either of these steps nor wait for processing.

20. Verizon's competitors also pay application fees as required by FirstEnergy's electronic application processing system known as SPANS, which Verizon does not need to pay. The fees amount to [redacted] per application plus [redacted] per pole and, like make-ready costs, are not recovered through FirstEnergy's annual rental rates.

21. Verizon is also subject to much more lenient overlashing rules than CLEC and cable company attachers. Unlike CLEC and cable companies, Verizon does not need to notify FirstEnergy of its overlashing activity or to perform pole loading studies. Cable company and CLEC attachers, however, must provide 15-days' advance notice of overlashing, 15-days' notice upon completion of the overlashing, and pole loading studies to support their overlashing.

22. Verizon is also not subject to the field audit costs that FirstEnergy's CLEC and cable attachers pay. FirstEnergy will be conducting field audits on a five-year cycle for all of its operating utilities that is similar to the field audit it has conducted in The Toledo Edison Company's service territory. The costs for that field audit to Verizon competitors were [redacted] per pole, and dividing [redacted] per pole by five years equals a rate difference of [redacted] per pole per year that Verizon's competitors will pay but Verizon will not.

    FirstEnergy performs tree removals near all of its facilities, including facilities on Verizon's poles, which is a significant benefit to Verizon.

23. FirstEnergy also inspects Verizon's pole plant because Verizon cannot be relied upon to properly inspect its own pole plant, and this inspection also provides a significant benefit to Verizon.

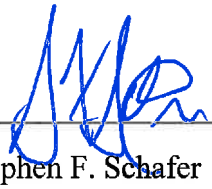
24. FirstEnergy has also replaced a number of poles for Verizon at FirstEnergy's expense. FirstEnergy also incurs significant unreimbursed expense responding to emergency events on Verizon-owned poles.

25. An analysis was performed under my supervision of Verizon's claim that Met-Ed made 135 requests to attach to Verizon's poles and that 66 of those required Verizon to incur pole replacement costs. The results of that analysis are attached hereto at Exhibit SFS-2. We determined that 15 of those pole replacements were the result of FirstEnergy asking Verizon to replace Verizon poles that Verizon did not know were dangerous or deteriorated. We also determined that 13 more of these pole replacement requests were nothing more than a forwarding of government or highway project requests. As a result, these highway project and deteriorated Verizon poles were replaced not simply for FirstEnergy's benefit.

26. First Energy's Field Reference Guide depicts the information required in applications by third party attachers, and is not a FirstEnergy construction standard.

27. FirstEnergy hired the firm Precision Consulting, Inc. ("PCI") to develop statistically-reliable samples of Penelec, Met-Ed and Penn Power poles to which Verizon is attached and Verizon poles to which FirstEnergy is attached, using FirstEnergy's GIS data files. FirstEnergy then hired the firm Davey Resource Group ("DRG") to perform a field audit of those poles on each of the lists.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

By: 

Stephen F. Schafer
Manager, Joint Use & Cable Locating
FirstEnergy Service Company

Dated: February 2, 2020

EXHIBIT SFS-1

EXHIBIT SFS-2

Verizon Analysis - PA Complaint, Mills Par 60	
Pole Replacements Verizon Made at Verizon's Cost	
Met-Ed requests to establish joint use on a Verizon pole or to Replace a Verizon Pole	135
Met-Ed requests requiring Verizon to incur pole replacement costs	66
Percentage of Met-Ed requests requiring Verizon to incur pole replacement costs	48.9%

FE Analysis - SPANS data for January 1, 2014 through September 30, 2019	
Pole Replacements Verizon Made at Verizon's Cost	
Met-Ed requests to establish joint use on a Verizon pole or to Replace a Verizon Pole	132
Met-Ed requests requiring Verizon to incur pole replacement costs	42
Met-Ed requests requiring Verizon to replace danger / deteoriated Verizon poles	15
Met-Ed requests requiring Verizon to replace Verizon poles for government / highway project	13
Percentage of Met-Ed requests requiring Verizon to incur pole replacement costs	31.8%

ATTACHMENT C

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Verizon Pennsylvania LLC and Verizon North LLC, *Complainants,*	)	
v.	)	**Proceeding Number 19-354** **Bureau ID Number EB-19-MD-008**
Metropolitan Edison Company, Pennsylvania Electric Company, and Penn Power Company, *Defendants*	)	

DECLARATION OF WILLIAM ZARAKAS

I, William Zarakas, declare as follows:

1. My name is William P. Zarakas. I am a Principal with The Brattle Group, an economic consulting firm, where I work primarily on economic and regulatory matters concerning the communications and energy industries. I have been involved in the economic analysis of issues facing these industries for roughly 30 years. I have provided reports and/or testimony before the Federal Communications Commission (FCC), the Federal Energy Regulatory Commission (FERC), the Securities and Exchange Commission (SEC), the Copyright Royalty Judges (Library of Congress), the U.S. Congress, state regulatory agencies, arbitration panels, foreign governments, and courts of law. I have previously provided testimony and/or expert reports to the FCC on a range of issues and proceedings, including the economic issues associated with mergers and acquisitions (e.g., Sprint/TMobile, AT&T/Time Warner, Tribune/Nexstar); the economics and feasibility of deploying broadband networks; competitive analysis with respect to the market for business service data (BDS); market share and churn analyses; cost models; foreclosure and bargaining models; and pole attachments matters. My curriculum vitae is attached hereto at Exhibit WZ-1.

2. Counsel for FirstEnergy has requested that I review the Pole Attachment Complaint submitted to the Federal Communications Commission ("FCC" or "Commission") by Verizon Pennsylvania LLC and Verizon North LLC against FirstEnergy utility operating companies Metropolitan Edison Company, Pennsylvania Electric Company and Penn

Power Company (collectively FirstEnergy). Specifically, Counsel requested that I provide my assessment concerning whether or not FirstEnergy held bargaining leverage and exercised bargaining power in its negotiations with Verizon with respect to the terms, conditions and rates for pole attachments.

3. Verizon claims that FirstEnergy obstructed negotiations between it and FirstEnergy with respect to its pole sharing arrangements and rates under the two companies' joint use agreements. Verizon further claims that this ultimately resulted to an impasse, which led Verizon to seek recourse with the Commission in the current proceeding. Verizon also claims that FirstEnergy was effective in its obstruction because FirstEnergy has bargaining leverage and exerted its bargaining power over Verizon during negotiations. Review of correspondence between Verizon and FirstEnergy indicates that the parties were unable to reach resolution.[1] However, Verizon asserts that FirstEnergy owns more poles (in the pole network covered under their joint use agreements) than Verizon, which gave FirstEnergy the clear upper hand in negotiations. Therefore, Verizon has asked the FCC to adjudicate by considering what the result of a negotiation between it and FirstEnergy would have produced if the bargaining leverage between the two parties was more balanced. Verizon believes that the lack of a balanced negotiation entitles it to be charged the pole attachment rate that FirstEnergy charges non-ILEC pole attachers (under a leasing arrangement) combined with the contractual attachment treatment included in the current joint use agreements.

4. Verizon's claim that FirstEnergy has bargaining power is without foundation. Verizon has based its conclusion concerning bargaining power on a cursory review of the number of poles (i.e., FirstEnergy has more poles than Verizon). However, the FCC, in its 2011 Pole Attachment Order, recognized that there is more to determining bargaining power than simply looking at relative percentages of pole ownership. Consideration of the following factors serves to negate concerns that FirstEnergy holds bargaining leverage and is able to exercise bargaining power in negotiating pole attachment rates with Verizon.

   - Verizon has a less-costly alternative to attaching to FirstEnergy's poles under the joint use agreements. FirstEnergy offered to provide pole attachments to Verizon under the leasing arrangements provided to non-ILECs and charge them the associated lower rate. Verizon rejected FirstEnergy's offer.
   - FirstEnergy would suffer considerable harm if it was unable to connect to Verizon's poles, which makes dissolution of mutual pole attachment agreements an impracticality. Theoretically, Verizon would realize even more harm (than would FirstEnergy) if both parties were unable to attach to each other's poles. However, the disruption and harm to FirstEnergy would be unprecedented and unacceptable, as FirstEnergy stated publicly in a prior

[1] For example, in email correspondence between Verizon and FirstEnergy, a Verizon representative concluded that due to "fundamental areas of disagreement, I didn't think it would be productive since any offer is grounded in First Energy needing to ultimately accept that the new telecom rate formula, with appropriate inputs, applies." Email from Brian Trosper (Verizon) to David J. Karafa (FirstEnergy), Subject: [EXTERNAL] RE: FirstEnergy Counterproposal, January 24, 2020.

Complaint proceeding.[2] As a result, Verizon was fully aware that FirstEnergy would be unable to act on any threat to dismantle the pole sharing arrangement.

- Economic and practical factors also negate the potential of FirstEnergy exercising bargaining power. Constructing a duplicate pole network is an expensive undertaking, and likely an impossible one. Even if FirstEnergy was able to replace Verizon's poles, it would almost certainly be prohibited from recovering the sizable incremental costs in the rates it charges to customers.
- Finally, the evergreen provision in the current joint use agreements prevents FirstEnergy from disconnecting Verizon's attachments from its poles. This means that FirstEnergy could not actually take any actions that are typically associated with the exercise of bargaining power.

5. Review of Verizon's preference for the terms and conditions included in the joint use agreements over switching to a leasing arrangement is also informative with respect to whether the two attachment arrangements are similarly situated. In opting not to accept FirstEnergy's offer to switch Verizon to the leasing arrangement that FirstEnergy provides to non-ILECs, Verizon revealed that it does not consider that the two pole attachment arrangements are similarly situated. Otherwise, Verizon would have readily accepted the offer of similarly situated pole attachment arrangements at a lower price.

I. BACKGROUND

6. It is my understanding that pole owners are required, by federal legislation, to allow non-ILEC telecommunications providers and cable television operators to attach to their respective poles at rates following formulas set by the FCC or state regulators. On the other hand, ILECs "have no statutory right to nondiscriminatory pole access under section 224(f)(1)."[3] Electric utilities and incumbent local exchange carriers had entered into joint use agreements and shared joint pole networks before federal legislation (requiring that pole access be given to non-ILECs) was passed. Joint use agreements "reflect a decades-old contractual responsibility of incumbent LECs to share in infrastructure costs and also account for the fact that incumbent LECs still own many poles today."[4] The arrangements, under which FirstEnergy and Verizon attach to each other's poles, as well as any payments due one another, are specified in such joint use agreements.

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[2] In the Matter of Commonwealth Telephone Company LLC d/b/a Frontier Communications, et. al., Complainants v. Metropolitan Edison Company, et.al., Respondents EB-14-MD-008, Response to Pole Attachment Complaint, Metropolitan Edison Company, et. al. July 11, 2014. "Whatever the scenario, the costs to remove FirstEnergy's electric facilities and transfer them to a newly-constructed pole or underground distribution system are prohibitively expensive relative to remaining on Frontier's poles, even if WVPSC or PaPUC would allow it (which they likely would not)."

[3] In the Matter of Implementation of Section 224 of the Act, a National Broadband Plan for Our Future, WC Docket No. 07-245, GN Docket No.09-51, Report and Order and Order on Reconsideration, April 7, 2011 (2011 Pole Attachment Order), ¶ 207.

[4] *Id.*, ¶ 216 n.654.

7. The rates that are charged by FirstEnergy to Verizon are different from the rates that FirstEnergy charges to non-ILECs (i.e., CLECs and cable companies). These latter rates are set under formulas specified by the FCC, referred to as the Telecom Rate and Cable Rate, respectively. Joint use agreements between ILECs and electric utilities also "implicate rights and responsibilities that differ from those in typical pole lease agreements between utilities and telecommunications carriers and cable operators."[5]

8. In the current Complaint, Verizon claims that FirstEnergy is overcharging for pole attachments because, it alleges, the arrangements under which Verizon is able to attach to FirstEnergy poles are similarly situated to the arrangements provided by FirstEnergy to non-ILECs, while the rates for pole attachments that FirstEnergy charges Verizon exceed those that FirstEnergy charges non-ILECs under lease arrangements. Verizon claims that FirstEnergy was able to charge these higher rates because FirstEnergy owns more poles (than does Verizon) in the shared pole network covered by the joint use agreement, which enabled FirstEnergy to exert bargaining power over Verizon. That is, Verizon claims that FirstEnergy did not accommodate Verizon's proposals when negotiating pole attachment rates because FirstEnergy's higher percentage of pole ownership gave it bargaining power over Verizon.

II. FIRSTENERGY'S BARGAINING POWER HAS NOT CHANGED SINCE ITS LAST JOINT USE NEGOTIATION WITH VERIZON.

9. Verizon represents that, during the relevant period of review, FirstEnergy owned 73% of the pole included under the Verizon-First-Energy joint use agreements, and Verizon owned the remaining 27%. The ownership percentages varied among the FirstEnergy utility operating companies, with Metropolitan Edison owning 81% of the poles included under the Verizon-FirstEnergy joint use agreement, and with Pennsylvania Electric Company owning 66% and Penn Power Company owning 78% of such poles.

10. The percentages of pole ownership under the joint use agreements have not materially changed since the time of the last negotiation between Verizon and First Energy for joint use rates in 2009. At that time, Verizon indicated that the joint use rate issue was "amiably resolved" and that "Verizon PA and FirstEnergy can finally have a common rate structure that is fair and equitable for all the Joint Use Agreements between both companies in Pennsylvania."[6] Verizon's letter to FirstEnergy plainly states that Verizon was satisfied with the results of its negotiations with FirstEnergy and does not convey any view that (in Verizon's opinion) FirstEnergy exerted bargaining power. The percentage of pole ownership, therefore, did not appear to unduly influence the outcome of negotiations in 2009 – which is in line with the FCC's acknowledgement that the percentage of pole ownership alone is not the sole determinant of bargaining power and corresponds with

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[5] *Id.*, ¶ 217. This means that joint use agreements typically provide ILECs with benefits that are not similarly conveyed to non-ILECs.

[6] Letter to FirstEnergy Joint Use Team from Norman L. Parish, Verizon, Manager – Network Engineering, August 12, 2009.

basic economic practicalities (discussed later in this declaration). Verizon did not present any evidence as to why circumstances differ today.

III. A LESS-COSTLY ALTERNATIVE AVAILABLE TO VERIZON HAS "REDUCED THE DISPARITY IN THE RELATIVE BARGAINING POWER" BETWEEN FIRSTENERGY AND VERIZON.

11. In its 2011 and 2018 Pole Attachment Orders,[7] the FCC indicated that evidence of bargaining power in setting pole attachment rates is an important consideration in the FCC's evaluation of ILEC pole attachment complaints. However, in these Orders, the Commission acknowledged that the percentage of pole ownership is not the sole indicator of bargaining power. That is, for the case at hand, simply demonstrating that FirstEnergy has more poles than does Verizon is not evidence, by itself, of superior bargaining power. In its 2011 Pole Attachment Order, the Commission explained that well-established bargaining theories "predict that each party will consider its best alternative to a negotiated agreement when negotiating."[8] The Commission noted that, although pole ownership percentage may be an initial indicator of bargaining power, "if there were less-costly alternatives for the incumbent LEC to pole deployment, or additional costs that the electric utility would need to consider under the best outside alternative, this would reduce the disparity in the relative bargaining power of the parties."[9]

12. Consideration of a less costly alternative, sometimes referred to as an outside option, is an important factor to account for in assessing bargaining power because it can mitigate or negate the bargaining power that a supplier may otherwise hold. In this case, Verizon had, and continues to have a lower cost alternative to the current joint use agreements. FirstEnergy offered to "transition Verizon out of the pole-owning business in FirstEnergy service territories" and provide pole attachments to Verizon under the same arrangements and rates that FirstEnergy charges non-ILECs (i.e., under the FCC's Telecom rates).[10] This provided Verizon with a lower cost alternative (compared to the rates under the joint use agreements) which, as the FCC indicated in its 2011 Pole Attachment Order, serves to mitigate any bargaining power differential that might otherwise arise from pole ownership percentages. FirstEnergy's offer is also contrary to the type of behavior that would be expected from a party that indeed holds bargaining power. Instead, a party with bargaining power would not be motivated to provide rate accommodation to a captive counterparty (i.e., a party with no bargaining power).

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7 In the Matter if Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment; Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, WT Docket No. 17-79, WC Docket No. 17-84, Third Report and Order and Declaratory Ruling, August 2, 2018 (2018 Pole Attachment Order).

8 2011 Pole Attachment Order, ¶ 206 n. 618.

9 *Id.*

10 Email from Stephen F. Schafer (Verizon, Manager, Joint Use & Cable Locating) to James Slavin (Verizon), Subject: [E] FirstEnergy Counterproposal, May 2, 2018.

IV. VERIZON'S REJECTION OF A LESS-COSTLY ALTERNATIVE INDICATES THAT IT DOES NOT PERCEIVE THAT JOINT USE AND LEASING ARRANGEMENTS ARE SIMILARLY SITUATED.

13. Verizon's rejection of the less-costly alternative also provides a practical test as to whether the attachment arrangements of the joint use agreements are similarly situated to those provided to non-ILECs under the telecom rate. As indicated above, Verizon rejected FirstEnergy's offer to transition Verizon out of the pole-owning business and provide pole attachments under the same conditions and rates that are provided to non-ILEC attachers. Thus, Verizon must have recognized that it receives net benefits under the joint use agreements that are above and beyond those that it would receive under the leasing arrangements that FirstEnergy provides to non-ILECs.

14. I am aware that the net value of the benefits that Verizon receives from FirstEnergy under the joint use agreements are in dispute in this proceeding. The FCC has recognized that benefits realized by ILECs under joint use agreements include the value associated with the ILEC occupying the lowest usable space on a pole, utility accommodation of ILEC space needs by installing taller poles, and waived make-ready costs and post-inspection fees.[11] The Commission also recognized that ILECs receive value from access (to utility poles) itself,[12] which would likely be significant in monetary terms. In addition to these ongoing benefits, ILECs, such as Verizon, also realized considerable benefits over time, in terms of cost and deployment efficiencies associated with joint pole use arrangements. The joint use agreements formed sharing arrangements through which each party was able to reduce its costs of service without compromising quality. This gave Verizon ready and unfettered access to the joint pole network as if it were its own. Seamless access to a pole network in the era before implementation of the Telecommunications Act of 1996 also allowed Verizon to establish itself as a reliable service provider in the eyes of its customers, which was a key factor in enabling the company to maintain a strong market share in the evolving market.

15. Verizon's rejection of FirstEnergy's offer to convert pole attachment arrangements and rates from joint use to the leasing arrangement provided to non-ILEC telecom reveals that Verizon does not consider the two pole attachment arrangements to be similarly situated. That is, it must have found that the pole attachment arrangements under the joint use agreements are superior to that provided under the lease arrangements, otherwise Verizon would have readily accepted what it perceived to be the same treatment (i.e., similarly situated arrangements) for a lower price.

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[11] In the Matter of Verizon Florida LLC, Complainant v. Florida Power and Light Company, Respondent. Docket No. 14-216 File No. EB-14-MD-003, February 11, 2015, ¶ 24.

[12] *Id.* As indicated earlier, the Commission recognized that ILECs "have no statutory right to nondiscriminatory pole access under section 224(f)(1)." 2011 Pole Attachment Order, ¶ 207.

V. PRACTICAL AND IMPLEMENTATION CONSIDERATIONS NEGATE ANY BARGAINING POWER FROM OWNING A MAJORITY OF POLES.

16. Verizon's relying on the percentage of pole ownership as a primary indicator of bargaining power is also misleading because it does not consider the limitations in the mechanism through which FirstEnergy can exert such power. Verizon's claim that FirstEnergy exerted bargaining power relies on the presumption that, in controlling a majority of pole resources, FirstEnergy could withhold and/or discontinue pole access if Verizon did not agree to the terms and rates that FirstEnergy demands. In practice, however, FirstEnergy would be subject to concomitant foreclosure actions by Verizon if it were to withhold and/or discontinue pole access. As a result, and as I discuss more fully below, FirstEnergy would thus not be able to follow through with any threat of foreclosure, thereby negating any prospect of exerting bargaining power.

17. First, joint pole ownership involves mutual dependence on pole access, which differs significantly from the buyer / seller relationships underlying traditional market power analysis (i.e., where buyers of a service are also not sellers of the same service). Some analyses of bargaining power are based on relative harm from foreclosure (i.e., which party has more to lose) but, in this case, both parties stand to incur substantial and unacceptable harm from the dissolution of mutual pole access arrangements. Although telecommunications facilities are less difficult and expensive to re-locate than electric facilities, it is reasonable to conclude that Verizon would likely realize greater harm in that it would need to remedy loss of access to more poles would FirstEnergy. However, seeking alternative means of access for one-quarter of FirstEnergy poles in Pennsylvania would be unprecedented and could be exceptionally damaging. Thus, any bargaining power from a higher percentage ownership of poles would be erased as it would be irrational for FirstEnergy to accept the risk of being unable to meet its service obligations to customers, even if the theoretical harm (resulting from foreclosure) would be greater for Verizon than it would be for FirstEnergy.

18. Second, FirstEnergy is obligated to provide service to its customers and, if it lost access to the 27% of poles under the joint use agreements that are owned by Verizon, FirstEnergy would immediately need to take steps to replace them. By definition, this would cost FirstEnergy much more than is the case today under the joint use agreements, that is, if it was physically possible to perform such a task. A firm operating outside of financial regulation may be able to pass part, or even all, of these higher costs onto customers (assuming that there was sufficient headroom in market prices). However, this would not be the case for FirstEnergy. FirstEnergy is a utility that is regulated by the Pennsylvania Public Utility Commission (PUC). The Pennsylvania PUC routinely reviews FirstEnergy's (specifically, each of FirstEnergy's utility operating companies') revenue requirement during rate case proceedings, in which are set the rates that the FirstEnergy operating utility companies will be able to charge their customers in Pennsylvania. It is exceptionally unlikely that the Pennsylvania PUC would allow higher pole costs (i.e., stemming from FirstEnergy dismantling of its joint use agreements with Verizon) into revenue requirements. FirstEnergy stockholders would therefore have to absorb these costs, which

would provide a significant disincentive for FirstEnergy to exert any bargaining power that FirstEnergy may have had due to its ownership of more poles than Verizon.

19. Third, it is highly unlikely that FirstEnergy would be able to actually replace the 27% of poles owned by Verizon, even if FirstEnergy irrationally decided that it was willing to 1) risk interrupting service to its electricity customers and 2) forego recovering any cost differential in the rates charged to customers. Constructing poles and incorporating them into a pole infrastructure requires gaining and perfecting rights-of-ways, involves procuring approvals and permits from local governments, and tends to disrupt residents, businesses and traffic. It is almost certain that local governments would not allow FirstEnergy or Verizon to construct a duplicative pole network on such a large scale while the original joint use network remains in place and usable.[13]

20. Fourth, while Verizon claims the evergreen provision included in the joint use agreements hinders them in negotiations, the evergreen provision also prevents FirstEnergy from disconnecting Verizon attachments from its poles.[14] Thus, any bargaining power that FirstEnergy might hold from having more poles than Verizon would be negated because the evergreen provision prevents FirstEnergy from exercising such power.

VI. CONCLUSION

21. Bargaining theory and FirstEnergy's negotiations with Verizon provide strong indications that FirstEnergy does not hold bargaining leverage and did not exert bargaining power. Both parties would face substantial harm if they were unable to access the pole network covered by the joint use agreements. FirstEnergy has no option other than continue its relationship with Verizon. On the other hand, Verizon was offered a less-costly option; that is, to change its access arrangements from that under the joint use agreements to a leasing arrangement identical to that provided by FirstEnergy to non-ILECs. The combination of the less-costly option available to Verizon and the inability of FirstEnergy to viably replace its access to Verizon's poles with alternative arrangements erases any bargaining power that FirstEnergy may have had as a result of owning more poles than Verizon (in the pole network under the joint use agreements).

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[13] The FCC's 2018 Pole Attachment Order included a Declaratory Ruling clarifying that state and local regulation cannot "prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service," and banned state and local moratoria related to wired and wireless telecommunications equipment deployment. However, it does not appear that the FCC had the construction of duplicative pole networks in mind when it composed its ruling. Furthermore, the FCC's Declaratory Order does not address the deployment of equipment used in the transmission and distribution of electricity. 2018 Pole Attachment Order, ¶ 140.

[14] For example, the Terms of Agreement (Article XIX) included in the Agreement between Metropolitan Edison Company and Bethel & Mt. Aetna Telephone and Telegraph Company Covering Joint Use of Poles (included as Exhibit 2 in Verizon's Complaint) state: "…notwithstanding such termination this agreement shall remain in full force and effect with respect to all poles jointly used by the parties at the time of such termination."

22. The analysis of FirstEnergy's bargaining power (i.e., to the extent there is any) is also highlighted by Verizon's rejection of a less-costly alternative. In opting not to accept FirstEnergy's offer, Verizon revealed that it does not consider that the two pole attachment arrangements are similarly situated. Otherwise, Verizon would have readily accepted the offer of similarly situated pole attachment arrangements at a lower price.

23. Any impasse in the negotiations between Verizon and FirstEnergy with respect to pole attachment rates thus appears to stem more from Verizon's demands – retaining the conditions associated with the joint use agreements while paying the rate associated with a differently situated pole attachment arrangement – than it does with FirstEnergy's bargaining power.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

By: _____

William Zarakas
Principal
The Brattle Group

Dated: February 1, 2020

EXHIBIT WZ-1

WILLIAM P. ZARAKAS
Principal

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William Zarakas is a Principal with The Brattle Group, an economics consulting firm, and an expert on economic and regulatory matters in the telecommunications, media and energy industries.

Mr. Zarakas has a leadership role in Brattle's practice in telecommunications and media. He has provided expert reports and testimonies in a range of regulatory proceedings concerning: the economic analysis of mergers among telecom carriers and media companies, competition and forebearnace from price regulation in the telecommunications industry, access and infrastructure sharing arrangements, and pricing and rate analyses. He has also developed models concerning the economics and financial feasibility of building-out broadband infrastructure, conducted valuations of a wide range of wireless spectrum bands and holdings, and examined the distribution of royalties and retransmission fees in the cable and satellite television industries.

Mr. Zarakas also leads much of Brattle's work concerning evolving utility regulatory and business models, including the application of performance based regulation (PBR) and regulatory reform and incentives designed to improve efficiencies and advance policy goals, such as decarbonization and customer engagement. Mr. Zarakas also works extensively on benefit-cost analyses, particularly with respect to investments in grid modernization, reliability, resilience and smartening the grid. He has authored a wide range of reports and articles on performance based regulation, "utility of the future" visions and implementation, the utility platform and multi-sided markets, and competition in the retail electricity sector.

He has also led special investigations on behalf of corporate boards of directors and audits of management practices and operational and financial performance on behalf of regulatory commissions.

Mr. Zarakas has provided testimony and expert reports before the Federal Communications Commission, the Federal Energy Regulatory Commission, the Securities and Exchange Commission, the Copyright Royalty Judges (Library of Congress), the U.S. Congress, state regulatory agencies, arbitration panels, foreign governments and courts of law.

He holds an M.A. in economics from New York University and a B.A., also in economics, from the State University of New York.

Competition and Antitrust. Recent work includes:

- Conducted merger simulation analysis, submitted testimony and provided ongoing support on the potential effects of the merger of mobile wireless carriers Sprint and T-Mobile, under review before the US Federal Communications Commission, the Department of Justice, and various state Attorneys General on behalf of DISH Network.
- Conducted merger analysis, submitted testimony and provided ongoing support on the potential effects of the merger of Sinclair Broadcast Group and Tribune Media, under review before the US Federal Communications Commission on behalf of DISH Network.

- Conducted merger analysis, submitted testimony and provided ongoing support on the potential effects of the mergers of Comcast-Time Warner Cable; AT&T-Time Warner; and, Disney-Fox.
- Conducted competitive analysis, submitted testimony, and provided expert support in a regulatory proceeding before the Federal Communications Commission on competition issues in dedicated internet bandwidth services, including possession of market power and assessment of market power abuse on behalf of Sprint Corporation.
- Analyzed effectiveness of retail competition in U.S. electricity markets.
- Analyzed market structure and degree of competition in U.S. retail telecom markets and authored expert reports with regard to Petitions for FCC to forbear from price regulating resale services and UNEs on behalf of Granite Telecom and Incompas.
- Analyzed acquisition price premium in merger of cross-state gas and electric utilities on behalf of TECO Energy, Inc., New Mexico Gas Company, Inc in a matter before the New Mexico Public Regulatory Commission.
- Analyzed prospective merger savings and divestiture losses for electric and gas utilities in merger applications before the U.S. Securities and Exchange Commission (SEC).

Spectrum Valuation and Due Diligence. Work includes:

- Led numerous analyses of the values of wireless spectrum in the U.S., Canada, the Middle East and North Africa (MENA), and other geographic markets. Scope of analyses included: PCS, AWS, 2.3-2.5 GHz, SMR, PLMR, IVDS, MSS and Big Leo spectrum bands, among others, for purposes of planning, transactional analysis, regulatory proceedings, domestic and international arbitration, and commercial litigation.
- Conducted analyses and authored expert reports concerning utility use of private networks vs. leased spectrum, and valuations of 900 MHz spectrum.
- Led due diligence of acquisition of spectrum holdings and telecom assets for major telecom carrier.
- Led due diligence of northwestern U.S. electric and gas utility on behalf of buyer; analysis included comprehensive sales, revenue, and operating and capital cost modeling and scenarios.

Telecom Regulatory and Compliance. Work includes:

- Analyzed and provided testimony in matters concerning acces and foreclosure of network elements and services.
- Developed cost and revenue models to estimate costs, feasibility and customer rates associated with deploying wireless broadband to Alaska and rural areas in the continental U.S. on behalf of GCI Communications for FCC proceedings regarding the Connect America Fund and Mobility Fund.
- Analysis and expert reports on matters concerning pole attachment rates before the FCC on behalf of electric utilities.
- Led comprehensive modeling concerning costs and rates for unbundled network elements (UNEs), undertaken in fulfillment of requirements associated with the Telecommunications Act of 1996, using the Total Element Long Run Incremental Cost (TELRIC) methodology

Utility Regulatory and Business Models. Analyzed, advised and/or testified on matters concerning regulatory frameworks, performance-based regulation (PBR) and utility business models, notably with respect to emerging competitive alternatives and network integration. Recent work includes:

- Analyzed implementation of New York's Reforming the Energy Vision by modeling the economics of the utility platform model, access pricing and financial impacts of retail competition on utility.
- Analyzed, advised and/or testified on matters concerning performance incentive mechanism (PIMs); e.g., analyses of: New York's "earnings adjustment mechanisms" on behalf of New York's six investor owned utilities) and performance measures and incentive structures on behalf of the Hawaiian Electric Companies.
- Surveyed and analyzed PBR frameworks and applications, including multi-year rate plans (MRPs), PIMs and other alternative regulatory mechanisms, including the U.K.'s "RIIO" model.
- Surveyed and analyzed regulatory approaches to setting electric distribution reliability standards around the world on behalf of the Australian Energy Market Commission (AEMC).
- Modeled multi-variate "utility of future" scenarios using system dynamic approach on behalf of utilities and industry groups.
- Advised Board of Directors of a major generation and transmission (G&T) cooperative and its member electric distribution cooperatives on matters concerning: asset valuations, risk management strategy, merger and acquisition options, and outlook for retail electric markets.

Infrastructure and Investment Analysis. Analyzed and testified on matters concerning infrastructure economics and financial feasibility. Work includes:

- Led benefit-cost and economic "break-even" analysis of utility system reliability and resilience investment using a value of lost load (VOLL) methodology on behalf of Public Service Electric & Gas Company (PSE&G).
- Conducted financial feasibility analysis concerning deployment of a broadband communications network for an Asian electric utility.
- Analyzed economics and financial feasibility of providing (wholesale) transport and (retail) broadband services for multiple U.S. electric utilities.

Management Analysis and Audits. Recent work includes:

- Led strategic organizational options analysis for the Board of Trustees of the Long Island Power Authority (LIPA).
- Led special investigations; e.g., economic analysis of "swap" transaction for the Special Committee of the Board of Directors of Global Crossing.
- Led management and/or regulatory audits of utilities and telecommunications carriers on behalf of state regulatory commissions Alabama, Kentucky, Maryland, New York and Pennsylvania.

Other Regulatory Analyses. Recent work includes:

- Led benchmarking studies of utility costs and regulatory practices.
- Analyzed markets for and costs of providing utility pole attachments.
- Calculated total factor productivity (TFP) and X factors in price regulation proceedings involving utilities before state regulatory commissions and incumbent telecommunications carriers before the FCC.
- Analyzed costs and value of retransmitted television programming in cable and satellite video markets on behalf of Music Claimants in proceedings involving distribution of royalty funds.

- Examined impact of regulatory fees and constraints on economic output in 22 countries in the Middle East and Africa for international mobile carrier.

Expert Testimony

Declaration of William P. Zarkas BellSouth Telecommunications, LLC d/b/a AT&T Florida, Complainant, v. Florida Power & Light Company, Respondent, in a Pole Attachment Complaint Before the Federal Communications Commission, Proceeding No. 19-187, Bureau ID No. EB-19-MD-006 (September 12, 2019).

Direct Testimony of William Zarakas In the Matter of the Application of Potomac Electric Power Company for the Authority to Implement a Multiyear Rate Plan for Electric Distribution Service in the District of Columbia, Formal Case No. 1156 (May 30, 2019).

Declarations of Coleman Bazelon, Jeremy Verlinda, and William Zarakas Before the Federal Communications Commission In the Matter of Applications of T-Mobile US, Inc. and Sprint Corporation for Consent to Transfer Control of Licenses and Authorizations, WT Docket No. 18-197

- May 1, 2019, Response to Israel, Katz, and Keating April 12, 2019 Declaration
- March 28, 2019, Response to Compass Lexecon February 20, 2019 Declaration and Mark McDiarmid March 6, 2019 Declaration
- March 25, 2019, Response to Applicants' February 7 Filings on Diversion Ratios
- March 18, 2019, Reply to Cornerstone's "Response to Dish's February 19 and 25 Submissions"
- February 19, 2019, Reply to Cornerstone "Response to Dish and CWA Comments"
- February 4, 2019, Network Model's Sensitivity to Millimeter Wave Adjustments
- January 28, 2019, Response to Applicant Filings on Diversion Ratios
- December 4, 2018, Further Reply Declaration of Coleman Bazelon, Jeremy Verlinda, and William Zarakas

Declaration (August 27, 2018) and Reply Declaration (October 31, 2018) of Joseph Harrington, Coleman Bazelon, Jeremy Verlinda, and William Zarakas Before the Federal Communications Commission In the Matter of Applications of T-Mobile US, Inc. and Sprint Corporation for Consent to Transfer Control of Licenses and Authorizations, WT Docket No. 18-197

"The Role of Competitive Bidding Based Prices in Determining the Rural Rate," William Zarakas and Augustin J. Ros, In the Matter of Promoting Telehealth and Telemedicine in Rural America, Before the Federal Communications Commission, WC Docket No. 17-130 (May 24, 2019).

Response to PC 51 Request for Comments, Prepared for Joint Utilities of Maryland, Prepared by William Zarakas, Sanem Sergici, Pearl Donohoo-Vallett, and Nicole Irwin in Exploring the Use of Alternative Rate Plans or Methodologies to Establish New Base Rates for an Electric Company of Gas Company Before the Public Service Commission of Maryland, PC 51 (March 29, 2019).

Declaration of William Zarakas and Dr. Eliana Garces Before the Federal Communications Commission In the Matter of Tribune Media Company (Transferor) and Nexstar Media Group, Inc. (Transferee) Consolidated Application for Consent to Transfer Control, MB Docket No. 19-30 (March 18, 2019).

Expert Report of William P. Zarakas On Behalf of BC Hydro, BC Hydro Fiscal 2020—Fiscal 2021 Revenue Requirements Application to the British Columbia Utilities Commission (February 8, 2019).

Direct and Rebuttal Testimony of William P. Zarakas On Behalf of Public Service Company of Oklahoma Before the Corporation Commission of the State of Oklahoma In the Appication of the Public Service Company of Oklahoma For an Adjustment To Its Rates and Charges and the Electric Service Rules, Regulations and Conditions of Service For Electric Service in the State of Oklahoma, Cause No. PUD 201800085 (September 21, 2018, February 5, 2019).

Declaration of William P. Zarakas Before the Federal Communications Commission In the Matter of Petition of USTelecom for Forbearance Pursuant to 47 U.S.C. § 160(c) to Accelerate Investment in Broadband and Next-Generation Networks WC Docket No. 18-141, Opposition of Granite to USTelecom's Forebearnace Petition (August 6, 2018).

Declaration of William P. Zarakas Before the Federal Communications Commission In the Matter of Petition of USTelecom for Forbearance Pursuant to 47 U.S.C. § 160(c) to Accelerate Investment in Broadband and Next-Generation Networks WC Docket No. 18-141, Opposition of Incompas, FISPA, Midwest Association of Competitive Communications, and the Northwest Telecommunciations Association (August 6, 2018)

Expert report on behalf of GCI Communications "Rate of Return Analysis of GCI's TERRA Network," by William P. Zarakas, Agustin J. Ros, and Nicholas E. Powers. Prepared for GCI Communication Corp., March 30, 2018, in connection with the FCC's investigation of the Rural Health Care Telecommunications Program.

Expert report on behalf of GCI Communications before the Federal Communications Commission, In the Matter of Connect America Fund and Universal Service Reform, WC Docket No. 10-90 and WT Docket No. 10-208A: analysis of the FCC's Rural Health Care Program Funding and Recipients, by William Zarakas, Augustin Ros, David Kwok, and M. Elaine Cunha, September 2017.

Declaration (August 7, 2017) and Reply Declaration (August 29, 2017) of William P. Zarakas and Jeremy A. Verlinda Before the Federal Communications Commission In the Matter of Tribune Media Company (Transferor) and Sinclair Broadcast Group, Inc. (Transferee), Consolidated Applications for Consent to Transfer Control, MB Docket No. 17-179.

Before the State of New York Public Service Commission In the Matter of Earnings Adjustment Mechanism and Scorecard Reforms Supporting the Commission's Reforming the Energy Vision, Case 16-M-0429, On Behalf of the New York Joint Utilities (Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York, Inc., New York State Electric & Gas Corporation, Niagara Mohawk Power Corporation d/b/a National Grid, Orange and Rockland Utilities, Inc., and Rochester Gas and Electric Corporation), Report: "Assessment of Load Factor as a System Efficiency Earnings Adjustment Mechanism," William Zarakas, Sanem Sergici, et. al. (February 10, 2017).

Declaration of William P. Zarakas Before the Federal Communications Commission In the Matter of Business Data Services in an Internet Protocol Environment, Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans, Special Access for Price Cap Local Exchange Carriers, AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, WC Docket No. 16-143, WC Docket No. 15-247, WC Docket No. 05-25, RM-10593. Declaration of William P. Zarakas and Susan M. Gately (January 27, 2016); Supplemental Declaration of William P. Zarakas (March 24, 2016); Declaration of William P. Zarakas and Jeremy Verlinda (June 28, 2016, Attachment D to Comments of Sprint Corporation); Declaration of David E. M. Sappington and William P. Zarakas (June 28, 2016, Attachment E to Comments of Sprint Corporation); Further Supplemental Declaration of William P. Zarakas (August 9, 2016, Attachment A of Reply Comments of Sprint Corporation).

Declaration of William P. Zarakas Before the Federal Communications Commission In the Matter of Verizon Virginia. LLC and Verizon South, Inc., Complainants, v. Virginia Electric and Power Company d/b/a Dominion Virginia Power, Docket No. 15-90, File No. EB-15-MD-006 (November 18, 2015).

Declaration of William P. Zarakas and Matthew Aharonian in the United States Court for the District of Columbia Circuit United States Telecom Association, Petitioner, v. Federal Communications Commission and the United States of America, Respondents, Case No. 15-1063 (and consolidated cases) (May 22, 2015).

Declarations Before the Federal Communications Commission In the Matter of Application of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Comcast to Assign or Transfer Control of Licenses, Federal Communications Commission, MB Docket No. 10-56. Analysis of the FCC's Vertical Foreclosure and Nash Bargaining Models Applied To The Proposed Comcast-Time Warner Cable Transaction (December 21, 2014) and Supplemental Declaration: Analysis of the FCC's Vertical Foreclosure and Nash Bargaining Models Applied To The Proposed Comcast-Time Warner Cable Transaction (March 5, 2015).

Before the Public Utilities Commission of the State of Hawaii, In The Matter of Public Utilities Commission Instituting an Investigation to Reexamine the Existing Decoupling Mechanisms for Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc., and Maui Electric Company, Limited, Docket No. 2013-1041, On Behalf of the Hawaiian Electric Companies. Report: "Targeted Performance Incentives: Recommendations to the Hawaiian Electric Companies," Prepared For The Hawaiian Electric Companies, William P. Zarakas and Philip Q Hanser (September 15, 2014).

Before the New Mexico Public Regulatory Commission, In The Matter Of The Application of TECO Energy, Inc., New Mexico Gas Company, Inc. and Continental Energy Systems, LLC, For Approval of TECO Energy Inc.'s Acquisition of New Mexico Gas Intermediate, Inc. and For All Other Approvals and Authorizations Required To Consummate and Implement The Acquisition, Utility Case No. 13-00231-UT, On Behalf of TECO Energy, Inc., New Mexico Gas Company, Inc. and Continental Energy Systems, LLC, Joint Applicants (March 2014).

"Analysis of Benefits: PSE&G's Energy Strong Program," by Peter Fox-Penner and William P. Zarakas Before the New Jersey Board of Public Utilities In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Energy Strong Program, Docket No. EO13020155 and GO13020156 (October 7, 2013).

"Review and Analysis of Service Quality Plan Structure In The Massachusetts Department of Public Utilities Investigation Regarding Service Quality Guidelines For Electric Distribution Companies and Local Gas Distribution Companies." Philip Q Hanser, David E. M. Sappington and William P. Zarakas, Massachusetts D.P.U. 12-120 (March 2013).

"Alaska Mobile Broadband Cost Model, Before The Federal Communications Commission In The Matter Of Connect America Fund and Universal Service Reform – Mobility Fund. WC Docket No. 10-90 and WT Docket No. 10-208A." William P. Zarakas and Giulia McHenry (February 2013; updated May 2016, with David Kwok).

Expert Report of William P. Zarakas In The United States District Court For The Northern District of Florida MCI Communications Services, Inc., Plaintiff v. Murphree Bridge Corporation, Defendant, Case No. 5:09-cv-337 (February 19, 2010).

Testimony of William P. Zarakas Before The Copyright Royalty Judges, Library of Congress, Washington D.C. In The Matter of Distribution of the 2004 and 2005 Cable Royalty Funds, Docket No. 2007-3 CRB CD 2004-20 (June 1, 2009).

Declaration of William P. Zarakas In The Circuit Court of Fairfax County, Virginia In The Matter of Sharon Dougherty, Plaintiff Vs. Thomas J. Dougherty, Defendant Case No. CL 2007-008757 (October 2008).

Expert report Public Service Company of New Mexico vs. Smith Bagley, Inc. and Lite Wave Communications LLC In The United States District Court For The District of New Mexico (March 2007).

"Comparative Market Value Analysis of Upper 700 MHz Public Safety Spectrum" Before the Before the Federal Communications Commission In the Matter of The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010, WT Docket No. 96-86 (June 2006).

"Analysis of Potential Lost Profits Associated With The Alleged Breach of Contract Between Orbcomm and Orbcomm Asia Limited" Before the American Arbitration Association (May 2006).

Expert report Before the Federal Communications Commission In Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act of 1934, as amended, for Forbearance from Sections 251(c)(3) and 251(d)(1) In the Anchorage LEC Study Area, WC Docket No. 05-281 (January 9, 2006).

Letter report of William Zarakas and Dorothy Robyn Before the U.S. House of Representatives Committee on Energy and Commerce and the U.S. Senate Committee on Commerce, Science and Transportation regarding the value of wireless spectrum in the 700 MHz band (May 18, 2005).

Expert report in MCI WorldCom Network Services, Inc. v. MasTec, Inc. Before the United States District Court Southern District of Florida, Case No. 01-2059-CIV-GOLD (May 2002).

Direct and Rebuttal testimony Before the Federal Communications Commission In the Matter of Virginia Cable Telecommunications Association v. Virginia Electric and Power Company, d/b/a Dominion Virginia Power and Dominion North Carolina Power, PA No. 01-005 (December 21, 2001).

"Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Rochester Gas And Electric Corporation" Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the combination of Energy East Corporation with RGS Energy Group, Inc. (June 20, 2001) in Exhibit J-1 (May 15, 2001).

"Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Sierra Pacific Resources" Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the acquisition by Sierra Pacific Resources of Portland General Electric Company, 2000 in Exhibit H-1 (January 31, 2000).

"Analysis Of The Economic Impact Of A Divestiture Of The Gas Operations Of Energy East" Before the U.S. Securities and Exchange Commission included in Form U-1 Application/ Declaration Under The Public Utility Holding Company Act of 1935 in the combination of Energy East Corporation with CMP Group, Inc. and with CTG Resources, Inc. in Exhibit J-1 (October 29, 1999).

Supplemental Affidavit of William Zarakas Before the Supreme Court of the State of New York, County of Niagara in Village of Bergen, et al. vs. Power Authority of the State of New York, February 1999.

Direct (December 15, 1997) and Rebuttal (March 9, 1998) Panel Testimony of William P. Zarakas and D. Daonne Caldwell Before the North Carolina Utilities Commission In Re: Proceeding to Determine Permanent Pricing for Unbundled Network Elements, Docket No. P-100, SUB 133D.

Direct (November 3, 1997) and Rebuttal (November 25, 1997) Panel Testimony of William P. Zarakas and D. Daonne Caldwell Before the South Carolina Public Service Commission In Re: Proceeding to Review BellSouth Telecommunications, Inc.'s Cost Studies for Unbundled Network Elements, Docket No. 97-374-C.

Direct Panel Testimony of William P. Zarakas and D. Daonne Caldwell Before the Florida Public Service Commission In Re: Petition of AT&T, MCI, and MFS for Arbitration with BellSouth Concerning

Interconnection, Rates, Terms and Conditions of a Proposed Agreement, Docket Nos. 960757-TP/960833-TP/960846-TP/960916-TP/971140-TP (November 13, 1997).

Direct (October 10, 1997) and Rebuttal (October 17, 1997) Panel Testimony of William P. Zarakas and D. Daonne Caldwell Before the Tennessee Regulatory Authority In Re: Contested Cost Proceeding to Establish Final Cost Based Rates for Interconnection and Unbundled Network Elements, Docket No. 97-01262.

Direct (August 29, 1997) and Rebuttal (September 12, 1997) Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Alabama Public Service Commission In Re: Generic Proceeding: Consideration of TELRIC Studies, Docket No. 26029.

Direct (April 30, 1997) and Rebuttal (September 8, 1997) Panel Testimony of William P. Zarakas and D. Daonne Caldwell before the Georgia Public Service Commission In Re: Review of Cost Studies, Methodologies and Cost-Based Rates for Interconnection and Unbundling of BellSouth Telecommunications Services, Docket No. 7061-U.

Diraect (July 11, 1997) and Rebuttal (September 5, 1997) Panel Testimony of William P. Zarakas and D. Daonne Caldwell Before the Louisiana Public Service Commission In Re: Review of Consideration of BellSouth Telecommunications, Inc.'s TSLRIC and LRIC Cost Studies to Determine Cost of Interconnection Services and Unbundled Network Components, to Establish Reasonable, Non-Discriminatory, Cost-Based Tariff Rates, Docket Nos. U-22022/22093.

Direct and Rebuttal Testimony Before the Virginia State Corporation Commission on Behalf of United Telephone - Southeast, Inc. and Centel Corporation (May 1994).

Direct and Rebuttal Testimony Before the Tennessee Public Service Commission on Behalf of United Telephone - Southeast, Inc., Docket No. 93-04818 (January 28, 1994).

Direct and Rebuttal Testimony Before the Florida Public Service Commission on Behalf of Southern Bell Telephone & Telegraph Company, Docket No. 920260-TL (December 10, 1993).

Direct and Rebuttal Testimony Before the Tennessee Public Service Commission on behalf of South Central Bell, Docket Nos. 92-13527 and 93-00311 (March 22 and March 29, 1993).

Papers,Publications and Presentations

Washington D.C. Performance Based Regulation Workshop, presented by William Zarakas, Sanem Sergici and Pearl Donohoo-Vallett, September 19, 2018.

Hawaii Public Utilities Commission Performance Based Regulation Workshop, PBR Tools and Experience Panel, "The Intersection of Utility Platforms and PBR," William Zarakas, Honolulu, HI, July 23-24, 2018.

"A New Face for PBR: Aligning Incentives in the Electric Utility Ecosystem" by William Zarakas, *Public Utilties Fortnightly*, December 2017.

"Two-sided Markets and the Utility of the Future: How Services and Transactions Can Shape the Utility Platform," by William P. Zarakas, *The Electricity Journal*, Volume 30 (2017) 43-46.

Performance Based Regulation: Plans Goals, Incentives and Alignment, by William Zarakas, Toby Brown, Léa Grausz, Heidi Bishop and Henna Trewn, prepared for DTE Energy, December 6, 2017.

PBR: Applications and Future, presented by William Zarakas to the Michigan PSC PBR Collaborative, Lansing, Michigan, November 8, 2017.

"DER Incentive Mechanisms as a Bridge to the Utility of the Future," by William P. Zarakas, Frank C. Graves and Heidi Bishop, presented at SNL Knowledge Center's Energy Utility Regulation Conference: Strategies for Profit and Reliability, December 14, 2016.

"Electric Utility Services and Evolving Platforms in the Mid-Atlantic Region," by William Zarakas, presented at the Mid-Atlantic Conference of Regulatory Utilities Commissioners (MACRUC) 20th Annual Education Conference, Williamsburg, VA, June 23, 2015.

"Growth Prospects and Shifting Electric Utility Business Models: Retail, Wholesale and Telecom Markets," by William P. Zarakas, *The Electricity Journal*, Volume 28, Issue 5, June 2015.

"Do We Need a New Way to Regulate Electric Utilities?," by William P. Zarakas, presented at the Energy Bar Association 2015 Annual Meeting, Washington, DC, May 6, 2015.

"Investing In Electric Reliability and Resiliency," by William P. Zarakas, presented at the NARUC 2014 Summer Meeting - Joint Electricity and Critical Infrastructure Committees, Dallas, TX, July 15, 2014.

"Utility Investments in Resiliency: Balancing Benefits with Cost in an Uncertain Environment," by William P. Zarakas, Sanem Sergici, Heidi Bishop, Jake Zahniser-Word and Peter S. Fox-Penner, *The Electricity Journal,* Volume 27, Issue 5, June 2014.

"Infrastructure and Competition in the Electric Delivery System," by William P. Zarakas, *The Electricity Journal*, Volume 26, Issue 7, September 2013.

"Low Voltage Resiliency Insurance, Portable small-scale generators could keep vital services on line during a major power outages," by William Zarakas, Frank Graves, and Sanem Sergici, *Public Utilities Fortnightly* September 2013.

"Finding the Balance Between Reliability and Cost: How Much Risk Should Consumers Bear?," by William P. Zarakas and Johannes P. Pfeifenberger, presented at the Western Conference of Public Service Commissioners, Santa Fe, NM, June 3, 2013

"The Utility of the Future: Distributed or Not?," by William P. Zarakas, presented at Advanced Energy 2013, New York, NY, April 30, 2013

"Rates, Reliability, and Region," by William P. Zarakas, Philip Q Hanser, and Kent Diep, *Public Utilities Fortnightly*, January 2013

"Approaches to Setting Electric Distribution Reliability Standards and Outcomes," by Serena Hesmondhalgh, William P. Zarakas, and Toby Brown, The Brattle Group, Inc., January 2012

"Analysis of Strategic Organizational Options for the Long Island Power Authority," by William P. Zarakas, Frank C. Graves, and Michael J. Beck, prepared for the Board of Trustees, Long Island Power Authority, October 2011.

"Measuring Concentration In Radio Spectrum License Holdings," by Coleman Bazelon and William Zarakas, presented at the Telecommunications Policy Research Conference (TPRC), George Mason University, September 26, 2009.

"Structural Simulation of Facility Sharing: Unbundling Policies and Investment Strategy in Local Exchange Markets," White Paper, July 2005 (with Glenn A. Woroch, Lisa V. Wood, Daniel L. McFadden, Nauman Ilias, and Paul C. Liu).

"Betting Against The Odds? Why broadband over power lines (BPL) can't stand alone as a high-speed Internet offering." Public Utilities Fortnightly, April 2005, pp. 41-45 (with Kenneth J. Martinian).

"The Impact of the Number of Mobile Operators on Consumer Benefit," White Paper, March 2005 (with Kenneth J. Martinian and Carlos Lapuerta).

"Wholesale Pricing and Local Exchange Competition", Info, Volume 6, Number 5, 2004, pp. 318-325 (with Lisa V. Wood and David E. M. Sappington).

"Regulatory Performance Measurement Plans and the Development of Competitive Local Exchange Telecommunications Markets", Working Paper, November 2003 (with David E. M. Sappington, Lisa V. Wood and Glenn A. Woroch).

"FCC Pole Attachment Rates: Rebutting Some of the Presumptions," presented to utility regulators, March 2003 (with Lisa V. Wood).

"The Concurrent Exchange of Fiber Optic Capacity and Services Between Global Crossing and its Carrier Customers," prepared for Special Committee on Accounting Matters of the Board of Directors of Global Crossing Ltd., January 2003.

ATTACHMENT D

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Verizon Pennsylvania LLC and Verizon North LLC, *Complainants,*	)	
v.	)	**Proceeding Number 19-354** **Bureau ID Number EB-19-MD-008**
Metropolitan Edison Company, Pennsylvania Electric Company, and Penn Power Company, *Defendants*	)	

DECLARATION OF THOMAS R. PRYATEL, P.E.

I, Thomas R. Pryatel, declare as follows:

1. My name is Thomas R. Pryatel. I am the Director, Energy Delivery Operations Services for FirstEnergy Service Company.

2. I have a Bachelor of Electrical Engineering degree from Cleveland State University, a Masters of Business Administration degree from Cleveland State University , and am a Registered Professional Engineer in the State of Ohio .

3. I make this declaration in support of Metropolitan Edison Company, Pennsylvania Electric Company, and Penn Power Company's ("FirstEnergy") Answer to the Pole Attachment Complaint in the above-captioned proceeding.

4. I have spent nearly 32 years with FirstEnergy, and my areas of responsibility include joint use and attachments to poles owned by all of the operating company subsidiaries of FirstEnergy Corp.

5. FirstEnergy and Verizon share a number of distribution poles to access their respective customers.

6. FirstEnergy is required by law to provide electric service in all of the areas that it serves. Accordingly, if FirstEnergy were to remove Verizon's facilities from FirstEnergy's poles, and, as the Commission anticipates, Verizon were to remove all of FirstEnergy's attachments from Verizon's poles, FirstEnergy would instantly need to find an alternative means to provide electricity to its customers.

7. The only possible alternatives are to construct either another pole line or underground facilities paralleling and duplicating Verizon's pole lines. In either case, FirstEnergy would need to remove its facilities from Verizon's pole lines and transfer them to the newly-constructed duplicate pole line or underground facilities.

8. Neither of these duplicate distribution system possibilities would likely be deemed an acceptable spend of FirstEnergy ratepayer money by the Pennsylvania Public Utility Commission ("PaPUC"), or other state and local officials in Pennsylvania. The PaPUC permits the construction of dual pole lines only in certain limited circumstances where it is impractical or impossible to share distribution poles. Examples include:

    a. Areas where there are limits on pole heights near airports and airfields in accordance with Federal Aviation Administration regulations which prevent or minimize adverse impacts to the navigable airspace.

    b. Areas where there are limits on pole heights located under transmission line crossings or transmission line underbuild which are required to maintain National Electrical Safety Code ("NESC") vertical clearances between the transmission and distribution conductors.

    c. Dual pole lines may be constructed to accommodate area load demographics. Generally urban areas will have dual pole lines when multiple circuits are necessary to serve the electrical demand.

    d. Dual pole lines may be constructed on the opposite side of the road to serve new load growth or a specific new bulk load where it is more economical or less intrusive to construct a brand new pole line rather than modify and upgrade an existing pole line. Companies like Verizon may or may not transfer to the new pole line later on at their discretion.

9. Unless it is impractical or impossible for FirstEnergy and its joint use partners like Verizon to jointly use existing pole lines, it is unlikely that the PaPUC, Pennsylvania Department of Transportation, and other state and local officials in Pennsylvania would tolerate such wasteful expenditures of resources simply because FirstEnergy and its ILEC joint use partner could not agree to new terms and conditions of a joint use agreement.

10. For aesthetic and safety reasons, state and local officials generally do not favor the presence of duplicate overhead pole lines or the disruption caused by the construction of redundant underground facilities unless it is impractical or impossible to avoid.

11. As an example, in early 2007, my former colleague Steven Ouellette was working for the FirstEnergy operating utility Ohio Edison, which was involved in a dispute with Verizon regarding the joint use of distribution poles.

12. The joint use agreement between Ohio Edison and Verizon had terminated and there was an issue whether duplicate pole lines were permissible along an Ohio Department of Transportation ("ODOT") right of way in Medina, Ohio.

13. Attached hereto at Exhibit TC-1 is an email Mr. Ouellette received on February 9, 2007 from Ray Lorello of ODOT, in which he explains that duplicate pole lines would not be permitted.

14. Mr. Lorello explained ODOT's exasperation with the joint use agreement dispute between Verizon and Ohio Edison.

15. Mr. Lorello explained that ODOT decided to revoke Verizon's permit to attach in ODOT's rights-of-way because Verizon did not allow Ohio Edison to attach to Verizon's pole line.

16. Mr. Lorello explained that ODOT's action to revoke Verizon's permit supports the efforts of the Public Utilities Commission of Ohio ("PUCO") to eliminate multiple pole lines in the public right of way.

17. I have personal knowledge of and supervisory responsibility for FirstEnergy's negotiations with Verizon regarding the joint use at issue in this Complaint. I have read the Declaration of Stephen F. Schafer and agree with its contents.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

By: _____

Thomas R. Pryatel
Director, Energy Delivery Operations Services
FirstEnergy Service Company

Dated: January 31, 2020

EXHIBIT TC-1

Magee, Thomas

From: Wolfe, Mike <mwolfe@firstenergycorp.com>
Sent: Thursday, June 26, 2014 12:21 PM
To: Magee, Thomas
Cc: Schafer, Stephen F; Pryatel, Thomas R.; Starkey, Joseph E
Subject: FW: Medina

fyi

From: Wolfe, Mike
Sent: Tuesday, June 24, 2014 9:57 AM
To: Wolfe, Mike
Subject:

----- Forwarded by Steven E. Ouellette/FirstEnergy on 02/09/2007 03:39 PM -----

James M. Murray/FirstEnergy
02/09/2007 03:23 PM

To Steven E. Strah/FirstEnergy@FirstEnergy, Mark A. Julian/FirstEnergy@FirstEnergy, Eric J. Dickson/FirstEnergy@FirstEnergy, Steven E. Ouellette/FirstEnergy@FirstEnergy
cc
Subject Fw: ODOT Removal Notice

FYI
----- Forwarded by James M. Murray/FirstEnergy on 02/09/2007 03:21 PM -----

"McCarter, Doris" <Doris.McCarter@puc.state.oh.us>
02/09/2007 02:50 PM

To <jmmurray@firstenergycorp.com>, <todd.colquitt@verizon.com>
cc
Subject FW: ODOT Removal Notice

Just to make certain you are aware of the situation. I've let folks here internally know.

DRAFT - This document is created only for the purposes stated within. It is intended solely for staff discussion, reflecting the views of the author(s) and not necessarily the view of the Staff as a whole or the Commission.

Doris McCarter, Departmental Director, Service Monitoring and Enforcement Department, Public Utilities Commission of Ohio, 7th Floor, 180 East Broad Street, Columbus, Ohio 43215 (614) 995-0137

From: Ray.Lorello@dot.state.oh.us [mailto:Ray.Lorello@dot.state.oh.us]
Sent: Friday, February 09, 2007 2:17 PM
To: tracie.a.crowell@verizon.com; marinellin@firstenergycorp.com; Dewhurst, Greg
Cc: seouellett@firstenergycorp.com; tony.mcafee@verizon.com; Kathy.Ferguson@dot.state.oh.us; Jim.Short@dot.state.oh.us; John.Schafrath@dot.state.oh.us; Myra.Binns@dot.state.oh.us; Mark.Manzo@dot.state.oh.us
Subject: ODOT Removal Notices

Gentlemen...ODOT has reached the end of the line on working with both Verizon and First Energy/Ohio Edison on trying to reach agreement on the joint use conflict between your companies which has created the potential for delays to our MED 18 14.00 PID 18235 project in ODOT District 3.....it was our intention to give both companies the opportunity to reach an agreement that would allow our highway project to move forward without delay, provide for the joint use of the poles set by Verizon, and eliminate having dual sets of poles in our right of way which is not only the objective of ODOT but also the Public Utilities Commission of Ohio. Over the past couple of weeks I worked with both of you to try and make that happen but to no avail.

Unfortunately both companies rejected one another's short term proposals which would have solved the immediate problem but rather kept bringing up the bigger issue of establishing a long term Joint Use Agreement...

So therefore, at the advice of ODOT's legal counsel and in concurrence with my office, we have issued the following notices from our Acting Director that will be delivered to you respective companies both by certified and regular mail service:

Verizon has been put on notice that their permit to install their facilities in our right of way has been revoked and you are instructed to remove those facilities from our right of way. Our permit was predicated on a joint use installation and since that is not possible because of the lack of an agreement we believe the company is in violation of the permit terms and therefore, creating a problem for our project by not allowing First Energy/Ohio Edison to place their facilities on their poles as agreed to in the permit except under conditions neither utility is willing to agree to.

First Energy/Ohio Edison has been given a "Removal of Obstruction" notice because their facilities are obstructing ODOT's ability to construct our project.

I want both of you to know I am now out of this conflict. Both myself and District 3 ODOT representatives responsible for utility relocation have done everything in our power to resolve the situation. We do not want multiple pole lines in our right of way. It is the Department's legal opinion that the ORC gives the Director of Transportation jurisdiction over our highway right of way and how utility facilities are installed in that right of way and we are exercising that right. This also supports the PUCO's initiative to eliminate multiple pole lines in the public right of way and their desire to eliminate multiple utility pole lines in general.

I am sorry we could not resolve this problem...you may call me if you wish but be advised my comments will be limited to "no comment" because this has now become an issue that is beyond my ability to respond to...

G. Raymond Lorello
Utility & R/W Program Manager
Ohio Department of Transportation
1980 West Broad St.
Columbus, Ohio 43223
614 466-2279
fax. 614 466-0158
Ray.Lorello@dot.state.oh.us

Michael G. Wolfe
Attorney
FirstEnergy Legal Dept. - Reading Office
2800 Pottsville Pike
P.O. Box 16001
Reading, PA 19612-6001
Phone: (610) 921-6202
Fax: (610) 939-8655
E-Mail: mwolfe@firstenergycorp.com
****

ATTACHMENT E

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	
Commonwealth Telephone Company LLC d/b/a Frontier Communications Commonwealth Telephone Company, Frontier Communications of Breezewood, LLC, Citizens Telecommunications Company of West Virginia d/b/a Frontier Communications Company of West Virginia, and Frontier West Virginia Inc., *Complainants,*	**EB-14-MD-008**
v.	
Metropolitan Edison Company, Pennsylvania Electric Company, West Penn Power Company d/b/a Allegheny Power, Monongahela Power Company, and The Potomac Edison Company, *Respondents*	

DECLARATION OF BRIDGER M. MITCHELL

1. An economist, I hold a Ph.D. in economics from the Massachusetts Institute of Technology and am an expert in telecommunications economics. I previously served on the economics faculty of Stanford University and as a senior economist at The Rand Corporation. At Charles River Associates I have served as a vice president and am currently a senior consultant.

2. I have published research in the field of telecommunications economics, including the book Telecommunications Pricing: Theory and Practice. My expertise includes theoretical and empirical analysis of telecommunications pricing, including peak-load

pricing, usage-sensitive pricing, an international comparative study of telephone rates, and billing for call duration. I have co-authored 5 books and published more than 70 professional papers in peer-reviewed journals and volumes. I have testified in judicial and regulatory proceedings concerning antitrust and competition issues. My curriculum vitae is attached as Exhibit BM-1 to my Declaration sworn in this proceeding.

3. I have been asked by FirstEnergy Corporation to comment on the bargaining positions of an electric utility and an incumbent local exchange telephone company (ILEC) when those two companies have joint-use agreements that provide for attachments to each other's utility poles.

4. As the Commission has observed in its April 7, 2011 Pole Attachment Order[1] it has been common practice for an electric distribution utility and an ILEC to have long-term agreements to share the costs of constructing and maintaining poles that both companies use to attach wires and related equipment needed for their respective distribution networks in a service area.[2]

5. The basic economics of joint use of a single distribution pole results from the opportunity for the two companies to share the total costs of a single pole, one that is constructed to allow attachments of the wires and associated equipment of both companies. Absent agreement to share a pole, each company must in theory incur the stand-alone cost of constructing and maintaining a pole for its own network. The cost of the joint-use pole will be somewhat greater than the costs of either one of the two

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[1] *In the Matter of Implementation of Section 224 of the Act: A National Broadband Plan for Our Future, Report and Order on Reconsideration, FCC 11-50*, April 7, 2011 (*Pole Attachment Order*).

[2] *Pole Attachment Order* ¶216.

stand-alone poles, because additional pole height must be provided to separate high-voltage electric utility wires from the telephone cables. But because the total cost of the joint-use pole is less than the sum of the costs of two stand-alone poles, the two companies have the opportunity to reduce their distribution costs by sharing poles.

6. Electric utilities and ILECs have long recognized the benefits of sharing distribution poles. The joint-use agreements commonly provide for the individual poles to be owned by one of the two companies and constructed to joint-use standards. In some cases, including those in the Frontier Complaint, the agreements provide for a periodic payment for attaching to each joint-use pole owned by the other company.[3]

7. By entering into a joint-use agreement the two companies strike a long-term bargain that indirectly determines what fraction each company will bear of the total costs of the shared joint-use poles. Each company incurs the full cost of constructing and maintaining the poles that it owns, makes payments for attaching to the other company's poles, and receives payments for attachments to its poles.

8. The agreement therefore also determines how the savings in total costs will be shared from constructing a single joint-use pole rather than the alternative of each company potentially constructing its own stand-alone pole. In the language of economic game theory, how the savings in total costs are shared between the electric utility and the ILEC can be understood to be the solution to a cooperative game.[4]

9. If the electric utility and the ILEC were initiating their distribution networks they would potentially face the choice of constructing separate poles for each company, or

[3] In other agreements, not at issue here, each company constructs and maintains its own poles and attaches to the poles of the counterpart company at no charge, as long as certain ownership percentages are maintained.

[4] H. P. Young, "Cost Allocations", in *Handbook of Game Theory with Economic Applications, vol. 2.* (1994a), ed. R. Aumann and S. Hart ; series editors, K. Arrow and M. Intriligator, pp. 1193-1235.

shared poles for joint use. The joint-use agreements, however, presumably came into existence to formalize an already existing practice of pole sharing as well as to provide for sharing of costs and pole use as networks were expanded.

10. In the cooperative game of sharing the costs savings, bargaining power arises when the two companies (players) have at least two feasible options. In the case of the initial joint-use agreements, it might be thought that the electric utility and the ILEC have two options: (1) to cooperatively agree to share poles and joint-use pole costs, or (2) for each company to construct its own poles and incur stand-alone costs.

11. It is my understanding, however, that the second option – in which each company constructs its own sole-use pole network – is not feasible, for several reasons. First, state public service commissions and municipalities are strongly opposed to proliferation of utility poles and new construction may also be required to be underground. Second, access to the necessary rights of way may be unobtainable from municipal or private property owners. Third, the costs of constructing new poles or constructing underground service greatly exceed the costs of continuing to pay pole attachment rates to the joint-use pole owner.

12. With no feasible option to their current joint-use agreement, neither the electric utility nor the ILEC has a basis with which to bargain for a change in the agreement governing existing joint-use poles. Thus, both companies lack bargaining power. Moreover, even if the joint-use agreement were terminated, most of the joint-use poles subject to Frontier's Complaint would continue to be governed by the

"evergreen" clause of the relevant agreement that gives each company the continuing right to attach its equipment to those poles at the same attachment rates.[5]

I DECLARE UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE UNITED STATES THAT THE FOREGOING IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

B. Mitchell

Bridger M. Mitchell

Date: July 10, 2014

[5] Frontier Complaint, Exhibit. 1, Metropolitan Edison and Commonwealth Telephone, January 1, 1975, p. 10, article 18; Exhibit. 3, Pennsylvania Electric and Commonwealth Telephone, September 1, 1958, pp. 12-13, article 19; Exhibit 11, Potomac Light and Power and General Telephone, January 1, 1960, p. 10, article 21; Exhibit 17, Potomac Light and Power and Chesapeake and Potomac Telephone of West Virginia, p. 10, article 21.

ATTACHMENT F

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

Verizon Pennsylvania LLC and Verizon North LLC, *Complainants,*	
v.	**Proceeding Number 19-354** **Bureau ID Number EB-19-MD-008**
Metropolitan Edison Company, Pennsylvania Electric Company, and Penn Power Company, *Defendants*	

DECLARATION OF RANDAL J. COLEMAN, P.E.

I, Randal J. Coleman, declare as follows:

1. My name is Randal J. Coleman. I am the Manager, Distribution Standards at FirstEnergy Service Company. I have held my current position since June 2007. I am a Professional Engineer licensed in the state of Pennsylvania. I received by Bachelor of Science degree in Engineering in 1993 from Geneva College.

2. In my current capacity, I oversee activities associated with the use of distribution poles owned and used by the above-named FirstEnergy operating utilities. My duties also include development and maintenance of construction standards, engineering practices, selection of materials and approved usage. The position requires a background in the NESC and application of this standard in addition to the safety guidelines and objectives of FirstEnergy.

3. I have worked for FirstEnergy since April 25, 1979 and have more than 30 years of experience in distribution principally in engineering and engineering-related areas. I am a member of the Southeastern Electrical Exchange NESC Advisory Committee, NEETRAC Management Board and I serve as an Advisor to the EPRI Distribution Committee.

4. I make this declaration in support of Metropolitan Edison Company, Pennsylvania Electric Company, and Penn Power Company's ("FirstEnergy") Answer to the Pole Attachment Complaint in the above-captioned proceeding.

5. Attached hereto at Attachment RC-1 are photographs of poles to which Verizon is attached and that I reviewed in support of FirstEnergy's Answer. In each case where the as-found construction did not match FirstEnergy's published construction standards a corrective notion was added to reflect a change in alignment and the new power space. The space notation was based on FirstEnergy's construction standards in effect as of January 2020. This is the same process FirstEnergy companies regularly use to make space accommodations for attaching parties.

6. I applied the following FirstEnergy construction standards when calculating the corrected space requirements for 210 of the as-found pole images attached hereto at Exhibit Attachment RC-1: Section 6 (entire section); Section 7 (entire section); Section 08-010; Section 08-505; Section 11-115; Section 11-116; Section 12-606; Section14-210; and Section 16-100. These construction standards are attached hereto at Attachment RC-2.

7. The chart attached hereto at Attachment RC-3 was prepared in 2014 under my supervision.

8. The chart explains certain costs associated with the removal of the electric facilities of FirstEnergy from poles owned by Verizon.

9. Specifically, the chart identifies the following costs that would be incurred by FirstEnergy to do the following:

    a. Construct a new overhead pole line for the needs of FirstEnergy alone that would be adjacent to a line of poles owned by Verizon and then transfer the existing FirstEnergy electric facilities from the Verizon poles to the newly- constructed pole line. These costs are identified in Rows 3-10.

    b. Construct a new overhead pole line for the needs of FirstEnergy alone that would be located across the street from a line of poles owned by Verizon, construct equivalent electric facilities for the use of FirstEnergy on that new pole line, and remove the existing FirstEnergy electric facilities from Verizon's poles. These costs are identified in Rows 12-19.

    c. Construct underground facilities for the needs of FirstEnergy alone that would be located adjacent to a line of poles owned by Verizon and then transfer the existing FirstEnergy electric facilities from the Verizon poles to the newly-constructed underground facilities. These costs are identified in Rows 21-28, with additional per customer costs identified in Rows 30-31.

10. As the chart indicates, the costs that would be incurred by FirstEnergy to perform such activities specified in Paragraphs 9(a)-(c) above would vary depending on the complexity of the electric facilities and whether the facilities are located in a "Rural" area or a "Congested" area.

11. The chart specifies different costs for 15kV, single-phase equipment; 15kV, three-phase equipment; 35 kV, single-phase equipment; and 35kV, three-phase equipment.

12. The difference between a 15kV line and a 35kV line is that a 35kV line holds more electric capacity.

13. 15kV lines are much more common than 35kV lines.

14. The difference between a single-phase and three-phase line is that a three phase line has three current carrying conductors with a neutral and single phase line has one current carrying conductor with a neutral.

15. Three-phase lines are often required in commercial areas, while single-phase lines are often all that is required in residential areas.

16. For "Rural" areas, our calculations assumed that there are 20 customers per mile, 10 locations for transformer installations, and, for three-phase scenarios, one location for a three-phase transformer installation.

17. For "Congested" areas, our calculations assumed that there are 120 customers per mile, 15 locations for transformer installations, and, for three-phase scenarios, five locations for three-phase transformer installations.

18. For all of our calculations on the chart, we assumed that there were thirty poles per mile with a 175-foot ruling span, a 1/0 Aluminum-Conductor Steel-Reinforces (ACSR) that is FirstEnergy's median conductor size.

19. A length of 175 feet is the median ruling span for 1/0 ACSR.

20. The costs in Rows 30-31 are the additional costs per customer that would be incurred to move facilities from overhead to underground.

21. The cost in Row 30 is the cost per customer to remove an overhead triplex secondary conductor and install an underground triplex secondary conductor.

22. The cost in Row 30 is the cost per customer to remove an overhead triplex secondary conductor and install an underground triplex secondary conductor, with the extra cost of performing a directional bore across a public right-of-way to provide secondary voltage.

23. As the table shows, the least costly alternative would be for FirstEnergy to construct a duplicate pole line next to the existing Verizon pole line and then transfer its facilities from the Verizon poles to the newly-constructed duplicate pole line. Using the simplest 15kV, single-phase facilities in rural areas, the cost per mile would be [redacted] In a congested area, the cost per mile would be [redacted] See Table at Rows 7 and 13.

24. For 35kV, three-phase facilities, the rural area and congested area per mile costs to construct a duplicate, adjacent pole line and transfer facilities would be [redacted] and [redacted], respectively. See Table at Rows 10 and 6.

25. These calculations for <u>adjacent duplicate pole lines</u> can be summarized as follows:

15 kV, single phase, rural:
15 kV, single phase, congested:
35 kV, 3-phase, rural:
35 kV, 3-phase, congested:

[redacted]

26. In many cases, however, there would be no room for a new pole line to be constructed adjacent to the existing pole line, and the new line must therefore be installed across the street. In that case, a simple transfer of facilities is not possible so that FirstEnergy would need not only to construct the new pole line but also rebuild its electric distribution facilities (and of course remove its existing facilities from Verizon's poles). In that events, the range of costs for <u>duplicate pole lines across the street</u> would be as follows:

15 kV, single phase, rural:
15 kV, single phase, congested:
35 kV, 3-phase, rural:
35 kV, 3-phase, congested:

[redacted]

27. The cost of going underground is even worse. FirstEnergy would need to construct underground facilities for its own needs that would be located adjacent to a line of poles owned by Verizon and then transfer its existing electric facilities from the Verizon poles to the newly-constructed underground facilities. The range of such costs for FirstEnergy to go underground would be as follows:

15 kV, single phase, rural:
15 kV, single phase, congested:
35 kV, 3-phase, rural:

[redacted]

[1] *See* Rows 7, 1, 10, and 6, respectively.
[2] *See* Rows 16, 12, 19 and 15, respectively.

35 kV, 3-phase, congested: [redacted]

28. Assuming that FirstEnergy was able to construct duplicate pole lines, then some average of the per-mile costs associated with adjacent vs. across the street pole lines, rural vs. congested, 15kV vs. 35kV, and single-phase vs. 3-phase would need to be calculated to determine the estimated per-mile cost for such an undertaking. That figure would likely be considerably higher than [redacted] per mile.

29. From an economic perspective, it makes no sense whatsoever for FirstEnergy to incur a minimum initial cost of [redacted] per mile and an annual cost thereafter of [redacted] per mile to create duplicate pole facilities when the alternative is to continue attaching to an existing pole line at a per mile cost of [redacted]

30. There are significant practical and physical barriers as to whether sufficient labor resources are available to build a duplicate pole distribution system, and how long it would take to accomplish such duplication. My best estimate is that it would take at least 3 years to accomplish any of the above alternatives.

31. In my experience analyzing attachments made to the poles of FirstEnergy, cable company attachments and non-pole owning telephone companies (CLECs) typically attach less equipment to utility poles than do telephone company pole owners (ILECs) like Verizon. In addition, cable companies and CLECs both typically occupy the middle space on the pole above the ILEC attachments and below electric utility attachments.

32. Since the ILEC's attachments are the lowest attachments on the pole, the ILEC attachments must maintain the mid-span clearance of 15'6" above the ground that is required by the National Electrical Safety Code. FirstEnergy includes this mid-span clearance requirement in its engineering standards. In order to maintain this clearance mid-span, ILECs typically attach their facilities higher than the 18 feet above ground level.

33. Verizon is no exception. Verizon is almost always the lowest attacher on its joint use poles that it shares with FirstEnergy, and its lowest attachments on these joint use poles are typically located higher than 18 feet above ground level, on average at 19.87 feet according to the statistically valid field audit FirstEnergy completed last month.

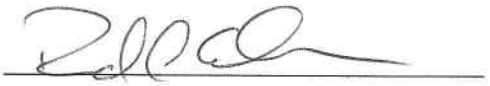
34. FirstEnergy's field audit shows that Verizon's facilities weigh much more than the facilities of other communications attachers, primarily because of the old copper wire that Verizon has not removed. This additional weight has several effects: (i) the load on the pole created by Verizon's attachments is greater than the load on the pole created by Verizon's competitors, especially when considering ice and wind conditions typically

[3] *See* Rows 25, 21, 28, and 24, respectively.

experienced in Pennsylvania; (ii) Verizon's attachments create more sag than do the attachments of Verizon's competitors, thus requiring even more pole space; and (iii) newcomers to the pole are disadvantaged more by Verizon's attachments than by the attachments of other communications companies, because Verizon's attachments use up more loading and space capacity, thus making it more likely the pole will lack available loading or space capacity and must be replaced with a taller or stronger pole by the new attacher.

35. If Verizon were not the lowest attacher on the pole but instead there were attachments below Verizon's attachments, then Verizon's attachments on average would need to be placed on the pole 3.5 feet above the lowest attacher or more. This is true because FirstEnergy's standards require six inches of separation between communications attachments mid span, and because Verizon's sag requires such additional pole space in order to meet this mid-span clearance standard.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

By: 

Randal J. Coleman
Manager, Distribution Standards
FirstEnergy Service Company

Dated: February 2, 2020

ATTACHMENT
RC-1

PUBLIC VERSION

FE Poles Center
Scid: 1012

33'-7" Pole Top

19'-8" Company 1

18'-6" Verizon

POLE INFO

Pole Tag: Penn Power 95-811
Calculated Pole Length: 40
Latitude: 41.24196442299246
Longitude: -80.47423438252979

DAVEY Resource Group

PUBLIC VERSION

38'-3" Pole Top

18'-8" Company 1

17'-4" Verizon

POLE INFO

Pole Tag: Penn Power 94-854

Calculated Pole Length: 45

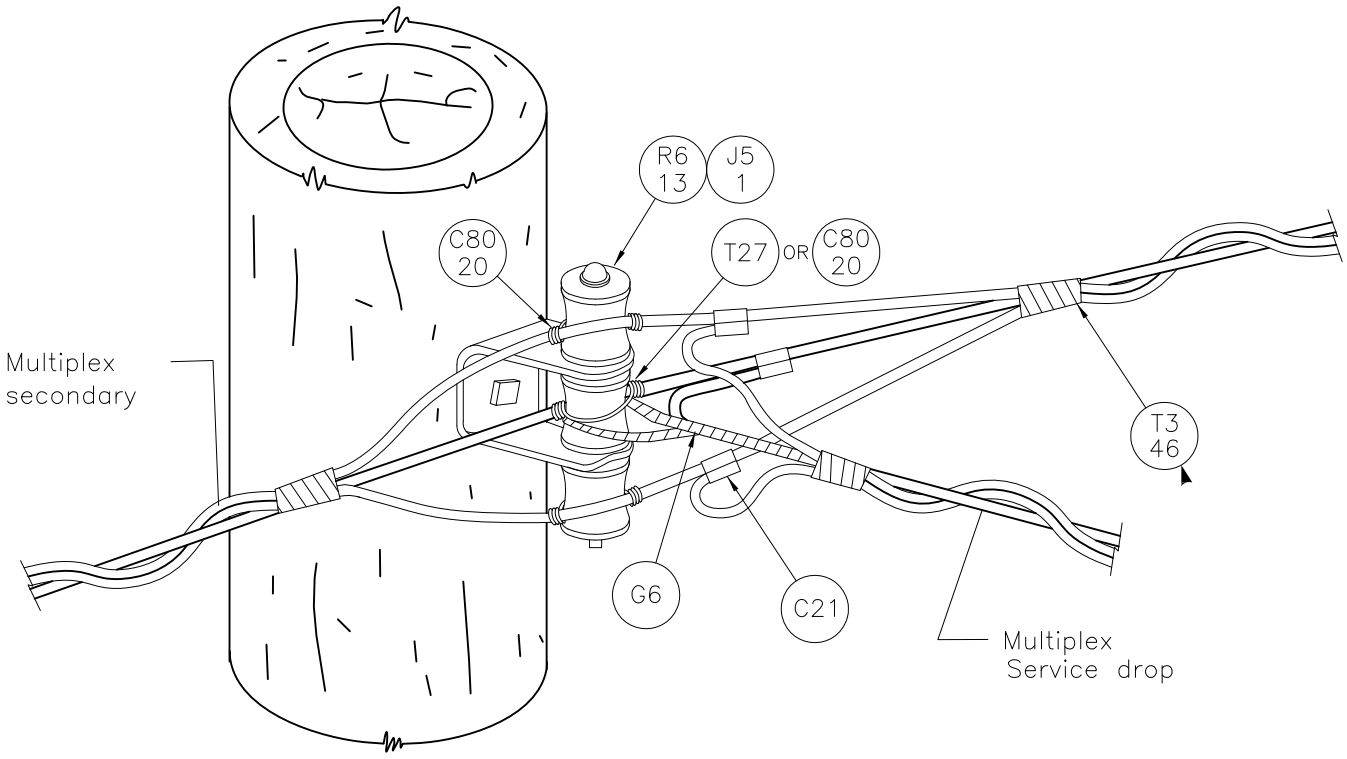
Latitude: 41.24227447208674

Longitude: -80.47424258747691

DAVEY Resource Group


646

ATTACHMENT
RC-2



Notes:

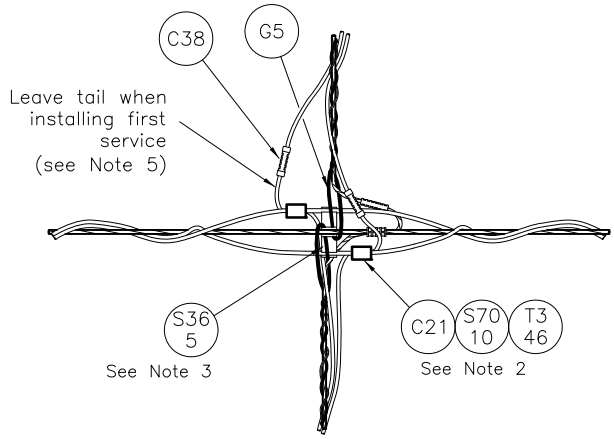
1. For conductor tie details, see Standard 4-115.

APPROVED BY: *LAH/RJG*

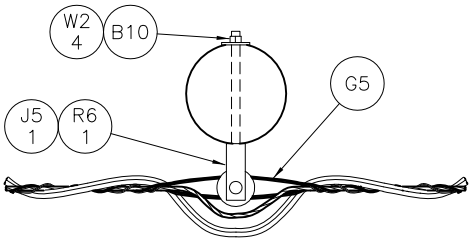
FirstEnergy	
REV. 4	Construction Std.
DATE 6/15	6–200

Triplex Rack Installation Details

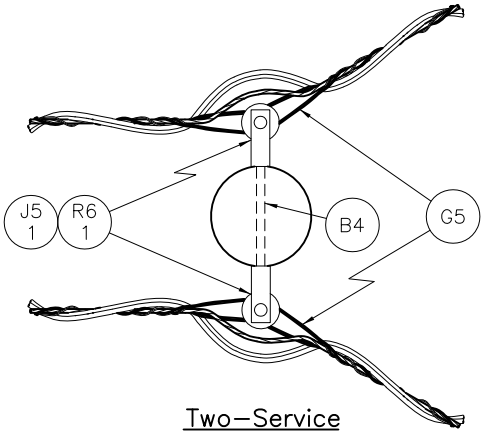
FE00063



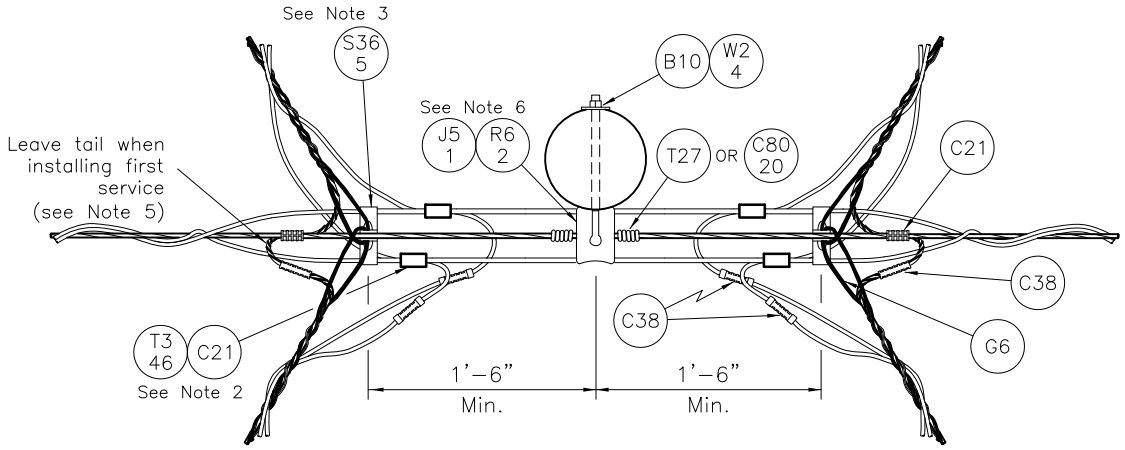
Mid–Span Service Take Off



One Service



Two–Service Clearance Poles



Notes:

1. For service drop splicing details, see Standard 6–211.
2. Insulate all line connections with electrical tape T3/46.
3. Use No. 4 Alum. tie wire on all spacers not secured to neutral with service grips.
4. Install no more than two mid–span services at any one location with no more than two locations per span.
5. Train, insulate, and secure the tail for future service taps when not used.
6. For conductor tie details, see Standard 4–115.

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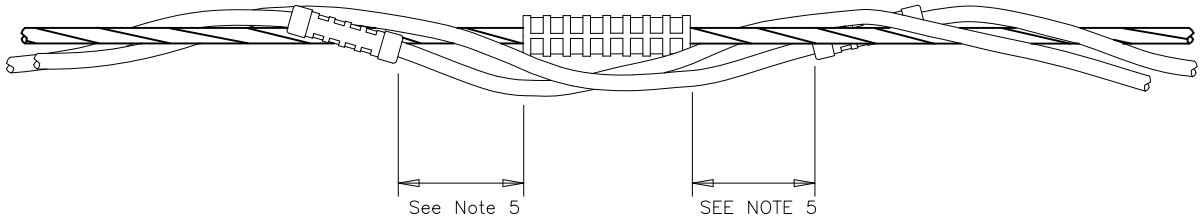
1–Wire Rack & Multiplex Spacer Installation

FirstEnergy

Construction Std.	REV.
6–210	2
FE00064	DATE 6/15



Multiplex Type	Neutral		Phase		
	Size	Conn. Id	Size	Bare Conn. Id	Insulated Conn. Id
#4 TPX	#4 ACSR	22212843	#4 AAC	22240703	22240623
1/0 Tpx, Quad	1/0 ACSR	22214113	1/0 AAC	22255653	22255493
2/0 Tpx, Quad	2/0 AAC	3517	2/0 AAC	3517	3162
2/0 Tpx, Quad	2/0 ACSR	22276151	2/0 AAC	3517	3162
3/0 Tpx, Quad	1/0 ACSR	22214113	3/0 AAC	22211523	95932844
4/0 TPX	2/0 ACSR	22276151	4/0 AAC	22211543	---
4/0 Quad	4/0 ACSR	20718006	4/0 AAC	22211543	---
336.4 Tpx, Quad	336.4 AAC	95919234	336.4 AAC	33217182	---

Notes:

1. Supporting messenger to be spliced approximately 2 inches shorter than the insulated conductors to avoid excessive tension in the insulated conductors.
2. File all sharp edges off tension compression sleeve after compressing.
3. Do not scrap cable lengths in excess of 50 feet.
4. For quadraplex service, one additional limited tension insulated compression sleeve is required.
5. Maintain a separation of 3 inches (min.) between connectors to prevent overlap.
6. Insulate bare sleeve by first applying four layers of half lapped high voltage splicing tape (sticky side up) to cover the connector and insulation then apply two layers of half-lapped PVC tape over high voltage splicing tape and extending 1 inch beyond the high voltage tape.

APPROVED BY: JAH/RFB

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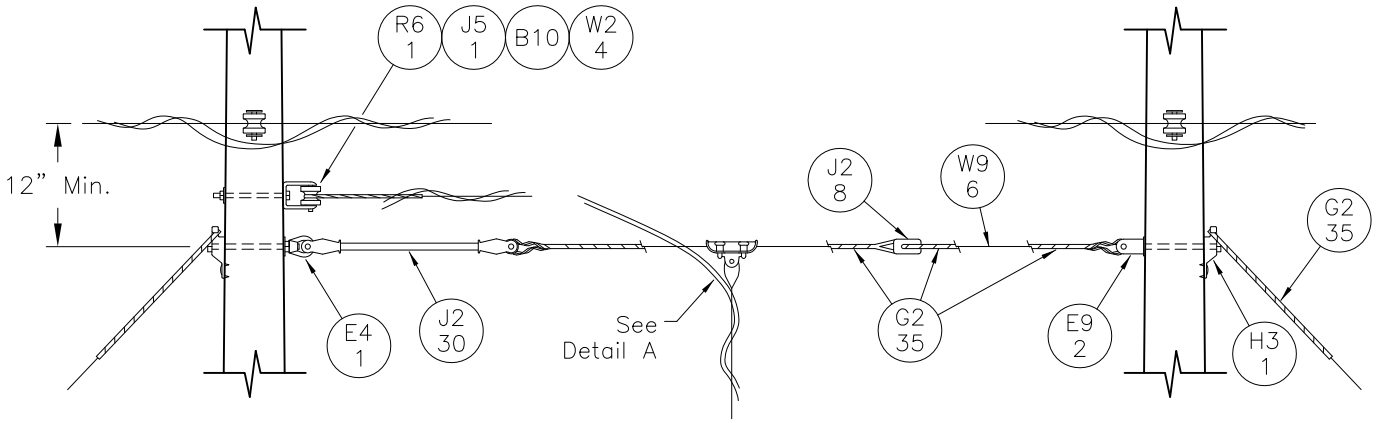
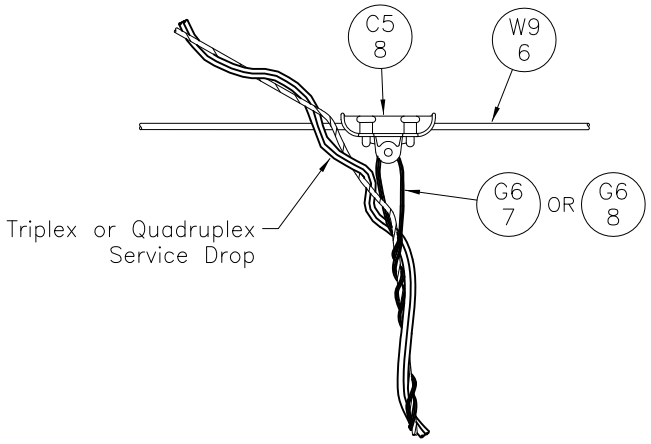
REV. 2	Construction Std.
DATE 3/03	6-211

Service Drop – Aluminum Multiplex Splicing Details

FE00065





Detail A

Notes:

1. This installation is for an addition of a midspan tap without the use of a bucket truck or ladder at the midspan tap location.
2. Each pole shall be guyed for 3500 lbs.
3. Service drop installation tension @60° shall be in the 50#–60# range.
4. Clearance from communication, not spacing, shall be a minimum of 40 inches at the pole & 30 inches at the take–off point. The minimum clearances over ground shall exceed 3–015 or 3–016 by 6 inches to account for the increase from initial to final sag conditions in the service drop.
5. Midspan applications shall be limited to 175 ft spans between secondary poles and 125 ft for the service drop. Service drop lengths beyond 80 ft are not recommended because of excessive sag.
6. Electrical connections shall be made at the pole and not at the take–off point.

APPROVED BY: *SAH/RJG*

#4 & 1/0 Triplex & Quadruplex Mid–Span Service Drops (Locations without Truck Access)

FirstEnergy

Construction Std.	REV.
	2
6–220	DATE
FE00066	2/15

APPROVED BY: [signature]

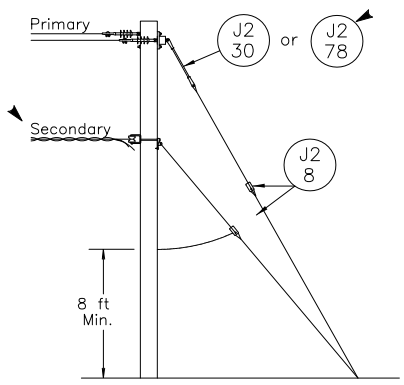


Fig. 1

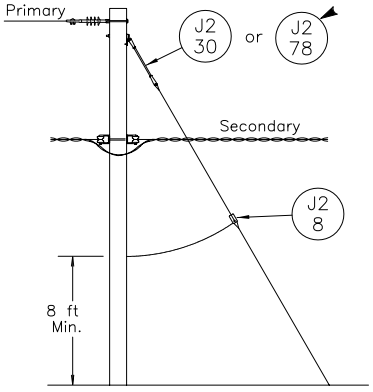


Fig. 2

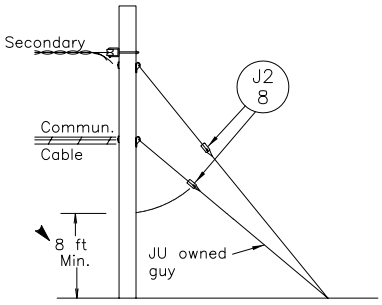


Fig. 3

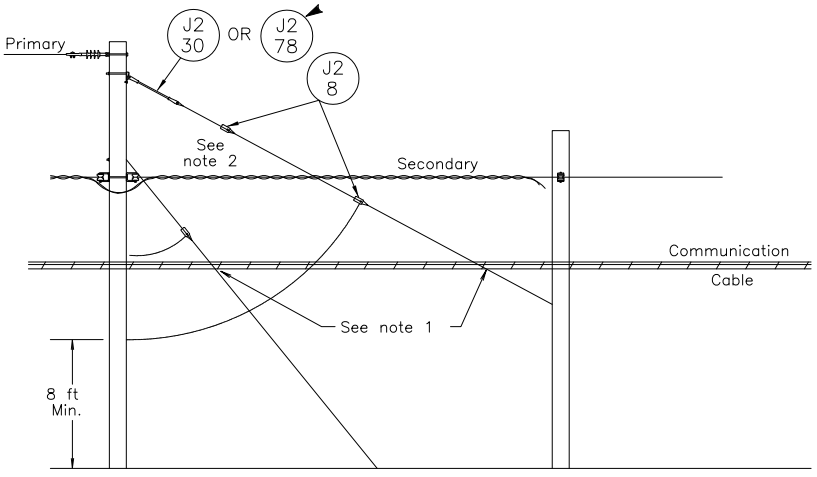


Fig. 4

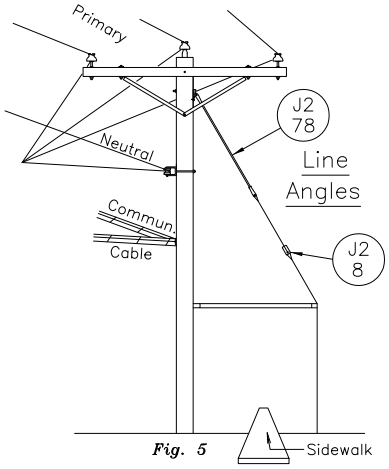


Fig. 5

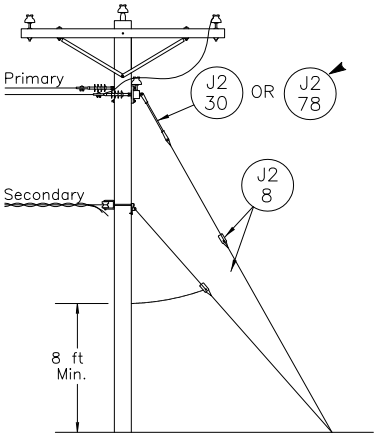


Fig. 6

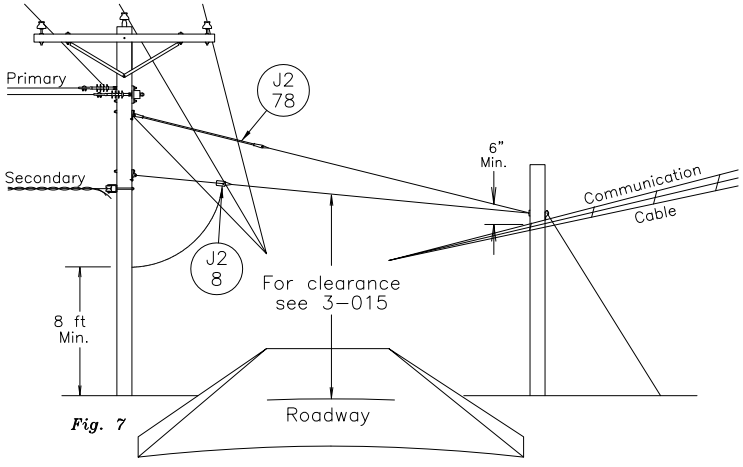


Fig. 7

NOTES:

► 1. When they are attached to the same structure. the minimum clearance between guy wire and communication cable is 6". The minimum clearance for anchor guys supported on different structures is 6". For span guys and neutrals, the minimum clearance is 24". Clearances are surface to surface.

2. If guy passes within 12" of secondary or within 12" of communication cable, it shall have an insulator as shown.

3. Guy insulators are placed to protect public and line workers in case the guy breaks, or goes slack, and makes contact with any energized conductor. A guy attached above primary conductors shall have an insulator placed so that if the guy breaks, there is an insulator at least 8 feet above ground and below all primary conductors. All guys are to have at least one insulator installed so that if the guy breaks, the insulator is at least 8 feet above the ground.

► 4. All sub–transmission and transmission construction requires fiberglass guy strain insulators be installed based on strength required for single or double down guy or head guying applications. Refer to Standard 7–040.

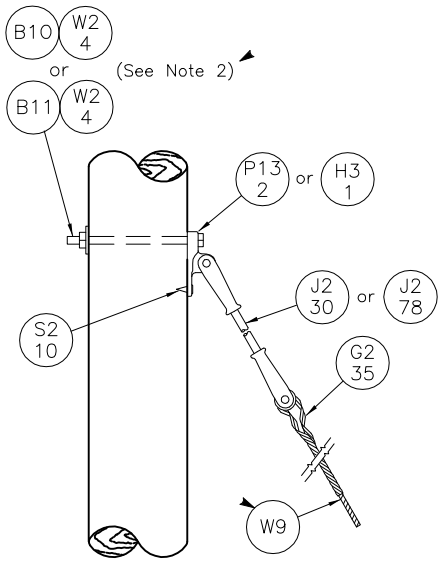
FirstEnergy	
REV.	Construction Std.
3	7–010
DATE	
12/14	

Insulator Application Guying

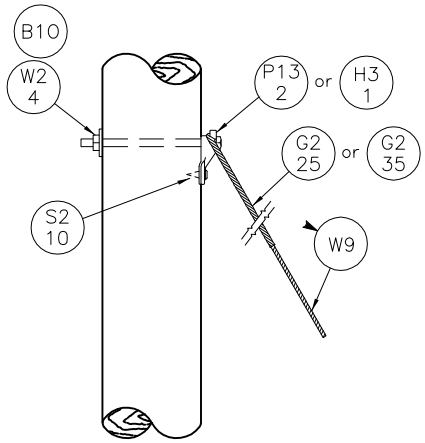
APPROVED BY: GLG/RJG

FE00068

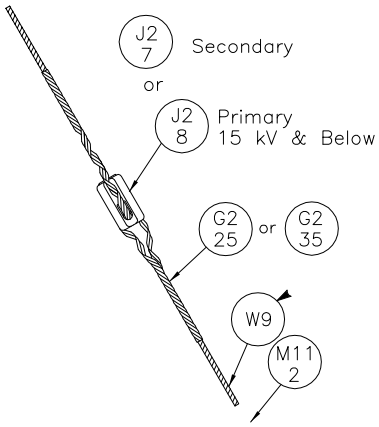
PUBLIC VERSION



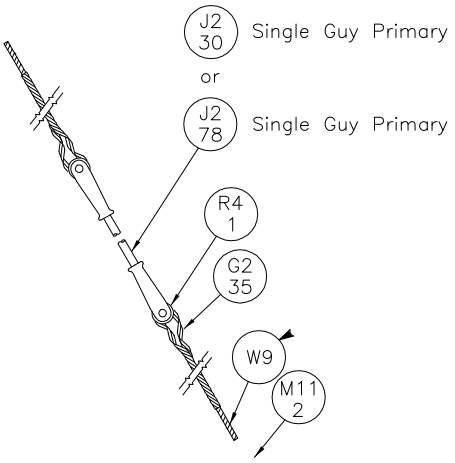
Primary Single Guy
Fig. 1



Secondary
Fig. 2



Mid–Lead Porcelain
Insulator Assembly
Fig. 3



Mid–Lead Fiberglass
Insulator Assembly
Fig. 4

Guy		Breaking Strength	Permitted Load (1)
W9/5	5M3	5,600#	5,040#
W9/7	12.5M	12,500#	11,250#
W9/8	20M	20,000#	18,000#
W9/9	25M	25,000#	22,500#

Notes:

1. The permitted load is a 10% derating of the ultimate guy strength. The guy tension with NESC overload factors applied must not exceed the permitted load.
2. Use a 3/4" bolt (B11) when using 12.5M guy or larger for tension purposes.
3. Refer to Standard 7–010 for guy insulator application.
4. All sub–transmission and distribution construction greater than 15 kV require fiberglass guy strain insulators be installed based on strength required for down guy applications.
5. Install guy marker (M11/2) on the outer most down guy.

APPROVED BY: RWF/RFE

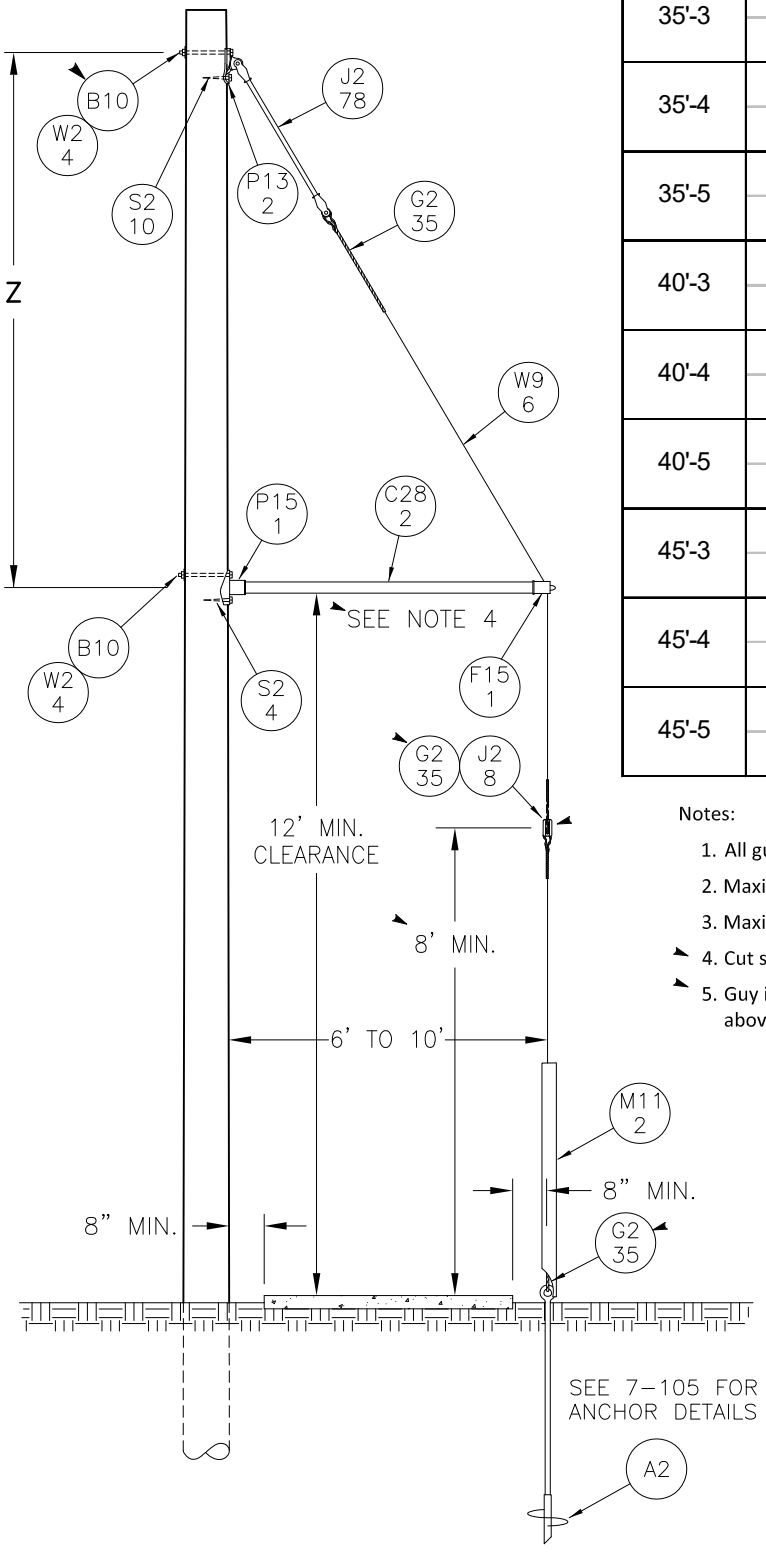
Distribution & Sub Transmission Down Guy Attachment Details

FirstEnergy

Construction Std.	REV.
7–040 FE90069	6
	DATE 09/19

PUBLIC VERSION

POLE HEIGHT & CLASS	Z	Maximum Line Angle			
		1-1/0 PRI 1/0 TPX	3-1/0 PRI 1/0 TPX	1-336 PRI 1/0 TPX	3-336 PRI 1/0 TPX
35'-3	8'	30°	30°	20°	15°
	14'	30°	30°	30°	25°
35'-4	8'	30°	10°	30°	10°
	14'	30°	20°	30°	15°
35'-5	8'	25°	10°	20°	5°
	14'	30°	15°	30°	10°
40'-3	8'	30°	30°	15°	15°
	14'	30°	30°	25°	20°
40'-4	8'	30°	10°	25°	10°
	14'	30°	20°	30°	15°
40'-5	8'	25°	5°	20°	10°
	14'	30°	10°	30°	15°
45'-3	8'	30°	30°	15°	10°
	14'	30°	30°	20°	15°
45'-4	8'	30°	10°	25°	5°
	14'	30°	15°	30°	10°
45'-5	8'	20°	5°	20°	5°
	14'	30°	10°	25°	5°



Notes:

1. All guys to be 3/8" EHS.
2. Maximum design angle, of table, limited to 30°.
3. Maximum design span, of table, limited to 179 ft.
4. Cut steel conduit to required length for strut.
5. Guy insulators shall be paced to protect the general public at least 8 ft above ground level.

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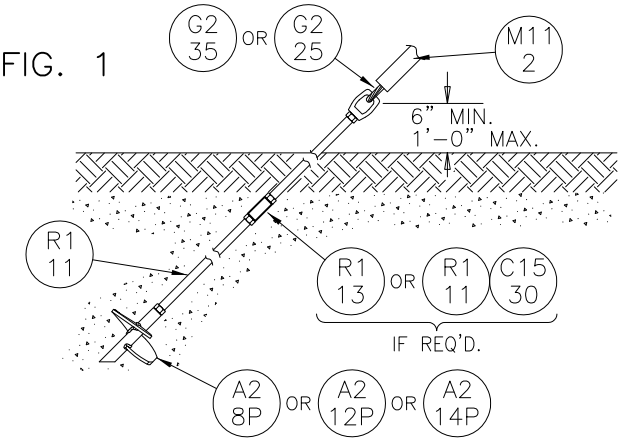
FirstEnergy	
REV. 3	Construction Std.
DATE 6/15	7-050

Sidewalk Guy

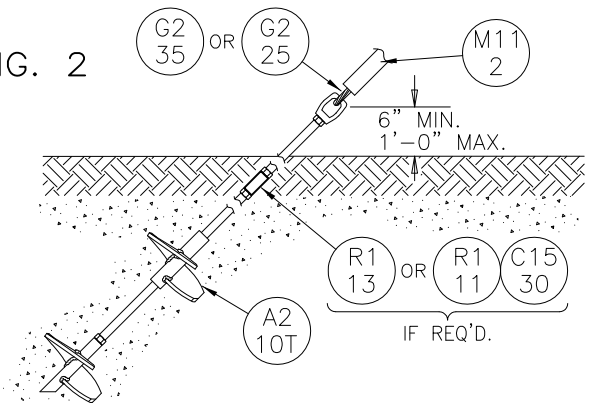
FE00070

FIG. 1



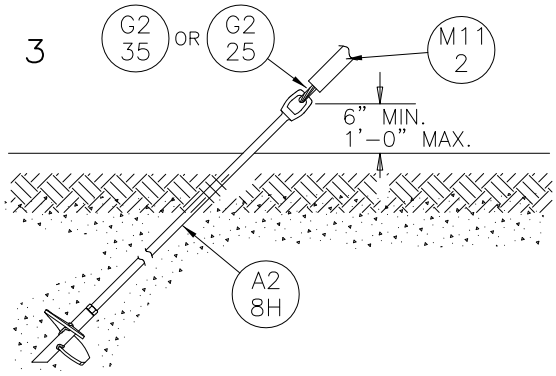
Power–Installed Screw Anchor
(PISA)

FIG. 2



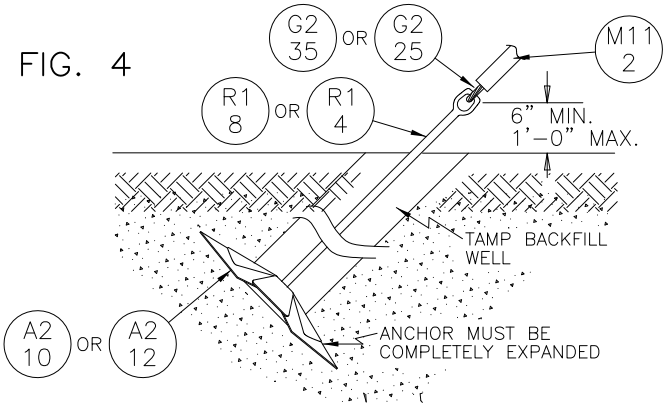
Multi–Helix Anchor
(PISA)

FIG. 3



No–Wrench Anchor
(hand or machine installed)

FIG. 4

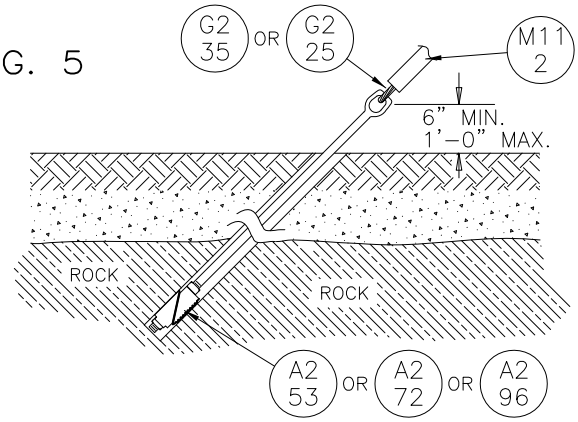


Expansion Anchor

NOTES:

1. (FIG. 1) Single–Helix power installed screw anchors are the preferred installation when applicable.
2. (FIG. 2) Multi–Helix anchors are used in areas where poor to medium soil conditions exist (i.e., swamp, sand, firm clay).
3. (FIG. 3) "No–Wrench" type anchors are used when temporary guying is required and for secondary conductor guying when soil conditions permit.
4. (FIG. 4) Expansion Anchors are used in areas that are not truck accessible or where other utilities may be in close proximity of anchor installation.
5. (FIG. 5) Rock Anchors, shall be set in holes 2–3/8" x 12" deep (min.) in rock, to develop full strength.
6. (FIGS. 1 & 2) Where soil conditions dictate that anchors be set more than one rod length deep, use an extension wrench to install second rod to gain adequate depth.
7. When more than one anchor is used to sustain the loads imposed on the pole, the anchors shall be spaced a minimum of five feet (5') apart. This separation is needed to prevent the reduction of the anchor holding strength.

FIG. 5



Rock Anchor

Anchor Types & Sizes

FirstEnergy

Construction Std.	REV.
7–105	2
	DATE 1/15

FE00071

Table I

Symbol	Anchor Description	Fig.	Anchor Holding Strength (lbs.) by Soil Classification			
			Clay	Sand	Swamp	Rock
A 2/8P	8" P.I.S. Anchor, f/ 1" rod w/ triple eyenut	1	25,000	10,000	---	---
A 2/12P	12" P.I.S. Anchor, f/ 1" rod w/ triple eyenut	1	30,000	18,500	---	---
A 2/14P	14" P.I.S. Anchor, f/ 1" rod w/ triple eyenut	1	32,000	19,500	---	---
A 2/10T	10" Multi-Helix Anchor, f/ 1" rod w/ t-eyenut	2	30,000	22,500	17,500	---
A 2/8H	8" 'No Wrench' Anchor, w/ tripleye	3	6,000*	3,200	---	---
A 2/10	10" Exp. Anchor, f/ 3/4" rod w/ double eyenut	4	23,000*	18,800	---	---
A 2/12	12" Exp. Anchor, f/ 1" rod w/ triple eyenut	4	36,000*	24,000	---	---
A 2/53	53" Rock Anchor, w/ 1" rod & triple eyenut	5	---	---	---	36,000*
A 2/72	72" Rock Anchor, w/ 1" rod & triple eyenut	5	---	---	---	36,000*
A 2/96	96" Rock Anchor, w/ 1" rod & triple eyenut	5	---	---	---	36,000*

Table II

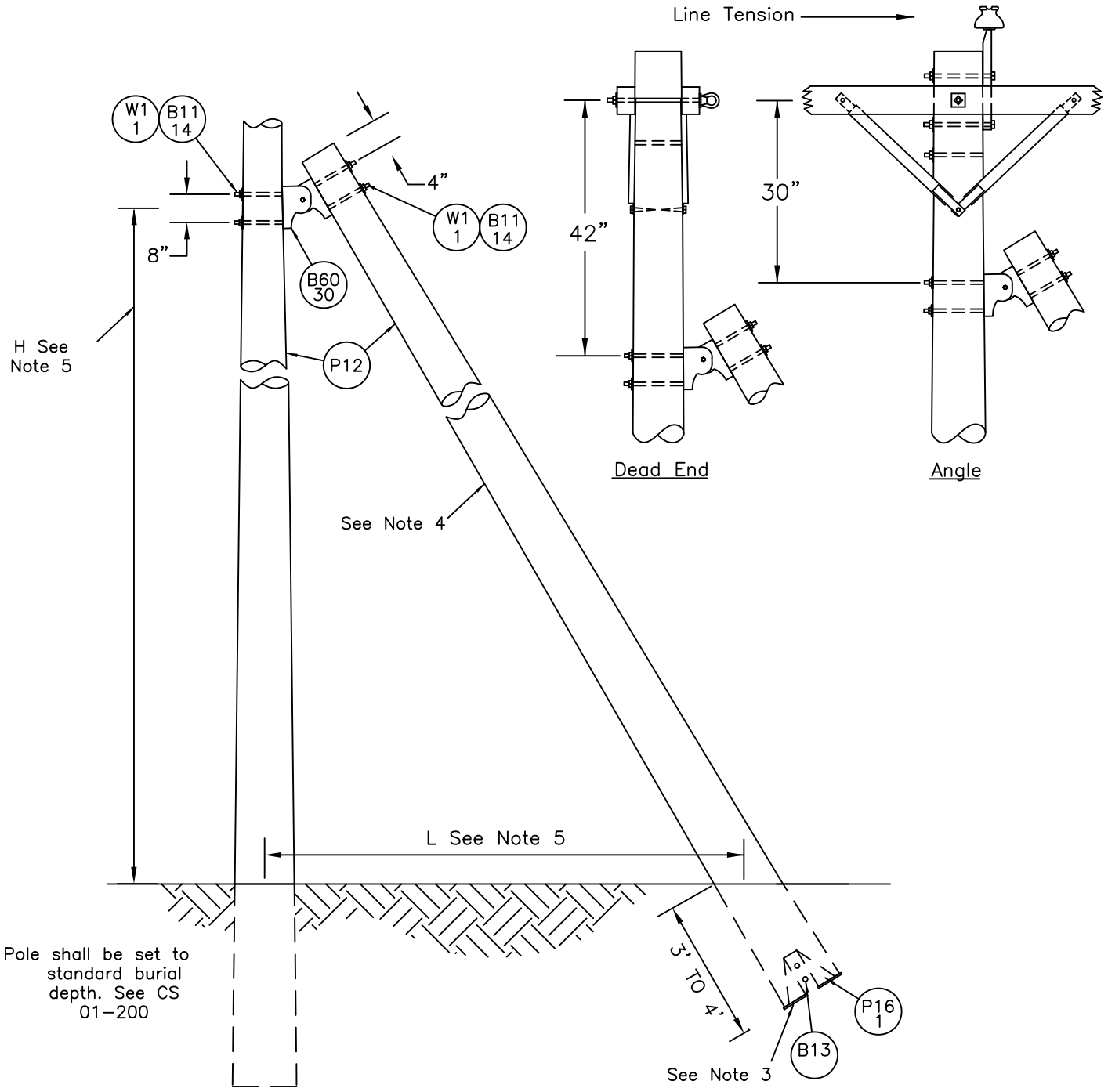
	Installation Torque (Ft-Lbs)										
	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000
Symbol	Estimated Holding Strength (Lbs)										
A 2/8P	7,000	9,500	12,000	15,000	18,000	20,000	22,000	23,500	25,000	---	---
A 2/12P	13,000	15,000	17,000	19,000	21,000	22,500	24,000	25,500	27,000	28,500	30,000
A 2/14P	15,500	17,200	19,000	21,000	23,000	24,500	26,000	28,000	30,000	31,000	32,000
A 2/10T	15,500	17,200	19,000	21,000	23,000	24,500	26,000	28,000	30,000	---	---
A 2/8H	6,000	---	---	---	---	---	---	---	---	---	---

Notes:

1. Holding strengths are **ultimate ratings**. Values **do not** include NESC safety factors for grades 'C' or 'B' construction.
2. Asterisk (*) values are limited by anchor rod strength.
3. The values listed in Table II should be used for applications where torque indicators are available.
4. When more than one anchor is used to sustain the loads imposed on the pole, the anchors shall be spaced a minimum of five feet (5') apart. This separation is needed to prevent the reduction of the anchor holding strength.

APPROVED BY:

FirstEnergy		Anchor Holding Strength & Torque Ratings
Rev. 2	Construction Std.	
Date 1/15	7 - 110	FE00072



Notes:

1. Push brace shall be installed as a last resort only when normal guying cannot be used.
2. This construction is for distribution only.
3. Use one pair of bearing plates in soft soil (i.e., sand or loam). They should be orientaed as shown.
4. Push brace is normally the same size/class as the line pole.
5. The minimum lead "L" shall be half the above grade mounting height "H"

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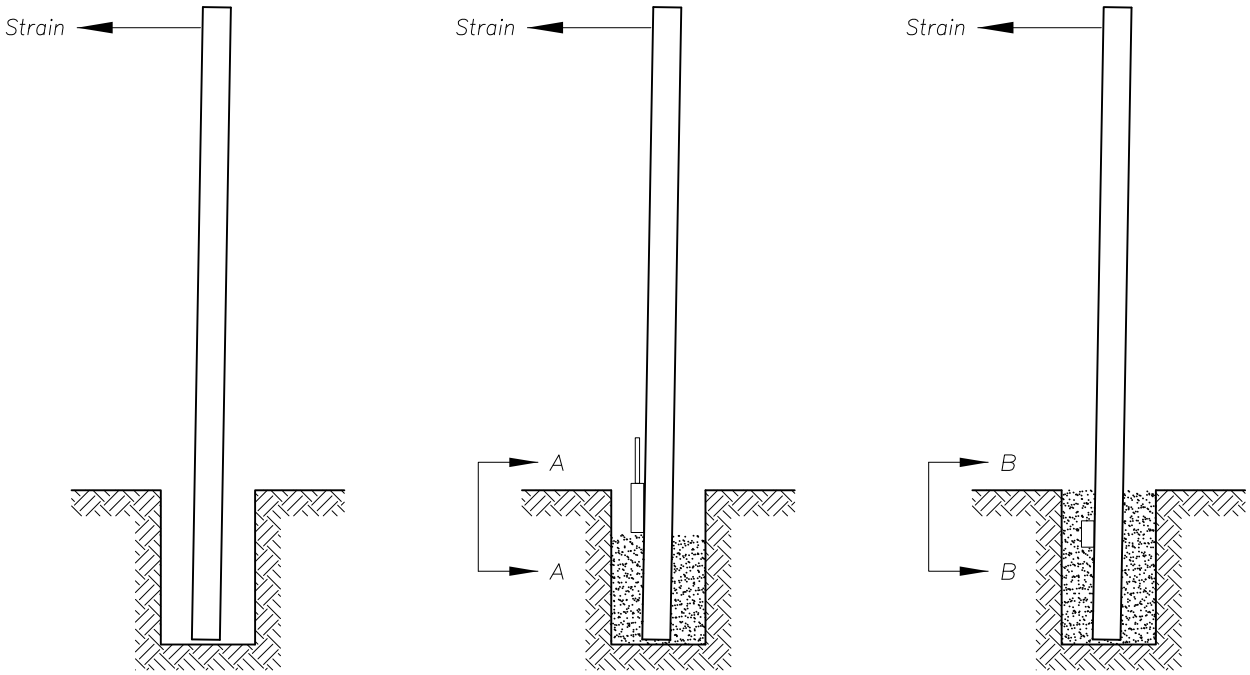
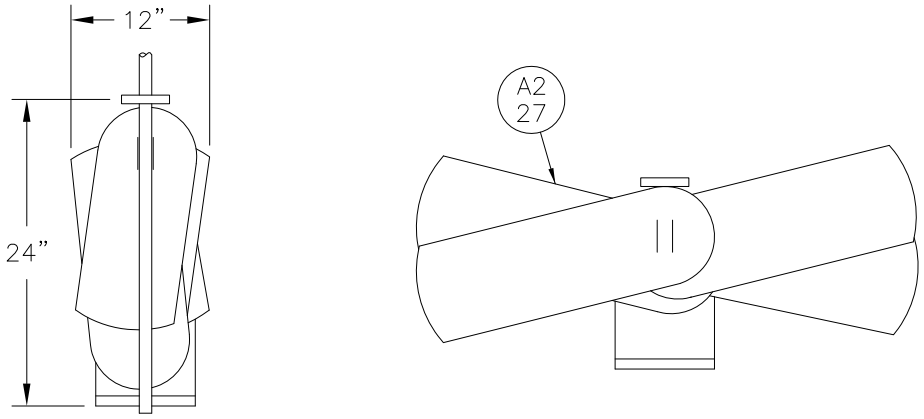
FirstEnergy	
REV.	Construction Std.
0	7–120
DATE	
4/18	

Push Brace

FE00073





Section A–A
POLE KEY CLOSED

Section B–B
POLE KEY EXPANDED

NOTES:

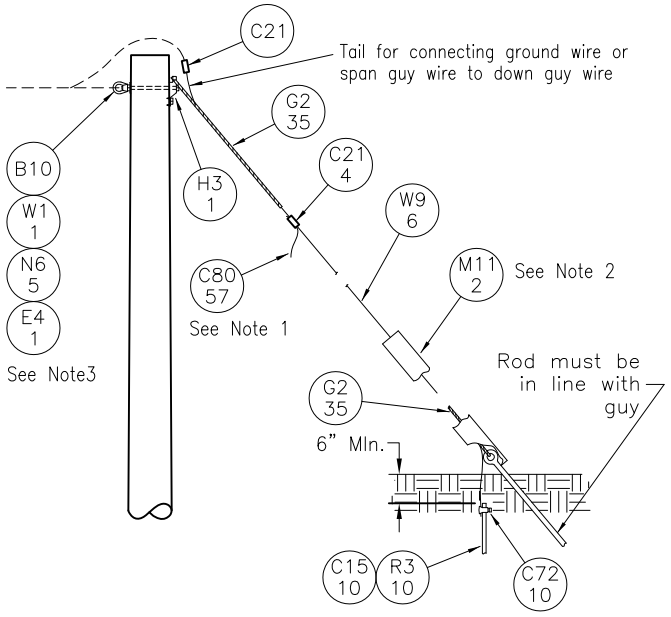
1. Pole blocking is for reduced tension span applications. See Section 8.
2. Set pole and rake 6" to 8", opposite direction of the strain.
3. Backfill and tamp within 18 inches of grade.
4. Thread rod on pole key and position in hole, in direction of strain.
5. Tamp the pole key until it is completely expanded. Remove rod and complete the backfill, tamping thoroughly.
6. For existing installations requiring pole blocking, excavate 18 inches below grade, in direction of the strain, and follow Notes 4 & 5.

APPROVED BY: GLJ/RJC

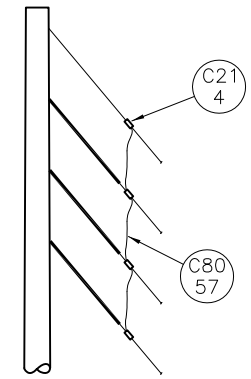
Pole Blocking

FirstEnergy

Construction Std.	REV.
7–140	1
FE00074	DATE 1/15

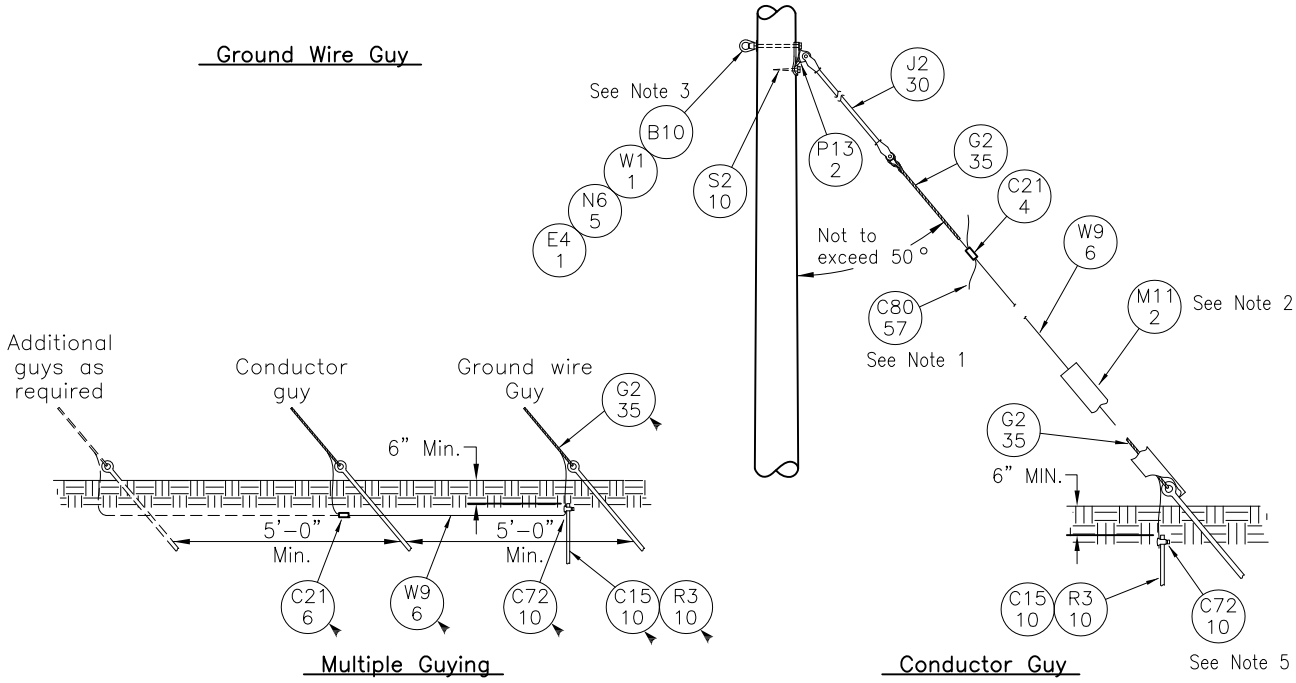


Ground Wire Guy



DETAIL "A"

Guy Wire Bonding



Multiple Guying

Conductor Guy

Notes:

1. Bond all guys to ground wire guy, using #4 solid soft drawn copper conductor. See detail "A"
2. Install guy marker on top guy at each anchor rod.
3. Install machine bolts with heads on guy pole eye plate side.
4. See Standard 7-105 for anchor details.
5. Ground rod not required at conductor guy if ground wire guy is installed. Install ground lead from ground wire guy to conductor guys, as shown in the "multiple guying" detail.
6. Guy design load is based on 90 percent of rated breaking strength, per NESC.
7. When calculating vertical pole crushing at the point of guy attachment, use actual load with no overload factor. This load not to exceed 5000 lbs. above 5000 lbs., see Standard 7-260.
8. When ground resistance of 10 ohms or less cannot be obtained by above methods, see Standard 5-050.
9. 3Ø medium angle 10 ft double arm / double post construction 34.5 kV.

APPROVED BY: EDJ/RFC

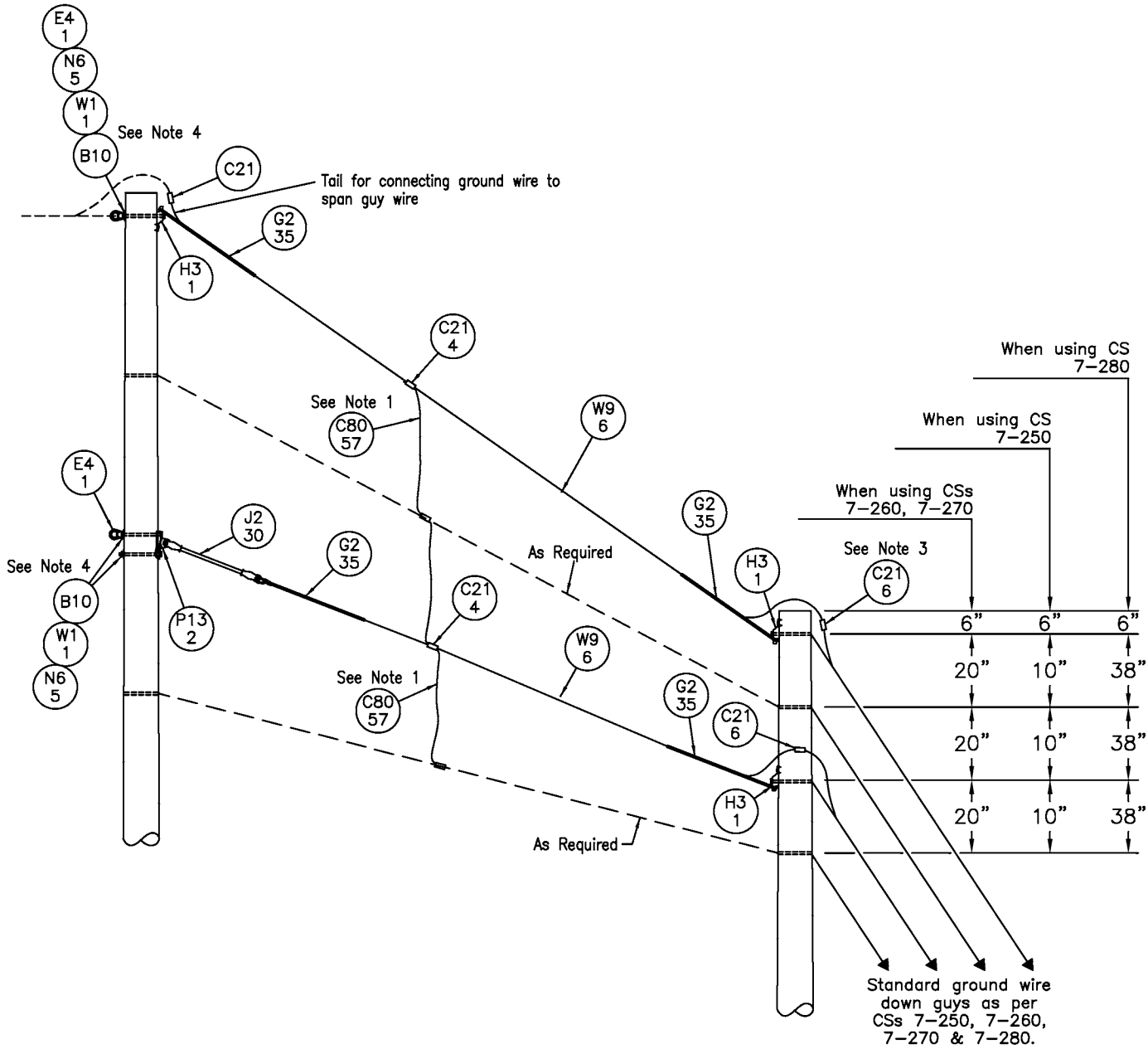
FirstEnergy	
REV.	Construction Std.
1	7–250
DATE	
6/15	

Transmission & Subtransmission Down Guys

13,500 Lbs. Maximum Guy Strength

5,000 Lbs. Vertical Pole Crushing Limit

FE00075



Notes:

1. Bond all guys to ground wire guy, using #4 solid soft drawn copper conductor.
2. Guy design load is based on 90 percent of rated breaking strength, per NESC.
3. Bond all ground wire and conductor span guys to down guys.
4. Install machine bolts with heads on guy pole eye plate side.

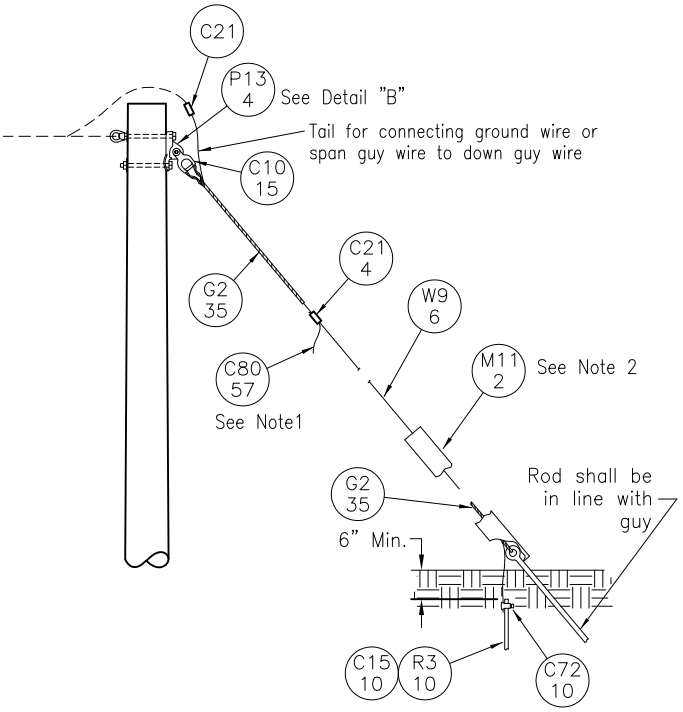
APPROVED BY: *JAR/RJE*

Transmission & Subtransmission Span Guys 13,500 Lbs Maximum Guy Strength

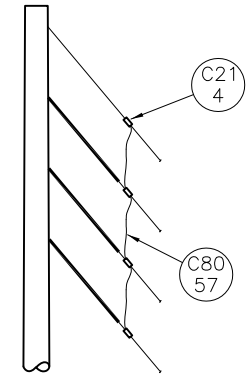
FirstEnergy

Construction Std.	REV.
7–255	2
	DATE 5/18

FE00076

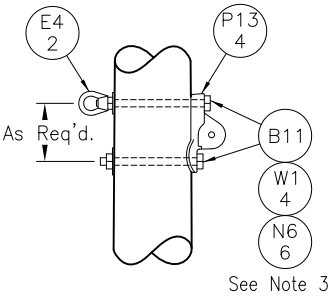


Ground Wire Guy

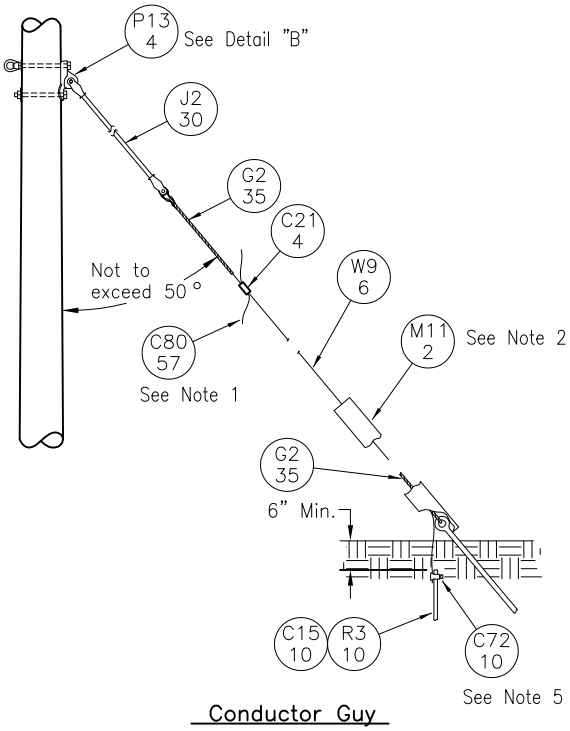


Detail "A"

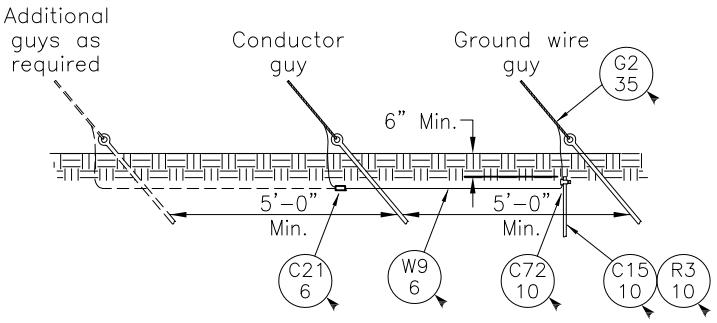
Guy wire bonding



Detail "B"



Conductor Guy



Multiple Guying

Notes:

1. Bond all guys to ground wire guy, using #4 solid soft drawn copper conductor. See Detail "A"
2. Install guy marker on top guy at each anchor rod.
3. Install machine bolts with heads on guy plate side.
4. See Standard 7-105 for anchor details.
5. Ground rod not required at conductor guy if ground wire guy is installed. Install ground lead from ground wire guy to conductor guys, as shown in the "Multiple Guying" Detail.
6. Guy design load is based on 90 percent of rated breaking strength, per NESC.
7. When ground resistance of 10 ohms or less cannot be obtained by above methods, see Standard 5-050.
8. When calculating vertical pole crushing at the point of guy attachment, use actual load with no overload factor. This load not to exceed 10,000 lbs above 10,000 lbs, see Standard 7-280.

APPROVED BY: SDJ/RJG

FirstEnergy	
REV.	Construction Std.
1	7–260
DATE 6/15	

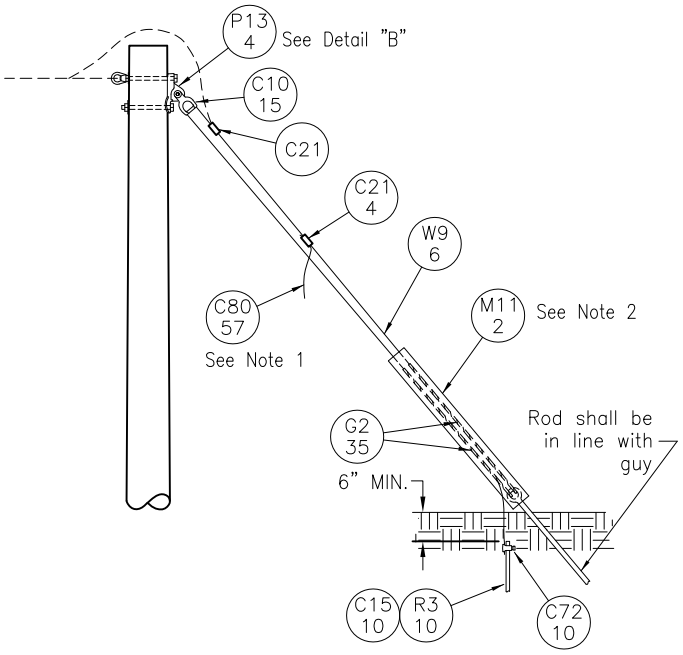
Transmission & Subtransmission Down Guys

13,500 Lbs Maximum Guy Strength

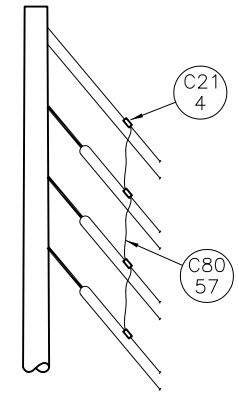
10,000 Lbs Vertical Pole Crushing Limit

FE00077

PUBLIC VERSION

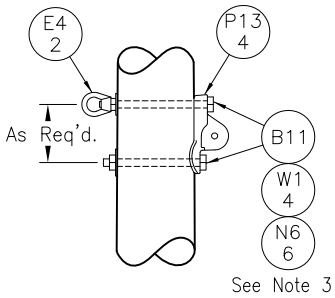


Ground Wire Guy

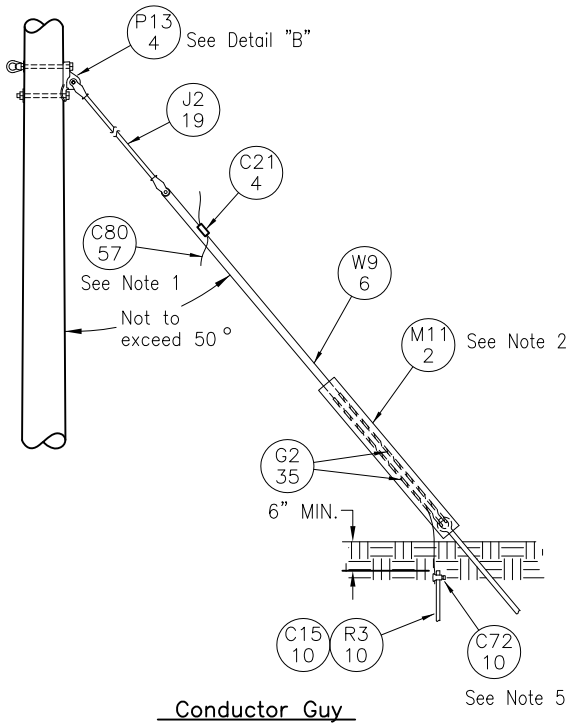


Detail "A"

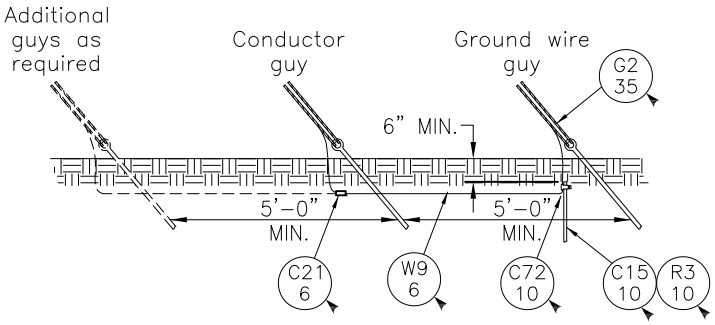
Guy wire bonding



Detail "B"



Conductor Guy



Multiple Guying

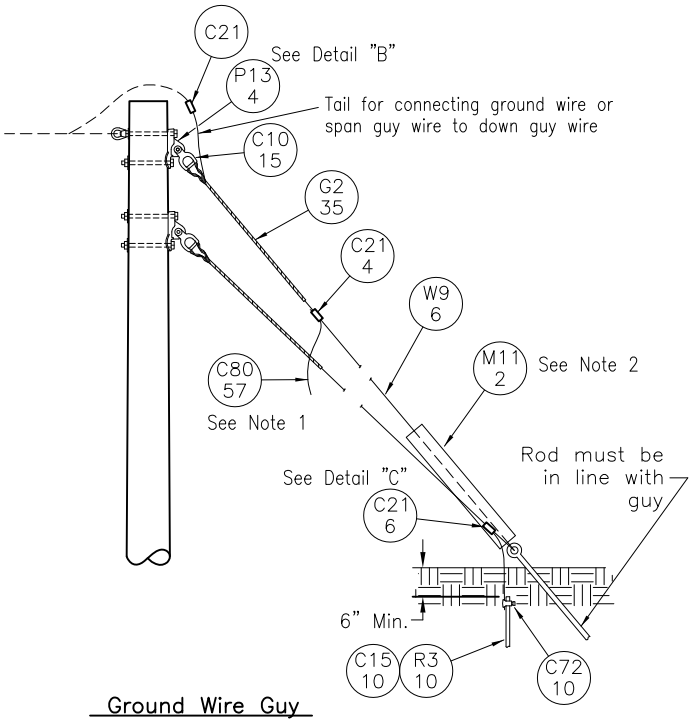
Notes:

1. Bond all guys to ground wire guy, using #4 solid soft drawn copper conductor. See Detail "A"
2. Install guy marker on top guy at each anchor rod.
3. Install machine bolts with heads on guy plate side.
4. See Standard 7-105 for anchor details.
5. Ground rod not required at conductor guy if ground wire guy is installed. Install ground lead from ground wire guy to conductor guys, as shown in the "Multiple Guying" detail.
6. Guy design load is based on 90 percent of rated breaking strength, per NESC
7. When ground resistance of 10 ohms or less cannot be obtained by above methods, see Standard 5-050.
8. When calculating vertical pole crushing at the point of guy attachment, use actual load with no overload factor. This load not to exceed 10,000 lbs. Above 10,000 lbs., see Standard 7-280.

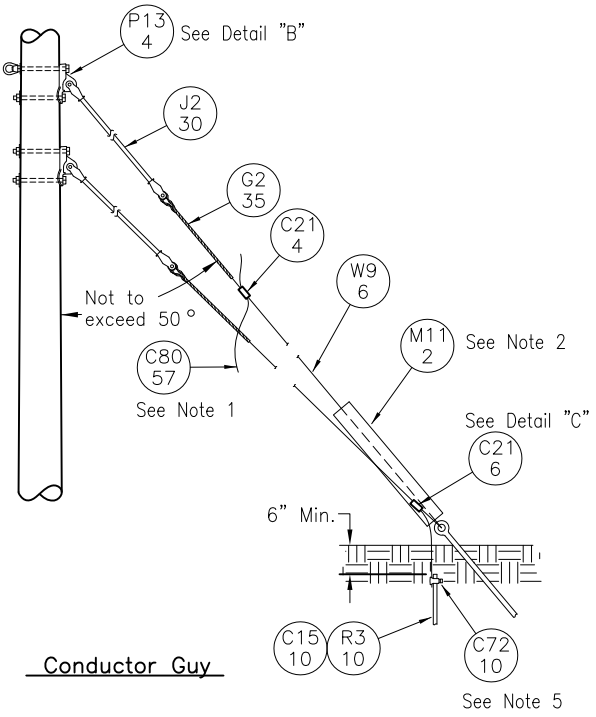
APPROVED BY: *DJ/RJG*

Transmission & Subtransmission Down Guys 27,000 Lbs Maximum Guy Strength 10,000 Lbs Vertical Pole Crushing Limit	FirstEnergy Construction Std. 7–270 REV. 1 DATE 6/15

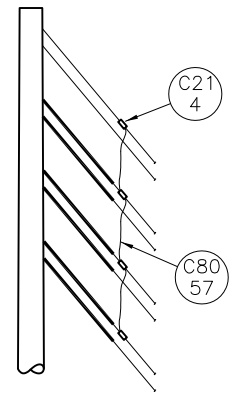
FE00078



Ground Wire Guy

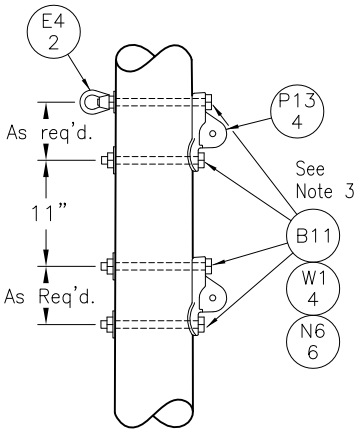


Conductor Guy

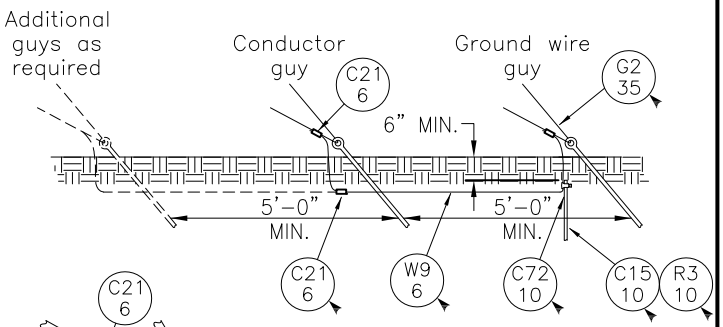


Detail "A"

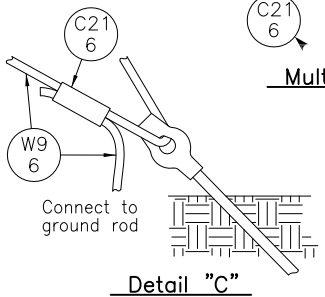
Guy wire bonding



Detail "B"



Multiple Guying



Detail "C"

Notes:

1. Bond all guys to ground wire guy, using #4 solid soft drawn copper conductor. See Detail "A"
2. Install guy marker on top guy at each anchor rod.
3. Install machine bolts with heads on guy plate side.
4. See Standard 7-105 for anchor details.
5. Ground rod not required at conductor guy if ground wire guy is installed. Install ground lead from ground wire guy to conductor guys, as shown in the "Multiple Guying" detail.
6. Guy design load is based on 90 percent of rated breaking strength, per NESC.
7. When ground resistance of 10 ohms or less cannot be obtained by above methods, see Standard 5-050.
8. When calculating vertical pole crushing at the point of guy attachment, use actual load with no overload factor. This load not to exceed 10,000 lbs. Above 10,000 lbs at any one guy plate.

FirstEnergy	Transmission & Subtransmission Down Guys
REV. 1 / DATE 6/15 — Construction Std. 7-280	27,000 Lbs Maximum Guy Strength
	20,000 Lbs Vertical Pole Crushing Limit

APPROVED BY: EJ/RJE

FE00079

SPAN LENGTH LIMITATIONS FOR VARIOUS PRIMARY TO SECONDARY SPACINGS

Maximum Span Lengths for Tangent or Angle Construction With a Bare Neutral

8 Ft. Tangent Crossarms for 15kV & 25kV						
Primary Conductor			4 ACSR	1/0 ACSR	336 AAC	636 AAC
► Neutral Conductor			4 ACSR	1/0 ACSR	1/0 ACSR	1/0 ACSR ◄
15kV	25kV	35kV				
42”	45”	N/A	245’	310’ ◄	160’	155’
60”	63”	N/A	270’	350’	245’	220’
78”	81”	N/A	300’	---	325’	280’

4 & 10 Ft. (15 kV) and 10 Ft. (25 & 35kV) Tangent Crossarms						
Primary Conductor			4 ACSR	1/0 ACSR	336 AAC	636 AAC
► Neutral Conductor			4 ACSR	1/0 ACSR	1/0 ACSR	1/0 ACSR ◄
15kV	25kV	35kV				
42”	45”	48”	210’	295’	145’	140’
60”	63”	66”	225’	325’	235’	175’
78”	81”	84”	---	---	325’	240’

Maximum Span Lengths for Tangent or Angle Construction With a 1/0 ACSR Triplex Secondary

8 Ft. Tangent Crossarms for 15kV & 25kV						
Primary Conductor			4 ACSR	1/0 ACSR	336 AAC	636 AAC
Secondary Conductor			1/0 Tpx	1/0 Tpx	1/0 Tpx	1/0 Tpx
Pri. Voltage	15kV	25kV	35kV			
Xarm to Sec. Space	42”	45”	N/A	215’	330’	175”	235’
	60”	63”	N/A	250’	350’	350’	300’
	78”	81”	N/A	275’	---	---	330’

4 & 10 Ft. (15 kV) and 10 Ft. (25 & 35kV) Tangent Crossarms						
Primary Conductor			4 ACSR	1/0 ACSR	336 AAC	636 AAC
Secondary Conductor			1/0 Tpx	1/0 Tpx	1/0 Tpx	1/0 Tpx
Pri. Voltage	15kV	25kV	35kV			
Xarm to Sec. Space	42”	45”	48”	205’	315’	175”	170’
	60”	63”	66”	225’	325’	325”	275’

Maximum Span Lengths for Deadend Construction With a Bare Neutral

4, 8, & 10 Ft. (15kV), 8 & 10 Ft. (25kV), and 10 Ft. (35kV)						
Primary Conductor			4 ACSR	1/0 ACSR	336 AAC	636 AAC
► Neutral Conductor			4 ACSR	1/0 ACSR	1/0 ACSR	1/0 ACSR ◄
15kV	25kV	35kV				
42”	45”	48”	195’	275’	130’	130’
60”	63”	66”	225’	325’	170’	165’
78”	81”	84”	---	---	310’	230’

Maximum Span Lengths for Deadend Construction With a 1/0 ACSR Triplex Secondary

4, 8, & 10 Ft. (15kV), 8 & 10 Ft. (25kV), and 10 Ft. (35kV)						
Primary Conductor			4 ACSR	1/0 ACSR	336 AAC	636 AAC
Secondary Conductor			1/0 Tpx	1/0 Tpx	1/0 Tpx	1/0 Tpx
Pri. Voltage	15kV	25kV	35kV			
Xarm to Sec. Space	42”	45”	48”	190’	295’	160’	150’
	60”	63”	66”	225’	325’	325’	275’

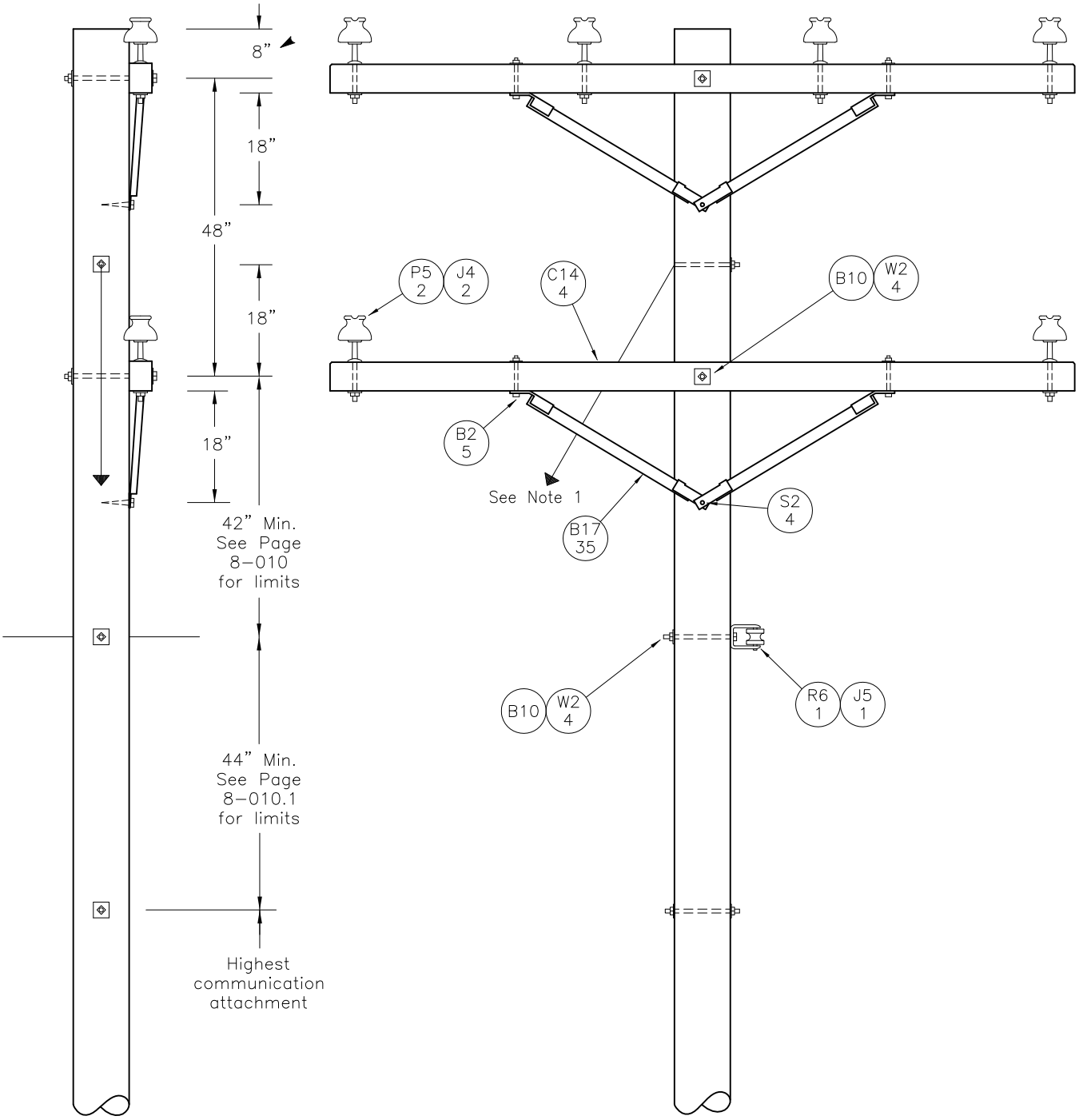
NOTES:

1. Spans of multiplex over 250 ft. are not recommended because of excessive sag.
2. Spans are limited by 25% conductor movement overlap, for galloping prone areas, contact Regional Engineering.
3. All standard spans are limited to 350’
4. Table span limits are consolidated; for specific case analysis, contact Regional Engineering.

PUBLIC VERSION

FirstEnergy	Construction Std.	Rev.	Date
	8-210080	2	2/04

PUBLIC VERSION



NOTE:
1. Guying as required. See Section 7 for details.
2. Refer to Standard 8–030 for maximum angles for various conductors using using single pin construction.

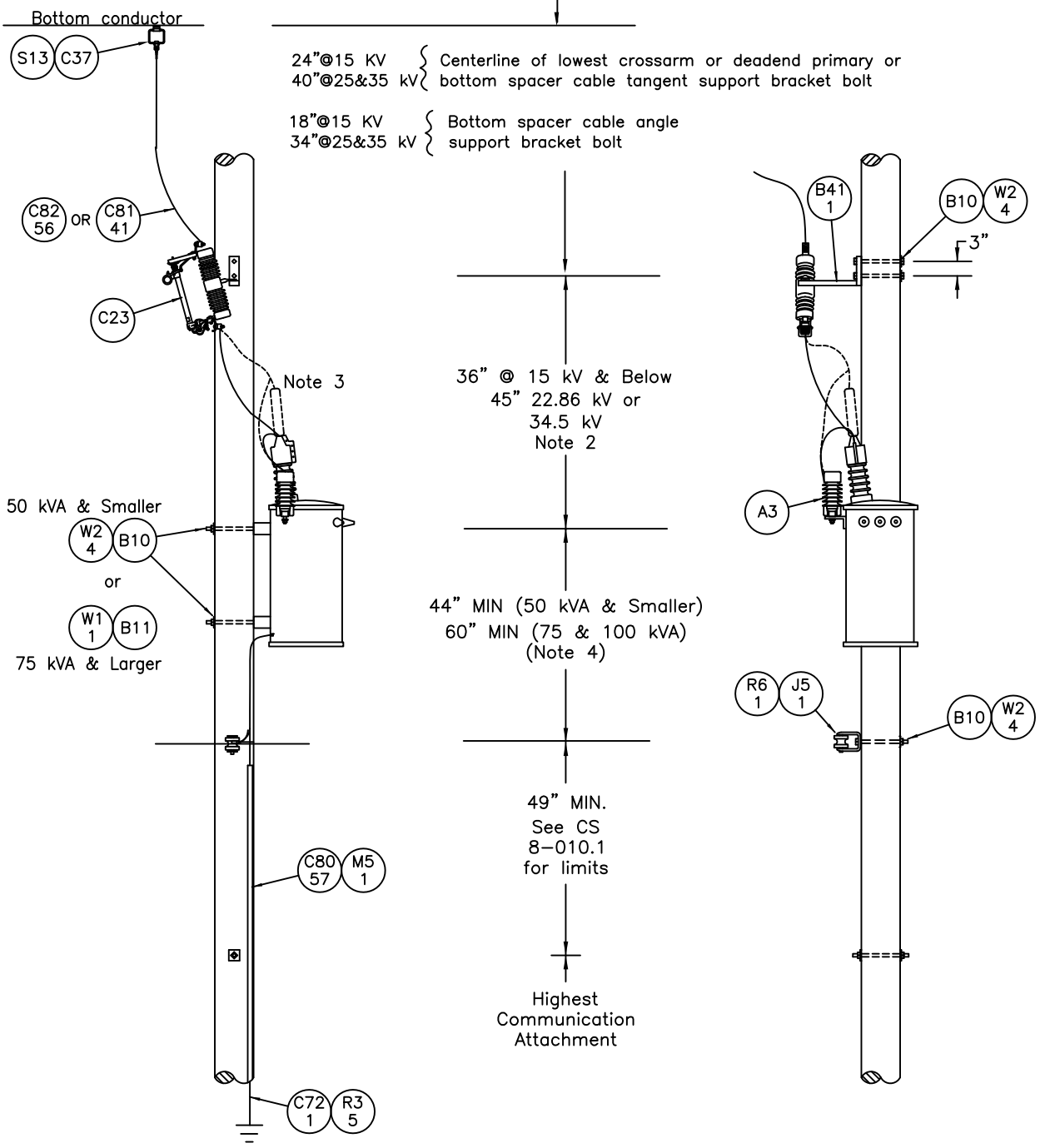
APPROVED BY: EDF/RFG

3ø Double Circuit Single Pin
10 Ft Crossarm Construction
15 kV Class

FirstEnergy

Construction Std.	REV.
8–505	3
FE00081	DATE 6/15

PUBLIC VERSION



Notes:

1. Two bushing transformers require ground lead to be taken to the H2 bushing.
2. IF the location is likely to have a cluster installation in the future, use 48" spacing @ 15 kV & 60" for 22.86 kV, & 34.5 kV. Add 18" If external current limiting fuse is used.
3. Current limiting fuse shall be installed on transformers used on the 22.86 kV and 34.5 kV systems where the nameplate does not indicate an internal current limiting fuse or any 15 kV transformer where the available asymmetric fault current exceeds 10 kA.
4. If open wire rack (R6/3) is used in place of single wire rack (R6/1), use the spacings shown on CS 11-120 for both transformer to secondary and for secondary to communication.

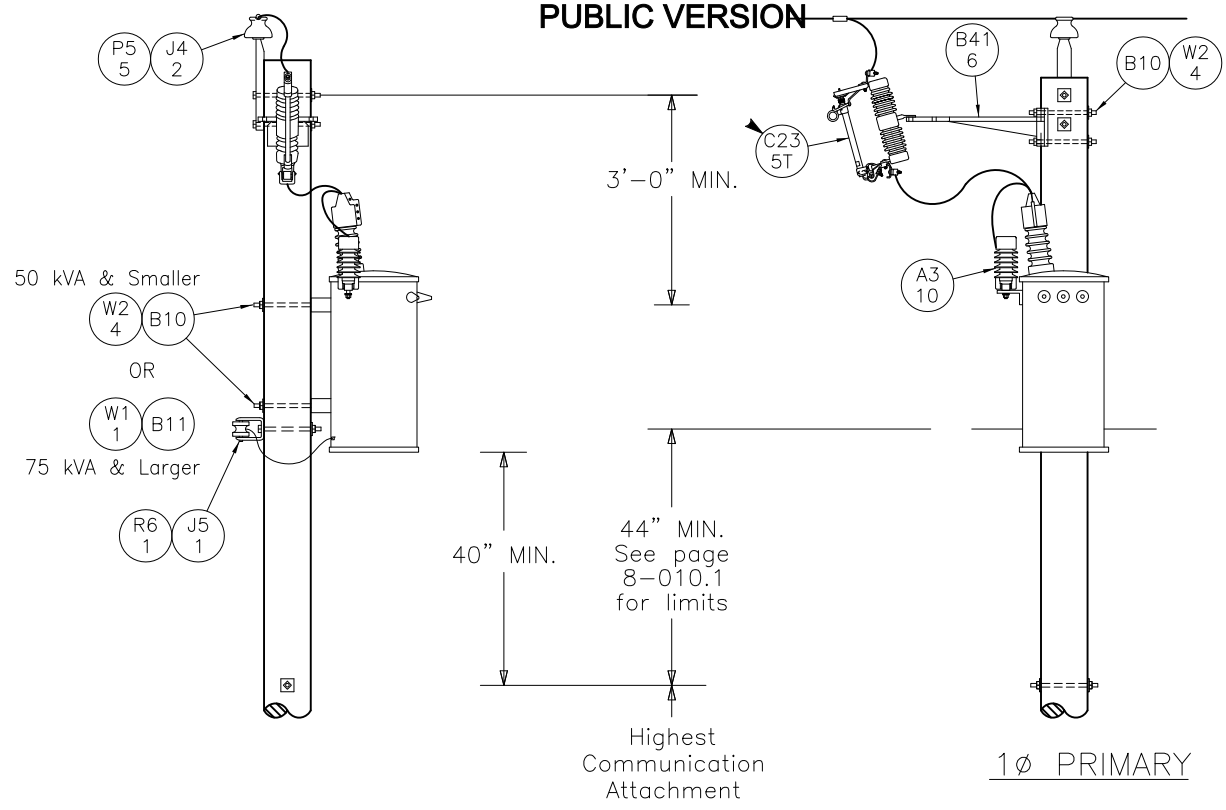
APPROVED BY: *JdH/RJG*

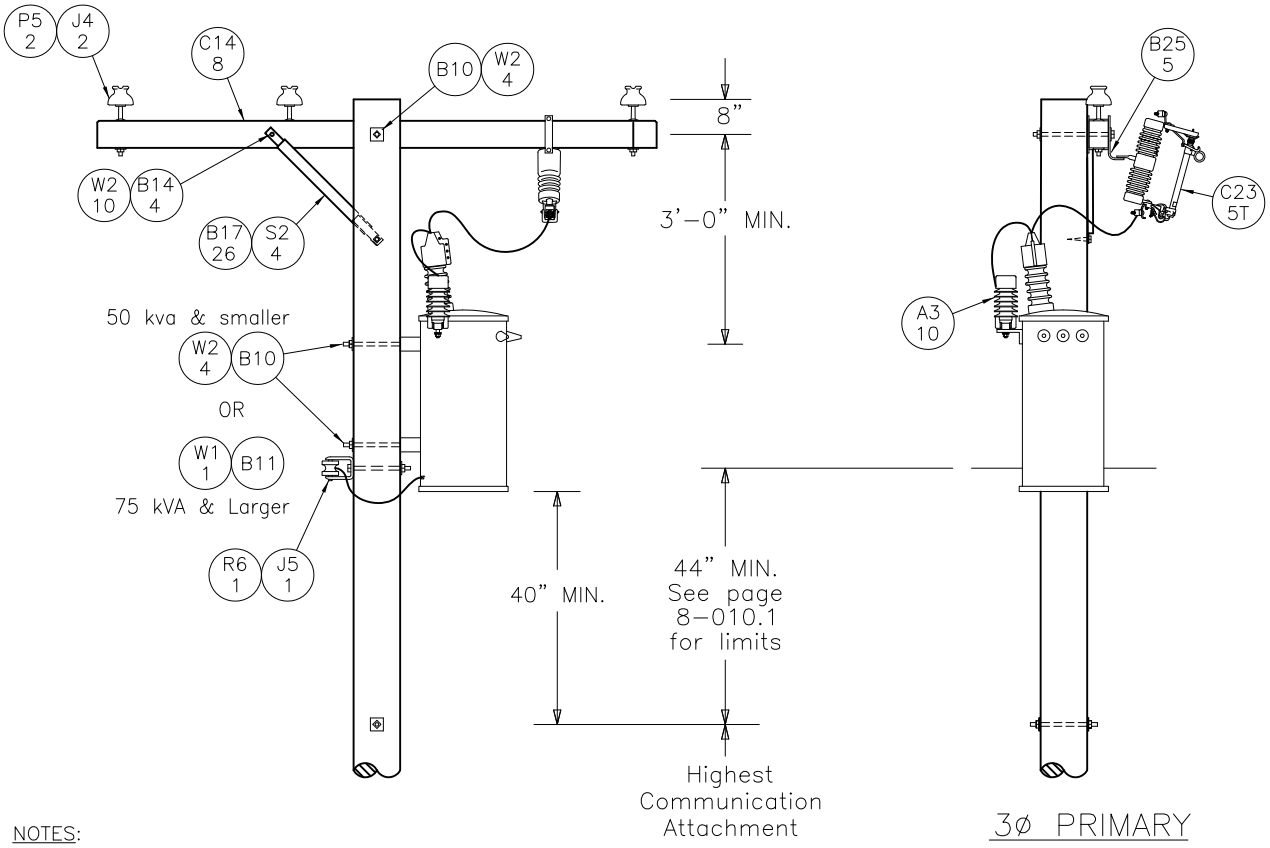
FirstEnergy.	
REV. 6	Construction Std.
DATE 10/18	11-115

1ø Conventional Transformer Installation Wye Primary Distribution

FE00082

PUBLIC VERSION





NOTES:

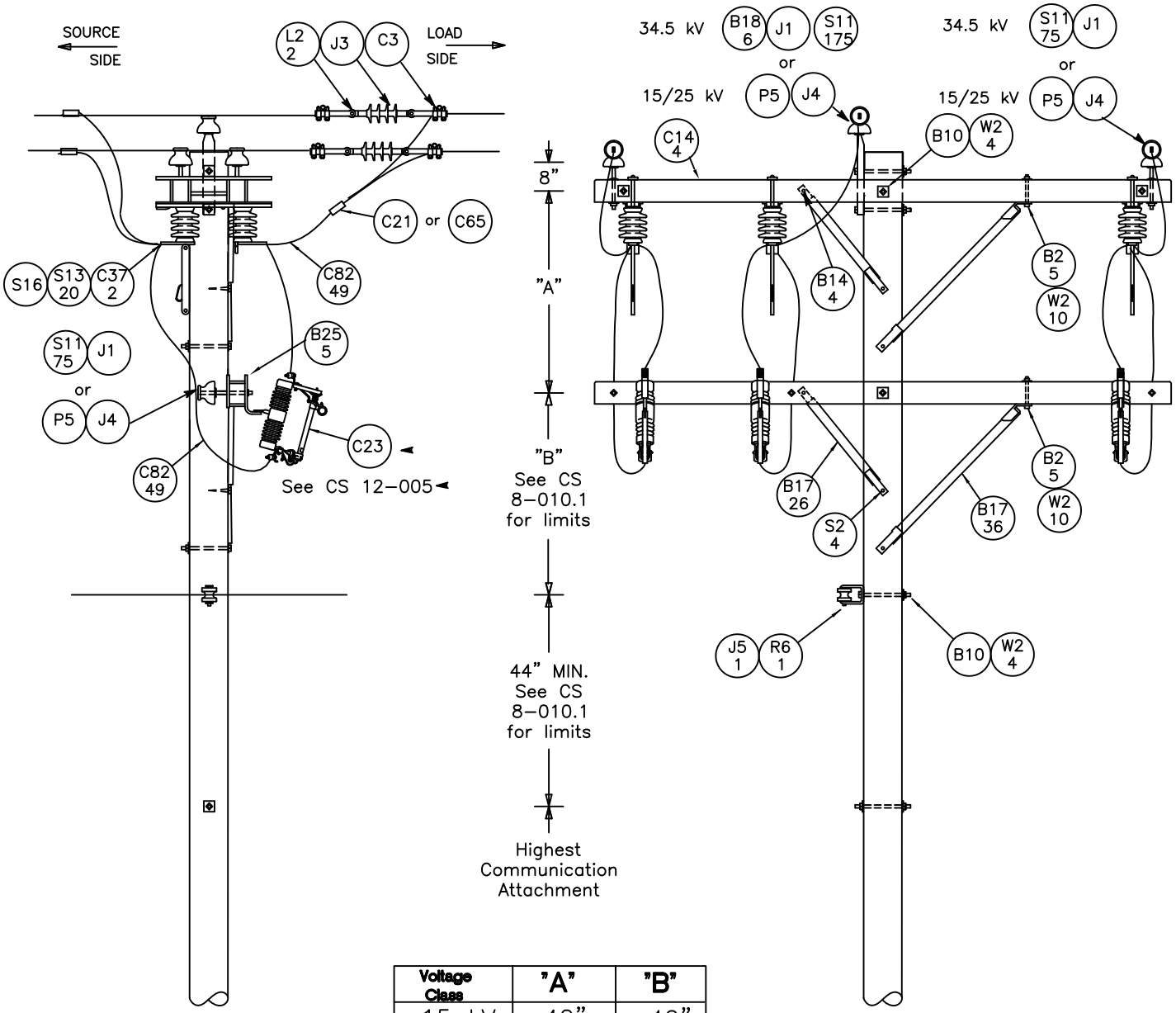
1. Transformers shall be rotated at least 45 degrees from centerline of primary conductor.
2. This configuration shall be used only when the addition of a transformer to an existing pole per page 11–115, would result in the replacement of the pole.

APPROVED BY: EDJ/RJE

METHODS FOR OBTAINING ADDITIONAL SECONDARY HEIGHT SINGLE–PHASE WYE CIRCUITS TRANSFORMERS 15 KV CLASS

FirstEnergy

Construction Std.	REV.
11–116	3
FE00083	DATE 10/14



Voltage Class	"A"	"B"
15 kV	42"	42"
25 kV	45"	45"
35 kV	48"	48"

Notes:

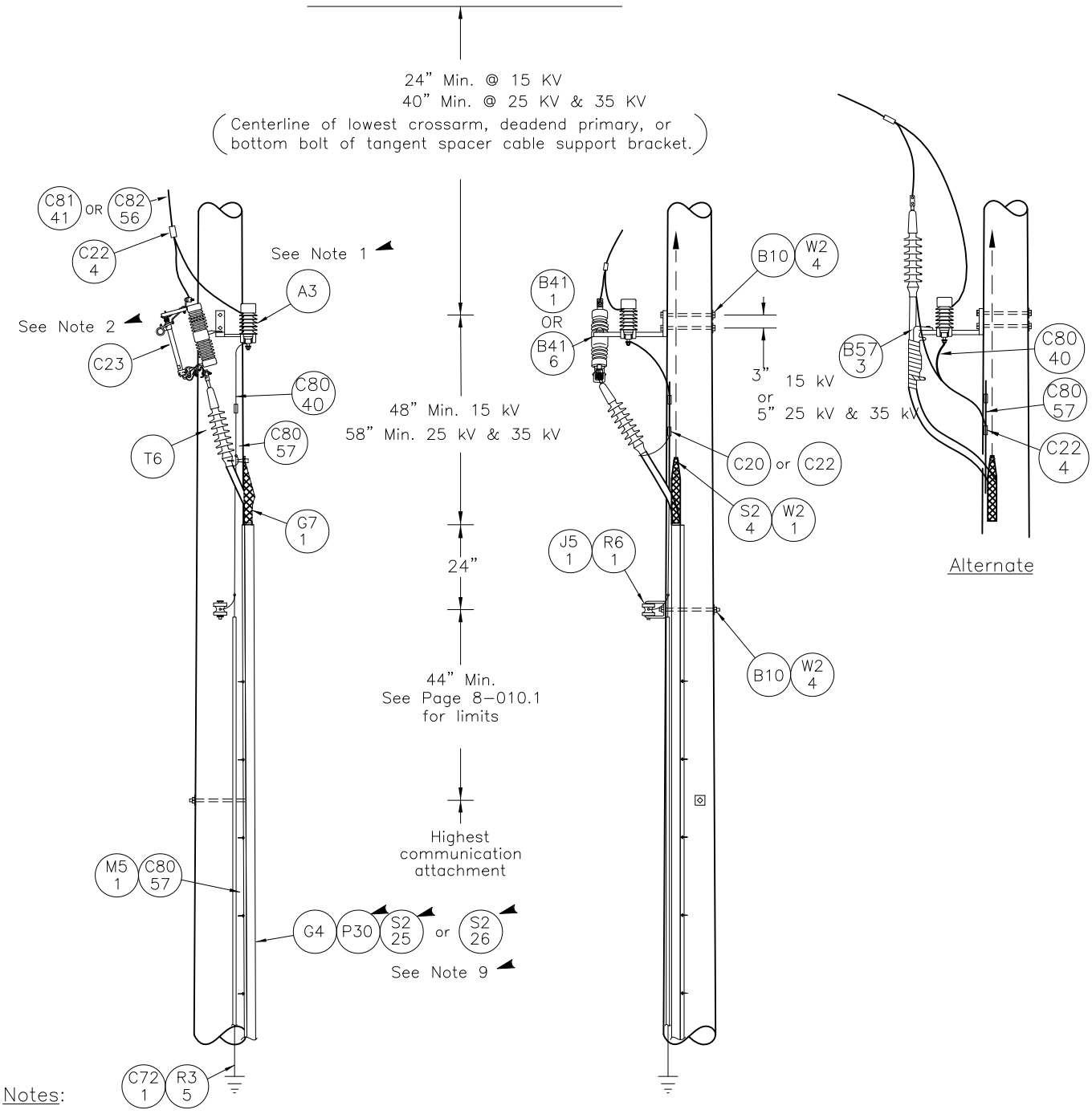
1. Guy as required. See CS Section 7 for details.
2. Caution – over tightening of disconnect bolts can result in misalignment of blade.
3. Open and remove fuseholders when not in use.
4. This installation is only used when a normally fused portion of a circuit may be tied to another circuit with more than a 300 amp total load.

APPROVED BY: JAH/RJE

FirstEnergy.	
REV. 4	Construction Std.
DATE 05/18	12-606

3ø Line Sectionalizing Using Cutouts & Disconnects 34.5 /19.9 kV or Below

FE00084



Notes:

1. Voltage dependent – Refer to Standard 5–350 for proper arrester application.
2. Voltage dependent – Refer to Standard 12–005 for proper cutout application and Standard 14–100 for proper riser fuse coordination.
3. Minimize bending of terminator.
4. Arresters must be grounded before energizing, due to small current drain when energized.
5. Alternate mounting is used when the fused protection is on the tap pole across the road.
6. See Standard 14–125 for riser pole grounding and neutral schematic.
7. Bend terminator pin to move terminator away from fuse holder exhaust.
8. For spacer cable construction, mount equipment on opposite side of pole from spacer cable.
9. Every pre–drilled hole on U–guard shall contain a lag screw.

APPROVED BY: JdH/RJG

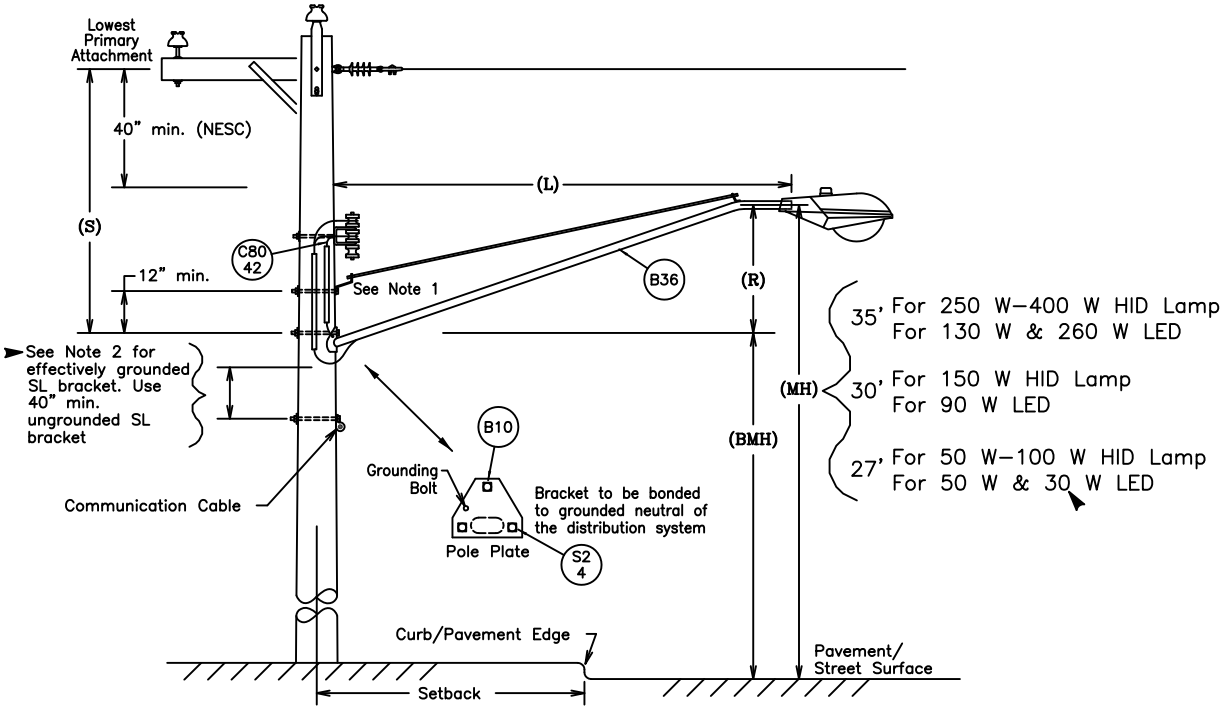
Single–Phase Riser Pole
#2 Thru 1/0 AL Jacketed Cable
34,500Y/19,900 V & Below

FirstEnergy

Construction Std.	REV.
14–210	8
	DATE 1/15

FE00085

PUBLIC VERSION



Installation Guide					
Nominal Bracket Length	Nominal Bracket Rise From Lower Thru–Bolt	Minimum Spacing Lowest Primary Attachment to Bracket Mounting Thru–Bolt	Bracket Mounting Heights (BMH)		
			70 W–100 W HID Lamp 30 W & 50 W LED	150 W HID Lamp 90 W LED	250 W–400 W HID Lamp 130 W & 260 W LED
(L)	(R)	(S)	Height to Thru–Bolt (BMH)	Height to Thru–Bolt (BMH)	Height to Thru–Bolt (BMH)
2.5'	18"	5.5'	25.5'	28.5'	33.5'
6'	24"	6.0'	25.0'	28.0'	33.0'
12'	42"	7.5'	23.5'	26.5'	31.5'
16'	54"	8.5'	22.5'	25.5'	30.5'
20'	66"	9.5'	21.5'	24.5'	29.5

Bracket Selection Guide				
	Pavement Width			
	Under 24' (2 Lanes)	24' to 36' (2–3 Lanes)	36' to 48' (3–4 Lanes)	48' to 60' (5+ Lanes)
Pole Setback From Edge of Pavement (Feet)	Lamp Bracket Length (Feet)			
0 to 8	2.5 or 6	6	12	12
9 to 14	12	12	16	16
15 to 18	16	16	20	20
19 to 22	20	20	20	20

*For setbacks over 22', contact ED Operations Services.

Notes:

1. Bracket may be installed above, below, or straddle secondary equipment.
2. Clearance to wood communication support arms is 20" min. for effectively grounded brackets. Clearance to communication cables, terminal boxes, brackets, and drive hooks is 4" for effectively grounded brackets.

APPROVED BY: JGK/RJG

Luminaire Brackets, Wood Pole

FirstEnergy

Construction Std.	REV.
16–100	4
FE00086	DATE 12/19

ATTACHMENT
RC-3

	A	B	C
1	ACTIVITY	POLES AND LOCATION	ESTIMATED COST
2			
3	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class - 1PH - Congested Area	[redacted]
4	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class - 3PH - Congested Area	
5	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class - 1PH - Congested Area	
6	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class - 3PH - Congested Area	
7	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class - 1PH - Rural Area	
8	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class - 3PH - Rural Area	
9	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class - 1PH - Rural Area	
10	CONSTRUCT DUPLICATE POLE LINE & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class - 3PH - Rural Area	
11			
12	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	15 kV Class - 1PH - Congested Area	
13	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	15 kV Class - 3PH - Congested Area	
14	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	35 kV Class - 1PH - Congested Area	
15	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	35 kV Class - 3PH - Congested Area	
16	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	15 kV Class - 1PH - Rural Area	
17	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	15 kV Class - 3PH - Rural Area	
18	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	35 kV Class - 1PH - Rural Area	
19	CONSTRUCT NEW POLE LINE/DISTRIBUTION SYSTEM & REMOVE ELECTRIC FROM FRONTIER POLES	35 kV Class - 3PH - Rural Area	
20			
21	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class Underground - 1PH - Congested Area	
22	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class Underground - 3PH - Congested Area	
23	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class Underground - 1PH - Congested Area	
24	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class Underground - 3PH - Congested Area	
25	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class Underground - 1PH - Rural Area	
26	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	15 kV Class Underground - 3PH - Rural Area	
27	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class Underground - 1PH - Rural Area	
28	CONSTRUCT UNDERGROUND & TRANSFER ELECTRIC FROM FRONTIER POLES	35 kV Class Underground - 3PH - Rural Area	
29			
30	ADDITIONAL PER CUSTOMER CHARGE TO MOVE UNDERGROUND	Underground Without Directional Boring	
31	ADDITIONAL PER CUSTOMER CHARGE TO MOVE UNDERGROUND	Underground With Directional Boring	

ATTACHMENT G