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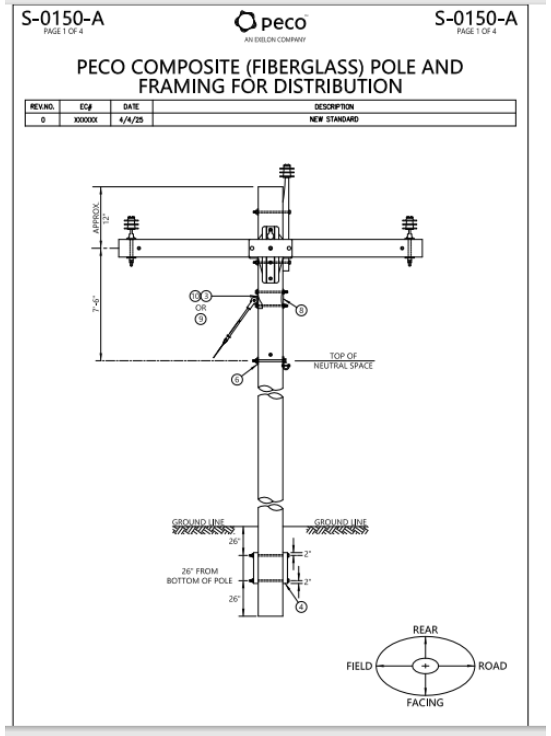
September 3rd, 2025

Composite (Fiberglass) Pole Update

Technical Services / Distribution Standards | Keene Jabbour Michael Keller

Why are we here talking today

- PECO's Distribution Standards, Field Crews, Methods and Safety teams have all worked together to develop a new PECO standard for Fiberglass poles S-1050A
- Fiberglass poles speak to the Innovation needed to implement PECO's strategy of rebuilding our grid. There are shortages in the current supply of wood poles. Fiberglass can meet these gaps.
- There were several pros and cons to this transition: Engineering, Field Crews, Supply, Safety, and Methods all worked together to create the new standards.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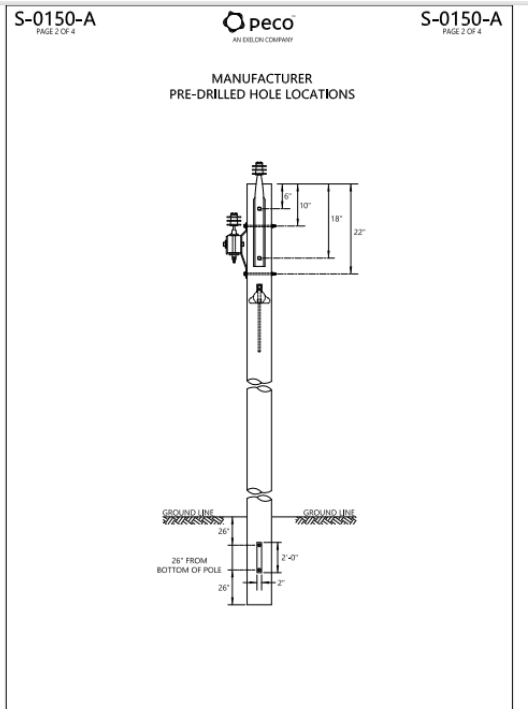
PECO COMPOSITE (FIBERGLASS) POLE AND FRAMING FOR DISTRIBUTION

REV.NO.	EC#	DATE	DESCRIPTION
0	XXXXXX	4/4/25	NEW STANDARD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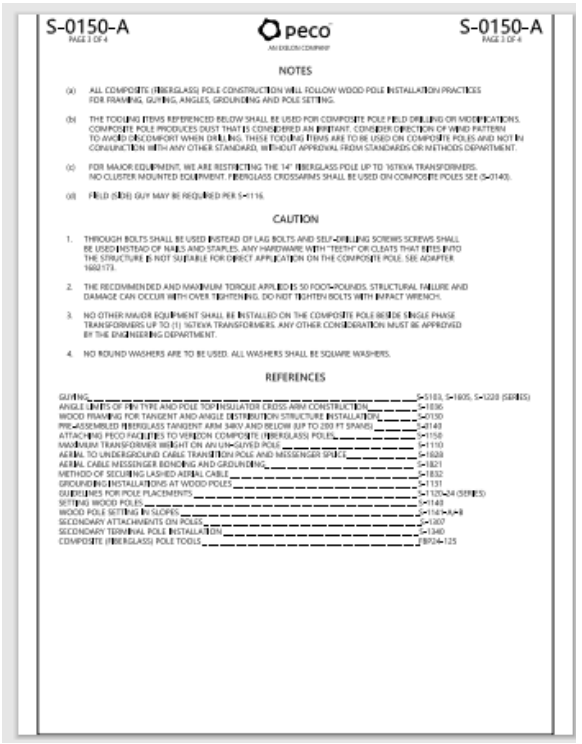
MANUFACTURER PRE-DRILLED HOLE LOCATIONS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NOTES

(a) ALL COMPOSITE (FIBERGLASS) POLE CONSTRUCTION WILL FOLLOW WOOD POLE INSTALLATION PRACTICES FOR FRAMING, GUYING, ANGLES, GROUNDING AND POLE SETTING.

(b) THE TOOLING ITEMS REFERENCED BELOW SHALL BE USED FOR COMPOSITE POLE FIELD DRILLING OR MODIFICATIONS. COMPOSITE POLE PRODUCES DUST THAT IS CONSIDERED AN IRRITANT. CONSIDER DIRECTION OF WIND PATTERN TO AVOID DISCOMFORT WHEN DRILLING. THESE TOOLING ITEMS ARE TO BE USED ON COMPOSITE POLES AND NOT IN CONJUNCTION WITH ANY OTHER STANDARD, WITHOUT APPROVAL FROM STANDARDS OR METHODS DEPARTMENT.

(c) FOR MAJOR EQUIPMENT, WE ARE RESTRICTING THE 14" FIBERGLASS POLE UP TO 167KVA TRANSFORMERS. NO CLUSTER MOUNTED EQUIPMENT. FIBERGLASS CROSSARMS SHALL BE USED ON COMPOSITE POLES SEE (S-0140).

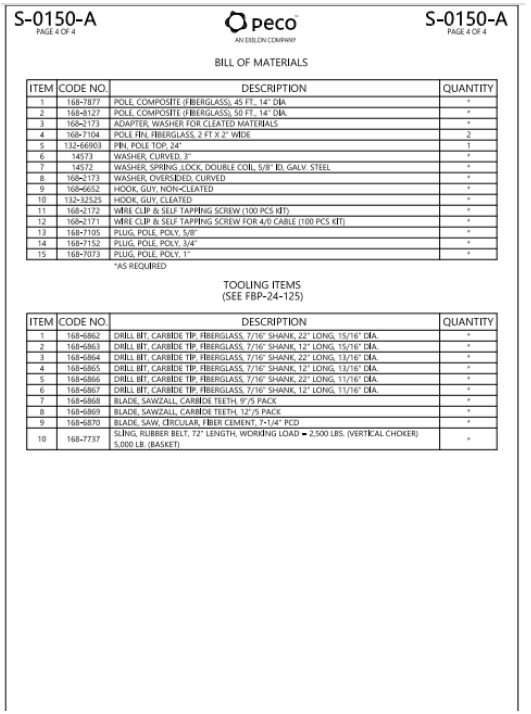
(d) FIELD (SIDE) GUY MAY BE REQUIRED PER S-0116.

CAUTION

1. THROUGH BOLTS SHALL BE USED INSTEAD OF LAG BOLTS AND SELF-DRILLING SCREWS SCREWS SHALL BE USED INSTEAD OF NAILS AND STAPLES. ANY HARDWARE WITH "TEETH" OR CLEATS THAT BITES INTO THE STRUCTURE IS NOT SUITABLE FOR DIRECT APPLICATION ON THE COMPOSITE POLE. SEE ADAPTER 1692173.
2. THE RECOMMENDED AND MAXIMUM TORQUE APPLIED IS 50 FOOT-POUNDS. STRUCTURAL FAILURE AND DAMAGE CAN OCCUR WITH OVER TIGHTENING. DO NOT TIGHTEN BOLTS WITH IMPACT WRENCH.
3. NO OTHER MAJOR EQUIPMENT SHALL BE INSTALLED ON THE COMPOSITE POLE BESIDE SINGLE PHASE TRANSFORMERS UP TO (1) 167KVA TRANSFORMERS. ANY OTHER CONSIDERATION MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
4. NO ROUND WASHERS ARE TO BE USED. ALL WASHERS SHALL BE SQUARE WASHERS.

REFERENCES

GUYING	S-5103, S-1605, S-1220 (SERIES)
ANGLE LIMITS OF TWO TYPE AND POLE TOP INSULATOR CROSS ARM CONSTRUCTION	S-1036
WOOD FRAMING FOR TANGENT AND ANGLE DISTRIBUTION STRUCTURE INSTALLATIONS	S-0130
PRE-ASSEMBLED FIBERGLASS TANGENT ARM 34KV AND BELOW (UP TO 200 FT SPANS)	S-0140
ATTACHING PECO FACILITIES TO VERIZON COMPOSITE (FIBERGLASS) POLES	S-1150
MAXIMUM TRANSFORMER WEIGHT ON AN UN-GUYED POLE	S-1110
AERIAL TO UNDERGROUND CABLE TRANSITION POLE AND MESSENGER SPACE	S-1628
AERIAL CABLE MESSENGER BONDING AND GROUNDING	S-1821
METHOD OF SECURING LASHED AERIAL CABLE	S-1832
GROUNDING INSTALLATIONS AT WOOD POLES	S-1131
GUIDELINES FOR POLE PLACEMENTS	S-1135-34 (SERIES)
SETTING WOOD POLES	S-1143
WOOD POLE SETTING IN SLOPES	S-1141-X-X-B
SECONDARY ATTACHMENTS ON POLES	S-1307
SECONDARY TERMINAL POLE INSTALLATION	S-1340
COMPOSITE (FIBERGLASS) POLE TOOLS	BP24-125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BILL OF MATERIALS

ITEM	CODE NO.	DESCRIPTION	QUANTITY
1	168-7877	POLE, COMPOSITE (FIBERGLASS), 45 FT., 14" DIA.	*
2	168-8127	POLE, COMPOSITE (FIBERGLASS), 50 FT., 14" DIA.	*
3	168-2173	ADAPTER, WASHER FOR CLEATED MATERIALS	*
4	168-7104	POLE PIN, FIBERGLASS, 2 FT X 2" WIDE	2
5	132-66903	PIN, POLE TOP, 24"	1
6	14573	WASHER, CURVED, 3"	*
7	14572	WASHER, SPRING LOCK, DOUBLE COIL, 5/8" ID, GALV. STEEL	*
8	168-2173	WASHER, OVERSIDED, CURVED	*
9	168-6652	HOOK, GUY, NON-CLEATED	*
10	132-32525	HOOK, GUY, CLEATED	*
11	168-2172	WIRE CLIP & SELF TAPPING SCREW (100 PCS KIT)	*
12	168-2171	WIRE CLIP & SELF TAPPING SCREW FOR 4/0 CABLE (100 PCS KIT)	*
13	168-7105	PLUG, POLE, POLY, 5/8"	*
14	168-7152	PLUG, POLE, POLY, 3/4"	*
15	168-7073	PLUG, POLE, POLY, 1"	*

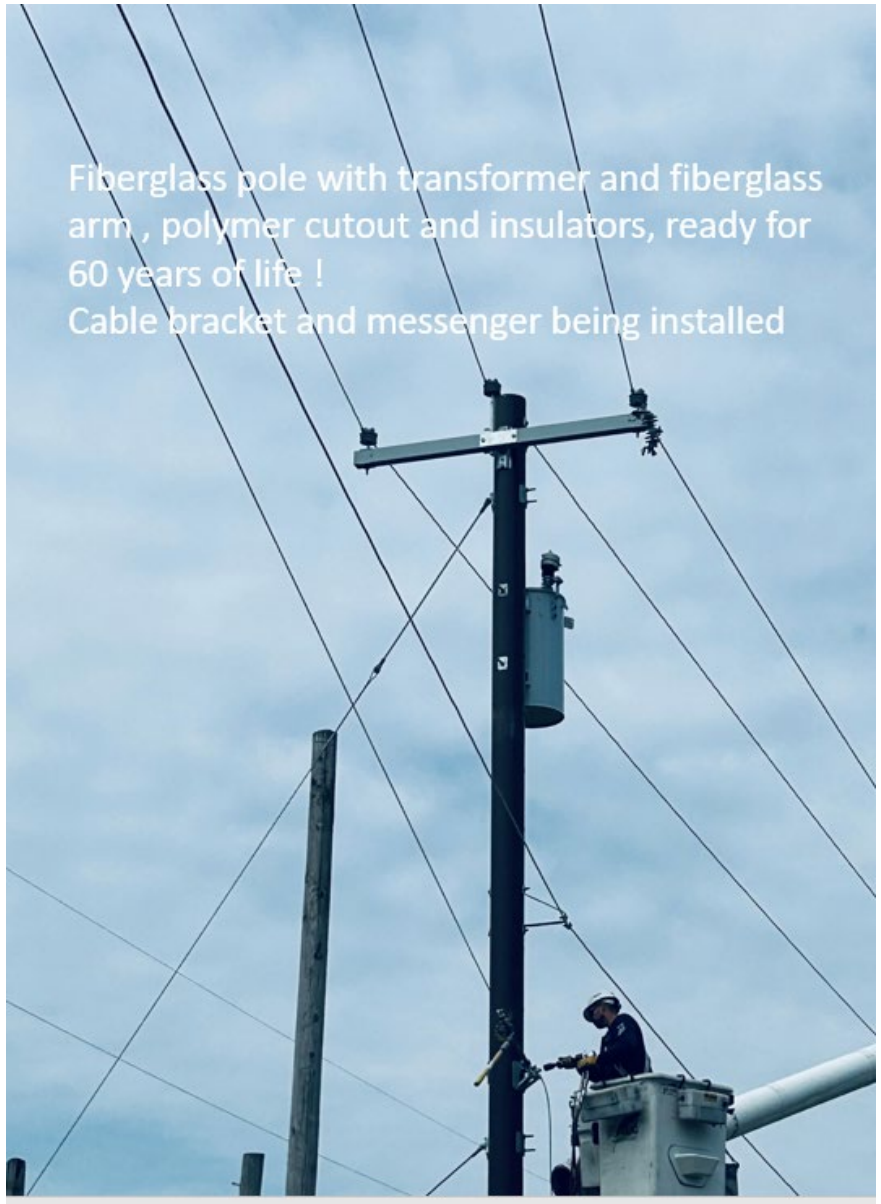
*AS REQUIRED

TOOLING ITEMS (SEE FBP-24-125)

ITEM	CODE NO.	DESCRIPTION	QUANTITY
1	168-6862	DRILL BIT, CARBIDE TIP, FIBERGLASS, 7/16" SHANK, 22" LONG, 15/16" DIA.	*
2	168-6863	DRILL BIT, CARBIDE TIP, FIBERGLASS, 7/16" SHANK, 12" LONG, 15/16" DIA.	*
3	168-6864	DRILL BIT, CARBIDE TIP, FIBERGLASS, 7/16" SHANK, 22" LONG, 13/16" DIA.	*
4	168-6865	DRILL BIT, CARBIDE TIP, FIBERGLASS, 7/16" SHANK, 12" LONG, 13/16" DIA.	*
5	168-6866	DRILL BIT, CARBIDE TIP, FIBERGLASS, 7/16" SHANK, 22" LONG, 11/16" DIA.	*
6	168-6867	DRILL BIT, CARBIDE TIP, FIBERGLASS, 7/16" SHANK, 12" LONG, 11/16" DIA.	*
7	168-6868	BLADE, SAWZALL, CARBIDE TEETH, 9", 5 PACK	*
8	168-6869	BLADE, SAWZALL, CARBIDE TEETH, 12", 5 PACK	*
9	168-6870	BLADE, SAW, CIRCULAR, FIBER CEMENT, 7-1/4" PCD	*
10	168-7737	SLING, RUBBER BELT, 72" LENGTH, WORKING LOAD = 2,500 LBS. (VERTICAL CHOKER) 5,000 LB. (BASKET)	*

Agenda

- ❑ Background
- ❑ Engineering Specifications
- ❑ Safety
- ❑ Methods - Tools
- ❑ Supply
- ❑ Open Discussions



Background

- Increased demand for Class 2 wood poles has caused an issue in supply chain.
- Trees used to produce utility poles take **time to grow**.
  - Heavier class poles (**Class 2** or stronger) take a longer time to produce.

Background

- Increasing framing lumber prices has resulted in timber being cut early to take advantage of higher prices
  - Decreases availability of heavy class poles.
- Supply shortage of Class 2 poles resulted in PECO looking at alternative pole material
- PennDOT has requirements regarding types of poles (no steel) allowed near roadways

Pros

- Engineered product with lighter weight and longer expected lifespans
  - Estimated 75 years service life
- Non-conductive
- Resistant to rot, pests, woodpeckers, etc.
- Does not require any toxic chemicals as preservative

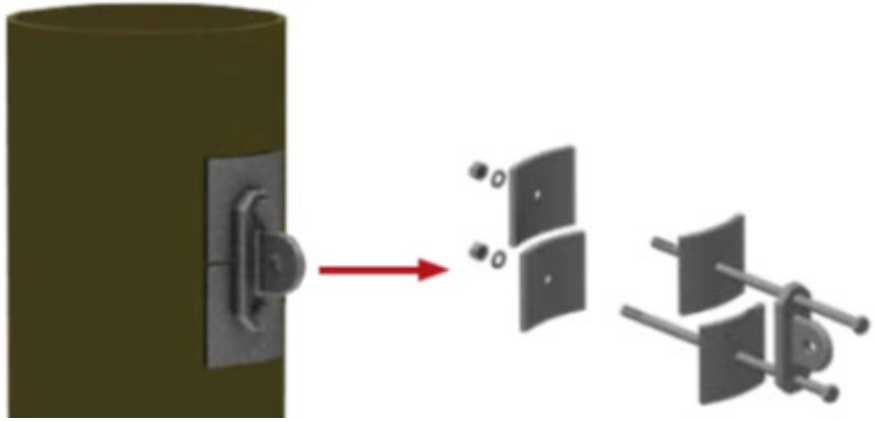
Cons

- Composite poles may cost 2.5 to 3 times cost of wood poles.

- Field Crew Adaptation
  - New Installation / Maintenance / Repair Methods

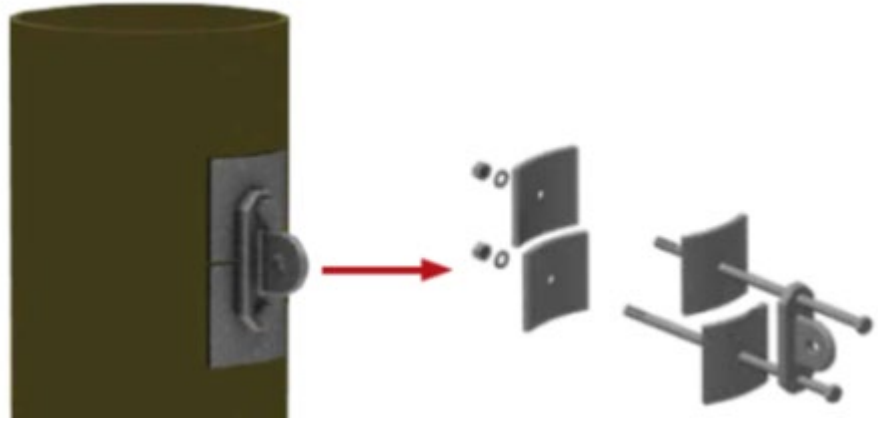
Engineering Specifications

- The Exelon Composite (fiberglass) pole material specification was issued March of 2023.
  - FGP-7000-E
- The Standard has been issued for Verizon Poles attachments. (S-1150 attaching to Verizon fiberglass poles issued 11/24)



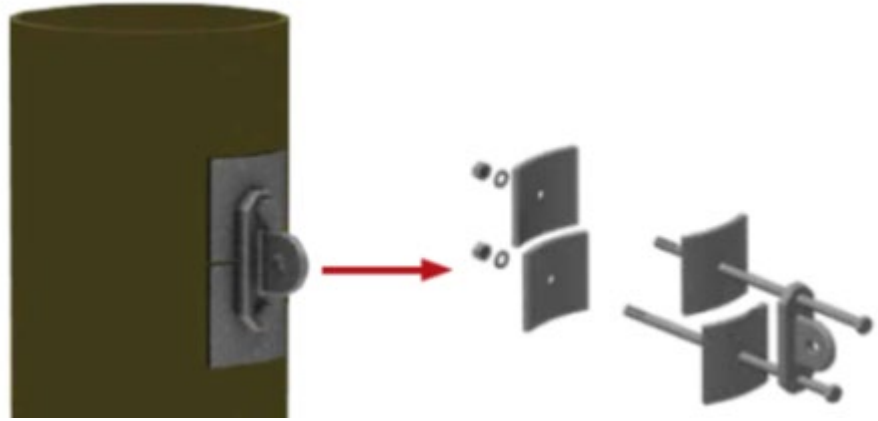
Engineering Specifications

- The PECO Fiberglass Standard is now complete and ready for issue.
  - 14-inch class H1 pole, 45’ and 50’ feet.
  - Predrilled for ridge pin and crossarms
  - Defined limits on positioning of bolt holes
  - Created New hardware and CatIDs
  - Created new Standard S-1050-A



Engineering Specifications

- All current Hardware for transformers is acceptable.
- All bolted connections require curved washers beneath both bolt head and nuts
- A pole line built with both 10- and 14-inch fiberglass poles and equipment is available at the PECO line school.



Methods and Tools

- New 12 and 22-inch drill bits
- New 9 and 12-inch SAWZAL blades
- New 7-inch Circular Saw Blades
- New Rubber Belt Grip Sling

Methods and Tools

- When tightening hardware, tightening only required to compress the spring washers.
  - Over tightening can damage the pole
- Draft Procedure in progress for handling, transporting and placing composite poles.

Supply

- Manufacturer can currently produce 1,200 poles per month at their local factory
  - 45 class 2 pole, 10-inch diameter

- Manufacturer can currently produce 600 larger diameter poles (14 inch) per month

Supply

- Local utilities have expressed interest in similar composite poles

Safety

- Working to find dust collecting drill bits for drilling poles

- All fiberglass poles should be bucket accessible
  - Safety and Methods have not yet given guidance for working from pole steps.

Timeline

- Released Tech Bulletin TB-25-036 for PECO fiberglass poles **June 2025**

- Held informational discussions with the field crews in **June 2025**

Technical Bulletin

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TB-25-036 April 28, 2025

LL/OE GREEN - Information Only

Attention

Electric Field Engineering, Electric Standards, Overhead Inspectors, Distribution Dispatchers, Overhead Operators, Aerial Construction, Distribution Testing, Electric Methods, Safety, Supply, Equipment Shops, Regional Electric Operations, Project & Contract Management, New Business

Summary: Fiberglass (Composite) Pole for Distribution Use – Introducing "S-0150 – PECO Fiberglass (Composite) Pole and Framing for Distribution"

PECO Distribution Standards has worked to introduce fiberglass (composite) poles for distribution use in the PECO Territory. The need came from the projected wood pole shortage experienced in 2022-2023 and to address system resiliency strategy. The forecast for wood poles exceeded the timeline necessary to replace the poles in LTIIP and Non-LTIIP programs that prompted PECO and Verizon to find a vendor and materials necessary for the installation of the fiberglass pole in our service areas. We completed the first phase of introducing the Verizon Composite Pole (S-1150) and now completed phase two with the PECO Preferred Fiberglass Pole for system use.

Fiberglass poles are fiber-reinforced polymer (FRP) or an engineered material consisting of reinforcement fibers, polymer resin, and additives to achieve the desired performance properties. The fiberglass distribution poles are classified as a wood equivalent pole to exceed ANSI 05.1 wood standards with lighter weight and longer expected life spans. National Electric Safety Code recognizes FRP composite distribution poles as having the same reliability as steel poles.

Details

New Standard S-0150, is designed for framing PECO's distribution system to fiberglass poles, which are sufficient for our distribution system needs with listed guidelines.

Previously S-1150 defined attachments to the composite poles and fostered preliminary design considerations.

The difference between the Verizon and PECO Pole selection is diameter and pole-loading.

PECO selected a brown extruded **fourteen-inch diameter fiberglass pole with three-eighths inch wall thickness** and limited to **a single phase, up to a 167kVA transformer**.

Verizon selected a brown **extruded ten-inch diameter fiberglass pole with three-eighths inch wall thickness** is limited to **a single phase, up to a 100kVA transformer**.

Information Contact: Will Tate (William.Tate@exeloncorp.com) Sr. Engineer, Dist. Standards

Timeline

- Complete design guidelines for designers and planners. - **September 2025**
- Complete logistics for delivery – **November 2025**
- Finalize change management for the field crews - **December 2025 - January 2026**

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TB-25-036 April 28, 2025

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Open Discussions

- Real Estate Facilities - Ensuring Verizon does not install fiberglass poles in rear-property areas until PECO evaluates work rules

- Supply - Working with Stella-Jones on an agreement to deliver the fiberglass poles

- Everyone - Support Needed:
  - Rollout and change management

Appendix

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TB-25-036 April 28, 2025

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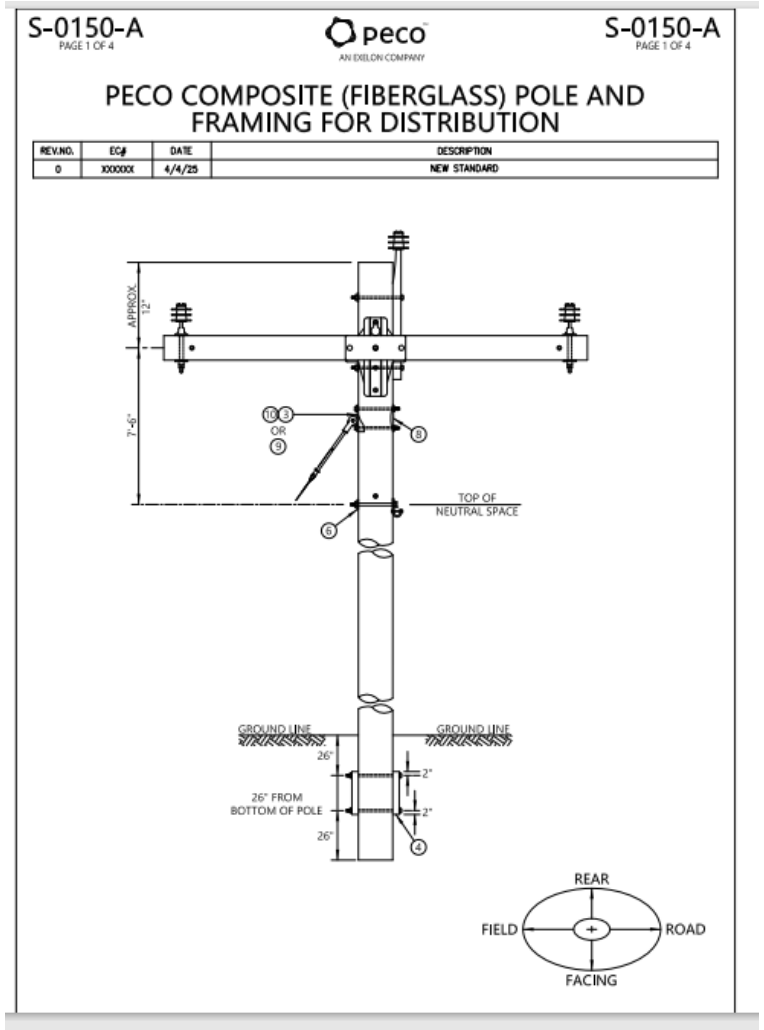
Appendix

S- 0150-A- PECO Fiberglass pole Standard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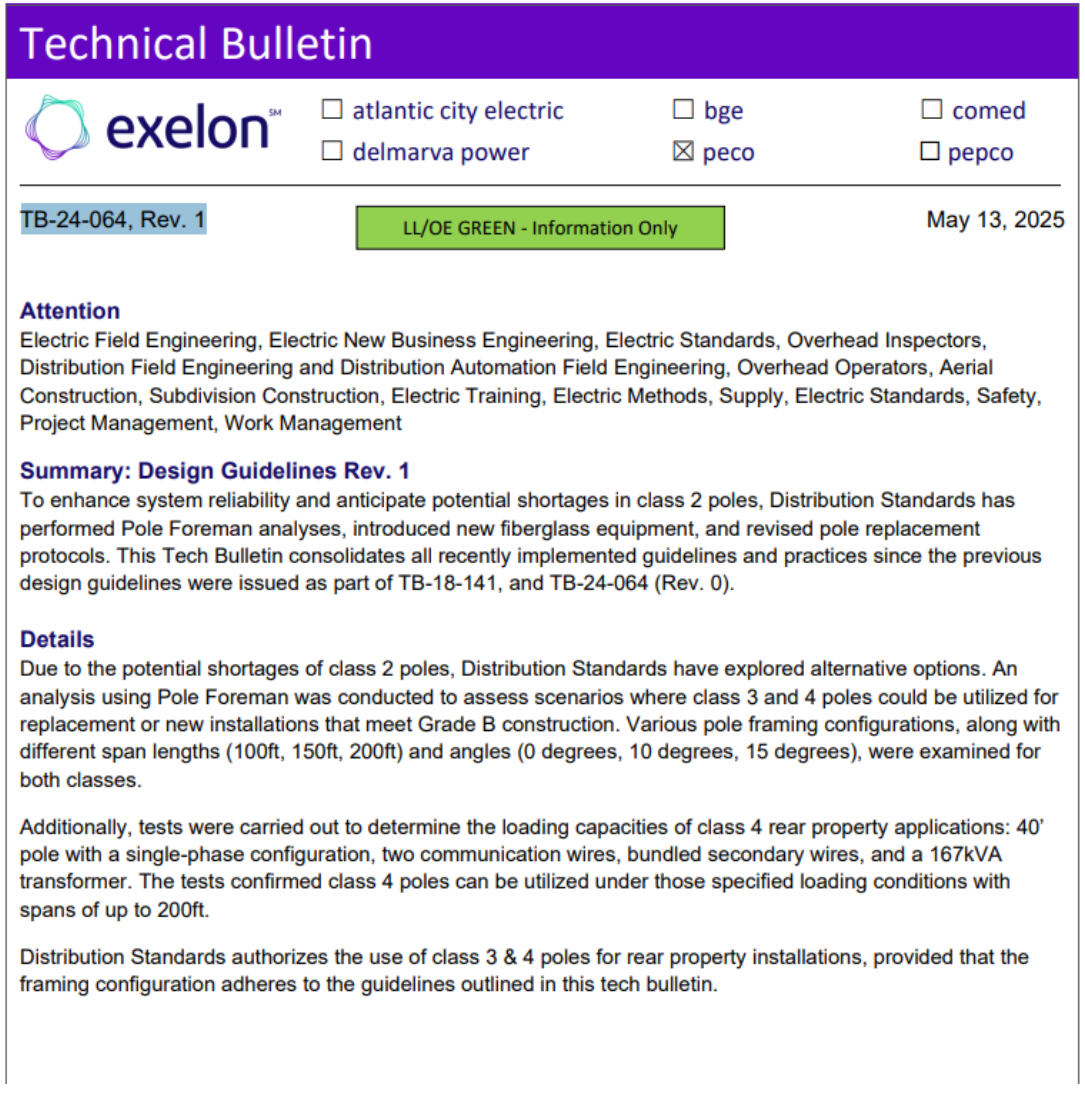
PECO COMPOSITE (FIBERGLASS) POLE AND FRAMING FOR DISTRIBUTION

REV.NO.	EC#	DATE	DESCRIPTION
0	XXXXXX	4/4/25	NEW STANDARD

APPROX. 12"
7'-6"
10 3 OR 9
8
TOP OF NEUTRAL SPACE
6
GROUND LINE
GROUND LINE
26"
26" FROM BOTTOM OF POLE
26"
2"
2"
4
REAR
FIELD
ROAD
FACING

Appendix

TB- 24-064 Rev 1 - Grade B construction for Class 3 and 4 poles



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TB-24-064, Rev. 1 LL/OE GREEN - Information Only May 13, 2025

Attention
Electric Field Engineering, Electric New Business Engineering, Electric Standards, Overhead Inspectors, Distribution Field Engineering and Distribution Automation Field Engineering, Overhead Operators, Aerial Construction, Subdivision Construction, Electric Training, Electric Methods, Supply, Electric Standards, Safety, Project Management, Work Management

Summary: Design Guidelines Rev. 1
To enhance system reliability and anticipate potential shortages in class 2 poles, Distribution Standards has performed Pole Foreman analyses, introduced new fiberglass equipment, and revised pole replacement protocols. This Tech Bulletin consolidates all recently implemented guidelines and practices since the previous design guidelines were issued as part of TB-18-141, and TB-24-064 (Rev. 0).

Details
Due to the potential shortages of class 2 poles, Distribution Standards have explored alternative options. An analysis using Pole Foreman was conducted to assess scenarios where class 3 and 4 poles could be utilized for replacement or new installations that meet Grade B construction. Various pole framing configurations, along with different span lengths (100ft, 150ft, 200ft) and angles (0 degrees, 10 degrees, 15 degrees), were examined for both classes.

Additionally, tests were carried out to determine the loading capacities of class 4 rear property applications: 40' pole with a single-phase configuration, two communication wires, bundled secondary wires, and a 167kVA transformer. The tests confirmed class 4 poles can be utilized under those specified loading conditions with spans of up to 200ft.

Distribution Standards authorizes the use of class 3 & 4 poles for rear property installations, provided that the framing configuration adheres to the guidelines outlined in this tech bulletin.

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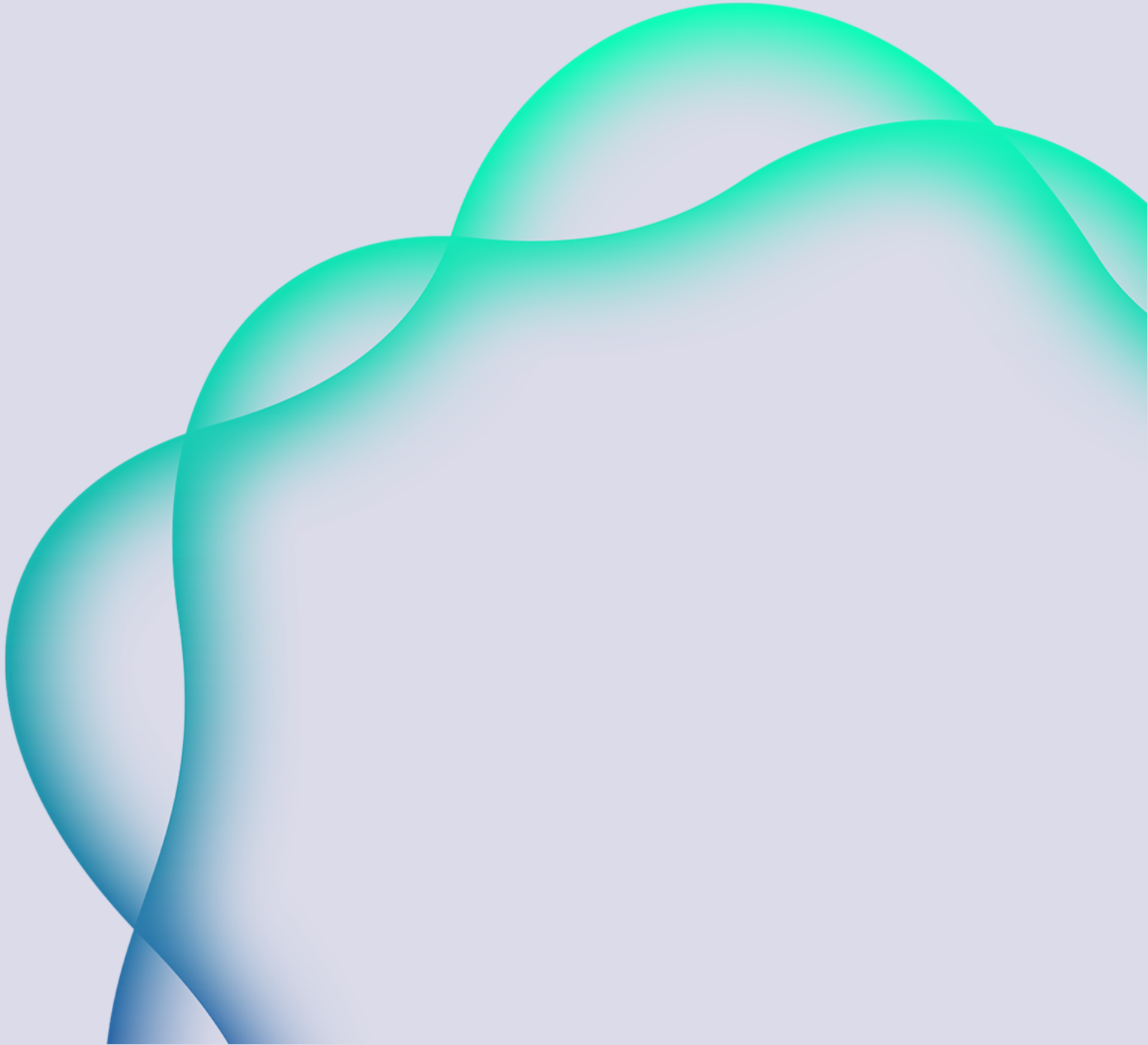
Thank you



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