FIBER OPTIC CONSTRUCTION STANDARDS

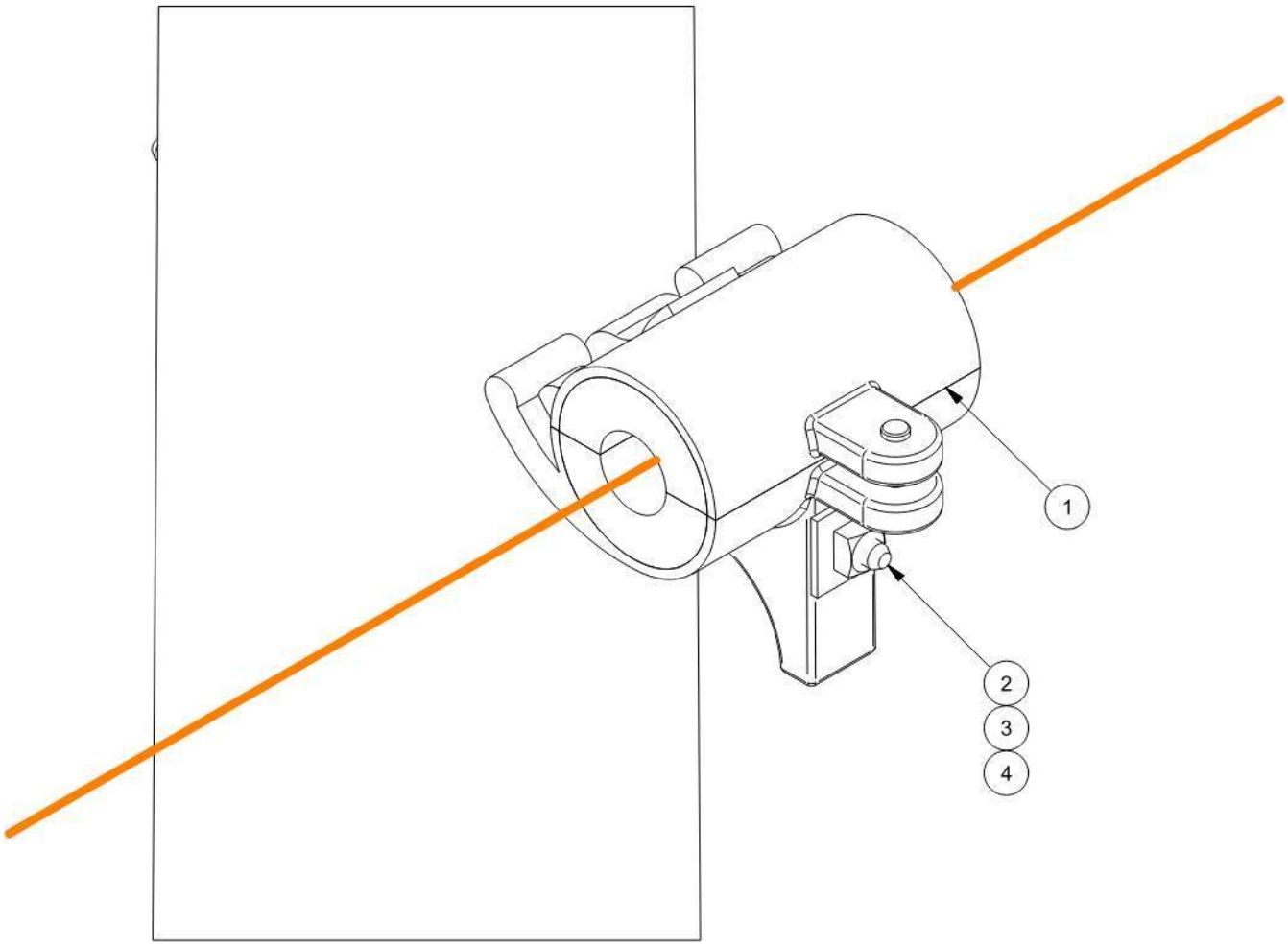
OKANOGAN COUNTY ELECTRIC CO-OP/METHOWNET

NOANET
Northwest Open Access Network

TABLE OF CONTENTS

TABLE OF CONTENTS

ADSS Tangent Support



ITEM	QTY	DESCRIPTION
1	1	SUPPORT UNIT (SPECIFY APPROPRIATE SIZE PER FIBER DIAMETER)
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
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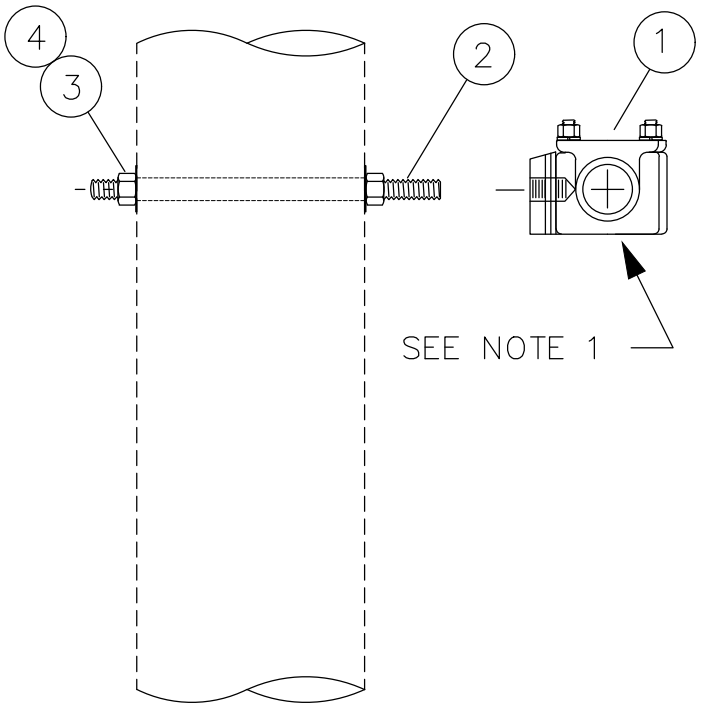

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.

ITEM	QTY	DESCRIPTION
1	1	FIBER OPTIC DIELECTRIC SUPPORT (SEE NOTE)
2	1	BOLT, DOUBLE ARMING 5/8" x 14"
3	2	WASHER, CURVED GALVANIZED, 2 1/4" x 3/16". 11/16" HOLE
4	2	5/8" GALVANIZED NUT
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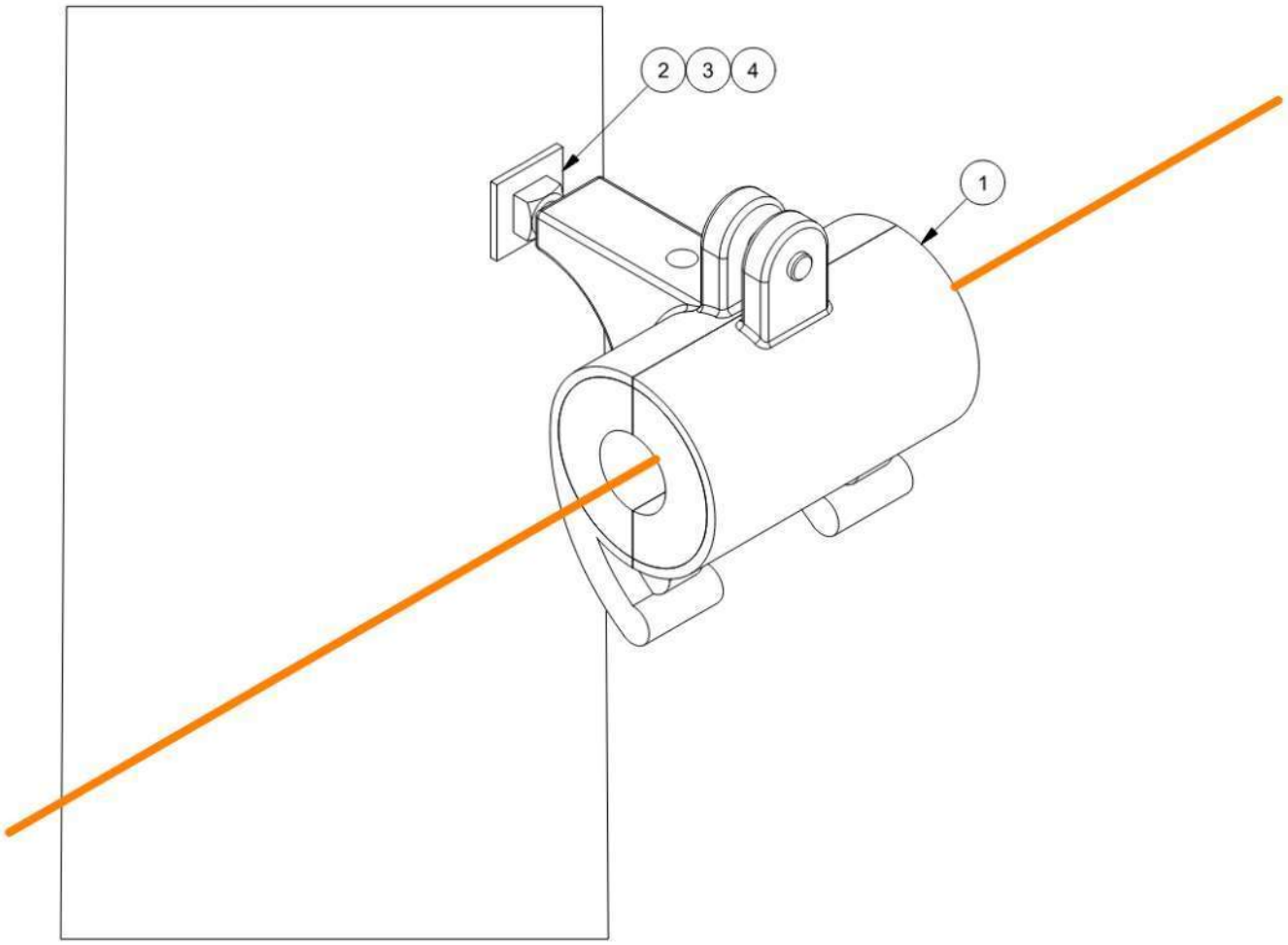

ITEM	QTY	DESCRIPTION
1	1	SUPPORT MOUNTED–SUSPENSION UNIT WITH ARMOUR
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
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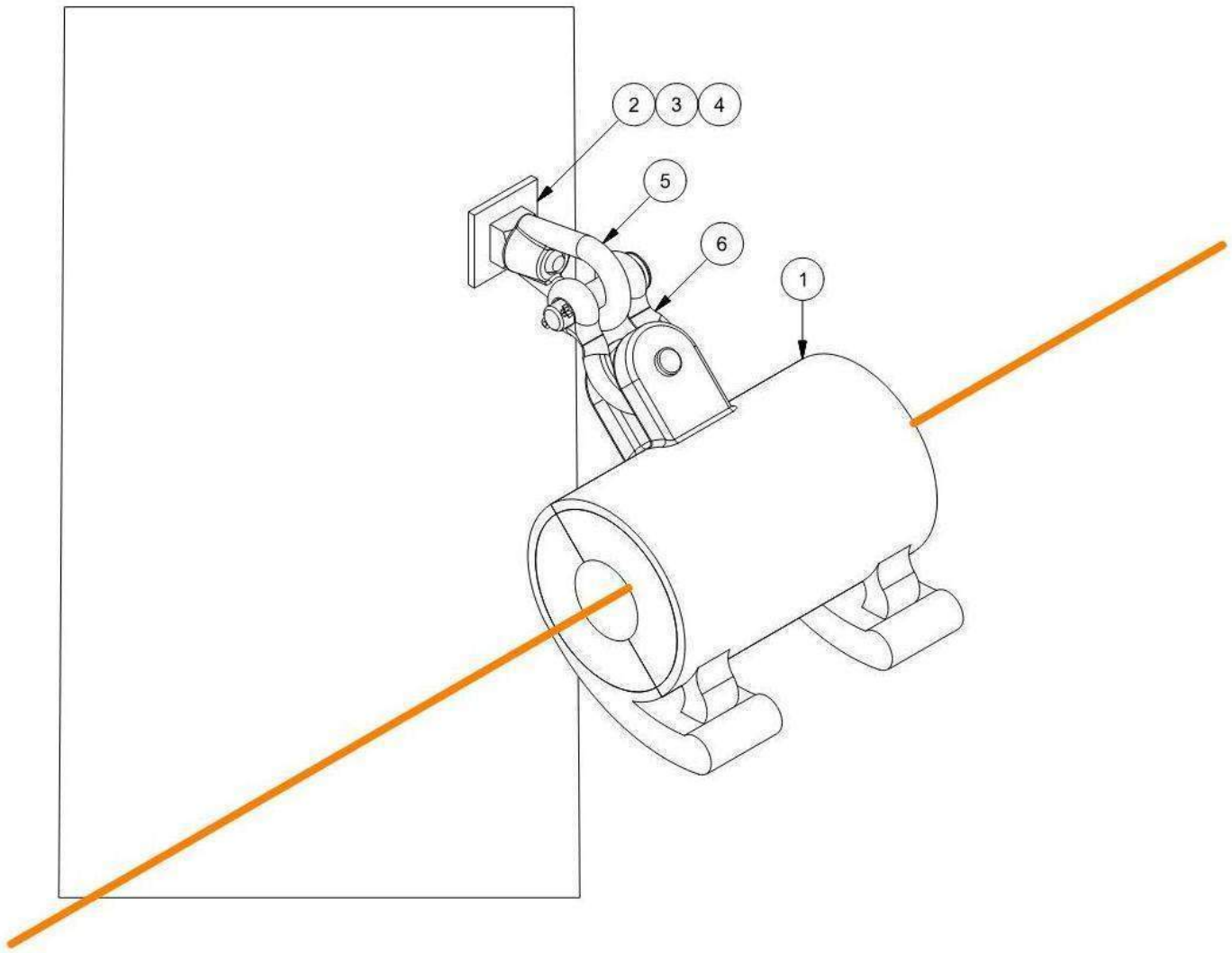

ITEM	QTY	DESCRIPTION
1	1	FIBER ALUMINMUM SUPPORT CLAMP
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
5	1	5/8" EYE NUT
6	1	1/2" ANCHOR SHACKLE
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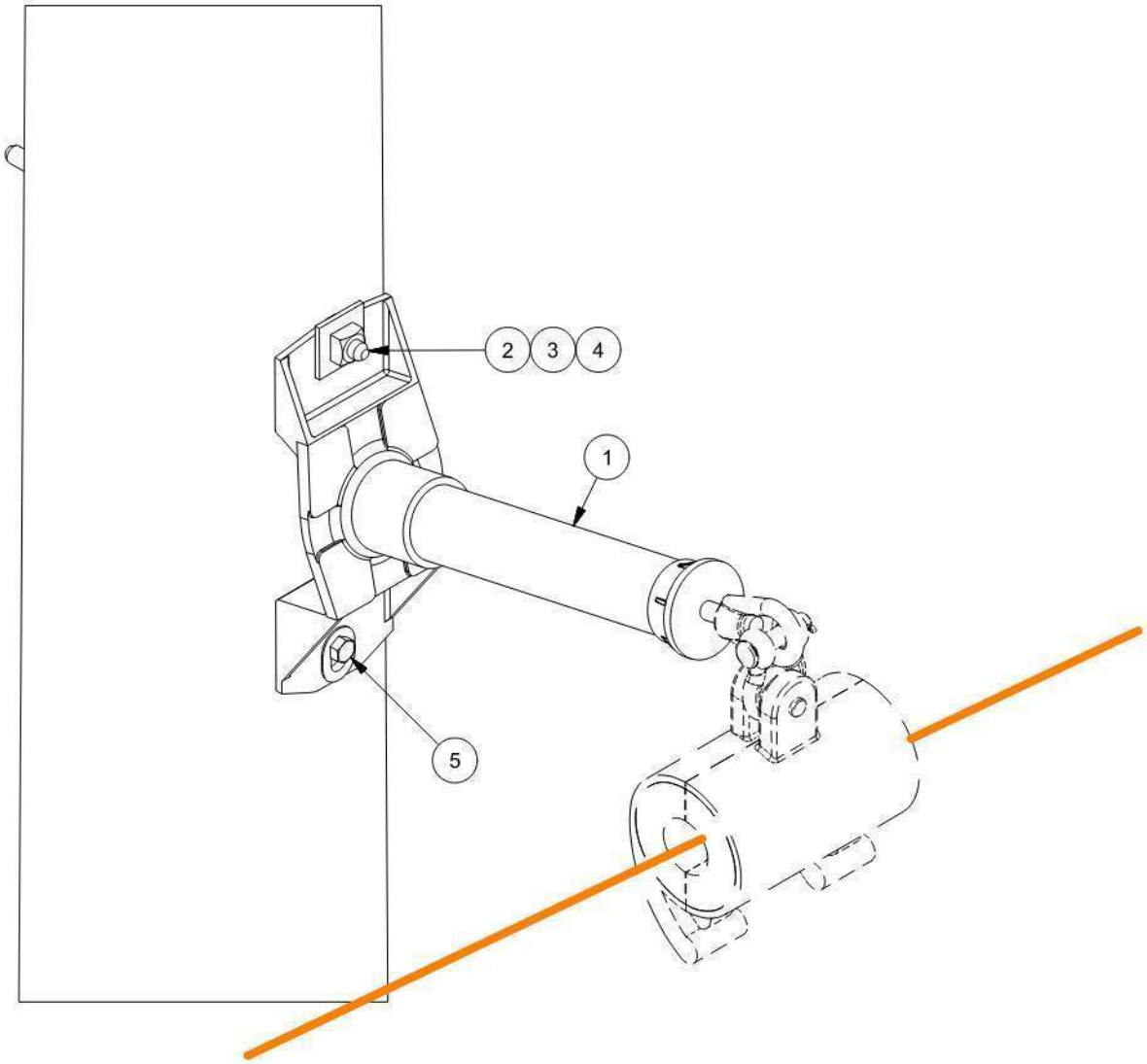

ITEM	QTY	DESCRIPTION
1	1	12" EXTENSION BRACKET
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
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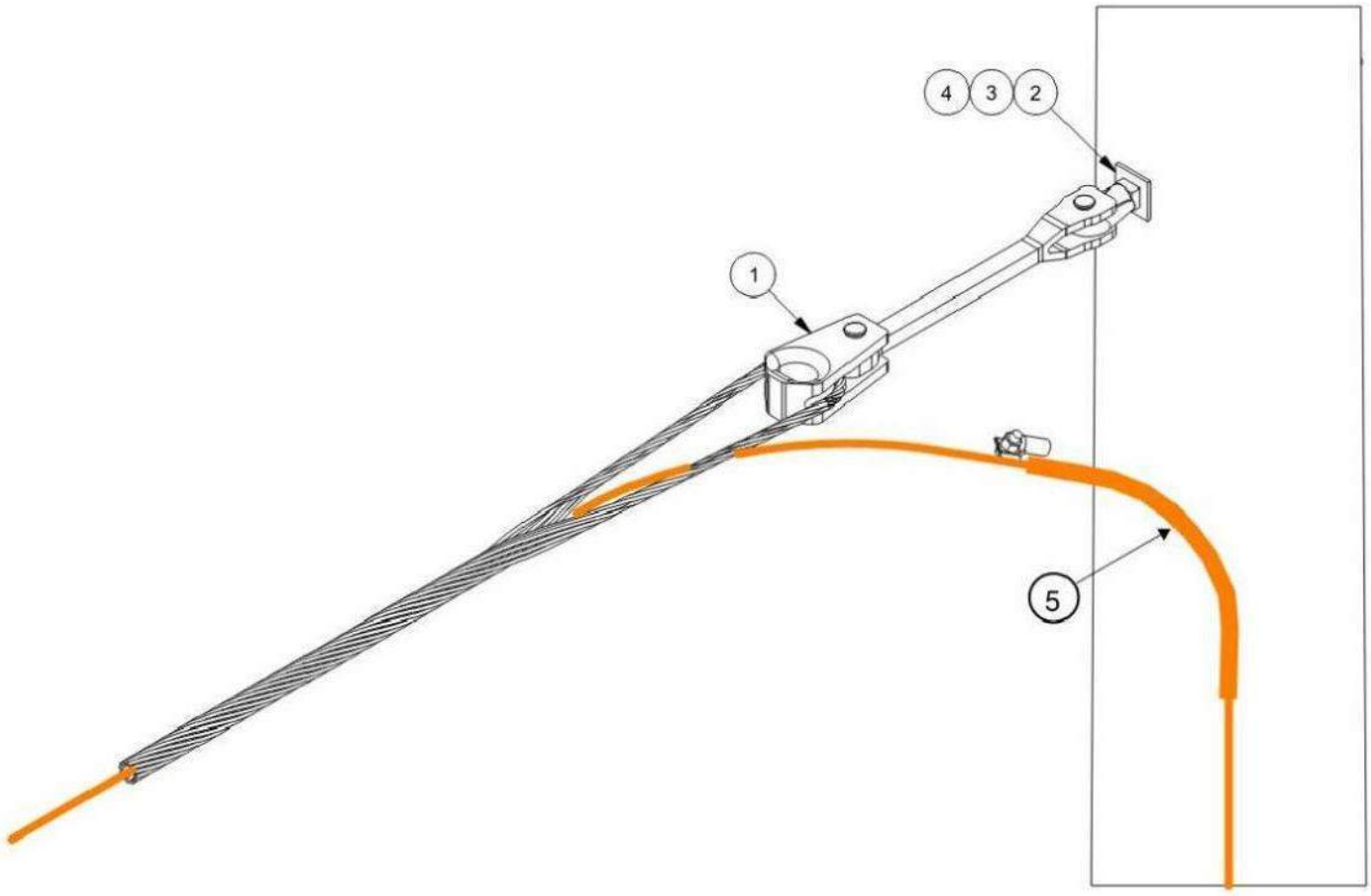

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.
2. MAXIMUM INTIAL TENSION IS 1,000 LBS.

ITEM	QTY	DESCRIPTION
1	1	FORMED WIRE DEADEND WITH THIMBLE CLEVIS
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
5	1	CABLE ABRASION PROTECTOR
6	1	14" EXTENSION LINK WITH EYENUT
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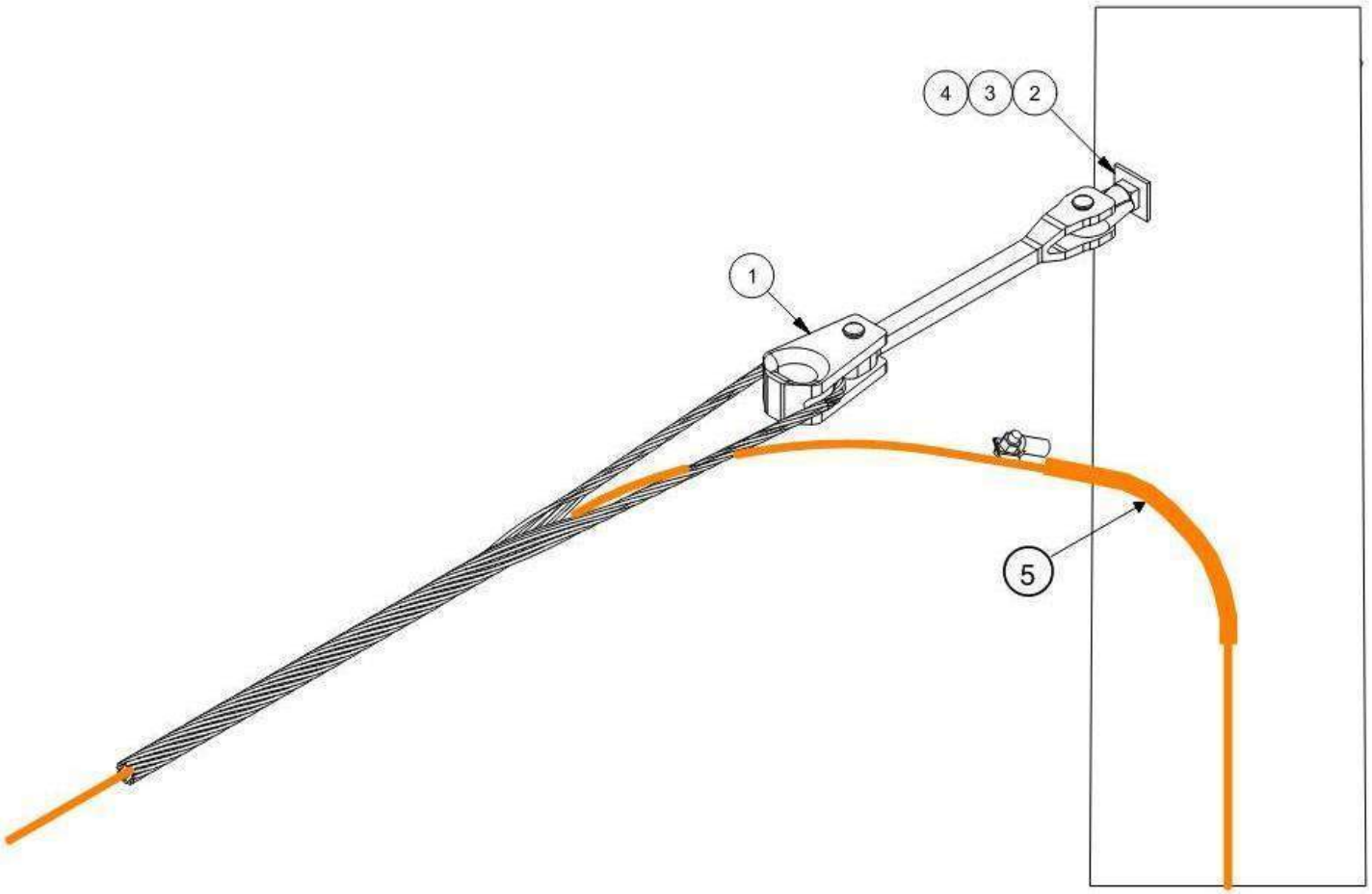

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.
2. MAXIMUM INTIAL TENSION IS 2,000 LBS.

ITEM	QTY	DESCRIPTION
1	1	FORMED WIRE DEADEND WITH THIMBLE CLEVIS
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
5	1	CABLE ABRASION PROTECTOR
6	1	14" EXTENSION LINK WITH EYENUT
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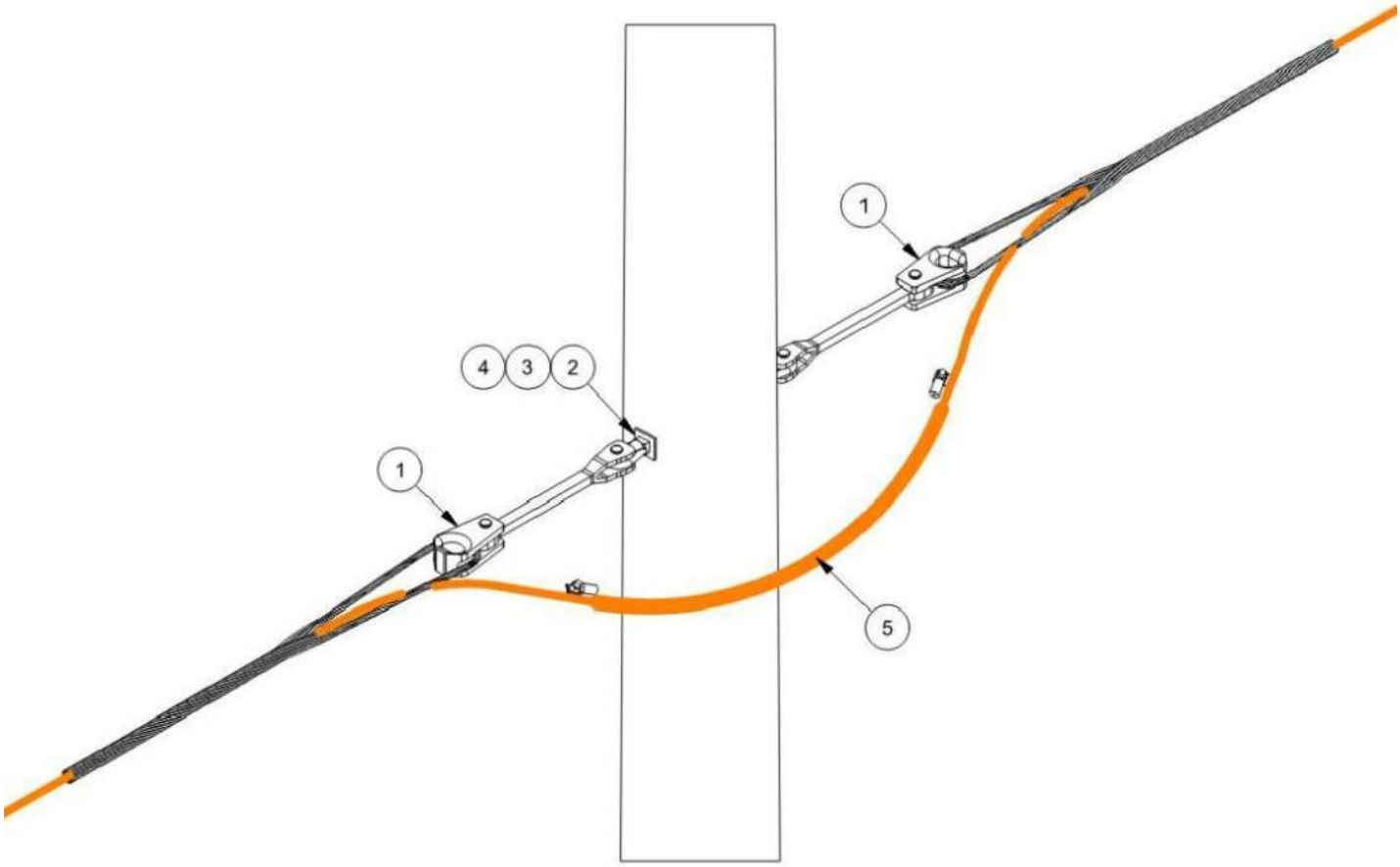

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.
2. MAXIMUM INTIAL TENSION IS 1,000 LBS.

ITEM	QTY	DESCRIPTION
1	1	FORMED WIRE DEADEND WITH THIMBLE CLEVIS
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
5	1	CABLE ABRASION PROTECTOR
6	1	14" EXTENSION LINK WITH EYENUT
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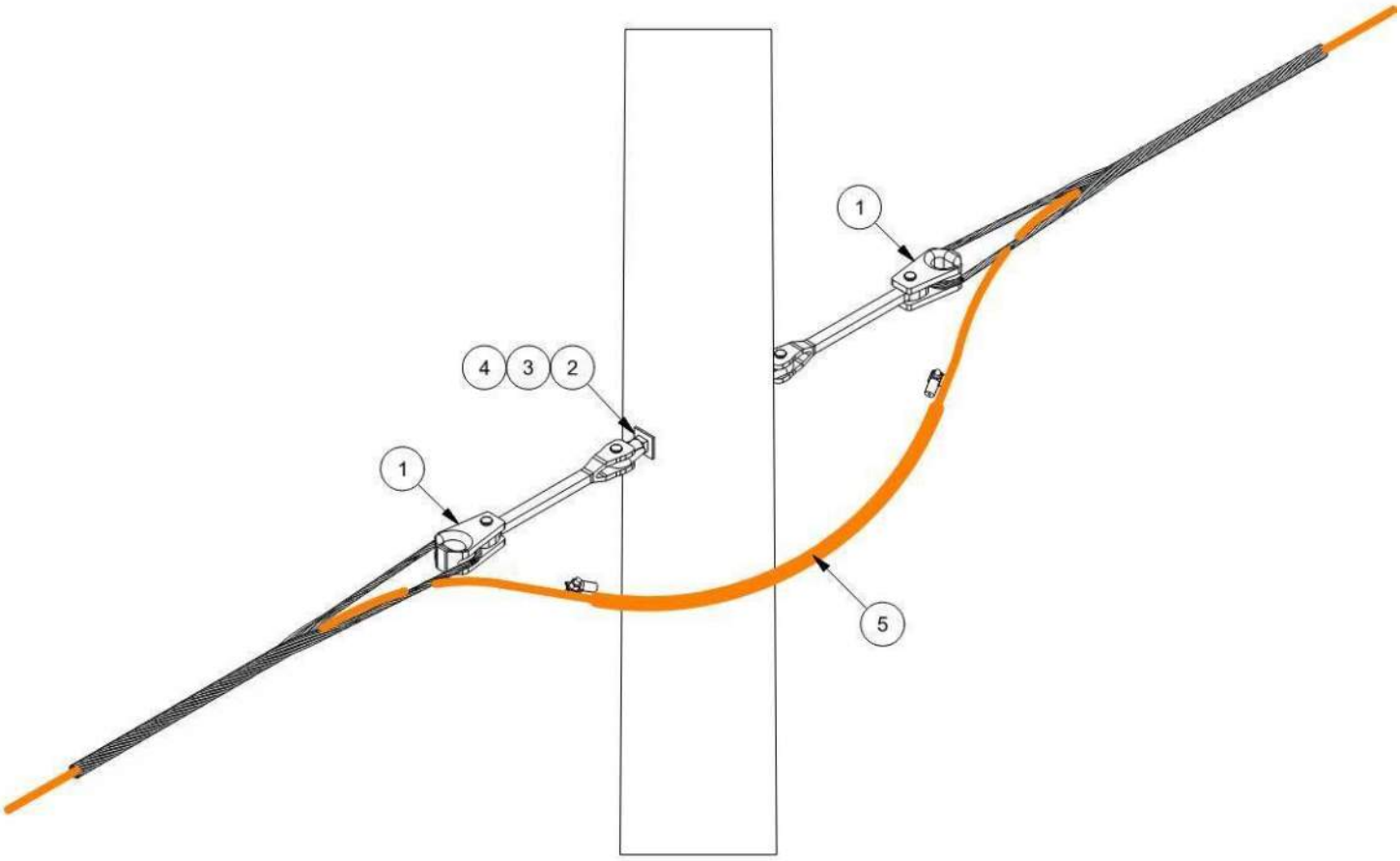

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.
2. MAXIMUM INTIAL TENSION IS 2,000 LBS.

ITEM	QTY	DESCRIPTION
1	1	FORMED WIRE DEADEND WITH THIMBLE CLEVIS
2	1	BOLT, DOUBLE ARMING 5/8" x 16"
3	2	WASHER, SQUARE GALVANIZED, 2" x 2" x 3/16"
4	2	5/8" GALVANIZED NUT
5	1	CABLE ABRASION PROTECTOR
6	1	14" EXTENSION LINK WITH EYENUT
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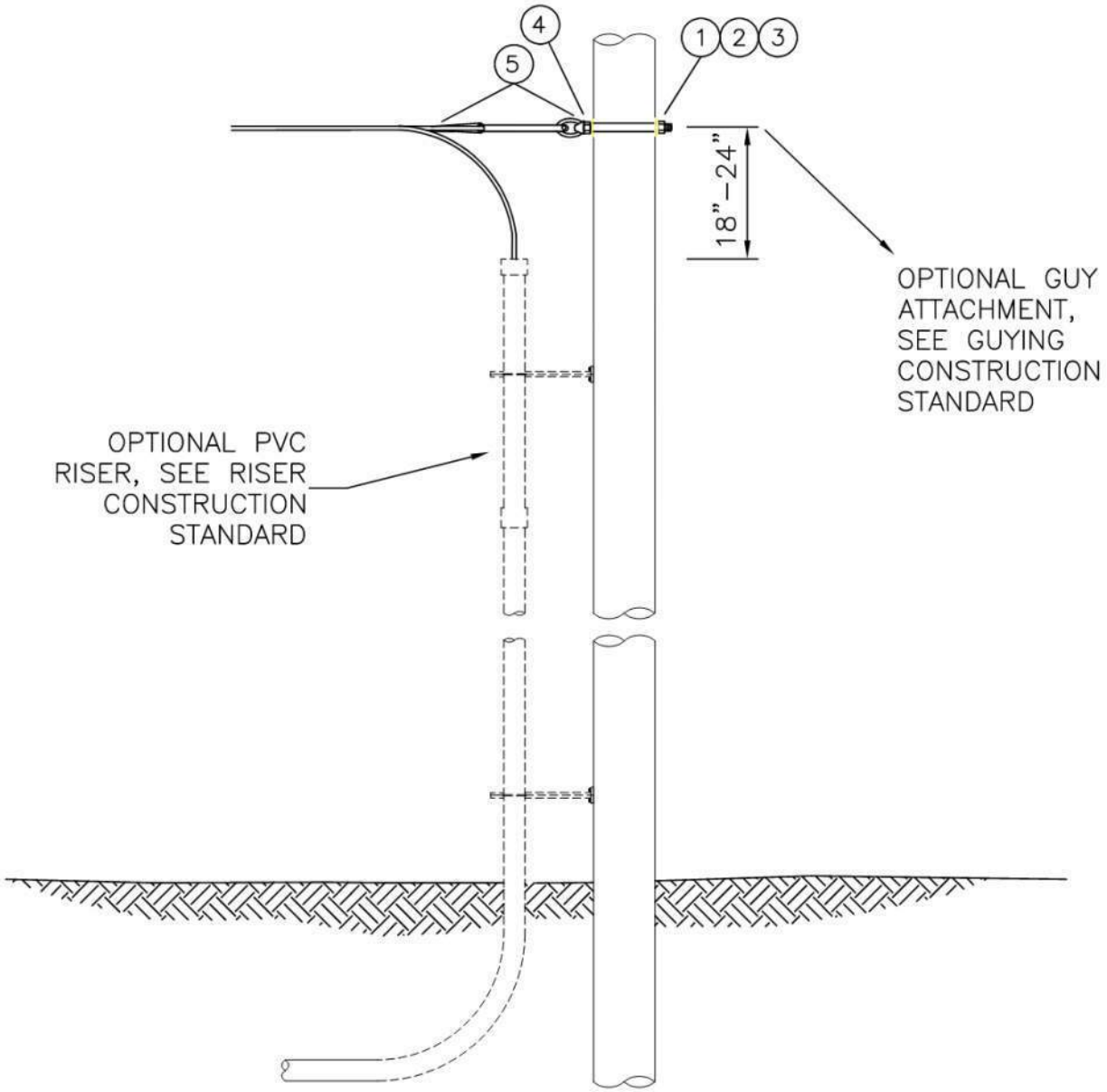

ITEM	QTY	DESCRIPTION
1	1	BOLT, MACHINE, 5/8" x 12" (OR AS REQ'D)
2	1	WASHER, SP LOCK GALVANIZED, 5/8"
3	2	WASHER, CURVED, 2 1/4" x 2 1/4" x 3/16", 11/16" HOLE
4	2	NUT, THIMBLE EYE, 5/8"
5	1	FIBER DEADEND, ADSS, SIZE AS REQ'D FOR FIBER DIAMETER
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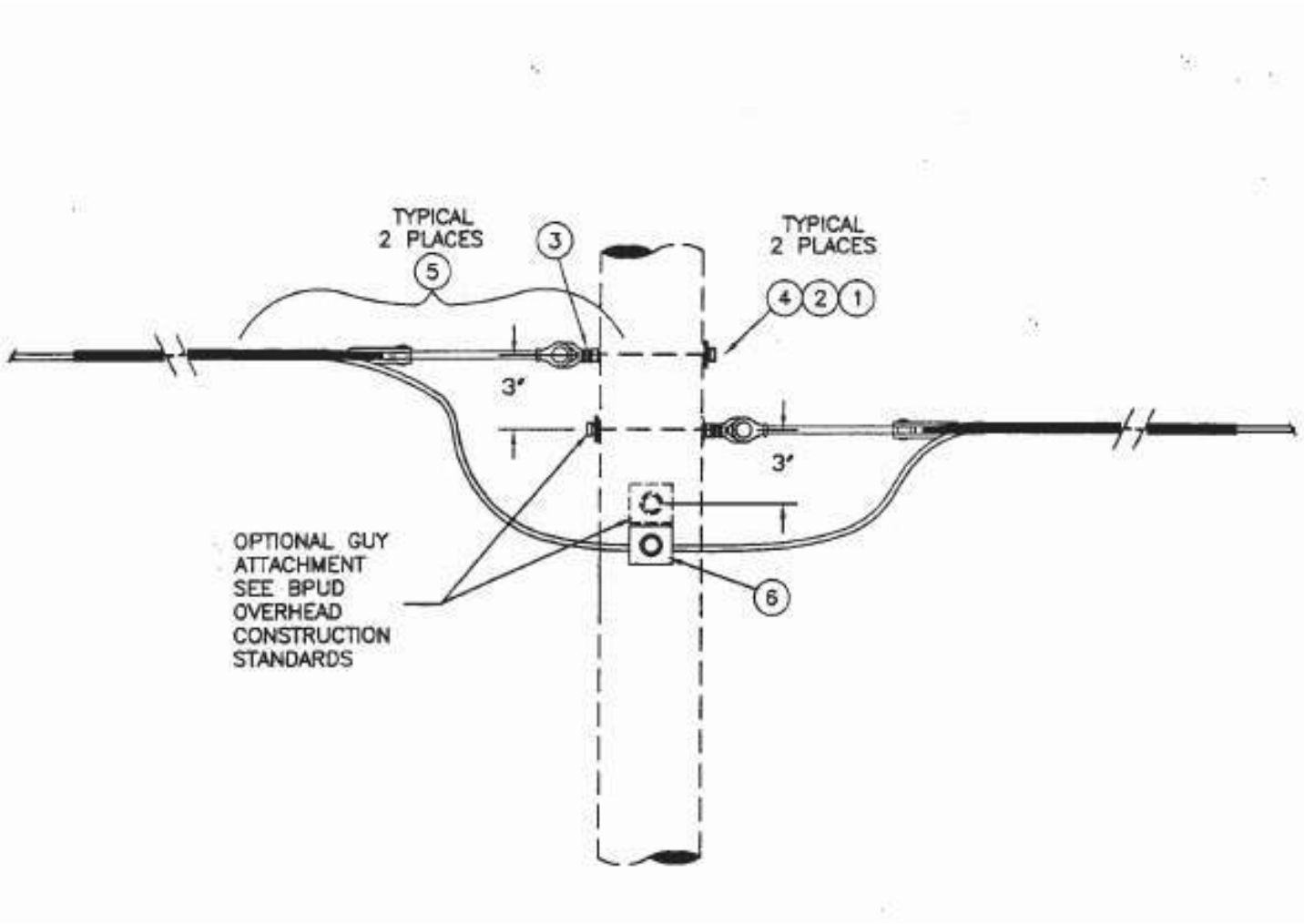

ITEM	QTY	DESCRIPTION
1	2	BOLT, MACHINE, 5/8" x 12" (OR AS REQ'D)
2	2	WASHER, SP LOCK GALVANIZED, 5/8"
3	2	WASHER, CURVED, 2 1/4" x 2 1/4" x 3/16", 11/16" HOLE
4	2	NUT, THIMBLE EYE, 5/8"
5	1	FIBER DEADEND, ADSS, SIZE AS REQ'D FOR FIBER DIAMETER
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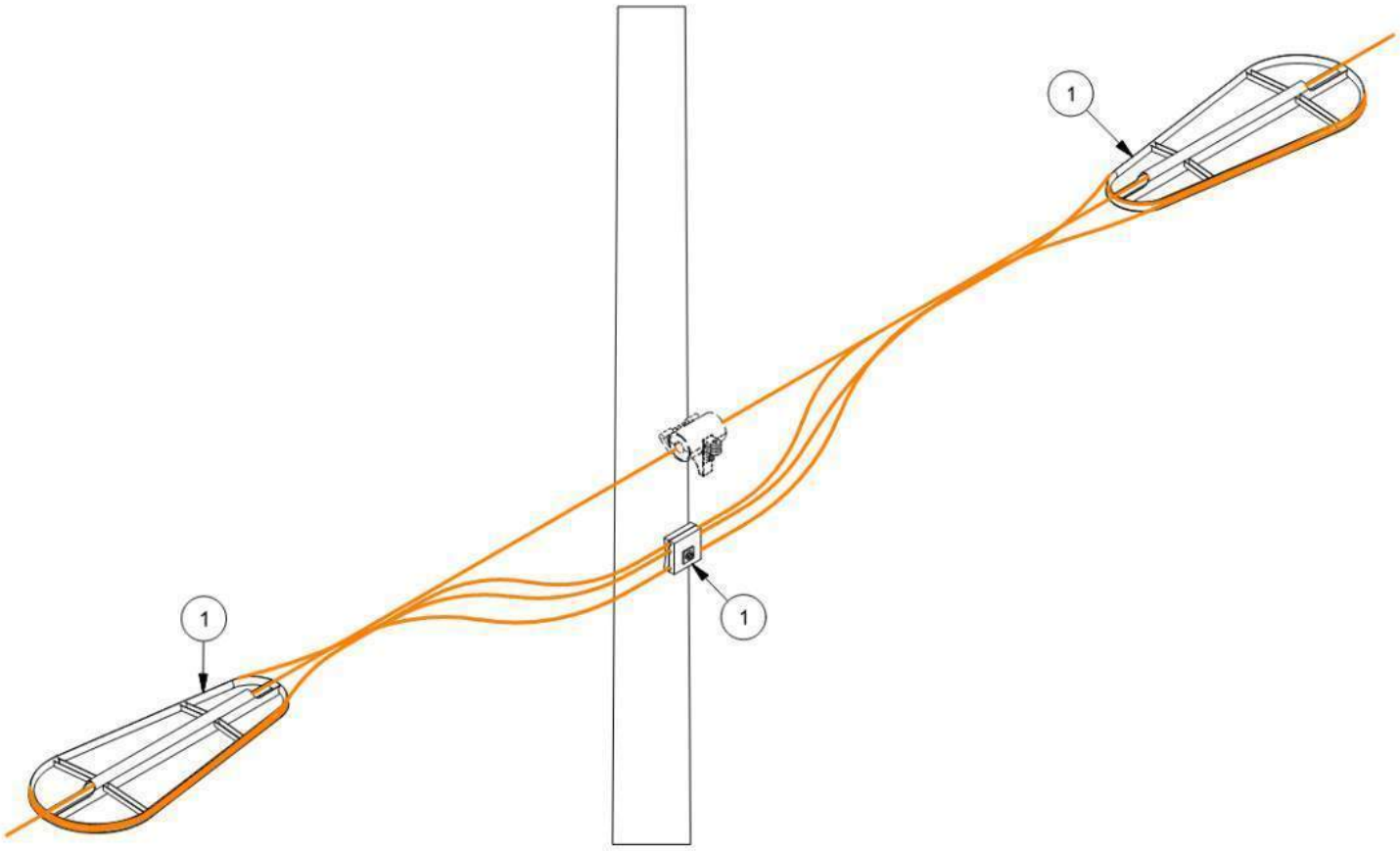

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.

ITEM	QTY	DESCRIPTION
1	1	IN-SPAN STORAGE SYSTEM KIT FOR ADSS COMPLETE WITH (2) STORAGE RACKS (SNOW SHOES) ARMOR RODS, CABLE PROTECTION BRACKET, MISC HARDWARE
2	25	8" CABLE TIES
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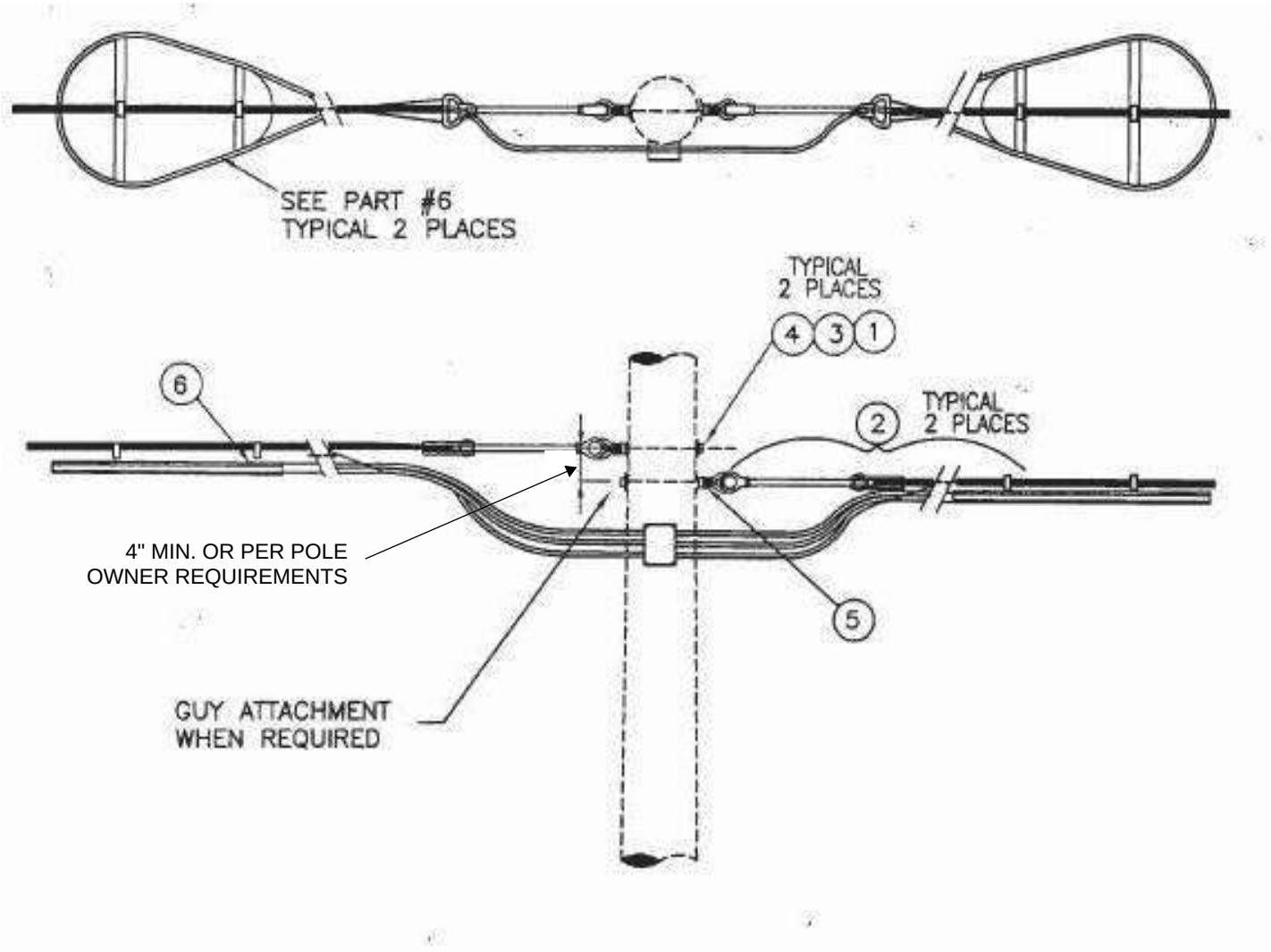

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.

ITEM	QTY	DESCRIPTION
1	2	BOLT, MACHINE, 5/8" x 12"
2	2	FIBER DEADEND, ADSS
3	2	WASHER, SP LOCK, GALV 5/8"
4	4	WASHER, CURVED, 3" x 3" x 1/4"L x 11/16" HOLE
5	2	PALNUT LOCK WASHER, 5/8"
6	1	IN-SPAN FIBER OPTIC STORAGE SYSTEM
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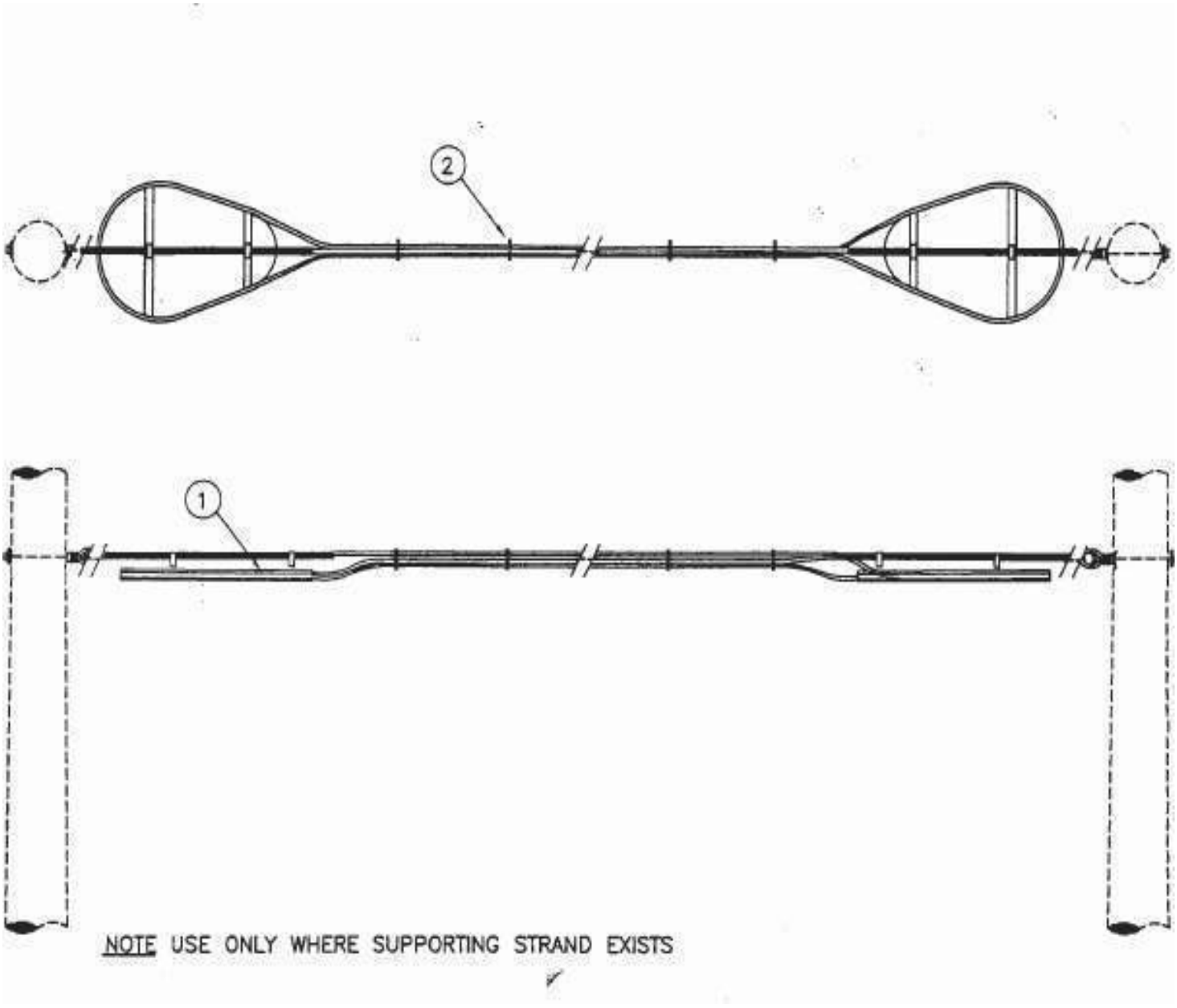

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.

ITEM	QTY	DESCRIPTION
1	1	IN-SPAN STORAGE SYSTEM KIT FOR ADSS COMPLETE WITH (2) STORAGE RACKS (SNOW SHOES) ARMOR RODS, CABLE PROTECTION BRACKET, MISC HARDWARE
2	AS REQ'D	8" CABLE TIES
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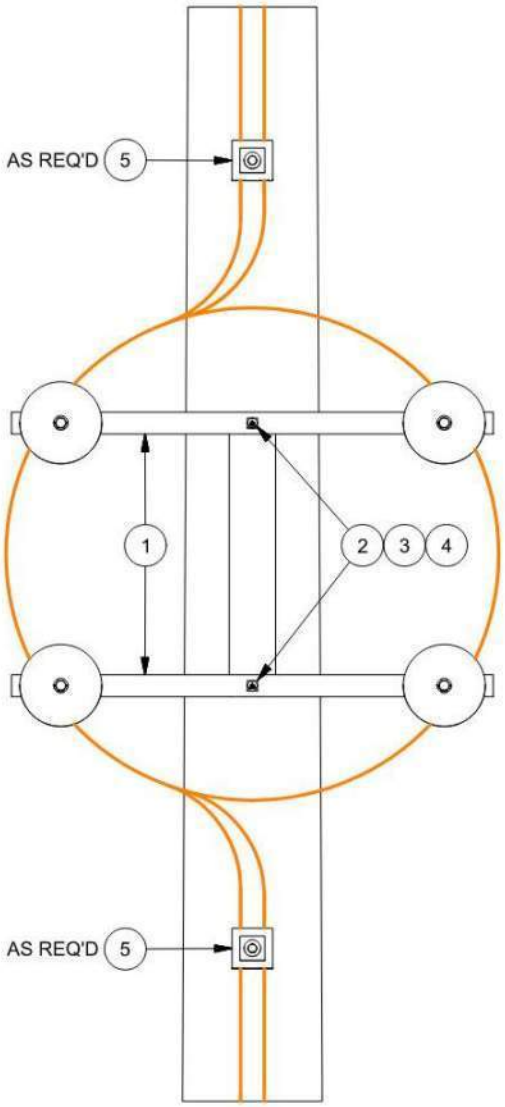

NOTE:
1. TO BE USED ONLY WITH POLE OWNER PERMISSION.

ITEM	QTY	DESCRIPTION
1	1	VERTICAL STORAGE SYSTEM – DOUBLE ARM COMPLETE WITH 2 STORAGE ARMS, 4 STORAGE SPOOLS, CABLE PROTECTION BRACKET, MISC HARDWARE
2	2	BOLT, MACHINE, 5/8" x 14" (or LENGTH AS REQ'D)
4	2	WASHER, SQUARE, GALV 2 1/4" x 2 1/4" x 3/16", 11/16" HOLE
5	AS REQ'D	DOWNLEAD CUSHION WITH HARDWARE
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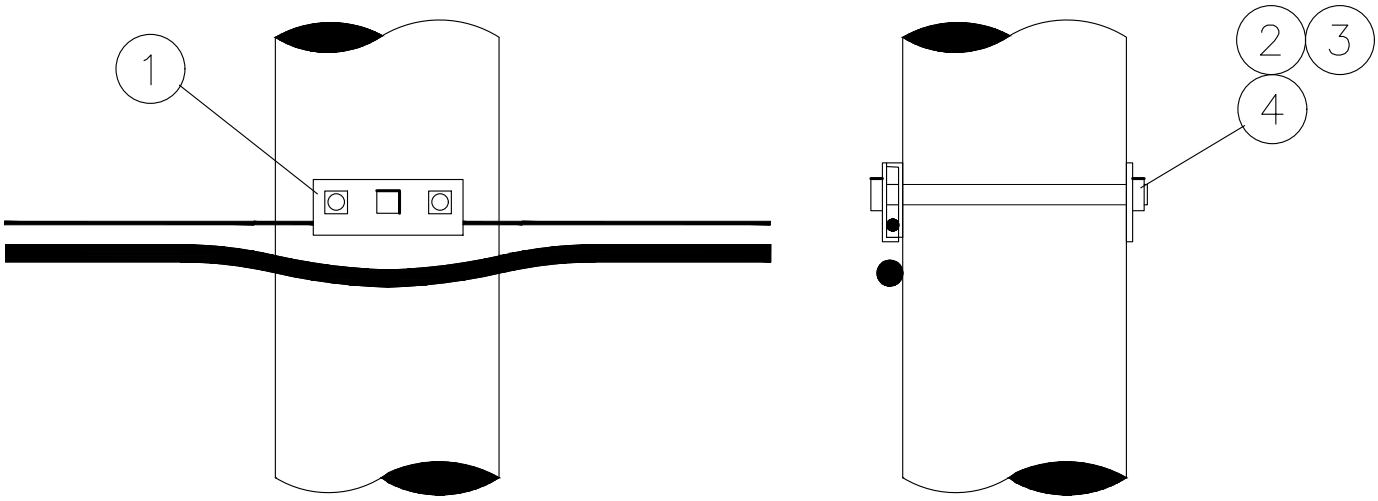

NOTE:
1. SEE RUS DRAWING NUMBERS 214 & 241 (APPENDIX A, SHEETS 1&2) FOR ADDITIONAL CONSTRUCTION DETAILS AND MATERIAL REQUIREMENTS.

ITEM	QTY	DESCRIPTION
1	1	3 BOLT CLAMP, MESSENGER, TANGENT
2	1	BOLT, MACHINE, 5/8" x 12" (or LENGTH AS REQ'D)
4	2	WASHER, 2 1/4" x 2 1/4" x 3/16", 11/16" HOLE
5	1	WASHER SP LOCK GALVANIZED, 5/8"
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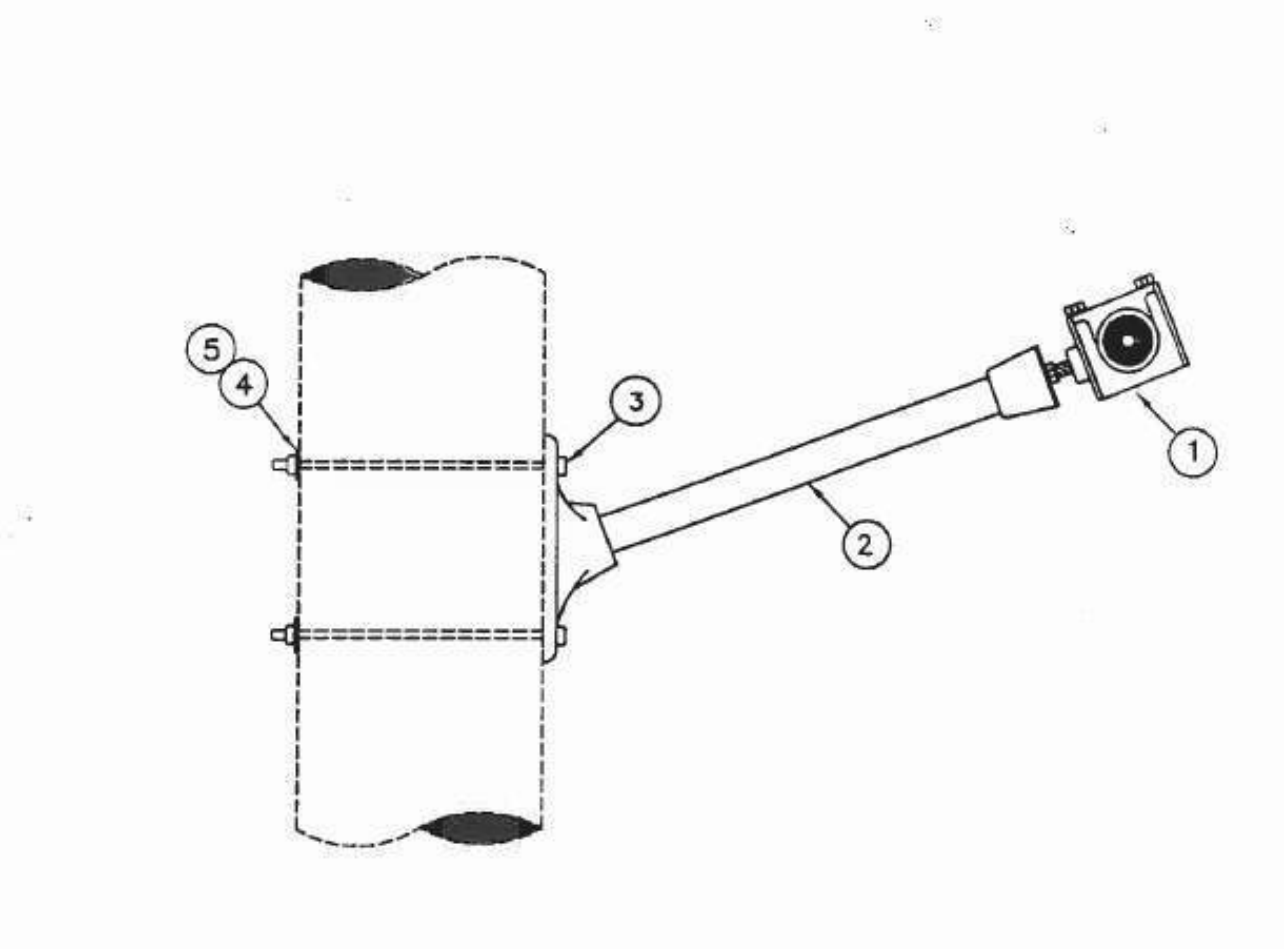

	Aluma-Form Part #
12"	F1CA-MV-A12-F2
18"	F1CA-MV-A18-F3
24"	F1CA-MV-A24-BF2
30"	F1CA-MV-A30-BF2

NOTE:
CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.

ITEM	QTY	DESCRIPTION
1	1	FIBER OPTIC DIELECTRIC SUPPORT (SEE NOTE)
2	1	FIBERGLASS BRACKET (SPECIFY LENGTH PER CHART)
3	2	BOLT, MACHINE 5/8" x 12" (OR LENGTH AS REQ'D)
4	2	WASHER, SQUARE CURVED, 2 1/4" x 2 1/4" x 3/16" x 11/16 HOLE
5	2	WASHER, SP LOCK GALV, 5/8"
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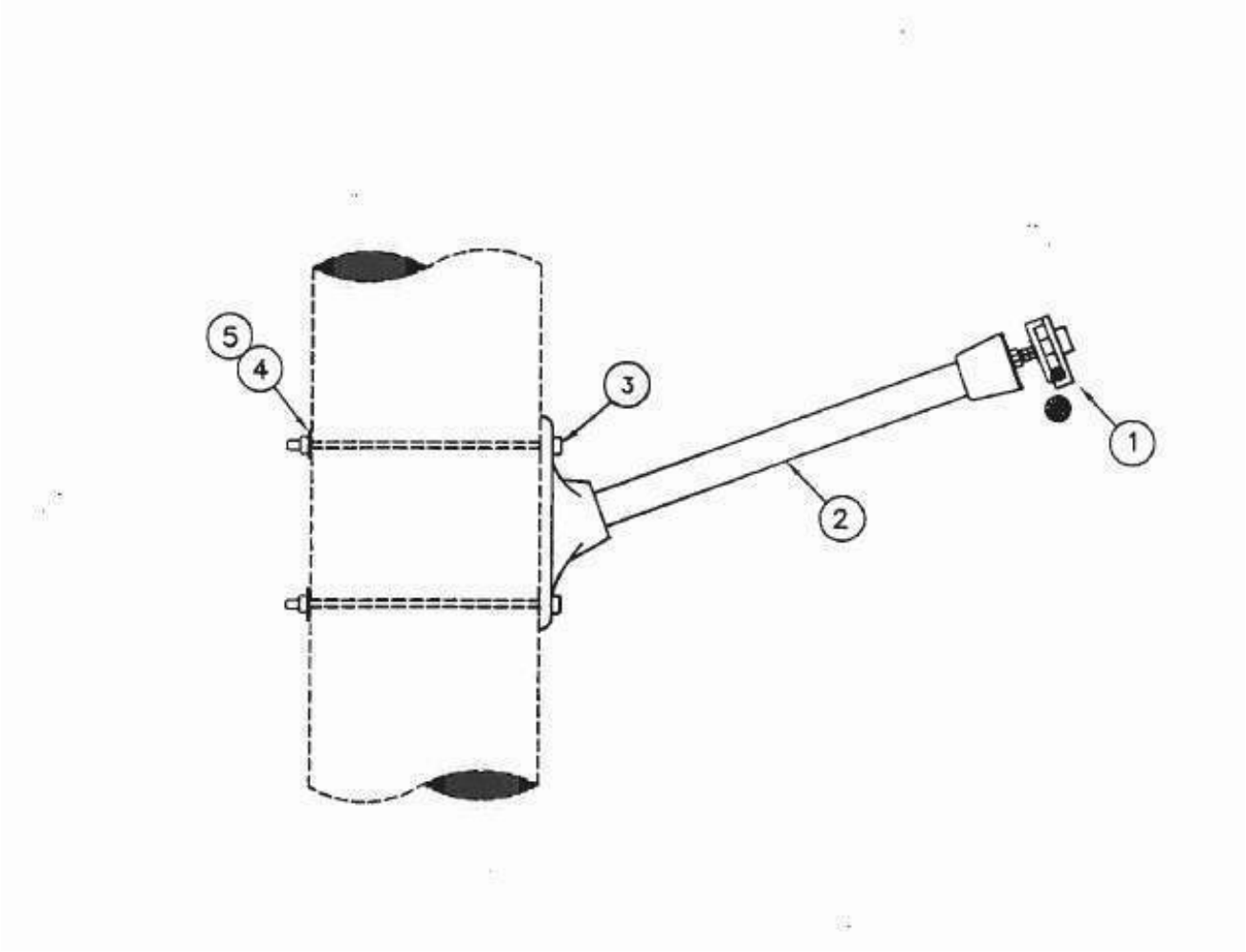

	Aluma-Form Part #
12"	F1CA-MV-A12-F2
18"	F1CA-MV-A18-F3
24"	F1CA-MV-A24-BF2
30"	F1CA-MV-A30-BF2

ITEM	QTY	DESCRIPTION
1	1	3–BOLT MESSENGER CLAMP
2	1	FIBERGLASS BRACKET (SPECIFY LENGTH PER CHART)
3	2	BOLT, MACHINE 5/8" x 12" (OR LENGTH AS REQ'D)
4	2	WASHER, SQUARE CURVED, 2 1/4" x 2 1/4" x 3/16" x 11/16 HOLE
5	2	WASHER, SP LOCK GALV, 5/8"
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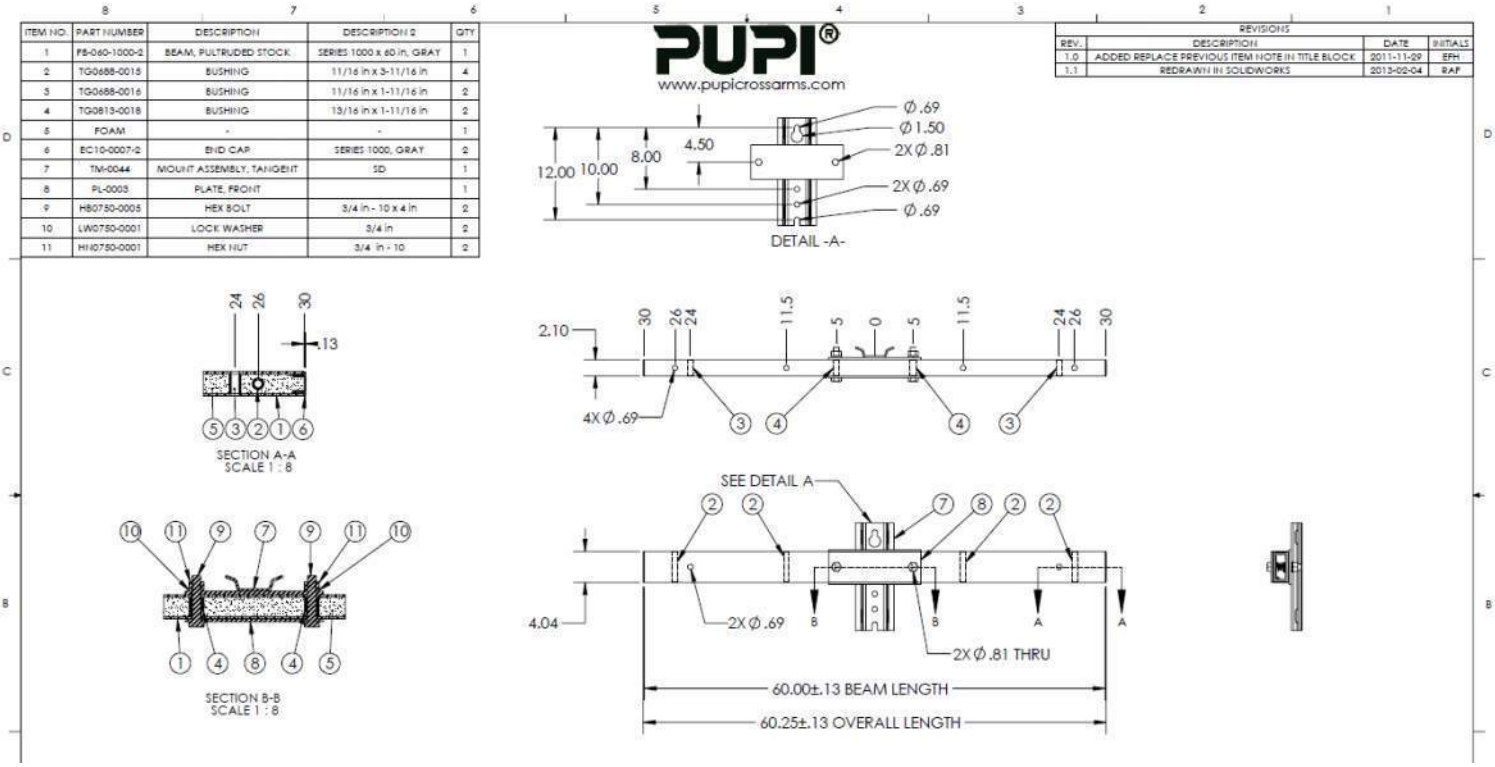

ITEM	QTY	DESCRIPTION
1	1	PUPI FIBERGLASS ARM, 60"
2	2	BOLT, MAHCINE SQ HAD GALV 3/4" x 14" w/ SQ NUT
3	2	WASHER, SQ CURVED 3/4" HD GALV 3" x 3" x 1/4"
4	2	WASHER DOUBLE COIL, 3/4" HD GALV SPRING LOCK
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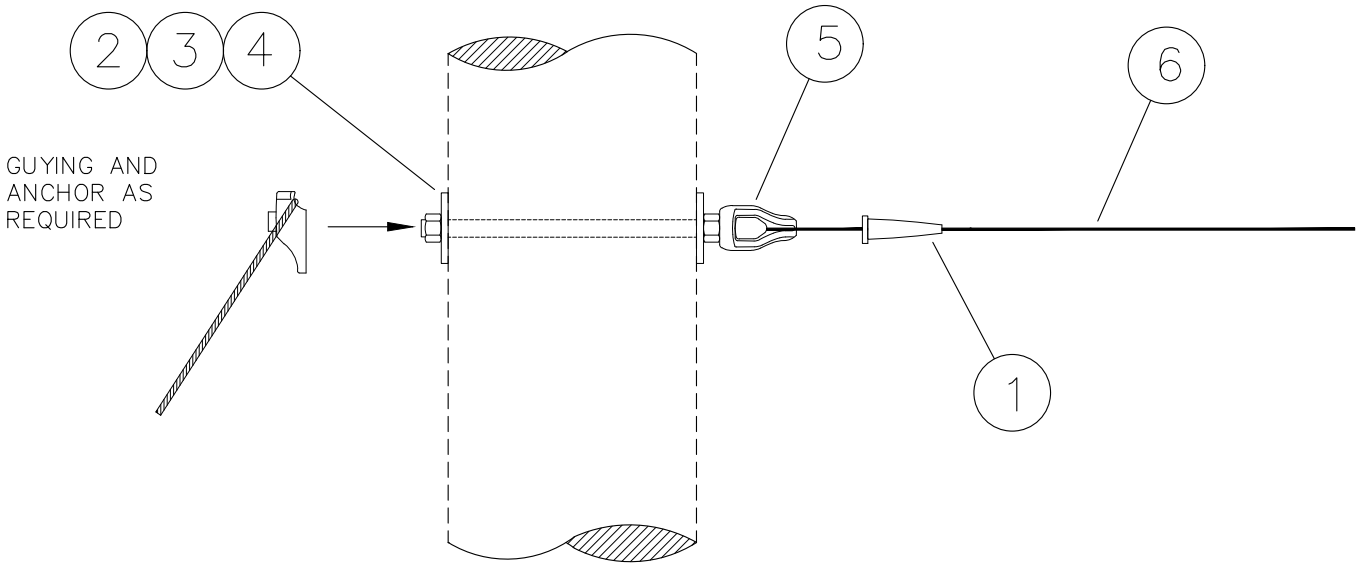

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.
2. MAXIMUM INTIAL TENSION IS 1,000 LBS.

ITEM	QTY	DESCRIPTION
1	1	DEADEND, AUTO 6M SHORT BAIL
2	1	BOLT, DOUBLE ARMING 5/8" x 14" (OR AS REQ'D)
3	2	WASHER, SP LOCK, GALV 5/8"
4	2	WASHER, CURVED, 3" x 3" x 1/4" x 11/16" HOLE
5	1	NUT, THIMBLEYE, 5/8"
6	AS REQ'D	ALUMAWELD 6M, 7 STR
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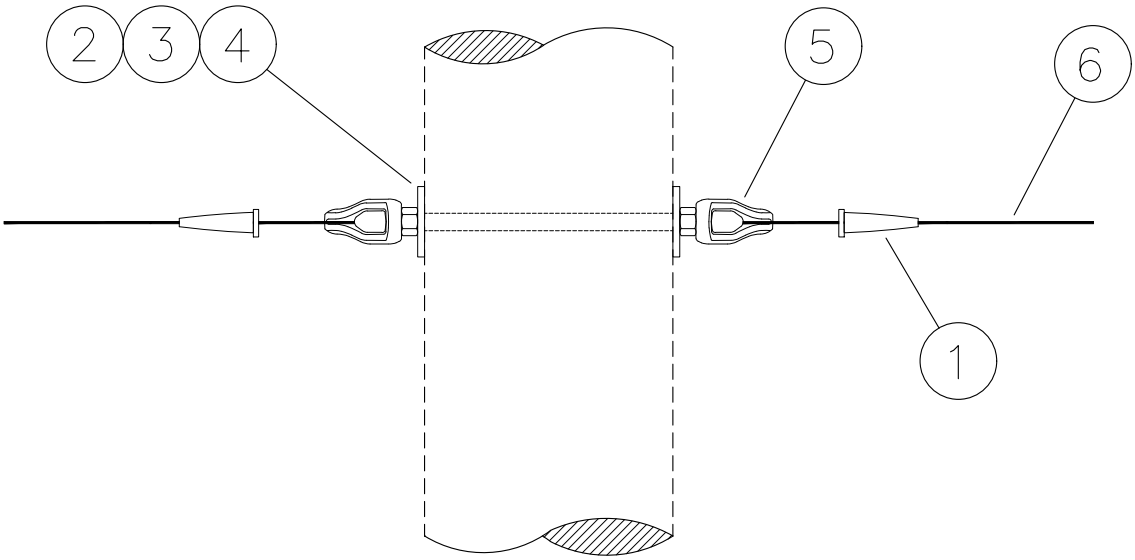

NOTE:
1. CHOOSE APPROPRIATE PART # TO MATCH DIAMETER OF THE FIBER OPTIC CABLE USED.
2. MAXIMUM INTIAL TENSION IS 1,000 LBS.

ITEM	QTY	DESCRIPTION
1	1	DEADEND, AUTO 6M SHORT BAIL
2	1	BOLT, DOUBLE ARMING 5/8" x 14" (OR AS REQ'D)
3	2	WASHER, SP LOCK, GALV 5/8"
4	2	WASHER, CURVED, 3" x 3" x 1/4" x 11/16" HOLE
5	1	NUT, THIMBLEYE, 5/8"
6	AS REQ'D	ALUMAWELD 6M, 7 STR
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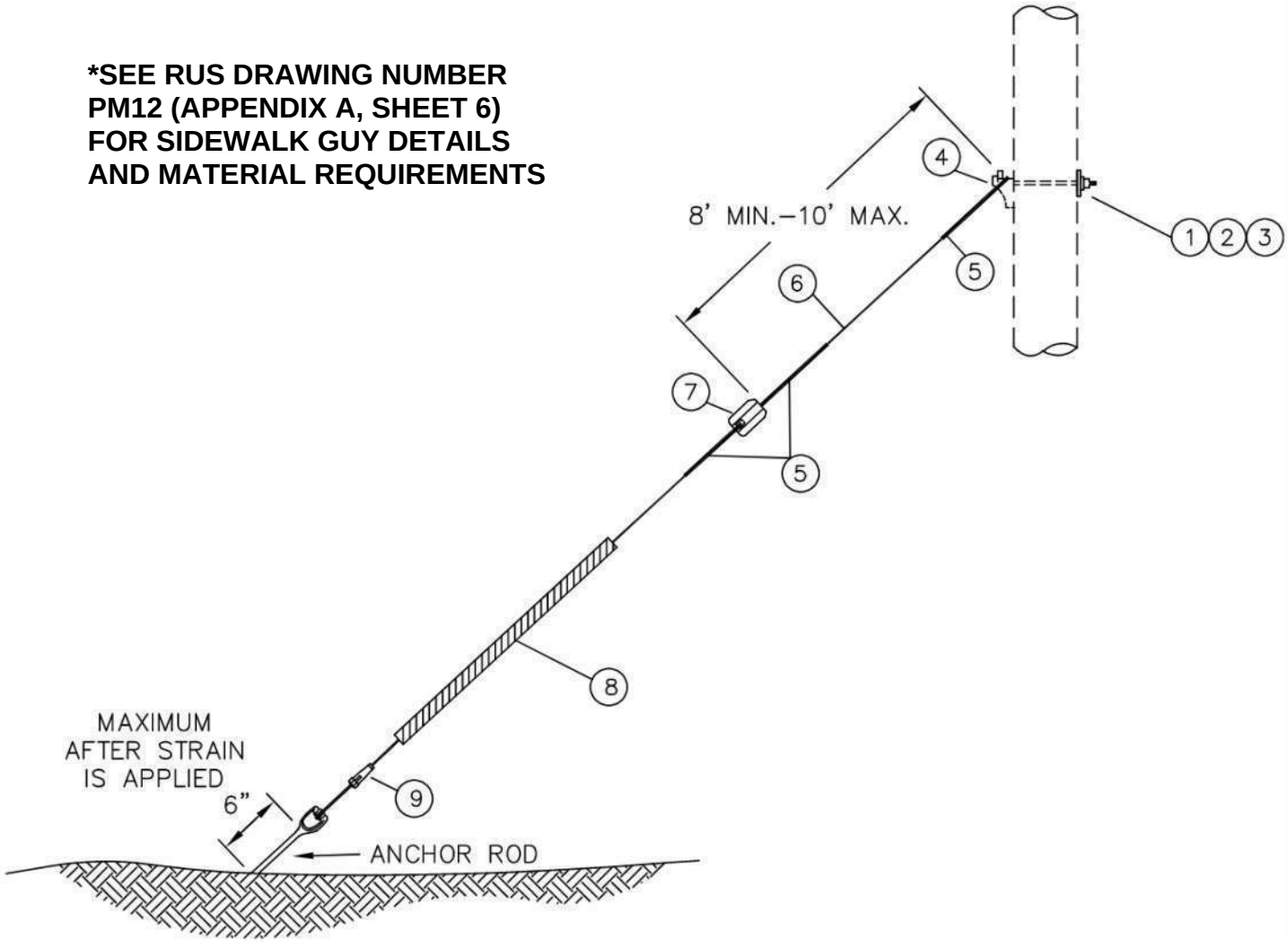
***SEE RUS DRAWING NUMBER PM12 (APPENDIX A, SHEET 6) FOR SIDEWALK GUY DETAILS AND MATERIAL REQUIREMENTS**



NOTE:
1. ONLY ATTACH TO EXISTING ANCHORS WHEN ANCHOR OWNER PERMISSION HAS BEEN GRANTED
2. INSTALLATION OF NEW ANCHOR LOCATIONS SHALL BE SPECIFIED ON CONSTRUCTION PRINTS OR APPROVED BY OCEC.
3. DO NOT ATTACH GUYING TO EXISTING COMMUNICATIONS ANCHORS
4. DO NOT ADD AUXILIARY EYE ATTACHMENTS TO EXISTING ANCHORS.

ITEM	QTY	DESCRIPTION
1	1	BOLT, MACHINE, 5/8" x 12" (OR AS REQ'D)
2	1	WASHER, CURVED, 2 1/4" x 2 1/4" x 3/16", 11/16" HOLE
3	2	WASHER, SP LOCK, GALV 5/8"
4	2	GUY HOOK
5	1	DEADEND PREFORMED GUY 6M
6	AS REQ'D	ALUMAWELD 6M, 7 STR
7	1	GUY STRAIN INSULATOR, 3/8" HOLE, 4 1/4" LENGTH, 2 7/8" DIA
8	1	GUY GUARD
9	1	DEADEND AUTOMATIC 6M SHORT BAIL
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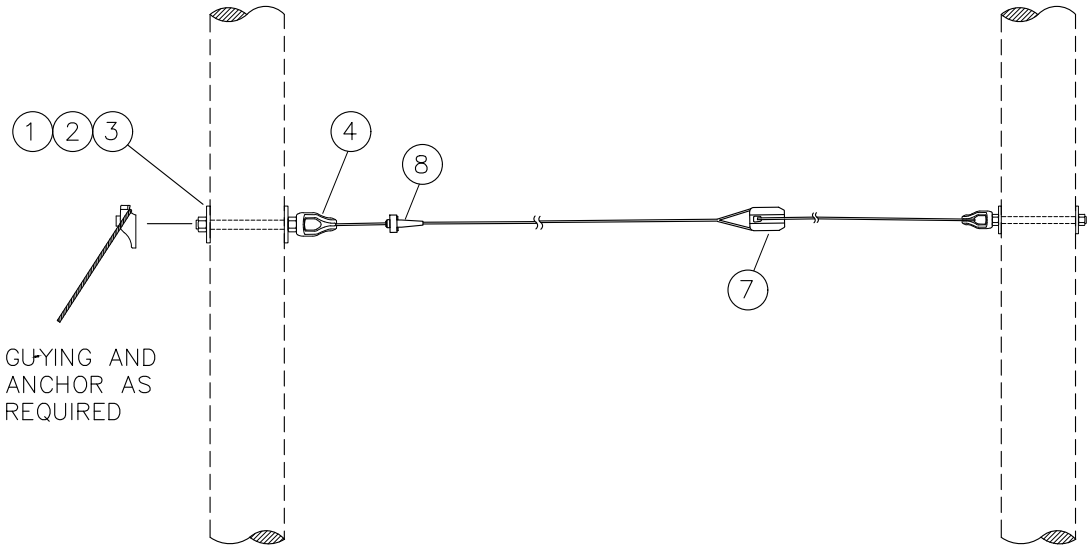
Fiber Optic Cable 6,000# Span Guy



NOTE:
1. STRAND ATTACHMENT HEIGHT ON UTILITY POLES WILL BE PER CONSTRUCTION DRAWINGS.
2. MINIMUM OF 18' CLEARANCE TO GROUND IS REQUIRED ABOVE ANY TRAVELED ROAD SURFACE.
3. 40" MINIMUM CLEARANCE TO ANY ENERGIZED CONDUCTOR, NEUTRAL OR AS UTILITY POLE OWNER REQUIRES ON CONSTRUCTION DRAWINGS.
4. BOND ALL STRAND TO MULTI-GROUND NEUTRAL PROVIDED BY UTILITY POLE OWNER. MAKE STRAND CONTINUOUS BETWEEN OVERHEAD GUY AND DOWN GUY WHENEVER POSSIBLE.
5. TENSION STRAND PER DESIGN REQUIREMENTS SO AS TO NOT OVERBURDEN EXISTING UTILITY COMPANY GUYING.

ITEM	QTY	DESCRIPTION
1	2	BOLT, MACHINE, 5/8" x 12" (OR AS REQ'D)
2	2	WASHER, CURVED, 2 1/4" x 2 1/4" x 3/16", 11/16" HOLE
3	2	WASHER, SP LOCK, GALV 5/8"
4	2	NUT, THIMBLE EYE, 5/8"
5	4	DEADEND PREFORMED GUY 6M
6	AS REQ'D	ALUMAWELD 6M, 7 STR
7	4	GUY STRAIN INSULATOR, 3/8" HOLE, 4 1/4" LENGTH, 2 7/8" DIA
8	1	DEADEND AUTOMATIC 6M SHORT BAIL
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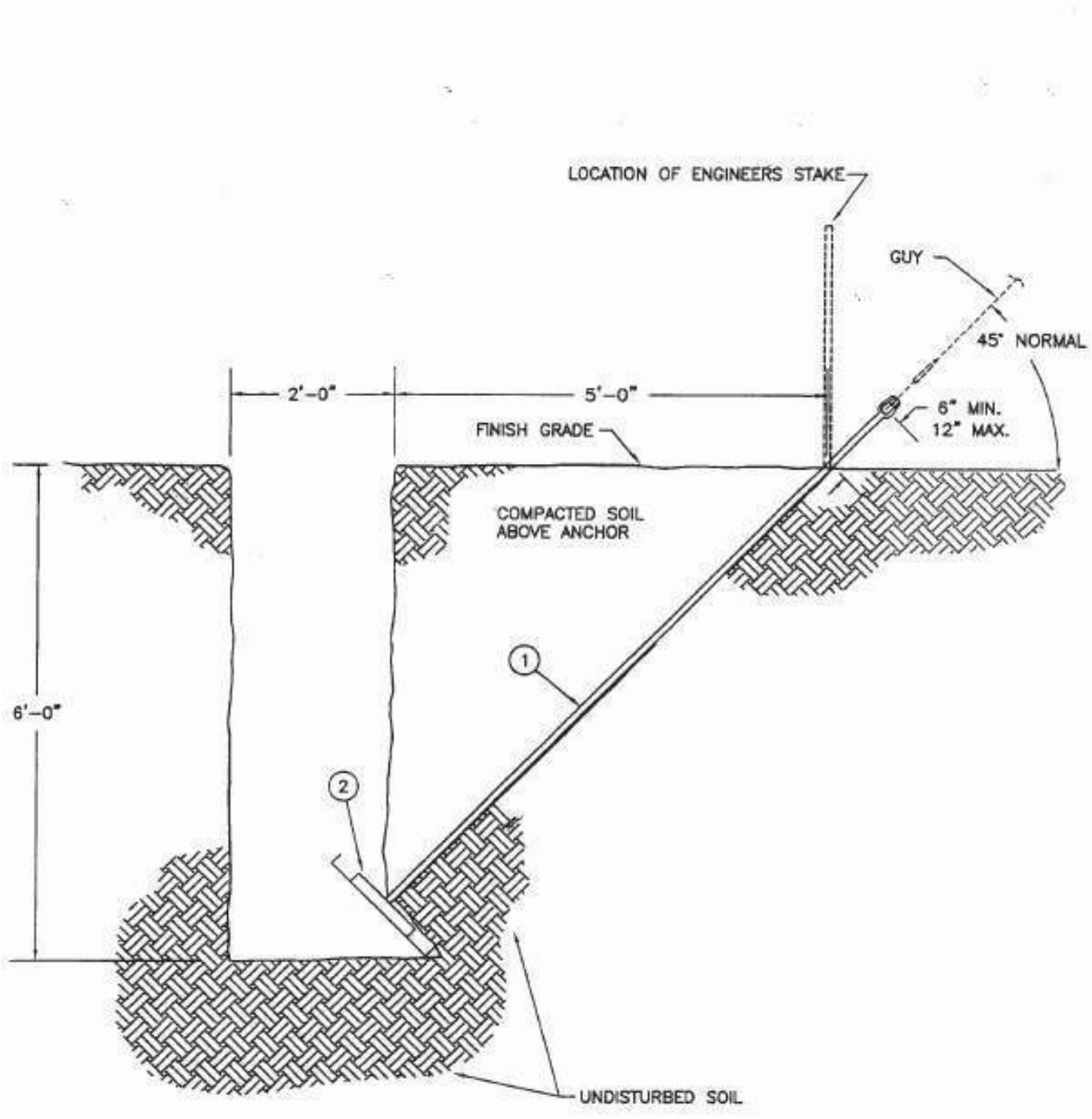

ITEM	QTY	DESCRIPTION
1	1	ANCHOR RD TWIN EYE, 3/4" x 8'
2	1	ANCHOR CROSS PLATE TYPE, 16" (INCLUDES NUT RETAINER)
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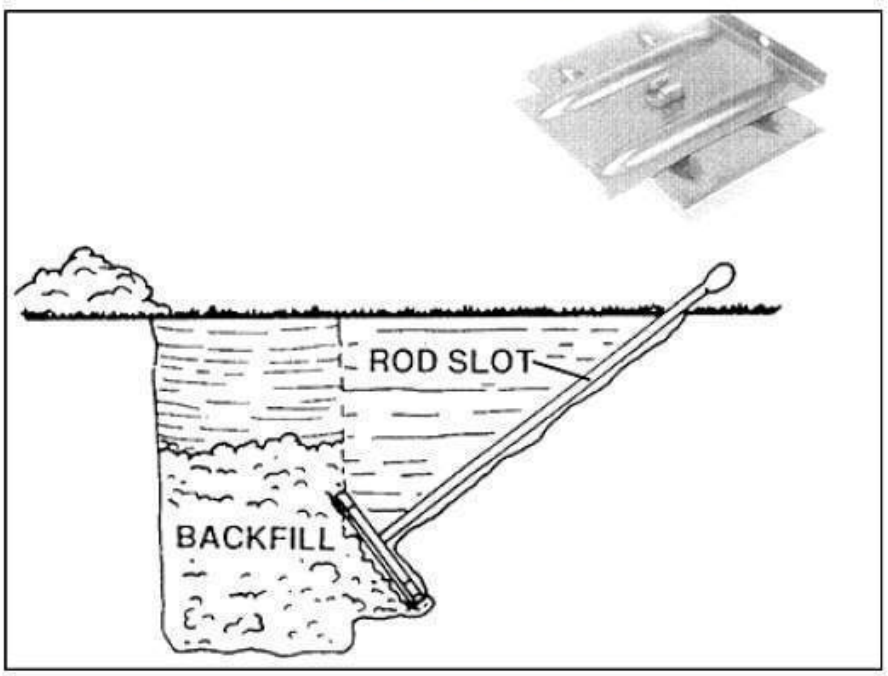
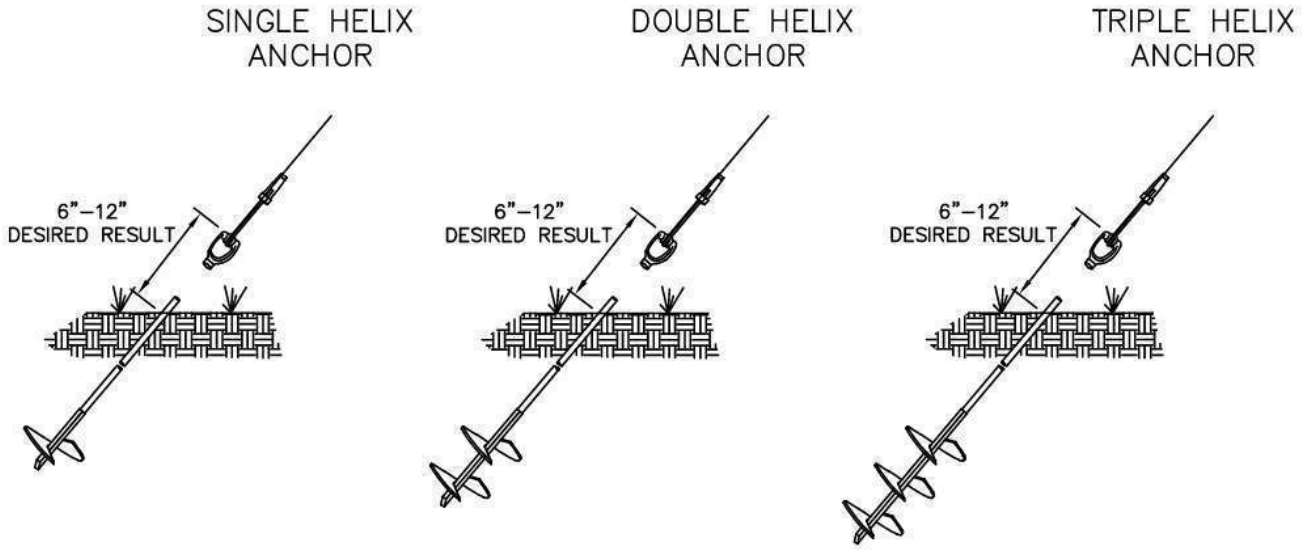
Common Types of Anchors and Installation

Plate Anchor

The Cross-Plate anchor is made for installation in holes drilled by power diggers. Because the size of the hole does not affect holding capacity, the same auger that is used to dig the pole holes on transmission projects can dig the hole. Cross-Plate anchors are installed in a diagonal bored hole, which is undercut so the anchor is at right angles to the guy. A rod trench is either cut with a trenching tool or drilled with a small power auger. Both anchor and rod trench should be refilled and tamped.

Figure 3 - Cross-Plate Anchor





HELIX/SCREW-IN ANCHOR

SCREW-IN ANCHORS ARE RECOMMENDED FOR SOFTER SOIL TYPES, INCLUDING CLASSES 5-7 IN THE SOIL CLASSIFICATION DATA CHART. THEY DO NOT WORK WELL IN ROCKY SOILS. SCREW-IN ANCHORS ARE USUALLY INSTALLED BY A POWER DRIVE MACHINE. SCREW-IN ANCHORS CAN ALSO BE USED IN APPLICATIONS WHERE AN ANCHOR WILL BE EMBEDDED IN CONCRETE.

SOIL CLASSIFICATION DATA

Class	Common Soil-Type Description	Geological Soil Classification	Probe Values in.-lb. (NM)	Typical Blow Count "N" per ASTM-D1586
0	Sound hard rock, unweathered	Granite, Basalt, Massive Limestone	N.A.	N.A.
1	Very dense and/or cemented sands; coarse gravel and cobbles	Caliche, (Nitrate-bearing gravel/rock),	750 - 1600 (85 - 181)	60-100+
2	Dense fine sands; very hard silts and clays (may be preloaded)	Basal till; boulder clay; caliche; weathered laminated rock	600-750 (68 - 85)	45-60
3	Dense sands and gravel; hard silts and clays	Glacial till; weathered shales, schist, gneiss and siltstone	500 - 600 56 - 68	35-50
4	Medium dense sand and gravel; very stiff to hard silts and clays	Glacial till; hardpan; marls	400 - 500 (45 - 56)	24-40
5	Medium dense coarse sands and sandy gravels; stiff to very stiff silts and clays	Saprolites, residual soils	300 - 400 (34 - 45)	14-25
6	Loose to medium dense fine to coarse sands to stiff clays and silts	Dense hydraulic fill; compacted fill; residual soils	200 - 300 (23 - 34)	7-14
**7	Loose fine sands; Alluvium; loess; medium - stiff and varied clays; fill	Flood plain soils; lake clays; adobe; gumbo, fill	100 - 200 (11 - 23)	4-8
**8	Peat, organic silts; inundated silts, fly ash very loose sands, very soft to soft clays	Miscellaneous fill, swamp marsh	less than 100 (0 - 11)	0-5

Class 1 soils are difficult to probe consistently and the ASTM blow count may be of questionable value.
**It is advisable to install anchors deep enough, by the use of extensions, to penetrate a Class 5 or 6, underlying the Class 7 or 8 Soils.

ITEM	QTY	DESCRIPTION
1	1	SCREW ANCHOR, 16,000 LB
2		
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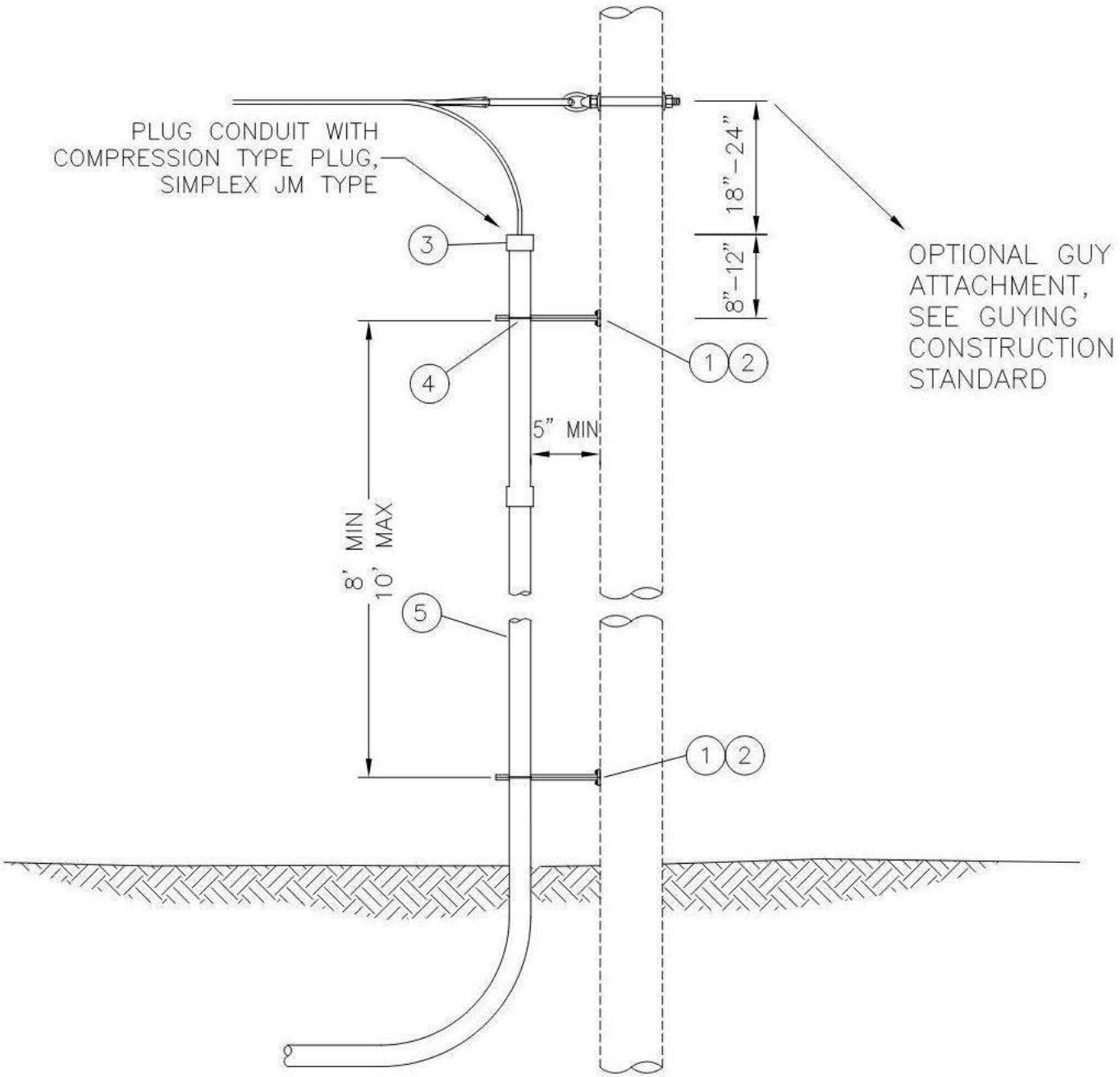

ITEM	QTY	DESCRIPTION
1	2	SCREWS, LAG, 1/2" x 4"
2	1	BRACKET, CONDUIT STANDOFF, 8 1/2"
3	1	PVC BELL END, SIZE PER CONDUIT
4	1	CONDUIT CLAMPS, STANDOFF BRACKET, SIZE PER CONDUIT
5	AS REQ'D	PVC CONDUIT – SIZE PER CONSTRUCTION PRINT
6		
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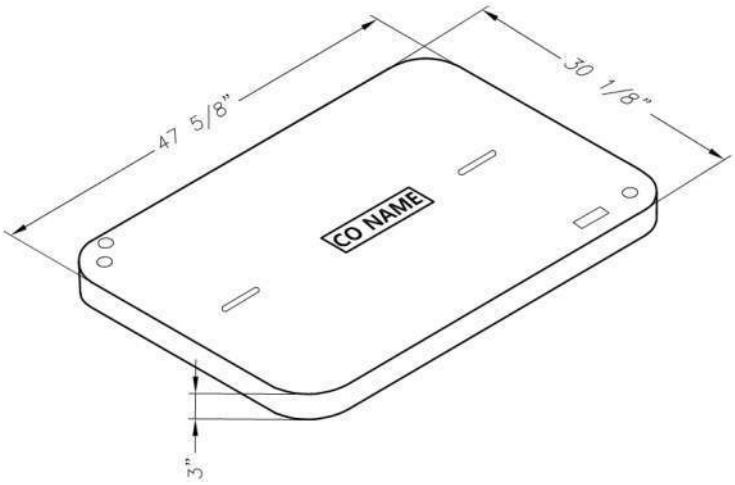
12		

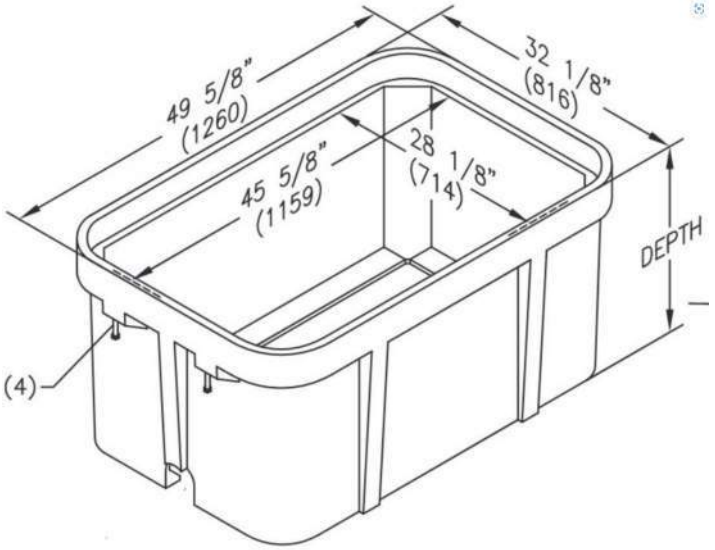
1. VAULTS ARE NEVER TO BE PLACED IN VEHICULAR DRIVING SURFACES. VAULTS ARE RATED FOR H22 LOADING, OCCASIONAL VEHICLE TRAFFIC ONLY.
2. ALL DUCTS ENTERING OR EXITING VAULT WILL BE PLUGGED WITH COMPRESSION TYPE PLUGS, SIMPLEX JM TYPES OR FOAM SEAL CABLES IN DUCTS.
3. VAULTS ARE TO BE PLACED FLUSH WITH GROUND SURFACE NEVER TO CAUSE A TRIP HAZARD.
4. VAULTS TO BE PLACED ON 5/8" MINUS GRAVEL OR WASHED PEA GRAVEL LEVELED AND COMPACTED TO SUPPORT VAULT PLACEMENT. MINIMUM OF 4" OF GRAVEL INSIDE VAULT. WIRE MESH MATERIAL REQUIRED TO COVER THE ENTIRE BOTTOM OF THE VAULT FOR RODENT PROTECTION. WIRE MESH WILL BE PLACED UNDER GRAVEL.
5. ALL INNERDUCT WILL BE EXTENDED DIRECTLY INTO VAULTS FOR FIBER PULLING PURPOSES. INNERDUCT WILL BE HDPE PVC, SDR 9 or 11 ORANGE, SMOOTH OUTSIDE, LONGITUDE RIBBED INSIDE. DUCT WILL NEVER EXTEND MORE THAN 6" INSIDE VAULT WALL. ENTRANCE HOLE THRU SIDE OF VAULT WILL BE DRILLED OR PRESSED.
6. CONDUIT SHALL BE SCHEDULE 40 ORANGE. CONDUITS CAN ENTER THROUGH THE BOTTOM OF THE VAULT, IN A 90 DEGREE FASHION, PLACED IN THE CORNERS OF THE VAULTS.
7. PLACE FIBER CABLE PER MANUFACTURER'S SPECIFICATIONS, NEVER PULLED OR TENSIONED MORE THAN 600 (MRCL) CABLE LOAD POUNDS, BEND RADIUS OF FIBER SHALL BE NO LESS THAN 18". TAG CABLES PER OWNER SPECIFICATIONS.
8. RACKING OF FIBER COIL AND SPLICE CASE IS ALWAYS REQUIRED. UTILIZE UNI-STRUT RACKING AND CABLE SHOES. SECURE SPLICE CASE WITH TIE WRAPS.
9. SECURE VAULT LID WITH PROVIDED LOCK DOWN BOLTS.
10. ALL LARGE VAULTS REQUIRE A GROUND ROD AND MARKER SIGN. GROUND ROD 5/8" x 8' COPPER CLAD AND #6 UNCOATED SOLID SOFT DRAWN COPPER.

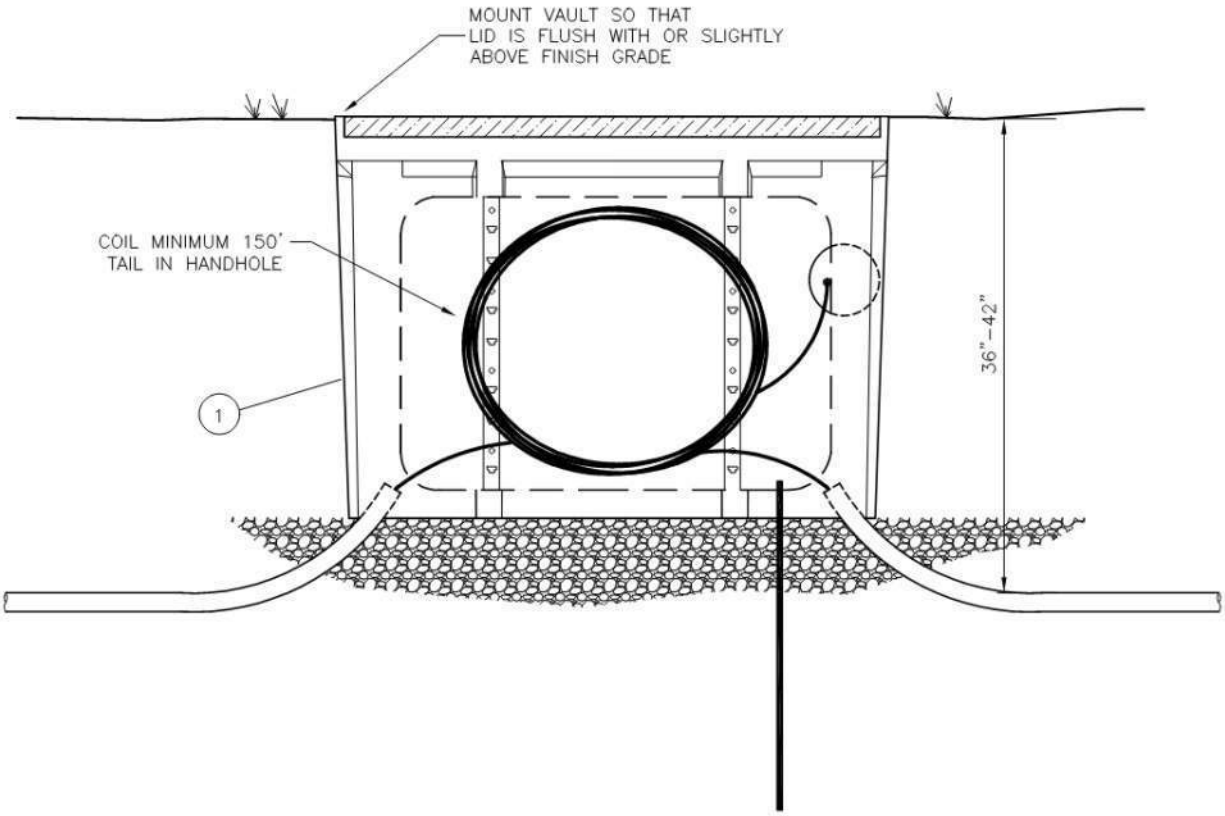
MARKER PLACEMENT

STORAGE AND RACKING

OKANOGAN COUNTY ELECTRIC CO-OP	FO-HHLG
FIBER OPTIC CONSTRUCTION STANDARDS Underground Fiber Optic Installation 30" x 48" x 36" Fiberglass Handhole	Rev No: Date: 3.12.2024 Page: PG 32







ITEM	QTY	DESCRIPTION
1	1	FIBERGLASS HANDHOLE 30" x 48" x 36"
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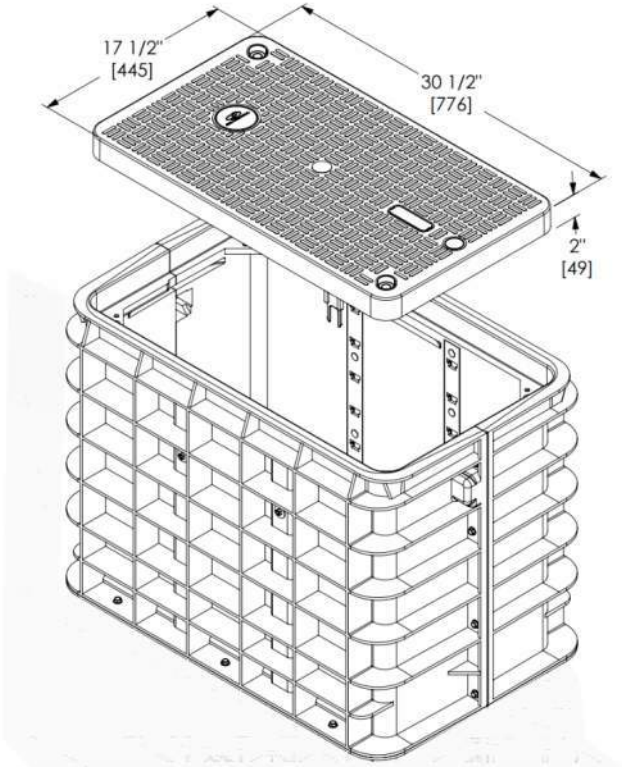

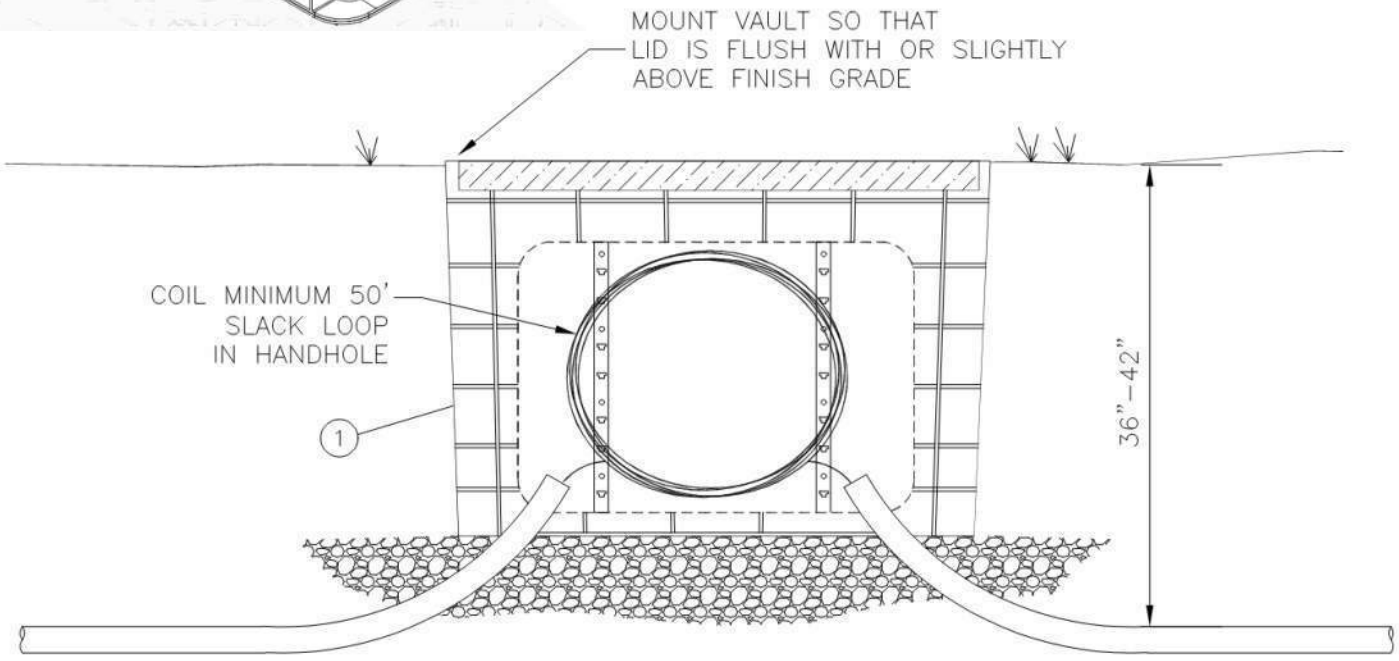

ITEM	QTY	DESCRIPTION	
1	1	FIBERGLASS HANDHOLE 17" X 30" X 24"	2
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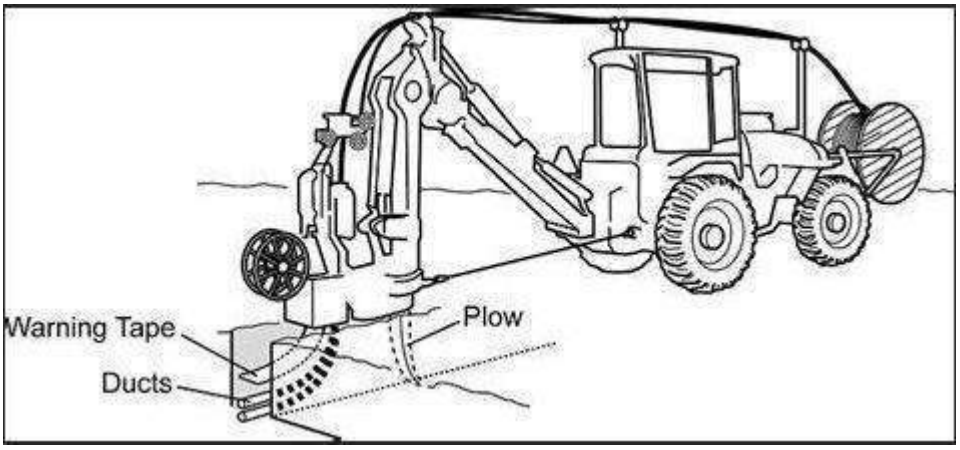
Trenching and Conduit Installation Requirements:

1. All trenches shall be excavated according to the trench detail and construction design.
2. The trench shall be straight and the bottom smooth, level and free from rocks, obstructions and sharp objects.
3. The conduit shall never be bent or kinked, with a minimum bend radius of 26" in 90degrees. Conduit will be coupled to withstand 125psi blowing pressure.
4. Orange fiber optic warning tape shall be placed at 12" above the conduit in trench and plow construction methods.
5. A minimum of one cable plow ripping pass will be made at full burial depth to ensure the conduit route is clear of obstructions. The plowing operation will be continuously observed for depth and proper feeding of conduit in plow shoot.
6. One foot of separation is required between fiber conduit and any other utilities. (or per joint utility owner)
7. Minimum depth of conduit must be 36" or as required by permitting authority. Minimum conduit depth for service drops on private property must be 24"
8. Contractor shall call for utility locates prior to digging.
9. Depths of existing utilities will be potholed for verification of location. Conflicts with existing utilities will be resolved prior to conduit placement.



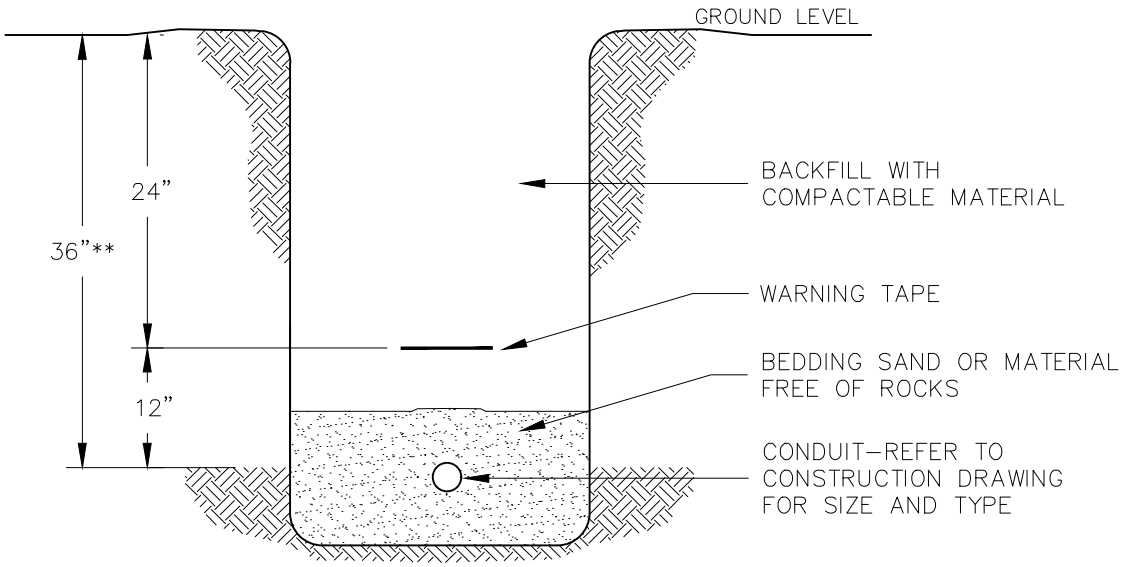
Trenching in Right of Way

1. All installations within State and County Rights of Way shall meet the installation requirements outlined in the right of way permit issued by the authority having jurisdiction and construction design.
2. An approved, licensed and bonded excavation contractor must perform all work in the road right of way.
3. Any work in the right of way must meet the erosion and sediment control requirements of the local jurisdiction.

Fiber Installation Requirements:

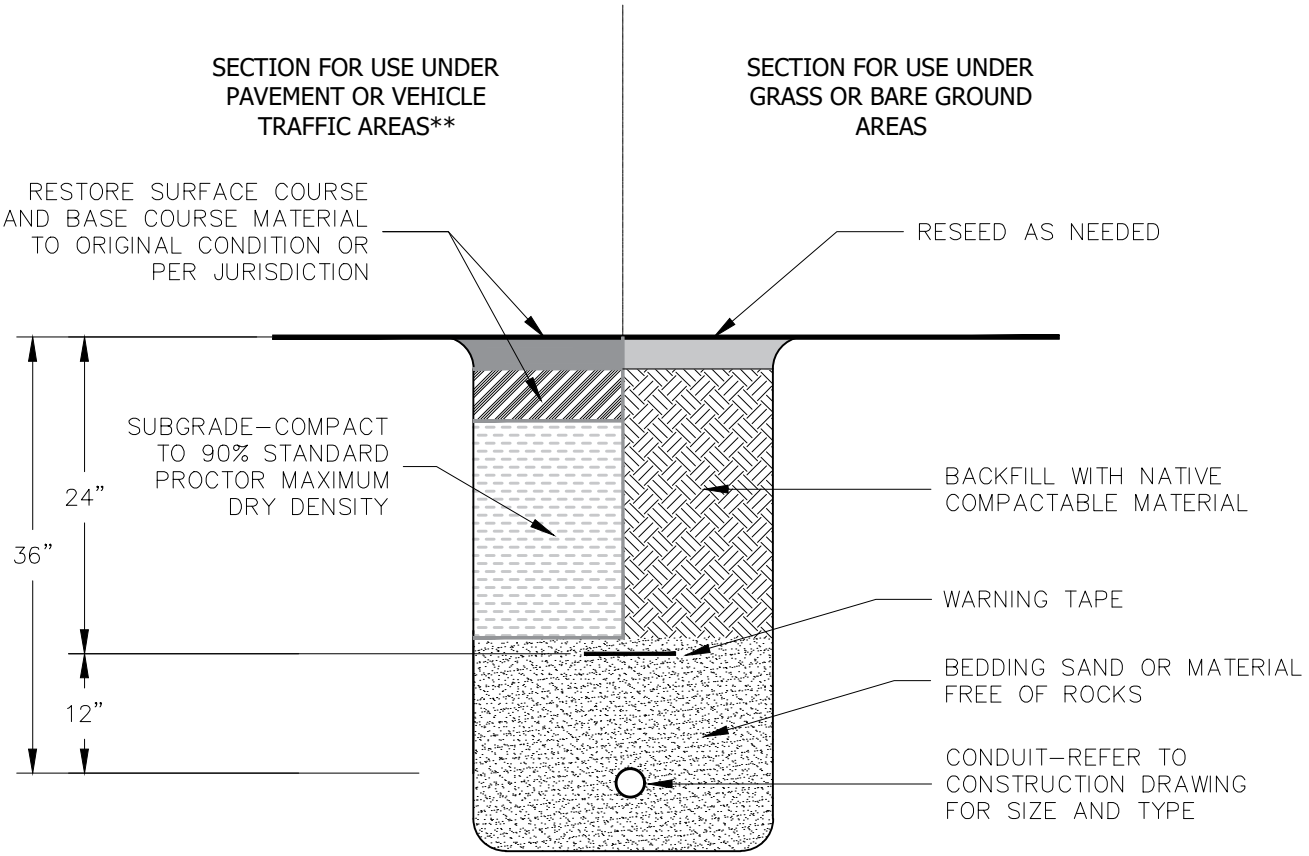
1. Conduit shall always be proofed for integrity prior to placement of fiber optic cable.
2. Cable will never be pulled over 600 pounds of pulling pressure or blowing pressure.
3. Avoid excessive cable twists.
4. Pulling or blowing speeds shall never exceed 150 feet per minute.
5. The use of capstan winches will be calibrated with never to exceed limits of 600lbs of force. Capstans shall be sized to meet the minimum bend radius requirements under tension.
6. Never bend over 15 x OD of cable, or a maximum bend radius of 18".
7. Installation temperature must alway stay between -22 and 140 degrees Fahrenheit.
8. Cable pulling lubricant used shall be recommended for cable pulling or blowing. Polywater, hydralube or equivalent. Never use soaps or detergents that cause the cable sheath to breakdown.
9. Refer to design maps for splicing locations. Fiber optic cable is never to be cut except only where designed.
10. Fiber optic cable sequential numbers are required at each pole location and vault wall. Sequential numbers will identify conduit length, and slack left in vaults and at poles.

TYPICAL TRENCH/PLOW SECTION

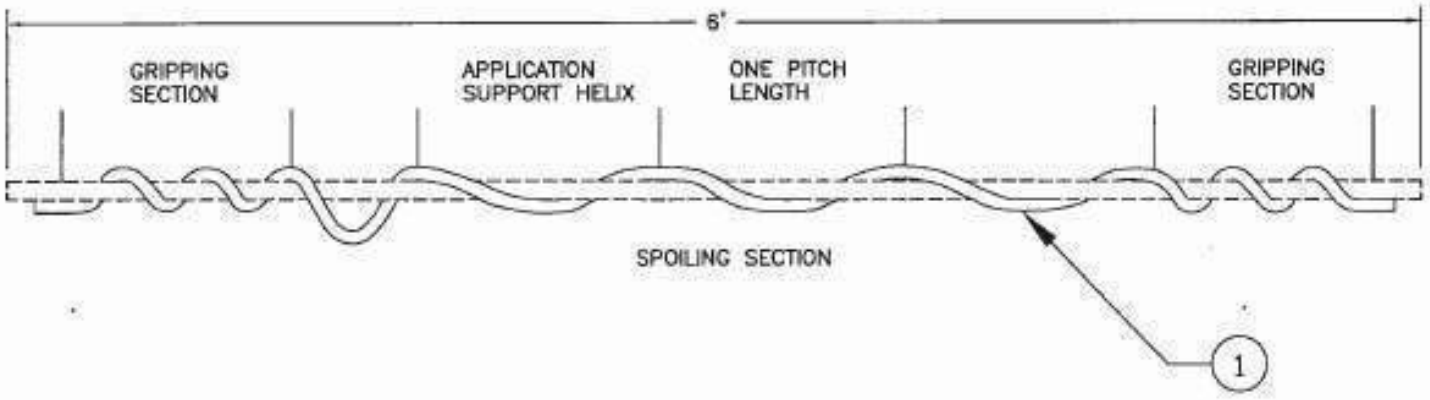


**TRENCH DEPTH MAY NEED TO BE ADJUSTED TO MEET THE REQUIREMENTS OF THE RIGHT OF WAY PERMIT ISSUED BY THE PERMITTING JURISDICTION.

TRENCH RESTORATION



**ADHERE TO ALL STATE OR LOCAL PERMIT REQUIREMENTS FOR RESTORATION



SPAN LENGTH		SPOILERS PER SPAN
FEET	METERS	
120–180	36.6–54.9	3
181–240	55.2–73.2	4
241–300	73.5–91.4	5
301–350	91.7–106.7	6
351–400	106.9–121.9	7
401–450	122.2–137.2	8

APPLICATION: 1/4" MESSENGER +1 .564"–.760" CABLE
5/16" MESSENGER +1 .373"–.565" CABLE
MULTIPLE MESSENGER + CABLE .575"–.717" TOTAL

ITEM	QTY	DESCRIPTION
1	1	AIRFLOW SPOILER (USE APPROPRIATE PART # FOR FIBER DIA.)
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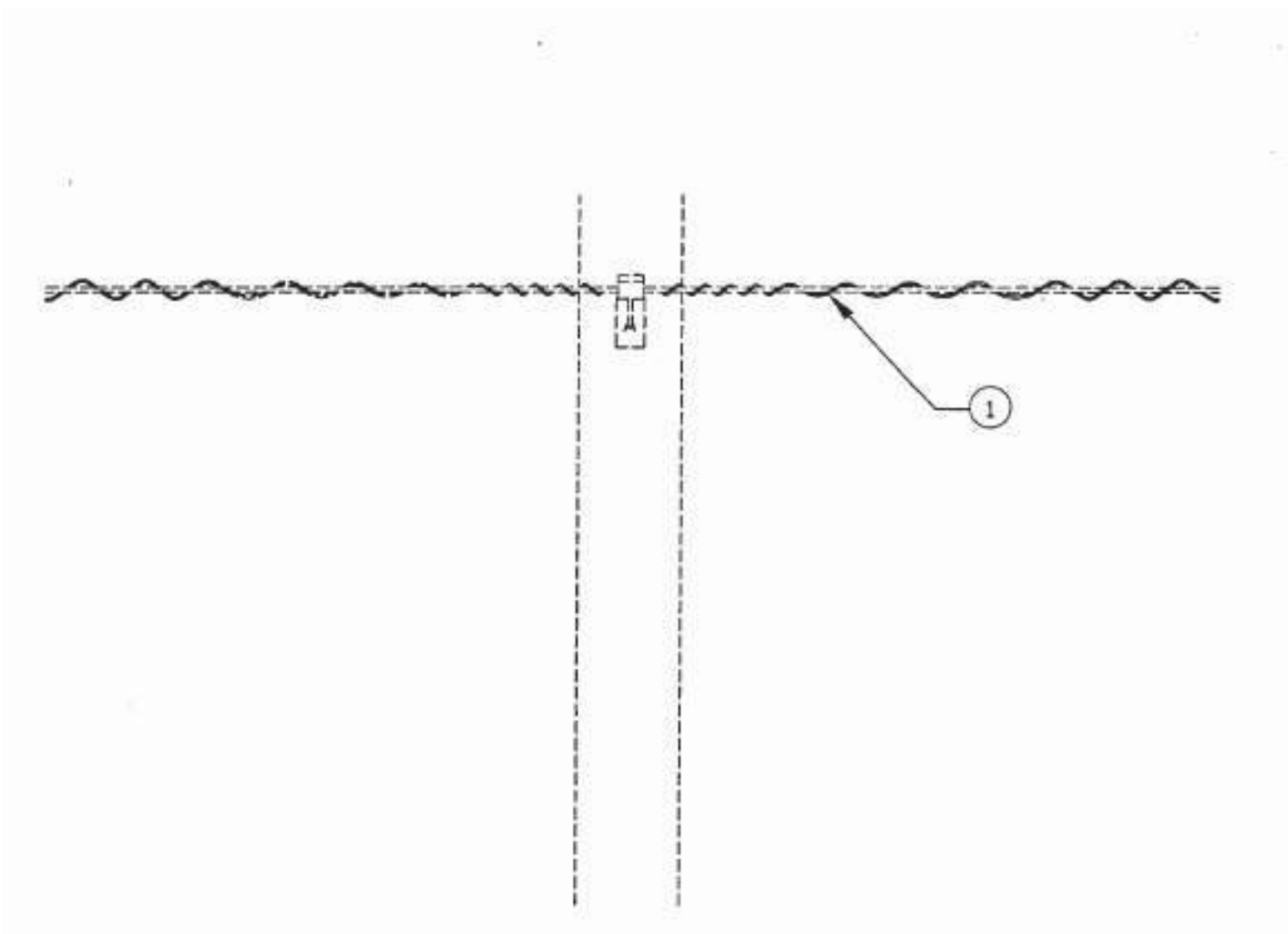

ITEM	QTY	DESCRIPTION
1	1	FIBER VIBRATION DAMPENER (PART # AS REQ'D FOR FIBER DIA.)
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Splicing and Splice Case Placement (1 of 2)

Cable Preparation and Storage Requirements:

1. Prepare cables for splicing by laying out flat on ground, reducing twists and bends.
2. For an aerial splice case application the Aerial Slack Loop will be in place prior to splice work taking place.
3. The aerial splice case shall be mounted with aerial adjustable offset brackets for ADSS or Strand and Lash applications.
4. Once splicing is completed, white cable tag to be placed on Cable denoting cable direction. Tag should be no more than 12" from plate on case.
5. Tape cable tails together to form a coil that neatly combines within the vault.
6. Cable bend radius should never be less than 18"
7. In vaults, verify conduits are plugged and visible in the bottom of the vault.
8. Coil cable neatly in the vault placed on cable shoes. Splice case will be supported on shoes with tie wraps.
9. Bond/Ground splice case to the ground rod or cable locater marker station.
10. Tag cable with owner cable tag, visible when vault is open, at top of coil, or in a aerial application at the splice case.
11. The aerial splice case shall be mounted with aerial mounting adjustable offset brackets for ADSS or strand and lash applications. Strap and tie wrap aerial ADSS cable slack. Overlash slack in a strand and application.
12. All aerial splice cases needed to be re-hung and mounted into aerial application within 48 hours of splice work completion

Fiber Splicing Requirements:

1. Cable openings shall match splice case procedures as outlined in manufacturer's requirements.
2. Fiber splicer is required to completely read and understand procedures documented in the coyote products application manual prior to work being performed.
3. Fiber splice will never cut a spliced fiber without check the light activity with a calibrated light detector prior to cutting.
4. No more than 24 fibers per tray.
5. End plates are always to be arranged to allow for additional future cable access.
6. Always flash test the splice case prior to storing case in vault.

Fiber Splicing Documents and Methods of Procedure Notifications:

1.Anytime a splicer is to access an active splice case, place a new splice case on existing lit backbone or lateral fiber, or work requiring splicing fibers in an active panel, a Method of Procedure (MOP) is needed, except for in the case of an outage.
2. A MOP is not needed for OTDR testing or splicing on dark fiber.
3. A MOP will be provided by NoaNet and will be sent to the Network Operations Center (NOC), contractor, and splicer a minimum of 10 business days prior to scheduled work. MOP window will be between 1AM and 5AM.
4. In certain instances, a MOP can be scheduled prior to the 10 day window for emergency needs and fiber repair work. It will be handled on a case-by-case basis depending on necessity of work and what fibers are on existing backbone. MOP will list a description of work, splice cases to be entered, or locations of installation of new splice cases. MOP will also provide a list of active customers on cables being worked on.
5. MOP will list NoaNet Engineer Contact information as well as NOC contact information.
6. NoaNet will provide Splicing Documents (Splice Docs) prior to work taking place. Splice Docs will provide splice locations, fiber splicing assignments, and distances to Cabinet, COLO or other end site location if not splicing back to a NoaNet Cabinet or COLO.
6. Fiber splicer is to always test for light prior to cutting. If light is found on fiber assignments, fiber splicer is to contact NoaNet Engineer before proceeding further.
7. If discrepancies are found regarding distances provided, or large fiber events/breaks on either existing backbone or newly installed fiber, fiber splicer is to contact NoaNet Engineer before MOP window closes as to fix any issues that may arise from said discrepancies.

Fiber Testing and Documentation:

1. Fiber splicer is to notify NOC prior to splice work is to begin, and prior to access to any NoaNet facilities, whether splicing or testing is to take place.
2. Fiber splicer must follow MOP instructions provided. Fiber splicer is to notify NOC and close out ticket once splice work has been completed.
3. Prior to splicing fiber, strands provided on splice docs must be tested on existing fiber and new fiber install to verify distances and any potential breaks or large loss events (greater than a 0.3DB loss and/or high reflection event in case of jumpers placed). As noted previously, if any issues arise NoaNet Engineers need to be notified of issue immediately.
4. Once splicing is complete bi-directional OTDR reports will be required in both 1310nm and 1550nm. OTDR should run for a minimum of 1 minute, and for up to 3 minutes on longer distance reports. On these occasions splicer will be notified of the necessary run times on long distances prior to work taking place.
5. NoaNet will provide splicer with building contact information for customer site. NoaNet will provide access information for splicer to enter NoaNet facilities for testing.
6. All OTDR traces need to be delivered in raw format within 48 hours of splice work completion.

Acceptance of OTDR Testing and Splice Completion:

1. No fiber strand will be accepted that has an individual splice location event greater than 0.3dB (TIA Standard). This only pertains to strands spliced during work window, excludes existing network splices.
2. In certain instances, depending on job and contract for work, the individual splice event standards may be more strict. In these instances NoaNet will notify splicer prior to work taking place.
3. Fiber splice locations with reflections are not acceptable and will be rejected. This does not include connectors used during testing, jumpers at panels, or patch panel ports.
4. When testing with OTDR; fiber optic jumpers and ports to be cleaned every time both prior to OTDR testing and after testing has completed. Port caps always need to be replaced on unused ports after testing has completed.
NoaNet may require individual splice locations to be re-spliced to meet standards listed. If this was a new splice, the cost to fix the splice issue that does not meet standards outlined will not be re-imbursed by NoaNet.
5. If splicer does not follow MOP, testing requirements, or bi-directional testing, NoaNet will not re-imburse cost to fix splice issue that arise from not following procedures correctly.
6. Splicer and/or contractor to provide pictures of fiber install on customer premises. Either picture of fiber coiled on backboard if no panel is installed, or picture of mounted term panel after fiber has been spliced and tested. Pictures need to be delivered to NoaNet within 24 hours of being taken.

COYOTE® RUNT Closure

Catalog Number:
8006671 - Standard RUNT (A)
8006794 - Expanded RUNT (B)
8006692 - RUS-listed RUNT (C)

Closure Information		
Type	Standard	Expanded
Tray Part Numbers	80807701 - 12 ct. single fusion tray (x3) 80806033 - 12 ct. single fusion tray (x2) 80807114 - 72 ct. ribbon tray (x1)	80807701 - 12 ct. single fusion tray (x6) 80806033 - 12 ct. single fusion tray (x4) 80807114 - 72 ct. ribbon tray (x2)
Dimensions (L x W x H)	14.8" x 8.5" x 3"	14.8" x 8.5" x 4.8"
Ports	3	
Ground Studs	2	
Splice Capacity	36 single fusion or 72 ribbon splices	72 single fusion or 144 ribbon splices

COYOTE® ONE Dome Closure

Catalog Number:
COY1-001 - ONE for Buffer Tube (A, B, C)
COY1-002 - ONE for Ribbon (A, B, C)

Closure Information	
Tray Part Numbers	80809958 - 24 ct. single fusion tray (x4) 80813152 - 36 ct. single fusion tray (x4) 80808945 - 40 ct. single fusion tray (x2) LGSTR144 - 144 ct. ribbon tray (x2)
Dimensions (L x W x H)	16.0" x 10.8" x 5.7"
Ports	3
Ground Studs	3
Splice Capacity	144 single fusion or 288 ribbon splices

COYOTE® PUP Closure

Catalog Number:
8006622 - PUP for Buffer Tube (6-Port) (D)
800010515 - PUP for Buffer Tube (4-Port) (E)
8006621 - PUP for Ribbon (F)
8006661 - RUS-listed PUP (G)

Closure Information	
Tray Part Numbers	80807701 - 12 ct. single fusion tray (x6) 80806033 - 12 ct. single fusion tray (x4) 80807114 - 72 ct. ribbon tray (x2)
Dimensions (L x W x H)	17" x 8.5" x 7"
Ports	6 or 4
Ground Studs	6 or 4
Splice Capacity	72 single fusion or 144 ribbon splices

COYOTE® 6.5" x 17" Dome Closure

Catalog Number:
8006944 - Dome for Buffer Tube (D, E, G)
8006945 - Dome for Ribbon (F)

Closure Information	
Tray Part Numbers	80809958 - 24 ct. single fusion tray (x6) 80813152 - 36 ct. single fusion tray (x6) 80808945 - 40 ct. single fusion tray (x3) LGSTR144 - 144 ct. ribbon tray (x3)
Dimensions (Diameter x L)	8.6" x 17.9"
Ports	4
Ground Studs	4
Splice Capacity	216 single fusion or 432 ribbon splices

COYOTE® 6" x 22" Closure

Catalog Number:
8006560 - Buffer Tube (6-Port) (H)
8006633 - Buffer Tube (4-Port) (I)
8006540 - Ribbon (6-Port) (J)
8006631 - Ribbon (4-Port) (K)
8006587 - Express Buffer (6-Port) (L)
8006635 - Express Buffer (4-Port) (M)

Closure Information	
Tray Part Numbers	8001127 - 36 ct. single fusion tray (x6) 80805514 - 36 ct. single fusion tray (x4) 80805515 - 144 ct. ribbon tray (x2)
Dimensions (L x W x H)	22" x 8.5" x 7"
Ports	6 or 4
Ground Studs	6 or 4
Splice Capacity	216 single fusion or 288 ribbon splices

COYOTE® 6.5" x 22" Dome Closure

Catalog Number:
8006877 - Dome for Buffer Tube (H, I)
8006878 - Dome for Ribbon (J, K)
8006946 - Dome for Express Buffer Tube (L, M)

Closure Information	
Tray Part Numbers	80810086 - 36 ct. single fusion tray (x4) LGSTS72 - 72 ct. single fusion tray (x3) LGSTR216 - 216 ct. ribbon tray (x3)
Dimensions (Diameter x L)	8.6" x 22.6"
Ports	4
Ground Studs	4
Splice Capacity	216 single fusion or 648 ribbon splices

COYOTE® 8.5" x 22" Closure

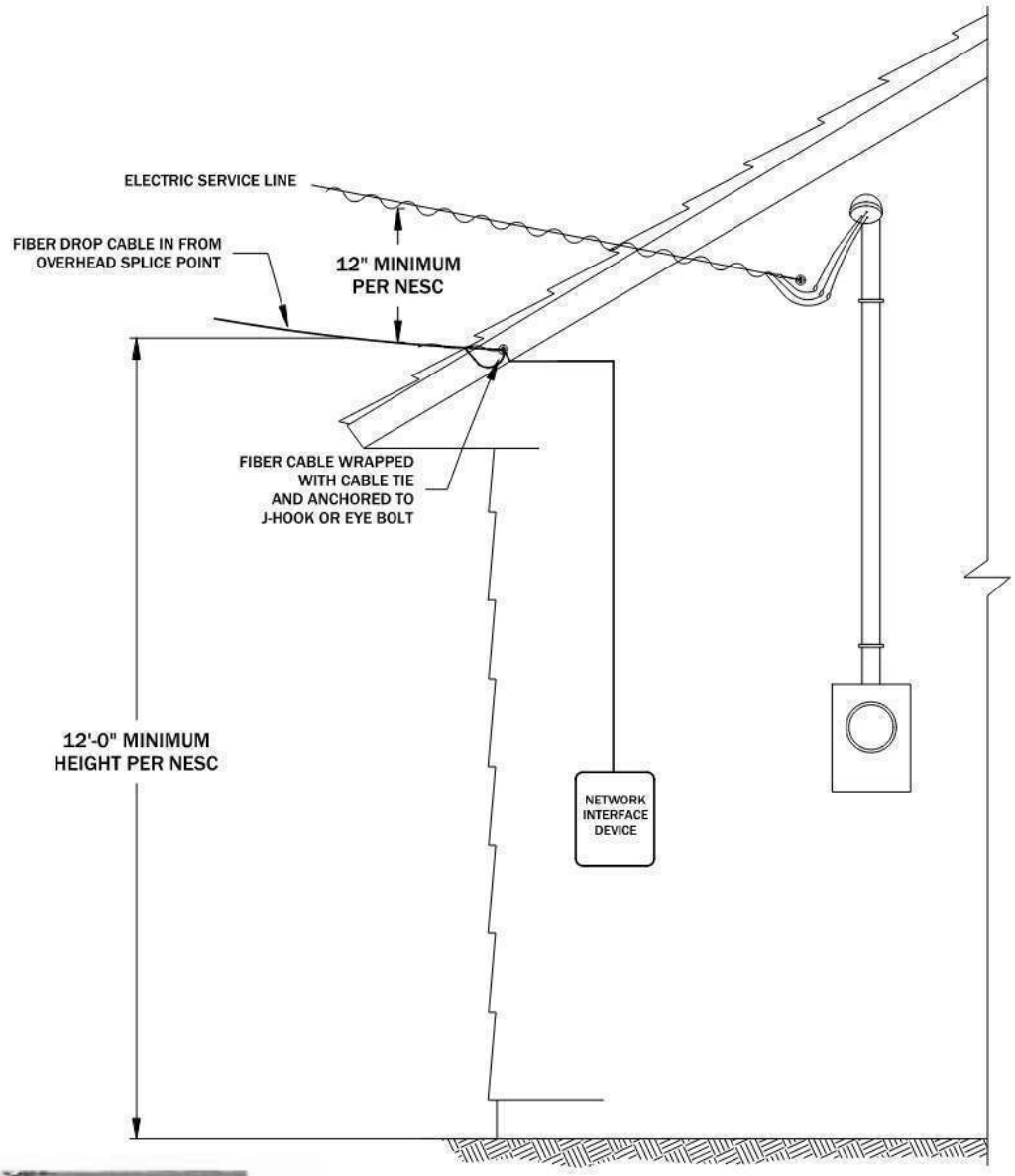
Catalog Number:
8006561 - Buffer Tube (6-Port) (N)
8006634 - Buffer Tube (4-Port) (O)
8006541 - Ribbon (6-Port) (P)
8006632 - Ribbon (4-Port) (Q)
8006588 - Express Buffer (6-Port) (R)
8006636 - Express Buffer (4-Port) (S)

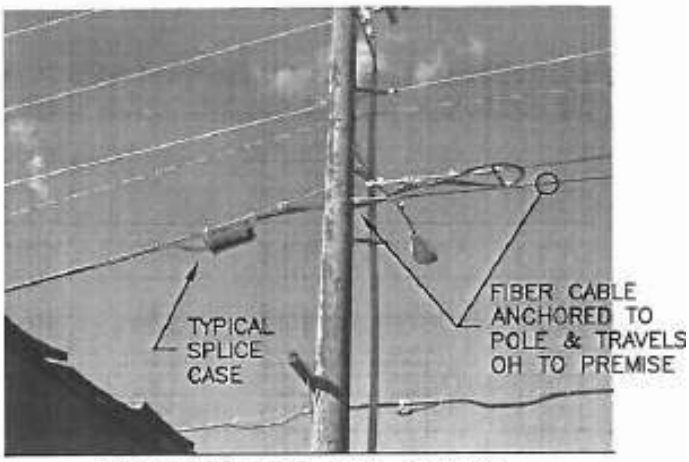
Closure Information	
Tray Part Numbers	8001127 - 36 ct. single fusion tray (x11) 80805514 - 36 ct. single fusion tray (x8) 80805515 - 144 ct. ribbon tray (x4)
Dimensions (L x W x H)	22" x 10.8" x 9.3"
Ports	6 or 4
Ground Studs	6 or 4
Splice Capacity	396 single fusion or 576 ribbon splices

COYOTE® 9.5" x 28" Dome Closure

Catalog Number:
80061055 - Dome for Buffer Tube (N, O, R, S)
80061056 - Dome for Ribbon (P, Q)

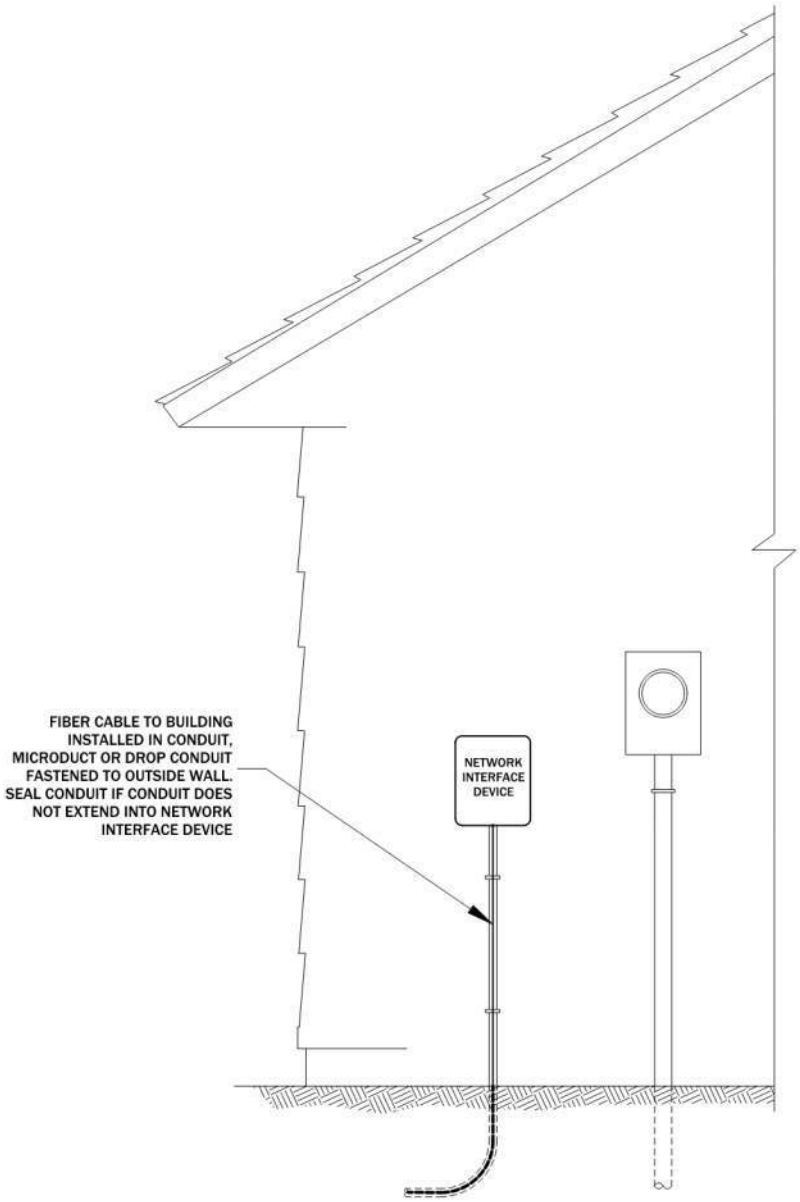
Closure Information	
Tray Part Numbers	80810086 - 36 ct. single fusion tray (x10) LGSTS72 - 72 ct. single fusion tray (x6) LGSTR216 - 216 ct. ribbon tray (x8)
Dimensions (Diameter x L)	13.3" x 29.4"
Ports	7
Ground Studs	7
Splice Capacity	432 single fusion or 1728 ribbon splices

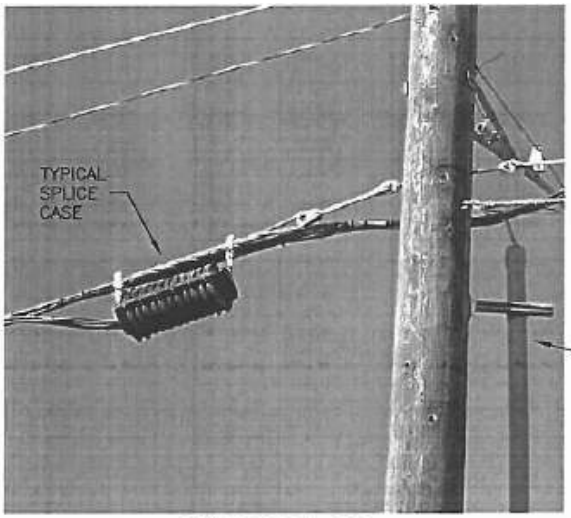




EXAMPLE OF OH SPLICE

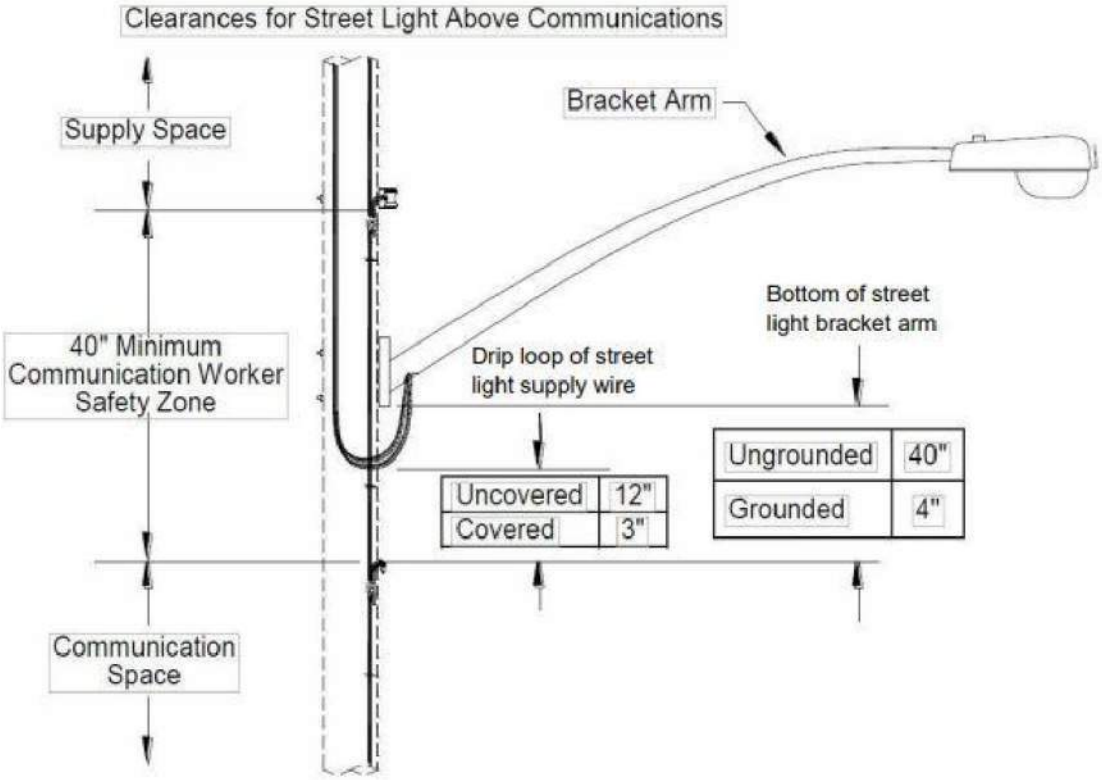
1. FIBER SERVICE DROP MUST MAINTAIN A 12' MINIMUM CLEARANCE ABOVE GRADE AT LOWEST POINT.
2. FIBER SERVICE DROP MUST NOT ATTACH TO ELECTRIC SERVICE WEATHERHEAD.
3. DETAILS SHOWN ARE MINIMUM REQUIREMENTS PER NATIONAL ELECTRIC SAFETY CODE.



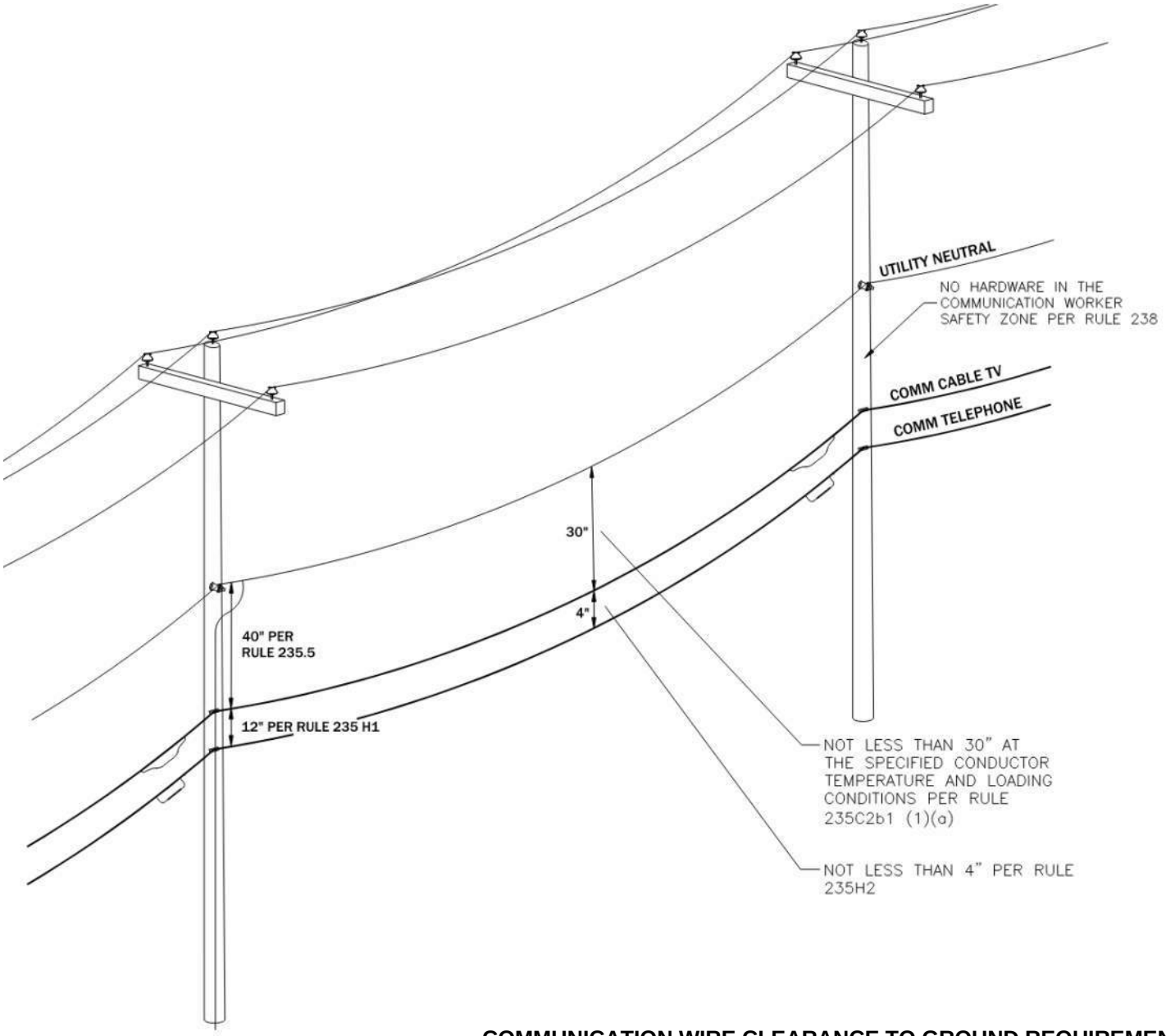


OH SPLICE TO PREMISE VIA RISER

FIBER INTO PREMISE FROM UG CONDUIT



1. DRIP LOOP MUST BE COVERED BY A SUITABLE NONMETALLIC COVERING THAT EXTENDS 2" BEYOND THE LOOP.

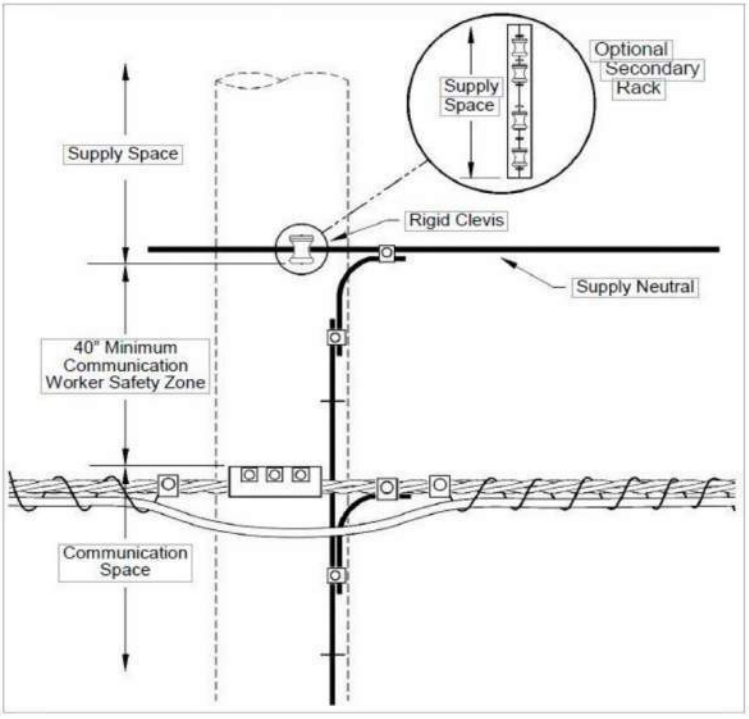


COMMUNICATION WIRE CLEARANCE TO GROUND REQUIREMENTS

National Electric Code Minimum Clearance Requirements	
Communication Service Drop to Electric Service Wire in Span	12"
Clearance Over Driveways, Areas Subject to Truck Traffic	1S'-6"
Clearance Over City and County Roads*	1S'-6"
Clearance Over Washington State Highways - Joint use with Electric	20'
Clearance Over Washington State Highways - Communications Only	24'
Clearance over Pedestrian Traffic Only	12'
Minimum Clearance Lowest Electric to Communications at Pole	40"
Electric Serivce Drops to Communication Service Drops at Midspan	12"
Vertical Spacing from Comm to Comm at Pole	12"

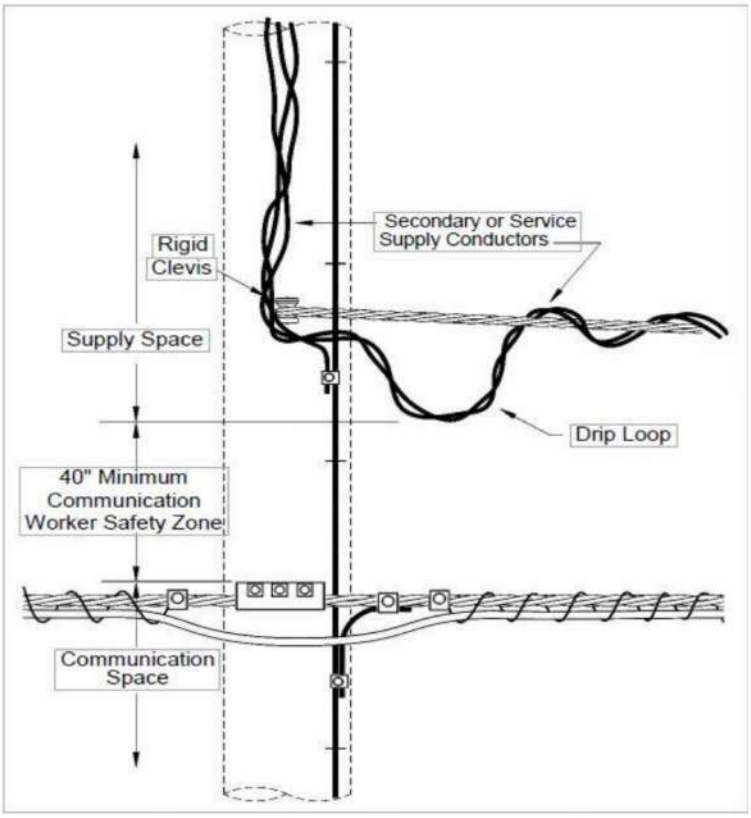
*Additional City and County Minumum Clearance Requirements may Apply.

Clearance to Supply Neutral in the Common Position



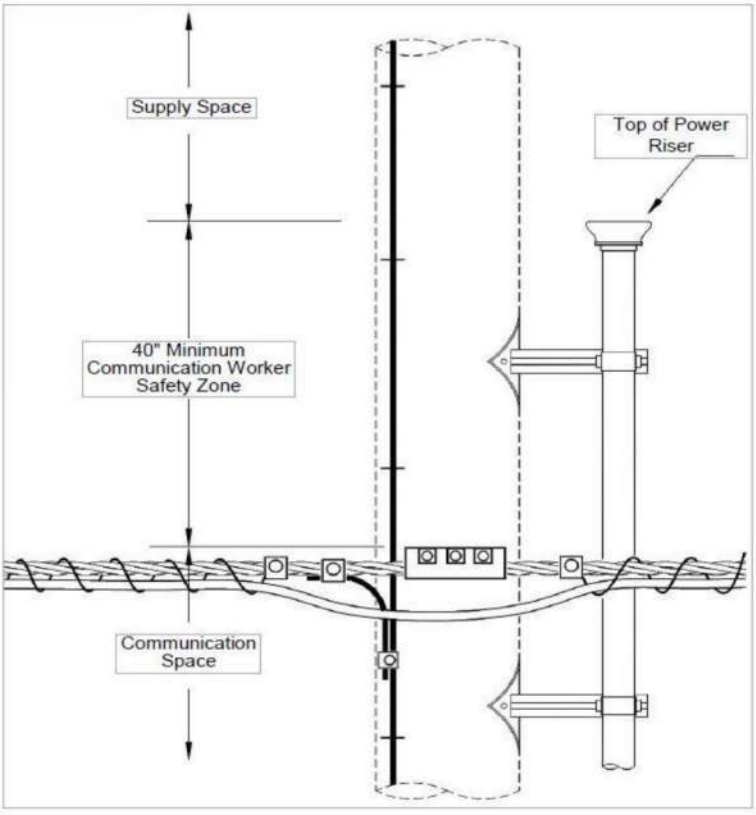
Minimum Clearance*
40 inches

Clearance to Secondary Conductor in the Common Position

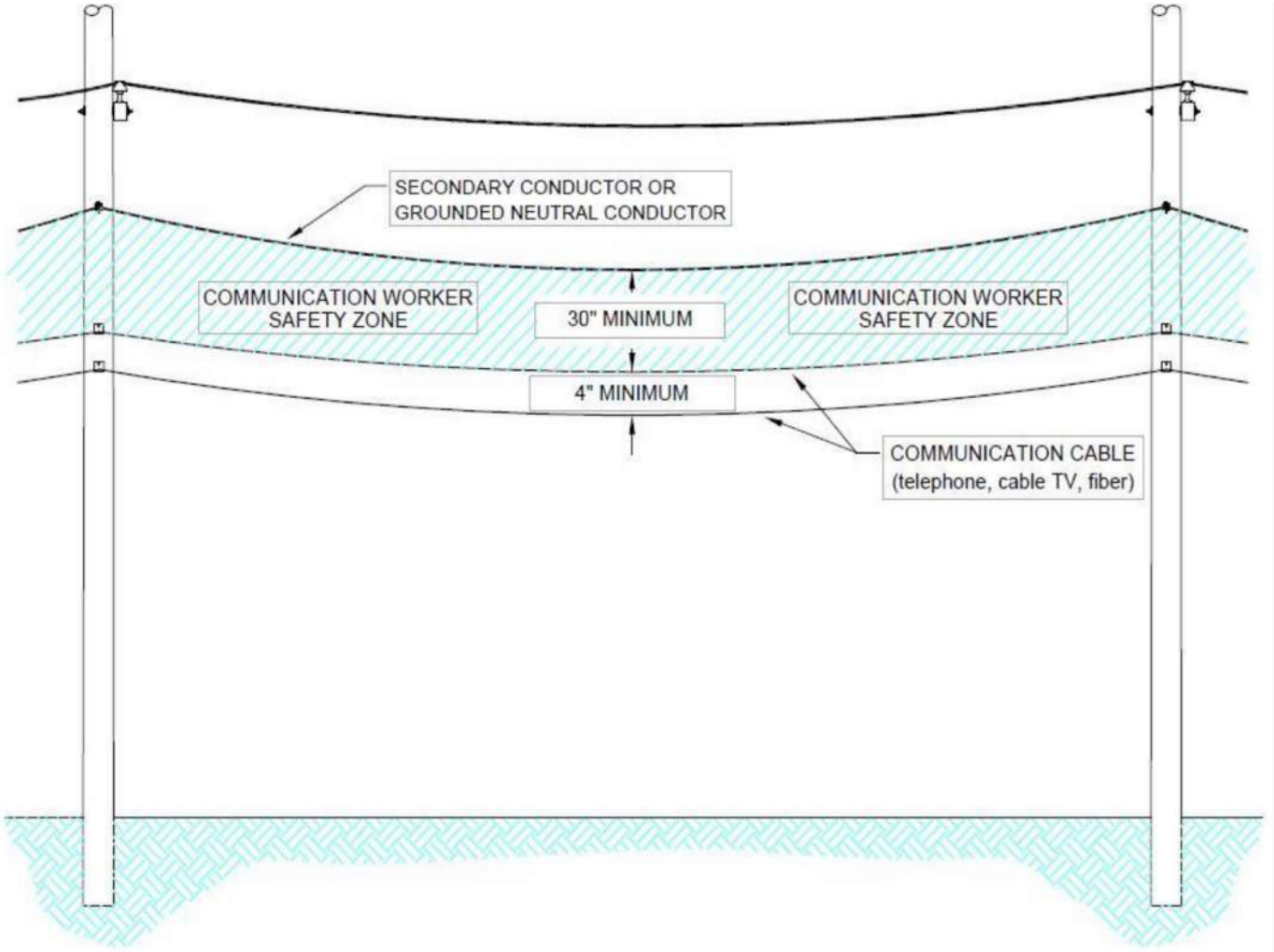


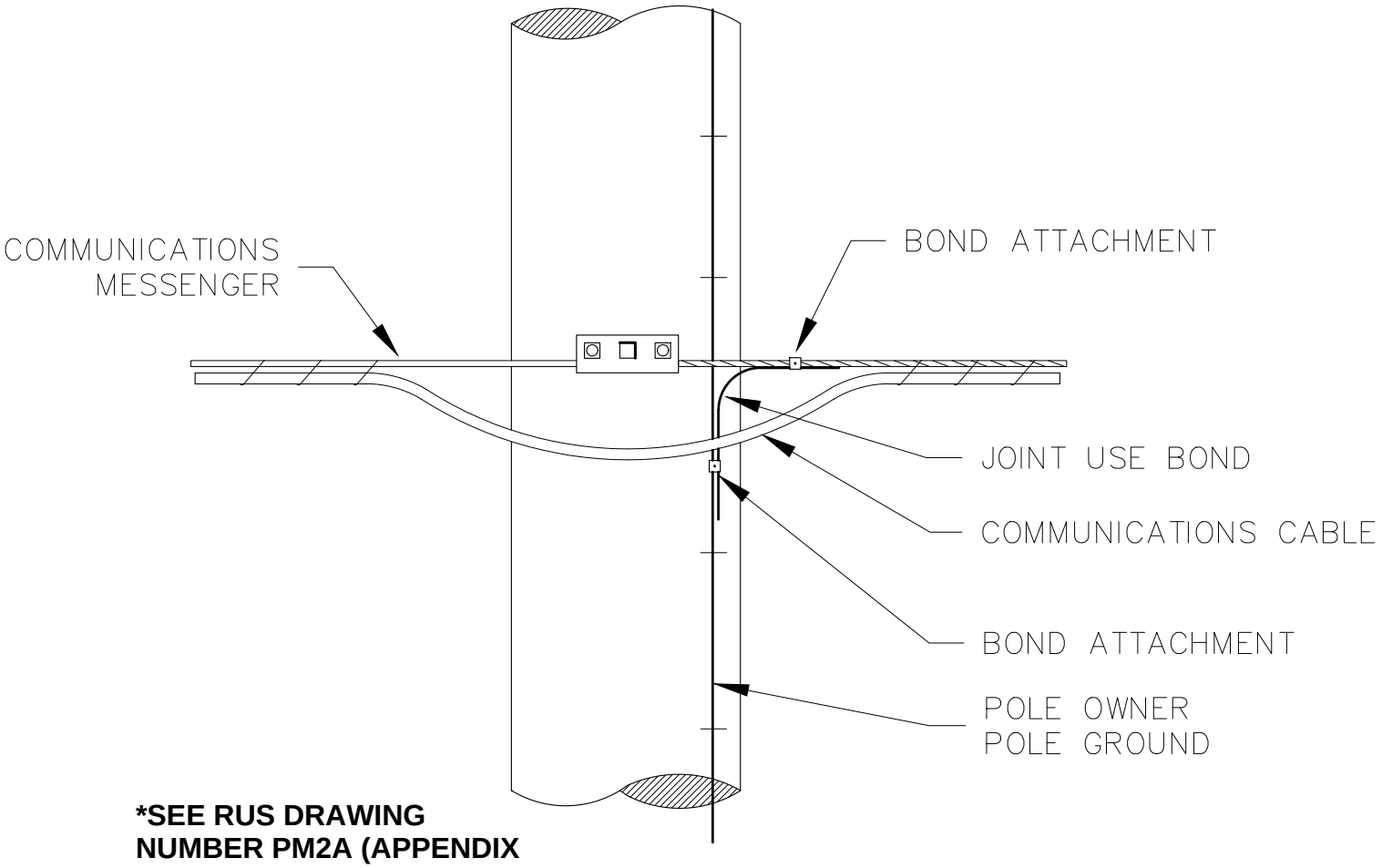
Minimum Clearance
40 inches

Clearance to Power Riser Termination (Top of the Conduit)

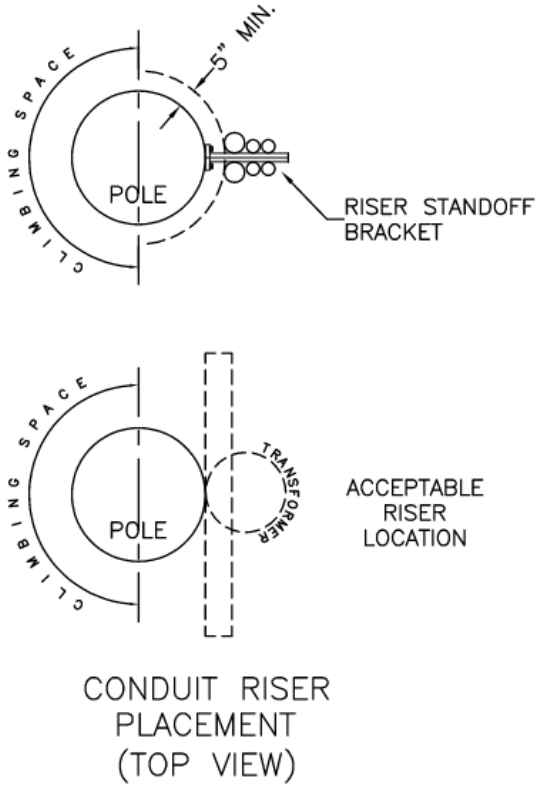


Minimum Clearance
40 inches

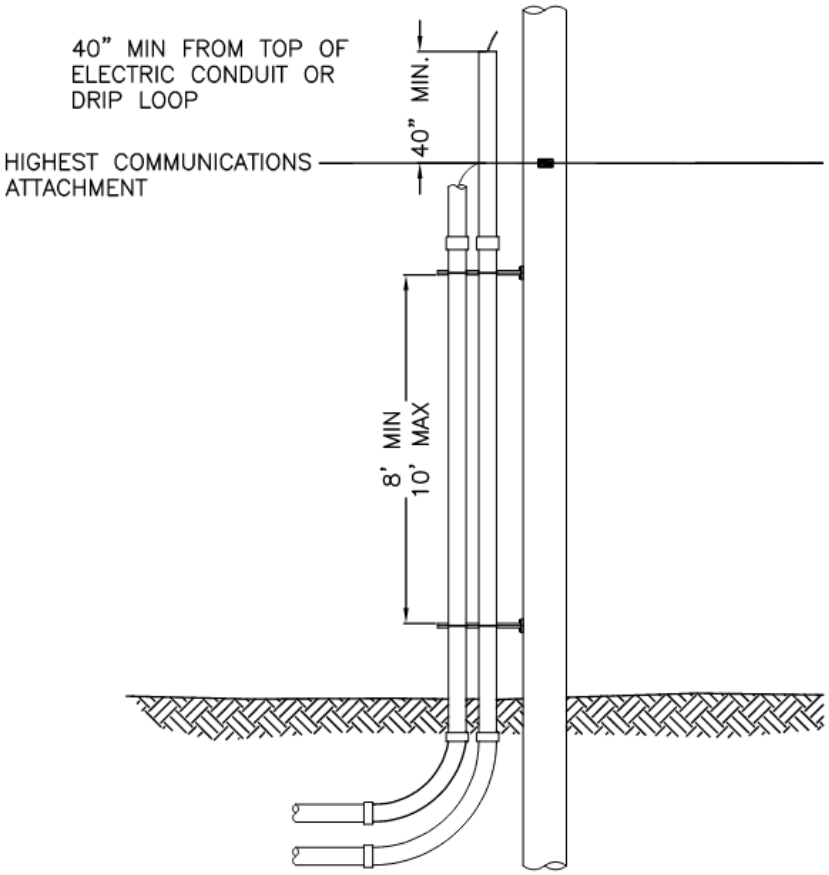

SECONDARY CONDUCTOR OR
GROUNDED NEUTRAL CONDUCTOR
COMMUNICATION WORKER
SAFETY ZONE
30" MINIMUM
COMMUNICATION WORKER
SAFETY ZONE
4" MINIMUM
COMMUNICATION CABLE
(telephone, cable TV, fiber)



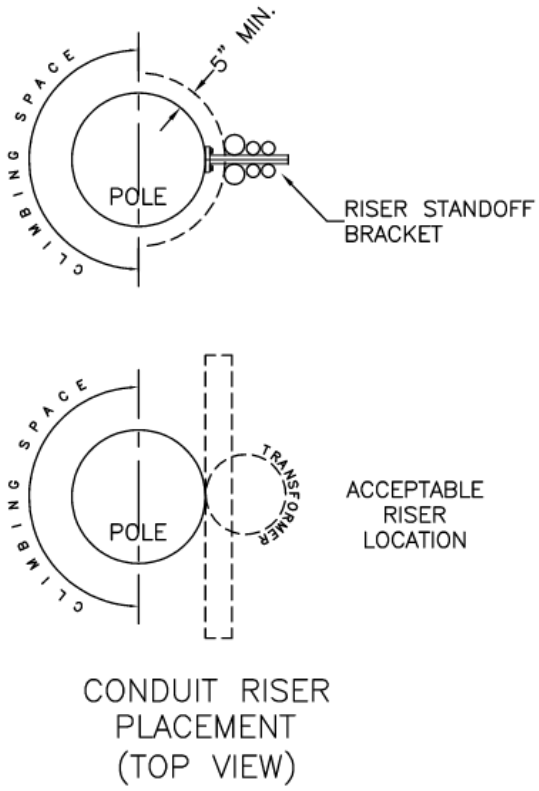
***SEE RUS DRAWING NUMBER PM2A (APPENDIX A, SHEET X) FOR ADDITIONAL DETAILS AND MATERIAL REQUIREMENTS**



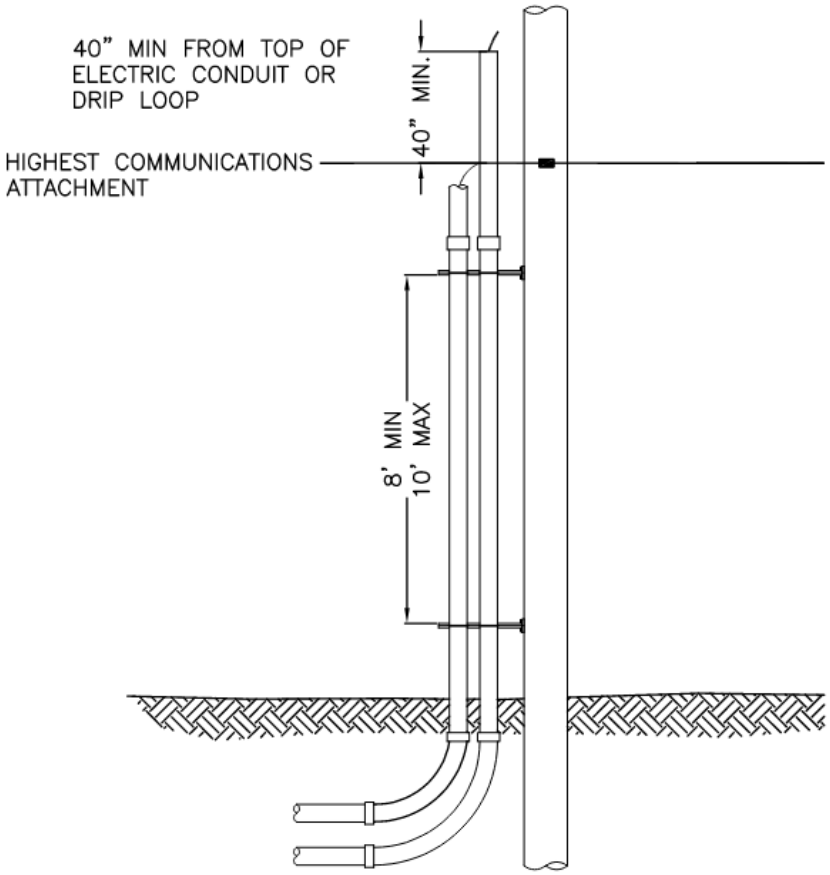
CONDUIT RISER PLACEMENT (TOP VIEW)



1. NEW RISERS SHALL BE ATTACHED TO EXISTING POWER STAND-OFF BRACKETS WHEN AVAILABLE.



CONDUIT RISER PLACEMENT (TOP VIEW)

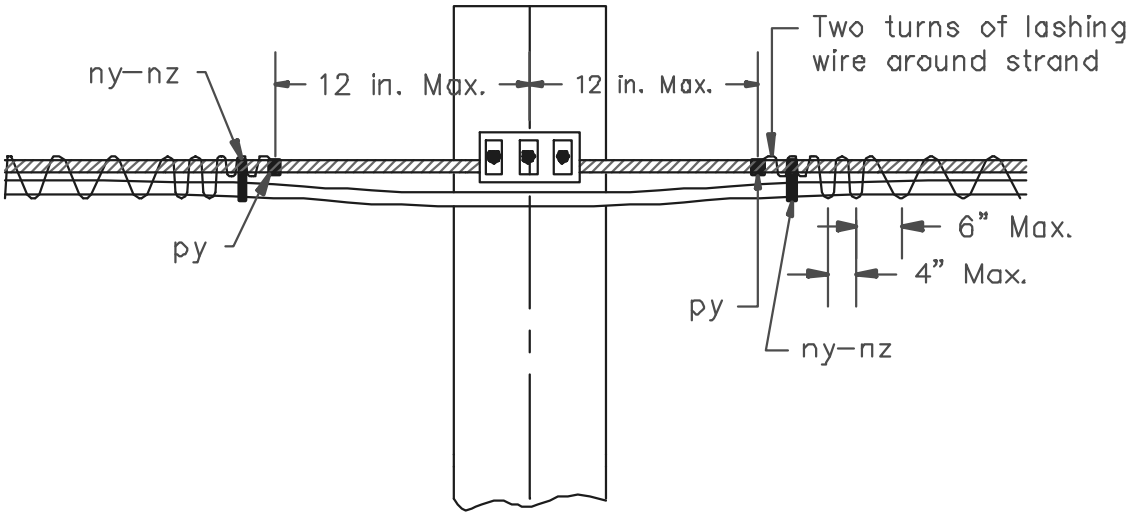


1. NEW RISERS SHALL BE ATTACHED TO EXISTING POWER STAND-OFF BRACKETS WHEN AVAILABLE.

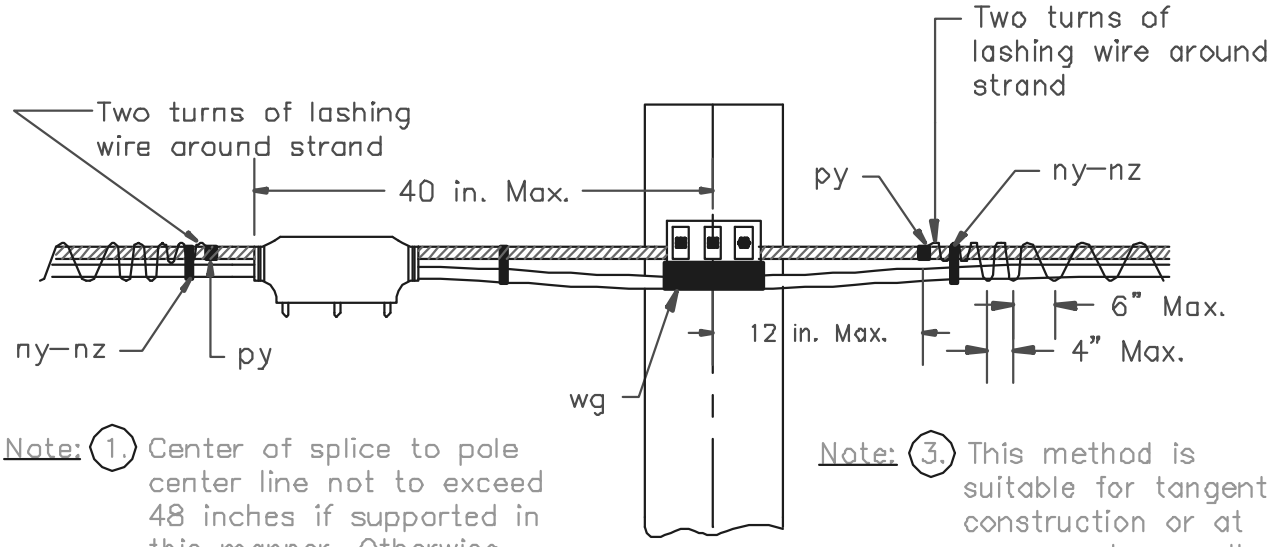
FIBER CONSTRUCTION STANDARD

DRAWINGS

APPENDIX A
Supplemental RUS Specification Drawings



No Splice at Pole



Note: (1.) Center of splice to pole center line not to exceed 48 inches if supported in this manner. Otherwise treat as a midspan splice.

Note: (2.) For converting English units to metric units use 1 in. = 25.4 mm.

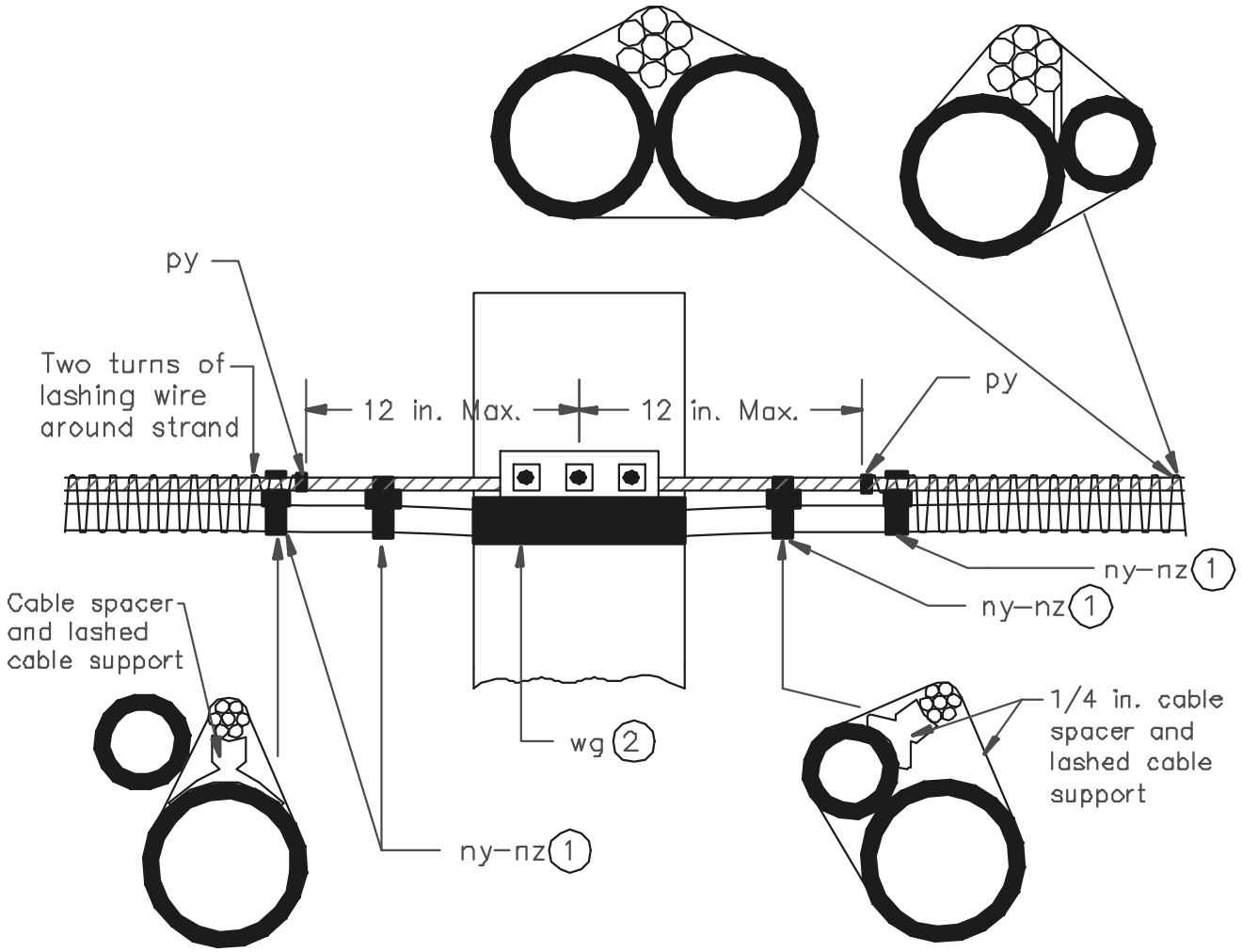
Note: (3.) This method is suitable for tangent construction or at corners where pull is away from pole.

Splice at Pole

ITEMS	MATERIALS	NO. REQ'D
*ny	Spacers, cable	2
*nz	Supports, lashed cable	2
*py	Clamps, terminating, lashing wire	2
wg	Guard, cable, plastic	1

RURAL TELECOMMUNICATIONS CONSTRUCTION PRACTICES
LASHED CABLE SUPPORT AT POLE

Scale: NTS		March 2001
		241



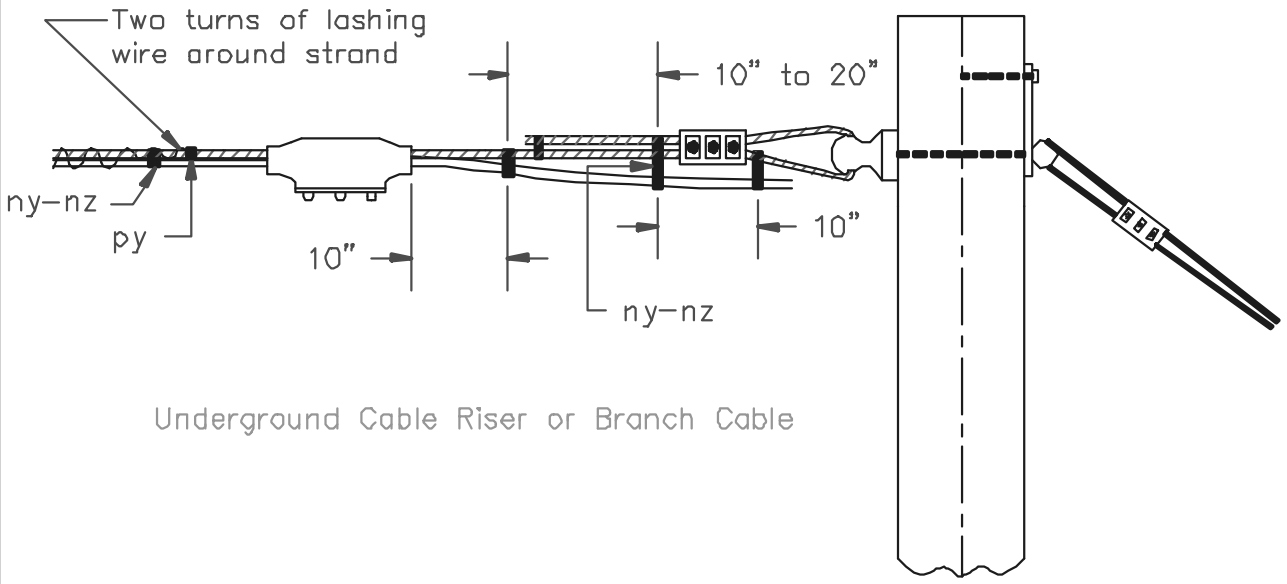
Notes:

1. Install cable spacers and lashed cable supports as needed to hold cable in position.
2. Place split cable guard around cable at point of contact with suspension clamp to prevent abrasion of cable. Secure split cable guard to cable by means of 3 full layers of vinyl tape.
3. For converting English units to metric units 1 in. = 25.4 mm.

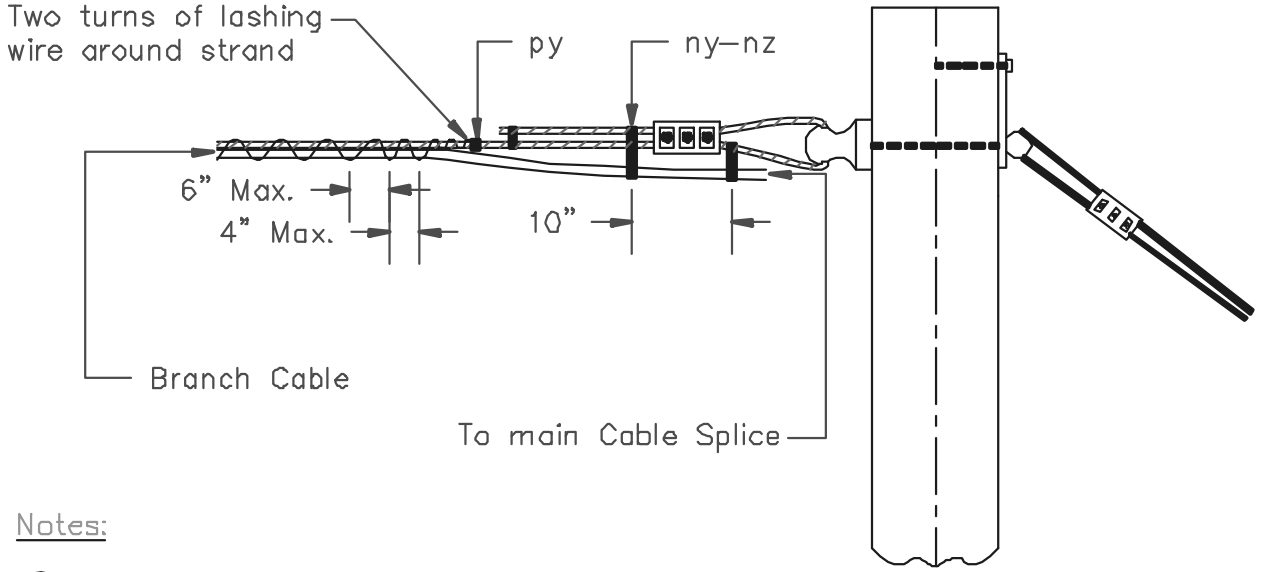
ITEMS	MATERIALS
*py	Clamps, terminating, lashing wire
*ny	Spacers, cable, 1/4"
*nz	Supports, lashed cable
wg	Guards, cable, split

RURAL TELECOMMUNICATIONS CONSTRUCTION PRACTICES
ARRANGEMENT DETAILS OF CABLES AT
POLE SUPPORTS

Scale: NTS		March 2001
		214



Underground Cable Riser or Branch Cable



Notes:

1. For converting English units to metric units use 1 in. = 25.4 mm.
2. This method of terminating lashing wire should be used at deadend junction of aerial cable and underground riser, and junction of branch and main cable.

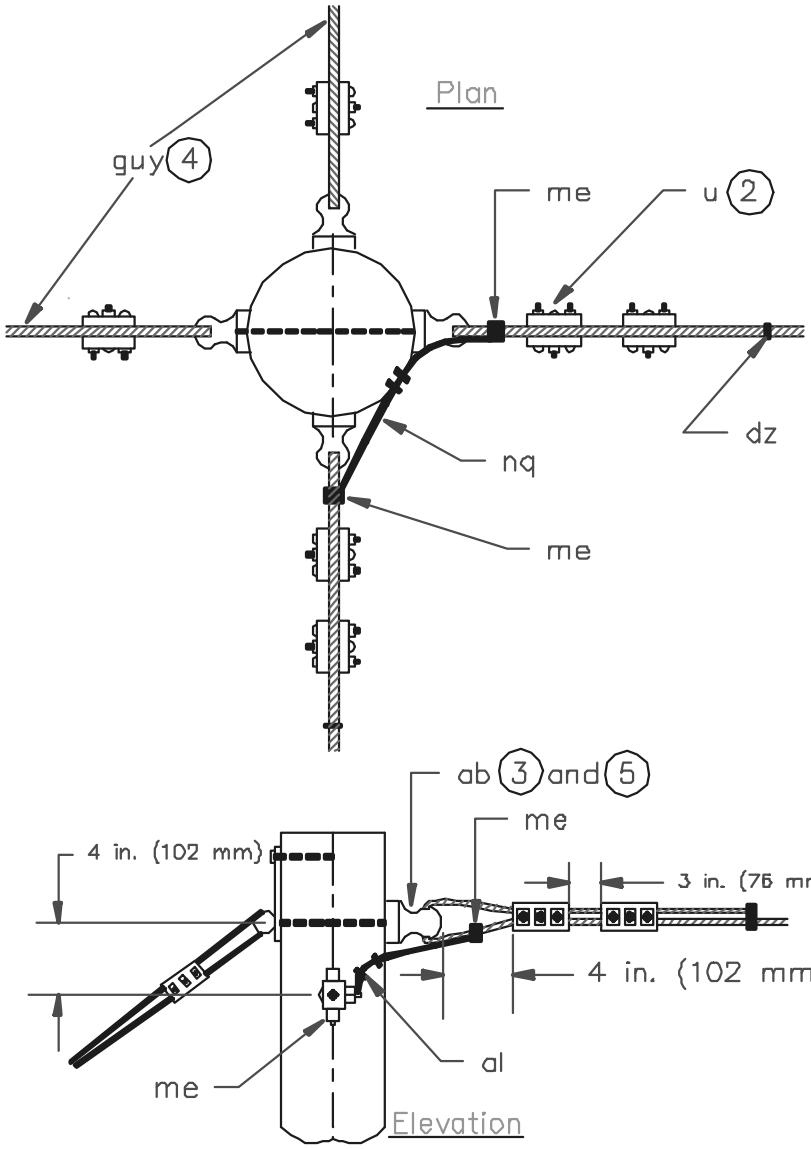
ITEMS	MATERIALS	NO. REQ'D
*ny	Spacers, cable	as required
*nz	Supports, lashed cable	as required
*py	Clamps, terminating, lashing wire	1

RURAL TELECOMMUNICATIONS CONSTRUCTION PRACTICES
LASHING WIRE TERMINATIONS

Scale: NTS		March 2001
		242

Notes:

1. Use for corners from 60 to 90 degrees.
2. An equivalent terminating device (mu) rated to provide the strength of the appropriate suspension strand may be used in lieu of 3-bolt guy clamps listed.
3. Square nut under eye nut may be omitted when length of bolt thread extending beyond pole is short enough to permit turning eye nut down to curved washer without interfering with the placing of strand.
4. Refer to guy assembly drawings PE1-2, -3, -4; PE1-2G, -3G, -4G; PE2-2, -3, -4; and PE2-2G, -3G, -4G for for guying materials.
5. Size of thimbleye nut is governed by size of thimbleye bolt used for guys.

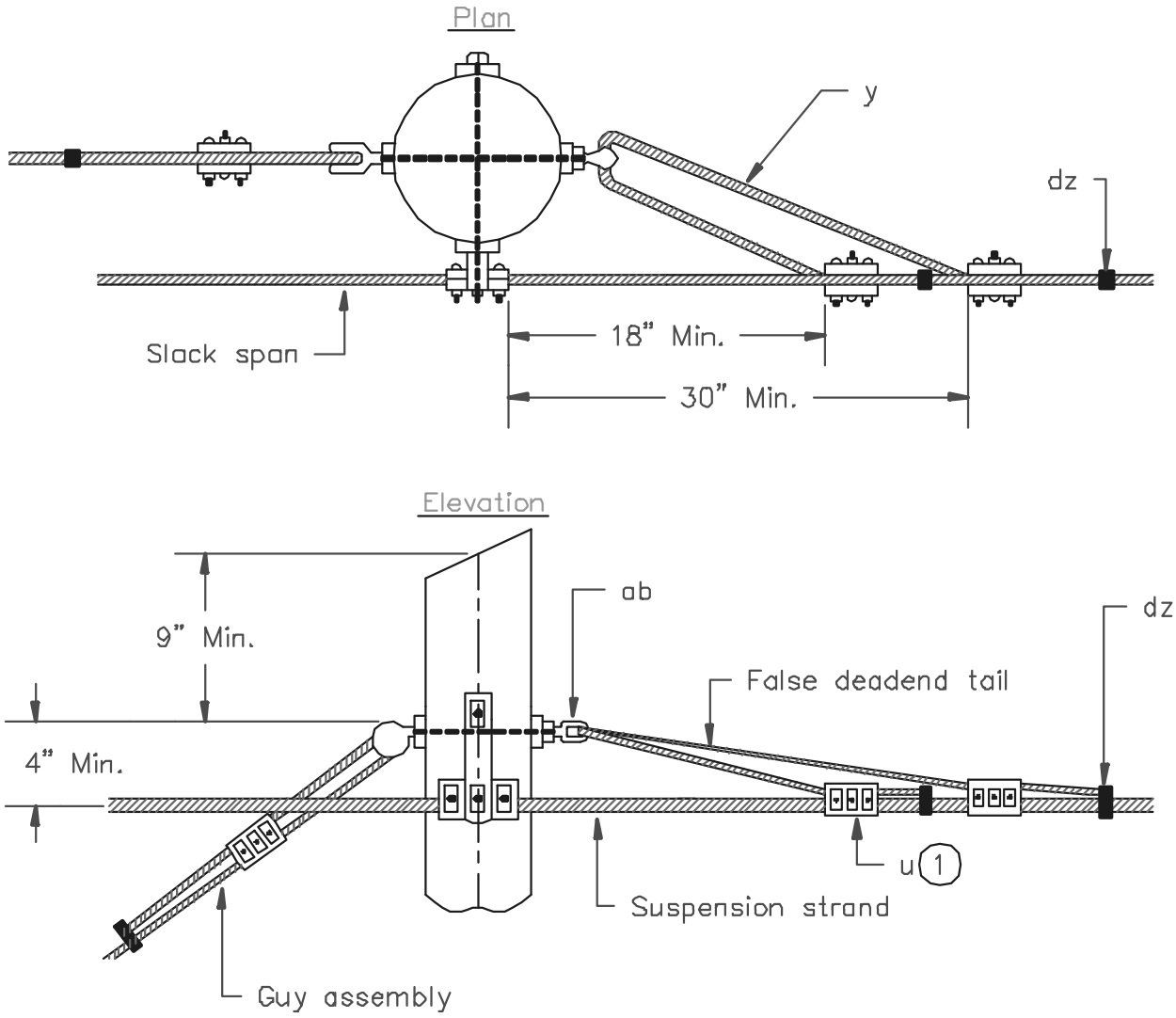


ITEMS	MATERIALS	6M NO. REQ'D	10M NO. REQ'D	16M NO. REQ'D
u	Clamps, guy, 3-bolt	1	1	2
ab	Nuts, thimbleye	1	1	1
*dz	Clips, guy	1	1	1
me	Connectors, grounding	2	2	2
*al	Staples, ground wire	as req'd	as req'd	as req'd
*ng	Wire, ground, bare, #6 AWG copper	as req'd	as req'd	as req'd

RURAL TELECOMMUNICATIONS CONSTRUCTION PRACTICES
SUSPENSION STRAND MOUNTING (CORNERS)

Scale: NTS | March 2001

203



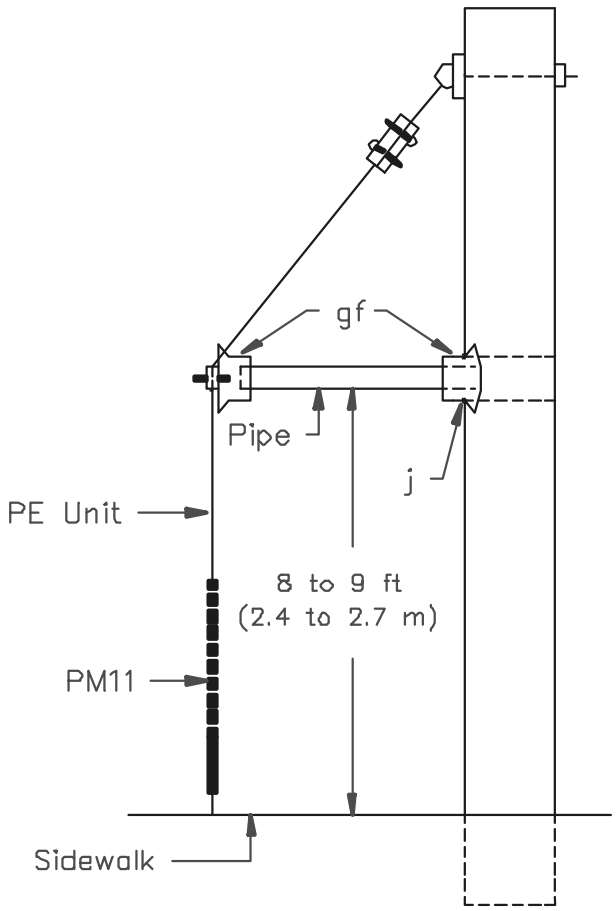
Notes:

1. An equivalent terminating device (mu) rated to provide the strength of the appropriate suspension strand may be used in lieu of 3-bolt guy clamps listed.
2. For converting English units to metric units use 1 in. = 25.4 mm.

		6M	10M	16M
ITEMS	MATERIALS	NO. REQ'D	NO. REQ'D	NO. REQ'D
u	Clamps, guy, 3-bolt	2	2	2
y	Strand, as required	6M	10M	16M
ab	Nuts, thimbleye, for 5/8 in. (16 mm) bolt	1	1	—
ab	Nuts, thimbleye, for 3/4 in. (19 mm) bolt	—	—	1
*dz	Clips, guy	2	2	2

RURAL TELECOMMUNICATIONS CONSTRUCTION PRACTICES
FALSE DEADEND

Scale: NTS		March 2001
		211



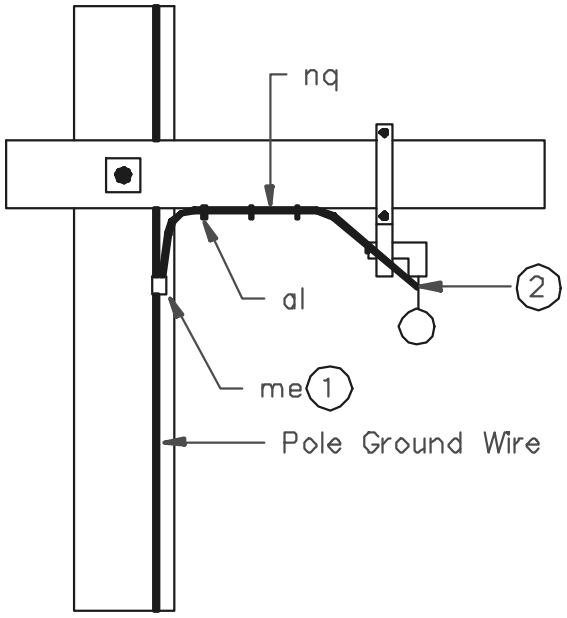
Note:

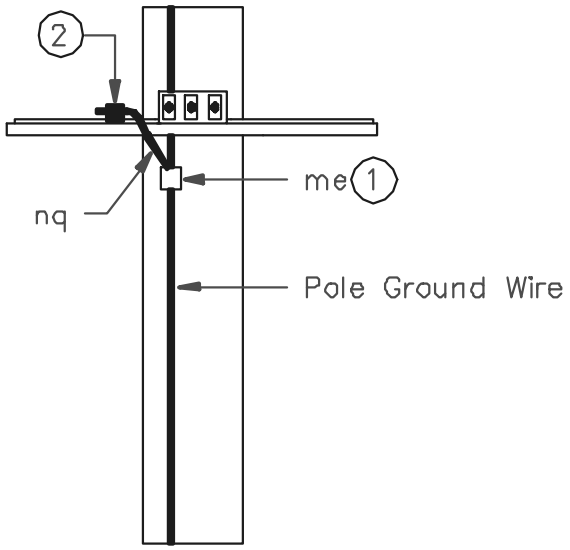
Where two guys are specified, the points of attachment of the two guy strands to the pole shall be separated by a minimum distance of 12 in. (305 mm) and the cable support clamp shall be placed on the thimbleye bolt for the lower guy.

ITEMS	MATERIALS	NO. REQ'D
*gf	Fittings, sidewalk guy arm	2
j	Screws, lag, 1/2 in. x 3 in. (13 mm x 76 mm)	as required
–	Pipe, galvanized steel, 2 in. (51 mm) ID, unthreaded, length as specified	1

RURAL TELECOMMUNICATIONS CONSTRUCTION PRACTICES
SIDEWALK GUY ARM ASSEMBLY

Scale: NTS		March 2001
		PM12

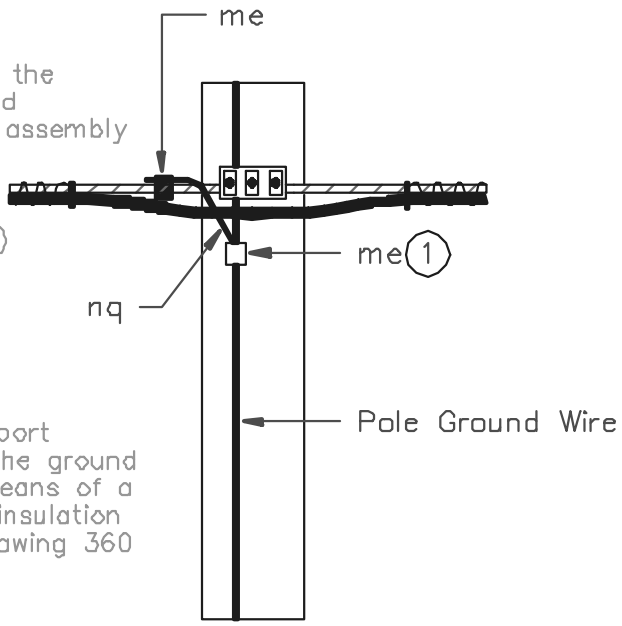




Notes:

1. Ground wire (item nq) shall be connected to the vertical pole ground wire of the multigrounded power system neutral or to the pole ground assembly (PM2 unit). If a multigrounded power system neutral is present on the pole but there is no vertical pole ground wire, a sufficient length of bare #6 AWG copper wire (item nq) shall be left coiled and taped to permit it to be extended up the pole and connected to the multigrounded neutral by a representative of the power company.

2. Carefully remove the insulation from the support wire or the strand to permit connection of the ground wire to the support wire or the strand by means of a grounding connector (item me). Where the insulation is required to be restored, refer to Guide Drawing 360 for restoration details.



ITEMS	MATERIALS	NO. REQ'D
me	Connectors, grounding	2
*nq	Wire, ground, bare, #6 AWG copper	as required
*al	Staples, ground wire	as required

RURAL TELECOMMUNICATIONS CONSTRUCTION PRACTICES
GROUND WIRE ASSEMBLY

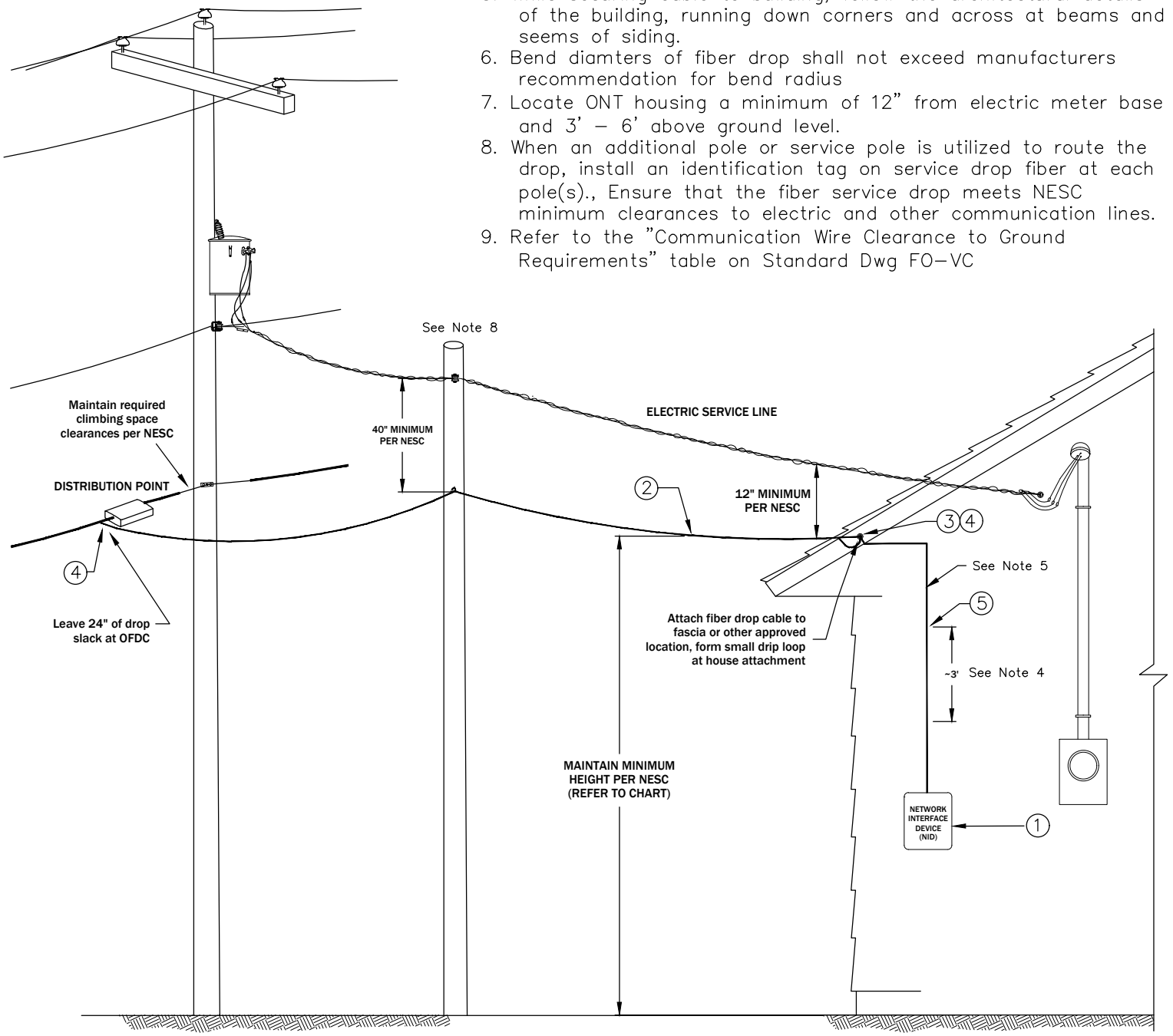
Scale: NTS		March 2001
		PM2A

FIBER CONSTRUCTION STANDARD DRAWINGS

Fiber Service Drop Installation Specification Drawings

GENERAL REQUIREMENTS FOR AERIAL FIBER SERVICE DROP INSTALLATION

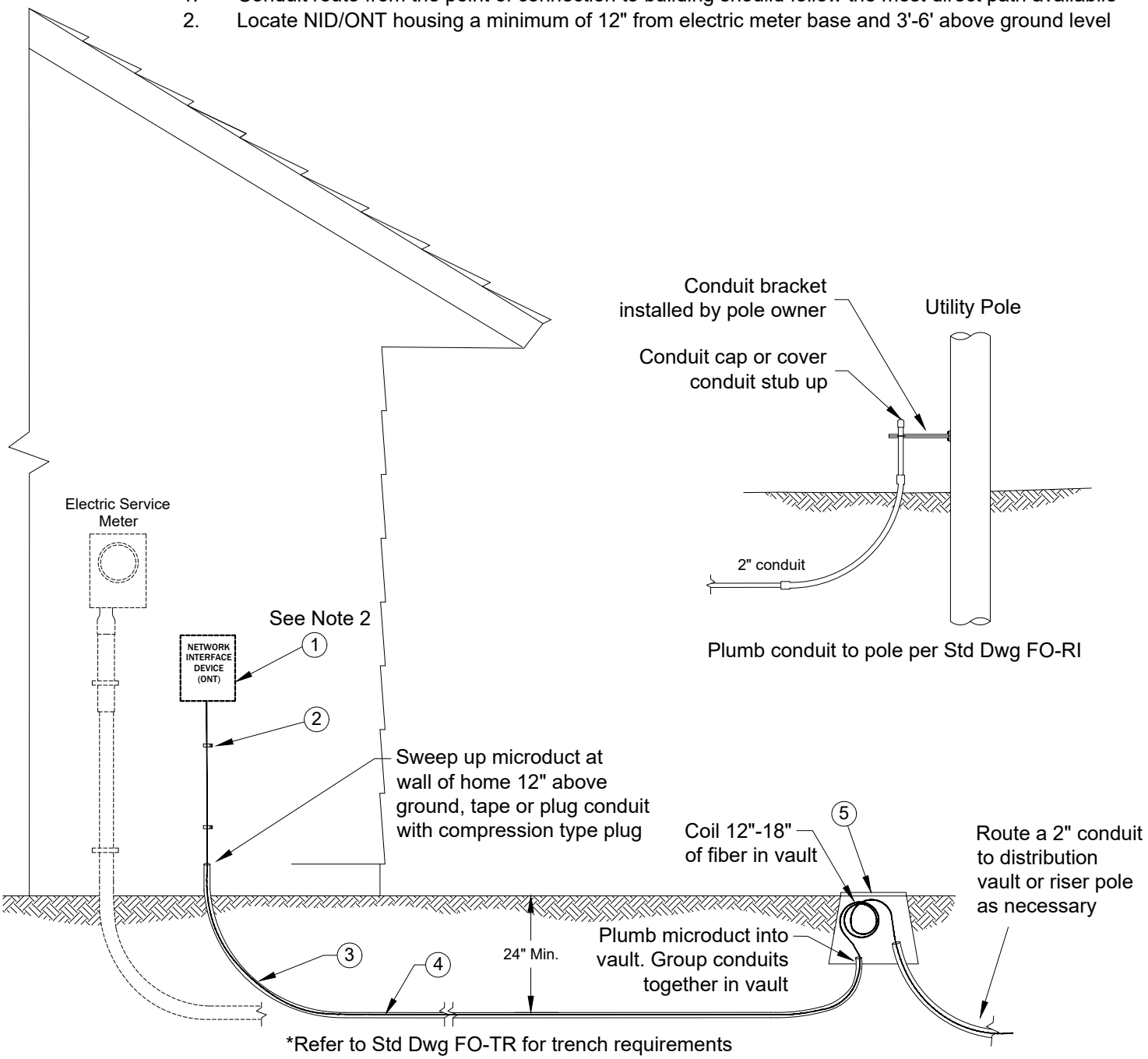
1. Fiber service drop must maintain minimum clearances above grade at lowest point. Refer to the chart on this page for requirements.
2. Fiber service drop must not attach to electric service weatherhead.
3. Sag from point of orgin at pole to attachment on house shall be (1% of length of drop) whenever possible while meeting NESC minimum clearances
4. Space cable clips approximately 3' apart or as required to secrely fasten fiber to side of home, NEVER USE STAPLES
5. While securing cable to building, follow the architectural details of the building, running down corners and across at beams and seems of siding.
6. Bend diamters of fiber drop shall not exceed manufacturers recommendation for bend radius
7. Locate ONT housing a minimum of 12" from electric meter base and 3' – 6' above ground level.
8. When an additional pole or service pole is utilized to route the drop, install an identification tag on service drop fiber at each pole(s)., Ensure that the fiber service drop meets NESC minimum clearances to electric and other communication lines.
9. Refer to the "Communication Wire Clearance to Ground Requirements" table on Standard Dwg FO–VC



ITEM	QTY	DESCRIPTION
1	1	NETWORK INTERFACE DEVICE (ONT HOUSING)
2	AS REQ'D	3MM FLAT DROP FIBER OPTIC CABLE
3	1	HOUSE ATTACHMENT
4	AS REQ'D	WEDGE CLAMP
5	AS REQ'D	CABLE CLIPS

GENERAL REQUIREMENTS FOR UNDERGROUND FIBER INSTALLATION

1. Conduit route from the point of connection to building shouild follow the most direct path availablle
2. Locate NID/ONT housing a minimum of 12" from electric meter base and 3'-6' above ground level



ITEM	QTY	DESCRIPTION
1	1	OUTDOOR OPTICAL NETWORK TERMINAL (ONT) HOUSING
2	AS REQ'D	CABLE CLIPS
3	AD REQ'D	18/14 3/4" LOCATABLE MICRODUCT, WITH PULL STRING
4	AS REQ'D	3MM FLAT DROP FIBER OPTIC CABLE
5	1	FIBER HANDHOLE "FLOWERPOT"

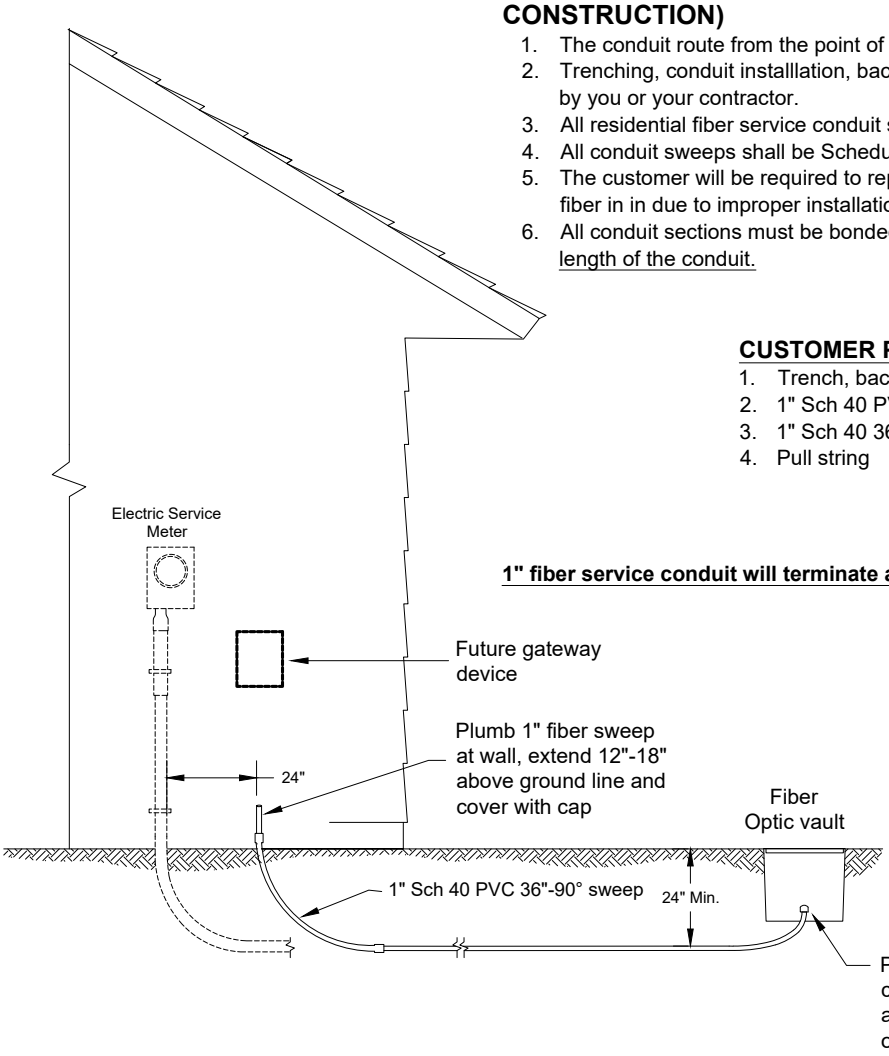
GENERAL REQUIREMENTS FOR FIBER CONDUIT INSTALLATION (NEW CONSTRUCTION)

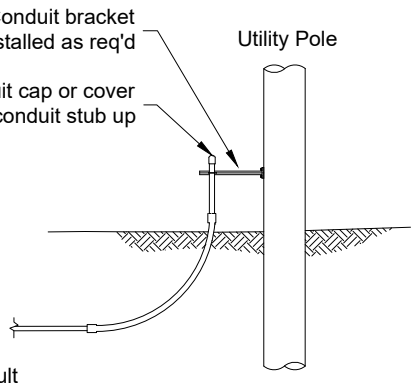
1. The conduit route from the point of connection to your home should be straight as possible.
2. Trenching, conduit installlation, backfilling and restoration on your property shall be completed by you or your contractor.
3. All residential fiber service conduit shall be grey 1" schedule 40 PVC.
4. All conduit sweeps shall be Schedule 40 PVC 36" minimum radius
5. The customer will be required to repair or replace any conduit that installers are unable to pull fiber in in due to improper installation, damaged or otherwise defective.
6. All conduit sections must be bonded with cement/glue and a pull string installed through the length of the conduit.

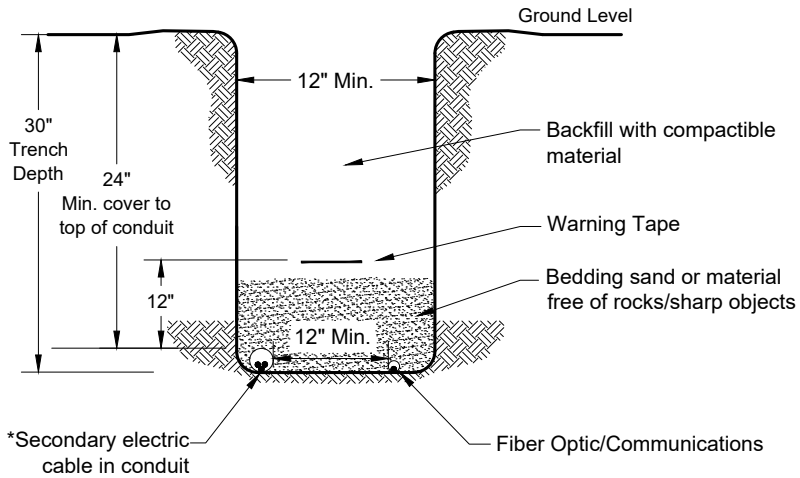
CUSTOMER PROVIDED ITEMS

1. Trench, backfill and restoration.
2. 1" Sch 40 PVC Conduit
3. 1" Sch 40 36"-90° sweeps (Qty as Req'd)
4. Pull string

1" fiber service conduit will terminate at either a fiber optic vault or at a utility pole

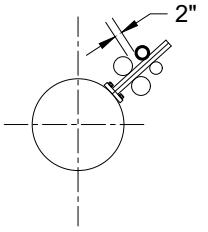




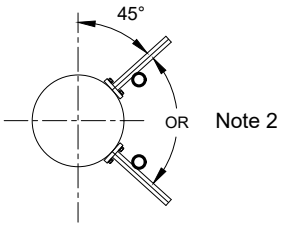


JOINT TRENCH
SECONDARY VOLTAGE ELECTRIC CABLE & FIBER CROSS SECTION

*Refer to utility owners electric trench details for electric service conduit installation requirements.



MULTIPLE CONDUITS



RISER LOCATION

RISER INSTALLATION NOTES

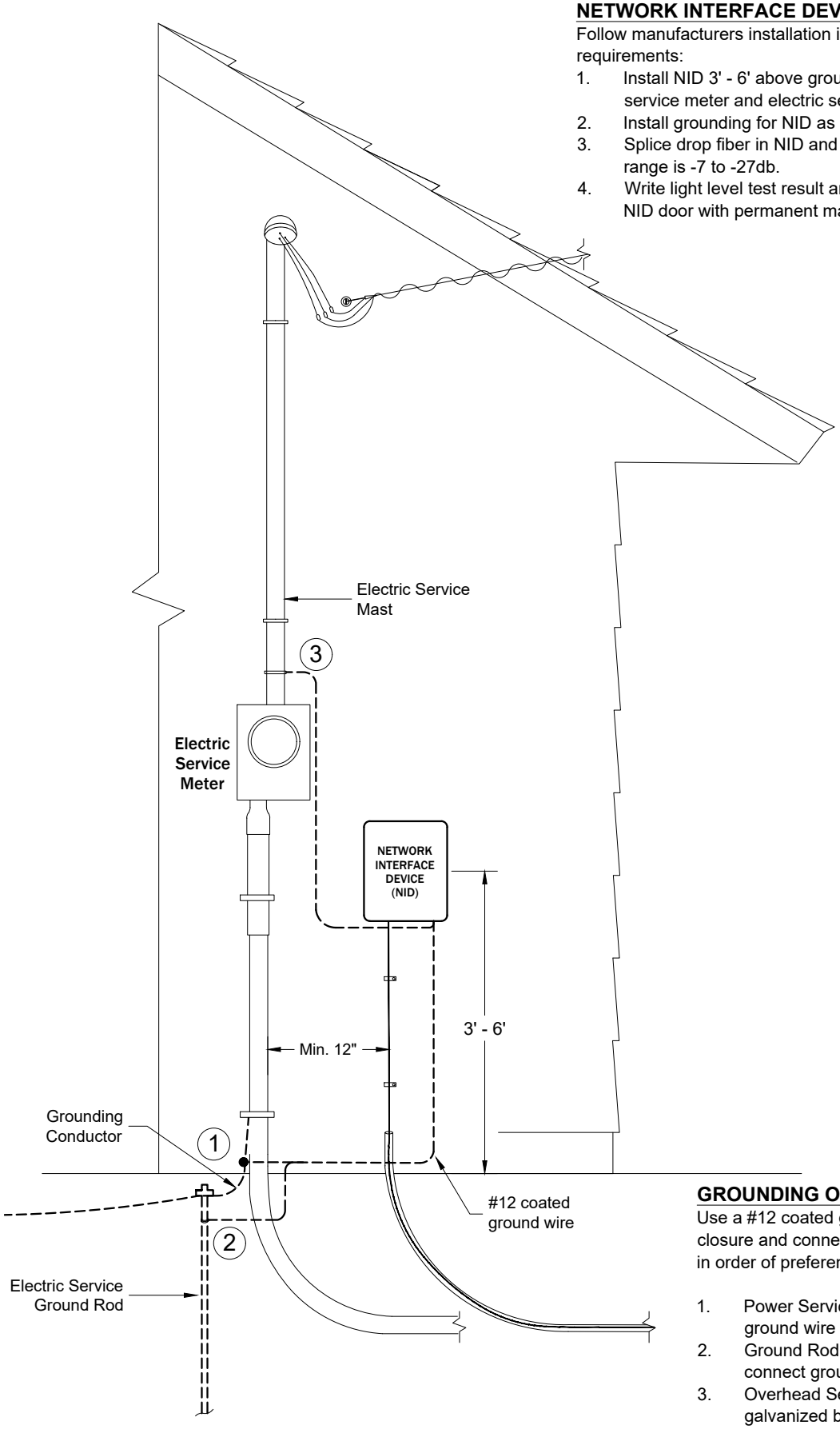
1. If riser brackets exist on pole, stub up conduit at existing brackets.
2. If riser brackets do not exist, verify proper quadrant for conduit placement with Engineering.

NID Installation and Grounding

NETWORK INTERFACE DEVICE (NID) INSTALLATION

Follow manufacturers installation instructions in addition to these requirements:

1. Install NID 3' - 6' above ground and a minimum of 12" from electric service meter and electric service conduit(s)
2. Install grounding for NID as shown below.
3. Splice drop fiber in NID and test light level. Acceptable light level range is -7 to -27db.
4. Write light level test result and OFDC port number legibly on inside of NID door with permanent marker.



GROUNDING OF ONT CLOSURE

Use a #12 coated ground wire from grounding clamp in closure and connect to one of the following locations (listed in order of preference)

1. Power Service Ground: Use split bolt to connect ground wire to existing service ground
2. Ground Rod Clamp: Use 5/8" ground rod clamp to connect ground wire to existing or new ground rod.
3. Overhead Service Entrance Mast: Use a 12" galvanized bonding strap, strap ground wire to mast.