

SECTION 7

SECONDARIES & SERVICES

Secondary Circuits

Secondary circuits are an economical method of distributing electrical requirements from the transformer to the service location.

The standard sizes for secondary conductor are: bare 2/0 AAC with insulated 2/0 AAC transformer leads for transformers up to 37.5 kVA; and 4/0 AAC with insulated 4/0 AAC transformer leads for transformers 50 kVA and above. 2/0 or 4/0 pin terminals are required to connect the transformer lead to the transformer's secondary terminal. (Alternatively, a pin terminal can be made by using a short piece of copper and a sleeve.)

The length of these secondary runs is generally limited to two spans on either side of the transformer; however this may be increased depending on the load involved.

All connections to the secondary conductor will be aluminum-to-aluminum and done using cablelok or universal type crimpits; see page 7-2 for further details.

Service Cables

All overhead services shall be aluminum triplex and quadruplex; the maximum length of service drop will generally be 85ft however this can be extended up to 100ft where: the service meets our requirements (SERVICE AND METERING REQUIREMENTS); the service meets or exceeds the minimum vertical clearance requirements at maximum design sag; and the service does not cross over any roadway.

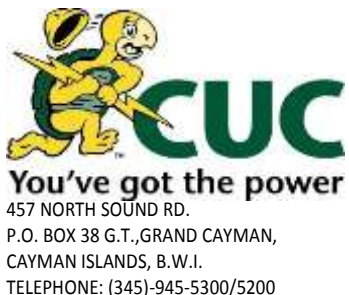
We must ensure that all new services meet the requirements of our service and metering standards before they are connected.

Splicing Service Cable

When transferring services to a relocated line, it is quite permissible, to splice a piece to the existing service drop rather than replace the total service; the existing service cable must be in good condition.

The neutral/messenger conductor must be spliced with a full tension sleeve to maintain full strength of the conductor.

The splice locations for the insulated conductors should be staggered and insulated with Vinyl Insulated Tape; there should be no need to spread the conductors when connected in this way.



DATE: June 13, 2019

DRAWN: C. Rose

REV.:

DATE:

APPROVED BY: C. Rose

DATE: June 20, 2019

DISTRIBUTION STANDARDS

SECONDARY CIRCUITS

STANDARD NO.

7-1

Standard Service and Secondary Connectors

CRIMPIT	SECONDARY DEADEND	YC2A2	#2	
		YC26A26	2/0	
		YC28A28	4/0	
CRIMPIT	COPPER (GRD. WIRE)	YC4C6	6 SOL-6 SOL	
		YC2A4	2 - 6 SOL	
		YC2C2	2 - 2	
CRIMPIT	CABLELOK (ALUMINUM)	YP26AU26	2/0 - 2	
		YP27AU26	2/0 - 2/0	
		YP28AU2	4/0 - 2/0	
		YPC28U28	4/0 - 4/0	
SLEEVES	SERVICE ENTRANCE (ALUMINUM)	YDS2CA	#2	Full Tension
		YSU2R8W	2 - 10	Red - Brown
		YSU2R4W	2 - 6	Red - Blue
		YSU2R2W	2 - 4	Red - Orange
		YSU2R2R	2 - 2	Red - Red
		YSD26R2R	2/0 - 2	Grey - Red
		YSD26R26R	2/0 - 2/0	Grey - Grey
		YSD27R26R	3/0 - 2/0	Black - Grey
		YSD28R26R	4/0 - 2/0	Pink - Grey
		YSD28R28R	4/0 - 4/0	Pink - Pink
CONNECTORS	TRANSFORMER GROUND (COPPER)	KC22B2	8 - 2	
		KC26	2 - 2/0	
CONNECTORS	BARTAP (COPPER)	QGFL26B2T6	8 - 2/0	
		QGFL29B1T6	6 - 250	
		QGFL34B1T6	1/0 - 500	
		QGFL44B1T6	750 - 1000	
CONNECTORS	TWO BOLT/SPACER (COPPER)	KVSW28	8 - 2/0	
		KVSW31	250 - 350	
		KVSW34	400 - 500	
		KVSW40	400 - 800	
		KVSW44	500 - 1000	



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REV.:

DATE:

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DISTRIBUTION STANDARDS

SECONDARY CIRCUITS

STANDARD NO.

7-2

Service Drops – Over Buildings

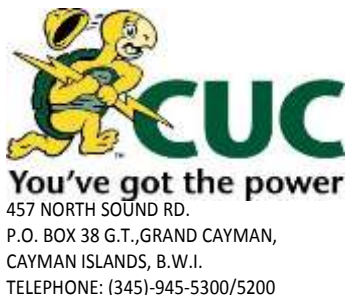
It is the policy of CUC that service cables should not be installed if they cross over a roof; however if there is no alternative we must ensure that it meets the requirements of the National Electric Safety Code (NESC). Table 6 on page 2-21 specifies the minimum clearance, vertical and horizontal, required by NESC for electrical lines crossing over or near buildings.

Our standard triplex and quadruplex service cable requires a minimum vertical clearance of 3.5 feet above a roof that is not readily accessible to pedestrians if the service is not attached to the building and 3 feet if the service is attached to the building. If the roof is readily accessible to pedestrians, the vertical clearance requirement increases to 11.0 feet. In all cases, this clearance must be maintained at the maximum design sag condition for the service cable. If there is any doubt about the clearance, a rope should be strung to confirm the clearance before the service cable is installed (NESC Rule 234C).

Open wire secondary requires a clearance of 10.5 feet above a roof that is not readily accessible to pedestrians and 11.5 feet when readily accessible to pedestrians. Our 13 kV distribution circuits require a minimum clearance of 12.5 feet above a roof that is not readily accessible to pedestrians and 13.5 feet when readily accessible to pedestrians.

The horizontal clearance requirements for buildings, balconies and projections are:

Conductor/Wire	Clearance (feet)
Effectively grounded guys	4.5
Ungrounded portions of guys exposed to:	
0 to 300 volts	4.5
Over 300 volts to 750 volts	5.0
Over 750 volts to 22 kV	7.0
Neutrals	4.5
Triplex and quadruplex supply cables	5.0
Open secondary, 0 to 750 V	5.5
Open supply conductors, 13 kV	7.5
Open supply conductors, 69 kV	8.1



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REV.:

DATE:

APPROVED BY: C. Rose

DATE: June 20, 2019

DISTRIBUTION STANDARDS

SECONDARY CIRCUITS

STANDARD NO.

7-3

Triplex Services

The standard size triplex cables for single phase services are #2 AAC, 2/0 AAC and 4/0 AAC. Refer to Standard 4-9 for Safe Maximum Conductor Loadings.

The standard triplex cable consists of two concentrically stranded, compressed 1350-H19 aluminum conductors insulated with crosslinked polyethylene (XLP). The #2 and 2/0 triplex cables are supported with a concentrically stranded AAC neutral, and the 4/0 triplex cable with a 6201 neutral.

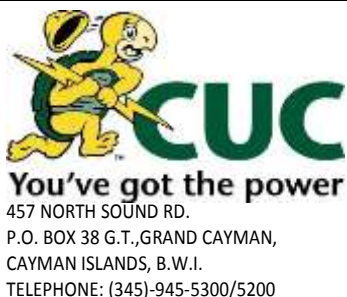
The #2 triplex cable can be used for services with a continuous load up to 35 kVA. Where the 120 volt loads are not balanced, the higher loaded leg is limited to 150 amps.

The 2/0 triplex cable can be used for services with a continuous load up to 55 kVA. Where the 120 volt loads are not balanced, the higher loaded leg is limited to 235 amps

The 4/0 triplex cable can be used for services with a continuous load up to 75 kVA. Where the 120 volt loads are not balanced, the higher loaded leg is limited to 315 amps

The maximum length of service cable allowable is limited due to the voltage drop, which is dependent on the peak load or demand (kVA). A 3.0% voltage drop limitation is applied for services connected directly to the transformer and 1.5% for services connected to a secondary run. The following table specifies the maximum length of triplex cable for various loads.

Maximum Length of Service Cable (Feet)							
Peak Load		#2 Clam/XLP		2/0 Nassa/XLP		4/0 Lepas/XLP	
kVA	Amperes	TFMR	Secondary	TFMR	Secondary	TFMR	Secondary
10	42	256	128				
12	50	213	107				
15	63	171	85	342			
20	83	128	64	257			
25	104	102	51	205	103		
30	125	85	43	171	86		
35	146	73	37	147	73	233	116
40	167			128	64	204	102
50	208			103	51	163	82
55	229			93	47	148	74
60	250					136	68
70	292					116	58
75	313					109	54



DATE: June 20, 2019

DRAWN: C. Rose

REV.:

DATE:

APPROVED BY: C. Rose

DATE: June 20, 2019

DISTRIBUTION STANDARDS

SECONDARY CIRCUITS

STANDARD NO.

7-4

Quadruplex Services:

The standard voltages for three phase services are 120/208 volts wye and 277/480 volts wye. There are a number of existing three phase services at 120/240 volts delta that will be maintained. However, no new or additional delta services are acceptable.

The standard size quadruplex cables for three phase services are 2/0 and 4/0 AAC. Refer to Standard 4-9 for Safe Maximum Conductor Loadings.

The standard quadruplex cable consists of three concentrically stranded, compressed 1350-H19 aluminum conductors insulated with crosslinked polyethylene (XLP). The quadruplex cables are supported with a concentrically stranded 6201 neutral.

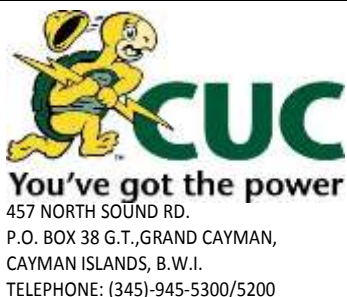
These standard conductors should be used in accordance with the following table which gives the maximum length of service cable from the transformer bank for various maximum loads to limit the voltage drop in the quadruplex cable to 3%.

Three Phase Service Conductor Selection				
Three Phase Voltage	Cable Conductor Size	Maximum Cable Load (kVA)	Normal Rating of Transformer Bank	Maximum Length of Service Cable (Feet)
120/208Y	2/0	74	3 x 25 kVA	104
	4/0	99	3 x 37.5 kVA	124
277/480Y	2/0	170	3 x 50 kVA	242
	4/0	229	3 x 75 kVA	285
120/240 Delta ⁹	2/0	85	3 x 25 kVA	121
	4/0	114	3 x 37.5 kVA	143

The maximum length of quadruplex service cable may be increased by 2 feet for each kVA that a particular maximum load is below the maximum cable load listed in the above table and still maintain the maximum 3% voltage drop. However, it is desirable to keep quadruplex cable runs as short as possible. The maximum length of a quadruplex service drop shall be 75 feet and the maximum span length for a quadruplex cable shall be 150 feet.

For services with loads greater than those listed in the above table, a pad-mounted transformer with underground service shall normally be used. For 120/208 volt Wye services a parallel quadruplex run may be considered.

⁹ For maintenance information only. Not for new services.



DATE: June 20, 2019

DRAWN: C. Rose

REV.:

DATE:

APPROVED BY: C. Rose

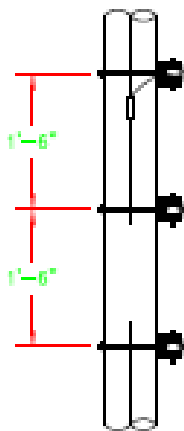
DATE: June 20, 2019

DISTRIBUTION STANDARDS

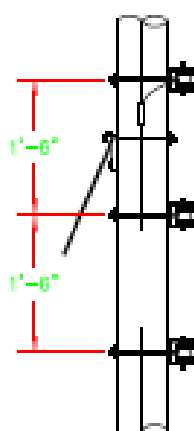
SECONDARY CIRCUITS

STANDARD NO.

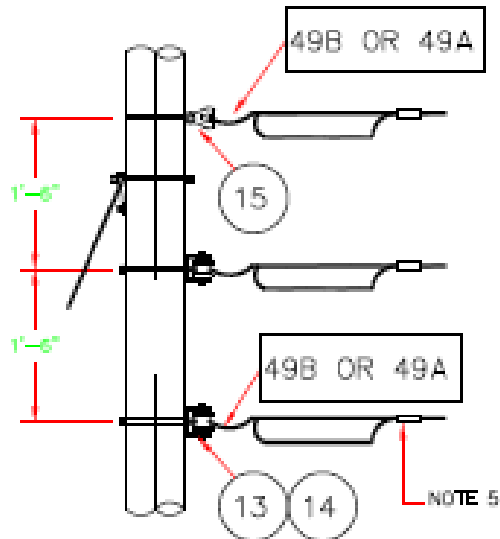
7-5



TYPE "SA"
TANGENT STRUCTURE



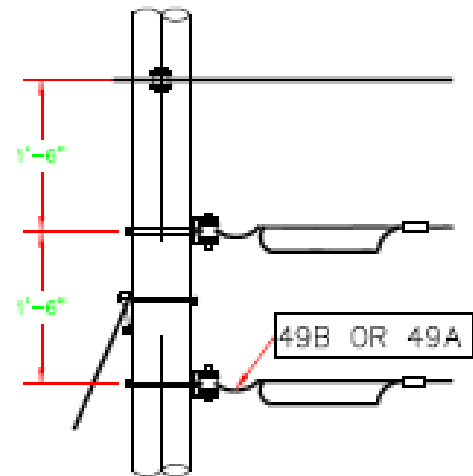
TYPE "SA"
ANGLE STRUCTURE



TYPE "SE"
SECONDARY DEADEND 4/0 + 2/0

NOTES:

1. SECONDARY FRAMING SA & SE INCLUDE THE TWO SECONDARY CONDUCTORS ONLY; USED WHEN ADDING SECONDARY TO AN EXISTING LINE.
2. SECONDARY FRAMING SA3 & SE3 INCLUDE ALL THREE CONDUCTORS (INCLUDES NEUTRAL); USED WHERE ONLY SECONDARY IS REQUIRED.
3. NEUTRAL CONDUCTOR SHALL BE CONNECTED TO THE POLE GROUND WIRE ON ALL STRUCTURES.
4. THE LOWEST SECONDARY CONDUCTOR HEIGHT SHALL BE NO LESS THAN 25' IN ACCORDANCE WITH OUR LICENSED OCCUPANCY AGREEMENT WITH TELECOMS.
5. WHEN DEADENDING 4/0 AND 2/0 SECONDARY CONDUCTOR USING A PREFORMED DEADEND, A LOOP SHALL BE PROVIDED AS SHOWN, FOR CONNECTING SERVICES; THE END OF THE LOOP SHALL BE SECURED USING ALUMINUM WIRE.
6. SECONDARY FRAMING, TYPE SA, SHOULD BE LIMITED TO A 45° LINE ANGLE; IF THE LINE ANGLE IS OVER 45° THE SECONDARIES SHOULD BE DEADENDED (SEE PAGE 7-5).



TYPE "SE"
SECONDARY DEADEND 4/0 + 2/0

ITEM NO.	QUANTITY						MATERIAL	STOCK NO.
	SA	SA3	SE 2/0	SE 4/0	SE3 2/0	SE3 4/0		
14	2	3	2	2	2	2	CLEVIS-SECONDARY D/E	185-00002
13	2	3	2	2	2	2	INSULATOR - SPOOL	457-00008
16C	2	3	3	3	3	3	BOLT - MACH. 5/8 X 12	088-00015
27	2	3	2	2	4	4	WASHER - SQUARE 2-1/4	973-00005
49A				2		2	DEADEND - PREFORMED 4/0	274-00003
49B			2		3	2	DEADEND - PREFORMED 2/0	274-00002
15			1		1	1	THIMBLE - CLEVIS	185-00003
29	2	3	2	2	3	3	DOUBLE COIL LOCK WASHER 5/8"	973-00011



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 Email: iguarby@caribbeanutilities.com
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PROJECT
CUC
STANDARDS

DRAWING
SECONDARY FRAMING
DETAILS

DATE: DEC 2011

SCALE: NTS

DRAWN BY: DCM

CHECKED BY: CP

APPROVED BY: SC

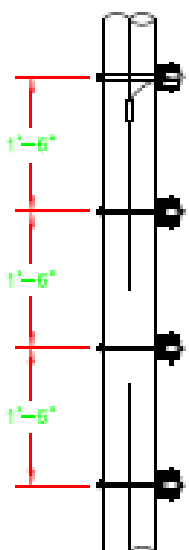
PROJECT # _____

DRAWING # 7-6

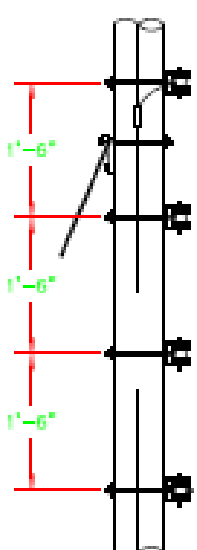
SHEET # 01 OF 01

REV. # B JULY 2014

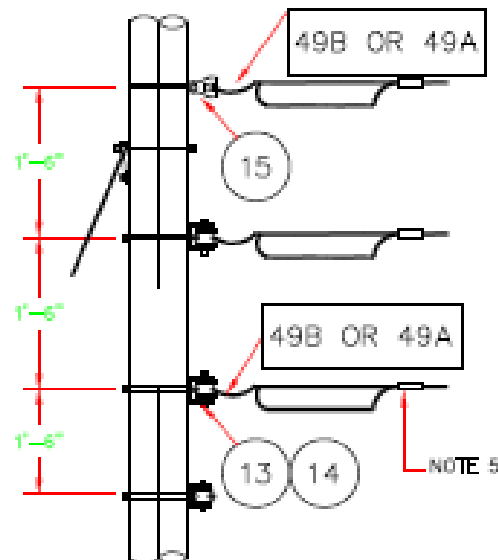
APPROVED



TYPE "SA3PH"
TANGENT STRUCTURE



TYPE "SA3PH"
ANGLE STRUCTURE

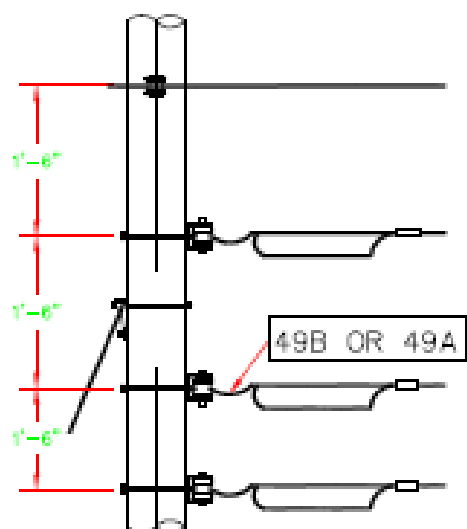


TYPE "SE3"-3PH
SECONDARY DEADEND 4/0 + 2/0

NOTE 5

NOTES:

1. SECONDARY FRAMING SA3PH & SE3PH INCLUDE THE THREE SECONDARY CONDUCTORS ONLY; USED WHEN ADDING SECONDARY TO AN EXISTING LINE.
2. SECONDARY FRAMING SA3-3PH & SE3-3PH INCLUDE ALL FOUR CONDUCTORS (INCLUDES NEUTRAL); USED WHERE ONLY SECONDARY IS REQUIRED.
3. NEUTRAL CONDUCTOR SHALL BE CONNECTED TO THE POLE GROUND WIRE ON ALL STRUCTURES.
4. THE LOWEST SECONDARY CONDUCTOR HEIGHT SHALL BE NO LESS THAN 25' IN ACCORDANCE WITH OUR LICENSED OCCUPANCY AGREEMENT WITH TELECOMS.
5. WHEN DEADENDING 4/0 AND 2/0 SECONDARY CONDUCTOR USING A PREFORMED DEADEND, A LOOP SHALL BE PROVIDED AS SHOWN, FOR CONNECTING SERVICES; THE END OF THE LOOP SHALL BE SECURED USING ALUMINUM WIRE.
6. SECONDARY FRAMING, TYPE 3PH SHOULD BE LIMITED TO A 45° LINE ANGLE; IF THE LINE ANGLE IS OVER 45° THE SECONDARIES SHOULD BE DEADENDED (SEE PAGE 7-6).



TYPE "SE3"-3PH
SECONDARY DEADEND
4/0 + 2/0

ITEM NO.	QUANTITY							MATERIAL	STOCK NO.
	SA 3PH	SA3 3PH	S/E 2/0	S/E 4/0	S/E3 2/0	S/E3 4/0			
14	3	4	3	3	3	3	CLEVS-SECONDARY D/E	185-00002	
13	3	4	3	3	3	3	INSULATOR - SPOOL	457-00008	
18C	3	4	4	4	4	4	BOLT - MACH, 5/8 X 12	098-00015	
27	3	4	3	3	8	8	WASHER - SQUARE, 2-1/4	973-00005	
49A				3		3	DEADEND - PREFORMED 4/0	274-00003	
49B			3		4	3	DEADEND - PREFORMED 2/0	274-00002	
15			1		1	1	THIMBLE - CLEVS	185-00003	
29	3	4	3	3	4	4	DOUBLE OSL LOCK WASHER 5/8"	973-00011	



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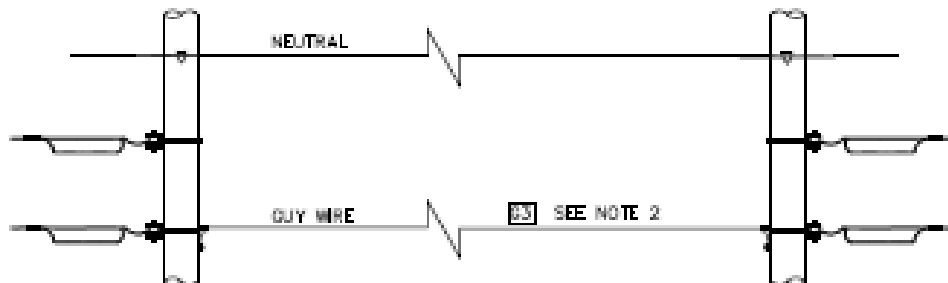
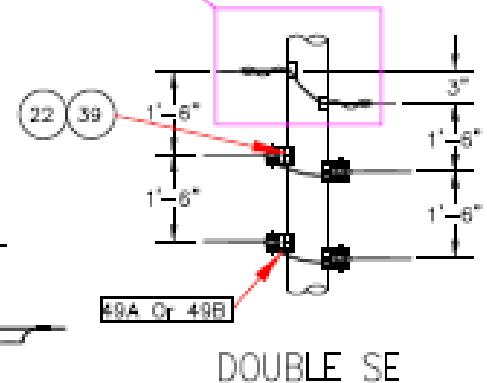
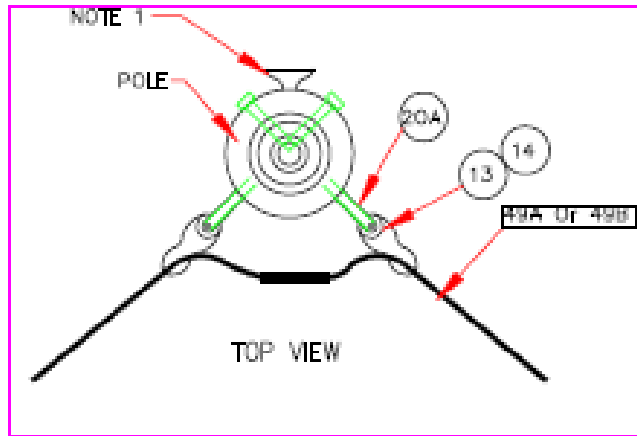
PROJECT
**CUC
 STANDARDS**

DRAWING
**THREE PHASE
 OVERHEAD SECONDARY
 FRAMING DETAILS**

DATE: JUNE 2014
 SCALE: NTS
 DRAWN BY: DM
 CHECKED BY: CJ
 APPROVED BY: CUC-SC

PROJECT # _____
 DRAWING # 7-6A
 SHEET # 01 OF 01
 REV. # **A**

APPROVED



ITEM NO.	QUANTITY				MATERIAL	STOCK NO.
	2-SE 2/0	2 E4/0	2-SE3 2/0	2-SE3 4/0		
14	2	2	2	2	CLIPS - THIMBLE	185-00003
20A	2	2	2	2	BOLT - OVAL EYE, 5/12	088-00021
22	2	2	3	3	NUT - SQUARE	565-00005
39	2	2	3	3	BOLT-ANCHOR, TRIPLE EYE, 3/4"	708-00006
49A		2		2	DEADEND-PREFORM 4/0	274-00003
49B	2		3	1	DEADEND-PREFORM 2/0	274-00002
13	2	2	2	2	INSULATOR - SPOOL	457-00008
27	4	4	8	8	WASHER - SQUARE, 2-1/4	973-00005
29	4	4	6	6	DOUBLE COIL LOCK WASHER 3/8"	973-00011

NOTES:

1. WHEN SECONDARIES ARE USED ON A STRUCTURE WITH A LINE ANGLE IN EXCESS OF 45 BUT LESS THAN 60, ONE GUY IS SUFFICIENT (DIRECTS THE ANGLE). FOR LINE ANGLES OVER 60 TWO GUYS ARE REQUIRED.

2. WHEN SECONDARIES ARE TERMINATED ON ADJACENT STRUCTURES AN OVIDHEAD GUY (G3) SHOULD NORMALLY BE USED RATHER THAN TWO DOWN GUYS.



CARIBBEAN UTILITIES COMPANY, LTD.

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Email: spareparts@cu.com
Web: www.cu.com

PROJECT
CUC
STANDARDS

DRAWING
SECONDARY DOUBLE
DEADEND AND GUYING
ARRANGEMENTS

DATE: DEC. 2011

SCALE: NTS

DRAWN BY: DM

CHECKED BY: CP

APPROVED BY: CUC SC

PROJECT # _____

DRAWING # 7-7

SHEET # 01 OF 01

REV. # A

APPROVED

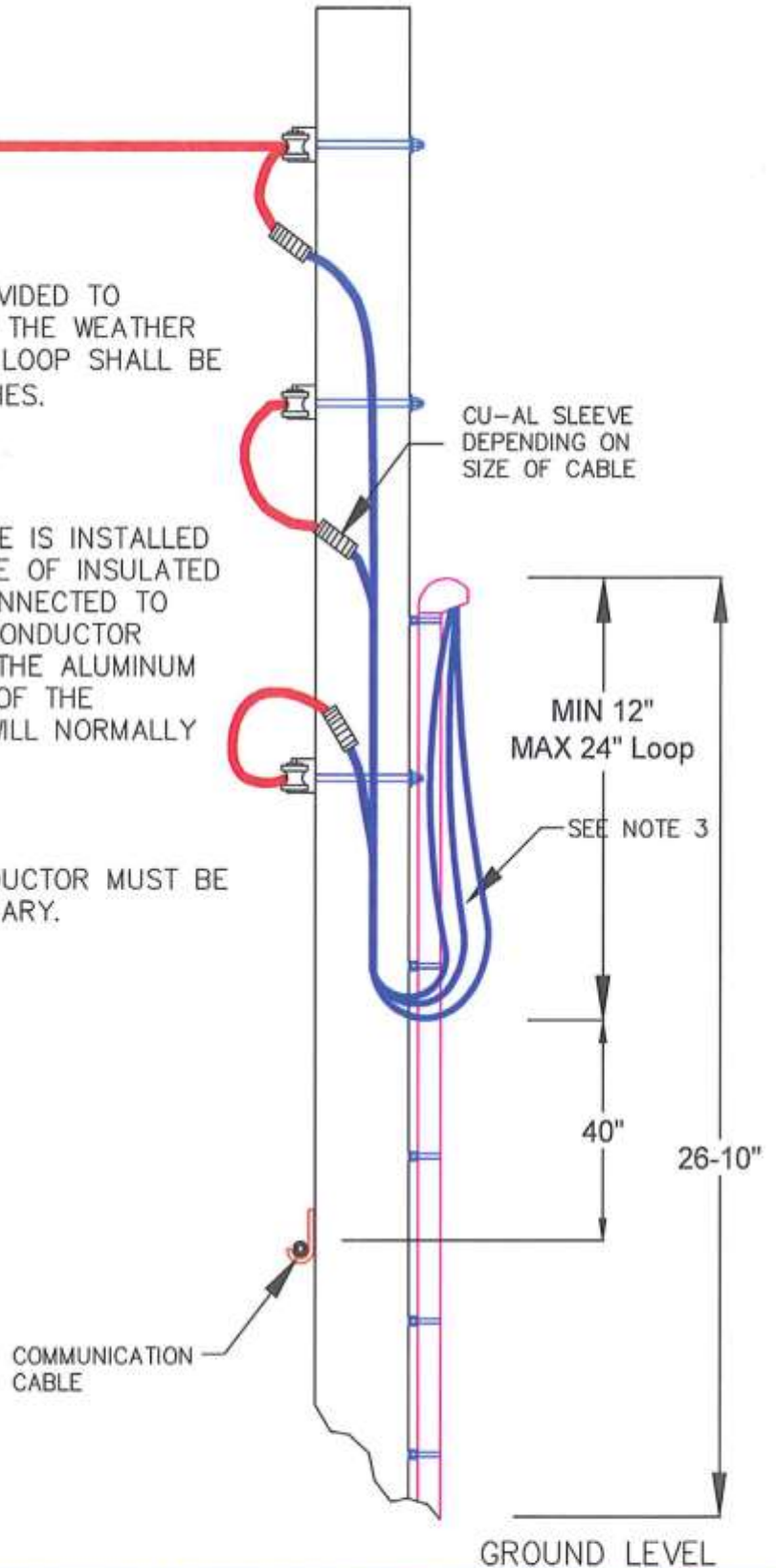
FOR FUTURE USE

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1. A WEATHER LOOP SHALL BE PROVIDED TO PREVENT MOISTURE FROM ENTERING THE WEATHER HEAD. IN ALL CASES THE WEATHER LOOP SHALL BE LIMITED TO A MAXIMUM OF 24" INCHES.

2. WHEN THE UNDERGROUND SERVICE IS INSTALLED ON A SERVICE POLE, A SHORT PIECE OF INSULATED ALUMINUM CONDUCTOR MUST BE CONNECTED TO THE CUSTOMERS COPPER SERVICE CONDUCTOR BEFORE IT CAN BE CONNECTED TO THE ALUMINUM SECONDARY CONDUCTOR. THE SIZE OF THE INSULATED ALUMINUM CONDUCTOR WILL NORMALLY BE #2, #2/0 OR #4/0.

3. APPROXIMATELY 6 FEET OF CONDUCTOR MUST BE PROVIDED TO CONNECT THE SECONDARY.

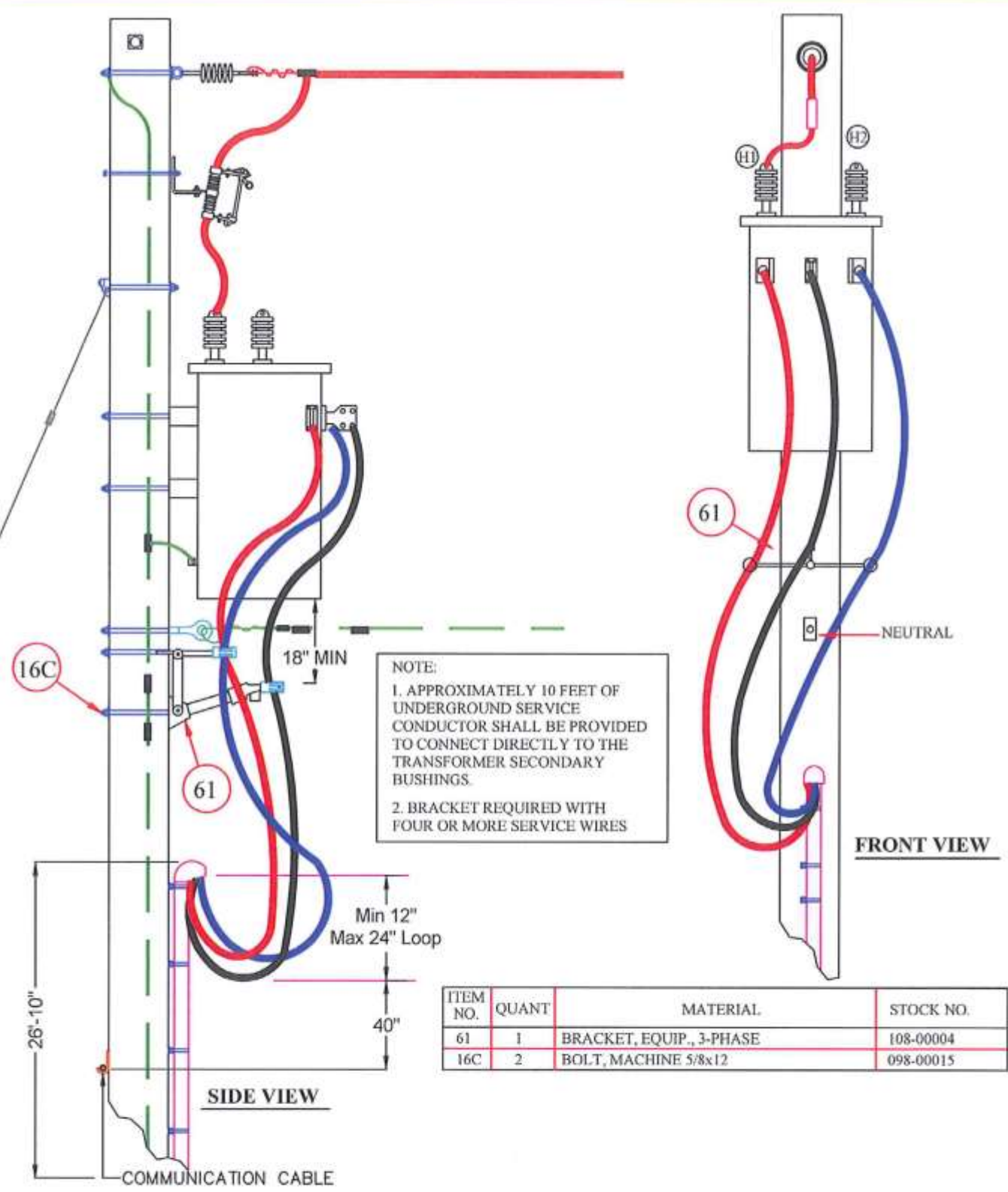


You've got the power
 457 NORTH SOUND RD.
 P.O. BOX 38 G.T., GRAND CAYMAN,
 CAYMAN ISLANDS, B.W.I.
 TELEPHONE: (345)-949-5300/5200

DATE: MAY 2013
DRAWN: DAC M.
REV: B
DATE: May 15, 2015

DISTRIBUTION STANDARDS	
SINGLE PHASE U/G SERVICE SECONDARY CONNECTION	
APPROVED BY:	STANDARD NO. 7-10
DATE: 2016-04-28	

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ITEM NO.	QUANT	MATERIAL	STOCK NO.
61	1	BRACKET, EQUIP., 3-PHASE	108-00004
16C	2	BOLT, MACHINE 5/8x12	098-00015



DATE: MAY 2013
DRAWN: DM

REV: D
DATE: May 26, 2015

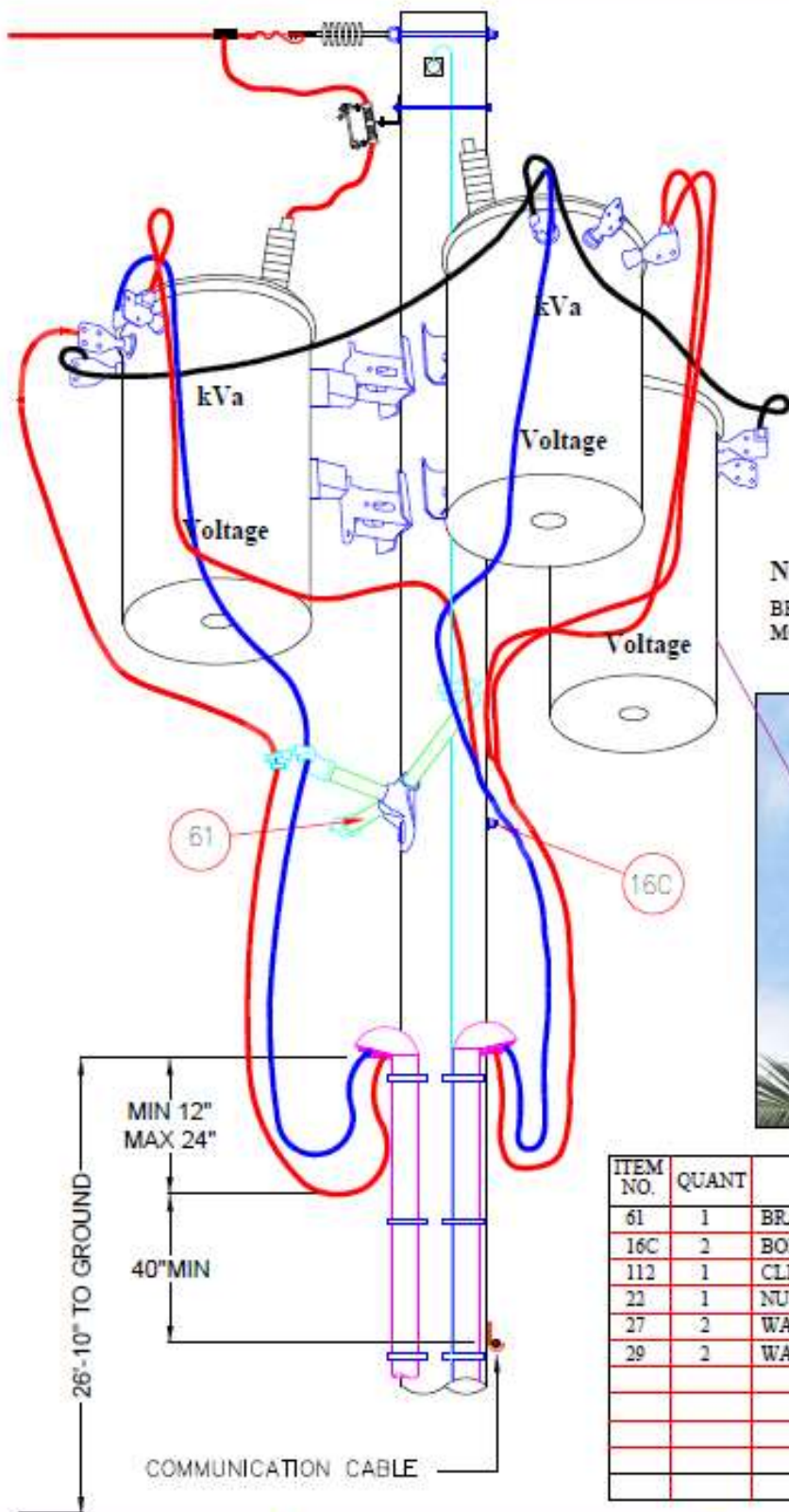
DISTRIBUTION STANDARDS

SINGLE PHASE U/G SERVICE TRANSFORMER CONNECTION

APPROVED BY: *[Signature]*

DATE: 2016 04 28

STANDARD NO.
7-11



NOTE:
BRACKET REQUIRED WITH FOUR OR MORE RUNS OF SERVICE WIRE



ITEM NO.	QUANT	MATERIAL	STOCK NO.
61	1	BRACKET, EQUIP., 3-PHASE	108-00004
16C	2	BOLT, MACHINE 5/8x12	098-00039
112	1	CLIP, 5/8" BONDING	188-00002
22	1	NUT, SQUARE, 5/8"	565-00005
27	2	WASHER, SQUARE, 5/8"	973-00005
29	2	WASHER, LOCK, DOUBLE COIL	973-00011



457 NORTH SOUND RD.
P.O. BOX 38 G.T., GRAND CAYMAN,
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TELEPHONE: (345)-949-5300/5200

DATE: MAY 2013
DRAWN: DM

REV: C
DATE: JUNE 20, 2019

DISTRIBUTION STANDARDS

**THREE PHASE TRANSFORMER
U/G SERVICE CONNECTION**

APPROVED BY:

STANDARD NO.

DATE :

7-12