

SECTION 10

TRANSFORMER INSTALLATIONS

TRANSFORMERS – GENERAL

Our general policy on transformer sizes and types are listed on page 10 – 3 and our general policy on U/G vs. O/H and services voltage is discussed on page 1-1. We have now standardized on a low loss transformer design as dictated by our high cost of generation (re losses) and in keeping with international environmental and energy conservation standards.

The low loss transformers are heavier because of the increase in the amount of core steel and winding material required to reduce losses; however, to compensate for this we have reduced the recommended size for three phase banks and will encourage U/G wherever possible.

CALCULATING TRANSFORMER LOADS

The KVA and/or Amperes load is calculated, for any voltage, using the following formulae:-

$$(a) \quad \text{SINGLE PHASE} \\ \text{KVA} = \frac{\text{Amperes} \times \text{Voltage}}{1000}$$

$$\text{Amperes} = \frac{\text{KVA} \times 1000}{\text{Voltage}}$$

$$(b) \quad \text{THREE PHASE} \\ \text{KVA} = \frac{\sqrt{3} \times \text{Amperes} \times \text{Voltage}}{1000}$$

$$\text{Amperes} = \frac{\text{KVA} \times 1000}{\sqrt{3} \times \text{Voltage}}$$

Transformer – Full Load Amperes							
Single Phase			Three Phase				
KVA	Amperes		KVA	Amperes			
	H.V.	240V		H.V.	240V	208V	480V
10	1.4	42	75	3.5	180	208	90
15	2.1	63	112	5.2	269	311	135
25	3.5	104	150	7.0	361	416	180
37.5	5.2	156	225	10.4	541	625	271
50	7.0	208	300	14.0	722	833	361
75	10.4	312	500	23.0	1203	1388	601
100	14.0	416	750	35.0			902
167	23.0	696	1000	46.0			1203
250	35.0	1042	1500	69.0			1804
333	46.0	1388	2000	92.0			2406

THREE PHASE: OPEN WYE – OPEN DELTA
NO NEW INSTALATIONS MAINTENANCE ONLY

Many of our services consist of a large single-phase load (120/240V) and a small three-phase load (240V); these are normally serviced with a two transformer, three-phase bank (closed delta, open delta). Both transformers carry the three-phase load and one carries the single-phase load. When using a open wye, open delta, each transformer is required to carry 58% of the three phase load. The transformers are normally referred to as the power transformer (carries three phase load only- smaller transformer and the lighting transformer (carries single phase load in addition to the three phase load – larger transformer).

For example, if a service is required to carry a single phase load of 28 KVA and a phase load of 11 KVA, the required transformer sizes are:-

	Large TFMR	Small TFMR
Single Phase	28 KVA	-
Three Phase (0.58 x 11)	6.4 KVA	6.4 KVA
Total Load	34.4 KVA	6.4 KVA
Actual TFMR SIZE	37.5 KVA	10.0 KVA

Another example – assuming a three-phase load requirement (customer) of 203 amperes, 37 amperes and 203 amperes, the transformer sizes can be determined as follows:

- (a) The three phase load is 37 amperes;

$$\text{KVA} = \frac{\sqrt{3} \times \text{amperes} \times \text{voltage}}{1000} = \frac{\sqrt{3} \times 37 \times 240}{1000} = 15.4$$

When using two transformers the requirement is 0.58 x 15.4 KVA = 8.9 KVA for each of the two transformers. Therefore a 10 KVA is adequate for the power transformer.

- (b) The single-phase load is 203 amperes, less the three-phase load of 37 amperes (203 – 37 = 166 amperes).

$$\text{KVA} = \frac{\text{amperes} \times \text{voltage}}{1000} = \frac{166 \times 240}{1000} = 39.8$$

- (c) The lighting transformer size is now:- Single phase – 39.8 KVA, plus three phase – 8.9 KVA = 48.7 KVA.

The power transformer (three phase) size is 10 KVA (load = 8.9 KVA) and the lighting or load transformer size if 50 KVA (8.9 KVA + 39.8 KVA = 48.7 KVA).

Since our smallest size transformer is 15 KVA (there may be some older 10KVA's available) we will have to use a 15KVA for the power transformer; a 50 KVA transformer is satisfactory for the lighting load, however, if additional capacity is required for growth, a 75 KVA will have to be used – now our bank size is a 15 KVA and a 74 KVA.

When calculating the load (KVA) for an existing three-phase (two transformer) bank, use the lighting transformer leg with the higher ampere reading.

LOCATING TRANSFORMERS ON THE POLE

The location of the transformer(s) on certain structures has an effect on the integrity of structure. Large single-phase transformers should never be placed on the side of a structure but rather on the front of the structure; the location of small transformers is not so important.

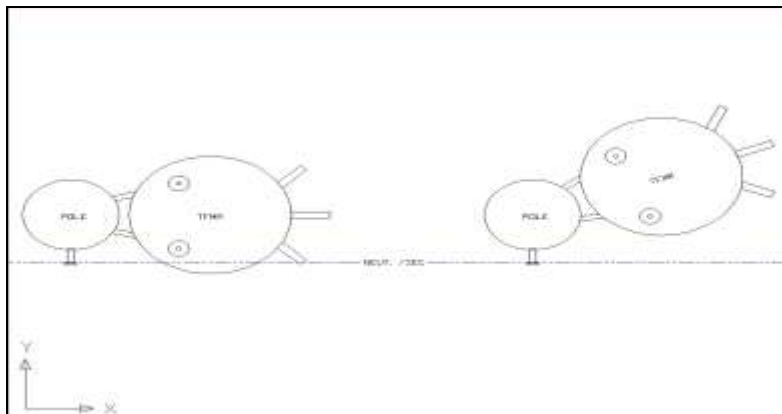
The overturning moment resulting from installing the transformer on the side of a pole is substantial; the resulting moment from a 167KVA transformer is equivalent to the pressure of a 45MPH wind on a single phase structure with 2/0 conductor. Unlike wind the overturning moment due to the transformer is continuous and in most cases will cause the pole to lean – which in turn will increase the overturning moment.

In some cases where the transformer tank is long or the space on the pole is not as per standards, we may want to lower the transformer location; the overturning moment can be minimized by installing the transformer off line, enough to clear the neutral or the neutral and secondary conductors. The clearance from the transformer tank to the neutral can be minimal as both are at ground potential; however the clearance from the transformer tank to the secondary conductors must be a minimum of 6 inches. With guyed structures (type B) it is normally quite practical to lower the transformer location and maintain the required clearance to the secondary conductors.

The bottom of the transformer shall not be less than 24'0" from the ground on any structure with communication attachments.

It is a good practice to use only type "A", "B" and "DE" structure types for transformer installations. The installation of transformers on structures type "DV" structures require working around working clearances, guys, cutouts, etc and not recommended.

It is also a good practice to minimize the number of HV connections at a structure; limit the structure to either a HV tap or transformer(s), preferably not both. Although we cannot determine the location of a primary tap, we normally have alternatives for the transformer location, particularly single phase installations.



TRANSFORMER TYPES

Our specifications call for an internal arrester in all pole-mounted transformers. We do however have number of older transformers with no internal arrester; these transformers will require an external lightning arrester. All pad-mounted transformers will be protected by a lightning arrester at the cable dip.

The standardized size and type of single-phase transformers are:

Single Phase Transformers SIZE (KVA) TYPE AND VOLTAGE			
Pole Mounted Transformers			Padmount Transformers
120/240V	227/480V	120/208V	120/240V
15			25
25	25	25	
37.5	37.5	37.5	
50	50	50	50
75	75	75	75
100	100	100	100
*167			167
*250			250

*Existing but not recommended for future Three Phase banks.

Three Phase Dead Front – Pad Mounted Transformers SIZE (KVA) TYPE AND VOLTAGE		
240/120 Volt For Maintenance only	120/208 Volt	277/480 Volt
Loop	Loop	Loop
-	75	-
225	225	225
300	300	300
500	500	500
		1000
		1500
		2000

TRANSFORMER INSTALLATIONS

Our overhead three phase transformer bank installations will generally be limited to 300KVA (3-100 KVA's); Open delta banks should be limited to 167 KVA for the lighting transformer.

Pad mounted transformers will generally be used for all three phase loads of 300 KVA and larger; 120/208 & 240/120 volt services are limited to 500 KVA. Our preferred voltage for three phase services, 300 KVA and larger 277/480 volt.

Transformer Lead Size				
Transformer Rating (KVA)	Primary Lead	Secondary Lead		Transformer Ground
		Neutral	Hot	
10 To 50	#2 SDBC	1-4/0 AAC Insulated	1-4/0 AAC Insulated	#2 SDBC
75 & 100	#2 SDBC	1-4/0 AAC Insulated	2-4/0 AAC Insulated	#2 SDBC

Fuse Link and Current Limiting Fuse		
Transformer Rating KVA	Fuse Size (7200/1,500 Volts)	
	Fuse Link	CLF
10	1.4 SF	12 K
15	2.1 SF	12 K
25	3.5 SF	12 K
37.5	5.2 SF	12 K
50	7.0 SF	12 K
75	10.4 SF	25 K
100	14.0 SF	25 K
167	21.0 SF	40 K
250	32.0 SF	40 K
333	46.0 SF	40 K

Transformer Weight & Height – Pole Mounted				
Rating KVA	Weight Range (lbs)		Height Range (lbs)	
	Standard Loss Older Types	Low Loss New Std.	Older Types	Low Loss New Std.
10				
15				
25				
37.5				
50				
75				
100				
167				
250				

**GUIDELINES FOR FUSING PROTECTION OF
DISTRIBUTION TRANSFORMERS**

SINGLE-PHASE TRANSFORMERS

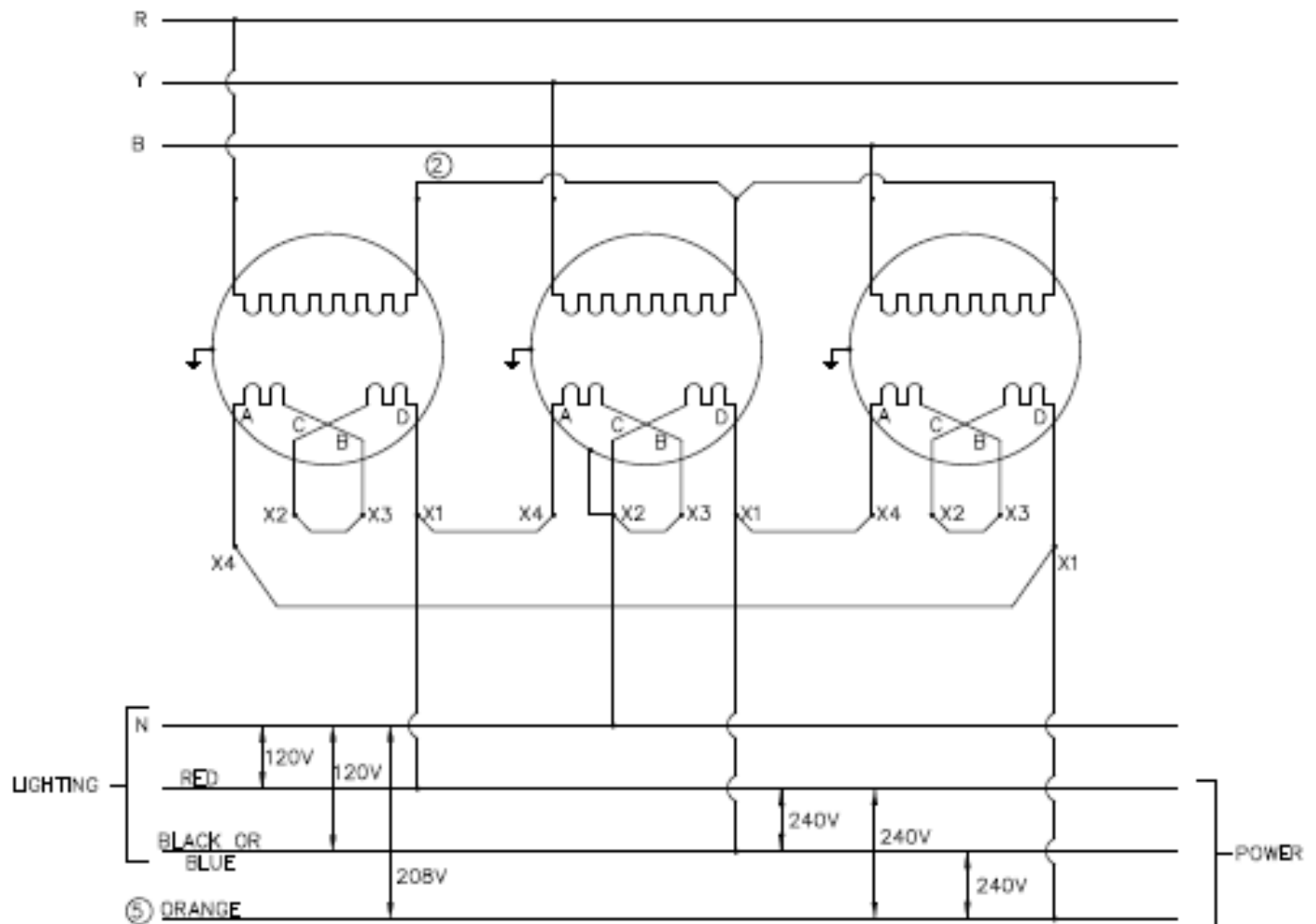
(Polemounted or padmounted, in 1-phase or 3-phase applications)

Tx. Size (kVA)	Fuse size (Amps)	Fuse Type	A.B. Chance Catalogue Number	CUC Stock Number
15	2.1	SloFast	M2D1SFA23	LIN 374 000 11
25	3.5	SloFast	M3D5SFA23	LIN 374 000 12
37.5	5.2	SloFast	M5D2SFA23	LIN 374 000 15
50	7.0	SloFast	M7D0SFA23	LIN 374 000 19
75	10.4	SloFast	M10D4SFA23	LIN 374 000 20
100	14.0	SloFast	M14SFA23	LIN 374 000 17
167	21.0	SloFast	M21SFA23	LIN 374 000 18
250	32.0	SloFast	M32SFA23	LIN 374 000 13
333	50.0	T	M50TA23	LIN 372 000 02


THREE-PHASE TRANSFORMERS

Tx. Size (kVA)	Fuse size (Amps)	Fuse Type	A.B. Chance Catalogue Number	CUC Stock Number
150	7.0	SloFast	M7D0SFA23	LIN 374 000 19
225	10.4	SloFast	M10D4SFA23	LIN 374 000 20
300	14.0	SloFast	M14SFA23	LIN 374 000 17
500	21.0	SloFast	M21SFA23	LIN 374 000 18
750	32.0	SloFast	M32SFA23	LIN 374 000 13
1000	50.0	T	M50TA23	LIN 372 000 02
1500	80.0	T	M80TA23	LIN 372 000 03
2000	100.0	T	M100TA23	LIN 372 000 04

3 PHASE 7200/12470 VOLT MULTI GROUNDED NEUTRAL, WYE CONNECTED SYSTEM.



NOTES:

1.  INDICATES A CONNECTION TO THE POLE GROUND.
2. THE PRIMARY NEUTRAL CONNECTION SHOULD NOT BE GROUNDING.
3. SECONDARY CONNECTIONS SHOWN FOR TRANSFORMER WITH FOUR SEPERATE EXTERNAL SECONDARY TERMINALS.
4. TRANSFORMERS RATING 7200-120/240 VOLT; (4 LV BUSHINGS)
5. SECONDARY 208V "HIGH" LEG IS DESIGNATED ORANGE IN ACCORDANCE WITH THE NEC. SECTION 230-56.
6. ADDITIVE POLARITY SHOWN; FOR INDIVIDUAL TRANSFORMERS WITH A SUBTRACTIVE POLARITY INTERCHANGE THE X1 AND X3 CONNECTIONS FOR THAT TRANSFORMER.



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PROJECT
**CUC
 STANDARDS**

DRAWING
WYE DELTA 240/120V

DATE: Aug. 2011

SCALE: NTS

DRAWN BY: DM

CHECKED BY: CJ

APPROVED BY: CUC SC

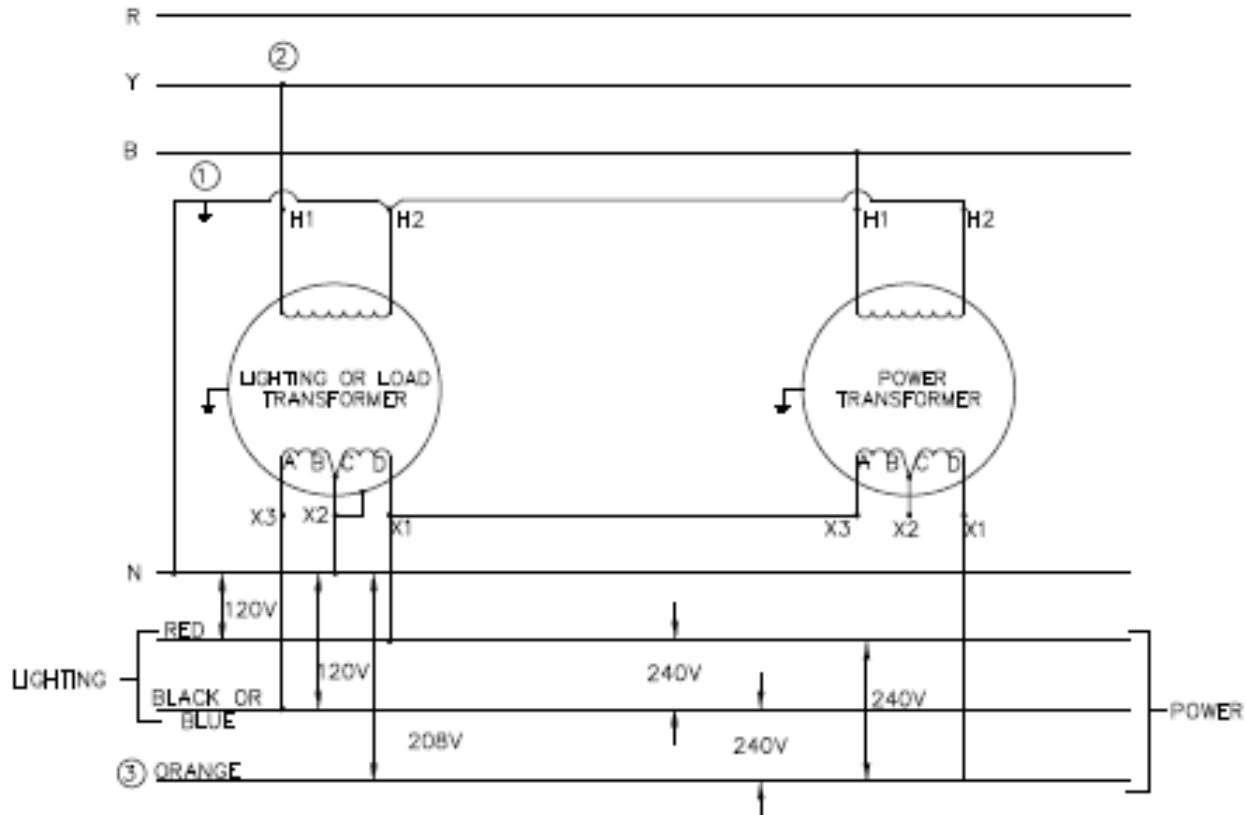
PROJECT # _____

DRAWING # 240/120V

SHEET # 01 OF 01

REV. # 

3 PHASE 7200/12470 VOLT MULTI GROUNDED NEUTRAL, WYE CONNECTED SYSTEM.



NOTES:

1.  INDICATES A CONNECTION TO THE POLE GROUND.
2. FOR DISTRIBUTION CIRCUITS WITH THE YELLOW (CENTRE) PHASE MORE HEAVILY LOADED THAN THE RED AND THE BLUE PHASE, CONNECT THE LOAD TRANSFORMER TO THE RED OR BLUE PHASE.
3. SECONDARY 208V "HIGH" LEG IS DESIGNATED ORANGE IN ACCORDANCE WITH THE NEC, SECTION 230-56.
4. ADDITIVE POLARITY SHOWN; FOR INDIVIDUAL TRANSFORMERS WITH A SUBTRACTIVE POLARITY INTERCHANGE THE X1 AND X2 CONNECTIONS FOR THAT TRANSFORMER.



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PROJECT
 CUC
 STANDARDS

DRAWING
 WYE OPEN DELTA
 240/120V

DATE: Aug. 2011

SCALE: NTS

DRAWN BY: DM

CHECKED BY: CJ

APPROVED BY: CUC SC

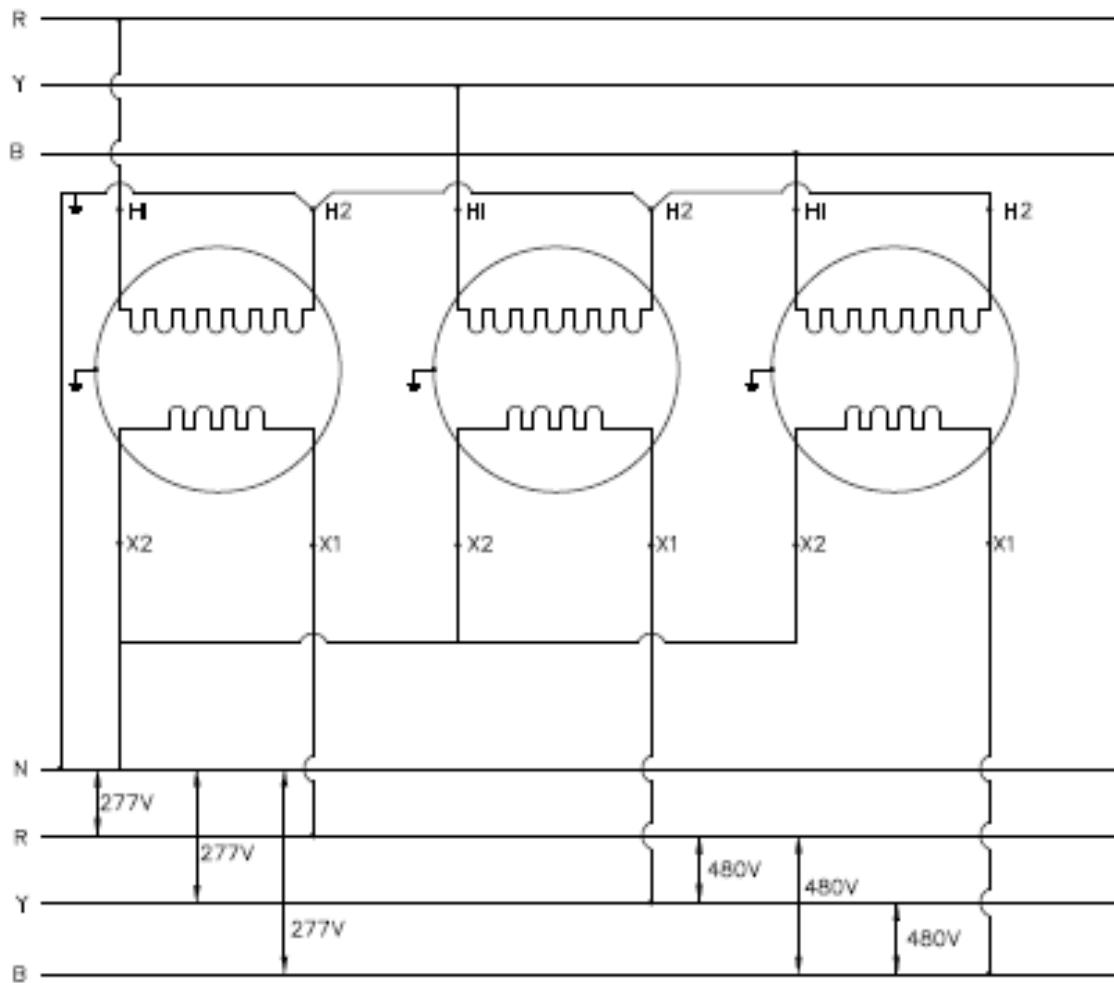
PROJECT # _____

DRAWING # 240/120V


SHEET # 01 OF 01

REV. # 

3 PHASE 7200/12470 VOLT MULTI GROUNDED NEUTRAL, WYE CONNECTED SYSTEM.



NOTES:

1.  INDICATES A CONNECTION TO THE POLE GROUND.
2. TRANSFORMER RATING 7200-277V.
3. ADDITIVE POLARITY SHOWN; FOR INDIVIDUAL TRANSFORMERS WITH A SUBSTRACTIVE POLARITY INTERCHANGE THE X1 AND X2 CONNECTIONS FOR THAT TRANSFORMER.




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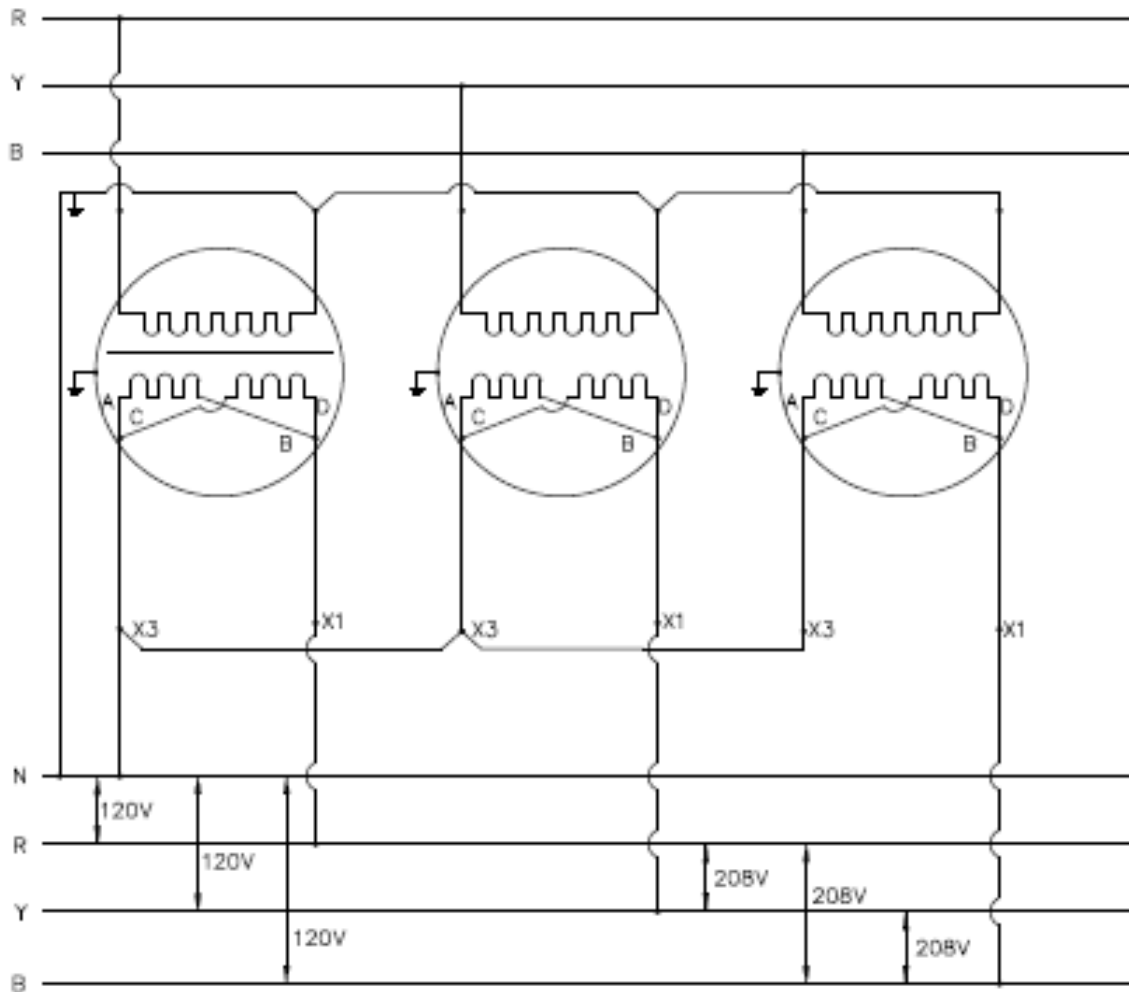
PROJECT
**CUC
 STANDARDS**

DRAWING
WYE - WYE 277/480V


DATE: Aug. 2011
 SCALE: NTS
 DRAWN BY: DM
 CHECKED BY: CJ
 APPROVED BY: CUC SC

PROJECT # _____
 DRAWING # 277/480V
 SHEET # 01 OF 01
 REV. # 

3 PHASE 7200/12470 VOLT MULTI GROUNDED NEUTRAL, WYE CONNECTED SYSTEM.



NOTES:

1.  INDICATES A CONNECTION TO THE POLE GROUND.
2. TRANSFORMER RATING 7200-120V; 120/240V WINDING LEADS MODIFIED INTERNALLY IN THE TEST SHOP TO PRODUCE 120V ONLY BETWEEN X1 & X3 TERMINALS.
3. FOR TRANSFORMERS WITH FOUR EXTERNAL SECONDARY BUSHINGS. SEE DIAGRAM Pg. 10-13.
4. ADDITIVE POLARITY SHOWN; FOR INDIVIDUAL TRANSFORMERS WITH A SUBTRACTIVE POLARITY INTERCHANGE THE X1 AND X3 CONNECTIONS FOR THAT TRANSFORMER.



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PROJECT
**CUC
 STANDARDS**

DRAWING
WYE - WYE 120/208V

DATE: Aug. 2011

SCALE: NTS

DRAWN BY: DM

CHECKED BY: CJ

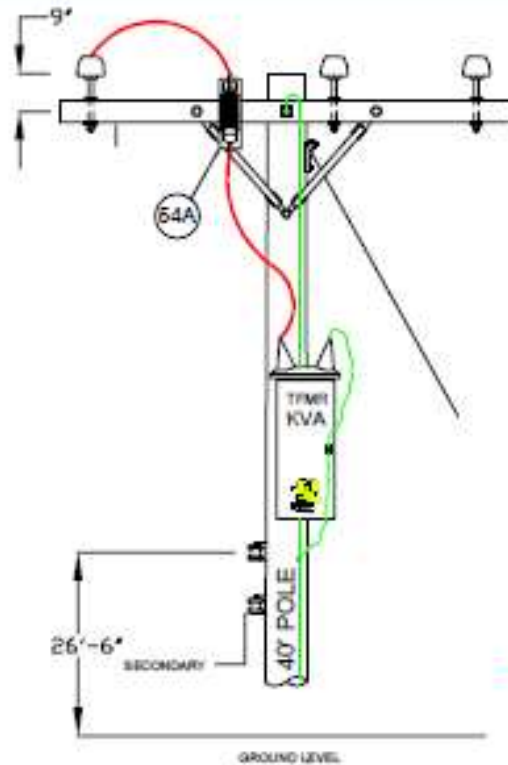
APPROVED BY: CUC SC

PROJECT # _____

DRAWING # 120/208

SHEET # 01 OF 01

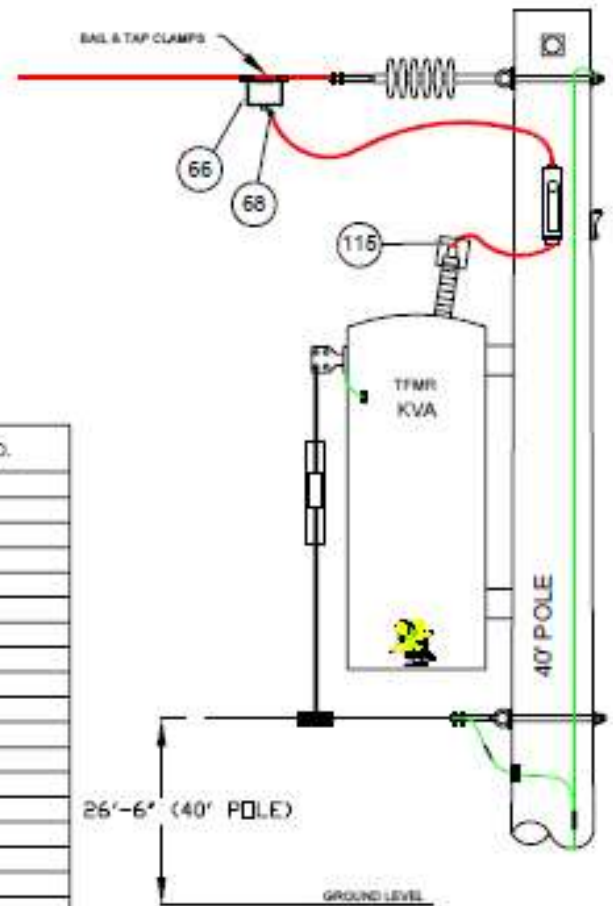
REV. # 



NOTES:

1. A 40' POLE IS REQUIRED FOR ALL TRANSFORMER INSTALLATIONS ON JOINT USE POLES UP TO 100 KVA. OVER 167KVA ASSESSEMENT ON POLE CLASS TO BE DONE FOR POLE LOADING

2. SEE DRAWING 10-15 FOR TX GROUNDING DEATILS.



ITEM NO.	QUANTITY		MATERIAL	STOCK NO.
	<50	>75		
26A	1	1	SCREW-LAG 1/2" X 3"	744-00001
27	3	3	WASHER-SQ. 5/8"	973-00005
60	1	1	BRACKET, MOUNTING T	108-00009
16C	3	3	BOLT MACHINE 5/8x12	098-00015
68	1	1	CLAMP, TAP BRONZE #8 BOL	183-00006
115	1	1	GUARD, TFMR BUSHING	411-00002
29	3	3	WASHER - DOUBLE COIL 5/8"	973-00011
64A	1	1	Switch Cutout, Dist	264-00002
66	1	1	Clamp, Bail 1/0-477	183-00001
112	1	1	Clip, 5/8 Bonding	188-00002
70A	3	3	Connector, Bartap 250	213-00002
72	2	2	Connector, TFMR Ground	213-00010
99B	15		Wire, 2/0 Copper PVC 600V	983-00003
82H	3		Sleeve-Service 2/0-2/0	785-00007
99C		25	Wire, Insulated, 4/0	983-00004
82L	3		Sleeve-Service 4/0-4/0	785-00010
28		5	Washer, Curved, 3/4"	973-00001
17A		2	Bolt, Machine 3/4"x12"	098-00009
		2	Washer, Double Coil 3/4"	973-00012
	1	1	Transformer	
	1	1	Fuselink	



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PROJECT
**CUC
STANDARDS**

DRAWING
SINGLE PHASE
TRANSFORMER
INSTALLATION 10-167KVA

DATE: Oct. 2011

SCALE: NTS

DRAWN BY: DM

CHECKED BY: CJ

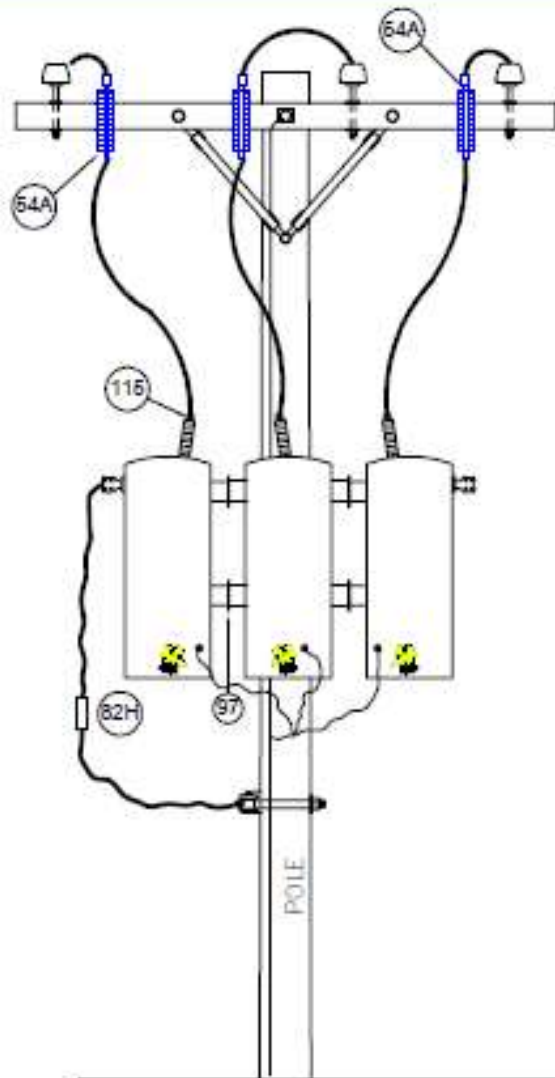
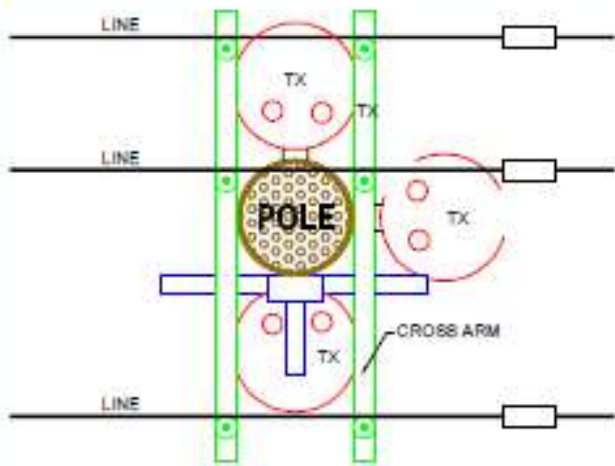
APPROVED BY: CUC DC

PROJECT # _____

DRAWING # 10-167KVA

SHEET # 01 OF 01

REV. # **A**



NOTES:

1. THE CLUSTER MOUNT BRACKETS SHALL BE POSITIONED ABOVE A THE NUTRAL BRACKET. AS SHOWN; DRILL HOLE FOR TOP CLUSTER MOUNT BRACKET 8-1/2" ABOVE THE NEUTRAL CLEWS BOLT.
2. THE TRANSFORMER MAY CONNECTIONS SHALL BE AS PER PAGES 10-8/13
3. THE THREE PHASE FIBERGLASS STANDOFF BRACKET CAN BE ACCESSED WITH SWITCH STICK FROM GROUND
4. IF A 45° & ABOVE POLE IS NEEDED FIBERGLASS CUTOUT BRACKET TO BE USED

ITEM NO.	QUANTITY			MATERIAL	STOCK NO.
	+37.5	50	+50		
26A	4	4	4	Screw, Lag 1/2" x 3"	744-00001
27	3	3	6	Washer, Square 5/8"	973-00005
97	1	1	1	Bracket, Cluster Mount	108-00005
16C	2	3	4	Bolt, Machine 5/8" x 12"	006-00015
66	3	3	3	Clamp, Ball 1/0-477	183-00001
68	3	3	3	Clamp, Tap Bronze #8 Sol	183-00006
115	3	2	2	Guard, TFMR Bushing	411-00002
20	2	2	2	Washer-Double Coil 5/8	973-00011
54A	3	3	3	Switch Cutout, Dial	264-00002
99B	25			Wire, 2/0 Copper PVC 600V	983-00003
		25	25	Wire, 4/0 Copper PVC 600V	983-00004
82H	1			Sleeve-Service 2/0-2/0	785-00007
82L		1	1	Sleeve-Service 4/0-4/0	785-00010
28		6	6	Curved Washer	973-00011
			6	Bolt, Machine 3/4" x 14"	
27			4	Bolt, Machine 5/8" x 10"	973-00005
	3	3	3	Transformer	
	3	3	3	Fuselink	



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PROJECT
**CUC
STANDARDS**

DRAWING
**THREE PHASE
TRANSFORMER BANK**

DATE: OCT. 2011

SCALE: NTS

DRAWN BY: DM

CHECKED BY: CJ

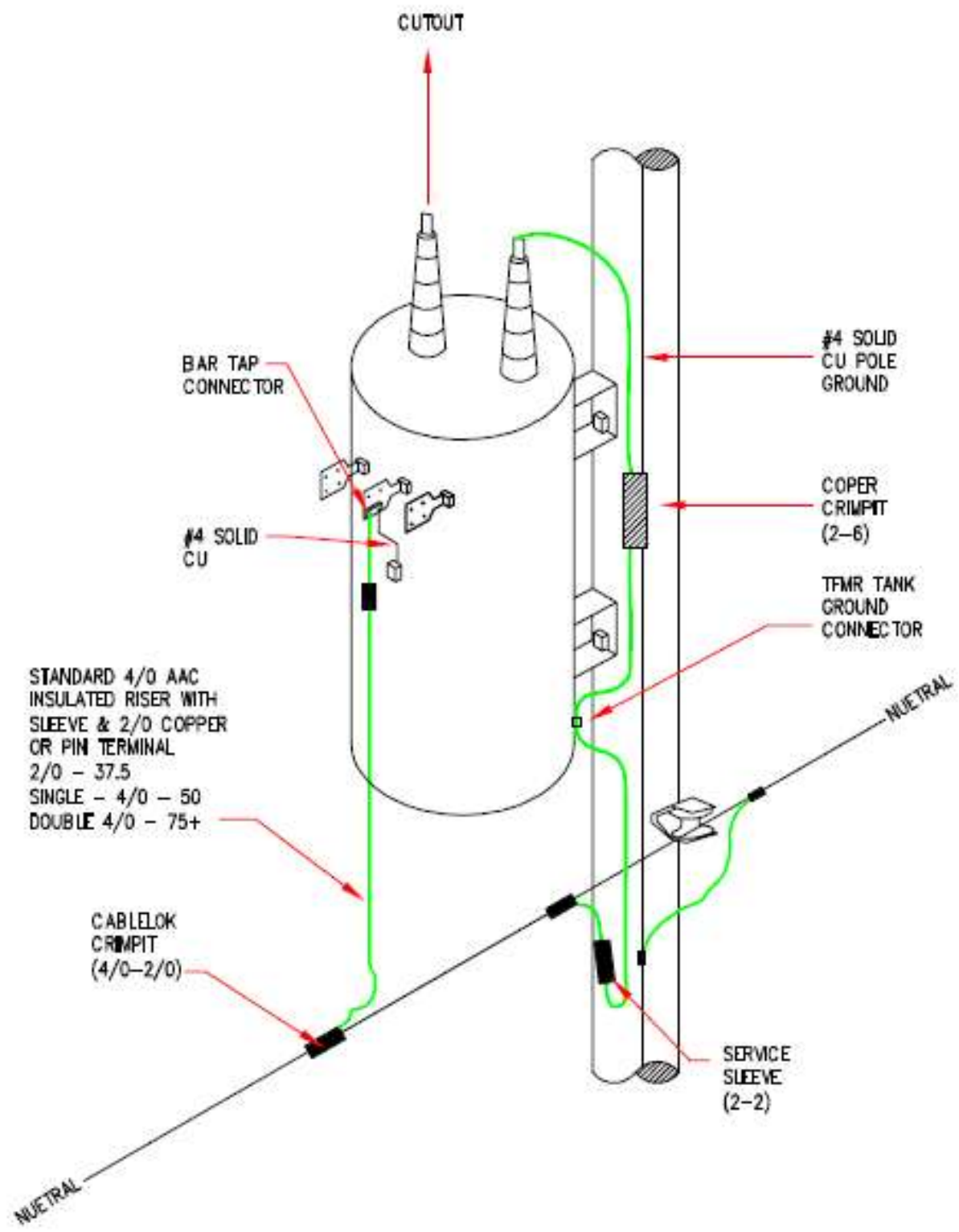
APPROVED BY: CUC DC

PROJECT # _____

DRAWING # 3 PHASE

SHEET # 01 OF 01

REV. # 



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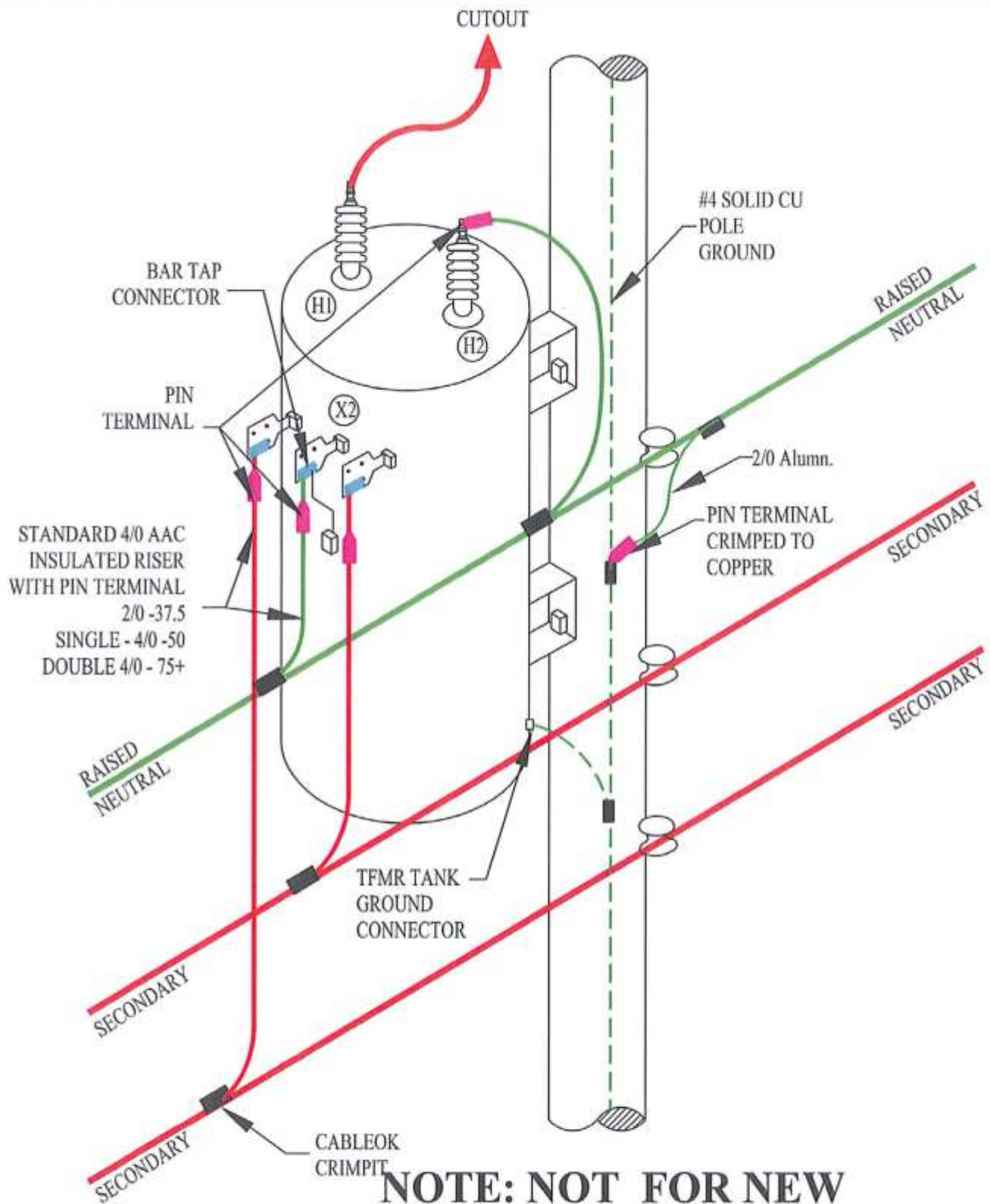
PROJECT
 CUC STANDARDS

DRAWING
 SINGLE PHASE TRANSFORMER
 GROUND CONNECTIONS

DATE:	JUNE 2007
SCALE:	NTS
DRAWN BY:	DM
CHECKED BY:	SC
APPROVED BY:	CUC SC

PROJECT #	_____
DRAWING #	GR-03
SHEET #	01 OF 01
REV. #	A

C:\Users\jacob\OneDrive\Documents\10-15A RAISED NEUTRAL SINGLE PHASE TRANSFORMER.dwg 4/6/2016 9:29:30 PM L:\ELECTRICAL



NOTE: NOT FOR NEW CONSTRUCTION



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

DATE: JUNE 2007
 DRAWN: DAC M.
 REV: C
 DATE: FEB 25, 2015

DISTRIBUTION STANDARDS

RAISED NEUTRAL SINGLE PHASE TRANSFORMER

APPROVED BY: *[Signature]*
 DATE: 2016-07-28

STANDARD NO.
 10-15A

THREE PHASE TRANSFORMER - FULL LOAD AMPERES

KVA	H.V.	120 V	208 V	240 V	277 V	480 V
75	3.47	361	208	180	156	90
100	4.63	481	278	241	208	120
150	6.94	722	416	361	313	180
225	10.42	1083	625	541	469	271
300	13.89	1443	833	722	625	361
500	23.15	2406	1388	1203	1042	601
750	34.72	3608	2082	1804	1563	902
1000	46.30	4811	2776	2406	2084	1203
1500	69.45	7217	4164	3608	3126	1804
2000	92.60	9623	5551	4811	4169	2406

120 120
 208 208
 240 240
 277 277
 480 480
 THREE PHASE H.V. 12470

KVA	IN RUSH CURRENT		COLD LOAD PICKUP			HOT LOAD PICKUP	
	I _{RUSH-12}	I _{RUSH-25}	I _{CLP-6}	I _{CLP-3}	I _{CLP-2}	I _{HLP-12}	I _{HLP-15}
75	41.7	86.8	20.8	10.4	6.9	41.7	52.1
100	55.6	115.7	27.8	13.9	9.3	55.6	69.4
150	83.3	173.6	41.7	20.8	13.9	83.3	104.2
225	125.0	260.4	62.5	31.3	20.8	125.0	156.3
300	166.7	347.2	83.3	41.7	27.8	166.7	208.3
500	277.8	578.7	138.9	69.4	46.3	277.8	347.2
750	416.7	868.1	208.3	104.2	69.4	416.7	520.9
1000	555.6	1157.5	277.8	138.9	92.6	555.6	694.5
1500	833.4	1736.2	416.7	208.3	138.9	833.4	1041.7
2000	1111.2	2315.0	555.6	277.8	185.2	1111.2	1389.0

- I_{RUSH-12} IN RUSH @ 12 TIMES RATED CURRENT @ 0.01 SECONDS
- I_{RUSH-25} IN RUSH @ 25 TIMES RATED CURRENT @ 0.01 SECONDS
- I_{CLP-6} COLD LOAD PICK UP @ 6 TIMES RATED CURRENT @ 1 SECOND
- I_{CLP-3} COLD LOAD PICK UP @ 3 TIMES RATED CURRENT @ 10 SECONDS
- I_{CLP-2} COLD LOAD PICK UP @ 2 TIMES RATED CURRENT @ 900 SECOND
- I_{HLP-12} HOT LOAD PICKUP @ 12 TIMES RATED CURRENT @ 0.1 SECOND
- I_{HLP-15} HOT LOAD PICKUP @ 15 TIMES RATED CURRENT @ 0.1 SECOND

SINGLE PHASE TRANSFORMER - FULL LOAD AMPERES

KVA	H.V.	120 V	240 V
10	1.39	83	42
15	2.08	125	63
25	3.47	208	104
37.5	5.21	313	156
50	6.94	417	208
75	10.4	625	313
100	13.9	833	417
167	23.2	1392	696

120 120
 240 240
 480 480
 SINGLE PHASE
 H.V. 7200

KVA	IN RUSH CURRENT		COLD LOAD PICKUP			HOT LOAD PICKUP	
	I _{RUSH-12}	I _{RUSH-25}	I _{CLP-6}	I _{CLP-3}	I _{CLP-2}	I _{HLP-12}	I _{HLP-15}
10	16.7	34.7	8.3	4.2	2.8	16.7	20.8
15	25.0	52.1	12.5	6.3	4.2	25.0	31.3
25	41.7	86.8	20.8	10.4	6.9	41.7	52.1
37.5	62.5	130.2	31.3	15.6	10.4	62.5	78.1
50	83.3	173.6	41.7	20.8	13.9	83.3	104.2
75	125.0	260.4	62.5	31.3	20.8	125.0	156.3
100	166.7	347.2	83.3	41.7	27.8	166.7	208.3
167	278.3	579.9	139.2	69.6	46.4	278.3	347.9

I_{RUSH-12} IN RUSH @ 12 TIMES RATED CURRENT @ 0.01 SECONDS

I_{RUSH-25} IN RUSH @ 25 TIMES RATED CURRENT @ 0.01 SECONDS

I_{CLP-6} COLD LOAD PICK UP @ 6 TIMES RATED CURRENT @ 1 SECOND

I_{CLP-3} COLD LOAD PICK UP @ 3 TIMES RATED CURRENT @ 10 SECONDS

I_{CLP-2} COLD LOAD PICK UP @ 2 TIMES RATED CURRENT @ 900 SECOND

I_{HLP-12} HOT LOAD PICKUP @ 12 TIMES RATED CURRENT @ 0.1 SECOND

I_{HLP-15} HOT LOAD PICKUP @ 15 TIMES RATED CURRENT @ 0.1 SECOND