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3				
2	12/16/13	KATIGBAK	GUINN	ADCOCK
1	3/22/13	KATIGBAK	GUINN	ADCOCK
0	10/28/10	CECCONI	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

SECTION 6 - POLE MOUNT TRANSFORMERS

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DWG.
06.00-00A

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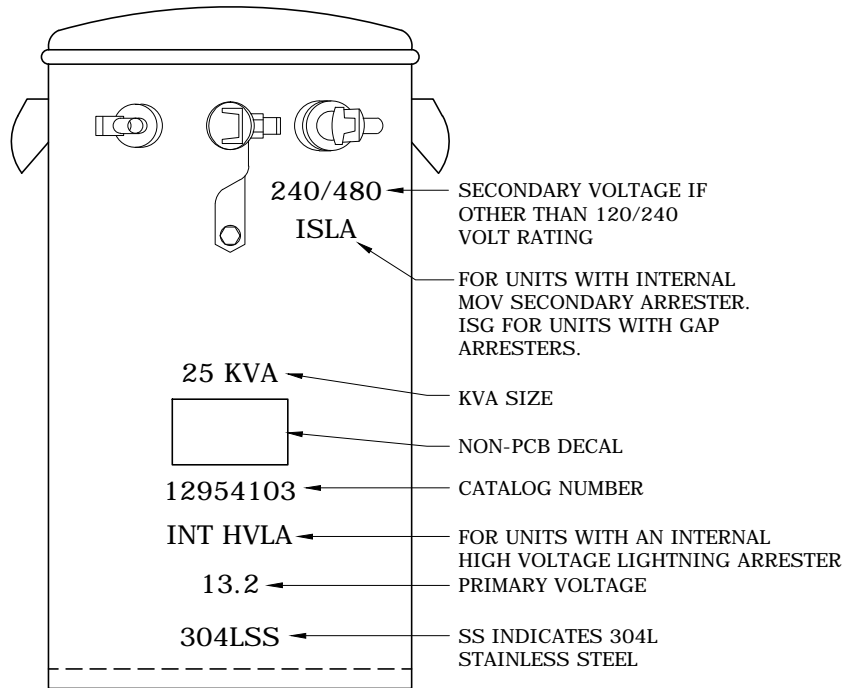


3	12/17/14	KATIGBAK	GUINN	ADCOCK
2	10/9/13	KATIGBAK	GUINN	ADCOCK
1	8/27/12	KATIGBAK	BURLISON	ELKINS
0	7/10/10	CECCONI	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

SECTION 6 - POLE MOUNT TRANSFORMERS

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DEC	DEM	DEP	DEF
		X	
06.00-00B			



NOTES:

1. NAMEPLATE LOCATED ON UPPER HANGER BRACKET.

3				
2				
1				
0	9/2/10	SIMMONS	GUILIN	ELKINS
REVISED	BY	CK'D	APPR.	

POLEMOUNT TRANSFORMER MARKINGS

 **Progress Energy**

CAR DWG. 06.00-01

CATALOG NUMBER	COMPATIBLE UNIT	KVA SIZE	PRIMARY VOLTS	STYLE	SECONDARY VOLTS
12920609	TFO10SM12CC	10	7.2	1BC	120/240
12920708	TFO15SM12CC	15	7.2	1BC	120/240
12920807	TFO25SM12CC	25	7.2	1BC	120/240
12920906	TFO37SM12CC	37.5	7.2	1BC	120/240
12921003	TFO50SM12CC	50	7.2	1BC	120/240
12930608	TFO10SM23CC	10	13.2	1BC	120/240
12930707	TFO15SM23CC	15	13.2	1BC	120/240
12930806	TFO25SM23CC	25	13.2	1BC	120/240
12930905	TFO37SM23CC	37.5	13.2	1BC	120/240
12931002	TFO50SM23CC	50	13.2	1BC	120/240
* 12954004	TFO10SMKCC	10	7.2/13.2	1BC	120/240
* 12954608	TFO15SMKCC	15	7.2/13.2	1BC	120/240
* 12954103	TFO25SMKCC	25	7.2/13.2	1BC	120/240
* 12954202	TFO50SMKCC	50	7.2/13.2	1BC	120/240
12954301	TFO75DMJCC	75	7.2/13.2	2BC	120/240
12954400	TFO100DMJCC	100	7.2/13.2	2BC	120/240
12954509	TFO167DMJCC	167	7.2/13.2	2BC	120/240
12932307	TFO10DTM25CC	10	14.4	2BC	120/240
12932406	TFO15DTM25CC	15	14.4	2BC	120/240
12932505	TFO25DTM25CC	25	14.4	2BC	120/240
12932604	TFO37DTM25CC	37.5	14.4	2BC	120/240
12932703	TFO50DTM25CC	50	14.4	2BC	120/240
12932802	TFO75DTM25CC	75	14.4	2BC	120/240
12932901	TFO100DTM25CC	100	14.4	2BC	120/240
12933008	TFO167DTM25CC	167	14.4	2BC	120/240
12933107	TFO250DTM25CC	250	14.4	2BC	120/240
12933206	TFO333DTM25CC	333	14.4	2BC	120/240
12933305	TFO500DTM25CC	500	14.4	2BC	120/240
12934006	TFO25DTM25DC	25	14.4	2BC	240/480
12934204	TFO50DTM25DC	50	14.4	2BC	240/480
12934303	TFO75DTM25DC	75	14.4	2BC	240/480
12934402	TFO100DTM25DC	100	14.4	2BC	240/480
12934501	TFO167DTM25DC	167	14.4	2BC	240/480
12934600	TFO250DTM25DC	250	14.4	2BC	240/480
12934709	TFO333DTM25DC	333	14.4	2BC	240/480
12934808	TFO500DTM25DC	500	14.4	2BC	240/480

* NEW UNITS NO LONGER PURCHASED. CHECK ON AVAILABILITY PRIOR TO ORDERING.

NOTES:

1. SEE DWG. 06.00-10B FOR MORE TRANSFORMERS AND NOTES.

3				
2				
1				
0	6/30/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

POLEMOUNT TRANSFORMER CATALOG NUMBERS



CATALOG NUMBER	COMPATIBLE UNIT	KVA SIZE	PRI VOLTS	STYLE	SEC VOLTS
12936001	TFO25DTM25FC	25	14.4	2BC	277
12936209	TFO50DTM25FC	50	14.4	2BC	277
12936308	TFO75DTM25FC	75	14.4	2BC	277
12936407	TFO100DTM25FC	100	14.4	2BC	277
12936506	TFO167DTM25FC	167	14.4	2BC	277
12936605	TFO250DTM25FC	250	14.4	2BC	277
12936704	TFO333DTM25FC	333	14.4	2BC	277
12936803	TFO500DTM25FC	500	14.4	2BC	277
** 9220180426	TFO75DM12CC	75	7.2	2BC	120/240
** 9220180429	TFO100DM12CC	100	7.2	2BC	120/240
** 9220180432	TFO167DM12CC	167	7.2	2BC	120/240
9220214651	TFO3SM12CC	3	7.2	1BC	120/240
9220214660	TFO3SM23CC	3	13.2	1BC	120/240

* NEW UNITS NO LONGER PURCHASED. CHECK ON AVAILABILITY PRIOR TO ORDERING.
** NEW CATALOG NUMBER: CHECK ON AVAILABILITY OR LEAD TIME

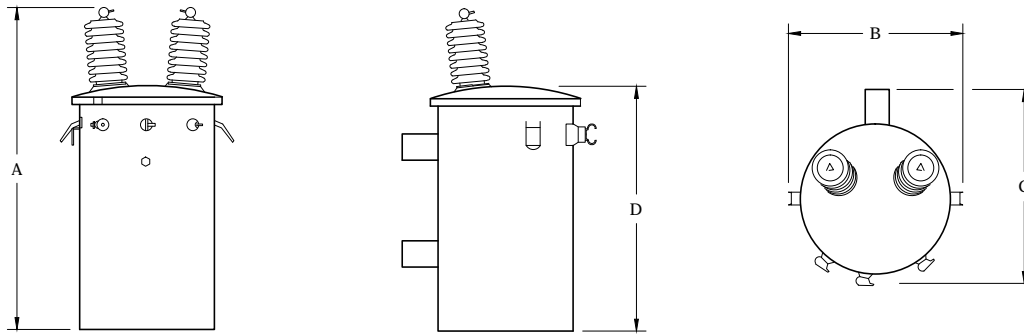
NOTES:

- AS A GENERAL RULE, OVERHEAD-TYPE TRANSFORMERS USED ON THE PROGRESS ENERGY CAROLINAS DISTRIBUTION SYSTEM DO NOT HAVE VOLTAGE ADJUSTMENT TAPS. THE EXCEPTION IS:
2-BUSHING CONVENTIONAL UNITS WITH PRIMARY VOLTAGE RATINGS OF 14.4KV
THESE UNITS HAVE FOUR (4) TAPS BELOW NORMAL AT THE FOLLOWING VOLTAGES:
13800 / 13200 / 12870 / 12540.
- SEE DWGS. 12.06-01A AND 12.06-01B FOR STAINLESS STEEL POLE TYPE TRANSFORMERS. THESE UNITS UNITS ARE TO BE USED ONLY IN DESIGNATED COASTAL AREAS.
- SEE DWG. 06.00-10A FOR OTHER TRANSFORMERS.

3				
2				
1				
0	10/14/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

POLEMOUNT TRANSFORMER CATALOG NUMBERS





TRANSFORMER DIMENSIONS (INCHES)												
KVA	12470 120/240 VOLTS				22860 120/240 VOLTS				34500 120/240 VOLTS			
	A	B	C	D	A	B	C	D	A	B	C	D
3	29	15	17	20	34	14	18	21	38	18	22	22
10	31	24	20	22	36	24	20	21	39	26	22	21
15	31	26	22	22	36	26	22	22	39	26	22	21
25	31	26	22	22	42	26	22	22	41	26	24	23
37.5	33	24	26	22	38	26	26	27	43	28	26	26
50	35	26	27	24	38	26	27	25	45	28	26	28
75	43	25	32	31	47	29	32	33	51	25	32	32
100	45	25	32	34	48	31	34	33	51	33	35	32
167	57	28	35	45	54	33	35	41	64	28	35	45
250	58	38	36	45	58	38	36	45	-	-	-	-
333	59	45	39	46	59	45	39	46	-	-	-	-
500	70	46	45	58	70	46	45	58	-	-	-	-

TRANSFORMER WEIGHT (POUNDS) AND OIL CAPACITY (GALLONS)						
KVA	12470 120/240 VOLTS		22860 120/240 VOLTS		34500 120/240 VOLTS	
	WEIGHT (LBS.)	OIL CAPACITY (GALLONS)	WEIGHT (LBS.)	OIL CAPACITY (GALLONS)	WEIGHT (LBS.)	OIL CAPACITY (GALLONS)
3	131	4	141	5	216	8
10	230	8	227	8	280	11
15	275	11	330	12	304	10
25	313	10	440	14	425	15
37.5	409	12	493	16	525	20
50	505	15	568	15	638	21
75	847	35	818	28	942	33
100	962	38	1068	39	1119	43
167	1497	68	1497	54	1570	71
250	1795	61	1795	61	-	-
333	2191	72	2191	72	-	-
500	3275	110	3275	110	-	-

NOTES:

1. THE DIMENSIONS, WEIGHTS AND OIL CAPACITIES LISTED ABOVE WILL VARY WITH THE MAKES AND STYLES OF TRANSFORMERS. CONTACT DISTRIBUTION STANDARDS FOR INFORMATION ON DESIGNS FOR SECONDARY VOLTAGES OTHER THAN 120/240 VOLTS.
2. "B" AND "C" DIMENSIONS INCLUDE COOLING FINS WHEN APPLICABLE.
3. APPROXIMATE NET WEIGHTS INCLUDE WEIGHT OF OIL.

3				
2				
1				
0	12/16/13	SIMMONS	GUINN	ADCOCK
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**TYPICAL TRANSFORMER DIMENSIONS,
WEIGHTS & OIL CAPACITIES**



CAR

DWG.
06.00-12

TYPES OF COMMERCIAL AND INDUSTRIAL BUSINESSES			
TYPE OF BUSINESS	PEAK DEMAND DURATION (HOURS)	TYPE OF BUSINESS	PEAK DEMAND DURATION (HOURS)
FAST FOOD	8	CONVENIENCE STORES	4
SUPERMARKETS	8	HOTELS	4
LARGE & SMALL RETAIL STORES	8	SMALL OFFICE BUILDINGS	4
LARGE OFFICE BUILDINGS	8	RESTAURANTS	4
		SCHOOLS	4

MAXIMUM KVA LOADING					
SINGLE-PHASE COMMERCIAL OVERHEAD CONVENTIONAL & CSP TRANSFORMERS					
TRANSFORMER SIZE	SUMMER (100%)	WINTER (140%)	TRANSFORMER SIZE	SUMMER (100%)	WINTER (140%)
10	10	14	50	50	70
15	15	21	75	75	105
25	25	35	100	100	140
37.5	37.5	52	167	167	233

MAXIMUM KVA LOADING					
SINGLE-PHASE RESIDENTIAL OVERHEAD TRANSFORMERS					
TRANSFORMER SIZE	SUMMER 130%	WINTER 160%	TRANSFORMER SIZE	SUMMER 130%	WINTER 160%
10	13	16	50	65	80
15	19	24	75	97	120
25	32	40	100	130	160
37.5	49	60	167	217	267

MAXIMUM KVA LOADING								
THREE-PHASE OVERHEAD CSP TRANSFORMER BANKS								
HOSPITALS AND SPECIAL CARE FACILITIES			INDUSTRIALS AND VAULTS					
BANK SIZE	SUMMER 100%	WINTER 140%	SUMMER 100%	WINTER 140%	4 HOUR PEAK		8 HOUR PEAK	
					SUMMER	WINTER	SUMMER	WINTER
45	45	63	45	63	54	73	46	63
75	75	105	75	105	90	122	77	105
112	112	156	112	156	134	181	115	157
150	150	210	150	210	180	243	155	210

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

MAXIMUM TRANSFORMER LOADING (OH)

MAXIMUM KVA LOADING (CONTINUED)

THREE-PHASE OVERHEAD CONVENTIONAL TRANSFORMER BANKS								
BANK SIZE OR TRANSFORMER SIZE	HOSPITAL AND SPECIAL CARE FACILITIES		INDUSTRIALS AND VAULTS		4 HOUR PEAK		8 HOUR PEAK	
	SUMMER 100%	WINTER 140%	SUMMER 100%	WINTER 140%	SUMMER	WINTER	SUMMER	WINTER
45	45	63	45	63	54	73	46	65
75	75	105	75	105	90	122	77	110
112	112	156	112	156	134	172	115	160
150	150	210	150	210	180	225	155	215
225	225	315	225	315	270	313	232	320
300	300	420	300	420	360	450	309	425
500	500	700	500	700	600	668	515	710
750	750	1,050	750	1,050	900	1,125	773	1,060
1,000	1,000	1,400	1,000	1,400	1,200	1,335	1,030	1,420
1,500	1,500	2,100	1,500	2,100	1,800	2,000	1,545	2,125

NOTES:

1. SELECT THE TYPE OF BUSINESS. THE CORRESPONDING DEMAND DURATION IS HOW LONG THE CUSTOMER'S DEMAND LASTS ON PEAK DAYS BASED ON DATA FROM LOAD RESEARCH STUDIES. THE CUSTOMER'S DEMAND TYPICALLY DROPS TO 75% OF THE MAXIMUM DURING ALL OTHER TIMES.
2. NOTE THAT TRANSFORMER LOADING IS GIVEN IN KVA. ADJUSTMENTS FOR POWER FACTOR NEED TO BE DEFINED BY THE ENGINEER.
3. HIGHLY FLUCTUATING INTERMITTENT LOADS (HFIL): TAKE THE SUM OF THE HFILS AND DIVIDE BY THREE ($\Sigma \text{HFIL}/3$), AND ADD TO THE CONSTANT LOAD. FUSE CURVES NEED TO BE CHECKED BY USING THE SUM OF THE HFIL (NOT DERATED BY 3) AND THE CONSTANT LOAD DUE TO FUSE PERFORMANCE.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

MAXIMUM TRANSFORMER LOADING (OH)



REPLACEMENT POLICY

DISTRIBUTION TRANSFORMERS ARE PRIMARY COST COMPONENTS IN PROVIDING CUSTOMER SERVICE. THE ESTIMATED SERVICE LIFE FOR TRANSFORMERS IS 30 YEARS. TRANSFORMERS SHOULD NOT BE REPLACED UNLESS ABSOLUTELY NECESSARY.

DO NOT REPLACE A TRANSFORMER UNLESS:

- PHYSICAL DAMAGE OCCURS THAT CANNOT BE FIELD REPAIRED SUCH AS BROKEN BUSHINGS, RUSTING, LEAKING OIL, PROBLEMS WITH SECONDARY BREAKER, ETC.
- THE CONDITION OF THE TRANSFORMER IS AN IMMEDIATE SAFETY HAZARD.
- THE TRANSFORMER IS OVERLOADED.
- THE TRANSFORMER IS UNDERLOADED AND CAN BE ECONOMICALLY DOWNSIZED.
- THE TRANSFORMER IS KNOWN TO HAVE A PCB CONCENTRATION OF 50 PPM OR MORE.

REINSTALLATION POLICY

ONLY NON-PCB TRANSFORMERS (LESS THAN 50 PPM) AS SHOWN BY BLUE DOT, BLUE NON-PCB LABEL, OR NAMEPLATE SHOULD BE INSTALLED. ANY TRANSFORMER OF UNKNOWN PCB CONTENT THAT HAS BEEN REMOVED FROM SERVICE SHOULD HAVE A "PCB ARTICLE STORAGE FOR REUSE" LABEL PLACED ON IT (CN 9220066730) AND SENT TO THE GARNER TRANSFORMER SHOP. THE LABEL MUST BE PLACED ON THE TRANSFORMER AS SOON AS IT ARRIVES AT THE L&S YARD.

NON-PCB TRANSFORMERS IN OPERABLE CONDITION SHOULD BE RESTOCKED AND RE-USED. DO NOT SEND OPERABLE TRANSFORMERS TO THE TRANSFORMER SHOP UNLESS THEY NEED REPAIR, PAINTING, TESTING, OR HAVE A KNOWN OR ASSUMED PCB CONTENT OF 50 PPM OR MORE.

A POLE MOUNT TRANSFORMER OF UNKNOWN PCB CONTENT MAY NOT BE TRANSFERRED FROM ONE POLE TO ANOTHER IN THE FIELD.

CSP UNITS

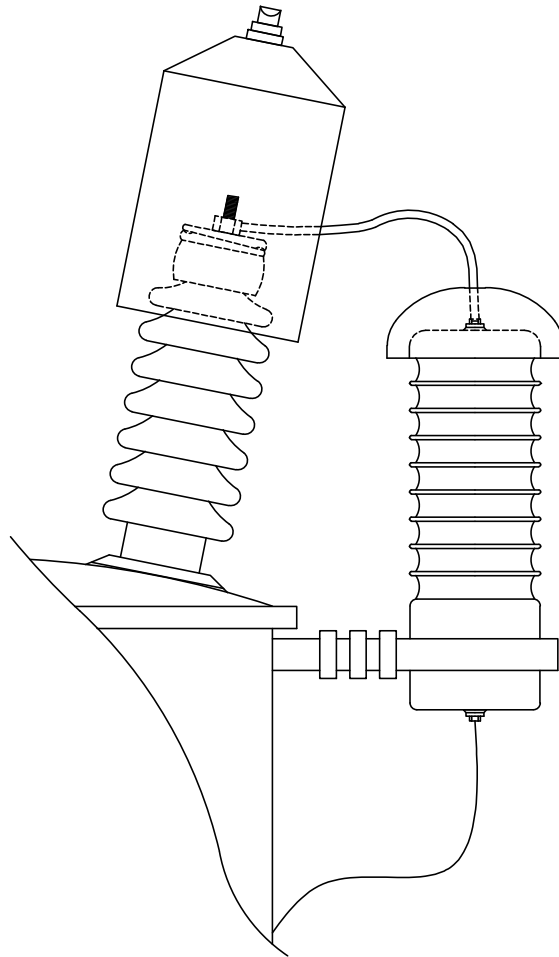
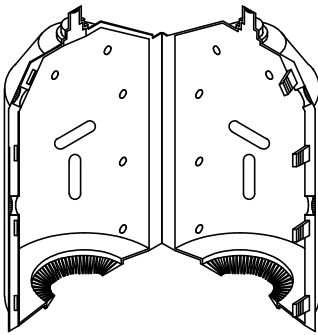
- ANY CSP UNIT BEING INSTALLED, REINSTALLED OR RE-ENERGIZED MUST HAVE A FUSED CUTOUT. IF AN ARRESTER NEEDS TO BE REPLACED ON A CSP UNIT AND A CUTOUT IS NOT PRESENT, INSTALL A CUTOUT WHEN THE ARRESTER IS REPLACED. FUSE THE CUTOUT WITH THE SAME FUSE SIZE AND FUSE SPEED REQUIRED FOR A SIMILAR CONVENTIONAL TRANSFORMER.



3				
2	6/5/14	SIMMONS	GUINN	ADCOCK
1	5/24/11	COX	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DISTRIBUTION TRANSFORMER POLICIES

DEC	DEM	DEP	DEF
		X	
06.00-20			



CU WGEQBUSHSNAPC
CN 10300507

NOTES:

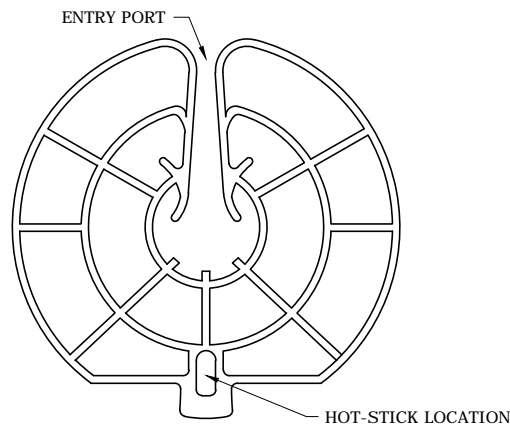
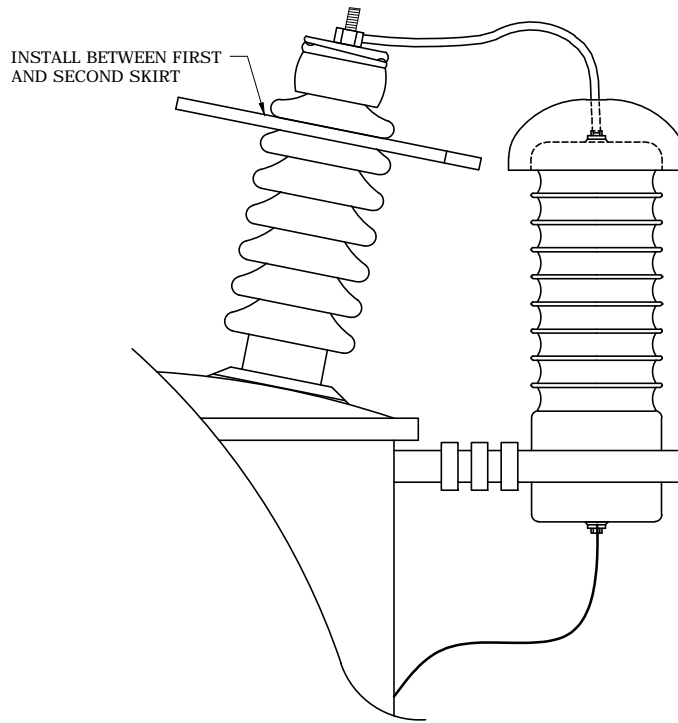
1. USE ON ALL NEW NON-COASTAL INSTALLATIONS. DO NOT INSTALL WILDLIFE GUARDS ON ANY TRANSFORMER INSTALLED IN A COASTAL ENVIRONMENT DUE TO SALT BUILDUP IN THE WILDLIFE GUARD.
2. INSTALL WILDLIFE GUARD ON TOP OF TRANSFORMER PRIMARY BUSHING BETWEEN THE FIRST AND SECOND SKIRT.
- 3. ALL NEW ARRESTERS ARE DIRECT CONNECTED WHERE THE LEAD SHOULD BE BROUGHT OUT OF THE SIDE SLOT (KNOCKOUT) ON THE WILDLIFE GUARD. EXTERNALLY GAPPED ARRESTERS SHALL BE REPLACED
4. ANY "SOFT TYPE" WILDLIFE GUARDS WHICH ARE REMOVED, SHALL BE SCRAPPED AND REPLACED.



3				
2	12/17/14	SIMMONS	GUINN	ADCOCK
1	6/5/14	SIMMONS	GUINN	ADCOCK
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

APPLICATION OF WILDLIFE GUARDS
ON TRANSFORMER BUSHINGS

DEC	DEM	DEP	DEF
		X	
06.00-23			



WGTRBUSHELECC
CN 9220097300

NOTES:

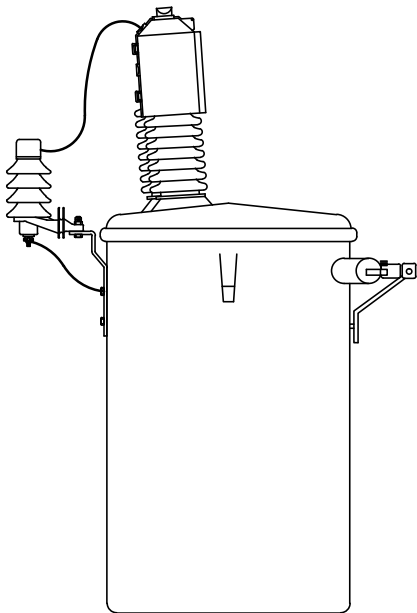
1. USE THESE GUARDS ONLY WHEN AN ANIMAL GUARD MUST BE STICK APPLIED.
2. INSPECT CONDITION OF INSULATOR PRIOR TO INSTALLATION. DO NOT INSTALL ON AN INSULATOR THAT IS SUSPECT.
3. USE ON SINGLE BUSHING TRANSFORMERS OR ON PRIMARY BUSHING ON A DOUBLE BUSHING TRANSFORMER.
4. DO NOT USE ON THE NORTH RIVER 34.5KV FEEDERS.
5. INSTALL WITH THE SPLIT OPENING POINTING TOWARDS THE LIGHTNING ARRESTER.
6. INSTALL WITH THE FLAT SIDE DOWN.
7. WHEN INSTALLED, THE OUTER EDGES SHOULD BE AT LEAST 1-1/2 INCHES FROM THE LIGHTNING ARRESTER LEAD AND 2-1/2 INCHES FROM THE ARRESTER INSULATOR. ALSO MAINTAIN AT LEAST 2-1/2 INCHES FROM THE POLE, OTHER INSULATORS OR ANY OTHER GROUNDED OBJECT.
8. DO NOT CUT OR ALTER THE GUARD TO MEET CLEARANCE REQUIREMENTS.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

ELECTROSTATIC WILDLIFE GUARDS

DUTY CYCLE (KV) RATINGS FOR ARRESTERS PROTECTING TRANSFORMERS

TRANSFORMER NAMEPLATE PRIMARY RATING	NUMBER OF PRIMARY BUSHINGS	SYSTEM PRIMARY RATING	TRANSFORMER PRIMARY CONNECTION		
			GROUNDING WYE	FLOATING WYE SEE NOTE 3	DELTA
12.47GRDY/7.2 KV	1-B	12.47KV	10	N/A	N/A
7.2/12.47Y KV	2-B	12.47KV	10	10	N/A
14.4/24.94Y KV	2-B	12.47KV	N/A	N/A	10 OR 18
14.4/24.94Y KV	2-B	22.86KV	18	18	N/A
22.86GRDY/13.2KV	1-B	22.86KV	18	N/A	N/A
19.92/34.5Y KV	2-B	34.5KV	27	27	N/A
34.5GRDY/19.92 KV	1-B	34.5KV	27	N/A	N/A



**CATALOG NUMBERS FOR TRANSFORMER ARRESTERS INCLUDING
MOUNTING BRACKET, PRIMARY RISER AND GROUND STRAP**

DUTY CYCLE RATING (KV)	CATALOG NUMBER	COMPATIBLE UNIT
10	11231107	AREQOHTR10C
18	11231800	AREQOHTR18C
27	14002364	AREQOHTR27C

NOTES:

- ARRESTERS SHALL BE POSITIONED SUCH THAT A BLOWN DISCONNECTOR WILL NOT AFFECT OTHER ENERGIZED EQUIPMENT.
- ALWAYS KEEP ARRESTER TAP AND GROUND LEADS AS SHORT AS POSSIBLE.
- WHEN POSSIBLE, ALWAYS MOUNT ARRESTERS ON THE TRANSFORMER TANK UNLESS THE PRIMARY IS CONNECTED FLOATING WYE. FOR FLOATING WYE-DELTA TRANSFORMER BANK CONNECTIONS, LOCATE ARRESTERS ON SOURCE-SIDE OF THE CUTOUT.
- CAUTION:** IF ARRESTER ISOLATOR HAS SEPARATED FROM THE ARRESTER, THE BOTTOM OF THE ARRESTER COULD BE ENERGIZED!
- ONCE SILICON CARBIDE ARRESTERS ARE REMOVED, THEY SHOULD BE SCRAPPED.
- GROUND RODS SHALL BE INSTALLED AT ALL POLES CONTAINING ARRESTERS ACCORDING TO THE STANDARD PROCEDURES OUTLINED ON DWGS. 01.01-01A, 01.01-01B, 01.01-01C, AND 01.01-05.
- ARRESTER GROUND STRAPS SHALL BE DIRECTLY CONNECTED AND GROUNDED TO THE TRANSFORMER TANK.

3				
2				
1				
O	10/28/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

POLEMOUNT TRANSFORMER ARRESTERS



CAR

DWG.
06.00-27

SINGLE TRANSFORMER SIZE (KVA)	ONE TRANSFORMER, SINGLE PHASE TWO TRANSFORMERS, THREE PHASE (OPEN WYE OR OPEN DELTA) THREE TRANSFORMERS, WYE CONNECTED			THREE TRANSFORMERS DELTA CONNECTED
	TRANSFORMER VOLTAGE RATING			TRANSFORMER VOLTAGE RATING
	7200	12540 13200 14400	19920	12540 14400
BELOW 10	1.25 AMP TYPE X 21123807	1.25 AMP TYPE X 21123807	N/A	N/A
10	2 AMP TYPE D 21123815	1.5 AMP TYPE D 21123823	1.25 AMP TYPE X 21123807	2 AMP TYPE D 21123815
15	3 AMP TYPE D 21123831	2 AMP TYPE D 21123815	1.25 AMP TYPE X 21123807	3 AMP TYPE D 21123831
25	5 AMP TYPE D 21123849	3 AMP TYPE D 21123831	2 AMP TYPE D 21123815	5 AMP TYPE D 21123849
37.5	7 AMP TYPE X 21123864	5 AMP TYPE D 21123849	3 AMP TYPE D 21123831	7 AMP TYPE X 21123864
50	10 AMP IS/KS/MS/S 21127303	7 AMP TYPE X 21123864	5 AMP TYPE D 21123849	10 AMP IS/KS/MS/S 21127303
75	15 AMP IS/KS/MS/S 21127402	7 AMP TYPE X 21123864	5 AMP TYPE D 21123849	15 AMP IS/KS/MS/S 21127402
100	20 AMP IS/KS/MS/S 21127501	10 AMP IS/KS/MS/S 21127303	7 AMP TYPE X 21123864	20 AMP IS/KS/MS/S 21127501
150	30 AMP IS/KS/MS/S 21127709	15 AMP IS/KS/MS/S 21127402	10 AMP IS/KS/MS/S 21127303	30 AMP IS/KS/MS/S 21127709
167	30 AMP IS/KS/MS/S 21127709	15 AMP IS/KS/MS/S 21127402	15 AMP IS/KS/MS/S 21127402	30 AMP IS/KS/MS/S 21127709
250	50 AMP IS/KS/MS/S 21127907	25 AMP IS/KS/MS/S 21127600	20 AMP IS/KS/MS/S 21127501	50 AMP IS/KS/MS/S 21127907
333	65 AMP IS/KS/MS/S 21128004	30 AMP IS/KS/MS/S 21127709	25 AMP IS/KS/MS/S 21127600	65 AMP IS/KS/MS/S 21128004
500	80 AMP IS/KS/MS/S 21128103	40 AMP IS/KS/MS/S 21127808	30 AMP IS/KS/MS/S 21127709	80 AMP IS/KS/MS/S 21128103

LEGEND

FUSE AMPERAGE RATING

FUSE TYPE

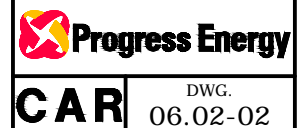
FUSE TYPE CATALOG NUMBER

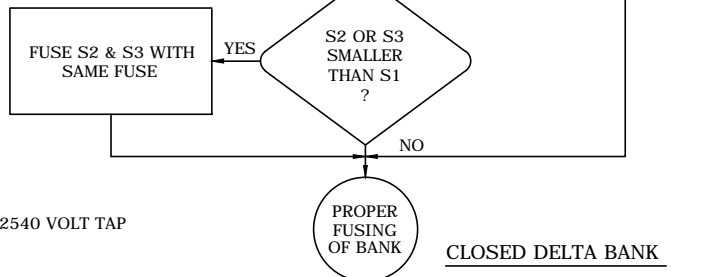
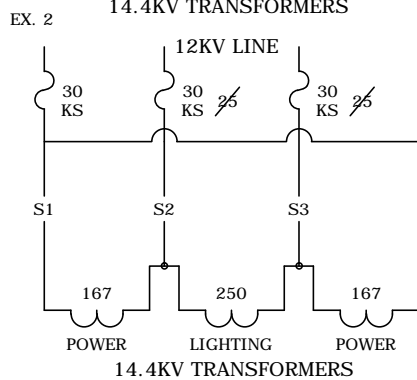
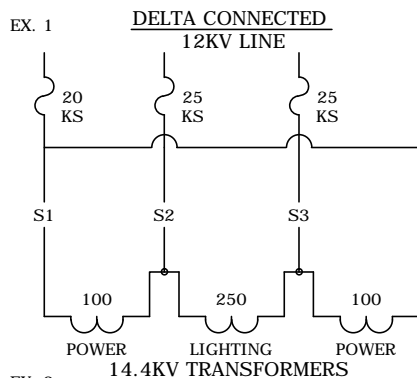
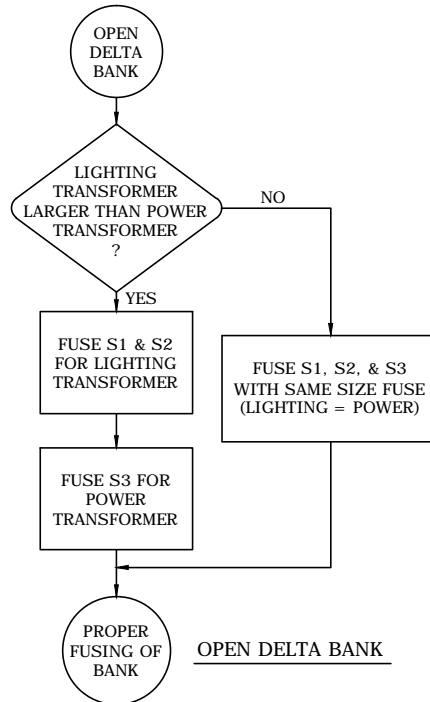
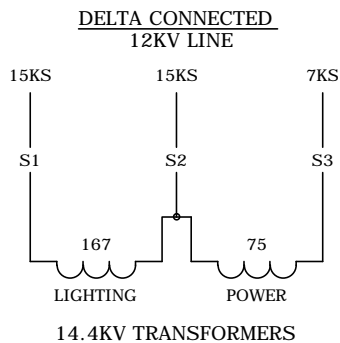
NOTES:

1. TYPE X FUSES ARE KEARNEY. TYPE D FUSES ARE COOPER.
2. TYPE IS, KS, MS AND S FUSES OF THE SAME AMPERE RATING CAN BE SUBSTITUTED FOR ONE ANOTHER. THESE ARE SOMETIMES REFERRED TO AS UNIVERSAL TYPE FUSES.
3. SEE DWG. 06.02-05 FOR FUSING OF DELTA BANKS.
4. FOR INSTALLATIONS NOT COVERED BY THIS TABLE CONTACT DISTRIBUTION STANDARDS.
5. WHEN ONE FUSE IS BLOWN ON A THREE PHASE BANK, ALL FUSES SHALL BE REPLACED.

3				
2				
1	8/17/12	SIMMONS	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TRANSFORMER FUSE TABLE





FOR OPEN AND CLOSED WYE CONNECTED BANKS FUSE EACH TRANSFORMER PER DWG. 06.02-02.

*TYPICALLY WILL BE ON THE 12540 VOLT TAP SETTING FOR 12KV

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

FUSING INSTRUCTIONS DELTA-DELTA TRANSFORMER BANKS (12KV LINE - 14.4KV TRANSFORMERS)

SINGLE-PHASE, WYE BANK OR OPEN DELTA BANK RISERS

TRANSFORMER SIZE KVA	SECONDARY			PRIMARY
	120/208V 3Ø WYE	120/240V 1Ø OR 3Ø 277/480V 3Ø WYE	480V 1Ø	2.4, 7.2 OR 14.4 KV 1Ø
	AL	AL	AL	CU
5	1/0	1/0	1/0	6 WP
10	1/0	1/0	1/0	6 WP
15	1/0	1/0	1/0	6 WP
25	4/0	1/0	1/0	6 WP
37.5	500	1/0	1/0	6 WP
50	500	4/0	1/0	6 WP
75	2-500	500	1/0	6 WP
100	2-500	500	4/0	6 WP
167	3-500	2-500	500	6 WP

CLOSED DELTA BANK RISERS

TRANSFORMER SIZE KVA	SECONDARY		PRIMARY	
	120/240V 3Ø	480V 3Ø	2.4 KV 3Ø	4.16, 12.5 OR 24.9 KV 3Ø
	AL	AL	CU	CU
5-5-5	1/0	1/0	6 WP	6 WP
10-10-10	1/0	1/0	6 WP	6 WP
15-15-15	1/0	1/0	6 WP	6 WP
25-25-25	4/0	1/0	6 WP	6 WP
37.5-37.5-37.5	4/0	1/0	6 WP	6 WP
50-50-50	500	4/0	6 WP	6 WP
75-75-75	2-500	500	2 WP	6 WP
100-100-100	2-500	500	2 WP	6 WP
167-167-167	3-500	2-500	2 WP	6 WP

NOTES:

1. ALL SECONDARY TRANSFORMER HOTLEG LEADS ARE 600 VOLT ALUMINUM CABLE WITH CROSS-LINKED POLYETHYLENE INSULATION. OVERHEAD NEUTRAL CONDUCTOR CAN BE BARE ALUMINUM.
2. SINGLE SERVICE CONNECTION TO TRANSFORMERS 50KVA AND BELOW SHALL USE STEM CONNECTORS. FOR MULTIPLE SERVICES, USE SECONDARY CONNECTOR (CN 153529). FOR TRANSFORMERS ABOVE 75 KVA, LEADS ARE NOT NECESSARY IF THE SERVICES WILL BE CONNECTED DIRECTLY TO THE SECONDARY BUSHINGS. MULTIPLE UNDERGROUND SERVICES SHALL BE FED BY A SINGLE RISER. SEE DWG. 21.04-01.
3. FOR OPEN DELTA-CONNECTED BANKS, EITHER 120/240 OR 240/480 VOLTS, LEADS NOT COMMON TO TWO TRANSFORMERS ARE TO BE SELECTED FROM THE SINGLE PHASE TABLE ABOVE ACCORDING TO THE SIZE OF EACH TRANSFORMER.
4. FOR CLOSED DELTA AND OPEN DELTA-CONNECTED BANKS MADE UP OF UNEQUAL SIZED TRANSFORMERS, LEADS AND JUMPERS COMMON TO TWO TRANSFORMERS ARE TO BE SIZED ACCORDING TO THE LARGER TRANSFORMER. USE TOP TABLE FOR OPEN DELTA CONNECTED BANKS AND BOTTOM TABLE FOR CLOSED DELTA CONNECTED BANKS.

3				
2				
1				
0	11/23/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TRANSFORMER RISER SIZES



TRANSFORMER SIZE KVA	DELTA BANK LEADS BETWEEN BUSHINGS	
	SECONDARY	
	120/240V 3Ø	480V 3Ø
	AL	AL
5-5-5	1/0	1/0
10-10-10	1/0	1/0
15-15-15	1/0	1/0
25-25-25	1/0	1/0
37.5-37.5-37.5	4/0	1/0
50-50-50	4/0	1/0
75-75-75	500	1/0
100-100-100	500	4/0
167-167-167	2-500	500

NOTES:

1. ALL SECONDARY TRANSFORMER HOTLEG LEADS ARE 600 VOLT ALUMINUM CABLE WITH CROSS-LINKED POLYETHYLENE INSULATION. OVERHEAD NEUTRAL CONDUCTOR CAN BE BARE ALUMINUM.
2. SINGLE SERVICE CONNECTION TO TRANSFORMERS 50KVA AND BELOW SHALL USE STEM CONNECTORS. FOR MULTIPLE SERVICES, USE SECONDARY CONNECTOR (CN 153529). FOR TRANSFORMERS ABOVE 75 KVA, LEADS ARE NOT NECESSARY IF THE SERVICES WILL BE CONNECTED DIRECTLY TO THE SECONDARY BUSHINGS. MULTIPLE UNDERGROUND SERVICES SHALL BE FED BY A SINGLE RISER. SEE DWG. 21.04-01.
3. FOR OPEN DELTA-CONNECTED BANKS, EITHER 120/240 OR 240/480 VOLTS, LEADS NOT COMMON TO TWO TRANSFORMERS ARE TO BE SELECTED FROM THE SINGLE-PHASE TABLE ABOVE ACCORDING TO THE SIZE OF EACH TRANSFORMER.
4. FOR CLOSED DELTA AND OPEN DELTA-CONNECTED BANKS MADE UP OF UNEQUAL SIZED TRANSFORMERS, LEADS AND JUMPERS COMMON TO TWO TRANSFORMERS ARE TO BE SIZED ACCORDING TO THE LARGER TRANSFORMER.

3				
2				
1				
O	11/23/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DELTA SECONDARY TRANSFORMER BUS SIZES



NOTES:

1. FOR TRANSFORMERS 75 KVA AND ABOVE, NO SECONDARY LEADS ARE NECESSARY. CONNECT SERVICES DIRECTLY TO THE SECONDARY BUSHINGS WITH TERMINAL LUGS (SEE DWG. 23.02-05).
2. SINGLE ALUMINUM SERVICE CONNECTIONS TO TRANSFORMERS 50KVA AND BELOW SHALL USE STEM CONNECTORS. FOR MULTIPLE SERVICES, USE SECONDARY CONNECTOR (ITEM # 153529) WITH COVER. FOR EXISTING TRANSFORMERS, MULTIPLE SERVICES MAY BE CONNECTED TOGETHER WITH ONE COMMON LEAD EXTENDING TO THE SECONDARY BUSHING. THE SIZE OF THE LEADS SHALL BE SIZED PER DWGS. 06.03-01A AND 06.03-01B.
- 3. ALL STEM CONNECTOR TERMINATIONS TO UNDERGROUND CABLES ARE TO BE AQUA-SEALED AND TAPED TO PREVENT WATER INTRUSION INTO THE CABLE.

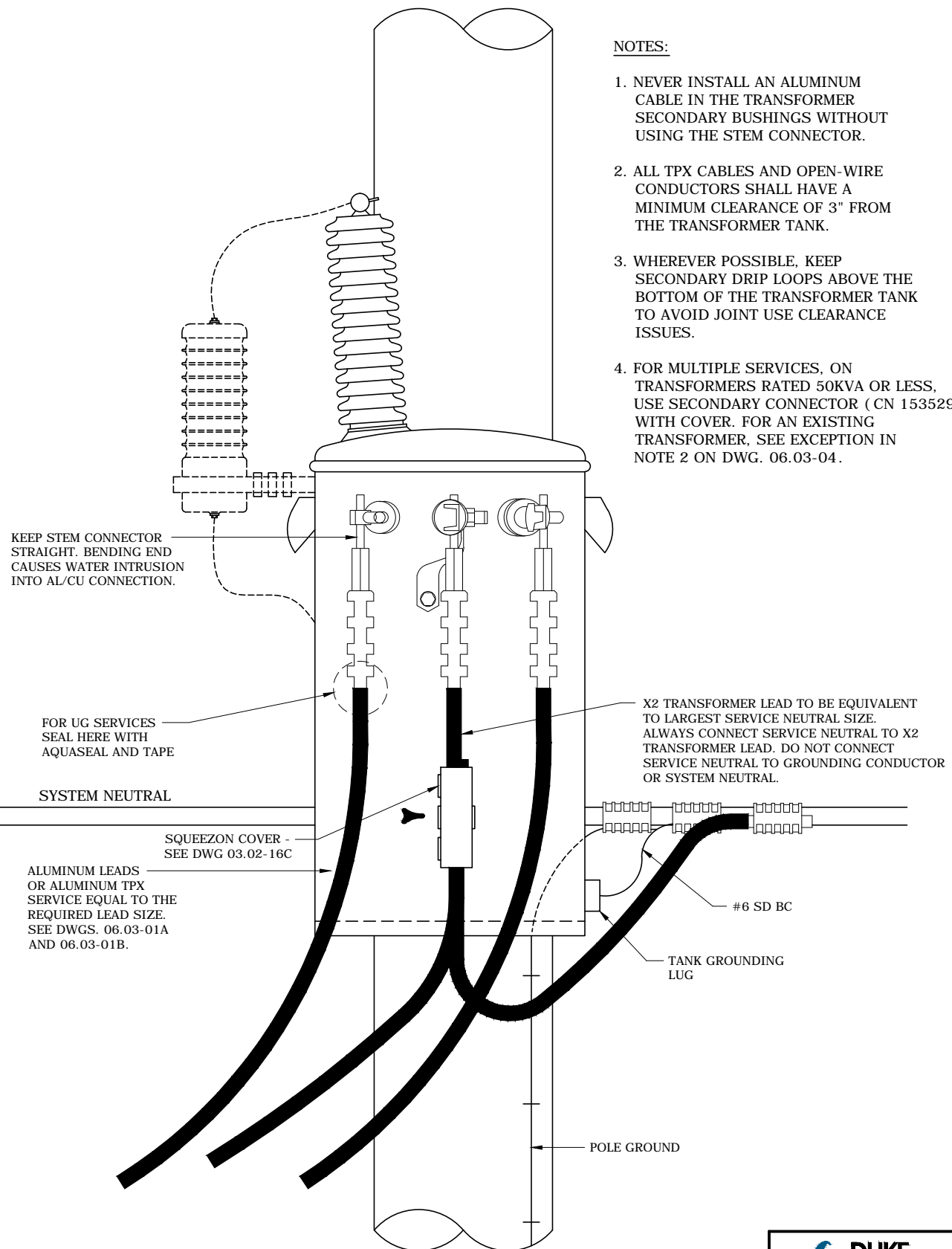
STEM CONNECTORS				DIES REQUIRED	
ITEM NUMBER	CONDUCTOR SIZE	COLOR CODE	STEM SIZE	BURNDY	KEARNEY
9220195899	#6 STR AL	BLUE	#4	W-BG	5/8
9220106044	#4 STR AL	ORANGE	#4 SOLID	W-BG	5/8
11199601	#2 STR AL	RED	#4 SOLID	W-BG	5/8
11199700	#1/0 STR AL	YELLOW	#2 SOLID	W-BG	840
11199809	#2/0 STR AL	GRAY	#1/0 SOLID	W-K840	840
11199502	#4/0 STR AL	PINK	#1/0 SOLID	W-K840	840
11199908	336.4 ACSR AL & 350 MCM AL	GREEN	1/2" DIA	W-K840	-
76333021	500 MCM	PINK	1/2" DIA	U34ART	1-1/8 - 1

3				
2	9/4/15	ROBESON	BURLISON	ADCOCK
1	1/31/13	SIMMONS	GUINN	ADCOCK
0	11/8/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

SECONDARY LEAD SPECIFICATIONS



DEC	DEM	DEP	DEF
		X	
06.03-04			



NOTES:

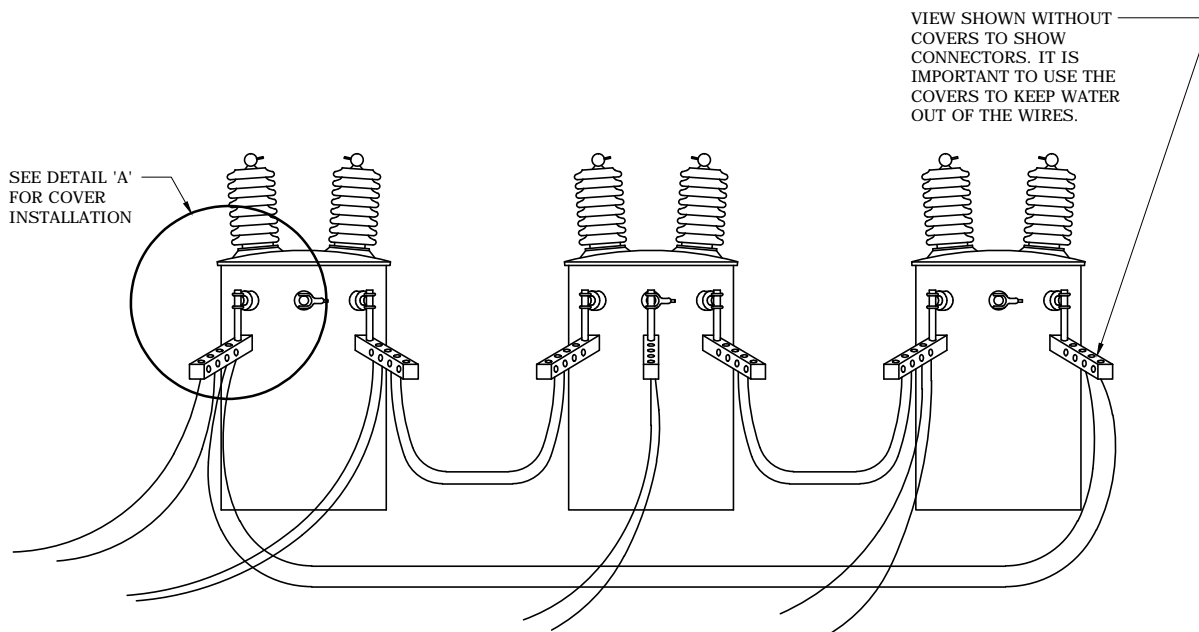
1. NEVER INSTALL AN ALUMINUM CABLE IN THE TRANSFORMER SECONDARY BUSHINGS WITHOUT USING THE STEM CONNECTOR.
2. ALL TPX CABLES AND OPEN-WIRE CONDUCTORS SHALL HAVE A MINIMUM CLEARANCE OF 3" FROM THE TRANSFORMER TANK.
3. WHEREVER POSSIBLE, KEEP SECONDARY DRIP LOOPS ABOVE THE BOTTOM OF THE TRANSFORMER TANK TO AVOID JOINT USE CLEARANCE ISSUES.
4. FOR MULTIPLE SERVICES, ON TRANSFORMERS RATED 50KVA OR LESS, USE SECONDARY CONNECTOR (CN 153529) WITH COVER. FOR AN EXISTING TRANSFORMER, SEE EXCEPTION IN NOTE 2 ON DWG. 06.03-04.



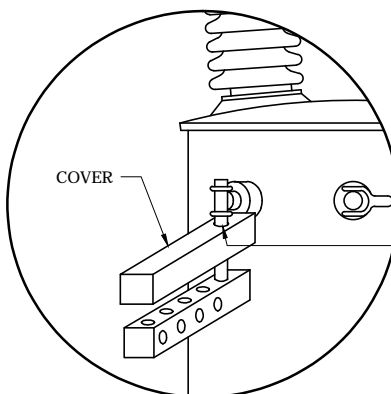
3	12/1/14	SIMMONS	DANNA	ADCOCK
2	4/4/13	DANNA	DANNA	ADCOCK
1	1/31/13	SIMMONS	GUINN	ADCOCK
0	11/23/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TRANSFORMER SECONDARY CONNECTION DETAILS

DEC	DEM	SEP	DEF
		X	X
06.03-05			



CU KTSTUD4H50ALC CN 153529 - STEM, 4-HOLE, 500 KCM, FOUR HOLE ALUMINUM SET SCREW BLOCK WITH TINNED COPPER 1/2 IN STUD, WITH COVER



DETAIL 'A'

NOTES:

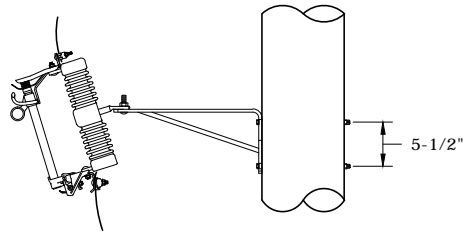
1. USE THESE CONNECTORS ON THREE-PHASE BANKS OR SINGLE-PHASE TRANSFORMERS WITH MULTIPLE SERVICES. TRANSFORMER UNITS MUST BE 50KVA OR SMALLER. LARGER UNITS WILL HAVE SECONDARY SPADES.
2. ALL BANK LEADS MUST BE FULLY INSULATED. SIZE PER DWGS. 06.03-01A AND 06.03-01B.
3. PUSH CONNECTOR STEM THROUGH COVER HOLE. CONNECT CONNECTOR STEM IN TRANSFORMER LUG. CLEAN WIRE AND APPLY INHIBITOR. INSERT WIRE IN BOTTOM OF CONNECTOR.
4. BEND WIRE AS NEEDED BEFORE INSERTING IN CONNECTOR.
5. MAINTAIN AT LEAST 3" CLEARANCE FROM TANK TO INSULATED LEAD.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

THREE-PHASE TRANSFORMER
BANK SECONDARY CONNECTORS

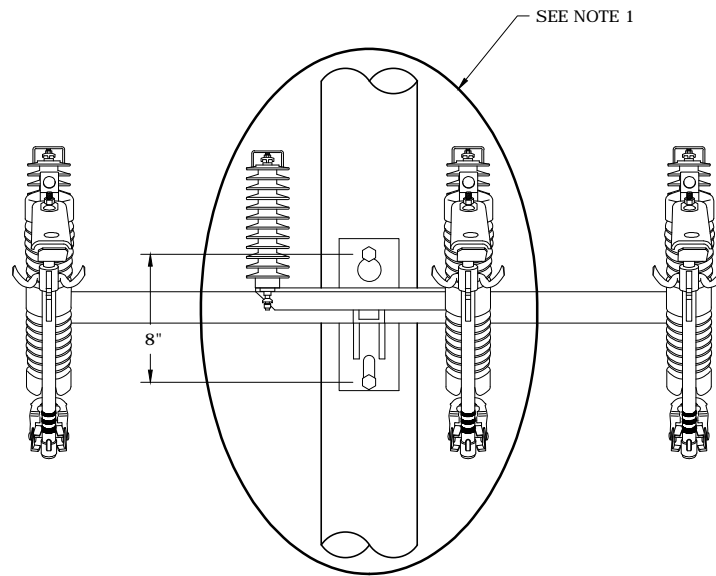


CAR DWG.
06.03-07



27KV TRANSFORMER CUTOUT BRACKET

CN 12912002 (BKTCOLA18STLC) 



STANDARD THREE-PHASE CUTOUT BRACKET

CN 12912101 (BKTCOLATRISTLC)

NOTES:

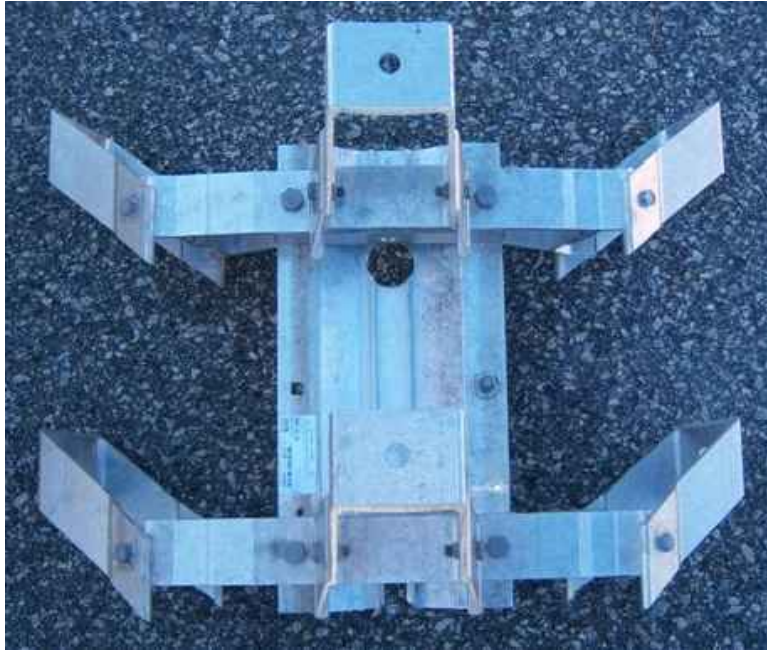
1. IF ARRESTER MOUNTING PROVISION EXISTS ON THE TRANSFORMER TANK, THE ARRESTERS SHOULD BE MOUNTED ON THE TANK UNLESS IT IS A 3-TRANSFORMER FLOATING WYE-DELTA BANK. LOCATE ARRESTERS FOR 3-TRANSFORMER FLOATING WYE-DELTA BANKS ON SOURCE SIDE OF CUTOUT. IF ARRESTERS COME MOUNTED ON TRANSFORMER TANK, RELOCATE TO SOURCE SIDE OF CUTOUTS. IF ARRESTER MOUNTING PROVISION DOES NOT EXIST, MOUNT THE ARRESTERS ON THE CUTOUT BRACKET.



3	8/5/14	GUINN	GUINN	ADCOCK
2	3/22/13	GUINN	GUINN	ADCOCK
1	8/29/12	KATIGBAK	GUINN	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TRANSFORMER CUTOUT BRACKETS

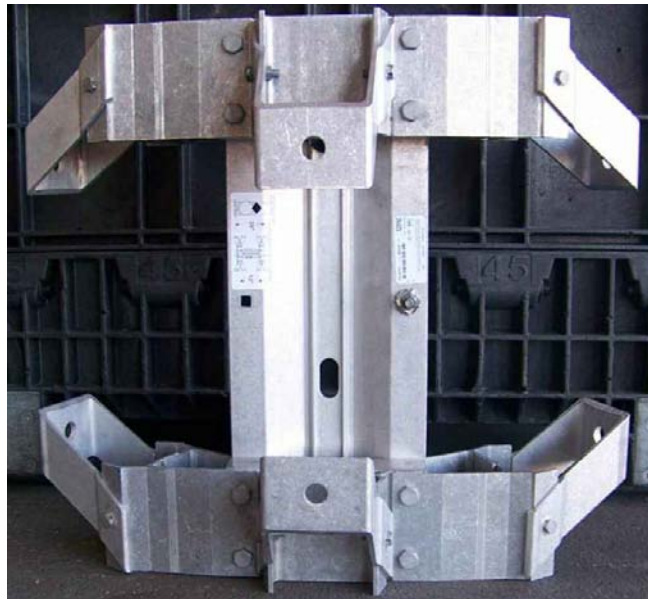
DEC	DEM	DEP	DEF
		X	
06.04-03			



RACK TYPE BRACKET
 CU BKTTFMRSMALC
 CN 12912507
 5 THRU 50 KVA UNITS

NOTES:

1. USE TWO 3/4" BOLTS TO MOUNT BRACKET TO POLE. USE TWO 5/8" BOLTS TO ATTACH EACH TRANSFORMER TO BRACKET.



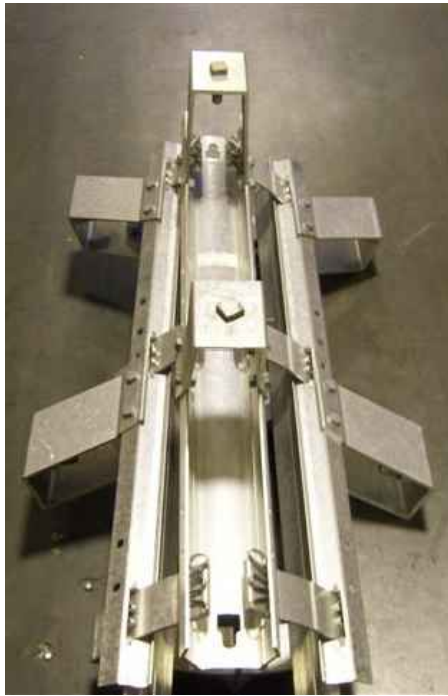
THREE UNIT WING TYPE CLUSTER BRACKET
 CU BKTTFMRMEDALC
 CN 12912200
 75 THRU 167 KVA UNITS

NOTES:

1. USE TWO 3/4" BOLTS TO MOUNT BRACKET TO POLE. USE TWO 3/4" BOLTS TO ATTACH EACH TRANSFORMER TO BRACKET.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TRANSFORMER BANK MOUNTING BRACKETS

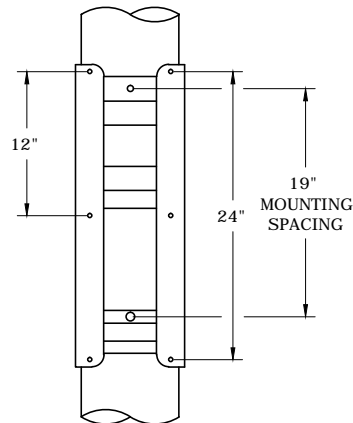


THREE UNIT BANDED CLUSTER

CU BKTTFMRLGEALC
CN 12912705
250 - 500 KVA UNITS

NOTES:

1. USE TWO 5/8" BOLTS TO MOUNT BRACKET TO POLE. USE TWO 3/4" BOLTS TO MOUNT EACH TRANSFORMER TO BRACKET.
2. A PLATFORM IS THE PREFERRED MOUNTING FOR TRANSFORMERS OF THIS SIZE. CONSULT WITH DISTRIBUTION STANDARDS ON POLE SIZE AND GUYING PRIOR TO USING THIS TRANSFORMER MOUNTING BRACKET.
3. CHECK ON AVAILABILITY AS THIS IS A SPECIAL ORDER ITEM.



TWO UNIT CLUSTER BRACKET

CN 76332584 (CU BKTTFMROPWYEC)
5 THRU 167 KVA UNITS

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TRANSFORMER BANK MOUNTING BRACKETS



CAR

DWG.
06.04-07

NOTES:

1. USE NON-LOADBREAK CUTOUTS.

CU TFUSE27CO100C (CN 11211802)

2. USE 18KV LIGHTNING ARRESTERS ON A 23KV LINE.

CU AREQOHTR18C (CN 11231800)

3. USE 10KV LIGHTNING ARRESTERS ON A 12KV LINE.

CU AREQOHTR10C (CN 11231307)

- 4. USE 27KV LIGHTNING ARRESTER ON A 34.5 LINE.

CU AREQOHTR27C (CN 14002364)

- 5. USE CUTOUT BRACKET ON THE POLE OR CROSSARM BRACKET ON A CROSSARM.

CUTOUT BRACKET - CU BKTCOLA18STLC (CN 12912002)

CROSSARM BRACKET - CU BKTCOLASTLXARM (CN 9220240204)

6. USE #6 SD COPPER WP PRIMARY RISERS.

7. FOR UNITS WITH EXTERNAL LIGHTNING ARRESTERS, ROTATE ARRESTER FROM SHIPPING POSITION TO STRAIGHT OUT FROM TANK.

- 8. NON-COASTAL INSTALLATIONS - IF TRANSFORMER DOESN'T HAVE WILDLIFE GUARDS, ADD ONE TO EACH PRIMARY BUSHING(S) AND ARRESTER. SEE DWG. 06.00-23. CU WGEQBUSHSNAPC (CN 10300507). DO NOT INSTALL WILDLIFE GUARDS ON ANY TRANSFORMER INSTALLED IN A COASTAL ENVIRONMENT DUE TO SALT BUILDUP INSIDE THE WILDLIFE GUARD.

- 9. RURAL TYPE GAPPED TRANSFORMERS ARE OBSOLETE AND SHALL NOT BE USED FOR NEW INSTALLATIONS. EXISTING INSTALLATIONS SHOULD BE REMOVED WHEN OTHER WORK IS REQUIRED ON THE POLE.

10. CSP UNITS BEING REINSTALLED SHALL BE FUSED WITH A CUTOUT.

11. FOR 50 KVA AND SMALLER, USE QUANTITY TWO - 5/8" X 12" GALVANIZED BOLTS TO MOUNT TRANSFORMER. FOR 75 KVA - 167 KVA, USE QUANTITY TWO - 3/4" X 12" GALVANIZED BOLTS TO MOUNT TRANSFORMER.



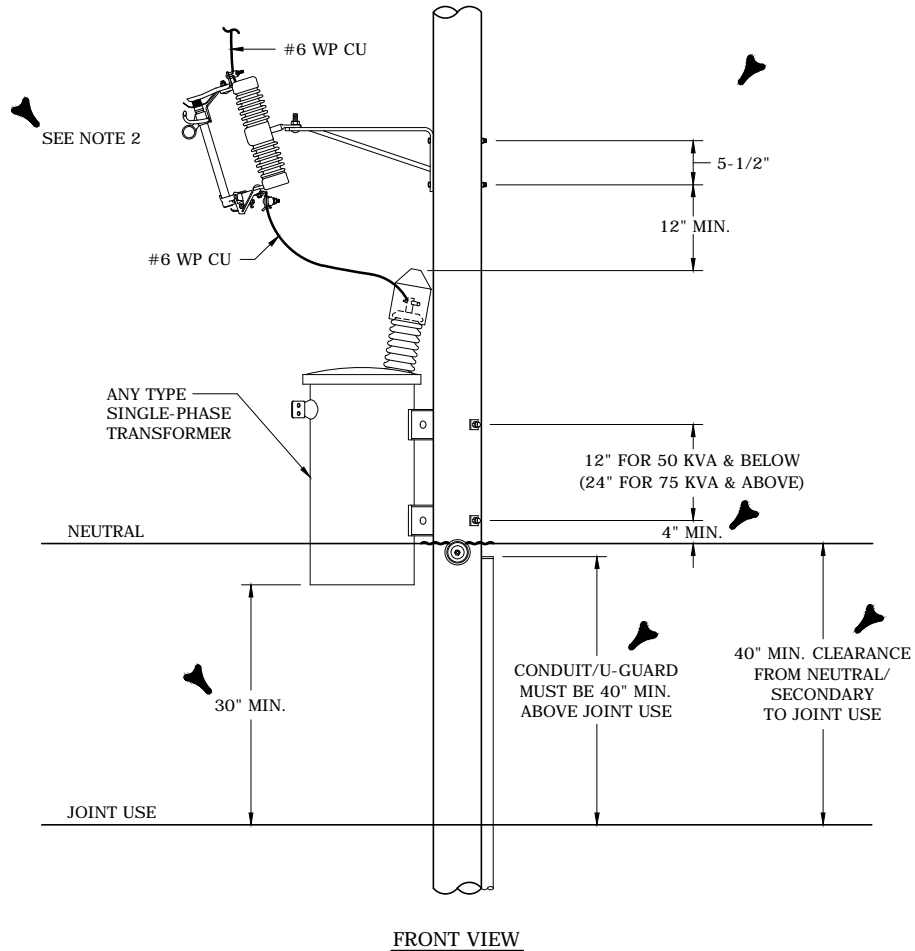
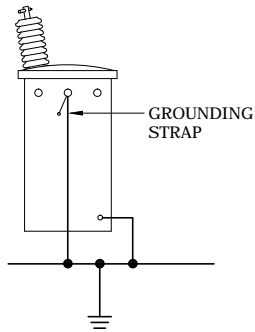
3	8/5/14	SIMMONS	GUINN	ADCOCK
2	9/7/12	KATIGBAK	BURLISON	ELKINS
1	5/24/11	COX	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

SINGLE-PHASE TRANSFORMER INSTALLATIONS
GENERAL POLICIES

DEC	DEM	DEP	DEF
		X	
06.06-01			

GROUNDING DETAILS

120/240



NOTES:

1. MINIMUM BOLT HOLE SPACING IS 4"; NO HOLES SHOULD BE DRILLED CLOSER THAN 4".

2. THE CUTOUT CAN BE MOUNTED AT VARIOUS HEIGHTS AND/OR POSITIONS ON THE POLE FOR EASE OF INSTALLATION AND OPERATION.

3. THE BOTTOM OF THE TRANSFORMER TANK MUST MAINTAIN 30 INCHES OF CLEARANCE ABOVE JOINT USE CABLES.

3				
2				
1	5/23/12	ROBESON	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

SINGLE-PHASE TRANSFORMER MOUNTING DIMENSIONS



CAR

DWG.
06.06-04

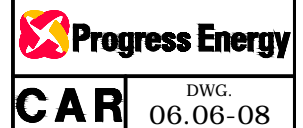
PRIMARY LINE VOLTAGE	SECONDARY DELIVERY VOLTAGE		NAME PLATE RATING OF TRANSFORMER TO BE USED		PRIMARY NEUTRAL CONNECTION	SECONDARY NEUTRAL CONNECTION	TYPE OF TRANSFORMER	SPECIFICATION DWG. NUMBER
	VOLTS	# OF WIRES	PRIMARY	SECONDARY				
23KV	120	2	22860 GRD Y /13200	120 ¹	GROUNDED	CENTER TAP	CSP OR ONE BUSHING CONVENTIONAL	06.10-01, II
23KV	120	2	14400/24940 GRD Y	120 ¹	GROUNDED	CENTER TAP	TWO BUSHING CONVENTIONAL	06.10-01, IV
23KV	120/240	3	22860 GRD Y /13200	120/240	GROUNDED	CENTER TAP	CSP OR ONE BUSHING CONVENTIONAL	06.10-02, II
23KV	120/240	3	24940 GRD Y /14400	120/240	GROUNDED	CENTER TAP	RURAL	06.10-02, IV
23KV	120/240	3	14400/ 24940 GRD Y	120/240	GROUNDED	CENTER TAP	TWO BUSHING CONVENTIONAL	06.10-03, II
12KV	120	2	12470 GRD Y /7200	120 ¹	GROUNDED	CENTER TAP	CSP OR ONE BUSHING CONVENTIONAL	06.10-01, I
12KV	120	2	7200/ 12470 GRD Y	120 ¹	GROUNDED	CENTER TAP	TWO BUSHING CONVENTIONAL	06.10-01, III
12KV	120/240	3	14400/ 24940 GRD Y	120/240	NONE	CENTER TAP	TWO BUSHING CONVENTIONAL	06.10-03, II
12KV	120/240	3	12470 GRD Y /7200	120/240	GROUNDED	CENTER TAP	CSP OR ONE BUSHING CONVENTIONAL	06.10-02, I
12KV	120/240	3	12470 GRD Y /7200	120/240	GROUNDED	CENTER TAP	RURAL	06.10-02, III
12KV	120/240	3	7200/ 12470 GRD Y	120/240	GROUNDED	CENTER TAP	TWO BUSHING CONVENTIONAL	06.10-03, I

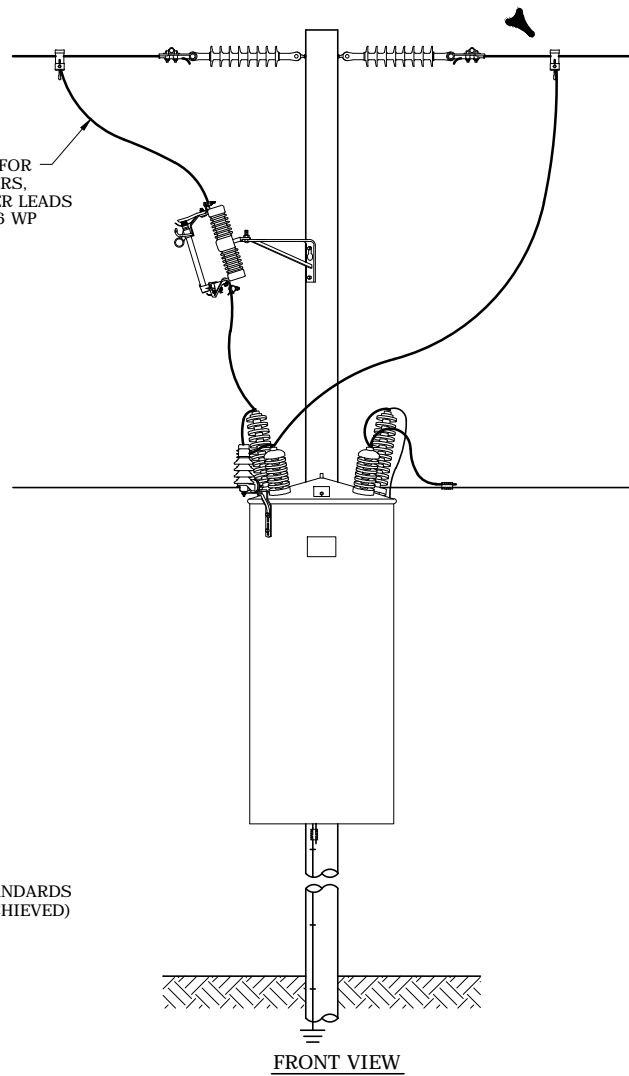
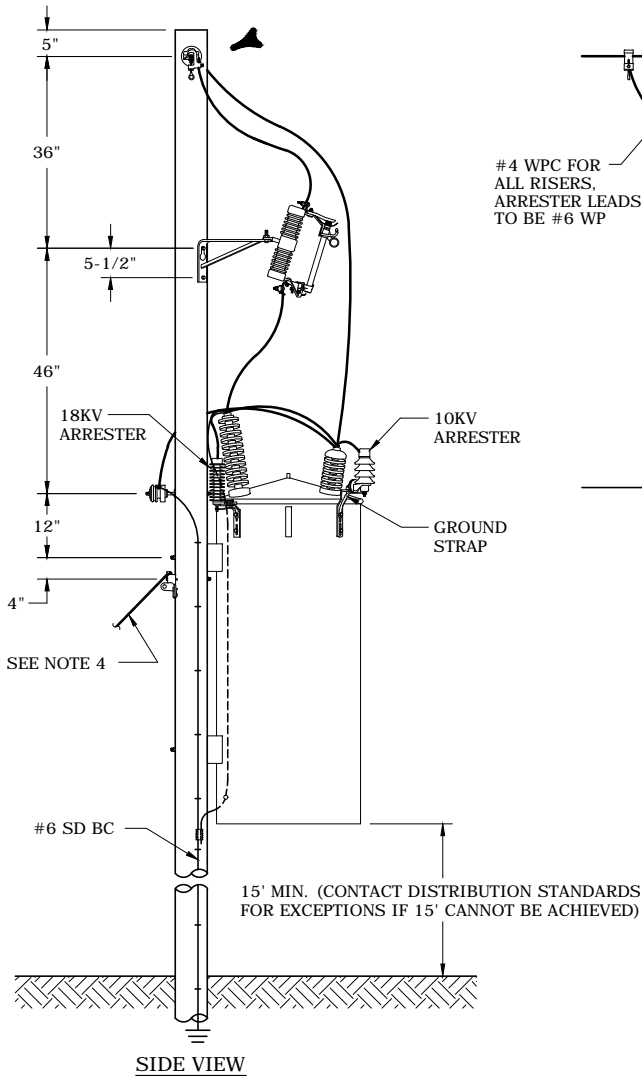
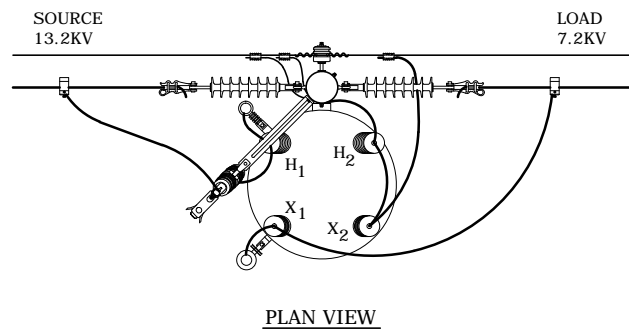
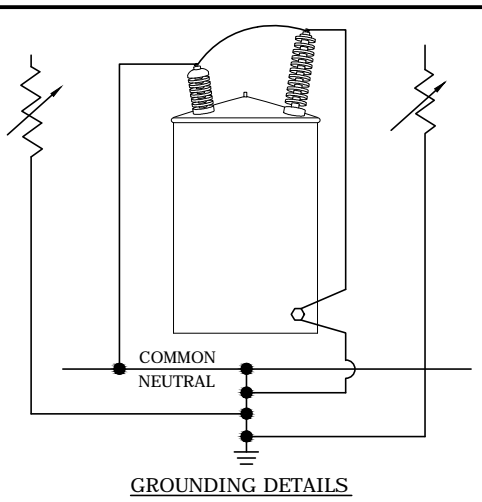
NOTES:

1. TO PARALLEL SECONDARY COILS IN 120/240 VOLT TRANSFORMERS, REFER TO THE REFERENCED SPECIFICATION DWGS. SHOWN IN THE TABLE.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

SINGLE-PHASE
SINGLE TRANSFORMER INSTALLATION





NOTES:

1. LENGTH OF ARRESTER LEADS SHOULD BE AS SHORT AS POSSIBLE.
2. USE #4 WPC FOR ALL TRANSFORMER RISERS.
3. MAY ALSO BE USED AS A 7.2 TO 13.2KV STEP-UP TRANSFORMER BY CONNECTING 7.2KV SOURCE TO SECONDARY BUSHINGS.
4. FOR 167KVA TRANSFORMER, ADD GUY TO POLE TO KEEP POLE FROM LEANING WITH WEIGHT OF TRANSFORMER ON ONE SIDE.
5. MOUNT ARRESTERS NEXT TO H₁ AND X₁ BUSHINGS IF MOUNTING NUTS ARE AVAILABLE. IF NOT AVAILABLE, MOUNT THE 18KV ARRESTER ON THE CUTOUT COLA BRACKET AND THE 10KV ARRESTER ON A SEPARATE COLA BRACKET.

3				
2				
1	4/13/11	DANNA	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

13.2/7.2KV STEP DOWN TRANSFORMER
(167 KVA OR SMALLER)

23 KV

LARGEST TRANSFORMERS THAT WILL CLEAR BEYOND FUSES

FUSE AMPS	TYPE KS FUSE		TYPE K FUSE	
	CONV. (KVA)	CSP (KVA)	CONV. (KVA)	CSP (KVA)
100	500	50	250	50
80	500	50	200	50
65	500	50	167	50
50	333	50	100	50
40	200	50	75	50
30	167	50	50	50
25	167	37.5	50	25
20	100	25	25	25

LARGEST TRANSFORMERS THAT WILL
CLEAR BEYOND RECLOSERS

RCL SIZE	CONV. (KVA)	CSP (KVA)
100	250	50
70	200	50
50	100	50
35	75	50
25	50	25
15	25	10
10	10	5
5	-	-

12 KV

LARGEST TRANSFORMERS THAT WILL CLEAR BEYOND FUSES

FUSE AMPS	TYPE KS FUSE		TYPE K FUSE	
	CONV. (KVA)	CSP (KVA)	CONV. (KVA)	CSP (KVA)
100	333	50	100	50
80	250	50	100	50
65	200	50	75	37.5
50	167	50	50	37.5
40	100	37.5	37.5	37.5
30	100	25	25	25
25	75	25	25	10
20	50	25	15	10

LARGEST TRANSFORMERS THAT WILL
CLEAR BEYOND RECLOSERS

RCL SIZE	CONV. (KVA)	CSP (KVA)
100	100	50
70	100	37.5
50	50	25
35	37.5	25
25	25	5
15	15	5
10	5	-
5	-	-

NOTES:

1. THE SIZES SHOWN IN THE ABOVE TABLES ARE A GUIDE. UNUSUAL CIRCUMSTANCES OR COORDINATION PROBLEMS MAY REQUIRE A DEPARTURE FROM THE ABOVE. REFER SUCH PROBLEMS TO DISTRIBUTION RELIABILITY.
2. THE ABOVE TABLES ARE FOR SINGLE-PHASE TRANSFORMERS, FOR THREE-PHASE PMT'S, DIVIDE ACTUAL TRANSFORMER KVA RATING BY THREE AND THEN ENTER TABLE.
3. FOR RECLOSER COORDINATION WITH UNDERGROUND TRANSFORMERS, SEE DWG. 08.05-04.
4. ADDITIONAL FUSE COORDINATION GUIDES ON DWGS. 07.00-15, 08.05-03 AND 08.05-04.

3				
2				
1				
O	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	


TRANSFORMER COORDINATION WITH SOURCE SIDE FUSES AND RECLOSERS

THE DISTRIBUTION TRANSFORMER CONNECTION DRAWINGS SHOW THE MOST COMMON TRANSFORMER CONNECTIONS PRESENTLY BEING USED. PARTICULAR NOTE SHOULD BE MADE OF THE FOLLOWING:

1. TRANSFORMER CONNECTIONS (DWGS. 06.10-01 THROUGH 06.10-13) ARE SHOWN FOR BOTH SUBTRACTIVE AND ADDITIVE POLARITY TRANSFORMERS AND ASSUME THAT ALL TRANSFORMERS IN A BANK ARE THE SAME POLARITY. THIS IS TRUE IN MOST CASES AND AS A RESULT THE SECONDARY BUSHING MARKINGS (X₁, X₂, X₃, ETC.) WILL BE THE SAME FOR EACH TRANSFORMER IN THE BANK. THE DRAWINGS DO NOT APPLY WHERE UNITS OF DIFFERENT POLARITY ARE IN THE SAME BANK. IN THIS CASE THE SECONDARY BUSHING MARKINGS WILL BE DIFFERENT AND CARE MUST BE TAKEN IN ORDER TO ENSURE THAT CONNECTIONS ARE MADE ACCORDING TO THE BUSHING DESIGNATIONS (X₁, X₂, X₃, ETC.). IF TRANSFORMERS OF DIFFERENT POLARITIES ARE NOT CONNECTED PROPERLY, HIGH SECONDARY VOLTAGES CAN RESULT, OR SECONDARY VOLTAGES CAN CANCEL RESULTING IN HIGH CIRCULATING CURRENTS, BLOWN FUSES, ETC. SEE DWG. 06.07-05.
2. WHEN TRANSFORMERS IN A BANK ARE REPLACED, IT IS NECESSARY TO KEEP CUSTOMERS' MOTORS RUNNING IN THE SAME DIRECTION. PHASE ROTATION SHOULD BE CHECKED BEFORE AND AFTER ANY CONNECTIONS ARE CHANGED. ROTATION MAY BE REVERSED BY SWAPPING CONNECTIONS OF TWO OF THE PHASE WIRES. IF THE BANK HAS A LIGHTING TRANSFORMER, SWAP THE TWO LARGE LIGHTING WIRES.
3. FOR CLARITY, SOME GROUND CONNECTIONS ARE SHOWN AS TAPS. WHEREVER POSSIBLE, A CONTINUOUS LOOP SHOULD BE USED BETWEEN BUSHINGS OR FROM A BUSHING TO GROUND.
4. IN CLOSED WYE CONNECTED SECONDARIES, THE NEUTRAL BUS MUST BE THE SAME SIZE AS THE PHASE CONDUCTORS. THE GROUND LEADS AND SECONDARY NEUTRAL BEYOND THE BUS SHOULD BE A REDUCED SIZE FROM THAT OF THE NEUTRAL BUS. NOTE THAT ALL TRANSFORMERS BUT ONE SHOULD HAVE THE GROUND STRAP REMOVED SO THAT CURRENT FLOW WILL BE THROUGH THE PROPER CONDUCTORS.
5. BE SURE TO REMOVE GROUND STRAP CONNECTIONS ON THE SECONDARY OF POWER TRANSFORMERS IN BANKS WITH DELTA SECONDARIES.
6. IN CLOSED BANKS WITH A DELTA SECONDARY CONNECTION, THE VOLTAGES OF THE TAP SETTINGS OF ALL OF ALL TRANSFORMERS MUST BE IDENTICAL TO PREVENT CIRCULATING CURRENTS AND OVERHEATING. THE PERCENT IMPEDANCE SHOULD BE APPROXIMATELY THE SAME TO ESTABLISH PROPER LOAD DIVISION. FOR UNITS OF EQUAL CAPACITY WITH ONE ODD IMPEDANCE, SUCH AS WHEN A FAILED UNIT MUST BE REPLACED, THE TOTAL BANK DERATING IS APPROXIMATED IN THE FOLLOWING TABLE:

	<u>RATIO OF ODD UNIT IMPEDANCE TO IMPEDANCE OF OTHER TWO UNITS</u>	<u>DERATING FACTOR</u>
	1.6	0.91
	1.5	0.93
	1.4	0.94
COPIED FROM THE	1.3	0.95
WESTINGHOUSE	1.2	0.97
DISTRIBUTION TRANS.	1.1	0.98
GUIDE REVISED APRIL	1.0	1.00
1986.	0.9	0.97
	0.8	0.93
	0.7	0.90

- 7. FOR 240/120 VOLT, THREE-PHASE BANKS, THE TWO POWER (WING) TRANSFORMERS SHOULD HAVE THE SAME KVA RATING AND SIMILAR IMPEDANCE (ATTEMPT TO KEEP IMPEDANCE VALUES WITH +/-5% OF EACH OTHER). UNEQUAL KVA OR IMPEDANCE VALUES CAN LEAD TO TRANSFORMER OVERLOADS.
8. DO NOT USE SINGLE BUSHING TRANSFORMERS IN THREE TRANSFORMER BANKS EXCEPT FOR WYE-WYE 208Y/120 VOLT BANKS.
9. DO NOT MIX SINGLE BUSHING TRANSFORMERS AND DOUBLE BUSHING TRANSFORMERS TOGETHER IN THE BANK.

3					TRANSFORMER CONNECTIONS GENERAL	 Progress Energy	
2							
1	9/9/11	SIMMONS	BURLISON	ELKINS			
0	10/19/10	SIMMONS	GUINN	ELKINS			
REVISED	BY	CK'D	APPR.				
						PGN	DWG. 06.07-01

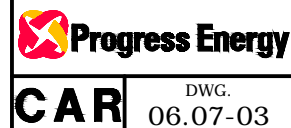
PRIMARY LINE VOLTAGE	SECONDARY DELIVERY VOLTAGE		NAME PLATE RATING OF TRANSFORMER TO BE USED		PRIMARY NEUTRAL CONNECTION	SECONDARY NEUTRAL CONNECTION	BANK CONNECTION		SPECIFICATION DWG. NUMBER
	VOLTS	# OF WIRES	PRIMARY	SECONDARY			PRI.	SEC.	
23KV	240/120	4	14400/ 24940 Y 13200/22860Y	120/240	GROUNDED	CENTER TAP LTG. TRANS.	OPEN WYE	OPEN DELTA	06.10-03, IV
23KV	240/120	4	22860 GRD Y /13200	120/240	GROUNDED	CENTER TAP LTG. TRANS.	OPEN WYE	OPEN DELTA	06.10-04, II
23KV	240	3	14400/ 24940 Y 13200/22860Y	120/240	GROUNDED	NONE	OPEN WYE	OPEN DELTA	SAME AS 06.10-03, IV W/O SEC.NEU.
23KV	240	3	22860 GRD Y /13200	120/240	GROUNDED	NONE	OPEN WYE	OPEN DELTA	SAME AS 06.10-04, II W/O SEC.NEU.
23KV	480	3	14400/ 24940 Y	240/480	GROUNDED	NONE	OPEN WYE	OPEN DELTA	06.10-11, II
12KV	240/120	4	14400/ 24940 Y	120/240	NONE	CENTER TAP LTG. TRANS.	OPEN ¹ DELTA	OPEN DELTA	06.10-04, IV
12KV	240	3	14400/ 24940 Y	120/240	NONE	NONE	OPEN ¹ DELTA	OPEN DELTA	SAME AS 06.10-04, IV W/O SEC.NEU.
12KV	480	3	14400/ 24940 Y	240/480	NONE	NONE	OPEN ¹ DELTA	OPEN DELTA	06.10-11, IV
12KV	240/120	4	7200/ 12470 Y	120/240	GROUNDED	CENTER TAP LTG. TRANS.	OPEN WYE	OPEN DELTA	06.10-03, III
12KV	240/120	4	12470 GRD Y /7200	120/240	GROUNDED	CENTER TAP LTG. TRANS.	OPEN WYE	OPEN DELTA	06.10-04, I
12KV	240	3	7200/ 12470 Y	120/240	GROUNDED	NONE	OPEN WYE	OPEN DELTA	SAME AS 06.10-03, III W/O SEC.NEU.
12KV	240	3	12470 GRD Y /7200	120/240	GROUNDED	NONE	OPEN WYE	OPEN DELTA	SAME AS 06.10-04, I W/O SEC.NEU.
12KV	480	3	7200/ 12470 Y	240/480	GROUNDED	NONE	OPEN WYE	OPEN DELTA	06.10-11, I

NOTES:

1. PRIMARY SWITCHING OF UNLOADED BANKS SHOULD BE DONE AT THE TRANSFORMERS TO PREVENT FERRORESONANT OVERVOLTAGES.
2. FOR TWO TRANSFORMER BANKS, USE TWO SINGLE BUSHING OR TWO DOUBLE BUSHING TRANSFORMERS, BUT DO NOT USE A SINGLE BUSHING AND A DOUBLE BUSHING TRANSFORMER TOGETHER IN A BANK.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

THREE-PHASE - TWO TRANSFORMER INSTALLATION



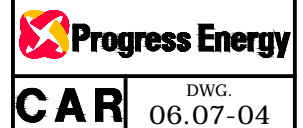
PRIMARY LINE VOLTAGE	SECONDARY DELIVERY VOLTAGE		NAME PLATE RATING OF TRANSFORMER TO BE USED		PRIMARY NEUTRAL CONNECTION	SECONDARY NEUTRAL CONNECTION	BANK CONNECTION		SPECIFICATION DWG. NUMBER
	VOLTS	# OF WIRES	PRIMARY	SECONDARY			PRI.	SEC.	
23KV	240/120	4	14400/ 24940 Y 13200/22860Y	120/240	FLOATING	CENTER TAP LTG. TRANS.	WYE ¹	-DELTA	06.10-05, II 06.10-06, II
23KV	208Y/120	4	22860 GRD Y /13200 14400/ 24940 Y 13200/22860Y	120 ²	GROUNDED	GROUNDED	WYE	- WYE	06.10-07, II 06.10-07, IV 06.10-09, II
23KV	480Y/277	4	14400/ 24940 Y	277	GROUNDED	GROUNDED	WYE	- WYE	06.10-10, II
23KV	240	3	14400/ 24940 Y 13200/22860Y	120/240	FLOATING	NONE	WYE ¹	-DELTA	SAME AS 06.10-05, II 06.10-06, II W/O SEC.NEU.
23KV	480	3	14400/ 24940 Y	277	GROUNDED	FLOATING	WYE	- WYE	06.10-12, III
23KV	480	3	14400/ 24940 Y	240/480	FLOATING	NONE	WYE ¹	-DELTA	06.10-12, II
23KV	600	3	14400/ 24940 Y	600	FLOATING	NONE	WYE ¹	-DELTA	06.10-13, II
12KV	240/120	4	14400/ 24940 Y	120/240	NONE	CENTER TAP LTG. TRANS.	DELTA ¹	-DELTA	06.10-05, IV 06.10-06, IV
12KV	208Y/120	4	14400/ 24940 Y	120 ²	NONE	GROUNDED	DELTA ¹	-WYE	06.10-08, II 06.10-09, IV
12KV	480Y/277	4	14400/ 24940 Y	277	NONE	GROUNDED	DELTA ¹	-WYE	06.10-10, IV
12KV	240	3	14400/ 24940 Y	120/240	NONE	NONE	DELTA ¹	-DELTA	SAME AS 06.10-05, IV 06.10-06, IV W/O SEC.NEU.
12KV	480	3	14400/ 24940 Y	277	NONE	FLOATING	DELTA ¹	-WYE	SAME AS 06.10-10, IV W/O SEC.NEU.
12KV	480	3	14400/ 24940 Y	240/480	NONE	NONE	DELTA ¹	-DELTA	06.10-12, IV
12KV	600	3	14400/ 24940 Y	600	NONE	NONE	DELTA ¹	-DELTA	06.10-13, IV
12KV	240/120	4	7200/ 12470 Y	120/240	FLOATING	CENTER TAP LTG. TRANS.	WYE ¹	-DELTA	06.10-05, I 06.10-06, I 06.10-06, II
12KV	208Y/120	4	12470 GRD Y /7200 7200/ 12470 Y	120 ²	GROUNDED	GROUNDED	WYE ¹	-WYE	06.10-07, I 06.10-07, III 06.10-09, I
12KV	240	3	7200/ 12470 Y	120/240	FLOATING	NONE	WYE ¹	-DELTA	SAME AS 06.10-05, I 06.10-06, I W/O SEC.NEU.
12KV	480	3	7200/ 12470 Y	240/480	FLOATING	NONE	WYE ¹	-DELTA	06.10-12, I

NOTES:

1. PRIMARY SWITCHING OF UNLOADED BANKS SHOULD BE DONE AT THE TRANSFORMERS TO PREVENT FERRORESONANT OVERVOLTAGES.
2. TO PARALLEL SECONDARY COILS IN 120/240 VOLT TRANSFORMER, REFER TO THE REFERENCED SPECIFICATION DWGS. SHOWN IN THE TABLE.
3. DO NOT USE SINGLE BUSHING TRANSFORMERS IN THREE TRANSFORMER BANKS EXCEPT FOR WYE-WYE 208Y/120 VOLT BANKS.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

THREE-PHASE
THREE TRANSFORMER INSTALLATION



POLARITY IS ESPECIALLY IMPORTANT WHEN BANKING TRANSFORMERS AND WHEN TWO OR MORE TRANSFORMERS ARE TO BE PARALLELED. CONNECTIONS TO ADDITIVE AND SUBTRACTIVE POLARITY WILL BE IN DIFFERENT PHYSICAL LOCATIONS ON THE TANK. BUSHING MARKINGS ON THE NAMEPLATE WILL BE AS SHOWN BELOW. NOTE THAT THE H₁ BUSHING IS ALWAYS ON THE LEFT WHEN FACING THE LOW VOLTAGE SIDE OF THE TRANSFORMER, AND THAT THE PHYSICAL LOCATION OF THE SECONDARY BUSHINGS (X₁ X₂ X₃ ETC.) ON AN ADDITIVE POLARITY TRANSFORMER IS DIFFERENT FROM THAT OF A SUBTRACTIVE POLARITY TRANSFORMER.

ADDITIVE POLARITY - ALL SINGLE-PHASE TRANSFORMERS RATED 167 KVA AND SMALLER, HAVING HIGH VOLTAGE WINDING 7200 VOLTS AND BELOW.

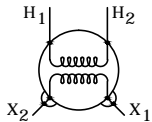
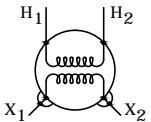
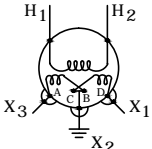
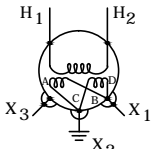
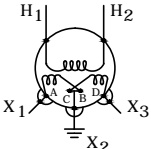
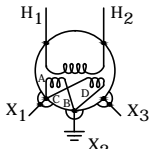
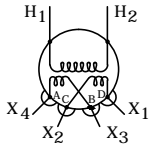
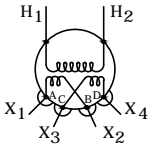
CHARACTERISTICS OF ADDITIVE POLARITY

1. THE LOW VOLTAGE X₁ BUSHING IS ON THE RIGHT WHEN FACING THE LOW VOLTAGE SIDE OF THE TRANSFORMER.
2. THE DIRECTION OF INDUCED VOLTAGE FROM H₁ TO H₂ IS OPPOSITE THE DIRECTION OF INDUCED VOLTAGE FROM X₁ TO X₂

➤ SUBTRACTIVE POLARITY - ALL SINGLE-PHASE TRANSFORMERS HAVING HIGH VOLTAGE WINDINGS OF 13200 AND ABOVE, ALL DUAL VOLTAGE (13200 X 7200) TRANSFORMERS AND ALL TRANSFORMERS LARGER THAN 167 KVA.

CHARACTERISTICS OF SUBTRACTIVE POLARITY

1. THE LOW VOLTAGE X₁ BUSHING IS ON THE LEFT WHEN FACING THE LOW VOLTAGE SIDE OF THE TRANSFORMER.
2. THE DIRECTION OF INDUCED VOLTAGE FROM H₁ TO H₂ IS THE SAME AS THE DIRECTION OF INDUCED VOLTAGE FROM X₁ TO X₂



"NEMA STANDARDS FOR LOW VOLTAGE EXTERNAL TERMINALS"		
DESCRIPTION OF CONNECTION	ADDITIVE POLARITY	SUBTRACTIVE POLARITY
<u>TWO TERMINALS:</u> SINGLE LOW VOLTAGE		
<u>THREE TERMINALS:</u> THREE WIRE 120/240 VOLTS (SERIES CONNECTION) TWO WIRE 120 VOLTS OR FOUR WIRE 208Y/120 VOLT BANK (PARALLEL CONNECTION)	  <p>ON <u>ADDITIVE POLARITY</u> TRANS., RECONNECT INTERNALLY A & C LEADS TO X₂ NEUTRAL TERMINAL & B & D LEADS TO X₁ PHASE TERMINAL.</p>	  <p>ON <u>SUBTRACTIVE POLARITY</u> TRANS., RECONNECT INTERNALLY A & C LEADS TO X₁ PHASE TERMINAL & B & D LEADS TO X₂ NEUTRAL TERMINAL.</p>
<u>FOUR TERMINALS:</u>	 <p>FOR 3-WIRE 120/240 VOLT (SERIES) OPERATION, CONNECT X₂ TO X₃ EXTERNALLY. FOR 4-WIRE 208Y/120 VOLT (PARALLEL) OPERATION CONNECT X₁ TO X₃ AND X₂ TO X₄ EXTERNALLY.</p>	

3				
2				
1	6/29/12	GUINN	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

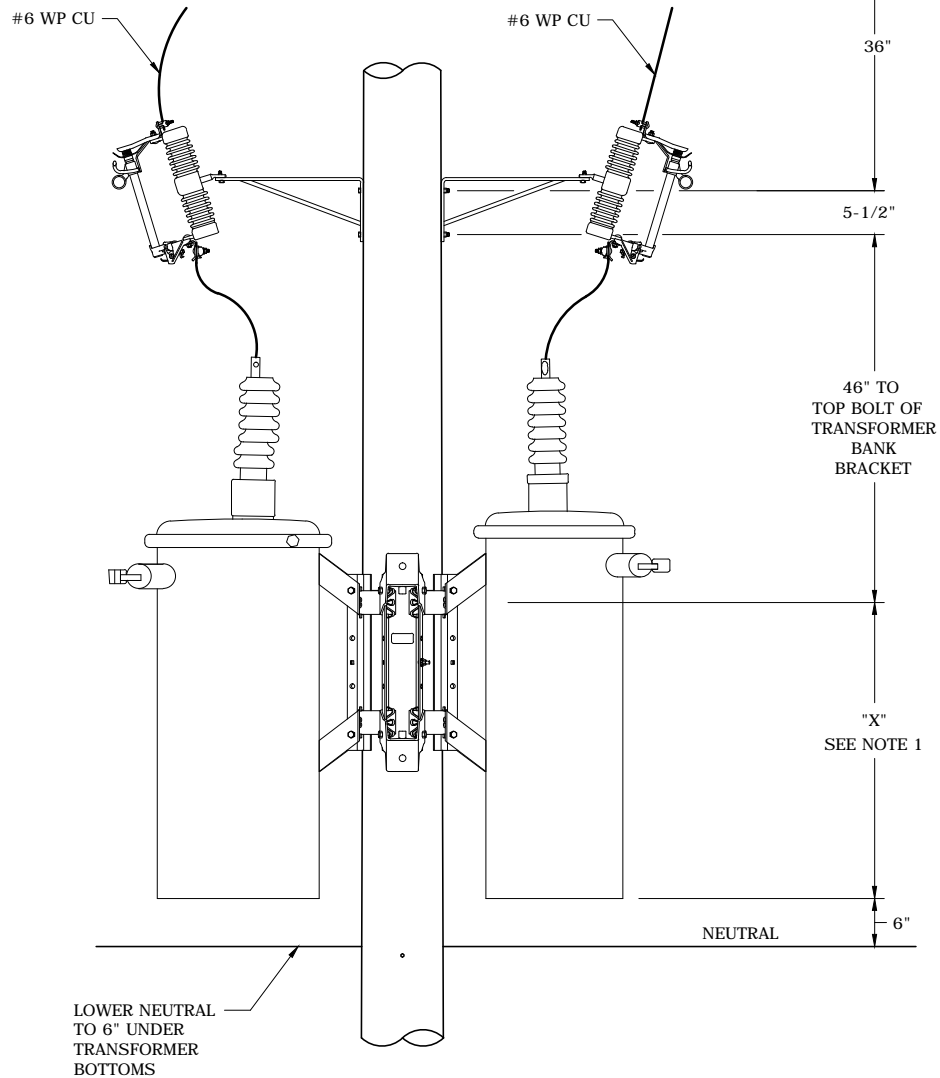
DISTRIBUTION TRANSFORMER POLARITY

NOTES:

1. ALL GENERAL POLICIES FOR SINGLE-PHASE TRANSFORMER INSTALLATIONS SHOULD BE FOLLOWED. GENERAL POLICIES CAN BE FOUND ON THE FOLLOWING DWGS. 06.00-20, 06.07-01, 06.15-01A, 06.15-01B AND 06.15-03.
2. THE LIGHTING TRANSFORMER SHOULD BE CONNECTED TO THE LEADING PHASE. A PHASE LEADS B PHASE, B PHASE LEADS C PHASE AND C PHASE LEADS A PHASE.
3. THE GROUND STRAP MUST BE REMOVED FROM THE SECONDARY NEUTRAL BUSHING ON THE POWER TRANSFORMER.
4. DO NOT MIX ONE BUSHING UNITS AND TWO BUSHING UNITS IN THE SAME BANK.
5. LIGHTNING ARRESTERS SHOULD BE MOUNTED ON THE TRANSFORMER TANK FOR ALL PRIMARY BUSHINGS CONNECTED TO AN ENERGIZED PRIMARY CONDUCTOR. MOUNT ARRESTER ON COLA BRACKET ONLY IF ARRESTER PROVISIONS ARE NOT ON TANK. THE H2 PRIMARY BUSHING SHOULD BE CONNECTED TO THE SYSTEM NEUTRAL WITH #6 SD BC.
6. TWO SINGLE-PHASE COLA BRACKETS (CU BKTCOLA18STLC, CN 12912002) SHOULD BE USED.
- 7. A TWO TRANSFORMER MOUNTING BRACKET SHOULD BE USED. SEE DWGS. 06.04-07 AND 06.07-10A FOR AVAILABLE BRACKET.
8. SEE DWG. 06.07-06B FOR TRANSFORMER BANK MOUNTING DIMENSIONS.

3					OPEN-WYE OPEN-DELTA TRANSFORMER BANKS GENERAL POLICIES	
2						
1	9/12/11	SIMMONS	BURLISON	ELKINS		
0	7/9/10	SIMMONS	GUINN	ELKINS		
REVISED	BY	CK'D	APPR.			
						

LOWEST PRIMARY WIRE



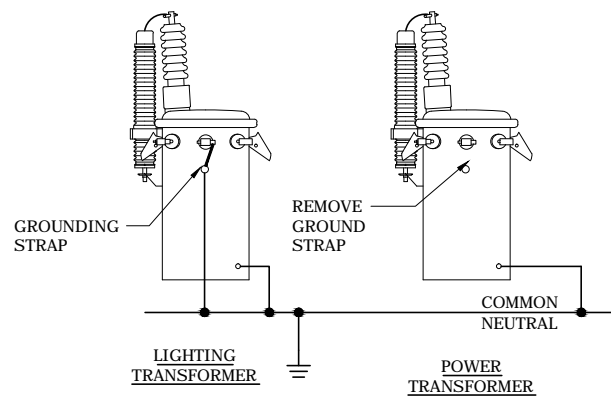
NOTES:

1. THE DISTANCE "X" BETWEEN THE TOP BOLT OF THE TRANSFORMER MOUNTING BRACKET AND THE BOTTOM OF THE TRANSFORMER VARIES. TYPICAL MAXIMUM DISTANCES ARE SHOWN IN THE TABLE BELOW.

SIZE OF TRANSFORMER	DISTANCE "X"
37.5 KVA AND BELOW	32"
50- 100 KVA	39"
167 KVA	48"

2. SEE DWG. 06.07-06A FOR TRANSFORMER BANKS GENERAL POLICIES.

**GROUNDING DETAILS
(240/120 VOLTS)**



3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

**OPEN-WYE OPEN-DELTA TRANSFORMER BANK
MOUNTING DIMENSIONS**


NOTES:

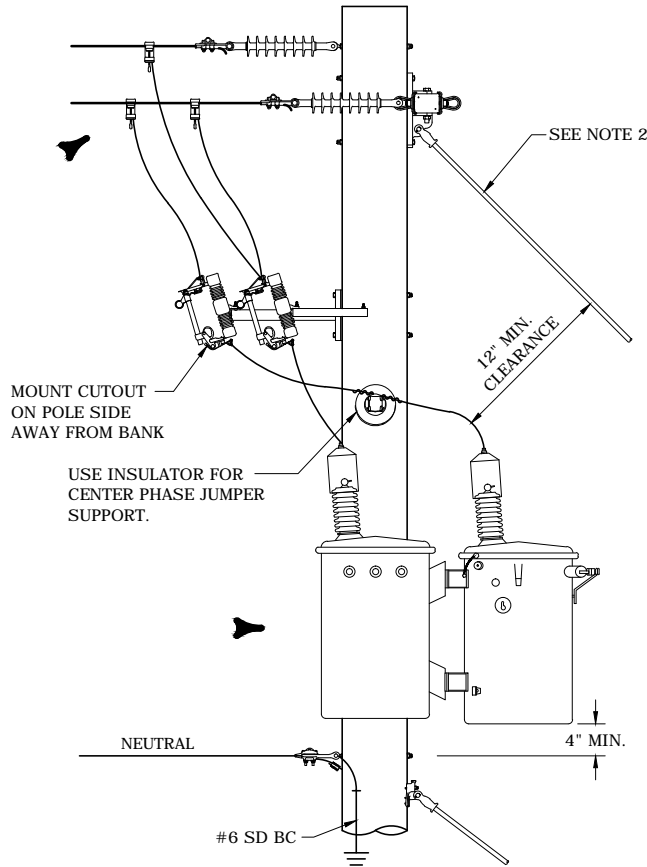
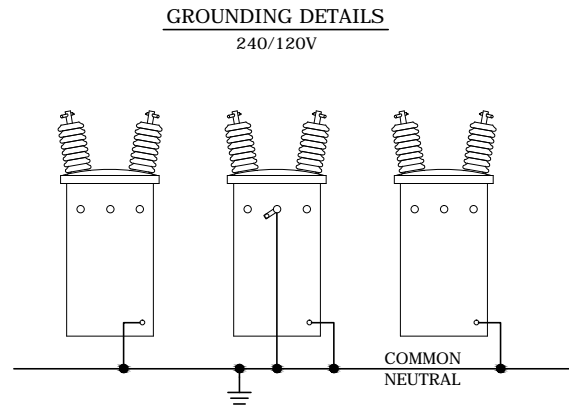
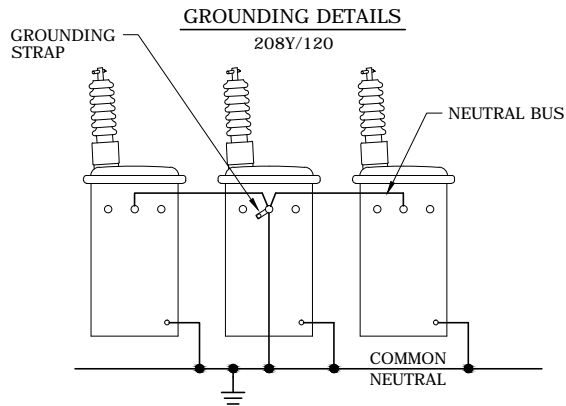
1. ALL GENERAL POLICIES FOR TWO TRANSFORMER BANK INSTALLATIONS SHOULD CONTINUE TO BE FOLLOWED. GENERAL POLICIES CAN BE FOUND ON THE FOLLOWING DWGS: 06.00-20, 06.07-01, 06.07-06A, 06.15-01A, 06.15-01B AND 06.15-03.
2. THE THREE-PHASE COLA BRACKET (CU BKTCOLATRISTLC , CN 12912101) SHOULD BE USED.
3. CLUSTER MOUNTING BRACKETS SHOULD BE USED.
4. ON 3-TRANSFORMER FLOATING WYE-DELTA BANKS, ARRESTERS SHALL BE MOUNTED ON SOURCE SIDE OF CUTOUT. IF ARRESTERS COME MOUNTED ON TRANSFORMER TANK, RELOCATE TO SOURCE SIDE OF CUTOUTS.

CLUSTER MOUNTING BRACKETS		
TRANSFORMER SIZES	COMPATIBLE UNIT	CATALOG NUMBER
5 TO 167 KVA 2 TRANSFORMER BANK	BKTTFMROPWYEC	76332584
5 TO 50 KVA 3 TRANSFORMER BANK	BKTTFMRSMALC	12912507
75 TO 167 KVA 3 TRANSFORMER BANK	BKTTFMRMEDALC	12912200
250 TO 333 KVA (CLASS 1 POLE REQUIRED) 3 TRANSFORMER BANK	BKTTFMRLGEALC	12912705 (NON-STOCKED)

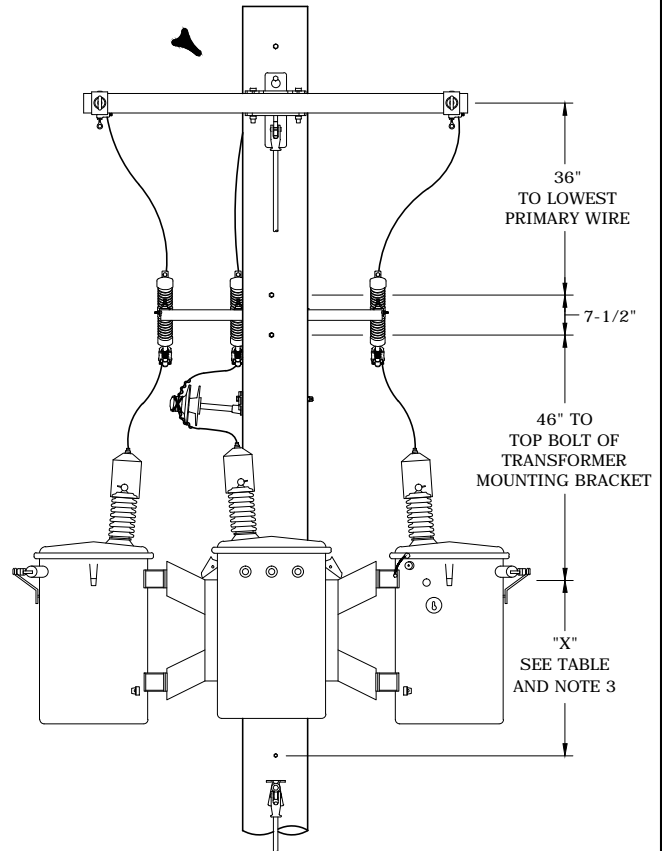
FOR 50 KVA AND BELOW, USE 5/8" X 2" MACHINE BOLTS.

FOR 75 KVA AND LARGER, USE 3/4" X 2" MACHINE BOLTS.

3					<p>THREE-PHASE TRANSFORMER BANKS</p> <p>GENERAL POLICIES</p>		<p>DWG.</p>
2							
1						<p>CAR</p>	<p>06.07-10A</p>
0	7/9/10	SIMMONS	GUINN	ELKINS			
REVISED	BY	CK'D	APPR.				



SIDE VIEW



FRONT VIEW

SIZE OF TRANSFORMER	DISTANCE "X"
50 KVA AND BELOW	32"
75-100 KVA	39"
167 KVA	42"

NOTES:

1. ALL GUYS ABOVE THE NEUTRAL POSITION MUST HAVE A GUY INSULATOR (LINK) OF SUFFICIENT LENGTH TO EXTEND BEYOND THE LOWEST ENERGIZED COMPONENT BY 24".
2. 12" MINIMUM CLEARANCE MUST BE MAINTAINED BETWEEN PRIMARY RISER AND ANY GUY INSULATOR. INSTALL A GUY OFFSET BRACKET IF NEEDED FOR GUY TO CLEAR TRANSFORMER PRIMARY BY 12 INCHES. THIS MAY BE NEEDED FOR LARGER TRANSFORMERS.
3. THE DISTANCE "X" BETWEEN THE TOP BOLT OF THE TRANSFORMER MOUNTING BRACKET AND THE BOTTOM OF THE TRANSFORMER VARIES. TYPICAL MAXIMUM DISTANCES ARE SHOWN IN THE TABLE.
4. ARRESTERS NOT SHOWN FOR CLARITY. THEY COME MOUNTED ON THE TRANSFORMER FROM THE FACTORY. FOR WYE-DELTA CONNECTED BANKS ONLY, THEY MUST BE RELOCATED TO THE CUTOUT BRACKET AND CONNECTED ON THE SOURCE SIDE OF THE CUTOUTS.



3				
2				
1	5/13/14	GUINN	GUINN	ADCOCK
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

**THREE-PHASE TRANSFORMER BANK
MOUNTING DIMENSIONS**

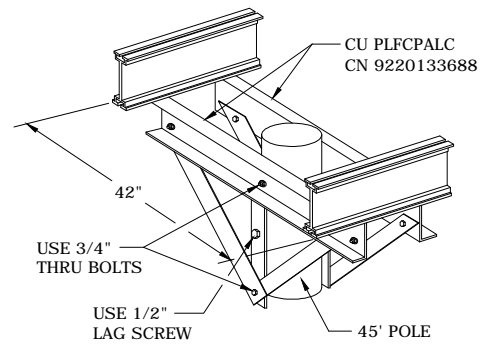
DEC	DEM	DEP	DEF
		X	
06.07-10B			

**TWO POLE ALUMINUM PLATFORM
WAREHOUSE CN 10351203**

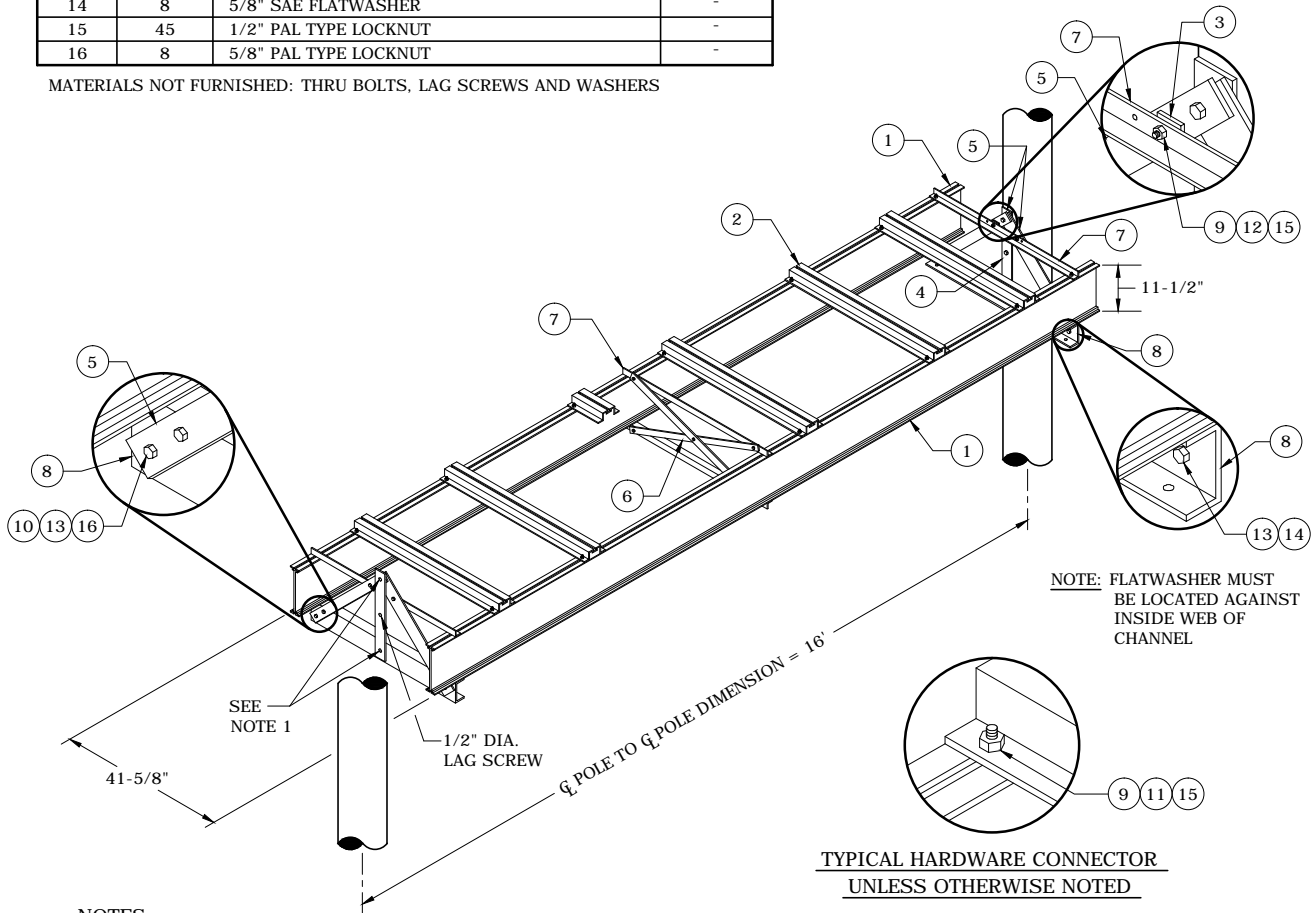
BILL OF MATERIALS

ITEM	QUANTITY	DESCRIPTION	LENGTH
1	2	"C1" I-BEAM, 11-1/2"	16'
2	6	"B2" HAT CHANNEL	41-1/8"
3	2	"C16" SPACER, BAR, 2-3/4" X 5/16"	1-3/4"
4	2	"C13" TEMPLATE BAR, 2-3/4" X 5/16"	22-7/16"
5	4	"C4" BRACE BAR, 2-3/4" X 5/16"	29-1/2"
6	2	"C15" X-BRACE BAR, 1-1/2" X 3/16"	40-3/16"
7	4	"C14" STABILIZER, ANGLE, 2" X 2" X 3/16"	41-1/8"
8	2	"C3" CHANNEL, 5" X 2"	41-5/8"
9	45	NUT, HEX, 1/2" (.018 OS)	-
10	8	NUT, HEX, 5/8" (.020 OS)	-
11	43	BOLT, HEX, 1/2" X 1-1/4"	1-1/4"
12	2	BOLT, HEX, 1/2" X 2" (FULL THREAD)	2
13	8	BOLT, HEX, 5/8" X 1-1/2"	1-1/2"
14	8	5/8" SAE FLATWASHER	-
15	45	1/2" PAL TYPE LOCKNUT	-
16	8	5/8" PAL TYPE LOCKNUT	-

MATERIALS NOT FURNISHED: THRU BOLTS, LAG SCREWS AND WASHERS



NOTE: "C16" SPACER USED WITH 1/2" X 2" HEX BOLT IN (2) LOCATIONS ONLY



NOTES:

1. PLATFORM REQUIRES FOUR 3/4" MACHINE BOLTS, FOUR 3/4" LOCK WASHERS AND FOUR 2-1/4" X 2-1/4" SQUARE WASHERS FOR TWO POLE MOUNTING. BOLTS SHOULD BE INSTALLED WITH BOLT HEAD TOWARDS THE PLATFORM CENTER. USE WASHERS AT ALL CONTACT POINTS.
2. THE TWO POLE PLATFORM WILL SUPPORT A LOAD OF 13,500 LBS (NO CENTER STUB REQUIRED). FOR GREATER LOADS, USE CENTER STUB SUPPORT (CU PLFCPALC).
3. THE CROSS MEMBERS CAN BE POSITIONED ANYWHERE ALONG THE BEAMS TO ALLOW EQUIPMENT TO BE PROPERLY SPACED.
4. FOR BANKS USING 250 AND 333 KVA TRANSFORMERS, AN EXTRA LARGE CLUSTER MOUNT BRACKET (CU BKTTFMRLGALC CN 12912705) IS AVAILABLE AS A MORE ECONOMICAL OPTION TO USING A PLATFORM. THIS BRACKET IS SPECIAL ORDER, NON-STOCKED. USE THE EXTRA LARGE CLUSTER MOUNT BRACKET WITH CLASS 1 POLE.
5. SEE DWG. 06.08-03B FOR PLATFORM ASSEMBLY INSTRUCTIONS.



3				
2				
1	4/22/14	SIMMONS	GUINN	ADCOCK
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

**TWO POLE ALUMINUM PLATFORM
16' - HEAVY DUTY**

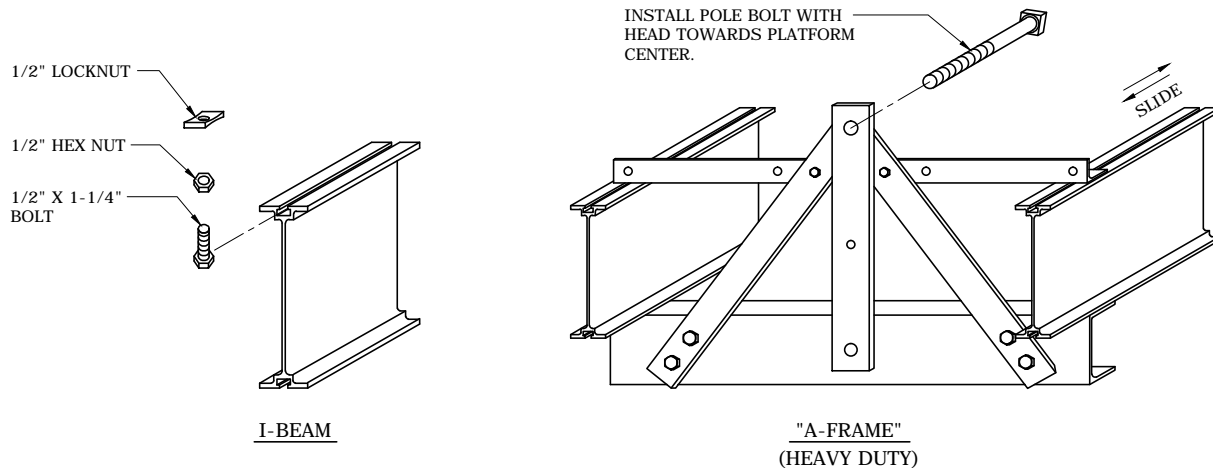
DEC	DEM	DEP	DEF
		X	
06.08-03A			

PLATFORM ASSEMBLY INSTRUCTIONS

FOR EASE OF INSTALLATION, THIS ADJUSTABLE PLATFORM MAY BE PRE-ASSEMBLED IN THE SHOP AND CARRIED TO THE JOB SITE. IT MAY ALSO BE ASSEMBLED AT THE BASE OF THE POLES.

IT IS RECOMMENDED YOU PROCEED AS FOLLOWS:

1. OPEN THE BOXED PARTS. EXAMINE THE ERECTION DIAGRAM. LOCATE AND IDENTIFY ALL ITEMS LISTED ON THE DIAGRAM.
2. POSITION THE I-BEAMS AND SLIDE 1/2" X 1-1/4" BOLTS INTO PLACE.
3. CRITICAL - BEGIN ASSEMBLY OF THE CROSSMEMBERS (C14'S, B2'S ETC.) AT THE CENTER OF THE PLATFORM, WORKING OUTWARD TOWARD THE ENDS. HEX NUTS AND PAL-TYPE LOCKNUTS ARE PROVIDED FOR EACH 1/2" BOLT.
4. COMPLETE THE ASSEMBLY WITH THE "A-FRAME" POLE FACE ATTACHMENTS IN THE APPROXIMATE FINAL POSITIONS. LEAVE ONE "A-FRAME" LOOSE TO SLIDE IN THE BEAMS FOR FINAL ADJUSTMENT.



5. HOIST PLATFORM TO DESIRED HEIGHT, LEVEL AND MAKE FINAL ADJUSTMENT OF "A-FRAME" ENDS TO INSURE GOOD CONTACT WITH THE POLES. BOLT THE "A-FRAMES" TO THE POLES USING THE THRU-BOLTS AND LAG BOLTS SPECIFIED ON THE ERECTION DIAGRAM. INSTALL THE POLE THRU-BOLTS WITH THE HEADS TOWARD THE PLATFORM CENTER.
6. CHECK TO BE SURE ALL NUTS ARE TIGHT AND ALL LOCKNUTS ARE IN PLACE.
7. INSTALL EQUIPMENT DIRECTLY ON ALUMINUM CROSSMEMBERS. THE CROSSMEMBERS MAY BE ADJUSTED TO SUPPORT THE LOAD. NO ADDITIONAL EQUIPMENT MOUNTING BOLTS ARE NECESSARY FOR NORMAL APPLICATIONS.

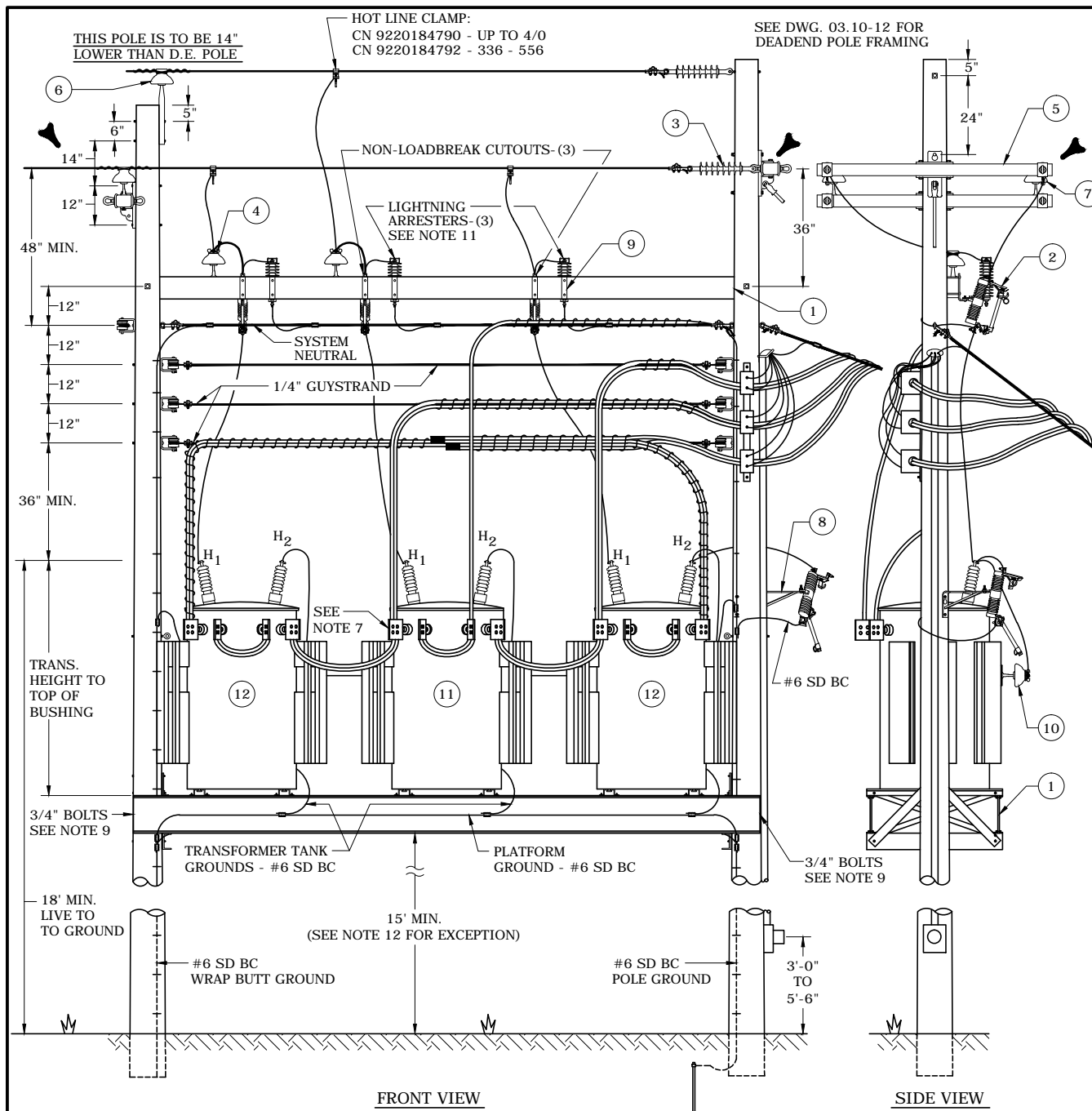
NOTES:

1. SEE DWG. 06.08-03A FOR PLATFORM DETAIL, NOTES AND BILL OF MATERIALS.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TWO POLE ALUMINUM PLATFORM
16' - HEAVY DUTY





NOTES:

1. SEE DWGS. 06.10-01 THROUGH 06.10-13 FOR TRANSFORMER CONNECTIONS.
2. DO NOT GROUND 1/4" GUYSTRAND SECONDARY MESSENGERS.
3. POTENTIAL TRANSFORMERS ARE REQUIRED FOR METERING 480 VOLT, 3Ø, 3W SERVICES. METERING SHOWN IS FOR 240/120, 3Ø, 4W SERVICES.
4. PLATFORM RATED WEIGHT CAPACITY WITHOUT CENTER STUB POLE IS 13,500 LBS. SEE DWGS. 06.08-03A AND 06.08-03B FOR INFORMATION ON STUB POLE.
5. ISSUE TRANSFORMERS, LOW VOLTAGE CONDUCTOR AND TERMINATIONS, METERING EQUIPMENT AND POLES SEPARATELY.
6. PARALLELED SERVICE CONDUCTORS ARE TO BE SPIRAL WRAPPED TOGETHER.
7. FOR SPADE EXTENSIONS, SEE DWG. 27.06-12.
8. SEE SECTION 01 FOR ADDITIONAL GROUNDING DETAILS.
9. EACH END OF PLATFORM TO BE ATTACHED TO POLE WITH QUANTITY TWO 3/4" BOLTS. SEE DWGS. 06.08-03A AND 06.08-03B FOR PLATFORM SPECIFICATIONS.
10. SEE DWG. 06.08-04B FOR BILL OF MATERIALS.
11. MOUNT PRIMARY ARRESTERS ON SOURCE SIDE OF CUTOUTS. IF ARRESTERS COME MOUNTED ON TRANSFORMER TANK, RELOCATE TO SOURCE SIDE OF CUTOUTS.
12. CLEARANCE TO BOTTOM OF PLATFORM CAN BE 11' ONLY IF THE AREA UNDER THE PLATFORM IS SUBJECT TO PEDESTRIANS OR RESTRICTED TRAFFIC. IF AREA UNDER PLATFORM IS SUBJECT TO RIDERS ON HORSEBACK OR OTHER LARGE ANIMALS, VEHICLES OR OTHER MOBILE UNITS EXCEEDING 8' IN HEIGHT, THE DIMENSION TO THE BOTTOM OF THE PLATFORM SHALL BE 15' MINIMUM.

3				
2	7/19/12	GUINN	GUINN	ELKINS
1	6/14/11	SIMMONS	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

WYE-DELTA TRANSFORMER PLATFORM INSTALLATION

BILL OF MATERIALS

MACRO UNIT	DESCRIPTION	ITEM NO	COMPATIBLE UNIT	QTY REQ'D	DESCRIPTION
TO250100T23CCCM	TFMR OH MU250100KVA 2-B/TAP MILD 23 KV 120/240V CLDEL	1	PLF16HDALC	1	STRUCTURE PLATFORM 16' HEAVY DUTY ALUMINUM
		2	TFUSE27CO100C	4	TRANS/CAP FUSE 27KV CUTOUT 100 AMP
		3	IDES25PC	3	INSULATOR DEADEND/SUSPENSION 25 KV POLYMER
		4	IPIN23C	2	INSULATOR PIN 23 KV
			PINSCREW6C	2	INSULATOR PIN SCREW x 6" x 1" HEAD
		5	ARMSDE72FC	2	CROSSARM SINGLE, FIBERGLASS, 72"
		6	PINPTP20C	1	INSULATOR PIN POLE TOP PIN 20" STEEL
			IPIN23C	1	INSULATOR PIN 23 KV
		7	PINCARMS586C	2	PIN, SHOULDER, 5/8" X 6" STEEL
			IPIN23C	2	INSULATOR PIN 23 KV
		8	BKTCOLA18STLC	1	BRACKET FOR CUTOUT OR ARRESTER, 18", STEEL
		9	BKTCOLASTLXARMC	6	BRACKET FOR CO OR ARR, STEEL, XARM MNTD.
TO25075T23CCCM	TFMR OH MU25075KVA 2-B/TAP MILD 23 KV 120/240V CLDEL	10	IPIN23C	3	INSULATOR PIN 23 KV
			PINSTLARMC	3	INSULATOR PIN STEEL CROSSARM PIN
TO250167T23CCCM	TFMR OH MU250167KVA 2-B/TAP MILD 23 KV 120/240V CLDEL	11	TFO250DTM25CC	1	OH 250KVA 2-B CON W/TAP MILD 14.4/24.94Y KV 120/240V
		12	TFO100DTM25CC	2	OH 100KVA 2-B CON W/TAP MILD 14.4/24.94Y KV 120/240V

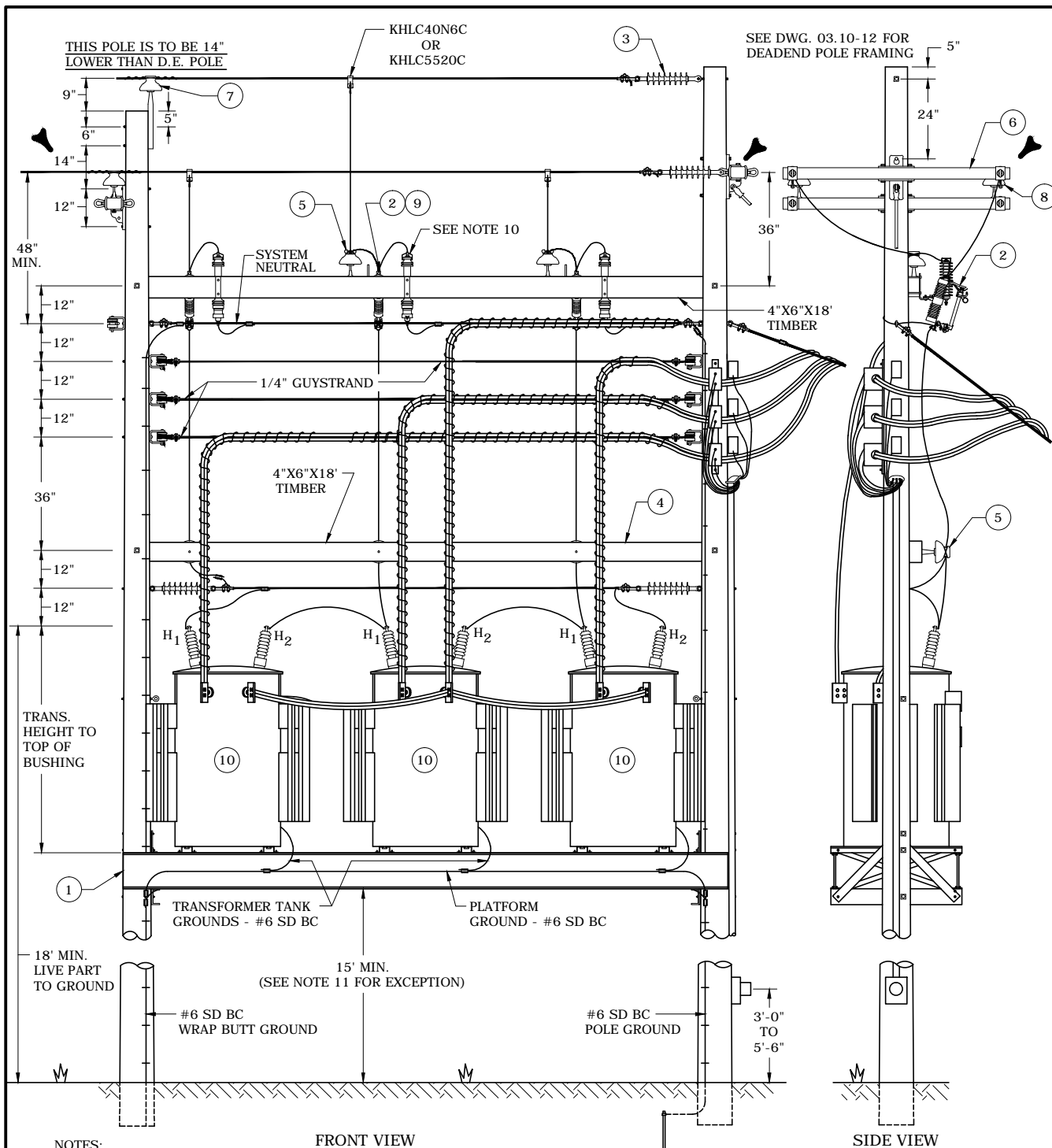
NOTES:

- SEE DWG. 06.08-04A FOR DESIGN SPECIFICATIONS.

3				
2				
1	7/19/12	GUINN	GUINN	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

WYE-DELTA TRANSFORMER PLATFORM INSTALLATION





NOTES:

1. SEE DWGS. 06.10-01 THROUGH 06.10-13 FOR TRANSFORMER CONNECTIONS.
2. FOR SPECIAL INSTALLATIONS CONTACT LOCAL ENGINEER.
3. PLATFORM RATED WEIGHT CAPACITY WITHOUT CENTER STUB POLE IS 13,500 LBS.
4. TRANSFORMERS SHOULD BE BOLTED TO PLATFORM USING BOLTS IN CROSSMEMBER T-SLOTS.
5. PARALLELED SERVICE CONDUCTORS ARE TO BE SPIRAL WRAPPED TOGETHER.
6. FOR SECONDARY CONNECTOR BLOCKS, SEE DWG. 27.06-12.
7. SEE SECTION 01 FOR ADDITIONAL GROUNDING DETAILS.
8. EACH END OF PLATFORM TO BE ATTACHED TO POLE WITH QUANTITY TWO 3/4" BOLTS. SEE DWGS. 06.08-03A AND 06.08-03B FOR PLATFORM SPECIFICATIONS.
9. SEE DWG. 06.08-05B FOR BILL OF MATERIALS.
10. MOUNT PRIMARY ARRESTERS ON THE TRANSFORMER TANK AT ALL HIGH VOLTAGE BUSHINGS IF PROVISIONS ARE AVAILABLE. OTHERWISE, MOUNT ON THE TIMBER ADJACENT TO CUTOUTS.
11. CLEARANCE TO BOTTOM OF PLATFORM CAN BE 11' ONLY IF THE AREA UNDER THE PLATFORM IS SUBJECT TO PEDESTRIANS OR RESTRICTED TRAFFIC. IF AREA UNDER PLATFORM IS SUBJECT TO RIDERS ON HORSEBACK OR OTHER LARGE ANIMALS, VEHICLES OR OTHER MOBILE UNITS EXCEEDING 8' IN HEIGHT, THE DIMENSION TO THE BOTTOM OF THE PLATFORM SHALL BE 15' MINIMUM.

3	7/19/12	GUINN	GUINN	ELKINS
2	8/31/11	BURLISON	BURLISON	ELKINS
1	6/14/11	SIMMONS	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

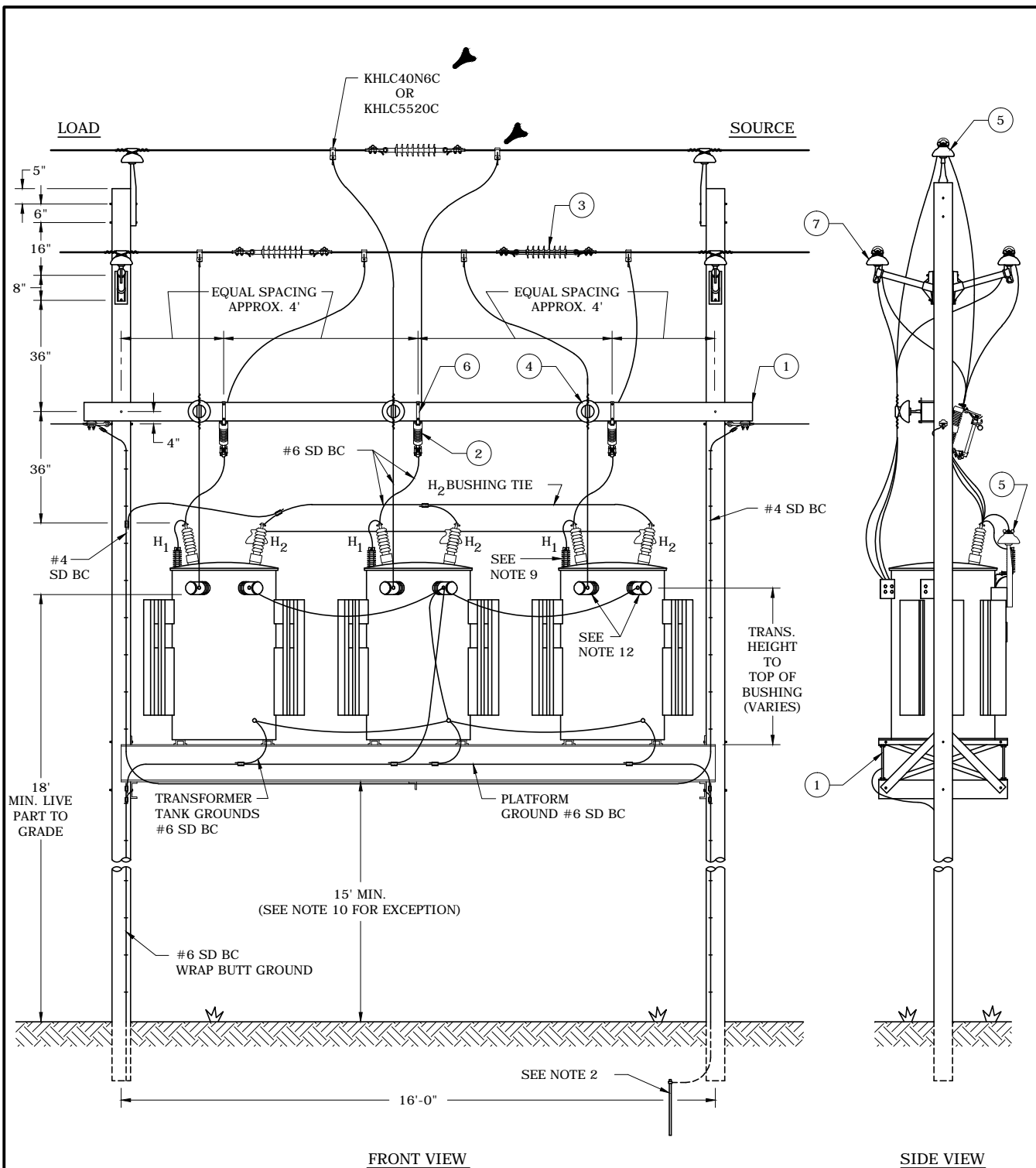
DELTA-WYE TRANSFORMER PLATFORM INSTALLATION

BILL OF MATERIALS					
MACRO UNIT	DESCRIPTION	ITEM NO	COMPATIBLE UNIT	QTY REQ'D	DESCRIPTION
TO750T12FYCM	TFMR OH MU 750KVA 2-B/TAP MILD 12.47KV 277/480V WYE	1	PLF16HDALC	1	STRUCTURE PLATFORM 16' HEAVY DUTY ALUMINUM
		2	TFUSE27CO100C	3	TRANS/CAP FUSE 27KV CUTOUT 100 AMP
		3	IDES25PC	5	INSULATOR DEADEND/SUSPENSION 25 KV POLYMER
		4	ARMS18WC	2	XARM SINGLE 4" X 6" X 18' PENTA WOOD FOR REG
		5	IPIN23C	5	INSULATOR PIN 23 KV
			PINSCREW6C	5	INSULATOR PIN SCREW X 6" x 1" HEAD
		6	ARMSDE72FC	2	CROSSARM SINGLE, FIBERGLASS, 72"
		7	PINPTP20C	2	INSULATOR PIN POLE TOP PIN 20" STEEL
			IPIN23C	2	INSULATOR PIN 23 KV
		8	PINCARMS586C	2	PIN, SHOULDER, 5/8" X 6", STEEL
			IPIN23C	2	INSULATOR PIN 23 KV
		9	BKTCOLASTLXARMC	6	BRACKET FOR CO OR ARR, STEEL, XARM MNTD.
		10	TFO250DTM25FC	3	OH 250KVA 2-B CON W/TAP MILD 14.4/24.94Y KV 277/480V
TO1000T12FYCM	TFMR OH MU 1000KVA 2-B/TAP MILD 12.47KV 277/480V WYE				
TO1500T12FYCM	TFMR OH MU 1500KVA 2-B/TAP MILD 12.47KV 277/480V WYE				
TO750T12BYCM	TFMR OH MU 750KVA 2-B/TAP MILD 12.47KV 120/208V WYE				

NOTES:

1. ISSUE TRANSFORMERS, LOW VOLTAGE CONDUCTOR AND TERMINATIONS, METERING EQUIPMENT AND POLES SEPARATELY.
2. SEE DWG. 06.08-05A FOR DESIGN SPECIFICATIONS AND NOTES.
3. SEE DWGS. 06.08-03A AND 06.08-03B FOR PLATFORM SPECIFICATIONS.

3					DELTA-WYE TRANSFORMER PLATFORM INSTALLATION	 Progress Energy
2						
1	7/19/12	GUINN	GUINN	ELKINS		
0	7/9/10	SIMMONS	GUINN	ELKINS		
REVISED	BY	CK'D	APPR.			
						 CAR
					DWG. 06.08-05B	



NOTES:

1. SEE DWG. 06.08-06B FOR NOTES AND BILL OF MATERIALS.

3				
2				
1	8/31/11	BURLISON	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

WYE-WYE PLATFORM INSTALLATION
12470Y/7200 OR 4160Y/2400 POD

BILL OF MATERIALS			
ITEM NO	COMPATIBLE UNIT	QTY REQ'D	DESCRIPTION
1	PLF16HDALC	1	STRUCTURE PLATFORM 16' HEAVY DUTY ALUMINUM
2	TFUSE27CO100C	3	TRANS/CAP FUSE 27KV CUTOOUT 100 AMP
3	IDES25PC	3	INSULATOR DEADEND/SUSPENSION 25 KV POLYMER
4	IPIN23C	3	INSULATOR PIN 23 KV
	PINCARMS586C	3	INSULATOR PIN CROSSARM SHOULDER 5/8x6"
5	PINPTP20C	5	INSULATOR PIN POLE TOP PIN 20" STEEL
	IPIN23C	5	INSULATOR PIN 23 KV
6	BKTCOLASTLXARMC	3	BRACKET FOR CO OR ARR, STEEL, XARM MNTD.
7	BKTFPIN18C	4	INSULATOR BRACKET FBG POST (BULL HORN) 18"
	IPIN23C	4	INSULATOR PIN 23 KV

NOTES:

1. SPANS AND TENSIONS ON BOTH SIDES OF STRUCTURE SHOULD BE EQUAL. STRUCTURE SHOULD NOT LEAN. GUYING MAY BE REQUIRED.
2. TRANSFORMERS SHOWN ARE FOR 4KV SECONDARY.
3. GROUND PLATFORM WITH COPPER GROUNDING LUG.
4. PLATFORM RATED WEIGHT CAPACITY WITHOUT CENTER STUB POLE IS 13,500 LBS.
5. TRANSFORMERS SHOULD BE BOLTED TO PLATFORM USING BOLTS IN CROSSMEMBER T-SLOTS.
6. EACH END OF PLATFORM TO BE ATTACHED TO POLE WITH QUANTITY TWO 3/4" BOLTS. SEE DWGS. 06.08-03A 06.08-03B FOR PLATFORM SPECIFICATIONS.
7. MOUNT PRIMARY ARRESTERS ON THE TRANSFORMER TANK AT ALL PRIMARY H1 BUSHINGS IF PROVISIONS ARE AVAILABLE. OTHERWISE, MOUNT ON THE TIMBER ADJACENT TO CUTOUTS.
8. CLEARANCE TO BOTTOM OF PLATFORM CAN BE 11' ONLY IF THE AREA UNDER THE PLATFORM IS SUBJECT TO PEDESTRIANS OR RESTRICTED TRAFFIC. IF AREA UNDER PLATFORM IS SUBJECT TO RIDERS ON HORSEBACK OR OTHER LARGE ANIMALS, VEHICLES OR OTHER MOBILE UNITS EXCEEDING 8' IN HEIGHT, THE DIMENSION TO THE BOTTOM OF THE PLATFORM SHALL BE 15' MINIMUM.
9. SEE DWG. 06.08-06A FOR DESIGN SPECIFICATIONS.
10. SECONDARY BUSHINGS FOR 12470Y/7200 VOLT SYSTEMS WILL BE ON COVER OF TRANSFORMERS.



3				
2	3/31/15	GUINN	BURLISON	ADCOCK
1	7/12/11	SIMMONS	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

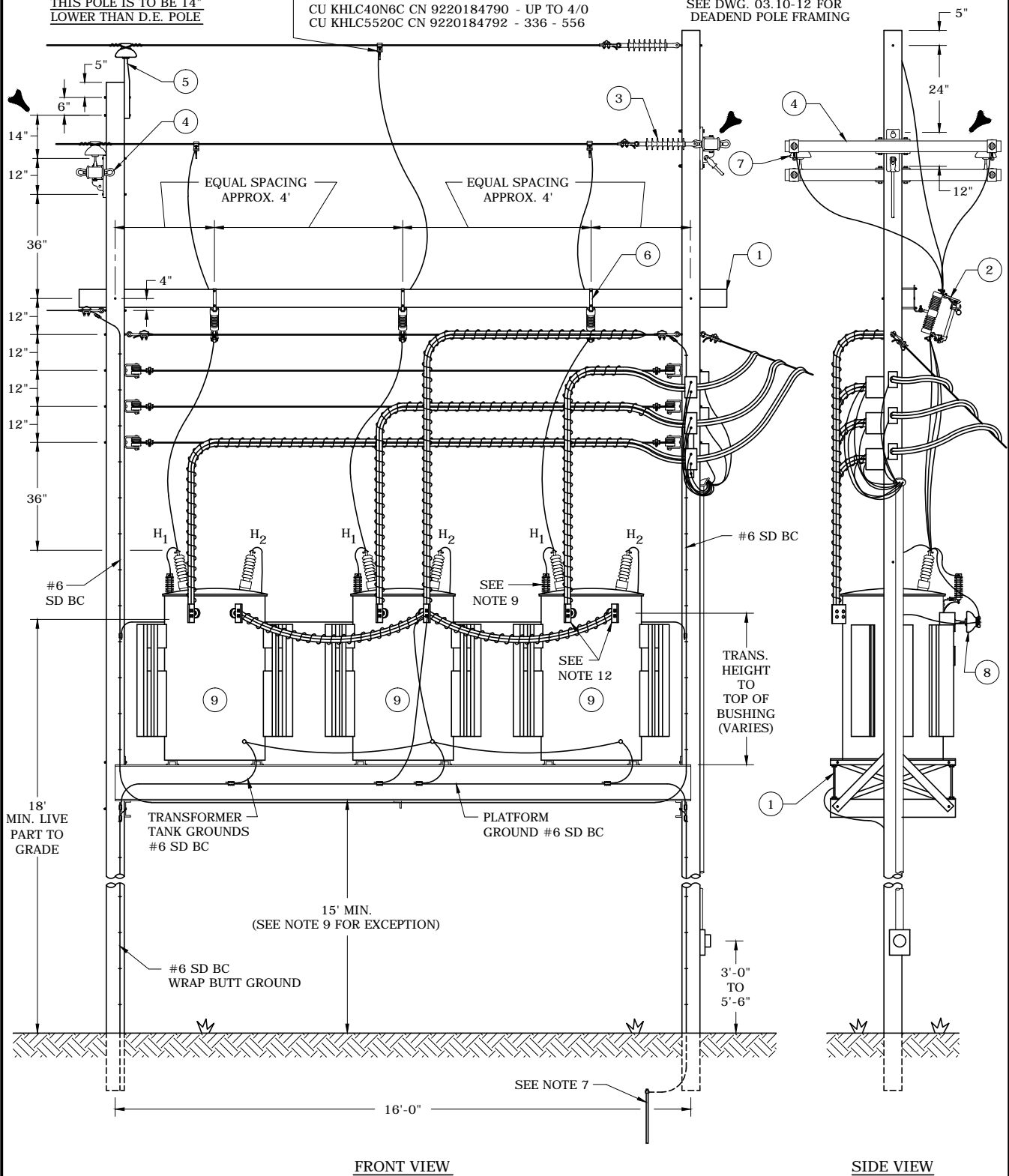
WYE-WYE STEPDOWN INSTALLATION
12470Y/7200 OR 4160Y/2400 SECONDARY

DEC	DEM	DEP	DEF
		X	
06.08-06B			

THIS POLE IS TO BE 14"
LOWER THAN D.E. POLE

HOT LINE CLAMP:
CU KHL40N6C CN 9220184790 - UP TO 4/0
CU KHL5520C CN 9220184792 - 336 - 556

SEE DWG. 03.10-12 FOR
DEADEND POLE FRAMING



3				
2				
1	7/27/12	GUINN	GUINN	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

WYE-WYE PLATFORM INSTALLATION

600 VOLT OR LESS POD

BILL OF MATERIALS					
MACRO UNIT	DESCRIPTION	ITEM NO	COMPATIBLE UNIT	QTY REQ'D	DESCRIPTION
TO750T23FYCM	TFMR OH MU 750KVA 2-B/TAP MILD 23 KV 277/480V WYE	1	PLF16HDALC	1	STRUCTURE PLATFORM 16' HEAVY DUTY ALUMINUM
		2	TFUSE27CO100C	3	TRANS/CAP FUSE 27KV CUTOUT 100 AMP
		3	IDES25PC	3	INSULATOR DEADEND/SUSPENSION 25 KV POLYMER
		4	ARMSDE72FC	2	CROSSARM SINGLE, FIBERGLASS, 72"
		5	PINPTP20C	1	INSULATOR PIN POLE TOP PIN 20" STEEL
			IPIN23C	1	INSULATOR PIN 23 KV
		6	BKTCOLASTLXARMC	3	BRACKET FOR CO OR ARR, STEEL, XARM MNTED.
		7	PINCARMS586C	2	PIN, SHOULDER, 5/8" X 6", STEEL
			IPIN23C	2	INSULATOR PIN 23 KV
		8	PINSTLARMC	2	INSULATOR PIN STEEL CROSSARM PIN
			IPIN23C	2	INSULATOR PIN 23 KV
		9	TFO250DTM25FC	3	OH 250KVA 2-B CON W/TAP MILD 14.4/24.94Y KV 277/480V
TO750T23BYCM	TFMR OH MU 750KVA 2-B/TAP MILD 23 KV 120/208V WYE				
TO750T23FYCM	TFMR OH MU 750KVA 2-B/TAP MILD 23 KV 277/480V WYE				
TO1000T23FYCM	TFMR OH MU 1000KVA 2-B/TAP MILD 23 KV 277/480V WYE				
TO1500T23FYCM	TFMR OH MU 1500KVA 2-B/TAP MILD 23 KV 277/480V WYE				

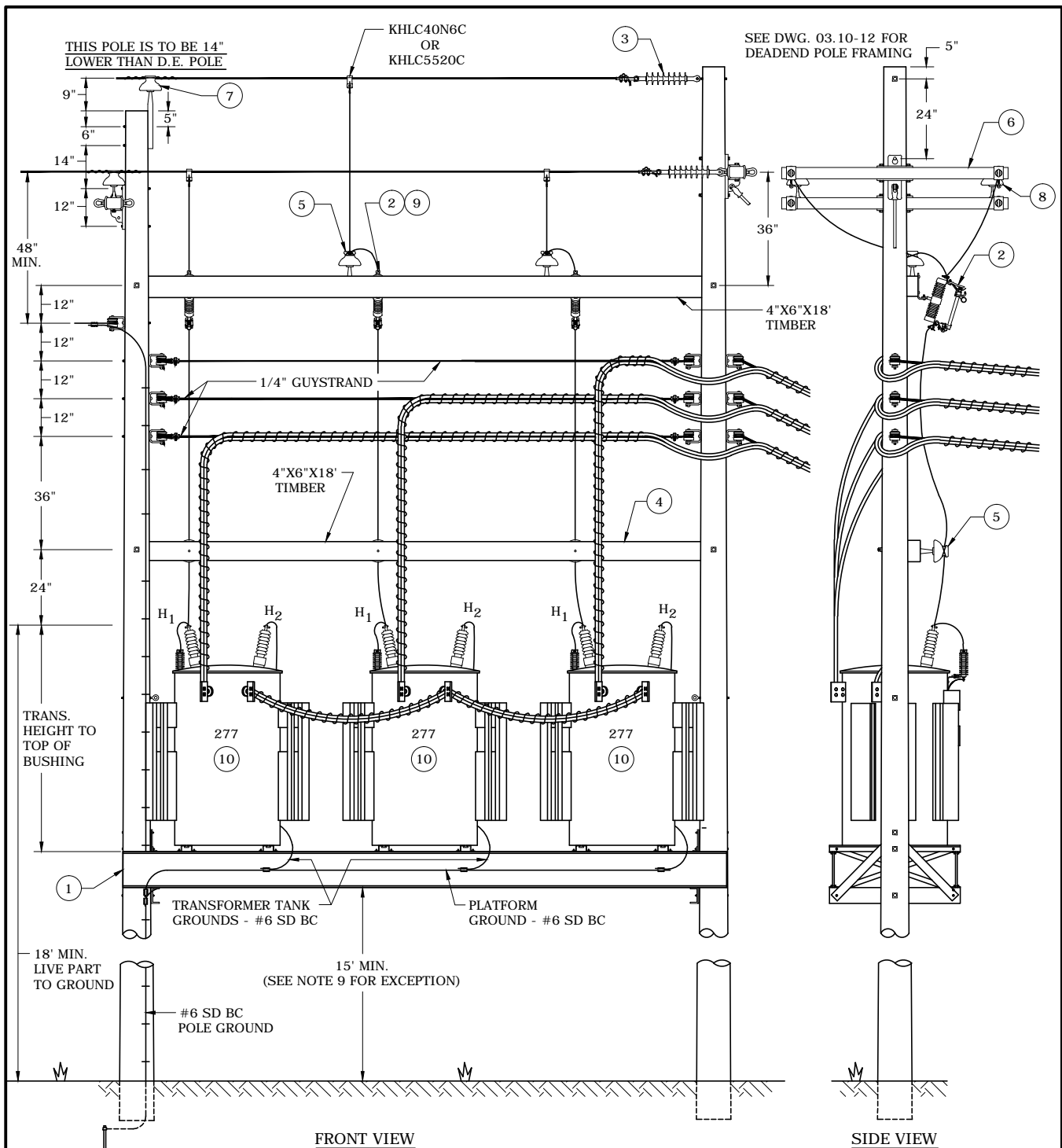
NOTES:

1. SPANS AND TENSIONS ON BOTH SIDES OF STRUCTURE SHOULD BE EQUAL. STRUCTURE SHOULD NOT LEAN. GUYING MAY BE REQUIRED.
2. SEE DWGS. 06.10-01 THROUGH 06.10-13 FOR TRANSFORMER CONNECTIONS.
3. FOR SPECIAL INSTALLATIONS CONTACT LOCAL ENGINEER.
4. PLATFORM RATED WEIGHT CAPACITY WITHOUT CENTER STUB POLE IS 13,500 LBS. SEE DWGS. 06.08-03A AND 06.08-03B FOR INFORMATION ON STUB POLE.
5. SEE SECTION 01 FOR ADDITIONAL GROUNDING DETAILS.
6. EACH END OF PLATFORM TO BE ATTACHED TO POLE WITH QUANTITY TWO 3/4" BOLTS. SEE DWGS. 06.08-03A AND 06.08-03B FOR PLATFORM SPECIFICATIONS.
7. MOUNT PRIMARY ARRESTERS ON THE TRANSFORMER TANK AT ALL PRIMARY H1 BUSHINGS IF PROVISIONS ARE AVAILABLE. OTHERWISE, MOUNT ON THE TIMBER ADJACENT TO CUTOUTS.
8. CLEARANCE TO BOTTOM OF PLATFORM CAN BE 11' ONLY IF THE AREA UNDER THE PLATFORM IS SUBJECT TO PEDESTRIANS OR RESTRICTED TRAFFIC. IF AREA UNDER PLATFORM IS SUBJECT TO RIDERS ON HORSEBACK OR OTHER LARGE ANIMALS, VEHICLES OR OTHER MOBILE UNITS EXCEEDING 8' IN HEIGHT, THE DIMENSION TO THE BOTTOM OF THE PLATFORM SHALL BE 15' MINIMUM.
9. SEE DWG. 06.08-08A FOR DESIGN SPECIFICATIONS.
10. PARALLELED SERVICE CONDUCTORS ARE TO BE SPIRAL WRAPPED TOGETHER.
11. SEE DWG. 27.06-12 FOR SECONDARY CONNECTOR BLOCKS.

3				
2	7/27/12	GUINN	GUINN	ELKINS
1	6/14/11	SIMMONS	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

WYE-WYE PLATFORM INSTALLATION
600 VOLT OR LESS POD





NOTES:

1. SEE DWG. 06.10-01 THROUGH DWG. 06.10-13 FOR TRANSFORMER CONNECTIONS.
2. FOR SPECIAL INSTALLATIONS CONTACT LOCAL ENGINEER.
3. PLATFORM RATED WEIGHT CAPACITY WITHOUT CENTER STUB POLE IS 13,500 LBS.
4. TRANSFORMERS SHOULD BE BOLTED TO PLATFORM USING BOLTS IN CROSSMEMBER T-SLOTS.
5. PARALLELED SERVICE CONDUCTORS ARE TO BE SPIRAL WRAPPED TOGETHER.
6. FOR SECONDARY CONNECTOR BLOCKS, SEE DWG. 27.06-12.
7. EACH END OF PLATFORM TO BE ATTACHED TO POLE WITH QUANTITY TWO 3/4\"
8. SEE DWG. 06.08-10B FOR BILL OF MATERIALS.
9. CLEARANCE TO BOTTOM OF PLATFORM CAN BE 11' ONLY IF THE AREA UNDER THE PLATFORM IS SUBJECT TO PEDESTRIANS OR RESTRICTED TRAFFIC. IF AREA UNDER PLATFORM IS SUBJECT TO RIDERS ON HORSEBACK OR OTHER LARGE ANIMALS, VEHICLES OR OTHER MOBILE UNITS EXCEEDING 8' IN HEIGHT, THE DIMENSION TO THE BOTTOM OF THE PLATFORM SHALL BE 15' MINIMUM.

3				
2				
1				
0	3/22/13	SIMMONS	GUINN	ADCOCK
REVISED	BY	CK'D	APPR.	

GROUNDING WYE-FLOATING WYE TRANSFORMER PLATFORM INSTALLATION FOR 480 VOLT 3 WIRE SERVICE



CAR DWG.
06.08-10A

BILL OF MATERIALS					
MACRO UNIT	DESCRIPTION	ITEM NO	COMPATIBLE UNIT	QTY REQ'D	DESCRIPTION
TO750T23GYCM	TFMR OH MU 750KVA 2-B/TAP MILD 12.47KV 480V 3-WIRE WYE	1	PLF16HDALC	1	STRUCTURE PLATFORM 16' HEAVY DUTY ALUMINUM
		2	TFUSE27CO100C	3	TRANS/CAP FUSE 27KV CUTOUT 100 AMP
		3	IDES25PC	3	INSULATOR DEADEND/SUSPENSION 25 KV POLYMER
		4	ARMS18WC	2	XARM SINGLE 4" X 6" X 18' PENTA WOOD FOR REG
		5	IPIN23C	5	INSULATOR PIN 23 KV
			PINSCREW6C	5	INSULATOR PIN SCREW X 6" x 1" HEAD
		6	ARMSDE72FC	2	CROSSARM SINGLE, FIBERGLASS, 72"
		7	PINPTP20C	2	INSULATOR PIN POLE TOP PIN 20" STEEL
			IPIN23C	2	INSULATOR PIN 23 KV
		8	PINCARMS586C	2	PIN, SHOULDER, 5/8" X 6", STEEL
			IPIN23C	2	INSULATOR PIN 23 KV
		9	BKTCOLASTLXARMC	6	BRACKET FOR CO OR ARR, STEEL, XARM MNTED.
		10	TFO250DTM25FC	3	OH 250KVA 2-B CON W/TAP MILD 14.4/24.94Y KV 277/480V
TO1000T23GYCM	TFMR OH MU 1000KVA 2-B/TAP MILD 12.47KV 480V 3-WIRE WYE				
TO1500T23GYCM	TFMR OH MU 1500KVA 2-B/TAP MILD 12.47KV 480V 3-WIRE WYE				

NOTES:

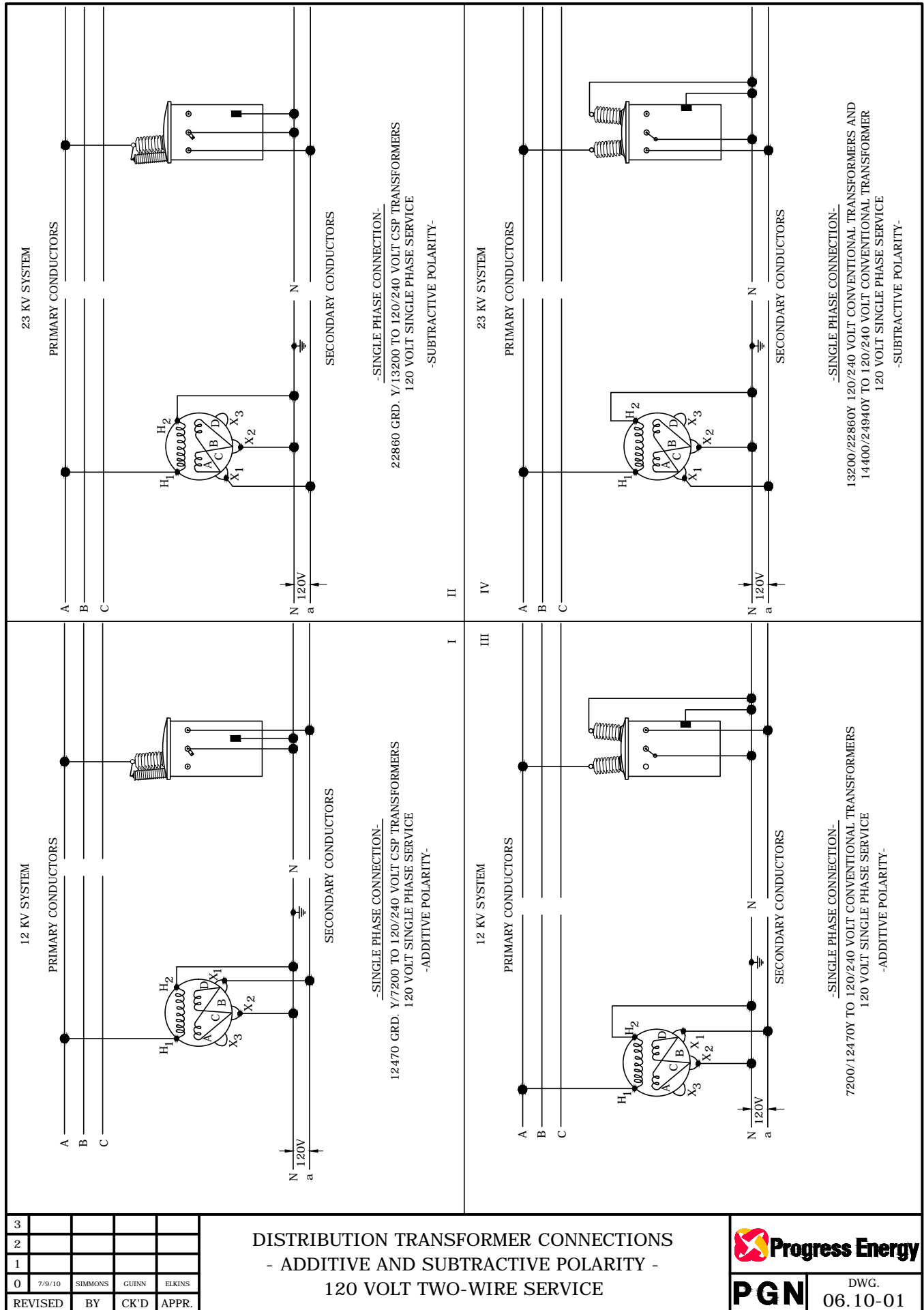
1. ISSUE TRANSFORMERS, LOW VOLTAGE CONDUCTOR AND TERMINATIONS, METERING EQUIPMENT AND POLES SEPARATELY.
2. SEE DWG. 06.08-10A FOR DESIGN SPECIFICATIONS AND NOTES.
3. SEE DWGS. 06.08-03A AND 06.08-03B FOR PLATFORM SPECIFICATIONS.

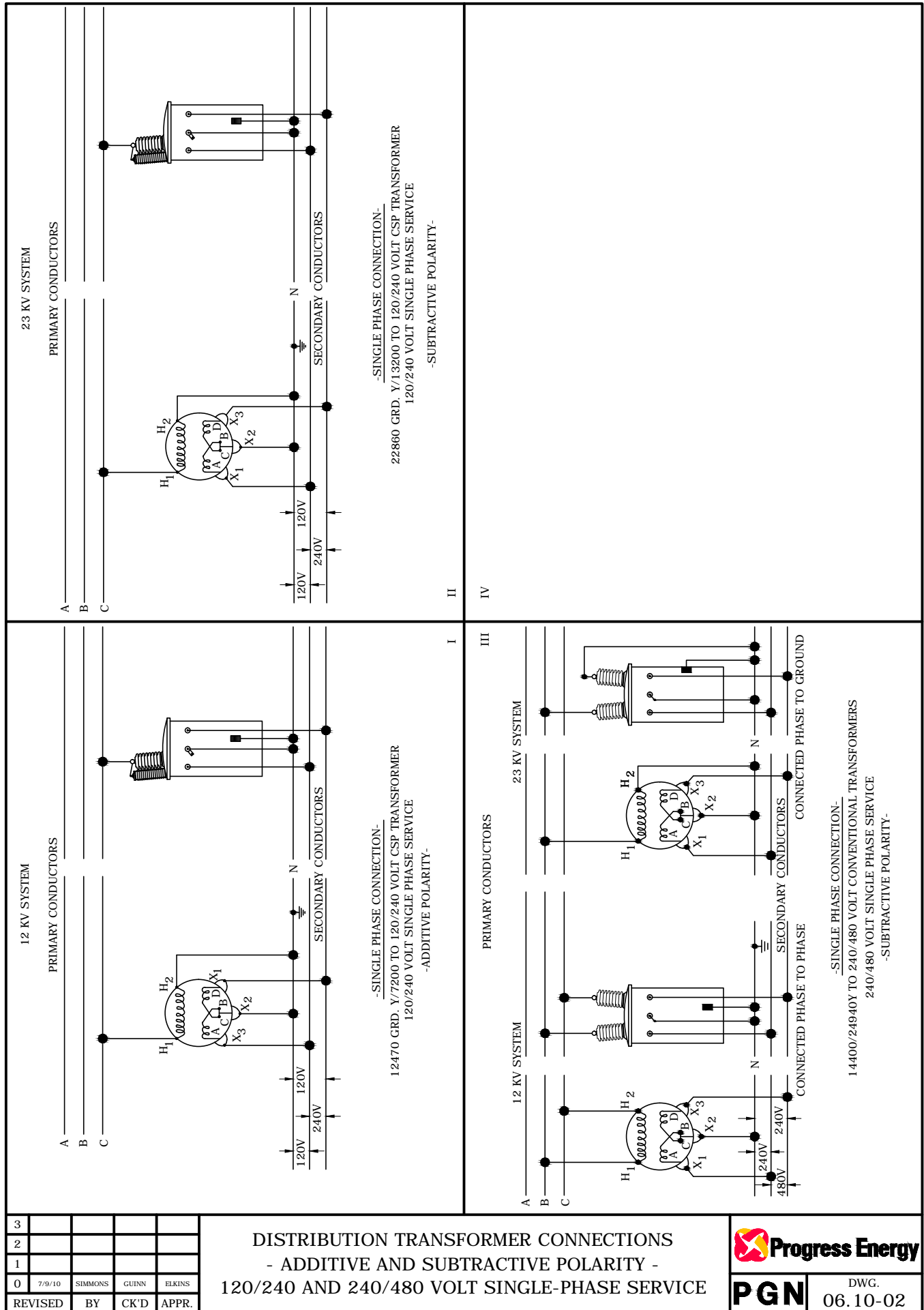
3				
2				
1				
0	3/22/13	SIMMONS	GUINN	ADCOCK
REVISED	BY	CK'D	APPR.	

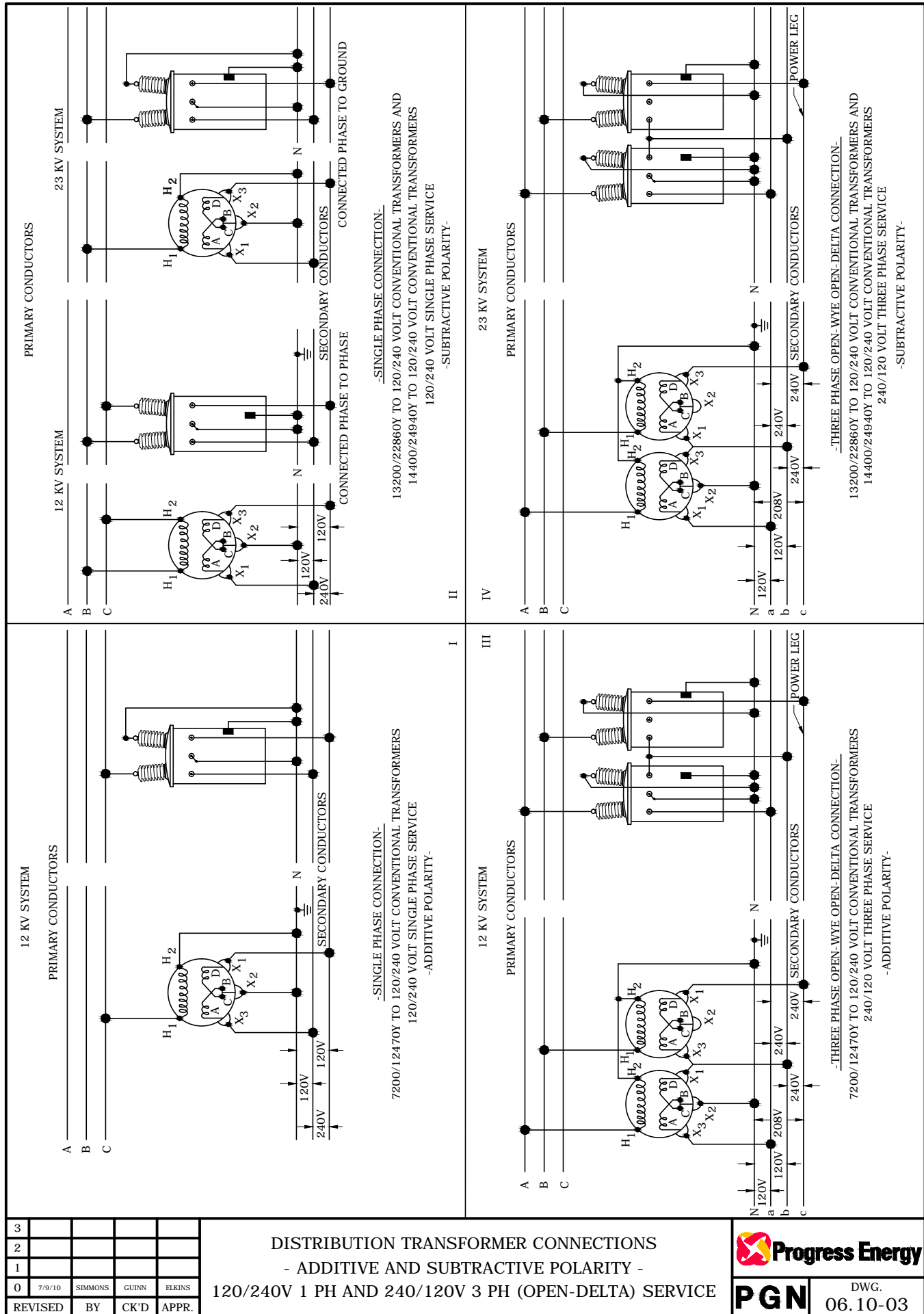
GROUNDING WYE-FLOATING WYE TRANSFORMER
PLATFORM INSTALLATION
FOR 480 VOLT 3 WIRE SERVICE

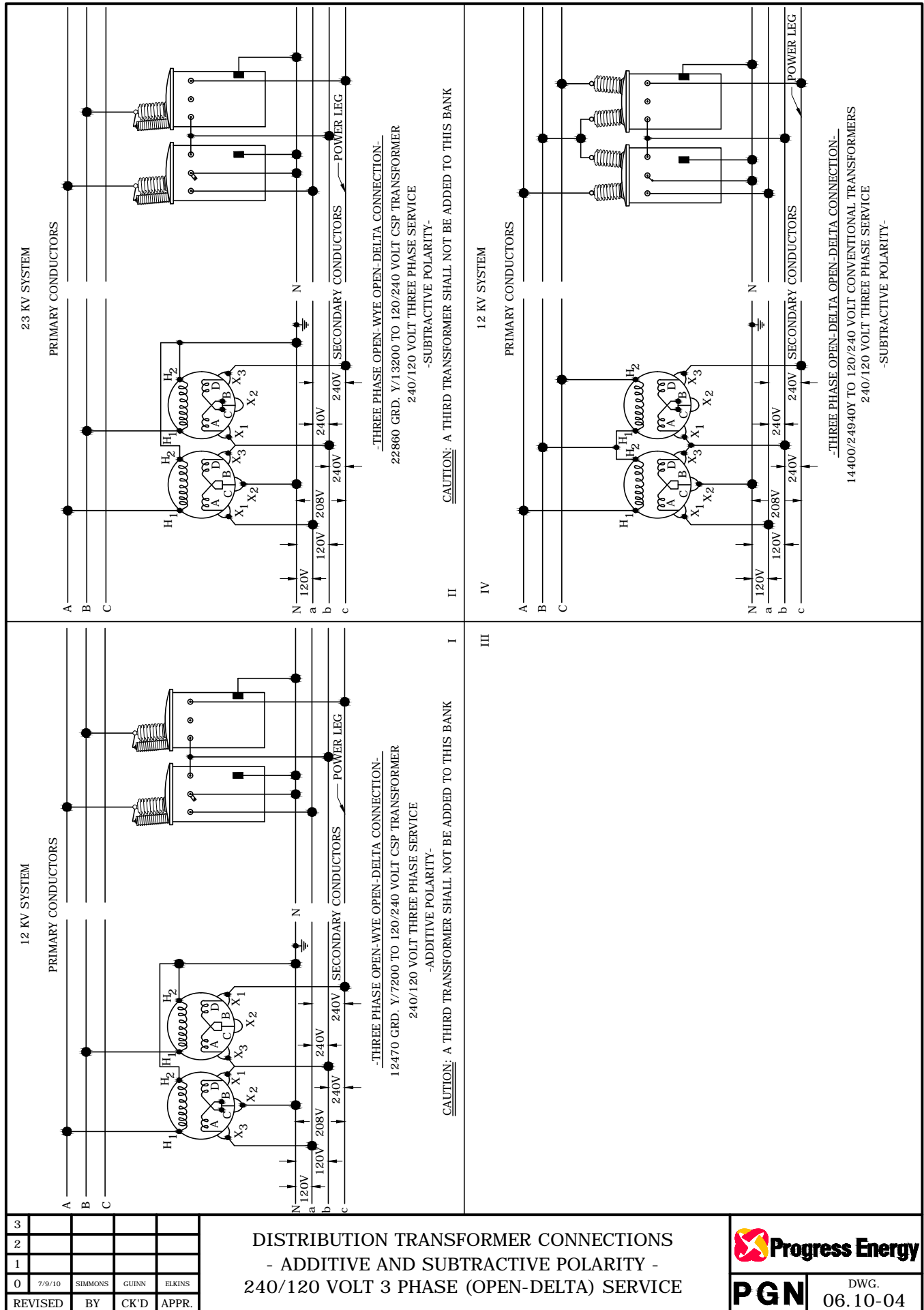


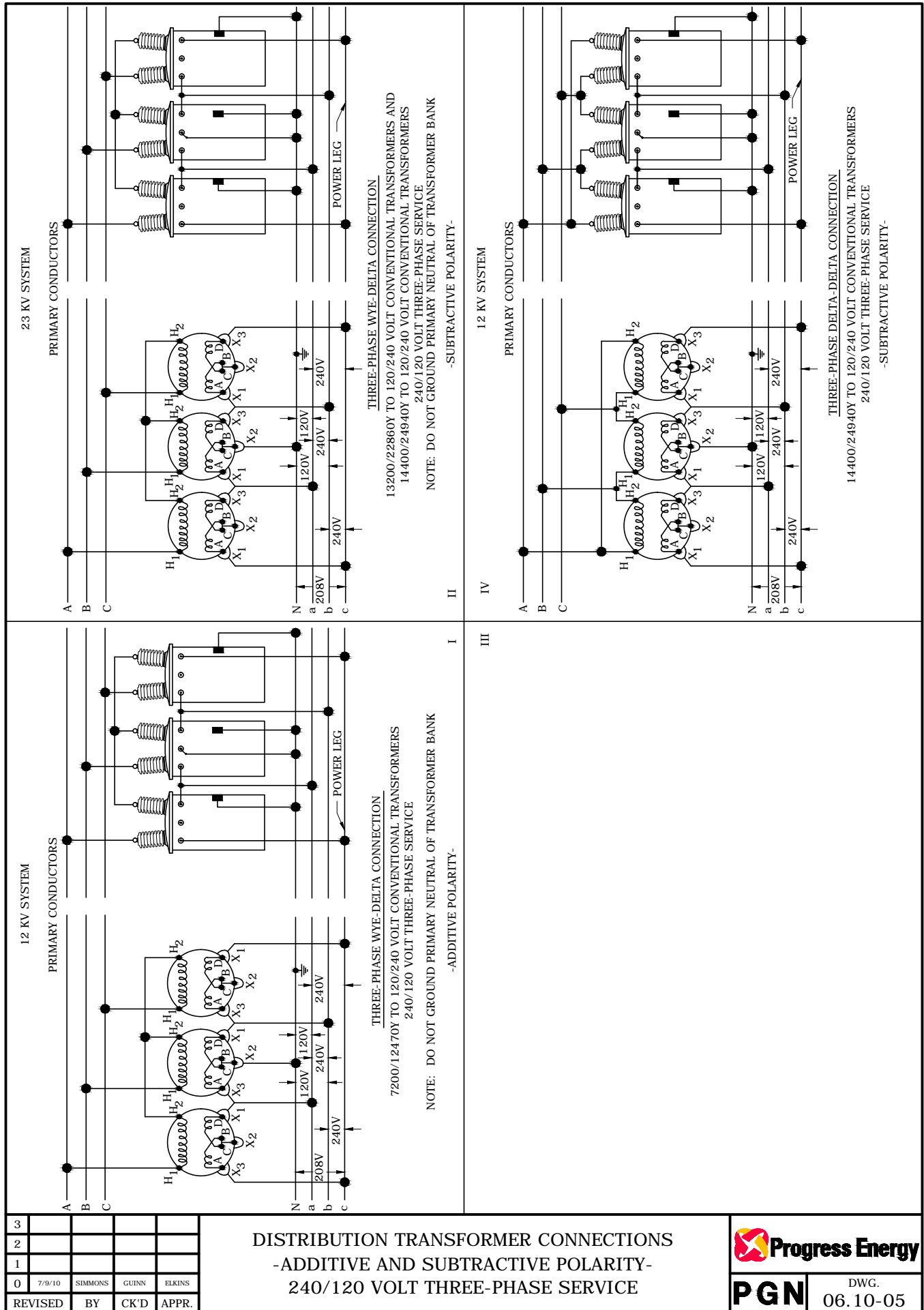
CAR DWG.
06.08-10B







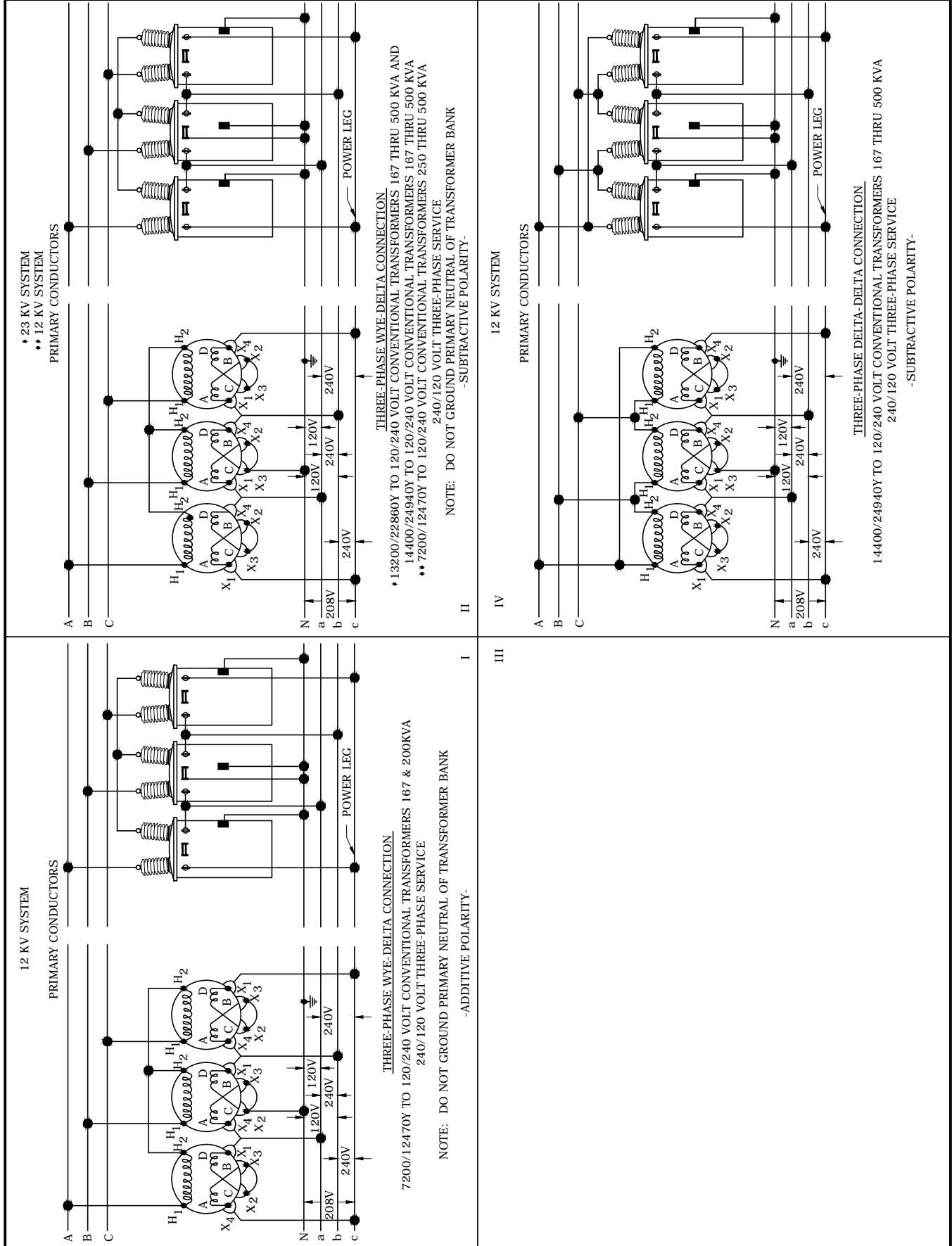




DISTRIBUTION TRANSFORMER CONNECTIONS
-ADDITIVE AND SUBTRACTIVE POLARITY-
240/120 VOLT THREE-PHASE SERVICE

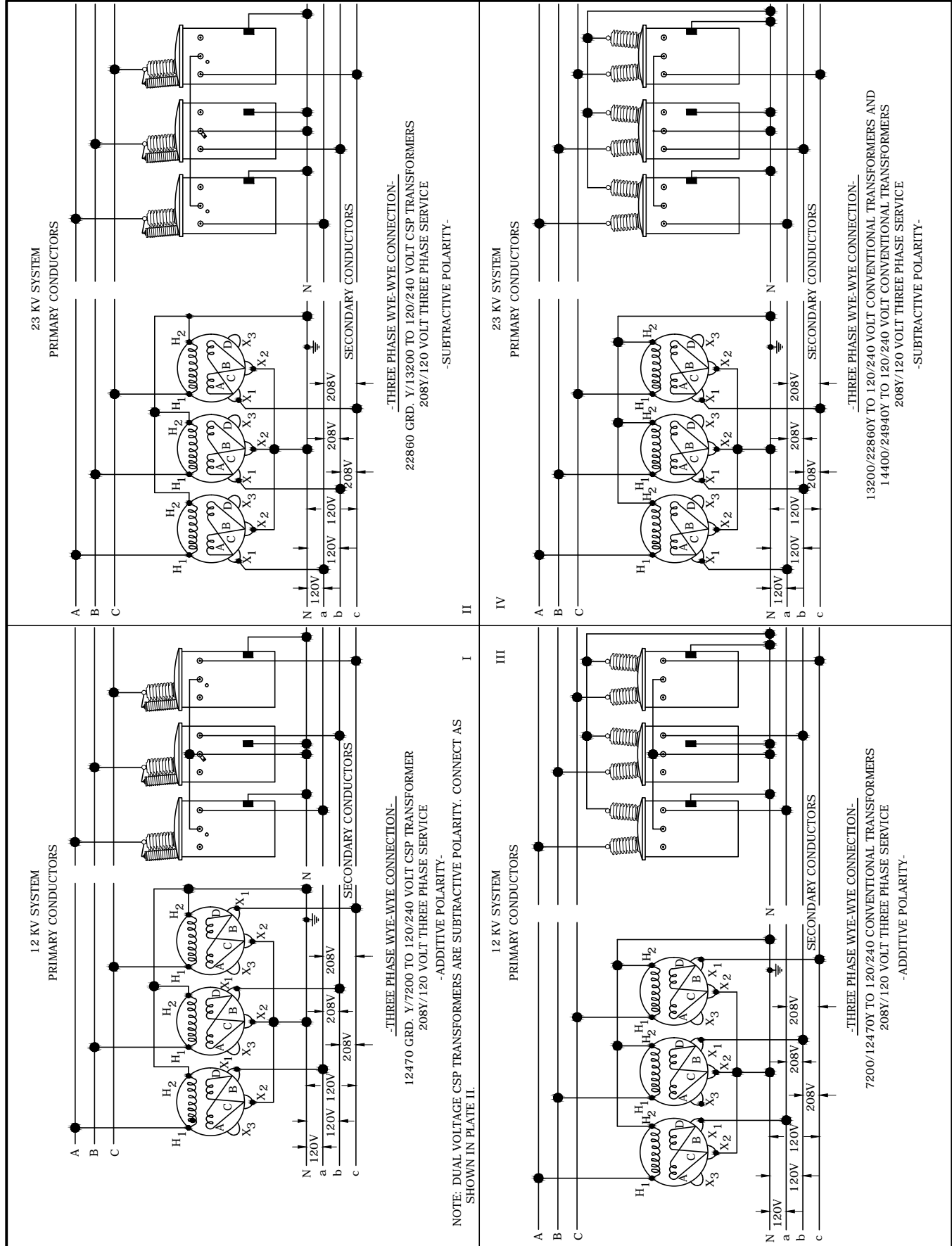
3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

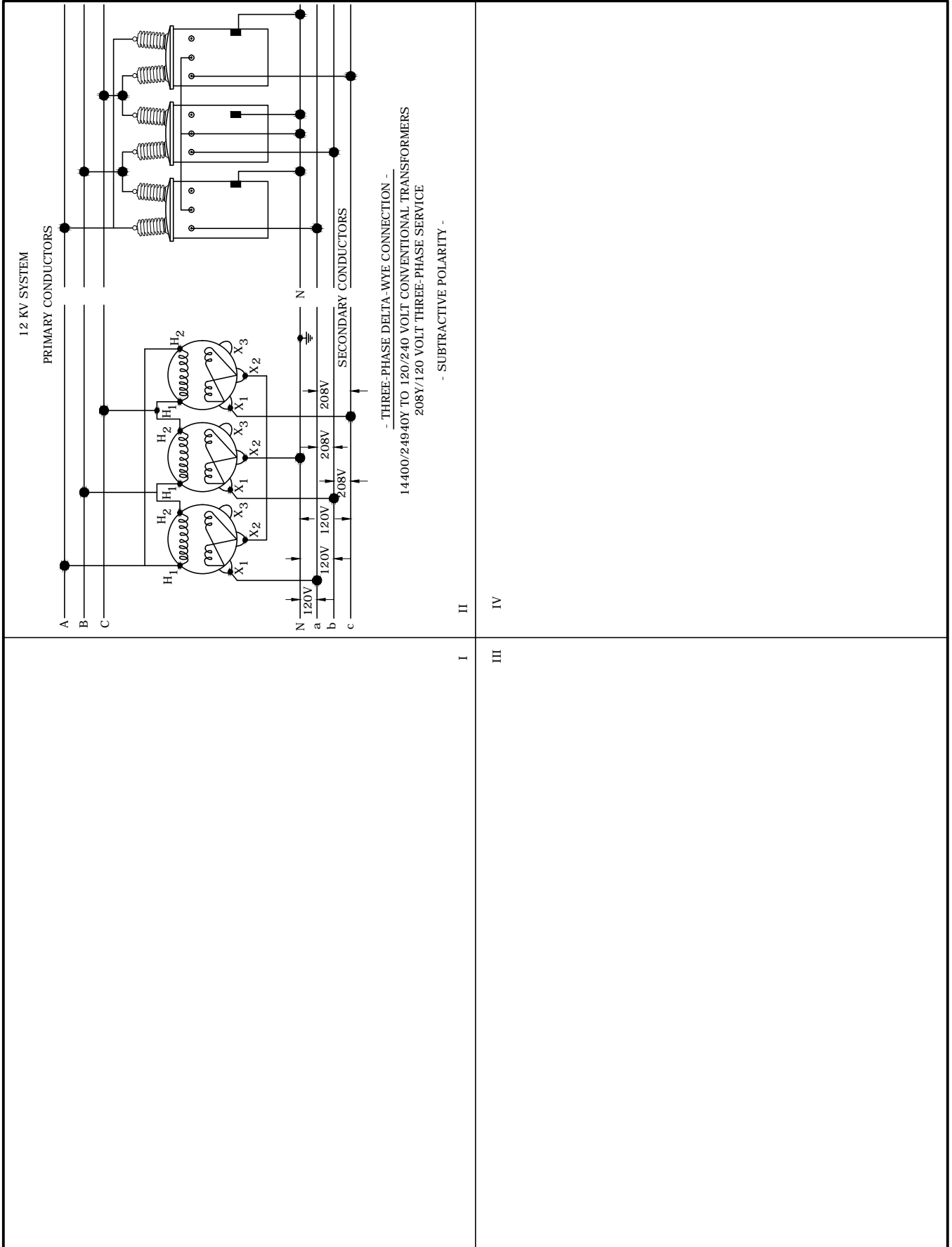
DISTRIBUTION TRANSFORMER CONNECTIONS
- ADDITIVE AND SUBTRACTIVE POLARITY -
240/120 VOLT THREE-PHASE SERVICE




3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DISTRIBUTION TRANSFORMER CONNECTIONS
- ADDITIVE AND SUBTRACTIVE POLARITY -
208Y/120 VOLT THREE PHASE SERVICE

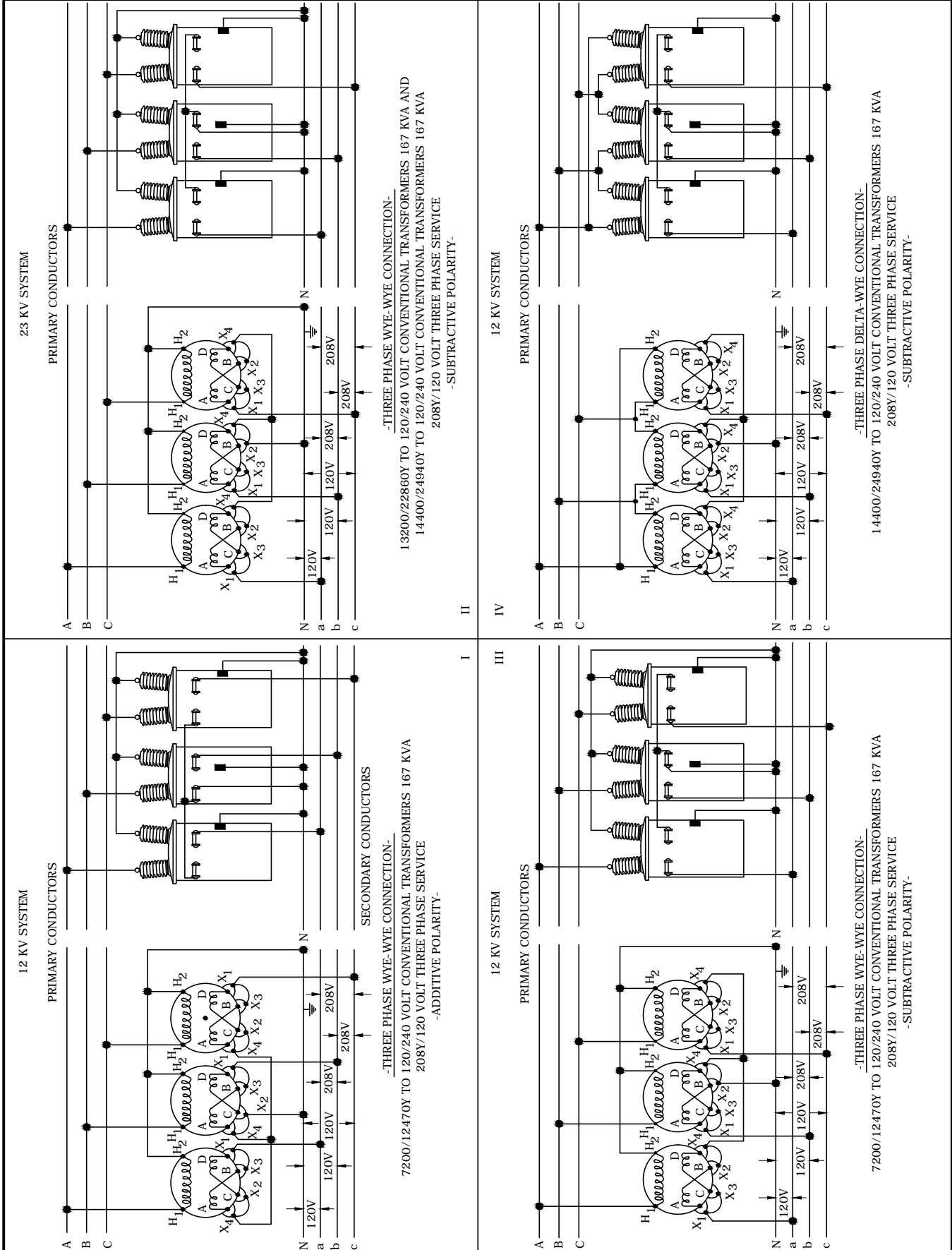


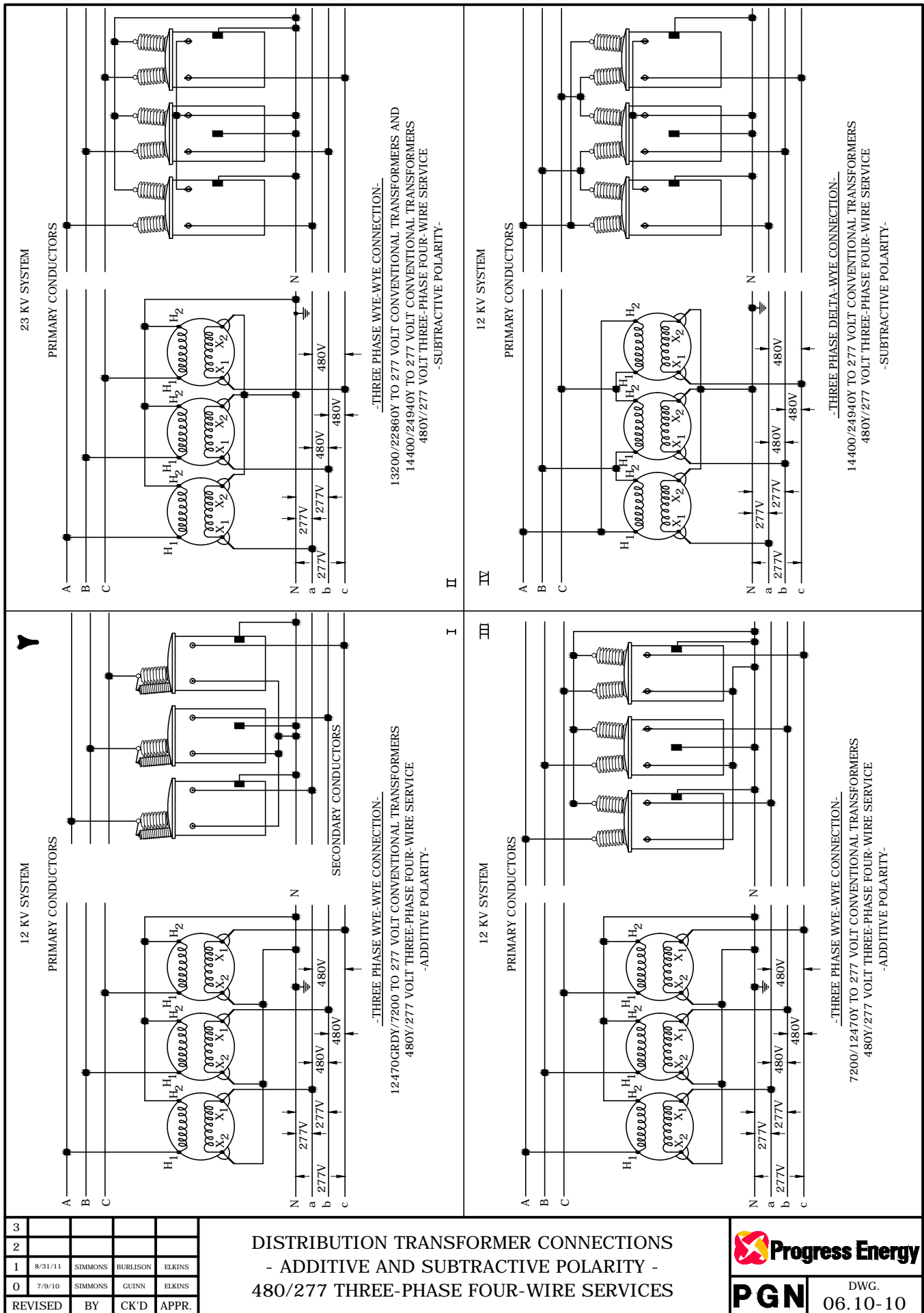


3					DISTRIBUTION TRANSFORMER CONNECTIONS - ADDITIVE AND SUBTRACTIVE POLARITY - 208Y/120 VOLT THREE-PHASE SERVICE				 PGN DWG. 06.10-08
2									
1									
0	7/9/10	SIMMONS	GUINN	ELKINS					
REVISED	BY	CK'D	APPR.						

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DISTRIBUTION TRANSFORMER CONNECTIONS 167 KVA
- ADDITIVE AND SUBTRACTIVE POLARITY -
208Y/120 VOLT THREE-PHASE SERVICE

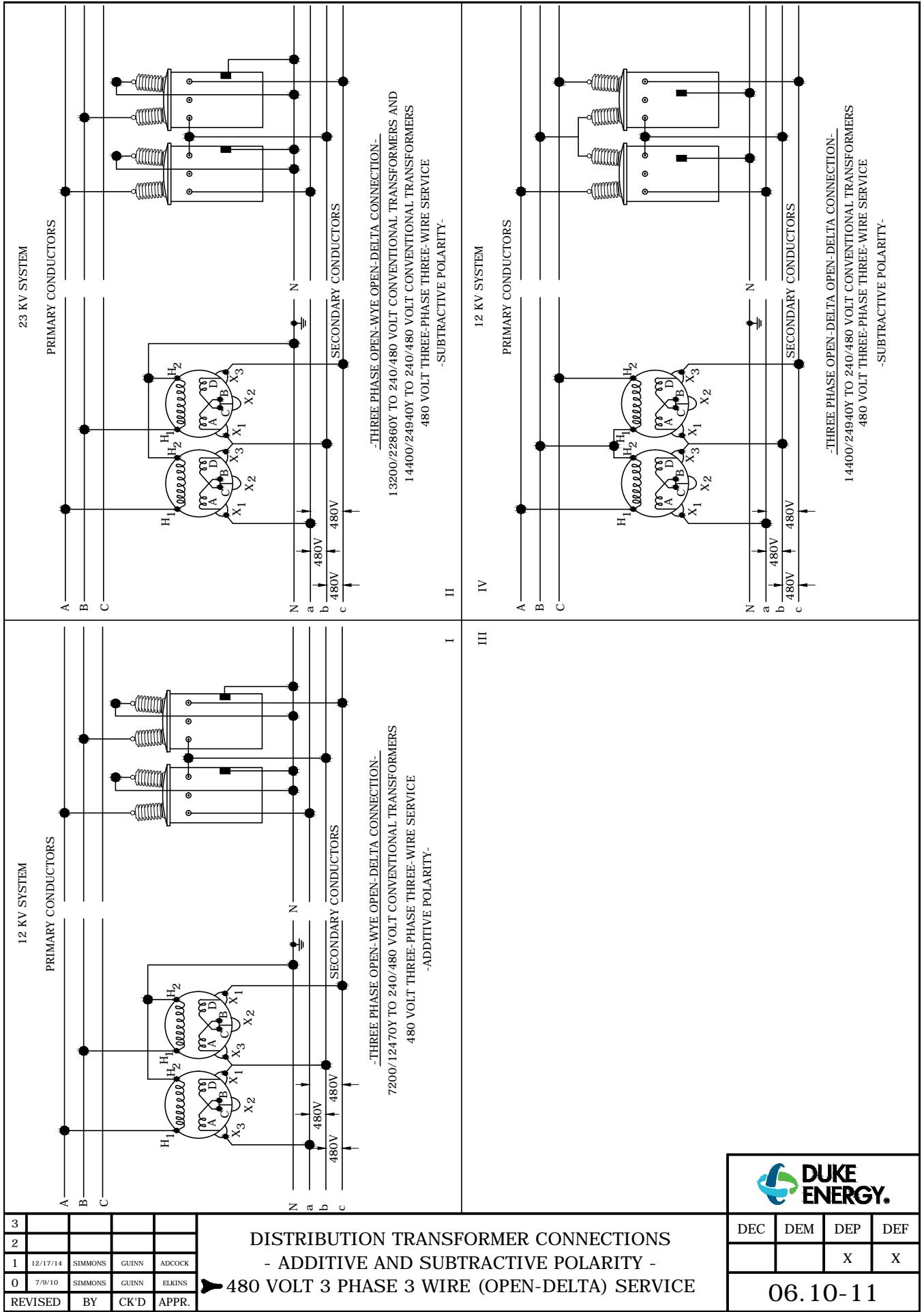




DISTRIBUTION TRANSFORMER CONNECTIONS

- ADDITIVE AND SUBTRACTIVE POLARITY -

480/277 THREE-PHASE FOUR-WIRE SERVICES



3				
2				
1	12/17/14	SIMMONS	GUINN	ADCOCK
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

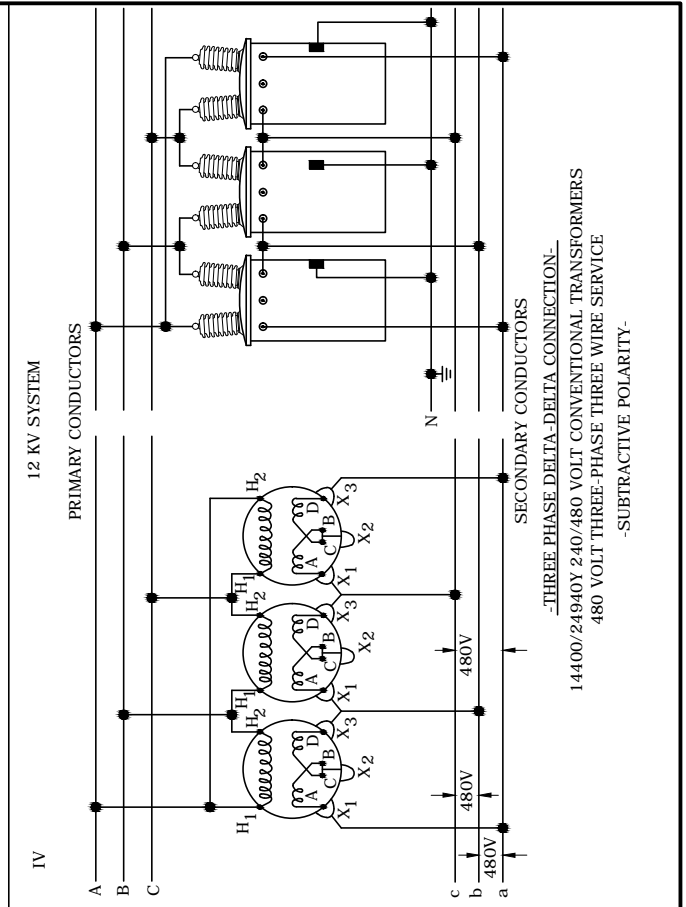
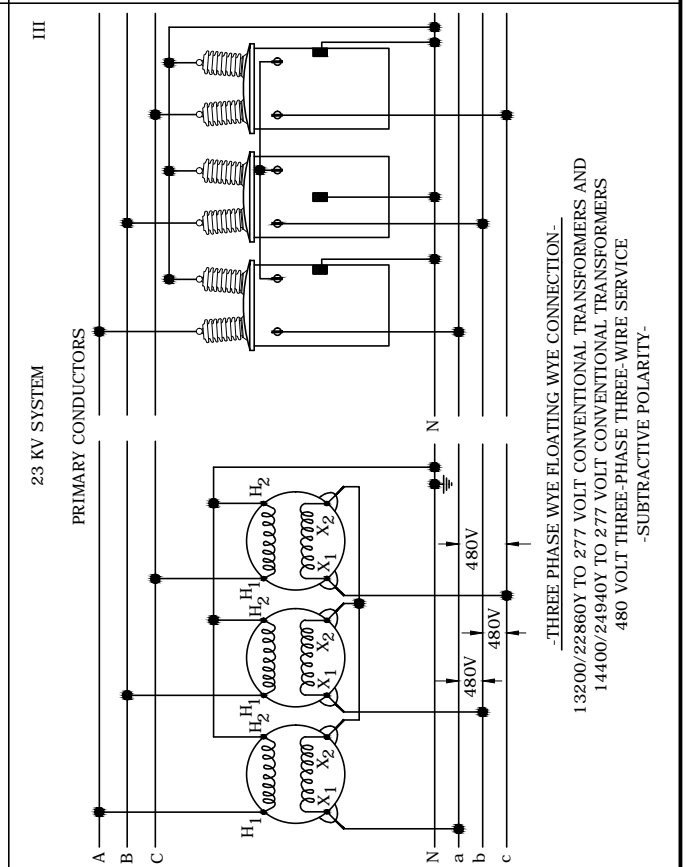
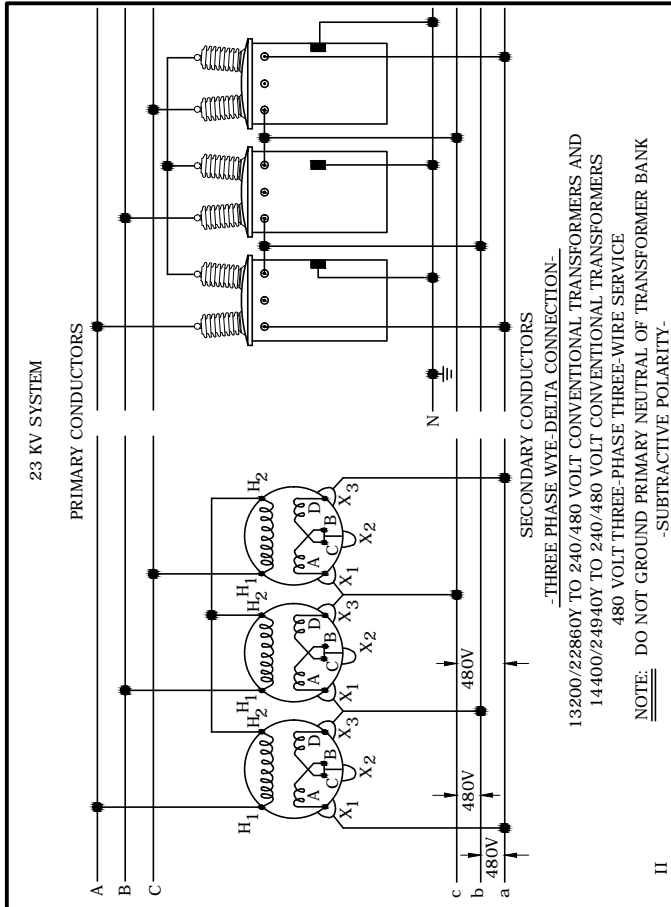
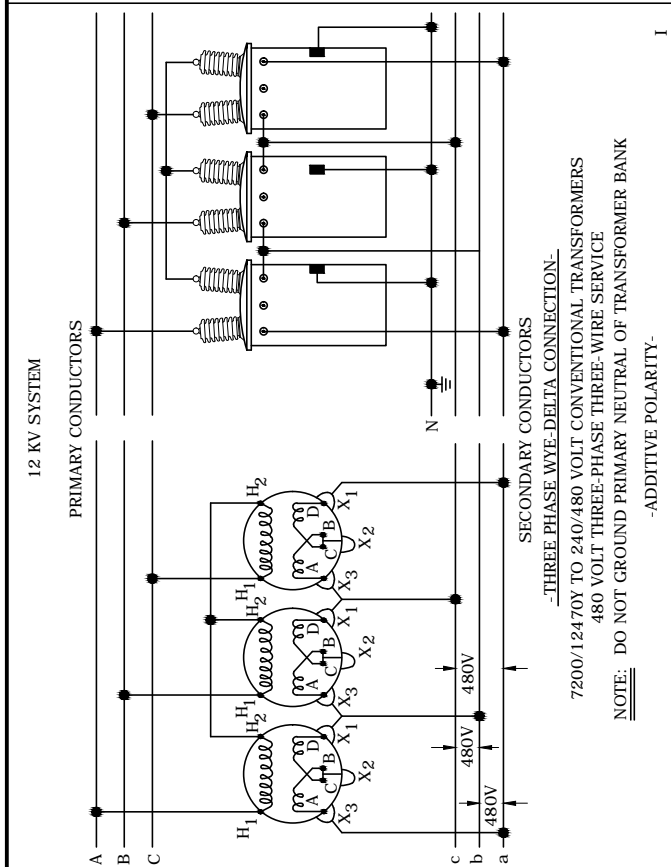
DISTRIBUTION TRANSFORMER CONNECTIONS
 - ADDITIVE AND SUBTRACTIVE POLARITY -
 480 VOLT 3 PHASE 3 WIRE (OPEN-DELTA) SERVICE

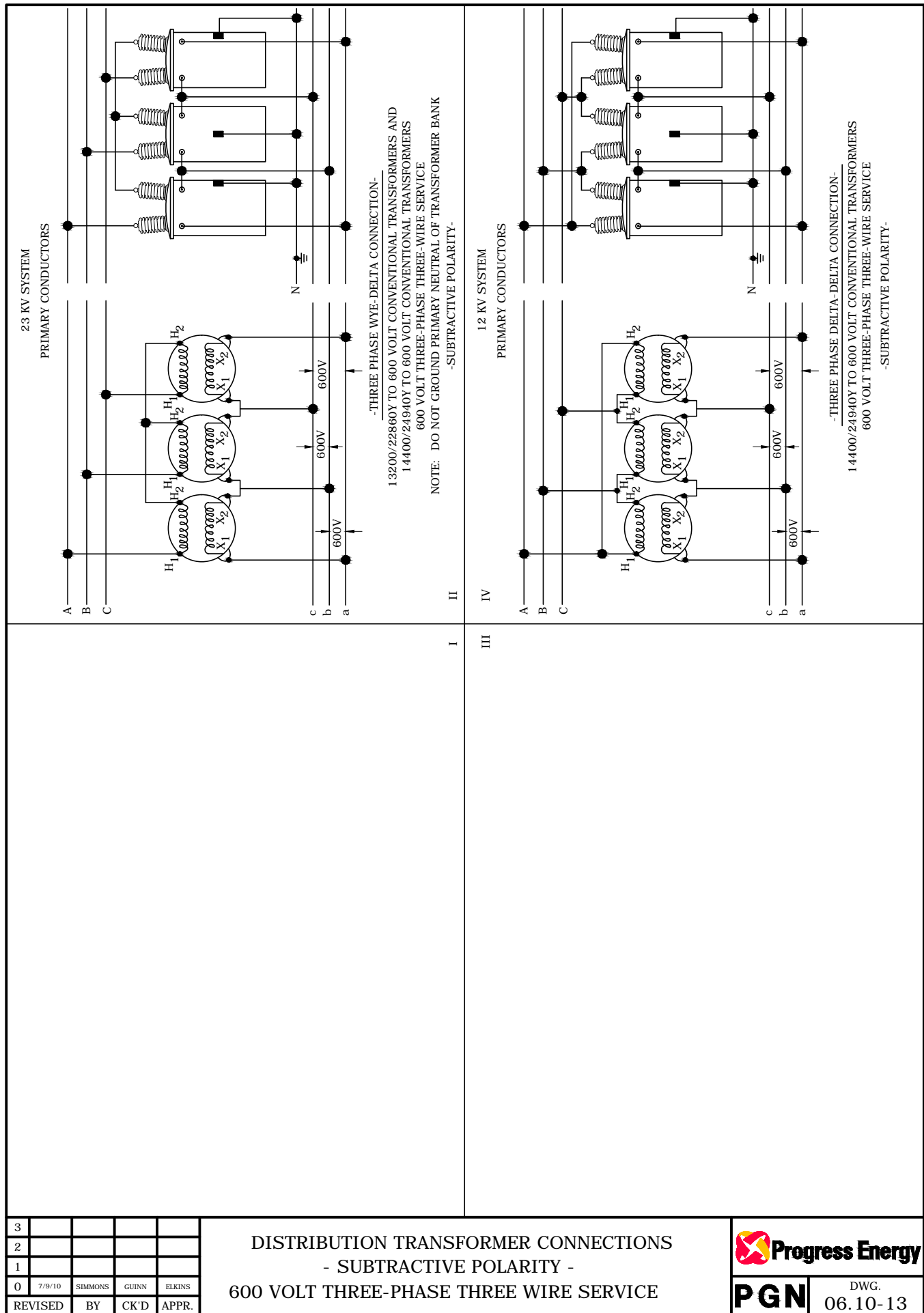
DEC	DEM	DEP	DEF
		X	X

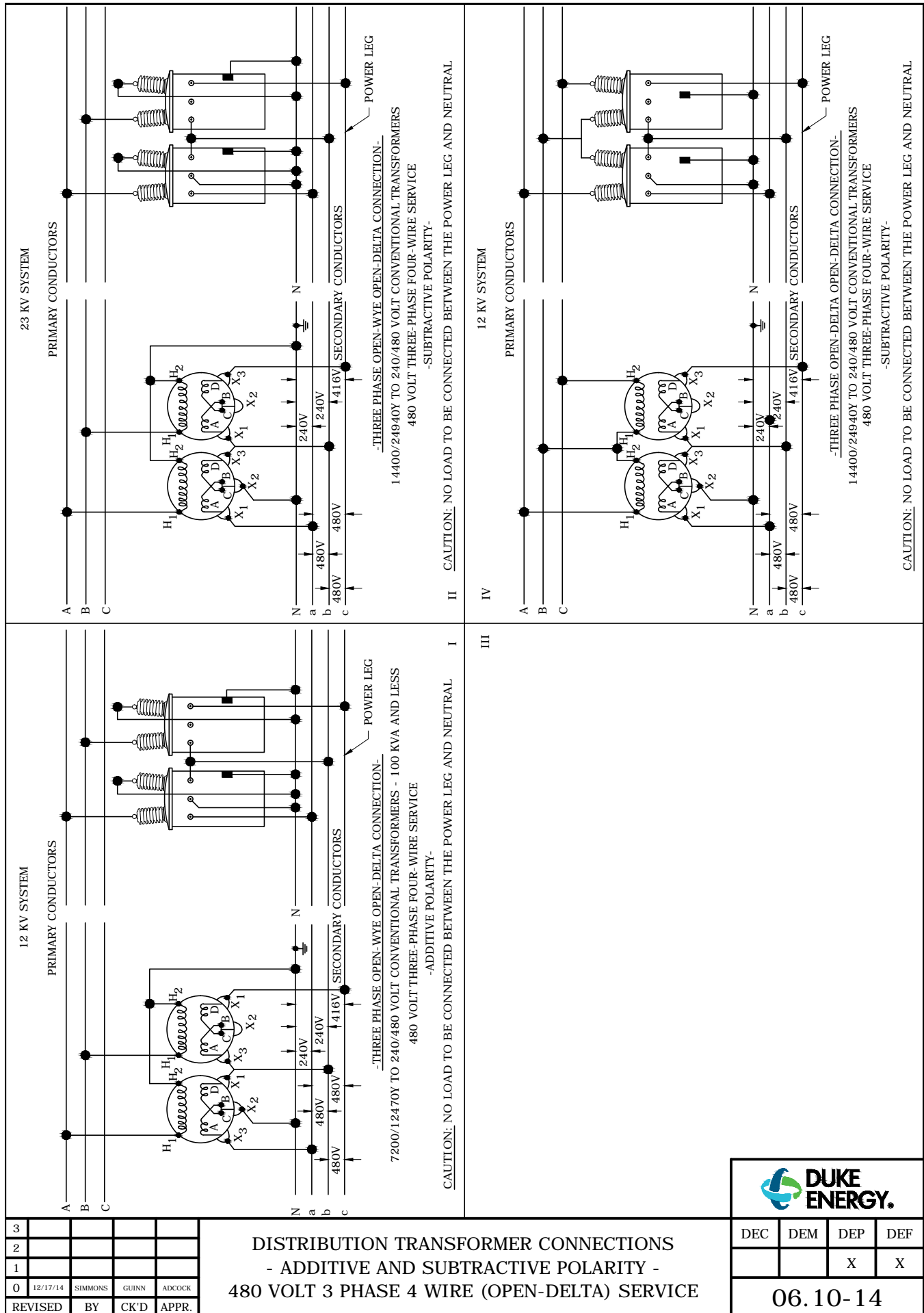
06.10-11

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

DISTRIBUTION TRANSFORMER CONNECTIONS
- ADDITIVE AND SUBTRACTIVE POLARITY -
480 VOLT THREE-PHASE THREE-WIRE SERVICE







3				
2				
1				
0	12/17/14	SIMMONS	GUINN	ADCOCK
REVISED	BY	CK'D	APPR.	

DISTRIBUTION TRANSFORMER CONNECTIONS

- ADDITIVE AND SUBTRACTIVE POLARITY -

480 VOLT 3 PHASE 4 WIRE (OPEN-DELTA) SERVICE

DEC

DEM

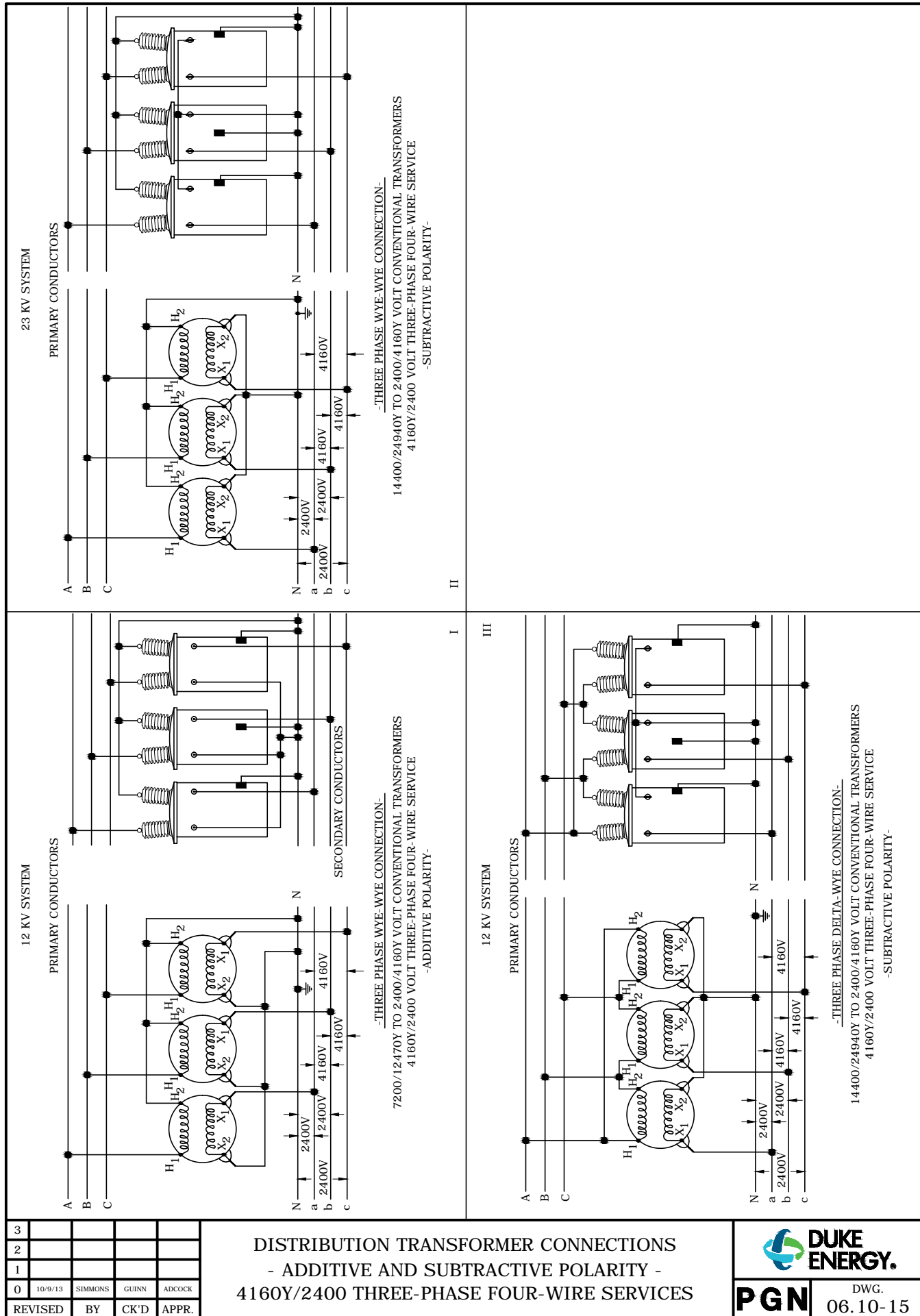
DEP

DEF

X

X

06.10-14



PROGRESS ENERGY
STANDARD PROCEDURES BULLETIN

OPERATING PROCEDURES FOR WYE-DELTA CONNECTED TRANSFORMER BANKS

WHEN ENERGIZING OR DE-ENERGIZING WYE-DELTA TRANSFORMER BANKS, THE BANK ARRESTERS MAY BE TEMPORARILY SUBJECTED TO 2.65 TIMES PHASE TO GROUND VOLTAGE, RESULTING IN ARRESTER FAILURE AND OTHER DAMAGES IF THE BANK IS NOT TEMPORARILY GROUNDED. NEWER, MOV ARRESTERS ARE MORE SUSCEPTIBLE TO THIS TYPE OF FAILURE THAN OLDER, SILICON CARBIDE ARRESTERS.

1. ENERGIZING WYE-DELTA BANK

- INSTALL A TEMPORARY MECHANICAL GROUND OR CLOSE THE GROUNDING CUTOUT IF ONE EXISTS, ON THE TRANSFORMER BANK HIGH SIDE (FLOATING) NEUTRAL.
- ENERGIZE THE TRANSFORMER BANK BY CLOSING ALL THREE PRIMARY CUTOUTS.
- REMOVE TEMPORARY MECHANICAL GROUND OR OPEN THE GROUNDING CUTOUT IF ONE EXISTS.

2. DE-ENERGIZING WYE-DELTA BANK

- INSTALL A TEMPORARY MECHANICAL GROUND OR CLOSE THE GROUNDING CUTOUT IF ONE EXISTS, ON THE TRANSFORMER BANK HIGH SIDE (FLOATING) NEUTRAL.
- OPEN ALL PRIMARY CUTOUTS SERVING THE TRANSFORMER BANK.

3. PARTIAL POWER ON WYE-DELTA BANK (1 OR 2 CUTOUTS FOUND OPEN)

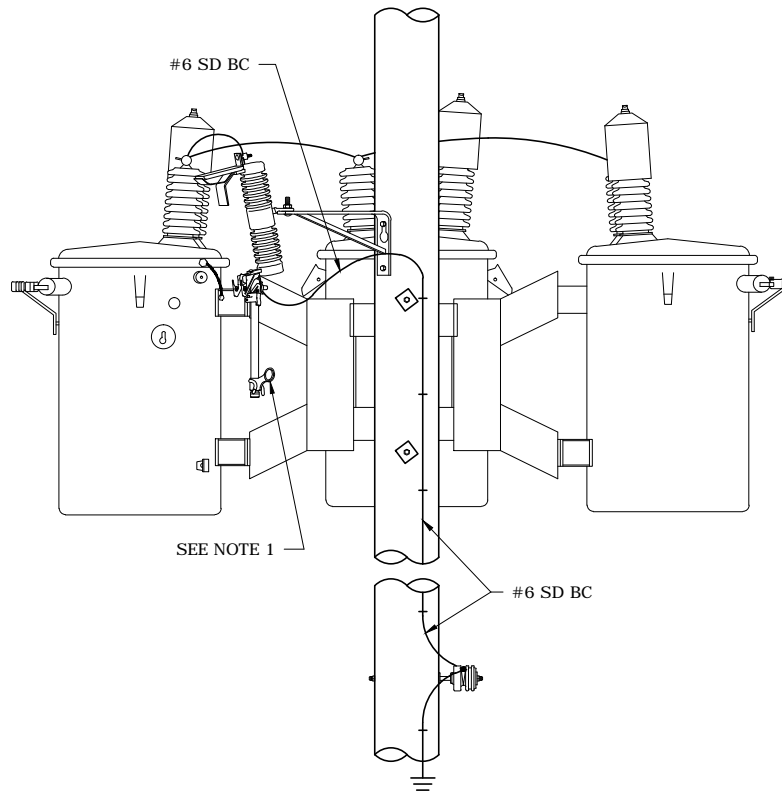
- OPEN REMAINING PRIMARY CUTOUT(S).
- INSTALL A TEMPORARY MECHANICAL GROUND OR CLOSE THE GROUNDING CUTOUT IF ONE EXISTS, ON THE TRANSFORMER BANK HIGH SIDE (FLOATING) NEUTRAL.
- VISUALLY INSPECT TRANSFORMER BANK AND DETERMINE CAUSE OF TROUBLE.
- AFTER TROUBLE HAS BEEN CORRECTED, RE-FUSE ALL PRIMARY CUTOUTS AND RE-ENERGIZE THE TRANSFORMER BANK BY CLOSING ALL THREE PRIMARY CUTOUTS.
- REMOVE TEMPORARY MECHANICAL GROUND OR OPEN THE GROUNDING CUTOUT IF ONE EXISTS.

NOTES:

1. TEMPORARY MECHANICAL GROUND WILL NOT SERVE AS A PROTECTIVE GROUND. FOLLOW ALL APPLICABLE COMPANY SAFETY RULES FOR PROTECTIVE GROUNDING.
2. IF GROUNDING CUTOUT EXISTS, IT SHALL BE A 300-AMP SOLID-BLADE CUTOUT.

3				
2				
1	8/27/12	ROBESON	BURLISON	ELKINS
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

WYE-DELTA TRANSFORMER BANKS
OPERATING PROCEDURES
TO PREVENT OVER VOLTAGES



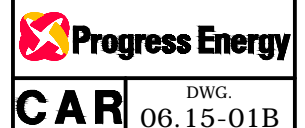
FRONT VIEW

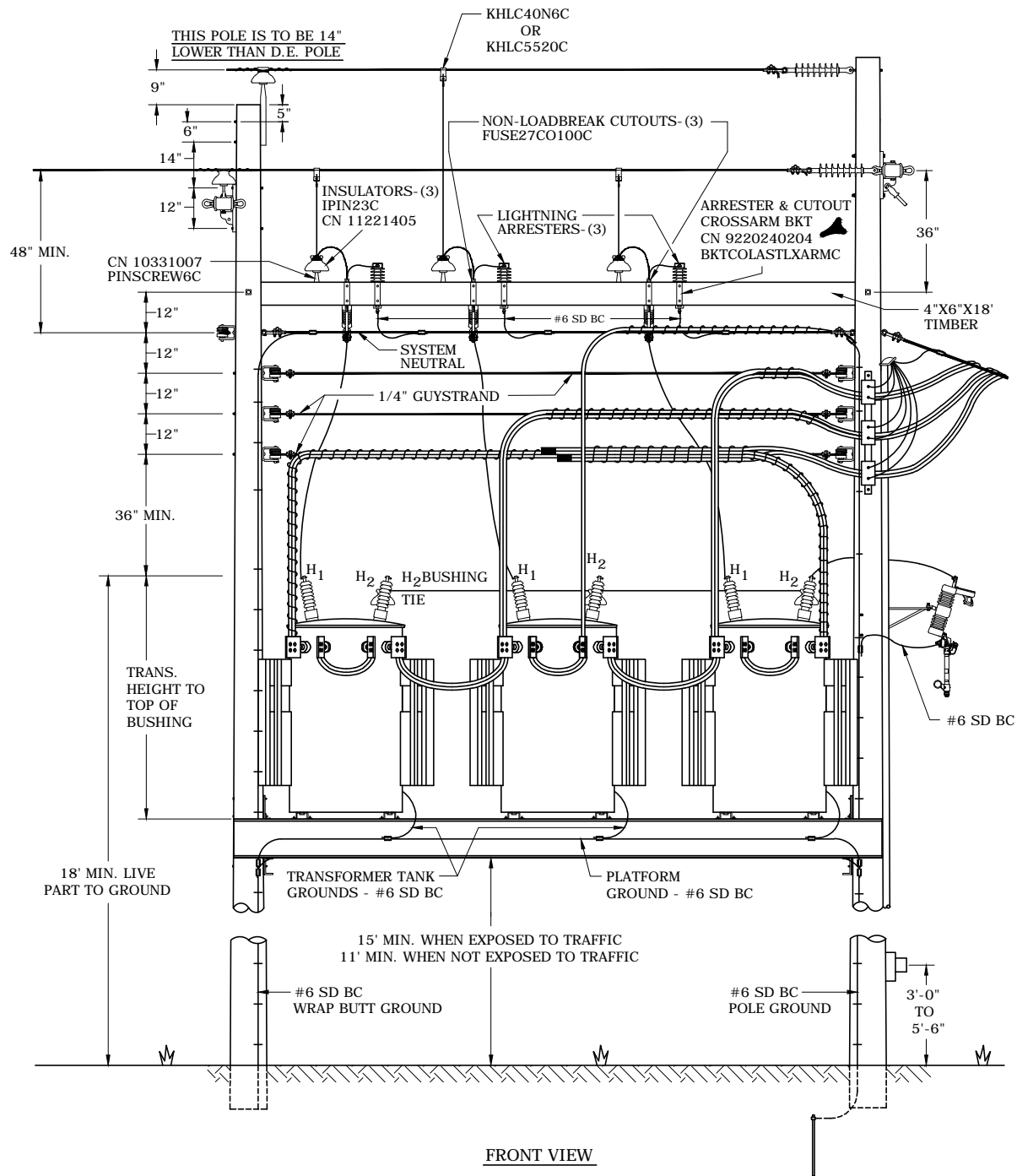
NOTES:

1. GROUNDING CUTOUT IS 300 AMP SOLID-BLADE.
2. SEE DWG. 06.15-01A FOR THE OPERATING PROCEDURES FOR WYE-DELTA CONNECTED TRANSFORMER BANKS.
3. THE GROUNDING CUTOUT SHALL BE OPEN DURING NORMAL OPERATION.
4. THE GROUNDING CUTOUT SHALL BE CLOSED DURING ENERGIZING OR DE-ENERGIZING A WYE-DELTA BANK.
5. THE GROUNDING CUTOUT WILL NOT SERVE AS A PROTECTIVE GROUND. FOLLOW ALL APPLICABLE COMPANY SAFETY RULES FOR PROTECTIVE GROUNDING.
6. GROUNDING CUTOUT MOUNTING BRACKET IS CU BKTCOLA18STLC.
7. MOUNT GROUNDING CUTOUT BRACKET WITH BOTTOM BOLT 4" ABOVE TOP BOLT OF TRANSFORMER HANGER.
8. SEE SECTION 01 FOR ADDITIONAL GROUNDING DETAILS.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

GROUNDING CUTOUT FOR
FLOATING WYE-DELTA TRANSFORMER BANKS
(POLE-MOUNT)





NOTES:

1. SEE DWG. 06.15-01A FOR THE OPERATING PROCEDURES FOR WYE-DELTA CONNECTED TRANSFORMER TANKS.
2. THE GROUNDING CUTOUT SHALL BE OPEN DURING NORMAL OPERATION.
3. THE GROUNDING CUTOUT SHALL BE CLOSED DURING ENERGIZING OR DE-ENERGIZING A WYE-DELTA BANK.
4. THE GROUNDING CUTOUT WILL NOT SERVE AS A PROTECTIVE GROUND. FOLLOW ALL APPLICABLE COMPANY SAFETY RULES FOR PROTECTIVE GROUNDING.
5. GROUNDING CUTOUT IS 300 AMP SOLID-BLADE.
6. LABEL GROUNDING CUTOUT AS FOLLOWS: "GRDSW". USE POLE MARKING LETTERS, PLACED DIRECTLY BELOW GROUNDING CUTOUT ON POLE.
7. SEE SECTION 01 FOR ADDITIONAL GROUNDING DETAILS.

3	7/9/13	GUINN	GUINN	ADCOCK
2	7/27/12	GUINN	GUINN	ELKINS
1	8/31/11	BURLISON	BURLISON	ELKINS
0	6/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

GROUNDING CUTOUT FOR FLOATING WYE-DELTA TRANSFORMER BANKS (PLATFORM-MOUNT)



CAR DWG.
06.15-01C

OVERHEAD SINGLE-PHASE TRANSFORMERS

TRANSFORMER TO BE INSTALLED	TRANSFORMER TO BE REMOVED			
	15 KVA	25 KVA	37.5 KVA	50 KVA
10 KVA	NO	YES	YES	YES
15 KVA	NA	NO	YES	YES
25 KVA	NA	NA	YES	YES
37.5 KVA	NA	NA	NA	NO
50 KVA	NA	NA	NA	NA

SINGLE-PHASE PAD-MOUNTED TRANSFORMERS

TRANSFORMER TO BE INSTALLED	TRANSFORMER TO BE REMOVED				
	37.5 KVA	50 KVA	75 KVA	100 KVA	167 KVA
25 KVA	NO	YES	YES	YES	YES
50 KVA	NA	NA	NO	YES	YES
100 KVA	NA	NA	NA	NA	YES

THREE-PHASE PAD-MOUNTED TRANSFORMERS

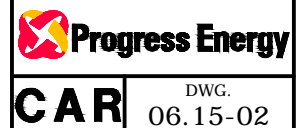
TRANSFORMER TO BE INSTALLED	TRANSFORMER TO BE REMOVED						
	150 KVA	300 KVA	500 KVA	750 KVA	1000 KVA	1500 KVA	2500 KVA
75 KVA	NO	NO	YES	YES	YES	YES	YES
150 KVA	NA	NO	NO	YES	YES	YES	YES
300 KVA	NA	NA	NO	YES	YES	YES	YES
500 KVA	NA	NA	NA	YES	YES	YES	YES
750 KVA	NA	NA	NA	NA	NO	YES	YES
1000 KVA	NA	NA	NA	NA	NA	NO	YES
1500 KVA	NA	NA	NA	NA	NA	NA	YES
2500 KVA	NA	NA	NA	NA	NA	NA	NA

NOTES:

- THESE GUIDELINES ARE BASED ON TRANSFORMER IN AND OUT COSTS AND TRANSFORMER PURCHASE COSTS. A "NO" IN THE TABLES MEANS THE TRANSFORMER IS NOT ECONOMICAL TO DOWNSIZE UNLESS IT MUST BE REPLACED FOR OTHER REASONS. A "YES" MEANS IT IS ECONOMICAL TO DOWNSIZE THE TRANSFORMER IF LOADING GUIDELINES ON DWGS. 06.00-14A AND 06.00-14B PERMIT.
- FOR OVERHEAD THREE-PHASE CSP BANKS THE SINGLE-PHASE TRANSFORMER ECONOMIC GUIDELINES SHOULD BE FOLLOWED. FOR OVERHEAD THREE-PHASE CONVENTIONAL BANKS THE AVAILABILITY OF REPLACEMENT TRANSFORMERS IS THE FIRST CONCERN DUE TO VARYING SECONDARY VOLTAGES AND IMPEDANCE MATCHING. IF TRANSFORMERS ARE AVAILABLE RUN AN ENGINEERING ESTIMATE (IGNORING LOSSES) TO DETERMINE IF

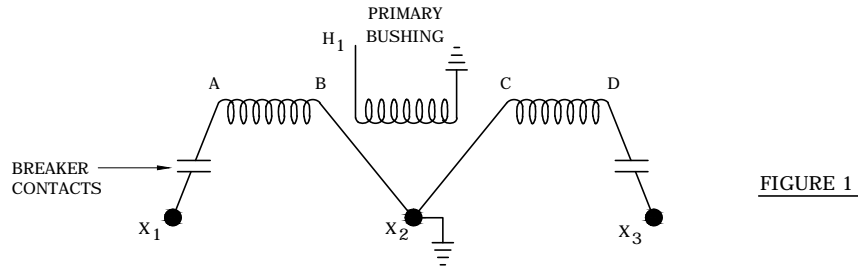
3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

ECONOMIC GUIDELINES FOR DOWNSIZING TRANSFORMERS



PROGRESS ENERGY CAROLINAS
STANDARD PROCEDURES BULLETIN

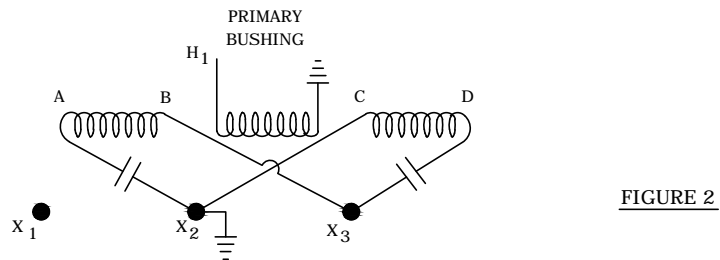
IN THE PAST, THE TRANSFORMER IN FIGURE 1 (14400 AND 13200 VOLT CSP, SUBTRACTIVE POLARITY) MAY HAVE BEEN INCORRECTLY CONNECTED FOR 120 VOLT SERVICE (208Y/120 VOLT BANKS) AS SHOWN IN FIGURE 2.



WHEN THIS TRANSFORMER IS CONNECTED AS SHOWN IN FIGURE 2, IT HAS BEEN PROVEN IN THE FIELD AND IN THE SYSTEM ENGINEERING LABORATORY THAT HIGH ELECTROSTATIC VOLTAGE (APPROXIMATELY 7000 VOLTS) WILL EXIST ON THE X3 BUSHINGS UNDER THE FOLLOWING CONDITIONS:

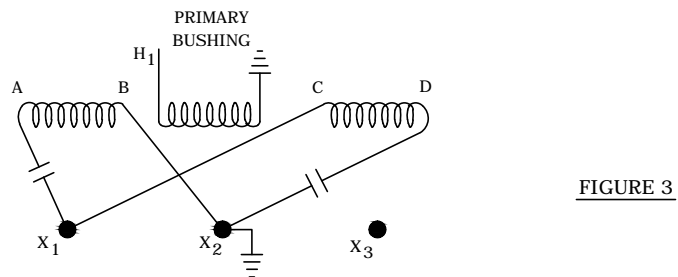
1. THE SECONDARY WINDINGS ARE PARALLELED BETWEEN THE X2 AND X3 BUSHINGS (X2 GROUNDED).
FIGURE 2.
2. THE CSP BREAKER CONTACTS ARE IN THE OPEN POSITION.
3. PRIMARY WINDING IS ENERGIZED.

THIS SITUATION EXISTS BECAUSE THE A-B LOW VOLTAGE WINDING IS FLOATING (DUE TO BREAKER CONTACT OPEN) CLOSE TO THE H1 END OF THE HIGH VOLTAGE WINDING (THE UNGROUNDED END).



INCORRECT CONNECTION

FIGURE 3 IS THE PROPER METHOD OF PARALLELING THE SECONDARY WINDINGS IN THIS TRANSFORMER (SEE DWGS. 06.07-05 AND 06.10-07, II). WITH THE BREAKER CONTACT OPEN, THE C-D WINDING IS "FLOATING", BUT THIS WINDING IS SITUATED CLOSE TO THE GROUNDED END OF THE HIGH VOLTAGE WINDING. CONNECTED AS SHOWN IN FIGURE 3, SOME ELECTROSTATIC VOLTAGE MAY STILL EXIST (APPROXIMATELY 750 VOLTS) ON THE X1 BUSHINGS.

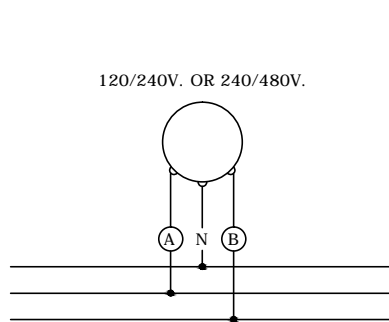


CORRECT CONNECTION

NOTE: THE WINDINGS IN THE 7200 VOLT CSP TRANSFORMERS ARE PARALLELED JUST THE OPPOSITE FROM ABOVE. FOR CORRECT PARALLELLING, SEE DWGS. 06.07-05 AND 06.10-07, I.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

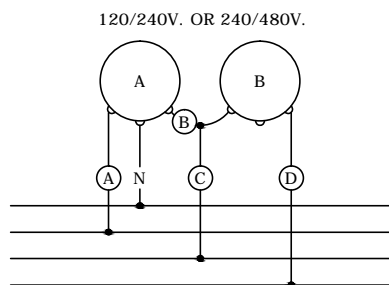
PARALLELING WINDINGS IN 14.4 AND
13.2 KV CSP TRANSFORMERS



SINGLE-PHASE CONNECTION

CURRENT CHECK POINTS - (A) (B)
VOLTAGE CHECK POINTS - (A) TO N, (B) TO N

$$KVA = \frac{[CURRENT (A) \times VOLTAGE (AN)] + [CURRENT (B) \times VOLTAGE (BN)]}{1000}$$



THREE-PHASE OPEN DELTA SECONDARY CONNECTION

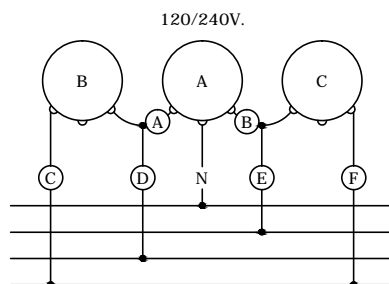
CURRENT CHECK POINTS - (A) (B) (D)
VOLTAGE CHECK POINTS - (A) TO N, (B) TO N, (C) TO (D)

TRANSFORMER A (LIGHTING TRANSFORMER)

$$KVA = \frac{[CURRENT (A) \times VOLTAGE (AN)] + [CURRENT (B) \times VOLTAGE (BN)]}{1000}$$

TRANSFORMER B

$$KVA = \frac{[CURRENT (D) \times VOLTAGE (CD)]}{1000}$$



THREE-PHASE DELTA SECONDARY CONNECTION

CURRENT CHECK POINTS - (A) (B) (C) (F)
VOLTAGE CHECK POINTS - (C) TO (D), (D) TO N, (E) TO N, (E) TO (F)

TRANSFORMER A (LIGHTING TRANSFORMER)

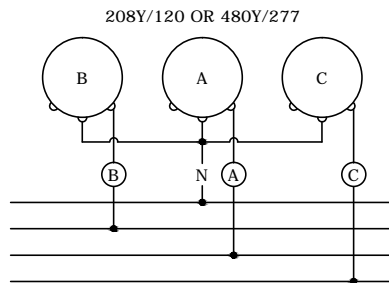
$$KVA = \frac{[CURRENT (A) \times VOLTAGE (DN)] + [CURRENT (E) \times VOLTAGE (EN)]}{1000}$$

TRANSFORMER B

$$KVA = \frac{[CURRENT (C) \times VOLTAGE (CD)]}{1000}$$

TRANSFORMER C

$$KVA = \frac{[CURRENT (F) \times VOLTAGE (EF)]}{1000}$$



ADDITIVE POLARITY
THREE-PHASE WYE SECONDARY CONNECTION

NOTE: TRANSFORMERS USED IN A 480Y/277 BANK WILL HAVE 2 BUSHINGS INSTEAD OF 3 AS SHOWN ABOVE

CURRENT CHECK POINTS - (A) (B) (C)
VOLTAGE CHECK POINTS - (A) TO N, (B) TO N, (C) TO N

TRANSFORMER A

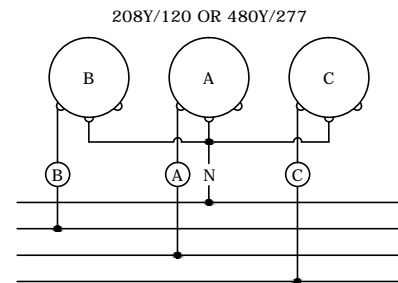
$$KVA = \frac{[CURRENT (A) \times VOLTAGE (AN)]}{1000}$$

TRANSFORMER B

$$KVA = \frac{[CURRENT (B) \times VOLTAGE (BN)]}{1000}$$

TRANSFORMER C

$$KVA = \frac{[CURRENT (C) \times VOLTAGE (CN)]}{1000}$$



SUBTRACTIVE POLARITY
THREE-PHASE WYE SECONDARY CONNECTION

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

TRANSFORMER LOAD & VOLTAGE CHECKS



PGN

DWG.
06.15-04

PROGRESS ENERGY STANDARD PROCEDURES BULLETIN
IDLE TRANSFORMERS

DEFINITION:

AN IDLE TRANSFORMER IS A TRANSFORMER THAT IS INSTALLED ON THE DISTRIBUTION SYSTEM BUT IS SERVING NO USEFUL PURPOSE. THERE IS NO CUSTOMER BEING SERVED, NO LIGHTS, NO TRAFFIC SIGNALS. THERE IS ALSO REASONABLE POTENTIAL FOR SERVING A CUSTOMER IN THE FUTURE. A TRANSFORMER INSTALLED IN A NEW DEVELOPMENT THAT IS SERVING NO CUSTOMERS BUT WILL IN THE FUTURE IS NOT CONSIDERED IDLE BECAUSE IT WILL BE SERVING CUSTOMERS IN THE NEAR FUTURE.

EXAMPLES ARE AS FOLLOWS:

1. A TRANSFORMER THAT WAS USED FOR TEMPORARY CONSTRUCTION SERVICE IS IDLE AFTER THE CONSTRUCTION IS COMPLETED AND THE TRANSFORMER IS NO LONGER NEEDED FOR CONSTRUCTION SERVICE.
2. A TRANSFORMER THAT SERVED A RESIDENTIAL CUSTOMER IS IDLE IF THE HOME IS NO LONGER OCCUPIED AND THERE IS NO PROSPECT OF SERVING A CUSTOMER AT THE SAME LOCATION.
3. A TRANSFORMER BANK THAT SERVED A COMMERCIAL/INDUSTRIAL CUSTOMER IS IDLE IF THE CUSTOMER IS NO LONGER IN BUSINESS AND THE TRANSFORMER BANK IS NOT NEEDED FOR A POTENTIAL NEW CUSTOMER AT THE SAME LOCATION.

ISSUES WITH IDLE TRANSFORMERS:

THERE ARE SEVERAL REASONS WHY IDLE TRANSFORMERS SHOULD BE REMOVED FROM THE SYSTEM. ONE THAT IS LEFT ENERGIZED EXPERIENCES "NO-LOAD" CORE LOSSES EVEN WHEN IDLE. THESE ARE ANNUAL LOSSES. A 25 KVA TRANSFORMER IS ESTIMATED TO HAVE \$35 OF ANNUAL CORE LOSSES. A 167 KVA TRANSFORMER IS ESTIMATED TO HAVE \$200 OF ANNUAL CORE LOSSES. A TRANSFORMER THAT IS IDLE IS A POTENTIAL FOR VANDALISM, RESULTING IN AN ENVIRONMENTAL ISSUE, AN OIL SPILL. THERE HAVE BEEN A NUMBER OF SPILLS DUE TO VANDALISM OF IDLE TRANSFORMERS AND SOME OF THESE REQUIRED SIGNIFICANT COSTS FOR CLEANUP.

A TRANSFORMER THAT IS IDLE IS A POTENTIAL HAZARD FOR CRIMINALS WHO WOULD ATTEMPT TO VANDALIZE THE UNITS TO STEAL COPPER. THEY WILL TAKE EXTRAORDINARY RISKS WITH NO REGARD FOR THEIR OWN SAFETY OR PROPERTY OF OTHERS.

TRANSFORMER COSTS HAVE INCREASED SUBSTANTIALLY SINCE 2004 DUE TO THE RISING COSTS OF RAW MATERIALS: COPPER, CORE STEEL, MINERAL OIL. COSTS WILL INCREASE AGAIN SIGNIFICANTLY IN JANUARY, 2010 AS NEW DEPARTMENT OF ENERGY (DOE) EFFICIENCY REQUIREMENTS ARE IMPLEMENTED. IT IS A SIGNIFICANT FINANCIAL BENEFIT TO THE COMPANY TO REMOVE AND RE-USE IDLE TRANSFORMERS VERSUS BUYING NEW ONES AT SIGNIFICANTLY HIGHER PRICES. ONES THAT HAVE BEEN REMOVED AND RE-USED DO NOT HAVE TO MEET THE MORE STRINGENT EFFICIENCY REQUIREMENTS OF DOE.

PROCEDURE:

ANY TRANSFORMER THAT IS IDLE BUT LEFT ON THE POLE SHALL BE DE-ENERGIZED TO SAVE ANNUAL CORE LOSSES. TRANSFORMERS WITH NO CUTOUPS (CSP) SHALL HAVE THE HOT LINE CLAMP REMOVED FROM THE PRIMARY AND GROUNDED TO THE SYSTEM NEUTRAL. TRANSFORMERS WITH CUTOUPS MAY BE DE-ENERGIZED BY OPENING THE CUTOUP AND REMOVING THE CUTOUP BARREL.

WHEN A TRANSFORMER HAS BEEN DE-ENERGIZED, ASSET ENGINEERING SHALL BE NOTIFIED. ASSET ENGINEERING WILL EVALUATE AND DETERMINE IF THE TRANSFORMER SHOULD BE REMOVED AND IF SO, PREPARE A WORK ORDER TO REMOVE. ASSOCIATED EQUIPMENT (CUTOUPS, ARRESTERS, SERVICE CONDUCTORS, ETC.) SHOULD BE REMOVED AT THE SAME TIME THE TRANSFORMER IS REMOVED.

FOR TRANSFORMER BANKS SERVING COMMERCIAL OR INDUSTRIAL CUSTOMERS, CONTACT WITH ACCOUNT MANAGERS WILL BE REQUIRED TO DETERMINE IF THERE IS POTENTIAL FOR FUTURE CUSTOMERS OCCUPYING A VACANT FACILITY.

TRANSFORMERS THAT HAVE BEEN REMOVED SHALL BE PLACED IN STOCK AT THE LOCAL STOREROOM, IF THE TRANSFORMER IS IN GOOD CONDITION AND IS NON-PCB. IF NOT IN GOOD CONDITION, OR THE PCB CONTENT IS UNKNOWN, THE TRANSFORMER SHALL BE RETURNED TO THE GARNER TRANSFORMER SHOP WHERE IT WILL BE EVALUATED, REPAIRED, REPAINTED AND RETURNED TO STOCK, IF POSSIBLE.

3				
2				
1				
0	7/9/10	SIMMONS	GUINN	ELKINS
REVISED	BY	CK'D	APPR.	

IDLE TRANSFORMERS

