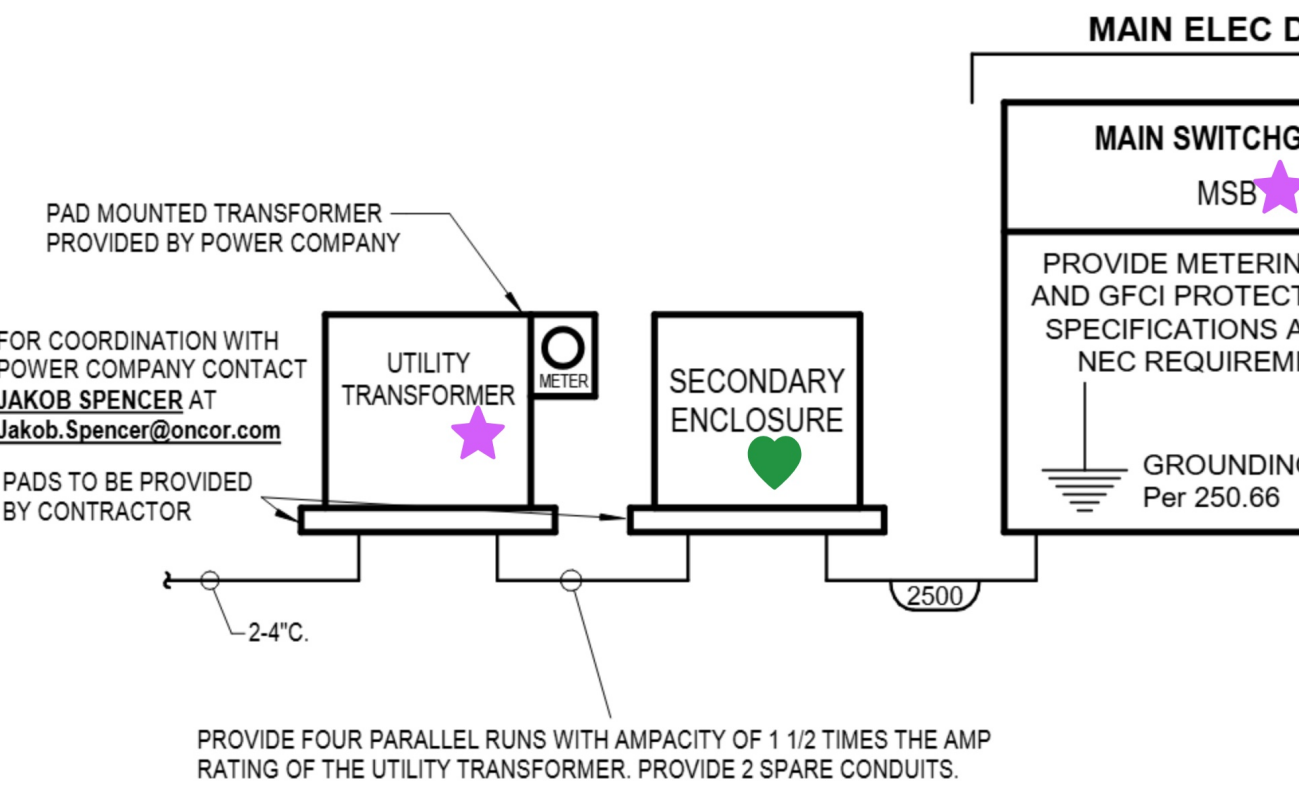
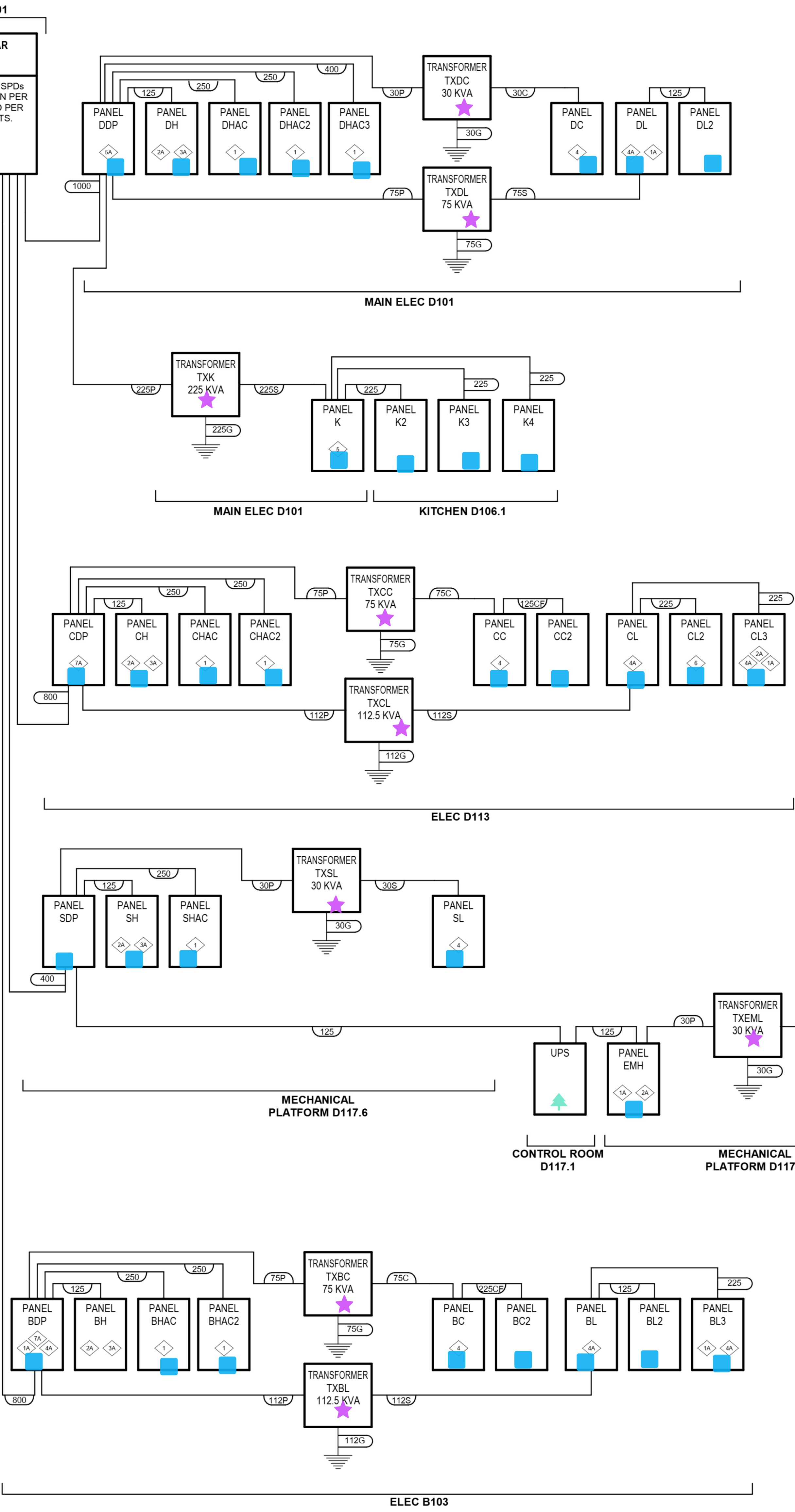




ELECTRICAL RISER METERING GENERAL NOTES

- GENERAL NOTES:**
- TO MEET IEC 6201 LOAD METERING REQUIREMENTS C405.12, PROVIDE ALL NECESSARY METERING AND NETWORK EQUIPMENT, SOFTWARE, CABLING, CTS AND OTHER HARDWARE TO METER ALL ELECTRICAL LOADS (WHETHER INSIDE OR OUTSIDE) BY IEC CATEGORY LISTED BELOW.
- SYSTEM FEATURES - THIS SYSTEM SHALL MET ALL THE FOLLOWING:**
- COLLECT ENERGY USE DATA FOR EACH END-USE CATEGORY. ACCURACY SHALL BE +/- 2%. SYSTEM SHALL GROUP, AGGREGATE, ADD, SUBTRACT, ETC. EACH LOAD TO PROPERLY REPORT TOTAL ENERGY USED ACROSS ALL PANELS BY EACH CATEGORY. NO EXCEPTIONS.
 - HOLD LOCAL REAL TIME DATA AND A DATA HISTORY OF 36 MONTHS MINIMUM. SHALL BE CAPABLE OF PROVIDING HOURLY, DAILY, MONTHLY AND YEARLY INFORMATION PER LOAD TYPE. SUBSCRIPTION-BASED ONLINE SERVICES FOR DATA COLLECTION, SUCH AS PROVIDED BY LEVITON OR OTHERS WILL BE REJECTED. NO EXCEPTIONS.
 - GRAPHICAL REPORTING - SYSTEM SHALL OFFER A LOCALLY-HOSTED WEB SCREEN SHOWING GRAPHIC AND NUMERIC VALUES OF ALL REQUIRED DATA. VIEWABLE FROM A SINGLE LOGIN EXISTING LOCALLY ON THE OWNER NETWORK. IT SHALL SHOW SEPARATE LOAD TYPES AND TOTAL LOAD INFORMATION. GRAPHS AND VALUES FOR AT LEAST 36 MONTHS. SUBSCRIPTION-BASED ONLINE SERVICES FOR DATA REPORTING, SUCH AS PROVIDED BY LEVITON OR OTHERS WILL BE REJECTED. THIS SYSTEM SHALL NOT REQUIRE THE OWNER TO VISIT A METER OR INDIVIDUAL METERS TO OBTAIN THE LOAD TOTALS. NO EXCEPTIONS.
- APPLICATION OF CTS:**
- IF ONE PANEL HAS ALL ONE LOAD TYPE, THE CTS MAY BE PLACED ON THE INCOMING FEEDER.
 - IF A PANEL HAS TWO LOAD TYPES SUCH AS TYPICAL LIGHTING PANELS, CTS MAY BE PLACED ON THE INCOMING FEEDER AND SEPARATE CTS MAY BE PLACED ON EACH EXTERIOR LIGHTING LOAD AND THE TOTAL LOAD SUBTRACTED FROM THE EXTERIOR LOAD TO DETERMINE INTERIOR LIGHTING LOAD.
 - IF A PANEL HAS MULTIPLE LOAD TYPES CTS MUST BE PLACED ON EACH LOAD AND THEN A TOTAL MUST BE CALCULATED BY LOAD TYPE AT EACH PANEL.
- LOAD CATEGORIES PER IEC 6201 ARE AS FOLLOWS:**
- HVAC AND WATER HEATING:
 - ALL HVAC AND WATER HEATING
 - INTERIOR LIGHTING:
 - ALL INTERIOR LIGHTING
 - EXTERIOR LIGHTING:
 - ALL EXTERIOR LIGHTING
 - PLUG LOADS:
 - ALL RECEPTACLES (DEVICES, APPLIANCES, EQUIPMENT
 - PROCESS LOADS:
 - KITCHEN EQUIPMENT, ANY SINGLE LOAD THAT ISN'T MENTIONED ABOVE AND REPRESENTS AT LEAST 5% OF THE TOTAL BUILDING LOAD.
 - BUILDING OPERATIONS AND MISC. LOADS:
 - ELEVATOR, AUTOMATIC DOORS, MOTORIZED SHADES, FOUNTAINS, SWIMMING POOLS AND OTHER BUILDING SUPPORT LOADS NOT INCLUDED ABOVE.
- SYSTEM SHALL BE SOCOMEC DIRIS SYSTEM OR APPROVED EQUAL:**
- CTS:
 - SOCOMEK TR-W SPLIT CORE (UP TO 600A) OR ROG STYLE (UP TO 400A), QTY AS REQUIRED.
 - POWER METERS:
 - SOCOMEK MULTI-CIRCUIT POWER METER SHALL BE DIRIS MCM SERIES (EACH GOOD FOR UP TO 16-3P CIRCUITS OR 48-1P CIRCUITS) (PROVIDE AT LEAST ONE IN EVERY ELECTRICAL ROOM) (CONNECTED VIA CAT-5 BACK TO DATA LOGGER VIA NETWORK) QTY AS REQUIRED.
 - NETWORK SWITCH:
 - MULTI-PORT SWITCH SHALL BE NON-POE UNMANAGED SWITCH BY TP-LINK, NETGEAR OR CISCO. PROVIDE ENOUGH PORTS TO LINK ALL POWER METER TOGETHER AND CONNECT THEM TO THE DATA LOGGER. PORTS AS REQUIRED, MOUNT IN MAIN ELECTRICAL ROOM, COORDINATE WITH OWNER TO TIE THIS SWITCH TO BUILDING NETWORK.
 - DATA LOGGER:
 - SOCOMEK DATALOG H WITH WEBVIEW, MOUNT IN MAIN ELECTRICAL ROOM.
 - ELSE:
 - ALL EQUIPMENT, WIRING, PROGRAMMING, ETC. SEE SPECIFICATIONS FOR MORE INFORMATION.
- THINGS TO NOTE:**
- UP TO 5% OF ONE LOAD CATEGORY MAY BE IN A PANEL WITH A PREDOMINATELY DIFFERENT CATEGORY (THINK WATER HEATING WITH HVAC, OR SMALL HVAC WITH PLUG LOADS). THIS KEEPS US FROM HAVING TO MOVE SMALL LOADS FROM ONE PANEL TO ANOTHER IN SOME CASES.
 - IF THE PROJECT HAS PREDOMINATELY 480V HVAC, 120 OR 208V HVAC MIXED IN LV PANELS WITH OTHER CATEGORY LOADS CAN BE IGNORED OR INCLUDED AS PART OF THE OTHER CATEGORY. WE ARE SEEKING TO CIRCUIT LOADS TO PANELS SUCH THAT THERE SHOULD NOT BE MORE THAN ONE OR TWO CATEGORIES IN MOST PANELS UNLESS SUCH A DESIGN IS NOT PRACTICAL.



SECONDARY SIDE OF XFMR [208v 3ph]	
15S	4-#4, 1-#8 GRN, 1 1/2".
30S	4-#10, 1-#6 GRN, 2".
45S	4-#20, 1-#4 GRN, 2 1/2".
75S	4-#250 MCM, 1-#2 GRN, 2 1/2".
112S	2-2 1/2". WITH 4-#30, 1-#4 GRN IN EACH.
150S	2-2 1/2". WITH 4-#250 MCM, 1-#2 GRN IN EACH.
225S	3-3". WITH 4-#300 MCM, 1-#2 GRN IN EACH.
300S	3-3". WITH 4-#400 MCM, 1-#10 GRN IN EACH.

ELECTRICAL RISER NOTES: (SOME NOTES MAY NOT BE USED) [3ph]

WHERE THE BELOW RISER NOTES ARE USED FOR SERVICE ENTRANCE CONDUCTORS, DISREGARD THE EQUIPMENT GROUNDING CONDUCTOR SHOWN. HOWEVER, ALL FEEDERS AFTER THE MAIN SERVICE DISCONNECT(S) DO REQUIRE A GROUNDING CONDUCTOR.

60	4-#4, 1-#10 GRN, 1 1/2".
80	4-#3, 1-#8 GRN, 1 1/2".
100	4-#1, 1-#6 GRN, 1 1/2".
125	4-#10, 1-#6 GRN, 2".
150	4-#10, 1-#6 GRN, 2".
175	4-#20, 1-#6 GRN, 2".
200	4-#30, 1-#6 GRN, 2".
225	4-#40, 1-#4 GRN, 2 1/2".
250	4-#250, 1-#4 GRN, 2 1/2".
300	4-#250, 1-#4 GRN, 3".
401	4". WITH 4-#250 MCM, 1-#3 GRN
500	2-2 1/2". WITH 4-#250 MCM, 1-#2 GRN IN EACH.
600	2-3". WITH 4-#350 MCM, 1-#1 GRN IN EACH.
800	3-3". WITH 4-#300 MCM, 1-#10 GRN IN EACH.
801	2-4". WITH 4-#250 MCM, 1-#10 GRN
1000	4-2 1/2". WITH 4-#250 MCM, 1-#20 GRN IN EACH.
1001	3-3". WITH 4-#400 MCM, 1-#20 GRN IN EACH.
1200	4-3". WITH 4-#350 MCM, 1-#30 GRN IN EACH.
1201	3-4". WITH 4-#200 MCM, 1-#30 GRN IN EACH.
1600	5-4". WITH 4-#400 MCM, 1-#40 GRN IN EACH.
1601	4-4". WITH 4-#600 MCM, 1-#40 GRN IN EACH.
2000	6-4". WITH 4-#400 MCM, 1-#250 MCM GROUND IN EACH.
2001	5-4". WITH 4-#600 MCM, 1-#250 MCM GROUND IN EACH.
2500	6-4". WITH 4-#600 MCM, 1-#350 MCM GROUND IN EACH.
3000	8-4". WITH 4-#500 MCM, 1-#400 MCM GROUND IN EACH.

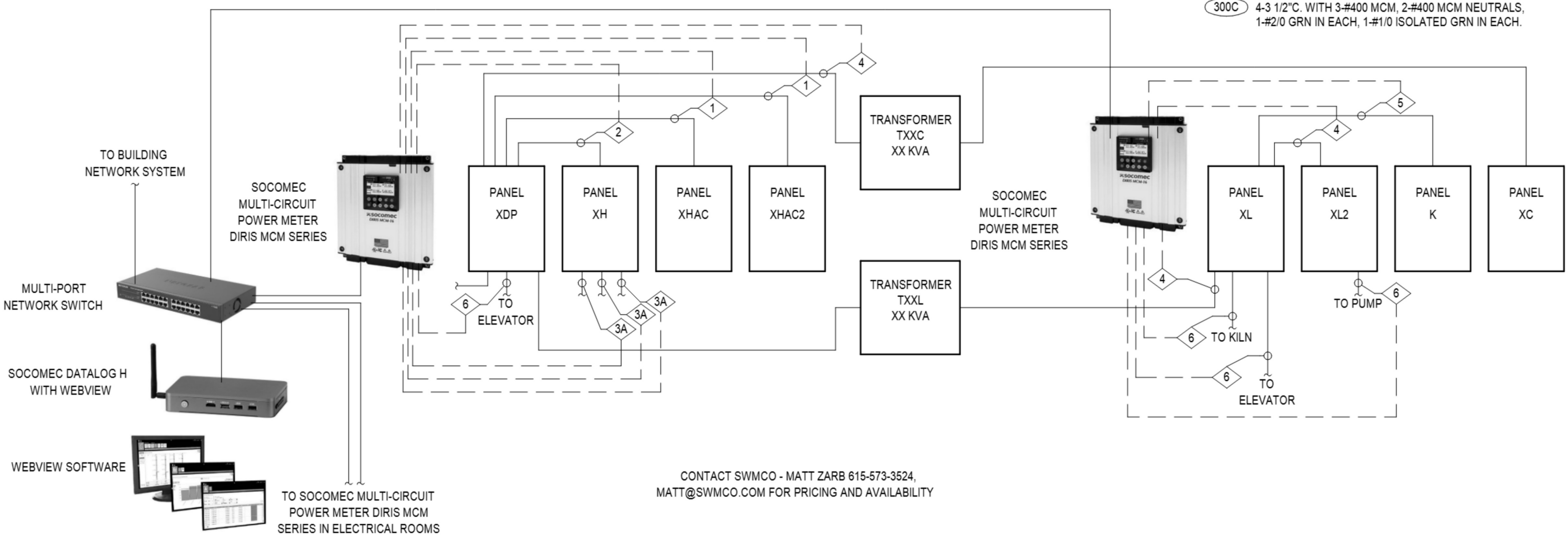
NON-LINEAR FEEDERS

100CF	3-#10, 2-#10 NEUTRAL, 1-#8 GRN, 1-#8 ISOLATED GRN, 2".
125CF	3-#20, 2-#20 NEUTRAL, 1-#6 GRN, 1-#6 ISOLATED GRN, 2".
150CF	3-#30, 2-#30 NEUTRAL, 1-#6 GRN, 1-#6 ISOLATED GRN, 2 1/2".
175CF	3-#40, 2-#40 NEUTRAL, 1-#6 GRN, 1-#6 ISOLATED GRN, 2 1/2".
200CF	3-#50 MCM, 2-#50 MCM NEUTRAL, 1-#6 GRN, 1-#6 ISOLATED GRN, 3".
225CF	3-#60 MCM, 2-#60 MCM NEUTRAL, 1-#4 GRN, 1-#4 ISOLATED GRN, 3 1/2".
250CF	3-#80 MCM, 2-#80 MCM NEUTRALS, 1-#4 GRN, 1-#4 ISOLATED GRN, 3 1/2".
400CF	2-3". WITH 3-#250 MCM, 2-#250 MCM NEUTRALS, 1-#3 GRN, 1-#3 ISOLATED GRN IN EACH.

ELECTRICAL RISER METERING PLAN NOTES

- METER THIS PANEL USING CTS AT INCOMING FEEDER OR AT OUTPUT BREAKER IN PARENT PANEL AND LABEL AS "HVAC".
- METER ALL HVAC AND / OR WATER HEATING LOADS IN THIS PANEL USING SEPARATE CTS AND LABEL AS "HVAC".
- METER THIS LIGHTING PANEL USING CTS AT INCOMING FEEDER OR AT OUTPUT BREAKER IN PARENT PANEL. SUBTRACT OUT ALL EXTERIOR LIGHTING CIRCUIT VALUES AND LABEL THE NET RESULTS AS "INTERIOR LIGHTING".
- METER THIS PLUG LOAD PANEL USING CTS AT INCOMING FEEDER OR AT OUTPUT BREAKER IN PARENT PANEL. SUBTRACT OUT ALL INDIVIDUALLY METERED LOADS THAT ARE FROM DIFFERENT LOAD TYPES AND LABEL THE NET RESULTS AS "PLUG LOADS".
- METER THIS PANEL USING CTS AT INCOMING FEEDER OR AT THE OUTPUT BREAKER IN PARENT PANEL AND LABEL AS "PROCESS LOADS".
- METER ALL KITCHEN EQUIPMENT IN THIS PANEL USING SEPARATE CTS AND LABEL AS "PROCESS LOADS".
- METER ALL MISC. LOADS USING SEPARATE CTS AND LABEL AS "MISC LOADS". (MISC LOADS INCLUDE ELEVATOR / K/LN / AUTOMATIC DOORS / MOTORIZED SHADES / FOUNTAIN / SWIMMING POOL EQUIPMENT / ETC.)
- METER THIS PANEL USING CTS AT INCOMING FEEDER OR AT OUTPUT BREAKER IN PARENT PANEL AND LABEL AS "WATER HEATING".
- METER ALL WATER HEATING LOADS IN THIS PANEL USING SEPARATE CTS AND LABEL AS "WATER HEATING".

AT ALL TERMINATIONS USE ANTIOXIDANT PER MANUFACTURE'S RECOMMENDATION.



ELECTRICAL RISER GENERAL NOTES

(SOME NOTES MAY NOT BE USED)

- GENERAL**
- COORDINATE EXACT LOCATION OF ALL EXTERIOR SWITCHBOARDS, PANELBOARDS, TRANSFORMERS, METERS, ETC. WITH OWNER AND ARCHITECT BEFORE FINAL INSTALLATION. AVOID INSTALLING AL SUCH ITEMS NEAR THE FRONT ENTRANCE. FEEDERS AND BRANCH CIRCUITS CAN EXIT THE BOTTOM OR TOP OF EACH PANELBOARD OR SWITCHBOARD AS REQUIRED. FEEDERS CAN EXIT THE SIDES OF TRANSFORMERS IF ACCEPTABLE PER MANUFACTURER.
- UTILITIES**
- THE UTILITY WORK SHOWN HERE IS PROPOSED AND MAY NOT INCLUDE ALL UTILITY COMPANY REQUIREMENTS AND CLEARANCES. COORDINATE FINAL UTILITY EQUIPMENT LOCATIONS, ROUTING, EASEMENTS, PAD INFORMATION, ETC. WITH UTILITY COMPANY BEFORE BIDDING.
- SERVICE ENTRANCE**
- EXCEPT FOR OVERHEAD AND UNDERGROUND SERVICE ENTRANCE, PROVIDE GROUNDING CONDUCTOR PER RISER NOTES (NEC 250.119, SIZED PER 250.122).
 - GROUNDING ELECTRODE CONDUCTOR (NEC 250.24) SHALL BE INSTALLED AT MAIN SERVICE DISCONNECT UNLESS REQUIRED ELSEWHERE BY CITY ORDINANCE.
 - LABEL ALL SERVICE ENTRANCE EQUIPMENT WITH THE CALCULATED FAULT CURRENT AND DATE OF CALCULATIONS (NEC 110.24(A) THE DATE OF CALCULATIONS SHALL BE THE DATE ON THE SEAL. SEE SPECIFICATIONS FOR MORE INFORMATION. PROVIDE A METER AND AN SPD PER SPECIFICATIONS AT EACH MAIN SWITCHBOARD.
 - WHEN A MAIN SERVICE DISCONNECT IS INSTALLED OUTSIDE, THE MAIN DISTRIBUTION PANEL INSIDE THE BUILDING MUST NOT HAVE THE GROUNDING CONDUCTOR TIED TO THE GROUNDING ELECTRODE SYSTEM.
- DRY TYPE TRANSFORMERS (480V-208/240)**
- ALL TRANSFORMERS TO BE 115°C RISE.
 - ALL TRANSFORMERS SERVING PANELS WITH ISOLATED GROUND OR DOUBLE-SIZED NEUTRAL SHALL HAVE A MINIMUM RATING OF K-13. ALL OTHERS MAY BE RATED K-1.
 - WHEREVER THE LENGTH OF THE SECONDARY CONDUCTORS FROM A TRANSFORMER EXCEED TEEN FEET (10'), PROVIDE AN OCPD (CIRCUIT BREAKER OR FUSED DISCONNECT) WITHIN 10' (TEN FEET) OF THE TRANSFORMER SECONDARY TERMINALS PER NEC 240-21(C)(2). UNLESS OTHERWISE NOTED, SIZE THE OCPD TO MATCH THE PANELBOARD THAT THE TRANSFORMER SERVES.
- OVERCURRENT PROTECTION / DISCONNECTING MEANS**
- PROVIDE ARC ENERGY REDUCTION PER SPECIFICATIONS AND SHALL MEET NEC 240.67 AND 240.87.
 - ALL SERVICE DISCONNECTING MEANS 1000A OR MORE SHALL HAVE GFPE PROTECTION (NEC 230.95). SEE SPECIFICATIONS FOR MORE INFORMATION. (DOES NOT APPLY TO 120/208/240V ELECTRICAL SYSTEMS).
 - ALL FEEDER DISCONNECTING MEANS 1000A OR MORE SHALL HAVE GFPE PROTECTION (NEC 210.13). SEE SPECIFICATIONS FOR MORE INFORMATION. (DOES NOT APPLY TO 120/208/240V ELECTRICAL SYSTEMS).
 - PROVIDE GFPE PROTECTION AT GENERATOR PER SPECIFICATIONS AND NEC (NEC 215.10, 230.95, 702).
- TERMINATIONS**
- THE USE OF BURNDY OR NSI (OR APPROVED EQUIVALENT) UL RATED COMPRESSION REDUCING PIN TERMINALS ON COPPER AND ALUMINUM CONDUCTORS IS ACCEPTABLE WHERE INSTALLED PER NEC AND PER MANUFACTURERS INSTRUCTIONS. SEE IMAGE ON THIS SHEET.

TRANSFORMER GROUNDS	SECONDARY SIDE OF XFMR - NON-LINEAR [208v 3ph]
15G	#8 GRN
30G	#6 GRN
45G	#4 GRN
75G	#2 GRN
112G	#2 GRN
150G	#10 GRN
225G	#20 GRN
300G	#20 GRN
15C	3-#3, 2-#3 NEUTRALS, 1-#8 GRN, 1-#8 ISOLATED GRN, 1-1/2".
30C	3-#20, 2-#20 NEUTRALS, 1-#4 GRN, 1-#4 ISOLATED GRN, 2".
45C	3-#40, 2-#40 NEUTRALS, 1-#2 GRN, 1-#2 ISOLATED GRN, 2 1/2".
75C	3-#400 MCM, 2-#400 MCM NEUTRALS, 1-#10 GRN, 1-#10 ISOLATED GRN, 4".
112C	2-3". WITH 3-#250 MCM, 2-#250 MCM NEUTRALS, 1-#2 GRN IN EACH, 1-#2 ISOLATED GRN IN EACH.
150C	2-3 1/2". WITH 3-#400 MCM, 2-#400 MCM NEUTRALS, 1-#10 GRN IN EACH, 1-#10 ISOLATED GRN IN EACH.
225C	3-3 1/2". WITH 3-#400 MCM, 2-#400 MCM NEUTRALS, 1-#10 GRN IN EACH, 1-#10 ISOLATED GRN IN EACH.
300C	4-3 1/2". WITH 3-#400 MCM, 2-#400 MCM NEUTRALS, 1-#20 GRN IN EACH, 1-#10 ISOLATED GRN IN EACH.