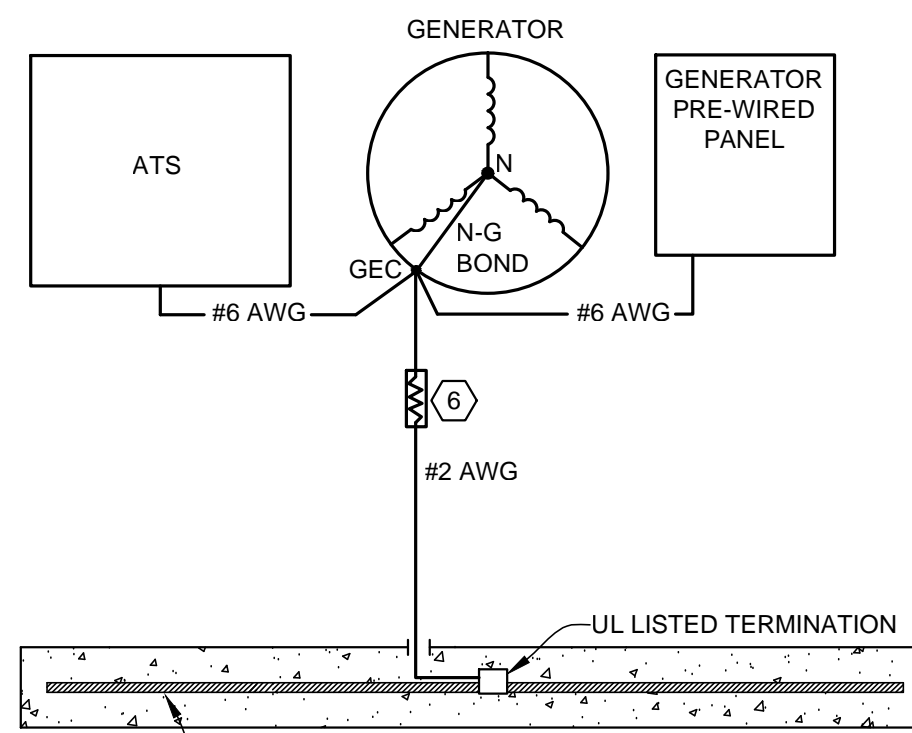
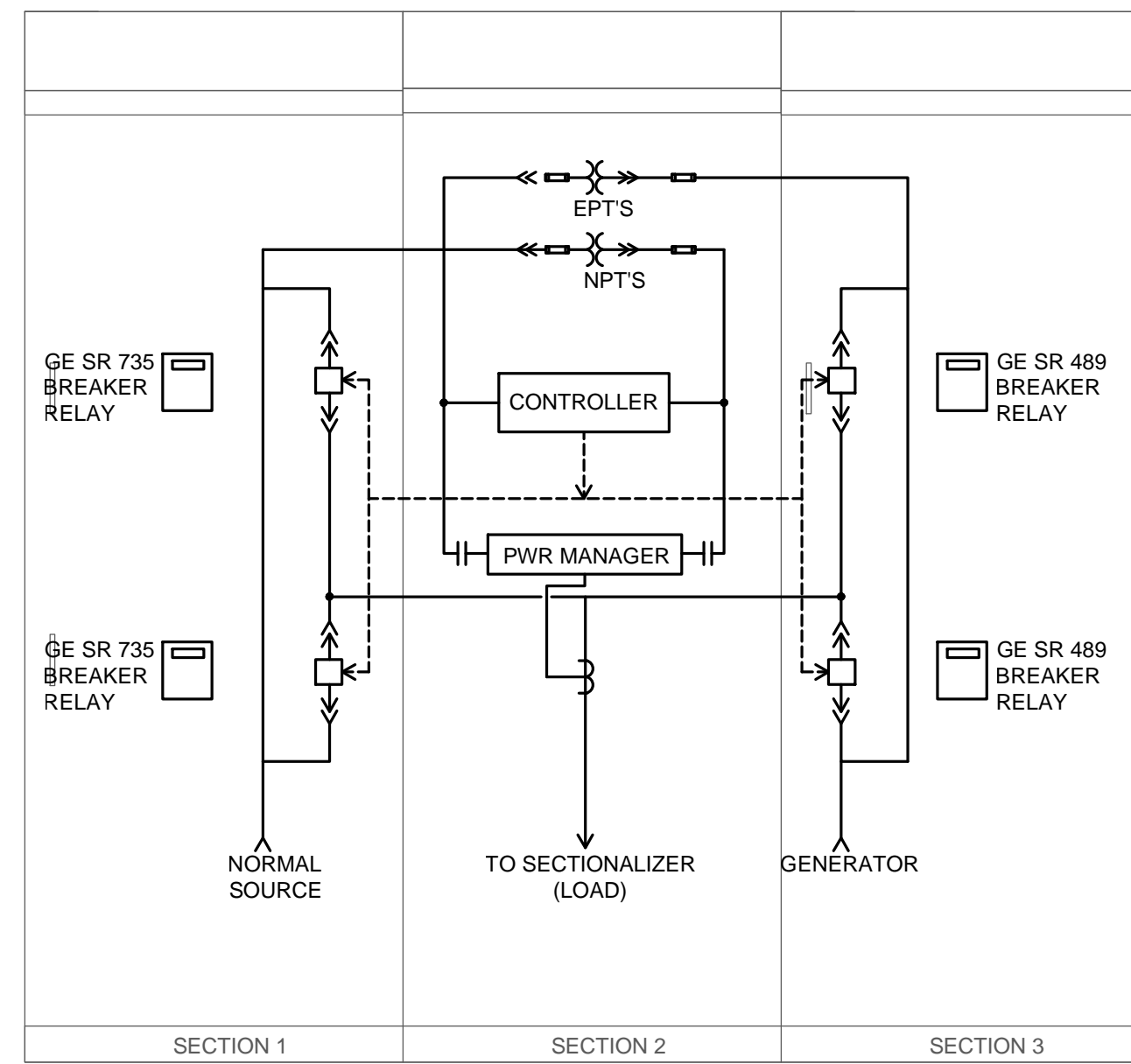


SYMBOL	DESCRIPTION
	15KV FUSES
	DRAW OUT TYPE CIRCUIT BREAKER
	CIRCUIT BREAKER
	DISCONNECT
	15KV STRESS CONES
	15KV 200A LOAD BREAK TAP
	600V, INSULATED MULTI-POINT SECONDARY TRANSFORMER BUSHING TERMINAL
	TRANSFORMER TF #150 VOLTAGE, KVA AND CONNECTIONS AS NOTED



GROUNDING DETAIL

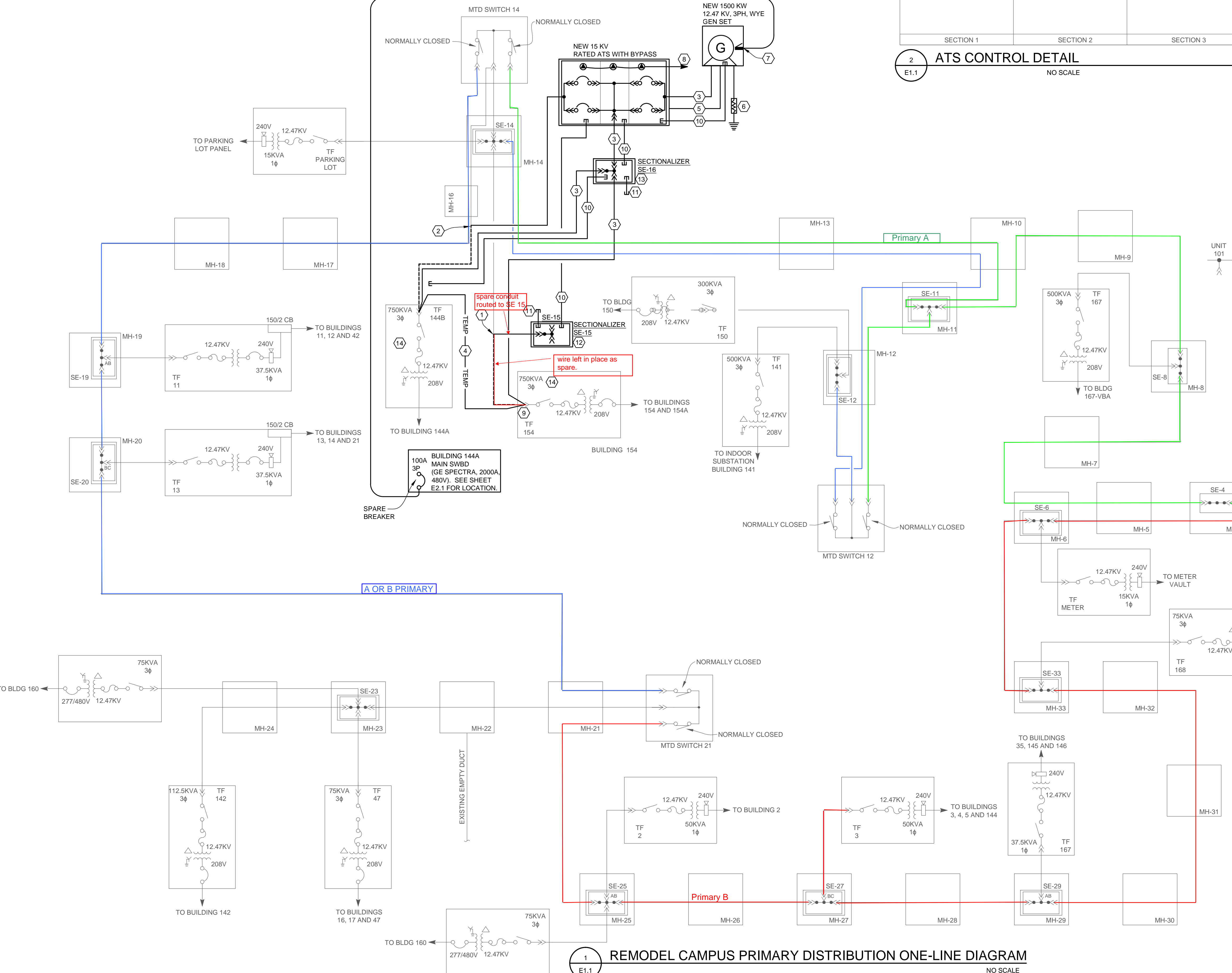


ATS CONTROL DETAIL

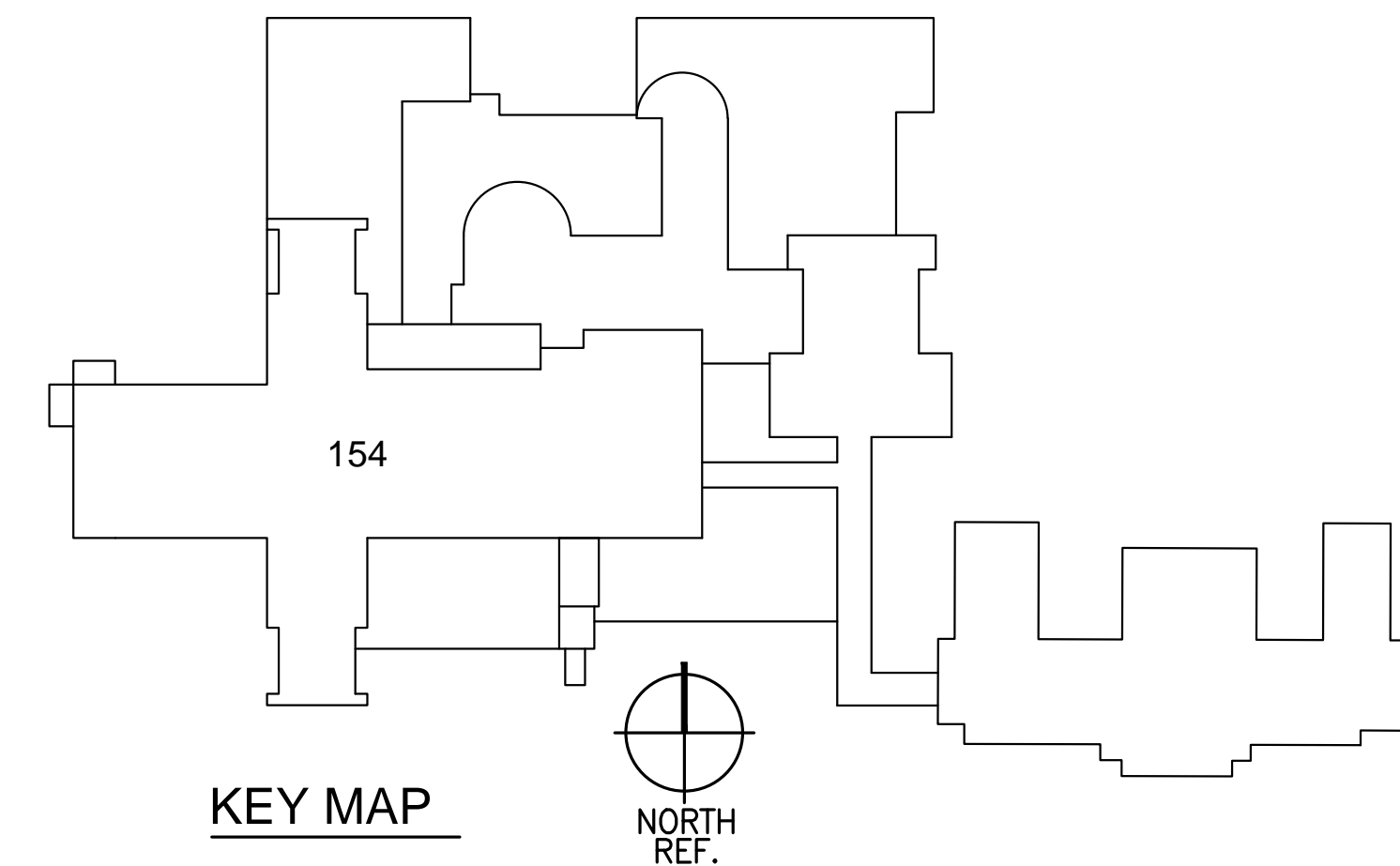
- ### SHEET WORK NOTES
- PULL BACK CONDUCTORS TO THE MAN HOLE, REWORK AND ROUTE EXISTING FEEDER TO A NEW 3-WAY SECTIONALIZER CABINET. THIS FEEDER WILL NOW BE FOR FUTURE USE.
  - INTERCEPT EXISTING 10 AWG 15 KV FEEDER AND ROUTE TO THE NEW 15KV RATED ATS. UTILIZE MANHOLE 16 TO PULL BACK THE CONDUCTORS. CONTRACTOR SHALL ALLOW IN BID FOR REPLACEMENT OF THE CONDUCTORS FROM MAN HOLE 16 AND CONDUCTOR SPLICE IN THE EVENT THAT THERE ARE ISSUES PULLING BACK THE CONDUCTORS.
  - PROVIDE OKONITE 1/0 AWG, 15 KV RATED, 133 MIL IN RIGID CONDUIT MINIMUM 30" BELOW GRADE. (ALL EXISTING CONDUCTOR IS OKONITE; EQUALS ONLY IF APPROVED BY THE PROJECT ENGINEER).
  - TEMPORARY ABOVE GROUND 15 KV FEEDER TO KEEP 144B TRANSFORMER ENERGIZED WHILE THE NEW ATS AND SECTIONALIZER CABINET ARE BEING INSTALLED. PROVIDE 200A FEED THROUGH LOAD BREAK AT TF-154. PROVIDE BARRICADE FOR FEEDER AND EACH TRANSFORMER WITH SIGNAGE INDICATING HIGH VOLTAGE.
  - PROVIDE (4) #12 AWG CONTROL WIRES FOR START SIGNAL IN DEDICATED 3/4" C, 24" BELOW GRADE. PROVIDE (4) #12 AWG IN DEDICATED 3/4" C, 24" BELOW GRADE FOR GENERATOR ANNUNCIATOR. PANEL. PROVIDE (2) TWISTED SHIELD PAIR CABLES IN DEDICATED 3/4" C FOR LOW VOLTAGE COMMUNICATIONS. COORDINATE ALL REQUIREMENTS WITH GENERATOR AND ATS SUPPLIERS. PROVIDE (2) ADDITIONAL 3/4" C SPARE CONDUITS.
- ### GENERAL NOTES
- COMPLY WITH 2011 NEC.
  - ALL 15 KV CABLEING SHALL BE #10 COPPER WITH CONCENTRIC NEUTRAL, 133MIL IN CONDUIT MINIMUM 30" BELOW GRADE.
  - ALL EQUIPMENT SHALL BE RATED FOR SEISMIC DESIGN CATEGORY D (Sd1 = .290, Sds=0.598, Iph=1.5).
  - HALF TONE ONE-LINE COMPONENTS ARE EXISTING TO REMAIN, SHOWN FOR REFERENCE. DASH LINES INDICATE DEMOLITION. DARK LINES INDICATE NEW EQUIPMENT OR WORK.

- ### SHEET WORK NOTES
- LOW RESISTANCE GROUND 200A, 10 SECONDS. PROVIDE IN A SEPARATE ENCLOSURE LOCATED INSIDE THE GENERATOR ENCLOSURE (48"x48"x48"). COORDINATE WITH GENERATOR SUPPLIER. COORDINATE THE RESISTANCE AMPERAGE WITH THE ATS GENERATOR RELAYS.
  - GEN SET PRE-WIRED 120/208V PANEL. BATTERY CHARGERS, WATER HEATERS, OIL HEATERS, ATS HEATERS AND OTHER MISC 120/ 208V LOADS ARE PRE-WIRED.
  - PROVIDE 20A, 120VAC CIRCUIT FROM THE GENERATOR 120 / 208V PANEL TO THE ATS HEATERS IN EACH OF 3 SECTIONS.
  - PROVIDE 15KV RATED ROTATABLE FEED THROUGH LOADBREAK INSERTS RATED FOR 200 AMPS FOR TEMPORARY POWERING OF THE 144B TRANSFORMER DURING CONSTRUCTION. THIS WILL INVOLVE TEMPORARILY REMOVING THE STEEL BARRIER THAT IS DIVIDING THE HV AND LV SECTIONS AND INSTALLING A TEMPORARY FLEXIBLE BARRIER AND COORDINATION WITH SQUARE D TECHNICAL SUPPORT. ONCE THE TEMPORARY FEEDER IS REMOVED, THE STEEL BARRIER SHALL BE INSTALLED SAME AS EXISTING.
  - PROVIDE (1) 4" C SPARE CONDUIT BETWEEN EQUIPMENT, MINIMUM 30" BELOW GRADE.
  - PROVIDE (1) 4" C STUB OUT FROM THE SECTIONALIZER CABINET TO 5 FEET OUT FROM THE CONCRETE PAD, MINIMUM 30" BELOW GRADE. PROVIDE CAP.
  - PROVIDE NEW 12.47 KV 3-WAY SECTIONALIZER CABINET WITH 200A LOAD BREAK BUSHINGS. PULL BACK TF-154 PRIMARY FEEDER AND ROUTE INTO THIS SECTIONALIZER CABINET. THIS WILL SERVE AS A SPARE FEEDER FOR FUTURE USE.
  - PROVIDE NEW 12.47 KV 3-WAY SECTIONALIZER CABINET WITH 200A LOAD BREAK BUSHINGS. SEE SHEET E1.1 ONE-LINE DIAGRAM.
  - THIS TRANSFORMER HAS A SPARE 4" RIGID CONDUIT STUB OUT. CONTRACTOR WILL NEED TO FIND THE EXACT STUB OUT LOCATION.

- ### PHASING GUIDELINE
- | STEP | DESCRIPTION   |
|------|---|
| 1    | PROVIDE TEMPORARY 15KV FEEDER BETWEEN TF-154 AND TF-144A TRANSFORMERS.  |
| 2    | DISCONNECT THE 15KV FEEDER AT TF-144B AND AT THE ORIGIN POINT SW #14.   |
| 3    | RE-WORK 15 KV FEEDER (PREVIOUSLY FEEDING TF-144A) AND GET CONDUITS IN PLACE FOR THE NEW ATS.  |
| 4    | REWORK IRRIGATION AND OTHER SITE MODIFICATIONS IN PREPARATION FOR THE NEW EQUIPMENT.  |
| 5    | INSTALL CONDUIT PROVISIONS FOR THE ATS, GEN SET AND SECTIONALIZER CABINETS, TRANSFORMERS AND 120/208 VOLT FEED TO 144A ELECTRICAL ROOM. THERE IS A SPARE 4" CONDUIT STUB TO THE PRIMARY CABINET OF EACH EXISTING TRANSFORMER FOR THE NEW CONDUCTORS TO BE PULLED IN AND LOAD BREAK ELBOW INSTALLED. |
| 6    | INSTALL NEW CONCRETE PAD FOR GENERATOR AND ATS.   |
| 7    | INSTALL CONDUCTORS AND PROVIDE TERMINATIONS.  |
| 8    | PERFORM HI-POT TESTING OF ALL 15 KV CABLES.   |
| 9    | PROVIDE TESTING OF THE ATS RELAYS FOR CORRECT OPERATION PRIOR TO ENERGIZING THE 12.47KV.  |
| 10   | ENERGIZE THE 12.47 KV FEED TO THE ATS NORMAL SIDE.  |
| 11   | FILL GENERATOR DIESEL TANK.   |
| 12   | PROVIDE INITIAL TESTING OF THE GENERATOR SET AND ATS WITHOUT CONNECTION TO THE LOAD. PERFORM VOLTAGE CHECKS, PHASE ROTATION/SEQUENCE CHECKS OF BOTH SOURCES, THE LOAD TERMINALS AND TEST ALL RELAY/BREAKER OPERATION INCLUDING THE BYPASS FEATURE.  |
| 13   | AFTER THE INITIAL TESTING IS SUCCESSFUL, AND AFTER IT HAS BEEN DEMONSTRATED THAT THE NORMAL SOURCE, EMERGENCY SOURCE AND LOAD TERMINALS PHASE ROTATION/ SEQUENCE ARE ALL THE SAME. PROVIDE FINAL TESTING.   |
| 14   | PERFORM PHASE ROTATION/SEQUENCE CHECKS AND THEN DISCONNECT TF-154 AND TF-144A FROM THE TF-154 FEEDER ORIGINATING AT SW #14. CONNECT THE ATS LOAD SIDE FEEDERS FROM THE SECTIONALIZER CABINET.   |
| 15   | PERFORM PHASE ROTATION/SEQUENCE CHECKS AND VOLTAGE CHECKS AT EACH TRANSFORMER TO ENSURE A MATCH WITH THE EXISTING.  |
| 16   | PERFORM FINAL TESTING OF THE SYSTEM WITH ACTUAL BUILDING LOAD FOR 8 HOURS. TESTING OF THE BYPASS FEATURE SHALL ALSO BE PERFORMED UNDER LOAD.  |
| 17   | AFTER SUCCESSFUL FINAL TESTING IS COMPLETE. FILL GENERATOR FUEL TANK.   |



REMODEL CAMPUS PRIMARY DISTRIBUTION ONE-LINE DIAGRAM



KEY MAP

<b>CONSULTANTS:</b> 		<b>ARCHITECT/ENGINEERS:</b> <b>CTA ARCHITECTS ENGINEERS</b> 13 N 23RD STREET BOX 1439 (59103) BILLINGS, MONTANA 59101 PHONE (406) 248-7455 CTA Project Number : FHVAFA3		<b>Drawing Title</b> ELECTRICAL CAMPUS PRIMARY DISTRIBUTION ONE-LINE <b>Approved Project Chief, Construction/Engineering</b>		<b>Project Title</b> EMERGENCY POWER UPGRADES VA MONTANA HEALTHCARE SYSTEM 100% DRAWINGS FOR CONSTRUCTION		<b>SOLICITATION #</b> W9128F-12-R-0030 RFP-07 <b>Project Number</b> 436-11-105 <b>Building Number</b> 154 <b>Drawing Number</b> E1.1 Dwg. 4 of 8	
<b>Revisions:</b> 		<b>Date</b> 		<b>Date</b> 5/22/2012		<b>Checked</b> JH		<b>Drawn</b> JH	