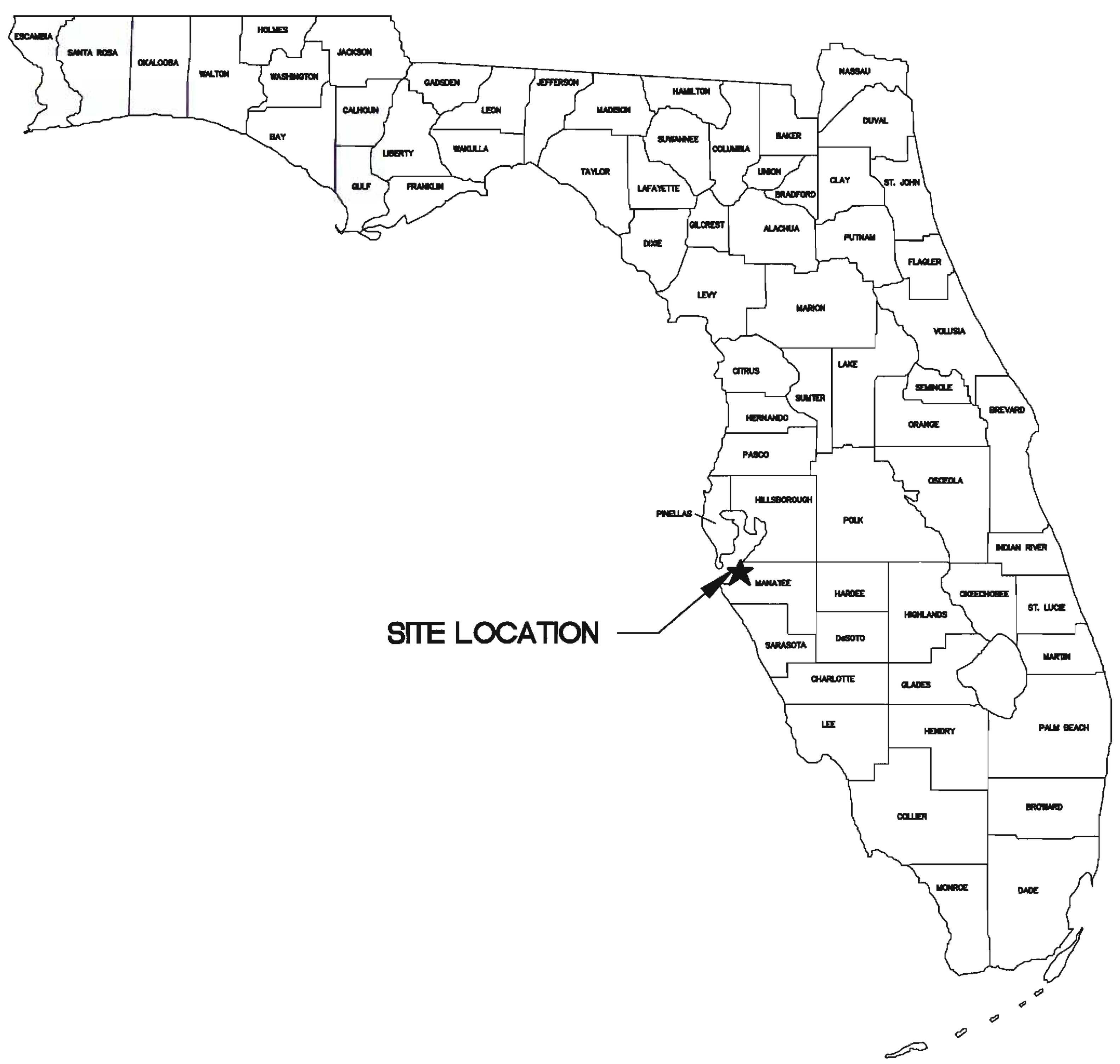
MANATEE COUNTY BRADENTON AREA CONVENTION CENTER EMERGENCY GENERATOR REPLACEMENT PROJECT WORK ASSIGNMENT #58

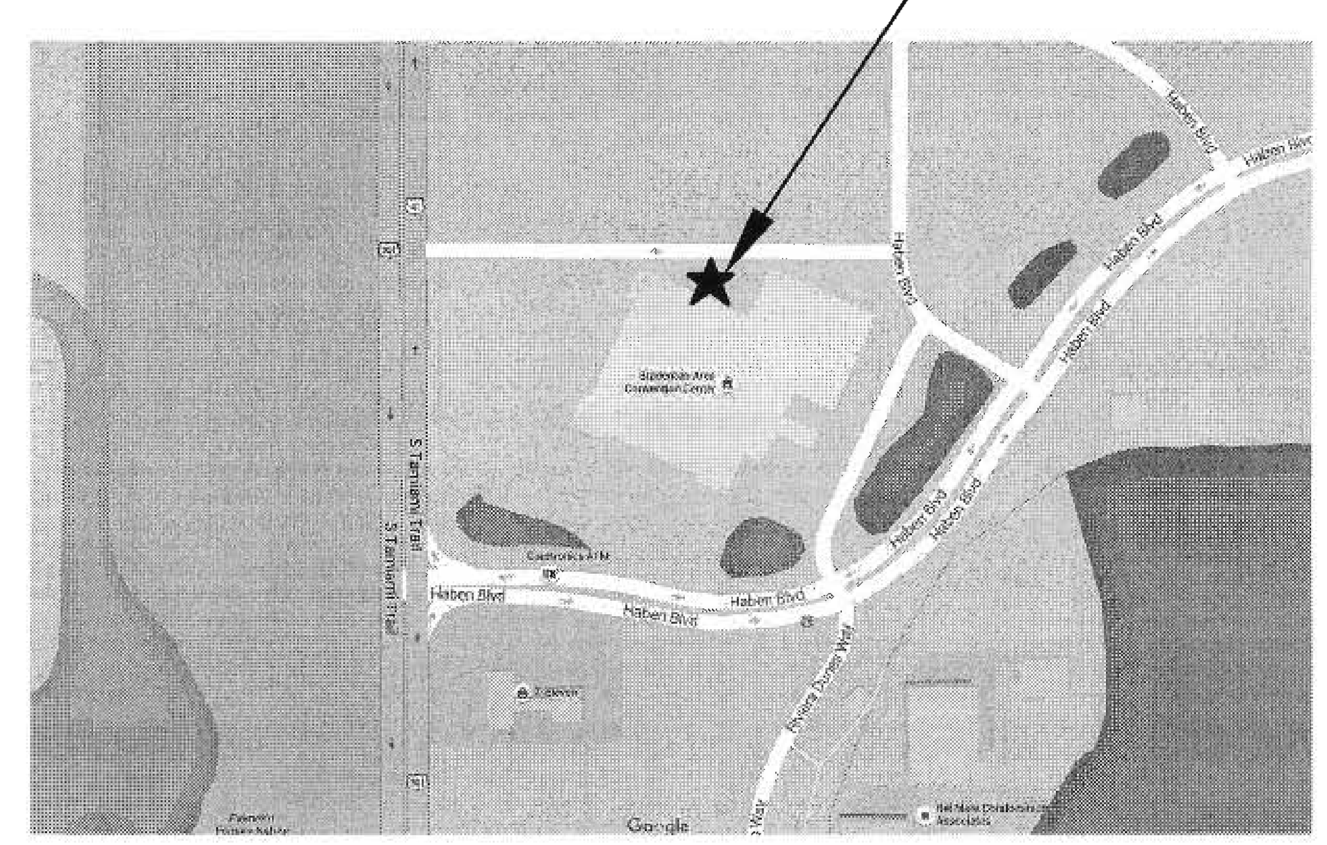


SITE LOCATION

LOCATION MAP

FLORIDA

SITE LOCATION



SITE MAP

SHEET SCHEDULE

SHEET	DESCRIPTION
COVER	PROJECT NAME, LOCATION AND SITE MAPS, SHEET SCHEDULE
E1.0	ELECTRICAL LEGEND AND GENERAL NOTES
E2.0	ELECTRICAL FLOOR/DEMO AND LIMITED SITE PLAN
E2.1	ELECTRICAL FLOOR/NEW AND LIMITED SITE PLAN
E5.0	ELECTRICAL ONE-LINE AND WIRE/CONDUIT SCHEDULE
E5.1	ELECTRICAL PANEL SCHEDULES AND ONE-LINE RISER
E5.2	ELECTRICAL DETAILS AND SPECIFICATIONS
E5.3	ELECTRICAL DETAILS AND SPECIFICATIONS

To the best of the engineer's knowledge, said plans and specifications comply with the applicable building codes and the applicable minimum fire safety standards as determined in accordance with Chapters 553 and 633, Florida Statutes at the date and Manatee County Ordinances of these plans.

ATP ENGINEERING SOUTH, PL
BRADENTON, FLORIDA
ENGR. BUSINESS #8908
941-751-6485

SEAL

MATTHEW J CAMDEN LICENSE No. 79284 STATE OF FLORIDA PROFESSIONAL ENGINEER

9-12-16

MATTHEW CAMDEN FL#79284

ELECTRICAL SYMBOLS AND ABBREVIATIONS

NOTE:
THESE ARE STANDARD SYMBOLS AND MAY NOT ALL APPEAR ON THE PROJECT DRAWINGS; HOWEVER WHEREVER THE SYMBOL APPEARS ON THE PROJECT DRAWINGS, THE ITEM SHALL BE PROVIDED AND INSTALLED.

EQUIPMENT

SYMBOL	DESCRIPTION
MDP	DISTRIBUTION PANELBOARD AND CABINET – RECESSED MOUNT
MD	DISTRIBUTION PANELBOARD AND CABINET – SURFACE MOUNT
A	BRANCH PANELBOARD AND CABINET – RECESSED MOUNT
A	BRANCH PANELBOARD AND CABINET – SURFACE MOUNT
A	LOAD CENTER – SURFACE MOUNT
A	LOAD CENTER – RECESSED MOUNT
A-XX	DENOTES PANEL/PANELBOARD DESIGNATION
X Y	MOTOR "X" INDICATES HORSEPOWER "Y" INDICATES PHASE
X PF	CAPACITOR "X" INDICATES KVAR
	DISCONNECT SWITCH – FUSED "X"= RATING, "Y" = FUSE SIZE
	DISCONNECT SWITCH – NON–FUSED
	DISCONNECT SWITCH – CIRCUIT BREAKER
	MOTOR STARTER
	COMBINATION MOTOR STARTER
T XX	DRY TYPE TRANSFORMER – "XX" INDICATES KVA
M	METER SOCKET
M	CURRENT TRANSFORMER METER SOCKET
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
G	GENERATOR
N E ATS/MTS L	TRANSFER SWITCH ATS = AUTOMATIC TRANSFER SWITCH MTS = MANUAL TRANSFER SWITCH N = NORMAL POWER E = EMERGENCY POWER L = LOAD
	WIREWAY
B B	BUSWAY
	GROUND CONNECTION
S_x	HORSEPOWER RATED MANUAL MOTOR STARTER TOGGLE SWITCH WITH THERMAL OVERLOAD PROTECTION "X" INDICATES AS FOLLOWS NONE – SINGLE POLE 2 – 2 POLE 3 – 3 POLE
S_xP_y	HORSEPOWER RATED MANUAL MOTOR STARTER TOGGLE SWITCH WITH THERMAL OVERLOAD PROTECTION WITH PILOT LIGHT "X" INDICATES AS FOLLOWS: NONE – SINGLE POLE; 2 – 2 POLE; 3 – 3 POLE "Y" INDICATES AS FOLLOWS: Y – YELLOW LENS; G – GREEN LENS; R – RED LENS; W – WHITE LENS; B – BLUE LENS; A – AMBER
A	LOW VOLTAGE DRAWOUT TYPE CIRCUIT BREAKER "X" INDICATES AS FOLLOWS A – AIR TYPE S – SF6 TYPE V – VACUUM TYPE
	MOLDED CASE CIRCUIT BREAKER
	DRAW OUT MOTOR STARTER ASSEMBLY

RACEWAY SYSTEM

SYMBOL	DESCRIPTION
	CONCEALED CONDUIT
E	4" CONDUIT SLEEVE WITH BUSHINGS THRU WALL ABOVE CEILING
XX	LETTER DESIGNATION REFERS TO SYSTEM (SEE ABBREVIATIONS)
A–XX, PHASE CONDUCTORS, GROUND, SWITCH LEG, NEUTRAL, #50	QUANTITY OF CONDUCTORS OR CABLES IN CONDUIT "#50" DENOTES THE FEEDER SIZE "A–XX" DENOTES PANEL AND CIRCUIT #
	CONDUIT TURNED UP
	CONDUIT TURNED DOWN
	JUNCTION OR PULL BOX
	CABLE TRAY
	U/G CONDUIT TURNED UP
	U/G CONDUIT TURNED DOWN

DEVICES

SYMBOL	DESCRIPTION
Φ_x	DUPLEX RECEPTACLE – NORMAL CIRCUIT "X" INDICATES AS FOLLOWS: NONE = 20 AMP, 125VAC GFI = 20 AMP, 125VAC, GROUND FAULT INTERRUPTER TYPE HM = 20 AMP, 125VAC, HORIZONTAL MOUNT TYPE IG = 20 AMP, 125VAC, ISOLATED GROUND TYPE S = 20 AMP, 125VAC, TVSS PROTECTION TYPE WP = 20 AMP, 125VAC, WEATHERPROOF TYPE
	DOUBLE DUPLEX RECEPTACLE
	DUPLEX RECEPTACLE – ABOVE COUNTER. 44" AFF
	DOUBLE DUPLEX RECEPTACLE – ABOVE COUNTER. 44" AFF
	SINGLE RECEPTACLE – SEE DRAWINGS AND SPECIFICATIONS.
	SPECIAL RECEPTACLE – SEE DRAWINGS AND SPECIFICATIONS.
	SINGLE RECEPTACLE – FLOOR, SEE DRAWINGS AND SPECIFICATIONS.
	DUPLEX RECEPTACLE – FLOOR, SEE DRAWINGS AND SPECIFICATIONS.
C HEIGHT	CLOCK RECEPTACLE – 120VAC
S	TOGGLE SWITCH – SINGLE POLE
S2	TOGGLE SWITCH – DOUBLE POLE
S3	TOGGLE SWITCH – 3–WAY
S4	TOGGLE SWITCH – 4–WAY
Sa	TOGGLE SWITCH – a– INDICATES TYPE T: TIMER, K: KEY OPERATED
SD	SWITCH – DIMMER
SF	SWITCH – FAN SPEED CONTROL
W.O.S.	WALL MOUNTED OCCUPANCY SENSOR
C.O.S. x	CEILING MOUNTED OCCUPANCY SENSOR x = SWITCH LEG
JB	JUNCTION BOX
T	HVAC THERMOSTAT
H	HVAC HUMIDISTAT
PP	FURNITURE POWER POLE
CP	FURNITURE CABLE MANAGEMENT POLE.
	MUSHROOM HEAD RED PUSH BUTTON

DRAWING SYMBOLS

2 / E X	DETAIL NUMBER DRAWING NUMBER WHERE DRAWN
A / E X	SECTION LETTER DRAWING NUMBER WHERE DRAWN

FUEL WARNING SYSTEM

SYMBOL	DESCRIPTION
W	WARNING LIGHT
R	EQUIPMENT SHUT DOWN RELAY
	TAMPER SWITCH
	FLOW SWITCH

(1) REFER TO LIKE NUMBER NOTES.

(1) REFER TO LIKE NUMBER NOTES.

GENERAL NOTES (APPLY TO ALL DRAWINGS):

1. THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT AND DEVICES FOR A COMPLETE SYSTEM IN EVERY RESPECT AND DETAIL, TESTED AND LEFT READY IN PERFECT OPERATING CONDITION FOR THE OWNER'S USE. MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS' LABORATORIES AND SHALL BE INSTALLED IN ACCORDANCE WITH SUCH LISTINGS. INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. WORK SHALL MEET THE REQUIREMENTS OF THE SPECIFICATIONS AND CONFORM TO THE NEC (NFPA 70 & 72) AND ALL APPLICABLE CODES, AND BE COMPLETED BY A QUALIFIED, EXPERIENCED, LICENSED ELECTRICAL CONTRACTOR.
2. CONTRACTOR SHALL VERIFY PHASE ROTATION OF ALL INCOMING SERVICES CONNECTIONS THAT ARE TOUCHED, AND PROVIDE A STATEMENT TO THE OWNER THAT PHASING IS CORRECT.
3. THE ENGINEER HAS MADE AN EFFORT TO COORDINATE WORK WITH OTHER TRADES AND IDENTIFY ANY AND ALL CONFLICTS. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE FIELD WORK BETWEEN TRADES AND TO IDENTIFY FIELD CONDITIONS PRIOR TO INSTALLATION AND REPORT ANY CONFLICTS TO THE ENGINEER.
4. WHEN A CONFLICT OCCURS BETWEEN THE SPECIFICATIONS AND DRAWINGS, THE ITEMS OF GREATER QUANTITY AND/OR COST SHALL BE PROVIDED.
5. CONTRACTOR SHALL VERIFY THE LOCATION AND ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT FURNISHED BY OTHER TRADES PRIOR TO INSTALLATION. COORDINATE ROUGH–IN INSTALLATION WITH EQUIPMENT DETAILS.
6. ALL OPENINGS IN FIRE AND SMOKE PARTITIONS SHALL BE SEALED AS REQUIRED BY THE NEC/ FLORIDA BUILDING CODE. PROVIDE UL LISTED COMPOUND TO MATCH PARTITION RATING.
7. DO NOT SCALE DRAWINGS. VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION FOR EXACT DEVICE / EQUIPMENT LOCATION.
8. DEMOLITION WORK: PROVIDE DEMOLITION AND REMOVAL WORK AS INDICATED OR NEEDED. EQUIPMENT THAT IS TO BE REMOVED INCLUDES ALL ASSOCIATED WIRING, BOXES AND CONDUIT BACK TO SOURCE. CLOSE ALL UNUSED OPENINGS IN JUNCTION BOXES THAT REMAIN WITH SUITABLE PLUG OR COVER. WHEN REMOVING OR RELOCATING LIGHT FIXTURES OR OTHER DEVICES, FIELD VERIFY REMAINING DEVICES IN THE SAME CIRCUIT AND RECONNECT FOR CONTINUED SERVICE. EXISTING ELECTRICAL WORK INTERFERING WITH NEW CONSTRUCTION SHALL BE RELOCATED OR REROUTED TO SUIT FINAL INSTALLATION. CUTTING AND PATCHING REQUIRED SHALL BE DONE TO RESTORE AREAS TO ORIGINAL CONDITION.
9. CONTRACTOR SHALL PROVIDE TO LOCAL AHJ OR PERMITTING AGENCY A COPY OF ALL MAJOR EQUIPMENT CUT SHEETS AT TIME OF APPLICATION IF REQUESTED.
10. EXISTING PAD WILL BE POURED OVER AND CONNECTED TO FOR A NEW REPLACEMENT GENERATOR SET.
11. EXISTING DIESEL TANK WILL BE RE–USED AS REQUESTED BY OWNER AT ANOTHER FACILITY. AN UNDERBELLY TANK SHALL BE INCLUDED IN THE PURCHASE OF THE GENERATOR.
12. LOCATION OF THE BUILDING AND VEGETATION SHALL BE VERIFIED PRIOR TO START OF CONSTRUCTION. MOVEMENT OF TREES AND OTHER ITEMS MAY BE REQUIRED TO KEEP SAFE CLEARANCES.
13. AN EMERGENCY SHUTOFF SHALL BE INCLUDED WITH A NEMA 3R BOX IN A CLOSE PROXIMITY OF THE GENERATOR PER CODE REQUIREMENTS.
14. ALL EQUIPMENT SHALL BE ABOVE THE BASE FLOOD ELEVATION OF THE AREA.
15. THE LOWEST POINT OF THE PAD SHALL BE AT LEAST AT AN ELEVATION OF 8'.

ABBREVIATIONS

A	AMPERE
AC	AIR CONDITIONING OR ALTERNATING CURRENT
ACC	ACCESS
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLER UNIT
AM	AMMETER
ARCH	ARCHITECT
AT	AMPERE TRIP
ATC	AUTOMATIC TEMPERATURE CONTROL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CAT	CATEGORY
CB	CIRCUIT BREAKER
CH	CHILLER
CKT	CIRCUIT
CL	CENTER LINE
CLF	CURRENT–LIMITING FUSE
CM	CEILING MOUNTED
CNTL	CONTROL
CU	COPPER
DWG(S)	DRAWING(S)
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EPO	EMERGENCY POWER OFF
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING TO REMAIN
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FACC	FIRE ALARM COMMAND CENTER
FATC	FIRE ALARM TERMINAL CABINET
FLR	FLOOR
FMC	FURNISHED BY MECHANICAL CONTRACTOR
FO	FIBER OPTIC
FOTC	FIBER OPTIC TERMINAL CABINET
FSS	FIRE SUPPRESSION SYSTEM
FWE	FURNISHED WITH EQUIPMENT
GFI	GROUND FAULT INTERRUPTER
GND,G	GROUND
GRS	GALVANIZED RIGID STEEL CONDUIT
HOA	HAND–OFF–AUTO
HACR	HEATING/AIR CONDITIONING–RATED
HID	HIGH INTENSITY DISCHARGE
HPF	HIGH POWER FACTOR
HPS	HIGH PRESSURE SODIUM
HZ	HERTZ
HP	HORSEPOWER
IG	ISOLATED GROUND
IMC	INTERMEDIATE METALLIC CONDUIT
JB	JUNCTION BOX
KAIC	KILO AMPERE INTERRUPTING CAPACITY
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERE
KW	KILOWATT
LC	LIGHTING CONTACTOR
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
M–G	MOTOR GENERATOR
MDP	MAIN DISTRIBUTION PANEL
MH	METAL HAUIDE
MOD	MOTOR OPERATED DAMPER OR DOOR
MTD	MOUNTED
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NF	NON–FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OCPD	OVER CURRENT PROTECTIVE DEVICE
PNL	PANEL
ø	PHASE
PB	PUSHBUTTON
PE	PHOTOELECTRIC CONTROLLER
PP	PATCH PANEL
PVC	POLYVINYL CHLORIDE CONDUIT
R	RELOCATED
RTU	ROOF TOP UNIT
SCH	SCHEDULE
SEC	SECURITY
SW	SWITCH
SWGR	SWITCHGEAR
TEL,T	TELEPHONE
TBB	TELEPHONE BACKBOARD
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TC	TIME CLOCK
XFMR	TRANSFORMER
XFR	TRANSFER
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL,U.L.	UNDERWRITERS LABORATORIES
UPS	UNINTERRUPTIBLE POWER SUPPLY
U.O.N.	UNLESS OTHERWISE NOTED
VT	VAPORTIGHT
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
V	VOLT
VM	VOLTMETER
W	WATT
WHM	WATTHOUR METER
WM	WATTMETER
WP	WEATHER PROOF

ATP ENGINEERING SOUTH, P.
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DATE | DESCRIPTION

MANATEE COUNTY CONVENTION AND CIVIC CENTER
GENERATOR REPLACEMENT
1 HABEN BLVD.
PALMETTO, FLORIDA 34221
WORK ASSIGNMENT #58

DRAWING TITLE: ELECTRICAL LEGEND AND GENERAL NOTES

FILE:	MC CONV GEN REP
JOB NO.:	2015.104
DATE :	02/22/2016
PLOT SIZE:	1:1
DRAWN BY:	MC
CHECKED BY:	JDC
SHEET No.:	E1.0

PROJECT SCOPE OF WORK:
(APPLIES TO ALL DRAWINGS)

THE SCOPE OF WORK INCLUDES: THE ELECTRICAL, PLUMBING, AND STRUCTURAL WORK DESCRIBED IN THE PLANS.
PANEL BOARDS, CONDUITS, WIRE, DISCONNECTS, SWITCHES, LIGHTS, DOORS, LOCKS, HANDLES, ALL UTILITY REQUIREMENTS INCLUDING UTILITY FEES AND METERING REQUIREMENTS SHALL BE INCLUDED IN THE SCOPE. THE INSTALLATION OF THE NEW GENERATOR WITH ALL NEW EXHAUST SHALL BE IN THE SCOPE. THE REMOVAL AND SCRAPPING OF THE OLD GENERATOR SHALL BE IN THE SCOPE. ANY SCRAPPING SHALL DIESEL FUEL REMOVAL AND TANK SALVAGE FOR THE COUNTY SHALL BE INCLUDED. ALL CONTROLS SYSTEMS SHALL BE INSTALLED INCLUDING REMOTE ANNUNCIATOR AND CONTROL WIRES AND CONDUITS, AND THE RUNNING OF ALL CONDUITS AND WIRES THAT ARE REQUIRED TO MAKE THE SYSTEM COMPLETELY FUNCTIONAL SHALL BE INCLUDED IN THE SCOPE. ALL SOIL TESTING, ENVIRONMENTAL WASTE REMOVAL, SOIL REMOVAL, COMPACTION, NEW PILINGS, AND NEW FILL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN THE SCOPE OF WORK. ALL CONCRETE TESTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN THE SCOPE OF WORK. ALL MATERIALS AND WORK STATED OR NOT STATED SHALL BE INCLUDED TO MAKE THIS A COMPLETE BUILD.

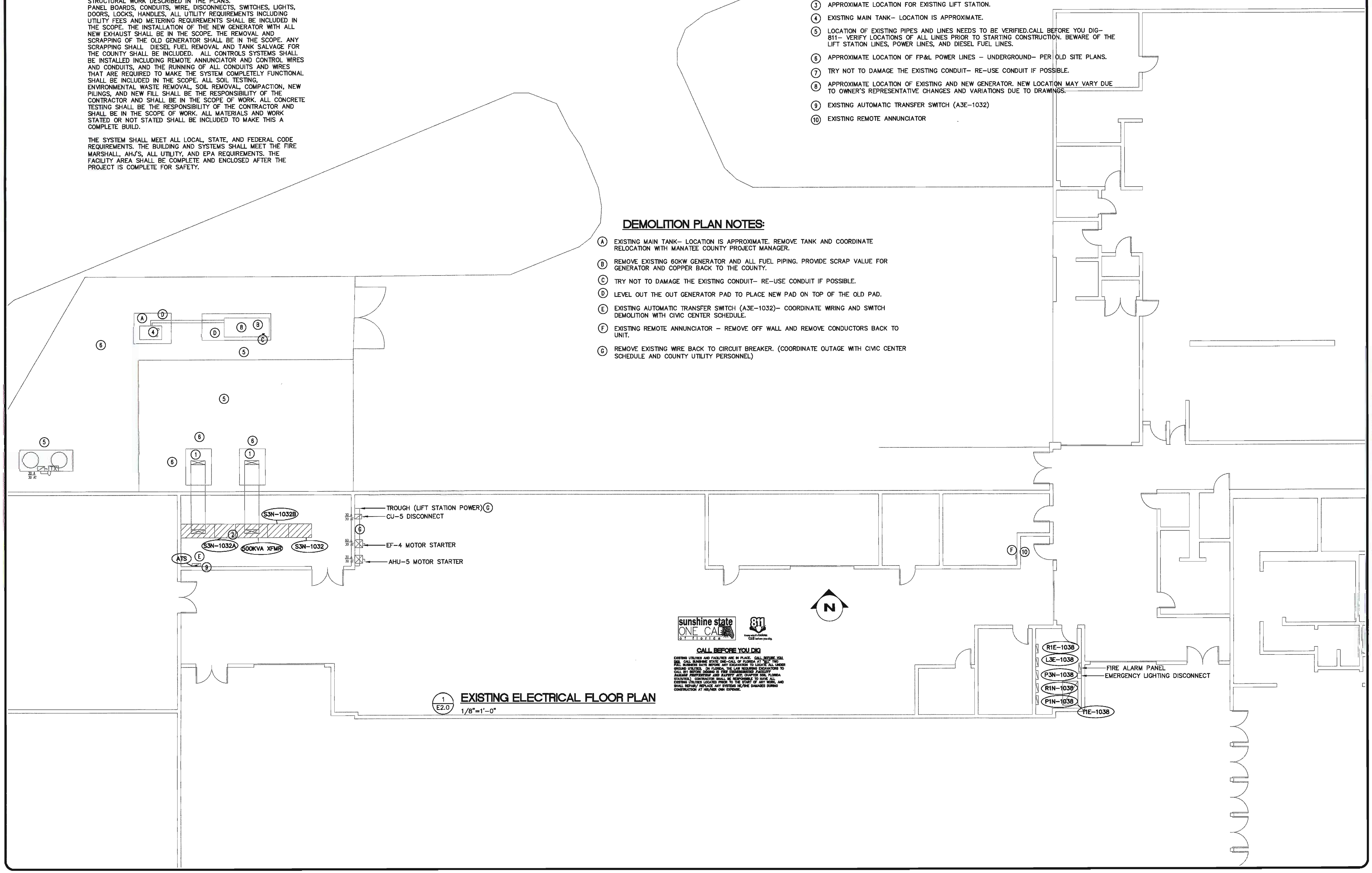
THE SYSTEM SHALL MEET ALL LOCAL, STATE, AND FEDERAL CODE REQUIREMENTS. THE BUILDING AND SYSTEMS SHALL MEET THE FIRE MARSHALL, AHJ'S, ALL UTILITY, AND EPA REQUIREMENTS. THE FACILITY AREA SHALL BE COMPLETE AND ENCLOSED AFTER THE PROJECT IS COMPLETE FOR SAFETY.

EXISTING PLAN NOTES:

1. EXISTING UTILITY PAD MOUNT TRANSFORMER. REFER TO ONE LINE DIAGRAM.
2. EXISTING ELECTRIC METER AND ENCLOSURE.
3. APPROXIMATE LOCATION FOR EXISTING LIFT STATION.
4. EXISTING MAIN TANK– LOCATION IS APPROXIMATE.
5. LOCATION OF EXISTING PIPES AND LINES NEEDS TO BE VERIFIED.CALL BEFORE YOU DIG– 811– VERIFY LOCATIONS OF ALL LINES PRIOR TO STARTING CONSTRUCTION. BEWARE OF THE LIFT STATION LINES, POWER LINES, AND DIESEL FUEL LINES.
6. APPROXIMATE LOCATION OF FP&L POWER LINES – UNDERGROUND– PER OLD SITE PLANS.
7. TRY NOT TO DAMAGE THE EXISTING CONDUIT– RE-USE CONDUIT IF POSSIBLE.
8. APPROXIMATE LOCATION OF EXISTING AND NEW GENERATOR. NEW LOCATION MAY VARY DUE TO OWNER'S REPRESENTATIVE CHANGES AND VARIATIONS DUE TO DRAWINGS.
9. EXISTING AUTOMATIC TRANSFER SWITCH (A3E–1032)
10. EXISTING REMOTE ANNUNCIATOR

DEMOLITION PLAN NOTES:

A. EXISTING MAIN TANK– LOCATION IS APPROXIMATE. REMOVE TANK AND COORDINATE RELOCATION WITH MANATEE COUNTY PROJECT MANAGER.
B. REMOVE EXISTING 60KW GENERATOR AND ALL FUEL PIPING. PROVIDE SCRAP VALUE FOR GENERATOR AND COPPER BACK TO THE COUNTY.
C. TRY NOT TO DAMAGE THE EXISTING CONDUIT– RE-USE CONDUIT IF POSSIBLE.
D. LEVEL OUT THE OUT GENERATOR PAD TO PLACE NEW PAD ON TOP OF THE OLD PAD.
E. EXISTING AUTOMATIC TRANSFER SWITCH (A3E–1032)– COORDINATE WIRING AND SWITCH DEMOLITION WITH CIVIC CENTER SCHEDULE.
F. EXISTING REMOTE ANNUNCIATOR – REMOVE OFF WALL AND REMOVE CONDUCTORS BACK TO UNIT.
G. REMOVE EXISTING WIRE BACK TO CIRCUIT BREAKER. (COORDINATE OUTAGE WITH CIVIC CENTER SCHEDULE AND COUNTY UTILITY PERSONNEL)



EXISTING ELECTRICAL FLOOR PLAN
1/E2.0 1/8"=1'-0"

ATP ENGINEERING SOUTH, P.L.
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REV.#	DESCRIPTION	DATE

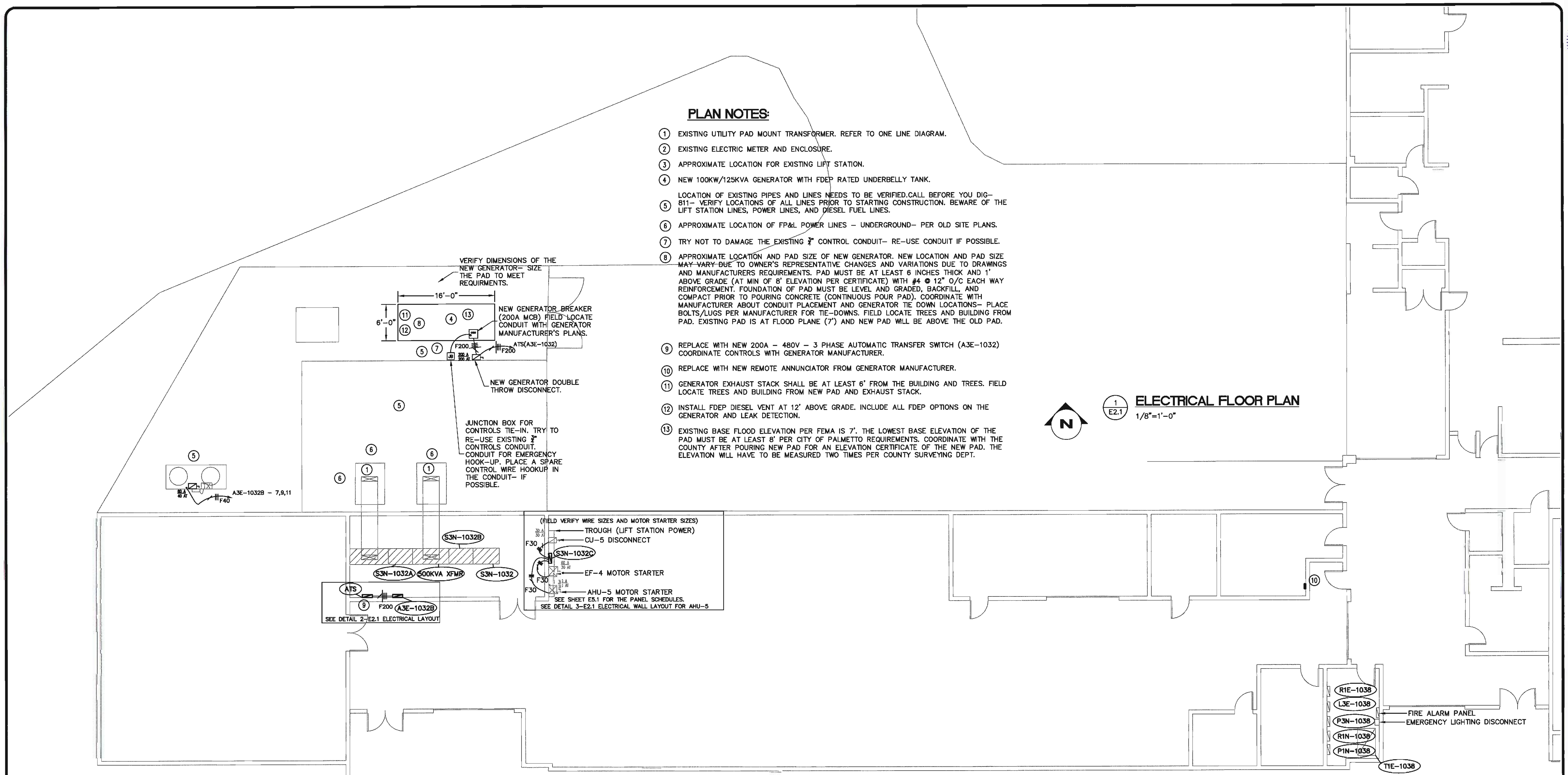
MANATEE COUNTY CONVENTION AND CIVIC CENTER
GENERATOR REPLACEMENT
1 HABEN BLVD.
PALMETTO, FLORIDA 34221
WORK ASSIGNMENT #58

DRAWING TITLE:
ELECTRICAL FLOOR/DEMO AND LIMITED SITE PLAN

FILE:	MC CONV GEN REP
JOB NO.:	2015.104
DATE :	02/22/2016
PLOT SIZE:	1:1
DRAWN BY:	MC
CHECKED BY:	JDC
SHEET No.:	E2.0

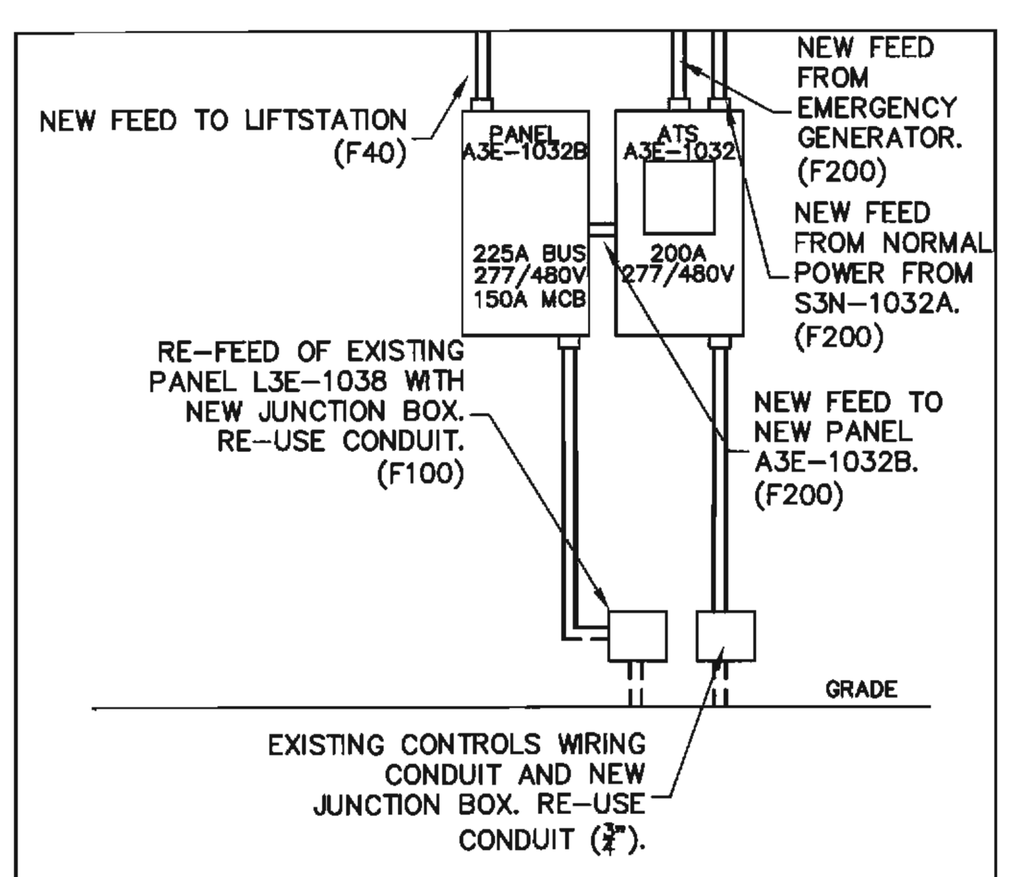
PLAN NOTES:

1. EXISTING UTILITY PAD MOUNT TRANSFORMER. REFER TO ONE LINE DIAGRAM.
2. EXISTING ELECTRIC METER AND ENCLOSURE.
3. APPROXIMATE LOCATION FOR EXISTING LIFT STATION.
4. NEW 100KW/125KVA GENERATOR WITH FDEP RATED UNDERBELLY TANK.
5. LOCATION OF EXISTING PIPES AND LINES NEEDS TO BE VERIFIED.CALL BEFORE YOU DIG– 811– VERIFY LOCATIONS OF ALL LINES PRIOR TO STARTING CONSTRUCTION. BEWARE OF THE LIFT STATION LINES, POWER LINES, AND DIESEL FUEL LINES.
6. APPROXIMATE LOCATION OF FP&L POWER LINES – UNDERGROUND– PER OLD SITE PLANS.
7. TRY NOT TO DAMAGE THE EXISTING ¾" CONTROL CONDUIT– RE-USE CONDUIT IF POSSIBLE.
8. APPROXIMATE LOCATION AND PAD SIZE OF NEW GENERATOR. NEW LOCATION AND PAD SIZE ~~MAY VARY DUE~~ TO OWNER'S REPRESENTATIVE CHANGES AND VARIATIONS DUE TO DRAWINGS AND MANUFACTURERS REQUIREMENTS. PAD MUST BE AT LEAST 6 INCHES THICK AND 1' ABOVE GRADE (AT MIN OF 8' ELEVATION PER CERTIFICATE) WITH #4 @ 12" O/C EACH WAY REINFORCEMENT. FOUNDATION OF PAD MUST BE LEVEL AND GRADED, BACKFILL, AND COMPACT PRIOR TO POURING CONCRETE (CONTINUOUS POUR PAD). COORDINATE WITH MANUFACTURER ABOUT CONDUIT PLACEMENT AND GENERATOR TIE DOWN LOCATIONS– PLACE BOLTS/LUGS PER MANUFACTURER FOR TIE–DOWNS. FIELD LOCATE TREES AND BUILDING FROM PAD. EXISTING PAD IS AT FLOOD PLANE (7') AND NEW PAD WILL BE ABOVE THE OLD PAD.
9. REPLACE WITH NEW 200A – 480V – 3 PHASE AUTOMATIC TRANSFER SWITCH (A3E–1032) COORDINATE CONTROLS WITH GENERATOR MANUFACTURER.
10. REPLACE WITH NEW REMOTE ANNUNCIATOR FROM GENERATOR MANUFACTURER.
11. GENERATOR EXHAUST STACK SHALL BE AT LEAST 6' FROM THE BUILDING AND TREES. FIELD LOCATE TREES AND BUILDING FROM NEW PAD AND EXHAUST STACK.
12. INSTALL FDEP DIESEL VENT AT 12' ABOVE GRADE. INCLUDE ALL FDEP OPTIONS ON THE GENERATOR AND LEAK DETECTION.
13. EXISTING BASE FLOOD ELEVATION PER FEMA IS 7'. THE LOWEST BASE ELEVATION OF THE PAD MUST BE AT LEAST 8' PER CITY OF PALMETTO REQUIREMENTS. COORDINATE WITH THE COUNTY AFTER POURING NEW PAD FOR AN ELEVATION CERTIFICATE OF THE NEW PAD. THE ELEVATION WILL HAVE TO BE MEASURED TWO TIMES PER COUNTY SURVEYING DEPT.



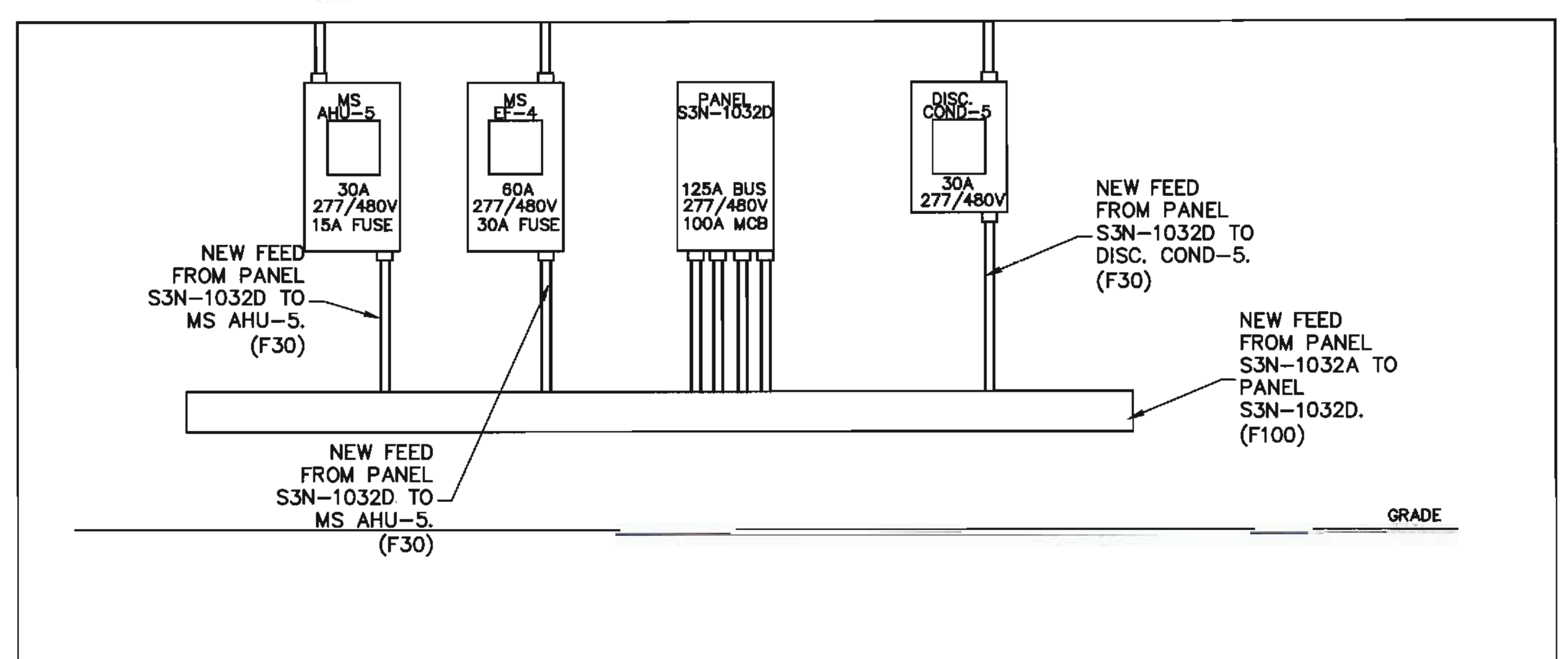
VERIFY DIMENSIONS OF THE NEW GENERATOR– SIZE THE PAD TO MEET REQUIRMENTS.
16'-0"
6'-0"
NEW GENERATOR BREAKER (200A MCB) FIELD LOCATE CONDUIT WITH GENERATOR MANUFACTURER'S PLANS.
ATS(A3E-1032)
F200
NEW GENERATOR DOUBLE THROW DISCONNECT.
JUNCTION BOX FOR CONTROLS TIE–IN. TRY TO RE–USE EXISTING ¾" CONTROLS CONDUIT. CONDUIT FOR EMERGENCY HOOK–UP. PLACE A SPARE CONTROL WIRE HOOKUP IN THE CONDUIT– IF POSSIBLE.
A3E-1032B – 7,9,11
F40
S3N-1032B
S3N-1032A
500KVA XFMR
S3N-1032
ATS
A3E-1032B
SEE DETAIL 2–E2.1 ELECTRICAL LAYOUT
(FIELD VERIFY WIRE SIZES AND MOTOR STARTER SIZES)
TROUGH (LIFT STATION POWER)
CU–5 DISCONNECT
S3N-1032C
EF–4 MOTOR STARTER
AHU–5 MOTOR STARTER
SEE SHEET E5.1 FOR THE PANEL SCHEDULES.
SEE DETAIL 3–E2.1 ELECTRICAL WALL LAYOUT FOR AHU–5
R1E-1038
L3E-1038
P3N-1038
R1N-1038
P1N-1038
T1E-1038
FIRE ALARM PANEL
EMERGENCY LIGHTING DISCONNECT
N

ELECTRICAL FLOOR PLAN (1/E2.1)
1/8"=1'-0"



NEW FEED TO LIFTSTATION (F40)
PANEL A3E-1032B
ATS A3E-1032
NEW FEED FROM EMERGENCY GENERATOR. (F200)
NEW FEED FROM NORMAL POWER FROM S3N–1032A. (F200)
225A BUS 277/480V 150A MCB
200A 277/480V
RE–FEED OF EXISTING PANEL L3E–1038 WITH NEW JUNCTION BOX. RE–USE CONDUIT. (F100)
NEW FEED TO NEW PANEL A3E–1032B. (F200)
GRADE
EXISTING CONTROLS WIRING CONDUIT AND NEW JUNCTION BOX. RE–USE CONDUIT (¾").

ELECTRICAL WALL LAYOUT (2/E2.1)
NO SCALE
SEE SHEET E5.1 FOR THE PANEL SCHEDULES.
SEE DETAIL 1–E2.1 FOR WIRE SIZES PER SHEET E5.0.



MS AHU-5
MS EF-4
PANEL S3N-1032D
DISC. COND-5
30A 277/480V 15A FUSE
60A 277/480V 30A FUSE
125A BUS 277/480V 100A MCB
30A 277/480V
NEW FEED FROM PANEL S3N–1032D TO MS AHU–5. (F30)
NEW FEED FROM PANEL S3N–1032D TO DISC. COND–5. (F30)
NEW FEED FROM PANEL S3N–1032A TO PANEL S3N–1032D. (F100)
NEW FEED FROM PANEL S3N–1032D TO MS AHU–5. (F30)
GRADE

ELECTRICAL WALL DETAIL LAYOUT FOR AHU-5 (3/E2.1)
NO SCALE
SEE SHEET E5.1 FOR THE PANEL SCHEDULES.
SEE DETAIL 1–E2.1 FOR WIRE SIZES PER SHEET E5.0.

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ENGR. BUSINESS #8988
941-751-6485

REV.#	DESCRIPTION	DATE

MANATEE COUNTY CONVENTION AND CIVIC CENTER
GENERATOR REPLACEMENT
1 HABEN BLVD.
PALMETTO, FLORIDA 34221
WORK ASSIGNMENT #58

DRAWING TITLE: ELECTRICAL FLOOR/NEW AND LIMITED SITE PLAN

FILE:	MC CONV GEN REP
JOB NO.:	2015.104
DATE:	02/22/2016
PLOT SIZE:	1:1
DRAWN BY:	MC
CHECKED BY:	JDC
SHEET No.:	E2.1

FEEDER AND BRANCH CIRCUIT SCHEDULE

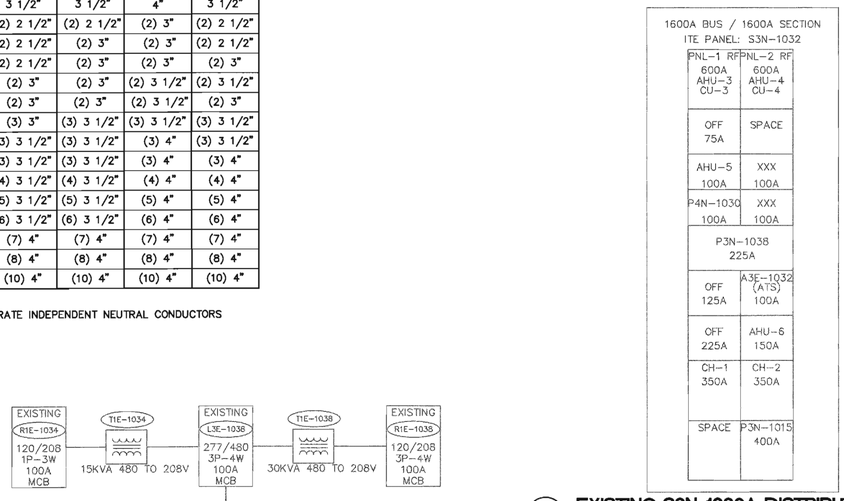
FEEDER/BRANCH CIRCUIT DESIGNATION	COPPER CONDUCTOR THHN,THWN,&THWN-2		CONDUIT SIZE AND QUANTITY [QUANTITY IS 1, UNLESS NOTED IN ( )]					
	PHASE & NEUTRAL	EQUIPMENT GROUND	1P, 1N, 1G, 2P, 1G	2P, 1N, 1G, 3P, 1G	3P, 1N, 1G	3P, 2N, 1G	3P, 3N, 1G	3P, 1N, 2G
F20	12	12	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
F30	10	10	3/4"	3/4"	3/4"	1"	1"	1"
F40-50	8	10	3/4"	1"	1"	1 1/4"	1 1/4"	1 1/4"
F60	6	10	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
F70-F80	4	8	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	1 1/2"
F90-F100	3	8	1 1/4"	1 1/4"	1 1/2"	1 1/2"	2"	1 1/2"
F110	2	6	1 1/4"	1 1/2"	1 1/2"	2"	2"	2"
F125	1	6	1 1/2"	2"	2"	2"	2 1/2"	2"
F150	1/0	6	1 1/2"	2"	2"	2 1/2"	2 1/2"	2 1/2"
F175	2/0	6	2"	2"	2 1/2"	2 1/2"	3"	2 1/2"
F200	3/0	6	2"	2 1/2"	2 1/2"	3"	3"	3"
F225	4/0	4	2"	2 1/2"	3"	3"	3"	3"
F250	250	4	2 1/2"	3"	3"	3 1/2"	3 1/2"	3-1/2"
F300	350	4	3"	3"	3 1/2"	3 1/2"	4"	3 1/2"
F350	2/0	3	(2) 2"	(2) 2 1/2"	(2) 2 1/2"	(2) 2 1/2"	(2) 3"	(2) 2 1/2"
F400	3/0	3	(2) 2"	(2) 2 1/2"	(2) 2 1/2"	(2) 3"	(2) 3"	(2) 2 1/2"
F450	4/0	2	(2) 2"	(2) 2 1/2"	(2) 2 1/2"	(2) 3"	(2) 3"	(2) 3"
F500	250	2	(2) 2 1/2"	(2) 3"	(2) 3"	(2) 3"	(2) 3 1/2"	(2) 3 1/2"
F600	350	1	(2) 2 1/2"	(2) 3"	(2) 3"	(2) 3"	(2) 3 1/2"	(2) 3"
F800	300	1/0	(3) 2 1/2"	(3) 3"	(3) 3"	(3) 3 1/2"	(3) 3 1/2"	(3) 3 1/2"
F900	350	2/0	(3) 3"	(3) 3"	(3) 3 1/2"	(3) 3 1/2"	(3) 4"	(3) 3 1/2"
F1000	400	2/0	(3) 3"	(3) 3"	(3) 3 1/2"	(3) 3 1/2"	(3) 4"	(3) 4"
F1200	350	3/0	(4) 3"	(4) 3"	(4) 3 1/2"	(4) 3 1/2"	(4) 4"	(4) 4"
F1600	400	4/0	(5) 3"	(5) 3"	(5) 3 1/2"	(5) 3 1/2"	(5) 4"	(5) 4"
F2000	400	250	(6) 3"	(6) 3"	(6) 3 1/2"	(6) 3 1/2"	(6) 4"	(6) 4"
F2500	500	350	(7) 3"	(7) 3 1/2"	(7) 4"	(7) 4"	(7) 4"	(7) 4"
F3000	500	400	(8) 3"	(8) 3 1/2"	(8) 4"	(8) 4"	(8) 4"	(8) 4"
F3500	500	500	(10) 3"	(10) 3 1/2"	(10) 4"	(10) 4"	(10) 4"	(10) 4"

NOTES:
1. DO NOT COMBINE NEUTRAL CONDUCTORS FOR ALL CIRCUITS. USE SEPARATE INDEPENDENT NEUTRAL CONDUCTORS FOR ALL CIRCUITS.

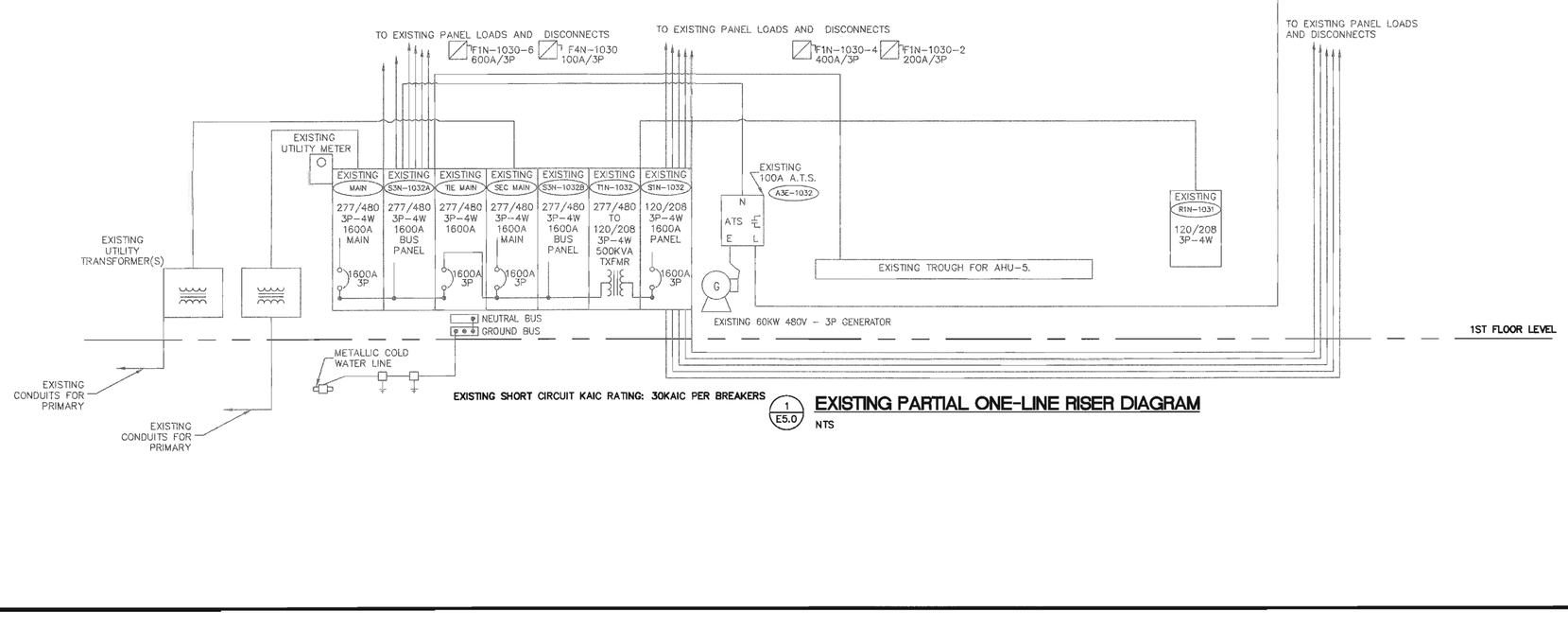
VOLTAGE DROP FOR 1ϕ, 20A BRANCH CIRCUITS

	DISTANCE ALLOWED			
FEEDER SIZE TO USE	120V	208V	277V	
F20	0 – 70 FEET	0 – 125 FEET	0 – 165 FEET	
F30	70 – 115 FEET	125 – 200 FEET	165 – 265 FEET	
F40-50	115 – 185 FEET	200 – 320 FEET	265 – 425 FEET	
F60	185 – 290 FEET	320 – 510 FEET	425 – 675 FEET	
F70-80	290 – 460 FEET	510 – 810 FEET	675 – 1075 FEET	

NOTES:
1. 20 A BRANCH CIRCUITS SHALL BE SIZED FOR VOLTAGE DROP. WIRE SIZES ARE NOT INDICATED ON THE DRAWINGS TO COMPENSATE FOR VOLTAGE DROP FOR THESE CIRCUITS. CONTRACTOR SHALL UTILIZE WIRE SIZE SHOWN ABOVE FOR DISTANCES LISTED ABOVE.
2. VOLTAGE DROP WIRE SIZES WILL BE STRICTLY ENFORCED. CONTRACTOR SHALL SUBMIT A LIST OF CIRCUITS THAT WILL EXCEED THE DISTANCES ALLOWED AND INDICATE WIRE SIZE TO BE USED PRIOR TO ANY WIRE BEING INSTALLED.



2 / E5.0 **EXISTING S3N-1032A DISTRIBUTION DIAGRAM**
NTS



1 / E5.0 **EXISTING PARTIAL ONE-LINE RISER DIAGRAM**
NTS

ATP ENGINEERING SOUTH, FL
BRADENTON, FLORIDA
ENGR. BUSINESS #8908
941-751-6485

REV.#	DESCRIPTION	DATE

MANATEE COUNTY CONVENTION AND CIVIC CENTER
GENERATOR REPLACEMENT
1 HABEN BLVD.
PALMETTO, FLORIDA 34221
WORK ASSIGNMENT #58

DRAWING TITLE:
ELECTRICAL
ONE-LINE
AND WIRE/CONDUIT
SCHEDULE

FILE:	MC CONV GEN REP
JOB NO.:	2015.104
DATE :	02/22/2016
PLOT SIZE:	1:1
DRAWN BY:	MC
CHECKED BY:	JDC
SHEET No.:	E5.0

POWER DISTRIBUTION PANELBOARD SCHEDULE	DESIGNATION:	S3N-1032A	MAINS:	1600 A MLO
	LOCATION:	Room 1032 - Electrical Room	BUS SIZE:	1600 AMP
	VOLTAGE:	480Y/277	PANEL MOUNTING:	Floor Mount
	PHASE:	3 PHASE, 4 WIRE	ALL BREAKERS:	65,000 AIC

CKT NO.	LOAD DESCRIPTION	LOAD CODE	CONN. KVA	BREAKER AMPS	BREAKER POLE	CONNECTED LOAD A	CONNECTED LOAD B	CONNECTED LOAD C	BREAKER AMPS	BREAKER POLE	CONN. KVA	LOAD CODE	LOAD DESCRIPTION	CKT NO.
1	PNL-1 Roof	M	149.34	600	3	298.68			600	3	149.34	M	PNL2-Roof	2
	(AHU/CU-3)	M	149.34				298.68				149.34	M	(AHU/CU-4)	
		M	149.34					298.68			149.34	M		
3	Off/Spare			75	3	0.00			X	3			Space	4
							0.00							
								0.00						
5	AHU-5 (S3N-1032C)**	M	11.38	100	3	11.38			100	3			Off	6
	(reduction -removal of	M	11.38				11.38							
	liftstation)	M	11.38					11.38						
7	P4N-1030			100	3	0.00			100	3			Off	8
							0.00							
								0.00						
9	P3N-1038			225	3	0.00								10
							0.00							
								0.00						
11	Off/Spare			125	3	18.84			150*	3	18.84	P	A3E-1032	12
							18.84				18.84	P	(Automatic Transfer Switch)	
								18.84			18.84	P	(added Liftstation)	
13	BAD(off)			225	3	32.49			150	3	32.49	M	AHU-6 (MAU-1)	14
							32.49				32.49	M		
								32.49			32.49	M		
15	AHU-8 (CU-6)	M	20.95	150	3	58.70			150	3	37.75	M	PNL3-Roof (AHU-7)	16
		M	20.95				58.70				37.75	M		
		M	20.95					58.70			37.75	M		
17	CH-2(AHU/CU-8)	M	65.69	350	3	131.37			350	3	65.69	M	CH-1 (AHU/CU-7)	18
		M	65.69				131.37				65.69	M		
		M	65.69					131.37			65.69	M		
19	P3N-1015			400	3	0.00								20
							0.00							
								0.00						
						551.45	551.45	551.45	KVA					
	TOTAL CONNECTED AMPS:		1990.81 AMPS			1990.81	1990.81	1990.81	AMPS					
	TOTAL CONNECTED LOAD:		1654.36 KVA											
	TOTAL DEMAND AMPS:		995.47 AMPS											
	TOTAL DEMAND LOAD:		827.24 KVA											

LOAD CODES:
L= LIGHTING
R= RECEPTACLES
M= MECHANICAL
C= COMPUTER
K= KITCHEN
P= PANELBOARD

*New 150A breaker in panel
**New panel S3N-1032C that is replacing splice connection in trough.

1 / E5.1 EXISTING PANEL S3N-1032A - MODIFIED

NTS

PANELBOARD SCHEDULE	DESIGNATION:	S3N-1032C	MAINS:	100A MCB
	LOCATION:	Hallway Area next to Trough	BUS SIZE:	125A
	VOLTAGE:	480Y/277	PANEL MOUNTING:	SURFACE
	PHASE:	3 PHASE, 4 WIRE	ALL BREAKERS:	22,000 AIC

CKT NO.	LOAD DESCRIPTION	LOAD CODE	CONN. KVA	BREAKER AMPS	BREAKER POLE	CONNECTED LOAD A	CONNECTED LOAD B	CONNECTED LOAD C	BREAKER AMPS	BREAKER POLE	CONN. KVA	LOAD CODE	LOAD DESCRIPTION	CKT NO.
1	AHU-5	M	6.65	30	3	13.30			30	3	6.65	M	CU-5	2
3		M	6.65				13.30				6.65	M		4
5		M	6.65					13.30			6.65	M		6
7	EF-4	M	1.87	30	3	1.87								8
9		M	1.87				1.87							10
11		M	1.87					1.87						12
13						0.00			30	3			SPD (TVSS)	14
15							0.00							16
17								0.00						18
						15.17	15.17	15.17	KVA					
	TOTAL CONNECTED AMPS:		54.77 AMPS			54.77	54.77	54.77	AMPS					
	TOTAL CONNECTED LOAD:		45.51 KVA											
	TOTAL DEMAND AMPS:		41.08 AMPS											
	TOTAL DEMAND LOAD:		34.13 KVA											

LOAD CODES:
L= LIGHTING
R= RECEPTACLES
M= MECHANICAL
C= COMPUTER
K= KITCHEN
P= PANELBOARD

2 / E5.1 NEW PANEL S3N-1032C

NTS

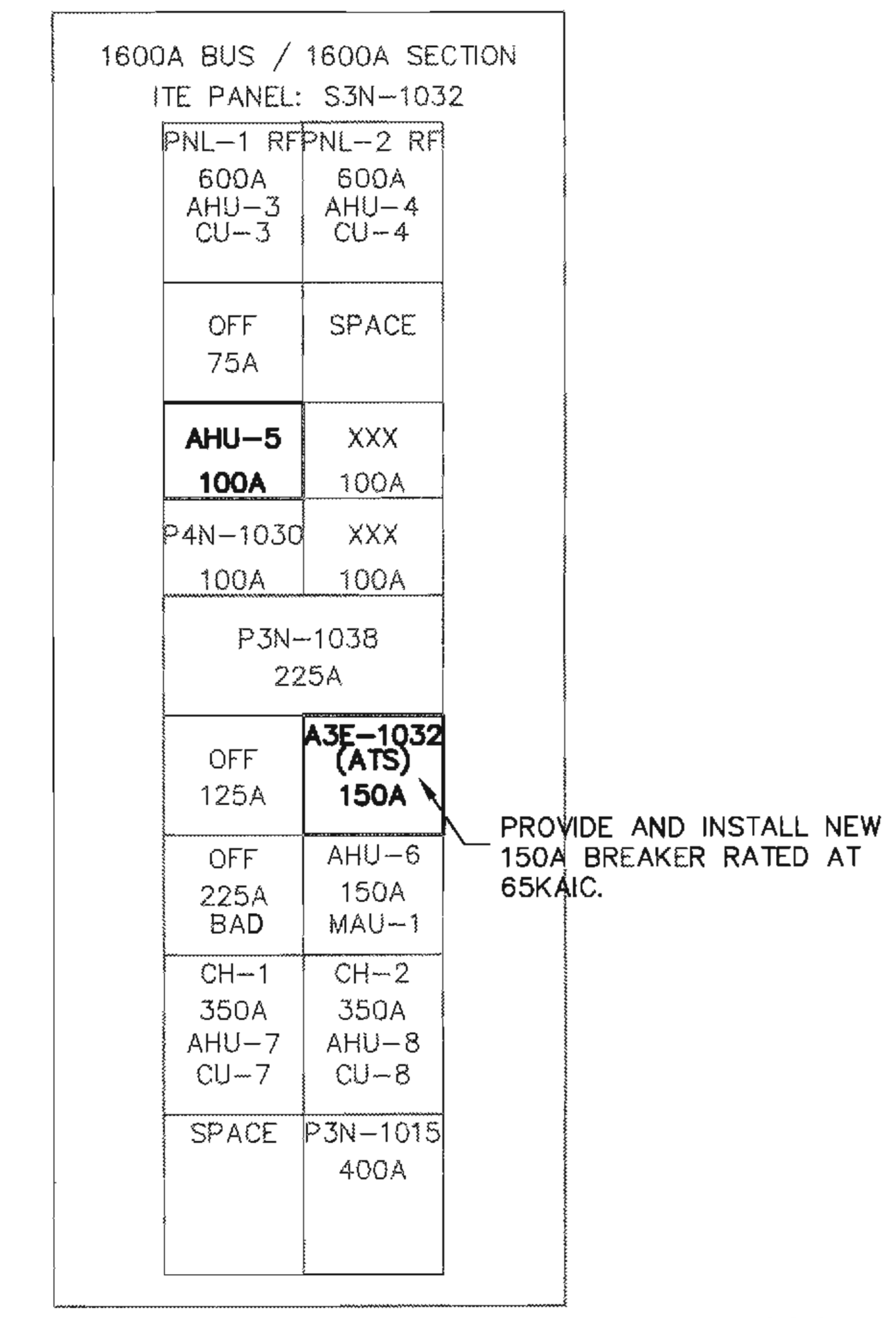
PANELBOARD SCHEDULE	DESIGNATION:	A3E-1032B	MAINS:	150A MCB
	LOCATION:	Electrical Room next to ATS	BUS SIZE:	225A
	VOLTAGE:	480Y/277	PANEL MOUNTING:	SURFACE
	PHASE:	3 PHASE, 4 WIRE	ALL BREAKERS:	42,000 AIC

CKT NO.	LOAD DESCRIPTION	LOAD CODE	CONN. KVA	BREAKER AMPS	BREAKER POLE	CONNECTED LOAD A	CONNECTED LOAD B	CONNECTED LOAD C	BREAKER AMPS	BREAKER POLE	CONN. KVA	LOAD CODE	LOAD DESCRIPTION	CKT NO.
1	Panel L3E-1038	P	15.00	100	3	15.00			100	3			Spare (future load)	2
3		P	15.00				15.00							4
5		P	15.00					15.00						6
7	Lift Station	M	5.12	40	3	5.12								8
9		M	5.12				5.12							10
11		M	5.12					5.12						12
13	SPD(TVSS)			30	3	0.00								14
15							0.00							16
17								0.00						18
						20.12	20.12	20.12	KVA					
	TOTAL CONNECTED AMPS:		72.64 AMPS			72.64	72.64	72.64	AMPS					
	TOTAL CONNECTED LOAD:		60.36 KVA											
	TOTAL DEMAND AMPS:		68.01 AMPS											
	TOTAL DEMAND LOAD:		56.52 KVA											

LOAD CODES:
L= LIGHTING
R= RECEPTACLES
M= MECHANICAL
C= COMPUTER
K= KITCHEN
P= PANELBOARD

3 / E5.1 NEW PANEL A3E-1032B

NTS



5 / E5.1 NEW S3N-1032A DISTRIBUTION DIAGRAM

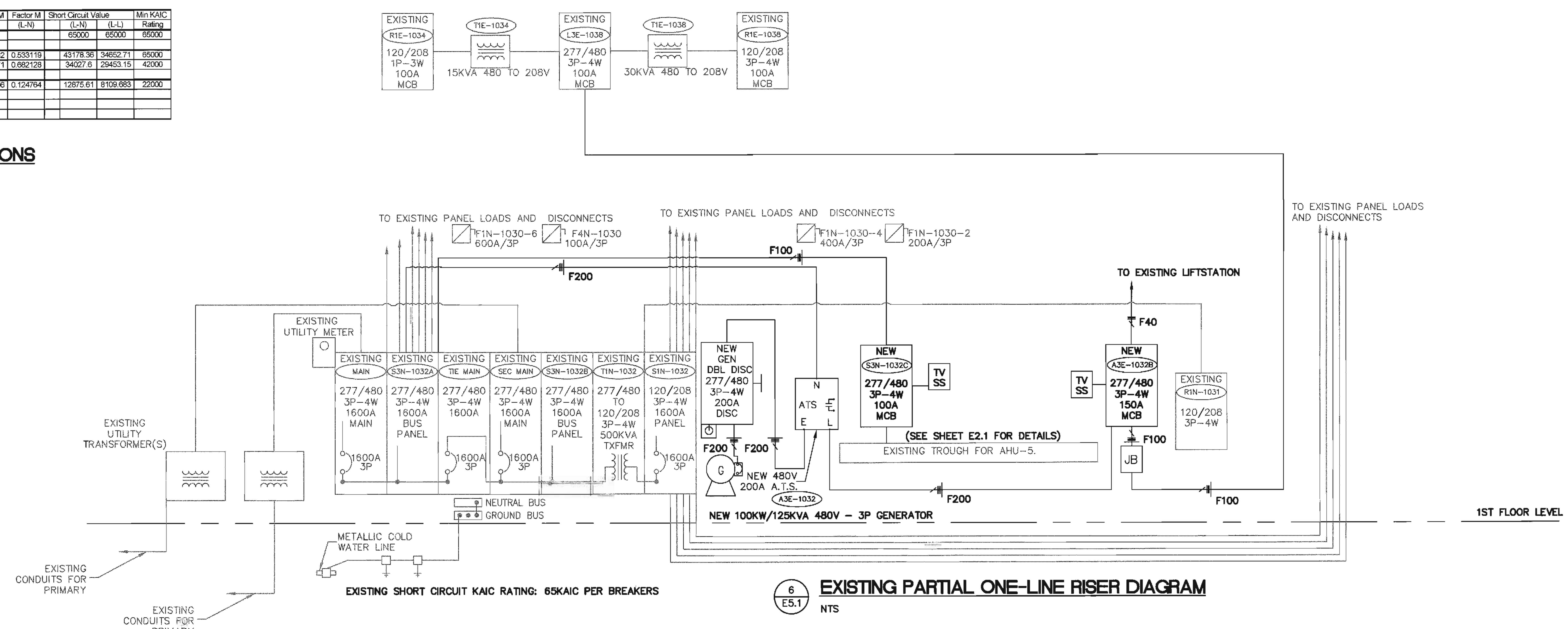
NTS AREAS BEING TOUCHED.

Fault Current Value per existing breakers and conditions
65000 AIC

Panel ID	Length(ft) L	Current I	Number of Conductors N	Wire Constant C	Voltage E(L-N)	Voltage E(L-L)	f (L-N)	f (L-L)	Factor M (L-L)	Factor M (L-N)	Short Circuit Value (L-N)	Short Circuit Value (L-L)	Min KAIC Rating
S3N-1032A					480	277					65000	65000	65000
(EXISTING CONDITIONS)													
A3E-1032	30	65000	1	13923	480	277	0.505384	0.875755	0.664282	0.533119	43178.36	34652.71	65000
A3E1032B	8	43178.36	1	4635	480	277	0.268922	0.466001	0.788071	0.682128	34027.6	29453.15	42000
S3N-1032C	80	65000	1	4635	480	277	4.048303	7.01511	0.198086	0.124764	12875.61	8109.683	22000

4 / E5.1 SHORT CIRCUIT/FAULT CURRENT CALCULATIONS

NTS



6 / E5.1 EXISTING PARTIAL ONE-LINE RISER DIAGRAM

NTS

ATP ENGINEERING SOUTH, FL
BRADENTON, FLORIDA
ENGR BUSINESS #8908
941-751-6485

REV. / DATE / DESCRIPTION

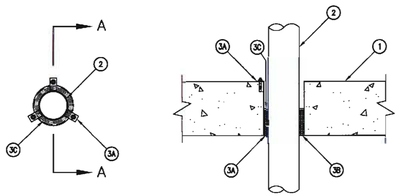
MANATEE COUNTY CONVENTION AND CIVIC CENTER
GENERATOR REPLACEMENT
1 HABEN BLVD.
PALMETTO, FLORIDA 34221
WORK ASSIGNMENT #58

DRAWING TITLE:
ELECTRICAL PANEL SCHEDULES AND ONE-LINE RISER

FILE:	MC CONV GEN REP
JOB NO.:	2015.104
DATE:	02/22/2016
PLOT SIZE:	1:1
DRAWN BY:	MC
CHECKED BY:	JDC
SHEET No.:	E5.1

SYSTEM NO. C-AJ-2002

May 18, 2005
F Rating – 2 Hr
T Ratings – 0 and 2 Hr
L Rating at Ambient – 7 CFM/sq ft
L Rating at 400 F – less than 1 CFM/sq ft (See Item 3C)
W Rating – Class 1 (See Item 3)



SECTION A-A

1. FLOOR OR WALL ASSEMBLY – MIN 2–1/2 IN. (64 MM) THICK LIGHTWEIGHT OR NORMAL WEIGHT (100–150 PCF OR 1600–2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF CIRCULAR OPENING IS 6–1/2 IN. (165 MM).

SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

2. NONMETALLIC PIPE OR CONDUIT – NOM 4 IN. (102 MM) DIAM (OR SMALLER) SCHEDULE 40 SOLID CORE OR CELLULAR CORE, POLYVINYL CHLORIDE (PVC) PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) OR VENTED (DRAIN, WASTE OR VENT) PIPING SYSTEMS OR RIGID NONMETALLIC CONDUIT++ OR SDR 13.5 CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS. A MAX OF ONE PIPE OR CONDUIT IS PERMITTED IN THE FIRESTOP SYSTEM. EXCEPT AS NOTED IN ITEM B, THE PIPE OR CONDUIT SHALL BE CENTERED IN THE THROUGH OPENING. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

SEE RIGID NONMETALLIC CONDUIT (DZXT) CATEGORY IN THE UL ELECTRICAL CONSTRUCTION MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS.

3. FIRESTOP SYSTEM – THE HOURLY T RATINGS FOR THE FIRESTOP SYSTEM ARE DEPENDENT UPON THE FIRESTOP ORIENTATION (WALL OR FLOOR), THE SIZE OF THE NONMETALLIC PIPE OR CONDUIT, AND THE FLOOR THICKNESS, AS TABULATED BELOW:

ORIENTATION (a)	NOMINAL PIPE DIAMETER In. (mm)	ANNULAR SPACE In. (mm)	F RATING HR	T RATING HR
F(b)	1/2–2 (13–51 mm)	1/4–1 (6–25 mm)	2	0
F(b)	2–1/2, 3 (64, 76 mm)	1/2–1 (13–25 mm)	2	0
W, F	1/2–2 (13–51 mm)	1/4–1 (6–25 mm)	2	2
W, F	2–1/2, 3 (64, 76 mm)	1/2–1 (13–25 mm)	2	2
W, F	3–1/2, 4 (89, 102 mm)	3/4–1 (19–25 mm)	2	2

(a) W = WALL, F = FLOOR
(b) MIN CONCRETE FLOOR THICKNESS IS 2–1/2 IN. (64 MM).
THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

A. STEEL SUPPORT CLIPS – NOM 1 IN. (25 MM) WIDE BY NOM 0.019 IN. (0.5 MM) THICK (28 GAUGE) GALV STEEL STRIPS FIELD–FORMED INTO "Z"–SHAPE WITH HEIGHT OF Z–SHAPE EQUAL TO THE FLOOR THICKNESS AND WITH WIDTH OF BOTTOM (AS INSTALLED) LEG OF SUFFICIENT LENGTH TO SPAN ANNULAR SPACE. TOP (AS INSTALLED) LEG OF Z–SHAPE TO BE MIN 2 IN. (51 MM) LONG AND MAY OR MAY NOT BE SECURED TO TOP SURFACE OF FLOOR WITH MASONRY ANCHORS. AS AN ALTERNATE TO THE Z–SHAPE CLIPS, THE GALV STEEL STRIPS MAY BE FORMED INTO "L"–SHAPE WITH HEIGHT EQUAL TO 2 IN. (51 MM) AND WITH BOTTOM (AS INSTALLED) LEG OF SUFFICIENT LENGTH TO SPAN ANNULAR SPACE. CLIPS SECURED TO OUTERMOST WRAP STRIP LAYER WITH STEEL WIRE TIE PRIOR TO INSERTION IN THROUGH OPENING. MIN OF THREE STEEL SUPPORT CLIPS TO BE USED, SYMMETRICALLY LOCATED, WITH BOTTOM LEG OF CLIPS FLUSH WITH BOTTOM PLANE OF FLOOR. WHEN ANNULAR SPACE AROUND NOM 1/2 IN. TO 2 IN. (13 MM TO 51 MM) DIAM PIPE IN FLOOR ASSEMBLY IS 1/4 IN. TO 3/8 IN. (6 MM TO 10 MM) , STEEL SUPPORT CLIPS ARE NOT REQUIRED.

B. FILL, VOID OR CAVITY MATERIALS* – WRAP STRIP – NOM 1/4 IN. (6 MM) THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. (51 MM) WIDE STRIPS. NOM 2 IN. (51 MM) WIDE STRIPS TIGHTLY WRAPPED AROUND NONMETALLIC PIPE (FOIL SIDE EXPOSED) TO FILL ANNULAR SPACE AROUND PIPE. A MIN OF ONE LAYER OF WRAP STRIP IS REQUIRED FOR NOM 1/2 IN. TO 2 IN. (13 MM TO 51 MM) DIAM PIPES. A MIN OF TWO LAYERS OF WRAP STRIP IS REQUIRED FOR NOM 2–1/2 IN. AND 3 IN. (64 MM AND 76 MM) DIAM PIPES. A MIN OF THREE LAYERS OF WRAP STRIP IS REQUIRED FOR NOM 3–1/2 IN. AND 4 IN. (89 MM AND102 MM) DIAM PIPES. EACH LAYER OF WRAP STRIP TO BE INSTALLED WITH BUTTED SEAM WITH BUTTED SEAMS IN SUCCESSIVE LAYERS STAGGERED. WRAP STRIP LAYERS SECURELY BOUND WITH STEEL WIRE OR ALUMINUM FOIL TAPE AND SLID INTO THROUGH OPENING SUCH THAT THE BOTTOM EDGES ARE FLUSH WITH THE BOTTOM PLANE OF THE FLOOR AND ARE RESTING ON THE STEEL SUPPORT CLIP LEGS. WHEN NOM 2 IN. TO 4 IN. (51 MM TO 102 MM) DIAM PVC PIPE IS USED IN MIN 4–1/2 IN. (114 MM) THICK CONCRETE FLOOR, THE PIPE MAY BE INSTALLED ECCENTRICITY IN THE THROUGH OPENING (MIN ZERO CLEARANCE AT POINT CONTACT LOCATION) PROVIDED THAT (1) THE INSIDE DIAM OF THE THROUGH OPENING IS 1.3 TO 1.5 TIMES LARGER THAN THE OUTSIDE DIAM OF THE PIPE, (2) THE ANNULAR SPACE BETWEEN THE PIPE AND THE SIDES OF THE OPENING AT THE BOTTOM 2 IN. (51 MM) OF THE THROUGH OPENING IS COMPLETELY FILLED WITH WRAP STRIP LAYERS INSTALLED FOLLOWING THE CONTOUR OF THE PIPE AND (3) THE BOTTOM EDGES OF THE WRAP STRIP LAYERS ARE RELIABLY SUPPORTED BY "Z"–SHAPED STEEL SUPPORT CLIPS ANCHORED TO THE TOP SURFACE OF THE CONCRETE FLOOR. IN WALL ASSEMBLIES, THE WRAP STRIP LAYERS ON THE NONMETALLIC PIPE ARE TO BE INSTALLED IN THE SAME MANNER USED FOR FLOOR ASSEMBLIES, BUT SHALL BE INSTALLED SYMMETRICALLY ON BOTH SIDES OF THE WALL WITH THE EXPOSED EDGES OF THE WRAP STRIP LAYERS FLUSH WITH THE WALL SURFACES.

C. FILL, VOID OR CAVITY MATERIALS* – CAULK OR SEALANT – MIN 1/4 IN. (6 MM) DIAM CONTINUOUS BEAD APPLIED TO INSIDE WALLS OF THROUGH OPENING PRIOR TO INSTALLATION OF STEEL SUPPORT CLIPS AND/OR WRAP STRIP. CAULK BEAD TO BE RECESSED 1 IN. (25 MM) FROM THE BOTTOM PLANE OR FLOOR. IN WALL ASSEMBLIES, CAULK BEAD TO BE RECESSED 1 IN. (25 MM) FROM WALL SURFACE ON BOTH SIDES OF WALL. IN FLOOR ASSEMBLIES, A NOM 1/2 IN. (13 MM) THICK COATING OF CAULK IS TO BE APPLIED TO THE TOP EDGES OF THE WRAP STRIP LAYERS AND TO FILL ALL GAPS AT THE WRAP STRIP/ CONCRETE INTERFACE. IN WALL ASSEMBLIES, THE EXPOSED EDGES OF THE WRAP STRIP LAYERS AND ALL GAPS AT THE WRAP STRIP/CONCRETE INTERFACE ON BOTH SIDES OF THE WALL TO BE COATED WITH THIN LAYER OF CAULK.
(NOTE: W RATING APPLIES ONLY WHEN FB–3000 WT SEALANT IS USED. CP 25WB+ NOT SUITABLE FOR USE WITH CPVC PIPES.)
*BEARING THE UL CLASSIFICATION MARKING
++BEARING UL LISTING MARK

(1 / E5.2) CONCRETE WALL PENETRATION DETAIL
N.T.S.

GENERAL NOTES:

(APPLY TO ALL ELECTRICAL SHEETS)

1. ALL WORK SHALL CONFORM TO OR EXCEED THE MINIMUM REQUIREMENTS OF THE CURRENT ANSI/NFPA 70 WITH STATE OF FLORIDA AMENDMENTS, NFPA 110, ANSI/IEEE C2 AND ALL FEDERAL, STATE, LOCAL, AND MUNICIPAL CODES AND ORDINANCES. THE ELECTRICAL SUBCONTRACTOR SHALL COMPLY WITH THE DIRECTIONS OF ALL AUTHORITIES HAVING JURISDICTION.

2. INSTALL WORK USING PROCEDURES DEFINED IN NEC STANDARDS OF INSTALLATION. ALL WORK SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.

3. THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE ALL FLOOR, WALL, AND CEILING PENETRATIONS TO COMPLETE HIS WORK. PROVIDE PROPER FIRE SAFEING FOR ALL PENETRATIONS MADE.

4. COORDINATE ALL ELECTRICAL WORK WITH ALL OTHER TRADES TO ENSURE EFFECTIVE AND EFFICIENT OVERALL INSTALLATION.

5. COORDINATE ALL ELECTRICAL SYSTEM DOWNTIME WITH THE OWNER, PERFORMANCE SERVICES, AND OTHER TRADES. DOWNTIME OF THE SYSTEM SHALL BE MINIMIZED. WEEKEND AND AFTER HOUR WORK SHALL BE REQUIRED TO PREVENT OR MINIMIZE INTERFERENCE WITH THE OWNER'S OPERATION.

6. ALL NEW EQUIPMENT SHALL BE SUBMITTED FOR APPROVAL PRIOR TO ORDERING.

7. PHYSICAL SIZES AND LOCATIONS OF ALL EQUIPMENT SHOWN ON THESE DRAWINGS ARE APPROXIMATE. COORDINATE ELECTRICAL WORK FOR THIS EQUIPMENT WITH THE OTHER TRADES.

8. PROVIDE APPROPRIATE SEALANT (I.E. FIRE STOPPING) TO MAINTAIN CONSTRUCTION INTEGRITY FOR ANY PENETRATIONS THROUGH FLOORS, STRUCTURAL CEILINGS, AND FIRE WALLS.

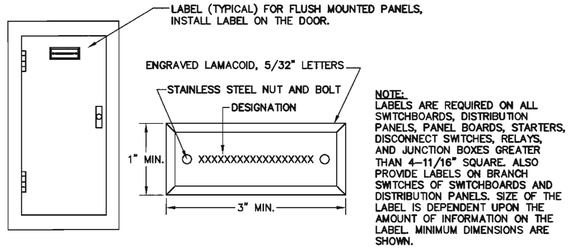
9. ALL BRANCH CIRCUITS SHALL UTILIZE SEPARATE INDEPENDENT NEUTRAL CONDUCTOR, AND INSULATED GROUNDING CONDUCTOR. DO NOT COMBINE NEUTRAL CONDUCTORS.

10. ALL FEEDER NEUTRAL/GROUNDED CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING. DERATE MULTIPLE CONDUCTORS IN A RACEWAY ACCORDINGLY WITH NEC TABLES.

11. INSTALL ALL CONDUITS, RACEWAYS, AND CABLE TRAY FOR MAXIMUM HEAD CLEARANCE IN MECHANICAL AREAS, AND ATTIC. COORDINATE CLEARANCES WITH PERFORMANCE SERVICES AND THE OWNER.

12. ALL ELECTRICAL SERVICE WORK SHALL COMPLY WITH THE LOCAL UTILITY. COORDINATE ALL REQUIREMENTS PRIOR TO BID AND INCLUDE ALL NECESSARY MATERIAL AND LABOR REQUIRED FOR THE NEW WORK BEING PERFORMED.

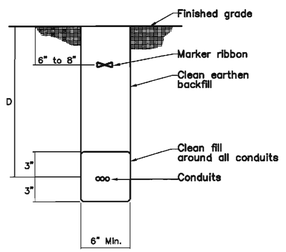
13. CONTRACTOR SHALL DEMOLISH ANY REMAINING EXISTING ELECTRICAL EQUIPMENT, DEVICES, CONDUIT, WIRE, UTILITY TRANSFORMER, ETC. COMPLETE. FIELD VERIFY EXACT REQUIREMENTS PRIOR TO BID.



NOTE:
LABELS ARE REQUIRED ON ALL SWITCHBOARDS, DISTRIBUTION PANELS, PANEL BOARDS, STARTERS, DISCONNECT SWITCHES, RELAYS, AND JUNCTION BOXES GREATER THAN 4–11/16" SQUARE. ALSO PROVIDE LABELS ON BRANCH SWITCHES OF SWITCHBOARDS AND DISTRIBUTION PANELS. SIZE OF THE LABEL IS DEPENDENT UPON THE AMOUNT OF INFORMATION ON THE LABEL. MINIMUM DIMENSIONS ARE SHOWN.

STANDARD COLORS:
1. NORMAL POWER– BLACK BACKGROUND, WHITE LETTERS
2. EMERGENCY POWER– RED BACKGROUND, WHITE LETTERING
3. IN ADDITION TO THE FUNCTION LABELS, PROVIDE LABELS IDENTIFYING ALL "MAIN SERVICE LABEL DISCONNECTS"– RED BACKGROUND, WHITE LETTERING

(3 / E5.2) EQUIPMENT LABELING DETAIL
NOT TO SCALE



BURIAL DEPTH	
SERVICE	"D"
Marker Ribbon	6" to 8"
Telephone	2'–0"
Power under 600V	2'–0"
Medium voltage power	3'–0"

Note:
Use burial depths shown on table unless noted otherwise in specifications or required by the NEC. Burial depths for utility company cables shall be as directed by the utility company.

(2 / E5.2) CONDUIT BURIAL DETAIL
N.T.S.

SPECIFICATIONS:

(APPLY TO ALL SHEETS)

COMPLETE SUBMITTALS MUST BE PROVIDED FOR THIS PROJECT.

1. PROVIDE AND INSTALL NEW GREEN INSULATED COPPER GROUNDING CONDUCTORS AS THE EQUIPMENT GROUNDING MEANS FOR ALL ELECTRICAL DEVICES AND EQUIPMENT.
2. ALL COVER PLATES FOR WIRING DEVICES SHALL BE WHITE NYLON TYPE. DEVICES SHALL BE WHITE IN COLOR.
3. PROVIDE LABELING FOR ALL PANELBOARDS, SWITCHBOARDS, AND DISCONNECT SWITCHES TO INCLUDE AN ENGRAVED PLASTIC LABEL IDENTIFYING THE EQUIPMENT AND WHERE IT IS FED FROM. ALL BRANCH DEVICES IN THE MAIN SWITCHBOARD SHALL HAVE AN ENGRAVED PLASTIC LABEL. ALL PANELBOARDS SHALL INCLUDE A TYPEWRITTEN DIRECTORY. ALL RECEPTACLES SHALL HAVE CIRCUIT NUMBERS WRITTEN ON THE INSIDE OF THE COVER PLATE. ALL JUNCTION BOX COVERS SHALL BE IDENTIFIED TO INDICATE CIRCUITS CONTAINED. WHERE MULTIPLE SWITCHES ARE GANGED TOGETHER THE SWITCHES SHALL BE IDENTIFIED.
4. ALL CONDUIT INSIDE THE BUILDING SHALL BE A ELECTRICAL METALLIC TUBING (EMT) AND SHALL BE A MINIMUM 1/2" UNLESS OTHERWISE NOTED. ALL CONDUIT INSTALLED UNDERGROUND SHALL BE SCHEDULE 40 PVC UNLESS OTHERWISE NOTED. ALL CONDUIT INSTALLED ABOVE GRADE OUTSIDE THE BUILDING SHALL BE RIGID STEEL OR PVC SCH 80.
5. SWITCHES SHALL BE 20 AMPERE RATED, 120/277 VOLT, HUBBELL 1121 SERIES OR APPROVED EQUIVALENT.
6. RECEPTACLES SHALL BE 20A, 120V GROUNDING TYPE LIKE HUBBELL 5342 SERIES.
7. ALL ELECTRICAL CONNECTORS, LUGS, BREAKERS, EQUIPMENT, ETC. SHALL BE RATED AT A MINIMUM OF 75 DEG. C.
8. WIRING METHODS:

   ALL WIRING SHALL BE COPPER. NO ALUMINUM WIRING WILL BE ALLOWED.

   MC TYPE CABLE SHALL NOT BE USED.

   ALL EXPOSED BRANCH CIRCUIT WIRING AND PANELBOARD FEEDERS SHALL BE TYPE THHN/THWN WIRING INSTALLED IN CONDUIT.
9. EMERGENCY GENERATOR IS A NEW GENERATOR RATED 100KW/125KVA DIESEL TYPE, SIZED AS SHOWN ON THE ONE–LINE RISER DIAGRAM AND BUILT IN COMPLIANCE WITH UL2200 STANDARDS, AND IS TO BE INSTALLED ON NEW CONCRETE PAD SIZED AS RECOMMENDED BY THE GENERATOR MANUFACTURER. THE UNIT SHALL BE THE LATEST TIER 4 APPROVED UNIT.

   PROVIDE AND INSTALL INTEGRAL VIBRATION ISOLATION SYSTEM AND BOLT DOWN CLIPS TO FIRMLY ATTACH GEN SET, FUEL TANK TO FOUNDATION OR STRUCTURE.

   PROVIDE COMPLETE LOAD BANK TESTING OF GENERATOR AT 75% LOAD FOR 4 HOURS. PROVIDE TEST LOG OF ALL IMPORTANT READINGS.

   THE UNIT INCORPORATES THE FOLLOWING FEATURES:

   THE ENGINE IS EQUIPPED WITH AN ISOCHRONOUS ELECTRONIC GOVERNOR TO MAINTAIN +/– 0.25% STEADY STATE FREQUENCY VARIATION FROM STEADY STATE NO LOAD TO STEADY STATE FULL LOAD.

   RADIATOR IS SIZED FOR 115 DEGREE AMBIENT TEMPERATURE WITH ALL ACCESSORIES AT 100% OPERATION AND 10% FOULING FACTOR.

   CRITICAL TYPE MUFFLER WITH MEASURED SOUND LEVEL AT DISTANCE OF 10 FEET IS 80 DB OR LESS. A NEW MUFFLER NEEDS TO BE INSTALLED ON THE SYSTEM. SEE MECHANICAL/PLUMBING PLAN FOR MUFFLER DIRECTION.

   CURRENT LIMITING, EQUALIZING FLOAT TYPE BATTERY CHARGER WITH–IN THE ENCLOSURE AREA.

   GENERATOR HAS CLASS H INSULATION RATED MAXIMUM 130 DEGREE C RISE OVER A 40 DEGREE C AMBIENT AT 100% RATING.

   3–POLE GENERATOR MOUNTED MAIN CIRCUIT BREAKER AS SIZED IN THE ONE LINE.

   BLOCK HEATER FOR ENGINE.

   REMOTE ANNUNCIATOR SHOULD BE INSTALLED AT OWNER SPECIFIED LOCATION, WITH THE FOLLOWING INDICATORS: OVER CRANK, LOW WATER TEMP., HIGH ENGINE TEMP. PRE ALARM, HIGH ENGINE TEMP., LOW OIL PRESSURE PRE ALARM, LOW OIL PRESSURE, OVERSPEED, LOW FUEL MAIN TANK, GEN SET NOT IN AUTO POSITION, AND AN AUDIBLE ALARM SILENCE BUTTON.

   UNIT HAS TO BE PROVIDED WITH AN AUTO START CONTROL PANEL WITH ALARMS FOR ADVERSE OPERATING CONDITIONS.

   THE GENERATOR MANUFACTURER MAY OR MAY NOT HAVE PROVIDED ELECTRICAL CONNECTION POINTS FOR THE TANK'S CRITICAL LOW FUEL LEVEL SWITCH TO BE CONNECTED TO THE GENERATOR SHUTDOWN / ANNUNCIATION CONTROLS. THE CONTRACTOR WILL HAVE TO VERIFY THAT THESE CONTROLS ARE LOCATED ON THE GENERATOR. IF THEY ARE NOT, PLEASE GIVE A PRICE FOR THE NEW CONTROLS OR ADDITION TO THE CONTROL SYSTEM TO THE OWNER IN THE BID DOCUMENTS.

   OUTPUT VOLTAGE 277/480V THREE PHASE FOUR WIRE 60 HZ

   GENERATOR SYSTEM WILL BE A NEW 100KW/125KVA GENSET WITH A 4 CYLINDER TURBO CHARGED ENGINE AND TIER 4 FINAL CERTIFIED LIKE THE KOHLER 100REOZJ4. OTHER ACCEPTABLE MANUFACTURERS ARE CUMMINS/ONAN, BALDOR, AND CATERPILLAR. GENERATOR SHALL BE INSTALLED PER MANUFACTURER'S STANDARDS.
10. AUTOMATIC TRANSFER SWITCH (ATS) IS NEW. IT SHALL BE SIZED IN ACCORDANCE WITH THE ONE–LINE SHEET E5.1. THE SHORT CIRCUIT RATING SHALL MEET OR EXCEED THE SHORT CIRCUIT VALUE FOR THE (ATS – A3E–1032) ON SHEET E5.1. THE TRANSFER SWITCH SHALL BE COORDINATED WITH THE GENERATOR MANUFACTURER AND INSTALLED PER ATS MANUFACTURER'S STANDARDS.
11. AN UNDERBELLY DIESEL FUEL OIL TANK MEETING ALL FDEP REQUIREMENTS SHALL BE INCLUDED WITH THE GENERATOR.
12. A MIAMI–DADE RATED ENCLOSURE SHALL BE INCLUDED ON THE ASSEMBLY.

    THE ENTIRE ENCLOSURE, AND INSTALLED GENERATOR SET ASSEMBLY SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE (NEC 2014), AND THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 110) WITH REGARD TO CLEARANCE AROUND ELECTRICAL EQUIPMENT AS SPECIFIED. AS A PART OF THE FINAL PACKAGE THE ENCLOSURE DETAILS SHALL BE SIGNED AND SEALED BY A LICENSED FLORIDA PROFESSIONAL STRUCTURAL ENGINEER FROM THE MANUFACTURER.

(APPLY TO ALL SHEETS)

14. ALL GENERATOR SERVICE, REPAIR, INSTALLATION AND START–UP TO BE PROVIDED.
15. A LEAK DETECTION SYSTEM AND ALARM SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR ON ALL OF THE OIL/FUEL PIPING. THE SYSTEM SHALL BE A RAYCHEM (TYCO THERMAL) TTS500 ZONE SENSING CABLE SYSTEM OR EQUIVALENT WITH ALL WORKING COMPONENTS OF THE SYSTEM INCLUDING: PANELS, ALARMS, COMPUTER COMPONENTS, SENSORS, AND ALL WIRING. PROVIDE A COMPLETE WORKING LEAK DETECTION SYSTEM WITH A REMOTE ANNUNCIATOR AND AN AUTO–DIALER SYSTEM.
16. CONSULT WITH OWNER'S REPRESENTATIVE PRIOR TO TURNING OFF ANY POWER. GENERATOR SYSTEMS MAY BE REQUIRED– CONSULT WITH OWNER'S REPRESENTATIVE. NOTIFY OWNER'S REPRESENTATIVE 7 DAYS PRIOR TO WHEN THE POWER WILL BE OUT. FACILITIES MAY NEED TO BE CLEANED OUT PRIOR TO POWER OUTAGE.
17. CLEAN UP ALL EQUIPMENT AND MATERIALS PRIOR TO LEAVING FOR THE DAY. NO EQUIPMENT SHALL BE LEFT ON SITE IN AN UNLOCKED AREA. ALL BUILDING EQUIPMENT SHALL BE LOCKED UP PRIOR TO LEAVING THE SITE. ALL CIVIC CENTER PROCEDURES SHALL BE FOLLOWED. ACCESS TO AREAS AND FACILITIES MAY BE LIMITED BY THE OWNER'S REPRESENTATIVE AND CIVIC CENTER EMPLOYEES. ACCESS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE AND THE CIVIC CENTER EMPLOYEES.
18. MECHANICALLY HELD TRANSFER SWITCH

    A. THE TRANSFER SWITCH UNIT SHALL BE ELECTRICALLY OPERATED AND MECHANICALLY HELD. THE ELECTRICAL OPERATOR SHALL BE A SINGLE–SOLENOID MECHANISM, MOMENTARILY ENERGIZED. MAIN OPERATORS WHICH INCLUDE OVERCURRENT DISCONNECT DEVICES WILL NOT BE ACCEPTED. THE SWITCH SHALL BE MECHANICALLY INTERLOCKED TO ENSURE ONLY ONE OF TWO POSSIBLE POSITIONS, NORMAL OR EMERGENCY.

    B. THE SWITCH SHALL BE POSITIVELY LOCKED AND UNAFFECTED BY MOMENTARY OUTAGES SO THAT CONTACT PRESSURE IS MAINTAINED AT A CONSTANT VALUE AND TEMPERATURE RISE AT THE CONTACTS IS MINIMIZED FOR MAXIMUM RELIABILITY AND OPERATING LIFE.

    C. ALL MAIN CONTACTS SHALL BE SILVER COMPOSITION. SWITCHES RATED 600 AMPERES AND ABOVE SHALL HAVE SEGMENTED, BLOW–ON CONSTRUCTION FOR HIGH WITHSTAND CURRENT CAPABILITY AND BE PROTECTED BY SEPARATE ARCING CONTACTS.

    D. INSPECTION OF ALL CONTACTS SHALL BE POSSIBLE FROM THE FRONT OF THE SWITCH WITHOUT DISASSEMBLY OF OPERATING LINKAGES AND WITHOUT DISCONNECTION OF POWER CONDUCTORS. A MANUAL OPERATING HANDLE SHALL BE PROVIDED FOR MAINTENANCE PURPOSES. THE HANDLE SHALL PERMIT THE OPERATOR TO MANUALLY STOP THE CONTACTS AT ANY POINT THROUGHOUT THEIR ENTIRE TRAVEL TO INSPECT AND SERVICE THE CONTACTS WHEN REQUIRED.

    E. DESIGNS UTILIZING COMPONENTS OF MOLDED–CASE CIRCUIT BREAKERS, CONTACTORS, OR PARTS THEREOF WHICH ARE NOT INTENDED FOR CONTINUOUS DUTY, REPETITIVE SWITCHING OR TRANSFER BETWEEN TWO ACTIVE POWER SOURCES ARE NOT ACCEPTABLE.

    F. WHERE NEUTRAL CONDUCTORS MUST BE SWITCHED, THE ATS SHALL BE PROVIDED WITH FULLY–RATED NEUTRAL TRANSFER CONTACTS. REFER TO GENERATOR MANUFACTURER'S REQUIREMENTS.

    G. WHERE NEUTRAL CONDUCTORS ARE TO BE SOLIDLY CONNECTED, A NEUTRAL TERMINAL PLATE WITH FULLY–RATED AL–CU PRESSURE CONNECTORS SHALL BE PROVIDED.

MICROPROCESSOR CONTROLLER WITH MEMBRANE INTERFACE PANEL

A. THE CONTROLLER SHALL DIRECT THE OPERATION OF THE TRANSFER SWITCH. THE CONTROLLER'S SENSING AND LOGIC SHALL BE CONTROLLED BY A BUILT–IN MICROPROCESSOR FOR MAXIMUM RELIABILITY, MINIMUM MAINTENANCE, AND INHERENT SERIAL COMMUNICATIONS CAPABILITY. THE CONTROLLER SHALL BE CONNECTED TO THE TRANSFER SWITCH BY AN INTERCONNECTING WIRING HARNESS. THE HARNESS SHALL INCLUDE A KEYED DISCONNECT PLUG TO ENABLE THE CONTROLLER TO BE DISCONNECTED FROM THE TRANSFER SWITCH FOR ROUTINE MAINTENANCE.

B. THE CONTROLLER SHALL BE ENCLOSED WITH A PROTECTIVE COVER AND BE MOUNTED SEPARATE FROM THE TRANSFER SWITCH UNIT FOR SAFETY AND EASE OF MAINTENANCE. SENSING AND CONTROL LOGIC SHALL BE PROVIDED ON PRINTED CIRCUIT BOARDS. INTERFACING RELAYS SHALL BE INDUSTRIAL GRADE PLUG–IN TYPE WITH DUST COVERS.

ATP ENGINEERING SOUTH, PL
BRADENTON, FLORIDA
ENGR. BUSINESS #6608
941-751-6485

REV # | DESCRIPTION | DATE

MANATEE COUNTY CONVENTION AND CMC CENTER
GENERATOR REPLACEMENT
1 HABEN BLVD.
PALMETTO, FLORIDA 34221
WORK ASSIGNMENT #58

DRAWING TITLE:
ELECTRICAL DETAILS AND SPECIFICATIONS

FILE:	MC CONV GEN REP
JOB NO.:	2015.104
DATE :	02/22/2016
PLOT SIZE:	1:1
DRAWN BY:	MC
CHECKED BY:	JDC
SHEET No.:	E5.2

C. THE CONTROLLER SHALL MEET OR EXCEED THE REQUIREMENTS FOR ELECTROMAGNETIC COMPATIBILITY (EMC) AS FOLLOWS:

1. ANSI C37.90A/IEEE 472 VOLTAGE SURGE TEST
2. NEMA ICS – 109.21 IMPULSE WITHSTAND TEST
3. IEC801–2 ELECTROSTATIC DISCHARGE (ESD) IMMUNITY
4. ENV50140 AND IEC 801 – 3 RADIATED ELECTROMAGNETIC FIELD IMMUNITY
5. IEC 801 – 4 ELECTRICAL FAST TRANSIENT (EFT) IMMUNITY
6. ENV50142 SURGE TRANSIENT IMMUNITY
7. ENV50141: CONDUCTED RADIO–FREQUENCY FIELD IMMUNITY
8. EN55011: GROUP 1, CLASS A CONDUCTED AND RADIATED EMISSIONS
9. EN61000 –4 – 11 VOLTAGE DIPS AND INTERRUPTIONS IMMUNITY

ENCLOSURE

A. THE ATS SHALL BE FURNISHED IN A NEMA TYPE 3R ENCLOSURE UNLESS OTHERWISE SHOWN ON THE PLANS.

B. PROVIDE STRIP HEATER WITH THERMOSTAT FOR TYPE 3R ENCLOSURE REQUIREMENTS.

C. CONTROLLER SHALL BE FLUSH–MOUNTED DISPLAY WITH LED INDICATORS FOR SWITCH POSITION AND SOURCE AVAILABILITY. IT SHALL ALSO INCLUDE TEST AND TIME DELAY BYPASS SWITCHES.

D. THE COMPLETE ASSEMBLY SHALL BE DEGREASED, AND THOROUGHLY CLEANED THROUGH A FIVE–STAGE AQUEOUS PROCESS. THE FINISH SHALL BE ANSI–61, LIGHT GRAY, ELECTROSTATICALLY–CHARGED POLYESTER POWDER PAINT OVER A PHOSPHATE COATING, AT A MINIMUM OF 2.0 MILS IN DENSITY. FINISH SHALL BE SUITABLE FOR INDOOR AND OUTDOOR ENVIRONMENTS.

E. FOR THOSE AUTOMATIC TRANSFER SWITCHES THAT ARE LESS THAN 1000 AMPERES, THE CONNECTION BETWEEN THE NORMAL DISCONNECTING DEVICE AND THE ATS SHALL BE MADE WITH THE APPROPRIATE SIZE CABLE. FOR THOSE AUTOMATIC TRANSFER SWITCHES THAT ARE GREATER THAN 1000 AMPERES, THE CONNECTION BETWEEN THE NORMAL DISCONNECTING DEVICE AND THE ATS SHALL BE MADE WITH THE APPROPRIATE SIZE BUS. BUS SHALL BE SILVER PLATED COPPER RATED NO LESS THAN 1000 AMPS PER SQUARE INCH.

F. A PRESSURE DISCONNECT LINK SHALL BE PROVIDED TO DISCONNECT THE NORMAL SOURCE NEUTRAL CONNECTION FROM THE EMERGENCY AND LOAD NEUTRAL CONNECTIONS FOR 4–WIRE APPLICATIONS. A GROUND BUS SHALL BE PROVIDED FOR CONNECTION OF THE GROUNDING CONDUCTOR TO THE GROUNDING ELECTRODE. A PRESSURE DISCONNECT LINK FOR THE NEUTRAL TO GROUND BONDING JUMPER SHALL BE PROVIDED TO CONNECT THE NORMAL NEUTRAL CONNECTION TO THE GROUND BUS.

G. CONTROL WIRING SHALL BE RATED FOR 600 VOLT, UL 1015. WIRES SHALL BE PLACED IN WIRE DUCT OR HARNESSED, AND SHALL BE SUPPORTED TO PREVENT SAGGING OR BREAKAGE FROM WEIGHT OR VIBRATION. ALL WIRING TO HINGED DOORS SHALL BE RUN THROUGH DOOR TERMINAL BLOCKS OR CONNECTION PLUGS.

DISCONNECTING AND OVERCURRENT PROTECTION DEVICE

A. FOR THOSE AUTOMATIC TRANSFER SWITCHES GREATER THAN 100 AMPERES, THE NORMAL CONNECTION SHALL BE PROVIDED WITH A INSULATED CASE BREAKER WITH TRIP PROTECTION WITH CURRENT RATINGS AS SHOWN ON THE PLANS. TWO BREAKER SHALL BE INSTALLED IN THE ATS ON THE UTILITY SOURCE SIDE AND THE GENERATOR SOURCE SIDE.

PART 3 OPERATION

VOLTAGE AND FREQUENCY SENSING

A. THE VOLTAGE OF EACH PHASE OF THE NORMAL SOURCE SHALL BE MONITORED, WITH PICKUP ADJUSTABLE TO 95% OF NOMINAL AND DROPOUT ADJUSTABLE FROM 70% TO 90% OF PICKUP SETTING.

B. SINGLE–PHASE VOLTAGE AND FREQUENCY SENSING OF THE EMERGENCY SOURCE SHALL BE PROVIDED.

TIME DELAYS

A. AN ADJUSTABLE TIME DELAY SHALL BE PROVIDED TO OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES AND DELAY ALL TRANSFER AND ENGINE STARTING SIGNALS.

B. AN ADJUSTABLE TIME DELAY SHALL BE PROVIDED ON TRANSFER TO EMERGENCY, ADJUSTABLE FROM 0 TO 5 MINUTES FOR CONTROLLED TIMING OF TRANSFER OF LOADS TO EMERGENCY.

C. AN ADJUSTABLE TIME DELAY SHALL BE PROVIDED ON RETRANSFER TO NORMAL, ADJUSTABLE TO 30 MINUTES. TIME DELAY SHALL BE AUTOMATICALLY BYPASSED IF EMERGENCY SOURCE FAILS AND NORMAL SOURCE IS ACCEPTABLE.

D. A 5–MINUTE COOLDOWN TIME DELAY SHALL BE PROVIDED ON SHUTDOWN OF ENGINE GENERATOR.

E. ALL ADJUSTABLE TIME DELAYS SHALL BE FIELD ADJUSTABLE WITHOUT THE USE OF TOOLS.

ADDITIONAL FEATURES

A. A SET OF GOLD–FLASHED CONTACTS RATED 10 AMPS, 32 VDC SHALL BE PROVIDED FOR A LOW–VOLTAGE ENGINE START SIGNAL. THE START SIGNAL SHALL PREVENT DRY CRANKING OF THE ENGINE BY REQUIRING THE GENERATOR SET TO REACH PROPER OUTPUT, AND RUN FOR THE DURATION OF THE COOL DOWN SETTING, REGARDLESS OF WHETHER THE NORMAL SOURCE RESTORES BEFORE THE LOAD IS TRANSFERRED.

B. A PUSH–BUTTON TYPE TEST SWITCH SHALL BE PROVIDED TO SIMULATE A NORMAL SOURCE FAILURE.

C. A PUSH–BUTTON TYPE SWITCH TO BYPASS THE TIME DELAY ON TRANSFER TO EMERGENCY, THE ENGINE EXERCISER PERIOD ON THE RETRANSFER TO NORMAL TIME DELAY WHICHEVER DELAY IS ACTIVE AT THE TIME THE PUSH–BUTTON IS ACTIVATED.

D. AUXILIARY CONTACTS, RATED 10 AMPS, 250 VAC SHALL BE PROVIDED CONSISTING OF ONE CONTACT, CLOSED WHEN THE ATS IS CONNECTED TO THE NORMAL SOURCE AND ONE CONTACT, CLOSED, WHEN THE ATS IS CONNECTED TO THE EMERGENCY SOURCE.

E. INDICATING LIGHTS SHALL BE PROVIDED, ONE TO INDICATE WHEN THE ATS IS CONNECTED TO THE NORMAL SOURCE (GREEN) AND ONE TO INDICATE WHEN THE ATS IS CONNECTED TO THE EMERGENCY SOURCE (RED). ALSO PROVIDE INDICATING LIGHTS FOR BOTH NORMAL AND EMERGENCY SOURCE AVAILABILITY.

F. TERMINALS SHALL BE PROVIDED TO INDICATE ACTUAL AVAILABILITY OF THE NORMAL AND EMERGENCY SOURCES, AS DETERMINED BY THE VOLTAGE SENSING PICKUP AND DROPOUT SETTINGS FOR EACH SOURCE.

G. ENGINE EXERCISER – AN ENGINE GENERATOR EXERCISING TIMER SHALL BE PROVIDED, INCLUDING A SELECTOR SWITCH TO SELECT EXERCISE WITH OR WITHOUT LOAD TRANSFER.

H. INPHASE MONITOR – AN INPHASE MONITOR SHALL BE INHERENTLY BUILT INTO THE CONTROLS. THE MONITOR SHALL CONTROL TRANSFER SO THAT MOTOR LOAD INRUSH CURRENTS DO NOT EXCEED NORMAL STARTING CURRENTS, AND SHALL NOT REQUIRE EXTERNAL CONTROL OF POWER SOURCES. THE INPHASE MONITOR SHALL BE SPECIFICALLY DESIGNED FOR AND BE THE PRODUCT OF THE ATS MANUFACTURER.

I. SELECTIVE LOAD DISCONNECT – A DOUBLE THROW CONTACT SHALL BE PROVIDED TO OPERATE AFTER A TIME DELAY, ADJUSTABLE TO 20 SECONDS PRIOR TO TRANSFER AND RESET 0 TO 20 SECONDS AFTER TRANSFER. THIS CONTACT CAN BE USED TO SELECTIVELY DISCONNECT SPECIFIC LOAD(S) WHEN THE TRANSFER SWITCH IS TRANSFERRED. OUTPUT CONTACTS SHALL BE RATED 6 AMPS AT 24 VDC OR 120 VAC.

OPTIONAL ACCESSORIES (PROVIDE OWNER'S REP WITH THE FOLLOWING OPTIONS)

A. COMMUNICATIONS INTERFACE – SERIAL MODULE (5110) TO ALLOW LOCAL OR REMOTE COMMUNICATIONS WITH ASCO POWERQUEST OR SITEWEB COMMUNICATION PRODUCTS. TO CONNECT SERIES 300 SERVICE ENTRANCE AUTOMATIC TRANSFER SWITCHES, AND ASCO ATS ANNUNCIATORS TO THE SERIAL NETWORK VIA AN RS485 INTERFACE (ACCESSORY 72A).

B. PROGRAMMABLE ENGINE EXERCISER – A SEVEN OR FOURTEEN DAY PROGRAMMABLE ENGINE EXERCISER WITH DIGITAL READOUT DISPLAY. SHALL INCLUDE ONE FORM C CONTACT FOR AVAILABILITY OF NORMAL AND EMERGENCY. INCLUDE "WITH OR WITHOUT" LOAD CONTROL SWITCH FOR EXERCISER PERIOD. THE EXERCISER SHALL BE BACKED UP BY A PERMANENT BATTERY. (ACCESSORY 11BG).

C. ENCLOSURE HEATER – A 125 WATT ENCLOSURE HEATER WITH TRANSFORMER AND THERMOSTAT (ADJUSTABLE FROM 30 TO 140 F) (ACCESSORY 44 G).

D. MONITORING SYSTEM
A PC BASED AUTOMATIC TRANSFER SWITCH (ATS) MONITORING SYSTEM DESIGNED TO COMMUNICATE WITH OTHER ATSS LOCATED IN REMOTE LOCATIONS SHALL BE PROVIDED. SYSTEM SHALL UTILIZE SERIAL COMMUNICATIONS CAPABILITY INHERENT WITH THE ATS MICROPROCESSOR–BASED CONTROL PANEL PRODUCT OFFERING. REFER TO SEPARATE SUGGESTED SPECIFICATION.

PART 4 ADDITIONAL REQUIREMENTS

WITHSTAND AND CLOSING RATINGS

A. THE ATS SHALL BE RATED TO CLOSE ON AND WITHSTAND THE AVAILABLE RMS SYMMETRICAL SHORT CIRCUIT CURRENT AT THE ATS TERMINALS WITH THE TYPE OF OVERCURRENT PROTECTION SHOWN ON THE PLANS. WCR ATS RATINGS AS BE AS FOLLOWS WHEN USED WITH SPECIFIC CIRCUIT BREAKERS:

ATS SIZE	WITHSTAND & CLOSING RATING	MCCBW/CLF
200	22,000A (OR GREATER)	100,000

TESTS AND CERTIFICATION

A. THE COMPLETE ATS SHALL BE FACTORY TESTED TO ENSURE PROPER OPERATION OF THE INDIVIDUAL COMPONENTS AND CORRECT OVERALL SEQUENCE OF OPERATION AND TO ENSURE THAT THE OPERATING TRANSFER TIME, VOLTAGE, FREQUENCY AND TIME DELAY SETTINGS ARE IN COMPLIANCE WITH THE SPECIFICATION REQUIREMENTS.

B. UPON REQUEST, THE MANUFACTURER SHALL PROVIDE A NOTARIZED LETTER CERTIFYING COMPLIANCE WITH ALL OF THE REQUIREMENTS OF THIS SPECIFICATION INCLUDING COMPLIANCE WITH THE ABOVE CODES AND STANDARDS, AND WITHSTAND AND CLOSING RATINGS. THE CERTIFICATION SHALL IDENTIFY, BY SERIAL NUMBER(S), THE EQUIPMENT INVOLVED. NO EXCEPTIONS TO THE SPECIFICATIONS, OTHER THAN THOSE STIPULATED AT THE TIME OF THE SUBMITTAL, SHALL BE INCLUDED IN THE CERTIFICATION.

C. THE ATS MANUFACTURER SHALL BE CERTIFIED TO ISO 9001 INTERNATIONAL QUALITY STANDARD AND THE MANUFACTURER SHALL HAVE THIRD PARTY CERTIFICATION VERIFYING QUALITY ASSURANCE IN DESIGN/DEVELOPMENT, PRODUCTION, INSTALLATION AND SERVICING IN ACCORDANCE WITH ISO 9001.

SERVICE REPRESENTATION

A. THE ATS MANUFACTURER SHALL MAINTAIN A NATIONAL SERVICE ORGANIZATION OF COMPANY–EMPLOYED PERSONNEL LOCATED THROUGHOUT THE CONTIGUOUS UNITED STATES. THE SERVICE CENTER'S PERSONNEL MUST BE FACTORY TRAINED AND MUST BE ON CALL 24 HOURS A DAY, 365 DAYS A YEAR.

B. EMERGENCY RESPONSE TIME TO THE SITE MUST BE WITHIN 24 HOURS.

C. THE MANUFACTURER SHALL MAINTAIN RECORDS OF EACH SWITCH, BY SERIAL NUMBER, FOR A MINIMUM OF 20 YEARS.

D. FOR EASE OF MAINTENANCE AND PARTS REPLACEMENT, THE SWITCH NAMEPLATE SHALL INCLUDE DRAWING NUMBERS, PART NUMBERS FOR MAIN COIL AND CONTROL.

18. PROVIDE AND INSTALL A DOUBLE THROW DISCONNECT SWITCH (200A–3P 480V AND NEMA 3R) WITH A RECEPTACLE CONNECTION 200A–480V (NEMA 3R) CONNECTION LIKE THE EATON GENERATOR DOUBLE THROW QUICK CONNECT SAFETY WITH POSI–LOK OR CAM–LOK. THE STYLE OF CONNECTION SHALL BE DETERMINED BY THE OWNER'S REPRESENTATIVE. THEY CURRENTLY HAVE A RUSSELL STOLL CONNECTION ON THE EMERGENCY BACKUP; WHICH MAY BE TOO LARGE AND BULKY FOR THE DISCONNECT.

19. ALL EMPLOYEES AND EQUIPMENT SHALL BE CLEARED IN ACCORDANCE WITH CIVIC CENTER ACCESS PROCEDURES. ALL WORK SHALL BE DONE WHEN THE CIVIC CENTER DOES NOT HAVE AN EVENT.

20. TIMING SHALL BE COORDINATED WITH THE CIVIC CENTER EMPLOYEES AND THE COUNTY REPRESENTATIVE. A MINIMUM OF A 3 YEAR FULLY COMPREHENSIVE WARRANTY SHALL BE PROVIDED ON ALL WORK AND EQUIPMENT PROVIDED.

21. A 3 YEAR SERVICE CONTRACT SHALL BE INCLUDED IN THE BID PROJECT. PROVIDE AND INSTALL TVSS/SPDS (TRANSIENT VOLTAGE SURGE SUPRESSION/SURGE PROTECTION DEVICE(S)) LIKE LEVITION 52277–M3 RATED AT 480V–D WITH 150KA RATING, NOISE FILTERING, AND A REPLACEABLE MODULE. OTHER ACCEPTABLE MANUFACTURERS ARE CUTLER HAMMER, GE, AND COOPER BUSSMAN.

ATP ENGINEERING SOUTH, PL
BRADENTON, FLORIDA
ENGR. BUSINESS #6908
941-751-6485

REV.#	DESCRIPTION	DATE

MANATEE COUNTY CONVENTION AND CIVIC CENTER
GENERATOR REPLACEMENT
1 HABEN BLVD.
PALMETTO, FLORIDA 34221
WORK ASSIGNMENT #58

DRAWING TITLE:
ELECTRICAL DETAILS AND SPECIFICATIONS

FILE:	MC CONV GEN REP
JOB NO.:	2015.104
DATE :	02/22/2016
PLOT SIZE:	1:1
DRAWN BY:	MC
CHECKED BY:	JDC
SHEET No.:	E5.3