REPLACEMENT GENERATOR/ENCLOSURE

CITY HALL COMPLEX BUILDING A
121 SW PORT ST. LUCIE BLVD.
PORT ST. LUCIE, FL 34984

SHEET INDEX

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ENGINEER'S SIGNATURE/SEAL
MICHAEL K. FREMPONG, FL-63140

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CHECKED BY:	MKF
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MECHANICAL-ELECTRICAL
COVER SHEET

ME-000

GENERAL CONDITIONS

SITE CLEARING

1. SALVAGED ITEMS: CAREFULLY REMOVE ITEMS INDICATED TO BE SALVAGED, AND STORE ON OWNER'S PREMISES WHERE INDICATED OR DIRECTED.

2. DISPOSAL: DISPOSE OF REMOVED AND DEMOLISHED ITEMS, INCLUDING TRASH AND DEBRIS, OFF OF OWNER;'S PROPERTY. BURNING WASTE IS NOT PERMITTED.

TEMPORARY FACILITIES

1. STANDARDS: COMPLY WITH THE REQUIREMENTS OF APPLICABLE LOCAL LAWS AND/OR CODES. INSTALL AND MAINTAIN TEMPORARY FACILITIES IN A SAFE, SECURE AND COMPLETE CONDITION THROUGH THEIR USE.

2. WATER SERVICE: INSTALL TEMPORARY WATER SERVICE AND DISTRIBUTION PIPING OF SIZES AND PRESSURES ADEQUATE FOR CONSTRUCTION PURPOSES. STERILIZE PIPING PRIOR TO USE. RECOMMEND PROVIDING ONE 3/4" FLEXIBLE RUBBER HOSE, 100 FEET LONG WITH AN ADJUSTABLE NOZZLE AT EACH OUTLET.

3. ELECTRIC POWER SOURCE: PROVIDE WEATHERTIGHT, GROUNDED TEMPORARY ELECTRICAL SERVICE – ENTRANCE AND DISTRIBUTION SYSTEM. COMPLY WITH APPLICABLE REQUIREMENTS OF NEMA, NECA AND UL STANDARDS AND GOVERNING REGULATIONS. INSTALL TEMPORARY LIGHTING OF ADEQUATE ILLUMINATION LEVELS TO PERFORM THE WORK THROUGH USE OF GROUNDED RECEPTACLES AND EXTENSION CORDS UNTIL BUILDING POWER IS AVAILABLE.

4. SANITARY FACILITIES: SANITARY FACILITIES INCLUDE TEMPORARY TOILETS, WASH FACILITIES AND DRINKING WATER FIXTURES. COMPLY WITH GOVERNING REGULATIONS INCLUDING SAFETY AND HEALTH CODES FOR THE TYPE, NUMBER, LOCATION, OPERATION AND MAINTENANCE OF FIXTURES AND FACILITIES. LOCATE SO THAT NO ONE WILL NEED TO WALK MORE THAN 200 FEET HORIZONTALLY TO REACH THESE FACILITIES.

5. FIRST AID SUPPLIES: COMPLY WITH GOVERNING REGULATIONS AND RECOGNIZED RECOMMENDATIONS FOR THE FIRST AID SUPPLIES WITHIN THE CONSTRUCTION INDUSTRY.

6. COLLECTION AND DISPOSAL OF WASTE: ESTABLISH A DAILY COLLECTION OF WASTE MATERIALS. ENFORCE REQUIREMENTS STRICTLY. DO NOT HOLD COLLECTED MATERIALS LONGER THAN SEVEN (7) DAYS DURING NORMAL WEATHER OR THREE (3) DAYS WHEN THE DAILY TEMPERATURE IS EXPECTED TO RISE ABOVE 80° F (27° C). HANDLE WASTE MATERIALS THAT ARE HAZARDOUS, DANGEROUS, OR UNSANITARY SEPARATELY FROM OTHER WASTE BY CONTAINERIZING. DISPOSE OF WASTE MATERIAL IN A LAWFUL MANNER.

7. BARRICADES, WARNING SIGNS AND LIGHTS: COMPLY WITH RECOGNIZED STANDARDS AND CODE REQUIREMENTS FOR ERECTION OF SUBSTANTIAL BARRICADES WHERE NEEDED TO PREVENT ACCIDENTS. PAINT WITH APPROPRIATE COLORS AND WARNING TO INFORM PERSONNEL AT THE SITE AND THE PUBLIC OF THE HAZARD BEING PROTECTED AGAINST. PROVIDE LIGHTING WHERE NEEDED, INCLUDING FLASHING RED OR CAUTION YELLOW LIGHT(S) WHERE APPROPRIATE.

8. SECURITY ENCLOSURE AND LOCKUP: INSTALL SUBSTANTIAL TEMPORARY ENCLOSURE OF PARTIALLY COMPLETED AREAS OF CONSTRUCTION. PROVIDE LOCKING ENTRANCES ADEQUATE TO PREVENT UNAUTHORIZED ENTRANCE, VANDALISM, THEFT AND SIMILAR VIOLATIONS OF PROJECT SECURITY.

9. ENVIRONMENTAL PROTECTION: CONDUCT CONSTRUCTION ACTIVITIES, AND BY METHODS THAT COMPLY WITH ENVIRONMENTAL REGULATIONS, MINIMIZE THE POSSIBILITY THAT THE AIR, WATERWAYS AND SUBSOIL MIGHT BE CONTAMINATED OR POLLUTED, OR THAT OTHER UNDESIRABLE EFFECTS MIGHT RESULT FROM THE PERFORMANCE OF WORK AT THE SITE. AVOID THE USE OF TOOLS AND EQUIPMENT THAT PRODUCE HARMFUL NOISE. RESTRICT THE USE OF NOISE MAKING TOOLS AND EQUIPMENT TO HOURS OF USE THAT WILL MINIMIZE COMPLAINTS.

EARTHWORK

1. EXISTING UTILITIES: LOCATE BY HAND EXCAVATION ALL EXISTING UTILITIES AND PROVIDE PROTECTION FROM DAMAGE.

2. PROTECTION: PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS AND OTHER FACILITIES IN AREAS OF WORK. BARRICADE OPEN EXCAVATIONS AND PROVIDE WARNING LIGHTS. COMPLY WITH REGULATIONS OF AUTHORITIES HAVING JURISDICTION.

3. EXCAVATION: REMOVE AND DISPOSE OF MATERIAL ENCOUNTERED TO OBTAIN REQUIRED SUBGRADE ELEVATIONS.

4. BACKFILL AND COMPACTION: PLACE AND COMPACT ACCEPTABLE SOIL MATERIAL IN 8" to 12" LAYERS TO REQUIRED ELEVATIONS. USE SOIL MATERIAL FREE OF CLAY, ROCK OR GRAVEL LARGER THAN 2" IN ANY DIMENSION, DEBRIS, VEGETABLE MATTER, WASTE AND FROZEN MATERIALS. USED SUBBASE MATERIAL WHERE INDICATED UNDER PIPING OR CONDUIT. COMPACT EACH LAYER OF BACKFILL AND FILL SOIL MATERIALS AND THE TOP 12" OF SUBGRADE FOR STRUCTURES, SLABS, STEPS AND PAVEMENTS TO 90% RELATIVE DENSITY FOR COHESIVE SOILS AND 95% RELATIVE DENSITY FOR COHESIVENESS SOILS. AT LAWNS OR UNPAVED AREAS, 85% RELATIVE DENSITY FOR COHESIVE SOILS AND 90% RELATIVE DENSITY FOR COHESIVENESS SOILS.

5. GRADING: GRADE AREAS INDICATED, INCLUDING ADJACENT TRANSITION AREAS, WITH UNIFORM LEVELS OR SLOPES BETWEEN FINISH ELEVATIONS. SHAPE SURFACE OF AREAS TO WITHIN 0.10" ABOVE OR BELOW REQUIRED SUBGRADE ELEVATION, COMPACTED AS REQUIRED.

6. MAINTENANCE: REPAIR AND RE–ESTABLISH GRADES IN SETTLED, ERODED, RUTTED OR OTHERWISE DAMAGED AREAS.

7. DISPOSAL: REMOVE EXCESS EXCAVATED MATERIAL, TRASH, DEBRIS AND WASTE MATERIAL FROM THE SITE.

GENERAL CONTRACTOR

1. REVIEW: ALL CONTRACTORS SHALL REVIEW THE PLANS AND FIELD CONDITIONS AND BECOME FAMILIAR WITH THE WORK. SHOULD HE BECOME AWARE OF ANY DISCREPANCIES, HE SHALL IMMEDIATELY ADVISE THE ENGINEER PRIOR TO COMMENCING WORK. THE CONTRACTOR OR HIS SUBS SHALL ASK FOR DETAILS WHENEVER UNCERTAIN ABOUT METHODS OF INSTALLATION. LACK OF DETAILS NOT REQUESTED SHALL NOT EXCUSE IMPROPER INSTALLATION.

2. VERIFICATION: CONTRACTORS SHALL NOT SCALE THESE DRAWINGS FOR CONSTRUCTION PURPOSES. IN THE EVENT OF OMISSION OR CONFLICTS WITH CONSTRUCTION OR MATERIALS OR OTHER CONFLICTS WITHIN THE DRAWINGS, THE CONTRACTORS SHALL NOTIFY THE ENGINEER AND GENERAL CONTRACTOR. VERIFY SIZE, LOCATION, AND CHARACTERISTICS OF ALL WORK AND EQUIPMENT TO BE FURNISHED BY OWNER OR OTHERS, WITH THE MANUFACTURER OR SUPPLIER BEFORE ANY CONSTRUCTION IS BEGUN. VERIFY SIZE AND LOCATION OF ALL OPENINGS FOR EQUIPMENT AND WORK WITH THE CONTRACTORS INVOLVED.

3. COMPLETE JOB: CONTRACTORS SHALL PROVIDE ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND DEVICES NECESSARY TO PROVIDE COMPLETE AND OPERATIONAL HVAC, PLUMBING AND ELECTRICAL SYSTEMS EVEN IF NOT SHOWN, BUT NO LESS THAN SHOWN ON THE PLANS, DIAGRAMS AND SPECIFICATIONS. THE SYSTEMS SHALL BE FULLY TESTED, BALANCED (FOR MECHANICAL) AND LEFT IN COMPLETE AND OPERATIONAL CONDITION. USE FIELD MEASUREMENTS FOR DETERMINING EXACT LOCATIONS AND CLEARANCES.

4. SITE SAFETY: THE CONTRACTOR SHALL MAINTAIN REQUIRED BARRICADES, WARNING DEVICES, SHORING, AND ALL MEASURES NECESSARY TO PROTECT THE WORKMEN AND PUBLIC AS REQUIRED BY THE REGULATORY BODIES HAVING JURISDICTION.

5. GENERAL CONTRACTOR RESPONSIBLE FOR BUILDING SURVEY, DEMOLITION PERMITS (IF ANY), AND FIELD VERIFICATION PRIOR TO CONSTRUCTION.

6. TOTAL COST: THE CONTRACTOR'S COST TO INCLUDE ALL FEES, PERMITS, DUMPSTER AND/OR ANY OTHER COST TO PROVIDE A COMPLETE PROJECT.

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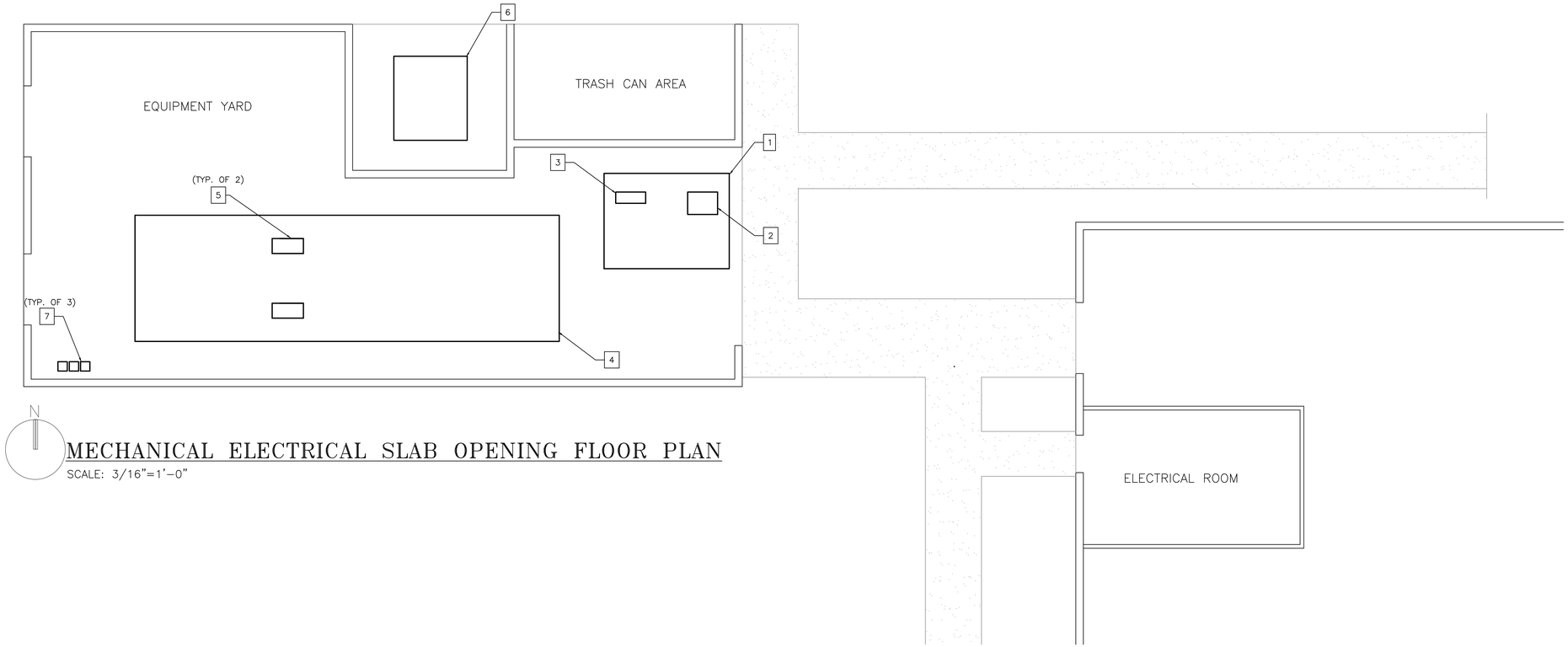
MECHANICAL- ELECTRICAL
GENERAL CONDITIONS

ME-003



MECHANICAL ELECTRICAL SLAB OPENING FLOOR PLAN

SCALE: 3/16"=1'-0"

PLAN NOTES:

1. PROVIDE 4" THICK CONCRETE SLAB FOR MAIN SWITCH, AUTOMATIC TRANSFER SWITCH AND MANUAL TRANSFER SWITCH.
2. PROVIDE 32"X24" OPENING IN CONCRETE SLAB FOR ELECTRICAL CONDUITS. COORDINATE WITH PLANS
3. PROVIDE 32"X12" OPENING IN CONCRETE SLAB FOR ELECTRICAL CONDUITS.
4. PROVIDE 24" THICK CONCRETE SLAB FOR NEW 1500 KW DIESEL GENERATOR.
5. PROVIDE 34"X16" OPENING IN CONCRETE SLAB FOR ELECTRICAL CONDUITS.
6. PROVIDE 4" THICK CONCRETE SLAB FOR TRANSFORMER. COORDINATE SLAB OPENING LOCATION AND SIZES WITH UTILITY PROVIDER(FPL).
7. PROVIDE 10"X10" OPENING ON SLAB FOR CHILLED WATER PIPING.

GENERAL NOTES:

1. COORDINATE ALL SLAB OPENINGS, AND SPECIFICATIONS WITH ARCHITECTURAL AND STRUCTURAL PLANS.

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MECHANICAL AND ELECTRICAL
SLAB OPENING PLAN

ME-100

PIPING LEGEND (NOT ALL LEGEND ARE USED)

SYMBOL	ABBR	DESCRIPTION
—CHWS—	CHWS	CHILLED WATER SUPPLY
—CHWR—	CHWR	CHILLED WATER RETURN
		PIPE TURNING DOWN OR AWAY
		PIPE TURNING UP OR TOWARD
		PIPE TURNING DOWN OR AWAY (TEE)
		REDUCER (NOT TYPICALLY SHOWN)
		PIPE CONNECTION
		PIPE ANCHOR
		PIPE SLEEVE or ALIGNMENT GUIDES
		PUMP (DIAGRAM)
		FLEXIBLE CONNECTOR
		INDICATES ASSEMBLY OF PIPING COMPONENTS (AS NOTED OR DIAGRAMED)

SYMBOL	ABBR	DESCRIPTION
		SHUTOFF VALVE (AS SPECIFIED FOR PIPING SYSTEM)
	BV	BALL VALVE
	CKV	CHECK VALVE
	BFV	BUTTERFLY VALVE
MS	BFV MS	BUTTERFLY VALVE W/ MEMORY STOP
	BAL VA	BALANCING VALVE
	BSV	COMBINATION BALANCING/SHUTOFF VALVE
	ACV	2-WAY MODULATING CONTROL VALVE W/ ACTUATOR
	ACV	3-WAY MODULATING CONTROL VALVE W/ACTUATOR
	PRV	PRESSURE REDUCING VALVE
	RV	RELIEF VALVE
	FMS	FLOW MEASUREMENT STATION
	STR	Y-TYPE STRAINER
	FCV	FLOW CONTROL VALVE
		UNION

SYMBOL	ABBR	DESCRIPTION
		FLANGES
		THREADED DRAIN PLUG
		MALE (GARDEN) HOSE CONNECTION WITH CAP
	TP	TEST PLUG
	FL SW	FLOW SWITCH
	PR SW	PRESSURE SWITCH
	TH	THERMOMETER
	B STR	BASKET STRAINER
	PG	PRESSURE GAUGE
	AAV	AUTOMATIC AIR VENT
	MAV	MANUAL AIR VENT
M	WM	WATER METER

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CODES AND STANDARDS REFERENCED BELOW.
2. COORDINATE ALL MECHANICAL WORK WITH STRUCTURAL MEMBERS, ELECTRICAL WORK, ALL OTHER TRADES, AND ALL EXISTING CONDITIONS.
4. DETERMINE FINAL LOCATIONS & ORIENTATION OF ALL EQUIPMENT IN THE FIELD.
5. COORDINATE FINAL EQUIPMENT LOCATIONS WITH THE GENERAL CONTRACTOR. THE LOCATION AS INDICATED ON THE DRAWING IS APPROXIMATE.
6. FIRESTOP/SMOKESTOP ALL PIPE PENETRATIONS THROUGH FIRE/SMOKE RATED ASSEMBLIES TO MAINTAIN THE INTEGRITY OF THE ASSEMBLY.

APPLICABLE CODES AND STANDARDS

FLORIDA BUILDING CODE MECHANICAL 2017
FLORIDA BUILDING CODE PLUMBING 2017
FLORIDA BUILDING CODE ENERGY CONSERVATION 2017
FLORIDA BUILDING CODE 2017
NEC 2011
NFPA 90 A
NFPA 90 B
ASHRAE 62.1-2013
SMACNA

GENERAL LEGEND (NOT ALL SYMBOLS USED)

SYMBOL	DESCRIPTION
A / B	DETAIL SYMBOL: A = IDENTIFYING NUMBER B = SHEET WHERE DETAIL IS SHOWN
A / B	SECTION SYMBOL: A = IDENTIFYING LETTER B = SHEET WHERE SECTION IS SHOWN
A	TITLE SYMBOL ON SHEET WHERE SHOWN: A = IDENTIFYING NUMBER/LETTER
AHU-8-1 9820	EQUIPMENT IDENTIFICATION (REFER TO SCHEDULES) CFM

SYMBOL	ABBR	DESCRIPTION
1		REVISION CLOUD AND REVISION NUMBER
23-1		KEYED REFERENCE NOTE OR SHEET NOTE
T		TEMPERATURE SENSOR (WALL MOUNTED) DASHED LINE INDICATES CONTROLLED DEVICE
TH		COMBINED TEMPERATURE/RELATIVE HUMIDITY SENSOR (WALL MOUNTED)
P		STATIC PRESSURE SENSOR
		POINT OF CONNECTION (POC) SYMBOL

ABBREVIATIONS (NOT ALL ABBREVATIONS USED)

ABBR	DESCRIPTION
ACH	AIR CHANGES PER HOUR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS
BAS	BUILDING AUTOMATION SYSTEM
BHP	BRAKE HORSEPOWER
CAV	CONSTANT AIR VOLUME
CAP	CAPACITY
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB
DDC	DIRECT DIGITAL CONTROL
EA	EXHAUST AIR
ESP	EXTERNAL STATIC PRESSURE
°F	DEGREES FAHRENHEIT
FT	FEET
H2O	WATER
HP	HORSEPOWER
HR	HOUR
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
HZ	HERTZ

ABBR	DESCRIPTION
IN	INCHES
KW	KILOWATTS
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NOM	NOMINAL
NR	NOT REQUIRED
NTS	NOT TO SCALE
OA	OUTSIDE AIR
POC	POINT OF CONNECTION
RA	RETURN AIR
RPM	REVOLUTION PER MINUTE
SA	SUPPLY AIR
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION
SP	STATIC PRESSURE
TA	TRANSFER AIR
TYP	TYPICAL
V	VOLTS, VOLTAGE
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE

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MECHANICAL GENERAL NOTES
LEGENDS AND ABBREVIATIONS

M-001

MECHANICAL SPECIFICATIONS

1. COMMON WORK RESULTS

IDENTIFICATION TAG– PROVIDE ADHESIVE BACK STENCIL WITH NOT LESS THAN 1" HIGH NUMBERS/LETTERS AS EQUIPMENT TAG.

EQUIPMENT ACCESS– INSTALL ALL PIPING AND ACCESSORIES TO PERMIT ACCESS TO EQUIPMENT FOR MAINTENANCE AND SERVICE.

SCOPE OF WORK– PROVIDE ALL LABOR AND MATERIALS AS REQUIRED TO ACHIEVE A COMPLETE AND OPERATIONAL HVAC SYSTEM. COORDINATE WITH ALL OTHER TRADES.

MATERIALS– ALL MATERIALS SHALL BE NEW AND FREE OF DEFECTS UNLESS OTHERWISE STATED. APPROVAL OF ANY MATERIALS DOES NOT MEAN ACCEPTANCE OF WORK WHERE INSTALLED IF SUCH MATERIALS PROVE DEFECTIVE.

2. CHILLED WATER PIPING

DELIVERY, STORAGE, AND HANDLING– PIPING MATERIAL SHALL BE UNDAMAGED AND COMPLY WITH SPECIFICATIONS. COVER PIPE TO ELIMINATE RUST AND CORROSION WHILE ALLOWING SUFFICIENT VENTILATION TO AVOID CONDENSATION. DO NOT STORE MATERIALS DIRECTLY ON GRADE. PROTECT PIPE, TUBE, AND FITTING ENDS SO THEY ARE NOT DAMAGED. WHERE END CAPS ARE PROVIDED OR SPECIFIED, TAKE PRECAUTIONS SO THE CAPS REMAIN IN PLACE. PROTECT FITTINGS, FLANGES, AND UNIONS BY STORAGE INSIDE OR BY DURABLE, WATERPROOF, ABOVE GROUND PACKAGING.

PIPE MATERIAL SHALL BE NEW, FREE OF DEFECTS, RUST AND SCALE, AND MEETING THE LATEST REVISION OF ASTM SPECIFICATIONS AS LISTED IN THIS SPECIFICATION.

CONSTRUCT ALL PIPING FOR THE HIGHEST PRESSURES AND TEMPERATURES IN THE RESPECTIVE SYSTEM IN ACCORDANCE WITH ANSI B31, BUT NOT LESS THAN 125 PSIG UNLESS SPECIFICALLY INDICATED OTHERWISE.

PROVIDE WELDED PIPE FITTINGS. USE ONLY LONG RADIUS ELBOWS HAVING A CENTERLINE RADIUS OF 1.5 PIPE DIAMETERS.

WELDER QUALIFICATIONS– CONTRACTOR SHALL SUBMIT HIS STANDARD WELDING PROCEDURE SPECIFICATIONS, PROCEDURE QUALIFICATION RECORDS AND QUALIFICATION TEST RECORDS FOR EACH WELDER ALONG WITH ASSOCIATED CONTINUITY RECORDS TO DEMONSTRATE COMPLIANCE WITH ASME SECTION IX, PARAGRAPH QW–322.

THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF WELDER QUALIFICATION DOCUMENTS AT THE JOBSITE, INCLUDING TEST RECORDS AND CONTINUITY RECORDS FOR EACH WELDER.

PRODUCTS–
2" AND SMALLER: PROVIDE ASTM A53, TYPE F, STANDARD WEIGHT (SCHEDULE 40) BLACK STEEL PIPE WITH ASTM A126/ANSI B16.4, CLASS 125, STANDARD WEIGHT, CAST IRON THREADED FITTINGS.

2–1/2" AND LARGER: PROVIDE ASTM A53, STANDARD WEIGHT (SCHEDULE 40) BLACK STEEL PIPE WITH ASTM A234 GRADE WPB/ANSI B16.9, STANDARD WEIGHT, SEAMLESS CARBON STEEL WELD FITTINGS.

UNIONS AND FLANGES –
2" AND SMALLER: PROVIDE ASTM A197/ANSI B16.3 MALLEABLE IRON UNIONS WITH BRASS SEATS. USE BLACK MALLEABLE IRON ON BLACK STEEL PIPING. USE UNIONS OF A PRESSURE CLASS EQUAL TO OR HIGHER THAN THAT SPECIFIED FOR THE FITTINGS OF THE RESPECTIVE PIPING SERVICE BUT NOT LESS THAN 250 PSI.

2–1/2" AND LARGER: ASTM A181 OR A105, GRADE 1 HOT FORGED STEEL FLANGES OF THREADED, WELDING AND OF A PRESSURE CLASS COMPATIBLE WITH THAT SPECIFIED FOR VALVES, PIPING SPECIALTIES AND FITTINGS OF THE RESPECTIVE PIPING SERVICE. FLANGES SMALLER THAN 2–1/2" MAY BE USED AS NEEDED FOR CONNECTING TO EQUIPMENT AND PIPING SPECIALTIES. USE RAISED FACE FLANGES ANSI B16.5 FOR MATING WITH OTHER RAISED FACE FLANGES ON EQUIPMENT WITH FLAT RING OR FULL FACE GASKETS. USE ANSI B16.1 FLAT FACE FLANGES WITH FULL FACE GASKETS FOR MATING WITH OTHER FLAT FACE FLANGES ON EQUIPMENT.

GASKETS– BRANDED, COMPRESSED, NON–ASBESTOS SHEET GASKETS. KLINGERSIL C4401, GARLOCK 3000, JM CLIPPER 978 OR APPROVED EQUAL.

EXECUTION– CAREFULLY INSPECT ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES BEFORE INSTALLATION. ANY ITEMS THAT ARE UNSUITABLE, CRACKED OR OTHERWISE DEFECTIVE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE IMMEDIATELY. EXCLUDING MINOR SURFACE RUST, PIPING THAT EXHIBITS SIGNIFICANT OXIDATION OR CORROSION WILL BE REJECTED.

EXERCISE CARE AT EVERY STAGE OF STORAGE, HANDLING, LAYING AND ERECTING TO PREVENT ENTRY OF FOREIGN MATTER INTO PIPING, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES. DO NOT ERECT OR INSTALL ANY ITEM THAT IS NOT CLEAN.

REMOVE ALL LOSE DIRT, SCALE, OIL, CHIPS, BURRS AND OTHER FOREIGN MATERIAL FROM THE INTERNAL AND EXTERNAL SURFACES OF ALL PIPE AND PIPING COMPONENTS PRIOR TO ASSEMBLY, INCLUDING DEBRIS ASSOCIATED WITH CUTTING, THREADING AND WELDING.

DURING FABRICATION AND ASSEMBLY, REMOVE SLAG AND WELD SPATTER FROM INTERNAL PIPE SURFACES AT ALL JOINTS BY PEENING, CHIPPING AND WIRE BRUSHING.

DURING CONSTRUCTION, UNTIL SYSTEM IS FULLY OPERATIONAL, KEEP ALL OPENINGS IN PIPING AND EQUIPMENT CLOSED EXCEPT WHEN ACTUAL WORK IS BEING PERFORMED ON THAT ITEM OF THE SYSTEM. USE PLUGS, CAPS, BLIND FLANGES OR OTHER ITEMS DESIGNED FOR THIS PURPOSE.

FURNISH AND INSTALL ALL FLANGES, CAPS, BYPASSES, DRAINS, VALVES, ETC. REQUIRED TO FACILITATE FLUSHING AND DRAINING OF THE COOLING SYSTEM PIPING.

INSTALL ALL VALVES, CONTROL VALVES, AND PIPING SPECIALTIES, INCLUDING ITEMS FURNISHED BY OTHERS, AS SPECIFIED AND/OR DETAILED. MAKE CONNECTIONS TO ALL EQUIPMENT INSTALLED BY OTHERS WHERE THAT EQUIPMENT REQUIRES THE PIPING SERVICES INDICATED IN THIS SECTION.

WELDED PIPE JOINTS– MAKE ALL WELDED JOINTS BY FUSION WELDING IN ACCORDANCE WITH ASME CODES, ANSI B31, AND STATE CODES WHERE APPLICABLE.

ALL PIPE WELDING SHALL BE COMPLETED BY QUALIFIED WELDERS IN ACCORDANCE WITH THE CONTRACTOR'S PROCEDURE SPECIFICATIONS.

CONTRACTOR WILL ENSURE THAT THESE STEPS ARE FOLLOWED WHERE PIPE SECTIONS WILL BE JOINED BY WELDING:

1. CLEANING– WELDING SURFACES WILL BE CLEAN AND FREE OF DEFECTS.
2. ALIGNMENT– INSIDE DIAMETER OF PIPING COMPONENTS WILL BE ALIGNED AS ACCURATELY AS POSSIBLE. INTERNAL MISALIGNMENT SHALL NOT EXCEED 1/16".
3. SPACING– PIPE SECTIONS WILL BE SPACED TO ALLOW DEPOSITION OF WELD FILLER MATERIAL THROUGH THE ENTIRE WELD JOINT THICKNESS.
4. GIRTH BUTT WELDS

a. GIRTH BUTT WELDS SHALL BE COMPLETE PENETRATION WELDS.
b. CONCAVITY WILL NOT EXCEED 1/32"
c. UNDER CUTS WILL NOT EXCEED 1/32"
d. AS WELDED SURFACES ARE PERMITTED HOWEVER SURFACES WILL BE FREE FROM COARSE RIPPLES, GROOVES, ABRUPT RIDGES AND VALLEYS.

ELECTRODES SHALL BE LINCOLN, OR APPROVED EQUAL, WITH COATING AND DIAMETER AS RECOMMENDED BY THE MANUFACTURER FOR THE TYPE AND THICKNESS OF WORK BEING DONE.

USE TOP OR TOP 45 DEGREE CONNECTION TO MAIN FOR UPFEED RISERS AND BOTTOM 45 DEGREE CONNECTION TO MAIN FOR DOWNFEED RISERS. BOTTOM CONNECTIONS ARE NOT ACCEPTABLE UNLESS APPROVED BY THE DSF MECHANICAL INSPECTOR.

USE A MINIMUM OF TWO ELBOWS IN EACH PIPE LINE TO A PIECE OF TERMINAL EQUIPMENT TO PROVIDE FLEXIBILITY FOR EXPANSION AND CONTRACTION OF THE PIPING SYSTEMS. OFFSET PIPE CONNECTIONS AT EQUIPMENT TO ALLOW FOR SERVICE, SUCH AS REMOVAL OF THE TERMINAL DEVICE.

USE ECCENTRIC FITTINGS FOR CHANGES IN HORIZONTAL PIPE SIZES WITH THE FITTINGS INSTALLED FOR PROPER AIR VENTING. CONCENTRIC FITTINGS MAY BE USED FOR CHANGES IN VERTICAL PIPE SIZES.

UNIONS AND FLANGES– INSTALL A UNION OR FLANGE, AS REQUIRED, AT EACH AUTOMATIC CONTROL VALVE AND AT EACH PIPING SPECIALTY OR PIECE OF EQUIPMENT WHICH MAY REQUIRE REMOVAL FOR MAINTENANCE, REPAIR, OR REPLACEMENT. WHERE A VALVE IS LOCATED AT A PIECE OF EQUIPMENT, LOCATE THE FLANGE OR UNION CONNECTION ON THE EQUIPMENT SIDE OF THE VALVE. CONCEALED UNIONS OR FLANGES ARE NOT ACCEPTABLE.

GASKETS– STORE HORIZONTALLY IN COOL, DRY LOCATION AND PROTECT FROM SUNLIGHT, WATER AND CHEMICALS. INSPECT FLANGE SURFACES FOR WARPING, RADIAL SCORING OR HEAVY TOOL MARKS. INSPECT FASTENERS, NUTS AND WASHERS FOR BURRS OR CRACKS. REPLACE DEFECTIVE MATERIALS.

ALIGN FLANGES PARALLEL AND PERPENDICULAR WITH BOLT HOLES CENTERED WITHOUT USING EXCESSIVE FORCE. CENTER GASKET IN OPENING. LUBRICATE FASTENER THREADS, NUTS AND WASHERS WITH LUBRICANT FORMULATED FOR APPLICATION.

DRAW FLANGES TOGETHER EVENLY TO AVOID PINCHING GASKET. TIGHTEN FASTENERS IN CROSS PATTERN SEQUENCE (12 – 6 O'CLOCK, 3 – 9 O'CLOCK, ETC.). ONE PASS BY HAND AND FOUR PASSES BY TORQUE WRENCH AT 30% FULL TORQUE, 60% FULL TORQUE AND TWO PASSES AT FULL TORQUE PER ASME B16.5.

PIPING SYSTEM LEAK TESTS– VERIFY THAT THE PIPING SYSTEM BEING TESTED IS FULLY CONNECTED TO ALL COMPONENTS AND THAT ALL EQUIPMENT IS PROPERLY INSTALLED, WIRED, AND READY FOR OPERATION. IF REQUIRED FOR THE ADDITIONAL PRESSURE LOAD UNDER TEST, PROVIDE TEMPORARY RESTRAINTS AT EXPANSION JOINTS OR ISOLATE THEM DURING THE TEST. VERIFY THAT HANGERS CAN WITHSTAND ANY ADDITIONAL WEIGHT LOAD THAT MAY BE IMPOSED BY THE TEST.

PROVIDE ALL PIPING, FITTINGS, BLIND FLANGES, AND EQUIPMENT TO PERFORM THE TESTING.

CONDUCT PRESSURE TEST WITH TEST MEDIUM OF WATER AT 100 PSIG FOR 8 HOURS. IF LEAKS ARE FOUND, REPAIR THE AREA WITH NEW MATERIALS AND REPEAT THE TEST; CAULKING WILL NOT BE ACCEPTABLE.

DO NOT INSULATE PIPE UNTIL IT HAS BEEN SUCCESSFULLY TESTED.

FOR HYDROSTATIC TESTS, USE CLEAN WATER AND REMOVE ALL AIR FROM THE PIPING BEING TESTED BY MEANS OF AIR VENTS OR LOOSENING OF FLANGES/UNIONS. MEASURE AND RECORD TEST PRESSURE AT THE HIGH POINT IN THE SYSTEM.

HYDRONIC PIPING SYSTEM FLUSHING– ALL NEW CHILLED WATER PIPING SHALL BE FLUSHED THOROUGHLY BEFORE THE SYSTEM IS PUT IN TO OPERATION. USE EXISTING MAKE UP WATER SYSTEM TO FILL THE PIPING. FLUSH ALL PIPING AND COMPONENTS WITH A CLEAN SOURCE OF WATER UNTIL THE DISCHARGE FROM THE SYSTEM IS CLEAN. DISCHARGE SHALL BE FROM DRAINS PROVIDED AT ALL LOW POINTS IN THE PIPING, ENDS OF HEADERS AND AS OTHERWISE NECESSARY TO FLUSH AND DRAIN THE ENTIRE SYSTEM.

HYDRONIC PIPING SYSTEM FLUSHING– ALL NEW CHILLED WATER SYSTEM PIPING SHALL BE FLUSHED THOROUGHLY. FLUSH PIPING SYSTEMS USING THE FOLLOWING PROCEDURE:

1. CLOSE ISOLATION VALVES SHOWN ON DRAWINGS.
2. OPEN BYPASS VALVES THAT CONNECT THE ENDS OF SUPPLY AND RETURN MAINS.
3. FLUSH MAINS BY TURNING ON FLUSHING WATER SOURCE AND SEQUENTIALLY OPENING DRAINS ON MAINS UNTIL THE DISCHARGE IS CLEAN. THIS WILL FLUSH THE MAINS WITHOUT FORCING WATER/DEBRIS INTO THE BRANCHES AND RUN OUT PIPES.
4. REPEAT STEPS 1–3 TO CLEAN DEBRIS FROM THE MAINS.

CONTRACTOR SHALL OPEN DRAIN VALVES AT SELECTED LOCATIONS IN THE SYSTEM TO VERIFY THE EFFECTIVENESS OF FLUSHING PROCEDURES. IF SEDIMENT OR DEBRIS IS IDENTIFIED IN THE SYSTEM, IT WILL BE FLUSHED AGAIN AND REINSPECTED AT NO EXPENSE TO THE STATE.

AFTER FLUSHING OPERATIONS ARE COMPLETE, DRAIN AND/OR BLOW OUT ANY RESIDUAL WATER, CLEAN AND REPLACE ALL STRAINERS, LEAVE FLUSHING CONNECTIONS/VALVES IN PLACE AND CAP.

ALL FLUSHING PROCEDURES SHALL BE DOCUMENTED BY COMPLETING AND SUBMITTING THE REPORT FORM INCLUDED AT THE END OF THIS SECTION.

3. PIPING INSULATION CHILLED WATER

RIGID CLOSED CELL POLYISOCYANURATE, MINIMUM NOMINAL DENSITY 2.0 LBS PER CU.FT K VALUE NOT MORE THAN 0.19 AT 75° F. MINIMUM COMPRESSIVE STRENGTH OF 24 PSI PARALLEL AND 13 PSI PERPENDICULAR. PROVIDE 1.5" THICKNESS FOR PIPING INSULATION.

4. PIPING JACKETING

ALUMINUM JACKETING ASTM B209 ALLOY 110, 2'' OVERLAPPING CIRCUMFERENCIAL JOINT WITH INTEGRAL LOCKING CLIP.

5. SUBMITTALS

SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1. VALVES
2. PRESSURE GAUGES
3. THERMOMETERS
4. PIPING
5. INSULATION

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PROJECT

REPLACEMENT GENERATOR/ENCLOSURE
CITY HALL COMPLEX BUILDING A
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PORT ST. LUCIE, FL 34984

SEAL

ENGINEER'S SIGNATURE/SEAL
MICHAEL K. FREMPONG, FL–63140

REVISIONS

#	DATE	DESCRIPTION
1		

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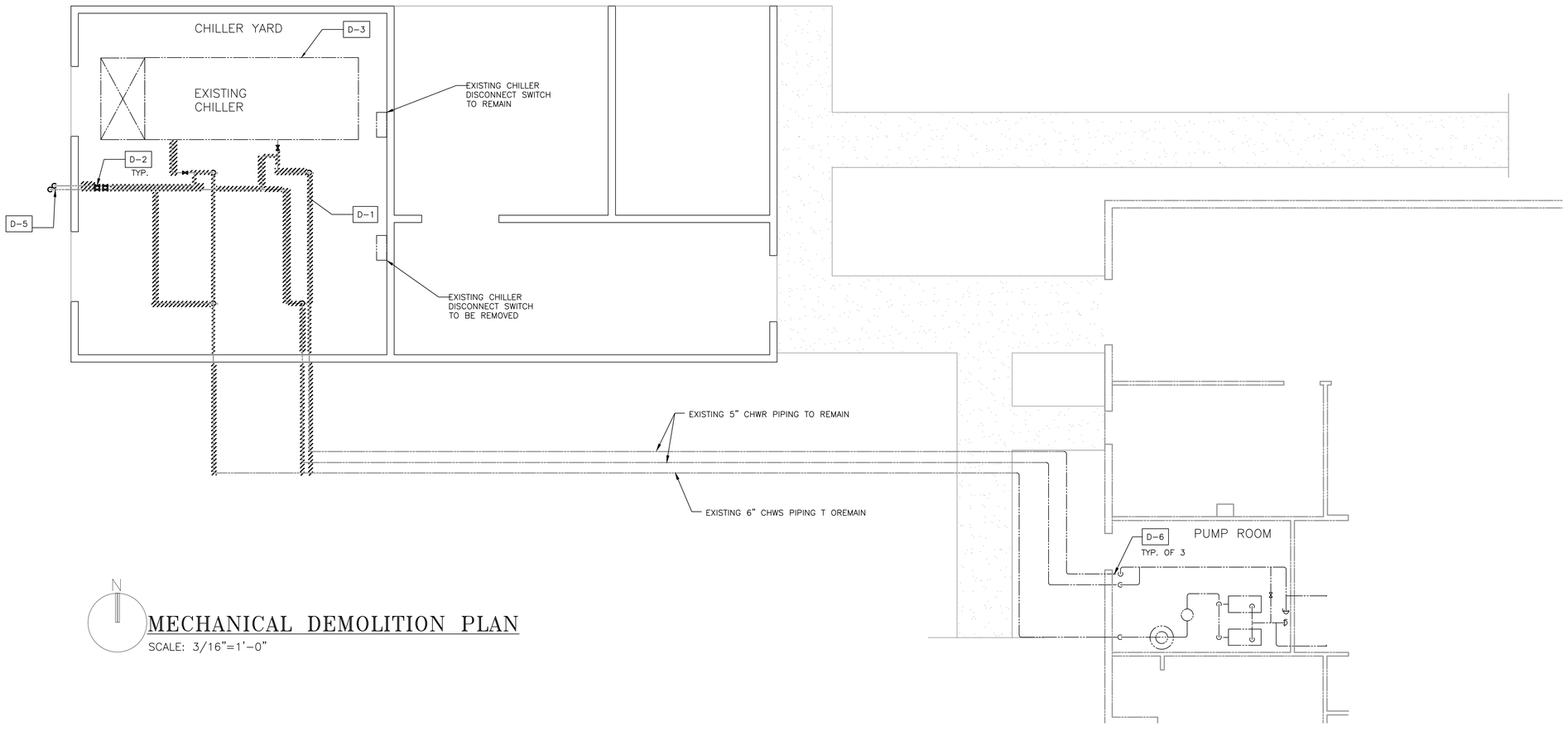
MECHANICAL SPECIFICATIONS

M-002



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MECHANICAL DEMOLITION PLAN

SCALE: 3/16"=1'-0"

DEMOLITION NOTES:

D-1 REMOVE CHILLED WATER PIPING INDICATED ABOVE. PIPING UNDER SLAB SHALL BE ABANDONED IN PLACE.

D-2 REMOVE AND STORE CHILLED WATER ISOLATION VALVES FOR REINSTALLATION LATER.

D-3 EXISTING AIR COOLED CHILLER TO REMAIN.

D-4 EXISTING CHILLED WATER PIPING TO PUMP ROOM IN BUILDING A TO REMAIN.

D-5 EXISTING CHILLED WATER PIPING FROM CENTRAL CHILLER PLANT TO REMAIN.

D-6 EXISTING CHILLED WATER PIPING TO MECHANICAL ROOM TO REMAIN.

GENERAL DEMOLITION NOTES:

1. VISIT AND CAREFULLY EXAMINE THOSE PORTIONS OF THE SITE AND/OR PRESENT BUILDING AFFECTED BY THIS WORK SO, AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK BEFORE SUBMITTING PROPOSALS. SUBMISSION OF PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT, OR MATERIALS REQUIRED, BECAUSE OF DIFFICULTIES ENCOUNTERED, WHICH COULD HAVE BEEN FORESEEN HAD SUCH EXAMINATION BEEN MADE, WILL NOT BE RECOGNIZED.
2. LEGALLY DISPOSE OF ALL MATERIAL AND EQUIPMENT AS DIRECTED BY THE OWNER. EQUIPMENT TO BE SALVAGED SHALL BE DELIVERED TO THE OWNER AT LOCATION AS DIRECTED.

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MICHAEL K. FREMPONG LICENSE No. 63140 STATE OF FLORIDA PROFESSIONAL ENGINEER

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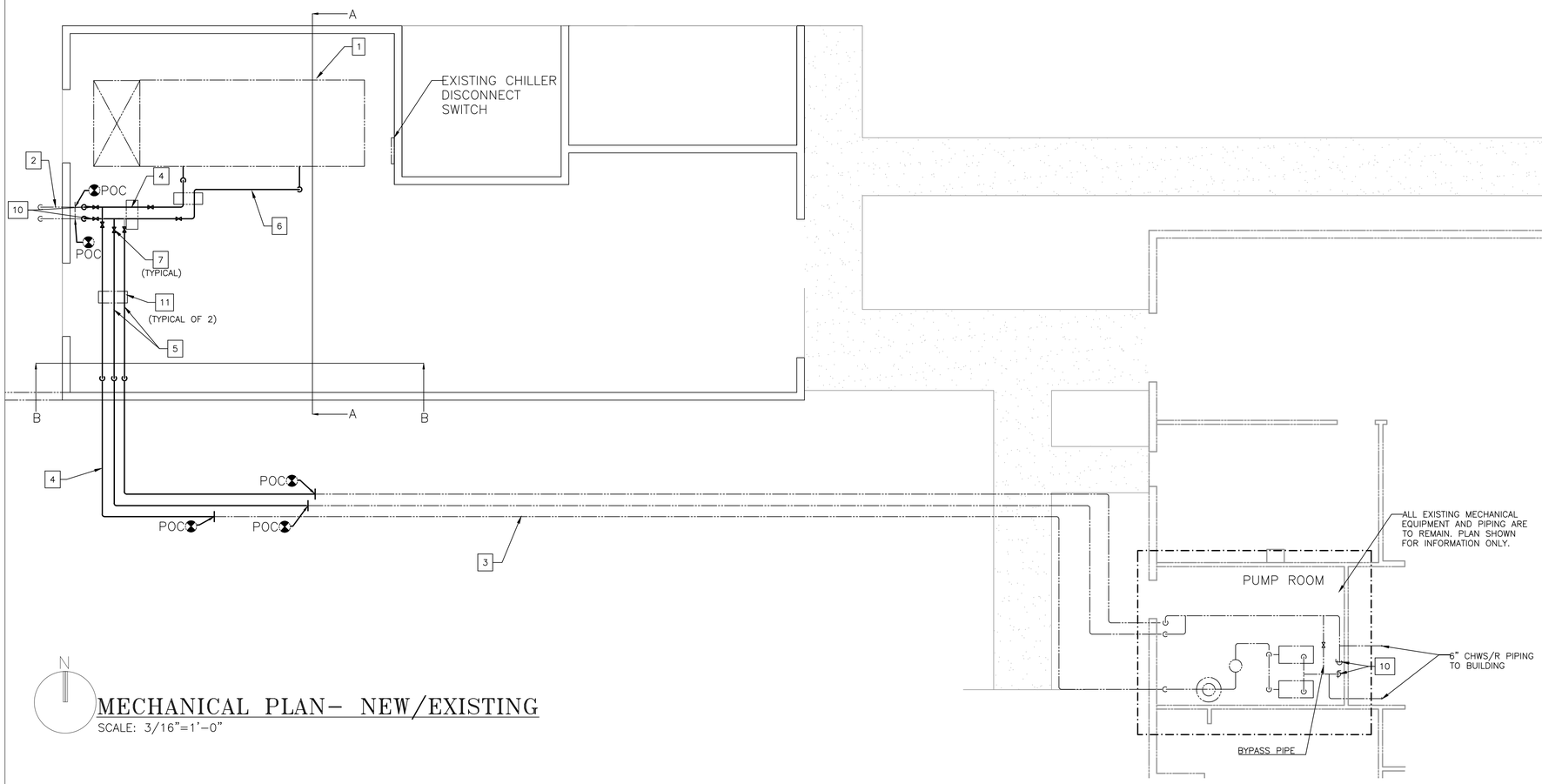
MECHANICAL DEMOLITION PLAN

MD-100

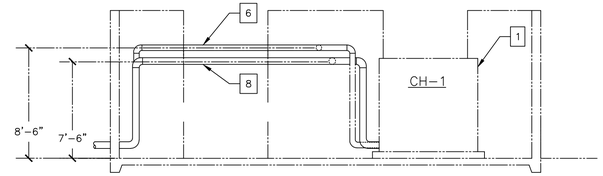


MECHANICAL PLAN– NEW/EXISTING

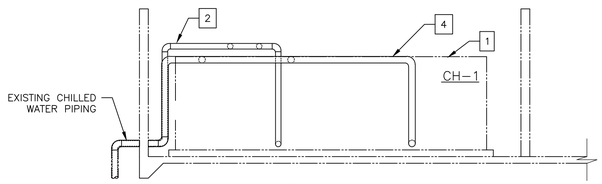
SCALE: 3/16"=1'–0"

NEW EXISTING NOTES:

1. EXISTING AIR COOLED CHILLER.
2. EXISTING CHILLED WATER PIPING FROM CENTRAL CHILLER PLANT.
3. EXISTING CHILLED WATER SUPPLY PIPING TO PUMP ROOM IN BUILDING A.
4. PROVIDE NEW 6" CHWS PIPING TO CONNECT TO EXISTING PIPING.
5. PROVIDE NEW 5" CHWR PIPING TO CONNECT TO EXISTING PIPING.
6. PROVIDE NEW 6" CHWR PIPING
7. PROVIDE ISOLATION VALVE.
8. PROVIDE NEW 6" CHWS PIPING.
9. PROVIDE NEW 5" CHWR PIPING.
10. SHUT OFF ISOLATION VALVES DURING FLUSHING OF CHILLED WATER PIPING.
11. PROVIDE PIPE SUPPORT.



SECTION A–A



SECTION B–B

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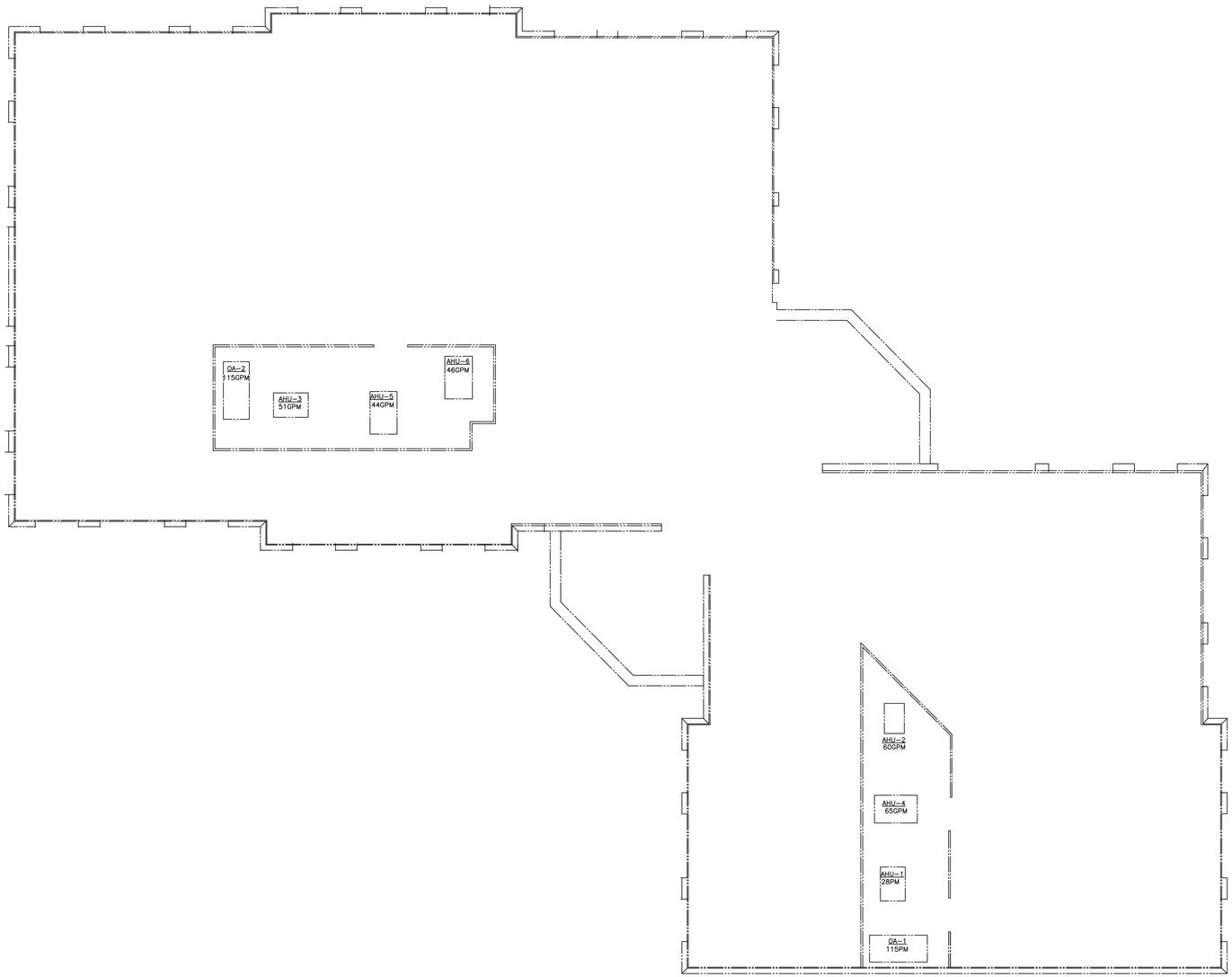
MECHANICAL PLAN
NEW-EXISTING

M-100



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MECHANICAL EQUIPMENT PLAN- 2ND FLOOR

SCALE: 3/32"=1'-0"

GENERAL NOTES:

1. EQUIPMENT FLOOR PLAN SHOWN FOR TEST AND BALANCE PURPOSES PURPOSES ONLY.
2. PRIOR TO COMMENCEMENT OF CONSTRUCTION, PERFORM TEST AND BALANCE TO VERIFY FLOW RATES SHOWN ON PLANS. THE MEASURED CHILLED WATER FLOW RATES WILL SERVE AS BASELINE. AFTER COMPLETION OF INSTALLATION RE-BALANCE THE SYSTEM TO REFLECT THE BASELINE FLOW RATES.

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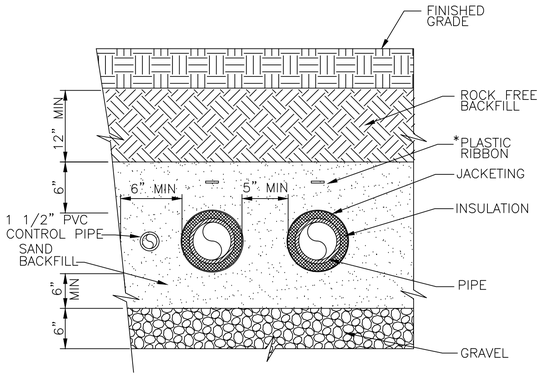
MECHANICAL PLAN- 2ND FLOOR

M-101

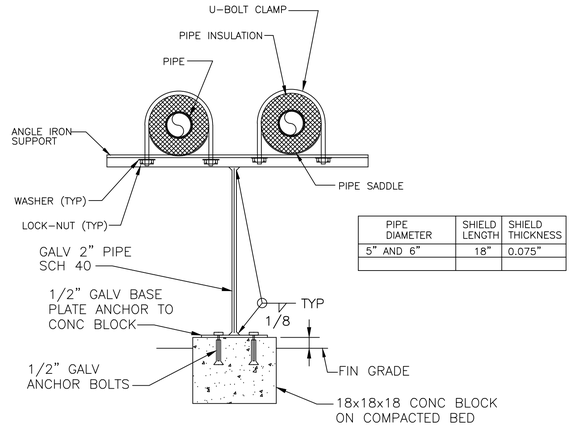


NOTES:

1. RUN 1 1/2" PVC PIPE FOR CONTROL SYSTEM ALONG SIDE CHILLED WATER PIPES TO ALL BUILDINGS.

TYPICAL UNDERGROUND PIPING INSTALLATION DETAIL

NTS

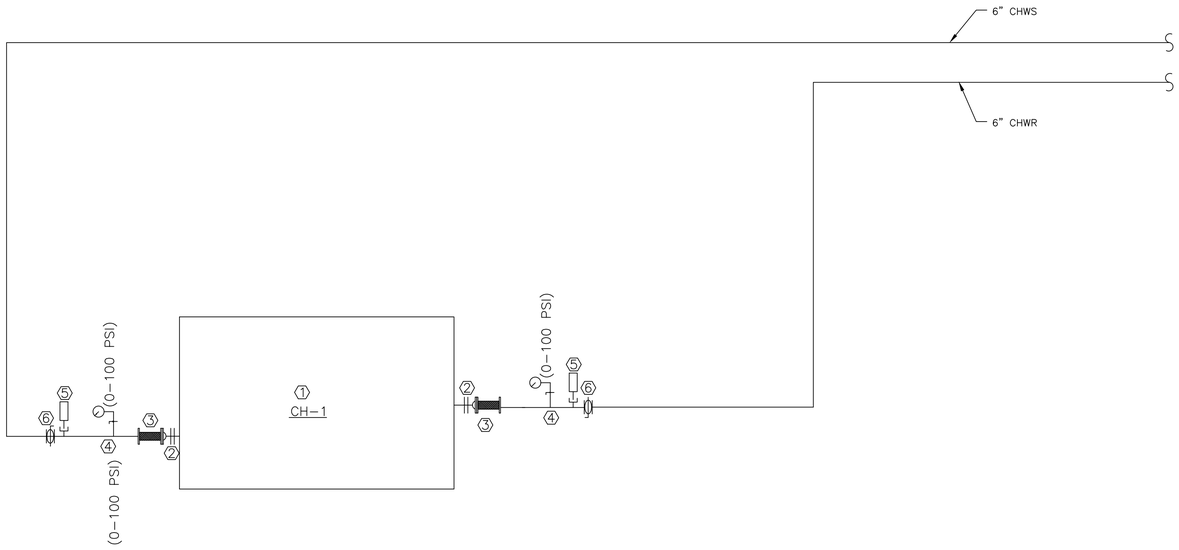


PIPE DIAMETER	SHIELD LENGTH	SHIELD THICKNESS
5" AND 6"	18"	0.075"

NOTE:
COMPLETE STAND HOT DIPPED GALV (120)

TYPICAL PIPE SUPPORT DETAIL

NTS



1. EXISTING AIR COOLED CHILLER ON STRUCTURAL SLAB AND NEOPRENE PAD ISOLATORS
2. FLANGE PIPE CONNECTION TO EVAPORATOR
3. 12" LONG FLEXIBLE CONNECTOR, S.E. HOSE #SECF800
4. PRESSURE GAUGE (RANGE AS NOTED)
5. THERMOMETER WELL AND THERMOMETER, (0-120°F)
6. BUTTERFLY VALVE TAPPED LUG BODY, LEVER HANDLE

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HYDRONIC FLOW DIAGRAM

M-501

GENERAL NOTES:

1. ALL WORK SHALL BE IN COMPLIANCE WITH 2014 VERSION OF THE NEC, 2017 FLORIDA BUILDING CODE (6TH EDITION), AND ALL OTHER APPLICABLE CODES AND REGULATIONS AS DETERMINED BY THE AHJ.

2. CONTRACTOR SHALL THOROUGHLY REVIEW ALL DESIGN DOCUMENTS TO ASSURE THAT ELECTRICAL SERVICE FOR ALL ITEMS AND/OR EQUIPMENT REQUIRING ELECTRICAL SERVICE IS INCLUDED. ANY ITEM AND/OR EQUIPMENT NOT PROVIDED WITH ELECTRICAL SERVICE, REQUIRING SUCH, SHALL BE IMMEDIATELY BROUGHT TO THE OWNERS ATTENTION.

3. IT IS THE REQUIREMENT OF THE CONTRACT DOCUMENTS THAT THE CONTRACTOR SHALL PROVIDE SYSTEMS AND COMPONENTS THAT ARE FULLY COMPLETE, OPERATIONAL AND SUITABLE FOR THE INTENDED USE. ALL MATERIAL AND ALL WORK WHICH MAY BE REASONABLY IMPLIED AS BEING INCIDENTAL TO THE WORK OF THIS SECTION OR OTHER APPLICABLE SECTIONS SHALL BE FURNISHED AT NO EXTRA COST. THERE MAY BE SITUATIONS IN THE DOCUMENTS WHERE INSUFFICIENT INFORMATION EXISTS TO PRECISELY DESCRIBE A CERTAIN COMPONENT OR SUBSYSTEM, OR THE ROUTING OR PLACEMENT OF A COMPONENT OR ITS COORDINATION WITH OTHER BUILDING ELEMENTS. IN CASES SUCH AS THIS, THE CONTRACTOR SHALL INCLUDE IN THEIR SCOPE THE SPECIFIC COMPONENTS OR SUBSYSTEMS WITH ALL PARTS NECESSARY FOR THE INTENDED USE, FULLY COMPLETE AND OPERATIONAL, AND INSTALLED IN WORKMANLIKE MANNER EITHER CONCEALED OR EXPOSED PER THE DESIGN INTENT.

4. THE DRAWINGS ARE NOT INTENDED TO SHOW EXACT LOCATIONS OF EQUIPMENT OR CONDUIT THE LOCATIONS OF EQUIPMENT, FIXTURES, OUTLETS, AND SIMILAR DEVICES SHOWN ON THE DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATE ONLY. EXACT LOCATIONS SHALL BE AS DETERMINED IN FIELD BY CONTRACTOR, DURING CONSTRUCTION, AFTER COORDINATION WITH THE OWNER AND/OR HIS DESIGNATED REPRESENTATIVE AND APPROVAL. OBTAIN IN THE FIELD ALL INFORMATION RELEVANT TO THE PLACING OF ELECTRICAL WORK, AND IN CASE OF ANY INTERFERENCE WITH OTHER WORK, PROCEED AS DIRECTED BY THE OWNER AND FURNISH ALL LABOR AND MATERIALS NECESSARY TO COMPLETE THE WORK IN AN APPROVED MANNER.

5. ELECTRICAL LOADS (KVA, KW, HORSEPOWER, AMPERES, ETC.) AND WIRING REQUIREMENTS INDICATED ON THE ELECTRICAL DRAWINGS ARE ESTIMATES REPRESENTATIVE OF THE "BASIS OF DESIGN" STANDARD FOR MECHANICAL EQUIPMENT. ELECTRICAL EQUIPMENT RATINGS, BUS RATINGS, CIRCUIT WIRE SIZES, CIRCUIT WIRE QUANTITIES, CONDUIT SIZES, CONDUIT QUANTITIES AND OVERCURRENT PROTECTION DEVICE RATINGS INDICATED ON THE DRAWINGS ARE BASED ON SUCH EQUIPMENT. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL COMPARE INDICATED ELECTRICAL EQUIPMENT RATINGS, WIRE SIZES AND QUANTITIES, CONDUIT SIZES AND QUANTITIES AND OVERCURRENT PROTECTIVE DEVICE RATINGS TO THE NAMEPLATE AND / OR APPROVED SHOP DRAWINGS OF ACTUAL EQUIPMENT BEING FURNISHED. CONTRACTOR SHALL PROVIDE ELECTRICAL MATERIALS CONFORMING TO THE REQUIREMENTS OF THE ACTUAL EQUIPMENT BEING FURNISHED, REFLECTING ADJUSTED RATINGS, WIRE SIZES AND QUANTITIES, CONDUIT SIZES AND QUANTITIES AND OVERCURRENT PROTECTIVE DEVICE RATINGS AS REQUIRED. OVERCURRENT PROTECTIVE DEVICE RATINGS SHALL BE DECREASED IF REQUIRED TO MATCH ACTUAL EQUIPMENT REQUIREMENTS AND/OR MANUFACTURER'S RECOMMENDATION. OTHER ELECTRICAL RATINGS, WIRE SIZES AND QUANTITIES AND CONDUIT SIZES AND QUANTITIES SHALL NOT BE DECREASED TO LESS THAN THAT INDICATED ON THE ELECTRICAL DRAWINGS.

6. MECHANICAL AND ELECTRICAL EQUIPMENT HAS BEEN LOCATED AND ARRANGED TO MINIMIZE INTERFERENCES WITH EQUIPMENT AND STRUCTURE. CONTRACTOR SHALL THOROUGHLY BECOME FAMILIAR WITH THE WORK TO BE PERFORMED BY ALL TRADES AND THE PHYSICAL CHARACTERISTICS OF THE STRUCTURE IN ORDER TO SCHEDULE AND INSTALL EQUIPMENT AND TO MINIMIZE POSSIBLE INTERFERENCES. FAILURE TO PROPERLY COMMUNICATE AND SCHEDULE WORK WITH OTHER TRADES RESULTING IN ADDITIONAL WORK AND MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

7. UNLESS OTHERWISE NOTED, MOTOR STARTERS AND DISCONNECT SWITCHES SHALL BE FURNISHED BY DIVISION 23 AND SHALL BE INSTALLED AND WIRED BY DIVISION 26.

8. ALL MATERIAL SHALL BE NEW AND SHALL CONFORM TO THE STANDARDS OF THE UNDERWRITER'S LABORATORIES, INC., AND THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION.

9. A COMPLETE GROUNDING SYSTEM SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC, AND AS SHOWN ON THE DRAWINGS.

10. IN GENERAL, EXISTING WIRING, RACEWAYS AND JUNCTION BOXES SHALL REMAIN FOR RE-USE WHEREVER PRACTICAL. VERIFY VIABILITY OF ALL EXISTING WIRING INTENDED TO BE REUSED BY CONDUCTING MEGGER TESTS AND RECORDING RESULTS. CONTRACTOR SHALL SUBMIT RFI SEEKING RESOLUTION FOR ANY WIRING EXHIBITING SIGNIFICANT VARIANCES. ANY EXISTING WIRING, CONDUITS, FITTINGS, OR JUNCTION BOXES WHICH SHOW EVIDENCE OF DAMAGE, CORROSION, OR IMPROPER INSTALLATION SHALL BE REPLACED. EXISTING REMAINING CONDUITS MUST MEET ALL NEC REQUIREMENTS AND SHALL COMPLY WITH ALL REQUIREMENTS OF THE CONTRACT SPECIFICATIONS PRIOR TO INSTALLATION OF NEW CONDUCTORS.

11. WIRING SHALL BE INSTALLED IN RGS OR EMT UNLESS OTHERWISE NOTED. ALL CONDUITS EXPOSED TO WEATHER OR SUBJECT TO PHYSICAL DAMAGE SHALL BE RGS USING THREADED WATERTIGHT RIGID GALVANIZED FITTINGS. UTILIZE FLEXIBLE METALLIC CONDUIT FOR FINAL CONNECTIONS TO MOTORS AND OTHER VIBRATING EQUIPMENT. FLEXIBLE CONDUIT RUNS SHALL NOT EXCEED 6 FEET IN LENGTH.

12. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL NOT BE INSTALLED WITHIN ENVIRONMENTAL AIR SPACES PER NEC 300.22(C).

13. CONDUCTORS SHALL BE COPPER RATED AT NOT LESS THAN 600 VOLTS. MINIMUM SIZE SHALL BE #12 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS. ALL CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. ALL CONDUCTORS #10 AND SMALLER SHALL BE SOLID.

14. CONDUCTORS SHALL BE TYPE THHN OR THWN AS REQUIRED. PROVIDE A PULL CORD IN ALL EMPTY CONDUITS. PULL CORD SHALL BE JET LINE #232 POLYOFIN, 200LB TEST, OR APPROVED EQUAL. CONDUIT ENDS SHALL BE PROTECTED BY PLASTIC THREADED BUSHINGS.

15. PROVIDE AN UPDATED TYPED DIRECTORY IN ALL AFFECTED PANELBOARDS CLEARLY DESCRIBING THE LOCATION OF AND TYPE OF LOAD BEING SERVED FOR ALL CIRCUITS.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL ELECTRICAL EQUIPMENT FROM FOREIGN MATERIAL DURING CONSTRUCTION (PAINT, SPACKLE, ETC.).

17. ALL BRANCH CIRCUITS LARGER THAN 20A SHALL BE SEPARATELY HOME RUN TO THE PANEL. PROVIDE SEPARATE NEUTRALS FOR EACH BRANCH CIRCUIT.

18. ALL TERMINALS, SPLICING CONNECTORS, LUGS, ETC. SHALL BE IDENTIFIED FOR USE WITH THE MATERIAL (CU/AL) OF THE CONDUCTOR AND SHALL BE PROPERLY INSTALLED.

19. THE WORD "PROVIDE" MEANS TO FURNISH AND INSTALL UNLESS NOTED OTHERWISE.

20. EXISTING LIGHTING FIXTURES AND GENERAL PURPOSE RECEPTACLES IN MECHANICAL AND ELECTRICAL EQUIPMENT ROOMS AFFECTED BY THE INSTALLATION OF NEW EQUIPMENT SHALL BE RE-LOCATED TO THE NEAREST ACCESSIBLE AND PRACTICAL LOCATION. CONTRACTOR SHALL COORDINATE SUCH LOCATIONS WITH EQUIPMENT CONDITIONS AND LAYOUT.

21. WIRE AMPACITY SIZE FOR 100A CIRCUITS AND BELOW IS BASED ON NEC TABLE 310.15(B)(16), 60 DEGREE CELSIUS COLUMN FOR AMPACITY. WIRE AMPACITY SIZE FOR OVER 100A IS BASED ON NEC TABLE 310.16, 75 DEGREE CELSIUS COLUMN FOR AMPACITY.

22. ALL CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE AND SHALL BE RATED TO MATCH THEIR RESPECTIVE PANELBOARD INTERRUPTING CAPACITIES. PANELBOARDS SHALL MAINTAIN THEIR EXISTING FULLY RATED INTERRUPTING CAPACITY RATINGS. CIRCUIT BREAKERS SHALL MATCH OTHER TYPES CURRENTLY INSTALLED AND SHALL BE FULLY COMPATIBLE AND LISTED FOR USE IN THE PANELBOARDS IN WHICH THEY ARE BEING INSTALLED.

23. MINIMUM WIRE SIZES SHALL BE AS INDICATED, EXCEPT THAT CONTRACTOR SHALL INCREASE WIRING SIZES FOR FEEDERS AND BRANCH CIRCUITS TO LIMIT VOLTAGE DROP TO 2 PERCENT AND 3 PERCENT RESPECTIVELY, WHERE NECESSARY BASED ON CIRCUIT LENGTHS ACCORDINGLY, EQUIPMENT GROUNDING CONDUCTORS SHALL BE INCREASED IN SIZE PROPORTIONATELY ACCORDING TO THE CIRCULAR MIL AREA OF THE UNGROUNDED CONDUCTORS IN COMPLIANCE WITH NEC ARTICLE 250.122(B).

24. EQUIPMENT AND JUNCTION BOXES INSTALLED WITHIN CONCEALED SPACES SHALL BE ACCESSIBLE AS REQUIRED BY NEC. IF NECESSARY, PROVIDE REASONABLE AND CODE COMPLIANT ACCESS PANELS ABOVE CEILINGS OR NEARBY FOR INSPECTION, TESTING AND SERVICE CONSIDERATIONS. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL DEVICES AND BOXES WITH WINDOWS, MILLWORK, BUILT-INS, AND CABINETS PRIOR TO INSTALLATION OF ANY NEW RACEWAYS.

GENERAL NOTES:

25. PAINT ALL EXPOSED CONDUIT TO MATCH ADJACENT SURFACE IN FINISHED SPACES.

26. THE WORK PRACTICES EMPLOYED ON THIS PROJECT SHALL AT ALL TIMES COMPLY WITH OR EXCEED THE LATEST ADOPTED EDITION OF THE NEC (NATIONAL ELECTRICAL CODE). ELECTRICAL CONTRACTOR SHALL PROVIDE OR OBTAIN ALL REQUIRED LABOR, MATERIAL , EQUIPMENT, INSURANCE, TOOLS, PERMITS, INSPECTIONS, ETC. TO PERFORM THE PROJECT ELECTRICAL WORK AS PER NEC, LOCAL AGENCIES, AND OWNER REQUIREMENTS.

27. ALL CONDUITS INSTALLED IN DRY INTERIOR LOCATIONS SHALL BE ELECTRICAL METALLIC TUBING UNLESS OTHERWISE NOTED. USE COMPRESSION FITTINGS ONLY.

28. ALL CONDUITS INSTALLED IN EXTERIOR LOCATIONS SHALL BE RIGID GALVANIZED STEEL CONDUIT OR IMC. ALL EXTERIOR EQUIPMENT SHALL BE CONNECTED WITH LIQUID TIGHT FLEXIBLE METAL CONDUIT AND WEATHERPROOF FITTING.

29. ALL MATERIALS SHALL BE U.L. APPROVED. PROVIDE UL LISTED FIRESTOP ASSEMBLY FOR ANY OPENING THROUGH FIRE RATED WALLS OR CEILING USED AS PASSAGE FOR ELECTRICAL COMPONENTS SUCH AS CONDUITS OR ELECTRICAL BOXES.

30. LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED UNDER THE ELECTRICAL CONTRACTORS' SCOPE OF WORK SHALL BE PERFORMED BY EXPERIENCED MECHANICS OF THE PROPER TRADE AND ALL WORKMANSHIP SHALL BE FIRST CLASS AND SHALL BE IN COMPLIANCE WITH THE SPECIFIC REQUIREMENTS OF THE CONTRACT DRAWINGS.

31. ALL DISCREPANCIES ON DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING, PRIOR TO SUBMISSION OF BIDS. SUBMISSION OF A BID CONSTITUTES ACCEPTANCE OF FIELD CONDITIONS.

32. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE FOLLOWING CODES AND STANDARDS:
    A. FLORIDA ADMINISTRATIVE CODE 59A-5
    B. NATIONAL FIRE PROTECTION ASSOCIATION, (NFPA); MORE SPECIFICALLY NFPA 72, 99 AND 110.
    C. ALL LOCAL CODES, ORDINANCES AND REGULATIONS
    D. FPL STANDARDS
    E. THE AUTHORITY HAVING JURISDICTION
    F. FLORIDA ACCESSIBILITY CODE

33. ALL CONDUITS, CABINETS, PANELS AND OTHER EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH N.C. 250 AND ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES.

34. ALL LUMINARIES SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH THE CEILING SYSTEM MANUFACTURER RECOMMENDATIONS AND LOCAL CODE REQUIREMENTS.

35. THIS DRAWING IS A GUIDE FOR THE INSTALLATION OF ELECTRICAL SERVICE. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE A FUNCTIONING SYSTEM.

36. ALL HOME RUN CABLES SHALL BE RUN WITHOUT SPLICES EXCEPT WHERE OTHERWISE INDICATED.

37. ELECTRICAL CONTRACTOR SHALL FOLLOW OWNER/GENERAL CONTRACTOR, NATIONAL AND LOCAL AGENCIES, ETC. SAFETY REGULATIONS PROCEDURES ELECTRICAL CONTRACTOR SHALL PROVIDE ADEQUATE EQUIPMENT AND WORKING AREA PROTECTION TO PREVENT INJURIES TO PEOPLE AND DAMAGE TO PROPERTY.ALL WORK SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER.

38. ELECTRICAL CONTRACTOR SHALL FULLY TEST ALL ELECTRICAL SYSTEMS UPON COMPLETION OF WORK. PROVIDE FINAL CLEANUP AND CONDUCT FIELD TESTS AFTER INSTALLATION OF ALL ELECTRICAL WORK.

39. ADJUST ITEMS TO THE SATISFACTION OF THE OWNER AND ENGINEER. LEAVE CABINET INTERIORS CLEAN AND FREE FROM CONSTRUCTION DEBRIS, NEATLY DRESS ALL WIRING, AND RE-TIGHTEN ALL TERMINATORS PER MANUFACTURERS' RECOMMENDATIONS.

40. MAINTAIN ON THE JOB SITE, IN GOOD CONDITION, ONE SET OF UP TO DATE AS-BUILT ELECTRICAL DRAWINGS. PROGRESSIVELY, NEATLY, LEGIBLY AND EXACTLY RECORD ON THESE DRAWINGS THE LOCATIONS OF ALL CONCEALED CONDUIT RUNS AND ALL WORK WHICH IS INSTALLED DIFFERENTLY FROM THE LOCATION AND MANNER INDICATED ON THE DRAWINGS. PROVIDE A COPY OF THESE PLANS FOR THE OWNER.

41. PROVIDE A FULL ONE YEAR WARRANTY ON ALL ELECTRICAL, LABOR AND MATERIALS INSTALLED ON THIS PROJECT, STARTING FROM THE ISSUANCE OF THE OWNER'S CERTIFICATE OF OCCUPANCY.

42. CONTRACTOR SHALL INSTALL A BACKBOX AT EVERY LOCATION OF HVAC THERMOSTAT PROVIDED BY DIVISION 23 CONTRACTOR. PROVIDE 1/2" EMT CONDUIT WITH NYLON PULL STRING TO EQUIPMENT CONTROLLED.

43. PAINT ALL EXPOSED CONDUIT TO MATCH ADJACENT SURFACE IN FINISHED SPACES.

44. COORDINATE THE HEIGHTS OF WALL MOUNTED LIGHTING FIXTURES TO CLEAR MIRRORS, CABINETS AND BUILT-INS.

45. INSTALL A BACKBOX AT EVERY LOCATION OF HVAC THERMOSTAT PROVIDED BY DIVISION 23 CONTRACTOR. PROVIDE 1/2" EMT CONDUIT WITH PULL STRING.

46. SUBMITTALS

    1. SUBMIT MANUFACTURER'S CUT SHEETS AND CATALOG DATA CLEARLY INDICATING THE SPECIFIC PART OR PRODUCT CATALOG NUMBERS APPROVAL.

    2. SUBMIT COPIES OF SHOP DRAWINGS FOR THE FOLLOWING ITEMS:
    A. SWITCHGEAR INCLUDING SWITCHBOARD, AUTOMATIC TRANSFER SWITCHES
    B. SURGE PROTECTION DEVICES

50. COORDINATION AND ARC FLASH STUDY

    1. CONTRACTOR SHALL PROVIDE AN ARC FLASH ANALYSIS AS STIPULATED BY NFPA 70E AND AS NECESSARY TO PROVIDE LABELING IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, ARTICLE 110.16.
    2. CONTRACTOR SHALL PROVIDE A COORDINATION STUDY FOR NEW MAIN, TRANSFER SWITCH AND EXISTING MAIN. PER RESULTS OF COORDINATION STUDY, CONTRACTOR SHALL ADJUST LONG, SHORT, INSTANTANEOUS AND GROUND FAULT SETTINGS ON NEW MAIN SWITCH, NEW AUTOMATIC TRANSFER SWITCH AND EXISTING MAIN IN EXISTING ELECTRICAL ROOM.

51. FOR SWITCHBOARDS AND PANELBOARDS, THE FOLLOWING MANUFACTURERS AS ACCEPTABLE:

    A. SQUARE D
    B. GENERAL ELECTRIC
    C. CUTLER HAMMER

52. FOR GENERATOR, THE FOLLOWING MANUFACTURERS ARE ACCEPTABLE:

    A. KOHLER
    B. ALTERNATE MANUFACTURER'S SHALL BE REVIEWED BY ENGINEER AND ARE SUBJECT TO APPROVAL PRIOR TO BID.

53. FOR TRANSFER SWITCH, THE FOLLOWING MANUFACTURERS ARE ACCEPTABLE:

    A. ASCO BY SCHNEIDER ELECTRIC.
    B. ALTERNATE MANUFACTURER'S SHALL BE REVIEWED BY ENGINEER AND ARE SUBJECT TO APPROVAL PRIOR TO BID.
    C. TRANSFER SWITCH SHALL BE UL 1008 LISTED, NFPA 110 COMPLIANT, 3 POLE BYPASS ISOLATION, 2000A, 480V, TIME BASE RATED 100KWCR FOR 50MS, TYPE 3R ENCLOSURE, PUBLISHED SHORT CIRCUIT RATINGS WHEN PROTECTED WITH BREAKERS UPSTREAM WITH INSTANTANEOUS TRIP SETTINGS AND ALSO WHEN PROTECTED WITH BREAKERS WITH SHORT TIME SETTINGS PER UL 1008 7TH EDITION.

CONSULTANT

BEED
BEED Engineering, Inc.
4680 Lipscomb Street North Suite 10 H
Palm Bay, Florida 32905
Ph 321.432.5176 Fax 321.757.5422
beedengineering.com
Board of Professional Engineers License 29706
MEP-FP Design & Consulting Engineering Services

PMD engineering
6117 School House Court
Wesley Chapel, FL 33545
813.322.4373
www.pmdeng.com
COA No. 28666

PROJECT

REPLACEMENT GENERATOR/ENCLOSURE
CITY HALL COMPLEX BUILDING A
121 SW PORT ST. LUCIE BLVD.
PORT ST. LUCIE, FL 34984

SEAL

Pablo M. Diaz, PE FL #65597

REVISIONS

#	DATE	DESCRIPTION
1		

DRAWING INFO

PROJECT #:	6126
DRAWN BY :	PMD
DESIGNED BY :	PMD
CHECKED BY:	PMD/MKF
DATE :	6-3-20

SHEET NUMBER

GENERAL SPECIFICATION

E-001

GENERAL NOTES:

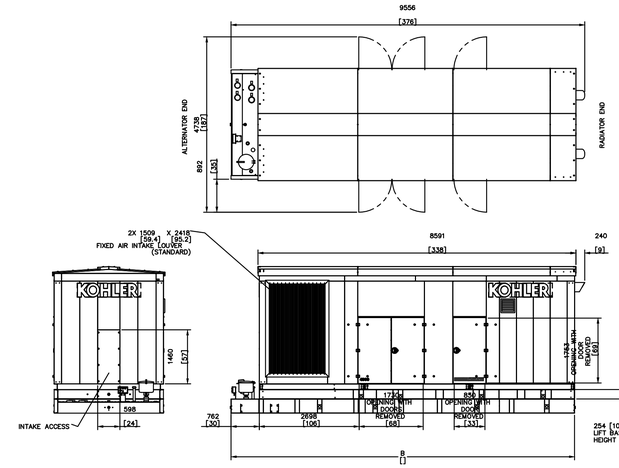
54. AUTOMATIC TRANSFER SWITCH

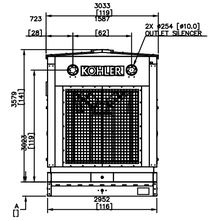
BASIS OF DESIGN ASCO 7000 SERIES SERVICE ENTRANCE BYPASS ISOLATION 2000A/3 POLES WITH SOLID NEUTRAL 480V RATED 22KA RMS SYM, TYPE 3RX 316 STAINLESS STEEL DOUBLE DOOR ENCLOSURE UL 1008 LISTED, NFPA 110 COMPLIANT (ASCO CAT NO: G07AUBA32000N5XS, 5L1, 18B, 18G, 31Z, 40NB, 44G, 82E, 119BG, 119M, 150B8), 5L1 (MAINTAINED TYPE TEST SWITCH), 18B, 18G (SOURCE AVAILABILITY CONTACTS), 31Z (PRE/POST TRANSFER SIGNAL CONTACTS), 44G (STRIP HEATER SHALL BE INCLUDED TO AVOID CONDENSATION INSIDE THE TRANSFER SWITCH DUE TO CHANGE IN TEMPERATURE), 119BG (120 VAC SHUNT TRIP ACCESSORY TO BE ABLE TO TRIP THE MAIN BREAKER REMOTELY IN CASE OF AN EMERGENCY), 119M (ENERGY REDUCTION MAINTENANCE SWITCH IN ORDER TO MEET NEC 2014 ARTICLE 240.87), 158B8 (PM8000 POWER QUALITY METER WITH CT'S ON LOAD SIDE, RIDE TROUGH MODULE AND MODBUS COMMUNICATION CAPABILITY) AND SHALL BE EQUIPPED WITH A 100% RATED SQUARE D SERVICE ENTRANCE RATED TYPE NW 2000A LSIG CIRCUIT BREAKER ON THE NORMAL SIDE OF THE TRANSFER SWITCH . TRANSFER SWITCH ASSEMBLERS THAT PROVIDE TRANSFER SWITCH DEVICES WITH 3RD PARTY CONTROLS NOT ALLOWED, ALL TRANSFER & BYPASS ISOLATION SWITCHES AND CONTROLLERS SHALL BE THE PRODUCT OF THE SAME MANUFACTURER. CONTROLLER SHALL BE ASCO GROUP 5 AND MUST BE EQUIPPED WITH ASCO FEATURE 27 IN–PHASE MONITOR. A TWO WAY BYPASS ISOLATION SHALL PROVIDE MANUAL BYPASS OF THE LOAD TO EITHER SOURCE AND PERMIT ISOLATION OF THE AUTOMATIC TRANSFER SWITCH FROM ALL SOURCE AND LOAD POWER CONDUCTORS FOR MAINTENANCE PURPOSES. BYPASS TO THE LOAD –CARRYING SOURCE SHALL BE ACCOMPLISHED WITH NO INTERRUPTION OF POWER TO THE LOAD, DESIGNS WHICH DISCONNECT THE LOAD WHEN BYPASSING NOT ACCEPTABLE. ANY ALTERNATE SHALL BE SUBMITTED FOR APPROVAL TO THE CONSULTING ENGINEER AT LEAST 10 DAYS PRIOR TO BID. ALTERNATE BIDS MUST LIST ANY DEVIATIONS FROM THE SPECIFICATIONS.

55. MANUAL TRANSFER SWITCH

BASIS OF DESIGN ASCO 300 SERIES TRIPLE SWITCH 3MTDQ UL 1008 LISTED, NFPA 110 COMPLIANT, 2000A 3–POLE WITH SOLID NEUTRAL, 480V RATED 22KA RMS SYM MANUAL TRANSFER SWITCH WITH INTEGRATED CAM–LOCKS (ASCO CAT NO: G3MTDQA32000N0XS,44G) TRANSFER SWITCHES MUST BE A CONTACTOR TYPE DEVICE, CIRCUIT BREAKER TYPE TRANSFER SWITCH WILL NOT BE ACCEPTABLE. THE 3MTDQ SHALL BE FURNISHED IN A NEMA 3RX 316 STAINLESS STEEL DOUBLE DOOR ENCLOSURE. STRIP HEATER SHALL BE INCLUDED TO AVOID CONDENSATION INSIDE THE TRANSFER SWITCH DUE TO CHANGE IN TEMPERATURE. MANUAL TRANSFER SWITCH SHALL PROVISION TO CONNECT PERMANENT GENERATOR, PORTABLE GENERATOR AND LOAD BANK. ANY ALTERNATE TO THE BASIS OF DESIGN SHALL BE SUBMITTED TO THE CONSULTING ENGINEER IN WRITING AT LEAST 10 DAYS PRIOR TO BID

ABREVIATIONS		
SYMBOL		MOUNTING
AFF	ABOVE FINISHED FLOOR	
AFG	ABOVE FINISHED GRADE	
WP	WEATHERPROOF	
WIRING		
SYMBOL		MOUNTING
(	RACEWAY CONCEALED IN WALL OR CEILING (3/4" MINIMUM) SEE SPECIFICATIONS.	SEE SPECIFICATIONS
(	RACEWAY CONCEALED UNDER FLOOR OR BELOW GRADE (3/4" MINIMUM) SEE SPECIFICATIONS.	SEE SPECIFICATIONS
-----	RACEWAY EXPOSED ON WALL OR CEILING (3/4" MINIMUM)	SEE SPECIFICATIONS



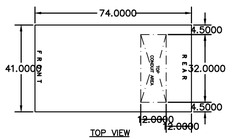


NOTE: DIMENSIONS IN [ ] ARE ENGLISH EQUIVALENTS.
*WEIGHT INCLUDES ENCLOSURE AND SILENCERS.

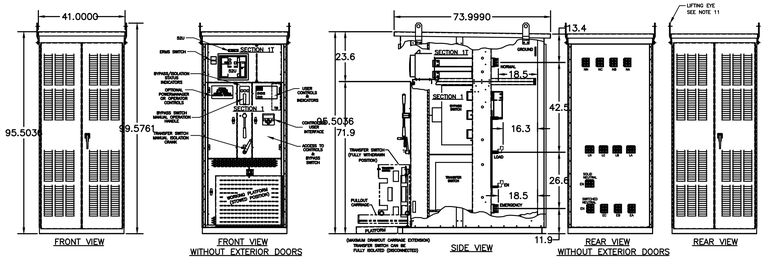
ALUM. SLT ENCLOSURE WEIGHT KG [LBS]	2878 [6346]

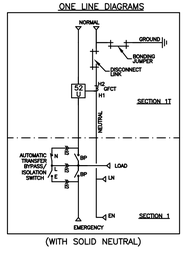
TANK & LIFT BASE INFORMATION					
LITERS [GALLONS]	GENSETS	HEIGHT DIM A MM [INCH]	LENGTH DIM B MM [INCH]	TANK WEIGHT KG [LBS] (NO FUEL)	
SL1 LIFT BASE	KD1250–1750	SEE NOTE	8520 [336]	1342 [2959]	
5863 [1549]	KD1250–1750	381 [15]	9281 [365]	5210 [11,486]	
9880 [2605]	KD1250–1750	559 [22]	9281 [365]	5692 [12,548]	
11204 [2960]	KD1250–1750	635 [25]	9281 [365]	5857 [12,913]	
19214 [5076]	KD1250–1750	889 [35]	11113 [438]	8161 [17,993]	
21985 [5808]	KD1250–1750	991 [39]	11113 [438]	8568 [18,889]	

TANK WEIGHT + LIFT BASE WEIGHT + ENCLOSURE WEIGHT + GENERATOR SET WEIGHT (REFERENCE FROM GENERATOR SET ADV) =TOTAL WEIGHT

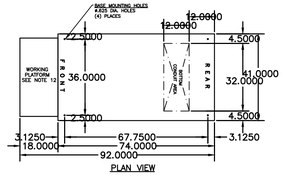


TOP VIEW





(WITH SOLID NEUTRAL)



PLAN VIEW

GENERAL NOTES
1. TYPE 3RX3 ENCLOSURE, FREE STANDING, FLOOR MOUNTED. CODE GAUGE FORMED STEEL FRAME CONSTRUCTION.
2. FRONT DOOR HAS A STAINLESS STEEL, PADLOCKABLE HANDLE.
3. FINISH: TYPE 3RX (3): EXTERIOR CONSTRUCTED OF CODE GAUGE TYPE 316 STAINLESS STEEL.
4. CLEARANCES:
   FRONT: 36 INCHES REAR: 42 INCHES
5. ALL BUS IS SILVER–PLATED COPPER, BASED ON 1000A PER SQ. IN. DENSITY.
6. FULL RATED NEUTRAL CONNECTION FOR EACH SOURCE AND THE LOAD.
   IT IS IN THE FOLLOWING FORMAT AS SPECIFIED BY THE CATALOG NO. NEUTRAL TYPE;
   A. SOLID COPPER BUS) NEUTRAL (SHOWN)
7. FRONT & REAR ACCESS
8. EXTERIOR VENTS SUPPLIED WITH POLYESTER DUST FILTERS.

SPECIFICATIONS
1. SERVICE VOLTAGE:
   SYSTEM RATING: 2000 AMPS, 3Ø, 4W.
   GROUND BUS– 300 RATED.
   SHORT CIRCUIT RATING– 1000A–2000A: 100,000 AIC RMS SYM @ 480V.
   THE EMERGENCY SOURCE INPUT MUST BE PROTECTED BY A REMOTE OVERCURRENT PROTECTION DEVICE AS LISTED ON THE MARKINGS ON THE TRANSFER SWITCH.
2. NEUTRAL BUS: 100% RATED.
3. APPLICABLE LABELS: U.L. 891– SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT.

TERMINATIONS 2000A
1. SUPPLIED WITH MECHANICAL (SCREW TYPE) LUGS FOR CU/AL CABLE.
   NORMAL: (6) 1/0 – 600MCM PER PHASE & NEUTRAL
   LOAD: (6) 1/0 – 600MCM PER PHASE & NEUTRAL
   EMERGENCY: (6) 1/0 – 600MCM PER PHASE & NEUTRAL
   GROUND: (16) 1/0 – 750MCM
   A. SUITABLE WIRE BENDING SPACE IS PROVIDED AS PER NEC.
2. OPTIONAL LUGS MAY BE SUPPLIED.

CIRCUIT BREAKER: ITEM 52U
1. SQUARE "D" 100% RATED TYPE "MW", 2000AF/2000AT STATIONARY MOUNTED, MANUALLY OPERATED, WITH LONG DELAY, SHORT DELAY, INSTANTANEOUS AND GROUND FAULT TRIP SETTINGS.
2. PROVIDE ENERGY REDUCTION MAINTENANCE SETTING (ERMS).

KOHLER.

Industrial Diesel Generator Set - KD1500
Tier 2 EPA-Certified for Stationary Emergency Applications

Alternator	Voltage	Ph	Hz	150°C Rise Standby Rating kW/kVA	Amps	130°C Rise Standby Rating kW/kVA	Amps	125°C Rise Prime Rating kW/kVA	Amps	105°C Rise Prime Rating kW/kVA	Amps
	220/380	3	60	1500/1875	2849	1500/1875	2849	1350/1688	2565	1350/1662	2565
	230/400	3	60	1500/1875	2707	1500/1875	2707	1350/1688	2437	1350/1688	2437
KH06810TO4D	240/416	3	60	1500/1875	2603	1500/1875	2603	1350/1688	2343	1350/1688	2343
	277/480	3	60	1500/1875	2256	1500/1875	2256	1350/1688	2031	1350/1688	2031
	347/600	3	60	1500/1875	1805	1500/1875	1805	1350/1688	1625	1350/1662	1625
KH05641TO4D	2400/4160	3	60	1500/1875	261	1500/1875	261	1340/1675	233	1340/1675	233
KH06721TO4D	2400/4160	3	60	1500/1875	261	1500/1875	261	1340/1675	233	1340/1675	233

Engine Specifications	60 Hz
Manufacturer	Kohler
Engine: model	KD45V20
Engine: type	4-Cycle, Turbocharged, Intercooled
Cylinder arrangement	20-V
Displacement, L (cu. in.)	45 (2746)
Bore and stroke, mm (in.)	135 x 157 (5.31 x 6.18)
Compression ratio	15.0:1
Piston speed, m/min, (ft./min.)	565 (1854)
Main bearings: quantity, type	11, Precision Half Shells
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	1654 (2218)
Cylinder head material	Cast Iron
Crankshaft material	Steel
Valve (exhaust) material	Steel
Governor: type, make/model	KODEC Electronic Control
Frequency regulation, no-load to-full load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Lubricating System	60 Hz
Type	Full Pressure
Oil pan capacity with filter (dipstick max. mark), L (qt.) §	165 (174)
Oil pan capacity with filter (initial fill), L (qt.) §	180 (190)
Oil filter: quantity, type §	4, Cartridge
Oil cooler	Water-Cooled

§ Kohler recommends the use of Kohler Genuine oil and filters.

Fuel System	60 Hz
Fuel supply line, min. ID, mm (in.)	19 (0.75)
Fuel return line, min. ID, mm (in.)	12 (0.5)
Max. fuel flow, Lph (gph)	555 (147)
Min./max. fuel pressure at engine supply connection, kPa (in. Hg)	-30/30 (-8.8/8.8)
Max. return line restriction, kPa (in. Hg)	20 (5.9)
Fuel filter: quantity, type	1, Primary Engine Filter 1, Fuel/Water Separator
Recommended fuel	#2 Diesel ULSD

Fuel Consumption	60 Hz
Diesel, Lph (gph) at % load	**Standby Rating**
100%	401 (105.9)
75%	316 (83.5)
50%	222 (58.6)
25%	124 (32.8)
Diesel, Lph (gph) at % load	**Prime Rating**
100%	371 (98.0)
75%	287 (75.8)
50%	203 (53.6)
25%	119 (31.4)

Radiator System	60 Hz
Ambient temperature, °C (°F)*	50 (122)
Engine jacket water capacity, L (gal.)	143 (37)
Radiator system capacity, including engine, L (gal.)	278 (73.4)
Engine jacket water flow, Lpm (gpm)	2339 (618)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	623 (35429)
Heat rejected to charge air cooler at rated kW, dry exhaust, kW (Btu/min.)	454 (25818)
Charge cooling air inlet temperature at 25°C (77°F) ambient, °C (°F)	229 (444)
Turbocharger boost (abs), bar (psi)	3.45 (50.0)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	1750 (68.9)
Fan, kWm (HP)	70 (93.9)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in, H_2O)	0.125 (0.5)

* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).

Remote Radiator System☩	60 Hz
Exhaust manifold type	Dry
Connection sizes:	
Water inlet/outlet, mm (in.)	—
Charge air cooler inlet/outlet (pipe dia. of flange), mm (in.)	—
Static head allowable above engine, kPa (ft. H_2O)	70 (23.5)

☩ Contact your local distributor for cooling system options and specifications based on your specific requirements.

NEW 2,000 AMP. MAIN/AUTO TRANSFER SWITCH
NOT TO SCALE

CONSULTANT
BEED
BEED Engineering, Inc.
4680 Lipscomb Street North Suite 10 H
Palm Bay, Florida 32905
Ph 321.432.5176 Fax 321.757.5422
beedengineering.com
Board of Professional Engineers License 29706
MEP-FP Design & Consulting Engineering Services

PAD engineering
6117 School House Court
Wesley Chapel, FL 33545
813.322.4373
www.pmdeng.com
COA No. 28666

PROJECT
REPLACEMENT GENERATOR/ENCLOSURE
CITY HALL COMPLEX BUILDING A
121 SW PORT ST. LUCIE BLVD.
PORT ST. LUCIE, FL 34984

SEAL
Pablo M. Diaz, PE FL #65597

REVISIONS

#	DATE	DESCRIPTION
1		

DRAWING INFO

PROJECT #:	6126
DRAWN BY :	PMD
DESIGNED BY :	PMD
CHECKED BY:	PMD/MKF
DATE :	6-3-20

SHEET NUMBER
LEGEND, NOTES AND DETAILS
E-002

GENERAL NOTES

1. FLOOR MOUNTED ENCLOSURE.
   TYPE 3RX5 ENCLOSURE – EXTERIOR CONSTRUCTED FROM TYPE 316 STAINLESS STEEL.
2. EXTERIOR DOORS HAVE PADLOCKABLE HANDLES WITH 3-POINT LATCH
3. FRONT & REAR ACCESS.
4. CLEARANCES: FRONT: 36" REAR: 42"
5. EXTERIOR VENTS: SUPPLY WITH POLYESTER DUST FILTERS.

SYSTEM NOTES

1. SYSTEM RATING: 2000 AMPS.
   SHORT CIRCUIT RATING: 100,000 RMS SYM @ 480V.
   THE SOURCES MUST BE PROTECTED BY A REMOTE OVERCURRENT PROTECTION DEVICE AS LISTED ON THE MARKINGS ON THE TRANSFER SWITCH.
2. ALL BUS IS COPPER
3. GROUND: 2OOI RATED.
4. NEUTRAL: 100I RATED.
5. APPLICABLE LABEL(S): U.L. 891

TRANSFER SWITCH

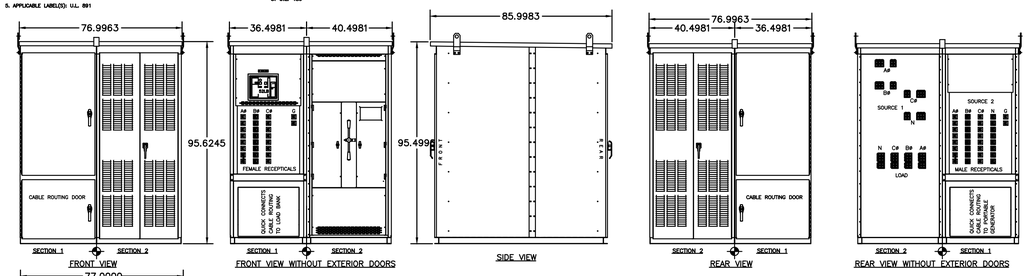
1. TRANSFER SWITCH RATING: 2000 AMPS.
   SHORT CIRCUIT RATING WHEN PROTECTED BY A CIRCUIT BREAKER
   TIME RESPONSE, MAXIMUM 0.05 SECONDS: 100,000 RMS SYM @ 480V.
2. FULL RATED NEUTRAL CONNECTION FOR EACH SOURCE.
   A. SOLID NEUTRAL
3. UL 1008

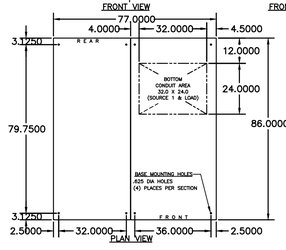
CIRCUIT BREAKER: 52LB

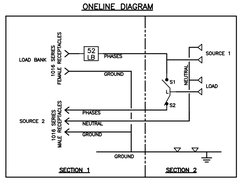
1. SQUARE "D" 100R RATED TYPE "HW", 2000AF/2000AT, STATIONARY MOUNTED, MANUALLY OPERATED WITH LONG DELAY AND INSTANTANEOUS TRIP SETTINGS.
   SHORT CIRCUIT RATING: AIC 100,000 RMS SYM @ 480V.
2. PROVIDE LONG DELAY, SHORT DELAY, INSTANTANEOUS AND GROUND FAULT TRIP SETTINGS.
3. U.L. 489

TERMINATIONS 2000A

LOAD BANK 1: (5) 1016 SERIES SINGLE POLE FEMALE RECEPTACLES PER PHASE
LOAD BANK 1: (2) 1016 SERIES SINGLE POLE FEMALE RECEPTACLES ON GROUND
SOURCE 1: (4) STANDARD MECHANICAL (SCREW TYPE) LUGS
1/0 AWG – 600MCM PER PHASE & NEUTRAL & GROUND
SOURCE 2: (5) 1016 SERIES SINGLE POLE MALE RECEPTACLES PER PHASE & NEUTRAL
SOURCE 2: (2) 1016 SERIES SINGLE POLE MALE RECEPTACLES ON GROUND
LOAD: (4) STANDARD MECHANICAL (SCREW TYPE) LUGS
1/0 AWG – 600MCM PER PHASE & NEUTRAL & GROUND







MANUAL TRANSFER SWITCH WITH TEMPORARY GENSET HOOK–UP

NOT TO SCALE

CONSULTANT

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PROJECT

REPLACEMENT GENERATOR/ENCLOSURE
CITY HALL COMPLEX BUILDING A
121 SW PORT ST. LUCIE BLVD.
PORT ST. LUCIE, FL 34984

SEAL

Pablo M. Diaz, PE FL #65597

REVISIONS

#	DATE	DESCRIPTION
1	:	

DRAWING INFO

PROJECT #:	6126
DRAWN BY :	PMD
DESIGNED BY :	PMD
CHECKED BY:	PMD/MKF
DATE :	6-3-20

SHEET NUMBER

DETAILS

E-003

SECTION 26 32 13
ENGINE GENERATOR

PART 1 GENERAL

1.1 SUMMARY

A This section includes the following items from a single supplier:
1. Engine Generator Set.
2. Enclosure
3. Related Accessories as specified
B Products Furnished or Supplied but not installed
C Products Installed but not furnished or supplied
D Related Requirements
1. It is the intent of this specification to secure an engine-driven generator set that has been prototype tested, factory built, production-tested, and site-tested together with all accessories necessary for a complete installation as shown on the plans and drawings and specified herein.
2. Any exceptions to the published specifications shall be subject to the approval of the engineer and submitted minimum 10 days prior to the closing of the bid with a line by line summary description of all the items of compliance, any items that have been are omitted or have been taken exception to, and a complete description of all deviations.
3. It is the intent of this specification to secure a generator set system that has been tested during design verification, in production, and at the final job site. The generator set will be a commercial design and will be complete with all of the necessary accessories for complete installation as shown on the plans, drawings, and specifications herein. The equipment supplied shall meet the requirements of the National Electrical Code and applicable local codes and regulations.
4. All equipment shall be new and of current production by an international, power system manufacturer of generators, transfer switches, and paralleling switchgear. The manufacturer shall be a supplier of a complete and coordinated system. There will be single-source responsibility for warranty, parts, and service through a factory-authorized representative with factory-trained technicians.

1.2 PRICE AND PAYMENT PROCEDURES

A Allowances
B Unit Prices
C Alternates or Alternatives
D Measurement and Payment

1.3 REFERENCES

A Abbreviations and Acronyms
B Definitions
C Reference Standards

1.4 ADMINISTRATIVE REQUIREMENTS

A Coordination
B Pre-installation Meeting
C Sequencing
D Scheduling

1.5 SUBMITTALS

A Action Submittals
1. Product Data
a The submittal shall include prototype test certification and specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set, the transfer switch, and the remote annunciator panel if it is included elsewhere in these specifications.
2. Shop Drawings
3. Samples

B Informational Submittal
1. Certificates
a The generator set shall be listed to UL 2200 or submitted to an independent third party certification process to verify compliance as installed.
2. Test and Evaluation Reports
3. Manufacturer's Instruction
4. Source Quality Control Submittals
5. Field or Site Quality Control
6. Manufacturer's Report
7. Special Procedure Submittal
8. Qualification Statement

C Closeout Submittal
1. Maintenance Contracts
2. Operation And Maintenance Data
3. Bonds
4. Warranty Documentation
5. Record Documentation
6. Software

D Maintenance Material Submittals

1.6 Quality Assurance

A Regulatory Agency
1. The generator set shall conform to the requirements of the following codes and standards:
a CSA C22.2, No. 14-M91 Industrial Control Equipment.
b EN50082-2, Electromagnetic Compatibility-Generic Immunity Requirements, Part 2: Industrial.
c EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
d IEC8528 part 4, Control Systems for Generator Sets.
e IEC Std 61000-2 and 61000-3 for susceptibility, 61000-6 radiated and conducted electromagnetic emissions.
f IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
g NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
h NFPA 99, Essential Electrical Systems for Health Care Facilities.

i NFPA 110, Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit. Component level type tests will not substitute for this requirement.
2. Qualifications
a The equipment shall be produced by a manufacturer who is ISO 9001 certified for the design, development, production and service of its complete product line.
b The power system shall be produced by a manufacturer who has produced this type of equipment for a period of at least 10 years and who maintains a service organization available twenty-four hours a day throughout the year.
3. Manufacturers
a The power system shall be furnished by a single manufacturer who shall be responsible for the design, coordination, and testing of the complete system. The entire system shall be installed as shown on the plans, drawings, and specifications herein.
4. Suppliers
5. Fabricators
6. Installers/ Applicators/ Erectors
7. Testing Agencies
8. Licensed Professional
9. Certificates
10. Preconstruction testing
11. Field and Site Samples
12. Mock-ups

1.7 Delivery, Storage, and Handling

A Delivery and Acceptance Requirements
B Storage and Handling Requirements
C Packaging Waste Management

1.8 Field or Site Conditions

A Ambient Conditions
1. Engine- generator set shall operate in the following conditions without any damage to the unit or its loads.
a Ambient Temperature: 77 °F
b Altitude : 500 ft
c Relative Humidity: 95%
B Existing Conditions

1.9 Warranty or Bond

A Manufacturer's Warranty
B Special Warranty
C Extended Correction Period

PART 2 PRODUCTS

2.1 Owner-Furnished or Owner-Supplied

A New Products
B Existing Products

2.2 Equipment

A Equipment
1. The generator set shall be a Kohler model KD1500 with a KH03850TO4D alternator. It shall provide 1,875.00 kVA and 1,500.00 kW when operating at 277/480 volts, 60 Hz, 0.80 power factor. The generator set shall be capable of a 130°C Standby rating while operating in an ambient condition of less than or equal to 77 °F and a maximum elevation of 500 ft above sea level. The standby rating shall be available for the duration of the outage.

B Engine
1. The minimum 45.0 liter displacement engine shall deliver a minimum of 2218 HP at a governed engine speed of 1800 rpm, and shall be equipped with the following:
a. Electronic isochronous governor capable of 0.25% steady-state frequency regulation
b. 24-volt positive-engagement solenoid shift-starting motors
c. 140-ampere automatic battery charging alternator with a solid-state voltage regulation
d. Positive displacement, full-pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain
e. Dry-type replaceable air cleaner elements for normal applications
f. Engine-driven or electric fuel-transfer pump including fuel filter and electric solenoid fuel shutoff valve capable of lifting fuel
g. Common rail fuel injection system
h. Variable flow rate fuel pump which helps adjust for the required flowrate and results in a very minimal return fuel rate
i. The turbocharged engine shall be fueled by diesel
j. The engine shall have a minimum of 20 cylinders and be liquid-cooled
2. The engine shall be EPA Tier II certified from the factory.
3. The generator must accept rated load in one-step.

C Cooling System
D Battery
E Housing
F Fuel oil storage
G Controller
H Generator Overcurrent and Fault Protection

I Alternator
1. The alternator shall be salient-pole, brushless, 2/3-pitch, with 4 bus bar provision for external connections, self-ventilated, with drip-proof construction and amortisseur rotor windings, and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be a vacuum pressure impregnated, fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to 130°C Standby. The PMG based excitation system shall be of brushless construction controlled by a digital, three phase sensing, solid- state, voltage regulator. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full rated load. The TIF factor shall not exceed 50.

2. The alternator shall have a maintenance-free bearing, designed for 40000 hour B10 life. The alternator shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.
3. The generator shall be inherently capable of sustaining at least 300% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current-support devices.
4. Motor starting performance and voltage dip determinations shall be based on the complete generator set. The generator set shall be capable of supplying 5,351.00 LRKVA for starting motor loads with a maximum instantaneous voltage dip of 35%, as measured by a digital RMS transient recorder in accordance with IEEE Standard 115. Motor starting performance and voltage dip determination that does not account for all components affecting total voltage dip, i.e., engine, alternator, voltage regulator, and governor will not be acceptable. As such, the generator set shall be prototype tested to optimize and determine performance as a generator set system.

J Vibration Isolation
1. Vibration isolators shall be provided between the engine-alternator and heavy-duty steel base.

2.3 Description
A Regulatory Requirements
B Sustainability Characteristics
2.4 Performance / Design Criteria
A Capacities
2.5 Operation
A Operators
B Controls
C Operation Sequence
2.6 Materials
2.7 Assembly or Fabrication
A Factory Assembly
B Shop Fabrication
C Assembly or Fabrication Tolerances
2.8 Mixes
2.9 Finishes
A Primer Materials
B Finish Materials
C Shop Finishing Materials
2.10 Accessories
2.11 Source Quality Control
A. Non-Conforming Work
1. To ensure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and/or local representative shall be responsible for three separate tests: design prototype tests, final production tests, and site tests.
a. **Design Prototype Tests.** Components of the emergency system, such as the engine/generator set, transfer switch, and accessories, shall not be subjected to prototype tests because the tests are potentially damaging. Rather, similar design prototypes and preproduction models shall be subject to the following tests:
i.Maximum power (kW)
ii. Maximum motor starting (kVA) at 35% instantaneous voltage dip.
iii. Alternator temperature rise by embedded thermocouple and/or by resistance method per NEMA MG1-32.6.
iv. Governor speed regulation under steady-state and transient conditions.
v. Voltage regulation and generator transient response.

vi. Harmonic analysis, voltage waveform deviation, and telephone influence factor.
vii. Three-phase short circuit tests.
viii. Alternator cooling air flow.
ix. Torsional analysis to verify that the generator set is free of harmful torsional stresses.
x. Endurance testing.
b. **Final Production Tests.** Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
i. Single-step load pickup
ii. Safety shutdown device testing
iii. Rated Power @ 0.8 PF
iv. Maximum power
v. Upon request, a witness test, or a certified test record sent prior to shipment.
c. **Site Tests.** The manufacturer's distribution representative shall perform an installation check, startup, and building load test. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:
i. Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.
ii. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. These shall include: block heaters, battery chargers, alternator strip heaters, remote annunciators, etc.
iii. Generator set startup under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during operation, normal and emergency line-to-line voltage and frequency, and phase rotation.
iv. Automatic start by means of a simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator set voltage, amperes, and frequency shall be monitored throughout the test.

B Non-Conforming Work
C Manufacturer's Services
D Coordination of Other Tests and Inspections

PART 3 EXECUTION

3.1 Installers
A Installer List
B Substitution Limitations
3.2 Examination
A Verification of Conditions
B Pre-installation Testing
C Evaluation and Assessment
3.3 Preparation
A Protection of In-place Condition
B Surface Preparation
C Demolition/ Removal
3.4 Installation
A Special Techniques
B Interface with Other Work
C System Integration

D Tolerances
3.5 Repair/ Restoration
3.6 Reinstallation
3.7 Field or Site Quality Control
A Field or Site Tests and Inspection
B Non-Conforming Work
C Manufacturer's Services
3.8 System Startup
3.9 Adjusting
3.10 Cleaning
A Waste Management
3.11 Closeout Activities
B Demonstration
C Training
3.12 Protection
3.13 Maintenance
3.14 Attachments

END OF SECTION

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PROJECT

REPLACEMENT GENERATOR/ENCLOSURE
CITY HALL COMPLEX BUILDING A
121 SW PORT ST. LUCIE BLVD.
PORT ST. LUCIE, FL 34984

SEAL

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REVISIONS

#	DATE	DESCRIPTION
1	.	

DRAWING INFO

PROJECT #:	6126
DRAWN BY :	PMD
DESIGNED BY :	PMD
CHECKED BY:	PMD/MKF
DATE :	6-3-20

SHEET NUMBER

SPECIFICATIONS

E-004

Specification
For
Service Entrance Automatic Transfer & Bypass-Isolation Switches

Division 26 - Electrical
Standby Power Generator Systems

PART 1 GENERAL

1.1 Scope

A. Furnish and install automatic transfer & bypass-isolation switch (ASCO 7AUB) system(s) 3 poles, 2000A, 480V, withstand and close-on ratings as shown on the plans. Each service entrance automatic transfer shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. All service entrance automatic transfer & bypass- isolation switches and controllers shall be the products of the same manufacturer.

B. Furnish an enclosure for the AUB that is for service entry. It shall provide all the proper disconnecting, protection, grounding and bonding required for service entrance equipment.

1.2 Codes and Standards

The service entrance automatic transfer and bypass-isolation switches and controls shall conform to the requirements of:

A. UL 1008 - Standard for Transfer Switch Equipment

B. IEC 947-6-1 Low-voltage Switchgear and Control gear; Multifunction equipment; Automatic Transfer Switching Equipment

C. NFPA 70 - National Electrical Code

D. NFPA 99 - Essential Electrical Systems for Health Care Facilities

E. NFPA 110 - Emergency and Standby Power Systems

F. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

G. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches

H. International Standards Organization ISO 9001:2008

I. UL 508 Industrial Control Equipment

J. UL 891 According to this UL standard the equipment shall be labeled: "Suitable for use only as service equipment."

1.3 Acceptable Manufacturers

A. Service entrance automatic transfer & bypass-isolation switches shall be ASCO CAT#: G07AUBA32000N5XM, 5L1, 18B, 18G, 31Z, 40NB, 44G, 82E, 119BG, 119M, 150B8 Series. Any alternate shall be submitted for approval to the consulting engineer at least 10 days prior to bid. Alternate bids must list any deviations from this specification.

B. Alternate manufacturers shall be reviewed and are subject to approval of engineer.

PART 2 PRODUCTS

2.1 Mechanically Held Transfer Switch

A. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include overcurrent disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.

B. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commodity of parts.

C. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.

D. All main contacts shall be silver composition. Switches rated 800 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.

E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 800 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.

F. 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.

G. Neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.

2.2 Bypass-Isolation Switch

A. A two-way bypass-isolation switch shall provide manual bypass of the load to either source and permit isolation of the automatic transfer switch from all source and load power conductors. All main contacts shall be manually driven.

B. Power interconnections shall be silver-plated copper bus bar. The only field installed power connections shall be at the service and load terminals of the bypass-isolation switch. All control inter-wiring shall be provided with disconnect plugs.

C. Separate bypass and isolation handles shall be utilized to provide clear distinction between the functions. Handles shall be permanently affixed and operable without opening the enclosure door. Designs requiring insertion of loose operating handles or opening of the enclosure door to operate are not acceptable.

D. Bypass to the load-carrying source shall be accomplished with no interruption of power to the load (make before break contacts). Designs which disconnect the load when bypassing are not acceptable. The bypass handle shall have three operating modes: "Bypass to Normal," "Automatic," and "Bypass to Emergency." The operating speed of the bypass contacts shall be the same as the associated transfer switch and shall be independent of the speed at which the manual handle is operated. In the "Automatic" mode, the bypass contacts shall be out of the power circuit so that they will not be subjected to fault currents to which the system may be subjected.

E. The isolation handle shall provide three operating modes: "Closed," "Test," and "Open." The "Test" mode shall permit testing of the entire emergency power system, including the automatic transfer switches with no interruption of power to the load. The "Open" mode shall completely isolate the automatic transfer switch from all source and load power conductors. When in the "Open" mode, it shall be possible to completely withdraw the automatic transfer switch for inspection or maintenance to conform to code requirements without removal of power conductors or the use of any tools.

F. When the isolation switch is in the "Test" or "Open" mode, the bypass switch shall function as a manual transfer switch.

G. Designs requiring operation of key interlocks for bypass isolation or ATS which cannot be completely withdrawn when isolated are not acceptable.

2.3 Microprocessor Controller

A. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.

B. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to ± 1% of nominal voltage. Frequency sensing shall be accurate to ± 0.2%. The panel shall be capable of operating over a temperature range of -20 to +60 degrees C and storage from -55 to +85 degrees C.

C. 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. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.

D. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.

E. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:

1.	EN 55011:1991	Emission standard - Group 1, Class A
2.	EN 50082-2:1995	Generic immunity standard, from which:
	EN 61000-4-2:1995	Electrostatic discharge (ESD) immunity
	ENV 50140:1993	Radiated Electro-Magnetic field immunity
	EN 61000-4-4:1995	Electrical fast transient (EFT) immunity
	EN 61000-4-5:1995	Surge transient immunity
	EN 61000-4-6:1996	Conducted Radio-Frequency field immunity
3.	IEEE472 (ANSI C37.90A) Ring Wave Test.	

2.4 Enclosure

A. The ATS shall be furnished in a Type 3RX 316 stainless steel double door enclosure

2.5 Disconnecting and Overcurrent Protection Device

A. ATS SHALL BE EQUIPPED WITH A 100% RATED SQUARE D SERVICE ENTRANCE RATED TYPE NW 2000A LSIG CIRCUIT BREAKER ON THE NORMAL SIDE OF THE TRANSFER SWITCH.

B. Service Entrance Circuit Breaker should be with Accessory 119M ERMS (Energy reduction maintenance switches) in order to meet NEC 2014 article 240.87 Arc Energy Reduction.

PART 3 OPERATIONS

3.1 Controller Display and Keypad

A. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:

1. Nominal line voltage and frequency
2. Single or three phase sensing
3. Operating parameter protection
4. Transfer operating mode configuration
   (Open transition)

All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

3.2 Voltage, Frequency and Phase Rotation Sensing

A. Voltage and frequency on both the normal and emergency sources (as noted below)

shall be continuously monitored, with the following pickup, dropout and trip setting capabilities (values shown as % of nominal unless otherwise specified):

Parameter	Sources	Dropout / Trip	Pickup / Reset
Undervoltage	N&E,3ϕ	70 to 98%	85 to 100%
Overvoltage	N&E,3ϕ	102 to 115%	2% below trip
Underfrequency	N&E	85 to 98%	90 to 100%
Overfrequency	N&E	102 to 110%	2% below trip
Voltage unbalance	N&E	5 to 20%	1% below dropout

B. Repetitive accuracy of all settings shall be within ± 0.5% over an operating temperature range of -20°C to 60°C.

C. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.

D. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).

E. Source status screens shall be provided for both normal & emergency to pro-vide digital readout of voltage on all 3 phases, frequency, and phase rotation.

F. The controller shall include a user selectable algorithm to prevent repeated transfer cycling to a source on an installation which experiences primary side, single phase failures on a Grounded Wye–Grounded Wye transformer which regenerates voltage when unloaded. The algorithm shall also inhibit retransfer to the normal (utility) source upon detection of a single phasing condition until a dedicated timer expires, the alternate source fails, or the normal source fails completely and is restored during this time delay period. The time delays associated with this feature shall be adjustable by the user through the controller keypad and LCD.

3.3 Time Delays

A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals.

B. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.

C. Two time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.

D. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.

E. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to

activate an adjustable 0 to 5 minute time delay in any of the following modes:

1. Prior to transfer only.
2. Prior to and after transfer.
3. Normal to emergency only.
4. Emergency to normal only.
5. Normal to emergency and emergency to normal.
6. All transfer conditions or only when both sources are available.

F. All time delays shall be adjustable in 1 second increments, except the extended parallel time, which shall be adjustable in .01 second increments.

G. All time delays shall be adjustable by using the LCD display and keypad or with a remote device connected to the serial communications port.

3.4 Additional Features

A. A three position momentary-type test switch shall be provided for the ***test/automatic/reset*** modes. The test position will simulate a normal source failure. The reset position shall bypass the time delays on either transfer to emergency or retransfer to normal.

B. A SPDT contact, rated 5 amps at 30 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.

C. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the AUB is connected to the normal source and one contact closed, when the AUB is connected to the emergency source.

D. LED indicating lights (16 mm industrial grade, type 12 type 12) shall be provided; one to indicate when the AUB is connected to the normal source (green) and one to indicate when the AUB is connected to the emergency source (red).

E. LED indicating lights (16 mm industrial grade, type 12) shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal and emergency sources, as determined by the voltage sensing trip and reset settings for each source.

The following features shall be built-in to the controller, but capable of being activated through keypad programming or the serial port only when required by the user:

F. Provide the ability to select "commit/no commit to transfer" to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.

G. Terminals shall be provided for a remote contact which opens to signal the AUB to

transfer to emergency and for remote contacts which open to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad or serial port.

H. An Inphase monitor shall be provided in the controller. 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 AUB manufacturer. The Inphase monitor shall be equal to ASCO Feature 27.

I. Engine Exerciser - The controller shall provide an internal engine exerciser. The engine exerciser shall allow the user to program up to seven different exercise routines. For each routine, the user shall be able to:

1. Enable or disable the routine.
2. Enable or disable transfer of the load during routine.
3. Set the start time:
   - time of day
   - day of week
   - week of month (1st, 2nd, 3rd, 4th, alternate or every)
4. Set the duration of the run.

At the end of the specified duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. A 10-year life battery that supplies power to the real time clock in the event of a power loss will maintain all time and date information.

K. System Status - The controller LCD display shall include a "System Status" screen which shall be readily accessible from any point in the menu by depressing the "ESC" key a maximum of two times. This screen shall display a clear description of the active operating sequence and switch position. For example,

Normal Failed
Load on Normal
TD Normal to Emerg
2min15s

Controllers that require multiple screens to determine system status or display "coded" system status messages, which must be explained by references in the operator's manual, are not permissible.

L. Self-Diagnostics - The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed.

M. Data Logging – The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory:

1. Event Logging

1. Data and time and reason for transfer normal to emergency.
2. Data and time and reason for transfer emergency to normal.
3. Data and time and reason for engine start.
4. Data and time engine stopped.
5. Data and time emergency source available.
6. Data and time emergency source not available.

2. Statistical Data

1. Total number of transfers.
2. Total number of transfers due to source failure.
3. Total number of days controller is energized.
4. Total number of hours both normal and emergency sources are available.

N. Communications Module – Shall provide remote interface module to support monitoring of vendor's transfer switch, controller and optional power meter. Module shall provide status, analog parameters, event logs, equipment settings & configurations over embedded webpage and open protocol. Features shall include:

1. Email notifications and SNMP traps of selectable events and alarms may be sent to a mobile device or PC. Modbus TCP/IP, SNMP, HTTP, SMTP open protocols shall be simultaneously supported.
2. Web app interface requiring user credentials to monitor and control the transfer switch supporting modern smart phones, tablets and PC browsers. User will be able to view the dynamic one-line, ATS controls status, alarms, metering, event logging as well as settings.
3. Secure access shall be provided by requiring credentials for a minimum of 3 user privilege levels to the web app, monitor (view only), control (view and control) and administrator (view, control and change settings). 128-Bit AES encryption standard shall be supported for all means of connectivity.
4. Shall allow for the initiating of transfers, retransfers, bypassing of active timers and the activating/deactivating of engine start signal shall be available over the embedded webpage and to the transfer switch vendor's monitoring equipment.
5. An event log displaying a minimum of ninety-nine (99) events shall be viewable and printable from the embedded webpages and accessible from supported open protocols.
6. Four (4) 100 Mbps Ethernet copper RJ-45 ports, five (5) serial ports, Termination dip-switches and LEDs for diagnostics.
7. DIN rail mountable.

This option shall be equivalent to ASCO accessory 72EE2

P. Power Meter – (feature bundle accessory 150B8).

The Power Meter shall conform to the requirements of:

1. UL 3111-1-Electrical Measuring and Testing Equipment
2. CAN/CSA-C22.2 No. 23-M89-CSA Safety Requirements for Electrical and Electronic Measuring and Test Equipment

3. The Power Meter shall be capable of operating without modification at a nominal frequency of 45 to 66Hz.

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COA No. 28666

PROJECT

REPLACEMENT GENERATOR/ENCLOSURE
CITY HALL COMPLEX BUILDING A
121 SW PORT ST. LUCIE BLVD.
PORT ST. LUCIE, FL 34984

SEAL

Pablo M. Diaz, PE FL #65597

REVISIONS

#	DATE	DESCRIPTION
1	.	

DRAWING INFO.

PROJECT #:	6126
DRAWN BY :	PMD
DESIGNED BY :	PMD
CHECKED BY:	PMD/MKF
DATE :	6-3-20

SHEET NUMBER

SPECIFICATIONS

E-005

4. The Power Meter shall be rated for an operating temperature of -4°F to 158°F and a storage temperature of -22°F to 176°F. and shall be rated for an 85% non-condensing, relative humidity.

5. The Power Meter shall accept inputs from industry standard instrument transformers (120 VAC secondary PT's and 5A secondary CT's). Direct phase voltage connections, 0 to 600VAC nominal, shall be possible without the use of PT's.

7. The Power Meter shall accept single, 3 phase, or three & four wire circuits. A fourth CT input shall be available to measure neutral or ground current. The Power Meter shall contain a built-in discrete contact to wire an ATS 14A auxiliary contact to indicate switch position.

8. The Power Meter shall accept AC voltage from the sensing lines for operation. Additional provisions shall be provided for external DC voltage input range 9-36 VDC with a nominal of 24 VDC.

9. The Power Meter shall be equipped with a continuous duty, long –life, 4 line x 20 character green backlit LCD

10. All setup parameters required by the Power Meter shall be stored in non-volatile memory and retained in the event of a control power interruption.

11. The Power Meter shall be flush mountable on a surface.

12. The Power Meter enclosure shall be sealed to IP-51 (NEMA 1) and the faceplate shall be sealed to IP-65 (NEMA 4). All push buttons shall be sealed tact switches.

13. The Power Meter shall send, when prompted, information to a central location equipped with a manufacturer supplied critical power management system or 3rd party monitor through manufacturer supplied communication modules. All 3rd party monitor must utilize industry standard open protocols Modbus/RTU.Modbus/TCP or SNMP.

14. An embedded RS-485 port will be provided which will enable communication at 9600, 19.2K, 38.4K, or 57.6K baud. DIP switches will be provided on the RS-485 port allowing a user to select 2-wire or 4-wire communication as well as the option to activate a terminating resistor on the port.

15. The Power Meter shall help facilities comply with NEC 220. It shall provide Maximum Demand calculations for the past 24 months, as per standards with 15 minute averages.

16. The following data will be available on the display and Modbus registers of the Power Meter:

- *Line-to-neutral voltages (V_{AN}, V_{BN}, and V_{CN})*
- *Line-to-neutral voltage average (V_{LNE})*
- *Line-to-line voltages (V_{AB}, V_{BC}, and V_{CA})*
- *Line-Line voltage average (V_{LLAVE})*
- *Current on each phase (I_A,I_B,and I_C)*
- *Current on the neutral conductor (I_N)*
- *Average current (I_{AVE})*
- *Active power, KW per phase and total (W_A,W_B,W_C, and WT)*
- *Apparent power, KVA per phase and total (V_{AA}, V_{AB}, V_{AC}, and V_{AT})*
- *KWHours importing, exporting and net (KWH_{IMP}, KWH_{EXP}, and KWH_{NET})*
- *KVARHours leading, lagging and net ($KVARH_{LEAD}$, KVARLAG, and KVARHNET)*
- *Power factor (PF)*
- *Signal Frequency (Hz)*
- *Digital Input*

17. The Power Meter shall offer an LCD which can display no less then nine different languages.

18. Displaying each of the metered values shall be done through the use of menu scroll buttons. There will be an escape button which will be used to take the user back to the previous page or to cancel a setting change. Pressing escape no more than three times will return the user to the home screen.

19. For ease of operator viewing, the display can be configured to remain on continuously, with no detrimental effect on the life of the Power Meter.

20. The display's contrast shall be configurable in intervals of 10% (ranging 0%-100%).

21. Setup of a system requirements shall be allowed from the front of the Power Meter.

PART 4 ADDITIONAL REQUIREMENTS

5.1 Withstand and Closing Ratings

A. The ATB shall be rated to close on and withstand the available RMS symmetrical short circuit current at the AUB terminals with the type of overcurrent protection shown on the plans.

B. The ATB shall be UL listed in accordance with UL 1008 and be labeled in accordance with .025 and .050 second time based ratings, or appropriate short time rating(s) as applicable ATB's which are not tested and labeled with .025 and .050 time based ratings, or appropriate short time rating(s) and have series, or specific breaker ratings only, are not acceptable.

5.2 Tests and Certification

A. The complete AUB 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, 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 AUB manufacturer shall be certified to ISO 9001:2008 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 9001:2008

C. The transfer switch system must contain a disconnect device on the normal source as well as a disconnect link on the utility neutral and a disconnect link between neutral and ground. The AUB manufacturer shall be certified to NEC 230.70, 230.70(B), 230.75 and 230.95.

5.3 Service Representation

A. The AUB 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. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

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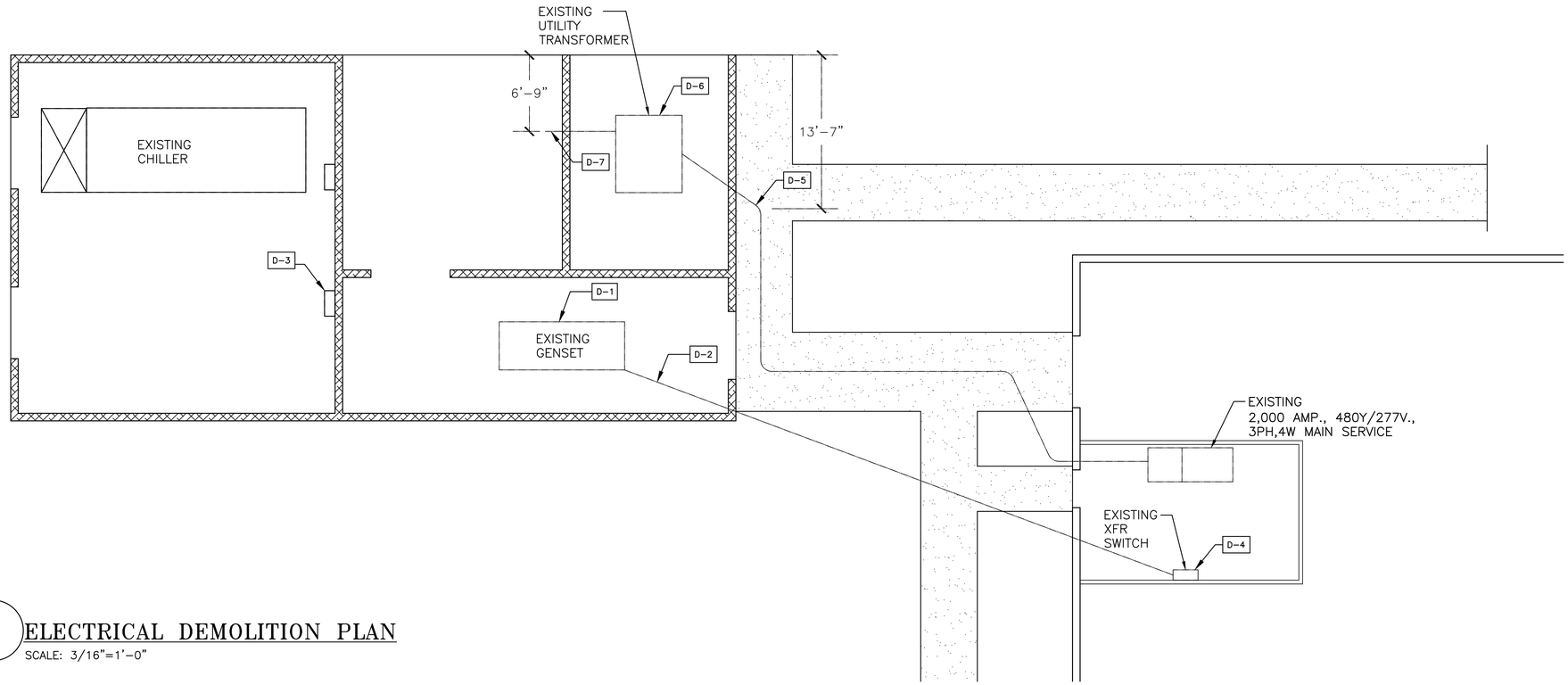
SPECIFICATIONS

E-006



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ELECTRICAL DEMOLITION PLAN

SCALE: 3/16"=1'-0"

DEMOLITION NOTES:

D-1 REMOVE EXISTING 250 KW ONAN GENERATOR AND SUB-BASE TANK AND RETURN TO OWNER. EXISTING REMOTE ANNUNCIATOR PANEL IN LOBBY SHALL BE DISCONNECTED AND RETURNED TO OWNER.

D-2 GENERAL ROUTING OF EXISTING EMERGENCY FEED CONDUIT AND CONDUCTORS AS WELL AS CONTROL CONDUCTORS, BATTERY CHARGER AND JACKET WARMER CONNECTED TO GENERATOR. FIELD VERIFY. ELECTRICAL CONTRACTOR SHALL REMOVE CONDUCTORS FROM GENERATOR TO EXISTING TRANSFER SWITCH AND RETURN TO OWNER. DURING INSTALLATION OF NEW GENERATOR, COORDINATE REUSING THESE CONDUITS TO ROUTE BATTERY CHARGER, BATTERY WARMER AND JACKET HEATER CONDUCTORS TO NEW GENERATOR IF PRACTICABLE. IF THE EXISTING CONDUIT IS NOT PRACTICAL TO USE, COORDINATE PLUGGING AND SEALING EXISTING CONDUITS. IF EXCAVATION WORK REVEALS THAT IT IS PRACTICABLE TO REMOVE CONDUITS, THEN THESE SHALL BE REMOVED. COORDINATE WORK WITH NEW EQUIPMENT AND NEW CONDUITS.

D-3 EXISTING 400 AMP. SAFETY SWITCH SHALL BE REMOVED AND RETURNED TO OWNER. THE EXISTING CONDUCTORS, IF PRESENT, SHALL BE REMOVED AT SOURCE AND RETURNED TO OWNER FOR RECYCLING. EXISTING CONDUIT SHALL BE CUT AT GRADE AND SEALED.

D-4 EXISTING 400 AMP., AUTOMATIC TRANSFER SWITCH. DURING RELOCATION OF UTILITY TRANSFORMER, THE EXISTING TRANSFER SWITCH SHALL BE CABLED TO A PORTABLE 250kW GENERATOR. ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY BARRIERS TO PROTECT UNAUTHORIZED PERSONS FROM COMING IN CONTACT WITH ENERGIZED CONDUCTORS AND EQUIPMENT. AFTER NEW GENERATOR AND NEW TRANSFER SWITCH ARE CONNECTED AND FUNCTIONAL, THEN THIS EXISTING SWITCHING MECHANISM SHALL BE REMOVED FROM TRANSFER SWITCH AND RETURNED TO OWNER. NORMAL POWER CONDUCTORS SHALL BE PERMANENTLY BONDED TOGETHER TO LOAD SIDE CONDUCTORS INSIDE EXISTING ENCLOSURE. ALL LABELS IDENTIFIYING EQUIPMENT AS TRANSFER SWITCH SHALL BE REMOVED.

D-5 APPROXIMATE DIMENSIONS LOCATING EXISTING BURIED ELECTRICAL SECONDARY CONDUCTORS AS PROVIDED BY FPL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL HAND DIG TO DETERMINE EXACT LOCATION AND PREVENT DAMAGE. IN THE EVENT PRECISE LOCATION CANNOT BE DETERMINED, ELECTRICAL CONTRACTOR SHALL NOTIFY FPL IMMEDIATELY. COORDINATE BUILDING SHUT-DOWN WITH FLORIDA POWER AND LIGHT AS WELL AS OWNER. AFTER DE-ENERGIZING UTILITY TRANSFORMER, REMOVE SECONDARY CONDUCTORS FROM EXISTING CONDUITS. INTERCEPT CONDUIT AFTER CAREFUL EXCAVATION AND REROUTE PORTION FROM UTILITY TRANSFORMER TO NEW EQUIPMENT. RE-USE UNDISTURBED CONDUIT TO THE GREATEST EXTENT PRACTICABLE.

D-6 FLORIDA POWER AND LIGHT SHALL RELOCATE TRANSFORMER. MAINTAIN REQUIRED CLEARANCES AFTER WALL IS MOVED UNDER SCOPE OF NEW WORK. PLEASE REFER TO NEW WORK PLAN FOR ADDITIONAL INFORMATION.

D-7 APPROXIMATE LOCATION OF BURIED EXISTING ELECTRICAL UTILITY PRIMARY CONDUCTORS.

GENERAL DEMOLITION NOTES:

1. REMOVE GENERATOR, SUB-BASE DIESEL FUEL TANK, UNUSED FUEL AND APPURTENANCES. ALL FEES FOR REMOVAL AND DISPOSAL, IF NECESSARY SHALL BE INCLUDED IN BID.
2. VISIT AND CAREFULLY EXAMINE THOSE PORTIONS OF THE SITE AND/OR PRESENT BUILDING AFFECTED BY THIS WORK SO, AS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK BEFORE SUBMITTING PROPOSALS. SUBMISSION OF PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT, OR MATERIALS REQUIRED, BECAUSE OF DIFFICULTIES ENCOUNTERED, WHICH COULD HAVE BEEN FORESEEN HAD SUCH EXAMINATION BEEN MADE, WILL NOT BE RECOGNIZED.
3. LEGALLY DISPOSE OF ALL MATERIAL AND EQUIPMENT AS DIRECTED BY THE OWNER. EQUIPMENT TO BE SALVAGED SHALL BE DELIVERED TO THE OWNER AT LOCATION AS DIRECTED.

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DATE :	6-3-20

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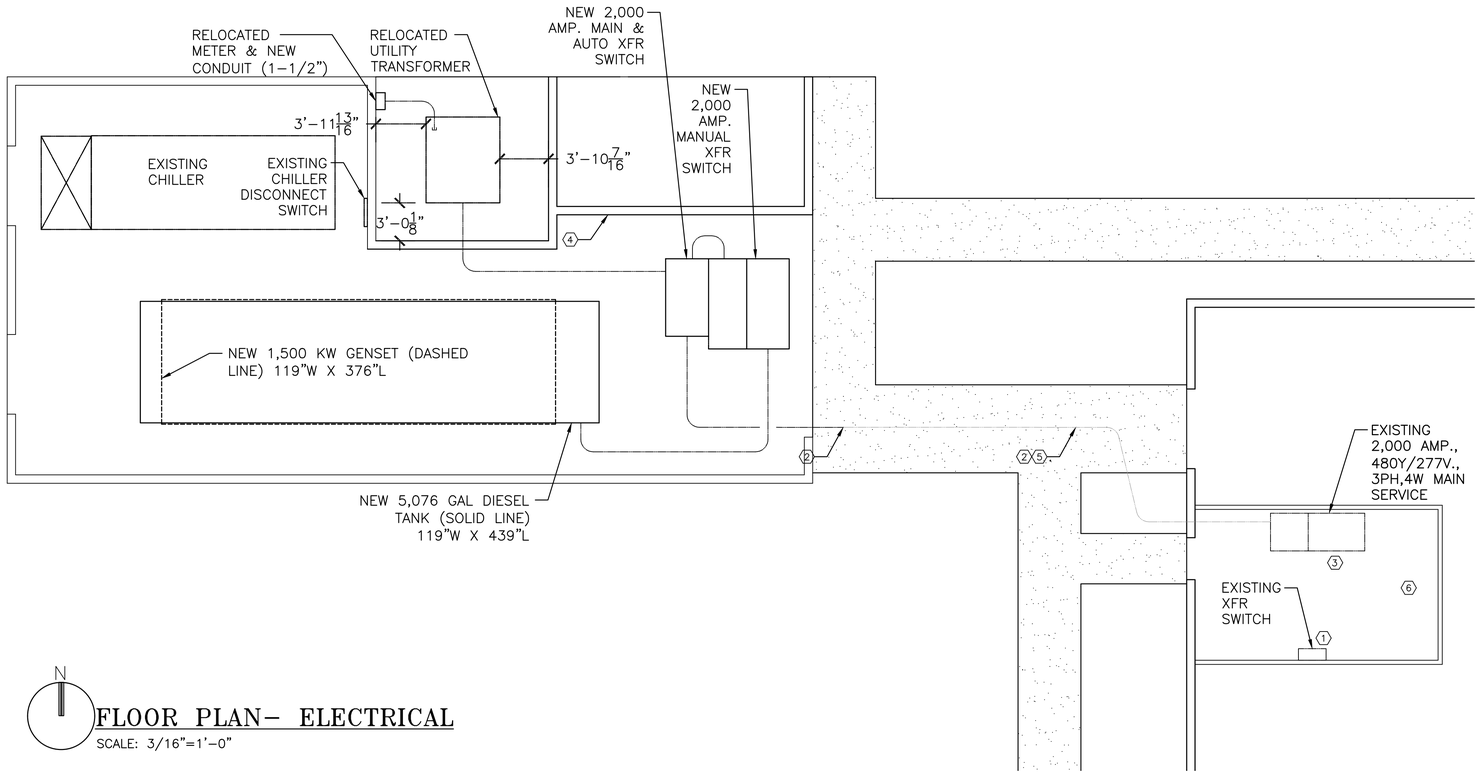
DEMOLITION PLAN

ED-100



FLOOR PLAN- ELECTRICAL

SCALE: 3/16"=1'-0"

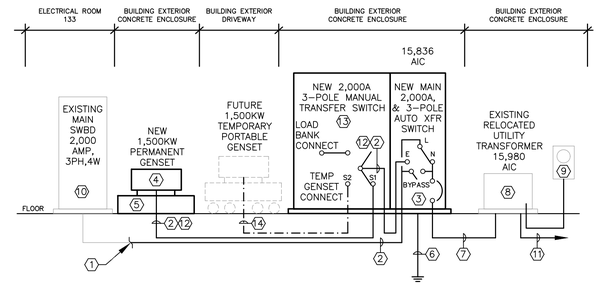
PLAN - KEYED NOTES: (#)

1. EXISTING 400 AMP. 3 POLE TRANSFER SWITCH. SWITCH SHALL REMAIN IN SERVICE DURING CONSTRUCTION TO PROVIDE EMERGENCY TRANSFER. AFTER CONSTRUCTION OF NEW GENERATOR AND NEW TRANSFER SWITCH IS COMPLETE, REMOVE EXISTING TRANSFER MECHANISM AND ALL RELATED CONTROL WIRING AND CONTROLS AND RETURN TO OWNER. THE NORMAL FEED CONDUCTORS FROM THE MAIN SWITCHBOARD SHALL BE PERMANENTLY BONDED TO THE LOAD CONDUCTORS WITH TAP BLOCKS. POLARIS OR ILSCO. THE EMERGENCY CONDUCTORS FROM THE GENERATOR SHALL BE REMOVED AND RETURNED TO OWNER.
2. APPROXIMATE LOCATION OF SERVICE ENTRANCE CONDUIT AND CONDUCTORS. EXCAVATION IN THESE AREAS SHALL BE BY HAND TO THE EXTENT PRACTICABLE SO AS TO RE-USE EXISTING CONDUIT AND CONDUCTORS ENTERING EXISTING ELECTRICAL ROOM TO THE GREATEST EXTENT PRACTICABLE.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL NEW CONDUIT, NEW CONDUCTORS AND (2) NEW 30 AMP., 2 POLE BREAKERS IN EXISTING PANEL E1 IN EXISTING ELECTRICAL ROOM TO PROVIDE POWER TO (2) 6000W BLOCK HEATERS. BATTERY CHARGER CIRCUITS, CONDUIT AND CONDUCTORS THAT PREVIOUSLY SERVED EXISTING GENERATOR BATTERY CHARGER MAY BE RE-USED TO SERVE NEW GENERATOR TO THE GREATEST EXTENT PRACTICABLE.
4. EXISTING LIGHTING AND RECEPTACLES LOCATED ON THESE WALLS SHALL BE REMOVED, RELOCATED AND RE-INSTALLED AFTER NEW WALLS ARE CONSTRUCTED. EXTEND CONDUIT AND CONDUCTORS AS REQUIRED.
5. PROVIDE AND INSTALL CONDUIT FOR GENERATOR CONTROLS TO MATCH EXISTING CONTROLS CONDUIT DIAMETER. EXTEND AS NEEDED. PROVIDE AND INSTALL (1) BELDEN 9841 AND (6) #14 THHN CU TO LOCATION OF NEW KOHLER RSA SERIAL REMOTE ANNUNCIATOR PANEL IN LOBBY.
6. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL DELAY ON MAKE RELAYS AT ELEVEN (11) PIECES OF EQUIPMENT. RELAY SHALL OPERATE ON CONTROL VOLTAGE, SIMILAR TO LITTLEFUSE KRPS SERIES. EACH RELAY SHALL BE INSTALLED IN THE CONTROLS CIRCUIT AND SET FOR A DELAY 15 SECONDS APART FROM THE NEXT RELAY, STARTING WITH A 30 SECOND MINIMUM. THIS SHALL ENSURE THAT ALL LOADS DO NOT ENERGIZE SIMULTANEOUSLY UPON THE STARTUP OF THE EMERGENCY GENERATOR. FOR EXAMPLE, THE FIRST PIECE OF EQUIPMENT WILL ENERGIZE AFTER 30 SECONDS OF THE GENERATOR STARTUP. THE NEXT PIECE OF EQUIPMENT AFTER 45 SECONDS AND SO ON. EQUIPMENT IS AS FOLLOWS:

1. CH-1
2. P1/P2
3. P3/P4
4. AHU-1
5. AHU-2
6. AHU-3
7. AHU-4
8. AHU-5
9. AHU-6
10. OA-1
11. OA-2

POWER DISTRIBUTION RISER DIAGRAM KEYED NOTES:

1. EXISTING 2,000 AMP. SERVICE ENTRANCE CONDUCTORS. COORDINATE WITH FLORIDA POWER AND LIGHT. DE-ENERGIZE EXISTING UTILITY TRANSFORMER. REMOVE EXISTING CONDUCTORS FROM EXISTING UTILITY TRANSFORMER TO EXISTING SWITCHBOARD AND PLACE CONDUCTORS IN STORAGE PROTECTED FROM THE ELEMENTS. INTERCEPT SIX (6) SETS OF 3" CONDUITS AND RE-ROUTE, EXTEND CONDUIT TO NEW MAIN/AUTOMATIC TRANSFER SWITCH AS SHOWN IN FLOOR PLAN ON THIS SHEET.
2. NEW 2,000 AMP., 3 PHASE UNDERGROUND SERVICE ENTRANCE CONDUCTORS - SIX (6) SETS OF 4 NO 400 KCMIL THWN CU CONDUCTORS AND ONE (1) 250 KCMIL THWN CU EQUIPMENT GROUND EACH IN A 3" CONDUIT.
3. NEW 2,000 AMP., MAIN WITH 3 POLE, 480VAC, 22,000 AIC, AUTOMATIC TRANSFER SWITCH WITH MAINTENANCE BYPASS IN NEMA 3RX TYPE 316 STAINLESS STEEL ENCLOSURE. SET COMIT TO TRANSFER DELAY TO 3 SECONDS MAXIMUM. BASIS OF DESIGN IS ASCO CAT NO: 007AUBA32000N5XM, 5L1, , 18B,18G, 31Z, 40NB, 44G, 82E, 119BG, 119M, 150BB, 41"W X 74"D X 99.58"H, 31Z (PRE-SIGNAL CONTACTS), 150B8 (PM8000 POWER QUALITY METER WITH CT'S ON LOAD SIDE, RIDE THROUGH MODULE AND MODBUS COMMUNICATION CAPABILITY OR EQUIVALENT BY KOHLER. NEUTRAL AND SERVICE GROUNDING ELECTRODE CONDUCTOR SHALL BE SOLIDLY BONDED WITHIN THIS ENCLOSURE. SEE GENERAL NOTES, SECTION 54 ON SHEET E-002 AND SPECIFICATION ON SHEETS E-005 AND E-006.
4. NEW 1,500KW DIESEL EMERGENCY GENERATOR WITH 480Y/277V., 3 PHASE, 4 WIRE SECONDARY VOLTAGE AND GENERATOR MOUNTED 2,000 AMP., 3 POLE MAIN BREAKER AND EMERGENCY STOP STATION. GENERATOR SHALL SUPPLY LOADS IN 10 SECONDS OR LESS. SEE BASIS OF DESIGN KOHLER SIZING REPORT AND SPECIFICATIONS ON SHEET E-101, E-102 OR EQUIVALENT BY CATERPILLAR.
5. DIESEL TANK SIZED FOR 48 HOURS RUN TIME. APPROXIMATELY 5,076 GALLONS. TANK SHALL BE PRESSURE TESTED PRIOR TO FILLING WITH FUEL. PROVIDE WITH FILL SPILL HARDWARE.
6. NEW GROUNDING SYSTEM. SERVICE GROUNDING ELECTRODE CONDUCTOR - ONE (1) 3/0 THWN CU BONDED TO THREE (3) 3/4" DIAMETER X 10'-0" LONG COPPER-CLAD GROUND RODS SPACED NOT LESS THAN 6'-0" APART.
7. NEW 2,000 AMP., 3 PHASE UNDERGROUND SERVICE-LATERAL CONDUCTORS - SIX (6) SETS OF 4 NO 400 KCMIL THWN CU EACH IN A 3" CONDUIT.
8. EXISTING RELOCATED 750KVA FLORIDA POWER AND LIGHT TRANSFORMER. FAULT CURRENT AT SECONDARY BUSHINGS IS 15,980 AIC. SEE FLOOR PLAN THIS SHEET FOR NEW LOCATION AND SHEET ED-100 FOR PRESENT LOCATION PRIOR TO NEW WORK.
9. EXISTING INSTRUMENT RATED METER AND METER BASE. RELOCATE METER BASE, CONDUIT, CURRENT TRANSFORMERS AND CABLING AS REQUIRED WHEN TRANSFORMER IS RELOCATED.
10. EXISTING BOND BETWEEN UNGROUNDED CONDUCTOR (NEUTRAL) AND SERVICE GROUNDING ELECTRODE CONDUCTOR SHALL BE REMOVED SUCH THAT NEUTRAL CONDUCTOR IS SEPARATE FROM GROUNDING SYSTEM. NEW BONDING POINT WILL BE AT NEW MAIN ON BUILDING EXTERIOR. SEE NOTE 3 THIS SHEET.
11. RELOCATED PRIMARY CONDUIT AND CONDUCTORS BY FLORIDA POWER AND LIGHT. COORDINATE WORK WITH NATE HOLZMACHER AT (772) 337-7013 AND NATE.HOLZMACHER@FPL.COM.
12. PROVIDE AND INSTALL 3/4" SCH 40 PVC WITH 2#14 THHN CU FOR GENERATOR STARTING.
13. NEW 2,000 AMP., 480VAC, MANUAL TRANSFER SWITCH WITH PORTABLE GENERATOR CONNECTION TERMINALS AND LOAD BANK CONNECTION IN NEMA 3RX TYPE 316 STAINLESS STEEL ENCLOSURE. SEE GENERAL NOTES, SECTION 55 ON SHEET E-002 AND DETAILS ON SHEET E-003.
14. PROVIDE 2,000 AMP., 3 PHASE TEMPORARY FLEXIBLE CABLES (PHASE, NEUTRAL AND GROUND) WITH PLUGS COMPATIBLE WITH MANUAL TRANSFER SWITCH RECEPTACLES FOR TEMPORARY GENERATOR HOOK-UP. COORDINATE WITH OWNER TO PROVIDE STORAGE WITH PROTECTION FROM ELEMENTS.



POWER DISTRIBUTION RISER DIAGRAM

NOT TO SCALE

CONSULTANT

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ELECTRICAL PLAN, RISER AND DETAILS

E-100

KOHLER. Power Systems — Sizing Report

Project information

Project name: Port St Lucie CH Generator
Customer's name: Beed Engineering
Customer contact: Michael Frempong

Site requirements

Voltage:	277/480	Application:	Local Government
Phase:	3	Emissions Requirement:	Stationary emergency (US EPA)
Frequency:	60Hz	Altitude:	500 Feet
Alt. Temp. Rise Duty:	130°C Standby	Max. Ambient Temp.:	77 Degrees F
Qty of Gensets:	1	Min. Genset Loading :	25 %
Fuel type:	Diesel	Max. Genset Loading :	90 %
Country :	United States		

Site load requirements summary

Running kW:	1,257.86	Max. Starting kW:	597.87 in step 1
Running kVA:	1,361.67	Max. Starting kVA:	1,456.30 in step 4
Running P.F.:	0.92		

Generator selection

Genset Model:	KD1500	Alternator:	KH03850T O4D	Rated kW :	1,500.00
Engine:	KD45V20	Alternator Leads:	12	Site Rated kW :	1,500.00
Emission level:	EPA Tier 2	Alt. Starting kVA at 35% V dip:	5,351.00	UL 2200 Certified	
BHP:	2,218.00	Cal Alt Temp rise with site loads:	105C		
Displacement:	2,746.00	Excitation System :	PMG		
RPM:	1800				

Generator Performance Summary

Voltage Dip Limit:	30.00 %	Calculated Voltage Dip:	17.03 %
Frequency Dip Limit:	10.00 %	Calculated Frequency Dip:	3.62 %
Harmonic Distortion Limit:	10.00 %	Calculated Harmonic Distortion:	3.57 %
		Calculated Genset % Loaded:	83.86 %

Report prepared by: Pablo Diaz

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS

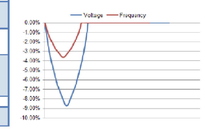
Software version: 1.0033.5.109 Thursday, June 11, 2020

KOHLER. Power Systems — Sizing Report

Model : KD1500, Alternator : KH03850T04D

Load Profile

Step # 1	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Misc. Linear Load Receptacles 3 Phase	1	309.12	309.12	1.00	309.12	309.12	1.00			
Misc. Linear Load Water Heaters 3 Phase	1	27.54	27.54	1.00	27.54	27.54	1.00			
Lighting Lighting Evenly distributed Fluorescent Std Electronic	1	261.21	435.35	0.60	261.21	435.35	0.60			
Step Total		597.87	691.92	0.86	597.87	691.92	0.86	8.70	3.62	3.17
Cum.Total		597.87	691.92	0.86						



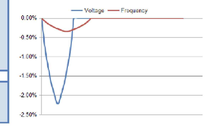
Report prepared by: Pablo Diaz

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS

Software version: 1.0033.5.109 Thursday, June 11, 2020

KOHLER. Power Systems — Sizing Report

Step # 2	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Elevator Elevator No 1 30.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line Regenerative drive : No	1	25.15	30.30	0.83	73.19	178.50	0.41			
Step Total		25.15	30.30	0.83	73.19	178.50	0.41	2.21	0.34	3.17
Cum.Total		622.02	722.15	0.86						



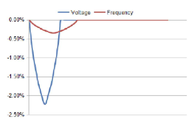
Report prepared by: Pablo Diaz

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS

Software version: 1.0033.5.109 Thursday, June 11, 2020

KOHLER. Power Systems — Sizing Report

Step # 3	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Elevator Elevator No 2 30.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line Regenerative drive : No	1	25.15	30.30	0.83	73.19	178.50	0.41			
Step Total		25.15	30.30	0.83	73.19	178.50	0.41	2.22	0.34	3.17
Cum.Total		648.16	752.99	0.86						



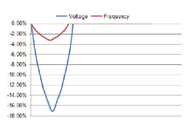
Report prepared by: Pablo Diaz

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS

Software version: 1.0033.5.109 Thursday, June 11, 2020

KOHLER. Power Systems — Sizing Report

Step # 4	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Air Conditioning Chiller No 2 3 Phase across the line	1	115.38	131.12	0.88	241.45	862.31	0.28			
Motor Pumps 1 & 2 20.00 HP 3 Phase Motor code : G Loaded NEMA Design VFD	1	18.84	20.93	0.90	18.84	20.93	0.90			
Motor Pumps 3 & 4 7.50 HP 3 Phase Motor code : G Loaded NEMA Design VFD	1	7.45	8.27	0.90	7.45	8.27	0.90			
Motor AHU-1 7.50 HP 3 Phase Motor code : G Loaded NEMA Design across the line	1	6.70	8.66	0.77	22.76	44.63	0.51			
Motor AHU-2 15.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line	1	12.94	16.44	0.79	41.95	89.25	0.47			



Report prepared by: Pablo Diaz

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS

Software version: 1.0033.5.109 Thursday, June 11, 2020

KOHLER. Power Systems — Sizing Report

Step # 4	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Motor AHU-3 20.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line	1	16.95	20.93	0.81	53.55	119.00	0.45			
Motor AHU-4 15.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line	1	12.94	16.44	0.79	41.95	89.25	0.47			
Motor AHU-5 20.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line	1	16.95	20.93	0.81	53.55	119.00	0.45			
Motor AHU-6 10.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line	1	8.78	11.25	0.78	29.75	59.50	0.50			

Report prepared by: Pablo Diaz

TOTAL SYSTEM INTEGRATION
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PROJECT

REPLACEMENT GENERATOR/ENCLOSURE
CITY HALL COMPLEX BUILDING A
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PORT ST. LUCIE, FL 34984

SEAL

Pablo M. Diaz, PE FL #65597

REVISIONS

#	DATE	DESCRIPTION
1		

DRAWING INFO

PROJECT #:	6126
DRAWN BY :	PMD
DESIGNED BY :	PMD
CHECKED BY:	PMD/MKF
DATE :	6-3-20

SHEET NUMBER

GENERATOR SIZING REPORT

E-500

KOHLER Power Systems — Sizing Report

Step # 4	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Motor OAU 10.00 HP 3 Phase Motor code : G Loaded NEMA Design across the line	1	8.78	11.25	0.78	29.75	59.50	0.50			
Step Total		225.70	265.28	0.85	540.99	1,466.30	0.37	17.03	8.20	3.57
Cum.Total		871.87	1,017.64	0.86						

Report prepared by: Pablo Diaz

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS

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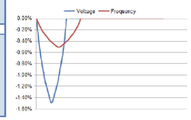
KOHLER Power Systems — Sizing Report

Step # 5	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Misc. Linear Load VAV group 1 Phase A-B	1	106.33	106.33	1.00	106.33	106.33	1.00			
Step Total		106.33	106.33	1.00	106.33	106.33	1.00	1.40	0.51	3.57
Cum.Total		560.20	1,110.28	0.88						



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TOTAL SYSTEM INTEGRATION
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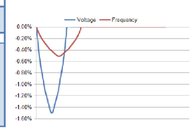
KOHLER Power Systems — Sizing Report

Step # 6	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Misc. Linear Load VAV group 2 Phase B-C	1	106.33	106.33	1.00	106.33	106.33	1.00			
Step Total		106.33	106.33	1.00	106.33	106.33	1.00	1.50	0.51	3.57
Cum.Total		1,084.53	1,205.13	0.90						



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TOTAL SYSTEM INTEGRATION
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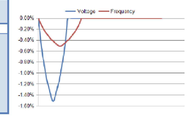
KOHLER Power Systems — Sizing Report

Step # 7	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Misc. Linear Load VAV group 3 Phase A-C	1	106.33	106.33	1.00	106.33	106.33	1.00			
Step Total		106.33	106.33	1.00	106.33	106.33	1.00	1.51	0.51	3.57
Cum.Total		1,191.86	1,311.46	0.92						



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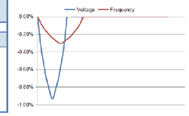
KOHLER Power Systems — Sizing Report

Step # 8	Qty	Run kW	Run kVA	Run PF	Start kW	Start kVA	Start PF	Volt Dip %	Freq Dip %	Volt. Dist. %
Misc. Linear Load Fan Powered VAV Boxes 3 Phase	1	65.00	65.00	1.00	65.00	65.00	1.00			
Step Total		65.00	65.00	1.00	65.00	65.00	1.00	0.95	0.50	3.57
Cum.Total		1,257.86	1,361.63	0.92						
Grand Total		1,257.86	1,361.67	0.92				17.03	3.82	3.57



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GENERATOR SIZING REPORT

E-501