FINAL DOCUMENTS

For the Construction of the

CEDAR BAY
WATER RECLAMATION FACILITY
BACK UP POWER SYSTEM

PROJECT LOCATION
1840 CEDAR BAY RD
JACKSONVILLE, FL 32218

LOCATION MAP

JEA
Building Community

VOLUME 1 OF 1
DRAWINGS

For Information regarding this project contact:

OLIVER DOMINGO
21 WEST CHURCH ST
JACKSONVILLE, FL 32202
904-665-6325

ch2m
CH2M HILL ENGINEERS, INC., A WHOLLY OWNED SUBSIDIARY OF JACOBS ENGINEERING GROUP INC.

245 RIVERSIDE AVENUE, SUITE 300
JACKSONVILLE, FLORIDA 32202
STATE OF FLORIDA

JEA No. XXXXXXX

JACOBS Proj No. 705890

MARCH 2020

GENERAL

	DWG NO	TITLE
01	G-00-002	INDEX OF DRAWINGS

CIVIL

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03	C-05-001	OVERALL SITE PLAN
04	C-05-101	DEMOLITION PLAN
05	C-05-201	ENLARGED SITE PLAN
06	C-05-202	ENLARGED PLAN
07	C-99-501	STANDARD DETAILS

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09	S-99-501	STANDARD DETAILS
10	S-99-502	STANDARD DETAILS
11	S-99-503	STANDARD DETAILS

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43	E-80-611	SIMPLIFIED OVERALL SINGLE LINE DIAGRAM
44	E-99-501	STANDARD DETAILS
45	E-99-502	STANDARD DETAILS

NO.	DATE	REVISION	BY	APVD
DSGN	D GARCIA	DR W POGUE CHK S RILEY	D GARCIA	APVD

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643 SW 4TH AVE, SUITE 400
GAINESVILLE, FLORIDA 32601

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CEDAR BAY - WATER SYSTEM RESILIENCY PLA

JEA
JACKSONVILLE, FLORIDA

GENERAL
INDEX OF DRAWINGS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
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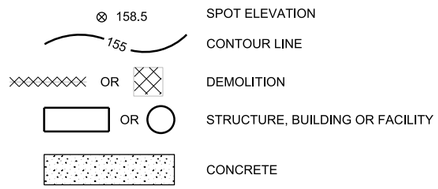
EXISTING SURVEY LEGEND

☼	METAL LIGHT POLE
○	METAL POLE
⋈	WATER VALVE
BFP	BACK FLOW PREVENTER
BOC	BACK OF CURB
CLF	CHAIN LINK FENCE
CONC	CONCRETE
D	DRAIN LINE
DIA	DIAMETER
E	ELECTRIC LINE
EA	EDGE OF ASPHALT
ELEV	ELEVATION
ELEC	ELECTRIC
HB	HOSE BIB
MLP	METAL LIGHT POLE
MO	MISCELLANEOUS ORNAMENTAL
MP	METAL POST
NAVD	NORTH AMERICAN VERTICAL DATUM
R	RADIUS
FM	FORCE MAIN
SW	SLUDGE WASTE
SV	SANITARY VALVE
UNK	UNKNOWN LINE

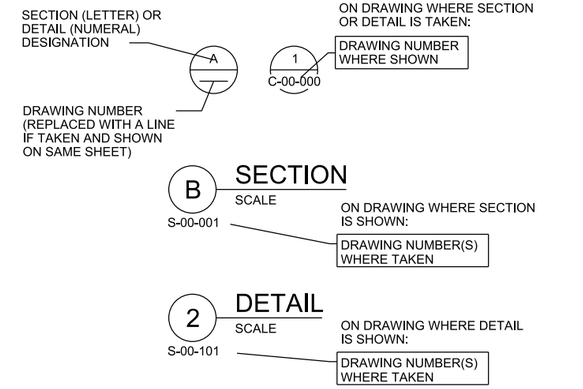
CIVIL LEGEND



GENERAL SITE NOTES:

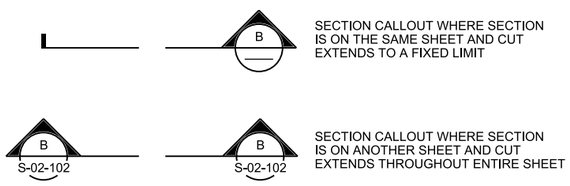
1. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS ARE BASE MAPS PROVIDED BY R.E. HOLLAND AND ASSOCIATES, INC. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
2. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY-LINED.
3. HORIZONTAL DATUM: FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, 1983 NORTH AMERICAN DATUM, 2011 ADJUSTMENT, US SURVEY FEET.
4. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). REFERENCE BENCHMARK ST JOHNS RIVER WATER MANAGEMENT DISTRICT BENCHMARK 04-026-0-01: 4"x4" PRECAST CONCRETE MONUMENT WITH SJRWMD DISK (BEGINNING AT THE INTERSECTION OF US HIGHWAY 17 AND CEDAR BAY ROAD IN JACKSONVILLE, HEAD EAST ON CEDAR BAY ROAD FOR 2.2 MILES TO THE STATION ON THE RIGHT. THE MARK IS 1.2 FEET EAST OF A 6' CHAIN LINK FENCE, 11.8' WET OF THE WEST EDGE OF CEDAR BAY ROAD, 56.4 SOUTHWEST FROM WOOD POWER POLE #1766B, AND 210.0 FEET NORTHWEST OF A WOOD POWER POLE #1766C) ELEV.: 13.26 NAVD 88 (ADJUSTED FROM NGVD 29 DATUM 14.316)
   ST JOHNS RIVER WATER MANAGEMENT DISTRICT BENCHMARK 04-027-0-01: 4"X4" PRECAST CONCRETE MONUMENT WITH SJRWMD DISK (BEGINNING AT THE INTERSECTION OF US HIGHWAY 17 AND CEDAR BAY ROAD IN JACKSONVILLE, HEAD EAST ON CEDAR BAY ROAD FOR 2.1 MILES TO A DIRT ROAD ON THE RIGHT, HEAD WEST ALONG DIRT ROAD FOR 0.2 MILES TO THE STATION. THE MARK IS IN THE MIDDLE OF THE DIRT ROAD, 1.0 FEET EAST OF A 6' CHAIN LINK FENCE, 56.4 FEET SOUTHWEST OF MONITORING WELL TFMW#1, AND 50.4 FEET SOUTHEAST FROM A FENCE CORNER) ELEV.: 21.867 NAVD 88 (ADJUSTED FROM NGVD 29 DATUM 22,923)
5. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
6. COORDINATES AND DIMENSIONS SHOWN FOR ROADWAY IMPROVEMENTS ARE TO FACE OF CURB OR EDGE OF PAVEMENT.
7. CONTRACTOR TO COORDINATE WITH JEA REGARDING LOCATION OF STAGING AREA FOR CONTRACTOR'S EMPLOYEE PARKING, CONTRACTOR'S TRAILERS AND ON-SITE STORAGE OF MATERIALS.
8. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN.
9. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
10. ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE SHALL BE COVERED WITH GRASS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION.
12. IF NEEDED, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR THE CAD FILE FOR CONSTRUCTION LAYOUT.
13. REQUIREMENTS FOR CONSTRUCTION SEQUENCING, STARTUP AND SUBSTANTIAL COMPLETION ARE DEFINED IN SECTIONS 01 31 13 PROJECT COORDINATION.

SECTION / DETAIL DESIGNATIONS

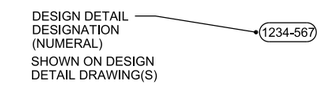


DRAWING TITLE
SCALE

ON DRAWING WHERE ONLY A TITLE IS REQUIRED WITH NO REFERENCE (eg: ELEVATIONS)



DESIGN DETAIL DESIGNATION



NOTES:

1. ALL DESIGN DETAILS ARE TYPICAL AND MUST BE USED IF DESIGN DETAIL DESIGNATION IS NOT SHOWN
2. THE TERM STANDARD DETAIL, OR A FORM OF IT, IS SYNOMONOUS WITH DESIGN DETAIL. THE DESIGN DETAILS REPRESENT THE CHARACTER AND NATURE OF THE WORK REQUIRED THROUGHOUT THE PROJECT. ALL ASSOCIATED WORK SHALL BE IN ACCORDANCE WITH THE DESIGN DETAILS SHOWN WHETHER THE DETAILS ARE SPECIFICALLY REFERENCED OR NOT.

NO.	DATE	DSGN	REVISION	BY	APVD
		O JOHN	C CHILDRESS	DR	CHK
			A MALONE		APVD
			R MORRISON		APVD

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CEDAR BAY - WATER SYSTEM RESILIENCY PLA

JEA
JACKSONVILLE, FLORIDA

GENERAL

GENERAL AND CIVIL LEGEND

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	C-00-001
SHEET	2 of 45

FINAL DOCUMENT

NO.	DATE	DR	REVISION	CHK	BY	APVD
DSGN		O JOHN	C CHILDRESS	A MALONE	R MORRISON	

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CIVIL
OVERALL SITE PLAN

FINAL DOCUMENT

VERIFY SCALE
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0 1"

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DWG	C-05-001
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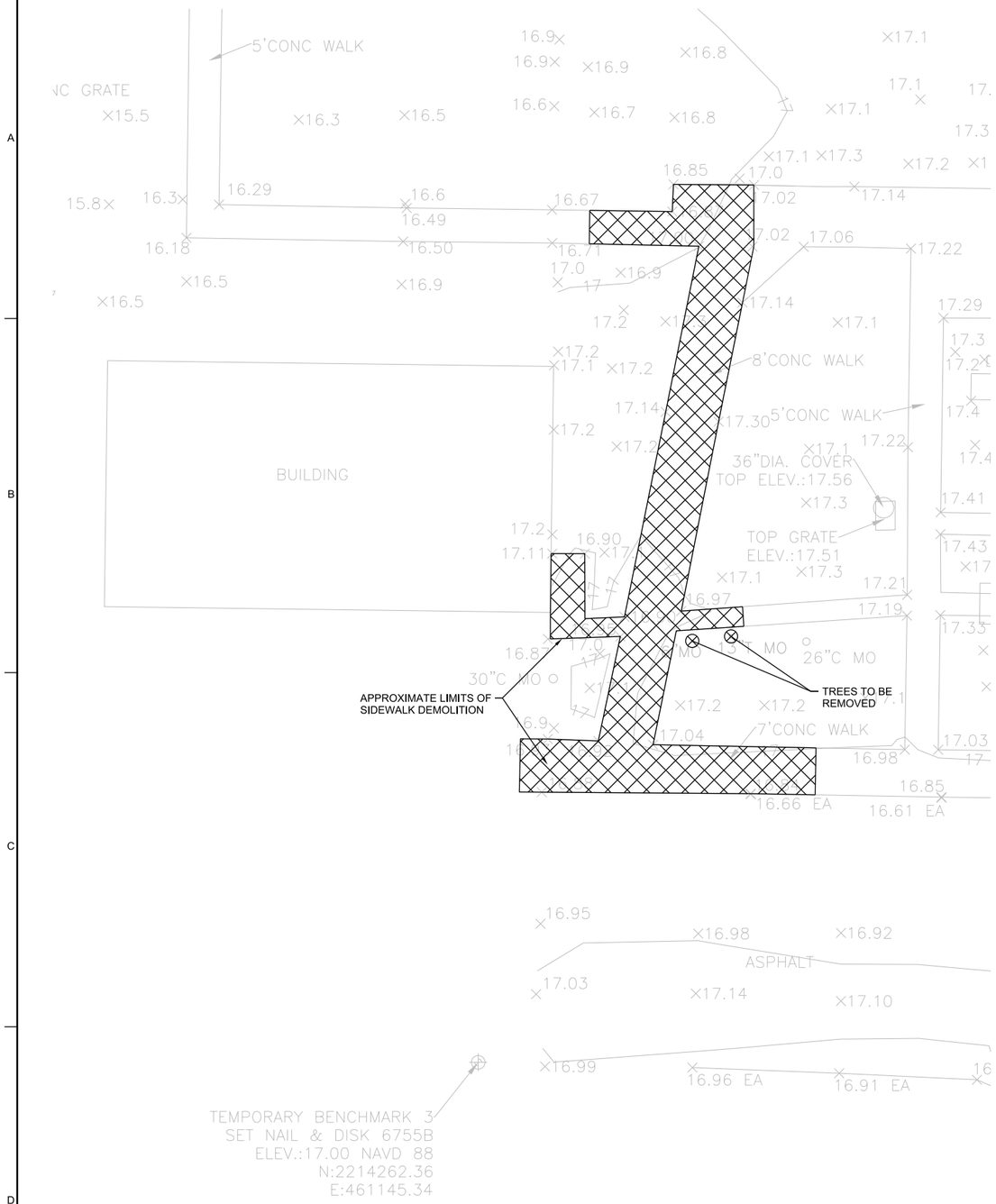
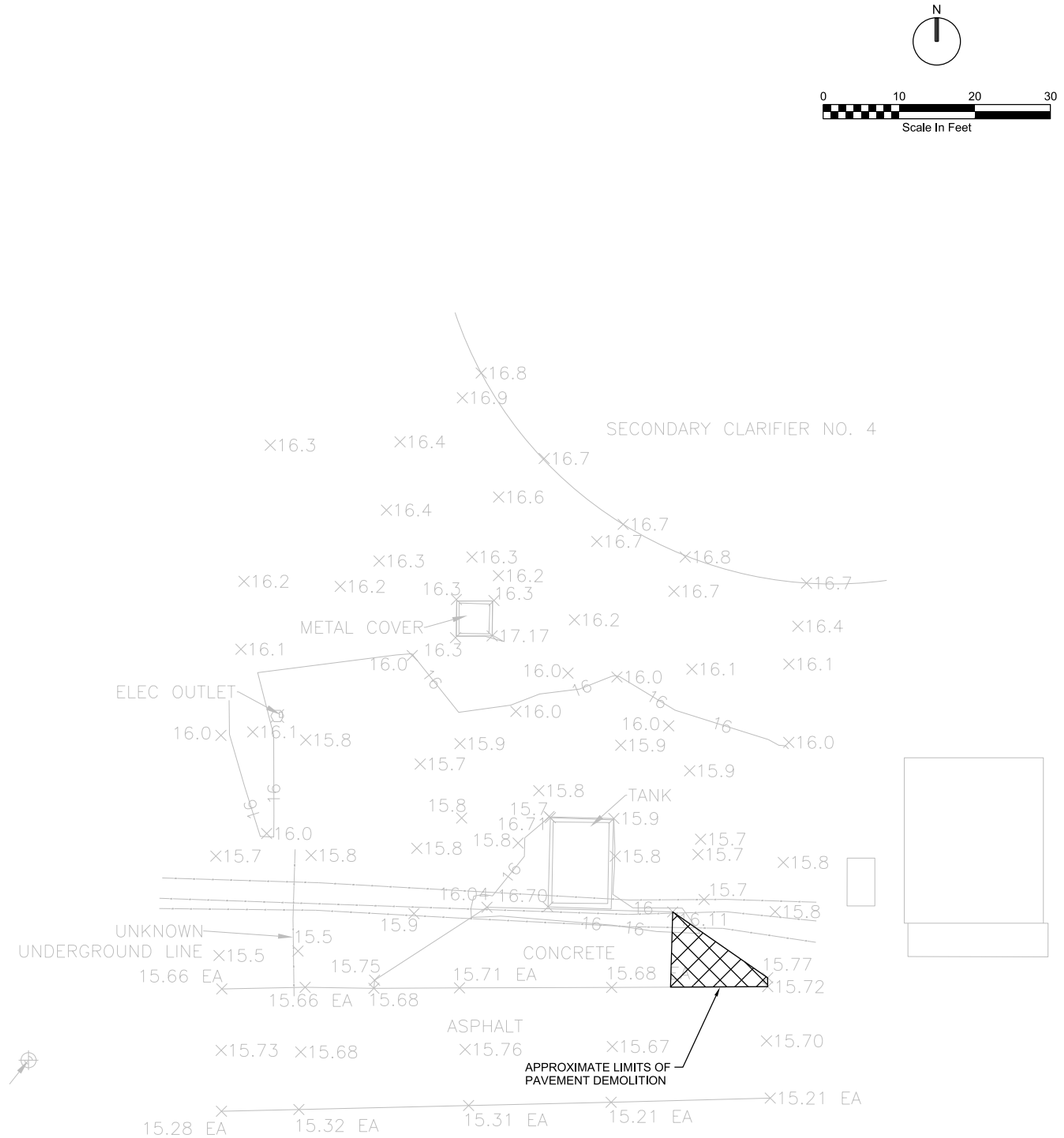


PROPOSED 250KW
STANDBY GENERATOR LOCATION



PROPOSED 600KW
STANDBY GENERATOR LOCATION

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CIVIL
DEMOLITION PLAN

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0 1"

DATE	MARCH 2020
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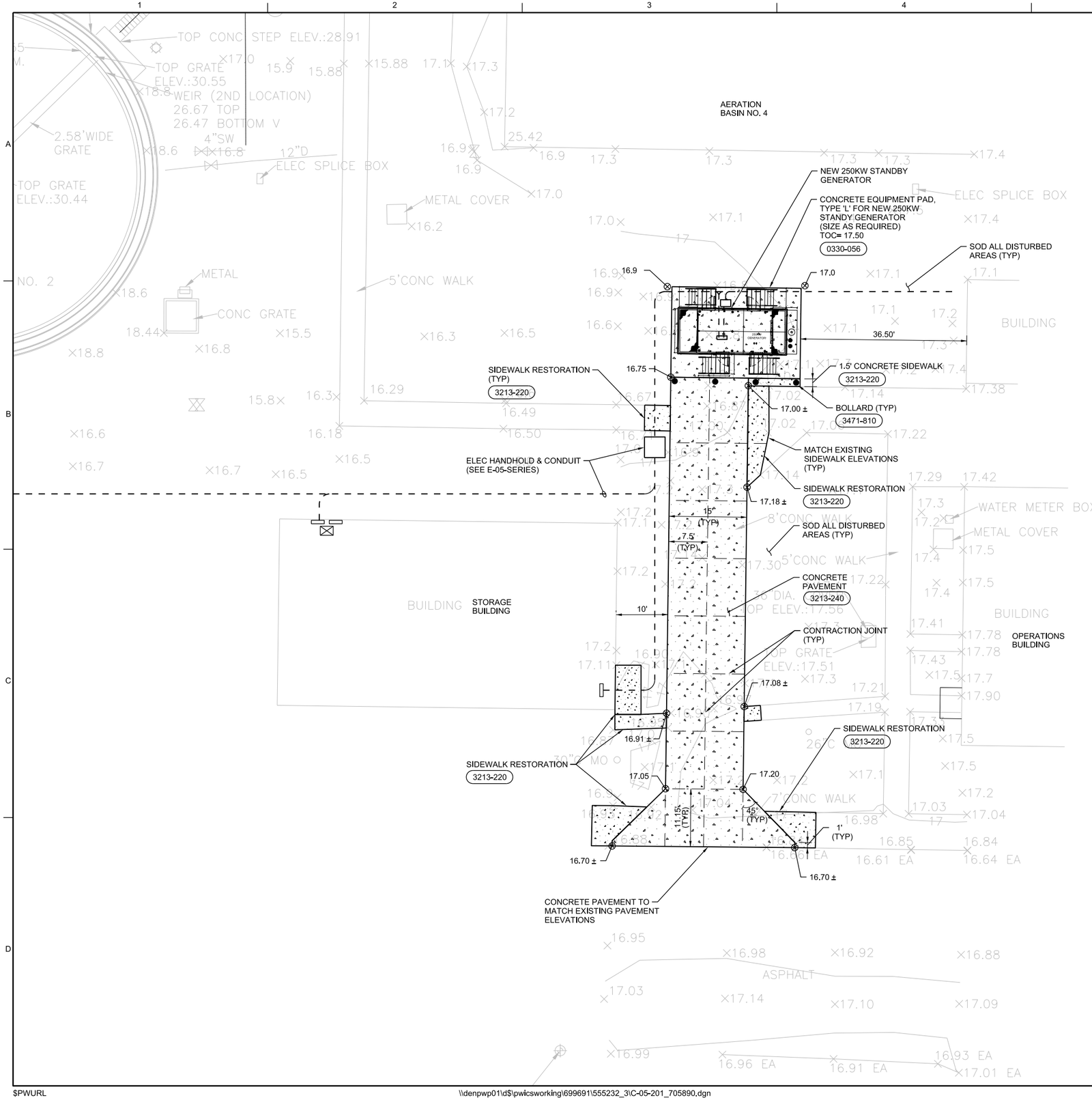

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		O JOHN	O JOHN	A MALONE	APVD	R MORRISON	

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CIVIL
ENLARGED SITE PLAN

VERIFY SCALE
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0 1"

DATE	MARCH 2020
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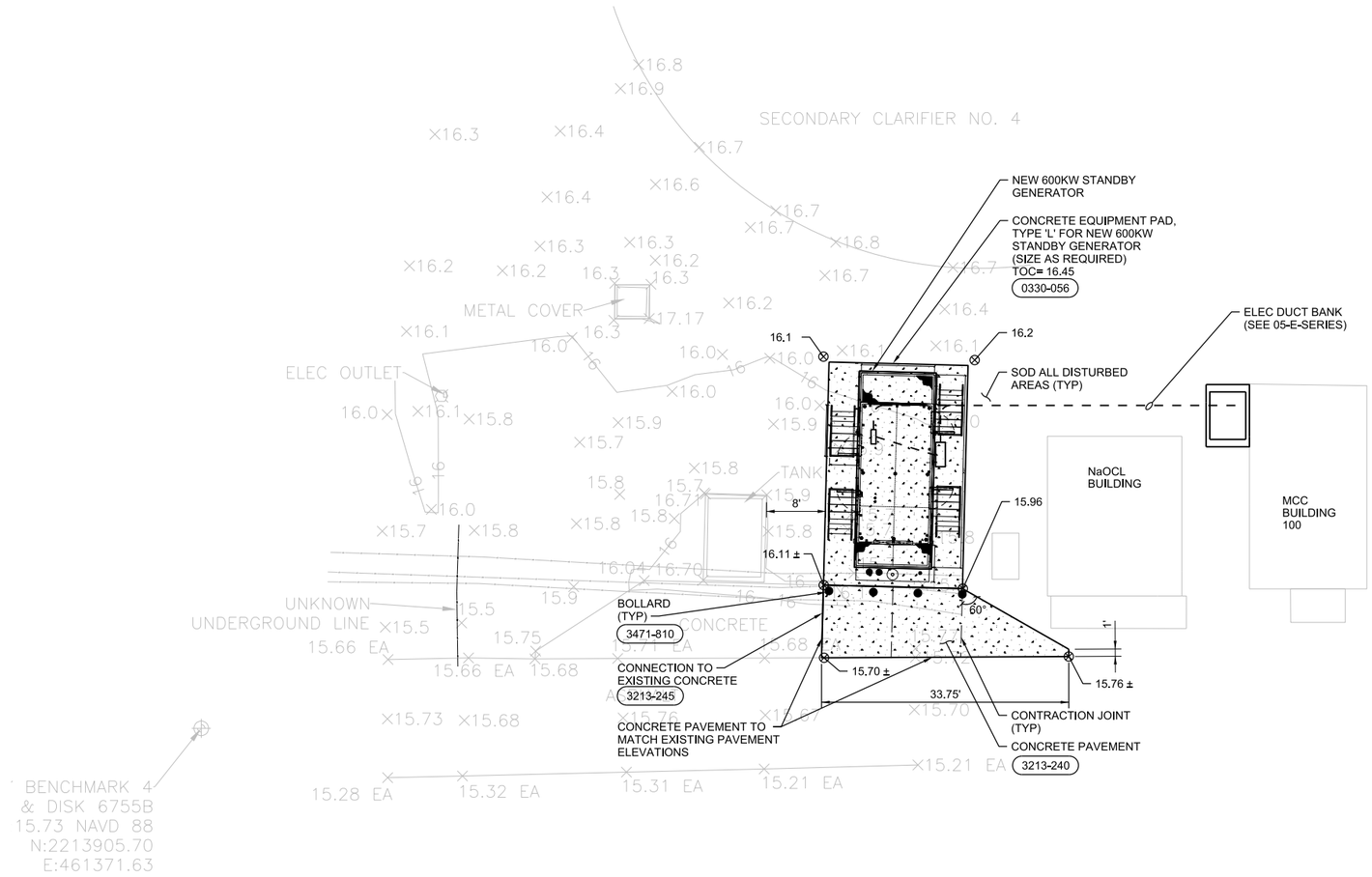

N

0 10 20 30

Scale In Feet

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DSGN		O JOHN		O JOHN	A MALONE		R MORRISON

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PLA

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CIVIL
ENLARGED PLAN

VERIFY SCALE

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0 1"

DATE	MARCH 2020
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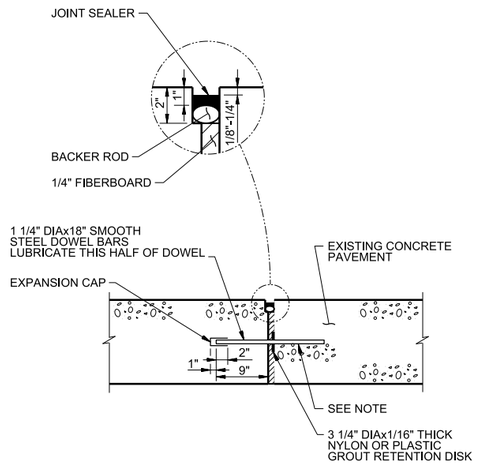
FINAL DOCUMENT



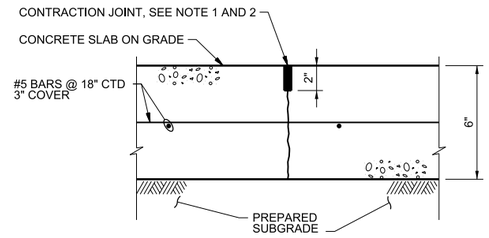
NOTE:

GANG-DRILL HOLES FOR DOWELS AT 12" CENTERS. CLEAN HOLES WITH COMPRESSED AIR AND PLACE NON-SHRINK GROUT AT BACK OF HOLE BEFORE DOWEL INSERTION.

CONCRETE TO EXISTING CONCRETE CONNECTION

NTS

3213-245



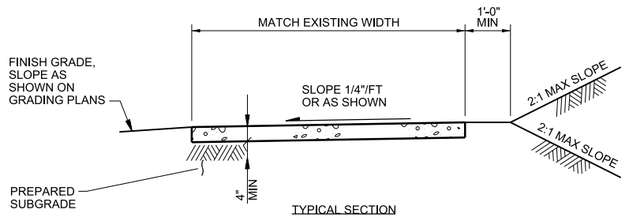
NOTES:

1. CONTRACTION JOINT SHALL BE MADE, CLEANED WITH COMPRESSED AIR, AND FILLED WITH SEALANT AS SPECIFIED.
2. CONCRETE JOINT SPACING: AS SHOWN.
3. INSTALL 1/2" PREMOLDED JOINT FILLER FULL DEPTH WHERE CONCRETE PAVEMENT ABUTS CONCRETE OR ANY RIGID STRUCTURE.

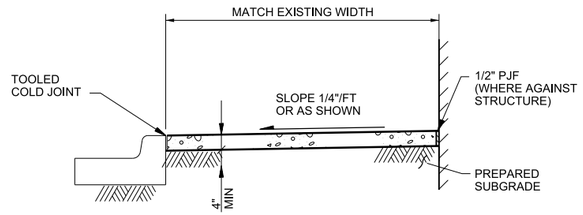
CONCRETE PAVEMENT

NTS

3213-240



TYPICAL SECTION

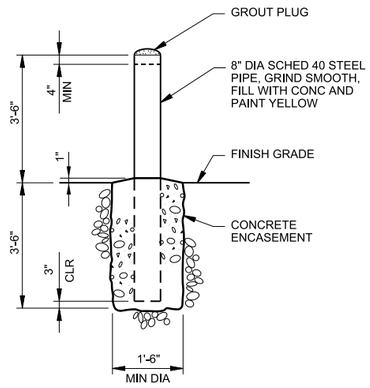


TYPICAL CURB SECTION

CONCRETE SIDEWALK

NTS

3213-220



BOLLARD

NTS

3471-810

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CIVIL

STANDARD DETAILS

VERIFY SCALE

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0 1"

DATE	MARCH 2020
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FINAL DOCUMENT

DESIGN CRITERIA

1. APPLICABLE CODE: FLORIDA BUILDING CODE, 6TH EDITION (2017)
2. REFER TO THE DRAWINGS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS.
3. ALL LOADS SHOWN ARE SERVICE LEVEL (UNFACTORED) UNLESS SPECIFICALLY NOTED OTHERWISE.
4. DEAD LOADS — SELF WEIGHT
5. ROOF SNOW LOADS (Pf): = 0 PSF
   GROUND SNOW LOADS (Pg): = 0 PSF
6. FLOOR LIVE LOADS:
   - GENERATOR FOUNDATION — 300 PSF
   - ELECTRICAL ROOM — 300 PSF
7. WIND LOADS:
   - ASCE 7 METHOD MWFRS DIRECTIONAL PROCEDURE
   - BASIC WIND SPEED (3-SECOND GUST)
     - Vult = 135 MPH
     - Vasd = 106 MPH
   - EXPOSURE CATEGORY = C
   - RISK CATEGORY = III
8. SEISMIC LOADS:
   - MAPPED SPECTRAL RESPONSE ACCELERATIONS
     - S_S = 0.104g
     - S_1 = 0.055g
   - DESIGN SPECTRAL RESPONSE ACCELERATIONS
     - S_{DS} = 0.111g
     - S_{D1} = 0.088g
   - SITE CLASS = D
   - SEISMIC DESIGN CATEGORY = C
   - IMPORTANCE FACTOR, Ie = 1.25

   STRUCTURES HAVE BEEN ANALYZED USING THE EQUIVALENT LATERAL FORCE PROCEDURES OF ASCE 7.
9. SOIL DESIGN PARAMETERS:
   A. NET ALLOWABLE SOIL BEARING PRESSURES: 1500 PSF (ASSUMED)

GENERAL INFORMATION

1. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
2. DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE INDIVIDUALLY CALLED OUT.
3. VERIFY FINAL OPENING DIMENSIONS IN WALLS, SLABS, AND DECKS WITH OTHER DISCIPLINE DRAWINGS PRIOR TO CONSTRUCTION OF THESE ELEMENTS.
4. FOR NUMBER, TYPE, SIZE, ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS, SEE OTHER DISCIPLINE DRAWINGS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO PLACING SLABS, WALLS AND FOUNDATIONS. COORDINATE PIPING OPENINGS WITH OTHER DISCIPLINE DRAWINGS.
5. DO NOT CUT OR MODIFY STRUCTURAL MEMBERS FOR PIPES, DUCTS, ETC, UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.
6. VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT ENGINEER IS GUARANTOR OF CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR THE COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, OR SAFETY AT THE JOB SITE.
7. INFORMATION (DETAILING, DIMENSIONS, CONFIGURATIONS, AND ELEVATIONS, ETC.) OF EXISTING CONSTRUCTION SHOWN REFLECTS AVAILABLE EXISTING DESIGN DOCUMENTS, AND DOES NOT NECESSARILY REPRESENT THE AS-CONSTRUCTED CONDITIONS. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS, ELEVATIONS AND DETAILING OF THE EXISTING STRUCTURES PRIOR TO UNDERTAKING ANY WORK THAT IS AFFECTED BY THE EXISTING STRUCTURE. NOTIFY ENGINEER IF CONDITIONS VARY FROM THAT SHOWN PRIOR TO STARTING WORK.

INSPECTION AND TESTING

1. SPECIFIED LABORATORY TEST MIXES AND SIMILAR TEST RESULTS TO VERIFY MATERIAL QUALITY AND CONFORMANCE TO SPECIFICATIONS, AND SUBMITTED FOR REVIEW PRIOR TO ACCEPTANCE FOR USE ON THE PROJECT, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

FOUNDATIONS

1. EXCAVATIONS SHALL BE SHORED TO PREVENT SUBSIDENCE AND DAMAGE TO ADJACENT EXISTING STRUCTURES, ROADS, UTILITIES, ETC.
2. FOUNDATION SLABS, SLABS-ON-GRADE AND WALL AND COLUMN FOUNDATIONS SPECIFICALLY NOTED TO BE ON FILL SHALL BEAR ON 6 INCHES OF COMPACTED GRANULAR FILL.
3. FOUNDATION BEARING SURFACES SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER OR QUALIFIED DESIGNEE PRIOR TO PLACEMENT OF FORMWORK OR REINFORCING STEEL. THE OBSERVATION SHALL VERIFY IF THE ACTUAL EXPOSED SUBGRADE MEETS ASSUMED CAPACITY.

FORMWORK, SHORING, AND BRACING

1. STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. DESIGN SHOWN DOES NOT INCLUDE NECESSARY COMPONENTS OR EQUIPMENT FOR STABILITY OF THE STRUCTURES DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.
2. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL ELEVATED CONCRETE FLOOR OR SLABS HAVE REACHED 80 PERCENT OF THE 28 DAY COMPRESSIVE STRENGTH AS DETERMINED BY FIELD CYLINDER BREAKS.
3. "BURY"BARS OR "CARRIER"BARS ARE NOT ALLOWED FOR THE BOTTOM MATS OF REINFORCING IN ALL ELEVATED SLABS AND ARE NOT ALLOWED FOR THE TOP MATS OF REINFORCING IN ELEVATED SLABS LESS THAN 12 INCHES THICK.

CONCRETE REINFORCING

1. REINFORCING STEEL:
   TYPICAL: ASTM A615, GRADE 60
2. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE"AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
3. CONCRETE COVER FOR REINFORCING, UNLESS SHOWN OTHERWISE, SHALL BE:
   WHEN CAST AGAINST EARTH: 3"
   ALL OTHER SURFACES 2"
4. 90 DEGREE BENDS, UNLESS OTHERWISE SHOWN, SHALL BE ACI 318 STANDARD HOOKS.
5. REINFORCING STEEL FOR FOOTINGS AND SLABS ON GRADE SHALL BE ADEQUATELY SUPPORTED ON BAR SUPPORTS WITH SPACERS TO KEEP REINFORCING ABOVE THE PREPARED GRADE. LIFTING REINFORCING OFF GRADE DURING CONCRETE PLACEMENT IS NOT PERMITTED.
6. REFER TO OPENING REINFORCING DETAILS 0330-001.
7. REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

CONCRETE DESIGN STRENGTH = 4,000 PSI MIN AT 28 DAYS[3] GRADE 60 REINFORCING STEEL										
BAR SIZE		#3	#4	#5	#6	#7	#8	#9	#10	#11
LAP SPLICE LENGTH										
SPACING = 3"	TOP BAR [2]	1'-4"	1'-8"	2'-1"	3'-0"	5'-2"	6'-8"	8'-6"	10'-10"	13'-4"
	OTHER BAR	1'-4"	1'-4"	1'-8"	2'-4"	4'-0"	5'-2"	6'-7"	8'-4"	10'-3"
SPACING = 4"	TOP BAR [2]	1'-4"	1'-8"	2'-0"	2'-5"	3'-10"	5'-0"	6'-5"	8'-1"	10'-0"
	OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	3'-0"	3'-11"	4'-11"	6'-3"	7'-8"
SPACING ≥ 6"	TOP BAR [2]	1'-4"	1'-8"	2'-0"	2'-5"	3'-6"	4'-0"	5'-0"	6'-2"	7'-5"
	OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"	4'-9"	5'-8"
EMBEDMENT LENGTH										
SPACING = 3"	TOP BAR [2]	1'-0"	1'-3"	1'-8"	2'-4"	4'-0"	5'-2"	6'-7"	8'-4"	10'-3"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-10"	3'-1"	4'-0"	5'-1"	6'-5"	7'-11"
SPACING = 4"	TOP BAR [2]	1'-0"	1'-3"	1'-7"	1'-10"	3'-0"	3'-11"	4'-11"	6'-3"	7'-8"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	2'-4"	3'-0"	3'-10"	4'-10"	5'-11"
SPACING ≥ 6"	TOP BAR [2]	1'-0"	1'-3"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"	4'-9"	5'-8"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	2'-1"	2'-5"	3'-0"	3'-8"	4'-5"

1. LAP LENGTHS ARE BASED ON MINIMUM CONCRETE COVER OF 2". LONGER LENGTHS ARE REQUIRED FOR CONCRETE COVER LESS THAN 2".
2. TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 INCHES OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.
3. WHERE 3000 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 16 PERCENT. WHERE 3500 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 7 PERCENT.

CAST IN PLACE CONCRETE

1. 28-DAY COMPRESSIVE STRENGTHS (TO MEET STRUCTURAL STRENGTH REQUIREMENTS): 4000 PSI
2. DESIGN STRENGTHS ARE SAME AS 28-DAY COMPRESSIVE STRENGTHS.
3. CONSTRUCTION JOINTS INDICATED ARE SUGGESTED LOCATIONS. CONTRACTOR MAY REVISE LOCATION OF JOINTS, SUBJECT TO SPECIFIED REQUIREMENTS. LAYOUT SHOWING ALL CONSTRUCTION JOINT LOCATIONS SHALL BE SUBMITTED FOR REVIEW BY ENGINEER.
4. ROUGHEN AND CLEAN CONSTRUCTION JOINTS IN WALLS AND SLABS AS SPECIFIED PRIOR TO PLACING ADJACENT CONCRETE.
5. COORDINATE PLACEMENT OF OPENINGS, PIPE PENETRATIONS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS AND INSERTS PRIOR TO PLACEMENT OF CONCRETE.
6. NO ALUMINUM CONDUIT OR PRODUCTS CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO THE CONCRETE SHALL BE EMBEDDED IN THE CONCRETE.

WELDING

1. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS):
   - D1.1, STRUCTURAL WELDING CODE STEEL
   - D1.2, STRUCTURAL WELDING CODE ALUMINUM
   - D1.3, STRUCTURAL WELDING CODE SHEET STEEL
   - D1.4, STRUCTURAL WELDING CODE REINFORCING STEEL
   - D1.6, STRUCTURAL WELDING CODE STAINLESS STEEL
2. REPAIR WELDS FOUND DEFECTIVE IN ACCORDANCE WITH AWS D1.1 SECTION 5.26.
3. USE INTERMITTENT WELDS AT FIELD WELDS OF EMBED PLATES AND ANGLES TO AVOID SPALLING OR CRACKING OF THE EXISTING CONCRETE.
4. BUTT JOINT WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

CONCRETE UNIT MASONRY

1. MORTAR: ASTM C270, TYPE S, HYDRATED. 2000 PSI MINIMUM 28 DAY COMPRESSIVE STRENGTH.
2. GROUT: ASTM C476 COARSE GROUT. 2000 PSI MINIMUM 28 DAY COMPRESSIVE STRENGTH.
3. CONCRETE MASONRY UNITS: ASTM C90, MEDIUM WEIGHT OR NORMAL WEIGHT, NET 2000 PSI COMPRESSIVE MASONRY STRENGTH.
4. REINFORCING STEEL ASTM A615, GRADE 60.
5. DESIGN f'mOF THE FINISHED ASSEMBLY SHALL BE 2000 PSI.
6. PLACE COURSES IN RUNNING BOND PATTERN, UNLESS INDICATED OTHERWISE.
7. PROVIDE MATCHING FOUNDATION DOWELS FOR ALL VERTICAL BARS.
8. LAP VERTICAL REINFORCING BARS 48 BAR DIAMETERS WITH FOUNDATION DOWELS, EXCEPT BARS PLACED EACH FACE IN CMU SHALL LAP DOWEL BARS 60 BAR DIAMETERS. LAP ALL OTHER VERTICAL BARS 72 BAR DIAMETERS.
9. MASONRY UNIT AND GROUT TESTING SHALL BE IN CONFORMANCE WITH IBC "UNIT STRENGTH METHOD". TESTING WILL BE OWNER FURNISHED. OTHER IBC TEST METHOD MAY BE SUBMITTED AS AN ALTERNATIVE.
10. DO NOT PLACE CONDUIT IN CELLS CONTAINING PARALLEL REINFORCEMENT.

DEFERRED SUBMITTALS

1. DEFERRED SUBMITTALS ARE THOSE PORTIONS OF THE DESIGN WHICH ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION AND WHICH ARE TO BE SUBMITTED TO THE PERMITTING AGENCY FOR ACCEPTANCE PRIOR TO INSTALLATION OF THAT PORTION OF THE WORK OR ARE REQUIRED TO BE SUBMITTED FOR REVIEW ONLY BY THE ENGINEER.
2. WHERE DEFERRED SUBMITTALS INCLUDE ADDITIONAL MATERIALS, INSTALLATION, ANCHORAGE, OR CERTIFICATION OF COMPONENTS THAT REQUIRE SPECIAL INSPECTION AND/OR STRUCTURAL OBSERVATION TO MEET CODE REQUIREMENTS, THE DEFERRED SUBMITTAL SHALL INCLUDE SPECIFIC LINE ITEMS TO BE ADDED TO THE APPROPRIATE TABLES IN THE PROJECT'S STATEMENT OF SPECIAL INSPECTIONS PLAN IF THEY ARE NOT ALREADY IDENTIFIED.
3. THE FOLLOWING IS A LIST OF DEFERRED SUBMITTALS PER SECTION 107.3.4.1 OF THE FBC THAT ARE EXPECTED TO CONTAIN STRUCTURAL CALCULATIONS OR SAFETY RELATED SYSTEM INFORMATION FOR REVIEW TO MEET BUILDING PERMITTING REQUIREMENTS FOR DESIGNED SYSTEMS. PRIOR TO INSTALLATION OF THE INDICATED STRUCTURAL ELEMENT, EQUIPMENT, DISTRIBUTION SYSTEM, OR COMPONENT OR ITS ANCHORAGE, THE CONTRACTOR SHALL SUBMIT THE REQUIRED CALCULATIONS AND SUPPORTING DATA AND DRAWINGS FOR REVIEW AND ACCEPTANCE BY THE ENGINEER. ADDITIONALLY, ACCEPTANCE INDICATED ON THE ENGINEER'S COMMENT FORM, ALONG WITH THE COMPLETED, FINAL SUBMITTAL SHALL THEN BE SUBMITTED BY THE CONTRACTOR TO THE PERMITTING AGENCY AND APPROVED PRIOR TO INSTALLATION OF THESE ITEMS.

SPECIFICATION SECTION	CODE REQUIRED DEFERRED SUBMITTALS FOR REVIEW BY PERMITTING AGENCY
01 88 15	ANCHORAGE AND BRACING

NO.	DATE	DR	REVISION	CHK	APVD	BY	APVD
DSGN	D EVERSON	K CHATHAM		J MAXFIELD			D EVERSON

PLA

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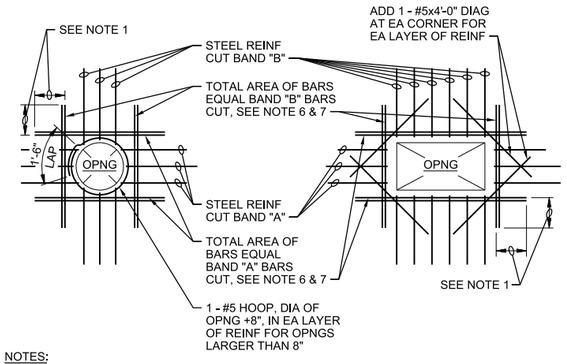
STRUCTURAL
NOTES

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	S-00-001
SHEET	8 of 45

FINAL DOCUMENT



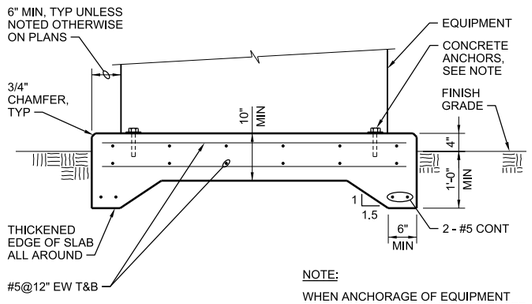
NOTES:

1. PROVIDE MINIMUM LAP, SEE GENERAL STRUCTURAL NOTES.
2. TYPICAL FOR ALL OPENINGS IN CONCRETE WALLS OF BELOW GRADE AND HYDRAULIC STRUCTURES AND ALL STRUCTURAL CONCRETE SLABS UNLESS INDICATED OTHERWISE ON PLANS.
3. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS.
4. PROVIDE A MINIMUM OF 2 "A" BARS AND 2 "B" BARS EACH SIDE OF OPENING (1 EACH FACE), INCLUDING DOWELS AND CORNER BARS, TYPICAL.
5. FOR OPENINGS LARGER THAN 8'-0", REINFORCE SAME AS FOR 8'-0" OPENINGS.
6. SPACE AT 3 BAR DIAMETERS (OR 3" MINIMUM) ON CENTER. LOCATE HALF OF TOTAL AREA ON EACH SIDE OF OPENING.
7. AT OPENINGS WITHIN 12" OF AN INTERSECTING WALL OR SLAB, PROVIDE ONLY THE EXTRA REINFORCEMENT WHICH WILL FIT, AT THE BAR SPACING IN NOTE 6.

OPENING REINFORCEMENT

NTS

0330-001



NOTE:

WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.

TYPE 'H'

GENERAL NOTE:

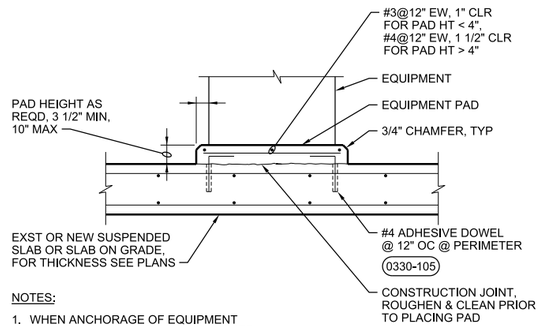
FOR GENERAL NOTES SEE DETAIL 4 OF 4.

CONCRETE EQUIPMENT PAD - TYPE 'H'

NTS

DETAIL 1 OF 4

0330-056



NOTES:

1. WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.
2. CONCRETE PADS FOR ELECTRICAL EQUIPMENT SHALL BE 3 1/2" HIGH, UNLESS NOTED OTHERWISE.

TYPE 'E'

GENERAL NOTE:

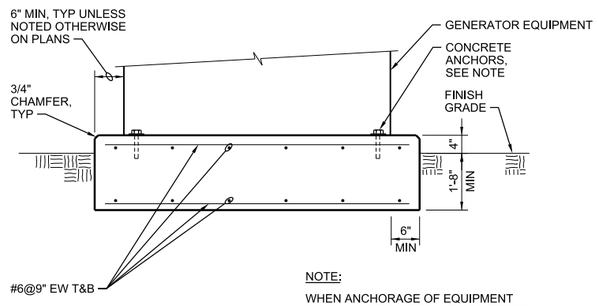
FOR GENERAL NOTES SEE DETAIL 4 OF 4.

CONCRETE EQUIPMENT PAD - TYPE 'E'

NTS

DETAIL 2 OF 4

0330-056



NOTE:

WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.

TYPE 'L'

GENERAL NOTE:

FOR GENERAL NOTES SEE DETAIL 4 OF 4.

CONCRETE EQUIPMENT PAD - TYPE 'L'

NTS

DETAIL 3 OF 4

0330-056

NOTES:

1. PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER.
2. THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER AND AS APPROVED BY THE ENGINEER. ANCHOR BOLTS SHALL BE HELD IN POSITION WITH A TEMPLATE OR OTHER ACCEPTABLE MEANS, MATCHING THE BASE PLATE, WHILE PAD IS BEING PLACED.
3. ANCHOR BOLT SLEEVES SHALL BE USED TO PROVIDE MINIMUM ANCHOR BOLT MOVEMENT OF 1/2" IN ALL HORIZONTAL DIRECTIONS. THE MINIMUM SLEEVE LENGTH SHALL BE 8 TIMES THE BOLT DIAMETER.
4. ANCHOR BOLT SLEEVES SHALL HAVE A MINIMUM INTERNAL DIAMETER 1" GREATER THAN BOLT DIAMETER AND A MAXIMUM INTERNAL DIAMETER 3" GREATER THAN ANCHOR BOLT DIAMETER. SLEEVES SHALL BE FILLED WITH NON-SHRINK GROUT AFTER BOLTS ARE ALIGNED. SEE 0330-057.
5. EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS INDICATED OTHERWISE.
6. WEDGES, SHIMS, OR LEVELING NUTS SHALL BE USED TO SUPPORT THE BASE WHILE THE GROUT IS PLACED. WEDGES OR SHIMS SHALL BE REMOVED AFTER GROUT IS SET AND PACK VOID WITH GROUT.
7. HEIGHT OF PADS SHALL BE MINIMUM REQUIRED FOR ANCHOR BOLT CLEARANCE TO KEEP ANCHOR BOLT ABOVE SUPPORTING SLAB (SEE TABLE BELOW). WHERE EQUIPMENT OR PIPING ELEVATION REQUIRE A PAD HEIGHT LESS THAN THE MINIMUM SHOWN, USE TYPE "B" EQUIPMENT PAD WITH BLOCKOUT.
8. TYPE "D" PAD SHALL BE USED ONLY WHERE SPECIFICALLY INDICATED. PLACE THE SURROUNDING FLOOR SLAB AFTER THE EQUIPMENT PAD.
9. AT CONTRACTOR'S OPTION, CONCRETE ANCHORS MAY BE USED IN LIEU OF CAST-IN-PLACE ANCHOR BOLTS FOR EQUIPMENT ANCHOR BOLTS LESS THAN 3/4" DIAMETER WHEN APPROVED BY THE EQUIPMENT MANUFACTURER AND APPROVED BY THE ENGINEER. ANCHORS SHALL BE INSTALLED WITH 4" MINIMUM EDGE DISTANCE IN EACH DIRECTION.

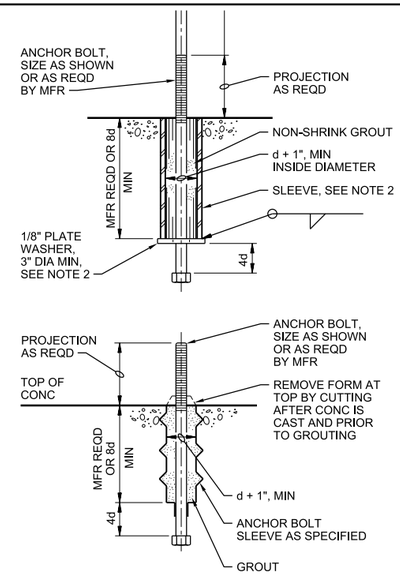
AB DIA (IN.)	1/2	5/8	3/4	7/8	1	1 1/4	1 3/8	1 1/2	1 3/4	2
MIN PAD HT (IN.)	7	8 1/2	10	11	12 1/2	15	16 1/2	18	21	24

CONCRETE EQUIPMENT PAD NOTES

NTS

DETAIL 4 OF 4

0330-056



MACHINERY ANCHOR BOLT DETAIL

NOTES:

1. FOR CONCRETE EQUIPMENT PAD DETAILS AND NOTES NOT SHOWN SEE 0330-056
2. MATERIAL TO MATCH BOLT.

ANCHOR BOLT DETAILS

NTS

DETAIL 1 OF 2

0330-057

NO.	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN	D EVERSON		K CHATHAM	J MAXFIELD		D EVERSON	

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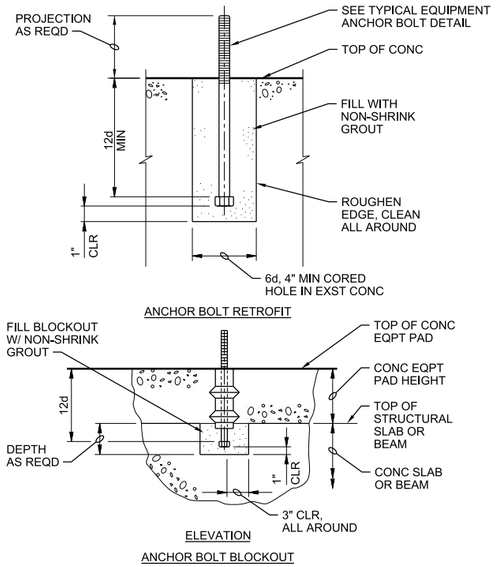
STRUCTURAL
STANDARD DETAILS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	S-99-501
SHEET	9 of 45

FINAL DOCUMENT



NOTES:

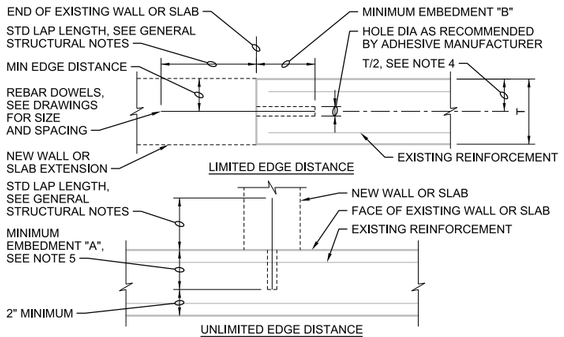
1. FOR CONCRETE EQUIPMENT PAD DETAILS AND NOTES NOT SHOWN SEE (0330-056)
2. MATERIAL TO MATCH BOLT.

ANCHOR BOLT DETAILS

NTS

DETAIL 2 OF 2

(0330-057)



DOWEL SIZE	MINIMUM EDGE DISTANCE	MINIMUM EMBEDMENT "A"	MINIMUM EMBEDMENT "B"
#3	2 1/2"	5"	8"
#4	3 1/2"	7"	11"
#5	4"	8"	13"
#6	5"	10 1/2"	16"
#7	6"	12 1/2"	20"
#8	7"	14"	22"
#9	7 1/2"	15"	24"

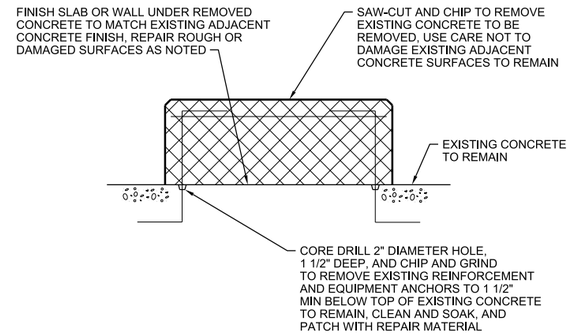
NOTES:

1. CONFORM TO REQUIREMENTS OF SPECIFICATION SECTION 03 63 00, CONCRETE DOWELING.
2. FOLLOW ADHESIVE MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION.
3. USE MINIMUM EMBEDMENTS SHOWN, EXCEPT USE MANUFACTURER'S MINIMUM RECOMMENDED EMBEDMENT IF GREATER.
4. LOCATE DOWELS CENTERED IN WALL OR SLAB UNLESS OTHERWISE NOTED ON DRAWINGS. WHERE 2 ROWS OF DOWELS INDICATED, STAGGER SPACING & LOCATE ALTERNATING DOWELS AT MINIMUM EDGE DISTANCE FROM OPPOSITE FACES.
5. PROVIDE MINIMUM EMBEDMENT "A" SHOWN IN TABLE UNLESS SHORTER EMBEDMENT DEPTH IS CALLED OUT ON DRAWINGS.

ADHESIVE DOWEL

NTS

(0330-105)



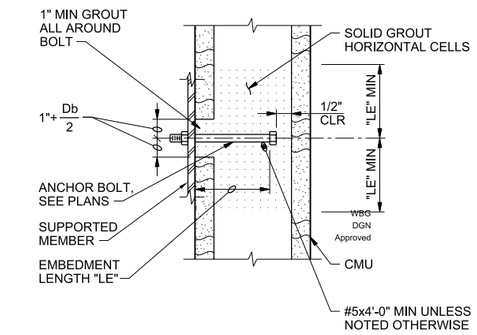
NOTES:

1. REMOVE CONCRETE OUT TO SOUND CONCRETE.
2. IF CHIPPING INTO THE SURFACE OF THE EXISTING SLAB OR WALL TO REMAIN IS REQUIRED, MAKE EDGES PERPENDICULAR TO THE SURFACE. DO NOT FEATHER EDGES.
3. FILL DEFECTIVE AREA WITH AN APPROVED PREPACKAGED REPAIR MATERIAL TO MATCH APPEARANCE OF ADJACENT CONCRETE SURFACES.
4. USE APPROVED BONDING AGENT ON SURFACES TO BE PATCHED PRIOR TO PLACING REPAIR MATERIAL.
5. DEMONSTRATE METHODS FOR REPAIR USING ACTUAL MATERIALS, METHODS, AND CURING PROCEDURES REQUIRED BY MATERIAL MANUFACTURERS. CONSULT WITH BONDING AGENT MANUFACTURER AND REPAIR MATERIAL MANUFACTURER ON TECHNIQUES.

CONCRETE DEMOLITION

NTS

(0330-143)



NOTE:

Db = DIAMETER OF BOLT

MASONRY ANCHOR BOLT

NTS

(0422-046)

NO.	DATE	REVISION	BY	APVD
DSGN	D EVERSON	DR K.CHATHAM	CHK J.MAXFIELD	APVD D EVERSON

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STRUCTURAL

STANDARD DETAILS

VERIFY SCALE

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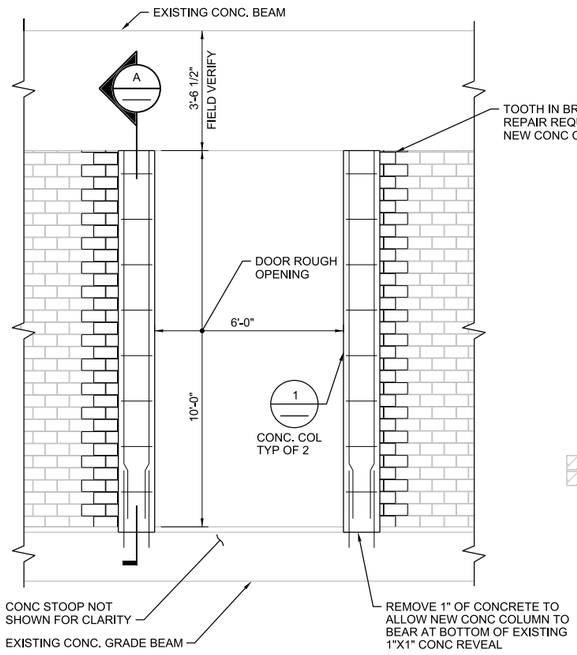
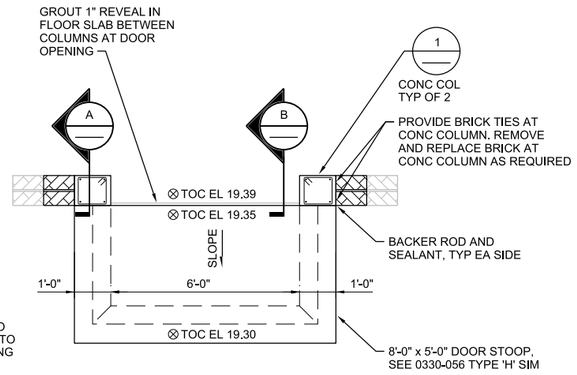
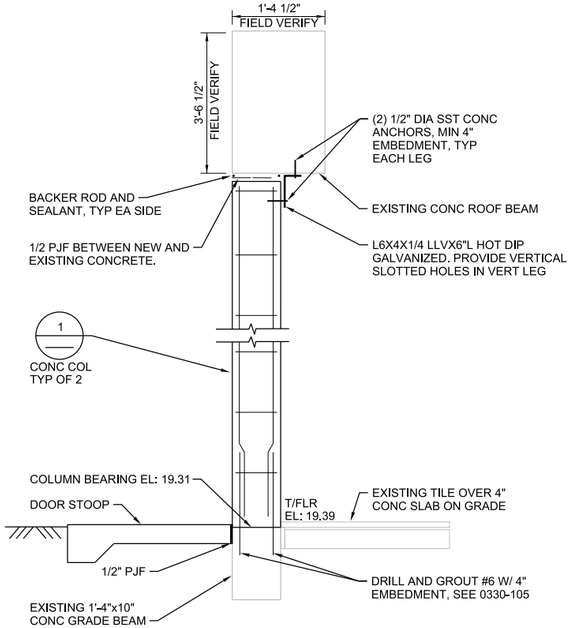


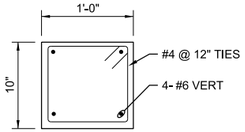
ELEVATION



PLAN

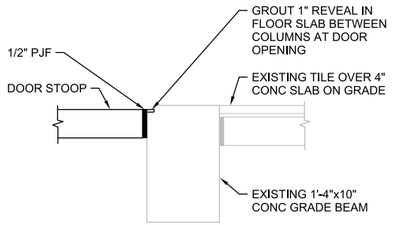


A SECTION



COLUMN

1 DETAIL



B SECTION

NEW OPENING IN EXISTING CMU WALL

NTS

0422-061

NO.	DSGN	DATE	DR	CHK	APVD	BY	APVD
REVISION			K.CHATHAM	J.MAXFIELD		D.EVERSON	

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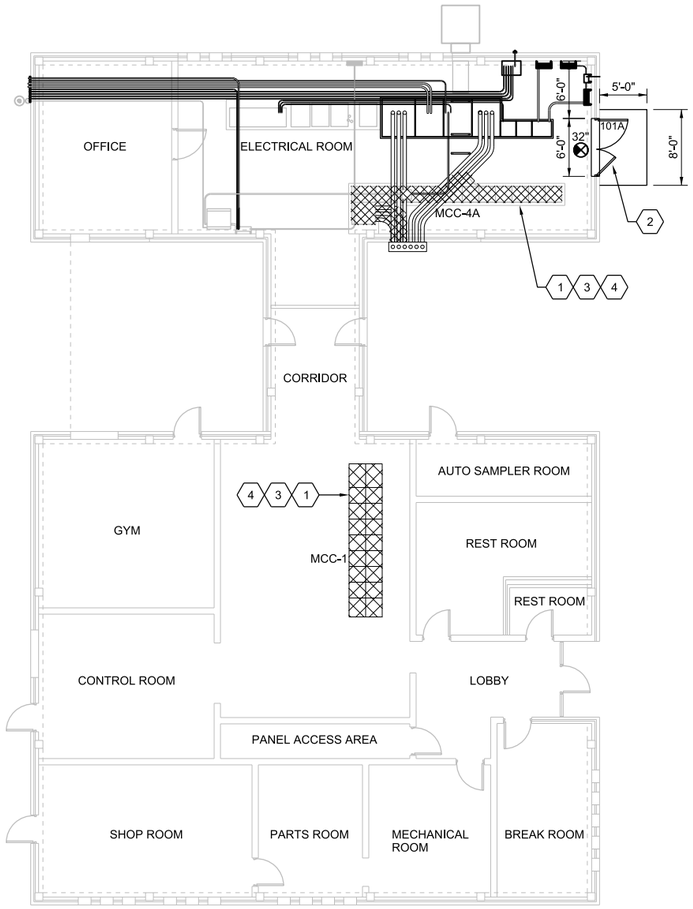
STRUCTURAL
STANDARD DETAILS

FINAL DOCUMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	S-99-503
SHEET	11 of 45



N

OPERATIONS BUILDING PLAN

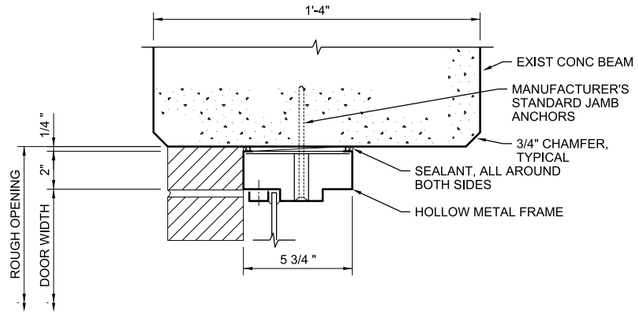
1/8" = 1'-0"

GENERAL NOTES

1. REFER TO ELECTRICAL DRAWINGS FOR PHASING OF WORK.

SHEET KEYNOTES

1. REPLACE ANY TILE DAMAGED BY DEMOLITION TO MATCH EXISTING.
2. NEW HOLLOW METAL DOOR, FRAME, AND HARDWARE.
3. PREPARE CONCRETE SUBFLOOR AT AREA OF DEMOLITION TO MATCH ELEVATION OF EXISTING CONCRETE SLAB AT ADJACENT TILE FLOOR.
4. INSTALL TILE TO MATCH EXISTING AT DEMOLISHED CONCRETE PADS.



DOOR HEAD AND JAMB

NTS

0811-001

DOOR AND HARDWARE SCHEDULE

	SIZE		DOOR				FRAME				DETAILS			HARDWARE										WIND PRESSURES (PSF)		REMARKS
DOOR NO.	WIDTH	HEIGHT	MATL	TYPE	FINISH	COL	MATL	TYPE	FINISH	COL	HEAD	JAMB	SILL	HINGE	LATCH	EXIT DEVICE	CLOSER	BOLT	PUSH/ PULL	STOP HOLDER	KICK PLATE	THSD	W-S	POSITIVE	NEGATIVE	
101A	PR 3'-0"/2'-8"	7'-2"	HM	F	PS-106	TBS	HM	F-1	PS-106	TBS	0811-001	0811-001	0871-001	H1	-	X1	C5	B2	-	-	-	T2	W2			-

DOOR AND HARDWARE NOTES

A. HOLLOW METAL (HM) DOORS

1. SUBMITTALS: SHOP DRAWINGS WILL INCLUDE COMPLETE PRODUCT DATA ON COMPONENTS, ACCESSORIES AND FINISHES. SHOW DOOR AND FRAME CONSTRUCTION, HANDLING AND ANCHORAGE DETAILS.
2. PRODUCT: HOLLOW METAL DOORS AND FRAMES; BHMA A156.115, ANSI A250.6 AND ANSI A250.8, LEVEL 3 MODEL 1, GAUGE 16; FLUSH END CLOSURE ON TOP; RUST-INHIBITING PRIME COATING; COLOR SELECTED BY OWNER. HOLLOW METAL WELDED FRAMES, 14-GAUGE. PROVIDE REMOVABE MULLIONS AND ASTRAGALS AT PAIR OF DOORS.
3. DELIVERY, STORAGE AND HANDLING: PROVIDE PACKAGING SUCH AS CARDBOARD OR OTHER CONTAINERS, SEPARATION, BANDING, AND WRAPPINGS. STORE DOORS UPRIGHT, INSIDE AT LEAST 1-INCH OFF FLOOR.
4. HARDWARE, PRODUCTS:

H1, BUTT HINGES: BHMA A156.1. 1-1/2 PAIR PER DOOR LEAF. HINGE HEIGHT: 4-1/2". REGULAR WEIGHT, TWO BALL-RACES, FULL MORTISE; SATIN SS. BY STANLEY OR EQUAL.

X1, EXIT DEVICE: BHMA A156.3. RIM TYPE. LEVER TRIM ETJ. BY SARGENT OR EQUAL.

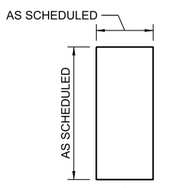
C5, PARALLEL ARM DOOR CLOSER WITH HOLD OPEN: PROVIDE ONE PER DOOR. BY SARGENT OR EQUAL.

B2, BHMA: A156.16 TOP AND BOTTOM SURFACE BOLTS. BY STANLEY OR EQUAL.

T2, SADDLE: ONE-PIECE FULL WIDTH OF OPENING; WITH SS MACHINE SCREWS IN THREADED EXPANSION ANCHORS AT CONCRETE; SERRATED 4" X 1/4", ANODIZED FINISH; BY PEMKO OR EQUAL.

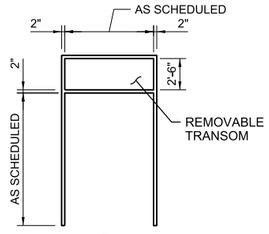
W2, WEATHERSTRIPPING; RUBBER VINYL BULB AT JAMBS AND HEAD, AND AT MEETING STILES OF PAIRS; MILL FINISH ALUM DOOR SHOE AND RAINDRIP. BY PEMKO OR EQUAL.

DOOR TYPE

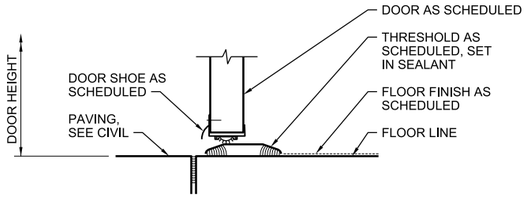


F
FLUSH PANEL

FRAME TYPE



F-1



DOOR SILL

NTS

0871-001

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
	A DOLSAK		K BANKS	B TRAUTWEIN	APVD	A DOLSAK	

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ARCHITECTURAL

OPERATIONS BUILDING PLAN - CONSTRUCTION PHASE 2

FINAL DOCUMENT

VERIFY SCALE

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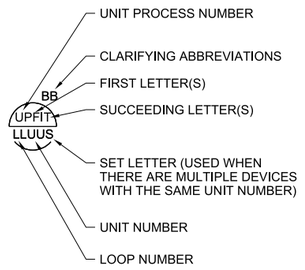
INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS



DIGITAL SYSTEM INTERFACES

- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- $\triangle_X$ DISCRETE INPUT
- ∇_X DISCRETE OUTPUT

INSTRUMENT IDENTIFICATION LETTERS TABLE

LETTER	FIRST-LETTER		SUCCEEDING-LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION	READOUT OR PASSIVE FUNCTION
A	ANALYSIS (+)		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
C	USER'S CHOICE (*)			CONTROL	
D	DENSITY (S.G.)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT, SENSOR		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE (*)		GLASS, GAUGE VIEWING DEVICE	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		USER'S CHOICE (*)	USER'S CHOICE (*)	USER'S CHOICE (*)
O	USER'S CHOICE (*)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI VARIABLE		MULTI FUNCTION	MULTI FUNCTION	MULTI FUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (*)	X AXIS	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TABLE BASED ON THE INTERNATIONAL SOCIETY OF AUTOMATION (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.
(*) WHEN USED, DEFINE THE MEANING HERE FOR THE PROJECT.

GENERAL INSTRUMENT OR FUNCTIONAL SYMBOLS

- FIELD MOUNTED
- REAR-OF-PANEL MOUNTED (OPERATOR INACCESSIBLE)
- PANEL MOUNTED (OPERATOR ACCESSIBLE)
- MCC MOUNTED
- COMPUTER FUNCTION
- PLC FUNCTION
- SHARED DISPLAY, SHARED CONTROL

TRANSDUCERS

A	ANALOG	I	CURRENT
D	DIGITAL	P	PNEUMATIC
E	VOLTAGE	PF	PULSE FREQUENCY
F	FREQUENCY	PD	PULSE DURATION
H	HYDRAULIC	R	RESISTANCE

EXAMPLE

CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

ACCESSORY DEVICES

A	ALARM
C	CONTROLLER
I	INDICATOR
R	RECORDER
S	SWITCH
T	TRANSMITTER
X	UNCLASSIFIED

EXAMPLE

TRANSMITTER AS AN ACCESSORY TO A FLOW ELEMENT

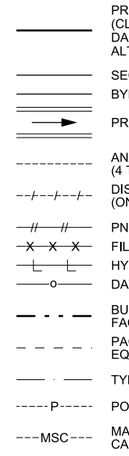
SPECIAL CASES

ON AND OFF EVENT LIGHTS

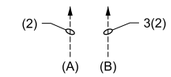
ON-OFF HAND SWITCH, MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).

STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

LINE LEGEND



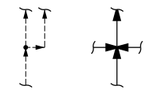
PARALLELING LINES



(A) TOTAL OF 2 SIGNALS

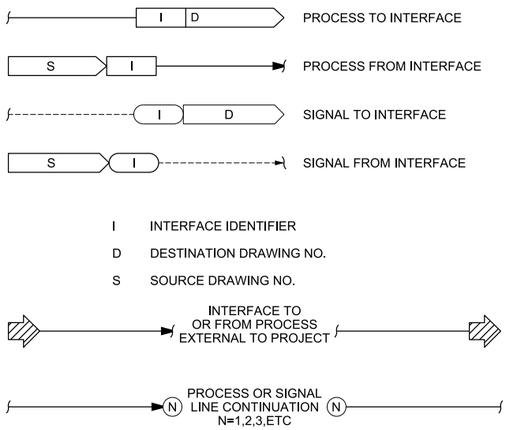
(B) 3 TYPICAL SETS OF 2 SIGNALS EACH. TOTAL OF 6 SIGNALS.

CONNECTING LINES



NON-CONNECTING LINES

INTERFACE SYMBOLS



I INTERFACE IDENTIFIER

D DESTINATION DRAWING NO.

S SOURCE DRAWING NO.

SELF CONTAINED VALVE & EQUIPMENT TAG NUMBERS

D-X-Y

D	CB	CIRCUIT BREAKER
	TNK	TANK
	GEN	GENERATOR
X		LOOP NUMBER
Y		UNIT NUMBER

ABBREVIATIONS & LETTER SYMBOLS

AC	ALTERNATING CURRENT
AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CCS	CENTRAL CONTROL SYSTEM
CL_2 etc.	CHLORINE (TYPICAL; USE STANDARD CHEMICAL ELEMENT ABBREVIATIONS)
CM	COMPUTER-MANUAL
COD	CHEMICAL OXYGEN DEMAND
CP-X	CONTROL PANEL NO. X
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DCU	DISTRIBUTED CONTROL UNIT
DO	DISSOLVED OXYGEN
FCL_2	FREE CHLORINE RESIDUAL
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP-W-X	FIELD PANEL NO. WX (W=UNIT PROCESS NUMBER X=PANEL NUMBER)
FR	FORWARD-REVERSE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
ISR	INTRINSICALLY SAFE RELAY
LEL	LOWER EXPLOSIVE LIMIT
LOS	LOCKOUT STOP
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MC	MODULATE-CLOSE
MCC-X	MOTOR CONTROL CENTER NO. X
MSC	MANUFACTURER SUPPLIED CABLE
OC	OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
pH	HYDROGEN ION CONCENTRATION
PLC	PROGRAMMABLE LOGIC CONTROLLER
RIO	REMOTE I/O UNIT
RM-X	REMOTE MULTIPLEXING MODULE NO. X
RTU-X	REMOTE TELEMETRY UNIT NO. X
SF	SLOWER-FASTER
SS	START-STOP
SSC	SUPERVISORY SET POINT CONTROL
TCL_2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
Δ	DIFFERENCE
Σ	SUM
×	MULTIPLY
÷	DIVIDE
F(X)	CHARACTERIZED
X^n	RAISED TO THE Nth POWER
$\sqrt{\ }$	SQUARE ROOT
AVG	AVERAGE
1:1	REPEAT OR BOOST
>	SELECT HIGHEST SIGNAL
<	SELECT LOWEST SIGNAL
}	BIAS
%	GAIN OR ATTENUATE

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK (∗) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK (∗∗) ARE TO BE PROVIDED UNDER DIVISION 26, ELECTRICAL.
3. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THE PROJECT.

NO.	DATE	DSGN	DR	CHK	APVD	REVISION	BY	APVD
		C SAHARKHIZ	A PASTRANA	P KESKAR	A QUINONES			

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INSTRUMENTATION AND CONTROL

LEGEND SHEET 1

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VALVE SYMBOLS

- GATE
- KNIFE GATE
- BUTTERFLY
- GLOBE
- BALL
- V VEE-BALL
- PLUG
- SEAT PORT ECCENTRIC PLUG
- DIAPHRAGM
- PINCH
- NEEDLE
- SWING CHECK
- BALL CHECK
- BACKFLOW PREVENTER
- ROTARY
- TELESCOPE
- S SAMPLE
- MUD
- PRESSURE RELIEF
- AIR AND/OR VACUUM RELEASE
- REGULATED SIDE PRESSURE CONTROL
- PRESSURE REGULATION (CLAY-TYPE)
- MULTI-PORT VALVE (GATE VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
- ANGLE GATE

GATE SYMBOLS

- SLUICE
- BUTTERFLY
- FABRICATED SLIDE
- FLAP
- STOP LOG
- SHEAR

ACTUATOR SYMBOLS

- PNEUMATIC DIAPHRAGM SPRING-OPPOSED, SINGLE OR DOUBLE ACTING
- PNEUMATIC CYLINDER SINGLE OR DOUBLE ACTING ACTUATED BY ONE INPUT
- M ELECTRIC MOTOR
- S SOLENOID
- VALVE POSITIONER
- H HYDRAULIC
- DIAPHRAGM, DIFFERENTIAL PRESSURE
- E/H ELECTROHYDRAULIC
- MANUAL

NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL, OR HYDRAULIC)

XX:
- FO FAIL OPEN
- FC FAIL CLOSED
- FLP FAIL TO LAST POSITION

PRIMARY ELEMENT SYMBOLS

- PARSHALL FLUME
- WEIR
- ORFICE PLATE
- FLOW TUBE
- PITOT-STATIC
- VORTEX METER
- ULTRASONIC FLOWMETER
- M ELECTROMAGNETIC FLOWMETER
- PROPELLER OR TURBINE METER
- THERMAL FLOWMETER
- LEVEL (BUBBLER TUBE)
- LS LEVEL (FLOAT)
- FI ROTAMETER
- DE DENSITY METER
- XX GENERIC
- LE LEVEL

MISCELLANEOUS SYMBOLS

- V VENT TO ATMOSPHERE
- AIR GAP
- T DRIP TRAP
- PIG INSERT POINT
- PIG CATCH POINT
- A SELF CONTAINED AIR SUPPLY
- AP AIR PURGE SET
- F FLUSHING CONNECTION
- S SEAL WATER SET
- WP WATER PURGE SET
- FLEXIBLE CONNECTION
- AERATOR
- DIAPHRAGM SEAL
- ANNULAR DIAPHRAGM SEAL
- SS COMPOSITE SAMPLER
- FLAME TRAP
- CALIBRATION COLUMN
- S INLINE SILENCER
- BLIND FLANGE
- PIPE CAP
- STRAINER
- BASKET STRAINER
- FILTER
- PULSATION DAMPENER
- EXPANSION CHAMBER
- FFLCPLLLX PANEL CONTINUED ON SAME OR OTHER DRAWING
- PANEL OUTLINE
- PANEL NAME
- 120V 120 VOLT, 60 HZ POWER
- 480V 480 VOLT, 60 HZ POWER
- XX AIR SET XX = SUPPLY PRESSURE IN PSIG.
- PLUG
- RECEPTACLE
- RUPTURE DISK (VACUUM)
- RUPTURE DISK (PRESSURE)
- TV TV MONITOR
- TV TV CAMERA
- A, B AND C LOGIC ELEMENT: IF A AND NOT B THEN C
- A, B OR C LOGIC ELEMENT: IF A OR B THEN C
- RADIO ANTENNA
- I OR I INTERLOCK, SEE CONTROL DIAGRAMS
- VOICE COMMUNICATION POINT
- SKIMMING MECHANISM
- SCREW CONVEYOR
- MIXER
- ELECTRIC MOTOR

PUMP AND COMPRESSOR SYMBOLS

- XX CENTRIFUGAL PUMP (DRY PIT)
- XX CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
- XX RECIPROCATING OR METERING PUMP (POSITIVE DISPLACEMENT)
- XX DIAPHRAGM PUMP
- XX GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
- XX PROGESSING CAVITY PUMP
- XX COMPRESSOR (CENTRIFUGAL)
- XX COMPRESSOR (PISTON)
- XX BLOWER OR FAN (CENTRIFUGAL)
- XX EJECTOR
- XX PISTON PUMP
- XX SUBMERSIBLE SUMP PUMP
- ROTARY PUMP
- VACUUM PUMP
- SCREW PUMP

XX:
- AS ADJUSTABLE SPEED
- CS-1 CONSTANT SPEED (SINGLE SPEED)
- CS-2 CONSTANT SPEED (TWO SPEED)

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		C SAHARKHIZ	A PASTRANA	P KESKAR	APVD	A QUINONES	

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INSTRUMENTATION AND CONTROL

LEGEND SHEET 2

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VERIFY SCALE
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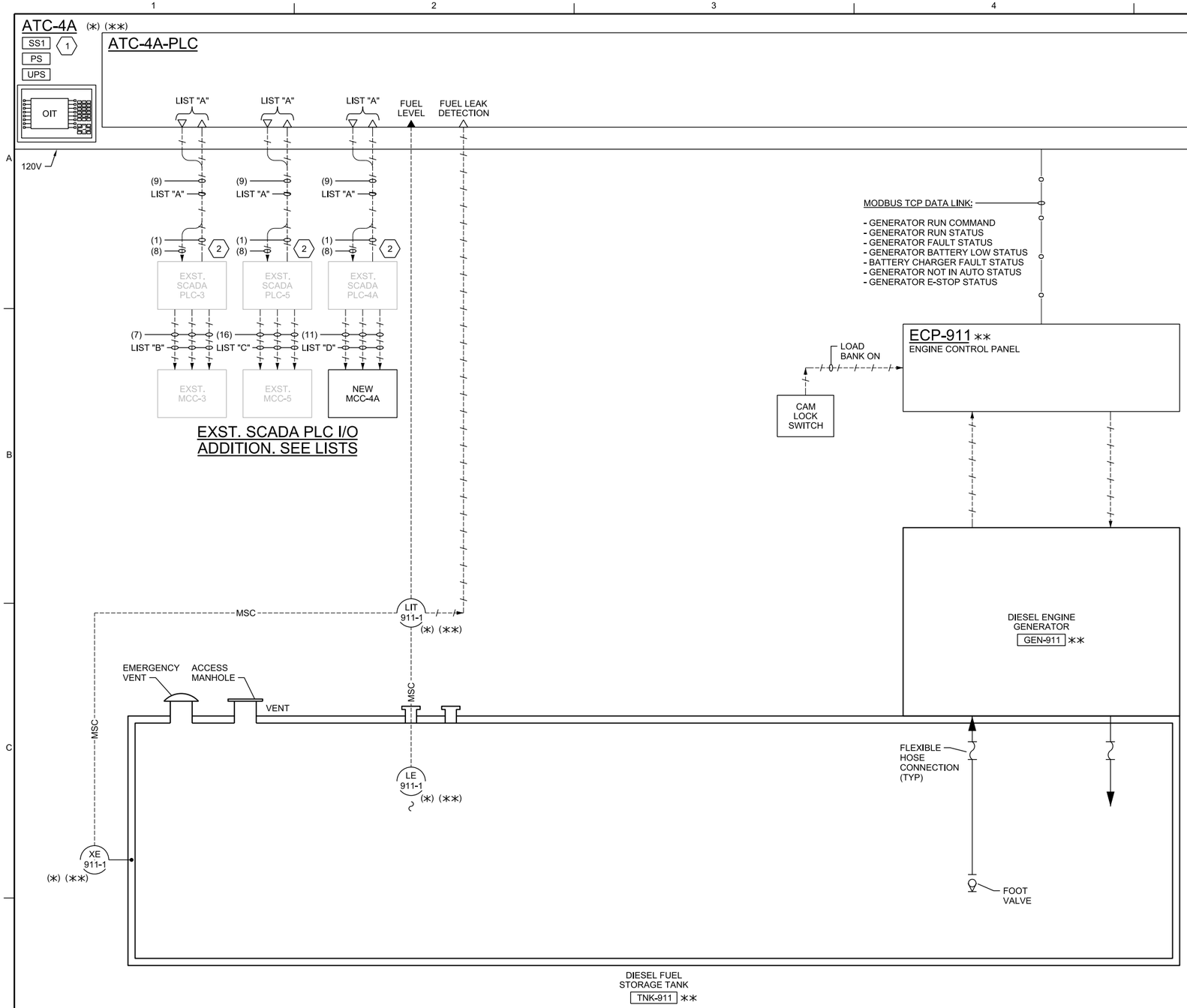

I/O LISTS

EXISTING SCADA PLC I/O MODIFICATIONS EXIST. PLC-3 (NEAR MCC-3): LIST "A" (2)

DI: NOTE 1
- PREFERRED UTILITY SOURCE BREAKER O/C
- BACK-UP UTILITY SOURCE BREAKER O/C
- INITIATE LOAD SHEDDING INTERLOCKS
- GENERATOR BREAKER OPEN/CLOSED
- POWER AVAILABLE AT SWBD-4A BUS

DO:
- LOAD SHED COMPLETE. (THIS DO WIRED TO ATC-4A-PLC AS A DI)

NOTE 1: DIs TO PLC-4A ORIGINATE AS DO FROM ATC-4A-PLC

LIST "B" ALL DOs TO STARTERS

- SLUDGE XFER PUMPS	: 4 DO
- WATER SEAL PUMPS	: 2 DO
- BLOWER	: 1 DO
TOTAL LOAD SHEDDING INTERLOCKS	: 7 DO

EXIST. PLC-5 (NEAR MCC-5): LIST "A" (2)

SEE PLC-5

LIST "C" ALL DOs TO STARTERS

- SEC. CLAR. #2 SCUM PUMPS	: 3 DO
- RETURN SLUDGE PUMPS 1, 2, 3	: 3 DO
- SEC. CLAR. 2, 3	: 2 DO
- WATER SEALS PUMPS 1, 2	: 2 DO
- SUMP PUMPS 3, 4	: 2 DO
- 30KVA XFMR	: 1 DO
- UNIT HTR	: 1 DO
-SUPPLY FANS 1, 2	: 2 DO
TOTAL LOAD SHEDDING INTERLOCKS	: 16 DO

EXIST. PLC-4A (NEAR MCC-4A): LIST "A" (2)

SEE PLC-4A

LIST "D" ALL DOs TO STARTERS

- PRIM. CLAR. 2, 3	: 2 DO
- WAS PUMPS 4, 5	: 2 DO
- NORTH/SOUTH PUMP VFDS	: 2 DO
- XFMR-AL	: 1 DO
- PV-204	: 1 DO
- PRIMARY SCUM PUMPS 8, 9	: 2 DO
- AIR COMPRESSOR	: 1 DO
TOTAL LOAD SHEDDING INTERLOCKS	: 11 DO

SHEET KEYNOTES

1. ATC-4A IS FURNISHED BY SWBD-4A MANUFACTURER IN A SEPARATE ENCLOSURE. SEE DIV. 26 480V SWBD SPECIFICATION AND DIV. 40, PACKAGE CONTROL SYSTEMS SPECIFICATION 40 99 90.
2. FOR MODIFICATIONS TO EXISTING PLC DIV. 40, SPECIFICATION 40 96 40, FACILITY CONTROL SYSTEMS INTEGRATION.

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		C SAHARKHIZ	A PASTRANA	P KESKAR	APVD	A QUINONES	

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PLA

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INSTRUMENTATION AND CONTROL

P&ID
MCC-4A BACKUP POWER SYSTEM

VERIFY SCALE
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0 1"

DATE	MARCH 2020
PROJ	705890
DWG	I-08-601
SHEET	15 of 45

FINAL DOCUMENT

ATC-100 LOCATION: NEW 600 KW GEN. SWBD.

SS1 (*) (**)
PS
UPS
OIT

ATC-100-PLC

120V

LIST "A"
LIST "A"
(1)
(11)
2
EXST. SCADA PLC-100
LIST "B"
(14)
EXIST. MCC-100 UPGRADED

FUEL LEVEL
FUEL LEAK DETECTION

MODBUS TCP DATA LINK:
- GENERATOR RUN COMMAND
- GENERATOR RUN STATUS
- GENERATOR FAULT STATUS
- GENERATOR BATTERY LOW STATUS
- BATTERY CHARGER FAULT STATUS
- GENERATOR NOT IN AUTO STATUS
- GENERATOR E-STOP STATUS

LOAD BANK ON
CAM LOCK SWITCH

ECP-921 **
ENGINE CONTROL PANEL

CB IN REMOTE
CB OPEN, CLOSED, TRIPPED
UTIL. SOURCE "E" PWR AVAIL.
(3)
CB OPEN, CLOSE
(2)
UTIL. SOURCE "F" PWR AVAIL.

CB-100-1 MAIN #1 ** BREAKER SOURCE "E"
CB-100-2 MAIN #2 ** BREAKER SOURCE "F"
CB-100-3 GENERATOR BREAKER **
CB-100-4 TIE ** BREAKER
1
LOCATED IN MCC-100
EXTERIOR MOUNTED (GEN. SWBD.)
LOCATED IN MCC-100

DIESEL ENGINE GENERATOR
GEN-921 **

MSC
LIT 921-1 (*) (**)
LE 921-1 (*) (**)
XE 921-1 (*) (**)
EMERGENCY VENT
ACCESS MANHOLE
VENT
FLEXIBLE HOSE CONNECTION (TYP)
FOOT VALVE

DIESEL FUEL STORAGE TANK
TNK-921 **

SHEET KEYNOTES

1. ATC-100 SHALL BE FURNISHED WITHIN THE NEW 600 KW GENERATOR SWBD ALONG WITH THE GEN. BREAKER. THIS DWG IS SCHEMATIC IN NATURE SHOWING THE ATC-100 & GENERATOR BREAKER IN SEPARATE SPOTS. SEE DIV. 26, 480V SWITCHBOARD SPECIFICATION & DIV. 40 PACKAGE CONTROL SPECIFICATION, 40 99 90.
2. FOR MODIFICATIONS TO EXIST. SCADA PLC-100 SEE DIV. 40 SPECIFICATION 40 96 90, FACILITY CONTROL SYSTEM INTEGRATION.

I/O LISTS

EXISTING SCADA PLC-100 I/O MODIFICATIONS EXIST. PLC-100 (NEAR MCC-100): LIST "A" 2

DI: NOTE 1
- MAIN UTILITY SOURCE (A) BREAKER O/C
- MAIN UTILITY SOURCE (B) BREAKER O/C
- INITIATE LOAD SHEDDING INTERLOCKS
- GENERATOR BREAKER OPEN/CLOSED
- POWER AVAILABLE AT MCC-100 BUS (A)
- POWER AVAILABLE AT MCC-100 BUS (B)
- TIE BREAKER OPEN/CLOSED

DO:
- LOAD SHED COMPLETE. (THIS DO WIRED TO ATC-100-PLC AS A DI)

NOTE 1: THESE DIs TO PLC-100 ORIGINATE AS DO FROM ATC-100-PLC

LIST "B" ALL DOs TO MCC-100 STARTERS

- DISK FILTER CONTROL PANEL 1 & 2	: 2 DO
- ON SITE RE-USE PUMPS 1-4	: 4 DO
- FILTER MUD WELL PUMPS 1 & 2	: 2 DO
- SCUM PUMPS 1 & 2	: 2 DO
- SUMP PUMPS 1 & 2	: 2 DO
- PANEL (PP1)	: 1 DO
- AIR FILTER SYSTEM AFS-1	: 1 DO
TOTAL LOAD SHEDDING INTERLOCKS	: 14 DO

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
REVISION		C SAHARKHIZ	A PASTRANA	P KESKAR		A QUINONES	

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CEDAR BAY - WATER SYSTEM RESILIENCY

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INSTRUMENTATION AND CONTROL
P&ID
MCC-100 BACKUP POWER SYSTEM

FINAL DOCUMENT

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DATE	MARCH 2020
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DWG	I-08-602
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SWBD-4A BUILDING
OPERATIONS BUILDING

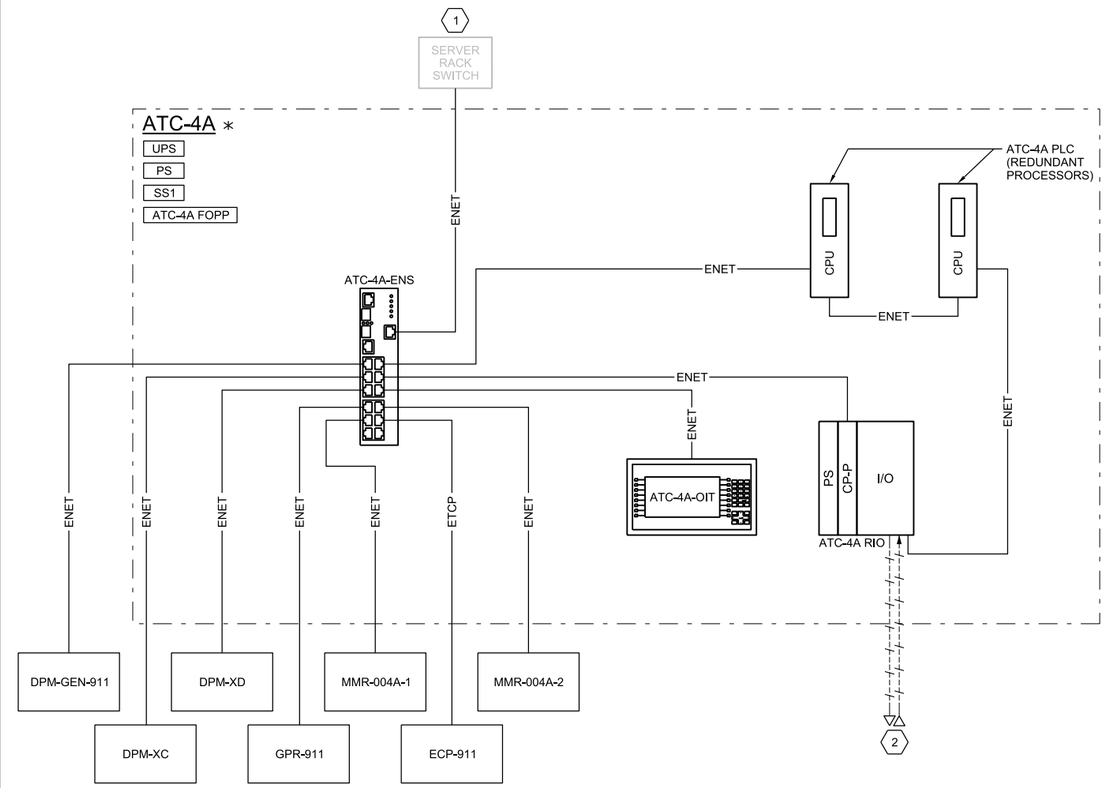
MCC-100 BUILDING

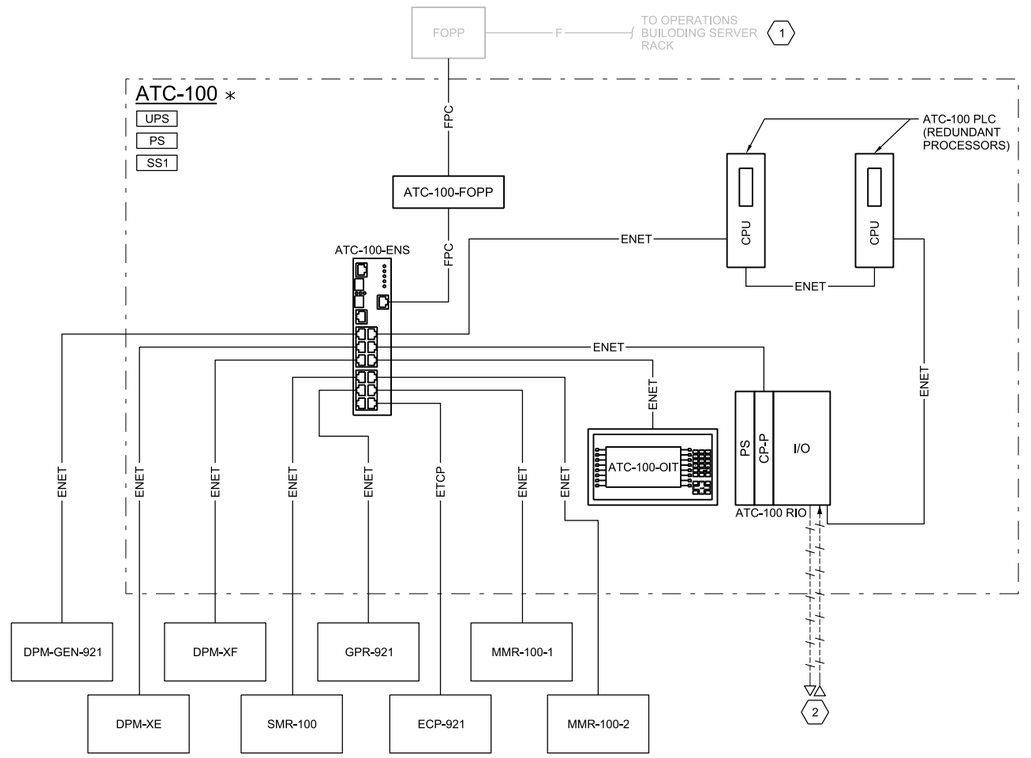
SHEET KEYNOTES

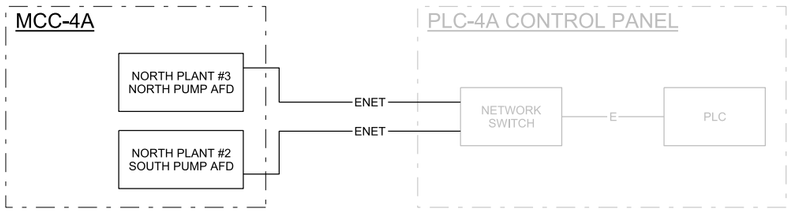
1. EXISTING SERVER RACK LOCATED IN OPERATIONS BUILDING AND IS ADJACENT TO NEW SWITCHBOARD SWBD-4A. REFER TO ELECTRICAL DRAWING E-80-201.
2. HARDWIRED I/O INTERFACE TO NEW FIELD EQUIPMENT AND EXISTING SCADA SYSTEM PLC NODES. REFER TO I/O LISTS AND DRAWINGS I-08-601 & I-08-602.

ABBREVIATIONS

AFD	ADJUSTABLE FREQUENCY DRIVE
ATC	AUTOMATIC TRANSFER CONTROLLER
CP-P	COMMUNICATIONS PROCESSOR, PROFINET
CPU	CENTRAL PROCESSING UNIT
E	ETHERNET CABLE, UNSPECIFIED
ENET	ETHERNET CABLE, CAT-6, PROFINET
ENS	ETHERNET SWITCH
ETCP	ETHERNET CABLE, CAT-6, MODBUS TCP
F	FIBER OPTIC CABLE, UNSPECIFIED
FOPP	FIBER OPTIC PATCH PANEL
FPC	FIBER OPTIC PATCH CORD
GPR	GENERATOR PROTECTION RELAY
I/O	INPUT/OUTPUT
MMR	MAIN MANAGEMENT RELAY
OIT	OPERATOR INTERFACE TERMINAL
PLC	PROGRAMMABLE LOGIC CONTROLLER
DPM	DIGITAL POWER MONITOR
PS	POWER SUPPLY
RIO	REMOTE INPUT/OUTPUT
SMR	SYNCHRONIZATION MONITORING RELAY
SS1	SURGE SUPPRESSION, 120V
UPS	UNINTERRUPTIBLE POWER SUPPLY







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		C SAHARKHIZ	A PASTRANA	DR	P KESKAR		A QUINONES

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INSTRUMENTATION AND CONTROL

P&ID
PARTIAL NETWORK BLOCK DIAGRAM

FINAL DOCUMENT

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ONE-LINE DIAGRAM-1

SYMBOL	DESCRIPTION
	DRAWOUT AIR CIRCUIT BREAKER, LOW VOLTAGE
400	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE, UNO
AS/AF or AT/AF	CIRCUIT BREAKER, STATIC TRIP UNIT, SENSOR AMP TRIP AND FRAME RATINGS SHOWN, 3 POLE, UNO
100/M	CIRCUIT BREAKER, MAGNETIC TRIP ONLY, TRIP RATING SHOWN, 3 POLE, UNO
400 400	CIRCUIT BREAKER WITH CURRENT LIMITING FUSES, TRIP AND FUSE RATING INDICATED, 3 POLE, UNO
400 225	FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE, UNO
100	SWITCH, CURRENT RATING INDICATED, 3 POLE, UNO
60 (3)	FUSE, CURRENT RATING AND QUANTITY INDICATED
1	MAGNETIC STARTER WITH OVERLOAD, NEMA SIZE INDICATED, FVNR UNO
AFD	ELECTRONIC STARTER/SPEED CONTROL RVSS = REDUCED VOLTAGE SOFT STARTER AFD = AC ADJUSTABLE FREQUENCY DRIVE DC = DC ADJUSTABLE SPEED DRIVE RVAT = REDUCED VOLTAGE AUTO TRANSFORMER TYPE RVRT = REDUCED VOLTAGE REACTOR TYPE
	CABLE OR BUS CONNECTION POINT
K	KEY INTERLOCK
	SURGE ARRESTER (GAP TYPE)
10	CAPACITOR - KVAR INDICATED, 3 PHASE
3	AC MOTOR, SQUIRREL CAGE INDUCTION - HORSEPOWER INDICATED
G 500/625	GENERATOR, KW/KVA RATING SHOWN
VS V 0-600V	ANALOG METER WITH SWITCH - SCALE RANGE SHOWN V = VOLTAGE KW = KILOWATTS A = AMPERAGE KVAR = KILOVARS PF = POWER FACTOR
DPM	DIGITAL POWER METER (MULTIFUNCTION)
	UTILITY REVENUE METER
	GROUND
15 KVA 480-120/240V 1 PH	TRANSFORMER, SIZE, VOLTAGE RATINGS, AND PHASE INDICATED
	SHIELDED ISOLATION TRANSFORMER
480-120V (3)	POTENTIAL TRANSFORMER, VOLTAGE RATING AND QUANTITY INDICATED
100:5 (3)	CURRENT TRANSFORMER, RATIO(100:5) AND QUANTITY INDICATED (3)
	CONNECTION POINT TO EQUIPMENT SPECIFIED IN OTHER DIVISIONS, RACEWAY, CONDUCTOR AND CONNECTION IN THIS DIVISION
SPD	SURGE PROTECTIVE DEVICE

ONE-LINE DIAGRAM-2

SYMBOL	DESCRIPTION
	DRAWOUT POWER CIRCUIT BREAKER, MEDIUM VOLTAGE
	NON DRAWOUT FUSED SWITCH, MEDIUM VOLTAGE
	DRAWOUT FUSED SWITCH AND CONTACTOR, MEDIUM VOLTAGE
	DRAWOUT FUSED SWITCH AND VACUUM CONTACTOR, MEDIUM VOLTAGE
	DRAWOUT VACUUM CONTACTOR, MEDIUM VOLTAGE
	MEDIUM VOLTAGE CABLE STRESS CONE TYPE TERMINATION, OPEN TERMINATOR OR ELBOW
	SWITCH - LOAD BREAK, GROUP OPERATED, MEDIUM VOLTAGE
	SWITCH W/ARCING HORNS, MEDIUM VOLTAGE
	DISCONNECTING FUSE - SOLID MATERIAL, MEDIUM VOLTAGE
	SWITCH - HOOK STICK OPERATED, SINGLE POLE, MEDIUM VOLTAGE
	FUSE - EXPULSION, HOOK STICK OPERATED, SINGLE POLE, MEDIUM VOLTAGE
	GROUND SWITCH, GANG OPERATED
	TERMINAL BLOCK LUG
	DELTA CONNECTION
	WYE GROUNDED CONNECTION, SOLID GROUND
R or Z	WYE NEUTRAL GROUND RESISTOR OR IMPEDANCE CONNECTION
86	RELAY OR DEVICE, FUNCTION NUMBER AS INDICATED
50:5 (1)	CURRENT TRANSFORMER, ZERO SEQUENCE, RATIO AND QUANTITY INDICATED
800/1200:5 (3)	BUSHING CURRENT TRANSFORMER, MULTI-RATIO AND QUANTITY INDICATED
MO	MOTOR OPERATOR, BREAKER OR SWITCH
MPR	MOTOR PROTECTION RELAY
MMR	MAIN MANAGEMENT RELAY
SMR	SYSTEM MANAGEMENT RELAY
GPR	GENERATOR PROTECTION RELAY
BE	PHASE UNBALANCE RELAY. BASLER 47N/27.

NOTES:

1. THESE ARE STANDARD LEGEND SHEETS. SOME SYMBOLS AND ABBREVIATIONS MAY APPEAR ON THE LEGEND AND NOT ON THE DRAWINGS.
2. FOR ADDITIONAL ABBREVIATIONS OF OTHER DIVISIONS (HVAC, MECHANICAL, AND STRUCTURAL/ARCHITECTURAL) SEE OTHER LEGENDS.

CONTROL DIAGRAM-1

SYMBOL	DESCRIPTION
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED
	PUSH BUTTON SWITCH, MAINTAINED CONTACTS WITH MECHANICAL INTERLOCK
	3 POSITION SELECTOR SWITCH MAINTAINED CONTACT
HAND OFF REMOTE	SELECTOR SWITCH - MAINTAINED CONTACT - CHART IDENTIFIES OPERATION WHEN NEEDED FOR CLARITY:

	POSITION		
CKT	HAND	OFF	REMOTE
1	X	O	O
2	O	O	X

X - CLOSED CONTACT
O - OPEN CONTACT

SYMBOL	DESCRIPTION
	TOGGLE SWITCH, ON-OFF TYPE
ON OFF	SELECTOR SWITCH, ON-OFF TYPE
	MUSHROOM HEAD PUSHBUTTON SWITCH
A	INDICATING LIGHT, PUSH-TO-TEST, LETTER INDICATES COLOR
A	INDICATING LIGHT - LETTER INDICATES COLOR A - AMBER G - GREEN S - STROBE B - BLUE R - RED C - CLEAR W - WHITE
ETM	ELAPSED TIME METER
M	MOTOR STARTER CONTACTOR COIL
CRX	CONTROL RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT
TDR X	TIME DELAY RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT
SV X	SOLENOID VALVE, X INDICATES NUMERICAL ORDER IN CIRCUIT
	CONTACT - NORMALLY OPEN
	CONTACT - NORMALLY CLOSED
	REMOTE DEVICE
	TIME DELAY RELAY CONTACT, NORMALLY OPEN, CLOSES WHEN ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, NORMALLY CLOSED, OPENS WHEN ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, CLOSES WHEN ENERGIZED, OPENS WHEN DE-ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, OPENS WHEN ENERGIZED, CLOSES WHEN DE-ENERGIZED AND TIMED OUT
	MOTOR SPACE HEATER
	TERMINAL BLOCK, REMOTE
	TERMINAL BLOCK, INTERNAL
	FUSED TERMINAL BLOCK
	FUSE, RATING INDICATED
CPT 120V	TRANSFORMER, CONTROL POWER
	THERMOCOUPLE

CONTROL DIAGRAM-2

SYMBOL	DESCRIPTION
	CAPACITOR
+ −	BATTERY
	LIMIT SWITCH, NORMALLY OPEN, CLOSES AT END OF TRAVEL
	LIMIT SWITCH, NORMALLY CLOSED, OPENS AT END OF TRAVEL
	TEMPERATURE SWITCH, OPENS ON TEMPERATURE RISE
	TEMPERATURE SWITCH, CLOSES ON TEMPERATURE RISE
	FLOAT SWITCH, NORMALLY OPEN, CLOSES ON DESCENDING LEVEL
	FLOAT SWITCH, NORMALLY OPEN, CLOSES ON RISING LEVEL
	PRESSURE SWITCH, NORMALLY CLOSED, OPENS ON RISING PRESSURE
	PRESSURE SWITCH, NORMALLY OPEN, CLOSES ON RISING PRESSURE
	FLOW SWITCH, CLOSES ON INCREASED FLOW
	FLOW SWITCH, OPENS ON INCREASED FLOW
NGR	NEUTRAL GROUND CURRENT LIMITING RESISTOR
RES	CALIBRATING RESISTOR
T GEN	TACHOMETER GENERATOR
GFS	GROUND FAULT SENSOR
	FLASHER
	SEALED CONTACT
	BUZZER
	POTENTIOMETER
	RESISTOR
	BLOWN FUSE INDICATOR
	COAXIAL CABLE
	MULTICONDUCTOR SHIELDED CABLE
	DUPLEX RECEPTACLE
L U	RELAY, WITH MECHANICAL LATCH
	FULLWAVE DIODE BRIDGE (AC TO DC)

NO.	DATE	DSGN	REVISION	CHK	DR
			APVD	BY	APVD
				P KESKAR	A QUINONES
				C HAMER	A QUINONES

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ELECTRICAL
LEGEND

FINAL DOCUMENT

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POWER SYSTEM PLAN-1

SYMBOL	DESCRIPTION
	CONNECTION POINT TO EQUIPMENT SPECIFIED. RACEWAY, CONDUCTOR,TERMINATION AND CONNECTION IN THIS DIVISION.
MCC-A	MAJOR ELECTRICAL COMPONENT OR DEVICE - NAME OR IDENTIFYING SYMBOL AS SHOWN.
	PANELBOARD - SURFACE MOUNTED
L P X X A	PANELBOARD LETTER OR NUMBER FACILITY NUMBER LP - LOW VOLTAGE PANEL DP - DISTRIBUTION PANEL
	PANELBOARD - FLUSH MOUNTED
	TERMINAL JUNCTION BOX
M	MOTOR, SQUIRREL CAGE INDUCTION
G	GENERATOR, VOLTAGE AND SIZE AS INDICATED.
LPXXA	HOME RUN - DESTINATION SHOWN
or G	EXPOSED CONDUIT AND CONDUCTORS*
or G	CONCEALED CONDUIT AND CONDUCTORS*

NOTE:
ALL UNMARKED CONDUIT RUNS CONSIST OF TWO NO. 12, ONE NO. 12 GROUND CONDUCTORS IN 3/4" CONDUIT. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF NO. 12 CONDUCTORS. CROSSHATCH WITH SUBSCRIPT "G" INDICATES GREEN GROUND WIRE.

G	CROSSHATCHES WITH BAR INDICATE NO.10 CONDUCTOR. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE.
A1	CONDUIT AND CONDUCTOR CALLOUT, SEE LEGEND.
	CONDUIT DOWN
	CONDUIT UP
	CONDUIT, STUBBED AND CAPPED
	CONDUIT TERMINATION AT CABLE TRAY
EX	EXISTING CONDUIT/ DUCT BANK
BD	BUS DUCT - SEE SPECIFICATIONS
CE	CONCRETE ENCASED CONDUIT
DB	DIRECT BURIED CONDUIT
FO	FIBER OPTIC CONDUIT
DB-XX	DUCT BANK WHERE DB-XX IS THE DUCT BANK NAME. SEE CIRCUIT AND RACEWAY CODING DEFINITION
	CONCEALED CONDUIT ROUTING AREA
	CONDUIT ROUTING AREA
	CABLE TRAY
T	TRANSFORMER
J or HH	GENERAL CONTROL OR WIRING DEVICE. LETTER SYMBOLS OR ABBREVIATIONS INDICATE TYPE OF DEVICE
CS	CONTROL STATION, SEE CONTROL DIAGRAMS FOR CONTROL DEVICE(S) REQUIRED.
30	NONFUSED DISCONNECT SWITCH, CURRENT RATING INDICATED, 3 POLE
60/40	FUSED DISCONNECT SWITCH, CURRENT RATING INDICATED (60/40, 60=SWITCH RATING / 40=FUSE RATING) 3 POLE
2	COMBINATION CIRCUIT BREAKER AND MAGNETIC STARTER, NEMA SIZE INDICATED

POWER SYSTEM PLAN-2

SYMBOL	DESCRIPTION
100/40	BREAKER, SEPARATELY MOUNTED, CURRENT RATING INDICATED (100/40, 100 = FRAME SIZE; 40 = TRIP RATING) 3 POLE
C 2	CONTACTOR, MAGNETIC, NEMA SIZE INDICATED
L 30	LIGHTING CONTACTOR, CURRENT RATING INDICATED
2	STARTER, MAGNETIC NEMA SIZE INDICATED
XX 2	CONVENIENCE RECEPTACLE - DUPLEX UNLESS NOTED OTHERWISE WP - WEATHERPROOF C - CLOCK HANGER TL - TWIST LOCK CRE - CORROSION RESISTANT GFCI - GROUND FAULT CIRCUIT INTERRUPTER SUBSCRIPT NUMBER AT RECEPTACLE INDICATES CIRCUIT
	240V RECEPTACLE
	CONVENIENCE RECEPTACLE - QUADRUPLEX
	MULTI OUTLET ASSEMBLY
	DUPLEX CONVENIENCE RECEPTACLE - FLUSH IN FLOOR
	CONVENIENCE RECEPTACLE, PEDESTAL, DUPLEX SINGLE FACE UNLESS INDICATED OTHERWISE
L20R 20	RECEPTACLE, SPECIAL PURPOSE-NEMA CONFIGURATION AND AMPERAGE INDICATED
T	THERMOSTAT
	UTILITY REVENUE METERING FACILITY
EUH	ELECTRIC UNIT HEATER
AC	ELECTRIC AIR CONDITIONER (SELF CONTAINED UNIT)
	UTILITY POLE

LIGHTING SYSTEM PLAN

1 or 1	LUMINAIRE, SEE SCHEDULE
1	LUMINAIRE, SEE SCHEDULE
1 or	LUMINAIRE WITH INTERNAL BATTERY BACKUP, SEE SCHEDULE
1	STRIP LUMINAIRE, SEE SCHEDULE
4 or 4	LUMINAIRE AND POLE, SEE SCHEDULE
5 or 5	WALL MOUNTED LUMINAIRE, SEE SCHEDULE
1	FLOOD LIGHTS - AIM IN THE DIRECTION SHOWN
	STANDBY LIGHTING UNIT, SURFACE MOUNTED, SEE SCHEDULE
XX or	EXIT LIGHTS - FILLED SECTION INDICATES LIGHTED FACE, ARROW INDICATES EGRESS DIRECTIONAL INDICATORS, XX = FIXTURE NUMBER, SEE SCHEDULE
$a or 2a	SMALL LETTER SUBSCRIPT AT SWITCH AND LUMINAIRE INDICATES SWITCHING. SUBSCRIPT NUMBER AT LUMINAIRE INDICATES CIRCUIT
$3	WALL SWITCH: 2- DOUBLE POLE P- PILOT LIGHT 3- THREE WAY K- KEY OPERATED 4- FOUR WAY D- DIMMER WP- WEATHERPROOF CRE- CORROSION RESISTANT EX- EXPLOSIONPROOF L- MOMENTARY 3-WAY M- MOTOR RATED MS- MANUAL STARTER WITH OVERLOADS
OS	OCCUPANCY SENSOR
LC	LIGHTING CONTACTOR
MD	MOTION DETECTOR
PC	PHOTOCELL

FIRE ALARM SYSTEM PLAN AND RISER

SYMBOL	DESCRIPTION
F P	FIRE ALARM STATION, MANUAL
	FIRE ALARM SYSTEM, AUTOMATIC SMOKE DETECTOR
HD	FIRE ALARM SYSTEM, AUTOMATIC, HEAT DETECTOR
F	FIRE ALARM BELL
F	FIRE ALARM HORN
	FIRE ALARM HORN/STROBE LIGHT

GROUND SYSTEM PLAN

SYMBOL	DESCRIPTION
	GROUND ROD
	GROUND ROD IN TEST WELL
G	GROUNDING CONDUCTOR, SIZE AS INDICATED
	PIGTAIL FOR CONNECTION TO EQUIPMENT CABINET OR FRAME
G	EQUIPMENT GROUND BUS
N	EQUIPMENT NEUTRAL BUS
TA	CABLE TO CABLE TEE
XJ	CABLE TO REINFORCING STEEL
WA	CABLE TO STEEL SURFACE

ABBREVIATIONS-1

ABBREVIATION	DESCRIPTION
A	AMPERE, AUTOMATIC
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AL	ALUMINUM
ATC	AUTOMATIC TRANSFER CONTROL
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAGE
BAT	BATTERY
BKR	BREAKER
BLDG	BUILDING
C	CONDUIT, CONTACTOR, CONDUCTOR, CLOSE, CENTIGRADE
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CS	CONTROL STATION:C=CLOSE, T=TRIP
CT	CURRENT TRANSFORMER, CABLE TRAY
CU	COPPER
DC	DIRECT CURRENT
DIV	DIVISION
DN	DOWN
DP	DISTRIBUTION PANEL
DS	DISCONNECT SWITCH
EA	EACH
ECP	ENGINE CONTROL PANEL
EG	ENGINE GENERATOR
ELEC	ELECTRIC
EMER	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
EO	ELECTRIC OPERATED, ELECTRIC OPERATOR
EQPT	EQUIPMENT
ETM	ELAPSED TIME METER
EXST	EXISTING
F	FORWARD, FREQ
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FDR	FEEDER
FPR	FEEDER PROTECTOR RELAY
FO	FIBER OPTIC
FP	FIELD PANEL
FREQ	FREQUENCY
FU	FUSE
FVNR	FULL VOLTAGE NON-REVERSING
FWD	FORWARD
G	GROUND
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GPR	GENERATOR PROTECTOR RELAY
GRS	GALVANIZED RIGID STEEL CONDUIT
HH	HANDHOLE
HMI	HUMAN-MACHINE INTERFACE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HP	HORSEPOWER
HS	HAND SWITCH
HZ	HERTZ
IC	INTERRUPTING CAPACITY
I & C	INSTRUMENTATION AND CONTROL
INST	INSTANTANEOUS
INT	INTERRUPTING
J,JB	JUNCTION BOX
K	KEY INTERLOCK
KAIC	KILOAMPERES INTERRUPTING CAPACITY
KV	KILOVOLTS
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOURS
LC	LIGHTING CONTACTOR
LCP	LOCAL CONTROL PANEL
LE	LEVEL ELEMENT
LIT	LEVEL INDICATING TRANSMITTER
LOR	LOCAL-OFF-REMOTE
LP	LIGHTING PANEL
LR	LOCAL/REMOTE
LS	LIMIT SWITCH, LEVEL SWITCH
LT	LEVEL TRANSMITTER
LFMC	LIQUID-TIGHT FLEX CONDUIT
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE, METAL HALIDE, MOUNTING HEIGHT
MIN	MINIMUM
MO	MOTOR OPERATOR
MPR	MOTOR PROTECTION RELAY
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MVMH	MEDIUM VOLTAGE MANHOLE
N	NEUTRAL, NORMAL
NA	NON-AUTOMATIC
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NESC	NATIONAL ELECTRICAL SAFETY CODE
NEUT	NEUTRAL
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
O	OPEN
OCA	OPEN-CLOSE-AUTO
OHM	OHMMETER
OL	OVERLOAD RELAY
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
PB	PULL BOX
PC	PHOTOCELL
PCB	POWER CIRCUIT BREAKER
PF	POWER FACTOR
PH	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
PWR	POWER
R	RELAY,REVERSE,RUN,RAISE
RCPT	RECEPTACLE
REF	REFERENCE
REM	REMOTE
RGS	RIGID GALVANIZED STEEL CONDUIT
RIO	REMOTE INPUT/OUTPUT
RMS	ROOT MEAN SQUARE
RPM	REVOLUTIONS PER MINUTE
RTU	REMOTE TELEMETRY UNIT
RTD	RESISTANCE TEMPERATURE DETECTO
SA	SURGE ARRESTER
SC	SPEED CONTROL
SCADA	SUPERVISORY CONTROL AND DATA ACQUITION SYSTEM
S/N	SOLID NEUTRAL
SPD	SURGE PROTECTION DEVICE
SS	START STOP
SST	STAINLESS STEEL
ST	SHUNT TRIP
SUB	SUBSTATION
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYMM	SYMMETRICAL
TD	TEMPERATURE DETECTOR, TIME DELAY
TDR	TIME DELAY RELAY
TEMP	TEMPERATURE
TJB	TERMINAL JUNCTION BOX
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VFD	VARIABLE FREQUENCY DRIVE
VM	VOLTMETER
VS	VOLTMETER SWITCH
W	WATTS
WP	WEATHERPROOF
XFMR	TRANSFORMER

NO.	DATE	REVISION	DR	CHK	BY	APVD
DSGN	A QUINONES	C HAMER	DR	P KESKAR	A QUINONES	APVD

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ELECTRICAL
LEGEND

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-00-002
SHEET	19 of 45

FINAL DOCUMENT

ONE LINE PROTECTION RELAYING AND ELEMENTARY DIAGRAMS-2

DEVICE FUNCTION NO.	DEVICE DESCRIPTION
21	IMPEDANCE/DISTANCE RELAY
25A	AUTOMATIC SYNCHRONIZER
25C	SYNCH CHECK RELAY
27	UNDERVOLTAGE RELAY
32	REVERSE POWER RELAY
40	GENERATOR LOSS OF EXCITATION RELAY
43CSE	AUTOMATIC POWER TRANSFER AND LOAD CONTROL MODE SEL. SWITCH
43CSX	MODE SEL. SWITCH
46	GENERATOR CURRENT UNBALANCE RELAY
47	PHASE SEQUENCE OR PHASE BALANCE VOLTAGE RELAY
49	THERMAL RELAY
50GS	INSTANTANEOUS OVERCURRENT DEVICE, GROUND SENSOR
50	INSTANTANEOUS OVERCURRENT DEVICE,
51	TIME OVERCURRENT RELAY
51G	TIME OVERCURRENT RELAY, GROUND FAULT
51V	TIME OVERCURRENT, VOLTAGE RESTRAINED
52	POWER CIRCUIT BREAKER
52CSX	POWER CIRCUIT BREAKER CONTROL SWITCH
59	OVERVOLTAGE RELAY
60	VOLTAGE OR CURRENT BALANCE RELAY
62	TIME-DELAY STOPPING OR OPENING RELAY
65A	ENGINE GOVERNOR, SPEED CONTROL
65A, MOP	ENGINE GOVERNOR, SPEED CONTROL MOTOR OPERATED POTENTIOMETER
65A, RL	ENGINE GOVERNOR, SPEED CONTROL RAISE/LOWER SWITCH
65B	ENGINE GOVERNOR, LOAD CONTROL
65B, MOP	ENGINE GOVERNOR, LOAD CONTROL MOTOR OPERATED POTENTIOMETER
65B, RL	ENGINE GOVERNOR, % LOAD RAISE/LOWER SWITCH
65E	AUTOMATIC POWER TRANSFER AND LOAD CONTROL, WOODWARD APTL
65F	AUTOMATIC GENERATOR LOADING CONTROL, WOODWARD AGLC
67	DIRECTIONAL TIME OVERCURRENT RELAY
74	ALARM RELAY
81O/U	FREQUENCY RELAY, OVER/UNDER
86	LOCKOUT RELAY
87	DIFFERENTIAL PROTECTIVE RELAY
90	VOLTAGE REGULATOR
90, MOP	ENGINE EXCITATION, POWER OPERATED POTENTIOMETER
90PF	ENGINE EXCITATION, POWER FACTOR CONTROL
90RL	ENGINE EXCITATION, RAISE/ LOWER SWITCH

X = DEVICE NUMBER, WHEN THERE ARE MULTIPLE UNITS

POWER CIRCUIT CALLOUTS

EQUIPMENT GROUNDS NEC 250 Table 122		100% GROUNDS NEC 250-122(A)		SERVICE GROUNDS NEC 250 Table 66	
2 Wire + Ground					
[20E2]	3/4"C-2#12,#12G	[20M2]	3/4"C-2#12,#12G	NA	NA
[30E2]	3/4"C-2#10,#10G	[30M2]	3/4"C-2#10,#10G	NA	NA
[40E2]	3/4"C-2#8,#10G	[40M2]	3/4"C-2#8,#8G	[40S2]	3/4"C-2#8,#8G
[50E2]	3/4"C-2#8,#10G	[50M2]	3/4"C-2#8,#8G	[50S2]	3/4"C-2#8,#8G
[60E2]	1"C-2#6,#10G	[60M2]	1"C-2#6,#6G	[60S2]	3/4"C-2#6,#8G
[70E2]	1"C-2#4,#8G	[70M2]	1"C-2#4,#4G	[70S2]	3/4"C-2#4,#8G
[80E2]	1"C-2#4,#8G	[80M2]	1"C-2#4,#4G	[80S2]	3/4"C-2#4,#8G
[90E2]	1"C-2#3,#8G	[90M2]	1"C-2#3,#3G	[90S2]	1"C-2#3,#8G
[100E2]	1"C-2#3,#8G	[100M2]	1"C-2#3,#3G	[100S2]	1"C-2#3,#8G
[110E2]	1"C-2#2,#6G	[110M2]	1"C-2#2,#2G	[110S2]	1"C-2#2,#8G
[125E2]	1-1/4"C-2#1,#6G	[125M2]	1-1/4"C-2#1,#1G	[125S2]	1-1/4"C-2#1,#6G
[150E2]	1-1/4"C-2#1/0,#6G	[150M2]	1-1/4"C-2#1/0,#1/0G	[150S2]	1-1/4"C-2#1/0,#6G
[200E2]	1-1/2"C-2#3/0,#6G	[200M2]	1-1/2"C-2#3/0,#3/0G	[200S2]	1-1/4"C-2#3/0,#4G
[225E2]	2"C-2#4/0,#4G	[225M2]	2"C-2#4/0,#4/0G	[225S2]	1-1/2"-2#4/0,#2G
[400E2]	3"C-2#500,#3G	[400M2]	3"C-2#500,#500G	[400S2]	3"-2#500,#1/0G
3 Wire + Ground					
[20E3]	3/4"C-3#12,#12G	[20M3]	3/4"C-3#12,#12G	NA	NA
[30E3]	3/4"C-3#10,#10G	[30M3]	3/4"C-3#10,#10G	NA	NA
[40E3]	3/4"C-3#8,#10G	[40M3]	3/4"C-3#8,#8G	[40S3]	3/4"C-3#8,#8G
[50E3]	3/4"C-3#8,#10G	[50M3]	3/4"C-3#8,#8G	[50S3]	3/4"C-3#8,#8G
[60E3]	3/4"C-3#6,#10G	[60M3]	3/4"C-3#6,#6G	[60S3]	3/4"C-3#6,#8G
[70E3]	1"C-3#4,#8G	[70M3]	1"C-3#4,#4G	[70S3]	1"C-3#4,#8G
[80E3]	1"C-3#4,#8G	[80M3]	1"C-3#4,#4G	[80S3]	1"C-3#4,#8G
[90E3]	1-1/4"C-3#3,#8G	[90M3]	1-1/4"C-3#3,#3G	[90S3]	1"C-3#3,#8G
[100E3]	1-1/4"C-3#3,#8G	[100M3]	1-1/4"C-3#3,#3G	[100S3]	1"C-3#3,#8G
[110E3]	1-1/2"C-3#2,#6G	[110M3]	1-1/2"C-3#2,#2G	[110S3]	1"C-3#2,#8G
[125E3]	1-1/2"C-3#1,#6G	[125M3]	1-1/2"C-3#1,#1G	[125S3]	1-1/2"C-3#1,#6G
[150E3]	1-1/2"C-3#1/0,#6G	[150M3]	1-1/2"C-3#1/0,#1/0G	[150S3]	1-1/4"C-3#1/0,#6G
[200E3]	2"C-3#3/0,#6G	[200M3]	2"C-3#3/0,#3/0G	[200S3]	1-1/2"C-3#3/0,#4G
[225E3]	2"C-3#4/0,#4G	[225M3]	2"C-3#4/0,#4/0G	[225S3]	2"C-3#4/0,#2G
[250E3]	2-1/2"C-3#300,#4G	[250M3]	2-1/2"C-3#300,#300G	[250S3]	2-1/2"C-3#300,#2G
[300E3]	3"C-3#350,#4G	[300M3]	3"C-3#350,#350G	[300S3]	2-1/2"C-3#350,#2G
[350E3]	3"C-3#500,#3G	[350M3]	3"C-3#500,#500G	[350S3]	3"C-3#500,#1/0G
[400E3]	4"C-3#600,#2G	[400M3]	3"C-3#500,#500G	[400S3]	3"C-3#500,#1/0G
[500E3]	(2)2-1/2"C-3#250,#2G	[500M3]	(2)2-1/2"C-3#250,#250G	[500S3]	(2)2-1/2"C-3#250,#1/0G
[600E3]	(2)3"C-3#350,#1G	[600M3]	(2)3"C-3#350,#350G	[600S3]	(2)3"C-3#350,#2/0G
[700E3]	(2)3"C-3#500,#1/0G	[700M3]	(2)3"C-3#500,#500G	[700S3]	(2)3"C-3#500,#2/0G
[800E3]	(2)3"C-3#500,#1/0G	[800M3]	(2)3"C-3#500,#500G	[800S3]	(2)3"C-3#500,#2/0G
[1000E3]	(3)3"C-3#350,#2/0G	[1000M3]	(3)3"C-3#500,#500G	[1000S3]	(3)3"C-3#500,#3/0G
[1200E3]	(3)3-1/2"C-3#600,#3/0G	[1200M3]	(3)3-1/2"C-3#600,#600G	[1200S3]	(3)3-1/2"C-3#600,#3/0G
[1600E3]	(4)3-1/2"C-3#600,#4/0G	[1600M3]	(4)3-1/2"C-3#600,#600G	[1600S3]	(4)3-1/2"C-3#600,#3/0G
[2000E3]	(5)3-1/2"C-3#600,#250G	[2000M3]	(5)3-1/2"C-3#600,#600G	[2000S3]	(5)3-1/2"C-3#600,#3/0G
[2500E3]	(6)3-1/2"C-3#600,#350G	[2500M3]	(6)3-1/2"C-3#600,#600G	[2500S3]	(6)3-1/2"C-3#600,#3/0G
[3000E3]	(8)3-1/2"C-3#600,#400G	[3000M3]	(8)3-1/2"C-3#600,#600G	[3000S3]	(8)3-1/2"C-3#600,#3/0G
[4000E3]	(10)3-1/2"C-3#600,#500G	[4000M3]	(10)3-1/2"C-3#600,#600G	[4000S3]	(10)3-1/2"C-3#600,#3/0G
4 Wire + Ground				**MULTI-WIRE 20 AMP**	
[20E4]	3/4"C-4#12,#12G	[20M4]	3/4"C-4#12,#12G	[20E5]	3/4"C-5#12,1#12G
[30E4]	3/4"C-4#10,#10G	[30M4]	3/4"C-4#10,#10G	[20E6]	3/4"C-6#12,1#12G
[40E4]	3/4"C-4#8,#10G	[40M4]	3/4"C-4#8,#8G	[20E7]	3/4"C-7#12,1#12G
[50E4]	3/4"C-4#8,#10G	[50M4]	3/4"C-4#8,#8G	[20E8]	3/4"C-8#12,1#12G
[60E4]	1"C-4#6,#8G	[60M4]	1"C-4#6,#6G	[20E9]	3/4"C-9#12,1#12G
[70E4]	1-1/4"C-4#4,#8G	[70M4]	1-1/4"C-4#4,#4G	[20E10]	1"C-10#10,1#10G
[80E4]	1-1/4"C-4#4,#8G	[80M4]	1-1/4"C-4#4,#4G	[20E11]	1"C-11#10,1#10G
[90E4]	1-1/4"C-4#3,#8G	[90M4]	1-1/4"C-4#3,#3G	[20E12]	1"C-12#10,1#10G
[100E4]	1-1/4"C-4#3,#8G	[100M4]	1-1/4"C-4#3,#3G	[20E13]	1"C-13#10,1#10G
[110S4]	1-1/2"C-4#2,#6G	[110M3]	1-1/2"C-4#2,#2G	[20E14]	1"C-14#10,1#10G
[125E4]	1-1/2"C-4#1,#6G	[125M4]	1-1/2"C-4#1,#1G	[20E15]	1"C-15#10,1#10G
[150E4]	2"C-4#1/0,#6G	[150M4]	2"C-4#1/0,#1/0G	[20E16]	1-1/4"C-16#10,1#10G
[200E4]	2"C-4#3/0,#6G	[200M4]	2"C-4#3/0,#3/0G	[20E17]	1-1/4"C-17#10,1#10G
[225E4]	2-1/2"C-4#4/0,#4G	[225M4]	2-1/2"C-4#4/0,#4/0G	[20E18]	1-1/4"C-18#10,1#10G
[250E4]	3"C-4#300,#4G	[250M4]	3"C-4#300,#300G	[20E19]	1-1/4"C-19#10,1#10G
[300E4]	3"C-4#350,#4G	[300M4]	3"C-4#350,#350G	[20E20]	1-1/4"C-20#10,1#10G
[350E4]	3-1/2"C-4#500,#3G	[350M4]	3-1/2"C-4#500,#500G		
[400E4]	(2)2"C-4#3/0,#2G	[400M4]	(2)3-1/2"C-4#500,#500G		
[500E4]	(2)3-1/2"C-4#250,#2G	[500M4]	(2)3-1/2"C-4#250,#250G		
[600E4]	(2)3"C-4#350,#1G	[600M4]	(2)3"C-4#350,#350G		
[700E4]	(2)3-1/2"C-4#500,#1/0G	[700M4]	(2)3-1/2"C-4#500,#500G		
[800E4]	(2)3-1/2"C-4#500,#1/0G	[800M4]	(2)3-1/2"C-4#500,#500G		
[1000E4]	(3)3"C-4#350,#2/0G	[1000M4]	(3)3"C-4#350,#350G		
[1200E4]	(3)4"C-4#600,#3/0G	[1200M4]	(3)4"C-4#600,#600G		
[1600E4]	(4)4"C-4#600,#4/0G	[1600M4]	(4)4"C-4#600,#600G		
[2000E4]	(5)4"C-4#600,#250G	[2000M4]	4"C-4#600,#600G		
[2500E4]	(6)4"C-4#600,#350G	[2500M4]	4"C-4#600,#600G		
[3000E4]	(8)4"C-4#600,#400G	[3000M4]	4"C-4#600,#600G		
[4000E4]	(10)4"C-4#600,#500G	[4000M4]	4"C-4#600,#600G		

THE MULTIWIRE CONFIGURATIONS SHOWN HERE SHALL NOT BE USED FOR RECEPTACLE CIRCUITS OR OTHER CORD-AND-PLUG-CONNECTED PORTABLE LOADS. NEC-240.4(B)

NOTE 1 - WHERE [-----] DESIGNATOR IS PRECEEDED BY "MC" PROVIDE METAL CLAD CABLE.

GENERAL CIRCUIT CONDUCTOR AND CONDUIT IDENTIFICATION

MULTICONDUCTOR POWER CABLE CIRCUIT CALLOUTS	
[PC1]	[3/4"C,1 (3C#12,1#12G) TYPE 2]
[PC2]	[3/4"C,1 (3C#10,1#10G) TYPE 2]
[PC3]	[1"C,1 (3C#8,1#10G) TYPE 2]
[PC4]	[1 1/4"C,2 (3C#12,1#12G) TYPE 2]
[PC5]	[1 1/2"C,2 (3C#10,1#10G) TYPE 2]
[PC1A]	[3/4"C,1 (2C#12,1#12G) TYPE 2]
[PC2A]	[3/4"C,1 (2C#10,1#10G) TYPE 2]

EMPTY CONDUIT	
[EC-1]	[3/4"C,WITH PULL STRING]
[EC-2]	[1"C,WITH PULL STRING]
[EC-3]	[1 1/4"C,WITH PULL STRING]
[EC-4]	[1 1/2"C,WITH PULL STRING]
[EC-5]	[2"C,WITH PULL STRING]
[EC-6]	[3"C,WITH PULL STRING]
[EC-7]	[4"C,WITH PULL STRING]
[EC-8]	[5"C,WITH PULL STRING]

AFD POWER CABLE CALLOUTS	
[20PV3]	[1"C,1(3C#12,1#12G) TYPE 8]
[30PV3]	[1 1/2"C,1(3C#10,1#10G) TYPE 8]
[40PV3]	[1 1/2"C,1(3C#8,1#8G) TYPE 8]
[60PV3]	[2"C,1(3C#6,1#6G) TYPE 8]
[80PV3]	[2"C,1(3C#4,1#4G) TYPE 8]
[100PV3]	[2 1/2"C,1(3C#2,1#2G) TYPE 8]
[150PV3]	[2 1/2"C,1(3C#1/0,3#10G) TYPE 9]
[175PV3]	[2 1/2"C,1(3C#2/0,3#8G) TYPE 9]
[200PV3]	[3"C,1(3C#4/0,3#8G) TYPE 9]
[250PV3]	[3"C,1(3C#250,3#8G) TYPE 9]
[300PV3]	[3 1/2"C,1(3C#350,3#8G) TYPE 9]
[350PV3]	[4"C,1(3C#500KCM,3#8G) TYPE 9]
[400PV3]	[2 EACH [2"C,1 (3C#4/0, 3#8G) TYPE 9]
[500PV3]	[2 EACH [3"C, 1(3C#250,1#8G) TYPE 9]

ANALOG CIRCUIT CALLOUTS	
[A1]	[3/4"C,1 TYPE 3]
[A2]	[1"C,2 TYPE 3]
[A3]	[1"C,3 TYPE 3]
[A4]	[1"C,4 TYPE 3]
[A5]	[1 1/4"C,5 TYPE 3]
[A6]	[1 1/4"C,6 TYPE 3]
[A7]	[1 1/2"C,7 TYPE 3]
[A8]	[1 1/2"C,8 TYPE 3]
[A9]	[1 1/2"C,9 TYPE 3]
[A10]	[2"C,10 TYPE 3]
[A11]	[2"C,11 TYPE 3]
[A12]	[2"C,12 TYPE 3]
[A13]	[2"C,13 TYPE 3]
[A14]	[2"C,14 TYPE 3]
[A15]	[3/4"C,1 TYPE 4]
[A16]	[3/4"C,2 TYPE 4]
[A17]	[1"C,3 TYPE 4]
[A18]	[1 1/4"C,4 TYPE 4]
[A19]	[1 1/4"C,5 TYPE 4]
[A20]	[1 1/4"C,6 TYPE 4]
[A21]	[1 1/2"C,7 TYPE 4]
[A22]	[1 1/2"C,8 TYPE 4]
[A23]	[2"C,9 TYPE 4]
[A24]	[3/4"C,1-4 pr. TYPE 5]
[A25]	[1"C,2-4 pr. TYPE 5]

CONTROL CIRCUIT CALLOUTS	
[C1]	[3/4"C,MSC]
[C2]	[3/4"C,2#14,1#14G]
[C3]	[3/4"C,3#14,1#14G]
[C4]	[3/4"C,4#14,1#14G]
[C5]	[3/4"C,5#14,1#14G]
[C6]	[3/4"C,6#14,1#14G]
[C7]	[3/4"C,7#14,1#14G]
[C8]	[3/4"C,8#14,1#14G]
[C9]	[3/4"C,9#14,1#14G]
[C10]	[3/4"C,10#14,1#14G]
[C11]	[3/4"C,11#14,1#14G]
[C12]	[3/4"C,12#14,1#14G]
[C13]	[3/4"C,13#14,1#14G]
[C14]	[3/4"C,14#14,1#14G]
[C15]	[3/4"C,15#14,1#14G]
[C16]	[3/4"C,16#14,1#14G]
[C17]	[3/4"C,17#14,1#14G]
[C18]	[3/4"C,18#14,1#14G]
[C19]	[3/4"C,19#14,1#14G]
[C20]	[1"C,20#14,1#14G]
[C21]	[1"C,21#14,1#14G]
[C22]	[1"C,22#14,1#14G]
[C23]	[1"C,23#14,1#14G]
[C24]	[1"C,24#14,1#14G]
[C25]	[1"C,25#14,1#14G]
[C30]	[1"C,30#14, 1#14G]
[C40]	[1 1/4"C, 40#14, 1#14G]
[C50]	[1 1/4"C, 50#14, 1#14G]

MULTICONDUCTOR CONTROL CABLE CIRCUIT CALLOUTS	
[CC1]	[1"C,2-24 BELDEN T842]
[CC5]	[3/4"C,1-5C TYPE 1]
[CC7]	[3/4"C,1-7C TYPE 1]
[CC9]	[1"C,1-9C TYPE 1]
[CC12]	[1"C,1-12C TYPE 1]
[CC19]	[1 1/2"C, 1-19C TYPE 1]
[CC25]	[1 1/2"C,1-25C TYPE 1]
[CC37]	[2"C,1-37C TYPE 1]
[CCC1]	[1-7C #12 TYPE 1]
[MSC]	[MANUFACTURER SUPPLIED CABLE]
[CAT]	[1"C, CAT6 CABLE]
[CX]	[1-1/2"C, COAX CABLE]
[FO]	[2"C, MULTI-MODE FIBER OPTIC CABLE]
[PH]	[1"C, PHONE CABLE]
[DP]	[1"C, PROFIBUS DP CABLE]

NOTES:

1. FOR CABLE TYPES, SEE SPECIFICATIONS.
2. CONDUIT SIZES ARE BASE ON THE AREA OF THW CONDUCTORS.
3. SIZING OF CONDUCTORS #1AWG AND SMALLER BASED ON AMPACITIES AT 60 DEGREES C, SIZING OF CONDUCTORS #1/0AWG AND LARGER BASED ON AMPACITIES AT 75 DEGREES C.
4. WHERE CIRCUITS ARE UNDERGROUND, DIRECT BURIED OR CONCRETE ENCASED, MINIMUM CONDUIT SIZE SHALL BE 1".
5. FOR METRIC CONDUIT SIZES USE THE FOLLOWING CONVERSION:
   1/2" = 16 mm 1/4" = 35 mm
   3/4" = 21 mm 1 1/2" = 41 mm
   1" = 27 mm 2" = 53 mm

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		A QUINONES	C HAMER	P KESKAR	APVD	A QUINONES	

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CEDAR BAY - WATER SYSTEM RESILIENCY PLA

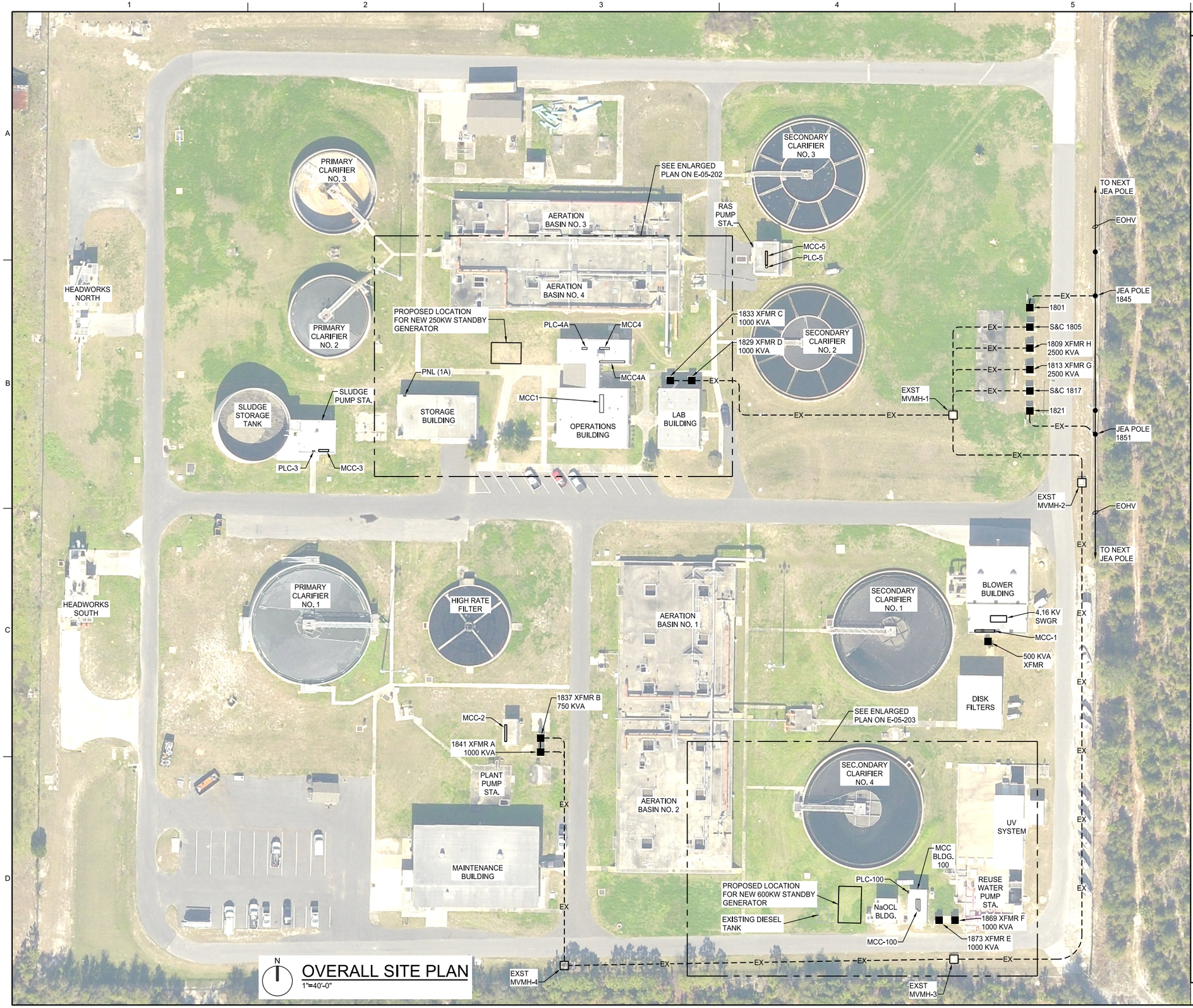
JEA
JACKSONVILLE, FLORIDA

ELECTRICAL
LEGEND

FINAL DOCUMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-00-003
SHEET	20 of 45



OVERALL SITE PLAN

1"=40'-0"

GENERAL NOTES

1. PRIOR TO ROUGH-IN AND THE START OF CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL FINAL EQUIPMENT LOCATIONS, PLACEMENTS, ORIENTATION, EQUIPMENT CONNECTION POINTS, ETC, WITH THE GENERAL CONTRACTOR AND THE EQUIPMENT INSTALLER. FIELD MEASURE THE SITE CONDITIONS AND CHECK EQUIPMENT CHARACTERISTICS TO VALIDATE MEASUREMENTS AND EXACT DIMENSIONS.
2. PRIOR TO THE START OF CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE THE ROUTING OF ALL ELECTRICAL CABLES, CONDUITS, TRANSFORMERS, ETC, WITH THE OWNER PM AND THE GENERAL CONTRACTOR. COORDINATE THE ROUTING OF RUNS FOR ALL UTILITIES (INCOMING POWER, OUTGOING POWER, DISTRIBUTION FEEDERS, BRANCH CIRCUITS, CONTROLS, COMMUNICATIONS, FIBER, WATER, SEWER, SEPTIC LINES, NATURAL GAS, ETC.) WITH OTHER TRADES.
3. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL UNDERGROUND CONCRETE ENCASED ELECTRICAL CONDUITS SHALL BE PER STANDARD DETAIL 2605-400a AND 2605-423c.
4. BOND ALL NEW CONCRETE ENCASED GROUND CONDUCTORS TO EXISTING GROUND CONDUCTORS IN ALL MANHOLES, PULL BOXES, CABLE TRAYS, AND SIMILAR LOCATIONS WHERE APPLICABLE.
5. UNLESS OTHERWISE SPECIFIED OR NOTED, ALL WALL MOUNTED ELECTRICAL PANELS, ENCLOSURES, AND SIMILAR EQUIPMENT SHALL BE MOUNTED 6'-6" (MAX) FROM THE TOP OF THE PANEL TO FINISHED FLOOR OR GRADE.
6. UNLESS OTHERWISE NOTED, ALL LIGHTING SWITCHES, CONTROL SWITCHES, AND SIMILAR EQUIPMENT SHALL BE MOUNTED WITH THEIR CENTERLINE APPROXIMATELY 4'-0" ABOVE FINISHED FLOOR, SLAB, OR GRADE.
7. A SEPARATE EQUIPMENT GROUNDING CONDUCTOR SHALL BE PROVIDED FOR EACH CIRCUIT (SEPARATE CONDUCTOR IN THE CONDUIT). THE CONDUCTOR SHALL BE TERMINATED AT THE PROPER DEVICE, TERMINAL, OR LUG AT THE POWER SOURCE (MCC GROUND BUS, PANELBOARD GROUND BUS, ETC.). GROUND CONDUCTOR SIZE SHALL BE PER LATEST EDITION OF THE NEC.
8. UNLESS SPECIFICALLY NOTED OTHERWISE, EXISTING PAVEMENT OR SIDEWALK SHALL BE SAW CUT AND REMOVED TO ALLOW FOR THE INSTALLATION OF NEW ELECTRICAL DUCTBANKS. AFTER INSTALLATION, REPLACE PAVEMENT OR SIDEWALK WITH NEW TO MATCH ORIGINAL CONDITIONS.
9. ALL EQUIPMENT AND MATERIALS SHAL BE, AS A MINIMUM, PER JEA'S MOST CURRENT EDITION OF STANDARDS AND METHODS OF INSTALLATION.
10. COMPLY WITH THE LATEST NATIONAL ELECTRICAL CODE (NEC) AND WITH ALL LOCAL CODES AND ORDINANCES, INCLUDING CLIENT'S ENGINEERING STANDARDS. IN CASE OF CONFLICT BETWEEN REQUIREMENTS, CONFORM WITH THE MOST RESTRICTIVE.
11. VERIFY ALL ELECTRICAL REQUIREMENTS AND EXACT LOCATION OF EQUIPMENT WITH DRAWINGS AND SPECIFICATIONS. CHECK AND VERIFY ALL DIMENSIONS IN THE FIELD.
12. CONDUIT ROUTINGS, WHERE SHOWN, ARE DIAGRAMATIC. COORDINATE ACTUAL ROUTINGS TO AVOID INTERFERENCES WITH ALL OTHER TRADES AND TO ADJUST TO EXISTING CONDITIONS.

NO.	DATE	DSGN	DR	CHK	REVISION	BY	APVD
	A QUINONES	A QUINONES	C HAMER	P KESKAR	APVD	A QUINONES	

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JEA
JACKSONVILLE, FLORIDA

ELECTRICAL
OVERALL SITE PLAN

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-05-201
SHEET	21 of 45

FINAL DOCUMENT

GENERAL NOTES

1. FOR EXACT GENERATOR PAD LOCATION AND DETAILS REFER TO CIVIL AND STRUCTURAL DRAWINGS.
2. FOR DUCT BANK DETAILS REFER TO DRAWING E-05-301.
3. FOR GENERATOR DETAILS REFER TO DRAWING E-80-207.
4. FOR POWER DISTRIBUTION INSIDE OPERATIONS BUILDING REFER TO DRAWINGS E-80-201, 202 AND 203.
5. REFER TO DRAWING E-80-610 FOR CONTROL RISER DIAGRAMS.

AERATION BASIN NO. 4

NEW 250KW STANDBY GENERATOR

DB-4

CAM LOCK SWITCH

DB-6

CONCRETE EQUIPMENT PAD 0330-056 TYPE 'H'

DB-3

2605-444

HH1

DB-3

DB-7

DB-1

TO SCADA PLC-3

PANEL (1A)

STORAGE BUILDING

DB-2

PANEL (3A)

SWBD-4A

ATC-4A

MCC-4A

DB-8

TO SCADA PLC-5

DB-8

EX

EX

EX

XFMR-C

XFMR-D

OPERATIONS BUILDING

LAB BUILDING

N

ENLARGED PLAN

1"=10'

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		A QUINONES	C HAMER	P KESKAR		A QUINONES	

REVISION

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0 1"

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SHEET	22 of 45

GENERAL NOTES

1. FOR EXACT GENERATOR PAD LOCATION AND DETAILS REFER TO CIVIL AND STRUCTURAL DRAWINGS.
2. FOR DUCT BANK DETAILS REFER TO DRAWING E-05-301.
3. FOR GENERATOR DETAILS REFER TO DRAWING E-80-206.
4. REFER TO DRAWING E-80-205 FOR POWER DISTRIBUTION INSIDE MCC BUILDING 100.

AERATION BASIN NO. 2

SECONDARY CLARIFIER NO. 4

UV SYSTEM

NEW 600KW STANDBY GENERATOR

GENERATOR BREAKER SECTION AND ATC-100

PLC-100

DB-5

MCC BLDG. 100

CONCRETE EQUIPMENT PAD, SEE SHEET C-05-202 FOR ADDITIONAL INFORMATION

CAM LOCK CONNECTION SWITCH

MCC 100

EX

EX

NaOCL BLDG.

REUSE WATER PUMP STA.

EXISTING DIESEL TANK

XFMR-E

XFMR-F

N

ENLARGED PLAN

1"=10'

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0 1"

DATE	MARCH 2020
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DWG	E-05-203
SHEET	23 of 45

FINAL DOCUMENT

GENERAL NOTES

1. SEE DUCTBANK DETAIL (2605-400a)

DB-1

DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-1	ATC-4A-PLC	SCADA PLC-3	CNTRL	1	18#14	1#14G	3/4"	DB-1	1	Through HH-1
	Genset ECP-911 N.C. Contact	Panel 1A Contactor's Coil	120	1	2#12	1#12G	3/4"	DB-1	2	Through HH-1

DB-2

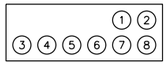
DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-2	Panel PP(19/21)	Panel 3A	208	1	3#2	1#8G	1-1/2"	DB-2	1	Through HH-1

DB-3

DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-3	ATC-4A-PLC	SCADA PLC-3	CNTRL	1	18#14	1#14G	3/4"	DB-3	1	Through HH-1
	Genset ECP-911 N.C. Contact	Panel 1A Contactor	120	1	2#12	1#12G	3/4"	DB-3	2	Through HH-1
	Panel PP(19/21)	Panel 3A	208	1	3#2	1#8G	1-1/2"	DB-3	3	Through HH-1

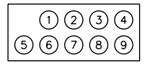
DB-4

DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-4	ATC-4A-PLC	SCADA PLC-3	CNTRL	1	18#14	1#14G	3/4"	DB-4	1	Through HH-1
	Panel PP(19/21)	Panel 3A	208	1	3#2	1#8G	1-1/2"	DB-4	2	Through HH1
	SWBD-4A	250kW Genset Utility Transformer	480	1	2#4	1#8G	1"	DB-4	3	
	SWBD-4A	250kWGenset Camlock Switch	480	2	4#3/0	1#1/0G	2"	DB-4	4, 5	
	Panel PP(23)	Genset ECP-911 N.C. Contact	120	1	2#12	1#12G	3/4"	DB-4	6	
	ATC-4A-PLC	Genset LIT-911-1	CNTRL.	1	2#14	1#14G	3/4"	DB-4	7	
	ATC-4A-PLC	Genset LIT-911-1	CNTRL.	1	1 TYPE 3		3/4"	DB-4	8	RGC PVC Coated
	ATC-4A-PLC	Genset ECP-911	CNTRL.	1	CAT6		1"	DB-4	9	
	ATC-4A-PLC	250kWGenset					1"	DB-4	10	Spare Conduit



DB-5

DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-5	ATC-100-PLC	Genset ECP-921	CNTRL.	1	CAT6		1"	DB-5	1	
	ATC-100-PLC	600kWGenset					1"	DB-5	2	Spare Conduit
	MCC-100(7F)	600kW Genset Utility Transformer	480	1	2#4	1#8G	1"	DB-5	3	
	MCC-100 Genset Breaker	600kWGenset Camlock Switch	480	3	4#600	1#3/0G	4"	DB-5	4, 5, 6	
	ATC-100-PLC	Genset LIT-921-1	CNTRL.	1	2#14	1#14G	3/4"	DB-5	7	
	ATC-100-PLC	Genset LIT-921-1	CNTRL.	1	1 TYPE 3		3/4"	DB-5	8	RGC PVC Coated



DB-6

DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-6	Genset ECP-911 N.C. Contact	Panel 1A Contactor's Coil	120	1	2#12	1#12G	3/4"	DB-6	1	Through HH1
	SWBD-4A	250kW Genset Utility Transformer	480	1	2#4	1#8G	1"	DB-6	2	
	ATC-4A-PLC	Genset LIT-911-1	CNTRL.	1	1 TYPE 3		3/4"	DB-6	3	RGC PVC Coated
	ATC-4A-PLC	250kWGenset					1"	DB-6	4	Spare Conduit
	Camlock Switch	250kWGenset	480	2	4#3/0	1#1/0G	2"	DB-6	5,6	
	Panel PP(23)	Genset ECP-911 N.C. Contact	120	1	2#12	1#12G	3/4"	DB-6	7	
	ATC-4A-PLC	Genset LIT-911-1	CNTRL.	1	2#14	1#14G	3/4"	DB-6	8	
	ATC-4A-PLC	Genset ECP-911	CNTRL.	1	CAT6		1"	DB-6	9	

DB-7

DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-7	ATC-4A-PLC	SCADA PLC-3	CNTRL	1	18#14	1#14G	3/4"	DB-7	1	Through HH-1

DB-8

DUCT BANK	FROM	TO	VOLTS	CABLE DATA			CONDUIT			REMARKS
				SETS	TYPE	GROUND	SIZE	LOCATION	POSITION	
DB-8	ATC-4A-PLC	SCADA PLC-5	CNTRL	1	18#14	1#14G	3/4"	DB-8	1	

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ELECTRICAL

DUCTBANK SCHEDULE

FINAL DOCUMENT

VERIFY SCALE

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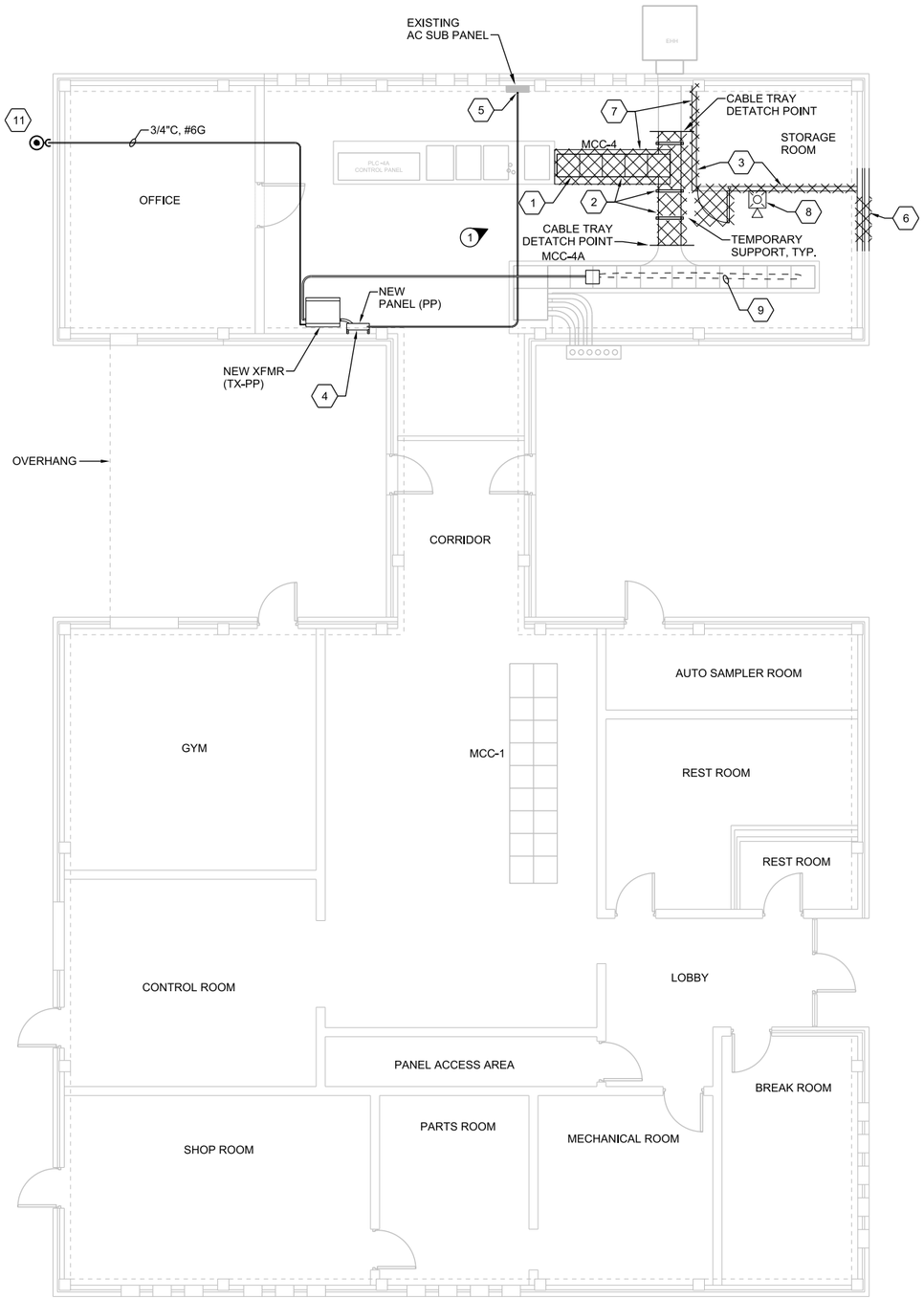
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-05-301
SHEET	24 of 45



N

OPERATIONS BUILDING PLAN - PHASE 1

3/16" = 1'-0"

1 PHOTO
NTS

GENERAL NOTES

1. ELECTRICAL EQUIPMENT TO BE DEMOLISHED CAN NOT BE REMOVED UNTIL ALL LOADS ARE TRANSFERRED.
2. REFER TO DRAWING E-80-601 FOR MCC-4 AND MCC-4A SINGLE LINE DIAGRAM DEMOLITION.

SHEET KEYNOTES

1. MCC-4 TO BE REMOVED.
2. REMOVE SECTION OF CABLE TRAY BETWEEN MCC-4 AND MCC-4A. INSTALL TEMPORARY STEEL CHANNEL SUPPORTS CONNECTED TO STRUCTURE ABOVE TO SUPPORT WIRING ABOVE EQUIPMENT DURING CONSTRUCTION.
3. DEMOLISH STORAGE ROOM INTERIOR WALLS AND DOOR. PATCH AND REPAIR MASONRY WALL AS NECESSARY TO MATCH EXISTING.
4. INSTALL NEW PANEL ON UNISTRUT CHANNELS TO SEPARATE FROM WALL AND TO AVOID OVERHEAD OBSTRUCTION.
5. RE-FEED EXISTING AC SUB PANEL FROM NEW PANEL (PP). REMOVE EXISTING FEEDER BACK TO MCC-4.
6. DEMOLISH CAVITY WALL AS REQUIRED FOR NEW DOOR IN WALL. SEE STRUCTURAL DETAIL 0442-061.
7. LIMIT FLOOR TILE DEMOLITION TO MODIFIED AREAS AND AS REQUIRED FOR CLEAN TILE REMOVAL.
8. HORN/STROBE TO BE RELOCATED. SEE DRAWING E-80-202 FOR NEW LOCATION.
9. TEMPORARILY FEED TRANSFORMER FROM MCC-4A AND PROVIDE ENOUGH SLACK OF WIRING TO EXTEND TO NEW PERMANENT CONNECTION IN SWBD-4A DURING CONSTRUCTION PHASE 2.
10. DEMOLISH CONCRETE EQUIPMENT PAD.
11. BOND NEW TRANSFORMER (TX-PP) TO NEW 3/4"X10'-0" GROUND ROD WITH #6 GND.

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
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OPERATIONS BUILDING PLAN - CONSTRUCTION PHASE 1

VERIFY SCALE

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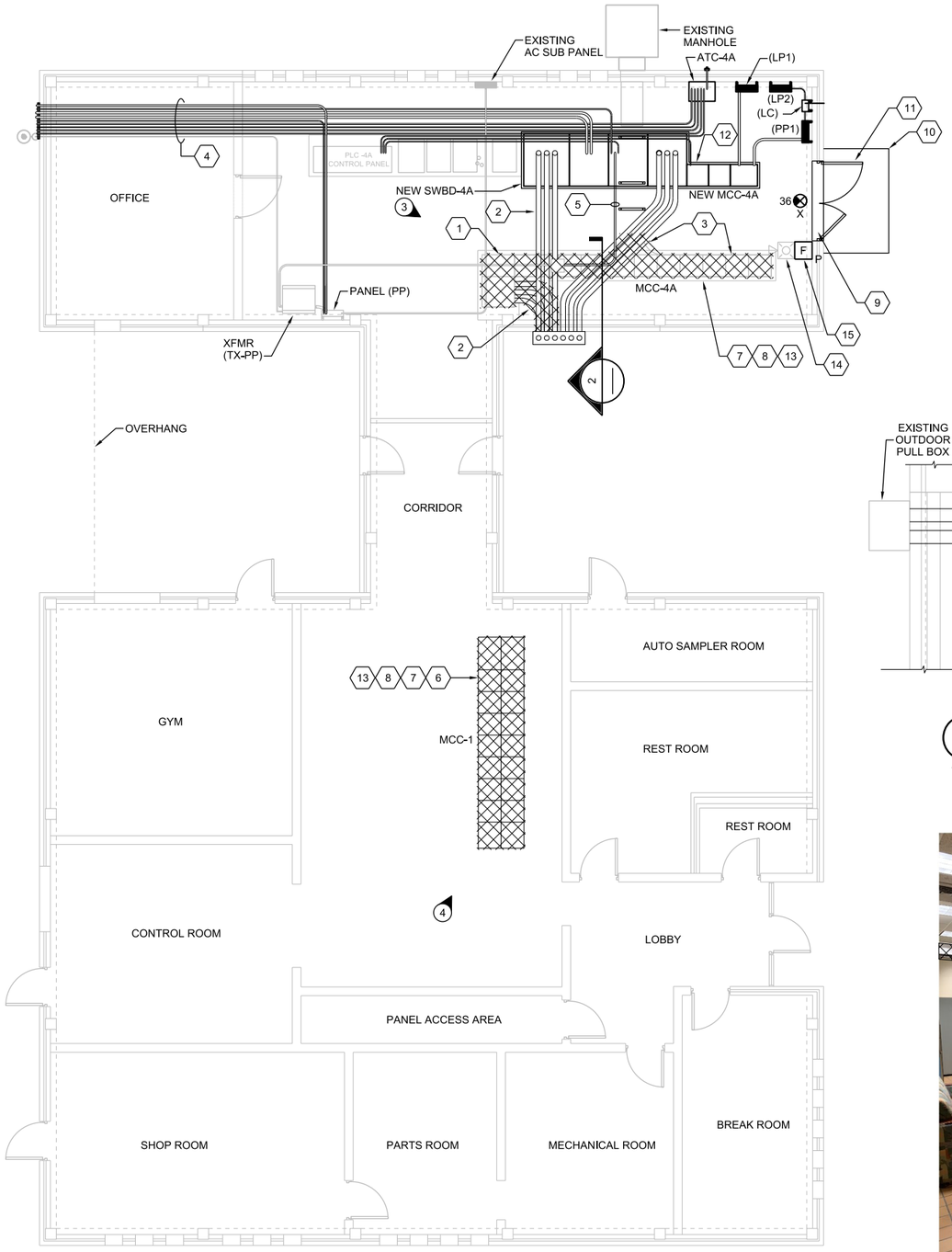
0 1"

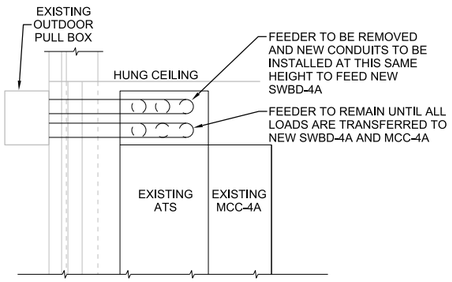
DATE	MARCH 2020
PROJ	705890
DWG	E-80-201
SHEET	25 of 45

FINAL DOCUMENT



OPERATIONS BUILDING PLAN - PHASE 2

3/16" = 1'-0"



2 SECTION

NTS

3 PHOTO

NTS

4 PHOTO

NTS

LUMINAIRE SCHEDULE

"X" LITHONIA CAT. EDGR1RSDEL, RECESSED MOUNTED LED EXIT SIGN, 120/277 VAC, SINGLE FACE, BRUSHED ALUMINUM HOUSING, RED LETTERS ON CLEAR, W/SELF DIAGNOSTIC AND NICKEL-CADMIUM BATTERY BACK UP.

FEEDER REPLACEMENT SEQUENCE:

A. DISCONNECT AND REMOVE EXISTING UTILITY FEEDER RUN THROUGH UPPER SET OF THREE CONDUITS.

B. REMOVE TOP THREE CONDUITS FROM OUTDOOR PULL BOX TO INTERIOR PULL BOX.

C. PROVIDE NEW CONDUITS FROM OUTDOOR PULL BOX TO NEW SWBD-4A AS SHOWN.

D. INSTALL NEW CABLE TRAY FROM NEW MCC-4A TO EXISTING VERTICAL CABLE TRAY.

D. INSTALL NEW UTILITY FEEDER FROM XFMR TO MAIN UTILITY BREAKER #1 IN SWBD-4A. INSTALL NEW FEEDERS FROM 250KW GENSET TO NEW SWBD-4A AND ATC-4A.

E. TRANSFER ACTIVE LOADS FROM EXISTING MCC-4A AND MCC-1 TO SWBD-4A, NEW MCC-4A, PANEL (PP) AND PANEL (LP1).

PHASE 2

PHASE 3

F. ONCE ALL LOADS ARE TRANSFERRED TO NEW EQUIPMENT, EXISTING UTILITY FEEDER FROM XFMR TO EXISTING ATS AND MCC-4A CAN BE DISCONNECTED, REMOVED, AND EXISTING ATS AND MCC-4A CAN BE DEMOLISHED.

G. PROVIDE NEW UTILITY FEEDER FROM XFMR TO MAIN UTILITY BREAKER #2 IN SWBD-4A THROUGH NEW CONDUITS.

GENERAL NOTES

1. FOR DEMOLITION AND PROPOSED ONE LINE DIAGRAMS REFER TO DRAWINGS E-80-602 AND E-80-604.
2. FOR CONTINUATION OF CONDUIT RUNS OUT OF THE BUILDING REFER TO DRAWING E-05-202.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE ONE #4/0G FROM SWBD-4A GROUND BUS BAR TO EXISTING GROUND INSIDE EXISTING MANHOLE THROUGH CABLE TRAY.
4. PROVIDE GROUND #6G TO CABLE TRAY FROM MCC-4A GND. BUS BAR.
5. FOR PANEL SCHEDULES REFER TO DRAWING E-80-607.
6. FOR SINGLE LINE DIAGRAMS REFER TO DRAWING E-80-602 AND E-80-604.

SHEET KEYNOTES

1. EXISTING ATS AND MCC-4A TO BE REMOVED.
2. SEE SECTION 2/E-80-202.
3. REMOVE EXISTING CABLE TRAY AFTER ALL CIRCUITS FROM EXISTING MCC-4A HAVE BEEN REFED FROM NEW SWBD-4A AND NEW MCC-4A.
4. FEEDERS FROM NEW LIGHTING CONTACTOR OF PANEL (1A), NEW 250KW GENSET, PLC-3, AND EXISTING PANEL 3A.
5. PROVIDE NEW CONDIUT, FROM JUNCTION BOX INSTALLED IN PHASE 1, TO NEW SWBD-4A TO FEED TX-PP. USE EXTRA SLACK OF CONDUCTORS TO NEW BREAKER LOCATION IN SWBD-4A.
6. EXISTING MCC-1 TO BE REMOVED.
7. DEMOLISH CONCRETE EQUIPMENT PAD.
8. LIMIT FLOOR TILE DEMOLITION TO MODIFIED AREAS AND AS REQUIRED FOR CLEAN TILE REPAIR.
9. NEW DOOR OPENING IN EXISTING WALL, SEE 0422-061.
10. CONCRETE DOOR STOOP, SEE 0422-061 SIM.
11. NEW DOOR. SEE ARCHITECTURAL DRAWING A-80-202 FOR DETAILS.
12. CONCRETE EQUIPMENT PAD 0330-056 TYPE 'E'.
13. REPAIR TILE AT DEMOLISHED CONCRETE PADS AND STORAGE ROOM TO MATCH EXISTING.
14. RELOCATED HORN/STROBE.
15. NEW ADDRESSABLE FIRE ALARM PULL STATION TO BE INSTALLED AT 48" A.F.F. AND CONNECTED TO EXISTING FIRE ALARM SYSTEM. CAT. NO. PAD100-PSSA.

NO.	DATE	DSGN	REVISION	CHK	DR	APVD	BY	APVD
		A QUINONES		C HAMER		P KESKAR	A QUINONES	

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ch2m:

ELECTRICAL

OPERATIONS BUILDING PLAN - CONSTRUCTION PHASE 2

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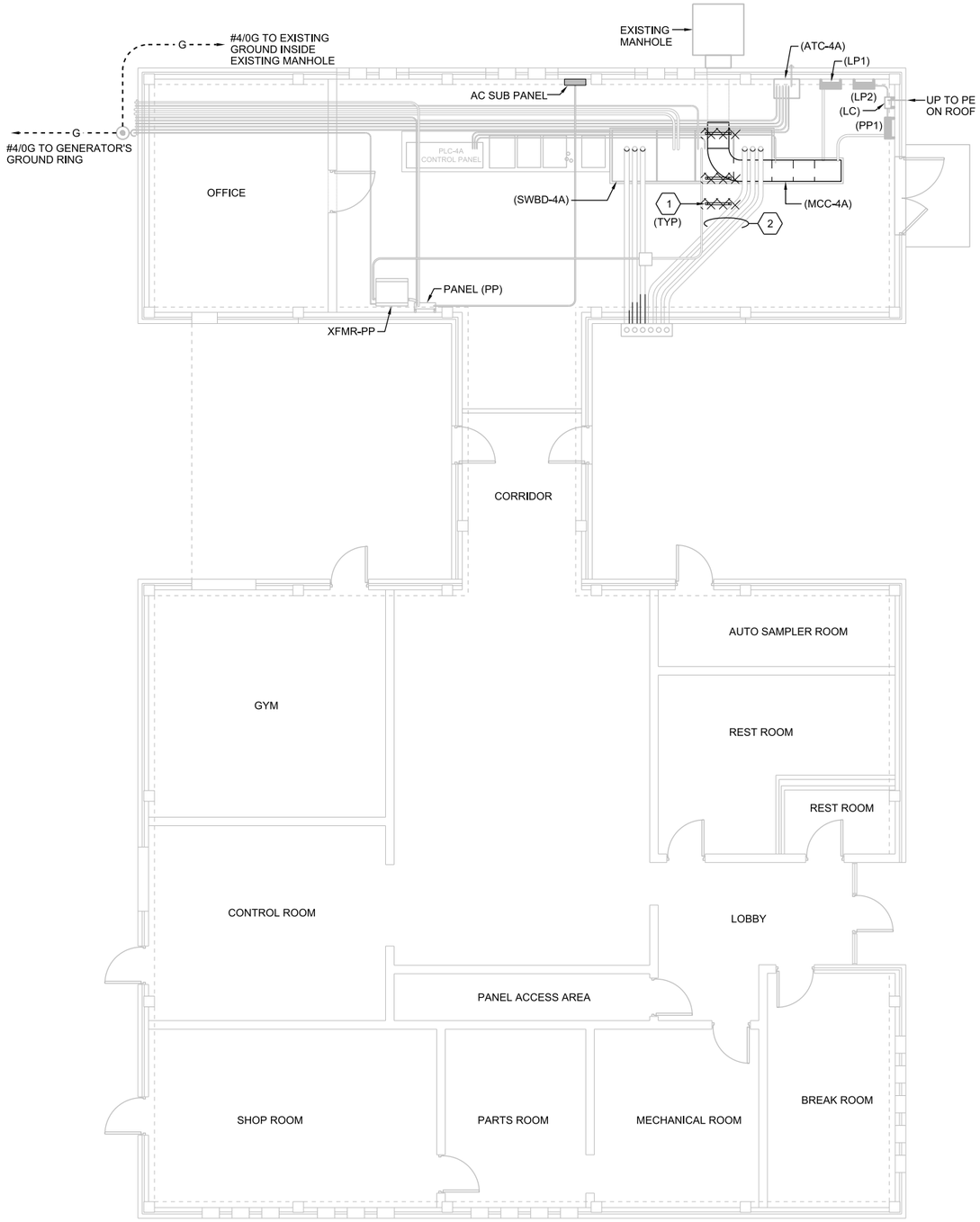

N

OPERATIONS BUILDING PLAN - PHASE 3

3/16" = 1'-0"

SHEET KEYNOTES

1. REMOVE TEMPORARY STEEL CHANNEL SUPPORTS.
2. PROVIDE NEW FEEDER FROM EXISTING TRANSFORMER TO NEW SWITCHBOARD THROUGH EXISTING CONDUITS AND EMPTY CONDUITS INSTALLED IN PHASE 2.

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
	A QUINONES	A QUINONES	C HAMER	P KESKAR	APVD	A QUINONES	

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CEDAR BAY - WATER SYSTEM RESILIENCY PLA

JEA
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ELECTRICAL

OPERATIONS BUILDING PLAN - CONSTRUCTION PHASE 3

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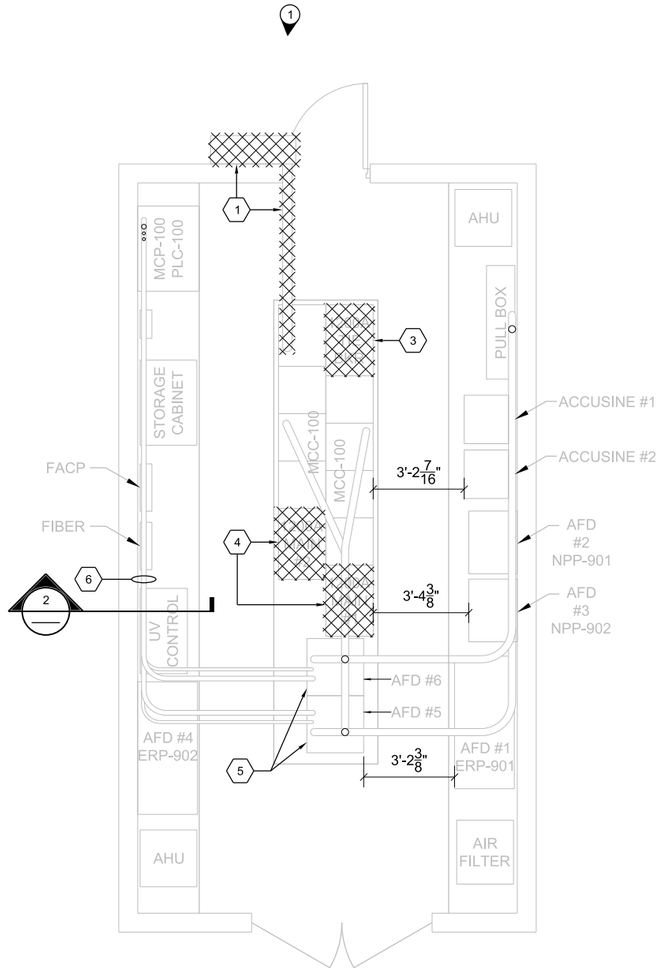

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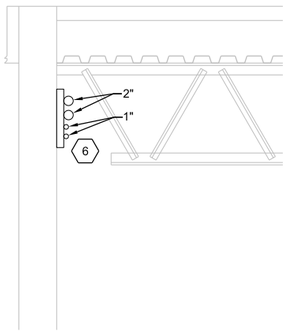
MCC BUILDING 9 PLAN - DEMOLITION

3/8" = 1'-0"

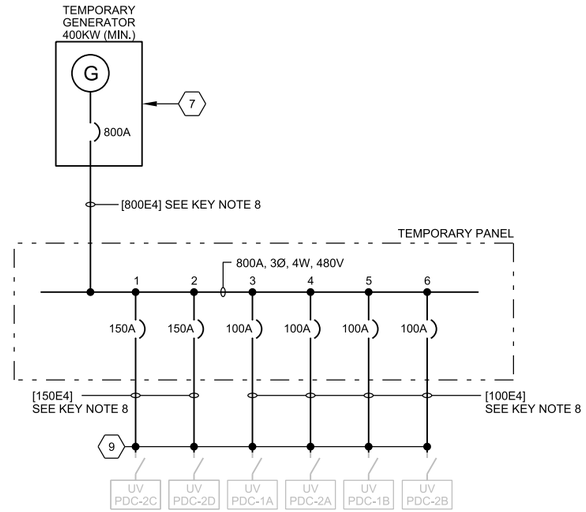


2 SECTION

NTS

1 PHOTO

NTS



TEMPORARY SINGLE LINE DIAGRAM

GENERAL NOTES

1. REFER TO DRAWING E-80-603 FOR MCC-100 SINGLE LINE DIAGRAM DEMOLITION.
2. REFER TO DRAWING E-80-605 FOR PROPOSED SINGLE LINE DIAGRAM OF MCC-100.
3. ALL EQUIPMENT AND CONDUCTORS INDICATED AS TEMPORARY SHALL BE DISCONNECTED AT THE END OF THE PROJECT AND REMOVED.

SHEET KEYNOTES

1. EXISTING JUNCTION BOX, CONDUIT, AND SAFETY SWITCH TO BE DEMOLISHED. FEEDER FROM PORTABLE GENERATOR TO SAFETY SWITCH SHALL BE DISCONNECTED FROM CAMLOCKS AND RETURN TO OWNER.
2. REPAIR BRICK AT DEMOLISHED CONDUIT TO MATCH EXISTING.
3. EXISTING TIE BREAKER TO BE DEMOLISHED AND REPLACED BY NEW 1200A ELECTRICALLY OPERATED BREAKER.
4. EXISTING UTILITY MAIN BREAKER TO BE DEMOLISHED AND REPLACED BY NEW 1200A ELECTRICALLY OPERATED BREAKER.
5. EXISTING AFD TO BE RELOCATED. REFER TO DRAWING E-80-205 FOR PROPOSED LOCATION.
6. EXISTING CONTROL FEEDERS TO BE REMOVED AND ARRANGED IN A HORIZONTAL CONFIGURATION.
7. CONTRACTOR PROVIDED TEMPORARY GENERATOR (FUEL INCLUDED).
8. TEMPORARY CONDUCTORS NEATLY ARRANGED ON THE GROUND IN PVC SCH-40 CONDUIT.
9. CONTRACTOR SHALL DE-TERMINATE EXISTING FEEDERS ON THE LINE SIDE OF THE EXISTING DISCONNECT SWITCH AND SAFELY SECURE CABLES. TERMINATE TEMPORARY CABLES TO ENERGIZE EQUIPMENT. CONTRACTOR TO PROVIDE ANY/ALL LUGS OR CONNECTING MEANS AS REQUIRED.
10. CONTRACTOR SHALL PROVIDE A TEMPORARY GENERATOR TO SUPPLY 120V, 1Ø, TEMPORARY POWER TO THE UV CONTROL PANEL AND MCP-100 WHILE MCC-100 IS RETROFITTED.

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
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ELECTRICAL

MCC BUILDING 9 PLAN - DEMOLITION

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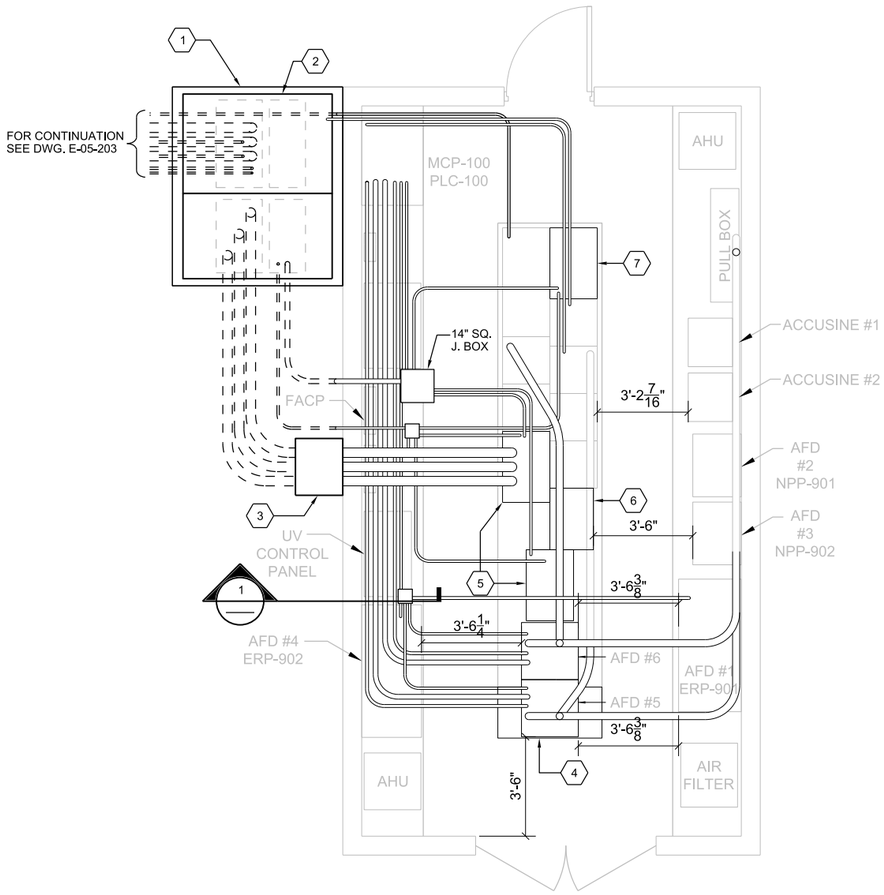

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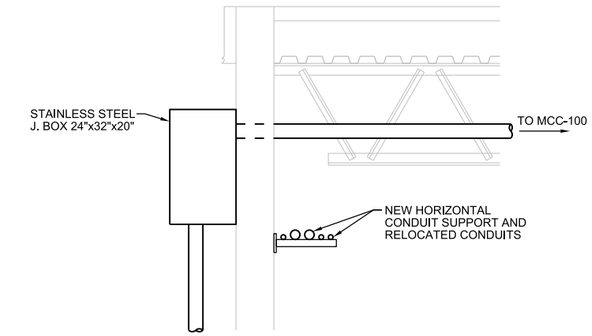
MCC BUILDING 9 PLAN - MODIFIED

3/8" = 1'-0"



1 NTS

SECTION

GENERAL NOTES

1. REFER TO DRAWING E-80-605 FOR PROPOSED SINGLE LINE DIAGRAM.
2. REFER TO DRAWING E-80-206 FOR GENERATOR DETAILS AND CONSTRUCTION SEQUENCE.
3. REFER TO DRAWING E-80-610 FOR CONTROL RISER DIAGRAMS.

SHEET KEYNOTES

1. CONCRETE EQUIPMENT PAD, 0330-056 'TYPE H'.
2. OUTDOOR GENERATOR BREAKER AND ATC ENCLOSURE.
3. 24"X32"20" STAINLESS STEEL JUNCTION BOX.
4. CONCRETE EQUIPMENT PAD, 0330-056 'TYPE E'.
5. NEW 1200A, 3Ø, 4P, ELECTRICALLY OPERATED BREAKER.
6. NEW TRANSITION SECTION FOR THE CONNECTION OF EXISTING BUS BAR A TO MAIN BREAKER 1 AND FROM UNDERGROUND SERVICE FEEDER TO MAIN BREAKER 1.
7. NEW 1200A, 3Ø, 4P, ELECTRICALLY OPERATED TIE BREAKER.

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REVISION

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MCC BUILDING 9 PLAN - MODIFIED

VERIFY SCALE

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0 1"

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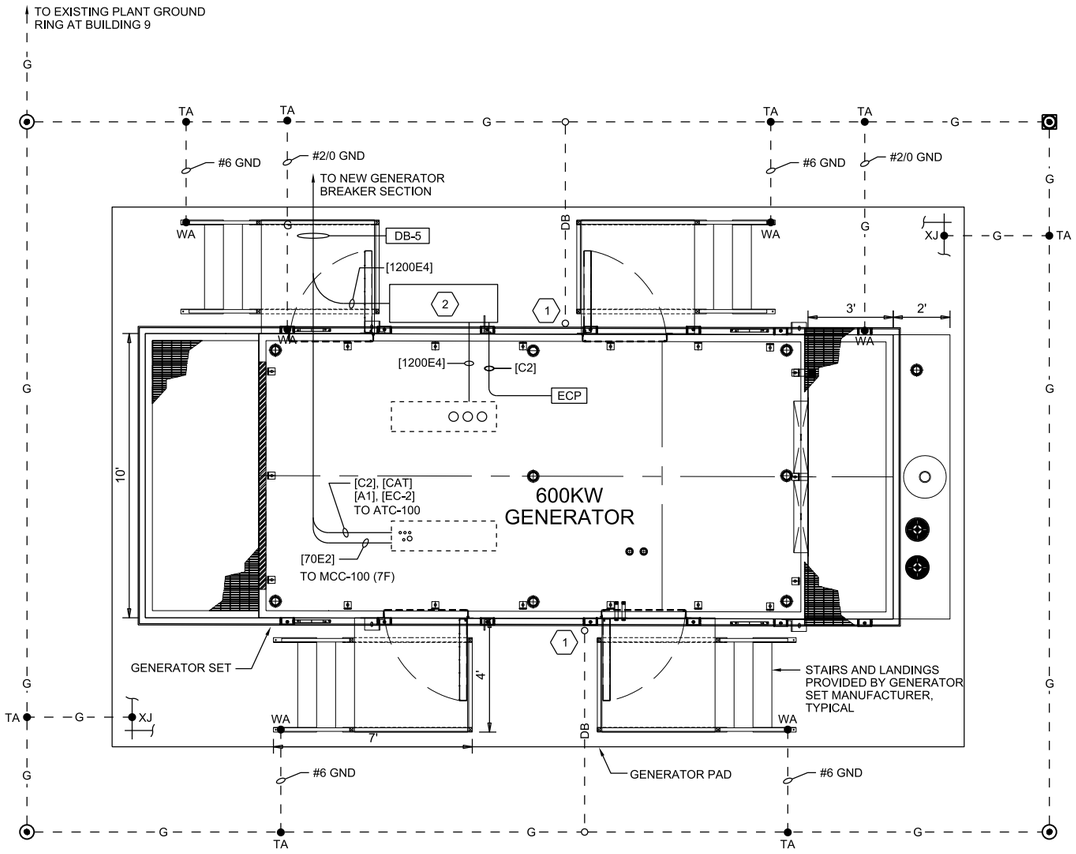
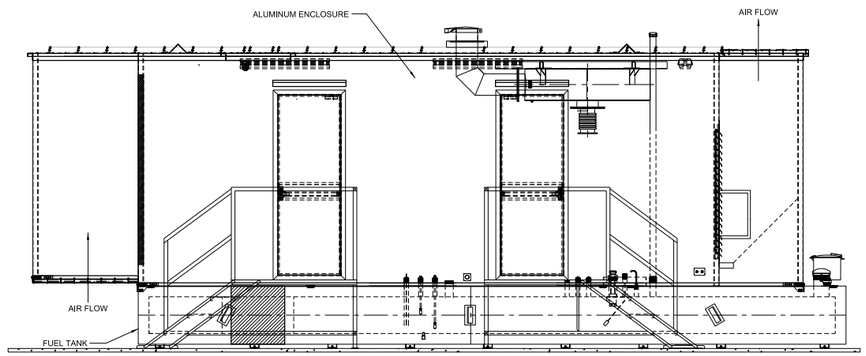


PLAN
3/8"=1'-0"



ELEVATION
N.T.S.

LOADS ON BACKUP POWER

Cedar Bay Wastewater Treatment Plant, JEA
Task Order No.10

Key No.	Major Load Description	Item Designation	LOAD KVA	Motor Rating (HP)
LOADS ON BACKUP POWER AT BUILDING 9				
LOADS AT EXISTING MCC-100 (UV/REUSE PUMP STATION)				
1	Harmonic Conditioner-1	HC-1	1.66	
2	UV-PDC-1B		49.88	
3	UV-PDC-2D		95.6	
4	UV-PDC-2B		57.37	
5	Non Potable Water Reuse Pump	NPP-901	38.24	50
6	Clarifier	CRA-401	1.66	0.25
7	Lighting Transformer (LT-1)		10	
8	UV-PDC-2C		99.77	
9	Non Potable Water Reuse Pump	NPP-902	38.24	50
10	UV-PDC-2A		42.4	
11	UV-PDC-1A		41.57	
12	SG-103		3.26	2
13	SG-102		3.26	2
14	SG-101		3.26	2
15	Panel (P-1)		2.49	
16	SG-105		3.26	2
17	SG-104		3.26	2
18	Harmonic Conditioner-2	HC-2	1.66	

NOTE:
THE STANDBY GENERATOR SHALL BE SIZED TO RUN ALL PRIORITY LOADS LISTED ABOVE. ALL OTHER NON-PRIORITY LOADS SHALL BE EFFECTIVELY DISABLE VIA EXISTING SCADA PLC DIGITAL OUTPUT INTERLOCKS TO PREVENT THEIR OPERATION DURING STANDBY GENERATOR OPERATION. SEE SPECIFICATION SECTION 40 96 90 FACILITY CONTROL SYSTEM INTEGRATION.

GENERAL SHEET NOTES

1. PROVIDE #4/0 BARE COPPER CONDUCTOR FOR MAIN GROUND LOOP, AND BONDING GROUND CONNECTIONS UNLESS SHOWN OTHERWISE.
2. BOND DRY TYPE TRANSFORMER, LOCATED INSIDE THE GENERATOR ENCLOSURE, TO GROUND RING WITH #6 GND.
3. DO NOT BOND GENERATOR NEUTRAL TO FRAME OF THE GENSET.
4. FOR DUCTBANK SECTIONS REFER TO DRAWING E-05-301.
5. FOR GENERATOR PAD LOCATION AND DETAILS REFER TO CIVIL AND STRUCTURAL DRAWINGS.
6. EXACT CONDUIT STUB UP LOCATION SHALL BE COORDINATED WITH GENERATOR'S SHOP DRAWINGS.

SHEET KEYNOTES

1. ROUTE 1" PVC SCH-40 CONDUIT FROM 12-INCHES AFF TO GROUNDING ELECTRODE. FOR USE WITH GROUND CONDUCTORS OF LIGHTNING PROTECTION SYSTEM. COORDINATE NUMBER AND LOCATIONS WITH LIGHTNING PROTECTION CONTRACTOR. REFER TO SPECIFICATION SECTION 26 41 00.
2. CAM LOCK CONNECTION SWITCH, 1200A, 4P, 4W, NON FUSED, DOUBLE THROW, IN A NEMA 4X STAINLESS STEEL ENCLOSURE, TO BE FURNISHED WITH GENERATOR FOR INSTALLATION BY ELECTRICAL CONTRACTOR.

NO.	DATE	DSGN	DR	CHK	APVD	REVISION	BY	APVD
		A QUINONES	C HAMER	P KESKAR	APVD		A QUINONES	

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CEDAR BAY - WATER SYSTEM RESILIENCY PLA

JEA
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ELECTRICAL

600KW GENERATOR ELEVATION AND GROUNDING PLAN

FINAL DOCUMENT

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0 1"

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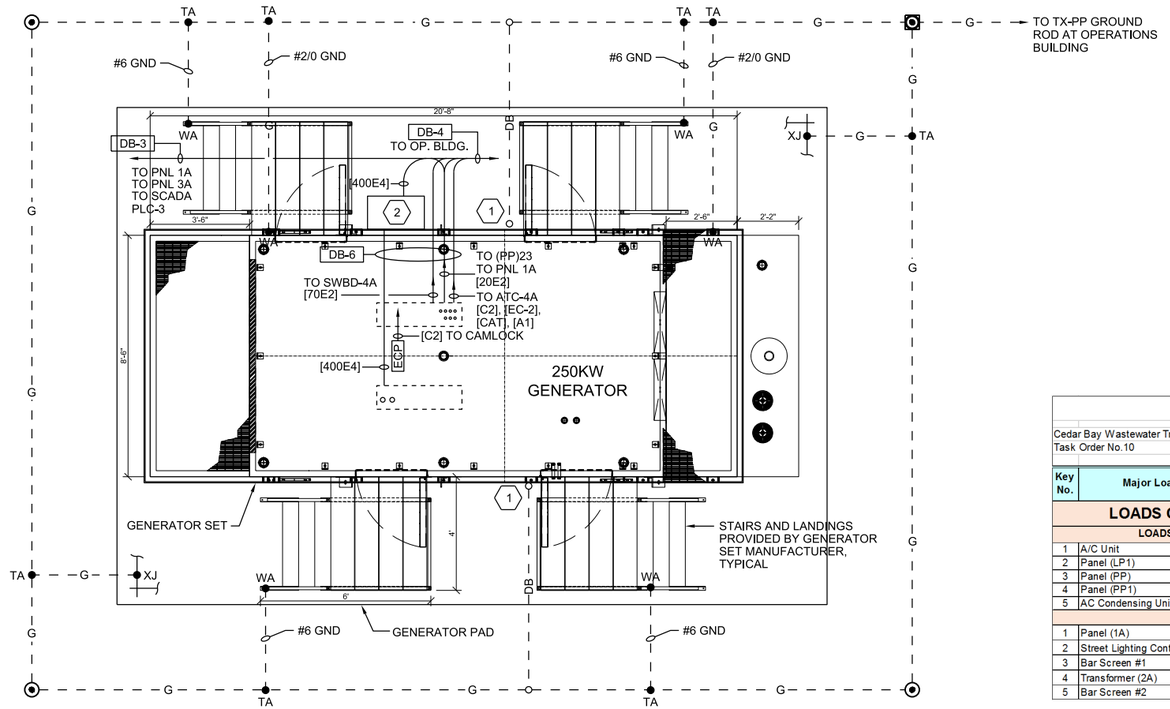
SHEET	30 of 45



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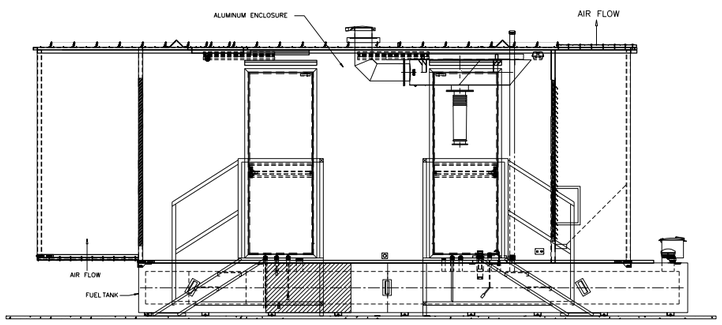
PLAN
3/8"=1'-0"



ELEVATION
N.T.S.

LOADS ON BACKUP POWER

Cedar Bay Wastewater Treatment Plant, JEA
Task Order No.10

Key No.	Major Load Description	Item Designation	LOAD KVA	Motor Rating (HP)
LOADS ON BACKUP POWER AT OPERATIONS BUILDING				
LOADS AT NEW SWBD-4A AND NEW MCC-4A (OPERATIONS BUILDING)				
1	A/C Unit		46.55	
2	Panel (LP1)		4.4	
3	Panel (PP)		56.43	
4	Panel (PP1)		20.95	
5	AC Condensing Unit		4.16	
LOADS AT EXISTING MCC-3 (SLUDGE PUMP STATION)				
1	Panel (1A)		26.6	
2	Street Lighting Contactor		25.8	
3	Bar Screen #1			3
4	Transformer (2A)		4.16	
5	Bar Screen #2			3

NOTE:
THE STANDBY GENERATOR SHALL BE SIZED TO RUN ALL PRIORITY LOADS LISTED ABOVE. ALL OTHER NON-PRIORITY LOADS SHALL BE EFFECTIVELY DISABLE VIA EXISTING SCADA PLC DIGITAL OUTPUT INTERLOCKS TO PREVENT THEIR OPERATION DURING STANDBY GENERATOR OPERATION. SEE SPECIFICATION SECTION 40 96 90 FACILITY CONTROL SYSTEM INTEGRATION.

GENERAL SHEET NOTES

1. PROVIDE #4/0 BARE COPPER CONDUCTOR FOR MAIN GROUND LOOP, AND BONDING GROUND CONNECTIONS UNLESS SHOWN OTHERWISE.
2. BOND DRY TYPE TRANSFORMER, LOCATED INSIDE THE GENERATOR ENCLOSURE, TO GROUND RING WITH #6 GND.
3. DO NOT BOND GENERATOR NEUTRAL TO FRAME OF THE GENSET.
4. FOR DUCTBANK SECTIONS REFER TO DRAWING E-05-301.
5. FOR GENERATOR PAD LOCATION AND DETAILS REFER TO CIVIL AND STRUCTURAL DRAWINGS.
6. EXACT CONDUIT STUB UP LOCATION SHALL BE COORDINATED WITH GENERATOR'S SHOP DRAWINGS.

SHEET KEYNOTES

1. ROUTE 1" PVC SCH-40 CONDUIT FROM 12-INCHES AFF TO GROUNDING ELECTRODE. FOR USE WITH GROUND CONDUCTORS OF LIGHTNING PROTECTION SYSTEM. COORDINATE NUMBER AND LOCATIONS WITH LIGHTNING PROTECTION CONTRACTOR. REFER TO SPECIFICATION SECTION 26 41 00.
2. CAM LOCK CONNECTION SWITCH, 400A, 4P, 4W, NON FUSED, DOUBLE THROW, IN A NEMA 4X STAINLESS STEEL ENCLOSURE, TO BE FURNISHED WITH GENERATOR FOR INSTALLATION BY ELECTRICAL CONTRACTOR.

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
			C HAMER	P KESKAR	APVD	A QUINONES	

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ELECTRICAL

250KW GENERATOR ELEVATION AND GROUNDING PLAN

VERIFY SCALE
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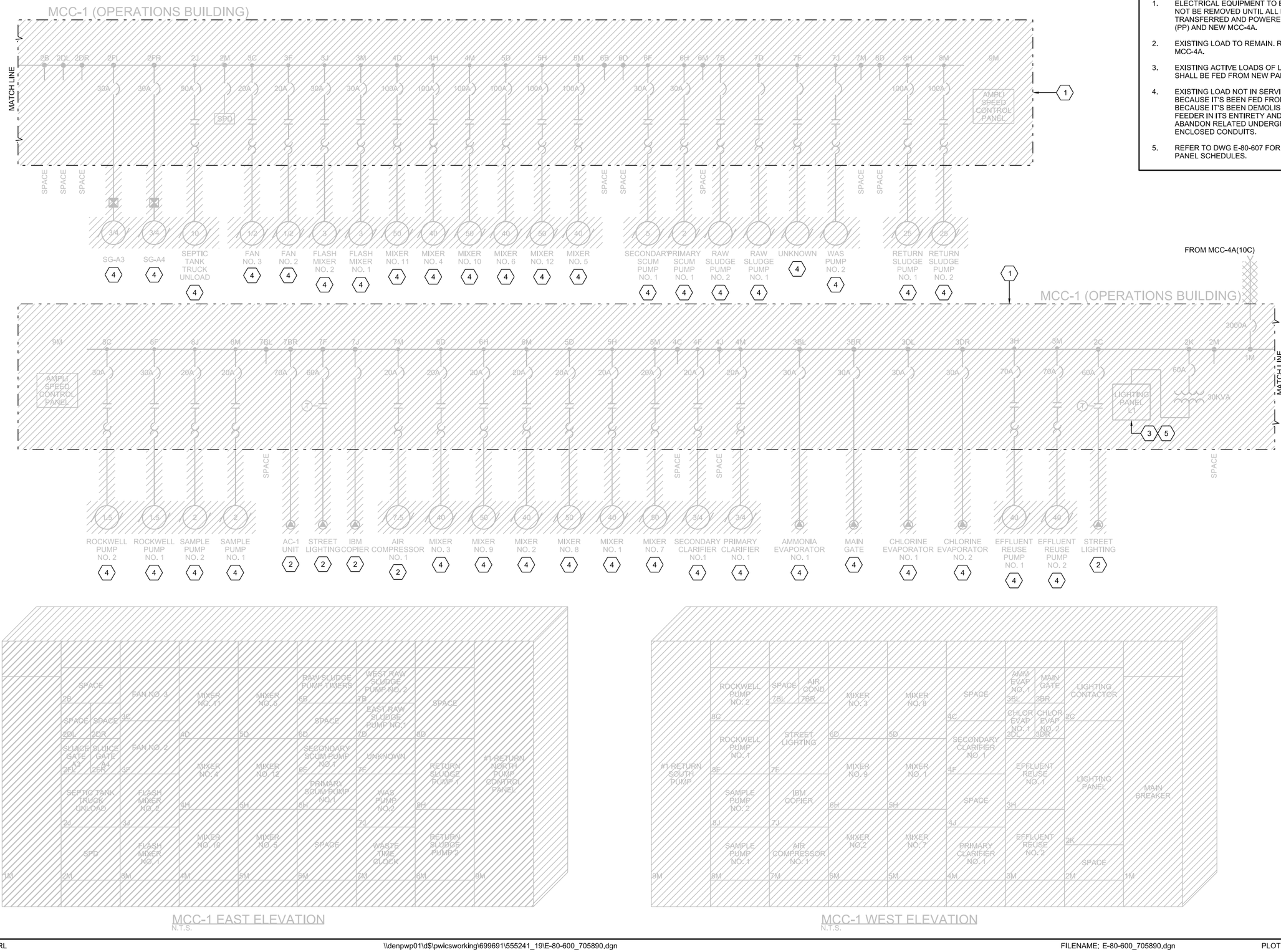
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-80-207
SHEET	31 of 45

SHEET KEYNOTES

1. ELECTRICAL EQUIPMENT TO BE DEMOLISHED CAN NOT BE REMOVED UNTIL ALL LOADS ARE TRANSFERRED AND POWERED FROM NEW PANEL (PP) AND NEW MCC-4A.
2. EXISTING LOAD TO REMAIN. REFED FROM NEW MCC-4A.
3. EXISTING ACTIVE LOADS OF LIGHTING PANEL SHALL BE FED FROM NEW PANEL (PP).
4. EXISTING LOAD NOT IN SERVICE. TURNED OFF BECAUSE IT'S BEEN FED FROM ANOTHER MCC OR BECAUSE IT'S BEEN DEMOLISHED. REMOVE FEEDER IN ITS ENTIRETY AND EXPOSED RACEWAY. ABANDON RELATED UNDERGROUND AND ENCLOSED CONDUITS.
5. REFER TO DWG E-80-607 FOR EXISTING AND NEW PANEL SCHEDULES.



MCC-1 EAST ELEVATION
N.T.S.

MCC-1 WEST ELEVATION
N.T.S.

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ELECTRICAL

MCC-1 SINGLE LINE DIAGRAM DEMOLITION CONSTRUCTION PHASE 2

CEDAR BAY - WATER SYSTEM RESILIENCY PLA

JEA
JACKSONVILLE, FLORIDA

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
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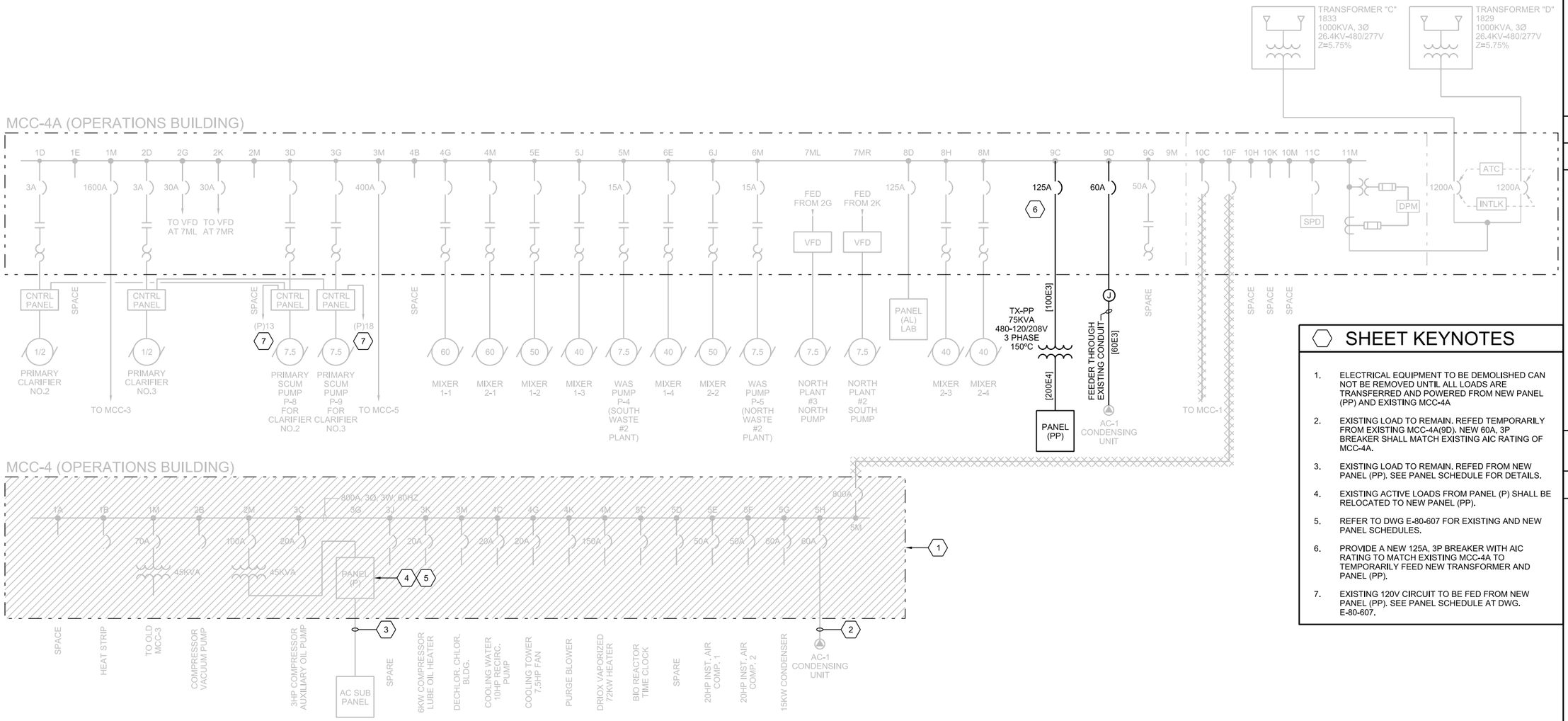

SHEET KEYNOTES

1. ELECTRICAL EQUIPMENT TO BE DEMOLISHED CAN NOT BE REMOVED UNTIL ALL LOADS ARE TRANSFERRED AND POWERED FROM NEW PANEL (PP) AND EXISTING MCC-4A
2. EXISTING LOAD TO REMAIN. REFED TEMPORARILY FROM EXISTING MCC-4A(9D). NEW 60A, 3P BREAKER SHALL MATCH EXISTING AIC RATING OF MCC-4A.
3. EXISTING LOAD TO REMAIN. REFED FROM NEW PANEL (PP). SEE PANEL SCHEDULE FOR DETAILS.
4. EXISTING ACTIVE LOADS FROM PANEL (P) SHALL BE RELOCATED TO NEW PANEL (PP).
5. REFER TO DWG E-80-607 FOR EXISTING AND NEW PANEL SCHEDULES.
6. PROVIDE A NEW 125A, 3P BREAKER WITH AIC RATING TO MATCH EXISTING MCC-4A TO TEMPORARILY FEED NEW TRANSFORMER AND PANEL (PP).
7. EXISTING 120V CIRCUIT TO BE FED FROM NEW PANEL (PP). SEE PANEL SCHEDULE AT DWG. E-80-607.

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DSGN	A QUINONES	C HAMER	DR	P KESKAR		A QUINONES

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MCC-4 AND MCC-4A SINGLE LINE DIAGRAM - DEMOLITION CONSTRUCTION PHASE 1

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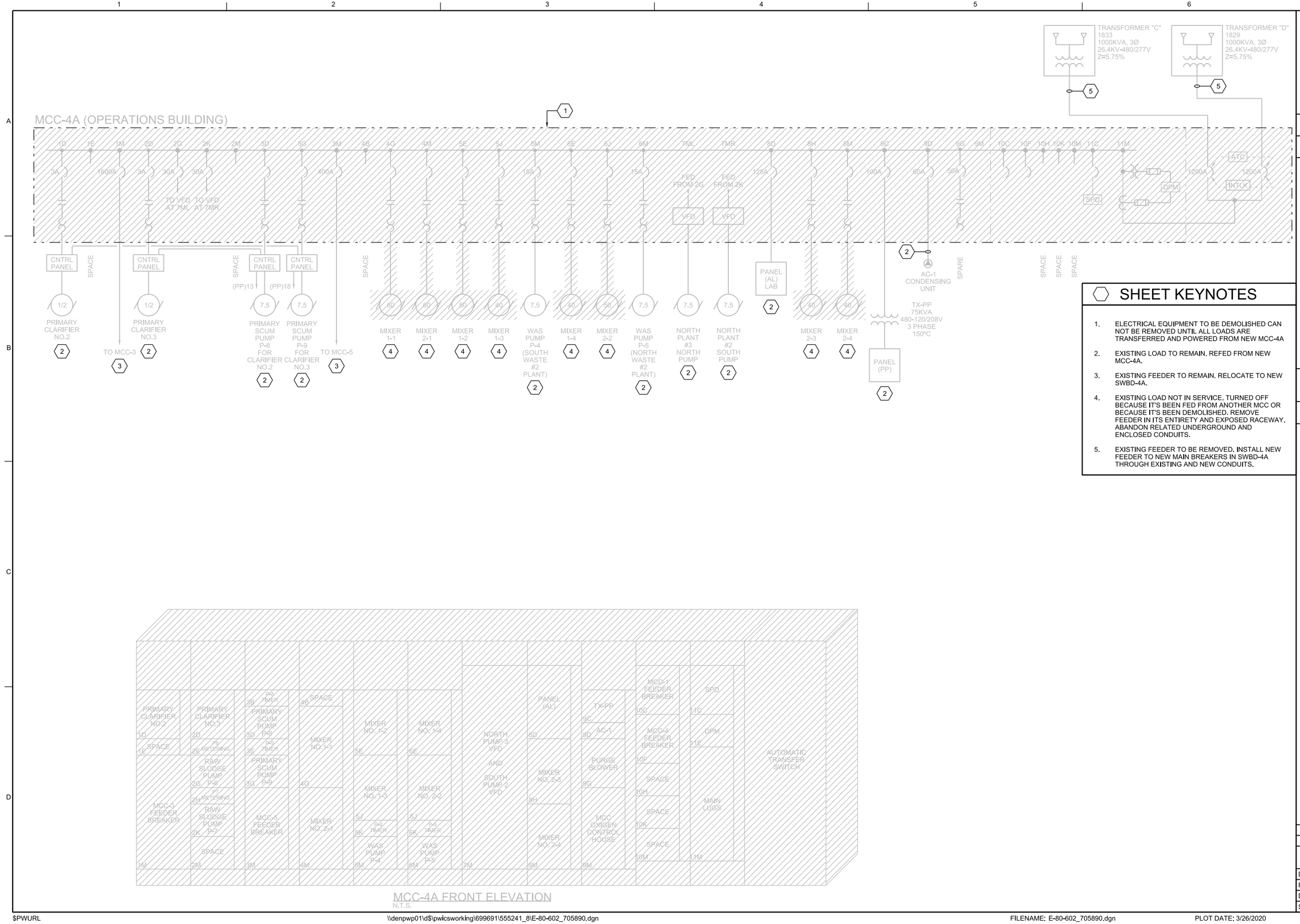

SHEET KEYNOTES

1. ELECTRICAL EQUIPMENT TO BE DEMOLISHED CAN NOT BE REMOVED UNTIL ALL LOADS ARE TRANSFERRED AND POWERED FROM NEW MCC-4A
2. EXISTING LOAD TO REMAIN. REFED FROM NEW MCC-4A.
3. EXISTING FEEDER TO REMAIN. RELOCATE TO NEW SWBD-4A.
4. EXISTING LOAD NOT IN SERVICE. TURNED OFF BECAUSE IT'S BEEN FED FROM ANOTHER MCC OR BECAUSE IT'S BEEN DEMOLISHED. REMOVE FEEDER IN ITS ENTIRETY AND EXPOSED RACEWAY. ABANDON RELATED UNDERGROUND AND ENCLOSED CONDUITS.
5. EXISTING FEEDER TO BE REMOVED. INSTALL NEW FEEDER TO NEW MAIN BREAKERS IN SWBD-4A THROUGH EXISTING AND NEW CONDUITS.

MCC-4A FRONT ELEVATION
N.T.S.

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ELECTRICAL
MCC-4A SINGLE LINE DIAGRAM
DEMOLITION
CONSTRUCTION PHASE 2

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DATE	MARCH 2020
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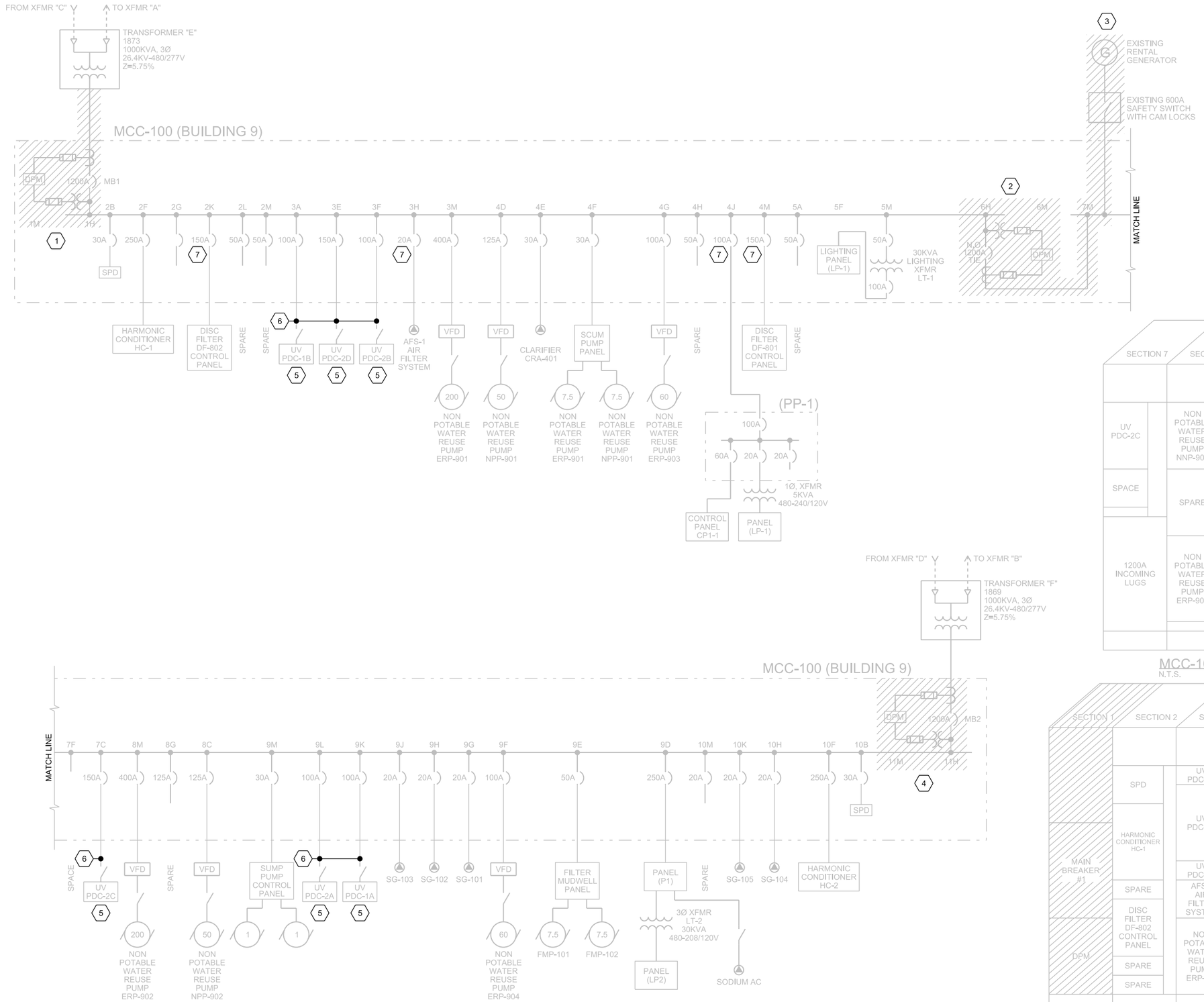
SHEET	34 of 45

SHEET KEYNOTES

1. DEMOLISH ENTIRE SECTION 1 INCLUDING MAIN BREAKER NO. 1 AND DIGITAL POWER METER. REMOVE FEEDER FROM TRANSFORMER "E" TO MCC-100.
2. DEMOLISH ENTIRE SECTION 6 INCLUDING TIE BREAKER. FEEDER FROM LOAD SIDE OF TIE BREAKER TO 1200 A LUGS AT (7M) SHALL REMAIN.
3. DEMOLISH GENERATOR FEEDER FROM MCC-100 BUS AND DISCONNECT SWITCH.
4. DEMOLISH ENTIRE SECTION 11 INCLUDING MAIN BREAKER NO. 2 AND DIGITAL POWER METER. FEEDER FROM TRANSFORMER "F" SHALL REMAIN.
5. REFER TO DRAWING E-80-204 FOR TEMPORARY POWER TO UV SYSTEM.
6. CONTRACTOR SHALL DE-TERMINATE EXISTING FEEDER ON THE LINE SIDE OF THE EXISTING DISCONNECT SWITCH AND SAFELY SECURE CABLES. TERMINATE TEMPORARY CABLES TO ENERGIZE EQUIPMENT. CONTRACTOR TO PROVIDE ANY/ALL LUG OR CONNECTION MEANS AS REQUIRED. SEE DWG E-80-204 FOR TEMPORARY SINGLE LINE DIAGRAM.
7. REPLACE EXISTING BREAKER BY NEW SHUNT TRIP BREAKER OF SAME AMPERAGE AND AIC RATING. REFER TO DWG. E-80-610 FOR CONTROL DIAGRAM.



NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		A QUINONES	C HAMER	P KESKAR	APVD	A QUINONES	

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CEDAR BAY - WATER SYSTEM RESILIENCY PLA

JEA
JACKSONVILLE, FLORIDA

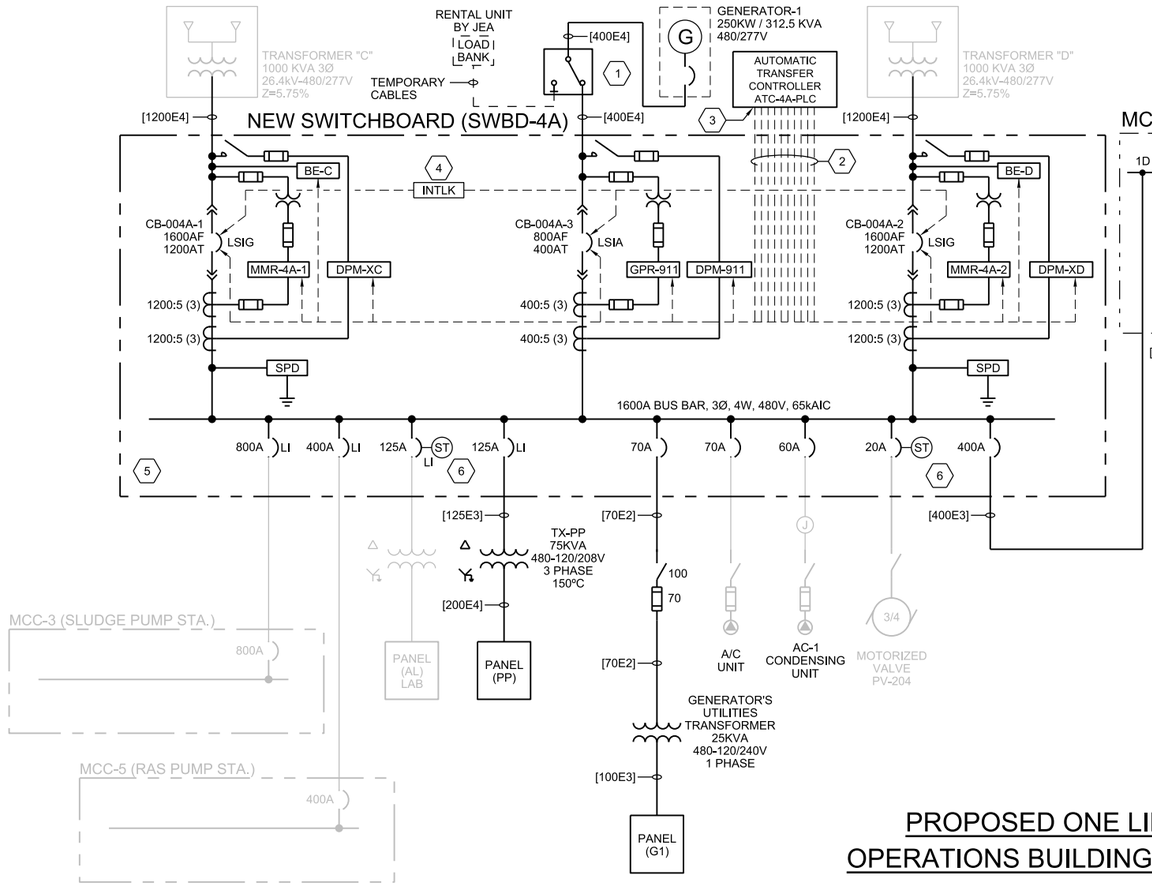
ELECTRICAL

MCC-100 SINGLE LINE DIAGRAM - DEMOLITION

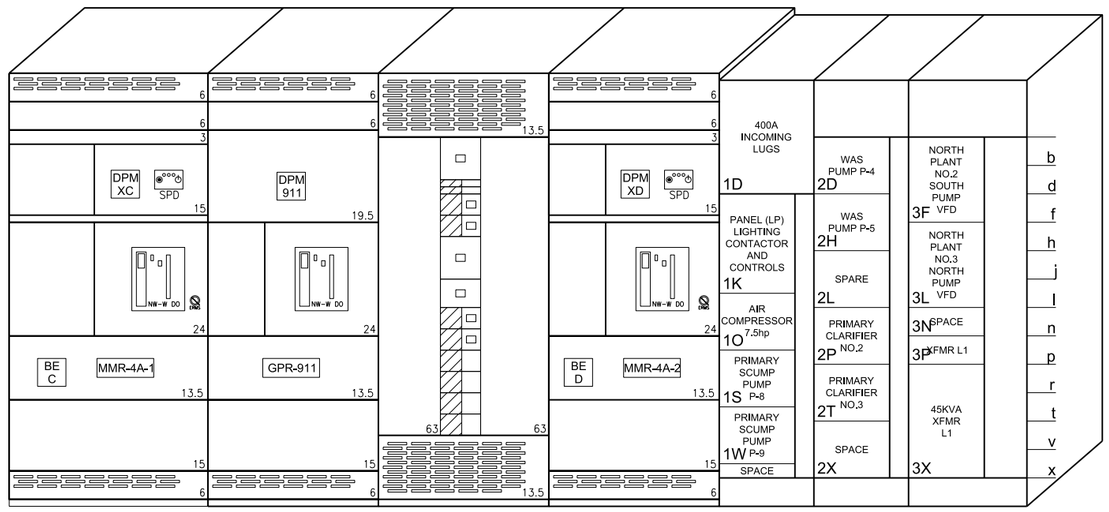
FINAL DOCUMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-80-603
SHEET	35 of 45



PROPOSED ONE LINE DIAGRAM
OPERATIONS BUILDING POWER SYSTEM



SWBD-4A AND MCC-4A ELEVATION
N.T.S.

SHEET KEYNOTES

1. FURNISH AND INSTALL A CAMLOCK CONNECTION SWITCH TO ALLOW MANUAL SWITCHING OF THE GENERATOR OUTPUT TO OWNER'S LOAD BANK FOR PERIODIC LOAD TESTING OF THE GENERATOR. JEA MAY RENT A LOAD BANK AS AND WHEN NEEDED.
2. FOR DETAILED ATC-4A PLC I/O REQUIREMENTS SEE DRAWING E-80-606.
3. FOR DETAILED PLC BLOCK DIAGRAM SEE DRAWING I-08-701. FOR DETAILED HARDWARE AND APPLICATION PROGRAMMING REQUIREMENTS SEE SPECIFICATION SECTION 40 99 90, PACKAGE CONTROL SYSTEM.
4. FOLLOWING HARD WIRE INTERLOCKS MUST BE IMPLEMENTED BETWEEN UTILITY MAINS AND GENERATOR BREAKER:

   a) GENERATOR BREAKER CAN NOT BE CLOSED UNLESS BOTH UTILITY MAIN INCOMING BREAKERS ARE OPEN.

   b) BOTH UTILITY INCOMING MAIN BREAKERS CAN NOT BE CLOSED SIMULTANEOUSLY. IF UTILITY SOURCE "C" BREAKER IS CLOSED, SOURCE "D" BREAKER CAN NOT BE CLOSED AND VICE VERSA.
5. GROUND THE GENERATOR NEUTRAL AT THE SERVICE ENTRANCE SWITCHBOARD TO BOND WITH TRANSFORMER WYE NEUTRAL TO CREATE A NON SEPARATELY DERIVED SYSTEM PER NEC.
6. FOR SHUNT TRIP BREAKER CONTROL DIAGRAM REFER TO DWG. E-80-610.

GENERAL SHEET NOTES

1. GENERATOR AND TRANSFORMER NEUTRALS SHALL BE BROUGHT INTO SWITCHGEAR AND BONDED WITH GROUND BUS TO CREATE A NON-SEPARATELY DERIVED STANDBY GENERATOR SYSTEM.
2. PROVIDE HARDWIRED INTERLOCKS TO PREVENT SIMULTANEOUS CLOSING OF BOTH UTILITY BREAKERS AND GENERATOR BREAKER.
3. FOR FUNCTIONAL BLOCK DIAGRAM REFER TO DRAWING E-80-606.
4. FOR PANEL SCHEDULES SEE DRAWING E-80-607.
5. FOR MOTOR CONTROL DIAGRAMS SEE DRAWINGS E-80-608 AND E-80-609.

NO.	DATE	DSGN
DR	C HAMER	P KESKAR
CHK	A QUINONES	APVD
REVISION		BY APVD

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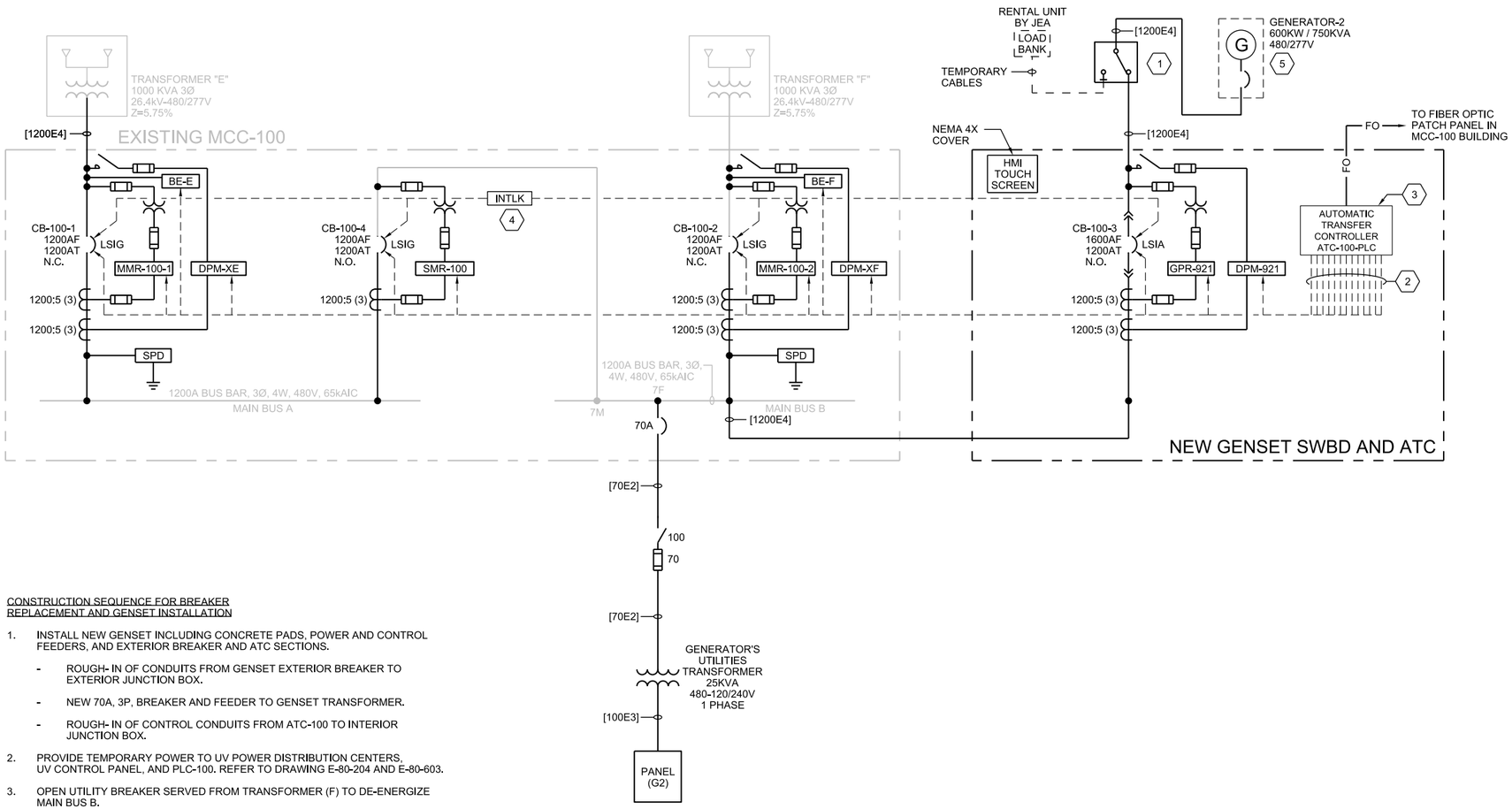
ELECTRICAL

NEW SWBD-4A, & MCC-4A
SINGLE LINE DIAGRAM

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-80-604
SHEET	36 of 45

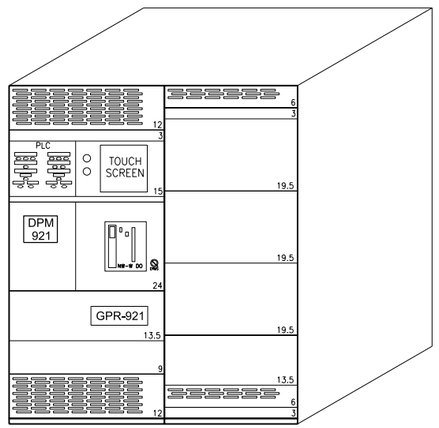
FINAL DOCUMENT



PROPOSED ONE LINE DIAGRAM

CONSTRUCTION SEQUENCE FOR BREAKER REPLACEMENT AND GENSET INSTALLATION

1. INSTALL NEW GENSET INCLUDING CONCRETE PADS, POWER AND CONTROL FEEDERS, AND EXTERIOR BREAKER AND ATC SECTIONS.
   - ROUGH- IN OF CONDUITS FROM GENSET EXTERIOR BREAKER TO EXTERIOR JUNCTION BOX.
   - NEW 70A, 3P, BREAKER AND FEEDER TO GENSET TRANSFORMER.
   - ROUGH- IN OF CONTROL CONDUITS FROM ATC-100 TO INTERIOR JUNCTION BOX.
2. PROVIDE TEMPORARY POWER TO UV POWER DISTRIBUTION CENTERS, UV CONTROL PANEL, AND PLC-100. REFER TO DRAWING E-80-204 AND E-80-603.
3. OPEN UTILITY BREAKER SERVED FROM TRANSFORMER (F) TO DE-ENERGIZE MAIN BUS B.
4. DISCONNECT FEEDER FROM LOAD SIDE OF TIE BREAKER AND INCOMING LUGS OF MAIN BUS B.
5. CLOSE UTILITY BREAKER SERVED FROM TRANSFORMER (F).
6. EXTEND NEW CONCRETE PAD AS SHOWN ON DRAWING E-80-205.
7. DISCONNECT UTILITY SERVICE FROM TRANSFORMER (E).
8. RELOCATE AFD-5 AND AFD-6 INCLUDING POWER AND CONTROL CONDUITS AND WIRING.
9. REMOVE MAIN UTILITY BREAKER SECTION 1 AND TIE BREAKER SECTION 6.
10. INSTALL NEW MAIN UTILITY BREAKER 1, SERVICE FEEDER FROM TRANSFORMER (E), TRANSITION SECTION, AND TIE BREAKER.
11. INSTALL CONTROL WIRING FROM MAIN BREAKER SECTION 1 AND TIE BREAKER SECTION 6 TO ATC-100.
12. ENERGIZE MAIN BUS A.
13. DISCONNECT UTILITY SERVICE FROM TRANSFORMER (F).
14. REMOVE MAIN UTILITY BREAKER SECTION 11.
15. REMOVE PORTABLE GENERATOR CONNECTION FROM MCC-100 (AT SECTION 7).
16. INSTALL NEW MAIN UTILITY BREAKER 2.
17. INSTALL NEW FEEDER FROM EXTERIOR GENERATOR BREAKER TO LOAD SIDE (MAIN BUS B) OF MAIN BREAKER 2.
18. INSTALL CONTROL FEEDERS FROM MAIN BREAKER 2 TO ATC-100.
19. RECONNECT EXISTING FEEDER FROM LOAD SIDE OF TIE BREAKER TO INCOMING LUGS OF MAIN BUS B (AT SECTION 7).
20. ENERGIZE MAIN BUS B.
21. REMOVE TEMPORARY POWER TO UV POWER DISTRIBUTION CENTERS, UV CONTROL PANEL, AND PLC-100 AND RE-CONNECT TO EXISTING CONDUCTORS.



NEW GENSET MAIN BREAKER AND ATC-100 ELEVATION

SHEET KEYNOTES

1. FURNISH AND INSTALL A CAMLOCK CONNECTION SWITCH TO ALLOW MANUAL SWITCHING OF THE GENERATOR OUTPUT TO OWNER'S LOAD BANK FOR PERIODIC LOAD TESTING OF THE GENERATOR. JEA MAY RENT A LOAD BANK AS AND WHEN NEEDED.
2. FOR DETAILED ATC-4A PLC I/O REQUIREMENTS SEE DRAWING E-80-606.
3. FOR DETAILED PLC BLOCK DIAGRAM SEE DRAWING I-08-701. FOR DETAILED HARDWARE AND APPLICATION PROGRAMMING REQUIREMENTS SEE SPECIFICATION SECTION 40 99 90, PACKAGE CONTROL SYSTEM.
4. FOLLOWING HARD WIRE INTERLOCKS MUST BE IMPLEMENTED BETWEEN MAIN-TIE-MAIN AND GENERATOR BREAKERS:

   a) GENERATOR BREAKER CAN NOT BE CLOSED UNLESS BOTH UTILITY SOURCE INCOMING BREAKERS ARE OPEN.

   b) BOTH UTILITY SOURCE INCOMING BREAKERS CAN NOT BE CLOSED SIMULTANEOUSLY UNLESS TIE AND GENERATOR BREAKERS ARE OPEN.

   c) TIE BREAKER CANNOT BE CLOSED UNLESS SOURCE E AND SOURCE F BREAKERS ARE OPEN AND GENERATOR BREAKER IS OPEN.
5. GROUND THE GENERATOR NEUTRAL AT MCC-100 TO BOND WITH TRANSFORMER WYE NEUTRAL TO CREATE A NON SEPARATELY DERIVED SYSTEM PER NEC.

GENERAL SHEET NOTES

1. GENERATOR AND TRANSFORMER NEUTRALS SHALL BE BROUGHT INTO SWITCHGEAR AND BONDED WITH GROUND BUS TO CREATE A NON-SEPARATELY DERIVED STANDBY GENERATOR SYSTEM.
2. PROVIDE HARDWIRED INTERLOCKS TO PREVENT SIMULTANEOUS CLOSING OF BOTH UTILITY BREAKERS AND GENERATOR BREAKER.
3. FOR FUNCTIONAL BLOCK DIAGRAM REFER TO DRAWING E-80-606.
4. FOR PANEL SCHEDULES SEE DRAWING E-80-607.
5. FOR GENERATOR DETAILS REFER TO DRAWING E-80-206.
6. FOR POWER AND CONTROL DISTRIBUTION INSIDE BUILDING #9 REFER TO DRAWING E-80-205.
6. SHORT CIRCUIT RATING OF NEW 70A, 3P, BREAKER, AT CUBICLE 7F, MUST MATCH EXISTING RATING OF MCC-100.
7. NEW FUSIBLE SAFETY SWITCH, GENERATOR'S UTILITIES TRANSFORMER, AND PANELBOARD (G2) SHALL BE INCLUDED PRE-WIRED AS PART OF THE GENSET BY THE GENERATOR SUPPLIER.
8. THE CONSTRUCTION SEQUENCE SHOWN IN THIS DRAWING IS A GUIDE FOR THE CONTRACTOR TO PERFORM THE WORK. IT CAN BE MODIFIED BASED ON OWNER'S RECOMMENDATIONS, SITE CONDITIONS AND CONTRACTOR'S PREFERENCES.
9. OUTDOOR GENSET MAIN BREAKER AND ATC SHALL BE INSTALLED IN A NEMA-3R STAINLESS STEEL ENCLOSURE.
10. CONTRACTOR SHALL PROVIDE 120V POWER TO NEW ATC-100 FROM EXISTING PANEL (LP-1) THRU AN EXISTING 20A, 1P, SPARE BREAKER IN THE PANEL.

NO.	DATE	DSGN	DR	CHK	BY	REVISION	APVD
		A QUINONES	C HAMER	P KESKAR	A QUINONES		

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ELECTRICAL

MCC-100 SINGLE LINE DIAGRAM - MODIFIED

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
PROJ	705890
DWG	E-80-605
SHEET	37 of 45

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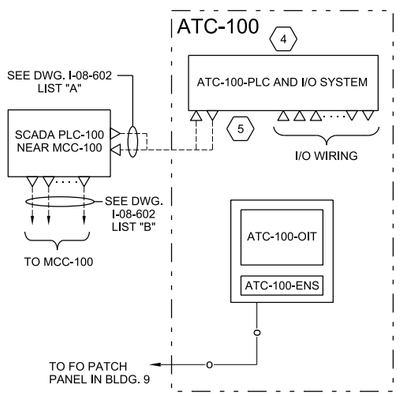
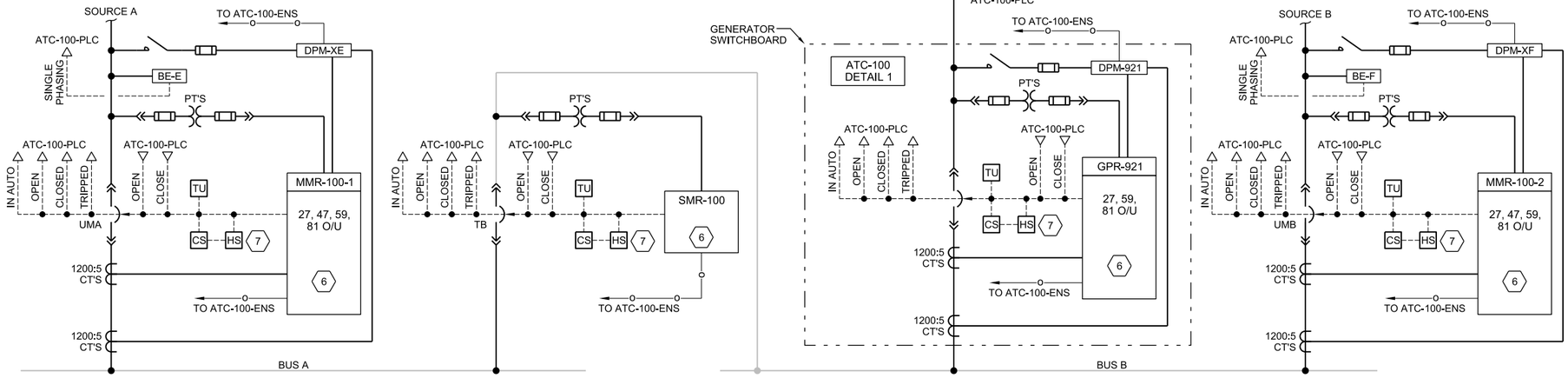


DETAIL 1

LOCATION: GEN. SWBD @ RIGHT



MCC-100 FUNCTIONAL BLOCK DIAGRAM 5

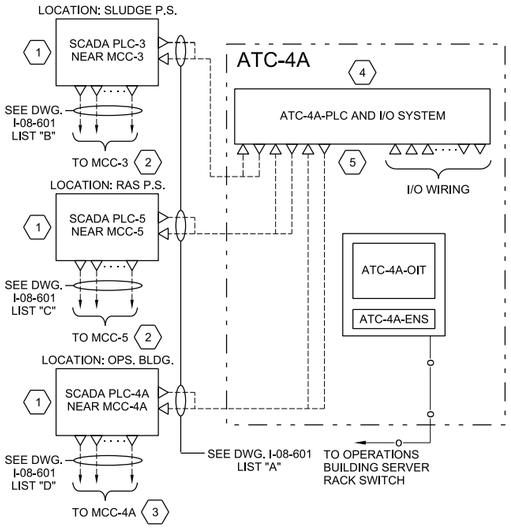
NTS

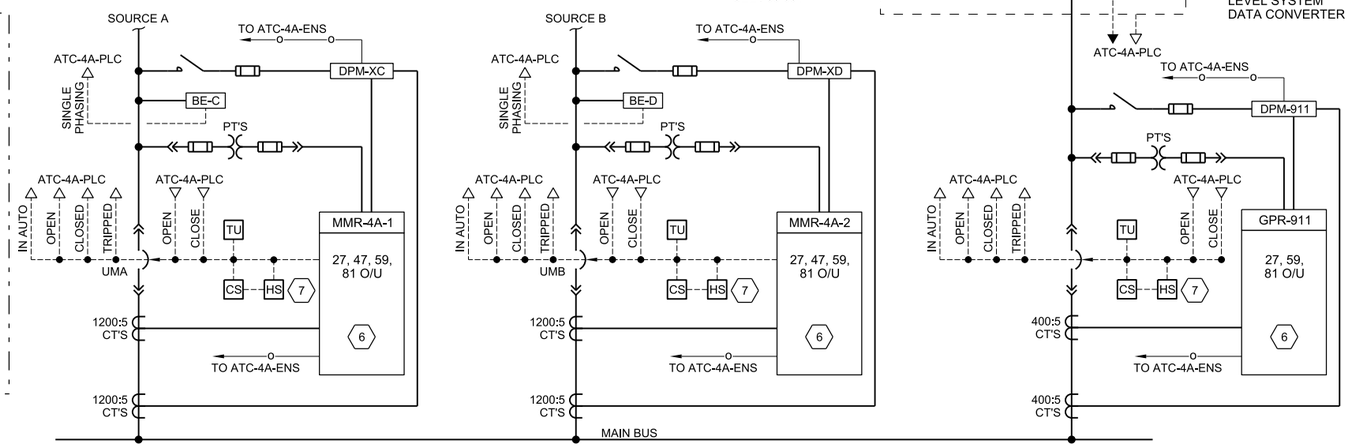
LEGEND

CS	CIRCUIT BREAKER CONTROL SWITCH
TU	CIRCUIT BREAKER TRIP UNIT
---------▷	DIGITAL INPUT TO SWITCHBOARD PLC
---------◁	DIGITAL OUTPUT FROM SWITCHBOARD PLC
---------◀	ANALOG OUTPUT FROM SWITCHBOARD PLC
—o—o—	DIGITAL COMMUNICATIONS

SHEET KEYNOTES

1. FOR MODIFICATIONS TO EXISTING SCADA PLC I/O AND CORRESPONDING APPLICATION PROGRAMMING SEE SPECIFICATION SECTION 40 96 90 FACILITY CONTROL SYSTEM INTEGRATION.
2. FOR MODIFICATIONS TO EXISTING STARTERS, CONTROL CABLE INTER CONNECTIONS REQUIREMENTS SEE DRAWING E-80-608, E-80-609 AND E-80-610.
3. SEE DRAWINGS E-80-608 AND E-80-609 FOR WIRING OF THE LOAD SHED INTERLOCKS IN TO NEW MCC-4A STARTERS.
4. FOR ATC-100-PLC AND ATC-4A-PLC HARDWARE AND APPLICATION PROGRAMMING REQUIREMENTS SEE SPECIFICATION SECTION 40 99 90, PACKAGE CONTROL SYSTEMS AND PARTIAL NETWORK BLOCK DIAGRAM, DRAWING I-08-701.
5. READ THIS PARTIAL BLOCK DIAGRAM WITH DRAWINGS I-08-601, I-08-602, AND I-08-701 FOR ADDITIONAL I/O DETAILS.
6. PROVIDE POWER SYSTEM PROTECTIVE ELEMENTS WITH A MULTI - FUNCTION, SOLID - STATE PROTECTIVE RELAY. PROPER COORDINATION AND OPERATION OF ALL RELAY PROTECTION SCHEMES SHOWN ON THIS DRAWING TO MEET SPECIFIED FUNCTIONAL BREAKER CONTROL SYSTEM AND PROTECTION REQUIREMENTS, IS THE RESPONSIBILITY OF THE GENERATOR / SWITCHBOARD SUPPLIER.
7. "HS" IS AN HOA SWITCH AND "CS" IS A BREAKER CONTROL SWITCH (CLOSE/TRIP). HS MUST BE IN HAND MODE TO ALLOW CS TO OPERATE. HARD WIRE INTERLOCKS MUST BE IN PLACE FOR HAND AND AUTO MODES.





SWBD-4A FUNCTIONAL BLOCK DIAGRAM 5

NTS

NO.	DATE	DSGN	REVISION	DR	CHK	APVD	BY
		A QUINONES			C HAMER	P KESKAR	A QUINONES

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ELECTRICAL

FUNCTIONAL BLOCK DIAGRAM

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PROJ	705890
DWG	E-80-606
SHEET	38 of 45

PANEL NAME		PANEL LOCATION	PANEL SCHEDULE						CIRCUIT BREAKER REMARKS
(L1)		INSIDE MCC-1	BUS RATING	225A		VOLTAGES			S = SHUNT TRIP H = HACR G = GFCI L = C/B LOCK TC = TIME CLK
FEED	MOUNTING	MAIN C/B OR MAIN LUG RATING & TYPE	AIC RATING	70,000A		L-L	208		NB = NEW C/B Sx = SWITCH CONTROL Cx = CONTACTOR CONTROL
TOP	IN MCC-1	225A MAIN LUGS	BUS MATERIAL	COPPER		L-N	120		EX = EXISTING LOAD TO REMAIN NL = NEW LOAD ON EXISTING
CKT NO.	BREAKER (REMARKS)	LOAD DESCRIPTION	LOAD TYPE	LOAD VA	PHASING L1 L2 L3	LOAD VA	LOAD TYPE	LOAD DESCRIPTION	BREAKER (REMARKS)	CKT NO.
1	20/1	SEC. CLARIFIER SCUMP PUMP CONTROL		600	■	600		PRI. CLARIFIER SCUM PUMP CONTROL	20/1 OFF	2
3	20/1	STRIP HEATERS		1,500	■	520		EAST YARD POLE RECEPTACLES	20/1	4
5	20/1	GYM WALL RECEPTACLES		1,620	■	600		REUSE RELAY CONTROL	20/1	6
7	20/1	CONTROL ROOM LIGHTS		256	■	968		AERATOR POLE RECEPTACLES	20/1	8
9	20/1	FIRE ALARM PANEL		1,620	■	3,496		WATER HEATER	30/2	10
11	60/1	SPARE		0	■	2,496				12
13	60/1	SPARE		0	■	520		SOUTH BASIN POLE RECEPTACLE	20/1	14
15	20/1	BREAK ROOM RECEPTACLES		1,260	■	360		BREAK ROOM TV AND GFCI OUTLET	20/1	16
17	20/1	GYM ROOM LIGHTS		448	■	1,500		BREAK ROOM MICROWAVE OUTLET	20/1	18
19	20/1	STORE ROOM LIGHTS		576	■	1,500		CAMERAS	20/1	20
21	20/1	BUILDING RECEPTACLES		1,620	■	520		RECEPTACLES AUTO SAMPLER ROOM	20/1	22
23	20/1	CONTROL ROOM LIGHTS		256	■	792		LIGHTS SAMPLER RM & WATER COOLER	20/1	24
25	20/1	LIQUID LEVEL CONTROLLER		180	■	360		WEST YARD POLE RECEPTACLES	20/1	26
27	20/1	HEAD LIGHTS		400	■	1,800		CONTROL BOARD	20/1	28
29	20/1	SPARE		0	■	40		PARSHALL FLUME	20/1	30
31	20/1	SPARE		0	■	600		RAW SLUDGE MAG METER	20/1	32
33	20/1	OFF BATH ROOMS		1,500	■	1,500		SOUTH AERATOR LIGHTS (NORTH-RIGHT)	20/1	34
35	20/1	SOUTH AERATOR LIGHTS (NSRTH-LEFT)		1,500	■	0		SPARE	40/2 OFF	36
37	20/1	SOUTH AERATOR LIGHTS (SOUTH-RIGHT)		1,500	■	0				38
39	20/1	SOUTH AERATOR LIGHTS (SOUTH-LEFT)		1,500	■	0		SPARE	40/2 OFF	40
41	20/1	CLARIFIER 1 STAIR LIGHTS		400	■	0				42
						7,652		TOTAL CONNECTED LOAD IN KVA - PHASE A		
						18,596		TOTAL CONNECTED LOAD IN KVA PHASE B		
						9,652		TOTAL CONNECTED LOAD IN KVA - PHASE C		
						33,900		TOTAL CONNECTED LOAD IN KVA ALL PHASES		
		NEC DEMAND LOAD IN AMPS		117.62		94.10		TOTAL CONNECTED LOAD IN AMPS - ALL PHASES		

PANEL NAME		PANEL LOCATION	PANEL SCHEDULE						CIRCUIT BREAKER REMARKS
(PP)		OPERATIONS BUILDING	BUS RATING	225A		VOLTAGES			S = SHUNT TRIP H = HACR G = GFCI L = C/B LOCK TC = TIME CLK
FEED	MOUNTING	MAIN C/B OR MAIN LUG RATING & TYPE	AIC RATING	10,000A		L-L	208		NB = NEW C/B Sx = SWITCH CONTROL Cx = CONTACTOR CONTROL
TOP	IN MCC-4	200A MAIN BREAKER 100% RATED	BUS MATERIAL	COPPER		L-N	120		EX = EXISTING LOAD TO REMAIN NL = NEW LOAD ON EXISTING
CKT NO.	BREAKER (REMARKS)	LOAD DESCRIPTION	LOAD TYPE	LOAD VA	PHASING L1 L2 L3	LOAD VA	LOAD TYPE	LOAD DESCRIPTION	BREAKER (REMARKS)	CKT NO.
1	20/1	ENTRANCE LIGHTS		1,000	■	1,000		EAST WING LIGHTS	20/1	2
3	20/1	WEST WING LIGHTS		1,000	■	900		RECEPTACLES	20/1	4
5	20/1	FLOW METER FE-200		500	■	1,500		CONTROL BOARD	20/1	6
7	20/1	METER PIT WEST		300	■	1,248		BATHROOM LIGHTS	20/1	8
9	60/2	AC SUB PANEL		4,554	■	1,400		ICE MAKER AND BACK RECEPTACLE	20/1	10
11				7,062	■	1,400		ICE MAKER AND BACK RECEPTACLE	20/1	12
13	20/1	LCP-PC-202, LCP-SP-202		1,200	■	2,496		WATER HEATER	30/2	14
15	20/1	LIGHTS AUTO SAMPLE ROOM		192	■	2,496				16
17	20/1	PRIMARY 3 SUMP		1,656	■	1,200		LCP-PC-203, LCP-SP-203	20/1	18
19	60/2	PANEL (3A)		4,992	■	1,620		BULDING RECEPTACLES	20/1	20
21				4,992	■	520		RECEPTACLES AUTO SAMPLE ROOM	20/1	22
23	20/1	PANEL (1A) CONTACTOR'S COIL		12	■	1,500		BREAK ROOM MICROWAVE OUTLET	20/1	24
25	20/1	WATER COOLER		600	■	1,620		GYM ROOM WALL RECEPTACLES	20/1	26
27	20/1	STORE ROOM LIGHTS		512	■	576		CONTROL ROOM LIGHTS	20/1	28
29	20/1	BATHROOM GFCI RECEPTACLE		1,920	■	1,920		FIRE ALARM PANEL	20/1	30
31	20/1	BREAK ROOM RECEPTACLES		1,260	■	1,800		BREAK ROOM TV AND GFCI RECEPTACLE	20/1	32
33	20/1	GYM ROOM LIGHTS		448	■	1,024		MCC-1 ROOM LIGHTS	20/1	34
35	20/1	PANEL (L1) CONTACTOR'S COIL		12	■	3		EXIT LIGHT	20/1	36
37	20/1	ATC-4A		1,500	■	0		SPARE	20/1	38
39	20/1	SPARE		0	■	0		SPARE	20/1	40
41	20/1	SPARE		0	■	0		SPARE	20/1	42
						20,030		TOTAL CONNECTED LOAD IN KVA - PHASE A		
						18,614		TOTAL CONNECTED LOAD IN KVA - PHASE B		
						18,685		TOTAL CONNECTED LOAD IN KVA - PHASE C		
						57,935		TOTAL CONNECTED LOAD IN KVA - ALL PHASES		
		NEC DEMAND LOAD IN AMPS		201.01		160.81		TOTAL CONNECTED LOAD IN AMPS - ALL PHASES		

PANEL NAME		PANEL LOCATION	PANEL SCHEDULE						CIRCUIT BREAKER REMARKS
(R)		OPERATIONS BUILDING (INSIDE MCC-4)	BUS RATING	225A		VOLTAGES			S = SHUNT TRIP H = HACR G = GFCI L = C/B LOCK TC = TIME CLK
FEED	MOUNTING	MAIN C/B OR MAIN LUG RATING & TYPE	AIC RATING	10,000A		L-L	208		NB = NEW C/B Sx = SWITCH CONTROL Cx = CONTACTOR CONTROL
TOP	INSIDE MCC-4	225A MAIN LUGS	BUS MATERIAL	COPPER		L-N	120		EX = EXISTING LOAD TO REMAIN NL = NEW LOAD ON EXISTING
CKT NO.	BREAKER (REMARKS)	LOAD DESCRIPTION	LOAD TYPE	LOAD VA	PHASING L1 L2 L3	LOAD VA	LOAD TYPE	LOAD DESCRIPTION	BREAKER (REMARKS)	CKT NO.
1	20/1	ENTRANCE LIGHTS		1,000	■	1,000		EAST WING LIGHTS	20/1	2
3	20/1	WEST WING LIGHTS		1,000	■	900		RECEPTACLES	20/1	4
5	20/1	FLOW METER FE-200		500	■	1,500		LIGHTS BASIN NORTH-N	20/1	6
7	20/1	METER PIT WEST		300	■	1,000		PSA YARD LIGHTS	20/1	8
9	60/2	AC SUB PANEL		4,554	■	1,400		ICE MAKER AND BACK RECEPTACLE	20/1	10
11				7,062	■	1,400		ICE MAKER AND BACK RECEPTACLE	20/1	12
13	20/1	LCP-PC-202, LCP-SP-202		1,200	■	1,000		LIGHTS PRIMARY CLARIFIER	20/1	14
15	20/1	PRIMARY 3 SUMP		1,656	■	1,000		LIGHTS PRIMARY CLARIFIER	20/1	16
17	20/1	LIGHTS BASIN NORTH-S		1,500	■	1,200		LCP-PC-203, LCP-SP-203	20/1	18
						5,590		TOTAL CONNECTED LOAD IN KVA - PHASE A		
						18,510		TOTAL CONNECTED LOAD IN KVA PHASE B		
						13,162		TOTAL CONNECTED LOAD IN KVA - PHASE C		
						28,172		TOTAL CONNECTED LOAD IN KVA ALL PHASES		
		NEC DEMAND LOAD IN AMPS		101.23		80.97		TOTAL CONNECTED LOAD IN AMPS - ALL PHASES		

PANEL NAME		PANEL LOCATION	PANEL SCHEDULE						CIRCUIT BREAKER REMARKS
(PP1)		OPERATIONS BUILDING	BUS RATING	150A		VOLTAGES			S = SHUNT TRIP H = HACR G = GFCI L = C/B LOCK TC = TIME CLK
FEED	MOUNTING	MAIN C/B OR MAIN LUG RATING & TYPE	AIC RATING	10,000A		L-L	208		NB = NEW C/B Sx = SWITCH CONTROL Cx = CONTACTOR CONTROL
TOP	SURFACE	150A MAIN BREAKER	BUS MATERIAL	COPPER		L-N	120		EX = EXISTING LOAD TO REMAIN NL = NEW LOAD ON EXISTING
CKT NO.	BREAKER (REMARKS)	LOAD DESCRIPTION	LOAD TYPE	LOAD VA	PHASING L1 L2 L3	LOAD VA	LOAD TYPE	LOAD DESCRIPTION	BREAKER (REMARKS)	CKT NO.
1	20/1	SEC. CLARIFIER SCUMP PUMP CONTROLS		600	■	600		PRI. CLARIFIER SCUMP PUMP CONTROLS	20/1	2
3	20/1	STRIP HEATERS		1,500	■	720		EAST YARD POLE RECEPTACLES	20/1	4
5	20/1	REUSE RELAY CONTROL		600	■	1,080		AERATOR POLE RECEPTACLES	20/1	6
7	20/1	CAMERAS		1,500	■	180		LIQUID LEVEL CONTROLER	20/1	8
9	20/1	WEST YARD POLE RECEPTACLES		720	■	400		HEAD LIGHTS	20/1	10
11	20/1	PARSHALL FLUME		40	■	600		RAW SLUDGE MAG METER	20/1	12
13	20/1	PANEL (LP2) CONTACTOR'S COIL		12	■	5,500		PANEL (LP2)	60/3	14
15	20/1	SPARE		0	■	4,400				16
17	20/1	SPARE		0	■	2,500				18
19	20/1	SPARE		0	■	0		SPARE	20/1	20
21	20/1	SPARE		0	■	0		SPARE	20/1	22
23	20/1	SPARE		0	■	0		SPARE	20/1	24
25	20/1	SPARE		0	■	0		SPARE	20/1	26
27	20/1	SPARE		0	■	0		SPARE	20/1	28
29	20/1	SPARE		0	■	0		SPARE	20/1	30
						8,392		TOTAL CONNECTED LOAD IN KVA - PHASE A		
						7,740		TOTAL CONNECTED LOAD IN KVA - PHASE B		
						4,820		TOTAL CONNECTED LOAD IN KVA - PHASE C		
						20,952		TOTAL CONNECTED LOAD IN KVA - ALL PHASES		
		NEC DEMAND LOAD IN AMPS		72.70		58.16		TOTAL CONNECTED LOAD IN AMPS - ALL PHASES		

PANEL NAME		PANEL LOCATION	PANEL SCHEDULE						CIRCUIT BREAKER REMARKS
(LP1)		OPERATIONS BUILDING	BUS RATING	100A		VOLTAGES			S = SHUNT TRIP H = HACR G = GFCI L = C/B LOCK TC = TIME CLK
FEED	MOUNTING	MAIN C/B OR MAIN LUG RATING & TYPE	AIC RATING	10,000A		L-L	480		NB = NEW C/B Sx = SWITCH CONTROL Cx = CONTACTOR CONTROL
TOP	SURFACE	MAIN LUGS	BUS MATERIAL	COPPER		N	NONE		EX = EXISTING LOAD TO REMAIN NL = NEW LOAD ON EXISTING
CKT NO.	BREAKER (REMARKS)	LOAD DESCRIPTION	LOAD TYPE	LOAD VA	PHASING L1 L2 L3	LOAD VA	LOAD TYPE	LOAD DESCRIPTION	BREAKER (REMARKS)	CKT NO.
1	20/2	STREET LIGHTS		1,200	■ ■	1,000		STREET LIGHTS	20/2	2
3				1,200	■ ■	1,000				4
5	20/2	SPARE		0	■ ■	0		SPARE	20/2	6
7				0	■ ■	0				8
9	20/2	SPARE		0	■ ■	0		SPARE	20/2	10
11				0	■ ■	0				12
13	20/2	SPARE		0	■ ■	0		SPARE	20/2	14
15				0	■ ■	0				16
17		SPACE		0	■ ■	0		SPACE	20/1	18
						2,200		TOTAL CONNECTED LOAD IN KVA - PHASE A		
						2,200		TOTAL CONNECTED LOAD IN KVA - PHASE B		
						0		TOTAL CONNECTED LOAD IN KVA - PHASE C		
						4,400		TOTAL CONNECTED LOAD IN KVA - ALL PHASES		
		NEC DEMAND LOAD IN AMPS		6.62		5.29		TOTAL CONNECTED LOAD IN AMPS - ALL PHASES		

PANEL NAME		PANEL LOCATION	PANEL SCHEDULE						CIRCUIT BREAKER REMARKS
AC SUB PANEL		OPERATIONS BUILDING	BUS RATING	60A		VOLTAGES			S = SHUNT TRIP H = HACR G = GFCI L = C/B LOCK TC = TIME CLK
FEED	MOUNTING	MAIN C/B OR MAIN LUG RATING & TYPE	AIC RATING	18,000A		L-L	240		NB = NEW C/B Sx = SWITCH CONTROL Cx = CONTACTOR CONTROL
TOP	SURFACE	60A MAIN LUGS	BUS MATERIAL	COPPER		L-N	120		EX = EXISTING LOAD TO REMAIN NL = NEW LOAD ON EXISTING
CKT NO.	BREAKER (REMARKS)	LOAD DESCRIPTION	LOAD TYPE	LOAD VA	PHASING L1 L2	LOAD VA	LOAD TYPE	LOAD DESCRIPTION	BREAKER (REMARKS)	CKT NO.
1	20/2	SPARE		0	■	0		SPARE	30/2	2
3				0	■	0				4
5	20/2	SPARE		0	■	1,440		15A TWIST LOCK RECEPTACLE	20/1	6
7				0	■	1,920		20A TWIST LOCK RECEPTACLE	20/1	8
9	20/1	CISCO SWITCH		1,100	■	1,100		CISCO SWITCH	20/2	10
11	20/1			1,100	■	1,100				12
13		SPACE		0	■	0		SPACE		14
15	20/1	UPS		1,800	■	0		SPACE		16
						3,640		TOTAL CONNECTED LOAD IN KVA - PHASE A		
						5,920		TOTAL CONNECTED LOAD IN KVA - PHASE B		
						9,560		TOTAL CONNECTED LOAD IN KVA - ALL PHASES		
		NEC DEMAND LOAD IN AMPS		49.79		39.83		TOTAL CONNECTED LOAD IN AMPS - ALL PHASES		

PANEL NAME		PANEL LOCATION	PANEL SCHEDULE						CIRCUIT BREAKER REMARKS
(LP2)		OPERATIONS BUILDING	BUS RATING	100		VOLTAGES			S = SHUNT TRIP H = HACR G = GFCI L = C/B LOCK TC = TIME CLK
FEED	MOUNTING	MAIN C/B OR MAIN LUG RATING & TYPE	AIC RATING	10,000A		L-L	208		NB = NEW C/B Sx = SWITCH CONTROL Cx = CONTACTOR CONTROL
TOP	SURFACE	MAIN LUGS	BUS MATERIAL	COPPER		L-N	120		EX = EXISTING LOAD TO REMAIN NL = NEW LOAD ON EXISTING
CKT NO.	BREAKER (REMARKS)	LOAD DESCRIPTION	LOAD TYPE	LOAD VA	PHASING L1 L2 L3	LOAD VA	LOAD TYPE	LOAD DESCRIPTION	BREAKER (REMARKS)	CKT NO.
1	20/1	LIGHTS BASIN NORTH-N		1,500	■	1,000		LIGHTS PRIMARY CLARIFIER #2	20/1	2
3	20/1	LIGHTS BASIN NORTH-S		1,500	■	1,000		LIGHTS PRIMARY CLARIFIER #3	20/1	4
5	20/1	PSA YARD LIGHTS		1,000	■	1,500		SOUTH AERATOR LIGHTS (NORTH-LEFT)	20/1	6
7	20/1	SOUTH AERATOR LIGHTS (NORTH-RIGHT)		1,500	■	1,500		SOUTH AERATOR LIGHTS (SOUTH-LEFT)	20/1	8
9	20/1	SOUTH AERATOR LIGHTS (SOUTH-RIGHT)		1,500	■	400		CLARIFIER 1 STAIR LIGHTS	20/1	10
11	20/1	SPARE		0	■	0		SPARE	20/1	12
13	20/1	SPARE		0	■	0		SPARE	20/1	14
15	20/1	SPARE		0	■	0		SPARE	20/1	16
17	20/1	SPARE		0	■	0		SPARE	20/1	18
19	20/1	SPARE		0	■	0		SPARE	20/1	20
21	20/1	SPARE		0	■	0		SPARE	20/1	22
23	20/1	SPARE		0	■	0		SPARE	20/1	24
25	20/1	SPARE		0	■	0		SPARE	20/1	26
27	20/1	SPARE		0	■	0		SPARE	20/1	28
29	20/1	SPARE		0	■	0		SPARE	20/1	30
						5,500		TOTAL CONNECTED LOAD IN KVA - PHASE A		
						4,400		TOTAL CONNECTED LOAD IN KVA - PHASE B		
						2,500		TOTAL CONNECTED LOAD IN KVA - PHASE C		
						12,400		TOTAL CONNECTED LOAD IN KVA - ALL PHASES		
		NEC DEMAND LOAD IN AMPS		43.02		34.42		TOTAL CONNECTED LOAD IN AMPS - ALL PHASES		

NO.	DATE	DSGN
		A QUINONES

REVISION	BY	APVD
	A QUINONES	

DR C HAMER CHK P KESKAR APVD

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ELECTRICAL

PANEL SCHEDULES

VERIFY SCALE

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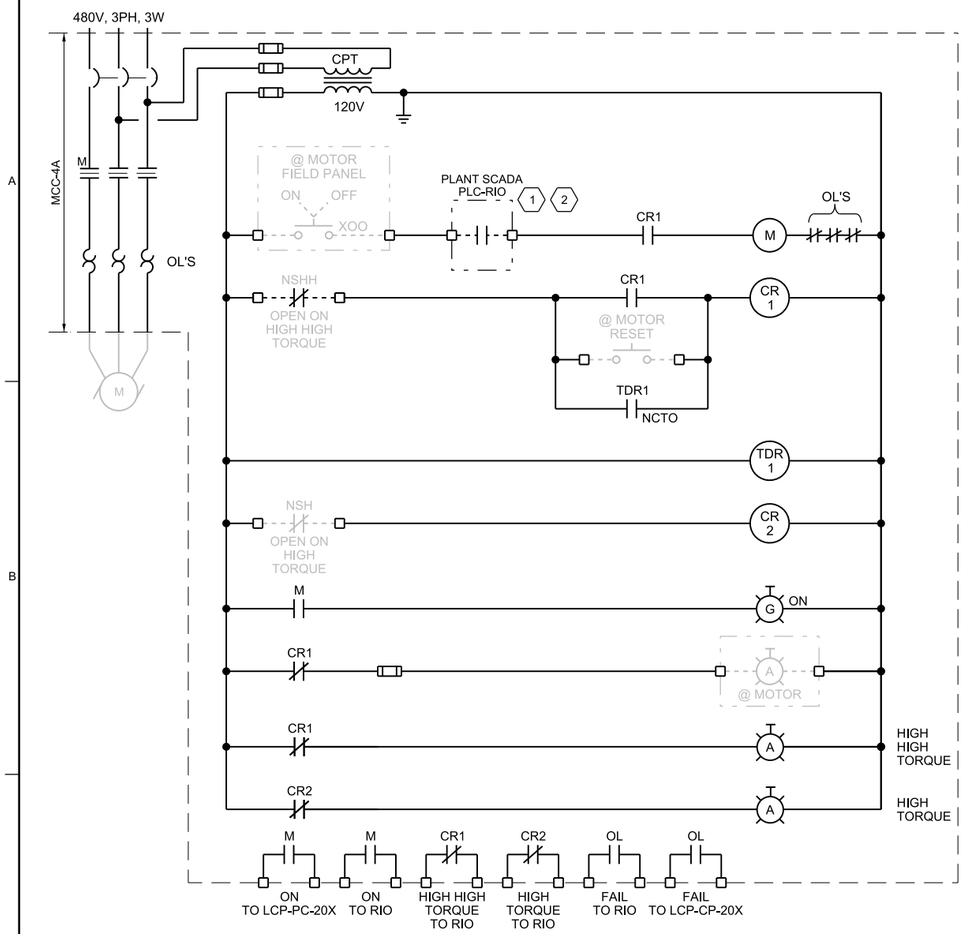
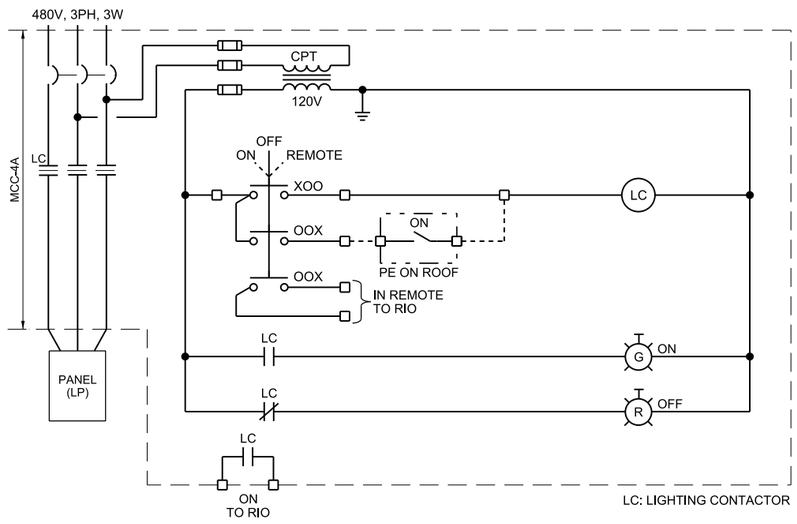
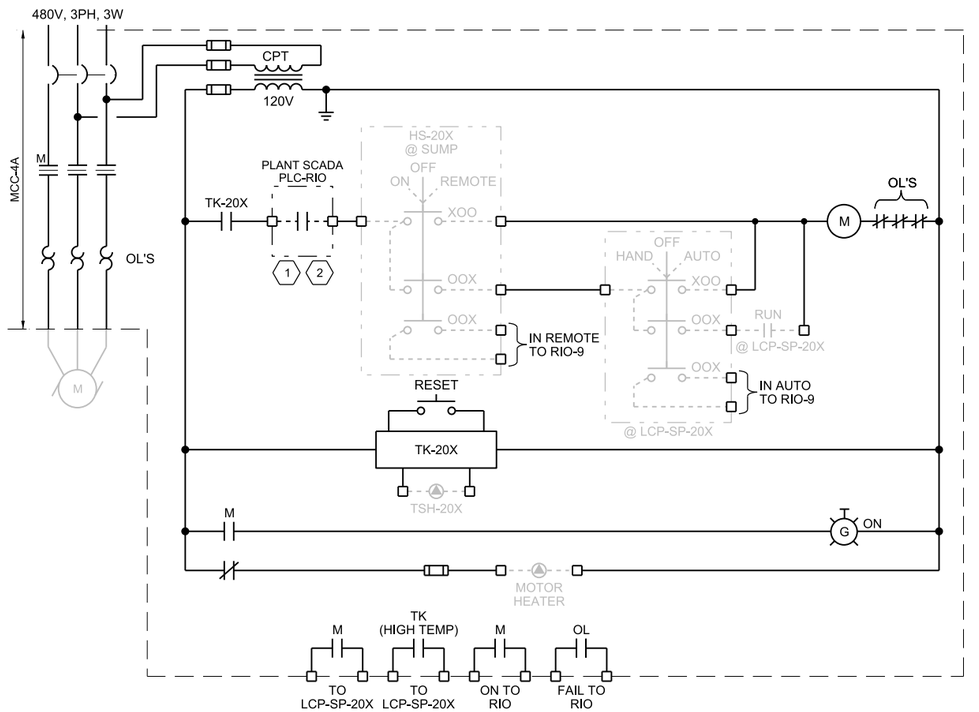


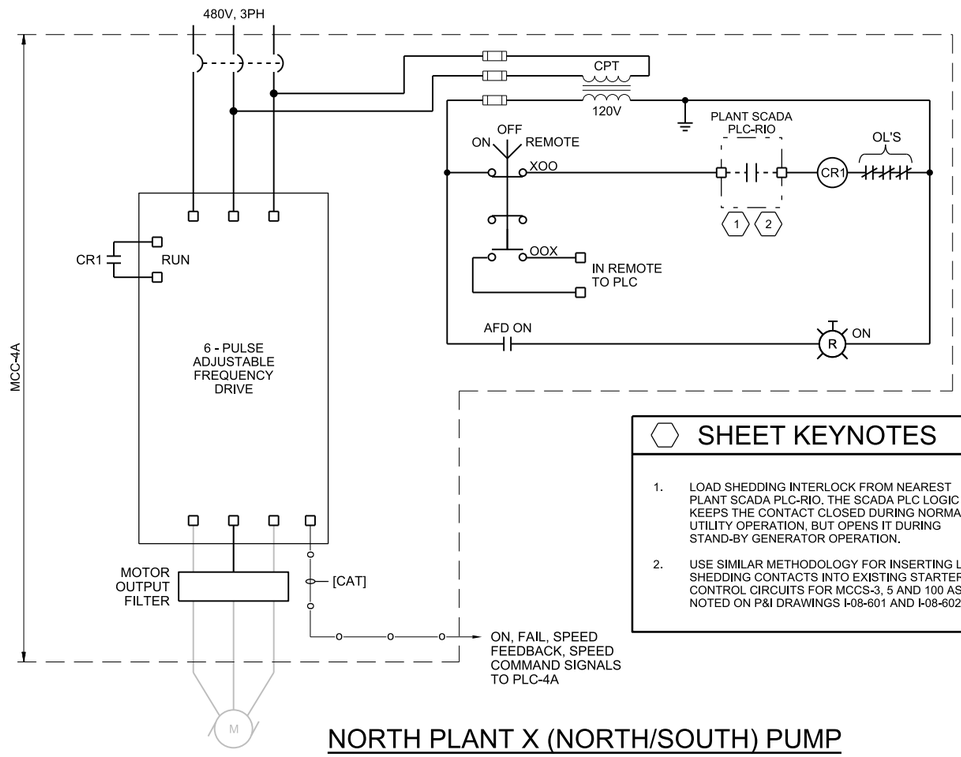
CLARIFIER - X, X = 2,3



SITE LIGHTING PANEL (LP) OP. BLDG.



PRIMARY CLARIFIER X SCUM PUMP - SP-20X, X=2,3



NORTH PLANT X (NORTH/SOUTH) PUMP

X = 2, 3

SHEET KEYNOTES

1. LOAD SHEDDING INTERLOCK FROM NEAREST PLANT SCADA PLC-RIO. THE SCADA PLC LOGIC KEEPS THE CONTACT CLOSED DURING NORMAL UTILITY OPERATION, BUT OPENS IT DURING STAND-BY GENERATOR OPERATION.
2. USE SIMILAR METHODOLOGY FOR INSERTING LOAD SHEDDING CONTACTS INTO EXISTING STARTER CONTROL CIRCUITS FOR MCCS-3, 5 AND 100 AS NOTED ON P&I DRAWINGS I-08-601 AND I-08-602.

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		A QUINONES	C HAMER	P KESKAR	APVD	A QUINONES	

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MOTOR CONTROL DIAGRAMS

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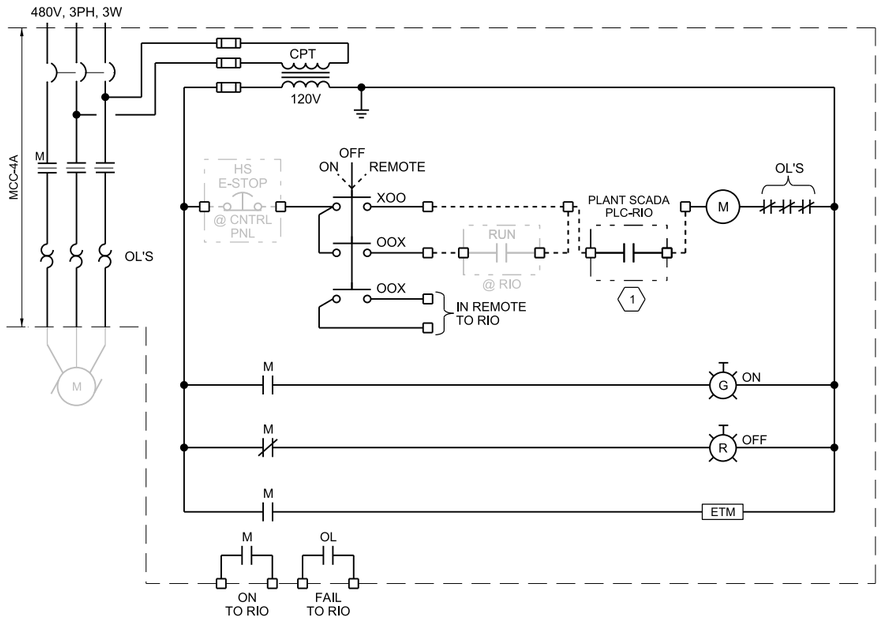
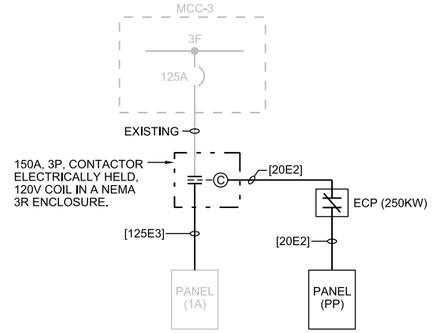
SHEET KEYNOTES

1. LOAD SHEDDING INTERLOCK FOR NON-PRIORITY MOTOR STARTER FROM NEAREST PLC SCADA PLC-RIO. THE SCADA PLC LOGIC KEEPS THE CONTACT CLOSED DURING NORMAL UTILITY OPERATION, BUT OPENS IT DURING STAND-BY GENERATOR OPERATION.

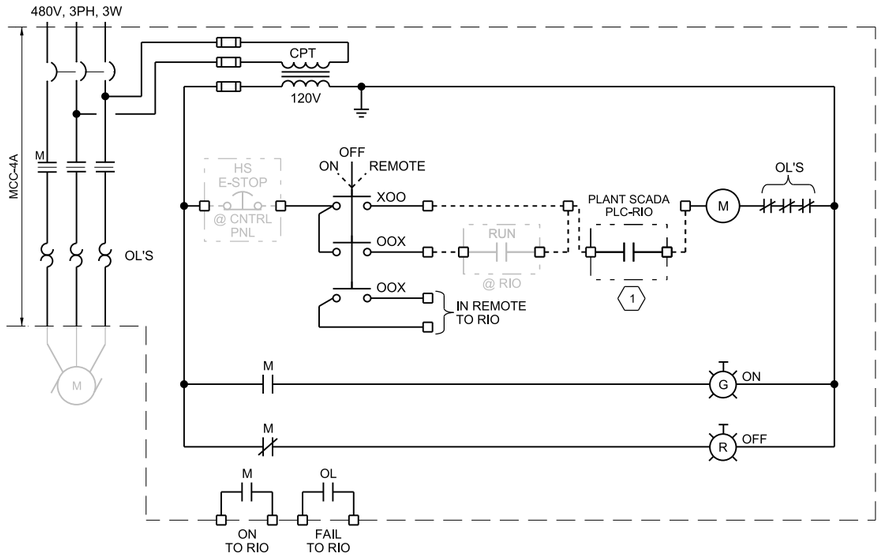


WASTE ACTIVATED PUMP - P-X

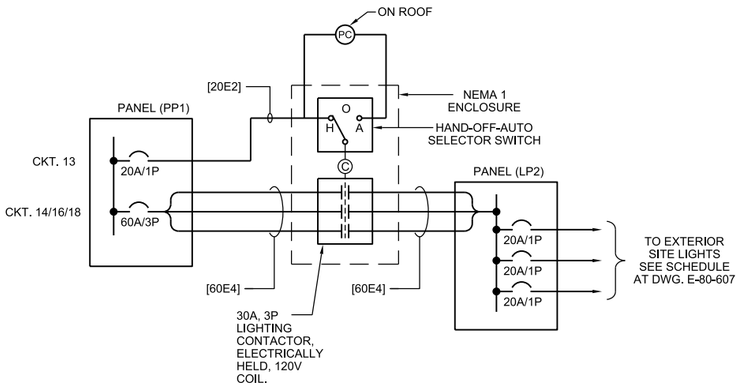
X = 4, 5



PARTIAL WIRING DIAGRAM



AIR COMPRESSOR NO.1



PARTIAL WIRING DIAGRAM

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MOTOR CONTROL DIAGRAMS

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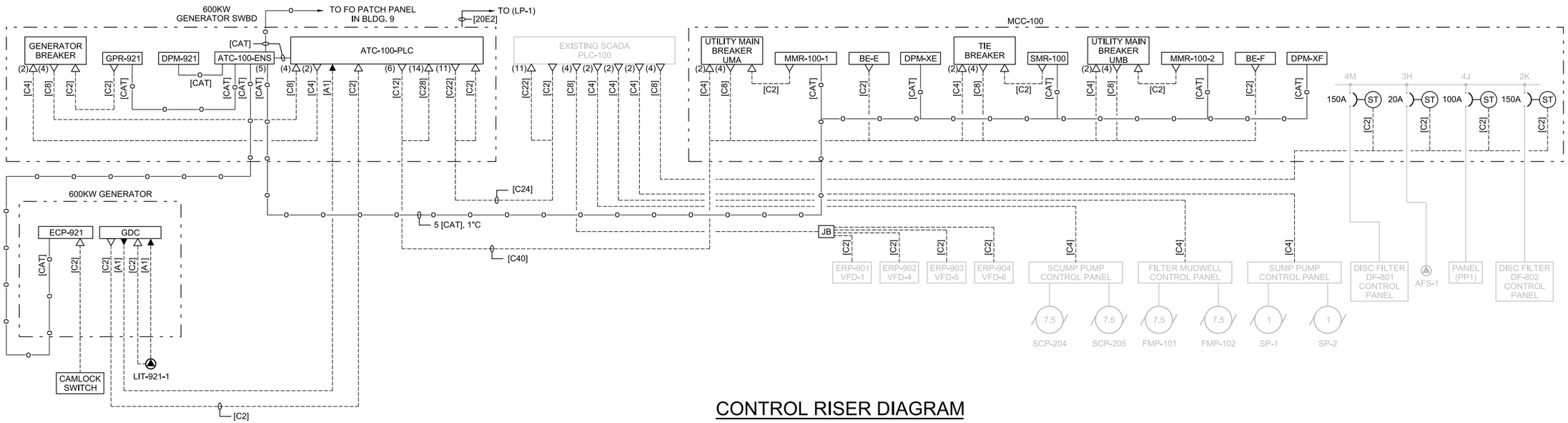
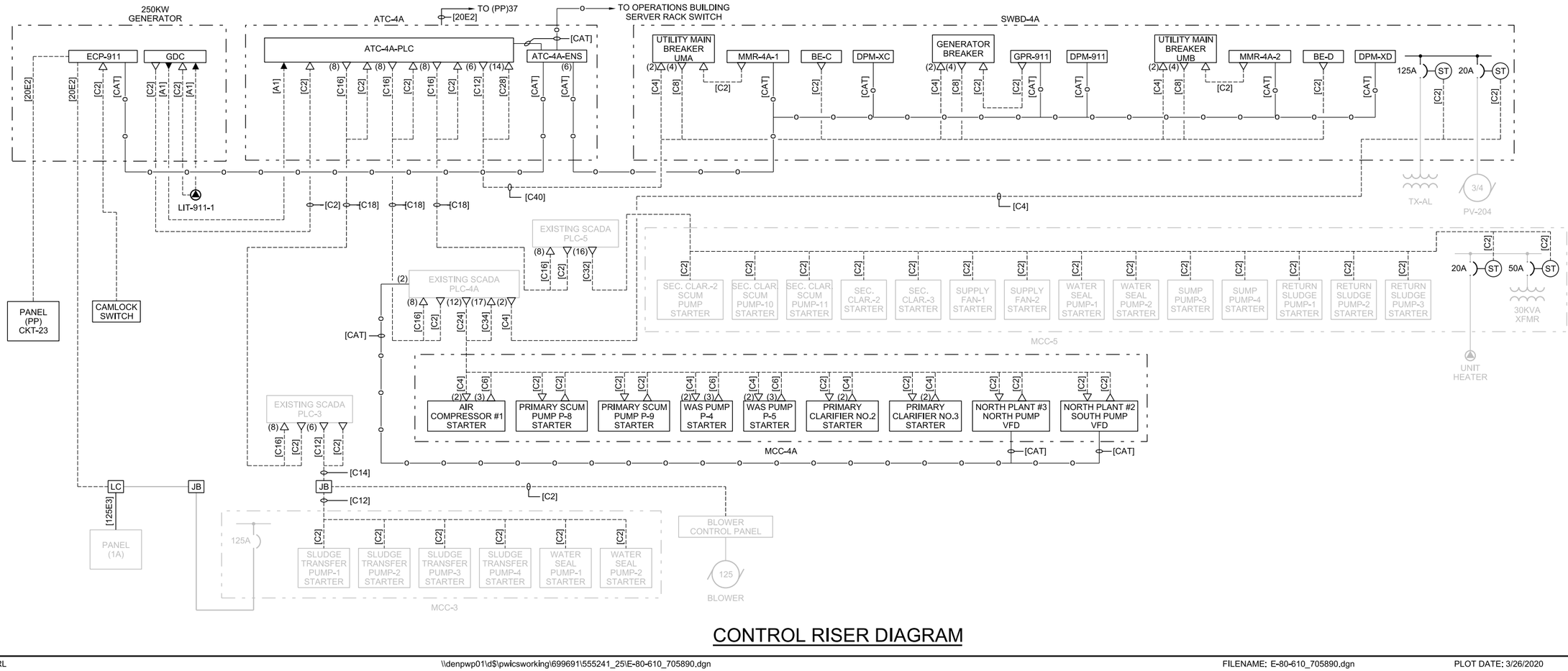


CONTROL RISER DIAGRAM



CONTROL RISER DIAGRAM

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MISCELLANEOUS CONTROL RISER DIAGRAMS

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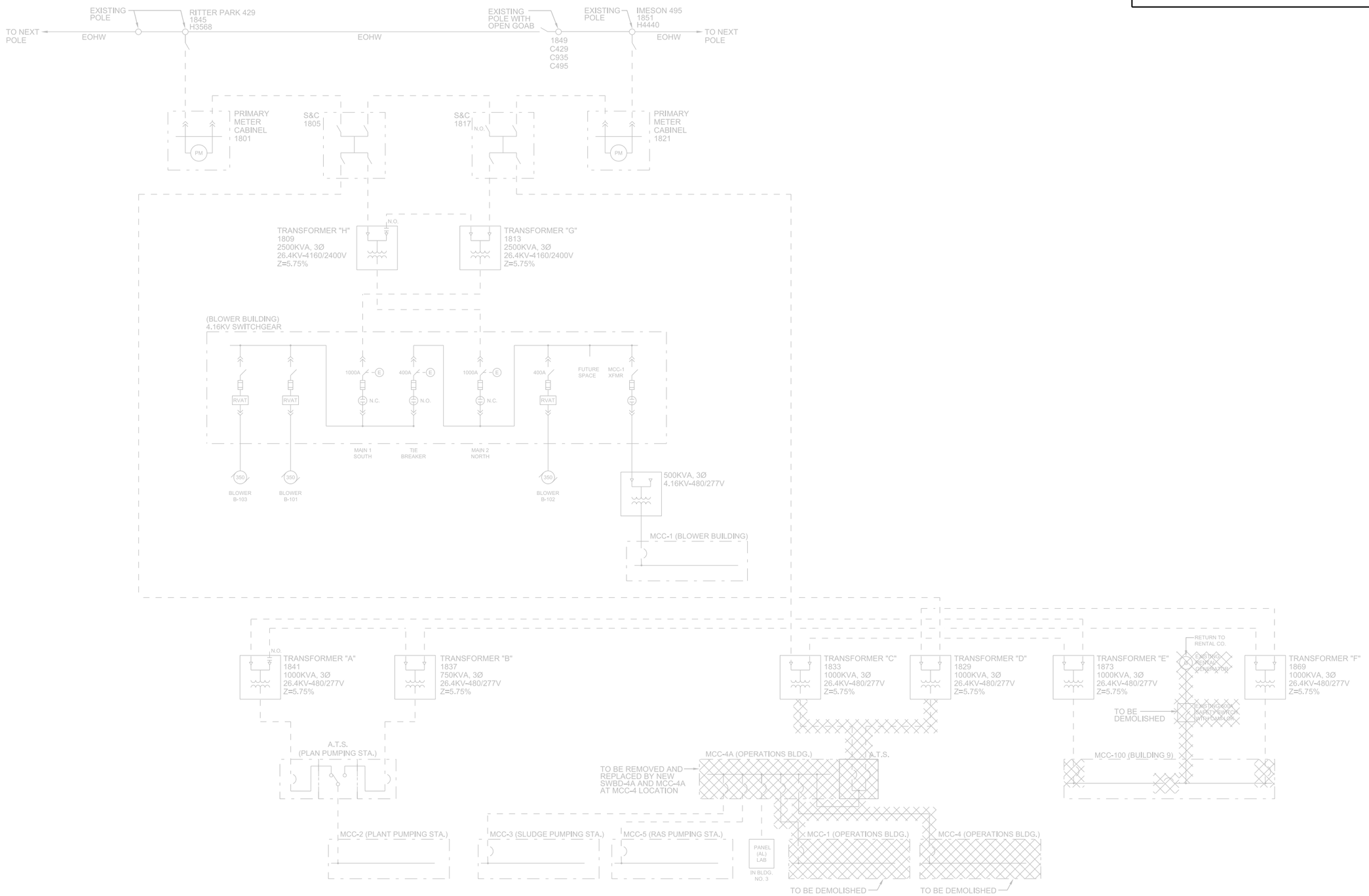
GENERAL SHEET NOTES

1. THIS DRAWING IS FOR REFERENCE ONLY.



SIMPLIFIED OVERALL SINGLE LINE DIAGRAM

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ch2m

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SIMPLIFIED OVERALL SINGLE LINE DIAGRAM

VERIFY SCALE

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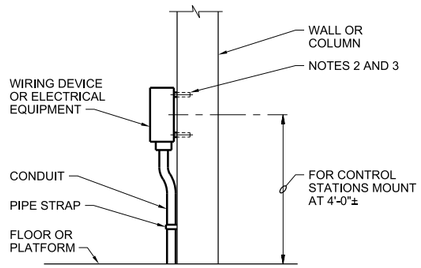


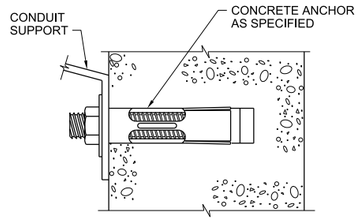
NOTES:

1. ALL MOUNTING HARDWARE SHALL BE STAINLESS STEEL. USE WASHER AND SPLIT-LOCK WASHERS UNDER ALL NUTS.
2. ON CONCRETE WALLS USE STAINLESS STEEL CONCRETE ANCHORS. MOUNT ENCLOSURE ON 1/2" SPACERS OF 1/2" SCHEDULE 80 PVC CONDUIT.
3. BOXES 6 INCHES SQUARE AND LESS SHALL BE SUPPORTED BY TWO ANCHORS. LARGER BOXES SHALL BE SUPPORTED BY AT LEAST FOUR.

DEVICE MOUNTING, WALL OR COLUMN

NTS

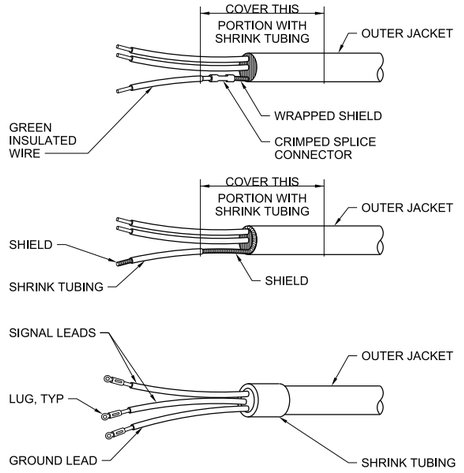
2605-002



CONCRETE ANCHOR INSTALLATION

NTS

2605-010



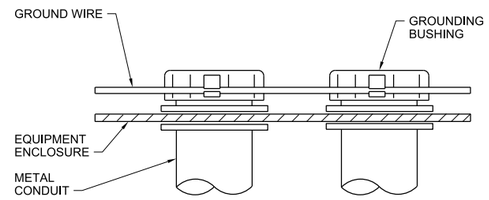
NOTES:

1. ALL SHIELDED INSTRUMENTATION CABLE SHALL BE TERMINATED IN ACCORDANCE WITH THIS DETAIL WHERE GROUNDING IS REQUIRED.

TERMINATION OF SHIELDED INSTRUMENTATION CABLE

NTS

2605-100b



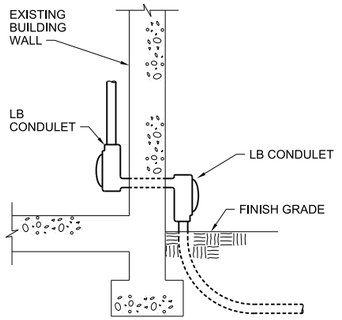
NOTES:

1. THE ENDS OF ALL CONDUITS REQUIRED TO BE GROUNDED BY THE SPECIFICATIONS SHALL BE GROUNDED IN ACCORDANCE WITH THIS DETAIL.

CONDUIT GROUNDING

NTS

2605-203



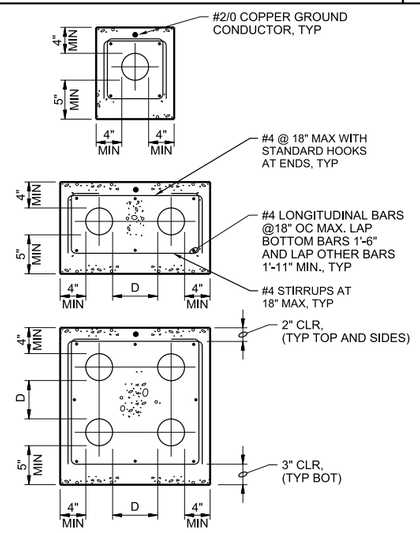
NOTES:

1. INSTALL CONDUITS THROUGH EXISTING WALLS IN ACCORDANCE WITH THIS DETAIL IF NOT OTHERWISE INDICATED.
2. DRILL HOLE USING METHODS THAT LEAVE A SMOOTH OPENING. SEAL OPENING AROUND CONDUIT, INSIDE, AND OUTSIDE, WITH ONE PART POLYURETHANE IMMERSIBLE SEALANT.

CONDUIT ENTRANCE

NTS

2605-304



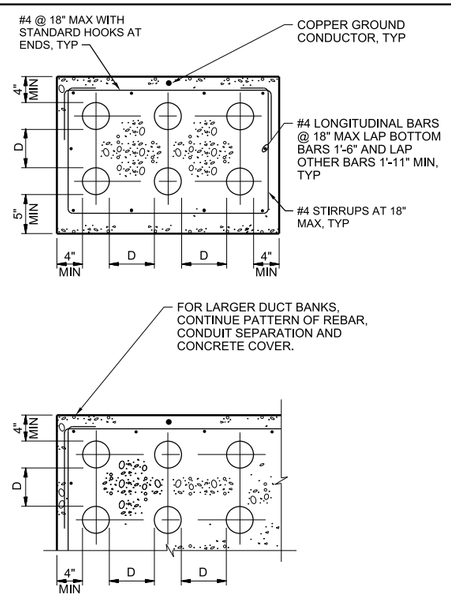
NOTES:

1. PROVIDE STEEL REINFORCEMENT FOR ALL DUCTBANKS UNDER DRIVEWAYS AND PAVED AREAS, AND WHERE INDICATED.
2. PROVIDE COMPACTED GRAVEL BEDDING UNDER ALL CONCRETE ENCASED DUCT RUNS.
3. IF DUCTBANK BURIAL DEPTH IS REQUIRED TO BE LESS THEN 12" BELOW GRADE THEN PROVIDE ADDITIONAL CONCRETE AS BACK FILL TO WITHIN 3" BELOW THE ASPHALT TOPCOAT.
4. DUCTBANKS SHOWN ARE INTENDED TO PROTECT ENCASED CONDUITS FROM IMPACT FROM AN EXCAVATOR AND ARE NOT INTENDED TO POSSESS STRUCTURAL CAPACITY AS DETAILED.

DUCT BANK - STEEL REINFORCED

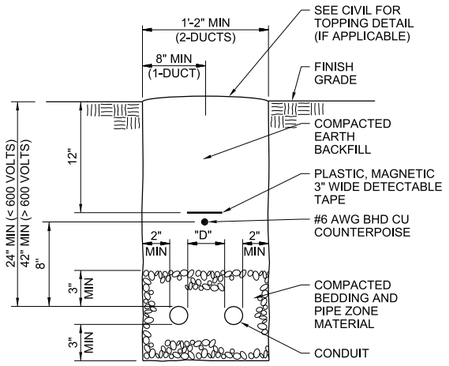
NTS

2605-400a



D = 3" FOR 2" AND LARGER CONDUITS

D = 2" FOR 1 1/2" AND SMALLER CONDUITS



D = 3" MIN FOR 2" AND LARGER CONDUIT

D = 2" MIN FOR 1 1/2" AND SMALLER CONDUIT

TRENCH AND CONDUIT PLACEMENT

NTS

2605-423c

NO.	DATE	DSGN	REVISION	CHK	BY
			C HAMER	P KESKAR	A QUINONES
			DR	APVD	APVD
	A QUINONES				

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GAINESVILLE, FLORIDA 32601

CEDAR BAY - WATER SYSTEM RESILIENCY PLA

JEA
JACKSONVILLE, FLORIDA

ELECTRICAL

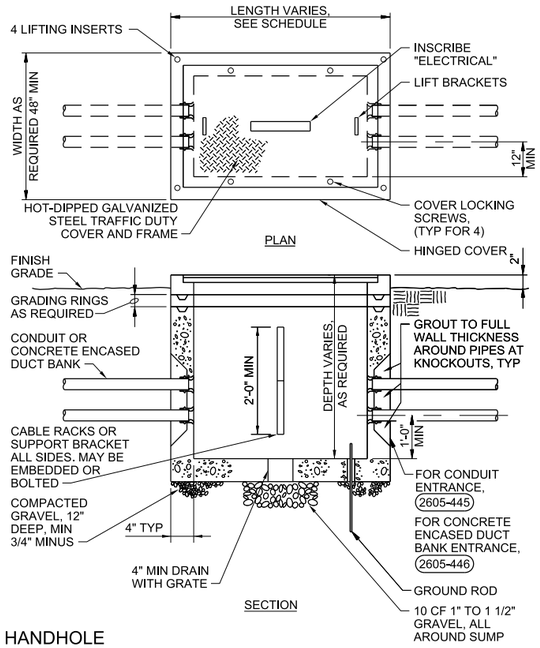
STANDARD DETAILS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

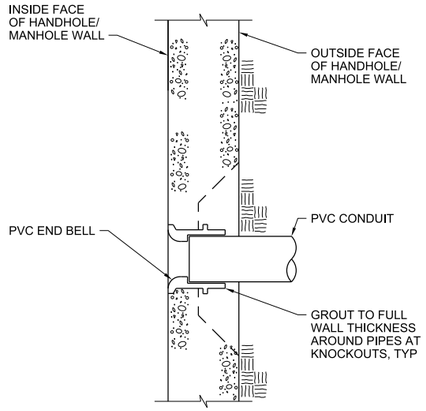
DATE	MARCH 2020
PROJ	705890
DWG	E-99-501
SHEET	44 of 45

FINAL DOCUMENT



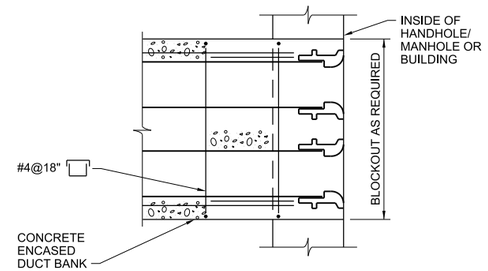
HANDHOLE
NTS

2605-444



CONDUIT HANDHOLE/MANHOLE ENTRANCE
NTS

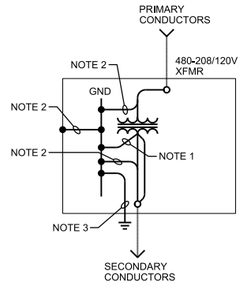
2605-445



CONDUIT HANDHOLE/MANHOLE ENTRANCE
NTS

NOTES:
1. EXTEND REBAR A MINIMUM OF 2' BEYOND THE LIMIT OF EXCAVATION.
2. DOWEL REBAR 2" INTO WALL OF PRECAST CONCRETE.

2605-446



480-208/120VAC TRANSFORMER GROUNDING DETAIL
NTS

NOTES:
1. BONDING JUMPER, NEC 250.102(C)(1).
2. EQUIPMENT GROUND, NEC 250.122.
3. GROUNDING ELECTRODE CONDUCTOR PER NEC 250.66.

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NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
		A QUINONES	C HAMER	P KESKAR		A QUINONES	

REVISION

PLA

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GAINESVILLE, FLORIDA 32601

ch2m

CEDAR BAY - WATER SYSTEM RESILIENCY

JEA
JACKSONVILLE, FLORIDA

ELECTRICAL
STANDARD DETAILS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2020
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DWG	E-99-502
SHEET	45 of 45

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