

**MECHANICAL PLAN - SUPPLY BLDG**  
 1/8" = 1'-0"

**MECHANICAL GENERAL NOTES:**

1. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF EQUIPMENT, DUCTS, AND GRILLES, ETC. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS THAT COMPLETE MECHANICAL SYSTEMS BE FURNISHED, INSTALLED, TESTED AND READY FOR OPERATION WHETHER OR NOT EVERY ITEM OF EQUIPMENT, ACCESSORY, DEVICE, ETC. IS SHOWN. RESISTANCE SHALL BE MADE TO THE FULL DRAWING PACKAGE INCLUDING ARCHITECTURAL, STRUCTURAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR COORDINATION AND IDENTIFICATION OF CONFLICTS. THE MECHANICAL SUBCONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICTS WITH OTHER TRADES, OR FOR PROPER EXECUTION OF THE WORK. FIELD VERIFY ALL DIMENSIONS BEFORE FABRICATING DUCTWORK.
2. DUCT DIMENSIONS INDICATED ON DRAWINGS ARE CLEAN INSIDE AIR STREAM DIMENSIONS.
3. NEW AC EQUIPMENT SHALL BE CLEANED AFTER THE FINISHING OF DRYWALL AND PRIOR TO THE RELEASE OF BUILDING TO OWNER. MECHANICAL CONTRACTOR TO PROVIDE ALL DOCUMENTATION WITH DATE AND TIME OF UNIT CLEANING AND CONSTRUCTION FILTER REPLACED WITH NEW.
4. PROVIDE YOUNG'S REGULATORS FOR BALANCING AIR DEVICES WHERE BALANCING DAMPERS ARE MADE INACCESSIBLE BY SHEETROCK CEILINGS.
5. REFLECTED CEILING PLANS ARE FOR DESIGN INTENT. ALIGNMENT OF FIXTURES, SPRINKLER HEADS, DIFFUSERS, AND OTHER DEVICES TO BE SYMMETRICAL IN THE ROOMS, ALIGNED WITH EACH OTHER AND AS SHOWN. CEILING HEIGHTS ARE SCHEDULED IN ROOM FINISH SCHEDULE. ABOVE CEILING SPACE IS LIMITED. THEREFORE COORDINATION OF ALL SYSTEMS WITH NEW STRUCTURES IS CRITICAL. COORDINATION SHOP DRAWINGS FOR REFLECTED CEILING SHALL BE SUBMITTED SHOWING LOCATIONS OF ALL FIXTURES, SPRINKLER HEADS, DIFFUSERS, AND OTHER DEVICES FOR REVIEW BY THE ARCHITECT PRIOR TO INSTALLATION OF ANY SYSTEMS.
6. HYDRONIC SYSTEM SHALL BE FLUSHED PRIOR TO OPERATION OF ALL NEW MECHANICAL EQUIPMENT. STRAINERS AT EACH HVAC UNIT SHALL BE CLEANED.
7. SIZE OF ROUND DUCT TO ALL FAN POWERED TERMINAL BOXES SHALL BE ONE SIZE LARGER THAN SCHEDULED WHERE THE LENGTH EXCEEDS 8'-0".
8. CONTRACTOR SHALL CONFIRM WALLS TO DECK AND FIELD VERIFY RETURN AIR PATH BACK TO AIR HANDLING UNIT. PROVIDE RETURN AIR OPENINGS OR BOOTHS AS REQUIRED AND SIZE AT MAXIMUM OF 800 FEET PER MINUTE AIR VELOCITY. WALLS TO DECK THAT ARE RATED SHALL BE PROVIDED RETURN AIR BOOTHS WITH FIRE DAMPERS AS REQUIRED.
9. CONTRACTOR SHALL COMPLY WITH ALL STATE, LOCAL, AND FEDERAL CODES AND AUTHORITIES HAVING JURISDICTION. CONTRACTOR SHALL COORDINATE WITH STRUCTURAL CONDITIONS AT THE SITE AND PROVIDE ALL CLEARANCES AS INDICATED.
10. EXPOSED DUCTWORK AND ASSOCIATED GRILLES AND ACCESSORIES SHALL BE PAINTED TO MATCH STRUCTURE. COORDINATE FINISH WITH ARCHITECT.
11. MECHANICAL CONTRACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR THE LOCATION OF ALL EQUIPMENT ON SHOP DRAWINGS AND DURING INSTALLATION TO ALLOW CLEARANCE TO REMOVE AND REPLACE FILTERS, AND ACCESS CONTROLS AND COIL AND DRAIN PAN LOCATIONS.

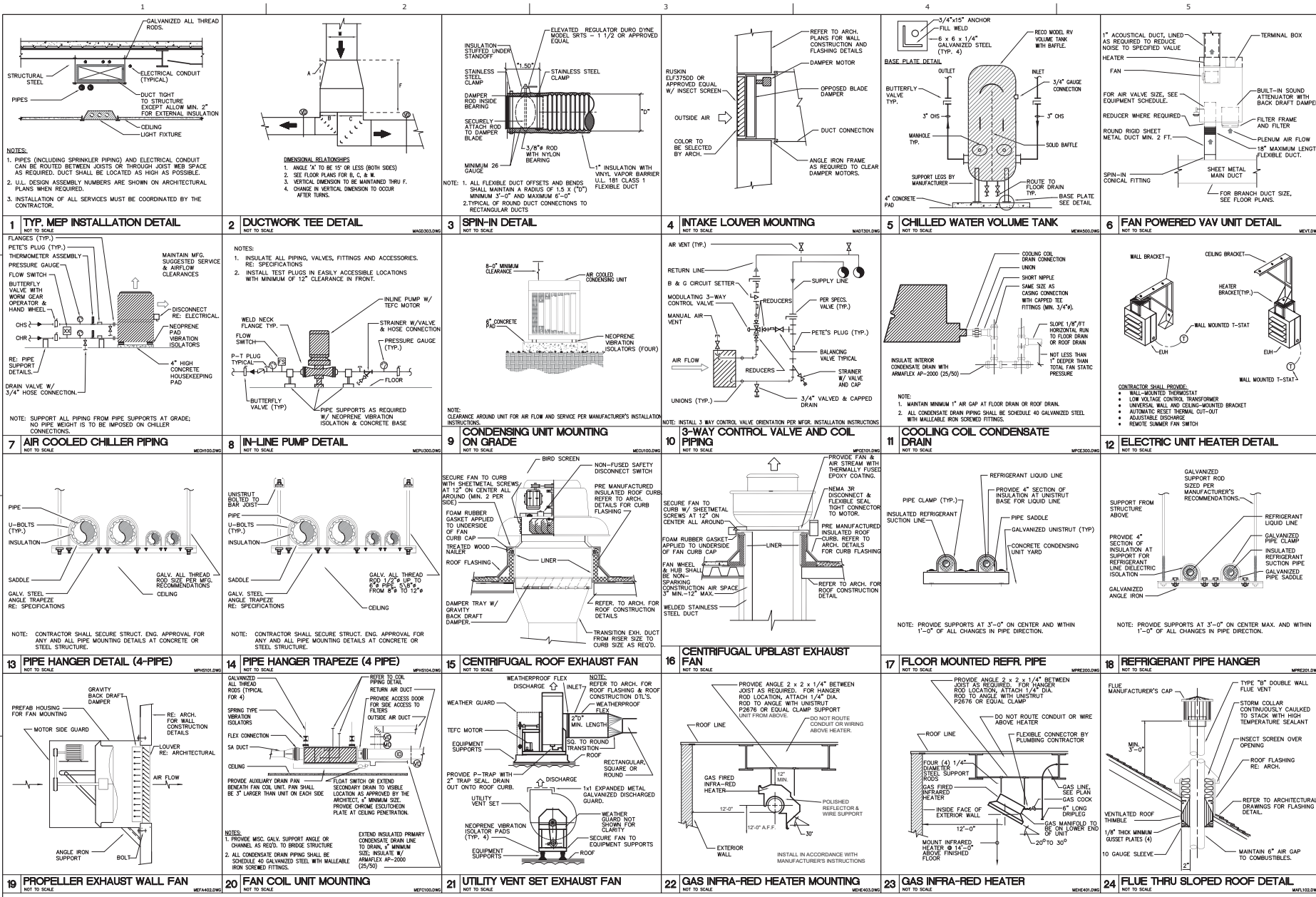
**MECHANICAL KEYED NOTES:**

11. PROVIDE MINI SPLIT CONDENSING UNIT AS SCHEDULED. ROUTE REFRIGERANT PIPING TO COORDINATING INDOOR UNIT.
12. PROVIDE FAN COIL UNIT AS SCHEDULED. UNIT TO BE SUSPENDED FROM CEILING.
13. PROVIDE RADIANT HEATER AS SCHEDULED.
14. PROVIDE EXHAUST FAN AS SCHEDULED. FAN SHALL BE MOUNTED ON A PREFABRICATED ROOF CURB. ROUTE DUCTWORK UP TO ROOF MOUNTED EXHAUST FAN.
15. PROVIDE DUCTLESS SPLIT SYSTEM AS SCHEDULED.
16. PROVIDE INTAKE AIR WALL LOUVER WITH FREE AREA AS SHOWN. COORDINATE FINAL SIZE AND LOCATION WITH ARCHITECT.
17. PROVIDE CONDENSING UNIT AS SCHEDULED. ROUTE REFRIGERANT PIPING TO COORDINATING INDOOR UNIT.
18. PROVIDE SIDEWALL EXHAUST FAN AS SCHEDULED.
19. PROVIDE THERMOSTAT FOR EXHAUST FAN MOUNT AT SAME ELEVATION AS LIGHT SWITCHES. THERMOSTAT SHALL ENERGIZE EXHAUST FAN WHEN TEMPERATURE REACHED ABOVE 80°F (ADJUSTABLE).
20. PROVIDE LOREN COOK GRAVITY HOOD 8'-0" OR EQUIVALENT. HOOD SHALL BE MOUNTED ON PREFABRICATED ROOF CURB.
21. DROP TO BENCH EQUIPMENT. SUPPORT FREE STANDING DROPS FROM FLOOR. COORDINATE EXACT LOCATION WITH OLIVERS PRIOR TO INSTALLATION. ROUTE SMOKE DUCTWORK DOWN TO POINT 4'-0" ABOVE FINISH FLOOR. USE FLEX DUCT FOR FINAL CONNECTION TO EQUIPMENT. HOSE TO BE SIMILAR TO MONOKIVENT SERIES 3000. PROVIDE CONNECTION TRANSITIONS AS REQUIRED. TYPICAL.
22. PROVIDE GAS-FIRED UNIT HEATER AS SCHEDULED. INSTALL PER MANUFACTURERS SPECIFICATIONS. ROUTE FLUE UP THROUGH ROOF. SIZE FLUE PER MANUFACTURERS RECOMMENDATIONS.
23. PROVIDE THERMOSTAT FOR GAS UNIT HEATER. MOUNT THERMOSTAT AT SAME ELEVATION AS LIGHT SWITCHES. THERMOSTAT SHALL ENERGIZE HEATER WHEN TEMPERATURE DROPS BELOW 60°F (ADJUSTABLE).
24. PROVIDE 8" DIAMETER MACROAIR FAN MODEL 550 PER ALTERNATE 3A.
25. PROVIDE 8" DIAMETER MACROAIR FAN MODEL 550 PER ALTERNATE 3B.
26. PROVIDE GAS-FIRED RADIANT UNIT HEATER AS SCHEDULED.
27. ROUTE 3/4" CONDENSATE DRAIN LINE MOP SINK COORDINATE WITH PLUMBING.
28. ROUTE 4" COMBUSTION AIR DUCT UP TO ROOF CAP. RE: DETAIL 24/M401.
29. ROUTE 4" FLUE DUCT UP THRU ROOF TO ROOF CAP. RE: DETAIL 24/M401.
30. PROVIDE RETURN AIR TRANSFER BOOT. SIZE AS SHOWN. RE: DETAIL 24/M402.

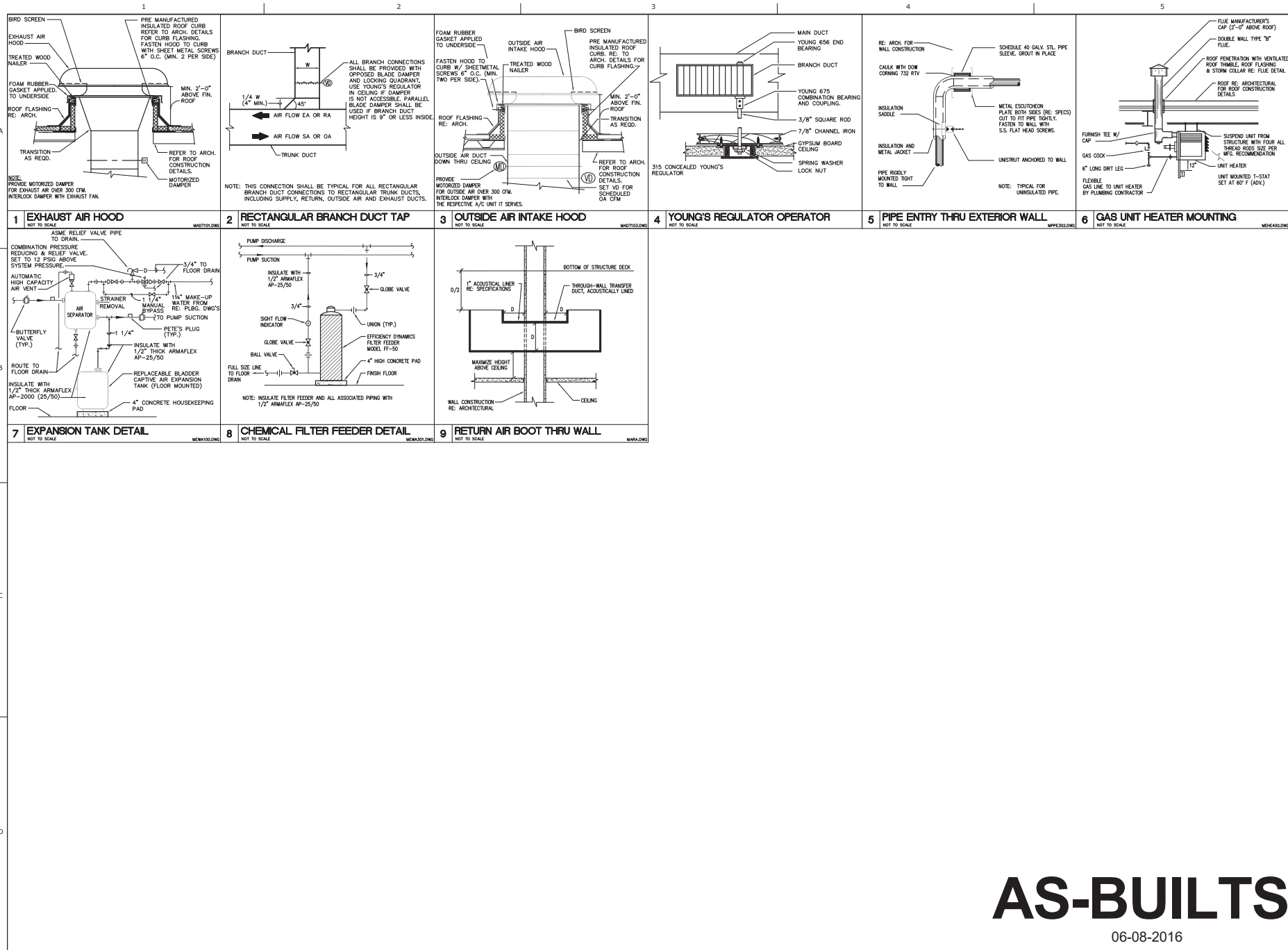


**AS-BUILTS**

06-08-2016



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**Marmon Mok**  
 ARCHITECTURE 210-223-9492/F 210-223-2282/F  
 700 N. St. Mary's Suite 1500 San Antonio, TX 78205

**#DBR**  
 Each Detail Approved For Use  
 2014-08-20 11:21 AM  
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**NSOC NEW SERVICE  
 CENTER PROJECT**  
 CAPITAL PORT DRIVE SAN ANTONIO, TX

San Antonio Water System

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 Date: 03/26/2015  
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 Revisions:  
 1 03/27/15 ADDENDUM 1  
 2 04/02/15 ADDENDUM 2  
 3 04/17/15 ADDENDUM 4  
 4 05/22/15 ASB No. 1  
 5 06/24/15 PR No. 1  
 6 06/24/15 PR No. 2 (GEN)  
 7 06/24/15 PR No. 3  
 8 06/26/15 FLAG HOLD  
 9 10/01/15 ASB No. 012  
 10 01/12/16 PR, TP HOUSE

SHEET TITLE  
**MECHANICAL  
 DETAILS**

SHEET No.

**M402**

**AS-BUILTS**  
 06-08-2016

### AIR HANDLING UNIT SCHEDULE (COOLING ONLY)

MARK	AHU-N1
SERVES	ADMIN BUILDING
SUPPLY AIR (CFM)	8,235
OUTSIDE AIR (CFM)	2,155
MIN. OUTSIDE AIR (CFM)	1,300
EXT. SP. (IN. W.G.)	2.5
FAN MOTOR HORSEPOWER	480/360
VOLTS/PHASE/HERTZ	480/3/60
MAX. FAN RPM	1919
FAN TYPE	DIRECT DRIVE PLENUM
VFD/STARTER BY CONTRACTOR	VFD
TOTAL COOLING (MBH)	412.4
SENSIBLE COOLING (MBH)	289.7
ENTERING AIR TEMP. DB/WB (F)	78.7 / 65.5
LEAVING AIR TEMP. DB/WB (F)	50.3 / 50.2
MAX. COIL FACE VEL. (FPM)	454
MAX. AIR PRESS. DROP (IN. W.G.)	0.81
WATER FLOW (GPM)	58.7
ENTERING WATER TEMP. (F)	42
MIN. ROWS/MAX. FNS PER IN	8/9
MAX. WATER PRESS. DROP (FT)	7
PIPING RUNOUT (IN)	2.5
MANUFACTURER	TRANE
MODEL	UC0421C
3-WAY/3-WAY CONTROL VALVES	3 WAY
WEIGHT (LBS.)	2,000
NOTES	1, 2, 3, 4, 5

- EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
- PROVIDE CHILLED WATER COIL WITH 3-WAY AUTOMATIC CONTROL VALVE. PROVIDED BY CONTRACTOR'S CONTRACTOR.
- PROVIDE FACTORY INSTALLED VFD.
- PROVIDE MIXING BOX WITH 2" MERV 13 FILTERS, CHILLED WATER COIL WITH STAINLESS STEEL CASING AND DRAIN/PAN AND DIRECT DRIVE PLENUM FANS AS SCHEDULED.
- PROVIDE WITH ECONOMIZER CONTROL.

### AIR COOLED CHILLER SCHEDULE

MARK	ACHH1
NOMINAL CAPACITY (TONS)	40
MIN. CAPACITY (TONS @ DESIGN)	34.6
WATER FLOW (GPM)	59.5
EVTLWT (DEG. F)	42.7/56
MAX. AMBIENT DESIGN (DEG. F)	105
MIN. AMBIENT DESIGN (DEG. F)	20
MAX. PRESSURE LOSS (FT)	7.8
FOLDING FACTOR (INlet Temp F / BTU)	0.0201
COMPRESSOR TYPE	SCROLL
QUANTITY OF COMPRESSORS	4
QUANTITY OF REFRIG. CIRCUITS	2
STAGES OF OPERATION (%)	4
MIN. STABLE OPERATION (TONS)	10
REFRIGERANT TYPE	410A
RATED EER (AT AIR)	10
RATED PLV (AT AIR)	13.8
RATED EER (AT DESIGN COND.)	8.4
QUANTITY OF CONDENSER FANS	4
SIZE OF CONDENSER MOTORS (KW)	1.2
63 dB	92
125 dB	86
250 dB	81
500 dB	83
1000 dB	85
2000 dB	84
4000 dB	77
8000 dB	67
A- WEIGHTED AVERAGE (Pressure)	88
VOLTS/PHASE/CYCLES	480/3/60
MIN. CKT AMPS (MCA)	84.8
MAX. OVRCRNT PROT (MOCP)	110
MFR	TRANE
MODEL	CG4M 40
MAX. DIMENSIONS LxWxH (INCHES)	114 x 88 x 85
WEIGHT (LBS.)	3700
NOTES	1, 2, 3, 4

- SOUND POWER DATA TO BE IN ACCORDANCE WITH ARI STANDARD 370.
- PROVIDE LOUVERED STEEL CONDENSER COIL GUARD (ENTIRE HEIGHT OF UNIT).
- PROVIDE FACTORY INSTALLED FLOW SWITCH.
- PROVIDE SOUND ATTENUATION TO MEET ABOVE SOUND CRITERIA.

### Fan Powered Terminal Unit Schedule

Tag	AHU	Room	Model	Size	CFM	Static Pressure	NC Levels	Fan	HP	APPA ESP	APPA kW	EAT	LAT	Vsh/Ph	Steps	MCA	MOP						
FRB-1-01	AHU-N1		DRIP	02	08	14x11	1000	360	1	0.3	37	21	800	0.31	0.25	960	5	64.4	91.4	480.5	8	8.4	15
FRB-1-02	AHU-N1		DRIP	02	08	14x11	1000	360	1	0.3	37	21	800	0.31	0.25	960	5	64.4	91.4	480.5	8	8.4	15
FRB-1-03	AHU-N1		DRIP	02	08	14x11	1000	360	1	0.3	37	21	800	0.31	0.25	960	5	64.4	91.4	480.5	8	8.4	15
FRB-1-04	AHU-N1		DRIP	02	08	14x11	1000	360	1	0.3	37	21	800	0.31	0.25	960	5	64.4	91.4	480.5	8	8.4	15
FRB-1-05	AHU-N1		DRIP	03	10	14x11	1150	345	1	0.3	37	21	800	0.31	0.25	920	7.5	64.4	90.8	480.3	8	14.0	15
FRB-1-06	AHU-N1		DRIP	03	12	14x11	1300	300	1	0.3	37	21	800	0.31	0.25	860	5	64.4	91.4	480.5	8	14.0	15
FRB-1-07	AHU-N1		DRIP	03	12	14x11	1300	300	1	0.3	38	22	800	0.31	0.25	1020	10.5	64.4	91.0	480.3	8	18.5	20
FRB-1-08	AHU-N1		DRIP	03	12	14x11	1300	300	1	0.3	38	22	800	0.31	0.25	1020	10.5	64.4	90.5	480.3	8	18.5	20
FRB-1-09	AHU-N1		DRIP	03	10	14x11	1100	324	1	0.3	38	20	840	0.31	0.25	864	7	64.4	90.7	480.5	8	13.3	15
FRB-1-10	AHU-N1		DRIP	03	12	14x11	1300	300	1	0.3	37	21	800	0.31	0.25	1020	10.5	64.4	90.9	480.3	8	21.3	20
FRB-1-11	AHU-N1		DRIP	02	08	14x11	1000	360	1	0.3	37	21	800	0.31	0.25	960	5	64.4	91.0	480.5	8	10.7	15
FRB-1-12	AHU-N1		DRIP	02	08	14x11	1000	360	1	0.3	37	21	800	0.31	0.25	960	5	64.4	91.0	480.5	8	10.7	15
FRB-1-13	AHU-N1		DRIP	02	08	14x11	1000	360	1	0.3	37	21	800	0.31	0.25	960	5	64.4	91.0	480.5	8	10.7	15
FRB-1-14	AHU-N1		DRIP	03	12	14x11	1300	300	1	0.3	37	21	755	0.31	0.25	1010	10	64.4	91.4	480.3	8	17.8	20

1. All data are based on tests conducted in accordance with ASHRAE 130-2008 and ASHRAE 90.1-2008.
2. All performance based on tests conducted in accordance with ASHRAE 130-2008 and ASHRAE 90.1-2008.
3. All NC levels determined using ASHRAE 90.1-2008 Appendix E.
4. All fan flow, pressure losses and heating performance values have been corrected for altitude.
5. Units of measure: dimensions (in.) air flow (CFM), water flow (GPM), air pressure (in. w.g.), water head losses (ft) and temperatures (degF).
6. In the "Steps" column, code "2" denotes a modulating speed heater.
7. Provide FPEs in integral door disconnect.
8. The minimum supply circuit ampacity (MCA) and maximum overcurrent protection (MOP) ratings were calculated in accordance with UL standards based on motor and electric coil full load current ratings.

### AIR DEVICE SCHEDULE

MARK	MANUFACTURER/MODEL	TYPE	NC	REMARKS
A	TITUS/TMS-AA	24"x24" SUPPLY	25	ALUMINUM CONSTRUCTION. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
B	TITUS/50F	24"x24" EGGRATE RETURN/EXHAUST	20	ALUMINUM CONSTRUCTION. EXHAUST GRILLES TO HAVE OGD'S.
C	TITUS/50F	12"x12" EGGRATE RETURN/EXHAUST	25	ALUMINUM CONSTRUCTION. EXHAUST GRILLES TO HAVE OGD'S.
D	TITUS/TMS-AA	12"x12" SUPPLY	25	ALUMINUM CONSTRUCTION. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
E	TITUS/350FL	RETURN/EXHAUST GRILLES	25	ALUMINUM CONSTRUCTION. EXHAUST GRILLES TO HAVE OGD'S.
F	TITUS/300FS	SIDEWALL SUPPLY	25	ALUMINUM CONSTRUCTION.

- PROVIDE STANDARD WHITE FINISH FOR ALL AIR DEVICES UNLESS NOTED OTHERWISE ON PLAN.
- PAN/ALL SURFACES VISIBLE THROUGH FACE OF RETURN AIR GRILLES FLAT BLACK. THIS SHALL INCLUDE PIPING, CONDUIT, DUCTWORK, AND STRUCTURAL MEMBERS.
- PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING. IN AREAS WITH HARD CEILING, PROVIDE FRAMES FOR SURFACE MOUNTING.
- UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE. FOR ROUND NECK DIFFUSERS:  
 6" DIA: 0-120 CFM  
 8" DIA: 125-250 CFM  
 10" DIA: 255-370 CFM  
 12" DIA: 375-600 CFM

### DUCTLESS SPLIT SYSTEM SCHEDULE

MARK	DS-N1-1	DS-N1-2
SERVES	ELECTRICAL ROOM	IT ROOM
TYPE	HIGH WALL	HIGH WALL
AIRFLOW (CFM)	350	350
TOTAL COOLING (MBH)	12	12
HEATING (KW)	NONE	NONE
VOLTS/PHASE/HERTZ	208 / 1 / 60	208 / 1 / 60
MCA	NOTE 5	NOTE 5
MOOP	NOTE 5	NOTE 5
MANUFACTURER	MITSUBISHI	MITSUBISHI
MODEL NUMBER	PKA-A12N44	PKA-A12N44
MARK	DSOU-N1-1	DSOU-N1-2
VOLTS/PHASE/HERTZ	208 / 1 / 60	208 / 1 / 60
LICA	13.0	13.0
MOOP	15.0	15.0
SEER	15.2	15.2
MANUFACTURER	MITSUBISHI	MITSUBISHI
MODEL NUMBER	PUY-A12N44	PUY-A12N44
NOTES	1, 2, 3, 4	1, 2, 3, 4

- PROVIDE REFRIGERANT PIPING IN ACCORDANCE WITH MFR'S RECOMMENDATIONS.
- PROVIDE FULL SIZE CONDENSATE DRAIN TO NEAREST RECEPTACLE.
- PROVIDE WALL MOUNTED THERMOSTAT.
- PROVIDE UNIT WITH CAPABILITY TO PROVIDE COOLING DOWN TO 14 DEG F.
- ROOM UNIT POWERED THROUGH OUTDOOR UNIT.

### FAN SCHEDULE

MARK	EF-1	EF-2
SERVES	MENS RESTROOMS / JANITORS	WOMENS RESTROOMS
CFM	730	315
E. S.P. (IN. W.G.)	0.375	0.375
TYPE	ROOF CENTRE	ROOF CENTRE
DIRECT/BELT DRIVE	DIRECT	DIRECT
FAN RPM	1,004	1,288
MOTOR HORSEPOWER	1/4	1/8
VOLTS/PHASE/HERTZ	120/1/60	120/1/60
WEIGHT	70	30
SONES	5	5.3
MANUFACTURER	COOK	COOK
MODEL NO	100C150	80C150H
NOTES	1, 3	1, 3

- FAN SHALL INCLUDE THE FOLLOWING: PREFABRICATED ROOF CURB, BRD SCREEN, SELF-ACTING BACKDRAFT DAMPER AND DISCONNECT SWITCH. FAN SHALL BE HIGH WIND RATED.
- ALL MECHANICAL EQUIPMENT SHALL BE SECURED TO STRUCTURE TO MEET TEXAS DEPARTMENT OF INSURANCE, WIND/TORNADO RESISTANT CONSTRUCTION GUIDE.

### GRAVITY HOOD SCHEDULE

MARK	GH-N1	GH-N2
SERVES	AHU-N1	BUILDING
CFM	6,485	5,150
MAX. P.D. (IN. W.G.)	0.05	0.05
INTAKE/RELIEF	INTAKE	RELIEF
THROAT SIZE (IN.)	42" x 48"	30" x 54"
MANUFACTURER	COOK	COOK
MODEL NO	GI	GR
NOTES	1, 2	1, 3

### ELECTRIC UNIT HEATER SCHEDULE

MARK	EH-N1-1
SERVES	SPRINKLER RISER ROOM
CFM	100
KW	2
VOLTS/PHASE/HERTZ	208/1/60
MANUFACTURER	MARKEL
MODEL NO.	F302T2DWB
NOTES	1

- SHALL INCLUDE BUILT-IN THERMOSTAT, DISCONNECT, FUSED CONTROL CIRCUIT, MANUAL RESET HIGH LIMIT, FAN ONLY SWITCH, AND WALL BRACKET.

### PUMP SCHEDULE

MARK	PCHP-N1
SERVES	PRIMARY CHILLED WATER
FLOW (GPM)	59
HEAD (FT H2O)	63
RPM	3450
HORSEPOWER	2
VOLTS/PHASE/HERTZ	480/3/60
PUMP TYPE	BL/BL
BEPELLER DIA. (IN.)	4.9
PUMP EFF. (%)	56.2%
STARTER/VFD BY CONTRACTOR	VFD
MANUFACTURER	BELL & GOSSETT
MODEL NO.	98-1-14AA
NOTES	1, 2, 3, 4, 5

- PROVIDE OSHA APPROVED COUPLING GUARD.
- PROVIDE PUMP WITH STAINLESS STEEL SHAFT AND SLEEVE.
- PROVIDE GALVANIZED BASE AND DRAIN PAN WITH THREADED OPENING.
- PROVIDE STRUCTURAL STEEL BASE WITH OPENINGS FOR FIELD MOUNTING.
- PROVIDE BALDOR SUPER E OR EQUIVALENT TYPE ODP MOTOR.



**NSOC NEW SERVICE CENTER PROJECT**  
 CAPITAL PORT DRIVE SAN ANTONIO, TX



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 1 03/27/15 ADDENDUM 1  
 2 04/02/15 ADDENDUM 2  
 3 04/17/15 ADDENDUM 4  
 4 05/22/15 ASB No. 1  
 5 06/24/15 PR No. 1  
 6 06/24/15 PR No. 1 (GEN)  
 7 06/24/15 FLAG FOOT  
 8 10/01/15 ASB No. 012  
 9 01/12/16 PR, PP HOUSE

SHEET TITLE  
**MECHANICAL SCHEDULES**  
 - ADMIN

SHEET NO.  
**M501**

# AS-BUILTS

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FAN SCHEDULE				
MARK	EF-1	EF-2	EF-3	EF-4
SERVES	RESTROOMS / JANITOR	BATTERY STORAGE	SERVICE BAY	VEHICLE EXHAUST
CFM	315	100	8300	1,200
E.S.P. (IN W.G.)	0.375	0.25	0.5	2.5
TYPE	ROOF CENTRIFUGAL DOWNBLAST	ROOF CENTRIFUGAL DOWNBLAST	SIDEWALL	SUSPENDED
DIRECT/BELT DRIVE	DIRECT	DIRECT	DIRECT	BELT
FAN RPM	1373	1253	860	2,330
MOTOR HORSEPOWER	1/4	1/20	1.5	1
VOLTS/PHASE/HERTZ	120/1/60	120/1/60	480/3/60	480/3/60
WEIGHT	80	55	460	440
SONES	5.3	3.2	19.2	72 dBA
MANUFACTURER	COOK	COOK	COOK	COOK
MODEL NO.	90C15DEC	70C15SH	MEPEH008	120CPV
NOTES	1,2,3	1,4,5	6,9	1,7,8

NOTES:  
 1. PROVIDE BACKDRAFT DAMPER, BIRDSCREEN, PREFABRICATED ROOF MOUNT AND FACTORY MOUNTED DISCONNECT.  
 2. FAN SHALL BE INTERLOCKED WITH CORRESPONDING FAN COIL UNIT.  
 3. PROVIDE EC MOTOR (ECM) WITH INTEGRAL SPEED CONTROLLER.  
 4. PROVIDE ALL ALUMINUM, CLASS 'A' SPARK RESISTANT CONSTRUCTION.  
 5. PROVIDE UNIT WITH PHENOLIC COATING WITH UV PROTECTION.  
 6. PROVIDE BACKDRAFT DAMPER, BIRDSCREEN, FACTORY MOUNTED DISCONNECT, WALL MOUNTING SLEEVE & DISCHARGE LOUVER.  
 7. FAN TO HAVE VERTICAL DISCHARGE.  
 8. PROVIDE FAN WITH MOTOR STARTER.  
 9. PROVIDE FAN WITH VFD.

AIR DEVICE SCHEDULE				
MARK	MANUFACTURER/MODEL	TYPE	NC	REMARKS
A	TITUS/TMS-AA	24"x24" SUPPLY	25	ALUMINUM CONSTRUCTION. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
B	TITUS/SOF	24"x24" EGGRATE RETURN	20	ALUMINUM CONSTRUCTION.
C	TITUS/TMS	12"x12" SUPPLY	25	ALUMINUM CONSTRUCTION. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
D	TITUS/SOF	12"x12" EXHAUST GRILLES	20	ALUMINUM CONSTRUCTION. EXHAUST GRILLES TO HAVE ODS'S.

NOTES:  
 1. PROVIDE STANDARD WHITE FINISH FOR ALL AIR DEVICES UNLESS NOTED OTHERWISE ON PLAN.  
 2. PAINT ALL SURFACES VISIBLE THROUGH FACE OF RETURN AIR GRILLES FLAT BLACK. THIS SHALL INCLUDE PIPING, CONDUIT, DUCTWORK, AND STRUCTURAL MEMBERS.  
 3. PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING. IN AREAS WITH HARD CEILINGS, PROVIDE FRAMES FOR SURFACE MOUNTING.  
 4. UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.  
 FOR ROUND NECK DIFFUSERS:  
 6" DIA: 9-120 CFM  
 8" DIA: 125-250 CFM  
 10" DIA: 250-370 CFM  
 12" DIA: 375-600 CFM

GAS INFRA-RED RADIANT HEATER SCHEDULE	
MARK	IRH-1
SERVES	SERVICE BAYS F100
FUEL TYPE	NATURAL GAS
CAPACITY (MBH)	150
VOLTS/PHASE/HERTZ	115 / 1 / 60
AMP/RANGE	4-5
MANUFACTURER	REVERBERAY
MODEL NUMBER	RL340-130
WEIGHT	265
NOTES	1,2,3,4,5

NOTES:  
 1. PROVIDE LOW VOLTAGE CONTROL TRANSFORMER, UNIVERSAL WALL AND CEILING MOUNTED BRACKET, AUTOMATIC RESET THERMAL CUT-OUT AND DISCONNECT SWITCH.  
 2. PROVIDE 24-VOLT TWO STAGE THERMOSTAT.  
 3. PROVIDE WITH OUTDOOR COMBUSTION AIR INLET KIT.  
 4. PROVIDE WITH A VENT KIT.  
 5. UNIT SHALL SHUTDOWN WHEN THE FIRE ALARM IS ACTIVATED.

GAS UNIT HEATER SCHEDULE	
MARK	GUH-N2-1
SERVES	FLEET SUPPLY
CFM	960
GAS HEAT INPUT/OUTPUT (MBH)	75/82.3
VENT SIZE (IN)	4
VOLTS/PHASE/HERTZ	120/1/60
MANUFACTURER	REZNOR
MODEL NO.	USDAP-75
WEIGHT (LBS)	80
NOTES	1, 2

NOTES:  
 1. PROVIDE WITH 24V CONTROL TRANSFORMER, REMOTE 1 STAT, INTEGRATED CIRCUIT BOARD WITH DIAGNOSTIC LIGHTS, MULTI-TRY DIRECT SPARK IGNITION WITH 100% LOCKOUT, FAN RELAY, FAN GUARD, CEILING SUSPENSION KIT.  
 2. PROVIDE WITH VENT PIPE AND APPROVED VENT CAP AS REQUIRED.

ELECTRIC UNIT HEATER SCHEDULE	
MARK	EUH-N2-1
SERVES	SPRINKLER RISER ROOM
CFM	100
KW	2
VOLTS/PHASE/HERTZ	208/1/60
MANUFACTURER	MARKEL
MODEL NO.	F304272DWB
NOTES	1

NOTES:  
 1. SHALL INCLUDE BUILT-IN THERMOSTAT, DISCONNECT, FUSED CONTROL CIRCUIT, MANUAL RESET HIGH LIMIT, "FAN ONLY" SWITCH, AND WALL BRACKET.

DX SPLIT SYSTEM SCHEDULE (GAS HEAT)			
MARK	FCU-N2-1		FCU-N2-2
	SERVES	INTERIOR SPACE	INTERIOR SPACE
SUPPLY AIR (CFM)	1,600		875
OUTSIDE AIR (CFM)	85		65
EXT. SP. (IN W.G.)	0.5		0.5
FAN MOTOR HORSEPOWER	3/4		1/2
BELT/DIRECT DRIVE	DIRECT		DIRECT
TOTAL COOLING (MBH)	41.2		25.6
SENSIBLE COOLING (MBH)	36.7		21.7
ENTERING AIR TEMP. DBWB (F)	75.4 / 59.5		78.4 / 62.7
LEAVING AIR TEMP. DBWB (F)	52.8 / 49.8		55.2 / 53.2
INPUT (MBH)	80		60
OUTPUT (MBH)	64		48
ENTERING AIR TEMP. (F)	67.3		65.9
LEAVING AIR TEMP. (F)	90		90
VENT SIZE (IN)	4		4
VOLTS/PHASE/HERTZ	208 / 3 / 60		208 / 3 / 60
MCA	12.3		10.3
MOOP	20		15
MANUFACTURER	TRANE		TRANE
FURNACE MODEL	TUDC000A9H1B		TUDH000A9H31B
EVAPORATOR COIL MODEL	4TDC000B3CCH		4TDC000B3C3H
WEIGHT (LBS)	185		185
NOTES	4,5,6		4,5,6
MARK	CU-N2-1		CU-N2-2
NUMBER OF COMPRESSORS	1		1
SEVEREER (ARI)	14 / 11.5		14 / 11.5
AMBIENT AIR	105		105
VOLTS/PHASE/HERTZ	208 / 3 / 60		208 / 3 / 60
MCA	15		10
MOOP	30		15
MANUFACTURER	TRANE		TRANE
MODEL	4TAX000C3		4TAX000A3
WEIGHT (LBS)	225		225
NOTES	1, 2, 3		1, 2, 3

NOTES:  
 1. PROVIDE CONDENSER COIL HAIL GUARDS.  
 2. PROVIDE LOW AMBIENT CONTROL.  
 3. INSTALL REFRIGERANT PIPING IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.  
 4. PROVIDE SINGLE POINT ELECTRICAL CONNECTION.  
 5. INDOOR UNIT IN HORIZONTAL FLOW CONFIGURATION.  
 6. PROVIDE PROGRAMMABLE THERMOSTAT.

DUCTLESS SPLIT SYSTEM SCHEDULE				
MARK	DS-N2-1	DS-N2-2	DS-N2-3	
	SERVES	I.T. CLOSET	ELECTRICAL ROOM	BATTERY STORAGE
TYPE	HIGH WALL	HIGH WALL	HIGH WALL	
AIRFLOW (CFM)	350	350	350	
TOTAL COOLING (MBH)	12	12	12	
HEATING (KW)	NONE	NONE	NONE	
VOLTS/PHASE/HERTZ	208 / 1 / 60	208 / 1 / 60	208 / 1 / 60	
MCA	NOTE 5	NOTE 5	NOTE 5	
MOOP	NOTE 5	NOTE 5	NOTE 5	
MANUFACTURER	MTS/UBSHI	MTS/UBSHI	MTS/UBSHI	
MODEL NUMBER	PKA-A12H4	PKA-A12H4	PKA-A12H4	
MARK	DSU-N2-1	DSU-N2-2	DSU-N2-3	
VOLTS/PHASE/HERTZ	208 / 1 / 60	208 / 1 / 60	208 / 1 / 60	
MCA	13.0	13.0	13.0	
MOOP	15.0	15.0	15.0	
SEER	15.2	15.2	15.2	
MANUFACTURER	MTS/UBSHI	MTS/UBSHI	MTS/UBSHI	
MODEL NUMBER	PUY-A12NH4	PUY-A12NH4	PUY-A12NH4	
NOTES	1,2,3,4	1,2,3,4	1,2,3,4	

NOTES:  
 1. PROVIDE REFRIGERANT PIPING IN ACCORDANCE WITH MFR'S RECOMMENDATIONS.  
 2. PROVIDE FULL SIZE CONDENSATE DRAIN TO NEAREST RECEPTACLE.  
 3. PROVIDE WALL MOUNTED THERMOSTAT.  
 4. PROVIDE UNIT WITH CAPABILITY TO PROVIDE COOLING DOWN TO 14 DEG F.  
 5. INDOOR UNIT POWERED THROUGH OUTDOOR UNIT.



NSOC NEW SERVICE CENTER PROJECT  
 CAPITAL PORT DRIVE SAN ANTONIO, TX



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Drawn	DBR
Checked	DBR
Date	03/26/2015
PROJECT No.	14029
Revisions	1 03/27/15 ADDENDUM 1 2 04/02/15 ADDENDUM 2 3 04/17/15 ADDENDUM 4 4 05/22/15 ASB No. 1 5 06/24/15 PR No. 1 6 09/24/15 PR No. 1 (GSN) 7 09/24/15 PR No. 1 (GSN) 8 09/24/15 PR No. 1 (GSN) 9 10/01/15 ASB No. 012 10 01/12/16 PR, IP HOUSE

SHEET TITLE  
 MECHANICAL SCHEDULES  
 - FLEET

SHEET NO.

M502

AS-BUILTS

06-08-2016

DUCTLESS SPLIT SYSTEM SCHEDULE			
MARK	DS-N3-1		DS-N3-2
	SERVES	I.T. CLOSET	ELECTRICAL ROOM
TYPE	HIGH WALL	HIGH WALL	
AIRFLOW (CFM)	350	350	
TOTAL COOLING (MBH)	12	12	
HEATING (KW)	NONE	NONE	
VOLTS/PHASE/HERTZ	208 / 1 / 60	208 / 1 / 60	
MCA	NOTE 5	NOTE 5	
MOCP			
MANUFACTURER	MTSUBSHI	MTSUBSHI	
MODEL NUMBER	PKA-A12H44	PKA-A12H44	
MARK	DSQU-N3-1	DSQU-N3-2	
VOLTS/PHASE/HERTZ	208 / 1 / 60	208 / 1 / 60	
MCA	13.0	13.0	
MOCP	15.0	15.0	
SEER	15.2	15.2	
MANUFACTURER	MTSUBSHI	MTSUBSHI	
MODEL NUMBER	PUY-A12NH44	PUY-A12NH44	

NOTES:  
1. PROVIDE REFRIGERANT PIPING IN ACCORDANCE WITH MFR'S RECOMMENDATIONS.  
2. PROVIDE FULL SIZE CONDENSATE DRAIN TO NEAREST RECEPTACLE.  
3. PROVIDE WALL MOUNTED THERMOSTAT.  
4. PROVIDE UNIT WITH CAPABILITY TO PROVIDE COOLING DOWN TO 14 DEG F.  
5. INDOOR UNIT POWERED THROUGH OUTDOOR UNIT.

GAS UNIT HEATER SCHEDULE			
MARK	QUH-N3-1	QUH-N3-2	QUH-N3-3
SERVES	TOOL ROOM	WAREHOUSE	WAREHOUSE
CFM	960	2,560	2,560
GAS HEAT INPUT/OUTPUT (MBH)	75/62.3	150/125	150/125
VENT SIZE (IN)	4	5	5
VOLTS/PHASE/HERTZ	120/1/60	120/1/60	120/1/60
MANUFACTURER	REZNOR	REZNOR	REZNOR
MODEL NO.	UDAP-75	UDBP-150	UDBP-150
WEIGHT (LBS)	80	255	255
NOTES	1, 2	1, 2	1, 2

NOTES:  
1. WITH 24V CONTROL TRANSFORMER, REMOTE T-STAT, INTEGRATED CIRCUIT BOARD WITH DIAGNOSTIC LIGHTS, MULTI-TRY DIRECT SPARK IGNITION WITH 100% LOCKOUT, FAN RELAY, FAN GUARD, CEILING SUSPENSION KIT.  
2. PROVIDE WITH VENT PIPE AND APPROVED VENT CAP AS REQUIRED.

GAS RADIANT UNIT HEATER SCHEDULE			
MARK	GRH-N3-1	GRH-N3-2	
SERVES	TOOL ROOM	TOOL ROOM/CAGE AREA	
FUEL TYPE	NATURAL GAS	NATURAL GAS	
CAPACITY (MBH)	100	100	
VOLTS/PHASE/HERTZ	120/1/60	120/1/60	
MANUFACTURER	REZNOR	REZNOR	
MODEL NO.	RHVH 100	RHVH 100	
WEIGHT (LBS)	36	36	
NOTES	1, 2	1, 2	

NOTES:  
1. WITH 24V CONTROL TRANSFORMER, REMOTE T-STAT, INTEGRATED CIRCUIT BOARD WITH DIAGNOSTIC LIGHTS, MULTI-TRY DIRECT SPARK IGNITION WITH 100% LOCKOUT, FAN RELAY, FAN GUARD, CEILING SUSPENSION KIT.  
2. PROVIDE WITH VENT PIPE AND APPROVED VENT CAP AS REQUIRED.

FAN SCHEDULE				
MARK	EF-1	EF-2	EF-3	EF-4
SERVES	RESTROOMS / ANITOR / KITCHENETTE	SNORKEL EXHAUST	VENTILATION	WAREHOUSE
CFM	315	1050	4000	4,000
E.S.P. (IN W.G.)	0.375	0.5	0.5	0.5
TYPE	ROOF CENTRIFUGAL DOWNBLAST	ROOF CENTRIFUGAL UPBLAST	ROOF CENTRIFUGAL DOWNBLAST	SIDE WALL
DIRECT/BELT DRIVE	DIRECT	DIRECT	BELT	DIRECT
FAN RPM	1302	1360	981	1,140
MOTOR HORSEPOWER	1/8	1/4	1	1
VOLTS/PHASE/HERTZ	120/1/60	120/1/60	480/3/60	480/3/60
WEIGHT	60	105	350	350
SONES	6.1	10.8	14.7	26
MANUFACTURER	COOK	COOK	COOK	COOK
MODEL NO.	80C15DH	120R15D	185C7B	30EP4H011
NOTES	1, 2	1, 3, 4	6, 7, 8	5, 7

NOTES:  
1. PROVIDE BACKDRAFT DAMPER, BIRDSCREEN, PREFABRICATED ROOF MOUNT AND FACTORY MOUNTED DISCONNECT.  
2. FAN SHALL BE INTERLOCKED WITH CORRESPONDING FAN COOL UNIT.  
3. PROVIDE ALL ALUMINUM, CLASS "A" SPARK RESISTANT CONSTRUCTION.  
4. PROVIDE UNIT WITH PHEROCLIC COATING WITH UV PROTECTION.  
5. PROVIDE BACKDRAFT DAMPER, BIRDSCREEN, FACTORY MOUNTED DISCONNECT, WALL MOUNTING SLEEVE & DISCHARGE LOUVER.  
6. PROVIDE AUTOMATIC BELT TENSIONER.  
7. PROVIDE FAN WITH VFD.  
8. PROVIDE BACKDRAFT DAMPER, BIRDSCREEN AND PREFABRICATED ROOF MOUNT.

AIR DEVICE SCHEDULE				
MARK	MANUFACTURER/MODEL	TYPE	NC	REMARKS
A	ITUS/MS-AA	2FX2F SUPPLY	25	ALUMINUM CONSTRUCTION. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
B	ITUS/90F	2FX2F EGOCRATE RETURN	20	ALUMINUM CONSTRUCTION.
C	ITUS/MS-AA	12X12 SUPPLY	20	ALUMINUM CONSTRUCTION. NECK SIZES AS INDICATED BELOW UNLESS NOTED ON PLAN.
D	ITUS/90F	12X12 EGOCRATE RETURN/EXHAUST GRILLES	20	ALUMINUM CONSTRUCTION. EXHAUST GRILLES TO HAVE GRIBS.

NOTES:  
1. PROVIDE STANDARD WHITE FINISH FOR ALL AIR DEVICES (UNLESS NOTED OTHERWISE ON PLAN).  
2. PAINT ALL SURFACES VISIBLE THROUGH FACE OF RETURN AIR GRILLES FLAT BLACK. THIS SHALL INCLUDE PIPING, CONDUIT, DUCTWORK, AND STRUCTURAL MEMBERS.  
3. PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING IN AREAS WITH HARD CEILINGS, PROVIDE FRAMES FOR SURFACE MOUNTING.  
4. UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.  
FOR ROUND NECK DIFFUSERS  
6" DA: 6-120 CFM  
8" DA: 125-250 CFM  
10" DA: 250-370 CFM  
12" DA: 375-600 CFM

ELECTRIC UNIT HEATER SCHEDULE	
MARK	EUH-N3-1
SERVES	SPRINKLER RISER ROOM
CFM	100
KW	2
VOLTS/PHASE/HERTZ	208/1/60
MANUFACTURER	MARKEL
MODEL NO.	F305T2DWB
NOTES	1

NOTES:  
1. SHALL INCLUDE BUILT-IN THERMOSTAT, DISCONNECT, FUSED CONTROL CIRCUIT, MANUAL RESET HIGH LIMIT, "FAN ONLY" SWITCH, AND WALL BRACKET.

GAS INFRA-RED RADIANT HEATER SCHEDULE	
MARK	IRH-2
SERVES	RECEIVING 5101
FUEL TYPE	NATURAL GAS
CAPACITY (MBH)	75
VOLTS/PHASE/HERTZ	115 / 1 / 60
AMPERAGE	4.5
MANUFACTURER	REVERBERAY
MODEL NUMBER	H-3-20-75
WEIGHT	120
NOTES	1, 2, 3, 4, 5

NOTES:  
1. PROVIDE LOW VOLTAGE CONTROL TRANSFORMER, UNIVERSAL WALL AND CEILING MOUNTED BRACKET, AUTOMATIC RESET THERMAL CUT-OUT AND DISCONNECT SWITCH.  
2. PROVIDE 24-VOLT TWO STAGE THERMOSTAT.  
3. PROVIDE WITH OUTDOOR COMBUSTION AIR INLET KIT.  
4. PROVIDE WITH A VENT KIT.  
5. UNIT SHALL SHUTDOWN WHEN THE FIRE ALARM IS ACTIVATED.

DX SPLIT SYSTEM SCHEDULE (GAS HEAT)		
MARK	FOU-N3-1	
	SERVES	INTERIOR SPACE
SUPPLY AIR (CFM)	1,465	
OUTSIDE AIR (CFM)	125	
EXT. SP. (IN W.G.)	0.5	
FAN MOTOR HORSEPOWER	3/4	
BELT/DIRECT DRIVE	DIRECT	
TOTAL COOLING (MBH)	41.6	
SENSIBLE COOLING (MBH)	35.1	
ENTERING AIR TEMP. DB/WB (F)	76.5 / 61.5	
LEAVING AIR TEMP. DB/WB (F)	54.1 / 51.1	
INPUT (MBH)	80	
OUTPUT (MBH)	84	
ENTERING AIR TEMP. (F)	65.7	
LEAVING AIR TEMP. (F)	90	
VENT SIZE (IN)	4	
VOLTS/PHASE/HERTZ	208 / 3 / 60	
MCA	12.3	
MOCP	20	
MANUFACTURER	TRANE	
FURNACE MODEL	TUD1C080H4	
EVAPORATOR COIL MODEL	47XC08B8C3CH	
WEIGHT (LBS)	185	
NOTES	4, 5, 6	
MARK	OU-N3-1	
NUMBER OF COMPRESSORS	1	
SEER/EER (AIR)	14 / 11.5	
AMBIENT AIR	105	
VOLTS/PHASE/HERTZ	208 / 3 / 60	
MCA	18	
MOCP	30	
MANUFACTURER	TRANE	
MODEL	4TTA3048D3	
WEIGHT (LBS)	235	
NOTES	1, 2, 3	

NOTES:  
1. PROVIDE CONDENSER COIL HALL GUARDS.  
2. PROVIDE LOW AMBIENT CONTROL.  
3. INSTALL REFRIGERANT PIPING IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.  
4. PROVIDE SINGLE POINT ELECTRICAL CONNECTION.  
5. INDOOR UNIT IN HORIZONTAL FLOW CONFIGURATION.  
6. PROVIDE PROGRAMMABLE THERMOSTAT.

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NSOC NEW SERVICE  
CENTER PROJECT  
CAPITAL PORT DRIVE SAN ANTONIO, TX

San Antonio Water System
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MECHANICAL SCHEDULES
REVISIONS
1 03/27/15 ADDENDUM 1
2 04/02/15 ADDENDUM 2
3 04/17/15 ADDENDUM 4
4 05/22/15 ASH No. 1
5 06/24/15 PR No. 1
6 06/24/15 PR No. 2 (GEN)
7 06/24/15 FLAG FOOT
8 06/24/15 FLAG FOOT
9 10/01/15 ASH No. 012
10 01/12/16 PR, 1P HOUSE

# AS-BUILTS

06-08-2016

SHEET TITLE  
MECHANICAL SCHEDULES  
- SUPPLY  
SHEET NO.  
M503



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Drawn	DBR
Checked	DBR
Date	03/26/2015
PROJECT No.	14029
Revisions	
1	03/27/15 ADDENDUM 1
2	04/02/15 ADDENDUM 2
3	04/17/15 ADDENDUM 4
4	05/22/15 ASB No. 1
5	06/24/15 PR No. 1
6	06/24/15 PR No. 2 (GEN)
7	06/26/15 FLAG FOOT
8	10/01/15 ASB No. 012
9	01/12/16 PR, FP HOUSE

SHEET TITLE  
**MECHANICAL CONTROL SEQUENCES**

SHEET NO.  
**M601**

**SEQUENCE(S) OF OPERATION:**

**RUN CONDITIONS - REQUESTED:**  
 THE UNIT SHALL RUN WHENEVER:  
 • ANY ZONE IS OCCUPIED.  
 • OR UNOCCUPIED ZONES NEED HEATING OR COOLING.

**HIGH STATIC SHUTDOWN:**  
 THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN HIGH STATIC SHUTDOWN SIGNAL.

**RETURN AIR SMOKE DETECTION:**  
 THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A RETURN AIR SMOKE DETECTOR STATUS.

**AHJ OPTIMAL START:**  
 THE UNIT SHALL START PRIOR TO SCHEDULED OCCUPANCY BASED ON THE TIME NECESSARY FOR THE ZONE TO REACH THEIR OCCUPIED SETPOINTS. THE START TIME SHALL AUTOMATICALLY ADJUST BASED ON CHANGES IN OUTSIDE AIR TEMPERATURE AND ZONE TEMPERATURES. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSE AND THE RETURN AIR DAMPER SHALL OPEN DURING OPTIMAL START.

**SUPPLY FAN:**  
 THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

**ALARMS SHALL BE PROVIDED AS FOLLOWS:**  
 • SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.  
 • SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

**SUPPLY AIR DUCT STATIC PRESSURE CONTROL:**  
 THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND SHALL MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN A DUCT STATIC PRESSURE SETPOINT. THE SUPPLY FAN VFD SPEED SHALL NOT DROP BELOW 30% (ADJ.). THE STATIC PRESSURE SETPOINT SHALL BE RESET BASED ON ZONE COOLING REQUIREMENTS.  
 • THE INITIAL DUCT STATIC PRESSURE SETPOINT SHALL BE 1.5 IN. H<sub>2</sub>O (ADJ.)  
 • AS COOLING DEMAND INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 2.8 IN. H<sub>2</sub>O (ADJ.)  
 • AS COOLING DEMAND DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 1.3 IN. H<sub>2</sub>O (ADJ.)  
 • IF ALL CONNECTED ZONE AIR VALVES ARE LESS THAN 80% (ADJ.) OPEN, THE SUPPLY AIR STATIC PRESSURE SHALL BE RESET DOWN BY 0.1 INCH OF STATIC ON 15 MINUTE INTERVALS UNTIL THE WORST CASE VAV BOX IS AT 95% OPEN. IF A VAV BOX AIR VALVE IS 100% OPEN, RESET THE SUPPLY AIR UP BY 0.1 INCH OF STATIC PRESSURE ON 15 MINUTE INTERVALS UNTIL THE WORST CASE VAV IS AT 95% OPEN.

**ALARMS SHALL BE PROVIDED AS FOLLOWS:**  
 • HIGH SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) GREATER THAN SETPOINT.  
 • LOW SUPPLY AIR STATIC PRESSURE: IF THE SUPPLY AIR STATIC PRESSURE IS 25% (ADJ.) LESS THAN SETPOINT.  
 • SUPPLY FAN VFD FAULT.

**SUPPLY AIR TEMPERATURE SETPOINT - OPTIMIZED:**  
 THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE AND SHALL MAINTAIN A SUPPLY AIR TEMPERATURE SETPOINT RESET BASED ON ZONE COOLING AND HEATING REQUIREMENTS. THE SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET FOR COOLING BASED ON ZONE COOLING REQUIREMENTS AS FOLLOWS:  
 • THE INITIAL SUPPLY AIR TEMPERATURE SETPOINT SHALL BE 55°F (ADJ.)  
 • AS COOLING DEMAND INCREASES, THE SETPOINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 53°F (ADJ.)  
 • AS COOLING DEMAND DECREASES, THE SETPOINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 60°F (ADJ.)

**COOLING COIL VALVE:**  
 THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE COOLING COIL VALVE TO MAINTAIN ITS COOLING SETPOINT.

**THE COOLING SHALL BE ENABLED WHENEVER:**  
 • ANY ZONE GENERATES A CALL FOR COOLING.  
 • AND THE SUPPLY FAN STATUS IS ON.  
 AND THE COOLING COIL VALVE SHALL OPEN TO 50% (ADJ.) WHENEVER THE FREEZE STAT IS ON.

**ALARMS SHALL BE PROVIDED AS FOLLOWS:**  
 • HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) GREATER THAN SETPOINT.  
 • LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS 5°F (ADJ.) LESS THAN SETPOINT.

**MINIMUM OUTSIDE AIR VENTILATION - CARBON DIOXIDE (CO<sub>2</sub>) CONTROL:**  
 WHEN IN THE OCCUPIED MODE, THE CONTROLLER SHALL MEASURE THE RETURN AIR CO<sub>2</sub> LEVELS AND MODULATE THE OUTSIDE AIR DAMPERS CLOSED AND RETURN AIR DAMPERS OPEN AT A RATE OF 2% EVERY 10 MINUTES, TO MAINTAIN CO<sub>2</sub> CONCENTRATIONS BELOW A CO<sub>2</sub> SETPOINT OF 750 PPM (ADJ.). IN THE EVENT THE CO<sub>2</sub> LEVELS IN THE ZONE(S) EXCEEDS THE CO<sub>2</sub> SETPOINT, THE OUTSIDE AIR DAMPER SHALL MODULATE IN CONJUNCTION WITH THE RETURN AIR DAMPER AT AN IDENTICAL RATE, TO INCREASE THE OUTSIDE AIR PERCENTAGE THROUGH THE AIR HANDLER UP TO THE SCHEDULED QM D.A.

**MIXED AIR TEMPERATURE:**  
 THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE.  
 ALARMS SHALL BE PROVIDED AS FOLLOWS:  
 • HIGH MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS GREATER THAN 80°F (ADJ.)  
 • LOW MIXED AIR TEMP: IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)

**SPACE CARBON DIOXIDE (CO<sub>2</sub>) CONCENTRATION MONITORING:**  
 THE CONTROLLER SHALL MEASURE THE SPACE CO<sub>2</sub> LEVELS.  
 • HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION: IF THE RETURN AIR CO<sub>2</sub> CONCENTRATION IS GREATER THAN 1000PPM (ADJ.) WHEN IN THE UNIT RUNNING.

**RETURN AIR TEMPERATURE:**  
 THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE.  
 ALARMS SHALL BE PROVIDED AS FOLLOWS:  
 • HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 80°F (ADJ.)  
 • LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)

**SUPPLY AIR TEMPERATURE:**  
 THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE. ALARMS SHALL BE PROVIDED AS FOLLOWS:  
 • HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.)  
 • LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)

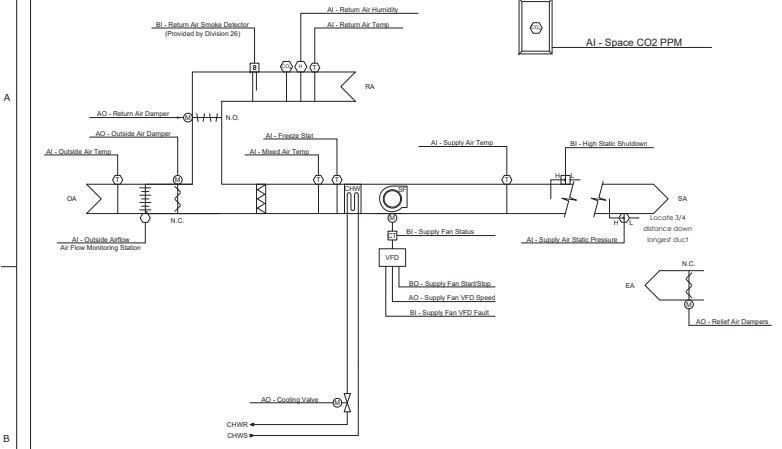
**ECONOMIZER:**  
 THE CONTROLLER SHALL MEASURE THE MIXED AIR TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN A SETPOINT 2°F (ADJ.) LESS THAN THE SUPPLY AIR TEMPERATURE SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION OF 20% (ADJ.) OPEN WHENEVER OCCUPIED.

**THE ECONOMIZER SHALL BE ENABLED WHENEVER:**  
 • OUTSIDE AIR TEMPERATURE IS LESS THAN 65°F (ADJ.)  
 • AND THE OUTSIDE AIR ENTHALPY IS LESS THAN THE RETURN AIR ENTHALPY.  
 • AND THE SUPPLY FAN IS ON.  
 THE ECONOMIZER SHALL BE DISABLED WHENEVER:  
 • MIXED AIR TEMPERATURE DROPS FROM BELOW 40°F  
 • OR THE RETURN STAT IS ON.  
 • OR ON LOSS OF SUPPLY FAN STATUS.

**THE OUTSIDE AIR DAMPER SHALL MODULATE TO DESIGN OUTSIDE AIR CFM SETPOINT. RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. IN OPTIMAL START UP THE RETURN AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED.**

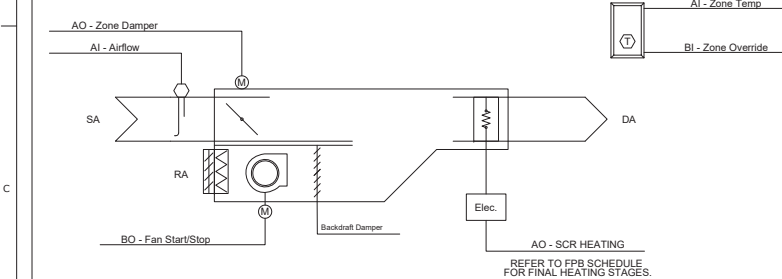
**DEHUMIDIFICATION:**  
 THE CONTROLLER SHALL MEASURE THE RETURN AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE TO MAINTAIN RETURN AIR HUMIDITY AT OR BELOW 50% RH (ADJ.) BY LOWERING SUPPLY AIR TEMPERATURE TO 52°F (ADJ.). DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THE SUPPLY FAN STATUS IS ON AND SHALL OPERATE IN CONJUNCTION WITH AIR TERMINAL UNITS.

**RETURN AIR HUMIDITY:**  
 THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR ECONOMIZER CONTROL OR HUMIDITY CONTROL.  
 ALARMS SHALL BE PROVIDED AS FOLLOWS:  
 • HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 70% (ADJ.)  
 • LOW RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS LESS THAN 35% (ADJ.)



**1 VARIABLE AIR VOLUME AIR HANDLING UNIT**

M601 AHWJ1 & AHWJ2



**2 PARALLEL FPB UNIT CONTROL DIAGRAM**

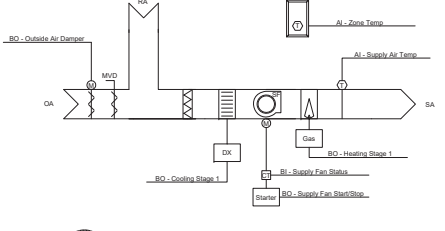
M601 REFER TO FPB SCHEDULE FOR FINAL HEATING STAGES.

**Sequences of Operation:**

**Variable Air Volume - Terminated Unit:**  
**Run Conditions - Scheduled:**  
 The unit shall run according to a user definable time schedule in the following modes:  
 • Occupied Mode: The unit shall maintain:  
 • A 72°F (adj.) cooling setpoint.  
 • A 70°F (adj.) heating setpoint.  
 • Unoccupied Mode (night setback): The unit shall maintain:  
 • A 55°F (adj.) cooling setpoint.  
 • A 55°F (adj.) heating setpoint.  
**Alarms shall be provided as follows:**  
 • High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).  
 • Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

**Zone Setpoint Adjust:**  
 The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.  
**Variable Volume Terminated Unit - Flow Control:**  
 The unit shall maintain zone setpoints by controlling the airflow through one of the following:  
**Occupied:**  
 • When zone temperature is greater than its cooling setpoint, the zone damper shall modulate between the minimum occupied airflow (adj.) and the minimum cooling airflow (adj.) until the zone is satisfied.  
 • When the zone temperature is between the cooling setpoint and the heating setpoint, the zone damper shall maintain the minimum required zone ventilation (adj.).  
 • When zone temperature is less than its heating setpoint, the controller shall enable heating to maintain the zone temperature at its heating setpoint. The zone damper shall maintain minimum occupied airflow (adj.).  
**Unoccupied:**  
 • When the zone is unoccupied the zone damper shall control to its minimum unoccupied airflow (adj.).  
 • When the zone temperature is greater than its cooling setpoint, the zone damper shall modulate between the minimum unoccupied airflow (adj.) and the minimum cooling airflow (adj.) until the zone is satisfied.  
 • When zone temperature is less than its unoccupied heating setpoint, the controller shall enable heating to maintain the zone temperature at the setpoint. Additionally, if warm air is available from the AHU, the zone damper shall modulate between the minimum unoccupied airflow (adj.) and the auxiliary heating airflow (adj.) until the zone is satisfied.

**Fan Control - Parallel:**  
 The fan shall run anytime the unit calls for heating. The fan shall run for a minimum user definable time (adj.).  
**Electric Reheating Stages:**  
 The controller shall measure the zone temperature and modulate reheating to maintain its setpoint. The fan should be considered the first stage of heating.  
 The reheating shall be enabled whenever:  
 • Outside air temperature is less than 65°F (adj.).  
 • AND the zone temperature is below setpoint.  
 AND sufficient airflow is provided.



**3 DX - SPLIT SYSTEM**

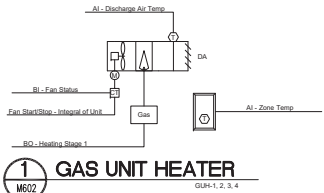
M601 FCU-W2-1, W2-2, W3-1, N3-1, N3-2, N3-1

**Run Conditions - Scheduled:**  
 The unit shall run according to a user definable time schedule in the following modes:  
 • Occupied Mode: The unit shall maintain:  
 • A 72°F (adj.) cooling setpoint.  
 • A 70°F (adj.) heating setpoint.  
 • Unoccupied Mode (night setback): The unit shall maintain:  
 • A 60°F (adj.) cooling setpoint.  
 • A 55°F (adj.) heating setpoint.  
**Alarms shall be provided as follows:**  
 • High Zone Temp: If the zone temperature is greater than the cooling setpoint by a user definable amount (adj.).  
 • Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

**Zone Setpoint Adjust:**  
 The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.  
**Zone Optimal Start:**  
 The occupant shall use an optimal start algorithm for morning start-up. This algorithm shall minimize the unoccupied warm-up or cool-down period while still achieving comfort conditions by the start of scheduled occupied period.

**Supply Fan:**  
 The supply fan shall run anytime the unit is commanded to run, unless shutdown on safeties. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime.  
**Alarms shall be provided as follows:**  
 • Supply Fan Failure: Commaneded on, but the status is off.  
 • Supply Fan In Hand: Commaneded off, but the status is on.  
 • Supply Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

**Gas Heating Stage:**  
 The controller shall measure the zone temperature and stage the heating to maintain its heating setpoint. To prevent short cycling, the stage shall have a user definable (adj.) minimum runtime.  
 The heating shall be enabled whenever:  
 • Outside air temperature is less than 65°F (adj.).  
 • AND the zone temperature is below heating setpoint.



**1 GAS UNIT HEATER**  
GSH-1, 2, 3, 4  
M602

**Run Conditions - Scheduled.**  
The unit shall run according to a user definable time schedule in the following modes:

- Occupied Mode: The unit shall maintain a heating setpoint of 70°F (adj.).
- Unoccupied Mode (night setback): The unit shall maintain a heating setpoint of 65°F (adj.).

Alarms shall be provided as follows:

- Low Zone Temp: If the zone temperature is less than the heating setpoint by 10°F (adj.).

**Zone Optimal Start:**  
The unit shall use an optimal start algorithm for morning start-up. This algorithm shall minimize the unoccupied warm-up or cool-down period while still achieving comfort conditions by the start of scheduled occupied period.

**Fan:**  
The fan shall run anytime the zone temperature drops below heating setpoint, unless shutdown on safeties.

**Gas Heating Stage:**  
The controller shall measure the zone temperature and stage the heating to maintain its heating setpoint. To prevent short cycling, the stage shall have a user definable (adj.) minimum runtime.

The heating shall be enabled whenever:

- Outside air temperature is less than 60°F (adj.).
- AND the zone temperature is below heating setpoint.

**Discharge Air Temperature:**  
The controller shall monitor the discharge air temperature.

Alarms shall be provided as follows:

- High Discharge Air Temp: If the discharge air temperature is greater than 120°F (adj.).
- Low Discharge Air Temp: If the discharge air temperature is less than 40°F (adj.).

**Fan Status:**  
The controller shall monitor the fan status.

Alarms shall be provided as follows:

- Fan Failure: Commanded on, but the status is off.
- Fan in Hand: Commanded off, but the status is on.
- Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

**HIGH VOLUME LOW SPEED FANS (HVLS):**

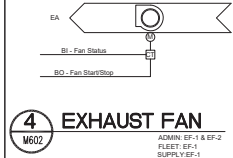
- THE HVLS FANS SHALL BE ENABLED BASED ON A USER ADJUSTABLE TIME OF DAY SCHEDULE.
- THE HVLS FANS SHALL BE DISABLED BY A FIRE ALARM CALL FROM THE FIRE ALARM CONTROL PANEL. (INFORMATION ONLY. THIS INTERLOCK IS PROVIDED BY DIVISIONS 26 AND 28.

**2 HVLS FANS**  
BA-1 & BA-2  
M602

**DUCTLESS SPLIT SYSTEM:**

- THE CONTROLLER SHALL MONITOR THE FAN COIL UNIT STATUS.
- THE CONTROLLER SHALL MONITOR THE SPACE TEMPERATURE.
- THE UNIT SHALL OPERATE ON ITS OWN FACTORY-SUPPLIED CONTROLS.

**3 IT ROOM DUCTLESS SPLIT SYSTEM**  
M602



**RUN CONDITIONS - INTERLOCKED:**  
THE EXHAUST FANS SHALL BE INTERLOCKED TO RUN WHENEVER THE AHJ RUNS UNLESS SHUTDOWN ON SAFETIES.

**FAN STATUS:**  
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

**4 EXHAUST FAN**  
M602  
FLEET: EF-1  
SUPPLY: EF-1

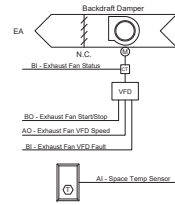
**5 ELECTRIC UNIT HEATER**  
M602

**RUN CONDITIONS - SCHEDULED:**  
THE UNIT SHALL BE ENABLED ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES. THE UNIT SHALL OPERATE USING FACTORY CONTROLS.

- OCCUPIED MODE: THE UNIT SHALL BE ENABLED WHEN OUTSIDE AIR TEMPERATURE IS LESS THAN 50°F (adj.).
- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL BE DISABLED.

**HEATER STATUS:**  
THE CONTROLLER SHALL MONITOR THE HEATER STATUS.

**6 GAS INFRARED HEATER**  
M602



**SEQUENCE OF OPERATION:**

**EXHAUST FAN - RUN CONDITIONS - CONTINUOUS OPERATION:**  
THE UNIT(S) SHALL RUN UNLESS SHUTDOWN ON SAFETIES.

THE EXHAUST FAN VFD SHALL RUN AT MINIMUM SCHEDULED AIRFLOW WHEN SPACE TEMPERATURE IS BELOW 80°F (adj.).

IF THE SPACE TEMPERATURE EXCEEDS 80°F THE VFD SHALL MODULATE THE FAN SPEED TO THE DESIGN AIRFLOW AND MAINTAIN AIRFLOW UNTIL SPACE TEMPERATURE DROPS BELOW 80°F.

**FAN STATUS:**  
THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (adj.).

**8 EXHAUST FAN CONTROL DIAGRAM**  
M602  
NOT TO SCALE  
FLEET: EF-3  
SUPPLY: EF-4



**7 EXHAUST FAN CONTROL DIAGRAM**  
M602  
NOT TO SCALE  
FLEET: EF-4 & EF-5  
SUPPLY: EF-4

**SEQUENCE OF OPERATION:**

**EXHAUST FAN:**

- **RUN CONDITIONS - INTERLOCKED:**  
FANS SHALL BE ENABLED/OPERATE DURING SCHEDULED OCCUPIED HOURS.
- FANS SHALL OPERATE WHEN ENABLED AND START BUTTON IS ENERGIZED

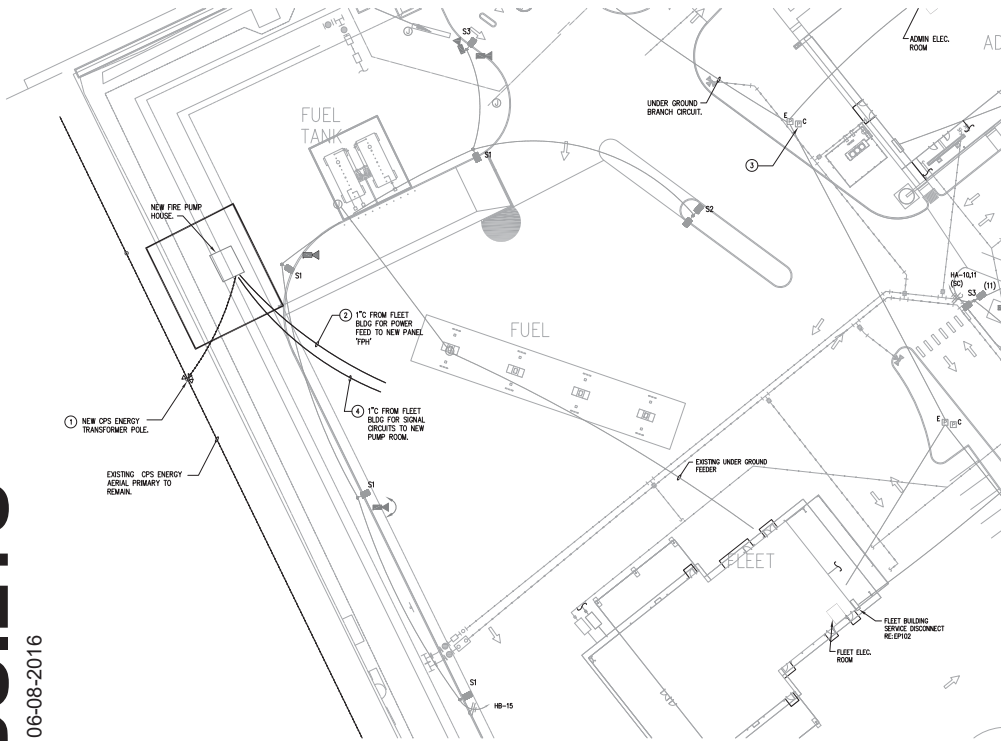
**FAN STATUS:**  
THE CONTROLLER SHALL MONITOR THE FAN STATUS.



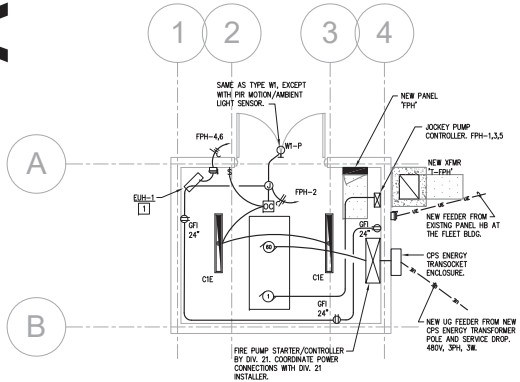


# AS-BUILTS

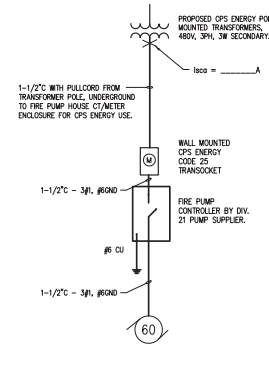
06-08-2016



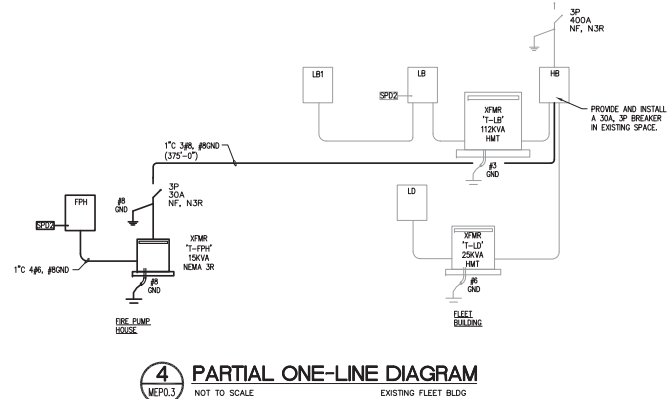
**1 PARTIAL SITE PLAN - ELECTRICAL**  
1" = 30'-0"



**2 ENLARGED PLAN - MEP**  
1/4" = 1'-0"



**3 ONE-LINE DIAGRAM**  
NOT TO SCALE  
FIRE PUMP BLDG



**4 PARTIAL ONE-LINE DIAGRAM**  
NOT TO SCALE  
EXISTING FLEET BLDG

### ELECTRICAL GENERAL NOTES

- COORDINATE WITH OPS ENERGY FOR NEW ELECTRIC SERVICE TO FIRE BUILDING ON THIS SITE. CONTACT MR. BRIAN HARMON (210) 353-2288. REFER TO ELECTRICAL RISER DIAGRAMS THIS SHEET.
- COORDINATE WITH OTHER TRADES FOR TIE-IN WITH COMMUNICATIONS CIRCUITS INCLUDING FIRE ALARM, PHONE AND/OR DATA, AND EMCS.
- COORDINATE EXACT LOCATIONS OF EXISTING STUB-OUTS WITH ACTUAL DIMENSIONS TAKEN IN THE FIELD AND OTHER UTILITIES.
- ALL NEW LIGHTING IN THE FIRE PUMP HOUSE SHALL BE FURNISHED 120V.
- REFER TO FIRE ALARM DRAWINGS FOR ADDITIONAL CONDUIT AND ROUGH-IN REQUIREMENTS.

### ELECTRICAL KEYED NOTES

- NEW OPS ENERGY SERVICE. COORDINATE CONDUIT REQUIREMENTS WITH OPS ENERGY. REFER TO ONE-LINE DIAGRAM 3, THIS SHEET.
- PROVIDE AND INSTALL FEEDER TO FIRE PUMP BUILDING DISCONNECT SWITCH. REFER TO ONE-LINE DIAGRAM 4, THIS SHEET AND CONDUIT BURIAL DETAIL 11, SHEET E604. INTERCEPT EXISTING STUB-OUT FROM FLEET BUILDING.
- REFER TO TECHNOLOGY DRAWINGS FOR COMMUNICATIONS PULL BOX AND CONDUIT REQUIREMENTS.
- PROVIDE AND INSTALL SIGNAL CIRCUIT CONDUIT TO FIRE PUMP BUILDING. REFER TO CONDUIT BURIAL DETAIL 11, SHEET E604. INTERCEPT EXISTING STUB-OUT FROM FLEET BUILDING. COORDINATE WITH OTHER TRADES.

### MECHANICAL KEYED NOTES

- PROVIDE NEW 5KW ELECTRIC UNIT HEATER SIMILAR TO REDD-1 MODEL FPHR0003-3-PHASE. UNIT SHALL INCLUDE BUILT-IN THERMOSTAT, FUSED CONTROL CIRCUIT, MANUAL, HIGH LIMIT RESET, WALL BRACKET, 208V, 3PH.

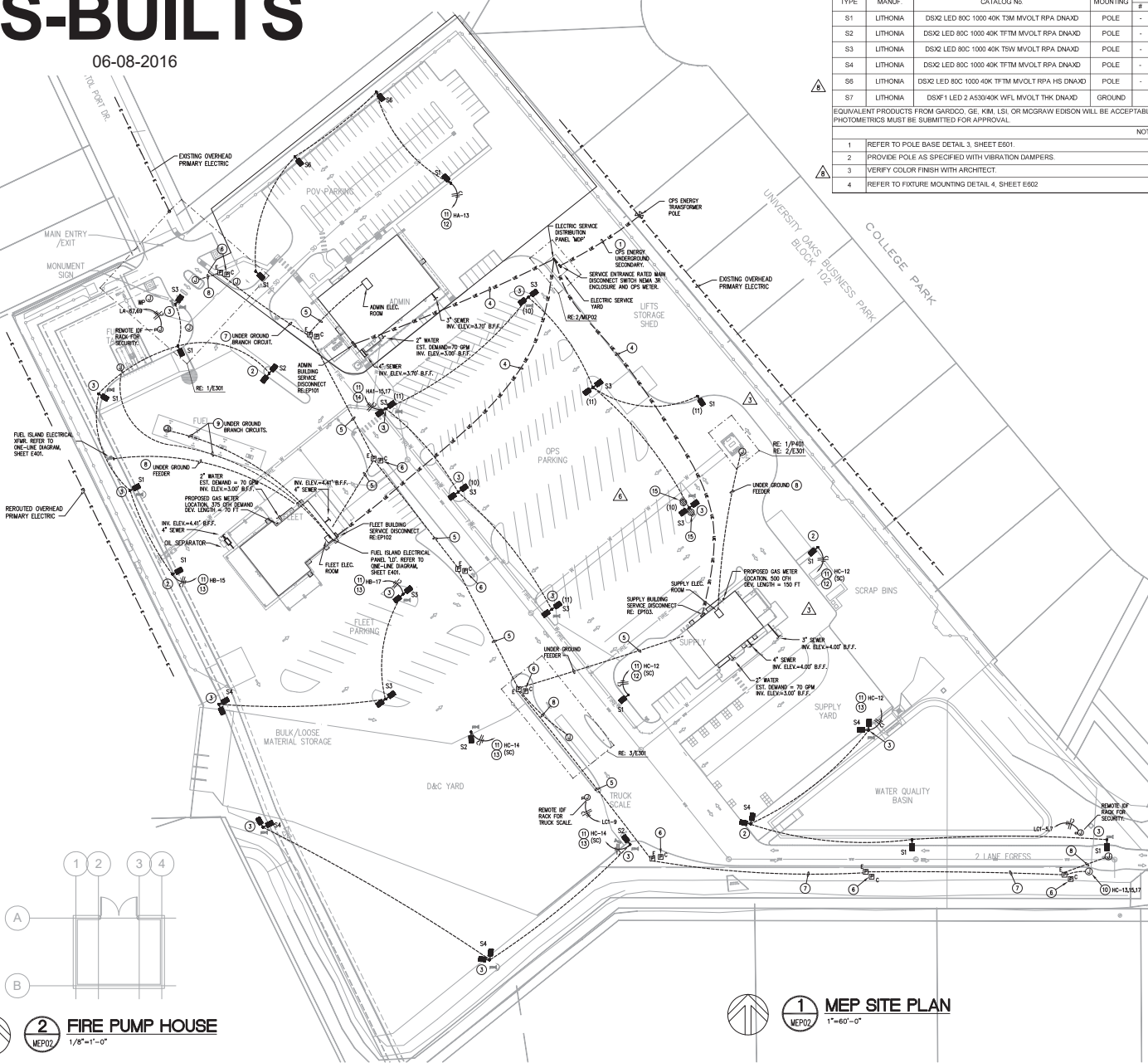
### ELECTRICAL LOAD SUMMARY

1. ADDITIONAL LOAD TO FLEET BLDG. (480V, 3PH)	
EXISTING DESIGN LOAD	165.90KVA
NEW LOAD: (100/208V, 3PH)	
JOCKEY PUMP (1 HP)	1.73KVA
HEATER	2.00KVA
LIGHTING	0.13KVA
RECEPTACLES	0.56KVA
TOTAL	172.90KVA
2. NEW SERVICE TO FIRE PUMP. (480V, 3PH)	
FIRE PUMP (60 HP)	63.9KVA
SPARE (200)	12.00KVA
TOTAL	75.90KVA
76.9KVA/831 = 208A @ 480V, 3PH; THEREFORE, THE EXISTING 400A SERVICE TO THE FLEET BLDG IS ADEQUATE.	
76.9KVA/831 = 92.5A x 1.25 = 115.6A @ 480V, 3PH.	
SERVICE FEEDER: 150A - 1Ø, #60ND, 1-1/2\"/>	

Panelboard FPH														
10,000 AIC Rating														
Existing														
X New														
120/208 Volt 3-Phase 4-Wire														
1 Section														
X MCO 0 AMP MCB														
X MLO 100 AMP BUS (Copper)														
1 -Nema Rating														
Notes	Load (VA)	Description	Type	Wire	CB	TRIP #	TRIP #	CB	Wire	Type	Description	Load (VA)	Notes	
1	576	JOCKEY PUMP (1 HP)	M	12	15/3	1	A	2	20/1	12	L LIGHTS AND RECEPTS	714		
	576		M	12	5	3	B	4	20/1	12	H EUH-1	1667	1	
	576		M	12	5	5	C	6	20/1	12	H	1667		
		SPARE		12	20/1	7	A	8	20/1	12	H	1667		
		SPARE		12	20/1	9	B	10	20/1	12	L	FIRE ALARM CNTRL PNL	400	1
		SPARE		12	20/1	11	C	12	12			SPACE		
		SPARE		13	A	14	30/3	10			SPD2			
		SPACE		15	B	16		10						
		SPACE		15	B	17	C	18						
	1,728	Subtotal										6,115		
N.E.C. (2011)														
Load Type	Conn.	Fct.	Diversity	N.E.C. (2011)	Load Type	Conn.	Fct.	Diversity						
220.44 (W) Recept	0	100%	0	220.12	(L) Lighting	1,114	125%	1,363						
220.56 (K) Kitchen	0	100%	0	220.12	(EL) Ext. Ltg	0	100%	0						
220.60 (C) Cooling	0	0%	0	620.14	(E) Elevators	0	100%	0						
220.60 (H) Heating	5,001	100%	5,001		(WH) Water Ht.	0	100%	0						
220.60 (F) Fans	0	100%	0	220.5	(M) Ltg. Mod.	0	125%	0						
630.11 (W) Welders	0	100%	0		(SP) Sub Panel	0	100%	0						
(M) Misc.	1,728	100%	1,728											
Total Connected Load =				7,843 VA =	21.8 AMPS	Location of Panel:		FIRE PUMP HOUSE						
Total Load (Diversified)=				8,122 VA =	22.6 AMPS	NOTES: 1. Provide handle locking device.								

# AS-BUILTS

06-08-2016



SITE LIGHTING FIXTURE SCHEDULE										
TYPE	MANUF	CATALOG No.	MOUNTING		VOLTAGE	INPUT W	MOUNTING HEIGHT	REMARKS	NOTES	
			#	TYPE						
S1	LITHONA	DSX2 LED 80C 1000 40K T3M MVOLT RPA DNAXD	POLE	-	LED	277	282	30'	WITH #RSP30-5.0-7-DNAXD-DM10-BC-VD	1,2,3
S2	LITHONA	DSX2 LED 80C 1000 40K T3M MVOLT RPA DNAXD	POLE	-	LED	277	282	30'	WITH #RSP30-5.0-7-DNAXD-DM10-BC-VD	1,2,3
S3	LITHONA	DSX2 LED 80C 1000 40K T3M MVOLT RPA DNAXD	POLE	-	LED	277	564	30'	WITH #RSP30-5.0-7-DNAXD-DM20-BC-VD	1,2,3
S4	LITHONA	DSX2 LED 80C 1000 40K T3M MVOLT RPA DNAXD	POLE	-	LED	277	564	30'	WITH #RSP30-5.0-7-DNAXD-DM20-BC-VD	1,2,3
S5	LITHONA	DSX2 LED 80C 1000 40K T3M MVOLT RPA DNAXD	POLE	-	LED	277	282	30'	WITH #RSP30-5.0-7-DNAXD-DM10-BC-VD	1,2,3
S6	LITHONA	DSX2 LED 80C 1000 40K T3M MVOLT RPA DNAXD	POLE	-	LED	277	282	30'	SAME AS S5 EXCEPT WITH HOUSE SIDE SHIELD.	1,2,3
S7	LITHONA	DSX1 LED 2 AS3040K WFL MVOLT THK DNAXD	GROUND	-	LED	277	37	AT GRADE		3,4

EQUIVALENT PRODUCTS FROM GARROD, GE, KIM, LSI, OR MCGRAW EDISON WILL BE ACCEPTABLE IF THEY MEET ALL CRITERIA FOR FIXTURE, POLE AND ACCESSORIES AS SPECIFIED. PHOTOMETRICS MUST BE SUBMITTED FOR APPROVAL.

NOTES:

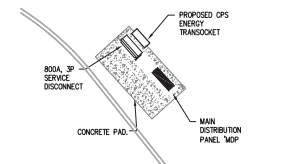
- REFER TO POLE BASE DETAIL 3, SHEET E601.
- PROVIDE POLE AS SPECIFIED WITH VIBRATION DAMPERS.
- VERIFY COLOR FINISH WITH ARCHITECT.
- REFER TO FIXTURE MOUNTING DETAIL 4, SHEET E602.

### ELECTRICAL GENERAL NOTES:

- COORDINATE WITH OPS ENERGY FOR NEW ELECTRIC SERVICE TO THREE BUILDINGS ON THIS SITE. CONTACT MR. BRIAN HARWOOD (210) 353-2288. REFER TO ELECTRICAL RISER DIAGRAMS SHEET E401.
- REFER TO TECHNOLOGY DRAWINGS (T- SERIES) FOR COMMUNICATIONS SERVICES AND DUCTBANK REQUIREMENTS. COMMUNICATIONS SHALL INCLUDE 2" CONDUITS FOR FIRE ALARM AND BUILDING EMCS.
- COORDINATE EXACT LOCATIONS OF PULL BOXES, LIGHTING STANDARDS, DUCTBANKS, AND EQUIPMENT WITH ACTUAL DIMENSIONS TAKEN IN THE FIELD AND OTHER UTILITIES.

### ELECTRICAL KEYED NOTES:

- NEW OPS ENERGY SERVICE. COORDINATE CONDUIT REQUIREMENTS WITH OPS ENERGY. REFER TO ONE-LINE DIAGRAM, SHEET E401.
- PROVIDE NEW POLE BASE PER DETAIL 3, SHEET E602 (TYP.)
- PROVIDE NEW POLE BASE WITH BASE MOUNTED PULL BOX PER DETAIL 3, SHEET E601.
- PROVIDE AND INSTALL FEEDER DUCTBANK TO BUILDING DISCONNECT SWITCH. REFER TO ONE-LINE DIAGRAM, SHEET E401 AND CONDUIT BURIAL DETAIL 11, SHEET E601.
- PROVIDE AND INSTALL ELECTRICAL DUCTBANK WITH (4) 2" CONDUITS FOR LIGHTING AND POWER DISTRIBUTION TO REMOTE FACILITIES (DE STATION, TRUCK SCALE, FUEL ISLAND, GATES). REFER TO PULL BOX DETAIL 11, SHEET E601.
- REFER TO TECHNOLOGY DRAWINGS FOR COMMUNICATIONS PULL BOX AND CONDUIT REQUIREMENTS.
- PROVIDE AND INSTALL TWO (2) 2" CONDUITS FOR ELECTRICAL SERVICES.
- PROVIDE AND INSTALL 1-1/2" CONDUIT FOR ELECTRICAL SERVICES.
- BRANCH CIRCUITS TO FUEL ISLAND AND/OR FUEL TANKS WITH SEAL-OFF FITTINGS AS REQUIRED. COORDINATE WITH PS VENDOR.
- PROVIDE AND INSTALL A 30A, 2P, FUSED, NEMA 3R DISCONNECT SWITCH ON FREE-STANDING SUPPORT RACK FOR GATE POWER. VERIFY EXACT LOCATION WITH GATE INSTALLER. BRANCH TO CONNECTION WITH GATE MOTOR OPERATOR 3/8" BROND, 1" C.
- TO CIRCUIT(S) INDICATED THROUGH PHOTOCELL CONTROLLED CONTACTOR.
- 1" - 2/8" #80ND.
- 1" - 2/8" #80ND.
- 1" - 3/8" #80ND.
- PROVIDE AND INSTALL A 50A, 20KV, TWISTLOCK RECEPTACLE AT POLE BASE (NON-NEMA HUBBELL #CS-636R; RECEPTACLE FOR HUBBELL PULL #CS-636A2). ROUTE TO POWER-SUPPLY-HOUSE 1" C WITH 3/8" BROND. PROVIDE RECEPTACLE IN NEMA 3R ENCLOSURE. TO NEW 50A, 2P BREAKER TO BE INSTALLED AT EXISTING PANEL 1B.
- RACK-MOUNT NEW POWER-SUPPLY-PANEL 4ATP ON FREE-STANDING RACK-SUPPORT.



**2 ENLARGED PLAN**  
1/8" = 1'-0"

**1 MEP SITE PLAN**  
1" = 60'-0"

**2 FIRE PUMP HOUSE**  
1/8" = 1'-0"



## NSOC NEW SERVICE CENTER PROJECT

CAPITAL PORT DRIVE SAN ANTONIO, TX



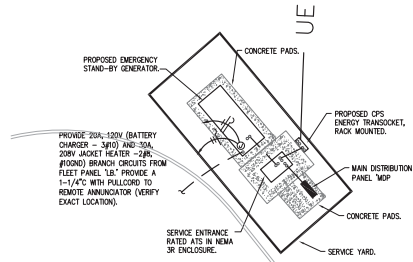
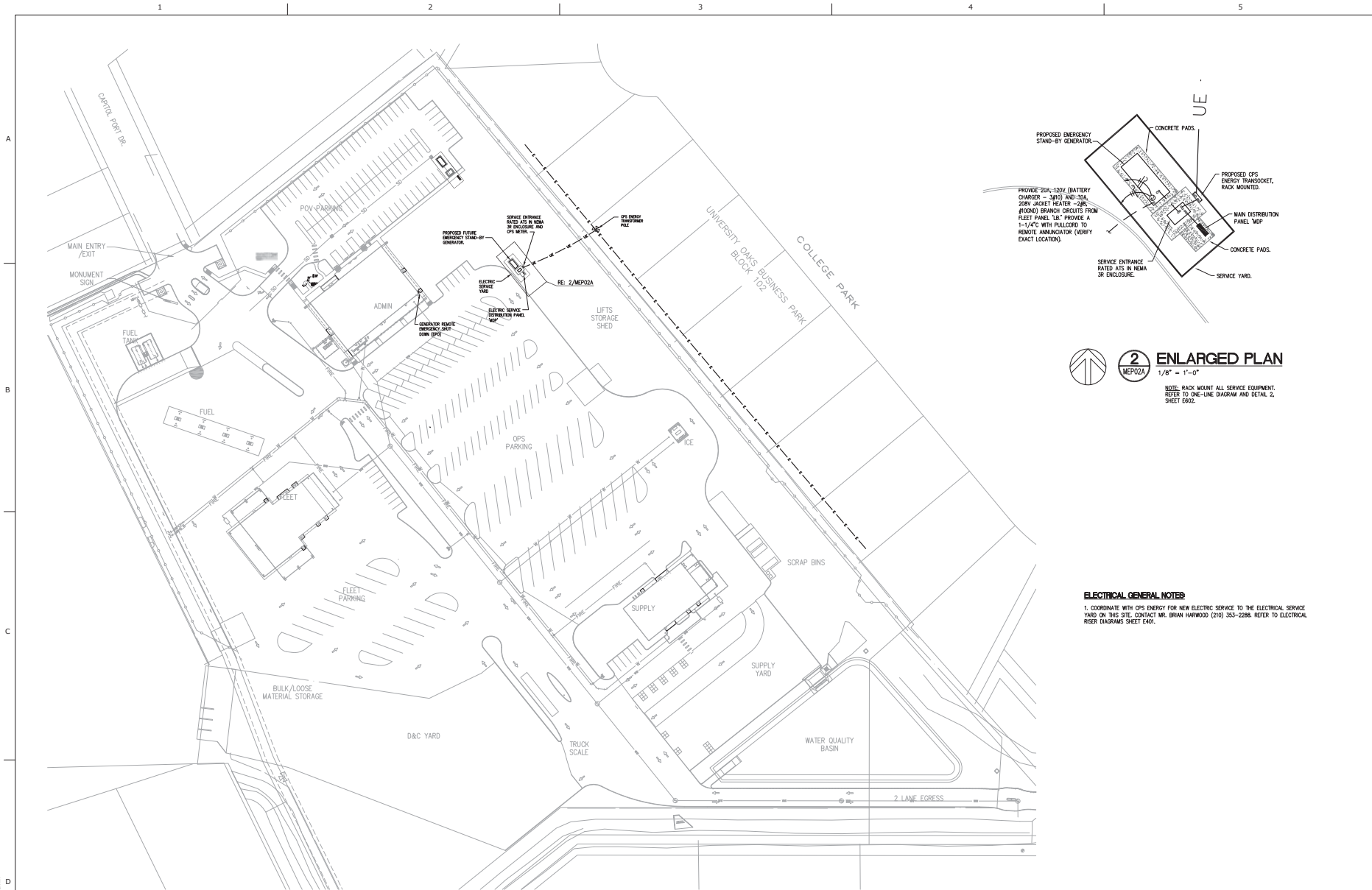
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Drawn	DBR
Checked	DBR
Date:	03/25/2015
PROJECT No.	14629
Revisions	
1	03/27/15 ADDENDUM 1
2	04/02/15 ADDENDUM 2
3	04/17/15 ADDENDUM 4
4	05/22/15 ARI No. 1
5	06/24/15 PR No. 1
6	06/24/15 PR No. 1 (GEN)
7	06/24/15 PR No. 1 (GEN)
8	06/24/15 PR No. 1 (GEN)
9	10/01/15 ARI No. 012
10	01/12/16 PR, 1P HOUSE

SHEET TITLE  
**MEP SITE PLAN**

SHEET NO.  
**MEP02**

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 User: jmorris



**2** ENLARGED PLAN  
 MEPO2A 1/8" = 1'-0"

NOTE: RACK MOUNT ALL SERVICE EQUIPMENT. REFER TO ONE-LINE DIAGRAM AND DETAIL 2, SHEET E602.

**ELECTRICAL GENERAL NOTES**  
 1. COORDINATE WITH OPS ENERGY FOR NEW ELECTRICAL SERVICE TO THE ELECTRICAL SERVICE YARD ON THIS SITE. CONTACT MR. BRIAN HARWOOD (710) 353-2266. REFER TO ELECTRICAL RISER DIAGRAMS SHEET E401.



**1** MEP SITE PLAN - GENERATOR  
 MEPO2A 1"=60'-0"

**AS-BUILTS**

06-08-2016

SHEET TITLE  
 MEP SITE PLAN - GENERATOR  
 SHEET NO.  
**MEP02A**

**Marmon Mok**  
 ARCHITECTURE 210-223-9492/F 210-223-2582/F  
 700 N. St. Mary's Suite 1600 San Antonio, TX 78205

**#DBR**  
 San Antonio Water System  
 2016-08-29/2015  
 PROJECT No. 14029

**NSOC NEW SERVICE CENTER PROJECT**  
 CAPITAL PORT DRIVE SAN ANTONIO, TX

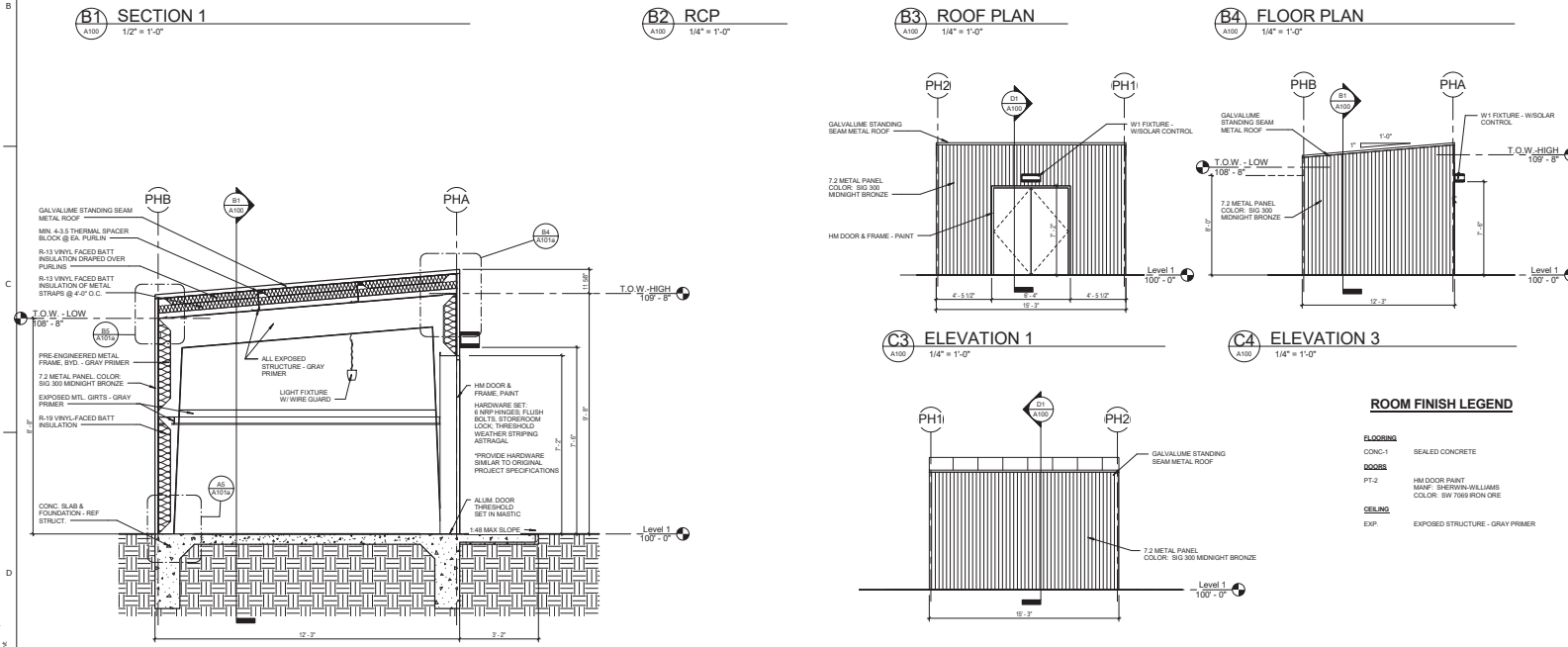
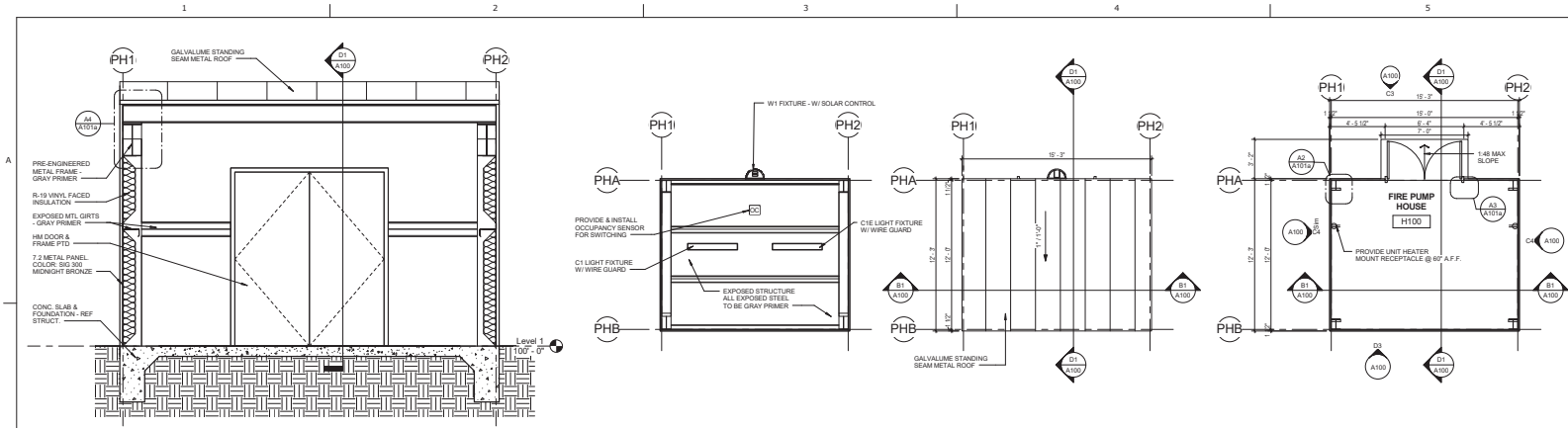


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 Date: 03/26/2015  
 PROJECT No. 14029

Revisions

1	03/27/15	ADDENDUM 1
2	04/02/15	ADDENDUM 2
3	04/17/15	ADDENDUM 4
4	05/22/15	ADD No. 1
5	06/24/15	PR No. 1
6	06/24/15	PR No. 2 (GEN)
7	06/24/15	PR No. 3 (GEN)
8	06/24/15	PR No. 4 (GEN)
9	10/01/15	ADD No. 012
10	04/12/16	PR, PP HOUSE



**ROOM FINISH LEGEND**

<b>FLOORING</b>	CONC-1	SEALED CONCRETE
<b>DOORS</b>	PT-2	HM DOOR PAINT MANF. SHERWIN-WILLIAMS COLOR: SW 7069 IRON ORE
<b>CEILING</b>	EXP	EXPOSED STRUCTURE - GRAY PRIMER

**Marmoni Mok**  
ARCHITECTURE 210.223.9492 F 210.223.2582 F  
700 N. ST. MARY'S SUITE 1600 SAN ANTONIO, TX 78205



**FIRE PUMP HOUSE**

SAWS OPERATIONS CENTERS



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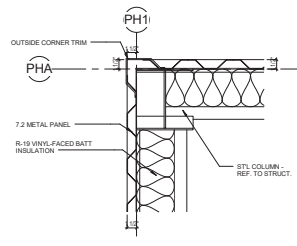
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Project No.: 14019  
Revisions:

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ELEVATIONS,  
SECTIONS**

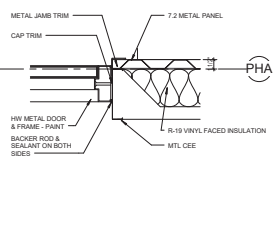
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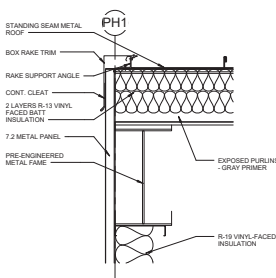




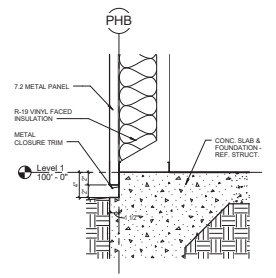
**A2** PLAN DETAIL  
A101a 1 1/2" = 1'-0"



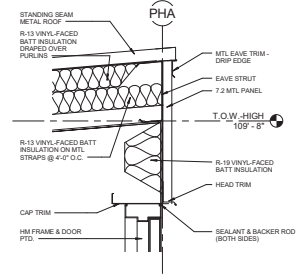
**A3** PLAN DETAIL  
A101a 1 1/2" = 1'-0"



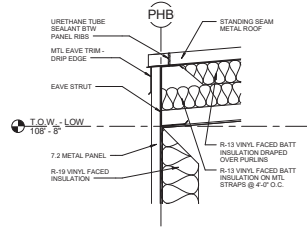
**A4** TOP OF WALL  
A101a 1 1/2" = 1'-0"



**A5** EXTERIOR WALL BASE  
A101a 1 1/2" = 1'-0"



**B4** ROOF EDGE DETAIL @ DOOR HEAD  
A101a 1 1/2" = 1'-0"



**B5** ROOF EDGE DETAIL  
A101a 1 1/2" = 1'-0"

**Marmon Mok**  
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**FIRE PUMP HOUSE**

SAWS OPERATIONS CENTERS



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PROJECT No. 14019  
Revisions:

SHEET TITLE  
**DETAILS**

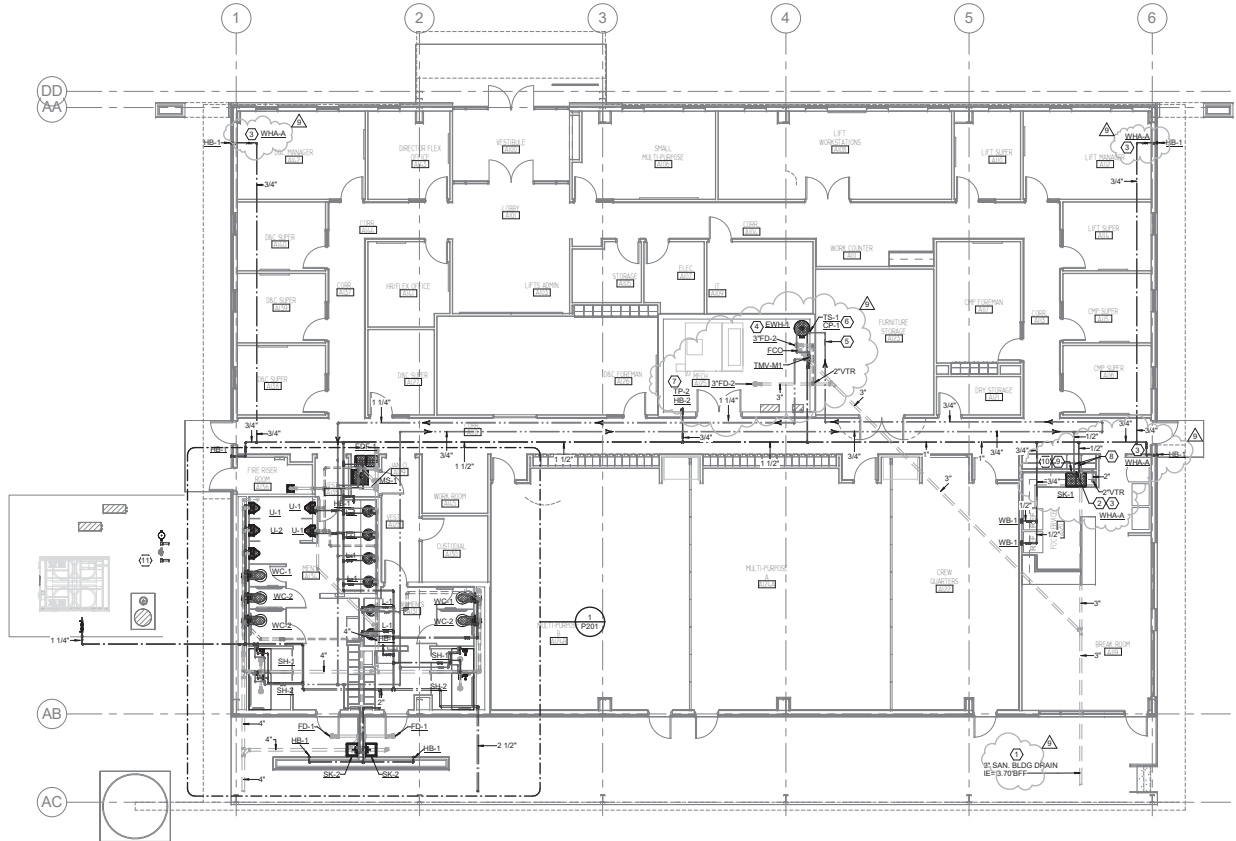
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**PLUMBING KEYED NOTES:**

- ① REFER TO CIVIL SITE PLAN FOR CONTINUATION. CONTRACTOR TO BE RESPONSIBLE FOR COORDINATION, VERIFICATION AND CONNECTION OF ALL UTILITIES TO SITE UTILITY STUB-OUTS.
- ② COLD AND HOT WATER DROPS TO FIXTURES OR EQUIPMENT. SIZES AS NOTED. PROVIDE WATER HAMMER ARRESTORS AS INDICATED. REFER TO FILLING RISER DIAGRAM FOR CONTINUATION IN WALL OR CHASE AND TO FOOD SERVICE DRAWINGS FOR EQUIPMENT ROUGH-IN REQUIREMENTS.
- ③ WATER HAMMER ARRESTOR, SIZE AS NOTED. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE WALL/CEILING. PANEL SHALL BE 12"X12" PAINTED TO MATCH WALL/CEILING.
- ④ ELECTRIC WATER HEATER, REFER TO XPL-02 FOR DETAIL.
- ⑤ HOT WATER CIRCULATING SYSTEM BALANCING VALVE.
- ⑥ 3/4" HOT WATER RETURN DROP TO CIRCULATING PUMP (SB-1) WITH TIME SWITCH (TS-1); SEE DETAIL 4PA-2.
- ⑦ 3/4" CW DN TO HOSE BIB (SB-3) AND TRAP PRIMER (TP-2). INSTALL HOSE BIBB, 30" A.F.F. AND TRAP PRIMER DEVICE WITH DISTRIBUTION UNIT AS REQUIRED. PROVIDE TRAP REFL. SUPPLY TO FLOOR DRAINS AT MECHANICAL ROOM USING JUMPS NO. 1023, OR EQUAL. TRAP PRIMER CONNECTION ADAPTER.
- ⑧ BALL VALVE ABOVE CEILING. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE CEILING. PANEL SHALL BE 12"X12" PAINTED TO MATCH CEILING.
- ⑨ PROVIDE LAVATORY SINK WITH POINT OF USE THERMOSTATIC MIXING VALVE (TMV-1) WITH INLET CHECK STOPS. SET AT 105°F. INSTALL BELOW LAVATORY AS HIGH AS POSSIBLE. TYPICAL FOR ALL LAVATORIES AND SINKS.
- ⑩ DISPOSER WASTE WITH CLEAN OUT.
- ⑪ PROVIDE THERMOM OR APPROVED EQUAL. 20V HEAT TRACE TAPE ON EXPOSED PIPING.

1 Plumbing Plan - Admin Bldg  
P101 1/8" = 1'-0"



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Revisions:  
3 04/17/15 ADDENDUM 4  
9 10/01/15 ASI No. 012

**AS-BUILTS**

06-08-2016

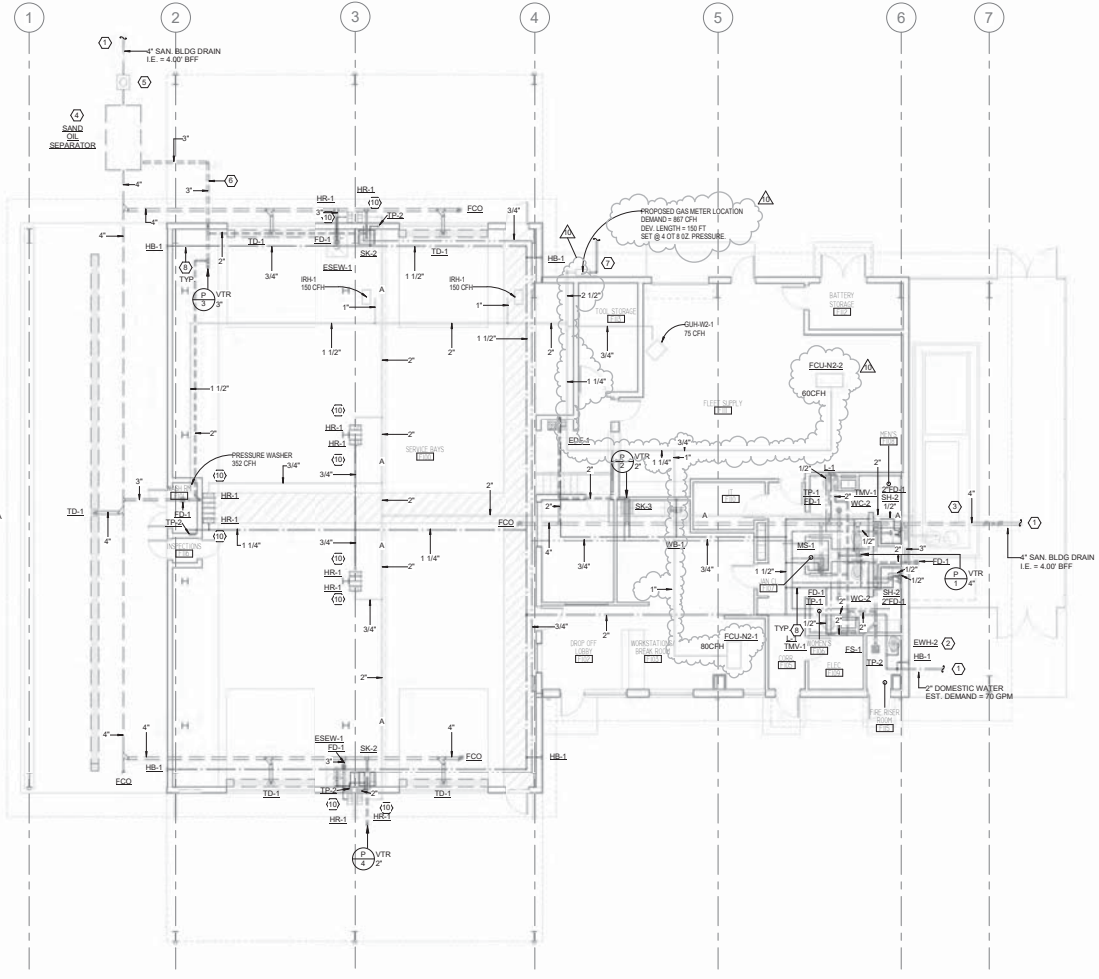
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Plumbing Plan - Admin Bldg

SHEET NO.  
**P101**

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1 2 3 4 5



**1** PLUMBING PLAN - FLEET BLDG  
 P102 1/8" = 1'-0"

- NOTE:**  
 DRAWING IS DIAGRAMMATIC ONLY. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF PIPING, DEVICES AND EQUIPMENT WITH BUILDING ELEMENTS AND THE WORK OF OTHER TRADES. REFER TO RISER DIAGRAMS FOR ADDITIONAL SIZING INFORMATION AND REQUIREMENTS.
- PLUMBING KEYED NOTES:**
- ① REFER TO CIVIL SITE UTILITY PLAN FOR CONTINUATION; CONTRACTOR TO BE RESPONSIBLE FOR COORDINATION, VERIFICATION AND CONNECTION OF ALL UTILITIES TO SITE UTILITY SUB-OUTS.
  - ② ELECTRIC WATER HEATER. SEE DETAIL XP501.
  - ③ COMPRESSED AIR SYSTEM, BY OTHERS
  - ④ OIL INTERCEPTOR. EQUAL TO PARK ENGINEERING SOCMPI500. SEE DETAIL 8P501.
  - ⑤ SAMPLE WELL BASIN EQUAL TO PARK SWB-154. SEE DETAIL 9P501.
  - ⑥ VENT FROM OIL INTERCEPTOR, CONNECT TO VENT SYSTEM AS SHOWN.
  - ⑦ HIGH PRESSURE GAS MAIN AND GAS METER ASSEMBLY BY LOCAL UTILITY COMPANY. CONTRACTOR IS RESPONSIBLE FOR ALL COST/FEE'S ASSOCIATED WITH GAS SERVICE.
  - ⑧ BALL VALVE ABOVE CEILING. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE CEILING. PANEL SHALL BE 12"X12" PAINTED TO MATCH CEILING. PROVIDE MARKING OF VALVE LOCATION ALONG THE CEILING TILE.
  - ⑨ WATER HAMMER ARRESTOR. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE CEILING. PANEL SHALL BE 12"X12" PAINTED TO MATCH WALL/CEILING.
  - ⑩ 3/4" CW/DW DOWN TO HOSE REEL. SEE DETAIL XP501.
  - ⑪ 1 1/2" CW DROP TO EMERGENCY SHOWER WITH EYEWASH.
  - ⑫ 3/4" CW DROP TO PRESSURE WASHER. PLUMBER TO MAKE FINAL CONNECTIONS TO EQUIPMENT.

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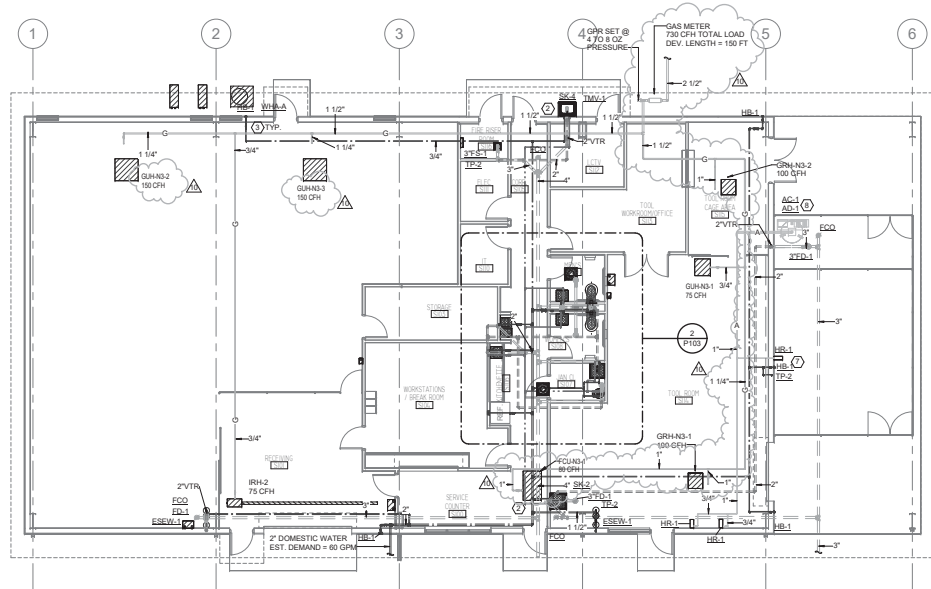


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 Revisions:  
 2 04/02/15 ADDENDUM 2  
 3 04/17/15 ADDENDUM 4  
 4 05/22/15 ASR No. 1  
 10 11/19/15 PR\_PLUMBING

**AS-BUILTS**  
 06-08-2016

SHEET TITLE  
**PLUMBING PLAN - FLEET BLDG**  
 SHEET NO.  
**P102**

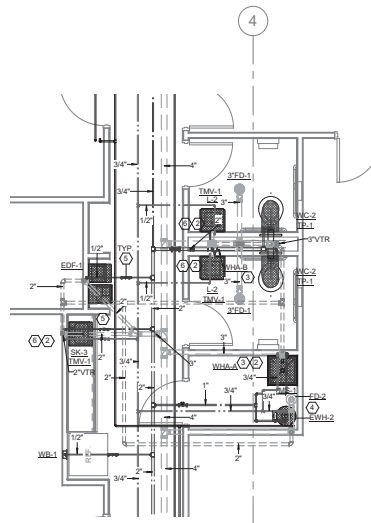




**PLUMBING KEYED NOTES:**

- ① REFER TO CIVIL SITE PLAN FOR CONTINUATION CONTRACTOR TO BE RESPONSIBLE FOR COORDINATION, VERIFICATION AND CONNECTION OF ALL UTILITIES TO SITE UTILITY STUB-OUTS.
- ② COLD AND HOT WATER DROPS TO FIXTURES OR EQUIPMENT. SIZES AS NOTED. PROVIDE WATER HAMMER ARRESTORS AS INDICATED. REFER TO PLUMBING RISER DIAGRAM FOR CONTINUATION IN WALL OR CHASE AND TO FOOD SERVICE DRAWINGS FOR EQUIPMENT ROUGH-IN REQUIREMENTS.
- ③ WATER HAMMER ARRESTOR, SIZE AS NOTED. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE WALL/CEILING. PANEL SHALL BE 12"x12" PAINTED TO MATCH WALL/CEILING.
- ④ ELECTRIC WATER HEATER. REFER TO 11/9501 FOR DETAIL.
- ⑤ BALL VALVE ABOVE CEILING. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE CEILING. PANEL SHALL BE 12"x12" PAINTED TO MATCH CEILING.
- ⑥ PROVIDE LAVATORY/SINK WITH POINT OF USE THERMOSTATIC MIXING VALVE (TM-1) WITH INLET CHECK STOPS. SET AT 105°F. INSTALL BELOW LAVATORY DRY AS HIGH AS POSSIBLE. TYPICAL FOR ALL LAVATORIES AND SINKS.
- ⑦ 3/4" AIR DOWN. PROVIDE ONE HR-1 HOSE REEL FOR AIR.
- ⑧ INSTALL ALL EQUIPMENT AS PER MANUFACTURER'S DETAILS AND RECOMMENDATIONS.

**1 Plumbing Plan - Supply Bldg**  
P103 1/8" = 1'-0"



**2 ENLARGED PLUMBING PLAN - SUPPLY BLDG**  
P103 1/4" = 1'-0"



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2 04/03/15 ADDENDUM 2  
3 04/17/15 ADDENDUM 4  
9 10/01/15 ASI No. 012  
10 11/19/15 PR\_PLUMBING

**AS-BUILTS**

06-08-2016

SHEET TITLE  
**PLUMBING PLAN - SUPPLY BLDG**

SHEET NO.  
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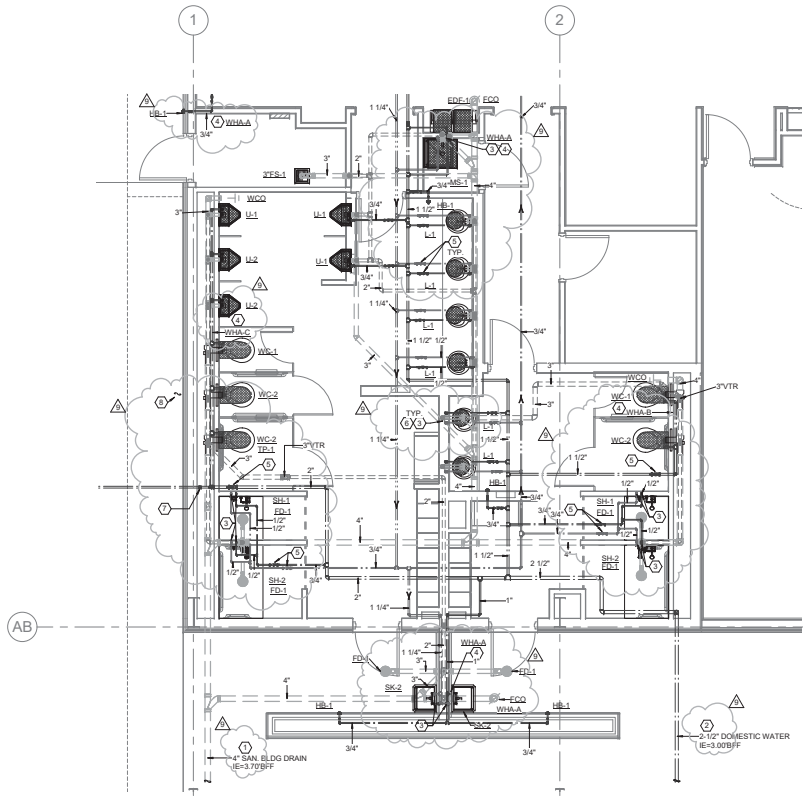
1 2 3 4 5

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**1** Enlarged Plumbing Plan - Admin Bldg  
P201 1/4" = 1'-0"

- PLUMBING KEYED NOTES:**
- REFER TO CIVIL SITE PLAN FOR CONTINUATION. CONTRACTOR TO BE RESPONSIBLE FOR COORDINATION, VERIFICATION AND CONNECTION OF ALL UTILITIES TO SITE UTILITY STUB-OUTS.
  - DOMESTIC WATER SERVICE ENTRY.
  - COLD AND HOT WATER DROPS TO FIXTURES OR EQUIPMENT. SIZES AS NOTED. PROVIDE WATER HAMMER ARRESTORS AS INDICATED. REFER TO PLUMBING RISER DIAGRAM FOR CONTINUATION IN WALL OR CHASE AND TO FOOD SERVICE DRAWINGS FOR EQUIPMENT ROUGH-IN REQUIREMENTS.
  - WATER HAMMER ARRESTOR. SIZE AS NOTED. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE WALL/CEILING. PANEL SHALL BE 12"x12" PAINTED TO MATCH WALL/CEILING.
  - BALL VALVE ABOVE CEILING. PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE CEILING. PANEL SHALL BE 12"x12" PAINTED TO MATCH CEILING.
  - PROVIDE LAVATORY SINK WITH POINT OF USE THERMOSTATIC MIXING VALVE (TMV) WITH INLET CHECK STOPS. SET AT 109°F. INSTALL BELOW LAVATORY AS HIGH AS POSSIBLE. TYPICAL FOR ALL LAVATORIES AND SINKS.
  - 1-1/4" CW DN TO BELOW SLAB. EXTEND TO CHILLER YARD FOR SERVICE TO MECHANICAL EQUIPMENT MAKE-UP WATER SYSTEM.
  - 1-1/4" CW FOR MECHANICAL SYSTEMS MAKE-UP WATER. COORDINATE ALL CONNECTIONS WITH MECHANICAL CONTRACTOR. PROVIDE BACKFLOW PREVENTER. INSTALL 42" AFF.



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2 04/03/15 ADDENDUM 2  
3 04/17/15 ADDENDUM 4  
5 05/22/15 ASI No. 1  
9 10/01/15 ASI No. 012

**AS-BUILTS**

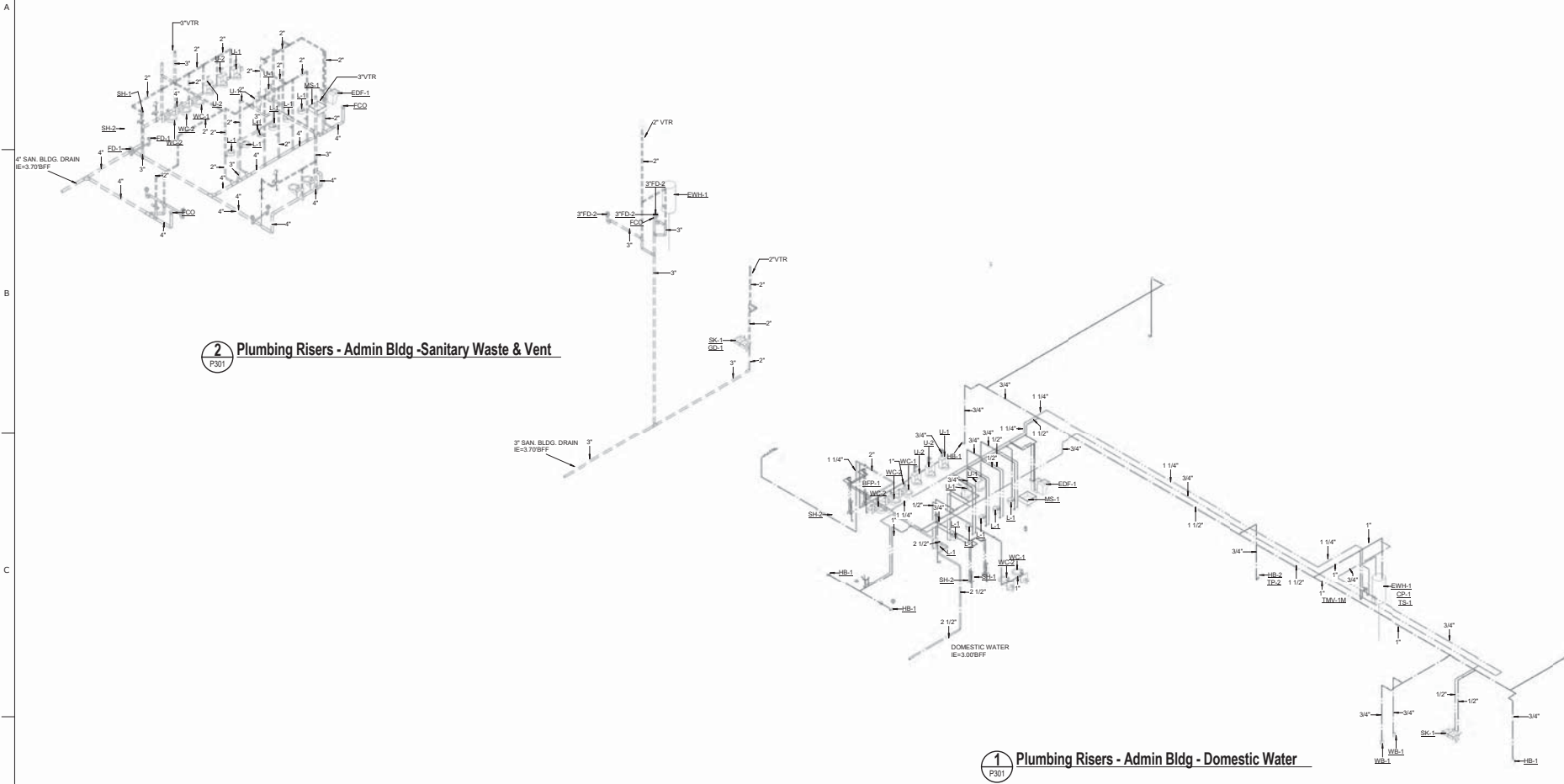
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SHEET TITLE  
**Enlarged Plumbing Plan - Admin Bldg**

SHEET NO.  
**P201**

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1 2 3 4 5



2 Plumbing Risers - Admin Bldg - Sanitary Waste & Vent

1 Plumbing Risers - Admin Bldg - Domestic Water



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SHEET TITLE  
**Plumbing Risers - Admin Bldg**

SHEET NO.  
**P301**

**AS-BUILTS**

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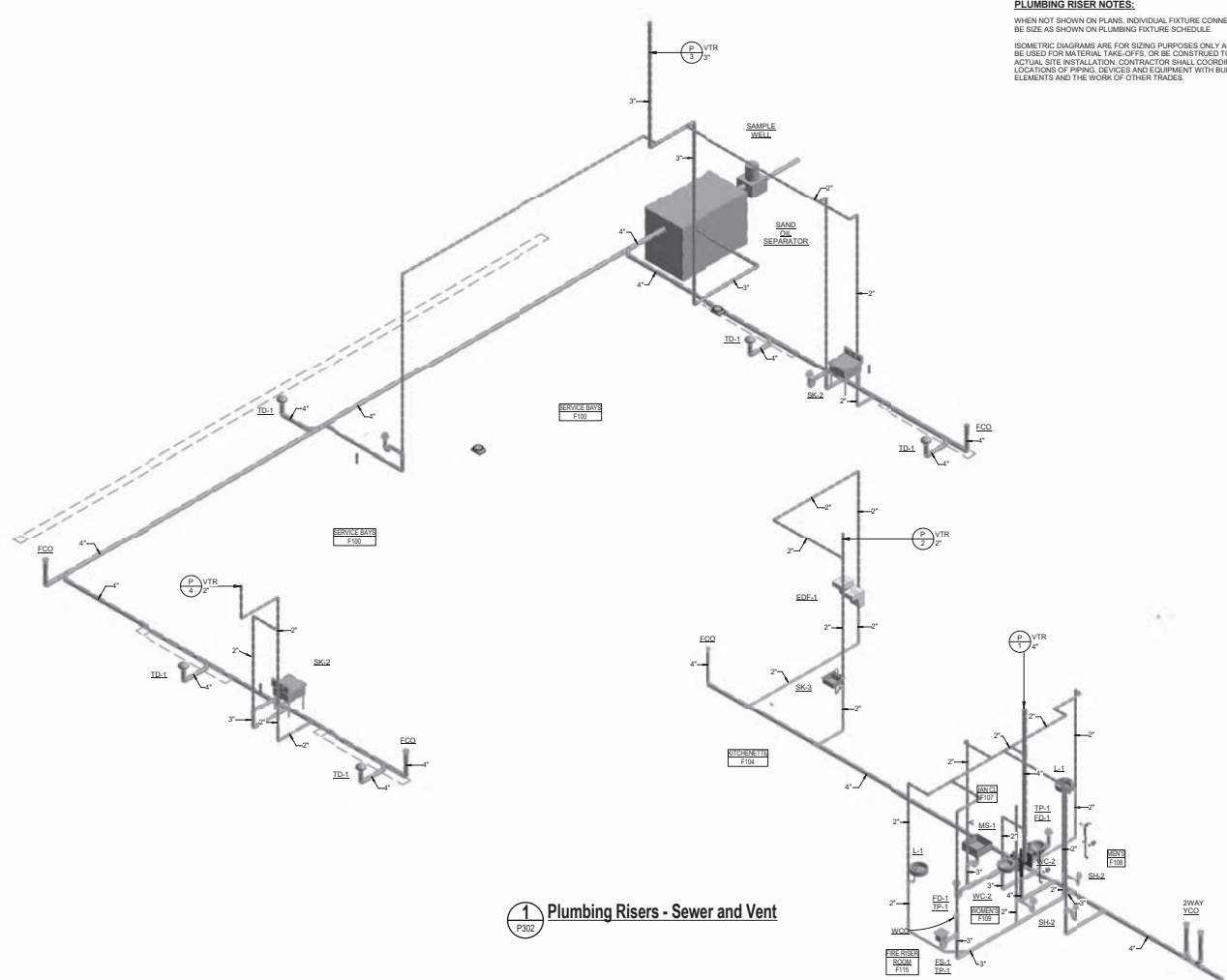
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**PLUMBING RISER NOTES:**  
 WHEN NOT SHOWN ON PLANS, INDIVIDUAL FIXTURE CONNECTIONS SHALL BE SIZE AS SHOWN ON PLUMBING FIXTURE SCHEDULE.  
 ISOMETRIC DIAGRAMS ARE FOR SIZING PURPOSES ONLY AND SHALL NOT BE USED FOR MATERIAL TAKE-OFFS. OR BE CONSIDERED TO INDICATE ACTUAL SITE INSTALLATION. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF PIPING, DEVICES AND EQUIPMENT WITH BUILDING ELEMENTS AND THE WORK OF OTHER TRADES.

**Plumbing Risers - Sewer and Vent**

# AS-BUILTS

06-08-2016

**MarmonMok**  
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 2015 State Professional Seal No. 2594  
 DBR Registration Number: 14027/2000

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 2 04/02/15 ADDENDUM 2

SHEET TITLE  
**Plumbing Risers - Sewer and Vent**

SHEET NO.  
**P302**

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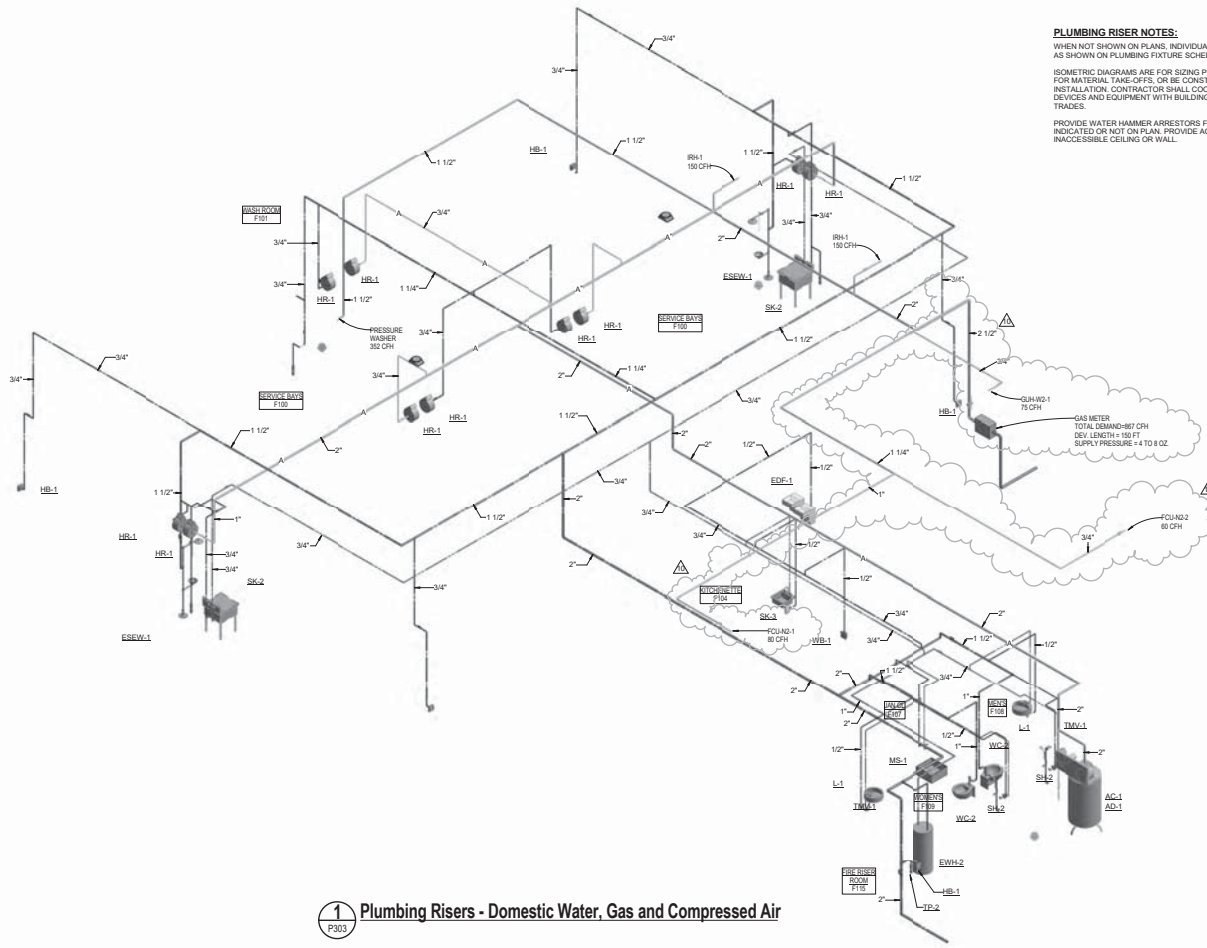
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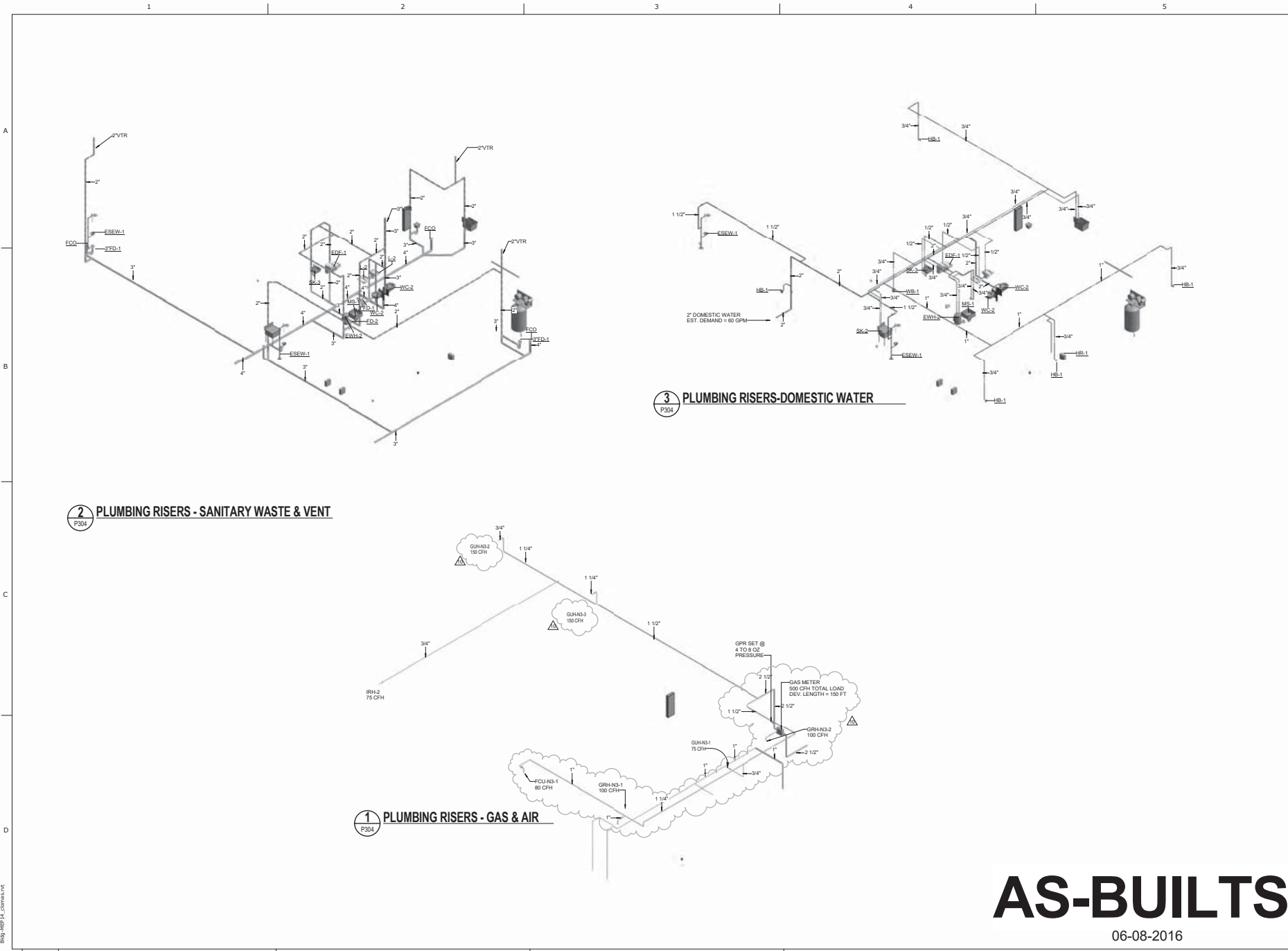
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**PLUMBING RISER NOTES:**  
 WHEN NOT SHOWN ON PLANS, INDIVIDUAL FIXTURE CONNECTIONS SHALL BE SIZE AS SHOWN ON PLUMBING FIXTURE SCHEDULE.  
 ISOMETRIC DIAGRAMS ARE FOR SIZING PURPOSES ONLY AND SHALL NOT BE USED FOR MATERIAL TAKE-OFFS, OR BE CONSTRUED TO INDICATE ACTUAL SITE INSTALLATION. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF PIPING, DEVICES AND EQUIPMENT WITH BUILDING ELEMENTS AND THE WORK OF OTHER TRADES.  
 PROVIDE WATER HAMMER ARRESTORS FOR EACH GROUP OF FIXTURES WHETHER INDICATED OR NOT ON PLAN. PROVIDE ACCESS PANEL WHERE LOCATED IN INACCESSIBLE CEILING OR WALL.

1 Plumbing Risers - Domestic Water, Gas and Compressed Air  
 P303

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**2 PLUMBING RISERS - SANITARY WASTE & VENT**  
 P304

**1 PLUMBING RISERS - GAS & AIR**  
 P304

**3 PLUMBING RISERS-DOMESTIC WATER**  
 P304

**AS-BUILTS**  
 06-08-2016

SHEET TITLE  
**PLUMBING RISERS**  
 - SUPPLY BLDG

SHEET NO.  
**P304**

**NSOC NEW SERVICE**  
**CENTER PROJECT**  
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 2 04/03/15 ADDENDUM 2  
 10 11/19/15 PR\_PLUMBING



**MarmonMok**  
 ARCHITECTURE 210-223-9492 F 210-223-2582 P  
 700 N. St. Mary's Suite 1600 San Antonio, TX 78205

GENERAL NOTE - PLUMBING FIXTURES

- 1. MOUNTING ELEVATION OF ALL HANG OR COUNTER MOUNTED FIXTURES SHALL BE COORDINATED WITH ARCHITECTURE... 2. FOR ALL FIXTURES AND EQUIPMENT WITH ASSOCIATED TRAP COMPONENT ACCESSIBLE PROVIDED UNDER SEPARATE DIVISIONS AND REQUIRING PLUMBING CONNECTIONS...

PLUMBING FIXTURE SCHEDULE table with columns: PLAN MARK, MINIMUM ROUGH-IN SIZES (W, DRAIN, C, W, H, V), DESCRIPTION. Includes items like TRAP PRIMER, TIME SWITCH, BACKFLOW PREVENTOR, SINK, etc.

EQUIPMENT FIXTURE SCHEDULE table with columns: PLAN MARK, DESCRIPTION. Includes items like AIR COMPRESSOR, HOSE REEL, AIR DRYER, HOSE REEL.

WATER HEATER SCHEDULE table with columns: MARK, RECOVERY, STORAGE, LEAVING WTR TEMP, INPUT (KW, VOLT, PH), MODEL, NOTES. Includes items like EWH-1, EWH-2, EWH-3.

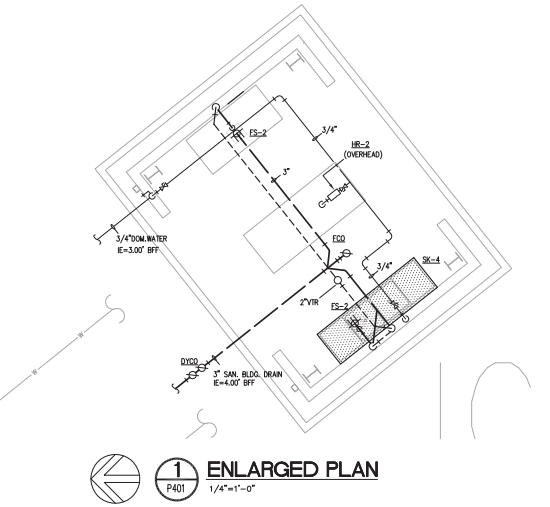
PLUMBING FIXTURE SCHEDULE table with columns: PLAN MARK, MINIMUM ROUGH-IN SIZES (W, DRAIN, C, W, H, V), DESCRIPTION. Includes items like WATER CLOSET, URINAL, LAVATORY, SINK, SHOWER, EMERGENCY SHOWER, GARBAGE DISPOSER, THERMOSTATIC MINGING VALVE, etc.

PLUMBING GENERAL PLAN NOTES:

- (A) DRAINAGE PIPING INVERT ELEVATIONS NOTED ON FLOOR PLANS AS: INV. CL. = 0.00' BFF ARE BELOW FINISHED FLOOR TAKEN FROM FIRST FLOOR FINISHED ELEVATION OF 0.00' TO FINISH BOTTOM OF PIPE... (B) PLUMBER SHALL VERIFY EXIST BUILDING FINISH FLOOR ELEVATION AND THE INVERT ELEVATION OF ALL DRAIN LINES...

SHOCK ARRESTOR SCHEDULE table with columns: P.D.L. SYMBOL, FIXTURE UNITS, SIZE. Includes items like (A) 1-11, (B) 12-32, (C) 33-60, (D) 61-113, (E) 114-154, (F) 155-330.

PLUMBING DIAGRAMS ILLUSTRATE SHOCK ARRESTORS AND AIR CHAMBERS FOR FIXTURES WITH CONNECTIONS TO AIR CHAMBERS WHERE USED... SHOCK ARRESTORS SHALL HAVE LIFETIME WARRANTY AND SHALL BE CERTIFIED BY THE MANUFACTURER TO BE SUITABLE FOR INSTALLATION WITHOUT REQUIREMENT FOR ACCESS DOORS.



ENLARGED PLAN 1/4"=1'-0"

AS-BUILTS

06-08-2016



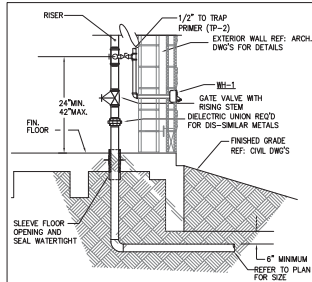
NSOC NEW SERVICE CENTER PROJECT CAPITAL PORT DRIVE SAN ANTONIO, TX



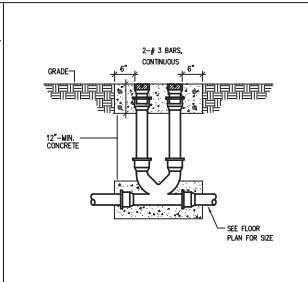
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SHEET TITLE PLUMBING SCHEDULES

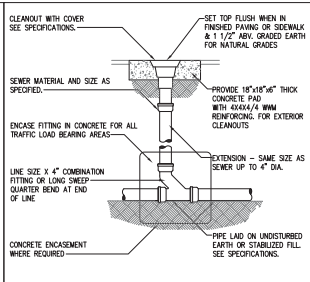
P401



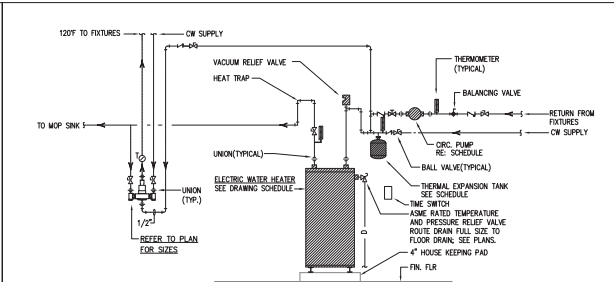
1 DOMESTIC WATER ENTRY DETAIL  
NOT TO SCALE



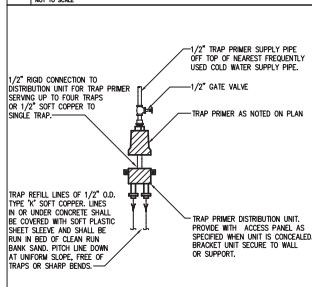
2 TWO-WAY YARD CLEAN-OUT  
NOT TO SCALE



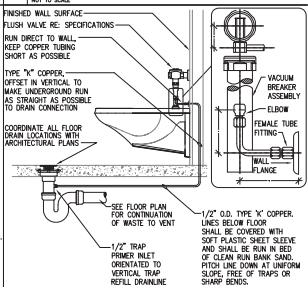
3 CLEAN-OUT DETAIL  
NOT TO SCALE



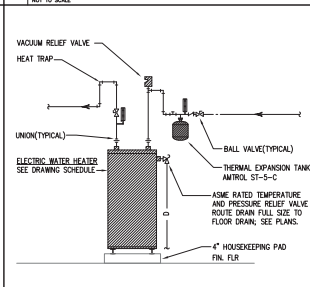
4 ELECTRIC WATER HEATER DETAIL WITH TMV  
NOT TO SCALE



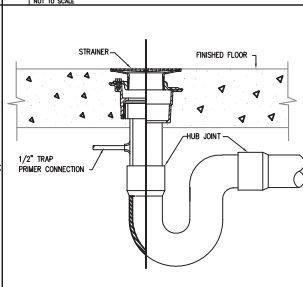
5 TRAP PRIMER DETAIL (TP-2)  
NOT TO SCALE



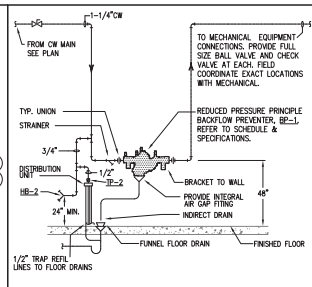
6 TRAP PRIMER DETAIL (TP-1)  
NOT TO SCALE



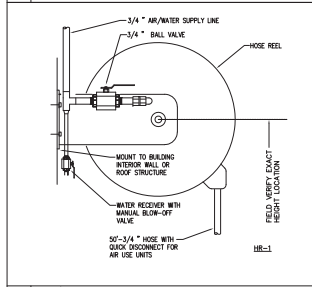
7 ELECTRIC WATER HEATER DETAIL  
NOT TO SCALE



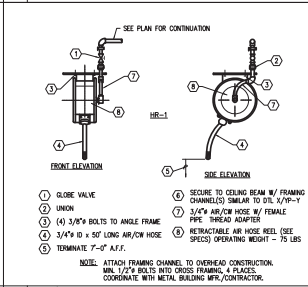
8 FLOOR DRAIN DETAIL  
NOT TO SCALE



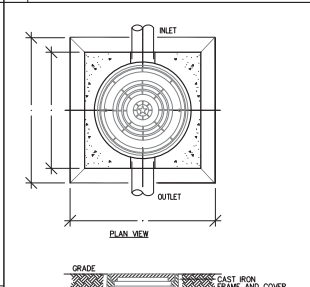
9 BACKFLOW PREVENTER DETAIL (BFP-1)  
NOT TO SCALE



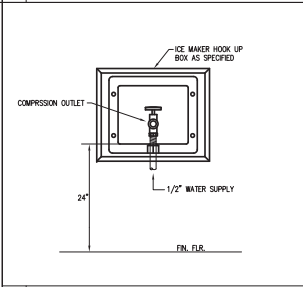
10 AIR/WATER HOSE REEL MOUNTING  
NOT TO SCALE



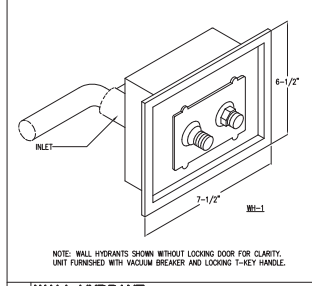
11 AIR/WATER HOSE REEL MOUNTING  
NOT TO SCALE



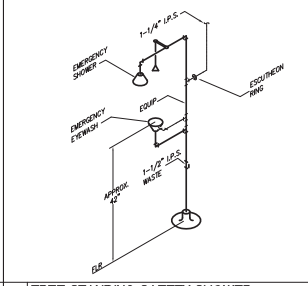
12 ICE MAKER SUPPLY BOX DETAIL (WB-1)  
NOT TO SCALE



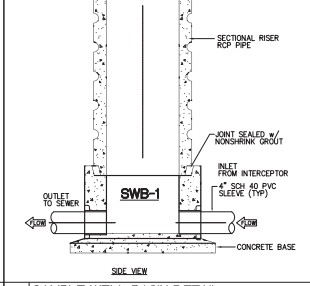
13 SAND-OIL SEPARATOR  
NOT TO SCALE



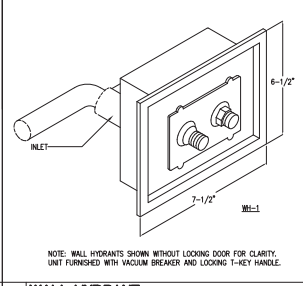
14 WALL HYDRANT  
NOT TO SCALE



15 FREE STANDING SAFETY SHOWER  
NOT TO SCALE



16 SAMPLE WELL BASIN DETAIL  
NOT TO SCALE



17 WALL HYDRANT  
NOT TO SCALE

AS-BUILTS

06-08-2016

MarmonMok  
ARCHITECTURE 210.233.9493 T 210.223.2582 F  
700 N. St. Mary's Suite 1600 San Antonio, TX 78205

#DBR  
San Antonio Water System  
16027000  
DATE: 06/08/2016  
USER: JCS

NSOC NEW SERVICE  
CENTER PROJECT  
CAPITAL PORT DRIVE SAN ANTONIO, TX

San Antonio Water System

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Date: 03/29/2015  
PROJECT NO: 14019  
Revisions:  
1: 08/22/15 ADDENDUM 1  
2: 04/02/15 ADDENDUM 2  
3: 04/13/15 ADDENDUM 4  
4: 08/22/15 ASI No. 1  
5: 08/24/15 PR No. 1  
6: 08/24/15 PR No. 2 (GEN)  
7: 08/24/15 PR No. 3 (GEN)  
8: 08/28/15 FLAG POLE  
9: 10/01/15 ASI No. 012  
10: 01/12/16 PR, PP, HOUSE

SHEET TITLE  
PLUMBING  
DETAILS

SHEET NO.  
P501

9/19/2014 7:21:13 AM  
C:\Users\jmarmon\Documents\14626 Admin  
Bldg MEP PLumbing.rvt



ABBREVIATIONS

Table with columns A, H, S, I, J, K, L. Contains abbreviations for Air Conditioning, Heating, Supply Air, etc.

Table with columns H, S, I, J, K, L. Contains abbreviations for Heating, Air Conditioning, Supply Air, etc.

Table with columns S, I, J, K, L. Contains abbreviations for Supply Air, Instrumentation, etc.

MOTORS AND CONTROLS

Table of motor and control symbols with descriptions like 'SINGLE/THREE PHASE MOTOR', 'ELECTRIC DUCT HEATER', etc.

RECEPTACLES AND OUTLETS

Table of receptacle and outlet symbols with descriptions like 'DUPLEX WALL RECEPTACLE', 'FLOOR MOUNTED RECEPTACLE', etc.

ELECTRICAL EQUIPMENT

Table of electrical equipment symbols with descriptions like 'DISTRIBUTION PANEL', 'PANELBOARD', 'TRANSFORMER', etc.

LIGHTING

Table of lighting symbols with descriptions like '2x4' FLUORESCENT OR LED LIGHT FIXTURE', 'CEILING MOUNTED EXIT SIGN', etc.

RACEWAYS AND WIRING

Table of raceway and wiring symbols with descriptions like 'HATCH MARKS INDICATE NUMBER OF CONDUCTORS', 'CONDUIT CONCEALED IN WALL OR CEILING', etc.

MISCELLANEOUS

Table of miscellaneous symbols with descriptions like 'INDICATES WALL MOUNTED WHEN ATTACHED TO ANY SYMBOL', 'KEYED NOTE REFERENCE', etc.

ELECTRICAL SYMBOLS

ONE LINE AND RISER DIAGRAMS

Table of electrical symbols for one-line and riser diagrams with descriptions like 'TRANSFORMER, TYPE & RATINGS AS NOTED', 'CURRENT TRANSFORMER', etc.

FIRE ALARM

Table of fire alarm symbols with descriptions like 'REFER TO FIRE PROTECTION DRAWINGS FOR FIRE ALARM SYMBOLS', 'HORN/TO PANEL WITH CIRCUIT NUMBER(S) INDICATED', etc.

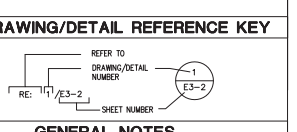
SECURITY

Table of security symbols with descriptions like 'REFER TO TECHNOLOGY DRAWINGS FOR SECURITY SYMBOLS', 'CONDUIT CONCEALED IN WALL OR CEILING', etc.

COMMUNICATIONS

Table of communications symbols with descriptions like 'REFER TO TECHNOLOGY DRAWINGS FOR COMMUNICATIONS SYMBOLS', 'CONDUIT OR CABLE, WHERE "X"', etc.

DRAWING/DETAIL REFERENCE KEY



GENERAL NOTES

- 1. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.
2. REFER TO SPECIFICATIONS FOR ALL MOUNTING HEIGHTS, MOUNTING HEIGHT STATED IN SPECIFICATIONS TAKE PRECEDENCE TO HEIGHTS STATED ON THIS SHEET.

SWITCHES

Table of switch symbols with descriptions like 'ALL SWITCHES SHALL BE MOUNTED AT 42" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED', '\$ SWITCH, SPST', etc.

FIRE ALARM

Table of fire alarm symbols with descriptions like 'REFER TO FIRE PROTECTION DRAWINGS FOR FIRE ALARM SYMBOLS', 'HORN/TO PANEL WITH CIRCUIT NUMBER(S) INDICATED', etc.

SECURITY

Table of security symbols with descriptions like 'REFER TO TECHNOLOGY DRAWINGS FOR SECURITY SYMBOLS', 'CONDUIT CONCEALED IN WALL OR CEILING', etc.

COMMUNICATIONS

Table of communications symbols with descriptions like 'REFER TO TECHNOLOGY DRAWINGS FOR COMMUNICATIONS SYMBOLS', 'CONDUIT OR CABLE, WHERE "X"', etc.

AS-BUILTS

06-08-2016

Marmon Mok ARCHITECTURE 210.233.9493 T 210.223.2582 P 700 N. St. Mary's Suite 1600 San Antonio, TX 78205

#DBR San Antonio Water System

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San Antonio Water System

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Drawn: DBR
Checked: DBR
Date: 03/29/2015
Project No: 14019

REVISIONS
1 09/27/15 ADD COLUMN 1
2 04/02/15 ADD COLUMN 2
3 04/23/15 ADD COLUMN 4
5 06/22/15 ASH No. 1
6 09/24/15 PR No. 1
7 09/24/15 PR No. 1 (CEN)
8 09/28/15 FLAG POLE
9 10/01/15 ASH No. 012
10 01/22/16 PR, PL, PHOUSE

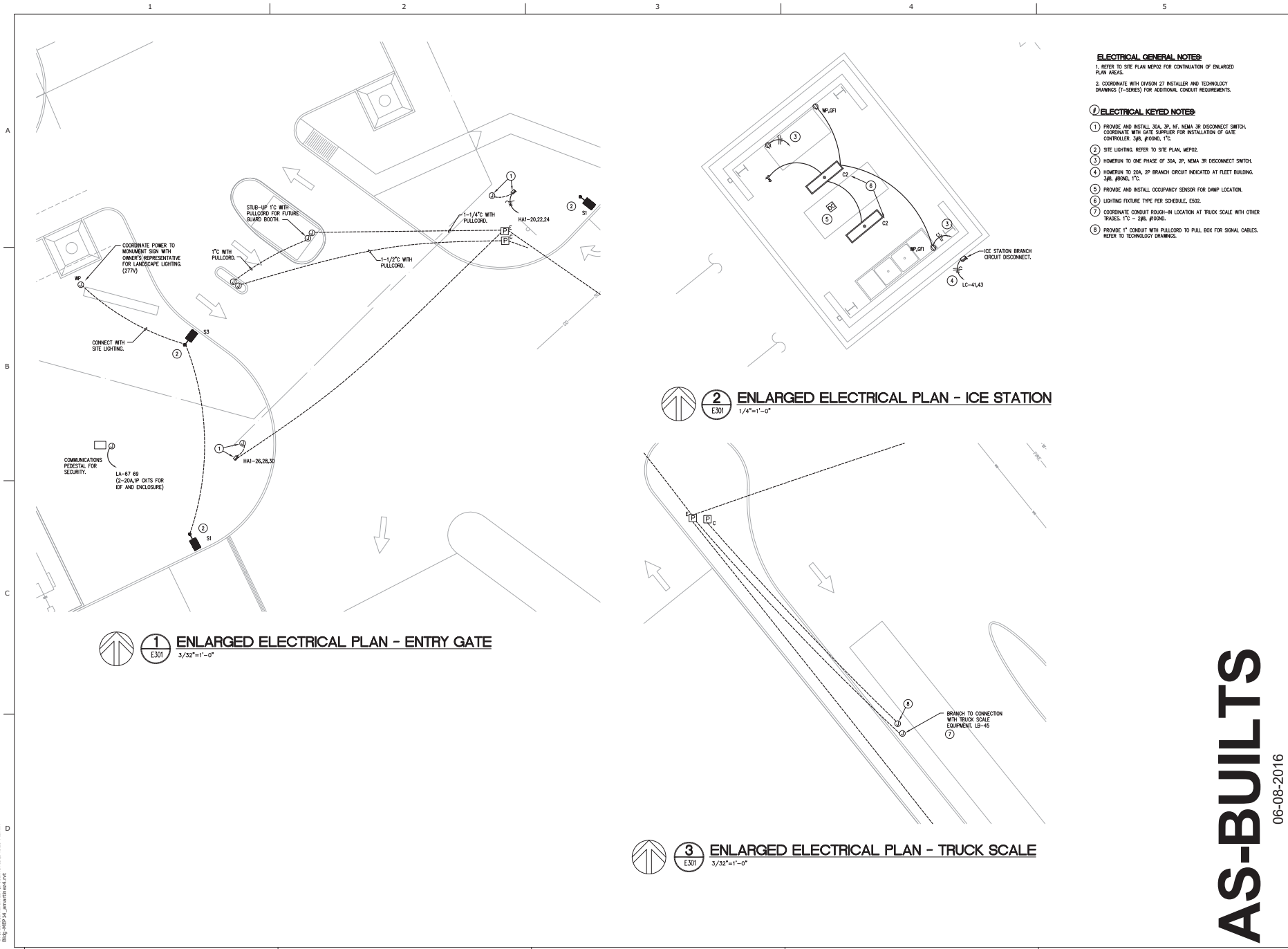
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GENERAL NOTES

E001



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 160526\_E301.dwg



**ELECTRICAL GENERAL NOTES:**  
 1. REFER TO SITE PLAN MEPO2 FOR CONTINUATION OF ENLARGED PLAN AREAS.  
 2. COORDINATE WITH DIVISION 27 INSTALLER AND TECHNOLOGY DRAWINGS (I-SERIES) FOR ADDITIONAL CONDUIT REQUIREMENTS.

**ELECTRICAL KEYED NOTES:**

- ① PROVIDE AND INSTALL 30A, 3P, 4P, NEMA 3R DISCONNECT SWITCH. COORDINATE WITH GATE SUPPLIER FOR INSTALLATION OF GATE CONTROLLER. 3/4\"/>
- ② SITE LIGHTING. REFER TO SITE PLAN, MEPO2.
- ③ HONOR TO ONE PHASE OF 20A, 2P, NEMA 3R DISCONNECT SWITCH.
- ④ HONOR TO 20A, 2P BRANCH CIRCUIT INDICATED AT FLEET BUILDING. 3/4\"/>
- ⑤ PROVIDE AND INSTALL OCCUPANCY SENSOR FOR DAMP LOCATION.
- ⑥ LIGHTING FIXTURE TYPE PER SCHEDULE, E502.
- ⑦ COORDINATE CONDUIT ROUGH-IN LOCATION AT TRUCK SCALE WITH OTHER TRADES. 1\"/>
- ⑧ PROVIDE 1\"/>

**Marmon Mok**  
 ARCHITECTURE 210-223-9492/F 210-223-2582/F  
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 ARCHITECT  
 2016-000001-1716-00001  
 2016-000001-1716-00001  
 DBR Project Number 160526.000

DATE	DESCRIPTION
2/16/16	ISS
3/16/16	REV

**NSOC NEW SERVICE CENTER PROJECT**  
 CAPITAL PORT DRIVE SAN ANTONIO, TX



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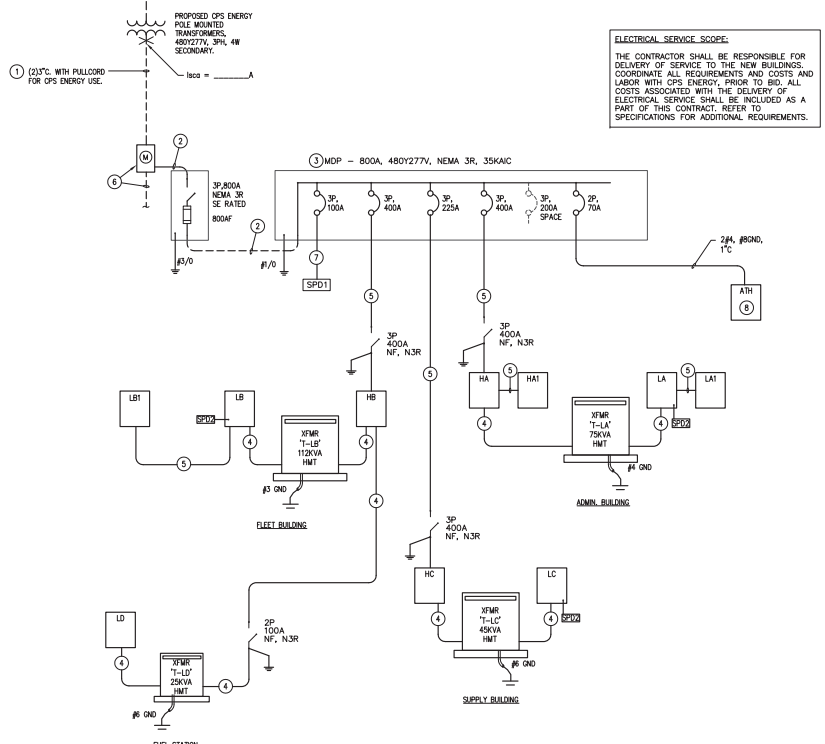
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Checked	DBR
Date	03/29/2015
PROJECT No.	14029
Revisions	
1	03/27/15 ADDENDUM 1
2	04/02/15 ADDENDUM 2
3	04/17/15 ADDENDUM 4
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5	06/24/15 PR No. 1
6	06/24/15 PR No. 2
7	06/24/15 PR No. 3 (GEN)
8	06/24/15 PR No. 4 (GEN)
9	10/01/15 ASI No. 012
10	01/12/16 PR, PP HOUSE

SHEET TITLE  
**ENLARGED ELECTRICAL PLANS**

SHEET NO.  
**E301**

**AS-BUILTS**

06-08-2016



**ELECTRICAL SERVICE SCOPE:**  
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY OF SERVICE TO THE NEW BUILDINGS. COORDINATE ALL REQUIREMENTS AND COSTS AND LABOR WITH CPS ENERGY. PRIOR TO BID, ALL COSTS ASSOCIATED WITH THE DELIVERY OF ELECTRICAL SERVICE SHALL BE INCLUDED AS A PART OF THIS CONTRACT. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**ELECTRICAL ONE-LINE DIAGRAM**  
 E401 N.T.S.

AMPERAGE	SETS	CONDUCTOR SIZE	CONDUIT (INCHES)
30A	1	4#10, 1#10 G.	3/4"
40A	1	4#10, 1#10 G.	1"
50A	1	4#10, 1#10 G.	1"
60A	1	4#10, 1#10 G.	1"
70A	1	4#10, 1#10 G.	1 1/4"
80A	1	4#10, 1#10 G.	1 1/4"
90A	1	4#10, 1#10 G.	1 1/4"
100A	1	4#10, 1#10 G.	1 1/4"
125A	1	4#10, 1#10 G.	1 1/2"
150A	1	4#10, 1#10 G.	1 1/2"
175A	1	4#10, 1#10 G.	2"
200A	1	4#10, 1#10 G.	2"
225A	1	4#10, 1#10 G.	2 1/2"
250A	1	4#10, 1#10 G.	2 1/2"
300A	1	4#10, 1#10 G.	3"
350A	1	4#10, 1#10 G.	3 1/2"
400A	2	4#10, 1#10 G.	3"
450A	2	4#10, 1#10 G.	2 1/2"
500A	2	4#10, 1#10 G.	2 1/2"
600A	2	4#10, 1#10 G.	3"
700A	2	4#10, 1#10 G.	4"
800A	2	4#10, 1#10 G.	4"
1000A	3	4#10, 1#10 G.	4"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.  
 2. GROUND NOT REQUIRED AT SERVICE LATERAL.

**ONE-LINE DIAGRAM GENERAL NOTES:**

- METERING EQUIPMENT ENCLOSURE PROVIDED BY CPS ENERGY, INSTALLED BY ELECTRICAL CONTRACTOR PER CPS SPECIFICATIONS. SERVICE LATERAL AND METERS SHALL BE INSTALLED BY CPS ENERGY.
- CONDUCTORS SHALL BE COPPER.
- CONTRACTOR SHALL OBTAIN RATINGS BASED ON THE OCCURRENCE RATE RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE AND TRANSFORMER FEEDER SCHEDULES TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.
- REFER TO PANEL SCHEDULES BEGINNING ON SHEET E401 FOR ALL OVER-CURRENT PROTECTIVE DEVICES NOT INDICATED ON THIS SHEET. USE OVER-CURRENT PROTECTIVE DEVICES INDICATED ON PANEL SCHEDULES TO DETERMINE CORRECT FEEDER SIZE, UNLESS NOTED OTHERWISE.
- PROVIDE AND INSTALL IDENTIFICATION TAG INDICATING THE AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION IN ACCORDANCE WITH NEC 110.24(A) AND 110.25(B).

**ELECTRICAL ONE-LINE KEYED NOTES:**

- 2 - 3" FOR UNDERGROUND SECONDARY FROM CPS ENERGY OVERHEAD TRANSFORMERS. REFER TO SITE PLAN, SHEET ME02.
- PROVIDE AND INSTALL TWO (2) 4" WITH 4#00KCMIL EACH.
- SERVICE PANEL MOUNTED TO UNSTRUCT RACK IN ELECTRICAL SERVICE YARD.
- REFER TO TRANSFORMER SCHEDULE.
- REFER TO FEEDER SCHEDULE.
- RACK MOUNTED CPS ENERGY TRANSFORMER, EXTEND 1" EMPTY CONDUIT TO NEAREST BUILDING ELECTRICAL CLOSET FOR METER MOUNTING.
- 4#10, #20ND, 1-1/2".
- PROVIDE AND INSTALL SIEMENS #1P0205, OR EQUIVALENT 25 KVA, 480V-120/240V, 1 PH NEMA 3R POWER CENTER WITH (2) 50A, 2P BREAKERS. REFER TO SITE PLAN, SHEET ME02. SECURE TO FREESTANDING SUPPORT RACK. COORDINATE EXACT LOCATION IN FIELD WITH OWNER'S REPRESENTATIVE.

MARK	MANUFACTURE	MODEL	CABLE SIZE
SP01	EMERSON	560-YC-12ANCOIS	#2
SP02	EMERSON	510-YA-08ANALIS	#8
SP03	EMERSON	510-SA-08ANALIS	#8

PRIMARY VOLTAGE				SECONDARY VOLTAGE			
480V, THREE PHASE				120/208V, THREE PHASE, FOUR WIRE			
KVA	FEEDER	CONDUIT	BREAKER	FEEDER	CONDUIT	BREAKER	OND. ELEC. SIZE
30	3 #8, 1 #10 GND.	1"	70A/SP	3 #10, 1 #10 NEUTRAL, 1 #6 GND.	1 1/4"	100A/SP	#6
45	3 #8, 1 #6 GND.	1 1/4"	90A/SP	3 #10, 1 #4 NEUTRAL, 1 #6 GND.	2"	150A/SP	#8
75	3 #8, 1 #6 GND.	1 1/2"	125A/SP	3 #250KCMIL, (2) #250KCMIL NEUTRAL, 1 #4 GND.	3 1/2"	250A/SP	#4
112.5	3 #8, 1 #6 GND.	2"	200A/SP	2 SETS - 3 #8, (2) #5/0 NEUTRAL, 1 #3 GND.	(2) 2 1/2"	400A/SP	#3

NOTE:  
 -ALL CONDUCTORS SHALL BE COPPER  
 -REFER TO SPECIFICATIONS 26 22 22.

ELECTRICAL LOAD ANALYSIS - Administration Building - 9395 sf			
480 / 277, 3-PHASE, 4-WIRE			
DESCRIPTION	NEC	KVA	
<b>LIGHTING</b>			
INTERIOR =	28,185 VA X 125%	220-100)	35.2
EXTERIOR =	5000 VA X 125%	220-100)	6.3
<b>POWER:</b>			
RECEPTACLES =	9,395 VA	220-13	9.4
MISCELLANEOUS =	15,201 VA		15.2
<b>KITCHEN =</b>	0 VA	220-20	0.0
<b>ELEVATORS =</b>	0 VA	820-14	0.0
<b>FUTURE POWER =</b>	0 VA		0.0
<b>HVAC:</b>			
COOLING =	82,600 VA	220-21	82.6
HEATING =	59500 VA	220-21	0.0
FANS =	7382 VA	220-21	7.4
PUMPS: CHW =	2800 VA	220-21	2.8
HW =	0 VA	220-21	0.0
CONDENSATE =	0 VA	220-21	0.0
25% LARGEST MOTOR =	4963 VA	220-14	5.0
<b>PLUMBING:</b>			
WATER HEATER =	6000 VA		6.0
DRINKING FOUNTAIN =	0 VA		0.0
CIRCULATING PUMP =	0 VA		0.0
<b>TOTAL =</b>			169.8
<b>TOTAL AMPS</b>			204.3
<b>SERVICE SIZE:</b>			400.0
<b>SPARE AMPACITY</b>			195.7

ELECTRICAL LOAD ANALYSIS - Fleet Building			
480 / 277, 3-PHASE, 4-WIRE			
DESCRIPTION	NEC	KVA	
<b>LIGHTING</b>			
INTERIOR =	20,730 VA X 125%	220-100)	25.9
EXTERIOR =	5000 VA X 125%	220-100)	6.3
<b>POWER:</b>			
RECEPTACLES =	6,910 VA	220-13	6.9
MISCELLANEOUS =	45,100 VA		45.1
<b>KITCHEN =</b>	0 VA	220-20	0.0
<b>ELEVATORS =</b>	0 VA	820-14	0.0
<b>FUTURE POWER =</b>	0 VA		0.0
<b>HVAC:</b>			
COOLING =	69,100 VA	220-21	69.1
HEATING =	0 VA	220-21	0.0
FANS =	5000 VA	220-21	5.0
PUMPS: CHW =	0 VA	220-21	0.0
HW =	0 VA	220-21	0.0
CONDENSATE =	0 VA	220-21	0.0
25% LARGEST MOTOR =	1250 VA	220-14	1.3
<b>PLUMBING:</b>			
WATER HEATER =	6000 VA		6.0
DRINKING FOUNTAIN =	0 VA		0.0
CIRCULATING PUMP =	0 VA		0.0
<b>TOTAL =</b>			165.5
<b>TOTAL AMPS</b>			199.1
<b>SERVICE SIZE:</b>			400.0
<b>SPARE AMPACITY</b>			200.9

ELECTRICAL LOAD ANALYSIS - Supply Building			
480 / 277, 3-PHASE, 4-WIRE			
DESCRIPTION	NEC	KVA	
<b>LIGHTING</b>			
INTERIOR =	21,774 VA X 125%	220-100)	27.2
EXTERIOR =	5000 VA X 125%	220-100)	6.3
<b>POWER:</b>			
RECEPTACLES =	5,833 VA	220-13	5.8
MISCELLANEOUS =	5,000 VA		5.0
<b>KITCHEN =</b>	0 VA	220-20	0.0
<b>ELEVATORS =</b>	0 VA	820-14	0.0
<b>FUTURE POWER =</b>	0 VA		0.0
<b>HVAC:</b>			
COOLING =	58,064 VA	220-21	58.1
HEATING =	0 VA	220-21	0.0
FANS =	2000 VA	220-21	2.0
PUMPS: CHW =	0 VA	220-21	0.0
HW =	0 VA	220-21	0.0
CONDENSATE =	0 VA	220-21	0.0
25% LARGEST MOTOR =	600 VA	220-14	0.6
<b>PLUMBING:</b>			
WATER HEATER =	3000 VA		3.0
DRINKING FOUNTAIN =	0 VA		0.0
CIRCULATING PUMP =	0 VA		0.0
<b>TOTAL =</b>			108.0
<b>TOTAL AMPS</b>			129.9
<b>SERVICE SIZE:</b>			200.0
<b>SPARE AMPACITY</b>			70.1

**AS-BUILTS**

06-08-2016



**NSOC NEW SERVICE CENTER PROJECT**  
 CAPITAL PORT DRIVE SAN ANTONIO, TX



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 1 03/27/15 ADDENDUM 1  
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 3 04/17/15 ADDENDUM 4  
 4 05/22/15 ADD. NO. 1  
 5 05/22/15 ADD. NO. 2  
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 7 09/24/15 PR. NO. 2 (GEN)  
 8 09/28/15 FLAG POLE  
 9 10/03/15 ASB No. 012  
 10 01/12/16 PR. 1P HOUSE

SHEET TITLE  
**E401**  
 ONE-LINE DIAGRAM

9/29/2014 7:21:45 AM  
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 User: m146254

**ONE-LINE DIAGRAM GENERAL NOTES**

- METERING EQUIPMENT ENCLOSURE PROVIDED BY OPS ENERGY, INSTALLED BY ELECTRICAL CONTRACTOR PER OPS SPECIFICATIONS. SERVICE LATERAL AND METERS SHALL BE INSTALLED BY OPS ENERGY.
- CONDUCTORS SHALL BE COPPER.
- CONTRACTOR SHALL INSTALL FEEDERS BASED ON THE FEEDER CURRENT RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE AND TRANSFORMER FEEDER SCHEDULES TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.
- REFER TO PANEL SCHEDULES, BEGINNING ON SHEET E501, FOR ALL OVER-CURRENT PROTECTIVE DEVICES NOT INDICATED ON THIS SHEET. USE OVER-CURRENT PROTECTIVE DEVICES INDICATED ON PANEL SCHEDULES TO DETERMINE CORRECT FEEDER SIZE, UNLESS NOTED OTHERWISE.
- PROVIDE AND INSTALL IDENTIFICATION TAG INDICATING THE AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION IN ACCORDANCE WITH NEC 110.2(A) AND 110.2(B).

**ELECTRICAL ONE-LINE KEYED NOTES**

- 2 - 3°C FOR UNDERGROUND SECONDARY FROM OPS ENERGY OVERHEAD TRANSFORMERS. REFER TO SITE PLAN, SHEET MEP02.
- PROVIDE AND INSTALL TWO (2) 4°C WITH 48600KVM EACH.
- SERVICE PANEL MOUNTED TO UNINSULATED RACK IN ELECTRICAL SERVICE YARD.
- REFER TO TRANSFORMER SCHEDULE.
- REFER TO FEEDER SCHEDULE.
- RACK MOUNTED OPS ENERGY TRANSFORMER, EXTEND 1" EMPTY CONDUIT TO NEAREST BUILDING ELECTRICAL CLOSET FOR METERS MONITORING.
- 480, #80ND, 1-1/2".
- PROVIDE AND INSTALL SEMI-INSULATED, OR EQUIVALENT 25 KVA, 480V-120/240V, 1 PH NEMA 3R POWER CENTER WITH (2) 50A, 2P BREAKERS. REFER TO SITE PLAN, SHEET MEP02, SECURE TO PREEXISTING SUPPORT RACK. COORDINATE EXACT LOCATION IN FIELD WITH OWNER'S REPRESENTATIVE.

**SPD SCHEDULE**

MARK	MANUFACTURE	MODEL	CABLE SIZE
SPD1	EMERSON	560-YC-12AN001S	#2
SPD2	EMERSON	510-YA-06AN01S	#8
SPD3	EMERSON	510-SA-06AN01S	#8

**HARMONIC MITGATING TRANSFORMER FEEDER SCHEDULE**

PRIMARY VOLTAGE				SECONDARY VOLTAGE			
480V, THREE PHASE				120/208V, THREE PHASE, FOUR WIRE			
KVA	FEEDER	CONDUIT	BREAKER	FEEDER	CONDUIT	BREAKER	GND. ELEC. SIZE
30	3 #3, 1 #0 GND.	1"	30A/3P	3 #3, 1 #0/0 NEUTRAL, 1 #0 GND.	1 1/4"	100A/3P	#6
45	3 #3, 1 #0 GND.	1 1/2"	60A/3P	3 #3/0, 1 #0/0 NEUTRAL, 1 #0 GND.	2"	150A/3P	#6
75	3 #1, 1 #0 GND.	1 1/2"	125A/3P	3 #250KML, (2) #250KML NEUTRAL, 1 #4 GND.	3 1/2"	250A/3P	#4
112.5	3 #3/0, 1 #0 GND.	2"	200A/3P	2 SETS - 3 #3/0, (2) #1/0 NEUTRAL, 1 #3 GND.	(2) 2 1/2"	400A/3P	#3
480V, SINGLE PHASE				120/240V, SINGLE PHASE, THREE WIRE			
KVA	FEEDER	CONDUIT	BREAKER	FEEDER	CONDUIT	BREAKER	GND. ELEC. SIZE
25	2 #4, 1 #0 GND.	1 1/2"	80A/2P	2 #3, 1 #0/0 NEUTRAL, 1 #0 GND.	1 1/2"	125A/2P	#6

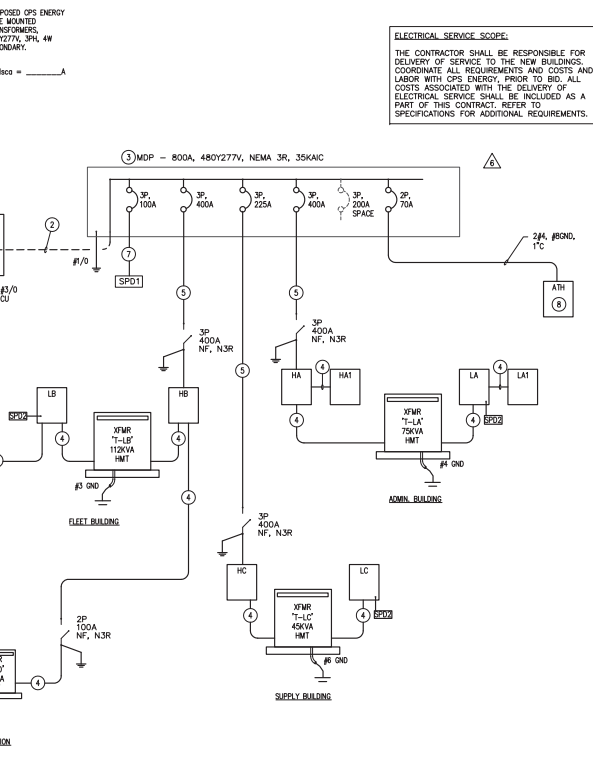
NOTE:  
 -ALL CONDUCTORS SHALL BE COPPER  
 -REFER TO SPECIFICATIONS 26 22 22.

**FEEDER SCHEDULE**

AMPERAGE	SETS	CONDUCTOR SIZE	CONDUIT (INCHES)
30A	1	#10, 1#0 G.	3/4"
40A	1	#8, 1#0 G.	1"
50A	1	#6, 1#0 G.	1"
60A	1	#6, 1#0 G.	1"
70A	1	#4, 1#0 G.	1 1/4"
80A	1	#4, 1#0 G.	1 1/4"
90A	1	#4, 1#0 G.	1 1/4"
100A	1	#4, 1#0 G.	1 1/4"
125A	1	#2, 1#0 G.	1 1/2"
150A	1	#2, 1#0 G.	1 1/2"
175A	1	#2, 1#0 G.	2"
200A	1	#2, 1#0 G.	2"
225A	1	#2, 1#0 G.	2 1/2"
250A	1	#2, 1#0 G.	2 1/2"
300A	1	#2, 1#0 G.	3"
350A	1	#2, 1#0 G.	3 1/2"
400A	2	#2, 1#0 G.	2"
450A	2	#2, 1#0 G.	2 1/2"
500A	2	#2, 1#0 G.	2 1/2"
600A	2	#2, 1#0 G.	3"
700A	2	#2, 1#0 G.	4"
800A	2	#2, 1#0 G.	4"
1000A	3	#2, 1#0 G.	4"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.  
 2. GROUND NOT REQUIRED AT SERVICE LATERAL.

**ELECTRICAL SERVICE SCOPE.**  
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY OF SERVICE TO THE NEW BUILDINGS. COORDINATE ALL REQUIREMENTS AND COSTS AND LABOR WITH OPS ENERGY, PRIOR TO BID. ALL COSTS ASSOCIATED WITH THE DELIVERY OF ELECTRICAL SERVICE SHALL BE INCLUDED AS A PART OF THIS CONTRACT. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



**ELECTRICAL ONE-LINE DIAGRAM**  
 E401A N.T.S.

**ELECTRICAL LOAD ANALYSIS - Administration Building - 9395 sf**  
 480 / 277, 3-PHASE, 4-WIRE

DESCRIPTION	NEC	KVA
<b>LIGHTING</b>		
INTERIOR =	220-100h	35.2
EXTERIOR =	220-100h	6.3
<b>POWER</b>		
RECEPTACLES =	9,395 VA	9.4
MISCELLANEOUS =	15,201 VA	15.2
KITCHEN = 0 VA 0		
ELEVATORS = 0 VA 0		
FUTURE POWER = 0 VA 0		
<b>HVAC</b>		
COOLING =	82,600 VA	82.6
HEATING =	59500 VA	0.0
FANS =	7302 VA	7.4
PUMPS: CHW =	2800 VA	2.8
HW =	0 VA	0.0
CONDENSATE =	0 VA	0.0
25% LARGEST MOTOR =	4963 VA	5.0
<b>PLUMBING</b>		
WATER HEATER =	6000 VA	6.0
DRINKING FOUNTAIN =	0 VA	0.0
CIRCULATING PUMP =	0 VA	0.0
TOTAL =	168.8	
TOTAL AMPS =	204.3	
SERVICE SIZE =	400.0	
SPARE AMPACITY =	195.1	

**ELECTRICAL LOAD ANALYSIS - Fleet Building**  
 480 / 277, 3-PHASE, 4-WIRE

DESCRIPTION	NEC	KVA
<b>LIGHTING</b>		
INTERIOR =	20,730 VA X 125%	25.9
EXTERIOR =	5000 VA X 125%	6.3
<b>POWER</b>		
RECEPTACLES =	8,810 VA	8.9
MISCELLANEOUS =	44,100 VA	44.1
KITCHEN = 0 VA 0		
ELEVATORS = 0 VA 0		
FUTURE POWER = 0 VA 0		
<b>HVAC</b>		
COOLING =	69,100 VA	69.1
HEATING =	0 VA	0.0
FANS =	5000 VA	5.0
PUMPS: CHW =	0 VA	0.0
HW =	0 VA	0.0
CONDENSATE =	0 VA	0.0
25% LARGEST MOTOR =	1250 VA	1.3
<b>PLUMBING</b>		
WATER HEATER =	6000 VA	6.0
DRINKING FOUNTAIN =	0 VA	0.0
CIRCULATING PUMP =	0 VA	0.0
TOTAL =	185.5	
TOTAL AMPS =	199.1	
SERVICE SIZE =	400.0	
SPARE AMPACITY =	207.9	

**ELECTRICAL LOAD ANALYSIS - Supply Building**  
 480 / 277, 3-PHASE, 4-WIRE

DESCRIPTION	NEC	KVA
<b>LIGHTING</b>		
INTERIOR =	21,774 VA X 125%	27.2
EXTERIOR =	5000 VA X 125%	6.3
<b>POWER</b>		
RECEPTACLES =	5,833 VA	5.8
MISCELLANEOUS =	5,000 VA	5.0
KITCHEN = 0 VA 0		
ELEVATORS = 0 VA 0		
FUTURE POWER = 0 VA 0		
<b>HVAC</b>		
COOLING =	58,064 VA	58.1
HEATING =	0 VA	0.0
FANS =	2000 VA	2.0
PUMPS: CHW =	0 VA	0.0
HW =	0 VA	0.0
CONDENSATE =	0 VA	0.0
25% LARGEST MOTOR =	600 VA	0.6
<b>PLUMBING</b>		
WATER HEATER =	3000 VA	3.0
DRINKING FOUNTAIN =	0 VA	0.0
CIRCULATING PUMP =	0 VA	0.0
TOTAL =	168.0	
TOTAL AMPS =	129.9	
SERVICE SIZE =	200.0	
SPARE AMPACITY =	70.1	

Panelboard HA															35000 AIC Rating X New Existing	
4802/27 Wye Volt. 3 Phase, 1 Section Type 1 Name Rating		Mains Type: 4 Wire			0 A MCB: 400 A BUS (Copper)			X Single Double Feed - Thru			Mounting X Surface Flush					
NOTE	Load (VA)   Type	Description	Wire	CB	CKT	CB	Wire	Description	Type	Load (VA)   NOTE	Flush	Existing				
--	--	SPARE	--	BA	1   2	0 A	--	--	--	--	--	--				
62958 VA	placi	T-LA	1	125 A	5   5	100 A	3	HA-1	H	42300 VA	--	--				
3198 VA	L   S	CORRIDOR LIGHTING	12	20 A	9   10	20 A	12	EXTERIOR LIGHTS	L	305 VA	--	--				
13296 VA	MT, M	AHU-N1	12	20 A	13   14	20 A	12	CISTERN PUMP	M	3324 VA	--	--				
78945 VA	C, M	PCU-N1	1	110 A	19   20	20 A	12	FPB-1.02	H	5738 VA	--	--				
3324 VA	MT, M	PCH-P-N1	12	20 A	23   24	20 A	12	EW-N1	WH, M	6000 VA	--	--				
18500 VA	H	FPB-1.05, 1.06	10	25 A	25   26	30 A	12	FPB-1.01, 1.03	H	10000 VA	--	--				
2458 VA	L	LIGHTING OFFICES	12	20 A	35   36	30 A	10	FPB-1.09, 1.10	H	20224 VA	--	--				
--	--	SPARE	--	20 A	37   38	--	--	--	--	--	--	--				
--	--	SPARE	--	20 A	39   40	0 A	--	SPARE	--	--	--	--				
--	--	SPARE	--	20 A	41   42	0 A	12	LIGHTING MULTI-PURPOSE	L	1324 VA	--	--				
N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity		N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity						
220.44	(R)Receptacle	41770 VA	61.97%	25885 VA		210.20(a)	(L)Lighting	6493 VA	125.00%	8116 VA						
220.56	(K)Kitchen	6650 VA	65.00%	4323 VA			(E)Ext. Ltg	78 VA	125.00%	98 VA						
220.60	(C)Cooling	84032 VA	100.00%	0 VA		620.14	(E)Elevators									
220.60	(H)Heating	99762 VA	100.00%	99762 VA			(WH)Wat. Htr.	6000 VA	100.00%	6000 VA						
220.60	(F)Fans	1400 VA	100.00%	1400 VA		220.5	(MT)Lrg. Motor	13296 VA	125.00%	16620 VA						
630.00	(M)Misc.	10014 VA	100.00%	10014 VA			(SP)Sub Ph.									
630.00	(W)Welder															
Total Connected Load:			273840 VA	VA =	329 A	Location of Panel:										
Total Load (Diversified):			177172 VA	VA =	213 A											

Panelboard HA1															35000 AIC Rating X New Existing	
4802/27 Wye Volt. 3 Phase, 1 Section Type 1 Name Rating		Mains Type: 4 Wire			0 A MCB: 100 A BUS (Copper)			X Single Double Feed - Thru			Mounting X Surface Flush					
NOTE	Load (VA)   Type	Description	Wire	CB	CKT	CB	Wire	Description	Type	Load (VA)   NOTE	Flush	Existing				
11000 VA	H	FPB-1.08	12	20 A	1   2	20 A	12	FPB-1.07	H	11000 VA	--	--				
9500 VA	H	FPB-1.13	10	25 A	3   4	20 A	12	FPB-1.14	H	10800 VA	--	--				
--	--	303 SPARE	--	30 A	13   14	20 A	--	203 SPARE	--	--	--	--				
--	--	SPARE	--	30 A	15   16	20 A	--	--	--	--	--	--				
--	--	SPARE	--	30 A	17   18	20 A	--	--	--	--	--	--				
--	--	203 SPARE	--	20 A	19   20	20 A	--	FRONT GATE OPENER	--	--	--	--				
--	--	SPARE	--	20 A	21   22	20 A	--	--	--	--	--	--				
--	--	403 SPARE	--	40 A	23   24	30 A	--	FRONT GATE OPENER	--	--	--	--				
--	--	SPARE	--	40 A	25   26	30 A	--	--	--	--	--	--				
--	--	SPARE	--	40 A	27   28	30 A	--	--	--	--	--	--				
--	--	SPACE	--	40 A	29   30	30 A	--	SPACE	--	--	--	--				
--	--	SPACE	--	--	31   32	--	--	SPACE	--	--	--	--				
--	--	SPACE	--	--	33   34	--	--	SPACE	--	--	--	--				
--	--	SPACE	--	--	35   36	--	--	SPACE	--	--	--	--				
--	--	SPACE	--	--	37   38	--	--	SPACE	--	--	--	--				
--	--	SPACE	--	--	39   40	--	--	SPACE	--	--	--	--				
--	--	SPACE	--	--	41   42	--	--	SPACE	--	--	--	--				
N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity		N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity						
220.44	(R)Receptacle	41770 VA	61.97%	25885 VA		210.20(a)	(L)Lighting	6493 VA	125.00%	8116 VA						
220.56	(K)Kitchen	6650 VA	65.00%	4323 VA			(E)Ext. Ltg	78 VA	125.00%	98 VA						
220.60	(C)Cooling	84032 VA	100.00%	0 VA		620.14	(E)Elevators									
220.60	(H)Heating	99762 VA	100.00%	99762 VA			(WH)Wat. Htr.	6000 VA	100.00%	6000 VA						
220.60	(F)Fans	1400 VA	100.00%	1400 VA		220.5	(MT)Lrg. Motor	13296 VA	125.00%	16620 VA						
630.00	(M)Misc.	10014 VA	100.00%	10014 VA			(SP)Sub Ph.									
630.00	(W)Welder															
Total Connected Load:			42300 VA	VA =	51 A	Location of Panel: ELEC A107										
Total Load (Diversified):			42300 VA	VA =	51 A											

Panelboard LA1															10000 AIC Rating X New Existing	
120/208 Wye Volt. 3 Phase, 1 Section Type 1 Name Rating		Mains Type: 4 Wire			0 A MCB: 100 A BUS (Copper)			X Single Double Feed - Thru			Mounting X Surface Flush					
NOTE	Load (VA)   Type	Description	Wire	CB	CKT	CB	Wire	Description	Type	Load (VA)   NOTE	Flush	Existing				
2000 VA	M	DATA EQUIPMENT RECEPTACLE	10	30 A	1   2	30 A	10	DATA EQUIPMENT RECEPTACLE	M	2000 VA	--	--				
180 VA	R	SECURITY EQUIPMENT	12	20 A	3   4	20 A	12	RECEPTS IT ROOM	R	720 VA	--	--				
2000 VA	H, M	ELH N1-1	12	20 A	5   6	20 A	12	MODULAR FURNITURE	R	500 VA	--	--				
720 VA	R	MODULAR FURNITURE	12	20 A	11   12	20 A	12	MODULAR FURNITURE	R	1800 VA	--	--				
1080 VA	R	MODULAR FURNITURE	12	20 A	13   14	20 A	12	MODULAR FURNITURE	R	360 VA	--	--				
1080 VA	R	MODULAR FURNITURE	12	20 A	15   16	20 A	12	MODULAR FURNITURE	R	1080 VA	--	--				
720 VA	R	MODULAR FURNITURE	12	20 A	17   18	20 A	12	SPARE	--	--	--	--				
600 VA	R	A131 ELECTRONIC SENSORS	12	20 A	19   20	20 A	12	SPARE	--	--	--	--				
200 VA	R	A131 ELECTRONIC SENSORS	12	20 A	21   22	20 A	12	SPARE	--	--	--	--				
--	--	SPARE	--	0 A	23   24	0 A	--	SPARE	--	--	--	--				
--	--	SPARE	--	0 A	25   26	20 A	--	SPARE	--	--	--	--				
--	--	SPARE	--	0 A	27   28	20 A	--	SPARE	--	--	--	--				
0 VA	M	CIRCULATION PUMP	12	20 A	29   30	20 A	12	CONDENSATE PUMP	R	430 VA	--	--				
N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity		N.E.C. (2014)	Load Type	Conn.	Fct.	Diversity						
220.44	(R)Receptacle	9070 VA	100.00%	9070 VA		210.20(a)	(L)Lighting	6493 VA	125.00%	8116 VA						
220.56	(K)Kitchen	6650 VA	65.00%	4323 VA			(E)Ext. Ltg	78 VA	125.00%	98 VA						
220.60	(C)Cooling	84032 VA	100.00%	0 VA		620.14	(E)Elevators									
220.60	(H)Heating	2000 VA	100.00%	2000 VA			(WH)Wat. Htr.	6000 VA	100.00%	6000 VA						
220.60	(F)Fans	4000 VA	100.00%	4000 VA		220.5	(MT)Lrg. Motor	6960 VA	100.00%	6960 VA						
630.00	(W)Welder						(SP)Sub Ph.									
Total Connected Load:			15870 VA	VA =	44 A	Location of Panel: ELEC A107										
Total Load (Diversified):			15870 VA	VA =	44 A											

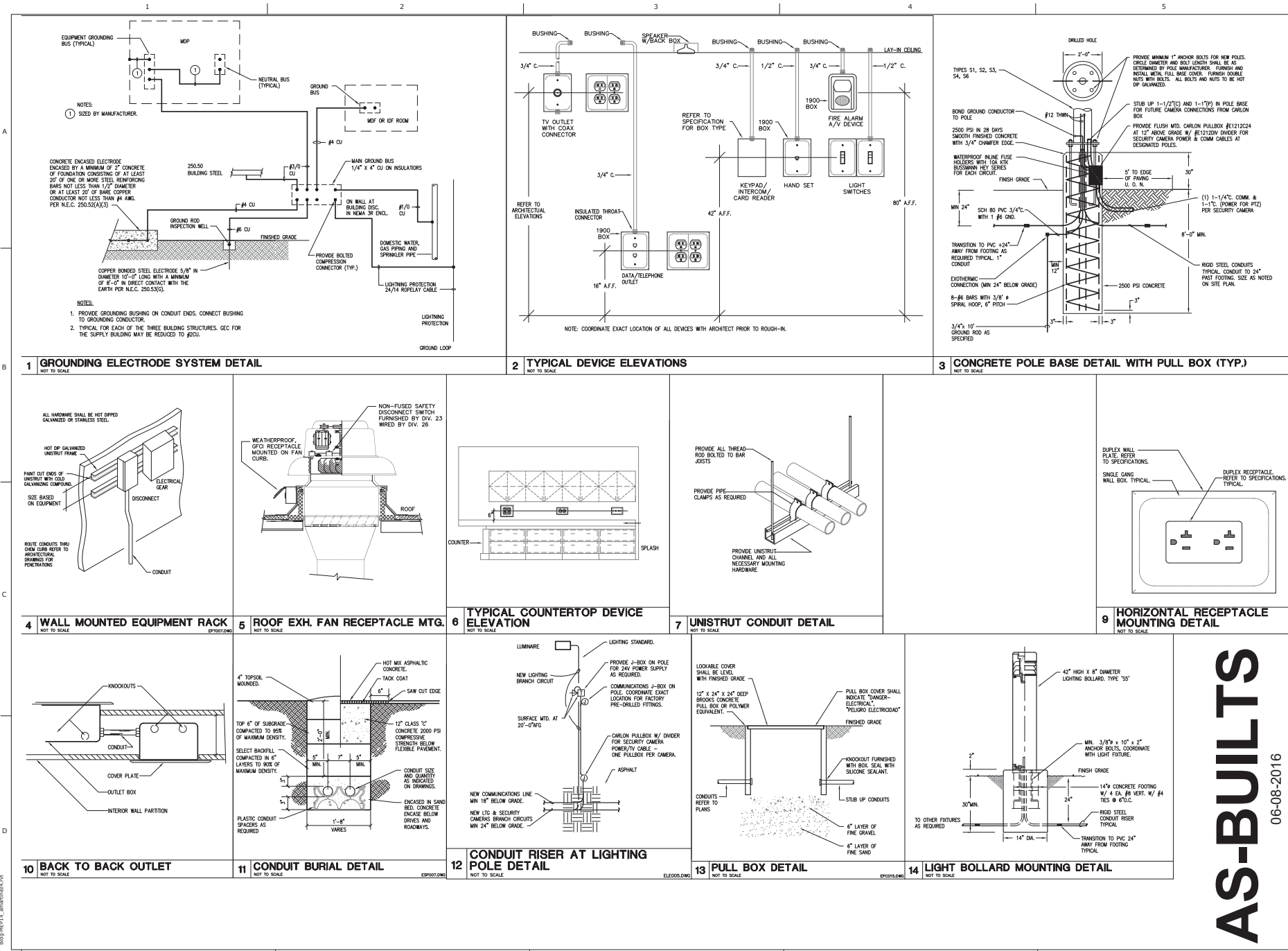
Panelboard LA															35000 AIC Rating X New Existing	
120/208 Wye Volt. 3 Phase, 1 Section Type 1 Name Rating		Mains Type: 4 Wire			250 A MCB: 400 A BUS (Copper)			X Single Double Feed - Thru			Mounting X Surface Flush					
NOTE	Load (VA)   Type	Description	Wire	CB	CKT	CB	Wire	Description	Type	Load (VA)   NOTE	Flush	Existing				
240 VA	L	DISPLAY CASE LIGHTS	12	20 A	1   2	20 A	12	RECEPTACLES	R	900 VA	--	--				
440 VA	R	RECEPTACLES	12	20 A	3   4	20 A	12	RECEPTACLES	R	1800 VA	--	--				
1080 VA	R	RECEPTACLE	12	20 A	5   6	20 A	12	RECEPTACLE	R	360 VA	--	--				
1080 VA	R	RECEPTACLE	12	20 A	7   8	20 A	12	FACP	M	250 VA	--	--				
120 VA	R	RECEPTACLE	12	20 A	9   10	20 A	12	RECEPTACLE	R	540 VA	--	--				
1080 VA	R	RECEPTACLE	12	20 A	11   12	20 A	12	RECEPTACLE	R	1260 VA	--	--				
360 VA	R	PROJECTOR	12	20 A	13   14	20 A	12	FLOOR BOX RECEPT	R	1080 VA	--	--				
360 VA	R	RECEPTACLE	12	20 A	15   16	20 A	12	RECEPTACLE	R	180 VA	--	--				
1080 VA	R	RECEPTACLE	12	20 A	17   18	20 A	12	RECEPTACLE	R	1800 VA	--	--				
720 VA	R	RECEPTACLE	12	20 A	19   20	20 A	12	RECEPTACLE	R	360 VA	--	--				
360 VA	R	RECEPTACLE	12	20 A	21   22	20 A	12	RECEPTACLE	R	540 VA	--	--				
360 VA	R	RECEPTACLE	12	20 A	23   24	20 A	12	RECEPTACLE	R	540 VA	--	--				
180 VA	R	MONITOR	12	20 A	25   26	20 A	12	RECEPTACLE	R	900 VA	--	--				
360 VA	R	RECEPTACLE	12	20 A	27   28	20 A	12	RECEPTACLE	R	540 VA	--	--				
500 VA	M	EDF-1	12	20 A	29   30	30 A	12	RECEPTACLE	R	720 VA	--	--				
900 VA	R	RECEPTACLE	12	20 A	31   32	20 A	12	VENDING MACHINE	K	750 VA	--	--				
1080 VA	R	DISHWASHER	12	20 A	33   34	20 A	12	VENDING MACHINE	K	750 VA	--	--				
840 VA	R	DISPOSAL	12	20 A	35   36	20 A	12	DISHWASHER	R	1500 VA	--	--				
720 VA	K	VENDING MACHINE	12	20 A	37   38	20 A	12	MICROWAVE/CFCI	R	1500 VA	--	--				
360 VA	R	RECEPTACLE	12	20 A	39   40	20 A	12	REFRIGERATOR	K	1200 VA	--	--				
1200 VA	K	REFRIGERATOR	12	20 A	41   42	20 A	12	RECEPTACLE	R	900 VA	--	--				
1500 VA	R	SMALL APPLIANCE	12	20 A	43   44	20 A	12	MONITOR	R	180 VA	--	--				
740 VA	M	FUTURE CEILING FANS	12	20 A	45   46	20 A	12	RECEPTACLE	R	900 VA	--	--				
1200 VA	M	M NORTH TANK #132A	12	20 A	47   48	20 A	12	RECEPTACLE	R	1800 VA	--	--				
180 VA	R	RECEPTACLE	12	20 A	49   50	20 A	12	RECEPTACLE	R	540 VA	--	--				
2704 VA	C, M	DCSU DB N2	12	20 A	51   52	20 A	12	DCSU DB N1	C, M	2704 VA	--	--				
180 VA	R	WP GFI RECEPT	12	20 A	53   54	20 A	12	EXT RECEPTACLE	R	1800 VA	--	--				
180 VA	R	MONITOR RECEIPT	12	20 A	55   56	20 A	12	EFT, EP-2	F	1800 VA	--	--				
--	--	--	--	--	--	--	--	LAPTOP LOCKERS RECEPTS	R	1800 VA	--	--				
--	--	--	--	--	--	--	--	61   62	20 A	12	LAPTOP LOCKERS RECEPTS	R	900 VA			
--	--	--	--	--	--	--	--	63   64	20 A	--	FRONT GATE IDF PEDASTAL	--	--			







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**AS-BULTS**

06-09-2016

SHEET TITLE  
 ELECTRICAL  
 DETAILS  
 SHEET NO.  
**E601**

**NSOC NEW SERVICE CENTER PROJECT**  
 CAPITAL PORT DRIVE SAN ANTONIO, TX

**#DBR**  
 ARCHITECTURE  
 210 N. ST. MARY'S SUITE 1600 SAN ANTONIO, TX 78205  
 210 N. ST. MARY'S SUITE 1600 SAN ANTONIO, TX 78205  
 DBR Project Number 1607.000  
 DBR CA, DBR IL, DBR MI, DBR TX

**Marmon Mok**  
 ARCHITECTURE 210-223-9492 F 210-212-2382 P  
 700 N. ST. MARY'S SUITE 1600 SAN ANTONIO, TX 78205

San Antonio Water System

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 Drawn DBR  
 Checked DBR  
 Date 03/29/2015  
 PROJECT No. 14029  
 Revisions  
 1 03/27/15 ADDENDUM 1  
 2 04/02/15 ADDENDUM 2  
 3 04/17/15 ADDENDUM 4  
 4 05/22/15 ASB No. 1  
 5 06/24/15 PR No. 1  
 6 07/24/15 PR No. 1 (GSD)  
 7 08/28/15 PLM HOLD  
 8 10/02/15 ASB No. 012  
 9 01/12/16 PLM HOLD

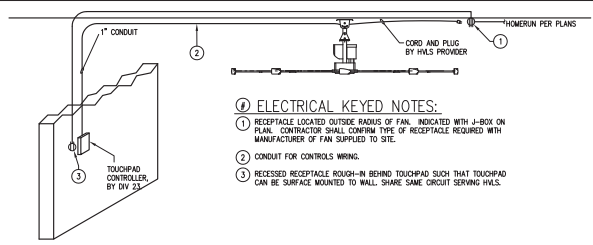
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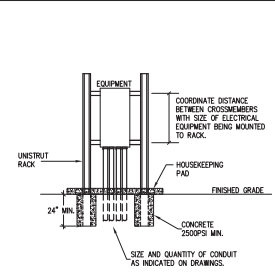
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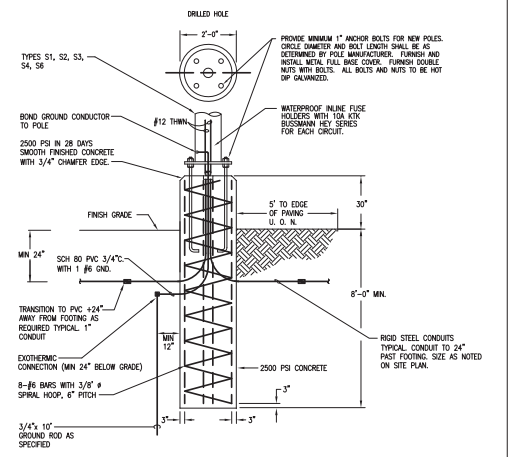
- ① ELECTRICAL KEYED NOTES:**
- ① RECEPTACLE LOCATED OUTSIDE RADIUS OF FAN. INDICATED WITH J-BOX ON PLAN. CONTRACTOR SHALL CONFIRM TYPE OF RECEPTACLE REQUIRED WITH MANUFACTURER OF FAN SUPPLIED TO SITE.
  - ② CONDUIT FOR CONTROLS WIRING.
  - ③ RECESSED RECEPTACLE ROUGH-IN BEHIND TOUCHPAD SUCH THAT TOUCHPAD CAN BE SURFACE MOUNTED TO WALL. SHARE SAME CIRCUIT SERVICING H.V.S.

DETAIL NOTES:  
1. CIRCUIT FAN THROUGH FIRE ALARM RELAY SUCH THAT AN ALARM CONDITION FROM FIRE ALARM WILL DISABLE THE FAN. FIRE ALARM PROVIDED BY FIRE PROTECTION AND FIRE ALARM CONTRACTOR.

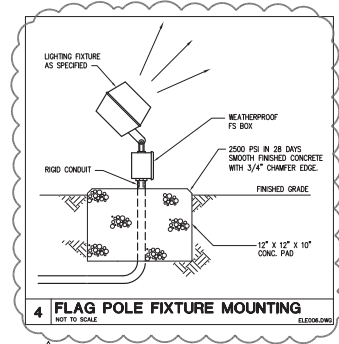
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**2 UNI-STRUT RACK DETAIL**  
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**3 CONCRETE POLE BASE DETAIL (TYP.)**  
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**4 FLAG POLE FIXTURE MOUNTING**  
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Date	03/25/2015
PROJECT No.	14629
Revisions	
1	03/27/15 ADDENDUM 1
2	04/02/15 ADDENDUM 2
3	04/17/15 ADDENDUM 4
4	05/22/15 ASI No. 1
5	05/24/15 PR No. 1
6	05/24/15 PR No. 2
7	05/24/15 PR No. 3 (GEN)
8	05/28/15 FLAG POLE
9	10/01/15 ASI No. 012
10	01/12/16 PR, RP HOUSE

SHEET TITLE  
**ELECTRICAL DETAILS**

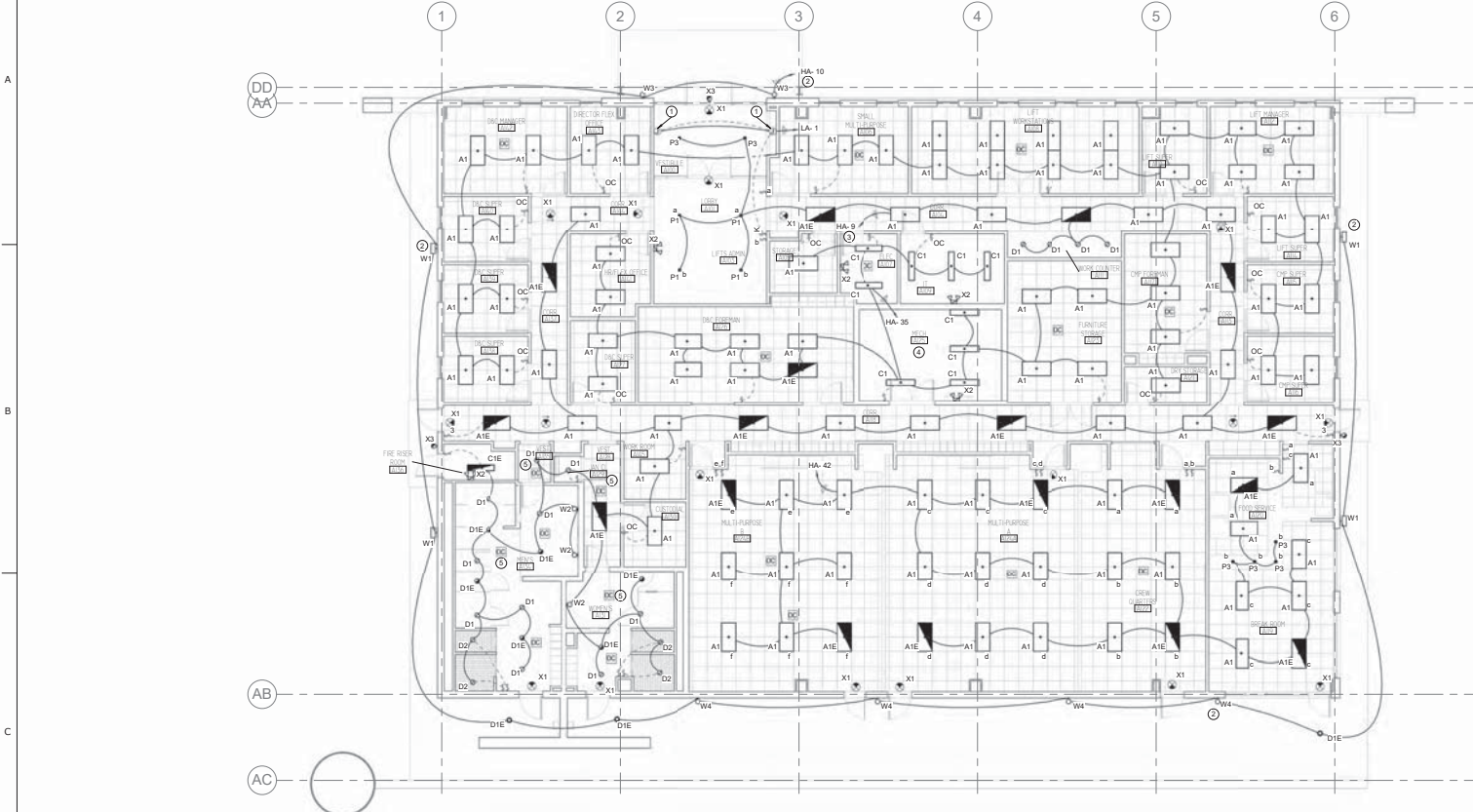
SHEET NO.

**E602**

**AS-BUILTS**

06-08-2016

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**LIGHTING PLAN GENERAL NOTES:**

- A. WHEN LOCATING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 72 INCHES AFF. COORDINATE SWITCH LOCATIONS IN ROOMS WITH ARCHITECT AND OTHER DEVICES (THERMOSTATS, FIRE ALARM, AND CALL BUTTONS).
- B. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT. MAXIMUM FIXTURE WIRE LENGTH FROM ANY 1/2"X3/8" FEET. LIGHTING CIRCUITS JOINTS SHALL BE MADE UP IN OVERHEAD J-BOXES SECURED TO STRUCTURE WITH LIGHTING WIRES FROM THE J-BOXES. FIXTURES DESIGNED TO BE QUICK-CLIPPED TOGETHER SHALL BE CONNECTED AS PER MANUFACTURER.
- C. COORDINATE LIGHT LOCATIONS WITH ARCHITECTURAL RCP AND OTHER CEILING ITEMS OR JOIST ITEMS PRIOR TO INSTALLATION. LIGHT LOCATIONS TAKE PRECEDENCE OVER AIR DEVICES.
- D. PROVIDE SECONDARY SUPPORT WIRES FROM ALL FOUR (4) CORNERS OF THE LAY-IN FIXTURES TO THE STRUCTURE ABOVE. DO NOT SUPPORT FIXTURES FROM CEILING GRID WIRE SUPPORTS, PIPING, CONDUIT, SIDE WALLS, OR MECHANICAL EQUIPMENT. CEILING SPECIFICATIONS DO NOT SUPERCEDE THIS REQUIREMENT.
- E. FIXTURES WITH 'E' SUFFIX HAVE EMERGENCY BATTERY PAGES.
- F. FIRESTOP ALL CONDUIT PENETRATIONS IN RATED WALLS. SEE ARCHITECTURAL FOR WALL RATINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO SHEET ROCK AND REPAIR. PROVIDE FIRE RATED SLEEVES IN ALL FLOOR PENETRATIONS.
- G. PROVIDE AN EXTRA UNSWITCHED HOT LEG FOR EXITS LIGHTS AND EMERGENCY LIGHT FIXTURES TO ALLOW LAMPS TO BE SWITCHED UNDER NORMAL OPERATION AND AUTOMATIC ON UPON POWER FAILURE.
- H. HOT LEG CONDUCTORS FOR EXIT AND EMERGENCY FIXTURES SHALL ORIGINATE FROM LINE SIDE OF ANY SWITCHES, BUT LOAD SIDE FROM ALL EMCS CONTACTORS, SUCH THAT OPENING EMCS CONTACTORS TRANSFERS ALL EXIT SIGNS AND EMERGENCY LIGHTS TO OPERATE OFF OF BATTERY BACKUP POWER.
- I. CIRCUIT ALL EXIT SIGNS TO NEAREST LIGHTING CIRCUIT, IN ACCORDANCE WITH GENERAL NOTE 'I'.
- J. ALL CEILING MOUNTED OCCUPANCY SENSORS SHALL BE WATTS10PPER DT-305, OR EQUAL. ALL SINGLE RELAY WALL SWITCH OCCUPANCY SENSORS SHALL BE WATTS10PPER DSW-100, OR EQUAL.
- K. ALL CEILING MOUNTED OCCUPANCY SENSORS SHALL BE INSTALLED ON THE LINE SIDE OF ALL LIGHT SWITCHES. NOT ALL SPACES HAVE SWITCHES. THESE SPACES SHALL BE CONTROLLED BY OCCUPANCY SENSORS ONLY.
- L. WHERE MULTIPLE SWITCHES CONTROL LIGHTING IN A SINGLE SPACE, PROVIDE CONTROL ACCORDING TO SUBSCRIPT NEXT TO LIGHT FIXTURES AND ASSOCIATED SWITCH. FOR EXAMPLE, FIXTURE TYPE 'A1' WITH SUBSCRIPT 'a' SHALL BE CONTROLLED BY SWITCH 'a'.
- M. EXTERIOR FIXTURES TYPE 'X3' SHALL BE CONNECTED TO NEAREST INTERIOR EXPRESS PATH BRANCH CIRCUIT, BY USE OF UNSWITCHED HOT LEG. TYPICAL OF ALL X3 FIXTURES.

**ELECTRICAL KEYED NOTES:**

- 1. PROVIDE JUNCTION BOX FOR FUTURE DISPLAY CASE LIGHTING. VERIFY EXACT MOUNTING LOCATION WITH ARCHITECT.
- 2. TO CIRCUIT INDICATED THROUGH PHOTOCELL CONTROLLED CONTACTOR.
- 3. TO CIRCUIT INDICATED THROUGH EMCS CONTROLLED CONTACTOR.
- 4. COORDINATE EXACT LOCATION OF LIGHTING FIXTURES WITH MECHANICAL EQUIPMENT.
- 5. ALL LIGHTING THIS ROOM SHALL BE CONTROLLED BY CEILING OCCUPANCY SENSOR.

**1 LIGHTING PLAN - ADMIN BLDG**  
1/8" = 1'-0"

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700 N. St. Mary's Suite 1600 San Antonio, TX 78205

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**NSOC NEW SERVICE CENTER PROJECT**  
CAPITAL PORT DRIVE SAN ANTONIO, TX

**San Antonio Water System**

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Date: 03/20/2015  
PROJECT No. 14029  
Revisions:  
2 04/03/15 ADDENDUM 2  
5 05/22/15 ASI No. 1

SHEET TITLE  
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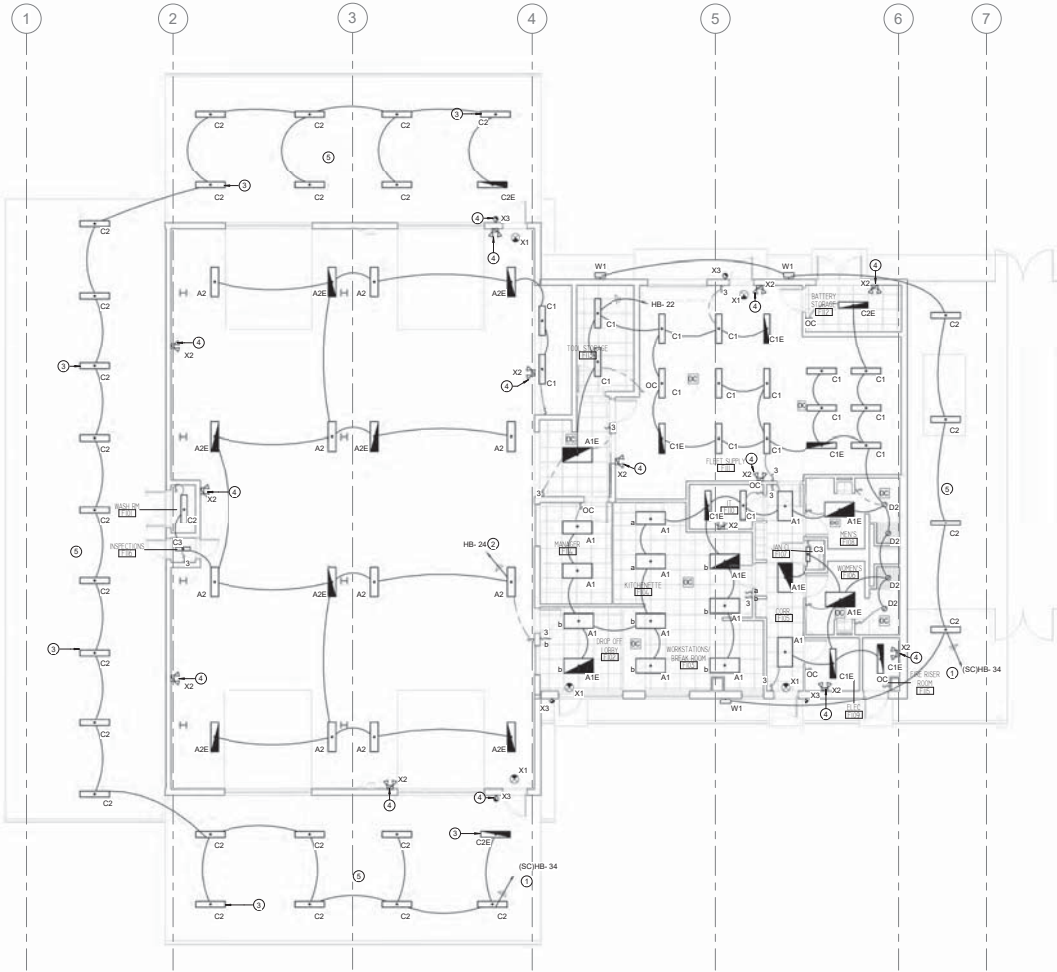
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**EL101**

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**1 LIGHTING PLAN - FLEET BLDG**  
18" = 1'-0"

**LIGHTING PLAN GENERAL NOTES:**

- A. WHEN LOCATING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 72 INCHES AFF. COORDINATE SWITCH LOCATIONS IN ROOMS WITH ARCHITECT AND OTHER DEVICES (THERMOSTATS, FIRE ALARM, AND CALL BUTTONS).
- B. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT. MAXIMUM FIXTURE WIRE LENGTH FROM ANY J-BOX 6 FEET. LIGHTING CIRCUITS JOINTS SHALL BE MADE UP IN OVERHEAD J-BOXES SECURED TO STRUCTURE WITH LIGHTING WHIPS FROM THE J-BOXES. FIXTURES DESIGNED TO BE QUICK-CLIPPED TOGETHER SHALL BE CONNECTED AS PER MANUFACTURER.
- C. COORDINATE LIGHT LOCATIONS WITH ARCHITECTURAL RCP AND OTHER CEILING ITEMS OR JOIST ITEMS PRIOR TO INSTALLATION. LIGHT LOCATIONS TAKE PRECEDENCE OVER AIR DEVICES.
- D. PROVIDE SECONDARY SUPPORT WIRES FROM ALL FOUR (4) CORNERS OF THE LAY-IN FIXTURES TO THE STRUCTURE ABOVE. DO NOT SUPPORT FIXTURES FROM CEILING GRID WIRE SUPPORTS, PIPING, CONDUIT, SIDE WALLS OR MECHANICAL EQUIPMENT. CEILING SPECIFICATIONS DO NOT SUPERCEDE THIS REQUIREMENT.
- E. FIXTURES WITH 'E' SUFFIX HAVE EMERGENCY BATTERY PACKS.
- F. FIRESTOP ALL CONDUIT PENETRATIONS IN RATED WALLS. SEE ARCHITECTURAL FOR WALL RATINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO SHEET, HOOK AND REPAIR. PROVIDE FIRE RATED SLEEVES IN ALL FLOOR PENETRATIONS.
- G. PROVIDE AN EXTRA UNSWITCHED HOT LEG FOR EXITS LIGHTS AND EMERGENCY LIGHT FIXTURES TO ALLOW LAMPS TO BE SWITCHED UNDER NORMAL OPERATION AND AUTOMATIC ON UPON POWER FAILURE.
- H. HOT LEG CONDUCTORS FOR EXIT AND EMERGENCY FIXTURES SHALL ORIGINATE FROM LINE SIDE OF ANY SWITCHES, BUT LOAD SIDE FROM ALL EMCS CONTACTORS; SUCH THAT OPENING EMCS CONTACTORS TRANSFERS ALL EXIT SIGNS AND EMERGENCY LIGHTS TO OPERATE OFF OF BATTERY BACKUP POWER.
- I. CIRCUIT ALL EXIT SIGNS TO NEAREST LIGHTING CIRCUIT, IN ACCORDANCE WITH GENERAL NOTE 7.
- J. PROVIDE AND INSTALL A COMPLETE UL/ULP CERTIFIED LIGHTNING PROTECTION SYSTEM. REFER TO SPECIFICATIONS, 04-11.13.3.
- K. ALL CEILING MOUNTED OCCUPANCY SENSORS SHALL BE WATTSTOPPER DT-355, OR EQUAL. ALL SINGLE RELAY WALL SWITCH OCCUPANCY SENSORS SHALL BE WATTSTOPPER DSW-100, OR EQUAL.
- L. ALL CEILING MOUNTED OCCUPANCY SENSORS SHALL BE INSTALLED ON THE LINE SIDE OF ALL LIGHT SWITCHES. NOT ALL SPACES HAVE SWITCHES. THESE SPACES SHALL BE CONTROLLED BY OCCUPANCY SENSORS ONLY.
- M. WHERE MULTIPLE SWITCHES CONTROL LIGHTING IN A SINGLE SPACE, PROVIDE CONTROL ACCORDING TO SUBSCRIPT NEXT TO LIGHT FIXTURES AND ASSOCIATED SWITCH. FOR EXAMPLE, FIXTURE TYPE 'A1' WITH SUBSCRIPT 'a' SHALL BE CONTROLLED BY SWITCH 'a'.
- N. EXTERIOR FIXTURES TYPE 'X3' SHALL BE CONNECTED TO NEAREST INTERIOR GROSS RAIN BRANCH CIRCUIT, BY USE OF UNSWITCHED HOT LEG. TYPICAL OF ALL X3 FIXTURES.

**Ⓞ ELECTRICAL KEYED NOTES:**

- 1 TO CIRCUIT INDICATED THROUGH PHOTOCELL CONTROLLED CONTACTOR.
- 2 TO CIRCUIT INDICATED THROUGH EMCS CONTROLLED.
- 3 MOUNT ON PERLINS. TYPICAL OF EXTERIOR C2 FIXTURES.
- 4 PROVIDE EMERGENCY FIXTURE IN LIEU OF LED WITH BATTERY PACK IF ALTERNATE #1 IS ACCEPTED.
- 5 ALL GANTRY LIGHTING FIXTURES SHALL BE DIRECTLY MOUNTED TO PERLINS. COORDINATE WITH STRUCTURAL.



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1 03/27/15 ADDENDUM 1  
2 04/03/15 ADDENDUM 2  
4 05/22/15 ASH No. 2

**AS-BUILTS**

06-08-2016

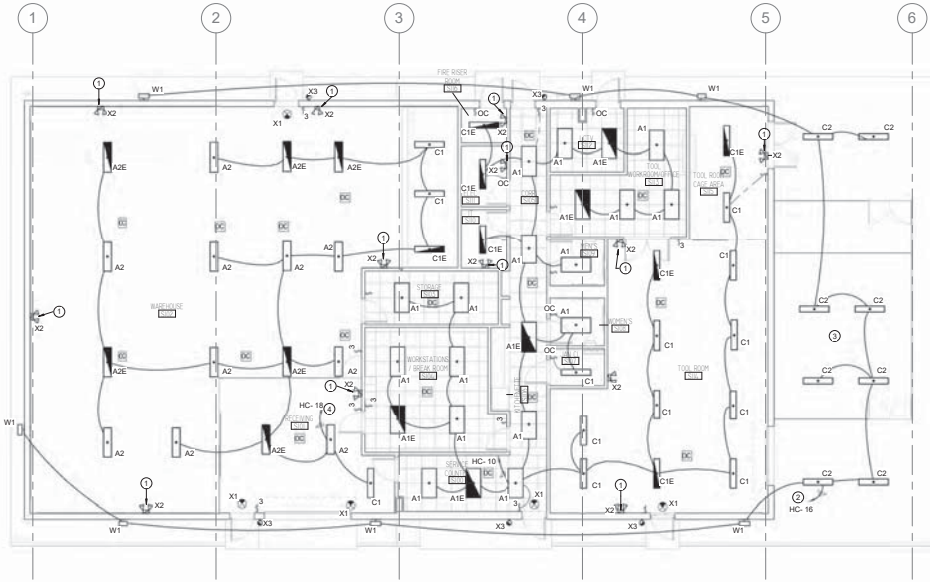
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SHEET NO.  
**EL102**

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 1 LIGHTING PLAN - SUPPLY BLDG  
1/8" = 1'-0"

**LIGHTING PLAN GENERAL NOTES:**

- A. WHEN LOCATING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 72 INCHES AFF. COORDINATE SWITCH LOCATIONS IN ROOMS WITH ARCHITECT AND OTHER DEVICES (THERMOSTATS, FIRE ALARMS, AND CALL BUTTONS).
- B. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT. MAXIMUM FIXTURE WIRE LENGTH FROM ANY JBOX 6 FEET. LIGHTING CIRCUITS JOINTS SHALL BE MADE UP IN OVERHEAD JBOXES SECURED TO STRUCTURE WITH LIGHTING WHIPS FROM THE JBOXES. FIXTURES DESIGNED TO BE QUICK-CLIPPED TOGETHER SHALL BE CONNECTED AS PER MANUFACTURER.
- C. COORDINATE LIGHT LOCATIONS WITH ARCHITECTURAL RCP AND OTHER CEILING ITEMS OR JOIST ITEMS PRIOR TO INSTALLATION. LIGHT LOCATIONS TAKE PRECEDENCE OVER AIR DEVICES.
- D. PROVIDE SECONDARY SUPPORT WIRES FROM ALL FOUR (4) CORNERS OF THE LAY-IN FIXTURES TO THE STRUCTURE ABOVE. DO NOT SUPPORT FIXTURES FROM CEILING GRID WIRE SUPPORTS, SPRING, CONDUIT, SIDE WALLS, OR MECHANICAL EQUIPMENT. CEILING SPECIFICATIONS DO NOT SUPERCEDE THIS REQUIREMENT.
- E. FIXTURES WITH 'E' SUFFIX HAVE EMERGENCY BATTERY PACKS.
- F. FIRESTOP ALL CONDUIT PENETRATIONS IN RATED WALLS. SEE ARCHITECTURAL FOR WALL RATINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO SHEET ROCK AND REPAIR. PROVIDE FIRE RATED SLEEVES IN ALL FLOOR PENETRATIONS.
- G. PROVIDE AN EXTRA UNSWITCHED HOT LEG FOR EXITS LIGHTS AND EMERGENCY LIGHT FIXTURES TO ALLOW LAMPS TO BE SWITCHED UNDER NORMAL OPERATION AND AUTOMATIC ON UPON POWER FAILURE.
- H. HOT LEG CONDUCTORS FOR EXIT AND EMERGENCY FIXTURES SHALL ORIGINATE FROM LINE-SIDE OF ANY SWITCHES, BUT LOAD SIDE FROM ALL EMCS CONTACTORS. SUCH THAT OPENING EMCS CONTACTORS TRANSFER ALL EXIT SIGNS AND EMERGENCY LIGHTS TO OPERATE OFF OF BATTERY BACKUP POWER.
- I. CIRCUIT ALL EXIT SIGNS TO NEAREST LIGHTING CIRCUIT, IN ACCORDANCE WITH GENERAL NOTE 1F.
- J. ALL CEILING MOUNTED OCCUPANCY SENSORS SHALL BE WATTS/STOPPER DT-205, OR EQUAL. ALL SINGLE RELAY WALL SWITCH OCCUPANCY SENSORS SHALL BE WATTS/STOPPER D5W-100, OR EQUAL.
- K. ALL CEILING MOUNTED OCCUPANCY SENSORS SHALL BE INSTALLED ON THE LINE SIDE OF ALL LIGHT SWITCHES. NOT ALL SPACES HAVE SWITCHES; THESE SPACES SHALL BE CONTROLLED BY OCCUPANCY SENSORS ONLY.
- L. WHERE MULTIPLE SWITCHES CONTROL LIGHTING IN A SINGLE SPACE, PROVIDE CONTROL, ACCORDING TO SUBSCRIPT NEXT TO LIGHT FIXTURES AND ASSOCIATED SWITCH. FOR EXAMPLE, FIXTURE TYPE 'A1' WITH SUBSCRIPT '1' SHALL BE CONTROLLED BY SWITCH '1'.
- M. EXTERIOR FIXTURES TYPE 'X3' SHALL BE CONNECTED TO NEAREST INTERIOR EGRESS PATH BRANCH CIRCUIT.

**ELECTRICAL KEYED NOTES:**

- 1. PROVIDE EMERGENCY FIXTURE IN LIEU OF LED WITH BATTERY PACK IF ALTERNATE #1B IS ACCEPTED.
- 2. TO CIRCUIT INDICATED THROUGH PHOTOCELL CONTROLLED CONTACTOR.
- 3. ALL CANSY LIGHTING FIXTURES SHALL BE DIRECTLY MOUNTED TO PERLINE. COORDINATE WITH STRUCTURAL.
- 4. TO CIRCUIT INDICATED THROUGH EMCS CONTROLLER.

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2 04/03/15 ADDENDUM 2

**AS-BUILTS**

06-08-2016

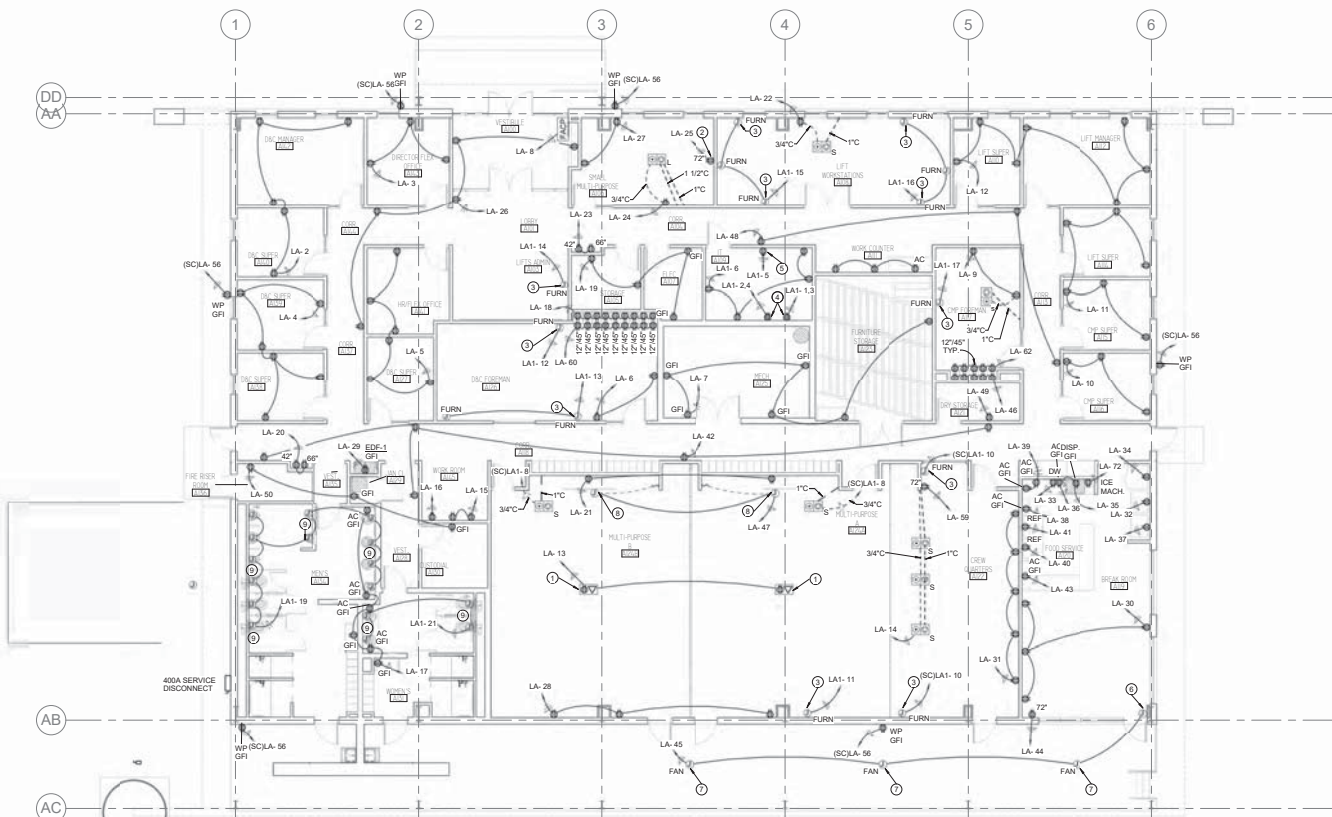
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LIGHTING PLAN - SUPPLY BLDG

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EL103

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1 POWER PLAN - ADMIN BLDG  
EP101  
1/8" = 1'-0"

**POWER PLAN GENERAL NOTES:**

- A. SEE ALL OTHER PLANS FOR ADDITIONAL DEVICES. SOME POWER CIRCUITING MAY BE ON OTHER PLANS. COORDINATE THE LOCATIONS OF DATA/CATV JACKS WITH THE RECEPTABLES. MOUNT ADJACENT TO EACH OTHER.
- B. WHEN LOCATING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 12 INCHES APART.
- C. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT.
- D. PROVIDE #10 AWG MIN NEUTRAL FOR ALL MULTIWIRE BRANCH CIRCUITS AND PROVIDE HANDLE TIES FOR CIRCUIT BREAKERS AS REQUIRED BY NEC 210.4
- E. COORDINATE RECEPTACLE LOCATIONS WITH MILLWORK AND COUNTERTOPS. DO NOT LOCATE RECEPTABLES BEHIND DRAWERS OR HIDDEN IN MILLWORK UNLESS SPECIFICALLY DIRECTED BY OWNER/ARCHITECT. REVIEW ARCHITECTURAL ELEVATIONS PRIOR TO RECEPTACLE ROUGH-INS. SEE ARCH. ELEVATIONS IN BREAKROOMS FOR APPLIANCES AND RECEPTACLE MOUNTING LOCATIONS.
- F. PROVIDE GFI RECEPTABLES WITHIN 6' OF ALL SINKS, AND AT ALL ROOFTOP RECEPTABLES, KITCHEN RECEPTABLES, BATHROOM/TOILET ROOMS, EXTERIOR RECEPTABLES UNDER/COUNTER EQUIPMENT, AND ALL RECEPTABLES SERVING DRINKING FOUNTAINS AND VENDING MACHINES.
- G. ALL EQUIPMENT SHALL HAVE A LOCAL DISCONNECTING MEANS, EITHER CORDED PLUG AND RECEPTACLE OR SWITCHED DISCONNECT. VERIFY FROM EQUIPMENT SUBMITTED OR RELOCATED IF DIRECT CONNECT OR RECEPTACLE IF DIRECT CONNECT. PROVIDE SWITCH AS PER NEC OTHERWISE, PROVIDE RECEPTACLE, CORD PLUG AS REQUIRED BY EQUIPMENT SUBMITTAL.
- H. PROVIDE AND INSTALL A COMPLETE UL/ULP CERTIFIED LIGHTNING PROTECTION SYSTEM. REFER TO SPECIFICATIONS, 26 41 13.13

**ELECTRICAL KEYED NOTES:**

- 1 J-BOX AT STRUCTURE. FLEX TO PROJECTOR OUTLET AND CEILING ENCLOSURE FOR AV.
- 2 J-BOX AT STRUCTURE. FLEX TO 72" MONITOR RECEPTACLE AND CEILING ENCLOSURE FOR AV.
- 3 ELECTRICAL CONNECTION TO MODULAR FURNITURE SYSTEM. COORDINATE ROUGH-IN LOCATION WITH FURNITURE VENDOR. VERIFY QUANTITY OF CIRCUIT PER WHIP. SEE GENERAL NOTE 17 ABOVE.
- 4 VERIFY TYPE AND LOCATION OF SPECIAL RECEPTACLE REQUIRED FOR IT EQUIPMENT WITH DIVISION 27 REPRESENTATIVE.
- 5 COORDINATE LOCATION OF SECURITY PANEL IN THIS ROOM WITH DIVISION 27.
- 6 PROVIDE ROUGH-IN AND BLANK PLATE FOR FUTURE SWITCH TO EXTERIOR CEILING FANS.
- 7 PROVIDE J-BOX WITH CIRCUIT CONDUCTORS FOR FUTURE CEILING FAN CONNECTION. CAP J-BOX FOR FUTURE USE. PROVIDE CONDUIT AND FLOORING TO FUTURE CONTROL.
- 8 PROVIDE ELECTRICAL CONNECTION TO MOTORIZED PROJECTION SCREEN. VERIFY CONTROL SWITCH LOCATION WITH BUILDING OWNER PRIOR TO ROUGH-IN.
- 9 PROVIDE 120V ROUGH-IN FOR AUTO SENSORS.



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5 05/22/15 ASI No. 1

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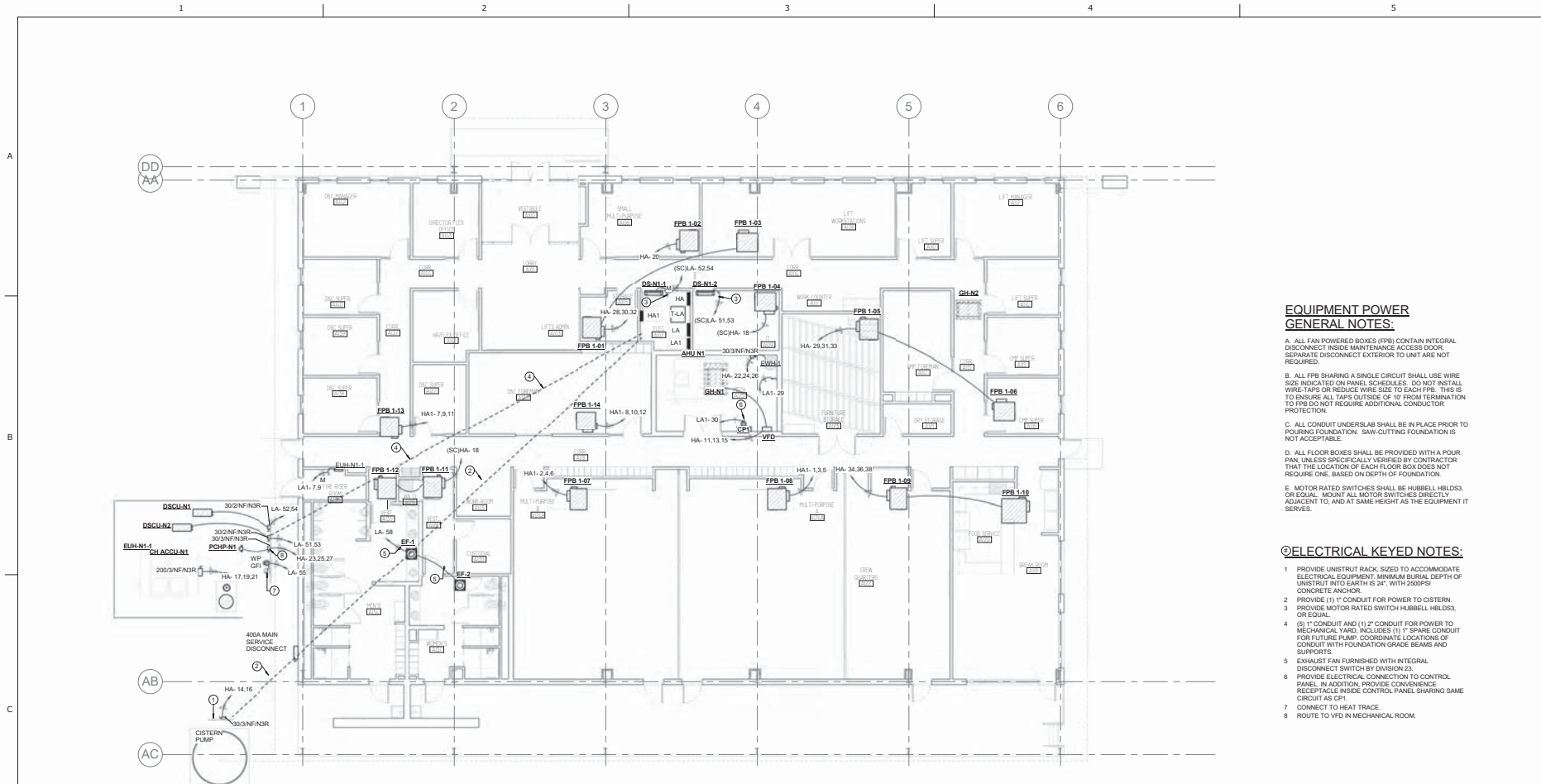
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**POWER PLAN - ADMIN BLDG**

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**EP101**

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**1** EQUIPMENT POWER PLAN - ADMIN BLDG  
 EP101A 1/8" = 1'-0"

**EQUIPMENT POWER GENERAL NOTES:**

- A. ALL FAN POWERED BOXES (FPB) CONTAIN INTEGRAL DISCONNECT INSIDE MAINTENANCE ACCESS DOOR. SEPARATE DISCONNECT EXTERIOR TO UNIT ARE NOT REQUIRED.
- B. ALL FPB SHARING A SINGLE CIRCUIT SHALL USE WIRE SIZE INDICATED ON PANEL SCHEDULES. DO NOT INSTALL WIRE TAPS OR REDUCE WIRE SIZE TO EACH FPB. THIS IS TO ENSURE ALL TAPS OUTSIDE OF 10' FROM TERMINATION TO FPB DO NOT REQUIRE ADDITIONAL CONDUCTOR PROTECTION.
- C. ALL CONDUIT UNDERSLAB SHALL BE IN PLACE PRIOR TO POURING FOUNDATION. SAW-CUTTING FOUNDATION IS NOT ACCEPTABLE.
- D. ALL FLOOR BOXES SHALL BE PROVIDED WITH A POUR PAN, UNLESS SPECIFICALLY VERIFIED BY CONTRACTOR THAT THE LOCATION OF EACH FLOOR BOX DOES NOT REQUIRE ONE, BASED ON DEPTH OF FOUNDATION.
- E. MOTOR RATED SWITCHES SHALL BE HUBBELL HBLD53, OR EQUAL. MOUNT ALL MOTOR SWITCHES DIRECTLY ADJACENT TO, AND AT SAME HEIGHT AS THE EQUIPMENT IT SERVES.

**ELECTRICAL KEYED NOTES:**

- 1. PROVIDE UNISTRUT RACK, SIZED TO ACCOMMODATE ELECTRICAL EQUIPMENT. MINIMUM BURIAL DEPTH OF UNISTRUT INTO EARTH IS 24" WITH 260RPS CONCRETE ANCHOR.
- 2. PROVIDE (1) 1" CONDUIT FOR POWER TO CISTERN, OR EQUAL.
- 3. PROVIDE MOTOR RATED SWITCH HUBBELL HBLD53, OR EQUAL.
- 4. (5) 1" CONDUIT AND (1) 2" CONDUIT FOR POWER TO MECHANICAL YARD. INCLUDES (1) 1" SPARE CONDUIT FOR FUTURE PUMP. COORDINATE LOCATIONS OF CONDUIT WITH FOUNDATION GRADE BEAMS AND SUPPORTS.
- 5. EXHAUST FAN FURNISHED WITH INTEGRAL DISCONNECT SWITCH BY QWIKON J3.
- 6. PROVIDE ELECTRICAL CONNECTION TO CONTROL PANEL. IN ADDITION, PROVIDE CONVENIENCE RECEPTACLE INSIDE CONTROL PANEL SHARING SAME CIRCUIT AS C/P1.
- 7. CONNECT TO HEAT TRACE.
- 8. ROUTE TO VFD IN MECHANICAL ROOM.



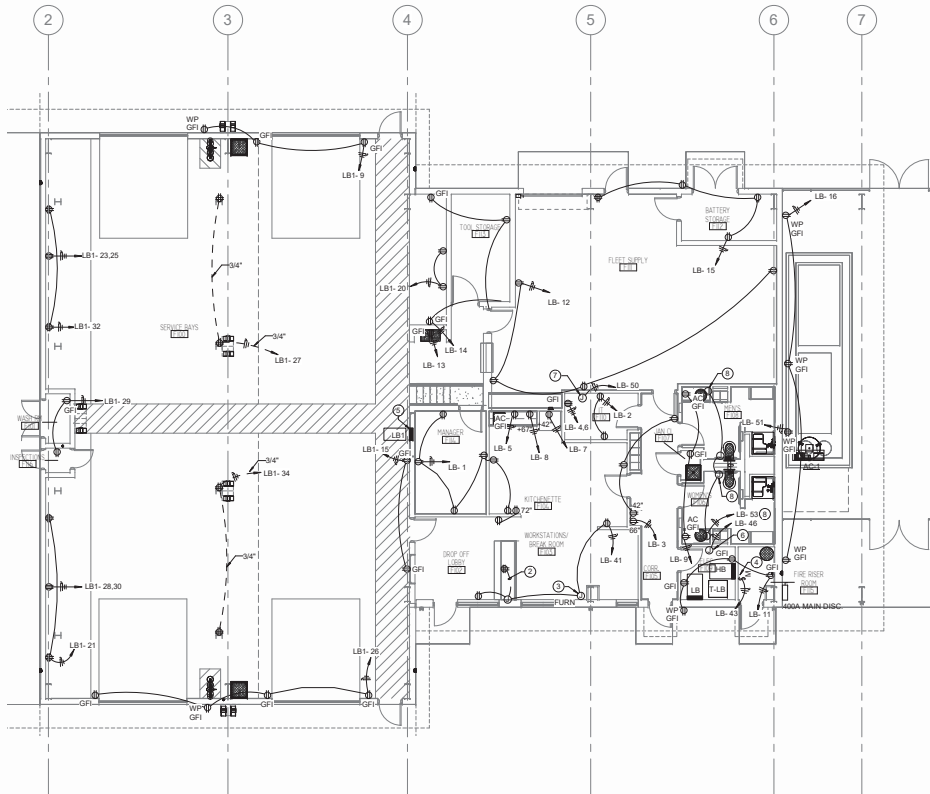
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 5 05/22/15 ASI No. 1

**AS-BUILTS**

06-08-2016

SHEET TITLE  
**EQUIPMENT POWER PLAN - ADMIN BLDG**

SHEET NO.  
**EP101A**



⊗ 1 POWER PLAN - FLEET BLDG  
EP102 1/8" = 1'-0"

**POWER PLAN GENERAL NOTES:**

- A. SEE ALL OTHER PLANS FOR ADDITIONAL DEVICES. SOME POWER CIRCUITING MAY BE ON OTHER PLANS. COORDINATE THE LOCATIONS OF DATA/CATV JACKS WITH THE RECEPTACLES. MOUNT ADJACENT TO EACH OTHER.
- B. WHEN LOCATING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 72 INCHES APART.
- C. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT.
- D. PROVIDE #10 AWG MIN NEUTRAL FOR ALL MULTIWIRE BRANCH CIRCUITS AND PROVIDE HANDLE TIES FOR CIRCUIT BREAKERS AS REQUIRED BY NEC 210.4.
- E. COORDINATE RECEPTACLE LOCATIONS WITH MILLWORK AND COUNTERTOPS. DO NOT LOCATE RECEPTACLES BEHIND DRAWERS OR HIDDEN IN MILLWORK UNLESS SPECIFICALLY DIRECTED BY OWNER/ARCHITECT. REVIEW ARCHITECTURAL ELEVATIONS PRIOR TO RECEPTACLE ROUGH-INS. SEE ARCH. ELEVATIONS IN BREAKROOMS FOR APPLIANCES AND RECEPTACLE MOUNTING LOCATIONS.
- F. PROVIDE GFI RECEPTACLES WITHIN 6' OF ALL SINKS, AND AT ALL ROOFTOP RECEPTACLES, KITCHEN RECEPTACLES, BATHROOM/TOILET ROOMS, EXTERIOR RECEPTACLES, UNDERCOUNTER EQUIPMENT, AND ALL RECEPTACLES SERVING DRINKING FOUNTAINS AND VENDING MACHINES.
- G. ALL EQUIPMENT SHALL HAVE A LOCAL DISCONNECTING MEANS, EITHER CORDED PLUG AND RECEPTACLE OR SWITCHED DISCONNECT. VERIFY FROM EQUIPMENT SUBMITTED OR RELOCATED IF DIRECT CONNECT OR RECEPTACLE. IF DIRECT CONNECT, PROVIDE SWITCH AS PER NEC OTHERWISE, PROVIDE RECEPTACLE, CORDED PLUG AS REQUIRED BY EQUIPMENT SUBMITTAL.
- H. PROVIDE AND INSTALL A COMPLETE UL/PLI CERTIFIED LIGHTNING PROTECTION SYSTEM. REFER TO SPECIFICATIONS, 26 41 13.13.
- I. OWNER & OWNER PM TO FIELD VERIFY ALL ELECTRICAL IN FLEET SERVICE BAY PRIOR TO PULLING WIRE.
- J. ALL OUTLETS IN FLEET SERVICE BAY TO BE 42" A.F.F.
- K. PROVIDE FLEXIBLE CONNECTION TO ALL EQUIPMENT USING LPMC IN SERVICE BAY, OR APPROVED EQUIVAL.

**ELECTRICAL KEYED NOTES:**

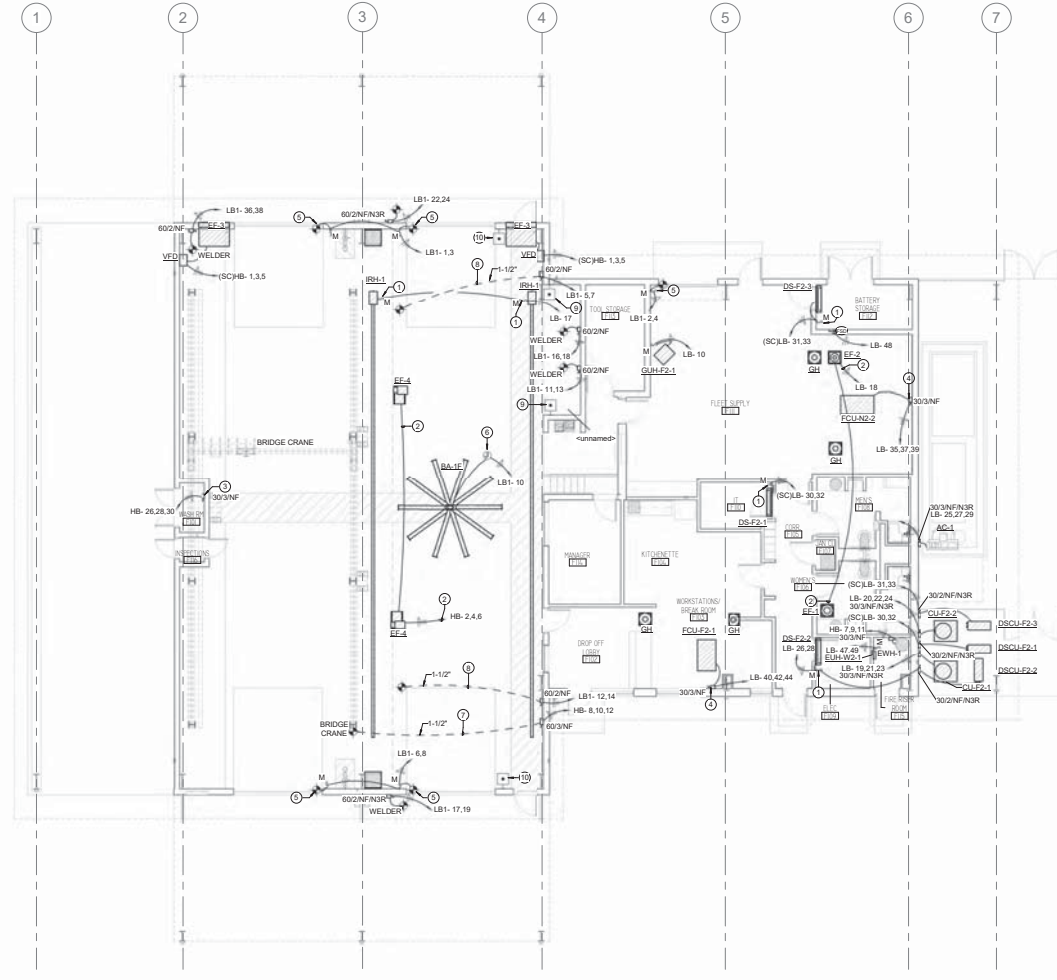
- 1. PROVIDE RED MUSHROOM TYPE PUSHBUTTON SWITCH TO OPERATE EXHAUST FAN #5 SERVING WELDING STATION VENTILATION. MOUNT AT 42" BOTH PUSHBUTTONS SERVING WELDER VENTILATION SHALL BE WIRING IN PARALLEL SUCH THAT ENABLING EITHER PUSHBUTTON WILL ENGAGE EXHAUST FAN.
- 2. COORDINATE RECEPTACLE LOCATION WITH MILLWORK. USE OF MC CABLE PERMITTED FROM JUNCTION BOX AT WALL TO QUAD IN MILLWORK.
- 3. ELECTRICAL CONNECTION TO MODULAR FURNITURE SYSTEM. COORDINATE ROUGH-IN LOCATION WITH FURNITURE VENDOR.
- 4. RECEPTACLE FOR CONNECTION TO DRYPIPE AIR COMPRESSOR.
- 5. PROVIDE #4 SPARE 1" CONDUIT FROM PANEL TO ACCESSIBLE SPACE ABOVE PANEL. IN ADDITION TO THE SPARE CONDUITS REQUIRED BY THE SPECIFICATIONS.
- 6. PROVIDE J-BOX ROUGH-IN AND CIRCUIT FOR FUTURE CONNECTION TO FIRE ALARM POWER SUPPLY EXPANDER.
- 7. PROVIDE CONNECTION TO SECURITY PANEL. COORDINATE LOCATION WITH DIV. 28 INSTALLER.
- 8. PROVIDE 120V ROUGH-IN FOR AUTO SENSORS.



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A  
 B  
 C  
 D



**EQUIPMENT POWER PLAN - FLEET BLDG**  
 EP102A 1/8" = 1'-0"

**EQUIPMENT PLAN GENERAL NOTES:**

- A. VERIFY ELECTRICAL POINTS OF CONNECTION TO VEHICLE LIFTS AND BRIDGE CRANE PRIOR TO LAYING CONDUIT IN SLAB.
- B. ALL CONDUIT UNDERSLAB SHALL BE IN PLACE PRIOR TO POURING FOUNDATION. SAW-CUTTING FOUNDATION IS NOT ACCEPTABLE.
- C. ALL FLOOR BOXES SHALL BE PROVIDED WITH A POUR PAUL UNLESS SPECIFICALLY VERIFIED BY CONTRACTOR THAT THE LOCATION OF EACH FLOOR BOX DOES NOT REQUIRE ONE, BASED ON DEPTH OF FOUNDATION.
- D. MOTOR RATED SWITCHES SHALL BE HUBBELL HELD3S, OR EQUAL. MOUNT ALL MOTOR SWITCHES DIRECTLY ADJACENT TO, AND AT SAME HEIGHT AS THE EQUIPMENT IT SERVES.

**ELECTRICAL KEYED NOTES:**

- 1 PROVIDE MOTOR RATED SWITCH HUBBELL HELD3S, OR EQUAL
- 2 EXHAUST FAN FURNISHED WITH INTEGRAL DISCONNECT SWITCH BY DW-22
- 3 PROVIDE ELECTRICAL CONNECTION TO PRESSURE WASHER. LOCATE DISCONNECT AT LOCATION THAT IS READILY ACCESSIBLE TO PERSONNEL BASED ON LOCATION OF PRESSURE WASHER.
- 4 MOUNT DISCONNECT WITHIN REACH OF UNIT. MOUNTED TO STRUCTURE. PROVIDE UNIT STRUT BRACING AS NECESSARY.
- 5 PROVIDE ELECTRICAL CONNECTION TO ROLLUP DOOR AND ROUGH-IN FOR CONTROL SWITCH. VERIFY CONTROL SWITCH LOCATION PRIOR TO ROUGH-IN.
- 6 ALTERNATE ACSE. RE: 1E602 FOR HVLS FAN ELECTRICAL INSTALLATION DETAILS.
- 7 PROVIDE ELECTRICAL CONNECTION TO BRIDGE CRANE. CONDUCTORS ON LOAD SIDE OF DISCONNECT SHALL BE UNDERSLAB. COORDINATION CONDUIT STUB-UP LOCATION WITH BRIDGE CRANE SUPPORT. PRIOR TO LAYING CONDUIT IN SLAB. VERIFY WITH CRANE SUPPLIER EXACT STUB-UP LOCATION OF CONDUIT.
- 8 PROVIDE ELECTRICAL CONNECTION TO VEHICLE LIFT. CONDUCTORS ON LOAD SIDE OF DISCONNECT SHALL BE UNDERSLAB. COORDINATION CONDUIT STUB-UP LOCATION WITH VEHICLE LIFT POINT OF ELECTRICAL CONNECTION. PRIOR TO LAYING CONDUIT IN SLAB. VERIFY WITH LIFT SUPPLIER EXACT STUB-UP LOCATION OF CONDUIT.
- 9 PROVIDE RED MUSHROOM TYPE PUSHBUTTON SWITCH TO OPERATE EXHAUST FAN #5 SERVING WELDING STATION VENTILATION. MOUNT AT 42". BOTH PUSHBUTTONS SERVING WELDER VENTILATION SHALL BE WIRED IN PARALLEL SUCH THAT ENABLING EITHER PUSHBUTTON WILL ENGAGE EXHAUST FAN.
- 10 PROVIDE RED MUSHROOM TYPE PUSHBUTTON SWITCH TO OPERATE VEHICLE EXHAUST FAN #4. RESPECTIVE TO THE FAN SERVING PLAN NORTH PLAN SOUTH VEHICLE SERVICE BAYS. MOUNT AT 42". BOTH PUSHBUTTONS SHALL ENGAGE A SINGLE FAN.

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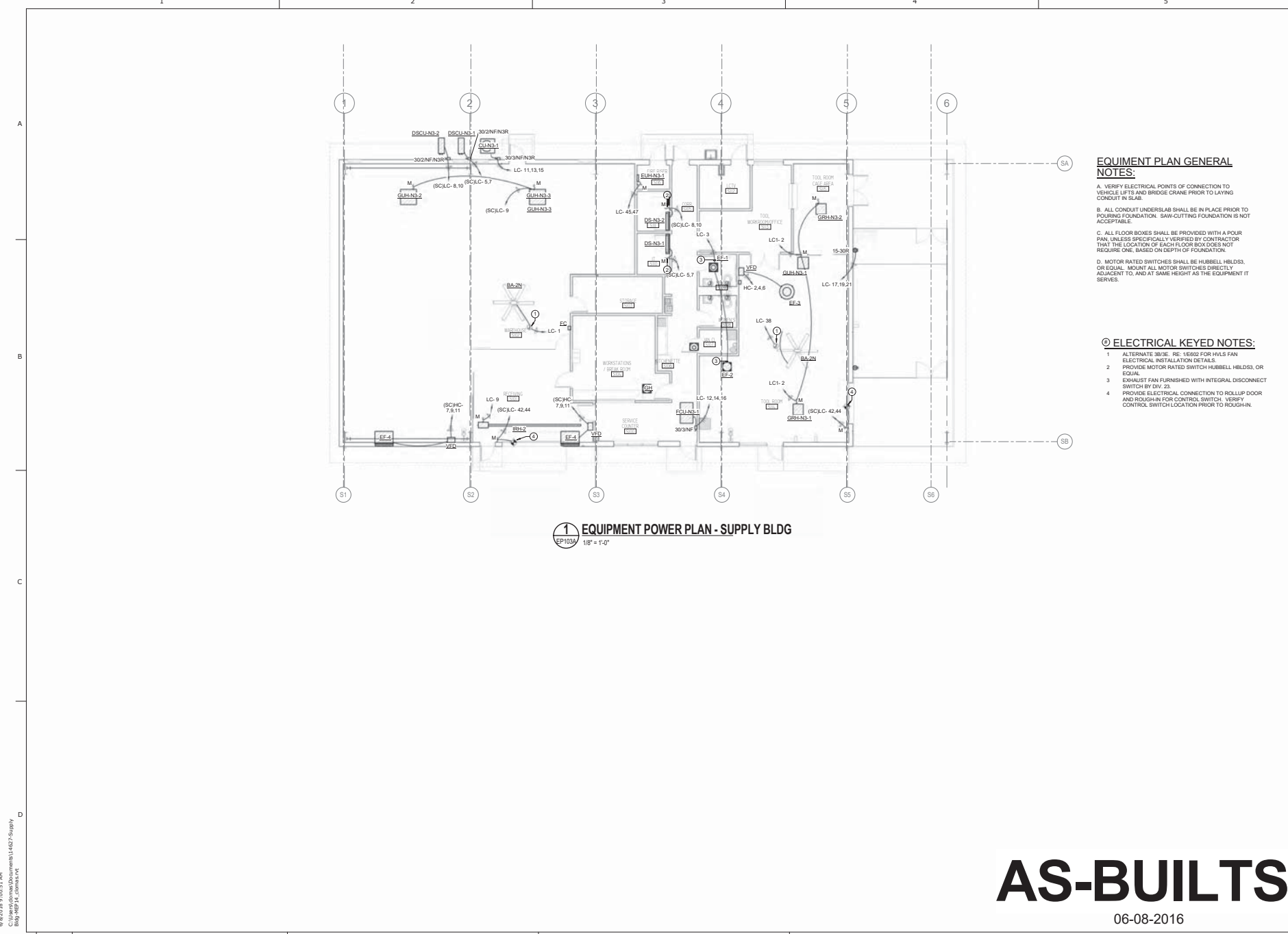
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SHEET TITLE  
**EQUIPMENT POWER PLAN - FLEET BLDG**  
 EP102A







**EQUIPMENT PLAN GENERAL NOTES:**

- A. VERIFY ELECTRICAL POINTS OF CONNECTION TO VEHICLE LIFTS AND BRIDGE CRANE PRIOR TO LAYING CONDUIT IN SLAB.
- B. ALL CONDUIT UNDERSLAB SHALL BE IN PLACE PRIOR TO POURING FOUNDATION. SWICUTTING FOUNDATION IS NOT ACCEPTABLE.
- C. ALL FLOOR BOXES SHALL BE PROVIDED WITH A POUR PAUL UNLESS SPECIFICALLY VERIFIED BY CONTRACTOR THAT THE LOCATION OF EACH FLOOR BOX DOES NOT REQUIRE ONE, BASED ON DEPTH OF FOUNDATION.
- D. MOTOR RATED SWITCHES SHALL BE HUBBELL HELDSS3 OR EQUAL. MOUNT ALL MOTOR SWITCHES DIRECTLY ADJACENT TO, AND AT SAME HEIGHT AS THE EQUIPMENT IT SERVES.

**ELECTRICAL KEYED NOTES:**

- 1 ALTERNATE 303E, RE: 1E602 FOR HVLS FAN ELECTRICAL INSTALLATION DETAILS.
- 2 PROVIDE MOTOR RATED SWITCH HUBBELL HELDSS3, OR EQUAL.
- 3 EXHAUST FAN FURNISHED WITH INTEGRAL DISCONNECT SWITCH BY DIV. 23.
- 4 PROVIDE ELECTRICAL CONNECTION TO ROLLUP DOOR AND ROUGH-IN FOR CONTROL SWITCH. VERIFY CONTROL SWITCH LOCATION PRIOR TO ROUGH-IN.



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 Revisions:  
 3 04/17/15 ADDENDUM 4

SHEET TITLE:  
**EQUIPMENT POWER PLAN - SUPPLY BLDG**

SHEET NO.  
**EP103A**

**AS-BUILTS**  
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# TECHNOLOGY SYMBOL LEGEND

# ABBREVIATIONS

VOICE & DATA SYMBOLS	
	VOICE OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE.
	VOICE OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE, X-NUMBER OF CABLE TERMINATIONS PER LOCATION AS INDICATED.
	VOICE OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +4" ABOVE COUNTER OR SPLASH UNLESS NOTED OTHERWISE.
	VOICE OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +4" ABOVE COUNTER OR SPLASH UNLESS NOTED OTHERWISE.
	PUBLIC TELEPHONE OUTLET, CABLE TYPE AS SPECIFIED, MOUNTING HEIGHT AS SPECIFIED.
	VOICE OUTLET, NO INSTRUMENT, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE.
	VOICE OUTLET, KEYMATE (1) APPLIES.
	POWER/COMMUNICATIONS POLE WITH X-NUMBER OF VOICE TERMINATIONS PER LOCATION.
	VOICE OUTLET, CABLE TYPE AS SPECIFIED, FLUSH FLOOR MOUNTED.
	VOICE OUTLET, CABLE TYPE AS SPECIFIED, SURFACE MOUNTED MONUMENT.
	DATA OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE.
	DATA OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE, X-NUMBER OF CABLE TERMINATIONS PER LOCATION.
	DATA OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +4" ABOVE COUNTER OR SPLASH UNLESS NOTED OTHERWISE.
	DATA OUTLET, KEYMATE (1) APPLIES.
	POWER/COMMUNICATIONS POLE WITH X-NUMBER OF DATA TERMINATIONS PER LOCATION.
	DATA OUTLET, CABLE TYPE AS SPECIFIED, FLUSH FLOOR MOUNTED.
	DATA OUTLET, CABLE TYPE AS SPECIFIED, SURFACE MOUNTED MONUMENT.
	CEILING DATA OUTLET, CABLE TYPE AS SPECIFIED WITH X-NUMBER OF CABLE TERMINATIONS PER LOCATION.
	VOICE AND DATA OUTLET WITH 1 VOICE RIN AND 1 DATA RIN, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE.
	VOICE AND DATA OUTLET WITH X-NUMBER OF VOICE TERMINATIONS AND Y-NUMBER OF DATA TERMINATIONS, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE.
	VOICE AND DATA OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +4" ABOVE COUNTER OR SPLASH UNLESS NOTED OTHERWISE.
	VOICE IS DESIGNATED AS AN ANALOG LINE.
	POWER/COMMUNICATIONS POLE WITH X-NUMBER OF VOICE TERMINATIONS AND Y-NUMBER OF DATA TERMINATIONS PER LOCATION.
	VOICE AND DATA OUTLET WITH X-NUMBER OF VOICE TERMINATIONS AND Y-NUMBER OF DATA TERMINATIONS, CABLE TYPE AS SPECIFIED, FLUSH FLOOR MOUNTED.
	VOICE AND DATA OUTLET, CABLE TYPE AS SPECIFIED, SURFACE MOUNTED MONUMENT.
	FIBER OPTIC OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE.
	FIBER OPTIC OUTLET WITH X-NUMBER OF FIBER OPTIC STRANDS, CABLE TYPE AS SPECIFIED, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE.
	FIBER OPTIC OUTLET, CABLE TYPE AS SPECIFIED, MOUNTED +4" ABOVE COUNTER OR SPLASH UNLESS NOTED OTHERWISE.
	FIBER OPTIC OUTLET, KEYMATE (1) APPLIES.
	POWER/COMMUNICATIONS POLE WITH X-NUMBER OF FIBER OPTIC STRANDS PER LOCATION.
	FIBER OPTIC OUTLET, CABLE TYPE AS SPECIFIED, FLUSH FLOOR MOUNTED.
	FIBER OPTIC OUTLET, CABLE TYPE AS SPECIFIED, SURFACE MOUNTED MONUMENT.
	ROUGH-IN LOCATION, INFRASTRUCTURE AS SPECIFIED.
	WIRELESS ACCESS POINT.
	ROUGH-IN LOCATION IN FLOOR.

SECURITY SYMBOLS	
	VIDEO OUTLET, CABLE TYPE AND TERMINATION AS SPECIFIED.
	VIDEO OUTLET, CABLE TYPE AND TERMINATION AS SPECIFIED, FLUSH FLOOR MOUNTED.
	VIDEO OUTLET, KEYMATE (1) APPLIES.
	VIDEO BROADCAST OUTLET, CABLE TYPE AND TERMINATION AS SPECIFIED.
	MULTIMEDIA OUTLET, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE, CABLE TYPES AND TERMINATIONS AS SPECIFIED.
	MULTIMEDIA ROUGH-IN LOCATION, MOUNTED +18" A.F.F. UNLESS NOTED OTHERWISE, CABLE TYPES AND TERMINATIONS AS SPECIFIED.
	MULTIMEDIA OUTLET, CABLE TYPES AND TERMINATIONS AS SPECIFIED, FLUSH FLOOR MOUNTED.
	PROGRAM SPEAKER, WALL MOUNTED, MOUNTING HEIGHT AS SPECIFIED.
	CONTROL PANEL, MOUNTED +48" A.F.F. UNLESS NOTED OTHERWISE.
	DISTRIBUTED SPEAKER, CEILING MOUNTED.
	MICROPHONE TYPE AS SPECIFIED.
	MICROPHONE OUTLET.
	CEILING MOUNTED ANTENNA.
	CAMERA.
	CAMERA PAN/TILT/ZOOM CAMERA.
	CARD READER.
	DURESS BUTTON.
	PUSH BUTTON.
	ELECTROMAGNETIC DOOR LOCK.
	DOOR POSITION SWITCH.
	GLASS BREAK SENSOR.
	ELECTRIC STRIKE.
	INTERFACE TO EXIT DEVICE ELECTRIC LATCH RETRACTION AND POWER TRANSFER PROVIDED BY DIV. 8.
	REQUEST-TO-EXIT MOTION SENSOR.
	INTERFACE TO SUMP PUMP TO MONITOR HIGH WATER ALARM TERMINALS WITHIN INTERFACE CABINET PROVIDED BY SUMP PUMP CONTRACTOR.
	INTERCOM.
	PROVIDE WALL MOUNTED INTRUSION KEYPAD, 2" x 4" x 2-1/8" JUNCTION BOX, FLUSH, VERTICALLY MOUNTED AT 56" A.F.F. TO BOTTOM OF BOX.
	PROVIDE WALL MOUNTED INTRUSION DETECTOR, 2" x 4" x 2-1/8" JUNCTION BOX, FLUSH, VERTICALLY MOUNTED AT 84" A.F.F. TO BOTTOM OF BOX.
	INTERFACE TO ELEVATOR CONTROL/MONITORING TERMINALS WITHIN INTERFACE CABINET PROVIDED BY ELEVATOR CONTRACTOR.
	PROVIDE COOLER/FREEZER TEMPERATURE MONITORING SENSOR.
	AUDIO/VISUAL TEMPERATURE DISPLAY.
	ALARM INDICATOR, 2" x 4" x 2-1/8" JUNCTION BOX, FLUSH, VERTICALLY MOUNTED AT 56" A.F.F. TO BOTTOM OF BOX.
	INTERFACE TO EXIT DEVICE WITH ELECTRIC LATCH RETRACTION WITH BUILT-IN REQUEST-TO-EXIT SWITCH AND POWER TRANSFER PROVIDED BY DOOR HARDWARE CONTRACTOR (POWER SUPPLY AND EXIT DEVICE WIRING PROVIDED BY DOOR HARDWARE CONTRACTOR).
	WATER SENSOR.
	SPARE CABLE FOR FUTURE MOTION DETECTORS WITH 10-FOOT SERVICE LOOP.

AUDIO/VISUAL & VIDEO BROADBAND SYMBOLS	
	VIDEO SYSTEM HEADER, EQUIPMENT AS SPECIFIED.
	POWER SUPPLY AS SPECIFIED.
	AMPLIFIER AS SPECIFIED.
	DIRECTIONAL COUPLER, dB LOSS LEVEL AS INDICATED.
	2-WAY VIDEO SPLITTER.
	3-WAY VIDEO SPLITTER WITH LOW-LEG INDICATED.
	2-PORT VIDEO TAP, dB LOSS LEVEL AS INDICATED.
	4-PORT VIDEO TAP, dB LOSS LEVEL AS INDICATED.
	8-PORT VIDEO TAP, dB LOSS LEVEL AS INDICATED.
	HIGH/LOW FREQUENCY EQ, dB LEVELS.
	VIDEO CABLE TERMINATION.
	VIDEO CABLE SPLICE.
	VIDEO IN-LINE EQUALIZER.
	FIBER OPTIC RECEIVER.
	FIBER OPTIC TRANSMITTER.
	500 COAXIAL CABLE AS SPECIFIED.
	750 COAXIAL CABLE AS SPECIFIED.
	RG6 COAXIAL CABLE AS SPECIFIED.
	WALL MOUNTED WALL CLOCK, MOUNTING HEIGHT AS SPECIFIED.
	DOUBLE SIDED WALL MOUNTED WALL CLOCK, MOUNTING HEIGHT AS SPECIFIED.
	CEILING MOUNTED PROJECTOR, MOUNTING HEIGHT AND TYPE AS SPECIFIED.
	SHORT THROW PROJECTOR, MOUNTING HEIGHT AND TYPE AS SPECIFIED.
	CONTROL PANEL, AS SPECIFIED.
	ROUGH-IN LOCATION, INFRASTRUCTURE AS SPECIFIED.
	LARGE FORMAT FLOOR BOX - OUTLET TYPES AND QUANTITIES AS SPECIFIED.

CABLE PLANT & RISER SYMBOLS	
	CONDUIT FOR GROUND WIRE.
	CONDUIT, SIZE AND TYPE AS INDICATED.
	FIBER OPTIC TERMINATION PANEL, SIZE & TYPE AS SPECIFIED.
	FIBER OPTIC CABLE, STRAND COUNT & TYPE (SM/MM) AS INDICATED.
	UNSHIELDED TWISTED PAIR (UTP) COPPER CABLE, SIZE & TYPE AS INDICATED.
	SHIELDED TWISTED PAIR (STP) COPPER CABLE, SIZE & TYPE AS INDICATED.
	COAXIAL COPPER CABLE, SIZE & TYPE AS INDICATED.
	HANDHOLE OR MANHOLE, SIZE & TYPE AS INDICATED.
	PULLBOX, SIZE AND TYPE AS INDICATED.
	CONDUIT HOME RUN, QUANTITY, SIZE & TYPE AS INDICATED.
	CONDUIT RUN TURNED UP, QUANTITY, SIZE & TYPE AS INDICATED.
	CONDUIT RUN TURNED DOWN, QUANTITY, SIZE & TYPE AS INDICATED.
	CONDUIT BANK, QUANTITY, SIZE & TYPE AS INDICATED.
	CONDUIT BANK, CONCRETE ENCASED, QUANTITY, SIZE & TYPE AS INDICATED.
	CABLE CHASE SLOT, SIZE AS INDICATED.
	CABLE SLACK, LENGTH AS INDICATED.

A.F.F.	ABOVE FINISHED FLOOR
AER	AERIAL
B	BURIED
CAT.3/5	CATEGORY 3/5
CATV	COMMUNITY ANTENNA TELEVISION
CCTV	CLOSED CIRCUIT TELEVISION
CLT	CLOSET
CO	CENTRAL OFFICE
DEMARC	DEMARKATION POINT
EMT	ELECTRIC METALLIC TUBE
F.O.C.	FIBER OPTIC CABLE
GP	GALVANIZED IRON PIPE
HH	HANDHOLE
IRC	INTERMEDIATE RIGID CONDUIT
ISP	INSIDE CABLE PLANT
IDF	INTERMEDIATE DISTRIBUTION FRAME
MDF	MAIN DISTRIBUTION FRAME
MH	MANHOLE
MM	MULTIMEDIA
OSP	OUTSIDE CABLE PLANT
PB	PULLBOX
PR	PAIR
PEX	PRIVATE BRANCH EXCHANGE
PVC	POLYVINYL CHLORIDE
SM	SINGLE MODE
SP	SERVICE PROVIDER
STP	SHIELDED TWISTED PAIR
TB	TERMINAL BLOCK
UTP	UNSHIELDED TWISTED PAIR
TR	TELECOMMUNICATIONS REGION

NOTES	
1.	CONTRACTOR SHALL REVIEW DRAWINGS AND SPECIFICATIONS THAT MAKE UP THE CONTRACT DOCUMENTS AND COMPLETE ALL WORK INCLUDED THEREIN.
2.	SCALE OF TECHNOLOGY DRAWINGS IS PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER CABLE LENGTHS, SIZE OF PATHWAYS, DIMENSIONS, ETC.
3.	TECHNOLOGY DRAWINGS SHALL BE USED TO COMPLEMENT THE WRITTEN SPECIFICATIONS.
4.	ANY DISCREPANCY OR CONFLICT WITHIN OR BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER. DISCREPANCIES OR CONFLICTS NOT BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER AND SUBSEQUENTLY CLARIFIED DURING THE BIDDING OF THE PROJECT WILL BE DEEMED TO HAVE BEEN BID OR PROPOSED IN THE MOST COSTLY OR ONEROUS MANNER, AND THE BETTER QUALITY OR GREATER QUANTITY OF WORK SHALL BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE ARCHITECT/ENGINEER'S INTERPRETATION.

INDEX OF DRAWINGS	
T000	TECHNOLOGY SYMBOLS, LEGEND, AND ABBREVIATIONS
T001	TECHNOLOGY SITE PLAN
T101	TECHNOLOGY FIRST FLOOR PLAN - ADMIN BUILDING
T102	TECHNOLOGY FIRST FLOOR PLAN - FLEET BUILDING
T103	TECHNOLOGY FIRST FLOOR PLAN - SUPPLY BUILDING
T200	TECHNOLOGY OF ROOM LAYOUTS AND RACK ELEVATIONS
T300	TECHNOLOGY TYPICAL DETAILS
T301	AUDIO/VISUAL TYPICAL DETAILS
T302	AUDIO/VISUAL SIGNAL FLOW DIAGRAMS AND EQUIPMENT SCHEDULES

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NSOC NEW SERVICE CENTER PROJECT

CAPITAL PORT DRIVE SAN ANTONIO, TX

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SHEET TITLE:  
TECHNOLOGY SYMBOLS,  
LEGEND AND  
ABBREVIATIONS

SHEET NO.:

T000

**GENERAL NOTES**

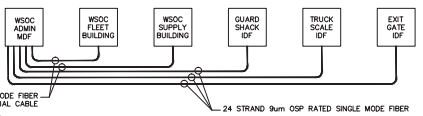
1. ALL DATA, VOICE, VIDEO AND SECURITY SYSTEMS SHALL REMAIN OPERATIONAL AT ALL TIMES DURING BUSINESS HOURS. ANY SYSTEM DOWNTIME SHALL BE SCHEDULED WITH THE ARCHITECT/ENGINEER AND OWNER AT LEAST TEN (10) WORKING DAYS IN ADVANCE. CONTRACTOR SHALL DEVELOP A PHASING PLAN AND SCHEDULE OF ANY REQUIRED SYSTEM DOWNTIME FOR REVIEW AND APPROVAL BY THE ARCHITECT/ENGINEER AND OWNER PRIOR TO ANY CONSTRUCTION ACTIVITIES.
2. THE EQUIPMENT ROOMS AND TELECOM ROOMS ENVIRONMENTAL CONTROLS SHALL BE MAINTAINED AT ALL TIMES. THE EQUIPMENT ROOMS AND TELECOM ROOMS TEMPERATURE SHALL REMAIN BETWEEN 60 - 70 DEGREES F WITH RELATIVE HUMIDITY OF 30% - 50% NON-CONDENSING. THE TEMPERATURE RANGE OF THE EQUIPMENT ROOMS AND TELECOM ROOMS SHALL BE MAINTAINED BETWEEN +1 - 10 DEGREES F.
3. OWNER SHALL BE RESPONSIBLE FOR POWER DOWN AND START-UP OF ALL DATA, VOICE, VIDEO AND SECURITY SYSTEMS. CONTRACTOR SHALL COORDINATE WITH THE ARCHITECT/ENGINEER AND OWNER AND PROVIDE A MINIMUM OF TEN (10) WORKING DAYS NOTICE FOR SCHEDULING OF ANY REQUIRED DOWNTIME.
4. ALL EXISTING CONDITIONS AS SHOWN ARE APPROXIMATELY CORRECT. NOT ALL EXISTING CONDITIONS ARE SHOWN. CONTRACTOR SHALL VISIT THE SITE TO FIELD VERIFY ALL EXISTING CONDITIONS AS REQUIRED TO PROPERLY PROVIDE A BID/PROPOSAL AND PERFORM ALL REQUIRED WORK.
5. CONTRACTOR SHALL RESTORE ALL PENETRATIONS PROVIDED THROUGH FIRE RATED WALLS/STRUCTURES FOR DATA, VOICE, VIDEO AND SECURITY CABLING BACK TO THE ORIGINAL FINISH.
6. CONTRACTOR SHALL RESTORE ALL PENETRATIONS PROVIDED THROUGH NON-RATED WALLS/STRUCTURES FOR DATA, VOICE, VIDEO AND SECURITY CABLING FOR SOUND TO REDUCE NOISE TRAVELING THROUGH PENETRATIONS.

7. CABLING FOR DATA, VOICE, VIDEO AND SECURITY SHALL BE ROUTED IN SEPARATE PATHWAYS IN JHOOKS, CONDUIT, CONDUIT SLEEVES, CORES, ETC. THROUGHOUT THE ENTIRE PATHWAY. DIFFERENT MEDIA TYPES (DATA, VOICE, VIDEO, SECURITY, ETC.) SHALL NOT SHARE THE SAME CONDUIT, JHOOK, CONDUIT SLEEVE, CORE, ETC.
8. CONDUITS SHALL CONTAIN NO MORE THAN THE EQUIVALENT OF (2) 90 DEGREE BENDS BETWEEN PULLING POINTS.
9. CONDUITS SHALL MAINTAIN A BEND RADIUS OF 6 TIMES THE DIAMETER OF THE CONDUIT FOR CONDUITS 1/2 INCH OR SMALLER AND 10 TIMES THE DIAMETER OF THE CONDUIT FOR CONDUITS GREATER THAN 1/2 INCHES.
10. ALL CONDUITS SHALL HAVE A PULL STRING INSTALLED FOR PULLING OF CABLE.
11. ALL SPARE CONDUITS OR CONDUITS FILLED WITH LESS THAN THE MAXIMUM ALLOWED FILL RATIO SHALL HAVE A PULL STRING INSTALLED AND LEFT FOR FUTURE PULLING OF CABLE. CLEARLY LABEL PULL STRING AS "PULL STRING" AND INDICATE THE OPPOSITE END LOCATION.
12. CONTRACTOR SHALL PROVIDE A LOCATE SERVICE FOR EXISTING UTILITIES AND CONDITIONS PRIOR TO EXCAVATION, TRENCHING OR BORING.
13. CONTRACTOR SHALL PROVIDE AND INSTALL (1) 2-INCH CONDUIT FROM EACH POLE MOUNTED VIDEO SURVEILLANCE CAMERA LOCATION TO NEAREST IDF ROOM. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PARAMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE 6-INCHES ABOVE FINISHED FLOOR IN IDF ROOM. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.

**KEYED NOTES**

1. THREE (3) 4-INCH SCHEDULE 80 PVC CONDUITS BURIED 36-INCHES BELOW GRADE FROM UTILITY POLE AT THE PROPERTY LINE TO NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER. TERMINATE CONDUITS 18" ABOVE GRADE AT THE UTILITY POLE. REFER TO CIVIL DRAWINGS FOR EXACT LOCATION OF THE UTILITY POLE AT THE PROPERTY LINE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
2. NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER.
3. THREE (3) NEW 4-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE TO NEW MDF ROOM IN THE NEW ADMINISTRATION BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE 6-INCHES ABOVE FINISHED FLOOR IN IDF ROOM. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
4. NEW ADMINISTRATION BUILDING MDF ROOM.
5. THREE (3) NEW 4-INCH AND TWO (2) 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW ADMINISTRATION MDF ROOM TO 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PARAMETER OF THE BUILDING. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
6. THREE (3) NEW 4-INCH AND TWO (2) 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS BURIED 36-INCHES BELOW GRADE FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
7. TWO (2) NEW 4-INCH AND TWO (2) 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER TO NEW FLEET BUILDING IDF ROOM. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PARAMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE 6-INCHES ABOVE FINISHED FLOOR IN IDF ROOM. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
8. NEW FLEET BUILDING IDF ROOM.
9. TWO (2) NEW 4-INCH AND TWO (2) 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER TO NEW SUPPLY BUILDING IDF ROOM. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PARAMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE 6-INCHES ABOVE FINISHED FLOOR IN IDF ROOM. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
10. NEW SUPPLY BUILDING IDF ROOM.
11. TWO (2) NEW 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER TO NEW GUARD SHACK IDF LOCATION. CONDUITS SHALL TERMINATE INSIDE OF CABINET. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
12. NEW GUARD SHACK IDF PEDESTAL LOCATION.
13. TWO (2) NEW 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER TO NEW TRUCK SCALE IDF LOCATION. CONDUITS SHALL TERMINATE INSIDE OF CABINET. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
14. NEW TRUCK SCALE IDF PEDESTAL LOCATION.
15. TWO (2) NEW 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER TO NEW TRUCK SCALE IDF LOCATION. CONDUITS SHALL TERMINATE INSIDE OF CABINET. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
16. NEW EXIT GATE IDF PEDESTAL LOCATION.
17. ONE (1) 2-INCH CONDUIT FROM NEAREST IDF/MDF LOCATION TO LIGHT POLE FOR VIDEO SURVEILLANCE. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PARAMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE IN LIGHT POLE BASE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
18. DATA CABLE(S) FOR CONTRACTOR PROVIDED. CONTRACTOR INSTALLED VIDEO SURVEILLANCE CAMERA. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE SECURITY CONTRACTOR PRIOR TO INSTALLATION. REFERENCE TECHNOLOGY SECURITY AND ELECTRICAL DRAWINGS FOR EXACT CONDUIT ROUGH-IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS.
19. DATA CABLE FOR VIDEO INTERCOM AT ENTRANCE GATE. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE SECURITY CONTRACTOR PRIOR TO INSTALLATION. REFERENCE TECHNOLOGY SECURITY AND ELECTRICAL DRAWINGS FOR EXACT CONDUIT ROUGH-IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS.
20. ONE (1) 1-INCH CONDUIT FROM GUARD SHACK IDF LOCATION TO ENTRANCE GATE. CONDUITS SHALL TRANSITION TO 36-INCHES BELOW GRADE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL COORDINATE TERMINATION REQUIREMENTS WITH SCALE CONTRACTOR PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
21. DATA CABLE FOR TRUCK SCALE. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE SCALE CONTRACTOR PRIOR TO INSTALLATION.
22. ONE (1) 1-INCH CONDUIT FROM TRUCK SCALE IDF LOCATION TO TRUCK SCALE. CONDUITS SHALL TRANSITION TO 36-INCHES BELOW GRADE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL COORDINATE TERMINATION REQUIREMENTS WITH SCALE CONTRACTOR PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
23. DATA CABLE FOR FUEL. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE CONTRACTOR PRIOR TO INSTALLATION.
24. ONE (1) 1-INCH CONDUIT FROM SUPPLY BUILDING IDF LOCATION TO FUEL ISLAND. CONDUITS SHALL TRANSITION TO 36-INCHES BELOW GRADE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL COORDINATE TERMINATION REQUIREMENTS WITH FUEL CONTRACTOR PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
25. OWNER PROVIDED/ OWNER INSTALLED EXTERIOR WIRELESS ACCESS POINT.
26. ONE (1) 2-INCH AND ONE (1) 1.0-1.2 INCH CONDUIT FROM NEAREST IDF/MDF LOCATION TO LIGHT POLE FOR VIDEO SURVEILLANCE. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PERIMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE IN LIGHT POLE BASE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.

8. NEW FLEET BUILDING IDF ROOM.
9. TWO (2) NEW 4-INCH AND TWO (2) 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER TO NEW SUPPLY BUILDING IDF ROOM. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PARAMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE 6-INCHES ABOVE FINISHED FLOOR IN IDF ROOM. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
10. NEW SUPPLY BUILDING IDF ROOM.
11. TWO (2) NEW 2-INCH SCHEDULE 80 PVC CONDUITS WITH IMC RADIUS BENDS AND SWEEPS FROM NEW 36-INCH X 36-INCH X 36-INCH HAND HOLE WITH LOCKABLE COMMUNICATIONS COVER TO NEW GUARD SHACK IDF LOCATION. CONDUITS SHALL TERMINATE INSIDE OF CABINET. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
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16. NEW EXIT GATE IDF PEDESTAL LOCATION.
17. ONE (1) 2-INCH CONDUIT FROM NEAREST IDF/MDF LOCATION TO LIGHT POLE FOR VIDEO SURVEILLANCE. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PARAMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE IN LIGHT POLE BASE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
18. DATA CABLE(S) FOR CONTRACTOR PROVIDED. CONTRACTOR INSTALLED VIDEO SURVEILLANCE CAMERA. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE SECURITY CONTRACTOR PRIOR TO INSTALLATION. REFERENCE TECHNOLOGY SECURITY AND ELECTRICAL DRAWINGS FOR EXACT CONDUIT ROUGH-IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS.
19. DATA CABLE FOR VIDEO INTERCOM AT ENTRANCE GATE. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE SECURITY CONTRACTOR PRIOR TO INSTALLATION. REFERENCE TECHNOLOGY SECURITY AND ELECTRICAL DRAWINGS FOR EXACT CONDUIT ROUGH-IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS.
20. ONE (1) 1-INCH CONDUIT FROM GUARD SHACK IDF LOCATION TO ENTRANCE GATE. CONDUITS SHALL TRANSITION TO 36-INCHES BELOW GRADE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL COORDINATE TERMINATION REQUIREMENTS WITH SCALE CONTRACTOR PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
21. DATA CABLE FOR TRUCK SCALE. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE SCALE CONTRACTOR PRIOR TO INSTALLATION.
22. ONE (1) 1-INCH CONDUIT FROM TRUCK SCALE IDF LOCATION TO TRUCK SCALE. CONDUITS SHALL TRANSITION TO 36-INCHES BELOW GRADE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL COORDINATE TERMINATION REQUIREMENTS WITH SCALE CONTRACTOR PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
23. DATA CABLE FOR FUEL. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH-IN AND TERMINATION REQUIREMENTS WITH THE CONTRACTOR PRIOR TO INSTALLATION.
24. ONE (1) 1-INCH CONDUIT FROM SUPPLY BUILDING IDF LOCATION TO FUEL ISLAND. CONDUITS SHALL TRANSITION TO 36-INCHES BELOW GRADE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL COORDINATE TERMINATION REQUIREMENTS WITH FUEL CONTRACTOR PRIOR TO INSTALLATION. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.
25. OWNER PROVIDED/ OWNER INSTALLED EXTERIOR WIRELESS ACCESS POINT.
26. ONE (1) 2-INCH AND ONE (1) 1.0-1.2 INCH CONDUIT FROM NEAREST IDF/MDF LOCATION TO LIGHT POLE FOR VIDEO SURVEILLANCE. CONDUITS SHALL TRANSITION TO 48-INCHES BELOW GRADE AT THE PERIMETER OF THE BUILDING. CONTRACTOR SHALL ENSURE THAT CONDUITS CLEAR ALL FOUNDATION WORK. CONDUITS SHALL TERMINATE IN LIGHT POLE BASE. CONTRACTOR SHALL PROVIDE PULL STRINGS IN ALL CONDUITS AND NYLON BUSHINGS AND CAPS ON EACH END OF ALL CONDUITS. CONTRACTOR SHALL PROVIDE DETECTABLE WARNING TAPE 12-INCHES BELOW GRADE THROUGHOUT THE CONDUIT TRENCH.

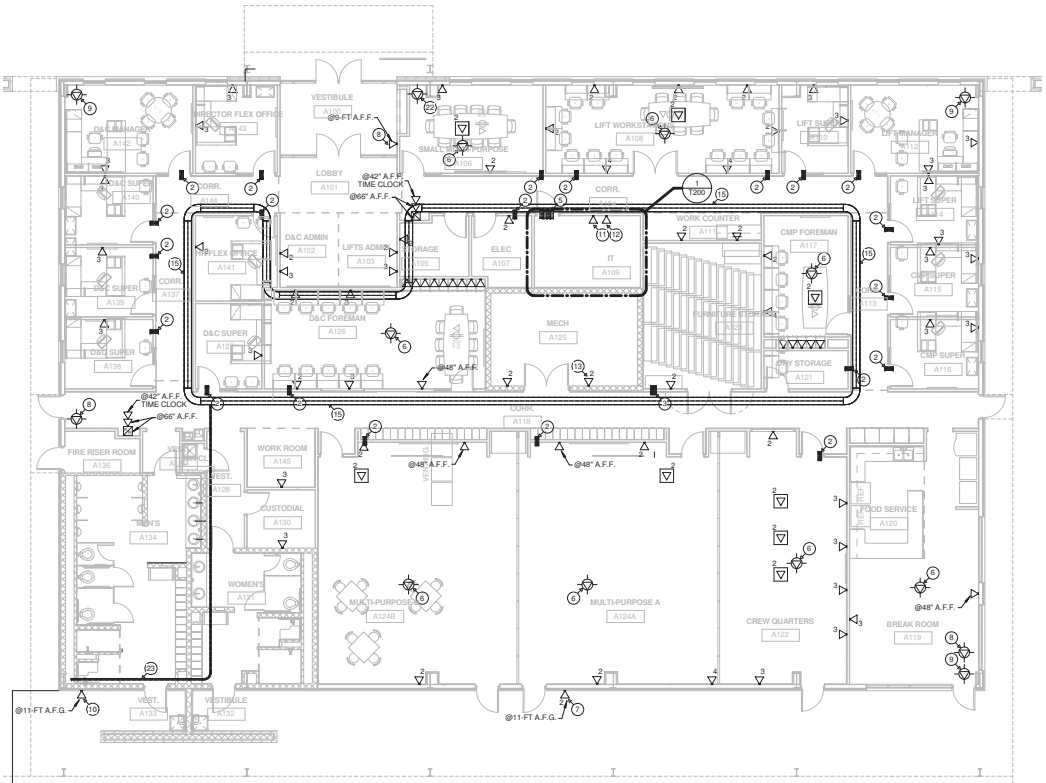


1 TECHNOLOGY SITE PLAN  
T001 1" = 50'-0"



- GENERAL NOTES**
1. CONTRACTOR SHALL RESTORE ALL PENETRATIONS PROVIDED THROUGH FIRE RATED WALLS/STRUCTURES FOR DATA, VOICE, VIDEO AND SECURITY CABLING BACK TO THE ORIGINAL RATING.
  2. CONTRACTOR SHALL RESTORE ALL PENETRATIONS PROVIDED THROUGH NON-RATED WALLS/STRUCTURES FOR DATA, VOICE, VIDEO AND SECURITY CABLING FOR SOUND TO REDUCE NOISE TRAVELING THROUGH PENETRATIONS.
  3. CABLING FOR DATA, VOICE, VIDEO AND SECURITY SHALL BE ROUTED IN SEPARATE PATHWAYS IN J-HOOKS, CONDUITS, CONDUIT SLEEVES, CORES, ETC. THROUGHOUT THE ENTIRE PATHWAY. DIFFERENT MEDIA TYPES (DATA, VOICE, SECURITY, ETC.) SHALL NOT SHARE THE SAME J-HOOK, CONDUIT, CONDUIT SLEEVE, CORE, ETC.
  4. ALL CONDUITS FOR DATA, VOICE AND VIDEO DEVICES SHALL ROUTE FROM THE DEVICE LOCATION AND TERMINATE ABOVE AN ACCESSIBLE CEILING IN THE SAME ROOM WHERE THE DEVICE IS LOCATED. IF THE ROOM WHERE THE DEVICE IS LOCATED DOES NOT HAVE AN ACCESSIBLE CEILING, THE CONDUIT SHALL ROUTE TO THE NEAREST ACCESSIBLE CEILING OFF OF A MAIN CORRIDOR. CONDUIT PATHWAY SHALL TAKE THE SHORTEST ROUTE TO THE APPLICABLE HOST ROOM TO MINIMIZE THE CABLE LENGTH.
  5. CONDUITS SEGMENTS SHALL BE NO MORE THAN 100- FEET IN LENGTH WITH NO MORE THAN THE EQUIVALENT OF (2) 90 DEGREE BENDS BETWEEN PULLING POINTS.
  6. CONDUITS SHALL MAINTAIN A BEND RADIUS OF 8 TIMES THE DIAMETER OF THE CONDUIT FOR CONDUITS 2 INCHES OR SMALLER AND 10 TIMES THE DIAMETER OF THE CONDUIT FOR CONDUITS GREATER THAN 2-INCHES.
  7. REFER TO ARCHITECTURAL DRAWINGS FOR HORIZONTAL PLACEMENT OF ROUGH-INS ON WALL.
  8. ALL CABLE TRAY PLACEMENT SHALL BE COORDINATED WITH THE ARCHITECT/ENGINEER PRIOR TO INSTALLATION TO VERIFY HEIGHT AND LOCATION.
  9. OPEN CEILING DOES NOT CONSTITUTE AS ACCESSIBLE CEILING. NO EXPOSED CABLING IS TO BE ROUTED IN OPEN SPACE. ALL CABLING SHALL BE ROUTED THROUGH CONDUIT IN OPEN SPACE.

- KEYED NOTES**
- 1 ONE (1) 2-INCH EMT CONDUIT SLEEVE ABOVE ACCESSIBLE CEILING WITH NYLON BUSHINGS ON EACH END AND SECURED TO WALL. CONDUIT SLEEVE SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVE SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVES SHALL BE USED FOR LOW VOLTAGE DATA, VOICE AND VIDEO CABLE ONLY.
  - 2 TWO (2) 2-INCH EMT CONDUIT SLEEVES ABOVE ACCESSIBLE CEILING WITH NYLON BUSHINGS ON EACH END AND SECURED TO WALL. CONDUIT SLEEVES SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVES SHALL BE USED FOR LOW VOLTAGE DATA, VOICE AND VIDEO CABLE ONLY.
  - 3 THREE (3) 2-INCH EMT CONDUIT SLEEVES ABOVE ACCESSIBLE CEILING WITH NYLON BUSHINGS ON EACH END AND SECURED TO WALL. CONDUIT SLEEVES SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVES SHALL BE USED FOR LOW VOLTAGE DATA, VOICE AND VIDEO CABLE ONLY.
  - 4 TWO (2) 4-INCH EMT CONDUIT SLEEVES ABOVE ACCESSIBLE CEILING WITH NYLON BUSHINGS ON EACH END AND SECURED TO WALL. CONDUIT SLEEVES SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVES SHALL BE USED FOR LOW VOLTAGE DATA, VOICE AND VIDEO CABLE ONLY.
  - 5 FOUR (4) 4-INCH EMT CONDUIT SLEEVES ABOVE ACCESSIBLE CEILING WITH NYLON BUSHINGS ON EACH END AND SECURED TO WALL. CONDUIT SLEEVES SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVES SHALL BE USED FOR LOW VOLTAGE DATA, VOICE AND VIDEO CABLE ONLY.
  - 6 DATA CABLE WITH 20- FEET OF SLACK NEATLY COILED AND STORED ON J-HOOK ABOVE ACCESSIBLE CEILING FOR OWNER PROVIDED/OWNER INSTALLED CEILING MOUNTED WIRELESS ACCESS POINT.
  - 7 DATA CABLE FOR OWNER PROVIDED/OWNER INSTALLED STRUCTURE / WALL MOUNTED WIRELESS ACCESS POINT.
  - 8 DATA CABLE FOR CONTRACTOR PROVIDED/CONTRACTOR INSTALLED INTERIOR WALL MOUNTED VIDEO SURVEILLANCE CAMERA. REFERENCE SECURITY DRAWINGS FOR EXACT CONDUIT ROUGH IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS. COORDINATE EXACT TERMINATION REQUIREMENTS WITH THE VIDEO SURVEILLANCE CONTRACTOR PRIOR TO TERMINATION.
  - 9 DATA CABLE FOR CONTRACTOR PROVIDED/CONTRACTOR INSTALLED EXTERIOR WALL MOUNTED VIDEO SURVEILLANCE CAMERA ROUTED INTO A ROOM WITH ACCESSIBLE CEILING. REFERENCE SECURITY DRAWINGS FOR EXACT CONDUIT ROUGH IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS. COORDINATE EXACT TERMINATION REQUIREMENTS WITH THE VIDEO SURVEILLANCE CONTRACTOR PRIOR TO TERMINATION.
  - 10 DATA CABLE FOR CONTRACTOR PROVIDED/CONTRACTOR INSTALLED EXTERIOR WALL MOUNTED VIDEO SURVEILLANCE CAMERA ROUTED INTO A ROOM WITHOUT AN ACCESSIBLE CEILING. CABLE SHALL BE TERMINATED IN A SURFACE MOUNT BOX THAT IS PLACED INSIDE OF A 4.1116 IN X 4.1116 IN X 2.18 IN DOUBLE GANG BOX. REFERENCE SECURITY DRAWINGS FOR EXACT CONDUIT ROUGH IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS. COORDINATE EXACT TERMINATION REQUIREMENTS WITH THE VIDEO SURVEILLANCE CONTRACTOR PRIOR TO TERMINATION.
  - 11 DATA CABLES FOR SECURITY PANEL. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH IN AND TERMINATION REQUIREMENTS WITH SECURITY CONTRACTOR PRIOR TO INSTALLATION. REFERENCE SECURITY DRAWINGS FOR EXACT CONDUIT ROUGH IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS. COORDINATE EXACT TERMINATION REQUIREMENTS WITH THE SECURITY CONTRACTOR PRIOR TO TERMINATION.
  - 12 DATA CABLE FOR SECURITY PANEL FOR VOICE CONNECTION. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH IN AND TERMINATION REQUIREMENTS WITH SECURITY CONTRACTOR PRIOR TO INSTALLATION. REFERENCE SECURITY DRAWINGS FOR EXACT CONDUIT ROUGH IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS. COORDINATE EXACT TERMINATION REQUIREMENTS WITH THE SECURITY CONTRACTOR PRIOR TO TERMINATION.
  - 13 DATA CABLE FOR ELECTRICAL/MECHANICAL CONTROLS. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH IN AND TERMINATION REQUIREMENTS WITH THE ELECTRICAL/MECHANICAL CONTRACTOR PRIOR TO INSTALLATION. REFERENCE MECHANICAL AND ELECTRICAL DRAWINGS FOR EXACT CONDUIT ROUGH IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS.
  - 14 DELETED.
  - 15 12-INCH WIDE X 4-INCH HIGH WIRE BASKET CABLE TRAY WITH ALL APPLICABLE MANUFACTURER BENDS, CONNECTORS, SLICES, TEES, ETC. (BY DIV. 26)
  - 16 DATA CABLE FOR IRRIGATION CONTROLS. COORDINATE EXACT LOCATION FOR CONDUIT ROUGH IN AND TERMINATION REQUIREMENTS WITH THE IRRIGATION CONTRACTOR PRIOR TO INSTALLATION. REFERENCE LANDSCAPE ARCHITECTURAL DRAWINGS FOR EXACT CONDUIT ROUGH IN LOCATION, HEIGHT AND TERMINATION REQUIREMENTS.
  - 17 DELETED.
  - 18 DELETED.
  - 19 DATA CABLE ATTACHED TO BRIDGE CRANE COLUMNS. CONDUIT SHALL ROUTE FROM BELOW UP TO DESK TO AVOID ANY CONFLICT WITH CRANE.
  - 20 DELETED.
  - 21 DELETED.
  - 22 ONE (1) 2-INCH EMT CONDUIT ABOVE ACCESSIBLE CEILING WITH NYLON BUSHINGS ON EACH END AND SECURED TO WALL. CONDUIT SHALL RUN FROM THE CABLE TRAY TO THE EXTERIOR WALL WHERE THE ANTENNA PIPE PROTRUDES THROUGH THE WALL. CONDUIT SLEEVE SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVE SHALL BE PROPERLY SEALED ON THE EXTERIOR AND INTERIOR TO RETURN WALL BACK TO ORIGINAL RATING. IF WALL IS NOT RATED, CONDUIT SLEEVE SHALL BE USED FOR ANTENNA CABLE ONLY.



1 TECHNOLOGY FIRST FLOOR PLAN - ADMIN BUILDING  
1/8" = 1'-0"

6/20/2016 2:33:08 PM  
 Project: NSOC - 2015  
 Drawing: NSOC-14013 - Admin Building  
 Author: J. B. B. / J. B. B.  
 Designer: J. B. B. / J. B. B.  
 Checker: J. B. B. / J. B. B.  
 Approver: J. B. B. / J. B. B.  
 Date: 6/20/2016 2:33:08 PM

