

PROJECT DESCRIPTION

DATA CENTER

PROJECT LOCATION:

LAS VEGAS, NV
89149

SHEET INDEX

- E1 ELECTRICAL COVER SHEET, GENERAL NOTES & SYMBOL LEGEND
E2 ELECTRICAL SITE PLAN
E3 OVERALL ONE LINE DIAGRAM
E4 ONE LINE DIAGRAM ADV POWER PANEL
E5 LOAD SCHEDULES
E6 SERVER ROOM EQUIPMENT LAYOUT

SCOPE OF WORK

ELECTRICAL SYSTEM DESIGN FOR DATA CENTER.

ELECTRICAL NOTES

- THIS DESIGN MAY BE USED FOR SECURING PERMITS, BID, PLANNING, THE COMPANY'S REVIEW OR SOME OTHER GOAL. THIS DESIGN DOES NOT CONSTITUTE A PROFESSIONAL FIELD CONDITIONS. THESE APPROVALS A REQUIREMENT FOR SERVICES OR THE COMPLETION OF THIS WORK.
- THE ELECTRICAL CONTRACTOR SHALL PAY ALL PERMIT FEES, PLAN REVIEW FEES, LICENSE FEES, INSPECTION AND TAXES APPLICABLE TO THE ELECTRICAL WORK. PROVIDE ALL INSTRUMENTS AND PERFORM ALL TESTS REQUIRED BY THE AHI. CORRECT ALL FAILURES AND REPLACE ANY DAMAGED PORTION OF THE WORK RESULTING FROM TESTS. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE TESTS.
- THIS DESIGN IS NOT A COMPLETE SET OF CONSTRUCTION DRAWING OR SHOP DRAWINGS. THIS DESIGN REPRESENTS DIAGRAMMATIC REPRESENTATION OF INTENDED SCOPE OF WORK.
- THE SYMBOLS AND ABBREVIATIONS LIST ON THIS SHEET IS A COMPREHENSIVE STANDARD GUIDE INTENDED FOR GENERAL USE ON ALL PROJECTS. THEREFORE, NOT ALL THE SYMBOLS AND ABBREVIATIONS CONTAINED IN THIS LIST ARE NECESSARILY USED ON THIS PARTICULAR PROJECT AND SHOULD BE USED FOR CLARIFICATION ONLY.
- ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE NATIONAL ELECTRICAL CODE, IECC, LIFE SAFETY CODE, LOCAL BUILDING CODE, OSHA REGULATIONS, LOCAL, STATE, FEDERAL AND AUTHORITY HAVING JURISDICTION CODES APPLICABLE AT THE TIME OF THE CONSTRUCTION.
- GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH NECA I STANDARD FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION (ANSI).
- ALL MATERIALS PROVIDED BY THE CONTRACTOR SHALL BE NEW AND FREE OF DEFECTS, LISTED/LABELLED FOR THE INTENDED PURPOSE BY UNDERWRITERS (UL) OR OTHER ORGANIZATION THAT IS ACCEPTABLE TO THE AHI.
- THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR SCHEDULING DELIVERY, RECEIVING, UNLOADING, STORING, SETTING IN PLACE, AND PROTECTING FROM DAMAGE, VANDALISM, THEFT OR WEATHER DURING CONSTRUCTION FOR ALL NEW EQUIPMENT PROVIDED BY THE ELECTRICAL CONTRACTOR OR PROVIDED BY OTHER PARTIES TO THE ELECTRICAL CONTRACTOR FOR INSTALLATION BY THE ELECTRICAL CONTRACTOR.
- THESE DRAWINGS AND ACCOMPANYING SPECIFICATIONS ARE INTENDED TO DESCRIBE AND ILLUSTRATE SYSTEMS WHICH WILL NOT BE SUBJECT TO THE ELECTRICAL CONTRACTOR'S CORRECTLY LAYING OUT ALL WORK TO CONFORM WITH THE ELECTRICAL CODE CLEARANCES, ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND SITE CONDITIONS, TO AVOID OBSTRUCTIONS AND TO ALLOW THE PROPER INSTALLATION OF EACH ITEM.
- DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT ONLY. COORDINATE WITH DRAWINGS OF OTHER TRADES TO FIT THE ACTUAL SPACE CONDITIONS, HEADROOM AND SPACE CONDITION TO BE MAINTAINED.
- THE DRAWINGS ARE TO BE CONSIDERED SCHEMATIC ONLY AND DO NOT NECESSARILY SHOW THE EXACT LOCATION AND DETAILS OF THE ACTUAL SPACE CONDITIONS, HEADROOM AND SPACE CONDITION TO BE MAINTAINED.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF RECEPTACLES, AND LIGHTING FIXTURES, ETC.
- UPON THE COMPLETION OF THE WORK, THE ENTIRE ELECTRICAL SYSTEM SHALL BE TESTED AND SHALL BE SHOWN TO THE AHI IN ACCORDANCE WITH THE ELECTRICAL CODE REQUIREMENTS AND THE INTENT OF THE SPECIFICATIONS AND DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL SYSTEM READY FOR OPERATION AND INSPECTION BY AHI.
- PREPARE AND FURNISH TO OWNER "AS-BUILT" PLANS FOR ALL WORK INSTALLED.
- ELECTRICAL CONTRACTOR SHALL FURNISH RECORD SET OF DRAWINGS WITH ANY DEVIATIONS MARKED IN RED INK.
- TEST AND INSPECT ALL WIRING AND EQUIPMENT INSTALLED UNDER THIS SECTION OF SPECIFICATIONS. ALL WIRING MUST BE FREE OF SHORTS AND BROKEN WIRE. LEAVE ALL MATERIALS AND APPARATUS IN PROPER LOCATION AT INTERVALS NOT TO EXCEED 100'.
- THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR THE CORRECT PHASE SEQUENCE OF ALL THREE-PHASE FEEDERS AND BRANCH CIRCUITS. VERIFY PROPER ROTATION OF ALL MOTORS.
- ELECTRICAL CONTRACTOR SHALL VERIFY PHASE LOAD BALANCING ON POWER PANELS UPON COMPLETION OF THE ELECTRICAL INSTALLATION.
- PROVIDE IDENTIFICATION ON ALL PANELBOARDS, SWITCHES, STARTERS, DIMMERS, SWITCHES IN DISTRIBUTION PANELBOARDS AND SWITCHGARDENS.
- CONDUIT RUNS WHEN SHOWN ARE DIAGRAMMATICAL. FINAL LOCATION AND ROUTING SHALL BE ESTABLISHED BY THE CONTRACTOR BASED ON THE INSTALLATION CONDITIONS AND SHALL BE VERIFIED IN THE FIELD. ALL CONDUIT TYPES AND INSTALLATION REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
- CONDUIT RUNS SHALL BE PARALLEL WITH OR AT RIGHT ANGLES TO WALLS AND CEILINGS. CONDUIT SHALL BE SUPPORTED BY APPROVED MEANS. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH A DRAG WIRE.
- ALL SUSPENDED CONDUITS SHALL BE RIGIDLY SUPPORTED FROM THE BUILDING STRUCTURE BY MEANS OF APPROVED CONDUIT FASTENERS, HANGERS, STRAPS, CLAMPS, ETC., FIRMLY ANCHORED IN PLACE AND SPACED AT INTERVALS NOT TO EXCEED 100'.
- PULLBOXES, JUNCTION BOXES, CONDUIT BODIES, AND EXPANSION JOINTS SHALL BE INSTALLED AS PER NFPA 70.
- PROVIDE CONDUIT EXPANSION FITTINGS WITH BONDING JUMPERS FOR ALL CONDUITS PASSING THROUGH EXPANSION JOINTS.
- PROVIDE SLEEVES FOR PENETRATIONS THROUGH BLOCK OR CONCRETE WALLS AND FLOORS.
- THE USE OF FLEXIBLE CONDUIT FROM LIGHTING FIXTURES TO JUNCTION BOX IS PERMITTED ONLY WHEN A SEPARATE GROUND WIRE IS INSTALLED WITH THE CONDUCTORS INSIDE FLEXIBLE CONDUIT. THE GROUND WIRE MUST BOND THE FIXTURE HOUSING TO THE JUNCTION BOX. MAXIMUM LENGTH SHALL BE 6'-0".
- FLEXIBLE CONDUIT INSTALLED OUT OF DOORS, IN ANY MECHANICAL EQUIPMENT ROOMS, OR IN NORMALLY WET AREAS SHALL BE LIQUID TIGHT FLEX WITH SUITABLE FITTINGS.
- PROVIDE CONDUIT, WIRING, CIRCUITING AND REQUIRED CONNECTIONS TO ALL DEVICES, FIXTURES AND EQUIPMENT. CONNECT TO CIRCUITS AS INDICATED. CIRCUIT NUMBERS ARE FOR INFORMATION PURPOSES ONLY. ACTUAL CIRCUIT NUMBERS SHALL BE DETERMINED IN THE FIELD AND REFLECTED IN THE PANEL SCHEDULE DIRECTORY AND ON THE AS-BUILT DRAWINGS.
- PROVIDE INDEPENDENT SUPPORT FOR DISCONNECT SWITCHES, CONTROL, STATIONS, BOXES, PANELS, ETC. WHERE NO WALLS OR OTHER STRUCTURAL SURFACE EXISTS.
- EQUIPMENT SIZED AND LOCATIONS ARE APPROXIMATE. ACTUAL DIMENSIONS TO BE DETERMINED BY EQUIPMENT FURNISHED.
- PROVIDE BRANCH CIRCUIT WIRING TO ALL ITEMS REQUIRING ELECTRICAL CONNECTIONS. WHERE BRANCH CIRCUIT WIRING IS NOT SHOWN, CONNECT ITEMS TO CIRCUITS NEAREST THE CONTRACTOR SHALL DETERMINE EXACT ROUTING OF CONDUITS AND WIRING AS INDICATED OTHERWISE. ALL BRANCH CIRCUITS SHALL BE MINIMUM #12 THHN AWG COVER, ALL HANDWARE FOR MOUNTING OF JUNCTION BOX.
- PROVIDE JUNCTION BOX FOR ANY DEVICE WITH PID TAIL SUCH AS SOLENOID VALVES, LIMIT SWITCHES, SMOKE DETECTORS AND ETC. FOR PROPER ELECTRICAL CONNECTION. PROVIDE ALL HANDWARE FOR MOUNTING OF JUNCTION BOX.
- ALL FIRE ALARM SYSTEMS RACEWAY, SWITCHES, AND JUNCTION BOXES SHALL BE PAINTED RED.
- TIGHTEN SCREWS AND BOLTS FOR CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE - TIGHTENING VALUES.
- EXACT LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT THAT REQUIRE ELECTRICAL CONNECTIONS ARE SHOWN ON THE MECHANICAL AND PLUMBING DRAWINGS. COORDINATE WITH MECHANICAL AND PLUMBING CONTRACTORS.
- WHEREVER THE INSTALLATION OF ELECTRICAL EQUIPMENT AS SHOWN ON THE DRAWINGS IS IN CONFLICT WITH THE DESIGN OR INTERFERENCE OR UNFAVORABLE FIELD CONDITIONS, THE CONTRACTOR SHALL INSTALL THE EQUIPMENT AT NEW LOCATIONS AS DIRECTED BY THE ENGINEER.
- DESIGN IS BASED ON ALL CONDUCTORS TO BE THHN COPPER AND NO MORE THAN 4 CURRENT CARRYING CONDUCTORS IN THE SAME RACEWAY OR CONDUIT, UNLESS OTHERWISE NOTED.
- WHEN EQUIPMENT IS BEING REMOVED/DOWN FROM THE FIELD, ALL WIRING ASSOCIATED WITH THE LOAD MUST BE REMOVED FROM THE JUNCTION BOX OR THE CIRCUIT BREAKER. DO NOT LEAVE UNUSED CONDUCTORS IN THE FIELD WITH ENDS TAPED WITH TAPE OR WIRE NUTS.
- SPARE WIRES INSTALLED SHALL BE NEATLY COILED, BOUND AND PLACED IN SPACE AVAILABLE. LEAVE AT A MINIMUM 3" OF SLACK AT EACH DESTINATION.
- WHERE EXISTING CIRCUIT TO REMAIN ARE INTERRUPTED DUE TO NEW CONSTRUCTION, CONDUIT AND WIRE SHALL BE EXTENDED RE-ENERGIZED.
- PROVIDE DISCONNECT SWITCHES FOR ELECTRICAL, HEATER, HVAC EQUIPMENT AND EXHAUST FANS WITHIN EYE SIGHT OF THE EQUIPMENT.
- PROVIDE SERVICE RECEPTACLE WITHIN 25 FEET OF EACH HVAC EQUIPMENT.
- ELECTRICAL CONTRACTOR TO VERIFY ACTUAL INSTALLED EQUIPMENT NAME PLATE DATA BEFORE ENERGIZING THE CIRCUIT. CONFIRM ELECTRICAL DESIGN VALUES AND ACTUAL EQUIPMENT BEING INSTALLED ARE IN COMPLIANCE WITH ELECTRICAL CODE AND MANUFACTURER INSTALLATION REQUIREMENTS.
- DISCONNECT SWITCHES SHALL BE HEAVY-DUTY, QUICK-MAKE, QUICK-BREAK TYPE. NEMA 1 ENCLOSURE FOR INDOOR LOCATIONS (NEMA 3R FOR OUTDOOR LOCATIONS). SWITCHES SHALL BE AS MANUFACTURED BY SQUARE D, GENERAL ELECTRIC, OR SIMENS (I.E.). PROVIDE FUSES AS MANUFACTURED BY Bussman, Gould-Shawmut, OR LITTELFUSE. ALL CONDUCTOR TERMINALS TO BE UL LISTED FOR A MAXIMUM OF 75°C. SWITCHES USED AS SERVICE ENTRANCE EQUIPMENT TO BE UL LISTED AS "SERV RATED EQUIPMENT".
- PANEL BOARDS SHALL BE MANUFACTURED BY SQUARE D, EATON, GENERAL ELECTRIC, OR SIMILAR, MEETING UL STANDARDS 50 AND 67, WITH UL LABEL. PANELS USED AS SERVICE ENTRANCE EQUIPMENT TO BE UL LISTED AS "SERV RATED EQUIPMENT".
- ALL SWITCHBOARDS AND PANELBOARDS SHALL BE MARKED WITH IDENTIFYING NAMEPLATES TO INDICATE THE DESIGNATIONS USED ON THESE DRAWINGS. PROVIDE NEW PANELBOARD SCHEDULES, CORRECTLY FILLED OUT FOR EVERY PANELBOARD.
- ALL PANELS, SWITCHES, ETC. SHALL HAVE SUFFICIENT GUTTER SPACE AND LUGS TO ACCOMMODATE CONDUCTORS SHOWN.
- BREAKERS: THERMAL, MAGNETIC TYPE, QUICK-BREAK, PLUG-IN TYPE FOR LOAD CENTERS AND BOLT IN TYPE FOR PANEL BOARDS AND SINGLE UNIT CONSTRUCTION. TWO POLE BREAKERS SHALL BE SINGLE UNIT COMMON TRIP TYPE. BREAKERS USED AS SWITCHES FOR 120V LIGHTING CIRCUITS SHALL BE APPROVED FOR THAT USE AND MARKED "SWD". ALL BREAKERS FOR HVAC AND REFRIGERATION EQUIPMENT SHALL BE "NAC" RATED BREAKERS.
- GROUNDING SYSTEM PERMANENTLY AND EFFECTIVELY GROUND ALL METALLIC CONDUIT, SUPPORTS, CABINETS, PANEL BOARDS AND SYSTEM NEUTRAL CONDUCTORS. MAINTAIN CONTINUITY OF EQUIPMENT GROUND THROUGHOUT THE SYSTEM. GROUND CLAMPS SHALL BE APPROVED TYPE, SPECIFICALLY DESIGNED FOR GROUNDING, WHERE GROUNDING CONDUCTOR IS ENCLOSED IN CONDUIT. GROUND CLAMP SHALL BE OF A TYPE WHICH GROUNDS BOTH CONDUCTOR AND CONDUIT. ALL CIRCUITS IN FLEXIBLE METAL OR PLASTIC CONDUIT SHALL INCLUDE A GROUND WIRE SIZED AND INSTALLED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE.
- PROVIDE AND INSULATED GREEN GROUNDING WIRE IN THE SAME CONDUIT AS THE BRANCH CIRCUIT OR FEEDER WIRING AND FOR ALL (3) PHASES AND/OR SINGLE PHASE, BRANCH CIRCUITS AND FOR ALL FEEDERS SHOWN OR NOT SHOWN.
- ALL WORK SHALL BE PERMANENTLY AND EFFECTUALLY GROUNDED WHETHER OR NOT SUCH CONNECTIONS ARE SPECIFICALLY SHOWN OR SPECIFIED. GROUND RESISTANCE AT ANY POINT SHALL NOT EXCEED 25 OHMS.
- ALL CONDUITS SHALL BE EMT UNLESS OTHERWISE NOTED.
- CONDUIT SHALL BE SIZED TO COMPLY WITH NEC FOR NUMBER AND SIZE OF CONDUCTORS INSTALLED PER NEC. PROVIDE SCHEDULE 40 PVC PLASTIC OR RIGID STEEL CONDUIT BELOW GRADE. MINIMUM 3/4". PROVIDE ELECTRICAL METAL TUBING (EMT) MEETING FS 1W363, IN EXISTING METAL CONDUIT. IN LENGTHS 8' OR LESS FOR INTERIOR LOCATIONS. EMT CONNECTORS AND COUPLING SHALL BE SET-SCREW TYPE. "MC" & "MC" TYPE CABLES MUST BE INSTALLED IN ACCORDANCE WITH N.E.C. AND CAN NOT BE SUPPORTED FROM CEILING SUPPORT WIRES.
- ELECTRICAL CONTRACTOR SHALL INSTALL SIZE OF CONDUIT SHOWN ON PLANS.
- ALL CONDUIT AND RACEWAY SYSTEMS TO BE INSTALLED WITH SEPARATE GROUND CONDUCTOR. CONDUIT SYSTEMS NOT TO BE USED AS THE SOLE GROUNDING MEANS.
- CONDUCTORS, INSULATED SOFT ANNEALED 80% PURE COPPER WITH 100% COPPER BOND AND B GAGE, #10 AND SMALLER TO BE SOLID, #8 AND LARGER TO BE STRAND. MINIMUM #12 UNLESS OTHERWISE INDICATED. CONDUCTORS MUST BE INSTALLED IN ACCORDANCE WITH NEC AND CANNOT BE SUPPORTED FROM CEILING SUPPORT WIRES. THINWALL EMT IS TO BE USED UNDERGROUND, AT SERVICE ENTRANCE, OUTSIDE, OR IN WET LOCATIONS. ALL INSULATION TO BE RATED FOR 90°C AND TYPES AS FOLLOWS:
#10 AND #12: 120/208 VOLT SYSTEM
#8 TO 4/0: 277/480 SYSTEM
PHASE A: BROWN
PHASE B: ORANGE
PHASE C: YELLOW
NEUTRAL: GRAY
GROUND: GREEN
- WHERE NEUTRALS SHALL BE EQUAL TO "SCOTCH LOCK" FOR #8 AWG WIRE AND SMALLER AND 1/2" LOCK TIGHT FOR #6 AWG AND LARGER.
- ALL LIGHTS AND LAMPS ARE FURNISHED BY CONTRACTOR EXCEPT AS NOTED ON THE LIGHT SCHEDULE. FIXTURE INSTALLATION SHALL BE BY THE ELECTRICAL CONTRACTOR ACCORDING TO LOCAL CODE AUTHORITY.
- EMERGENCY LIGHTING SHALL HAVE A MINIMUM OF 90 MIN. BATTERY BACK-UP, OR AS REQUIRED BY LOCAL CODE AUTHORITY. PROVIDE LOCK-OUT CIRCUIT BREAKERS FOR CIRCUITS SERVING EXIT SIGN FIXTURES AND EMERGENCY BATTERY PACK FIXTURES.
- ALL EMERGENCY LIGHTS SHALL BE CONNECTED AHEAD OF ANY LOCAL SWITCH.
- ALL EXIT SIGNS SHOWN ARE PER ARCHITECTURAL LAYOUT AND SHALL BE APPROVED BY FIRE DEPARTMENT AND BUILDING OFFICIAL.
- LAYOUT BRANCH CIRCUIT WIRING AND ARRANGEMENT OF HOME RUNS FOR LENGTH IS EXCEEDED, ECONOMY AND EFFICIENCY, INCREASE WIRE SIZE IF 100' FEET OF MAXIMUM IS EXCEEDED.
- CONCEAL WIRING SYSTEM ABOVE SUSPENDED CEILINGS OR IN WALL OR FLOOR CONSTRUCTION WHERE POSSIBLE. INSTALL CONDUITS PARALLEL TO BUILDING LINES, AND TO CLEAR ALL OPENING, DEPRESSIONS, PIPES, DUCTS, STRUCTURE, ETC.
- INSTALL CONDUIT CONTINUOUS BETWEEN BOXES AND CABINETS WITH NO MORE THAN FOUR (4) 90 DEGREE BENDS. SECURELY FASTEN IN PLACE WITH STRAPS, HANGERS AND STEEL SUPPORTS AS REQUIRED. DO NOT SUPPORT CONDUIT FROM SUSPENDED CEILING GRID OR SUSPENSION WIRES. REAM CONDUIT ENDS BEFORE INSTALLATION AND THOROUGHLY CLEAN BEFORE INSTALLATION. OPENINGS SHALL BE PLUGGED OR COVERED TO KEEP CONDUIT CLEAN. TERMINALS ON SWITCHES AND OUTLET SHALL NOT BE USED TO "FEED THRU" TO THE NEXT SWITCH OR OUTLET.
- PROVIDE SINGLE GANG PLASTER RING AND A 1/2" DIAMETER NYLON PULL ROPE TO ACCESSIBLE CEILING SPACE FROM ALL NEW TELEPHONE AND/OR DATA OUTLETS.
- FOR ALL WIRING DEVICES, VERIFY FINISH COLOR WITH ARCHITECT.

ABBREVIATIONS

A	AMPERE	DWG	DRAWING	KVA	KILOVOLT AMPERE	PT	POTENTIAL TRANSFORMER
AFF	ABOVE FINISHED FLOOR	E.C.	ELECTRICAL CONTRACTOR	KW	KILOWATT	PP	POWER PANEL
AFG	ABOVE FINISHED GRADE	E.L.	ELEVATION	KWH	KILOWATT HOUR	PWR	POWER
AFI	ARC FLASH INTERRUPTER	EL	ELEVATION	LCP	LOCAL CONTROL PANEL	RECEP	RECEPTACLE
AFCI	ARC FLASH CIRCUIT INTERRUPTER	ELEC	ELECTRICAL	LIS	LOAD INTERRUPTER SWITCH	REV	REVISION
ASYM	ASYMMETRICAL	EQUIP	EQUIPMENT	LP	LIGHTING PANEL	SHD	SHIELDED CABLE
ATS	AUTOMATIC TRANSFER SWITCH	EXST (E)	EXISTING	LTG	LIGHTING	SP	SPARE
AWG	AMERICAN WIRE GAUGE	FA	FIRE ALARM	MAX	MAXIMUM	SS	SURGE SUPPRESSION
BKR	BREAKER	FBO	FURNISHED BY OTHER	MCC	MOTOR CONTROL CENTER	SWD	SWITCHBOARD
C	CONDUIT	FOR	FEEDER	MCS	MOLDED CASE SWITCH	SWGR	SWITCHGEAR
CB	CIRCUIT BREAKER	FIXT	FIXTURE	MDP	MAIN DISTRIBUTION PANEL	SYM	SYMMETRICAL
CCTV	CLOSED CIRCUIT TELEVISION	FL	FLOOR	MN	MINIMUM	TEL	TELEPHONE
CKT	CIRCUIT	G	GROUND	MSB	MAIN SWITCHBOARD	TYP	TYPICAL
CL	CENTER LINE	G.C.	GENERAL CONTRACTOR	MSG	MAIN SWITCHGEAR	UG	UNDERGROUND
CLG	CEILING	GEN	GENERATOR	MTS	MAIN SWITCHGEAR	U.O.N.	UNLESS OTHERWISE NOTED
CNTL	CONTROL	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NA	NON-AUTOMATIC	V	VOLT OR VOLTAGE
CPT	CONTROL POWER TRANSFORMER	GFI	GROUND FAULT INTERRUPTER	NC	NORMALLY CLOSED	VA	VOLT AMPERE
CT	CURRENT TRANSFORMER	HD	HIGH INTENSITY DISCHARGE	NEC	NATIONAL ELECTRIC CODE	VFD	VARIABLE FREQUENCY DRIVE
CU	COPPER	HOA	HAND-OFF-AUTOMATIC	NO	NORMALLY OPEN	W	WATTS
D	DEMOLISH	HP	HORSE POWER	NTS	NOT TO SCALE	WHM	WATT HOUR METER
DIA	DIAMETER	IC	INTERRUPTING CAPACITY	P	POLE	WP	WEATHERPROOF
DISC	DISCONNECT	IO	INPUT / OUTPUT	PH	PHASE	WW	WIREWAY
DN	DOWN	JB	JUNCTION BOX	PNL	PANEL	XFMR	TRANSFORMER
DP	DISTRIBUTION PANEL BOARD	KV	KILOVOLT				

SYMBOL LEGEND

ELECTRICAL EQUIPMENT

TYPICAL FOR ALL RECEPTACLES, OUTLETS, JUNCTION BOXES AND EQUIPMENT. NUMBER DENOTES PANEL, CIRCUIT NUMBER.

- AFCI - ARC FLASH CIRCUIT INTERRUPTER
GFCI - GROUND FAULT CIRCUIT INTERRUPTER
SS - SURGE SUPPRESSION TYPE
IS - ISOLATED GROUND TYPE
WP - WEATHERPROOF

DOUBLE DUPLEX RECEPTACLE

SWITCHED DUPLEX RECEPTACLE - ONE OUTLET SWITCHED LOWER CASE LETTER DENOTES CONDUIT AND WIRE SHALL BE EXTENDED RE-ENERGIZED.

DOUBLE DUPLEX RECEPTACLE

SINGLE RECEPTACLE

SPECIAL RECEPTACLE AMPERE AND VOLTAGE RATING AS INDICATED ON DRAWING

SURFACE RACEWAY WITH RECEPTACLES, AS INDICATED ON DRAWINGS

DOUBLE DUPLEX RECEPTACLE - FLOOR MOUNTED

DUPLEX RECEPTACLE - FLOOR MOUNTED

SPECIAL RECEPTACLE - FLOOR MOUNTED

CEILING MOUNTED DUPLEX RECEPTACLE

FLOOR JUNCTION BOX

WALL MOUNTED JUNCTION BOX

JUNCTION BOX, SIZE AND MOUNT AS REQUIRED

ELECTRICAL OR TELEPHONE MANHOLE

ELECTRICAL OR TELEPHONE MANHOLE

TERMINAL BOX, SIZE IN ACCORDANCE WITH NEC REQUIREMENTS AND TO ACCOMMODATE ALL TERMINAL BLOCKS.

PULL BOX, SIZE IN ACCORDANCE WITH NEC REQUIREMENTS.

SURFACE PANELBOARD LETTERS & NUMERALS INDICATE EQUIPMENT TAG

RECESSED PANELBOARD LETTERS & NUMERALS INDICATE EQUIPMENT TAG

ELECTRICAL PANEL LETTERS AND NUMBERS INDICATE PANELBOARD IDENTIFICATION TAG. SEE PANEL SCHEDULE FOR DETAILS.

HOME RUN CIRCUITS TO PANELBOARD. NUMBER OF ARROWS INDICATES NUMBER OF CIRCUIT HOME RUNS. 1 PH 120V

FEEDER TAG WITH CONDUIT AND WIRE SIZE AND DATA

LOCK FOR RESPECTIVE KEY INTERLOCK WITH KEY CAPTIVE IN LOCK

LOCK FOR RESPECTIVE KEY INTERLOCK

ELECTRONIC METERING DEVICE

VOLTMETER - AMMETER SWITCH

VOLTMETER - VOLTMETER SWITCH

WATTHOUR METER

UTILITY COMPANY METER AND METER PAN AS REQUIRED

FUSE

SURGE PROTECTOR DEVICE

HARMONIC FILTER

POWER FACTOR CORRECTION CAPACITOR

LINE REACTOR

RESISTOR

GENERATOR

MEDIUM VOLTAGE CABLE STRESS CONNECTION

600 VOLT CABLE LIMITER CONNECTION

LIGHTNING ARRESTER. NUMBER IN PARENTHESES INDICATES QUANTITY.

GROUNDING WYE CONNECTION

UNGROUNDING WYE CONNECTION

OPEN DELTA CONNECTION

DELTA CONNECTION

NODE

WIRE TERMINAL

GROUND TEST ELECTRODE

GROUND ROD

UNDERGROUND GROUND SYSTEM BARE CABLE, SIZE AS NOTED OR INDICATED.

BUILDING GROUND SYSTEM BARE CABLE, SIZE AS NOTED OR INDICATED.

GROUND GRIE CABLE CONNECTION

GROUND CONNECTION

LIGHTING

TYPICAL FOR ALL LIGHTING FIXTURES:
1. CAPITAL LETTER DENOTES FIXTURE TYPE.
2. SEE LIGHTING FIXTURE SCHEDULE FOR DESCRIPTION, TYPE, AND DETAILS.
3. NUMBER DENOTES BRANCH CIRCUIT NUMBER AT RESPECTIVE LIGHTING PANELBOARD. LOWER CASE LETTER DENOTES SWITCHED CIRCUIT.

TYPICAL LIGHTING FIXTURE

SINGLE POLE SWITCH

DOUBLE POLE SWITCH

THREE-WAY SWITCH

FOUR-WAY SWITCH

SINGLE POLE KEY SWITCH

THREE WAY KEY SWITCH

SINGLE POLE SWITCH WITH PILOT LIGHT

DIMMING SWITCH

OCCUPANCY SENSOR TYPE SWITCH

THREE WAY DIMMING SWITCH

MANUAL MOTOR TOGGLE TYPE STARTER WITH INTEGRAL THERMAL OVERLOAD HEATER

EMERGENCY LIGHTING

EMERGENCY LIGHTING WITH EXIT SIGN

EXIT SIGN

MOTION SENSOR

PHOTOCELL

OCCUPANCY SENSOR

TIME CLOCK

LIGHTING CONTACTOR. NUMBER DENOTES CONTACTOR IDENTIFICATION TAG. SEE CONTACTOR SCHEDULE FOR NUMBER OF POLES AND DETAILS.

GENERATOR REMOTE ANNUNCIATOR

PADLOCK FAN

LOCK FOR RESPECTIVE KEY INTERLOCK WITH KEY CAPTIVE IN LOCK

LOCK FOR RESPECTIVE KEY INTERLOCK

ELECTRONIC METERING DEVICE

VOLTMETER - AMMETER SWITCH

VOLTMETER - VOLTMETER SWITCH

WATTHOUR METER

UTILITY COMPANY METER AND METER PAN AS REQUIRED

FUSE

SURGE PROTECTOR DEVICE

HARMONIC FILTER

POWER FACTOR CORRECTION CAPACITOR

LINE REACTOR

RESISTOR

GENERATOR

MEDIUM VOLTAGE CABLE STRESS CONNECTION

600 VOLT CABLE LIMITER CONNECTION

LIGHTNING ARRESTER. NUMBER IN PARENTHESES INDICATES QUANTITY.

GROUNDING WYE CONNECTION

UNGROUNDING WYE CONNECTION

OPEN DELTA CONNECTION

DELTA CONNECTION

NODE

WIRE TERMINAL

GROUND TEST ELECTRODE

GROUND ROD

UNDERGROUND GROUND SYSTEM BARE CABLE, SIZE AS NOTED OR INDICATED.

BUILDING GROUND SYSTEM BARE CABLE, SIZE AS NOTED OR INDICATED.

GROUND GRIE CABLE CONNECTION

GROUND CONNECTION

DISTRIBUTION EQUIPMENT

FOR ALL DISTRIBUTION EQUIPMENT:
GFP - GROUND FAULT PROTECTION
STB - SHUNT TRIP
LSTB - LONG SENSITIVE TRIP
100% - 100% RATED PROTECTION

ELECTRIC OPERATED DEVICE

ELECTRONIC TRIP TYPE DEVICE

CIRCUIT BREAKER

THERMAL MAGNETIC CIRCUIT BREAKER TOP NUMBER DENOTES TRIP AMPERE RATING BOTTOM NUMBER DENOTES FRAME SIZE AMPERE RATING #P - DENOTES NUMBER OF POLES

CIRCUIT BREAKER WITH ELECTRONIC TRIP PROGRAMMER. TOP NUMBER INDICATES FRAME SIZE, BOTTOM NUMBER INDICATES FRAME SIZE AMPERE RATING #P - DENOTES NUMBER OF POLES

DRAW-OUT TYPE THERMAL MAGNETIC CIRCUIT BREAKER TOP NUMBER DENOTES TRIP AMPERE RATING BOTTOM NUMBER DENOTES FRAME SIZE AMPERE RATING #P - DENOTES NUMBER OF POLES

MEDIUM VOLTAGE DRAW-OUT CIRCUIT BREAKER TOP NUMBER DENOTES TRIP SIZE AMPERE RATING BOTTOM NUMBER DENOTES FRAME SIZE AMP RATING #P - DENOTES NUMBER OF POLES

DRAW-OUT MVD PWR CIRCUIT BREAKER COMBINATION STARTER TOP NUMBER DENOTES TRIP SIZE AMPERE RATING MCP DENOTES MOTOR CIRCUIT PROTECTOR SIZE

DRAW-OUT FUSED SWITCH TOP NUMBER DENOTES SWITCH AMPERE RATING BOTTOM NUMBER DENOTES FUSE AMPERE RATING #P - DENOTES NUMBER OF POLES

FUSED MEDIUM VOLTAGE DRAW OUT STARTER TOP NUMBER DENOTES SWITCH AMPERE RATING #P - DENOTES NUMBER OF POLES

ELECTRICAL PANEL LETTERS AND NUMBERS INDICATE PANELBOARD IDENTIFICATION TAG. SEE PANEL SCHEDULE FOR DETAILS.

UNFUSED DISCONNECT SWITCH. NUMBER DENOTES SWITCH AMPERE RATING #P - DENOTES NUMBER OF POLES

FUSED DISCONNECT SWITCH TOP OR BOTTOM NUMBER DENOTES SWITCH AMPERE RATING BOTTOM OR TOP NUMBER DENOTES AMPERE FUSE RATING #P - DENOTES NUMBER OF POLES

MEDIUM VOLTAGE UNFUSED LOAD INTERRUPTER SWITCH NUMBER DENOTES SWITCH AMPERE RATING #P - DENOTES NUMBER OF POLES

MEDIUM VOLTAGE FUSED LOAD INTERRUPTER SWITCH TOP NUMBER DENOTES SWITCH AMPERE RATING BOTTOM NUMBER DENOTES FUSE AMPERE RATING #P - DENOTES NUMBER OF POLES

MAGNETIC MOTOR STARTER WITH THERMAL OVERLOADS

MAGNETIC MOTOR STARTER CONTACTOR NP - DENOTES NEMA STARTER SIZE

COMBINATION MAGNETIC MOTOR STARTER WITH DISCONNECT SWITCH. NP - DENOTES NEMA STARTER SIZE

CURRENT TRANSFORMER (CT) PRIMARY AND SECONDARY CURRENT RATINGS. NUMBER IN PARENTHESES INDICATES QUANTITY

POTENTIAL TRANSFORMER WITH PRIMARY AND SECONDARY FUSES

ENCLOSED CIRCUIT BREAKER TOP OR FIRST NUMBER DENOTES SWITCH AMPERE RATING BOTTOM OR SECOND NUMBER DENOTES FUSE AMPERE RATING #P - DENOTES NUMBER OF POLES

ENCLOSED CIRCUIT BREAKER/COMBINATION FVNR STARTER TOP NUMBER DENOTES MOTOR CIRCUIT PROTECTOR CONTINUOUS AMPERE RATING NP DENOTES NEMA STARTER SIZE #P - DENOTES NUMBER OF POLES

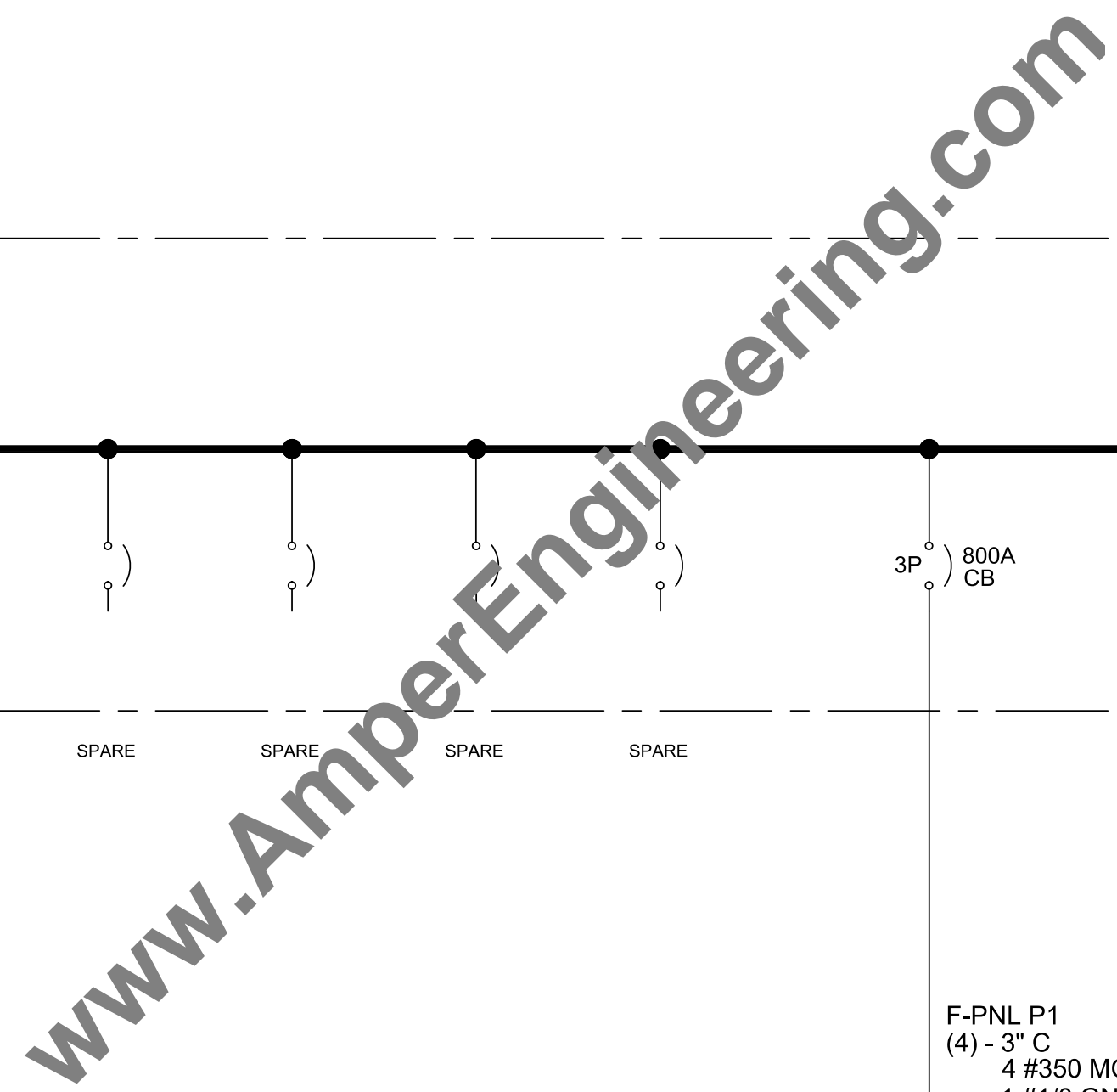
RELAY. NUMBER (S) DENOTE ANSI DEVICE FUNCTION NUMBER.

TRANSFORMER SIZE AS NOTED WITH PRIMARY AND SECONDARY VOLTAGE AS INDICATED

TRANSFORMER SIZE AS NOTED WITH PRIMARY AND SECONDARY VOLTAGE AS INDICATED

TRANSFORMER SIZE AS NOTED WITH PRIMARY AND SECONDARY VOLTAGE AS INDICATED

TRANSFORMER SIZE AS NOTED WITH PRIMARY AND SECONDARY VOLTAGE AS INDICATED

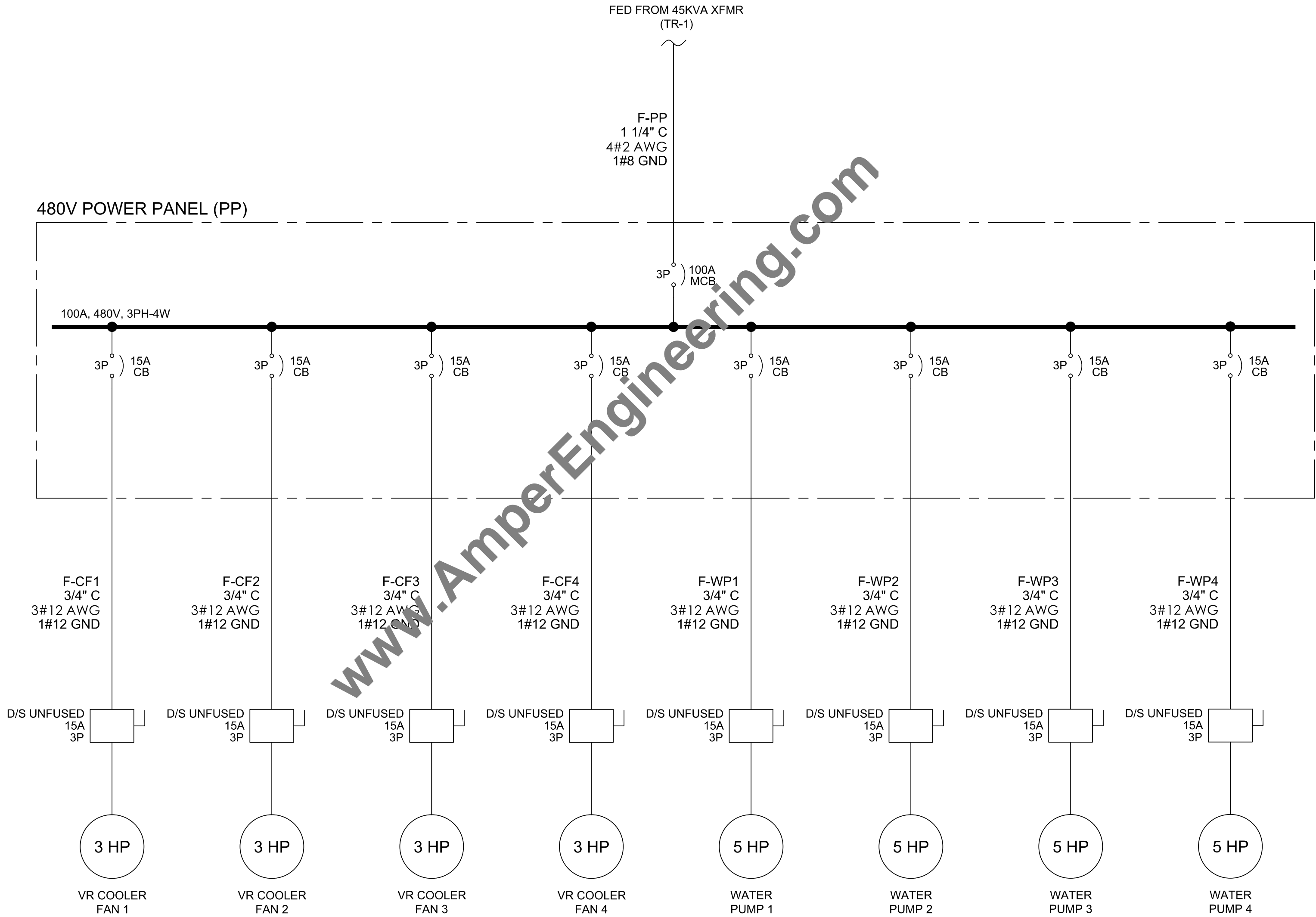


NOTE:

1. THIS DRAWING IS FOR FEED PURPOSE ONLY AND NOT TO BE USED FOR CONSTRUCTION.

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ONE LINE DIAGRAM 480V
POWER PANEL

PROFESSIONAL ENGINEERING:

DURAK EVRIM ERCAN P.E.
ENGINEERING | CONSULTING | ESTIMATING
201-920-2899 | info@AmperEngineering.com

SEAL & SIGNATURE:

Durak Evrim Ercan

PROFESSIONAL ENGINEER - STATE OF NEVADA
DURAK EVRIM ERCAN
Exp: 2/31/2022
ELECTRICAL
08/23/2021
No. 26561

NO ALTERATION PERMITTED
EXCEPT AS PROVIDED UNDER
DIRECTION OF A LICENSED
PROFESSIONAL ENGINEER.

0	06/15/2021	ISSUED FOR APPROVAL
REV	DATE	DESCRIPTION

CLIENT:

PROJECT:
DATA CENTER

ADDRESS:

LAS VEGAS, NV
89149

PROJECT NUMBER:

AE# 1286

SHEET SIZE:

24X36

DESIGNED BY:

AC

DRAWN BY:

IB

CHECKED BY:

DEE

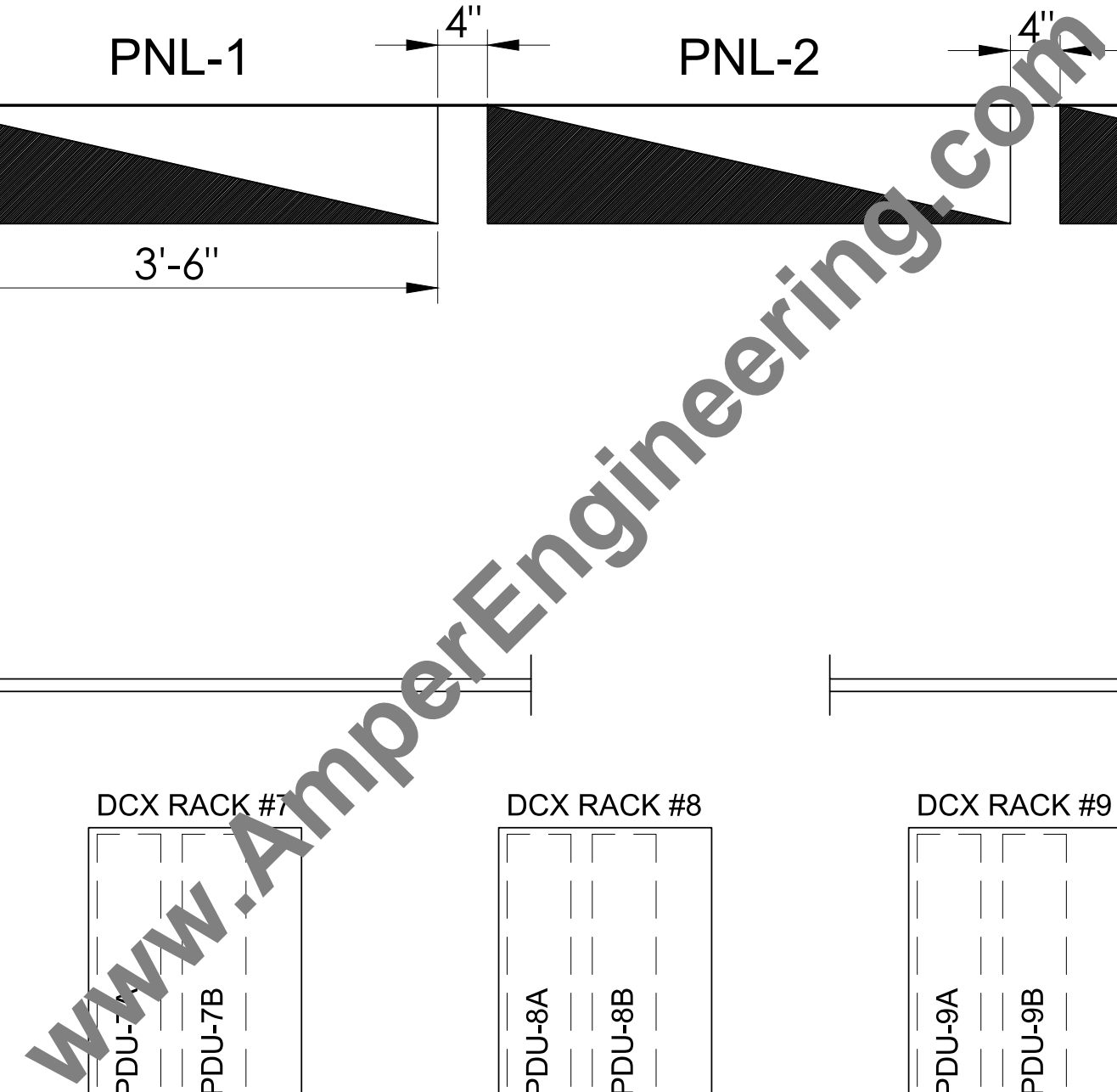
DRAWING TITLE:

ONE LINE DIAGRAM 480V
POWER PANEL

SHEET NO:

E4

① 800A/300A & 100A PANELBOARD ARE FACTORY ASSEMBLED PANELS BY MANUFACTURER (SQUARE D OR SIMILAR).



SCALE: 1" = 1'-0"

1. ALL DIMENSIONS ARE IN FT-INCHES UNLESS OTHERWISE NOTED.
2. DISTRIBUTION EQUIPMENT AS PER SQUARE D OR SIMILAR.
3. EQUIPMENT LAYOUT IS PRELIMINARY. ACTUAL LAYOUT SHALL BE DONE DURING DETAILED DESIGN.
4. THIS DRAWING IS FOR FEED PURPOSE ONLY AND NOT TO BE USED FOR CONSTRUCTION.

NO ALTERATION PERMITTED
EXCEPT AS PROVIDED UNDER
DIRECTION OF A LICENSED
PROFESSIONAL ENGINEER.

CLIENT:

ADDRESS:

LAS VEGAS, NV
89149

SHEET NO:

E6