

ELECTRICAL SPECIFICATIONS

PART I – GENERAL

A. CONDITIONS

1. FURNISH AND INSTALL A COMPLETELY WIRED AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO, THESE MAJOR ITEMS.
- A. LIGHTING FIXTURES AS INDICATED AND SPECIFIED ON THE PLANS.
- B. ELECTRICAL PANELS, SERVICE, CONDUIT, WIRING, ETC., FOR ALL OUTLETS AND EQUIPMENT.
- C. TELEPHONE, TELEVISION, AND FIRE ALARM, OUTLETS AND CONDUIT AS INDICATED.
2. OBTAIN AND REVIEW ALL OTHER DRAWINGS INCLUDING REFLECTED CEILING PLAN, INTERIOR AND EXTERIOR ELEVATIONS, FURNITURE PLANS AND ALL MILL WORK DRAWINGS. COORDINATE INSTALLATION OF ALL ELECTRICAL DEVICES AND EQUIPMENT PRIOR TO ROUGH-IN.
3. OBTAIN SUBMITTAL AND SHOP DRAWINGS FROM OTHER TRADES AND EQUIPMENT TO COORDINATE INSTALLATION ACCORDINGLY.
4. INSTALLATION SHALL COMPLY WITH ALL CURRENT APPLICABLE CODES AND GOVERNING AGENCIES HAVING JURISDICTION.
5. FIRE ALARM SYSTEM, IF REQUIRED PER IBC, SHALL BE DESIGN-BUILD BY OWNER'S/GC'S FIRE ALARM CONTRACTOR. DESIGN SHALL BE IN ACCORDANCE WITH NFPA 72. FIRE ALARM CONTRACTOR SHALL SUBMIT STAMPED DRAWINGS TO AHJ FOR REVIEW AND APPROVAL. FIRE ALARM CONTRACTOR IS RESPONSIBLE FOR TESTING AND VERIFYING THAT THE AUDIBILITY OF THE FIRE ALARM SYSTEM MEETS A MINIMUM OF 15 DBA ABOVE AMBIENT NOISE LEVELS. ADD HORNS WHERE REQUIRED TO MAINTAIN MINIMUM LEVELS.
6. PROVIDE FIRE STOP ON ALL PIPING THAT PENETRATES RATED WALLS. METHOD OF FIRE STOP SHALL MEET WALL RATING. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE RATED WALLS. THIS CONTRACTOR SHALL PROVIDE FIRE RATED ENCLOSURES AROUND ALL ROUGH-IN BOXES, PANELS, ETC. THAT ARE LOCATED IN FIRE RATED WALLS AND SHALL FIRE CAULK ALL OPENINGS IN RATED ASSEMBLIES.

B. RELATED WORK BY OTHERS

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, TRENCH, AND BACKFILL FOR ELECTRICAL SERVICE ENTRANCE FROM THE MAIN SERVICE TO UTILITY POINT OF ELECTRICAL SERVICE. ELECTRICAL CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE ELECTRICAL SERVICE ENTRANCE WITH SERVING UTILITY COMPANY.
2. THE ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, TRENCH, AND BACKFILL FOR PRIMARY PHONE AND CATV SERVICE FROM THE TELEPHONE TERMINAL BOARD OR CABINET TO THE PHONE COMPANY AND CATV COMPANY POINT OF SERVICE COORDINATE WITH LOCAL UTILITY COMPANIES.

C. CODES, REGULATIONS, AND STANDARDS

1. THE INSTALLATION SHALL COMPLY WITH APPLICABLE LOCAL AND STATE CODES AND ORDINANCES, WITH THE REGULATIONS OF THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE AND WITH THE REQUIREMENTS OF THE POWER, TELEPHONE, AND CATV COMPANIES FURNISHING SERVICES TO THIS INSTALLATION.
2. THE LATEST EDITIONS OF THE FOLLOWING INDUSTRY STANDARDS, SPECIFICATIONS, AND CODES ARE MINIMUM REQUIREMENTS:
- A. THE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION STANDARDS.
- B. THE NATIONAL ELECTRICAL CODE, INCLUDING LOCAL AMENDMENTS.
- C. UNDERWRITER LABORATORIES INCORPORATED STANDARDS.
- D. AMERICAN NATIONAL STANDARDS INSTITUTE.
- E. INTERNATIONAL BUILDING CODE.

D. INSPECTION OF SITE

1. PRIOR TO SUBMITTING A BID FOR ELECTRICAL WORK, THE CONTRACTOR SHALL VISIT THE SITE OF THE PROPOSED CONSTRUCTION AND SHALL THOROUGHLY ACQUAINT HIMSELF WITH EXISTING UTILITIES, AND WORKING CONDITIONS TO BE ENCOUNTERED, ETC. ALLOWANCE WILL NOT BE MADE FOR NONCOMPLIANCE WITH THIS CONDITION AFTER BIDDING.
2. ELECTRICAL INSTALLATION SHALL MEET THE EXISTING CONDITIONS.

E. STORAGE AND HANDLING OF MATERIAL

1. DELIVER MATERIALS AND EQUIPMENT TO THE PROJECT IN THE MANUFACTURER'S ORIGINAL, UNOPENED, LABELED CONTAINERS. PROTECT AGAINST MOISTURE, TAMPERING, OR DAMAGE FROM IMPROPER HANDLING OR STORAGE. CONTRACTOR SHALL PROTECT AND BE RESPONSIBLE FOR ANY DAMAGE TO WORK OR MATERIALS UNTIL FINAL ACCEPTANCE BY THE OWNER, AND SHALL MAKE GOOD WITHOUT COST TO THE OWNER, ANY DAMAGE OR LOSS THAT MAY OCCUR DURING THIS PERIOD.
2. ARRANGE FOR TIMELY DELIVERY OF MATERIALS AND EQUIPMENT TO THE JOB SITE IN ORDER TO MINIMIZE THE LENGTH OF TIME BETWEEN DELIVERY AND INSTALLATION.
3. COVER AND PROTECT ANY MATERIAL WHICH MAY BE AFFECTED BY THE WEATHER WHILE IN TRANSIT OR STORED AT THE PROJECT SITE. ANY MATERIAL FOUND DEFECTIVE OR NOT INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS MAY BE REJECTED BY THE ENGINEER.

F. CLEANUP

1. KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIALS, OR RUBBISH CAUSED BY EMPLOYEES OR WORK UNDER THIS DIVISION OF THE SPECIFICATIONS. AT THE COMPLETION OF THE WORK REMOVE ALL SURPLUS MATERIALS, TOOLS, ETC., AND LEAVE THE PREMISES BROOM-LEAN.

G. EXCAVATION, CUTTING, AND FITTING

1. PERFORM ALL EXCAVATION AND BACK FILLING REQUIRED FOR WORK PERFORMED UNDER THIS DIVISION OF THE SPECIFICATIONS. USE EXCAVATED MATERIALS FOR BACKFILL UNLESS OFF SITE MATERIALS ARE DEEMED NECESSARY.
2. PERFORM THE EXCAVATION, CUTTING, FITTING, REPAIRING, AND FINISHING OF THE WORK NECESSARY FOR THE INSTALLATION OF THE EQUIPMENT OF THIS SECTION. HOWEVER, NO CUTTING OF THE WORK OF OTHER TRADES OR OF ANY STRUCTURAL MEMBERS SHALL BE DONE WITHOUT THE CONSENT OF THE ARCHITECT.

H. DRAWINGS

1. THE DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND LOCATIONS OF THE ELECTRICAL WORK DATA PRESENTED ON THESE DRAWINGS ARE AS ACCURATE AS PLANNING CAN DETERMINE, BUT FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DRAWINGS AND ADJUST ALL WORK TO MEET THE REQUIREMENTS OF CONDITIONS SHOWN. THE ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER ALL OTHER DRAWINGS. DISCREPANCIES BETWEEN DIFFERENT PLANS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, OR REGULATIONS, OR CODES GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING BEFORE THE DATE OF BID OPENING. IF DISCREPANCIES ARE NOT REPORTED, THE CONTRACTOR SHALL BID THE GREATER QUANTITY OR BETTER QUALITY, AND APPROPRIATE ADJUSTMENTS WILL BE MADE AFTER CONTRACT AWARD. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD MEASURE AND CONFIRM MOUNTING HEIGHTS AND LOCATION OF ELECTRICAL EQUIPMENT WITH RESPECT TO COUNTERS, RADIATION, ETC. DO NOT SCALE DISTANCES OFF THE ELECTRICAL DRAWINGS, USE ACTUAL BUILDING DIMENSIONS.

I. COOPERATION WITH OTHER CONTRACTORS

1. COOPERATE WITH THE OTHER TRADES SO THAT THE INSTALLATION OF THE ELECTRICAL OUTLETS AND EQUIPMENT WILL BE PROPERLY COORDINATED. CONDUIT, LIGHTING FIXTURES, AND OTHER EQUIPMENT LOCATIONS SHALL BE VERIFIED WITH OTHER TRADES TO AVOID CONFLICT WITH THE PIPING, DUCTWORK, STEEL, BEAMS, OR OTHER OBSTRUCTIONS.
2. CAREFULLY VERIFY THE LOCATIONS OF THE OUTLET BOXES AND DETERMINE THAT THEY HAVE NOT BEEN DISTURBED DURING THE INSTALLATION OF MATERIALS OF OTHER TRADES.
3. COORDINATE THE LOCATION OF THE TRENCHES AND CONDUITS FOR ELECTRICAL AND TELEPHONE UTILITY SERVICES WITH THE GENERAL CONTRACTOR.
4. COORDINATE HVAC AND PLUMBING EQUIPMENT CONNECTION REQUIREMENTS WITH HVAC AND PLUMBING CONTRACTORS.

J. RECORD DRAWINGS

1. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN A SET OF DRAWINGS AT THE JOB SITE FOR THE EXCLUSIVE PURPOSE OF MAINTAINING A RECORD OF ALL WORK INSTALLED AND TO SHOW ANY DEVIATIONS FROM THE WORK INDICATED ON THE DRAWINGS.
2. AT THE COMPLETION OF THE PROJECT, ONE SET OF REPRODUCIBLE DRAWINGS, SHOWING ALL RECORD CONDITIONS, SHALL BE DELIVERED TO THE OWNER FOR ACCEPTANCE PRIOR TO FINAL PAYMENT.

PART II – PRODUCTS AND EXECUTION

A. MATERIALS

1. ALL MATERIALS SHALL BE NEW AND OF QUALITY AS SPECIFIED ON THE PLANS OR SPECIFICATIONS AND MUST CARRY THE UNDERWRITER'S LABORATORIES APPROVAL COVERING THE PURPOSE FOR WHICH THEY ARE USED, IN ADDITION TO MEETING ALL REQUIREMENTS OF THE CURRENT APPLICABLE CODES AND REGULATIONS.

B. SHOP DRAWINGS AND APPROVALS

1. THE ITEMS SPECIFIED HEREIN AND ON DRAWINGS ARE USED AS A STANDARD OF QUALITY. ANY MATERIALS OF EQUAL QUALITY AND AESTHETIC VALUE WILL BE GIVEN CONSIDERATION AS A SUBSTITUTE FOR THE MATERIALS SPECIFIED. NO APPROVAL WILL BE GIVEN TO A SPECIFIC CATALOG NUMBER, MODEL, OR TYPE OF EQUIPMENT, PRIOR TO BIDDING. AFTER BIDDING, THE DECISION OF THE ARCHITECT AND/OR ENGINEER DETERMINING EQUAL MATERIALS WILL BE FINAL.
2. THE CONTRACTOR SHALL SUBMIT SEVEN (7) IDENTICAL BOUND SETS OF SHOP DRAWINGS ON THE FOLLOWING ITEMS:
- A. LIGHTING FIXTURE CUTS AND PERFORMANCE DATA.
- B. OUTLINE DRAWINGS AND DATA SHEETS OF EACH PANELBOARD, LOAD CENTERS, AND DISTRIBUTION PANELS.
- C. OUTLINE DRAWINGS OF ALL SWITCH GEAR COMPONENTS.
- D. WIRING DEVICES AND COVERPLATES.
- E. ALL CIRCUIT BREAKERS INSTALLED IN PANELBOARDS, LOAD CENTERS, AND DISTRIBUTION PANELS.
3. SUBMIT ITEMS AT ONE TIME IN A NEAT AND ORDERLY MANNER WITHIN 15 DAYS OF AWARD OF CONTRACT. PARTIAL SUBMITTALS WILL NOT BE ACCEPTABLE.

C. SYSTEM GROUNDING

1. GROUNDING SHALL COMPLY WITH REQUIREMENTS OF ARTICLE 250. ALL EXPOSED NONCURRENT CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEWAY SYSTEMS, METALLIC CABLE ARMOR, GROUNDING CONDUCTOR OF NONMETALLIC SHEATHED CABLES, GROUNDING CONDUCTOR IN NONMETALLIC RACEWAYS, AND GROUNDED CONDUCTORS OF THE WIRING SYSTEM SHALL BE GROUND.
2. GROUNDING CONDUCTOR (NEUTRAL) OF THE WIRING SYSTEM SHALL BE CONNECTED TO THE SYSTEM GROUNDING CONDUCTOR AT A SINGLE PLACE IN EACH SYSTEM BY REMOVABLE BONDING JUMPERS, SIZED ACCORDING TO THE APPLICABLE PROVISIONS OF THE NATIONAL ELECTRICAL CODE. THE GROUNDED CONDUCTOR (NEUTRAL) TO THE GROUNDING CONDUCTOR CONNECTION SHALL BE LOCATED IN THE ENCLOSURE FOR THE SYSTEM'S OVERCURRENT PROTECTION OR WHERE OTHERWISE INDICATED ON THE PLANS OR SPECIFICATIONS.
3. A GROUND BUS SEPARATE FROM THE NEUTRAL BUS SHALL BE PROVIDED IN ALL DISTRIBUTION PANELS AND PANELBOARDS. PROPER TORQUE ON GROUND BUS SHALL BE VERIFIED, PER MANUFACTURER'S RECOMMENDATIONS, PRIOR TO ENERGIZING EQUIPMENT.
4. GROUND BUSES AND NEUTRAL BUSES IN ALL DISTRIBUTION PANELS, LOAD CENTERS, PANELBOARDS, AND THOSE PROVIDED IN ANY EQUIPMENT SHALL BE ISOLATED EXCEPT WHERE REQUIRED TO BE CONNECTED AS SPECIFIED ABOVE FOR THE SERVICE ENTRANCE.
5. WHEN INDICATED ON THE DRAWINGS, EQUIPMENT GROUNDING CONDUCTORS SHALL BE EXTENDED FROM THE GROUND BUS IN THE DISTRIBUTION EQUIPMENT TO THE RECEPTACLE, FIXTURE OR DEVICE LUGS WHERE THEY ARE PROVIDED. WHERE LUGS ARE NOT PROVIDED, EQUIPMENT GROUNDING CONDUCTORS SHALL BE CONNECTED TO EQUIPMENT ENCLOSURES. THE CONNECTIONS SHALL BE ARRANGED SUCH THAT REMOVAL OF THE RECEPTACLE, EQUIPMENT GROUND CONDUCTORS, OR GROUND JUMPERS FROM GROUND BUSING SHALL NOT AFFECT THE GROUND SYSTEM.
6. RACEWAYS MAY NOT BE USED AS A GROUNDING CONDUCTOR FOR POWER AND LIGHTING CIRCUITS. ALL CONDUIT SHALL HAVE SEPARATE CODE SIZED GREEN GROUND WIRE INSTALLED IN THE CONDUIT TO INSURE A CONTINUOUS GROUNDING PATH.
7. IN INACCESSIBLE LOCATIONS, MAKE CONNECTIONS BY EXOTHERMIC WELD PROCESS.
8. IN ACCESSIBLE LOCATIONS, CONNECTIONS SHALL BE MADE WITH BOLTED THROUGH, APPROVED SOLDERLESS BRONZE GROUNDING DEVICES.

D. WIRE

1. CONDUCTOR SIZES SHOWN ON THE DRAWINGS ARE BASED ON COPPER WIRE. UNLESS OTHERWISE SPECIFIED, ALL WIRE SHALL BE TYPE XHHW OR SE FOR FEEDERS OR BRANCH CIRCUITS LARGER THAN 4 AWG, TYPE THHN/THWN INSULATION FOR FEEDERS AND BRANCH CIRCUITS 4 AWG AND SMALLER. ALL BRANCH CIRCUIT WIRING SHALL BE COPPER.
2. ALUMINUM CONDUCTORS MAY BE UTILIZED FOR SERVICE ENTRANCE AND PANEL FEEDERS. CONDUCTORS SHALL BE ALUMINUM ALLOY AA-8000 SERIES.
3. THE WIRES SHALL BE MARKED WITH COLOR TO SIMPLIFY CIRCUIT IDENTIFICATION. UNLESS OTHERWISE REQUIRED BY LOCAL ORDINANCES GROUND WIRES SHALL BE GREEN, NEUTRAL WIRES SHALL BE 120V-WHITE, AND LIVE WIRES 208Y/120V AND 120/240 SHALL BE BLACK (PHASE A), RED (PHASE B), AND BLUE (PHASE C). CIRCUIT SHALL BE LABELED IN EACH J-BOX.
4. ALL CONDUCTORS SHALL BE RATED 600 VOLT.
5. SPLICES IN EXTERIOR PULL BOXES AND MANHOLES SHALL BE WEATHERPROOF USING "SCOTCHCAST" SPLICE KIT OR APPROVED EQUAL. SEAL ENDS OF CONDUITS AND DUCTS WITH "DUCTSEAL" OR APPROVED EQUAL.
6. PROVIDE SOLID CONDUCTOR FOR 12 AWG AND SMALLER.
7. ALL WIRING WITHIN RESIDENTIAL UNITS ONLY MAY BE TYPE NM CABLE.
8. NO WIRE SHALL BE INSTALLED IN THE CONDUIT SYSTEM UNTIL THE CONDUIT SYSTEM IS COMPLETE. USE MINERALAC NO. 100 OR EQUIVALENT AS A LUBRICANT TO FACILITATE THE INSTALLATION OF THE CONDUCTORS IN THE CONDUIT SYSTEM.
9. MC CABLE WITH COPPER CONDUCTORS AND GROUND WIRE MAY BE USED WHERE PERMITTED.

E. CONDUIT

1. ALL WIRING SHALL BE INSTALLED IN LISTED METALLIC CONDUIT EXCEPT AS PERMITTED IN OTHER SECTIONS. RGS, WITH A 20 MIL PVC COATING WILL BE USED WHEN IN CONTACT WITH EARTH. IMC MAY BE USED IN INDOOR LOCATIONS NOT IN CONTACT WITH THE EARTH. EMT MAY BE USED IN INDOOR LOCATIONS NOT IN CONTACT WITH EARTH, NOT IN CONCRETE SLABS OR WALLS, AND NOT SUBJECT TO DAMAGE. PVC MAY BE USED IN OR BELOW CONCRETE AND DIRECT BURIED IN EARTH. FLEXIBLE STEEL CONDUIT SHALL BE USED FOR INDOOR FINAL CONNECTIONS TO EQUIPMENT IN LENGTHS NOT TO EXCEED 72". LIQUID-TIGHT FLEXIBLE STEEL CONDUIT SHALL BE FOR OUTDOOR FINAL CONNECTIONS TO EQUIPMENT NOT TO EXCEED 48".
2. WHERE CONDUIT ENTERS OUTLET BOXES, FIXTURES OR CABINETS, FIRMLY FASTEN WITH STEEL SET SCREW, COMPRESSION CONNECTORS, OR DOUBLE LOCKNUTS FOR GRC. ALL CONNECTIONS SHALL HAVE BUSHINGS OR INSULATED THROAT CONNECTORS. FIRMLY FASTEN CONDUIT TO THE BUILDING CONSTRUCTION. RUN EXPOSED CONDUIT PARALLEL TO THE BUILDING LINES, SUPPORTED BY APPROPRIATE HANGERS (UNISTRUT, T & B OR APPLETON, OR EQUAL).
3. COVER METALLIC CONDUIT IN CONTACT WITH EARTH WITH POLYETHYLENE TAPED SPIRAL WRAPPED, 1/2 LAPPED TO PROVIDE 20 MIL THICKNESS. TAPE SHALL BE SCOTCH NO. 50 TAPE. CONDUIT AND DUCTS NOT UNDER BUILDINGS AND FEEDER DUCTS SHALL BE INSTALLED PER N.E.C. 300-5. MAKE JOINTS WITH COMPOUND TO BE WATERTIGHT.
4. SCHEDULE 40 PVC CONDUIT SHALL BE PERMITTED UNDERGROUND WITH PROPER FITTINGS, ALL UL APPROVED AND CEMENTED JOINTS. PENETRATIONS THROUGH FLOOR SLABS AND BENDS GREATER THAN 22" SHALL BE WRAPPED RIGID GALVANIZED STEEL ELBOWS.
5. FITTINGS AND CONDUIT BODIES SHALL BE STEEL. DIECAST FITTINGS ARE NOT ACCEPTABLE.
6. CONDUIT SIZES SHALL BE AS REQUIRED BY CODE AND AS INDICATED OR SPECIFIED.
7. ALL EMPTY CONDUIT SYSTEMS SHALL HAVE A 200 LB. TEST NYLON PULL STRING TO FACILITATE INSTALLATION OF FUTURE WIRE.
8. WIRING, CONDUITS, AND OUTLETS SHALL BE CONCEALED WITH THE BUILDING STRUCTURE, EXCEPT THAT CERTAIN MOTOR AND LIGHTING FEEDER CONDUITS MAY BE RUN EXPOSED IN CERTAIN AREAS AS INDICATED ON THE DRAWINGS.
9. CONDUIT PENETRATION THROUGH ROOF SHALL HAVE ROOF FLASHING WITH CAULK TYPE COUNTER FLASHING SLEEVE. INSTALLATION SHALL BE WATERTIGHT.
10. CONDUITS SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO THE STRUCTURE.

F. OUTLET, PULL, AND JUNCTION BOXES

1. EACH SWITCH, LIGHT, RECEPTACLE OR OTHER OUTLET, INSTALLED IN RESIDENTIAL UNITS, SHALL BE PROVIDED WITH A CODE SIZED, PLASTIC OUTLET BOX. JUNCTION AND PULL BOXES SHALL BE CODE SIZED, PLASTIC OR METAL OUTLET BOX. ALL OTHER OUTLET BOXES SHALL BE STEEL.
2. BOXES INSTALLED IN POURED CEMENT FLOORS SHALL BE FLUSH TYPE CAST IRON OR STEEL WITH WATERTIGHT CASKETING COVERS. WHERE BOXES ARE INSTALLED IN FLOORS WITH TILE OR CARPET FLOOR COVERING, COVERS SHALL BE OF THE RECESSED TYPE TO ACCOMMODATE THE FLOOR COVERING. BOXES INSTALLED FOR THE ALARM, COMPUTER, AND SECURITY SYSTEM SHALL BE PROVIDED WITH APPROPRIATE COVER PLATES.
3. BOXES FOR TELEPHONE, COMPUTER, T.V., FIRE ALARM, SECURITY, AND SIMILAR SYSTEMS SHALL BE MINIMUM 2-1/8" DEEP.

G. WIRING DEVICES

1. WALL SWITCHES SHALL BE SPECIFICATION GRADE AC SILENT TYPE SWITCHES, 20A 120/277 VOLT.
2. RECEPTACLES SHALL BE SPECIFICATION GRADE, DUPLEX TYPE: NEMAS-20R, 20 AMPERE, 120VOLT GROUNDING TYPE. SPECIAL APPLICATION RECEPTACLES SHALL BE INDICATED ON PLANS. MOUNT WITH THE GROUND DOWN.
3. DEVICE PLATES SHALL BE EQUAL TO SIERRA SMOOTH-LINE PLASTIC WALL PLATES. COLOR SHALL BE WHITE, UNLESS OTHERWISE NOTED.
4. RECEPTACLES IN OUTDOOR AND WET LOCATIONS SHALL BE INSTALLED WITH A HINGED OUTLET COVER/ENCLOSURE CLEARLY MARKED AND U.L. LISTED SUITABLE FOR WET LOCATIONS WHILE IN USE, EQUAL TO TAYMAC SPECIFICATION GRADE.

H. SERVICE ENTRANCE SECTION

1. THE SERVICE ENTRANCE EQUIPMENT SHALL BE AS INDICATED ON THE DRAWINGS. EQUIPMENT SHALL CARRY THE U.L. LABEL AND SHALL CONFORM TO THE POWER COMPANY REGULATIONS.
2. SERVICE ENTRANCE EQUIPMENT SHALL BE PROVIDED WITH A FULLY RATED COPPER OR ALUMINUM BUS. HORIZONTALLY TAPERED BUSSING SHALL NOT BE ALLOWED.

I. DISTRIBUTION PANELS

1. DISTRIBUTION PANELS SHALL BE PROVIDED WITH FULLY RATED COPPER OR ALUMINUM BUS. HORIZONTAL TAPERED BUSSING SHALL NOT BE ALLOWED.
2. ACCEPTABLE MANUFACTURERS – CUTLER HAMMER, SIEMENS, SQUARE D OR GENERAL ELECTRIC
3. FACTORY ASSEMBLED DEAD FRONT, METAL ENCLOSED, AND SELF-SUPPORTING SWITCH BOARD ASSEMBLY CONFORMING T NEMA PB 2 AND UL 891, AND COMPLETE FROM INCOMING LINE TERMINALS TO LOAD SIDE TERMINATIONS.
4. LINE AND LOAD TERMINATIONS: ACCESSIBLE FROM FRONT ONLY OF THE SWITCH BOARD. SUITABLE FOR CONDUCTOR MATERIALS AND NUMBER OF CONDUCTORS USED.
5. BUS CONNECTIONS: BOLTED. ACCESSIBLE FROM FRONT FOR MAINTENANCE. PROVIDE BELLEVILLE WASHERS FOR PROPERLY TORQUE ALL CONNECTIONS
6. PROVIDE FULLY-RATED NEUTRAL BUS AND FULLY RATED GROUND BUS MATCHING MATERIAL USED FOR MAIN BUS.
7. FUTURE PROVISIONS: FULLY EQUIP SPACES FOR FUTURE DEVICES WITH BUSSING AND BUS CONNECTIONS SUITABLY INSULATED AND BRACED FOR SHORT CIRCUIT CURRENTS. CONTINUOUS CURRENT RATING AS INDICATED ON DRAWINGS.
8. ALL CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE.

J. PANEL BOARDS

1. CIRCUIT BREAKER TYPE AS INDICATED ON DRAWINGS. UNLESS INDICATED OTHERWISE, ALL PANELS SHALL HAVE PANEL HAVE PANEL BOARD TYPE CONSTRUCTION WITH BOLT-ON CIRCUIT BREAKERS FOR 3Ø PANELS
2. MANUFACTURERS SHALL BE GENERAL ELECTRIC, SQUARE D, SIEMENS, CUTLER-HAMMER WITH VOLTAGE, SIZES, AND RATINGS AS INDICATED ON DRAWINGS.
3. THE CIRCUIT BREAKERS SHALL BE OPERABLE IN ANY POSITION AND BE REMOVABLE FROM THE FRONT OF THE PANEL BOARD WITHOUT DISTURBING THE ADJACENT UNITS. BRANCH BREAKERS SHALL BE OF SUCH DESIGN THAT COMBINATION OF SINGLE-POLE, DOUBLE-POLE, AND THREE-POLE BREAKERS CAN BE ASSEMBLED ON THE SAME PANEL. EACH BRANCH CIRCUIT SHALL BE CLEARLY NUMBERED. BRANCH AND MAIN TERMINALS SHALL BE SOLDERLESS TYPE. HANDLE TIES TO FORM MULTI-POLE BREAKERS NOT ACCEPTABLE.

K. LOAD CENTER

1. CIRCUIT BREAKER TYPE AS INDICATED ON DRAWINGS. MANUFACTURERS SHALL BE GENERAL ELECTRIC, SQUARE D, SIEMENS, CUTLER-HAMMER/EATON WITH VOLTAGE, SIZES, AND RATINGS AS INDICATED ON DRAWINGS.
2. THE CIRCUIT BREAKERS SHALL BE OPERABLE IN ANY POSITION AND BE REMOVABLE FROM THE FRONT OF THE PANEL BOARD WITHOUT DISTURBING THE ADJACENT UNITS. BRANCH BREAKERS SHALL BE OF SUCH DESIGN THAT COMBINATION OF SINGLE-POLE AND DOUBLE-POLE BREAKERS CAN BE ASSEMBLED ON THE SAME PANEL. EACH BRANCH CIRCUIT SHALL BE CLEARLY NUMBERED. BRANCH AND MAIN TERMINALS SHALL BE OF THE SOLDERLESS TYPE. HANDLE TIES TO FORM MULTI-POLE BREAKERS NOT ACCEPTABLE.
- A. CIRCUIT BREAKERS SHALL BE PLUG-IN TYPE
3. WIRE TERMINATION FOR PANEL BOARDS AND CIRCUIT BREAKERS SHALL BE LISTED AS SUITABLE FOR 75 DEGREES C.
4. PROVIDE A TYPEWRITTEN CIRCUIT INDEX BEHIND CLEAR PLASTIC COVER ON INSIDE OF DOOR. INFORMATION SHALL INCLUDE ROOM AND TYPE LOAD SERVED. ALL CIRCUIT BREAKERS SHALL BE IDENTIFIED, INCLUDING SPARES. INDEX CARD FRAME SHALL BE METAL, SECURED TO DOOR.
5. PANEL BOARDS/LOAD CENTERS TO BE PROVIDED WITH COPPER BUSSING ONLY.

L. LIGHTING FIXTURES

1. PROVIDE ALL LIGHTING FIXTURES, WIRED AND CONNECTED. THE DRAWINGS INDICATE THE FIXTURES FOR EACH LOCATION. PROVIDE LAMPS FOR ALL FIXTURES. THE LAMPS SHALL BE BY THE SAME MANUFACTURER. VERIFY CEILING CONSTRUCTION BEFORE ORDERING RECESSED UNITS. PROVIDE PLASTER FRAMES AND HANGERS AS REQUIRED. CEILING CONSTRUCTION, ARCHITECTURAL ACCESSORIES, VOLTAGE, AND BALLASTS TO MEET THE EXISTING CEILING CONDITION.

M. LIGHTING CONTROL

1. FURNISH AND INSTALL TIME SWITCHES, PHOTOCELLS, CONTRACTORS AND FULL LIGHTING CONTROL SYSTEMS AS REQUIRED FOR LIGHTING CONTROLS INDICATED ON THE DRAWINGS.
2. TIME SWITCHES SHALL BE EQUAL TO PARAGON, GENERAL ELECTRIC, TORK, OR INTERMATIC AND SHALL HAVE SIZE AND NUMBER OF POLES AS REQUIRED.
3. PHOTOCELLS SHALL BE EQUAL TO TORK OR INTERMATIC WITH VOLTAGE AS INDICATED.

N. TELEPHONE AND CABLE TELEVISION SYSTEMS

1. TELEPHONE WALL OUTLETS SHALL CONSIST OF STANDARD BOXES MOUNTED 18" ABOVE THE FLOOR UNLESS OTHERWISE INDICATED. PROVIDE A TERMINAL MOUNTING BOARD FOR THE INCOMING SERVICE CABLE.
2. CABLE TELEVISION OUTLETS SHALL CONSIST OF STANDARD BOXES MOUNTED 18" ABOVE THE FLOOR UNLESS OTHERWISE INDICATED. PROVIDE A TERMINAL MOUNTING BOARD FOR THE INCOMING SERVICE CABLE.

O. GUARANTEE

1. GUARANTEE ALL MATERIAL FURNISHED AND ALL WORKMANSHIP PERFORMED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF WORK. ANY DEFECTS DEVELOPING WITHIN THIS PERIOD, TRACEABLE TO MATERIAL FURNISHED AS A PART OF THIS SECTION OR WORKMANSHIP PERFORMED HEREUNDER, SHALL BE MADE GOOD AT NO EXPENSE TO THE OWNER.

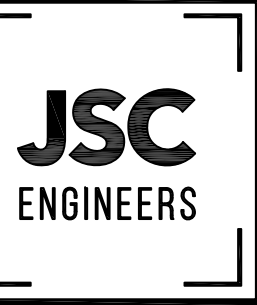
P. REMODELING WORK

1. THIS PROJECT INVOLVES CONSTRUCTION INSIDE AN EXISTING STRUCTURE. CONTRACTORS, BY SUBMITTING A BID ARE DEEMED TO BE COMPLETELY FAMILIAR WITH THE EXISTING CONDITIONS OF THE BUILDING AS IT INFLUENCES THE WORK DESCRIBED. NO CLAIMS FOR EXTRA COMPENSATION WILL BE CONSIDERED FOR EXISTING CONDITIONS VISIBLE OR REASONABLY INFERRABLE FROM A CAREFUL EXAMINATION OF THE EXISTING BUILDING CONDITIONS.
2. CONTRACTOR SHALL INSPECT THE EXISTING FIELD CONDITIONS AT THE SITE AND THE CONTRACT DOCUMENTS PRIOR TO THE START OF ANY WORK TO DETERMINE WHAT EFFECT THE EXISTING CONDITIONS WILL HAVE ON THE WORK POTENTIAL. CONTRACTOR SHALL REPORT DISCREPANCIES TO THE ARCHITECT AND INCLUDE IN THE BID ALL COSTS REQUIRED TO MAKE THE WORK MEET EXISTING CONDITIONS.
3. DEMOLITION: DISCONNECT, DEMOLISH, AND REMOVE ABANDONED MATERIALS AND EQUIPMENT INDICATED TO BE REMOVED AND NOT INDICATED TO BE SALVAGED OR REMAIN.
4. DISPOSAL, AND CLEANUP: REMOVE FROM THE SITE AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS AND EQUIPMENT NOT INDICATED TO BE SALVAGED.
5. PROTECT MATERIALS INDICATED TO REMAIN.

SYMBOLS LEGEND

NOTE: THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ETC, ARE NECESSARILY USED ON THE DRAWINGS.

- FLUORESCENT OR LED FIXTURE (SEE SCHEDULE)
- FIXTURE WITH EMERGENCY BATTERY BALLAST UNIT
- TRACK LIGHT
- DOWNLIGHT FIXTURE WITH EMERGENCY BATTERY BALLAST UNIT
- WALL MOUNTED FIXTURE WITH EMERGENCY BATTERY BALLAST UNIT
- DOWNLIGHT FIXTURE
- WALL MOUNTED FIXTURE
- PENDANT MOUNTED FIXTURE
- WALL WASHER
- SINGLE FACE EXIT SIGN – UNIVERSAL MOUNTED
- SINGLE FACE EXIT SIGN W/ DIRECTIONAL ARROWS – UNIVERSAL MTD
- DOUBLE FACE EXIT SIGN W/ DIRECTIONAL ARROWS – UNIVERSAL MTD
- DUAL HEADED EMERGENCY UNIT
- COMBO DUAL HEADED EMERGENCY AND EXIT SIGN UNIT
- LETTER INDICATES LIGHT FIXTURE AS INDICATED ON FIXTURE SCHED
- S SINGLE POLE SWITCH @ +48" UNLESS NOTED
- S_{bc} SWITCH BANK @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- S₂ 2 POLE SWITCH @ +48" UNLESS NOTED
- S₃ 3-WAY SWITCH @ +48" UNLESS NOTED
- S₄ 4-WAY SWITCH @ +48" UNLESS NOTED
- S_d DIMMER SWITCH – SIZE AS REQUIRED @ +48" UNLESS NOTED
- S_{3d} 3-WAY DIMMER SWITCH – SIZE AS REQUIRED @ +48" UNLESS NOTED
- S_{3dwy} 3-WAY DIMMER SWITCH BANK @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- S_s SWITCH SENSOR @ +48" UNLESS NOTED
- S_m MANUAL MOTOR STARTER
- Ⓞ OCCUPANCY SENSOR
- S_{osg} WALL SWITCH WITH OCCUPANCY SENSOR. TWO BUTTON DIGITAL LOW VOLTAGE WALL SWITCH. PROVIDES ON/OFF/0-10V DIMMING. SWITCH @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- S_{da} TWO BUTTON DIGITAL LOW VOLTAGE WALL SWITCH. PROVIDES ON/OFF/0-10V DIMMING. SWITCH @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- LC LIGHTING CONTACTOR
- Ⓢ LIGHTING CONTROLS POWER PACK (SEE LIGHTING CONTROLS SCHEDULE FOR TYPE INDICATED BY "#")
- Ⓢ DAYLIGHT SENSOR (SEE LIGHTING CONTROLS SCHEDULE)
- Ⓢ SPEAKER
- TELEPHONE OUTLET @ +18" UNLESS NOTED
- DATA OUTLET @ +18" UNLESS NOTED
- COMBINATION TELEPHONE/DATA OUTLET @ +18" UNLESS NOTED
- TELEVISION OUTLET @ +18" UNLESS NOTED
- DUCT DETECTOR
- HEAT DETECTOR
- 120 VOLT SMOKE DETECTOR WITH SOUNDER BASE AND BATTERY BACKUP
- AUXILIARY SYSTEM TERMINAL CABINET
- SWITCHBOARD, MOTOR CONTROL CENTER OR DISTRIBUTION BOARD
- BRANCH DISTRIBUTION PANELBOARD
- CARD READER. PROVIDE 2-GANG OUTLET BOX WITH SINGLE GANG RING AND 3/4" CONDUIT STUBBED UP IN WALL TO ABOVE ACCESSIBLE CEILING WITH BUSHING ON END OF CONDUIT @ 48" UNLESS NOTED OTHERWISE.
- GENERATOR
- TRANSFORMER
- MOTOR OUTLET
- DISCONNECT SWITCH – SIZE AND TYPE NOTED
- COMBINATION FUSED STARTER DISCONNECT SWITCH FUSE SIZE AS INDICATED, STARTER SIZE "1"
- MECHANICAL EQUIP. CONNECTION, SEE SCHED. ON MECH. PLAN
- JUNCTION BOX
- CONDUIT RUN CONCEALED IN WALL OR ABOVE CEILING
- CONDUIT RUN BELOW FLOOR OR GRADE
- SPECIAL HEAVY DUTY RECEPTACLE – SIZE AS NOTED. @ +18" UNLESS NOTED
- 1/2 SWITCHED RECEPTACLE @ +18" UNLESS NOTED
- FIRE RATED POKE THRU WITH TYPE INDICATED
- FLUSH FLOOR BOX WITH TYPE INDICATED
- SINGLE RECEPTACLE @ +18" UNLESS NOTED
- DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- DOUBLE DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- GFI DUPLEX RECEPTACLE
- FULL SWITCHED RECEPTACLE
- DUPLEX RECEPTACLE INSTALLED ABOVE COUNTERTOP
- DUPLEX RECEPTACLE WITH WEATHERPROOF COVERPLATE @ 18" UNLESS NOTED
- P1-3,5,7 HOMERUN TO PANELBOARD, INFORMATION AT ARROWS ARE CIRCUIT NUMBERS AND PANELBOARD FOR TERMINATION. REFER TO ASSOCIATED NOTE OR PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZES.
- INDICATES 1/2" CONDUIT CONCEALED IN CEILING OR WALL WITH (3) CONDUCTORS. (1) PHASE, (1) NEUTRAL AND (1) GROUND WIRE. ALL ARE #12 AWG UNLESS NOTED OTHERWISE.
- WHIP COUNT INDICATES NUMBER OF HOT CONDUCTORS



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01-18-2021

PROJECT:
NLV PERGOLA PARK
NEW LONGVIEW
LEE'S SUMMIT, MO

REVISIONS:	DATE	DESCRIPTION
1		
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3		
4		
5		

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SHEET TITLE:

ELECTRICAL
SPECS/SYMBOLS

DATE: 01.18.2021

JOB NO.: 20-261

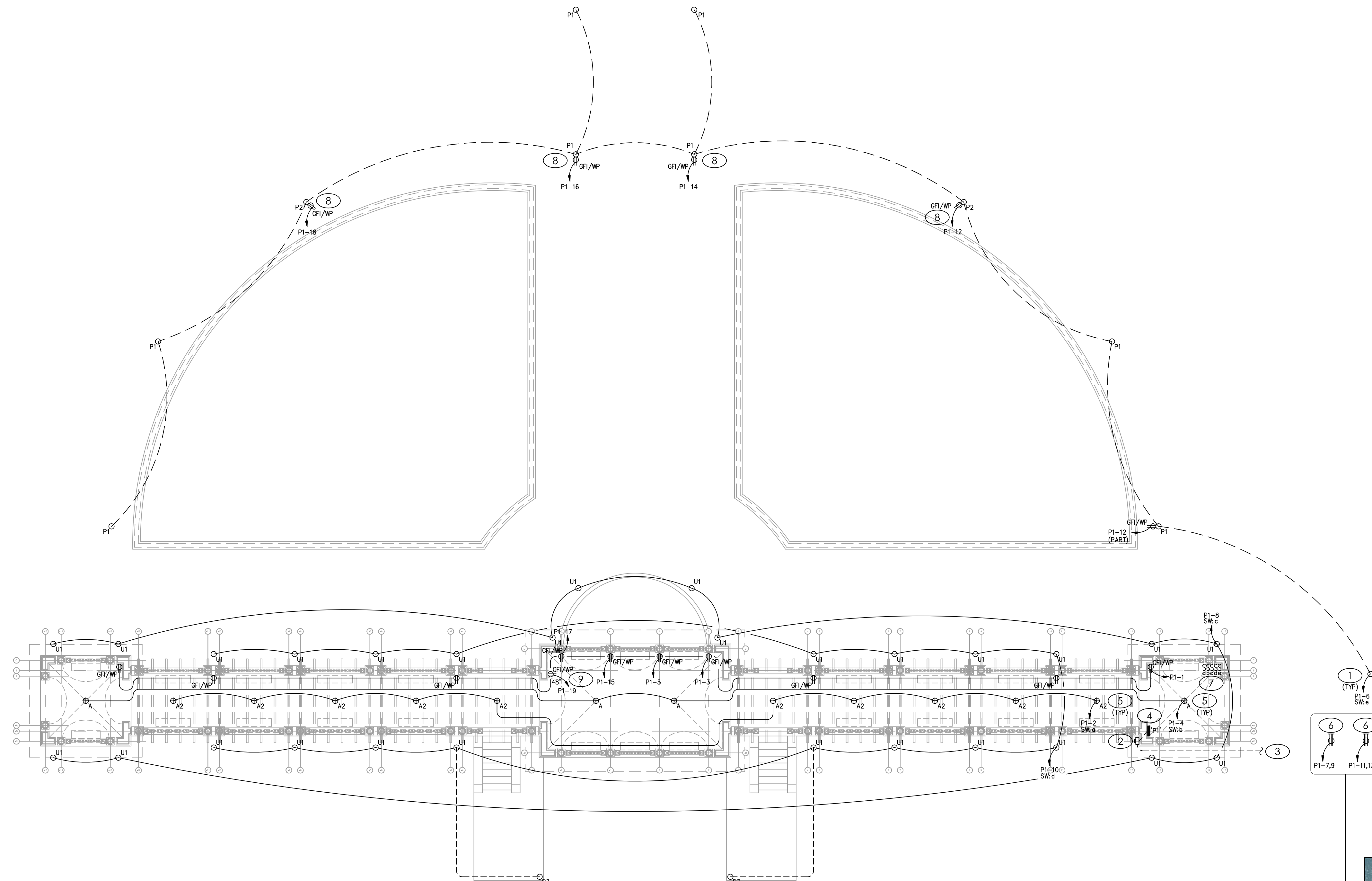
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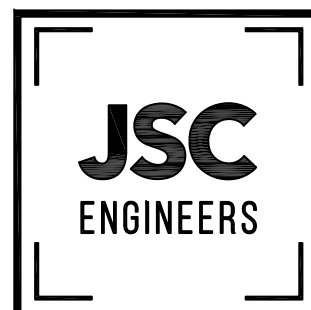
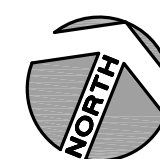
- A. DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. REFER TO ARCHITECTURAL PLANS OR FIELD MEASUREMENTS FOR DIMENSIONS.
- B. ALL WORK SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AND ALL LOCAL BUILDING CODES AND AMENDMENTS.
- C. ALL ROOF AND WALL PENETRATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. PROVIDE ALL REQUIRED SLEEVES, FLASHINGS, CURBS, REINFORCED ANGLES, SUPPORTING FRAMES, ETC. UNLESS THEY ARE SPECIFICALLY CALLED OUT TO BE FURNISHED BY OTHERS.
- D. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACE AVAILABLE, AND WITHOUT INTERFERENCES.
- E. THIS CONTRACTOR SHALL PERFORM ALL WORK INDICATED AND/OR AS REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF THE ELECTRICAL SYSTEMS.
- F. PROVIDE CONSTANT UNSWITCHED HOT LEG TO ALL LIGHTS WITH EMERGENCY BATTERY PACKS AND ALL OUTDOOR SCONCES.
- G. THE ELECTRICAL SYSTEM DESIGN IS BASED IN PART ON THE SPECIFIED HVAC EQUIPMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE EXACT LOCATIONS AND ELECTRICAL REQUIREMENTS OF ALL HVAC EQUIPMENT BEING FURNISHED. ANY CHANGES TO THE ELECTRICAL SYSTEM DUE TO HVAC EQUIPMENT SUBSTITUTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- H. ALL WIRING SHALL BE IN APPROVED RACEWAY.
- I. WIRE SIZE SHALL BE MINIMUM #12 AWG, THINN SOLID COPPER UNLESS OTHERWISE NOTED. PROVIDE GROUND WIRE WHERE REQUIRED BY CODE. INCREASE WIRE SIZE TO COMPENSATE FOR VOLTAGE DROP WHERE TOTAL LENGTH OF ANY BRANCH EXCEEDS 100 FEET.
- J. MAXIMUM NUMBER OF UNGROUNDED WIRES IN ANY CONDUIT SHALL BE THREE. ADDITIONAL WIRES ARE ACCEPTABLE IF WIRE SIZE IS INCREASED TO ALLOW FOR DERATING PER CODE. PROVIDE ADDITIONAL WIRES FOR SWITCHING AS REQUIRED.
- K. FIRE ALARM, AUDIO/VIDEO AND SURVEILLANCE SYSTEMS BY OTHERS.
- J. ALL CIRCUIT NUMBERS SHOWN NEXT TO DEVICES ARE ASSOCIATED WITH THE HOMERUN SHOWN AT A NEARBY VEIN AND SHALL TERMINATE AT THE DESIGNATED PANELBOARD CIRCUIT BREAKER.
- K. EC TO PROVIDE AND INSTALL RECEPTACLES, CAPS, AND CORDS AS REQUIRED. CAPS AND CORDS ARE TO BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
- L. ALL ELECTRICAL CONDUIT IS TO BE ROUTED PARALLEL OR PERPENDICULAR TO THE SURROUNDING STRUCTURE. ROUTE ALL CONDUIT ABOVE PERGOLA STRUCTURE TUCKED TO SIDES AS CLOSE AS POSSIBLE SO TO MAKE CONDUIT INCONSPICUOUS.

2. 10' HIGH PEDESTRIAN LIGHT FIXTURE TO BE SELECTED BY OWNER. COORDINATE CONTROL SCHEME WITH ARCHITECT AND OWNER. ROUTE POWER AND CONTROL WIRING AND CONDUIT UNDERGROUND TO FIXTURES. CONFIRM EXACT LOCATION OF FIXTURES WITH ARCHITECT PRIOR TO CONSTRUCTION.
3. ROUTE ELECTRIC SERVICE SECONDARY CONDUIT AND WIRING UNDERGROUND FROM EXISTING UTILITY SERVICE TRANSFORMER APPROXIMATELY 50' TO THE NORTHEAST OF THE SHOWN PANELBOARD LOCATION. COORDINATE EXACT DISTANCE AND ROUTING PRIOR TO CONSTRUCTION.
4. NEW ELECTRIC METER PER UTILITY REQUIREMENTS. REFER TO SINGLE LINE DIAGRAM ON SHEET E2 FOR MORE INFORMATION.
5. NEW PANELBOARD 'P1'. REFER TO PANELBOARD SCHEDULE AND SINGLE LINE DIAGRAM ON SHEET E2 FOR MORE INFORMATION.
6. COORDINATE EXACT LIGHT FIXTURE MOUNTING HEIGHT WITH ARCHITECT PRIOR TO CONSTRUCTION. REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET E2 FOR MORE INFORMATION.
7. 230V RECEPTACLE FOR CONNECTION TO LAKE AERATION AIR PUMP CABINET SHOWN FOR REFERENCE. COORDINATE EXACT LOCATION AND CONNECTION METHOD WITH ARCHITECT AND OWNER PRIOR TO CONSTRUCTION. ASSUME EQUIPMENT WILL BE LOCATED 200' FROM PANELBOARD FOR BIDDING PURPOSES. SIZE BRANCH WIRING FOR VOLTAGE DROP.
8. COORDINATE SWITCH SPECIFICATIONS WITH ASSOCIATED FIXTURES AND CONTROL SCHEME. CONFIRM DESIRED CONTROL METHOD WITH OWNER PRIOR TO CONSTRUCTION.
9. MOUNT WEATHERPROOF RECEPTACLE TO BASE OF FIXTURE POLE. COORDINATE INSTALLATION WITH FIXTURE POLE PROVIDER.
10. RECEPTACLE FOR CONNECTION TO SOUND SYSTEM BY OTHERS. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH OWNER PRIOR TO CONSTRUCTION.
11. CONDUIT AND CONDUCTOR ROUTE TO PEDESTRIAN STYLE FIXTURE ON CONCRETE DOCK TO BE INSTALLED IN COMPLIANCE WITH NEC ARTICLE 555 'MARINAS & BOATYARDS'. MINIMUM 1" DIAMETER UNDERGROUND CONDUIT.



SCALE : $1/8" = 1'-0"$

1



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01-18-2021

PROJECT:
NLV PERGOLA PARK
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REVISIONS:	DATE / DESCRIPTION
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ELECTRICAL SITE PLAN

DATE: 01.18.2021

JOB NO.: 20-261

SHEET:

E1

E

D

C

B

A

ELECTRICAL LIGHTING SCHEDULE (OR EQUAL, VERIFY ALL SELECTIONS AND FINISHES WITH OWNER OR ARCHITECT PRIOR TO ORDERING).							
FIXTURE TYPE	MANUFACTURER		VOLT AMPS	MOUNTING	LAMP TYPE	REMARKS	VOLT
	NAME	CATALOG NUMBER					
A	LITHONIA	PENDANT	16	PENDANT	INCLUDED LED 2700K	WET LOCATION PENDANT FIXTURE - 60W EQUIVALENT - BASIS OF DESIGN: GENERATION LIGHTING BAKERSVILLE COLLECTION ONE LIGHT OUTDOOR PENDANT - BLACK FINISH - DIFFUSE LENS. CONFIRM FINAL SELECTION WITH OWNER PRIOR TO ORDERING.	120
A2	KEYLESS WEATHERPROOF	PENDANT	32	PENDANT/SURFACE	INCLUDED LED 2700K	WET LOCATION KEYLESS BARE BULB FIXTURE - LED ACRYLIC [SHATTERPROOF] LENS EDISON-STYLE REPLICA. PROVIDE JUNCTION BOX AND FIXTURE/SOCKET FOR INSTALLATION OF COMPLETELY WEATHERPROOF ASSOCIATED SYSTEM.	120
P1	SELECTION BY OWNER	PEDESTRIAN POLE	100	GROUND	INCLUDED LED 2700K	WET LOCATION PEDESTRIAN FIXTURE - SELECTION BY OWNER - FIXTURE POLE (APPX 8'-10'-0") BY OTHERS - BASIS OF DESIGN: GENERATION LIGHTING BAKERSVILLE COLLECTION ONE LIGHT OUTDOOR PENDANT - BLACK FINISH - DIFFUSE LENS. CONFIRM FINAL SELECTION WITH OWNER PRIOR TO ORDERING.	120
P2	SELECTION BY OWNER	PEDESTRIAN POLE	100	GROUND	INCLUDED LED 2700K	WET LOCATION PEDESTRIAN FIXTURE - SELECTION BY OWNER - FIXTURE POLE (APPX 8'-10'-0") BY OTHERS. PROVIDE WITH 1" DIAM SCHEDULE 40 PVC CONDUIT STUBBED UP AND CAPPED AT TOP OF FIXTURE POLE BY OTHERS ROUTED BACK TO PANELBOARD. BASIS OF DESIGN: GENERATION LIGHTING BAKERSVILLE COLLECTION ONE LIGHT OUTDOOR PENDANT - BLACK FINISH - DIFFUSE LENS. CONFIRM FINAL SELECTION WITH OWNER PRIOR TO ORDERING.	120
P3	SELECTION BY OWNER	PEDESTRIAN POLE	100	GROUND	INCLUDED LED 2700K	WET LOCATION PEDESTRIAN FIXTURE - AT BOAT DOCK - SELECTION BY OWNER - FIXTURE POLE (APPX 4'-0") BY OTHERS. BASIS OF DESIGN: GENERATION LIGHTING BAKERSVILLE COLLECTION ONE LIGHT OUTDOOR PENDANT - BLACK FINISH - DIFFUSE LENS. CONFIRM FINAL SELECTION WITH OWNER PRIOR TO ORDERING.	120
U1	SELECTION BY OWNER	EXTERIOR UPLIGHT	54	GROUND	INCLUDED LED 4000K	WET LOCATION SITE UPLIGHT - BASIS OF DESIGN: LITHONIA TFX1 - FINAL SELECTION BY OWNER - PROVIDE ALTERNATE PRICE FOR CONTROLLABLE COLOR-CHANGING OPTION (ALTERNATE BASIS OF DESIGN - LITHONIA 8200 RGBW)	120

LIGHTING FIXTURE SCHEDULE

SCALE : NO SCALE

4

PANELBOARD: P1 (NEW)						FED FROM:				UTILITY				LINE-SIDE LUGS: MECHANICAL EQUIPMENT GROUND BUS			
BUS AMPS: 125A						AIC RATING: 10000 FULLY RATED											
MAIN SIZE/TYPE: 100A MCB						SERVES: PERGOLA											
VOLTS/PHASE: 120/240V, 1PH, 3W						MOUNTING: SURFACE											
SECTION: 1						LOCATION: EAST COLUMN											
CKT NO.	DESCRIPTION		VOLTAMPS/PHASE		WIRE NO.	BKR AMP	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE		DESCRIPTION		CKT NO.			
			A	B						A	B						
1	RCPT - GENERAL		1,080		12	20	1	1	20	12	600		LTG - PERGOLA 1	2			
3	RCPT - STAGE 1			800	12	20	1	1	20	12		600	LTG - PERGOLA 2	4			
5	RCPT - STAGE 2		800		12	20	1	1	20	12	900		LTG - PEDESTRIAN	6			
7	RCPT - AERATION CABINET 220V 1			1,500	10	20	1	1	20	12		432	LTG - UPLIGHTS 1	8			
9			1,500				1	1	20	12	864		LTG - UPLIGHTS 2	10			
11	RCPT - AERATION CABINET 220V 2			1,500	10	20	1	1	20	12		360	RCPT - WP LIGHT POLES 1	12			
13			1,500				1	1	20	12	360		RCPT - WP LIGHT POLES 2	14			
15	RCPT - STAGE 3			800	12	20	1	1	20	12		360	RCPT - WP LIGHT POLES 3	16			
17	RCPT - STAGE 4		800		12	20	1	1	20	12	360		RCPT - WP LIGHT POLES 4	18			
19	RCPT - SOUND SYSTEM			500	12	20	1	1					PROVISIONAL SPACE	20			
21	PROVISIONAL SPACE												PROVISIONAL SPACE	22			
23	PROVISIONAL SPACE						1	1					PROVISIONAL SPACE	24			
SUBTOTAL			5,680	5,100						3,084	1,752	SUBTOTAL					
TOTAL PHASE A - VA		8,764	LOAD		CONN. VA		DF	LOAD		CONN. VA		DF					
AMPS		73	COOLING				1.00	REFRIG				1.00					
TOTAL PHASE B - VA		6,852	HEATING				0	SIGN/DISP				1.25					
AMPS		57	LIGHTING		3,396		1.25	KITCHEN				1.00					
TOTAL PNLBD - VA		15,616	RECEPTACLES		11,720		1.0/5	EXISTING				1.00					
AMPS		65	MOTORS				1.00	LRG MOTOR				1.25	TOTAL DEMAND				
			SUPP HEAT				1.00	SHOW WNDW				1.25	15,605 VA				
			MISC EQUIP		500		1.00	LTG TRACK				1.00	65 A				
PANELBOARD NOTES																	

PANELBOARD SCHEDULES

SCALE : NO SCALE

3

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding - Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-by-Point" method where:

$ISC_{(2)} = ISC_{(1)} \times M_{(1)}$

$M = 1/(1+f)$

$ISC_{(1)}$ = short circuit current at fault point 1

$ISC_{(2)}$ = short circuit current at fault point 2

Feeder: $f_{(30)} = \frac{1.732 \times L \times I_{sc}}{C \times E}$

XFMR: $f_{(30)} = \frac{P(sca) \times V_p \times 1.73 \times \%Z}{100,000 \times KVA}$

$IS_{(100)} = \frac{V_p \times M \times IP_{(100)}}{Vs}$

Feeder: $f_{(100)} = \frac{2 \times L \times I_{sc}}{C \times E}$

XFMR: $f_{(100)} = \frac{P(sca) \times V_p \times \%Z}{100,000 \times KVA}$

VOLTAGE DROP (3Ø):

$\%VD = ((R \times \cos(\arccos(pf)) + X \times \sin(\arccos(pf))) \times L \# \times 1.73) / E$

VOLTAGE DROP (1Ø):

$\%VD = ((R \times \cos(\arccos(pf)) + X \times \sin(\arccos(pf))) \times 2 \times L \# \times 1) / E$

$\%VD$ CUM= Cumulative Voltage Drop from Fault Point 1 to Fault Point #

R= resistance in ohms per LF

X= reactances in ohms per LF

Date of Calculations: 01/09/1900

System Voltage: 240/120V - 1 phase

Fault Point (F#)	Bus/Feeder Description	Source (Fault Point)	Phase	Source Isc (amps)	Feeder			Conductor C' Value	Busway C' Value	L-L Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Conductor			Transformer						f	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (F#)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
					Conduit Type/ TX	Material	Quantity of Parallel Sets and Bus/ Phase & Neutral Size							Resistance (R)	Reactance (X)	Arccos (pf) (Radians)	Type	Degree Rise	kVA	New Xfmr Z	Existing Xfmr Z	Secondary Voltage							Tap Setting																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
1	Utility Service Point				13,021 at the secondary of the utility transformer										Source Isc + 6X Motor Contribution = 13111																		1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Motor Contribution				15 The connected full load motor amps (includes compressors) on the system																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
2	Utility Meter			13111	NM	AL	1 Set(s) of 1	4678	--	240	40	0.8	54	0.000250	0.000046	0.6435011																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

SC/VD ANALYSIS

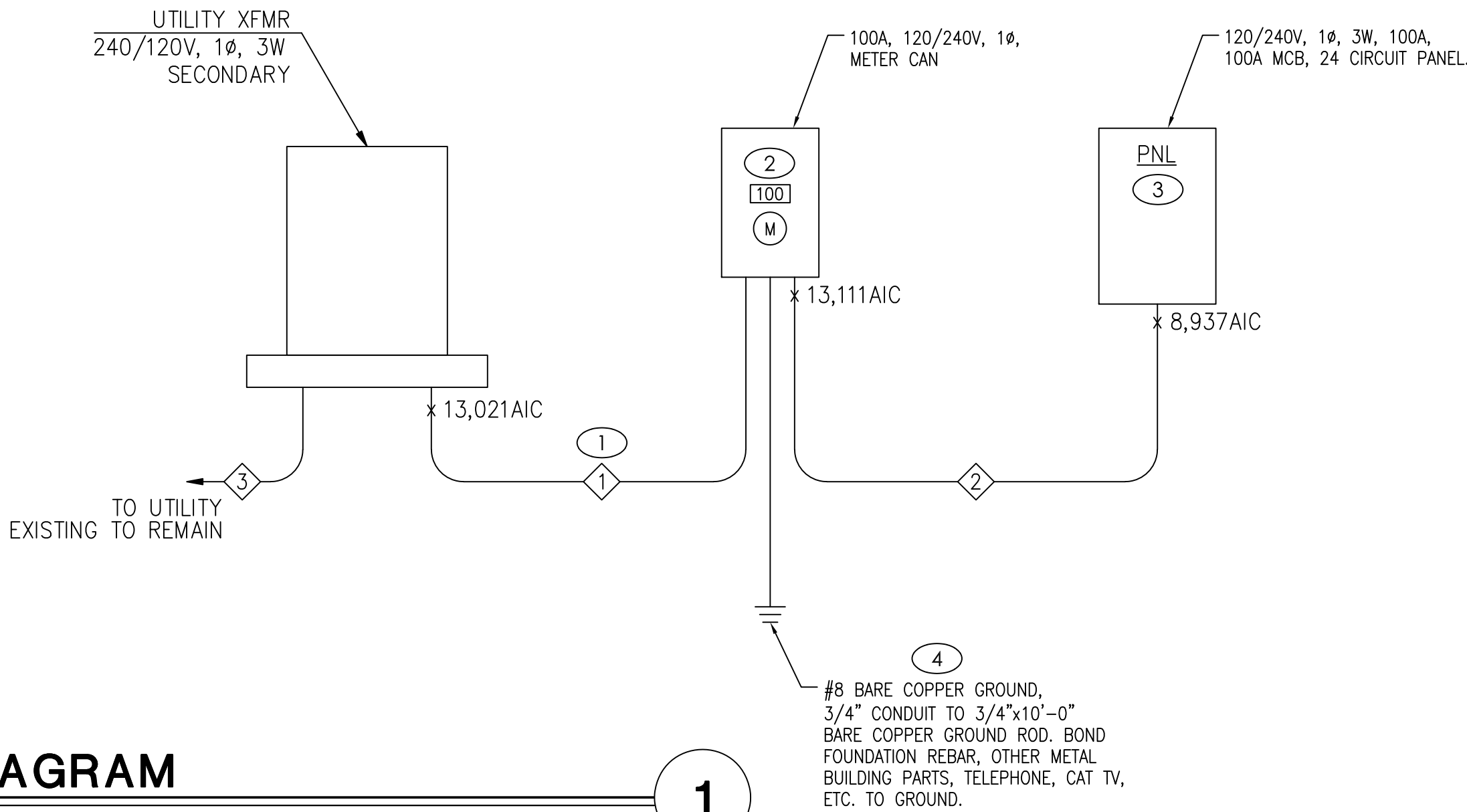
SCALE : NO SCALE

2

KEYED SLD NOTES

- PROVIDE NEW CONDUCTORS TO UTILITY TRANSFORMER. VERIFY EXACT LOCATION AND REQUIREMENTS WITH UTILITY PRIOR TO TRENCHING.
- PROVIDE NEW UTILITY METER PER UTILITY REQUIREMENTS IN COORDINATION WITH SWITCHGEAR VENDOR. VERIFY ACTUAL METERING SCHEME IS PROPERLY SELECTED, APPROVED BY UTILITY, AND PRICED AS SUCH PRIOR TO BIDDING.
- NEW DISCONNECT PER UTILITY REQUIREMENTS.
- PROVIDE NEW GROUND(S) & BOND PER NEC 250.52(A)(1), 250.52(A)(2), & 250.52(A)(5).

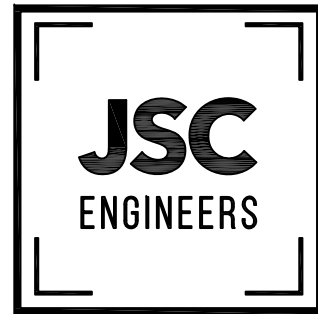
FEEDER NUMBER	
1	(1) 2"C (PVC) W/ 3 #1 AL
2	(1) 2"C EA W/ 4 #3 AL & 1 #6 AL GRND
3	PRIMARY CONDUCTORS BY UTILITY EXISTING TO REMAIN



NEW ELECTRICAL SERVICE SINGLE LINE DIAGRAM

SCALE : NO SCALE

1



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01-18-2021

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SCHEDULES

DATE: 01.18.2021

JOB NO.: 20-261

SHEET:

E2