ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

A. GENERAL CONDITION AND REQUIREMENTS:

THIS WORK IS SUBJECT TO THE GENERAL CONDITIONS AND THE GENERAL REQUIREMENTS BOUND THEREIN. THE FOLLOWING CODES AND REGULATIONS (LATEST VERSION) SHALL GOVERN THE EXTENT AND INSTALLATION OF ELECTRICAL WORK UNLESS MORE STRINGENT REQUIREMENTS ARE SHOWN ON THE DRAWINGS OR SPECIFIED HEREIN:

a) 2014 N.E.C. & F.B.C. 2017 6TH EDITION.
b) NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS (NFPA)
c) UNDERWRITERS LABORATORIES, INC (UL)
d) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
e) APPLICABLE LOCAL AND STATE BUILDING CODES

B. SCOPE:

1. THE SCOPE OF THIS DIVISION CONSISTS OF FURNISHING ALL PLANT LABOR, EQUIPMENT, SUPERVISION, APPLIANCE, MATERIALS AND PERFORMING ALL OPERATIONS REQUIRED TO COMPLETE ALL ITEMS OF WORK IN ACCORDANCE WITH THESE SPECIFICATIONS, APPLICABLE

2. THE WORK PROVIDED UNDER THIS DIVISION SHALL INCLUDE ALL LABOR, MATERIALS, PERMITS, INSPECTIONS AND RE-INSPECTION FEES, TOOLS, EQUIPMENT, TRANSPORTATION, INSURANCE, TEMPORARY PROTECTION, TEMPORARY LIGHTING, SUPERVISION AND INCIDENTAL ESSENTIAL FOR PROPER INSTALLATION AND OPERATION, EVEN THOUGH NOT SPECIFICALLY MENTIONED OR INDICATED BUT WHICH ARE USUALLY PROVIDED OR ARE ESSENTIAL FOR PROPER INSTALLATION AND OPERATION OF ALL ELECTRICAL SYSTEMS AS INDICATED IN THE CONTRACT DOCUMENTS.

C. SUBSTITUTION/APPROVED EQUAL:

1. PROVIDE ONLY UL LABELED PRODUCTS (WHERE APPLICABLE) OF TYPES INDICATED. ALL MATERIALS SHALL BE NEW AND IN PERFECT CONDITION. NOTWITHSTANDING ANY REFERENCE IN THESE DRAWINGS TO ANY ARTICLE, DEVICE, PRODUCT, MATERIAL, FORM, OR TYPE OF CONSTRUCTION BY NAME, MAKE OR A CATALOG NUMBER SUCH SHALL NOT BE CONSTRUCTED AS LIMITING CONDITION. THE CONTRACTOR IN SUCH CASES MAY AT HIS OPTION USE ANY ARTICLE, DEVICE, PRODUCT, MATERIAL, FORM OR TYPE OF CONSTRUCTION WHICH IN THE JUDGEMENT OF THE ARCHITECT/ENGINEER, EXPRESSED IN WRITING, IS EQUAL TO THAT SPECIFIED.

2. COST SAVINGS SHALL BE FORWARDED TO THE OWNER.

D. FEES, PERMITS AND REGULATIONS:

1. CONFORM TO ALL GOVERNING CODES, ORDINANCES OR REGULATIONS OF CITY, COUNTY, AND STATE HAVING JURISDICTION. WHERE LOCAL CODES ARE NOT APPLICABLE, CONFORM TO NATIONAL ELECTRIC CODE, LATEST REVISION.

2. BID WORK TO CONFORM TO CODE AT NO ADDITIONAL EXPENSE TO OWNER.

E. CONTRACTOR'S RESPONSIBILITIES:

1. COORDINATE WORK WITH OTHER TRADES. POWER AND TELEPHONE COMPANIES.
2. COORDINATE WORK SCHEDULE AND MATERIAL DELIVERY.

3. PROVIDE A COMPETENT SUPERINTENDENT IN CHARGE OF WORK AT ALL TIME. REPLACE SUPERINTENDENT NOT DEEMED COMPETENT BY ARCHITECT. DO NOT WITHDRAW OR CHANGE SUPERINTENDENT WITHOUT PRIOR APPROVAL OF ARCHITECT.

4. PROVIDE QUALIFIED MECHANICS. INSTALL MATERIALS AND EQUIPMENT IN NEAT, WORKMANLIKE MANNER. REMOVE AND REPLACE ANY MATERIAL OR EQUIPMENT, WHICH IS IMPROPERLY INSTALLED, OR DAMAGED IN THE OPINION OF THE ARCHITECT, AT CONTRACTOR'S EXPENSE.

5. EXAMINE WORK OF OTHERS. NOTIFY ARCHITECT IMMEDIATELY IN WRITING IF ANY CONDITION EXISTS WHICH WILL PREVENT SATISFACTORY INSTALLATION OF MATERIALS OR EQUIPMENT. STARTING OF WORK WITHOUT NOTIFICATION INDICATES ACCEPTANCE AND SUBSEQUENT CHANGES REQUIRED WILL BE AT CONTRACTOR'S EXPENSE.

6. THE INTEGRITY OF FIRE-RATED PARTITIONS SHALL BE MAINTAINED AROUND PENETRATING ELECTRICAL ELEMENTS. FIRE-RATED SEALANT, SLEEVES ESCUTCHEONS AND SIMILAR UNITS SHALL BE PROVIDED WHERE REQUIRED BY REFERENCE CODES AND AUTHORITIES HAVING JURISDICTION.

F. INTERPRETATIONS OF DRAWINGS:

1. THE DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW EXACT LOCATIONS OF CONDUIT RUNS, OUTLET BOXES, JUNCTION BOXES, PULL BOXES, ETC. THE LOCATIONS OF EQUIPMENT, APPLIANCES, FIXTURES, CONDUIT, OUTLETS, BOXES AND SIMILAR DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. EXACT LOCATIONS SHALL BE AS ACCEPTED BY THE ENGINEER DURING CONSTRUCTION. OBTAIN IN THE FIELD ALL INFORMATION RELEVANT TO THE PLACING OF ELECTRICAL WORK, IN AN ACCEPTABLE MANNER.

2. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES FOUND DURING CONSTRUCTION OF THE PROJECT AND DO NOT PROCEED WITH THAT PORTION OF THE PROJECT, UNTIL A WRITTEN DEFINITIVE STATEMENT IS RECEIVED PROVIDING CLEAR DIRECTION. IF A CONFLICT EXISTS BETWEEN THE CONTRACT DOCUMENTS AND ANY APPLICABLE CODE OR STANDARD, THE MOST STRINGENT REQUIREMENT SHALL BE INCLUDED FOR THIS PROJECT. THE ENGINEER SHALL MAKE THE DECISION REGARDING QUESTIONABLE AREAS OF CONFLICT.

3. COMPARE ALL DRAWINGS AND VERIFY FIGURES BEFORE LAYING OUT WORK AND "BE RESPONSIBLE FOR ANY ERRORS WHICH MIGHT HAVE BEEN AVOIDED THEREBY. SPECIAL NOTICE SHALL BE TAKEN OF CODE REQUIRED ELECTRICAL CLEARANCE AND ARCHITECT SHALL BE NOTIFIED IMMEDIATELY OF DISCREPANCIES.

4. WHEN MEASUREMENTS ARE AFFECTED BY CONDITIONS ALREADY ESTABLISHED, CONTRACTOR TO TAKE MEASUREMENTS NOTWITHSTANDING GIVING SCALE OR FIGURE DIMENSIONS ON DRAWINGS.

G. SERVICE AND METERING:

1. COMPANY: THE UTILITY COMPANY SERVING THIS PROJECT, WHICH WILL BE REFERRED TO AS THE UTILITY COMPANY HEREIN.

2. SERVICE: MAKE ALL ARRANGEMENTS WITH THE UTILITY COMPANY FOR OBTAINING A COMPLETE SERVICE. PAY ALL CHARGES AND PROVIDE ALL LABOR AND MATERIAL FOR THE SERVICE. SERVICE SHALL BE OBTAINED AT 120/240 VOLTS FROM THE UTILITY COMPANY. PROVIDE UNDERGROUND CABLES AND CONDUITS FOR INCOMING SERVICES FROM THE UTILITY'S PAD MOUNTED TRANSFORMER TO DISTRIBUTION EQUIPMENT. INSTALL METER SOCKET, AND PROVIDE CT CABINET AND WIRING. CONTRACTOR SHALL ALSO INCLUDE INSTALLATION COST OF UTILITY REQUIRED CONDUITS FROM THE UTILITY POLE TO PAD MOUNTED TRANSFORMER.

3. FEES: CONTACT THE UTILITY COMPANY TO DETERMINE IF ANY FEES, CHARGES OR COSTS WILL BE DUE THE COMPANY, AS REQUIRED FOR TEMPORARY POWER, PERMANENT POWER, INSTALLATIONS, HOOK-UPS, ETC. HIS FEE, CHARGE OR COST SHALL BE INCLUDED IN THE BID PRICE.

4. PAYMENT: PAY FOR ALL REQUIRED LICENSES, FEES AND INSPECTIONS. INCLUDE ALL COSTS IN THE PROPOSED CONSTRUCTION COST SUBMISSION. THESE COSTS SHALL INCLUDE BUT NOT BE LIMITED TO ALL-APPLICABLE TAXES, PERMITS, NECESSARY NOTICES, CERTIFICATES AND ALL COSTS REQUIRED TO OBTAIN IT.

H. CUTTING AND PATCHING:

THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL OPENING REQUIREMENTS WITH THE GENERAL CONTRACTOR. GENERAL CONTRACTOR SHALL PROVIDE ALL OPENINGS AND CLOSE IT.

IF GENERAL CONTRACTOR IS NOT PROPERTY INFORMED THIS DIVISION WILL PROVIDE OPENINGS AT HIS OWN EXPENSE. CUTTING OF STEEL, WOOD OR OTHER MAIN STRUCTURAL PARTS MUST BE APPROVED BY ARCHITECT PRIOR TO CUTTING.

I. HANDLING OF MATERIALS AND EQUIPMENT:

1. RECEIVE, HOUSE, HANDLE AND DELIVER TO PROPER LOCATION, MATERIALS AND EQUIPMENT.

2. PROTECT FROM DAMAGE, MOISTURE, DIRT, DEBRIS, AND WORK OF OTHER TRADES. USE OF PAPER, CARDBOARD, OTHER FLIMSY MATERIAL WILL NOT BE PERMITTED. REPLACE OR REFINISH MARKED OR DAMAGED SURFACES TO SATISFACTION OF ARCHITECT/ENGINEER.

J. CLEAN UP:

1. KEEP PREMISES FREE FROM ACCUMULATIONS OF WASTE MATERIAL OR RUBBISH.
   a. LEAVE PREMISES AND WORK IN CLEAN, ORDERLY CONDITION ACCEPTABLE TO ARCHITECT/ENGINEER.

   b. CLEAN ALL MATERIALS AND EQUIPMENT OF DIRT, DUST, PAINT, SPOTS, SOIL MARKS, ETC. ANY MATERIAL IN LESS THAN NEW CONDITION WILL BE REPLACED AT CONTRACTOR'S EXPENSE.

K. LABELS:

1. PROVIDE FOR ALL EQUIPMENT, APPARATUS, DISCONNECT AND REMOTE CONTROL SWITCHES, ETC., RIGID, LAMINATED, PHONEMIC LABELS, BLACK WITH WHITE LETTERS SELF ADHESIVE BACK. TAPE LABELS OR ADHESIVE NOT PERMITTED.

2. SPECIFIC EQUIPMENT (I.E. ELECTRICAL PANELS AND EQUIPMENT) SHALL BE IDENTIFIED WITH ONE INCH HIGH, 3-INCHES LONG, 1/16 -INCH THICK LABEL WITH 1/4 -INCH LETTERS.

L. AS BUILT DRAWINGS:

1. DURING PROGRESS OF WORK, KEEP ONE SET OF PRINTS OR JOB SHOWING ANY CHANGES FROM ORIGINAL PRINT.
2. UPON COMPLETION OF WORK; FURNISH ARCHITECT/ENGINEER WITH CLEAN SET OF LEGIBLE AND ACCURATELY MARKED PRINTS INDICATING ALL CHANGES FROM ORIGINAL PLANS.

M. GUARANTEE AND SERVICE:

1. CONTRACTOR AND MANUFACTURER TO GUARANTEE EQUIPMENT FOR ONE (1) YEAR AFTER FINAL ACCEPTANCE.

2. CONTRACTOR TO GUARANTEE MATERIAL AND WORKMANSHIP FOR ONE (1) YEAR AFTER FINAL ACCEPTANCE AND REPLACE ANY DEFECTS WITHOUT EXPENSE TO OWNER. FURNISH LUBRICATION, CLEANING NECESSARY ADJUSTMENTS AND/OR REPLACEMENTS, PREVENTATIVE MAINTENANCE, ETC.

3. LIGHT BULB REPLACEMENT LIMITED TO 30 DAYS.

N. SUBMITTALS:

1. WITHIN FIVE (5) DAYS AFTER AWARD OF CONTRACT THE CONTRACTOR SHALL ORDER AND SCHEDULE DELIVERY OF ALL MATERIALS AND EQUIPMENT CONCERNED WITH THIS PORTION TO ENGINEER, IN QUADRUPLICATE, A STATEMENT OF CONFIRMATION LISTING EQUIPMENT SUPPLIER, DATE ORDERED AND DELIVERY DATE. WHERE CHOICE OF MANUFACTURER IS GIVEN TO THE CONTRACTOR, LIST THE ONE ORDERED. THE FOLLOWING ITEMS MUST BE INCLUDED IN SUBMITTAL LETTER: PANELS, SWITCHBOARD, DISCONNECTS STARTERS, WIRE, CONDUIT, ELECTRIC METALLIC TUBING, OUTLET BOXES, DEVICES, PLATES, PLASTIC NAME PLATES, SPECIAL PURPOSE EQUIPMENT AND LIGHTING FIXTURES.

2. SHOP DRAWINGS TO BE SUBMITTED NO LATER THAN FORTY-FIVE (45) DAYS AFTER AWARD OF CONTRACT AND PRIOR TO INSTALLATION OF MATERIAL REQUIRING CONTRACTOR AT ONE TIME. INTERMITTENT OR INCOMPLETE SUBMITTALS WILL NOT BE CONSIDERED. MATERIAL OR EQUIPMENT REQUIRING SHOPS DRAWINGS APPROVAL IS NOT TO BE INSTALLED ON PROJECT UNTIL APPROVED SHOP DRAWINGS HAVE BEEN RETURNED BY ARCHITECT/ENGINEER.

O. INSPECTIONS:

1. DURING THE PROGRESS OF THE WORK, THE ENGINEER, OR OWNER'S REPRESENTATIVE, WILL MAKE OBSERVATIONS AT THE SITE TO DETERMINE CONFORMATION OF WORK WITH PLANS, SPECIFICATIONS AND THE INTENT THEREOF. DEFICIENCIES, VIOLATIONS AND INCORRECT WORKMANSHIP OR MATERIALS AND EQUIPMENT AND CORRECTIVE ACTION THEREFORE WILL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR, FOR HIS IMMEDIATE REMEDIAL ACTION.

P. INTERRUPTION OF EXISTING SERVICE:

1. 48 HOURS ADVANCE NOTICE IS REQUIRED FOR OUTAGES ON FEEDER4 AND BRANCH CIRCUIT CONSIDERED VITAL TO OPERATION BY OWNER, CONTRACTOR SHALL REQUEST SUCH OUTAGE, WITH ANTICIPATED DURATION THEREOF, IN WRITING FROM OWNER AND SHALL OBTAIN OWNER'S PERMISSION THEREFORE.

Q. SAMPLES:

1. PHYSICAL SAMPLES OF MATERIAL AND EQUIPMENT PROPOSED FOR INSTALLATION ON THIS PROJECT SHALL BE SUBMITTED TO ARCHITECT/ENGINEER UPON REQUEST.
2. SAMPLES SHALL BE SUBMITTED THROUGH THE GENERAL CONTRACTOR WITH ALL SHIPPING AND HANDLING CHARGES PREPAID. ANY EXPENSE INCURRED IN SECURING, DELIVERY AND RETURN OF SAMPLES IS RESPONSIBILITY OF CONTRACTOR. SAMPLES SHALL BE DELIVERED TO LOCATION DESIGNATED BY ARCHITECT/ENGINEER. IDENTIFY SAMPLE WITH SHIPPING TAG, WIRED IN PLACE, CONTAINING THE FOLLOWING INFORMATION:
   a. NAME OF PROJECT.
   b. NAME OF CONTRACTOR.
   c. SPECIFICATION SECTION NUMBER COVERING SAMPLE.
   d. MANUFACTURER'S NAME AND CATALOG NUMBER.
   e. DATE SUBMITTED.
3. SAMPLES SHALL REMAIN THE POSSESSION OF CONTRACTOR EXCEPT AS FOLLOWS:

   a. APPROVED SAMPLES, WITHOUT PHYSICAL DAMAGE, MAY BE INSTALLED ON THE PROJECT.
   b. SAMPLES NOT CALLED FOR WITHIN 14 DAYS AFTER NOTIFICATION WILL BE DISPOSED OF BY THE ARCHITECT/ENGINEER.

R. SPARE PARTS AND TOOLS:

1. FURNISH TO THE OWNER, AND OBTAIN RECEIPT FOR IT, THE FOLLOWING:
   a. HAVE ALL PREVIOUSLY LISTED DEFECTS CORRECTED.
   b. COMPLETE ALL WORK.
   c. TEST ALL SYSTEMS AND HAVE DATA ON SUCH TEST.
   d. HAVE ALL DIRECTORIES, LABELS AND INSTRUCTIONS.
   e. COMPILED WITH APPLICABLE PARAGRAPHS OF THIS SECTION.

2. FURNISH ADEQUATE MECHANICS AND PERSONNEL TO OPERATE SYSTEMS, MAKE ADJUSTMENTS, AND ASSIST WITH INSPECTION AS DIRECTED BY ARCHITECT/ENGINEER.

ELECTRICAL WORK

PART 1- PRODUCTS

A. CONDUIT:

CONDUIT SHALL BE PROVIDED AS FOLLOW, UNLESS OTHERWISE NOTED:
ELECTRICAL METALLIC TUBING (EMT): PROVIDE IN STUD AND HOLLOW MASONRY WALLS, ABOVE SUSPENDED AND FURRED CEILINGS, (MAXIMUM RUN LENGTH LENGTH OF 6'0") AND ALL TERMINATION TO EQUIPMENT SUBJECT TO VIBRATION. (MAXIMUM RUN LENGTH OF 4'0"). ALL FITTINGS SHALL BE APPLETON AST SERIES OR APPROVED EQUAL. LIQUID-TIGHT SHALL BE USED IN DAMP OR WET LOCATIONS AND FOR EQUIPMENT CONTAINING LIQUIDS. ALL FITTINGS SHALL BE O.Z GEDNEY AKC SERIES OR APPROVED EQUAL. PLASTIC CONDUIT AS MANUFACTURED BY ONE OF THE FOLLOWING:
A) CARLON PLASTIC PRODUCTS CORP.
B) CANTEX PLASTIC PRODUCTS
C) HATFIELD WIRE AND CABLE COMPANY.

A NYLON PULL WIRE SHALL BE INSTALLED IN ALL EMPTY CONDUITS. IDENTIFY INTENDED USE AT BOTH ENDS.

B. COUPLINGS AND CONNECTORS:

1. COUPLINGS AND CONNECTOR MANUFACTURED BY ONE OF THE FOLLOWING (OR APPROVED EQUAL): A) APPLETON ELECTRIC COMPANY, B) RACO C), STEEL CITY.

C. OUTLET BOXES:

1. GALVANIZED, STAMPED STEEL, 4-INCHES SQUARE BY 1-1/2 INCHES DEEP MINIMUM SIZE FOR WALL OUTLETS, MANUFACTURED BY, A) APPLETON ELECTRIC COMPANY, B) GENERAL CABLE COMPANY C) HATFIELD WIRE AND CABLE, D) REYNOLDS METAL COMPANIES, E) SIMPLEX WIRE AND CABLE F) TRIANGLE CONDUIT AND WIRE COMPANY OR APPROVED EQUAL

D. PANELBOARDS:

1. SQUARE-D, GENERAL ELECTRIC OR SIEMENS.

E. WIRE:

1. WIRE FOR THIS PROJECT AS MANUFACTURED BY ONE OF THE FOLLOWING: A) ANACONDA, B) GENERAL CABLE COMPANY, C) HATFIELD WIRE AND CABLE, D) REYNOLDS METAL COMPANY, E) SIMPLEX WIRE AND CABLE, F) TRIANGLE CONDUIT AND WIRE COMPANY OR APPROVED EQUAL

F. WIRING DEVICES:

1. SINGLE POLE SWITCH (ARROW HART #1991, HUBBLE #1221, PASS AND SEYMOUR #20AC 1).
2. THREE WAY SWITCH (HUBBLE #1223, ARROW HART #1993, PASS AND SEYMOUR #20AC).
3. RECEPTACLE, DUPLEX (HUBBLE #5262, ARROW HART #5262).
4. RECEPTACLE GFI (ARROW HART GF5242-I WITH 4501 COVER, HUBBLE GF5262-I WITH WP-26 COVER)

PART 2 - EXECUTION

A. GROUNDING:

1. PROVIDE EQUIPMENT GROUND SYSTEM IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 250.

   a. ALL BRANCH CIRCUIT RACEWAY CONTAIN MINIMUM ONE NO. 12 AWG, TYPE TW, GREEN CODED GROUND WIRE.
   b. GROUND CONDUCTOR FOR PANEL FEEDER AND BRANCH CIRCUITS WITH OVER CURRENT PROTECTION RATED MORE THAN 20 AMPERES SIZE.
   c. ALL FIXTURES, RECEPTACLES, SWITCHES BONDED TO GROUNDING SYSTEM.
   d. GREEN CODED GROUND CONTINUOUS FROM SERVICE ENTRANCE AND IN ADDITION TO NEUTRAL (1) NEUTRAL NOT USED AS GROUND FOR EQUIPMENT. EQUIPMENT GROUND BONDED TO NEUTRAL AT MAIN SERVICE ENTRANCE ONLY. (2) GREEN CODED GROUND CONDUCTORS TERMINATED UNDER EQUIPMENT GROUND BAR OF PANELS.

B. RACEWAYS:

1. PROVIDE ALL RACEWAYS FOR ALL SYSTEMS. RACEWAY LOCATIONS SHOWN ARE DIAGRAMMATIC, UNLESS SPECIFICALLY NOTED, AND GOVERN OBSTRUCTIONS. EXPOSED RACEWAYS RUN IN NEAT MANNER ACCEPTABLE TO ARCHITECT. RACEWAYS SUPPORTED USING USING CONDUIT CLAMPS SUPPORT OR HOLD RACEWAYS IN PLACE.

   a. RACEWAYS IMBEDDED IN EARTH, IN CONCRETE, IN DAMP OR WET LOCATIONS HOT DIPPED GALVANIZED RIGID, HEAVY WALL, THREADED NON-METALLIC, HIGH IMPACT DIRECT BURIAL TYPE II, PVC, WHERE PERMITTED BY CODES.
   b. RACEWAYS IN WALL OR FURRED CEILING TO BE ELECTRIC METALLIC TUBING
   c. RIGID STEEL CONDUIT USED FOR EXPOSED EXTERIOR RACEWAYS.

2. RACEWAYS REAMED SMOOTH AFTER CUTTING AND/OR THREADING.

3. RIGID STEEL, THREADED CONDUITS AND SCHEDULE 40 PVC TO HAVE DOUBLE LOCKNUTS AND O.Z. TYPE B BUSHING.

4. ELECTRIC METALLIC TUBING COUPLING AND CONNECTORS MACHINED STEEL, SET SCREW TYPE.

5. CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT MADE WITH SUFFICIENT STEEL, SET SCREW TYPE.

   a. USE FLEXIBLE, NON-METALLIC, LIQUID-TIGHT CONDUIT, UL APPROVED, FOR MOTOR CONNECTIONS.
   b. FLEXIBLE CONDUIT NOT USED FOR FIXTURE CONNECTIONS, EXCEPT RECESSED OR LAY-IN TYPE FIXTURES.
   c. MINIMUM SIZE 1/2 -INCH.

6. MINIMUM 24" RADIUS ELBOWS AND CONDUITS TO BE USED WHEN RISING FROM BELOW FLOOR ON SURFACE OF WALLS EXCEPT FOR LOW VOLTAGE RACEWAYS.

7. LOW VOLTAGE RACEWAYS (SYSTEMS OPERATING AT 70 VOLTS OR BELOW) TYPE 4 POLYVINYL CHLORIDE, UL FORMULA NON-METALLIC

   a. LOW VOLTAGE RACEWAYS TO HAVE BUSHING AT ALL TERMINALS.

   b. NYLON PULL CHORD 5W POUND TEST MINIMUM, LEFT IN ALL RACEWAYS, IN WHICH CONDUCTORS ARE NOT INSTALLED.

C. OUTLET BOXES:

1. EXCEPT AS NOTED OTHERWISE, ALL OUTLETS LOCATED AS FOLLOWS: (MEASURED FROM FINISHED FLOOR LEVEL TO BOTTOM OF BOX)

   a. SWITCHES----------48" TO OPERABLE PART
   b. RECEPTACLES----------15"
   c. WALL TELEPHONES---------48"

2. PROVIDE REQUIRED OUTLETS, SWITCH, PULL AND JUNCTION BOXES OF SUITABLE TYPE FOR MOUNTING INDICATED. BOXES SHALL BE GALVANIZED STEEL, NOT LESS THAN 4" SQUARE AND 1-1/2" DEEP UNLESS OTHERWISE INDICATED. BOXES SHALL BE SECURE TO STRUCTURE INDEPENDENT OF CONDUIT SUPPORTERS. PLASTER RINGS SHALL BE PROVIDED FOR RECESSED UNITS.

3. CONTRACTOR SHALL COORDINATE LOCATIONS OF UNITS INDICATED ON ELECTRICAL DRAWING WITH ACTUAL LOCATIONS ESTABLISHED BY ARCHITECT OR MECHANICAL CONTRACTOR FOR CLARIFICATION BEFORE PRECEDING WITH INSTALLATION.

D. PANELBOARDS (SHOP DRAWINGS REQUIRED):

1. BRANCH CIRCUIT PANEL BOARDS CIRCUIT BREAKER TYPE WITH BOLT-ON BREAKERS DEAD FRONT, LOCKING DOOR, FLUSH LOCK MASTER KEYPAD.

2. BREAKERS CLEARLY NUMBERED. WHERE SPACES ARE CALLED FOR, PROVIDE HARDWARE REQUIRED FOR FUTURE INSTALLATION OF BREAKERS. BUS AND HARD WARE BRACED FOR INTERRUPTING, CAPACITY OF LARGEST BREAKER IN PANEL; INTERRUPTING RATING AS SHOWN ON DRAWINGS.

3. PROVIDE TYPE CIRCUIT DIRECTORY UNDER TRANSPARENT SHIELD, ON INSIDE OF COVER OF EACH PANEL BOARD. DIRECTORY TO ACCURATELY LIST CIRCUIT NUMBER, LOCATION, TYPE OF OUTLETS INDICATE CONTROLLED AND CONNECTED LOAD ON CIRCUIT

4. PROVIDE LAMINATED, RIGID PLASTIC LABEL BELOW DIRECTORY WORDED AS FOLLOWS:
INSTALLED BY
(NAME OF THE CONTRACTOR)
(YEAR)

5. PROVIDE EACH PANEL BOARD WITH GREEN CODED BAR, NOT CONNECTED TO NEUTRAL, FOR GREEN EQUIPMENT GROUND WIRES. BACK BAR TO HAVE MINIMUM CAPACITY OF 11 TERMINAL WITH SOLDERLESS BOX LUGS FORE WIRE SIZE #12 MINIMUM TO #4 MAXIMUM. LOCATE BAR ADJACENT TO NEUTRAL BAR, BOLT OR WELD TO PANEL CAN.

6. PROVIDE PLASTIC LABEL LISTING PANEL DESIGNATION, VOLTAGE AND PHASE ON INSIDE OF PANEL COVER ABOVE DIRECTORY.

E. DISCONNECT SWITCHES (SHOP DRAWINGS REQUIRED):

1. PROVIDE DISCONNECT SWITCHES, FUSED AND NON-FUSED AS REQUIRED BY CODES.

   a. SWITCHES NENA RATED DUTY, FED. SPEC. W-S-865C
   b. RATED 240 VOLTS FOR 208 VOLT SYSTEM, AND 600 VOLTS FOR 480 VOLT SYSTEM.

2. EACH MOTOR, REMOTE FROM PANEL LOCATION, TO HAVE NON-FUSED DISCONNECT SWITCH OR BREAKER WITHIN SIGHT OF MOTOR LOCATION. SAFETY SWITCHES SAME MANUFACTURER AS BRANCH CIRCUIT PANELBOARDS. EXTERIOR SWITCH NEMA 3R.

F. BRANCH CIRCUIT WIRING:

1. CONDUCTORS TO BE COPPER. NO WIRE SMALLER THAN NUMBER # 12 AWG ANY BRANCH CIRCUIT

2. CONDUCTOR INSULATION, UNLESS OTHERWISE NOTED, TYPE THWN, INSULATION CODED AS FOLLOWS:

   a. 120/208/240 VOLT SYSTEM:
      (1) PHASE A, BLACK
      (2) PHASE B, RED
      (3) PHASE C, BLUE
      (4) NEUTRAL, WHITE
      (5) TRAVELERS, PURPLE
      (6) GROUND, GREEN

   b. 277/480 VOLT SYSTEM
      (1) PHASE A, YELLOW
      (2) PHASE B, ORANGE
      (3) PHASE C, BROWN
      (4) NEUTRAL, GRAY
      (5) TRAVELERS, 3 WAY, PINK
      (6) GROUND, GREEN

3. SAME COLOR INSULATION FOR PARTICULAR PHASE OR PART OF CIRCUIT RUN WITH SAME COLOR THROUGHOUT JOB. COLOR CODE INTEGRAL PART OF INSULATION. PAINTED OR TAPED CONDUCTORS NOT ACCEPTED EXCEPT AS FOLLOWS:

   a. WIRE SIZED NO. 1 AND LARGER MAY BE COLOR CODED WITH 3M TAPE (NO.35) FOR ENTIRE LENGTH OF EXPOSED AREA IN GUTTERS, PANEL CANS, SWITCHBOARDS, OR WIREWAYS.

4. SPLICES OR JOINTS IN CONDUCTORS MECHANICALLY AND ELECTRICALLY SOUND, MADE IN OUTLET BOXES ONLY, EXCEPT BALLAST CONNECTION. ALL JOINT MADE USUING TYPE Y, G, R, B SCOTCH-LOCK CONNECTORS ONLY.

   a. AT EACH OUTLET, LOOP OF WIRE 8-INCHES LONG LEFT FOR CONNECTION TO DEVICE.
   b. FLUORESCENT FIXTURE WIRING TO CONFIRM TO NATIONAL ELECTRIC CODE, ARTICLE 410-24; USE THHN INSULATION.

5. OUTLETS CONNECTED AS INDICATED ON PLANS, ALTERING CIRCUITS NOT PERMITTED WITHOUT WRITTEN APPROVAL OF ENGINEER.

6. ALL BRANCH CIRCUIT AND FEEDER RACEWAYS CONTAIN GREEN CODED, TW, GROUND WIRE IN ADDITION TO OTHER CONDUCTORS.

G. WIRING DEVICES (SHOP DRAWINGS REQUIRED):

1. PROVIDE ALL WIRING DEVICES INDICATED ON PLANS. COLOR OF DEVICE SELECTED BY ARCHITECT AT TIME OF SUBMITTAL.

H. DEVICE PLATES (SHOP DRAWINGS REQUIRED):

1. WIRING DEVICES TO HAVE PLASTIC TYPE PLATE AS REQUIRED BY DEVICE. COLOR BY ARCHITECT. OUTLET WITHOUT DEVICES, EXCEPT TELEPHONE, TO HAVE BLANK PLATE. PLATES HOLD IN PLACE BY OVAL HEAD, STAINLESS STEEL SCREWS, MATCHING PLATE BY COLOR.

I. FIXTURES (SHOP DRAWINGS REQUIRED):

1. PROVIDE FIXTURES AS LISTED ON FIXTURE SCHEDULE, COMPLETELY WIRED AND LAMPED WHERE DESIGNATED ON DRAWINGS. CORRELATE SUPPORT AND MOUNTING METHOD WITH ALL SUBCONTRACTORS INVOLVED WITH SURROUNDING SURFACE.

   a. FIXTURE SUPPORT BOLTED OR WELDED TO SUPPORT SURFACE.

2. FLORESCENT FIXTURE BALLAST CBM CERTIFIED, SOUND RATING A WITH AUTOMATIC THERMAL RESET. JEFFERSON, ADVANCE, SOLA OR APPROVED EQUAL ENERGY SAVING TYPE.

J. LAMPS:

PROVIDE NEW LAMPS IN ACCORDANCE WITH THE FOLLOWING:

   a. FLUORESCENT: 3500K/TB OT T5/OCTRON
   b. INCANDESCENT: INSIDE FROSTED WITH A MINIMUM RATING OF 140 VOLTS UNLESS OTHERWISE INDICATED.
   c. LOW VOLTAGE MR-16 MEDIUM SPOT

K. EXIT LIGHTS (SHOP DRAWINGS REQUIRED):

PROVIDE ALL EXIT LIGHT UNITS WHERE INDICATED ON DRAWINGS IN ACCORDANCE WITH ALL LOCAL CODE REQUIREMENT, INCLUDING FIRE DEPARTMENT.

L. POWER AND CONTROL WIRING TO EQUIPMENT:

1. PROVIDE ALL ELECTRICAL POWER CONNECTIONS TO EQUIPMENT INDICATED ON PLANS UNLESS OTHERWISE DIRECTED.

2. CONTROL EQUIPMENT, MOTOR STARTERS, RELAYS, LINE VOLTAGE CONTROLS TRANSFORMER, LOW VOLTAGE CONTROLS AND DEVICES NECESSARY FOR THE OPERATION OF HEATING, AIR CONDITIONING, VENTILATION AND PLUMBING SYSTEM FURNISHED AND SET IN PLACE BY RESPECTIVE SUBCONTRACTOR.

3. ALL CONTROL WIRING UNDER DIVISION 15 OF SPECIFICATIONS.

M. MOTOR STARTER:

1. ALL MOTORS SHALL BE FURNISHED AND INSTALLED BY MECHANICAL AND CONNECTED BY ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MOTORS STARTER NOT FURNISHED WITH EQUIPMENT.

N. TELEPHONE/COMM SYSTEM:

1. PROVIDE ALL RACEWAYS, PULL BOXES, OUTLETS, AND TERMINAL BOARDS REQUIRED FOR SYSTEM SHOWN.
   a. TERMINATE RACEWAYS IN MANNER SUITABLE TO TELEPHONE/COMM COMPANY, IN LOCATIONS SHOWN.
   b. COORDINATE ENTIRE SYSTEM WITH TELEPHONE/COMM COMPANY PRIOR TO INSTALLATION
   c. GROUNDING AS INDICATED AND/OR DIRECTED BY LOCAL TELEPHONE COMPANY
   d. ALL TELEPHONE/COMM SYSTEM, INCLUDING EQUIPMENT, SWITCHES, AND WIRING TO BE PROVIDED BY OWNER/REPRESENTATIVE.

1

GENERATOR NOTES:

15 KW, 0.8 PF, 120/240V, 1Ø, 60 HZ, STAND-BY GENERATOR, MOUNTES ON CONCRETE HOUSEKEEPING PAD PER GENERATOR MANUFACTURER'S SPECIFICAITONS.

COORDINATE EXACT LOCATION WITH OWNRER, AND/OR ARCHITECT.

1. CONTROL PANEL:
   •• MEETS NFPA 110 REQUIREMENTS

2. DIGITAL MICROPROCESSOR:
   •• TWO 4 LINE X 20 DISPALYS, FULL SYSTEM STATUS
   •• +/- 0.25%DIGITAL VOLTAGE REGULATION
   •• RS232, RS485 AND CANBUS REMOTE PORTS
   •• WATERPROOF CONNECTIONS
   •• PROGRAMMABLE I/O
   •• BUILT-IN PLC FOR SPECIAL APPLICATIONS
   •• ALL ENGINES SENSORS ARE 4-20 MA

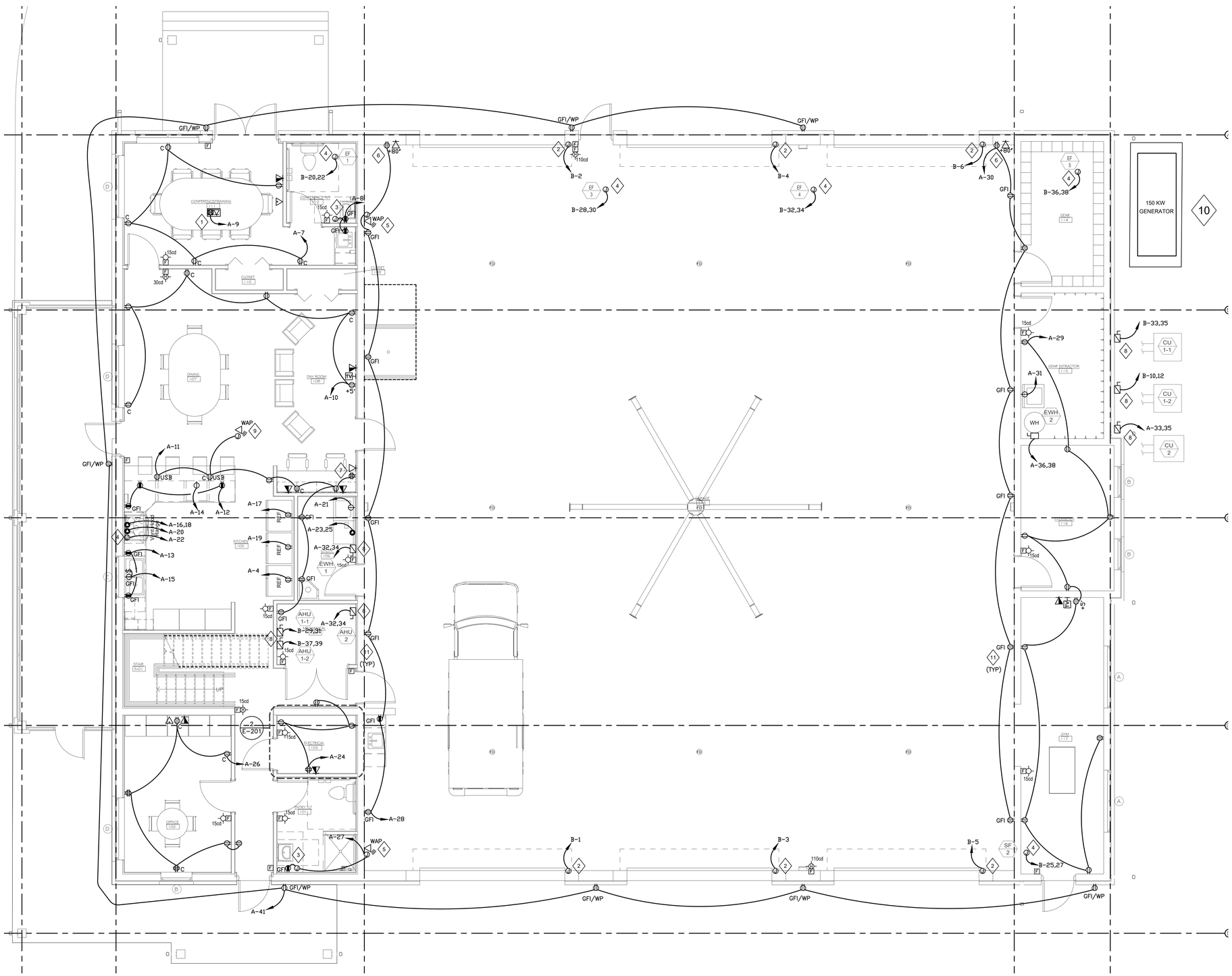
3. ENGINE FUNCTION MONITORING AND CONTROL
   •• FULL RANGE STAND-BY OPERATION.
   •• PROGRAMMABLE AUTO CRANK, EMERGENCY STOP, AUTO-OFF-MANUAL SWITCH
   •• ISOCHRONOUS GOVERNOR, +/-0.25% FREQUENCY REGULATION
   •• FULL SYSTEM STATUS ON ALL AC OUTPUT AND ENGINE FUNCTION PARAMETERS
   •• SERVICE REMINDERS, TRENDING, FAULT HISTORY (ALARM LOG)
   •• 12T FUNCTION FOR FULL GENERATOR PROTECTION
   •• SELECTABLE LOW-SPED EXERCISE
   •• TRANSFER SWITCH FUNCTION MONITORING AND CONTROL
   •• 2-WIRE START CONTROLS FOR ANY 2-WIRE TRANSFER SWITCH
   •• ELECTRONIC GOVERNOR - ISOCHORONOUS STEADY STATE REGULATION +/-0.25

1

GENERAL NOTES:

1. CONCRETE WORK REQUIRED FOR THE INSTALLATION OR CONSTRUCTION OF ANY OF THE ELECTRICAL WORK SPECIFIED HEREIN SHALL CONFORM TO THE REQUIREMENTS OF THE APPLICABLE SECTIONS OF THE SPECIFICATIONS.

2. CONDUITS RUN EXPOSED AND VULNERABLE



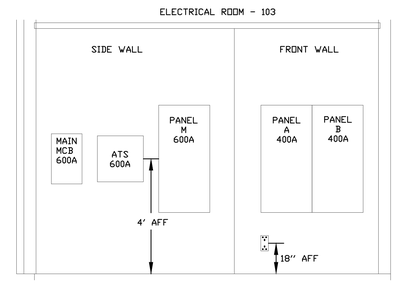
1 **FIRST FLOOR POWER & SYSTEMS PLAN**
SCALE: 1/4" = 1'-0"

GENERAL NOTES

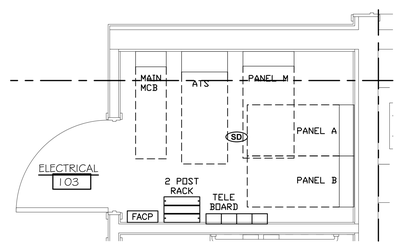
1. REFER TO ARCHITECTURAL INTERIOR ELEVATIONS TO COORDINATE EXACT PLACEMENT OF ALL DEVICES, EQUIPMENT, FIXTURES, SWITCHES AND RECEPTACLES. COORDINATE WITH OTHER DIVISIONS PRIOR TO ROUGH-IN.
2. VERIFY AND COORDINATE EXACT ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT WITH MANUFACTURER'S RECOMMENDATIONS PRIOR TO INSTALLATION OF EQUIPMENT.
3. PROVIDE, INSTALL, AND TERMINATE ALL FIRE ALARM SYSTEMS EQUIPMENT INCLUDING, BUT NOT LIMITED TO, RACEWAYS, WIRE CABLE, MODULES AND RELAYS.
4. ALERT SYSTEM WIRING AND DEVICES TO BE INSTALLED BY CERTIFIED INSTALLER.

KEYED NOTES

1. COORDINATE EXACT LOCATION OF FLOOR RECEPTACLES WITH CONFERENCE ROOM DESKS ON ARCHITECTURE DRAWINGS.
2. PROVIDE JUNCTION BOX FOR ROLLER DOOR OPENER. COORDINATE EXACT LOCATION WITH ARCHITECT AND/OR OWNER.
3. WALL JUNCTION BOX. COORDINATE EXACT PLACEMENT WITH ARCHITECTURAL DRAWINGS.
4. JUNCTION BOX FOR MECHANICAL EQUIPMENT. COORDINATE LOCATION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
5. PROVIDE WIRELESS ACCESS POINT DATA 7' AFF.
6. COORDINATE EXACT PLACEMENT WITH ARCHITECTURAL DRAWINGS.
7. PROVIDE RECEPTACLE AND DATA FOR RADIO ABOVE SHELF AND COORDINATE EXACT PLACEMENT WITH ARCHITECTURAL DRAWINGS.
8. DISCONNECT FOR MECHANICAL EQUIPMENT. COORDINATE LOCATION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
9. CEILING JUNCTION BOX FOR WAP. PROVIDE WIRELESS ACCESS POINT DATA 7' AFF. COORDINATE LOCATION WITH ARCHITECT.
10. PROVIDE STAND-BY GENERATOR AND CONNECT AS REQUIRED ON POWER RISER DIAGRAM ON SHEET E-401. COORDINATE LOCATION WITH ARCHITECT AND/OR OWNER.
11. ALL RECEPTACLES AND JUNCTION BOXES ON EXPOSED BLOCK, AS WELL AS THEIR ASSOCIATED RACEWAYS, SHAL BE FLUSH MOUNTED AND THUS RECESSED INTO BLOCK.



3 **103 ELECTRICAL ROOM ELEVATION**
SCALE: NTS



2 **103 ELECTRICAL ROOM FLOOR PLAN**
SCALE: 1/2" = 1'-0"

Francisco Cabral, State of Florida, Professional Engineer, License No. 87110.

This item has been electronically signed and sealed by Francisco Cabral, PE. on 04/15/2020 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

DCL ENGINEERING
800 HIGHLAND AVE. STE 102
ORLANDO, FL 32803
CA LIC.: 31963
PHONE: (407) 205-8485

PRICING SET

NO.	DESCRIPTION	DATE
1	ADDENDUM #1	04/10/20

FRANCISCO J. CABRAL LICENSE 87110 STATE OF FLORIDA PROFESSIONAL ENGINEER
Digitally signed by Francisco J. Cabral
Date: 2020.04.16 13:43:03 -04'00'
FRANCISCO J. CABRAL - FL PE #87110

John P. Adams, AIA
Jerome Bankovich, Jr., AIA, LEED
Ethan J. Hine, AIA
Jennifer Zaffuto, AIA, NCARB, MPA
1741 KWANIS TRAIL • DUBOS, PA • 814.371.1541 • F 814.371.8801 • KTHarch.com
800 NORTH HIGHLAND AVE • ORLANDO, FL • 407.203.6707 • F 407.409.0550
KTH ARCHITECTS

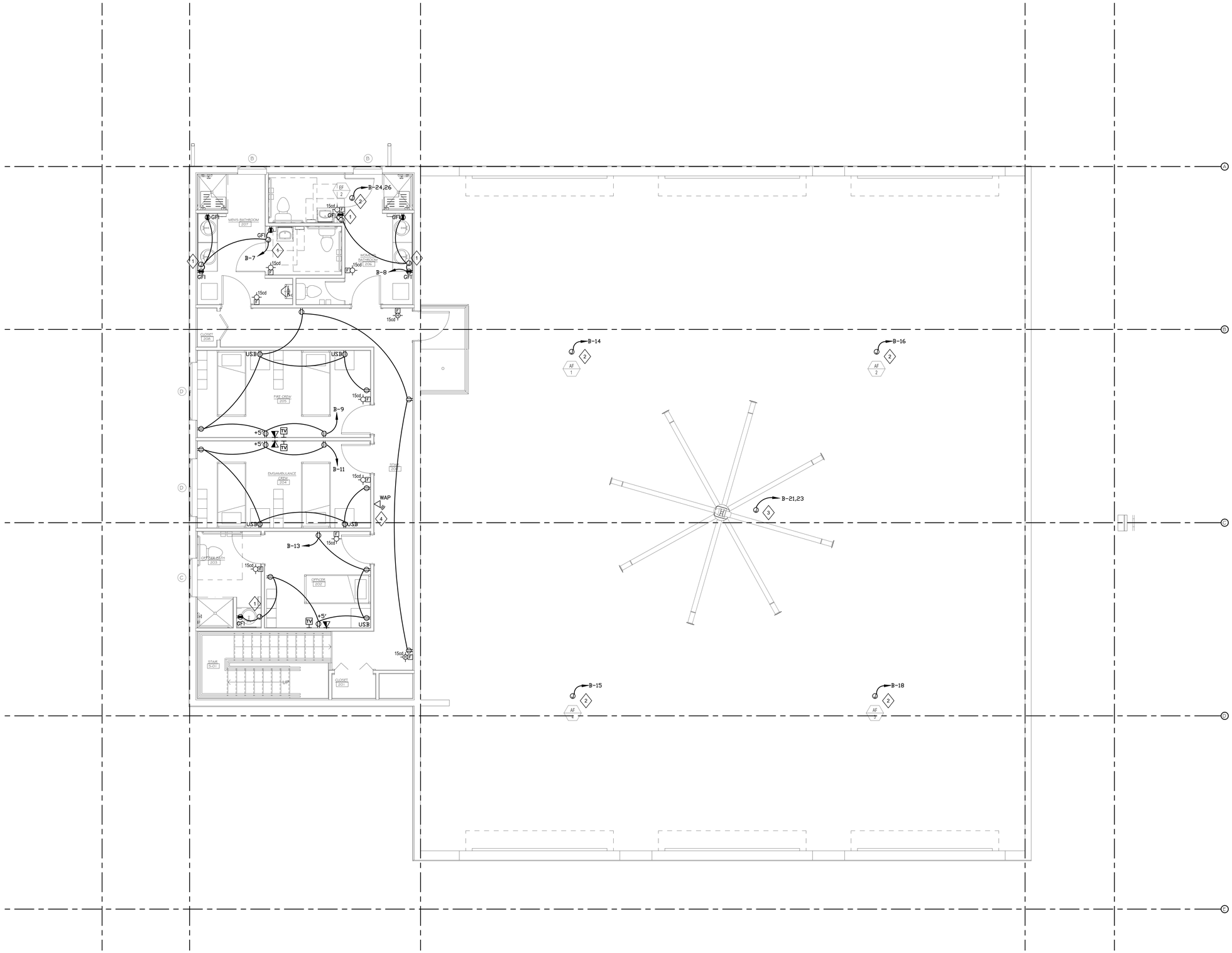
18104A

LAKE COUNTY
FIRE STATION NO. 39
FIRST FLOOR POWER & SYSTEMS PLAN
24815 WALLICK ROAD, SORRENTO, FL 32776

January 24, 2020

E201

COPYRIGHT 2020 - KTH ARCHITECTS, INC.



1 **SECOND FLOOR POWER & SYSTEMS PLAN**

SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. REFER TO ARCHITECTURAL INTERIOR ELEVATIONS TO COORDINATE EXACT PLACEMENT OF ALL DEVICES, EQUIPMENT, FIXTURES, SWITCHES AND RECEPTACLES. COORDINATE WITH OTHER DVISIONS PRIOR TO ROUGH-IN.
2. VERIFY AND COORDINATE EXACT ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT WITH MANUFACTURER'S RECOMMENDATIONS PRIOR TO INSTALLATION OF EQUIPMENT.
3. PROVIDE, INSTALL, AND TERMINATE ALL FIRE ALARM SYSTEMS EQUIPMENT INCLUDING, BUT NOT LIMITED TO, RACEWAYS, WIRE CABLE, MODULES AND RELAYS.
4. ALERT SYSTEM WIRING AND DEVICES TO BE INSTALLED BY CERTIFIED INSTALLER.

KEYED NOTES

1. WALL JUNCTION BOX, COORDINATE EXACT PLACEMENT WITH ARCHITECTURAL DRAWINGS.
2. JUNCTION BOX FOR MECHANICAL EQUIPMENT. COORDINATE LOCATION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
3. PROVIDE JUNCTION BOX FOR 24" DIA BIG ASS FAN. VERIFY EXACT LOCATION ON SITE/OWNER.
4. PROVIDE WIRELESS ACCESS POINT DATA 12" BELOW CEILING.

NO.	DESCRIPTION	DATE
1	ADDENDUM #1	04/10/20

FRANCISCO J. CABRAL LICENSE No. 87110 STATE OF FLORIDA PROFESSIONAL ENGINEER
Digitally signed by Francisco J. Cabral
Date: 2020.04.15 12:53:37 -04'00'
FRANCISCO J. CABRAL - FL PE #87110

John P. Adams, AIA
Jerome Bankovich, Jr., AIA, LEED
Ethan J. Hine, AIA
Jennifer Zaffuto, AIA, NCARB, MPA

KTH ARCHITECTS
1741 KIWANIS TRAIL • DUBOIS, PA • 814.371.1541 • F 814.371.8801 • KTHarch.com
800 NORTH HIGHLAND AVE. • ORLANDO, FL • 407.203.6707 • F 407.409.0550

LAKE COUNTY
FIRE STATION NO. 39
SECOND FLOOR POWER & SYSTEMS PLAN
24815 WALLICK ROAD, SORRENTO, FL 32776

18104A

January 24, 2020

PRICING SET

E202

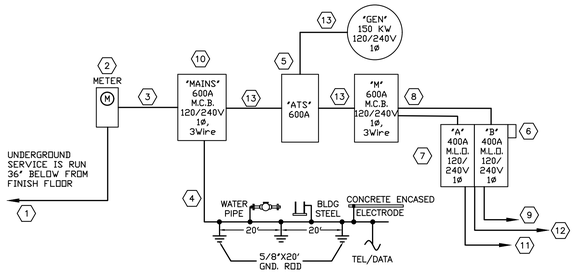
Francisco Cabral, State of Florida, Professional Engineer, License No. 87110.

This item has been electronically signed and sealed by Francisco Cabral, PE. on 04/15/2020 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

DCL ENGINEERING
800 HIGHLAND AVE. STE 102
ORLANDO, FL 32803
CA LIC.: 31963
PHONE: (407) 205-8485

COPYRIGHT 2020 - KTH ARCHITECTS, INC.



POWER RISER DIAGRAM

1. TO UTILITY POINT OF CONNECTION 120/240V, 1ø, 2 POLE & TRANSFORMER 2 SETS OF 3-400 KCMIL CU & #1 CU EG IN 3"C.
2. 600 AMP, SELF CONTAINED POWER COMPANY METER, 120/240V, 1ø
3. 2 SETS OF 3-400 KCMIL CU & #1 CU EG IN 3"C.
4. PROVIDE GROUNDING ELECTRODE PER N.E.C. USE #1 CU
5. 600 A NEMA 3R ATS
6. LIGHTNING ARRESTOR
7. NEW PANELS 400A MLO, 120/240V, 1ø, IN NEMA 3R ENCLOSURE.
8. 3-600 KCMIL CU AND #3 CU GROUND IN 3"C.
9. CIRCUITS TO LIGHTING FIXTURES & APPLIANCES.
10. 600A MAIN CIRCUIT BREAKER IN NEMA 3R.
11. TO IRRIGATION CONTROLLER (WHERE REQUIRED). SEE PLANS.
12. A/C COMPRESSOR, MIN #8 WITH GRD.
13. 2 SETS OF 3-400 KCMIL CU & #1 CU EG IN 3"C.

PANEL M

UPDATED: 1/22/2020 6:58 pm
ISSUED FOR: APPROVAL

LOCATION: **ELEC RM** VOLTAGE: 120/240V TRIM: SURFACE
MAIN: 600A MCB SYSTEM: 1ø, 3W BUS RATING 600A
CONN. LOAD: 157.1 KVA FEED: BOTTOM GROUND BUS: YES COPPER

CKT	LOAD SERVED	COND	PHASE	NEUT	GND	BKR	DMD	L1	L2	L3	DMD	BKR	GND	NEUT	PHASE	COND	LOAD SERVED	CKT
1	PANEL A	3"	600	600	#3	400/2	SF	42131			–	–	–	–	–	–	"	2
3			600				SF		41330		–	–	–	–	–	–	"	4
5	PANEL B	3"	600	600	#3	400/2	SF	37029			–	–	–	–	–	–	"	6
7			600				SF		36609		–	–	–	–	–	–	"	8
9	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	10
11	"	–	–	–	–	–	–		–		–	–	–	–	–	–	"	12
13	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	14
15	"	–	–	–	–	–	–		–		–	–	–	–	–	–	"	16
17	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	18
19	"	–	–	–	–	–	–		–		–	–	–	–	–	–	"	20
21	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	22
23	"	–	–	–	–	–	–		–		–	–	–	–	–	–	"	24
25	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	26
27	"	–	–	–	–	–	–		–		–	–	–	–	–	–	"	28
29	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	30
31	"	–	–	–	–	–	–		–		–	–	–	–	–	–	"	32
33	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	34
35	"	–	–	–	–	–	–		–		–	–	–	–	–	–	"	36
37	"	–	–	–	–	–	–	–			–	–	–	–	–	–	"	38
39	"	–	–	–	–	–	–		–		–	40/2	–	–	–	–	SURGE PROTACTION	40
41	"	–	–	–	–	–	–	–			–				–			42

INTERRUPT RATING: 42,000 AIC — 79160 77939 — **FROM:** ATS

LOADS (IN VA)	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER
LIGHTING	4723	1.25	5904
RECEPTS TO 10 KVA	10000	1.0	10000
RECEPTS REMAINING	37876	0.5	18938
SPACE HEATING	0	0.0	0
AIR CONDITIONING	66400	1.0	66400

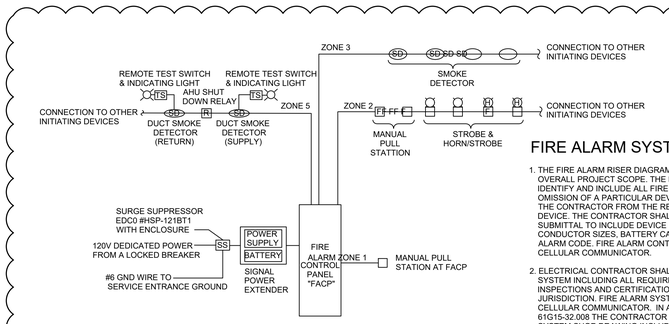
LOADS	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER
NON-SEASONAL MOTORS	0	1.0	0
LARGEST MOTOR	0	0.25	0
WATER HEATING	18200	1.0	18200
KITCHEN EQUIP.	19900	1.0	19900

REMAINING CONTINUOUS LOADS	0	1.25	0	
REMAINING NON-CONTINUOUS LOADS	0	1.0	0	
DEMAND LOADS	0	1.0	0	
TOTAL CONNECTED LOAD	157.1	KVA	654.6	AMPS
MIN. FEEDER/PANEL CAP.	139.3	KVA	580.6	AMPS
OVERALL DEMAND FACTOR	0.89			

LIGHTING FIXTURE SCHEDULE (AS NOTED OR APPROVED EQUAL)							
TYPE	QTY	MANUFACTURER	MODEL SERIES / STYLE	LAMP TYPE	VOLTS	INPUT WATTS	REMARKS
A	24	HE WILLIAMS	LP	LED	120	39.2	LP-22-L40/835-UNV
B	23	HE WILLIAMS	LP	LED	120	48.2	LP-24-L50/835-UNV
C	66	HE WILLIAMS	6DR	LED	120	36.4	6DR-L40/830-UNV-O-N-F1
D	13	LITHONIA	WALLPACK	LED	120	32	TWR1-LED-40K-MV
E	5	VISIONARIE	POLE LIGHT	LED	240	70	VSX1-T3-10L-4K-UNV
F	8	B-K LIGHTING	TENAYA 2	LED	240	42	STYZLEDX47NSP12D42MT
X	10	LITHONIA	LHQM	LED	120	5	LHQM LED R (HO RO)

LIGHTING FIXTURE SCHEDULE GENERAL NOTES :

1. ALL LIGHTING FIXTURES WERE SELECTED AS A BASIS-OF-DESIGN, WERE CHOSEN FOR PERFORMANCE, ENERGY EFFICIENCY, AND AESTHETICS. ALTERNATE PACKAGES MUST BE SUBMITTED FOR REVIEW 10 DAYS PRIOR TO BID. WRITTEN APPROVAL WILL BE REQUIRED TO BID.
2. CONTRACTOR SHALL CAREFULLY COORDINATE THE LIGHTING FIXTURE TYPES WITH THE TYPE OF CEILING WHERE THE LIGHTING FIXTURES ARE TO BE INSTALLED, MODIFY CATALOG NUMBER AS REQUIRED TO COORDINATE WITH CEILING.
3. WHEN FUTURE MODEL NUMBER DIFFERS FROM FUTURE DESCRIPTION THEN FUTURE DESCRIPTION SHALL GOVERN
4. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS ON ILLUMINARIES INCLUDING BALLAST LAMPS ETC.



TYPICAL FIRE ALARM SYSTEM RISER DIAGRAM
NO SCALE

FIRE ALARM SYSTEM NOTES

1. THE FIRE ALARM RISER DIAGRAM IS PROVIDED IN ORDER TO COMMUNICATE THE OVERALL PROJECT SCOPE. THE ENGINEER HAS MADE A GOOD FAITH EFFORT TO IDENTIFY AND INCLUDE ALL FIRE ALARM DEVICES INTO THE RISER DIAGRAM. THE OMISSION OF A PARTICULAR DEVICE FROM THE RISER DIAGRAM DOES NOT ALLEVIATE THE CONTRACTOR FROM THE RESPONSIBILITY OF FURNISHING AND INSTALLING THAT DEVICE. THE CONTRACTOR SHALL PROVIDE A COMPLETE FIRE ALARM SYSTEM SUBMITTAL TO INCLUDE DEVICE LOCATIONS, FULL SYSTEM RISER DIAGRAM, CONDUCTOR SIZES, BATTERY CALCULATIONS, ETC. PER REQUIREMENTS OF THE FIRE ALARM CODE. FIRE ALARM CONTROL PANEL TO BE FURNISHED WITH DMP WIRELESS CELLULAR COMMUNICATOR.
2. ELECTRICAL CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERABLE FIRE ALARM SYSTEM INCLUDING ALL REQUIRED EQUIPMENT, DEVICES, COMPONENTS, PERMITS, INSPECTIONS AND CERTIFICATIONS AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION. FIRE ALARM SYSTEM SHALL BE FURNISHED WITH A DMP WIRELESS CELLULAR COMMUNICATOR. IN ACCORDANCE WITH FLORIDA ADMINISTRATIVE CODE 61G15-32.008 THE CONTRACTOR SHALL PREPARE A COMPLETE DETAILED FIRE ALARM SYSTEM SHOP DRAWING INCLUDING FLOOR PLANS WITH ALL DEVICES, PANELS, WIRING ETC. AS WELL AS EQUIPMENT CUT SHEETS AND VOLTAGE DROP CALCULATIONS (IF REQUIRED) AND SHALL SUBMIT THEM TO THE FIRE MARSHALL AND OBTAIN THEIR APPROVAL PRIOR TO COMMENCEMENT OF THE WORK.

PANEL A

UPDATED: 2/9/2020 8:29 pm
ISSUED FOR: APPROVAL

LOCATION: **ELEC RM** VOLTAGE: 120/240V TRIM: SURFACE
MAIN: 400A MLO SYSTEM: 1ø, 3W BUS RATING 400A
CONN. LOAD: 83.7 KVA FEED: TOP GROUND BUS: YES COPPER

CKT	LOAD SERVED	COND	PHASE	NEUT	GND	BKR	DMD	L1	L2	L3	DMD	BKR	GND	NEUT	PHASE	COND	LOAD SERVED	CKT
1	LTG CONF.,DINING & KITCHEN	1/2"	#12	#12	#12	20/1	L	614 / 787			L	20/1	#12	#12	#12	1/2"	GARAGE LTG	2
3	LTG OFFICE, BATH, ELEC, STORAGE	1/2"	#12	#12	#12	20/1	L		753 / 800		K	20/1	#12	#12	#12	1/2"	REC. REF-3 106	4
5	LTG GYM, CLEAN, GEAR ROOM	1/2"	#12	#12	#12	20/1	L	899 / 1781			L	20/1	#12	#12	#12	1/2"	LTG SECOND FLOOR	6
7	REC. CONFR. 110	1/2"	#12	#12	#12	20/1	R		900 / 1360		R	20/1	#12	#12	#12	1/2"	JBOX CONFR. BATH 111	8
9	REC. CONFR. FLOOR	1/2"	#12	#12	#12	20/1	R	360 / 1080			R	20/1	#12	#12	#12	1/2"	REC. DINNING & DRY 108-109	10
11	REC. UTL, MECH, WAP & DINNING	1/2"	#12	#12	#12	20/1	R		1620 / 1500		K	20/1	#12	#12	#12	1/2"	REC. KITCHEN-1 106	12
13	REC. KITCHEN-2 106	1/2"	#12	#12	#12	20/1	K	1500 / 950			K	20/1	#12	#12	#12	1/2"	REC. DISHWASHER 106	14
15	REC. DISPOSAL 106	1/2"	#12	#12	#12	20/1	K		850 / 2000		K	50/2	#10	#6	#6	1"	RANGE REC.	16
17	REC. REF-1 106	1/2"	#12	#12	#12	20/1	K	800 / 2000			K				#6			18
19	REC. REF-2 106	1/2"	#12	#12	#12	20/1	K		800 / 1200		K	20/1	#12	#12	#12	1/2"	REC. MICROWAVE 106	20
21	REC. WASHER 107	1/2"	#12	#12	#12	20/1	R	1200 / 1500			K	20/1	#12	#12	#12	1/2"	HOOD 106	22
23	REC. DRYER	3/4"	#10	#10	#10	25/2	R		2500 / 1260		R	20/1	#12	#12	#12	1/2"	REC. ELE, LOBBY & STORAGE	24
25			#10				R	2500 / 1080			R	20/1	#12	#12	#12	1/2"	REC. OFFICE 102	26
27	JBOX ENTRY BATH 101, GRG WAP	1/2"	#12	#12	#12	20/1	R		1800 / 1260		R	20/1	#12	#12	#12	1/2"	REC GARAGE 1, WAP	28
29	REC. GEAR, EMS, GYM	1/2"	#12	#12	#12	20/1	R	1800 / 900			R	20/1	#12	#12	#12	1/2"	REC GARAGE 2	30
31	REC. WASHER 114	1/2"	#12	#12	#12	20/1	R		1200 / 4760		R	50/2	#10	#6	#6	1"	AHU 2	32
33	CU-2	3/4"	#6	#6	#8	40/2	A	3504 / 5760			R				#6			34
35			#6				A		3504 / 6100		W	60/2	#10	#4	#4	1"	WATER HEATER (EWH-2) 114	36
37	WATER HEATER (EWH-1) 105	3/4"	#8	#8	#10	40/2	W	3000 / 6100			W				#4			38
39			#8				W	3000 / –			–	40/2	–	–	–	–	SURGE PROTECTION	40
41	REC EXTERIOR	3/4"	#8	#8	#10	20/1	R	1440 / –			–				–			42

INTERRUPT RATING: 10,000 AIC — 42350 41367 — **FROM:** PANEL M

LOADS (IN VA)	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER
LIGHTING	4629	1.25	5786
RECEPTS TO 10 KVA	10000	1.0	10000
RECEPTS REMAINING	23980	0.5	11990
SPACE HEATING	0	0.0	0
AIR CONDITIONING	7008	1.0	7008

LOADS	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER
NON-SEASONAL MOTORS	0	1.0	0
LARGEST MOTOR	0	0.25	0
WATER HEATING	18200	1.0	18200
KITCHEN EQUIP.	19900	0.65	12935

REMAINING CONTINUOUS LOADS	0	1.25	0	
REMAINING NON-CONTINUOUS LOADS	0	1.0	0	
DEMAND LOADS	0	1.0	0	
TOTAL CONNECTED LOAD	83.7	KVA	348.8	AMPS
MIN. FEEDER/PANEL CAP.	65.9	KVA	274.7	AMPS
OVERALL DEMAND FACTOR	0.79			

PANEL B

UPDATED: 2/10/2020 2:11 pm
ISSUED FOR: APPROVAL

LOCATION: **ELEC RM** VOLTAGE: 120/240V TRIM: SURFACE
MAIN: 400A MLO SYSTEM: 1ø, 3W BUS RATING 400A
CONN. LOAD: 74.9 KVA FEED: TOP GROUND BUS: YES COPPER

CKT	LOAD SERVED	COND	PHASE	NEUT	GND	BKR	DMD	L1	L2	L3	DMD	BKR	GND	NEUT	PHASE	COND	LOAD SERVED	CKT
1	DOOR OPENER 1 112	1/2"	#12	#12	#12	20/1	R	800 / 800			R	20/1	#12	#12	#12	1/2"	DOOR OPENER 4 112	2
3	DOOR OPENER 2 112	1/2"	#12	#12	#12	20/1	R		800 / 800		R	20/1	#12	#12	#12	1/2"	DOOR OPENER 5 112	4
5	DOOR OPENER 3 112	1/2"	#12	#12	#12	20/1	R	800 / 800			R	20/1	#12	#12	#12	1/2"	DOOR OPENER 6 112	6
7	REC. WOMENS BATHROOM 1 206	1/2"	#12	#12	#12	20/1	R		1560 / 1560		R	20/1	#12	#12	#12	1/2"	REC. MENS BATHROOM 1 205	8
9	REC. 204, CORRIDOR	1/2"	#12	#12	#12	20/1	R	1620 / 4254			A	50/2	#10	#6	#6	3/4"	CU 1-2	10
11	REC. EMS/AMBULANCE CREW 203	1/2"	#12	#12	#12	20/1	R		1080 / 4254		A				#6			12
13	REC. 207, 208	1/2"	#12	#12	#12	20/1	R	1400 / 1840			A	20/1	#10	#10	#10	3/4"	AF-1	14
15	AF-4	3/4"	#10	#10	#10	20/1	A		1840 / 1840		A	20/1	#10	#10	#10	3/4"	AF-2	16
17	SITE LIGHTS	1/2"	#12	#12	#12	20/2	L	343 / 1840			A	20/1	#10	#10	#10	3/4"	AF-3	18
19			#12				L		343 / 828		A	20/2	#12	#12	#12	1/2"	EF-1	20
21	FAN 112 (SF-1)	3/4"	#10	#10	#10	25/2	R	828 / 828			A				#12			22
23			#10				R		828 / 348		A	20/2	#12	#12	#12	1/2"	EF-2	24
25	SF-2	1/2"	#12	#12	#12	20/2	A	828 / 348			A				#12			26
27			#12				A		828 / 828		A	20/2	#12	#12	#12	1/2"	EF-3	28
29	AHU 1-1	1"	#4	#4	#10	60/2	A	6480 / 828			A				#12			30
31			#4				A		6480 / 828		A	20/2	#12	#12	#12	1/2"	EF-4	32
33	CU 1-1	3/4"	#6	–	#10	50/2	A	4284 / 828			A				#12			34
35			#6				A		4284 / 828		A	20/2	#12	#12	#12	1/2"	EF-5	36
37	AHU 1-2	1"	#4	#4	#10	60/2	A	6480 / 828			A				#12			38
39			#4				A		6480 / –		–	40/2	–	–	–	–	SURGE PROTECTION	40
41	OUTDOOR LIGHTS, FANS	1/2"	#12	#12	#12	20/1	L	956 / –			–				–			42

INTERRUPT RATING: 10,000 AIC — 38153 36777 — **FROM:** PANEL M

LOADS (IN VA)	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER
LIGHTING	1642	1.25	2053
RECEPTS TO 10 KVA	10000	1.0	10000
RECEPTS REMAINING	3896	0.5	1948
SPACE HEATING	0	0.0	0
AIR CONDITIONING	59392	1.0	59392

LOADS	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER
NON-SEASONAL MOTORS	0	1.0	0
LARGEST MOTOR	0	0.25	0
WATER HEATING	0	1.0	0
KITCHEN EQUIP.	0	1.0	0

REMAINING CONTINUOUS LOADS	0	1.25	0	
REMAINING NON-CONTINUOUS LOADS	0	1.0	0	
DEMAND LOADS	0	1.0	0	
TOTAL CONNECTED LOAD	74.9	KVA	312.2	AMPS
MIN. FEEDER/PANEL CAP.	73.4	KVA	305.8	AMPS
OVERALL DEMAND FACTOR	0.98			

Francisco Cabral, State of Florida, Professional Engineer, License No. 87110.

This item has been electronically signed and sealed by Francisco Cabral, PE. on 04/15/2020 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

DCL ENGINEERING
800 HIGHLAND AVE, STE 102
ORLANDO, FL 32803
CA LIC.: 31963
PHONE: (407) 205-4485

PRICING SET

NO.	DESCRIPTION	DATE
1	ADDENDUM #1	04/10/20

FRANCISCO J. CABRAL LICENSE No. 87110 STATE OF FLORIDA PROFESSIONAL ENGINEER
Digitally signed by Francisco J. Cabral DN: cn=Francisco J. Cabral, c=US, o=KTH Architects, ou=Professional Engineer, email=fcabral@kthdesign.com, 13:42:06 -04'00'
FRANCISCO J. CABRAL - FL PE #87110

John P. Adams, AIA
Jerome Bankovich, Jr., AIA, LEED
Ethan J. Hine, AIA
Jennifer Zaffuto, AIA, NCARB, MPA
KTH ARCHITECTS
1741 KIWANIS TRAIL • DUBOIS, PA • 814.371.1541 • F 814.371.8801 • KTHarch.com
800 NORTH HIGHLAND AVE. • ORLANDO, FL • 407.203.6707 • F 407.409.0550

LAKE COUNTY
FIRE STATION NO. 39
ELECTRICAL RISER & ELECTRICAL SCHEDULES
24815 WALLICK ROAD, SORRENTO, FL 32776
18104A

January 24, 2020

E401

COPYRIGHT 2020 - KTH ARCHITECTS, INC.