LIGHTING

	LED LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.
A P:2 a	LUMINAIRE TYPE (INDICATE BY UPPERCASE LETTER SEE LIGHTING FIXTURE SCHEDULE). PANEL NAME : CIRCUIT NUMBER (INDICATED BY NUMBER) SWITCHING INDICATED BY LOWER CASE LETTERS.
EM	DENOTES LUMINAIRE ON EMERGENCY CIRCUIT.
	CEILING/WALL MOUNTED SELF POWERED EXIT LIGHT FIXTURE WITH DIRECTIONALARROWS AS INDICATED. SHADED AREA DENOTES FACE(S). ISOLITE ELITE SERIES LED EXIT SIGN

SWITCHES AND CONTROLS

$	20A SPST TOGGLE SWITCH U.O.N.
$3	20A 3-WAY TOGGLE SWITCH U.N.O.
$4	20A 4-WAY TOGGLE SWITCH U.N.O.
PC	WALL MOUNTED PHOTOCELL MOUNTED IN NEMA 3R ENCLOSURE.

WIRING SYSTEMS

3 / UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 Ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3 5 / UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 Ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3 5 7 / UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 Ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.

ELECTRICAL DRAWING LIST

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE,
	DUPLEX CONVENIENCE RECEPTACLE.
GFI	GFI DUPLEX CONVENIENCE RECEPTACLE.
	QUAD RECEPTACLE - 20A-1P, 125V, NEMA 5-20R.
FL/CL	FLOOR/ CEILING QUAD RECEPTACLE - 20A-1P, 125V, NEMA 5-20R.
	SPECIAL RECEPTACLE 220V
	DATA OUTLET - (1) PORT UNO, +18" AFF, UNO TEL / DATA OUTLET TO BE PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WOTH 1-1/4" DIAMETER GROMMETED OPENING.
	TELEPHONE/DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.
TV	CABLE TV OUTLET, WALL-MOUNTED.

MOTORS AND CONTROLS

A	30A/240V NON FUSED DISCONNECT SWITCH
B	60A/240V NON FUSED DISCONNECT SWITCH
SM	MANUAL MOTOR SWITCH
MD	MOTORIZED DAMPER

ANNOTATION

+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
X	KEYED NOTE REFERENCE
1 / E/2-1	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM

POWER DISTRIBUTION

	DISTRIBUTION PANELBOARD, 120/240V-SURFACE OR FLUSH MOUNTED.

4660 FIELDSTON ROAD, 10471
BLOCK : 5819
LOT : 2150
ZONE R1-2
MAP 1c
BUILDING USE : ONE & TWO FAMILY BUILDING

ELECTRICAL ABBREVIATIONS

A	AMPERES	EA	EACH
A/C, AC	ABOVE COUNTER	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
AT	AMP TRIP	ER	EXISTING TO BE RELOCATED
ATS	AUTOMATIC TRANSFER SWITCH	ETR	EXISTING TO REMAIN
AUTO	AUTOMATIC	EWF	ELECTRIFIED WORKSTATION FURNITURE
AWG	AMERICAN WIRE GAUGE	EWH	ELECTRO WATER HEATER
C	CONDUIT	FA	FIRE ALARM
C/B,CB	CIRCUIT BREAKER	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC
CKT	CIRCUIT	FDR	FEEDER
CLG	CEILING	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC
COMM	COMMUNICATION	FIXT	FIXTURE
CT	CURRENT TRANSFORMER	FL	FLOOR
CU	COPPER	FLUOR	FLUORESCENT
°C	DEGREE CELSIUS	G	GROUND
°F	DEGREE FAHRENHEIT	GFI	GROUND FAULT INTERRUPTER
DIA	DIAMETER	GP	GENERAL PURPOSE
DISC	DISCONNECT	HC	HUNG CEILING
DN	DOWN	HP	HORSEPOWER
DP	DISTRIBUTION PANEL	HWH	HOW WATER HEATER
DWH	DOMESTIC WATER HEATER	HZ	HERTZ
DWG	DRAWING	IC	INTERRUPTING CAPACITY
JB	JUNCTION BOX	PP	POWER PANEL
KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE
KV	KILOVOLT	PWR	POWER
KVA	KILOVOLT-AMPERES	R	REMOVE
KW	KILOWATTS	RE	RELOCATED EXISTING
LP	LIGHTING PANEL	REC	RECEPTACLE
LTG	LIGHTING	RGS	RIGID GALVANIZED STEEL
MAX	MAXIMUM	RR	REMOVE & RELOCATE
MC	MOTOR CONTROLLER	SECT	SECTION
MCB	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW
MER	MECHANICAL EQUIPMENT ROOM	SPST	SINGLE POLE SINGLE THROW
MIN	MINIMUM	SPEC	SPECIFICATION
MLO	MAIN LUGS ONLY	SW	SWITCH
MTD	MOUNTED	SWBD	SWITCHBOARD
MTS	MANUAL TRANSFER SWITCH	SYM	SYMMETRICAL
N	NEUTRAL	SYS	SYSTEMS
NE	NEW DEVICE TO REPLACE EXISTING	TELE	TELEPHONE
NIC	NOT IN CONTRACT	TEMP	TEMPERATURE
NL	NIGHT LIGHT	TXF	TOILET EXHAUST FAN
NTS	NOT TO SCALE	TYP	TYPICAL
OC	ON CENTER	UON	UNLESS OTHERWISE NOTED
P	POLES	V	VOLT/VOLTAGE
PB	PULLBOX	VA	VOLT AMPERE
PC	PERSONAL COMPUTER	VAV	VARIABLE AIR VOLUME
Ø	PHASE	VFD	VARIABLE FREQUENCY DRIVE
PNL	PANEL	VP	VAPORPROOF
W	WATT	WP	WEATHER PROOF
W	WIRE	XFMR	TRANSFORMER
WH	WALL HEATER	ZRT	ZONE REGISTER TERMINALS
E	EXISTING	IG	ISOLATED GROUND
TR	TAMPER RESISTANCE		

GENERAL NOTES
(APPLY TO ALL "E" DRAWINGS)

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NEW YORK CITY ELECTRICAL CODE, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CANCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
14. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINTIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
19. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE-RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE-RATED BOXES OR PUTTY PADS ARE UTILIZED.
22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITRH THE ENGINEER AND OWNER BEFORE INSTALLATION.
23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOACTIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.
27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.

ELECTRICAL SPECIFICATIONS

1. GENERAL:

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.

C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.

D. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.

E. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

F. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.

G. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT, PROVIDE EQUIPMENT CURBS AS REQUIRED.

H. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT ND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

I. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

J. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

K. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

L. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

M. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.

2. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. DEFINITIONS:

1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.

3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE. AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.

5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.

6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.

7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

B. TEMPORARY LIGHT AND POWER: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING OWNER. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS.

C. QUALITY ASSURANCE

1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL. MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.

2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.

3) CURRENT CHARACTERISTICS:

a. SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

b. DISTRIBUTION: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

4) HEIGHTS OF OUTLETS:

a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:

- RECEPTACLES AND TELEPHONES: 1 FT 4 IN.
- WALL SWITCHES: 4 FT-0 IN.
- WALL FIXTURES: 7 FT-0 IN.
- MOTOR CONTROLLERS: 5 FT-0 IN.
- CLOCKS: 7 FT 6 IN

b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

D. PRODUCT DELIVERY, STORAGE AND HANDLING

1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.

2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED, CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.

2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.

3) INSERTS AND SUPPORTS:

a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.

- SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
- MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
- CLIP FORM NAILS FLUSH WITH INSERTS.
- MAXIMUM LOADING 75 PERCENT OF RATING.

b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.

c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.

d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

G. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED, CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

H. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

I. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

3. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER, DATE IS EARLIER, THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR

D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.

F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

1) PROJECT NAME AND LOCATION

2) NAME OF ARCHITECT AND ENGINEER

3) ITEM IDENTIFICATION

4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.

2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1) SAFETY/DISCONNECT SWITCHES

2) FUSES

3) CIRCUIT BREAKERS

4) PANELBOARDS/LOADCENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).

5) RACEWAYS

6) WIRE AND CABLE

7) WALL SWITCHES

8) INSERTION RECEPTACLES

9) MOMENTARY CONTACT SWITCHES

10) TIME SWITCHES

11) LIGHTING FIXTURES.

E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING. PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT, CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.

5. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE- QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

7. FUSES:

A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

B. MOTOR CIRCUITS - ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.

D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.

E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN A ND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE.

2) 120/240 VOLTS, 225 AMP FRAME: 22,000 AMPS MINIMUM

8. DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:

H. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.

I. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD-LOCKABLE.

J. PANELBOARD SHALL BE CONSTRUCTED OF CODE-GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.

K. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).

L. DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.

M. DISCONNECTS

1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.

2) SWITCHING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANICALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.

3) SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.

4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

H. IDENTIFICATION

1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.

2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF-TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF ¼" HIGH WHITE LETTERING.

I. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

J. POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "QMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

B. MATERIALS

1) RACEWAYS:

a. RIGID STEEL CONDUIT: FULL-WEIGHT PIPE, GALVANIZED, THREADED.

b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS.

c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.

d. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.

e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.

2) FITTINGS AND ACCESSORIES:

a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.

b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.

c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.

d. BUSHINGS: METALLIC INSULATED TYPE.

ELECTRICAL SPECIFICATIONS (CONT.)

3) BOXES:

a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.

b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE: BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.

C. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB. FOR THROUGH-THE-FLOOR SYSTEMS, UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK, MACHINE SCREWS ON METAL, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, CRC-COLD GALVANIZED. EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS.
FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.

RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

D. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A ONE-PIECE PLUG WITH POZI-GRIP WEDGING PLUG AS MANUFACTURED BY OZ-GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.

INSTALL CABLE SUPPORTS AT THE TOP OF A VERTICAL RISE AND PROVIDE INTERMEDIATE ADDITIONAL SUPPORTS AS REQUIRED TO LIMIT SUPPORTED CONDUCTOR LENGTHS TO NOT GREATER THAN THOSE SPECIFIED IN TABLE 300.19(A).

A. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

D. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

E. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.

F. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

9. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.

C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).

E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS. WHEN USED IN LIEU OF WIRING IN CONDUIT, STATE IN PROPOSAL THAT PRICE IS BASED UPON THE USE OF HOSPITAL GRADE 'BX'.

F. COLOR CODING SHALL BE AS FOLLOWS:

120/208 VOLT SYSTEM:
BLACK FOR A PHASE
RED FOR B PHASE
BLUE FOR C PHASE

1) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.

WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.

G. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.

H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.

NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.

J. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.

K. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.

11. WIRING DEVICES:

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.

B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/208 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).

C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.

1) SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2-POLE, 3-WIRE GROUNDING, 15A, 125V, NEMA 5-20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
2) USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE: TAMPER RESISTANT,

E. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

F. COLORS: COORDINATE COLORS WITH ARCHITECT.

G. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

12. LIGHTING FIXTURES:

A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.

B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.

C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.

D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.

E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE, DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.

F. CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.

G. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED FOR USE .AC POWERED WITH PREMIUM LONG-LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.

13. TELEPHONE CONDUIT SYSTEM:

A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.

C. OUTLETS SHALL BE:

1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.

D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.

F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.

14. GROUNDING AND BONDING:

A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODE, AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM. WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN, EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.

B. USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.

C. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.

D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.

E. IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:

1) CIRCUITS SERVING ANY WALL BOX DIMMER.

2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE , OR AS OTHER WISE NOTED ON DRAWINGS.

3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES.

4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.

15. PANELBOARDS:

A. PANELBOARDS SHALL BE OF THE DEAD FRONT TYPE MANUFACTURED IN CODE GAUGE AND SIZE BOXES FOR MOUNTING AS INDICATED ON PLANS COMPLETE WITH TRIM, DOORS AND LOCKS. ALL LOCKS SHALL BE KEYED ALIKE.

B. CIRCUIT BREAKERS SHALL BE OF THE BOLT-ON THERMAL MAGNETIC MOLDED CASE TYPE, AND SHALL HAVE THE TRIP RATINGS AND NUMBER OF POLES SHOWN IN SCHEDULES ON THE CONTRACT DRAWINGS. FOR BLANK (SPACE) COMPARTMENTS, PROVIDE FULL RATED BUS. MINIMUM GUTTER SPACES SHALL BE 5-3/4". SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. PROVIDE 25% COPPER GROUND BUS AND 100% COPPER NEUTRAL BUS AND INCREASE NEUTRAL BUS INDICATED.

C. LOCKING TABS SHALL BE PROVIDED ON ALL CIRCUIT BREAKERS SERVING EMERGENCY LIGHTING, FIRE ALARM SYSTEM, SECURITY SYSTEMS AND OTHER EMERGENCY OR CRITICAL EQUIPMENT AND AS NOTED ON THE CONTRACT DRAWINGS. A TOTAL OF 5 SPARE LOCKING TABS SHALL BE FURNISHED TO THE OWNER.

D. BUSES SHALL BE HARD DRAWN COPPER OF 98 PERCENT CONDUCTIVITY AND SHALL HAVE CROSS SECTIONAL AREAS LARGE ENOUGH TO LIMIT THE TEMPERATURE RISE, WHEN CARRYING FULL LOAD, TO 35 DEGREES C. ABOVE AN AMBIENT INSIDE THE ENCLOSURE OF 55 DEGREES C. AS DEFINED IN IEEE STANDARD RULES. MAIN BUS CAPACITY SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.

E. ENCLOSURES SHALL BE SURFACE OR FLUSH AS INDICATED. TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. COVERS SHALL BE HINGED DOOR-IN-DOOR CONSTRUCTION WITH CYLINDER LOCKS AND CATCHES. LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY.

F. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARD SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

G. ALL STANDARD PANELBOARDS SHALL BE A MINIMUM OF 20" WIDE AND 5 3/4" DEEP.

H. FURNISH ALL PANELBOARDS WITH FEED-THRU LUGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

I. ALL NEW PANELBOARDS SHALL BE PROVIDED WITH AN ENGRAVED WHITE CORE LAMACOID NAMEPLATE, WITH 3/4 IN. WHITE LETTERING ON A BLACK BACKGROUND, WITH DESIGNATION LISTED (PANELBOARD NAME), FASTENED WITH EPOXY CEMENT OR OVAL HEAD CHROME PLATED MACHINE SCREWS.

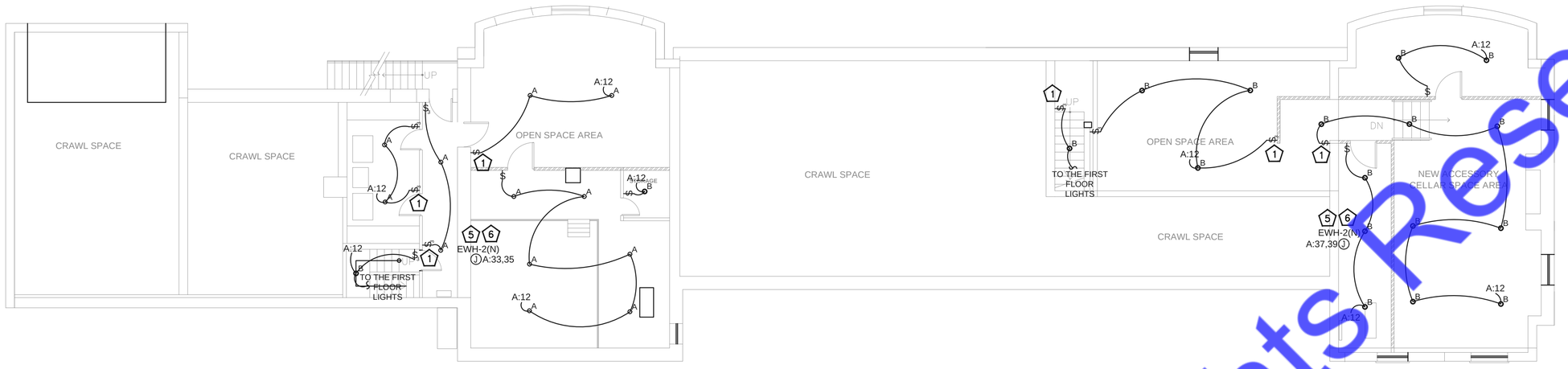
J. THE CIRCUIT DIRECTORY SHALL BE TYPEWRITTEN AND PROVIDED INSIDE EACH PANEL DOOR TO INDICATE EQUIPMENT AND/OR AREA SERVED. DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC, TRANSPARENT COVER. THE TYPEWRITTEN LIST INDICATING CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE PROVIDED.

K. TIE-BARS SHALL NOT BE USED TO CREATE MULTI-POLE CIRCUITS. MAXIMUM 42 CIRCUITS ALLOWED.

L. ONLY ONE WIRE SHALL BE INSTALLED UNDER EACH CIRCUIT BREAKER LUG.

M. SHORT CIRCUIT RATING OF PANELBOARDS SHALL NOT BE LESS THAN AS INDICATED ON THE CONTRACT DRAWINGS OR SPECIFIED HEREIN. WHERE NOT INDICATED OR SPECIFIED THE MINIMUM SHORT CIRCUIT RATING SHALL BE EQUAL TO THE INTERRUPTING CAPACITY OF THE LOWEST RATED CIRCUIT BREAKER IN THE PANELBOARD, BUT IN NO CASE LESS THAN 10,000 AMPERES R.M.S. SYMMETRICAL FOR 208Y/120 VOLT SYSTEM. SERIES RATED PANELBOARDS SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.

N. FOR ALL EXISTING PANELBOARDS, CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO REPLACE EXISTING AS REQUIRED AS INDICATED ON DRAWINGS.



CELLAR FLOOR LIGHTING PLAN

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

A. E.C SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE FINAL SELECTION, QUANTITY AND MOUNTING DETAILS OF LIGHTING FIXTURE. FOR MORE DETAILS REFER TO LIGHT FIXTURE SCHEDULE IN THE PLAN.

B. SWITCHES LOCATION SHOWN IN THE DRAWINGS ARE DIAGRAMMATIC,FOR ACTUAL LOCATION AND MOUNTING HEIGHTS OF SWITCHES REFER TO ARCHITECTURAL PLANS.

C. E.C TO COORDINATE EXACT LOCATION AND MOUNTING HEIGHTS OF FIXTURES WITH ARCHITECT/OWNER.

D. REFER TO DWG. E-001.00 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS.

E. REFER TO DWG. E-002.00 & E-003.00 FOR ELECTRICAL SPECIFICATIONS.

F. CIRCUITING FOR LIGHTING FIXTURES IN ROOMS/AREA WITH SWITCHES SHALL BE CONTROLLED BY DESIGNATED SWITCHES. IF SPECIFIC DESIGNATION IS NOT INDICATED, ALL LIGHTING FIXTURES IN ROOM/AREA SHALL BE CONTROLLED BY THE SWITCH INDICATED.

G. ALL BRANCH CIRCUITS LOCATED IN THE DWELLING UNIT SHALL BE CIRCUITED TO RESPECTIVE UNITS PANEL, CIRCUIT NUMBERS INDICATED, U.O.N.

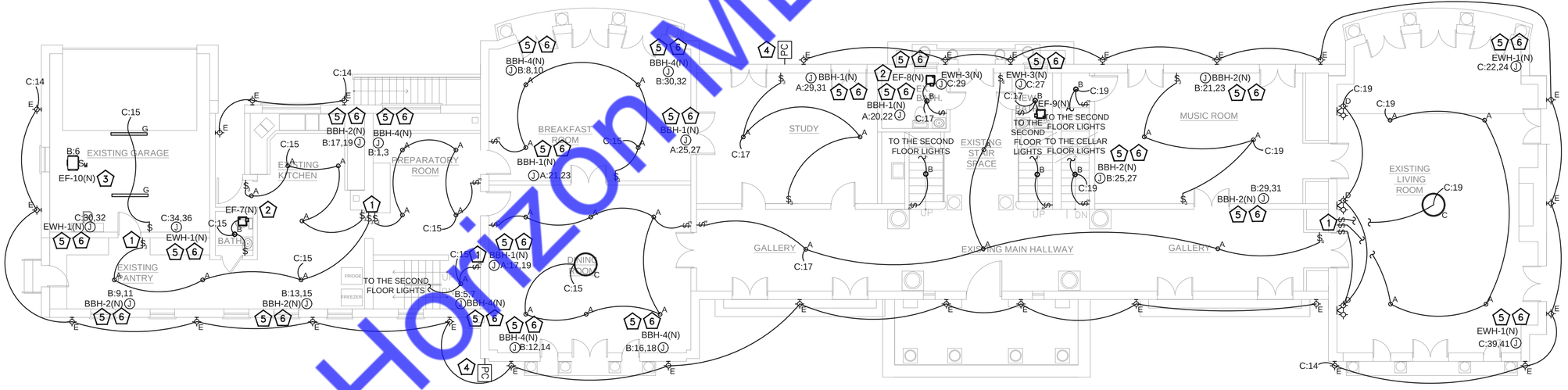
H. NOT LESS THAN 75 PERCENT OF AMPS IN PERMANENTLY INSTALLED LIGHTING FIXTURE SHALL BE HIGH-EFFICACY OR NOT LESS THAN 75 PERCENT OF THE PERMANENTLY INSTALLED LIGHTING FIXTURE SHALL CONTAIN ONLY HIGH-EFFICACY LAMPS.

ELECTRICAL POWER PLAN KEY NOTES:

1. E.C. SHALL COORDINATE THE EXACT LOCATION OF THE SWITCHES WITH ARCHITECT/OWNER IN FIELD.
2. NEW EXHAUST FANS INTERLOCKED WITH LIGHT SWITCH. SEE MECHANICAL DRAWINGS FOR MORE INFORMATION AND SPECIFICATIONS.
3. INTERCONNECT EXHAUST FAN EF-10(N) WITH THE CO/NO2 SENSOR WITH CONTROLLER IN SPACE. E.C SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR ADDITIONAL INFORMATION.
4. EXTERIOR LIGHT FIXTURES SHALL BE CONTROLLED VIA PHOTOCELL. E.C SHALL COORDINATE EXACT LOCATION AND MOUNTING HEIGHT IN THE FIELD.
5. ELECTRICAL CONTRACTOR SHALL COORDINATE FOR EXACT LOCATION OF MECHANICAL/PLUMBING EQUIPMENTS WITH MECHANICAL/PLUMBING DRAWINGS.
6. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL/PLUMBING UNIT WITH MECHANICAL/PLUMBING CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

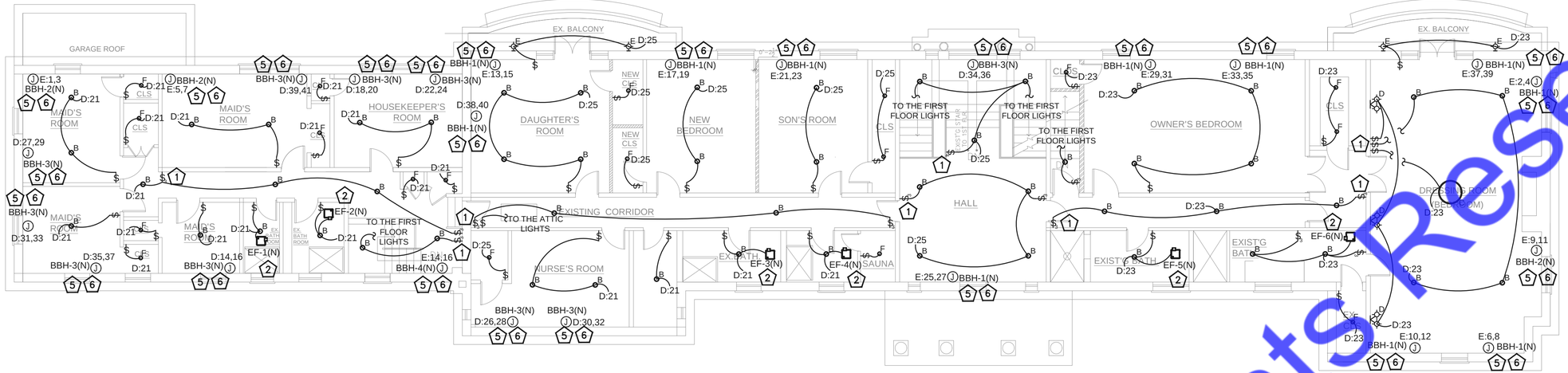
LIGHT FIXTURE SCHEDULE

TAG	MANUFACTURER	DESCRIPTION	MODEL NUMBER	WATTAGE
A	PROLIGHTS	ECLPENDANTSVW_BLACK	ECLPENDANTSVW_4000K_60DEG	60.5 W
B	PROLIGHTS	ECLPENDANTJRFC_WHITE_BRACKET	ECLPENDANTJRFC_GREEN_60DEG	34.3 W
C	FRANKLITE	MONDRIAN 12 LIGHT FITTING	FL2450-12	48.6 W
D	FRANKLITE	TAFFETA 2LT BRACKET	FL2155/2	8.2 W
F	MODULAR LIGHTING INSTRUMENTS	THIMBLE 74 LED DE 2700K MEDIUM BLACK STRUC	11620032	8.5 W
E	LEDSC4	MAX BIG SINGLE EMISSION	AT19-18X9S3OSZ5	19.7 W
G	LENA LIGHTING	TUBA IP69K PC 1220MM 8200LM 840 LS2 (1F) 120D IK10 46W	772528	46 W



FIRST FLOOR LIGHTING PLAN

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



SECOND FLOOR LIGHTING PLAN

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

A. E.C SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE FINAL SELECTION, QUANTITY AND MOUNTING DETAILS OF LIGHTING FIXTURE. FOR MORE DETAILS REFER TO LIGHT FIXTURE SCHEDULE IN THE PLAN.

B. SWITCHES LOCATION SHOWN IN THE DRAWINGS ARE DIAGRAMMATIC,FOR ACTUAL LOCATION AND MOUNTING HEIGHTS OF SWITCHES REFER TO ARCHITECTURAL PLANS.

C. E.C TO COORDINATE EXACT LOCATION AND MOUNTING HEIGHTS OF FIXTURES WITH ARCHITECT/OWNER.

D. REFER TO DWG. E-001.00 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS.

E. REFER TO DWG. E-002.00 & E-003.00 FOR ELECTRICAL SPECIFICATIONS.

F. CIRCUITING FOR LIGHTING FIXTURES IN ROOMS/AREA WITH SWITCHES SHALL BE CONTROLLED BY DESIGNATED SWITCHES. IF SPECIFIC DESIGNATION IS NOT INDICATED, ALL LIGHTING FIXTURES IN ROOM/AREA SHALL BE CONTROLLED BY THE SWITCH INDICATED.

G. ALL BRANCH CIRCUITS LOCATED IN THE DWELLING UNIT SHALL BE CIRCUITED TO RESPECTIVE UNITS PANEL, CIRCUIT NUMBERS INDICATED, U.O.N.

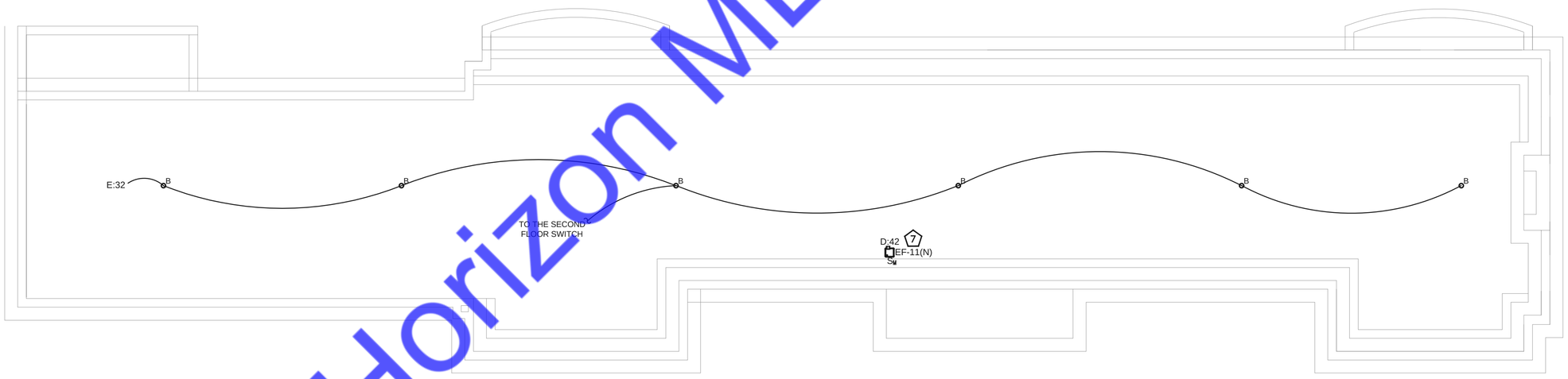
H. NOT LESS THAN 75 PERCENT OF AMPS IN PERMANENTLY INSTALLED LIGHTING FIXTURE SHALL BE HIGH-EFFICACY OR NOT LESS THAN 75 PERCENT OF THE PERMANENTLY INSTALLED LIGHTING FIXTURE SHALL CONTAIN ONLY HIGH-EFFICACY LAMPS.

ELECTRICAL POWER PLAN KEY NOTES:

1. E.C. SHALL COORDINATE THE EXACT LOCATION OF THE SWITCHES WITH ARCHITECT/OWNER IN FIELD.
2. NEW EXHAUST FANS INTERLOCKED WITH LIGHT SWITCH. SEE MECHANICAL DRAWINGS FOR MORE INFORMATION AND SPECIFICATIONS.
3. NOT USED.
4. EXTERIOR LIGHT FIXTURES SHALL BE CONTROLLED VIA PHOTOCELL. E.C SHALL COORDINATE EXACT LOCATION AND MOUNTING HEIGHT IN THE FIELD.
5. ELECTRICAL CONTRACTOR SHALL COORDINATE FOR EXACT LOCATION OF MECHANICAL/PLUMBING EQUIPMENTS WITH MECHANICAL/PLUMBING DRAWINGS.
6. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL/PLUMBING UNIT WITH MECHANICAL/PLUMBING CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
7. INTERCONNECT EXHAUST FAN EF-11(N) WITH THE THERMOSTAT FOR THE SAUNA. E.C SHALL COORDINATE WITH THE MECHANICAL DRAWING FOR ADDITIONAL INFO.

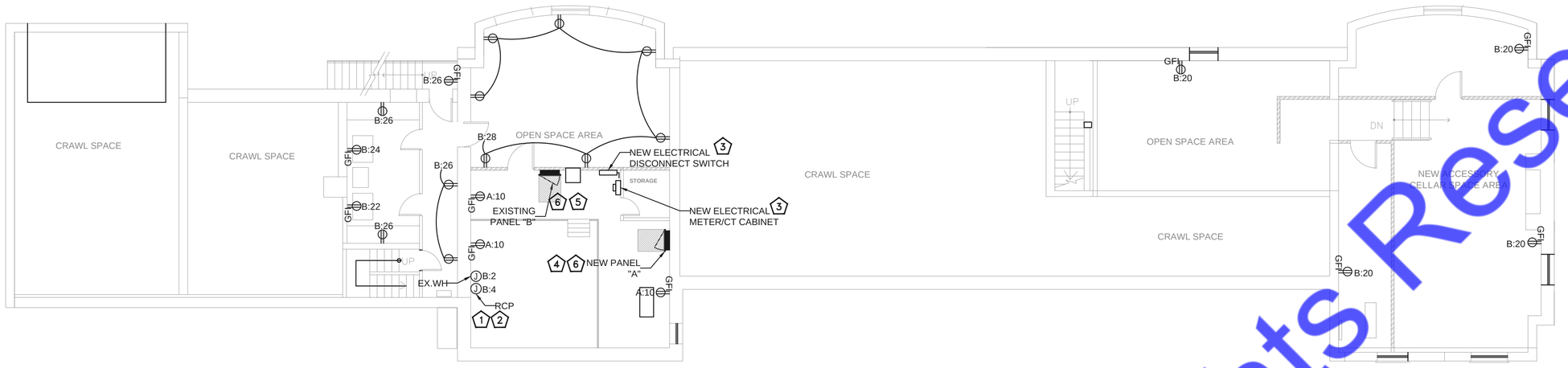
LIGHT FIXTURE SCHEDULE

TAG	MANUFACTURER	DESCRIPTION	MODEL NUMBER	WATTAGE
A	PROLIGHTS	ECLPENDANTSVW_BLACK	ECLPENDANTSVW_4000K_60DEG	60.5 W
B	PROLIGHTS	ECLPENDANTJRFC_WHITE_BRACKET	ECLPENDANTJRFC_GREEN_60DEG	34.3 W
C	FRANKLITE	MONDRIAN 12 LIGHT FITTING	FL2450-12	48.6 W
D	FRANKLITE	TAFFETA 2LT BRACKET	FL2155/2	8.2 W
F	MODULAR LIGHTING INSTRUMENTS	THIMBLE 74 LED DE 2700K MEDIUM BLACK STRUC	11620032	8.5 W
E	LEDSC4	MAX BIG SINGLE EMISSION	AT19-18X9S3OSZ5	19.7 W
G	LENA LIGHTING	TUBA IP69K PC 1220MM 8200LM 840 LS2 (1F) 120D IK10 46W	772528	46 W



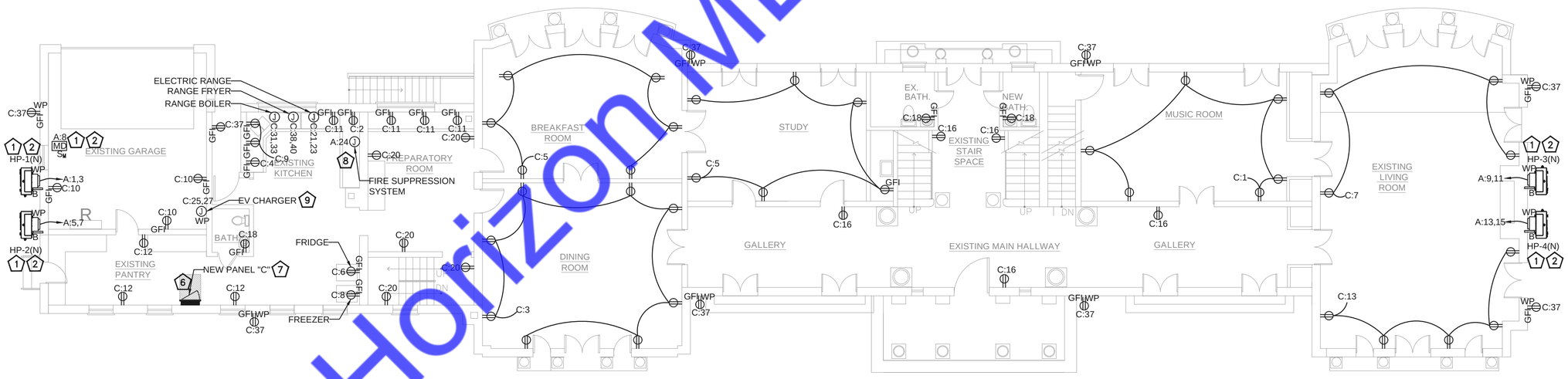
ATTIC FLOOR LIGHTING PLAN

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



CELLAR FLOOR POWER PLAN

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



FIRST FLOOR POWER PLAN

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

A. COORDINATE WITH THE ARCHITECT/OWNER FOR FINAL LOCATION OF A OUTLET & MOUNTING HEIGHTS.

B. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER/EQUIPMENT MANUFACTURER FOR FINAL ELECTRICAL REQUIREMENT INCLUDING RECEPTACLE, PLUG, CORD, DIRECT CONNECTION, CABLE, BREAKER ETC. OF EQUIPMENTS IN FIELD AND PROVIDE THE ELECTRICAL CONNECTION PER MANUFACTURER RECOMMENDATIONS IN FIELD. BASE BID ACCORDINGLY.

C. E.C. SHALL PROVIDE THE ELECTRICAL OUTLETS/RECEPTACLE DATA CONNECTION BASED ON FINAL EQUIPMENT SELECTION.

D. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATE WITH OTHER TRADE CONTRACTORS AND THE OCCUPANT.

E. THE RECEPTACLES MARKED AS GFI ON THE FLOOR PLAN INDICATES THAT THE RECEPTACLES SHALL BE GFI PROTECTED. E.C SHALL PROVIDE GFI BREAKER IN PANEL IF GFI RECEPTACLES IS NOT READILY ACCESIBLE OR FOR THE RECEPTACLE OTHER THAN 20A.

F. THE EC MUST FIELD-VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO INSTALLATION.

G. ALL RECEPTACLES IN HABITABLE ROOMS MUST BE ARC-FAULT CIRCUIT-INTERRUPTER (AFCI) PROTECTED.

H. ALL REQUIRED 125V RECEPTACLES MUST BE OF THE TAMPER-RESISTANT (TR) TYPE.

I. ALL MATERIALS AND EQUIPMENT USED MUST BE NEW, UL LISTED, AND PROPERLY LABELED.

1. ELECTRICAL CONTRACTOR SHALL COORDINATE FOR EXACT LOCATION OF MECHANICAL/PLUMBING EQUIPMENTS WITH MECHANICAL/PLUMBING DRAWINGS.

2. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL/PLUMBING UNIT WITH MECHANICAL/PLUMBING CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

3. NEW 600A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL METER, CT CABINET & THE DISCONNECT SWITCH FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH OWNER /UTILITY COMPANY FOR LOCATION.

4. NEW 600AMP (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

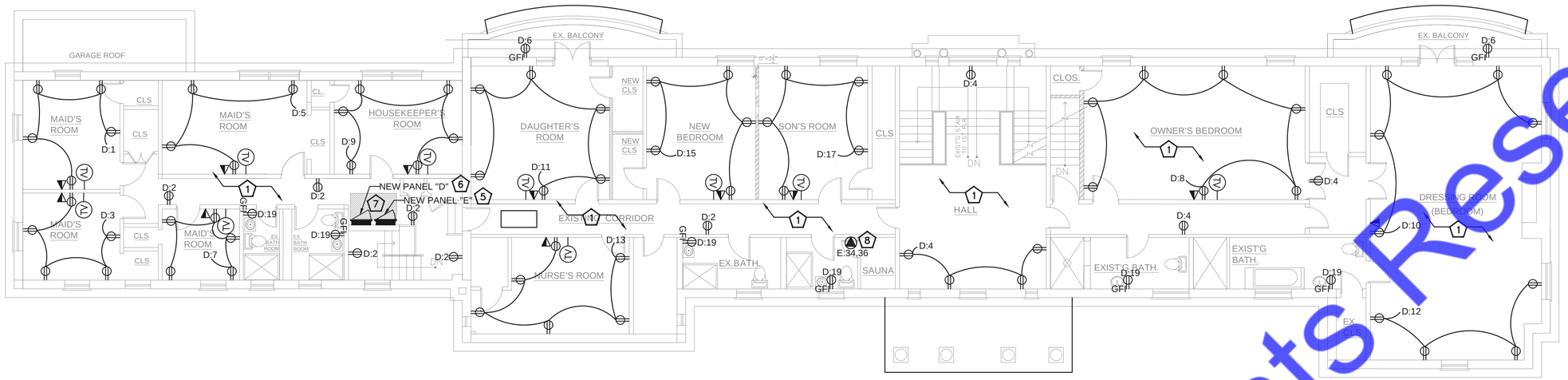
5. EXISTING 150A(M.L.O), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B"(NAME TO BE VERIFY ON FIELD) TO REMAIN. E.C. TO FIELD VERIFY THE EXACT SIZE, LOCATION & OPERABLE CONDITION OF THE PANEL, REPLACE IF INOPERABLE. BASE BID ACCORDINGLY.

6. E.C. SHALL VERIFY/PERFORM THE INSTALLATION OF ELECTRICAL PANELS IN COMPLIANCE WITH NEC ARTICLE 110.26(A) AND (B). E.C. SHALL FIELD VERIFY THAT THE PANELS ARE UNOBSTRUCTED AND THE AREA WHERE THE PANELS ARE PLACED SHALL NOT BE USED AS A STORAGE SPACE.

7. NEW 200AMP (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "C" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

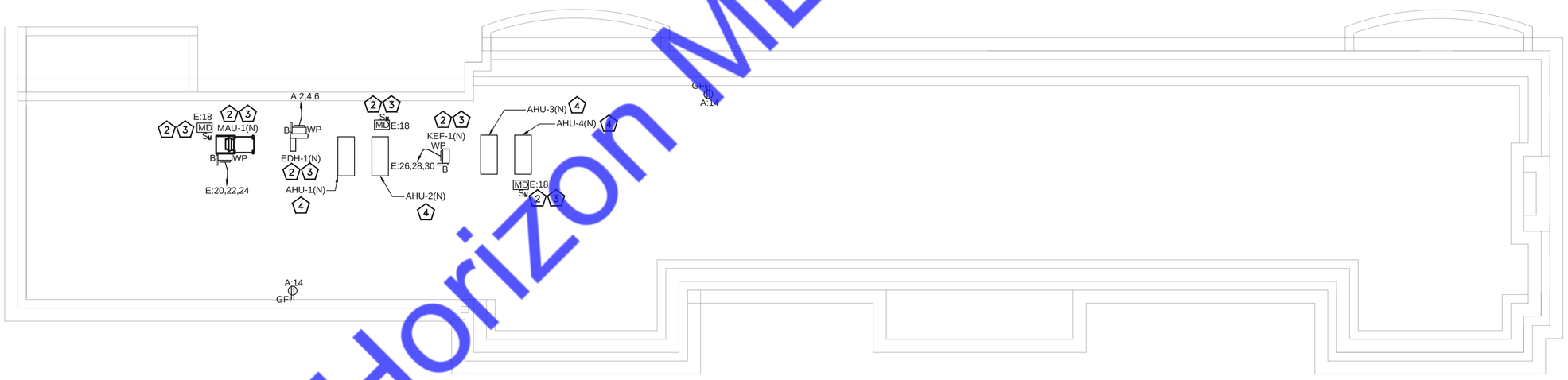
8. ELECTRICAL CONTRACTOR TO COORDINATE WITH FIRE SUPPRESSION SYSTEM VENDOR FOR ITS POWER REQUIREMENT AND OTHER DETAILS BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.

9. PROVIDE OUTLET FOR ELECTRIC VEHICLE CHARGER. E.C SHALL COORDINATE WITH THE OWNER/ARCHITECT FOR THE EXACT REQUIREMENT LOCATION OF THE CHARGER IN THE FIELD. BASE BID ACCORDINGLY.



SECOND FLOOR POWER PLAN

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



ATTIC FLOOR POWER PLAN

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

A. COORDINATE WITH THE ARCHITECT/OWNER FOR FINAL LOCATION OF A OUTLET & MOUNTING HEIGHTS.

B. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER/EQUIPMENT MANUFACTURER FOR FINAL ELECTRICAL REQUIREMENT INCLUDING RECEPTACLE, PLUG, CORD, DIRECT CONNECTION, CABLE, BREAKER ETC. OF EQUIPMENTS IN FIELD AND PROVIDE THE ELECTRICAL CONNECTION PER MANUFACTURER RECOMMENDATIONS IN FIELD. BASE BID ACCORDINGLY.

C. E.C. SHALL PROVIDE THE ELECTRICAL OUTLETS/RECEPTACLE DATA CONNECTION BASED ON FINAL EQUIPMENT SELECTION.

D. FINAL CONDUIT/CABLE ROUTING SHALL BE DETERMINED IN FIELD, AND PRIOR TO THE COMMENCEMENT OF WORK, COORDINATE WITH OTHER TRADE CONTRACTORS AND THE OCCUPANT.

E. THE RECEPTACLES MARKED AS GFI ON THE FLOOR PLAN INDICATES THAT THE RECEPTACLES SHALL BE GFI PROTECTED. E.C SHALL PROVIDE GFI BREAKER IN PANEL IF GFI RECEPTACLES IS NOT READILY ACCESIBLE OR FOR THE RECEPTACLE OTHER THAN 20A.

F. THE EC MUST FIELD-VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO INSTALLATION.

G. ALL RECEPTACLES IN HABITABLE ROOMS MUST BE ARC-FAULT CIRCUIT-INTERRUPTER (AFCI) PROTECTED.

H. ALL REQUIRED 125V RECEPTACLES MUST BE OF THE TAMPER-RESISTANT (TR) TYPE.

I. ALL MATERIALS AND EQUIPMENT USED MUST BE NEW, UL LISTED, AND PROPERLY LABELED.

1. E.C SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT RECEPTACLE MOUNTING HEIGHT. BASE BID ACCORDINGLY.

2. ELECTRICAL CONTRACTOR SHALL COORDINATE FOR EXACT LOCATION OF MECHANICAL/PLUMBING EQUIPMENTS WITH MECHANICAL/PLUMBING DRAWINGS.

3. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL/PLUMBING UNIT WITH MECHANICAL/PLUMBING CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

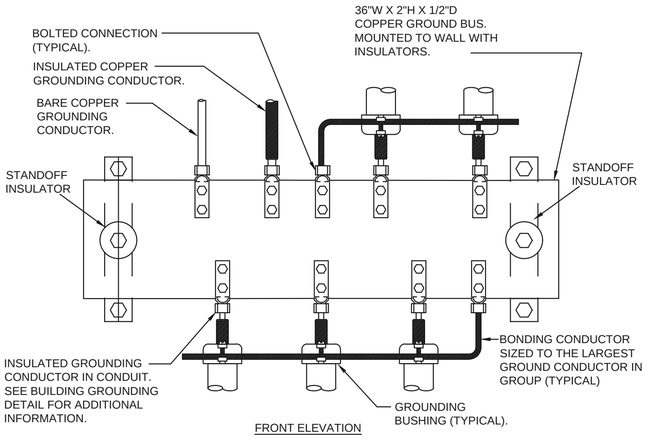
4. AHU UNITS SHALL BE FED FROM THE OUTDOOR HP UNITS. E.C SHALL COORDINATE WITH THE MECHANICAL DRAWINGS FOR THE EXACT REQUIREMENT OF MECHANICAL UNITS. BASE BID ACCORDINGLY.

5. NEW 225AMP (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "E" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

6. NEW 100AMP (MLO), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "D FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.

7. E.C. SHALL VERIFY/PERFORM THE INSTALLATION OF ELECTRICAL PANELS IN COMPLIANCE WITH NEC ARTICLE 110.26(A) AND (B). E.C. SHALL FIELD VERIFY THAT THE PANELS ARE UNOBSTRUCTED AND THE AREA WHERE THE PANELS ARE PLACED SHALL NOT BE USED AS A STORAGE SPACE.

8. PROVIDE NEMA 6-20R RECEPTACLE FOR THE "CLEARLIGHT SANCTUARY RETREAT FULL SPECTRUM 4 PERSON INFRARED SAUNA". E.C SHALL COORDINATE WITH THE OWNER FOR THE EXACT SAUNA REQUIREMENT & SPECS BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.



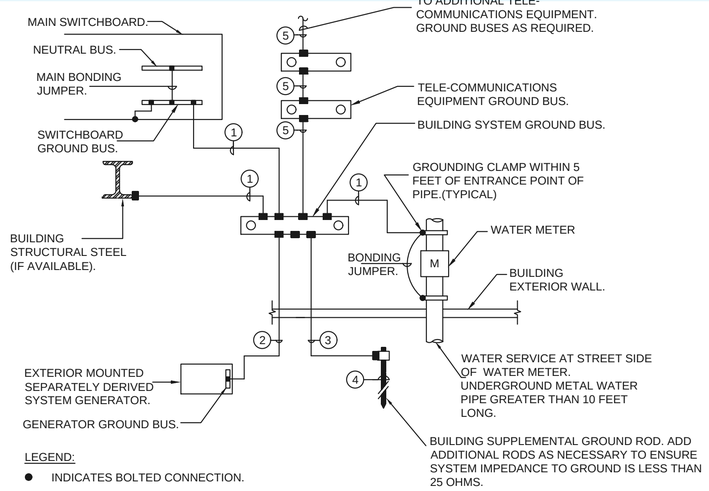
FRONT ELEVATION

NOTES:

1. REFER TO BUILDING GROUNDING ELECTRODE SYSTEM DETAIL FOR EXACT CONFIGURATION.

5 BUILDING ELECTRICAL SYSTEMS GROUND BUS

E-201.00 N.T.S



LEGEND:

- ● INDICATES BOLTED CONNECTION.
- ■ INDICATES EXOTHERMIC WELD CONNECTION, COMPATIBLE WITH MATERIALS BEING JOINED.

(1) INSULATED COPPER GROUNDING ELECTRODE CONDUCTOR IN CONDUIT SIZED AS PER NEC ARTICLE 250.66.

(2) INSULATED COPPER GROUNDING ELECTRODE CONDUCTOR ENCASED IN CONCRETE SIZED AS PER NEC ARTICLE 250.66

(3) #1/0 AWG BARE COPPER GROUND CONDUCTOR.

(4) 3/4" x 10'-0" LONG COPPER-CLAD GROUND ROD DRIVEN WITH TOP 12" BELOW GRADE.

(5) #4/0 IN 1"C INSULATED COPPER GROUND CONDUCTOR IN 30mm CONDUIT.

4 BUILDING GROUNDING ELECTRODE SYSTEM

E-201.00 N.T.S

System No. W-L-2059
F Ratings - 1 and 2 Hr (See Items 2 and 3)
T Ratings - 3/4, 1, 1-1/2 and 2 Hr (See Items 2 and 3)
L Rating At Ambient - 1 CFM/sq ft
L Rating At 400 F - Less Than 5 CFM/sq ft

Section A-A

1. Wall Assembly - The 1 or 2 h fire rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300, U400 and V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs - Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* - 5/8 in. (16 mm) thick, 4 ft (1219 mm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5 in. (127 mm).
2. Through-Penetrants - One nonmetallic pipe or conduit to be centered within the firestop system. The annular space shall be max 1/4 in. (6 mm). Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes or conduits may be used:
   A. Polyvinyl Chloride (PVC) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 or 80 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems. When Schedule 80 PVC pipe is used, the F and T Ratings are 1 hr. When Scheduled 80 PVC pipe is used in closed (process or supply) piping systems, the F and T Ratings are equal to the assembly rating of the wall in which it is installed.
   B. Rigid Nonmetallic Conduit - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 or 80 PVC conduit installed in accordance with Article 347 of the National Electrical Code (NFPA No. 70). When Schedule 80 PVC conduit is used, the F and T Ratings are 1 hr.
   C. Chlorinated Polyvinyl Chloride (CPVC) Pipe - Nom 4 in. (102 mm) diam (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.
   D. Acrylonitrile-Butadiene Styrene (ABS) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 solid or foamed core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   E. Fire Retardant Polypropylene (FRPP) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   F. Polyvinylidene Fluoride (PVDF) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 PVDF pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   G. Fiberglass Reinforced Pipe (FRP) Pipe - Nom 4 in. (102 mm) diam (or smaller) glass fiber reinforced thermosetting resin pipe for use in closed (process or control) or vented (drain, waste or vent) piping systems. When FRP pipe is used, T Rating is 3/4 hr.
   H. High Density Polyethylene (HDPE) Pipe - Nom 4 in. (102 mm) diam (or smaller) Schedule 40 HDPE pipe for use in closed (process or supply) piping systems.
3. Firestop System - The firestop system shall consist of the following:
   A. Void or Cavity Material* - Sealant - Fill material forced into annular space to max extent possible. Caulk shall be installed flush with both surfaces of wall assembly.
   SPECIFIED TECHNOLOGIES INC - SpecSeal 100, 101, 102, 105, 120 or 129 Sealant, SpecSeal LCI Sealant, Pensil 300 Sealant or SpecSeal Series SIt.300 Sealant
   B. Fill, Void or Cavity Material - Wrap Strip - Nom 1/8 or 3/16 in. (3.2 or 4.8 mm) thick intumescent material faced on both sides with a plastic film, supplied in 2 in. (51 mm) wide strips or nom 1/4 in. (6 mm) thick intumescent material faced on both sides with a plastic film, supplied in 1-1/2 in. (38 mm) wide strips. The layers of wrap strips are individually wrapped around the through-penetrant with ends butted and held in place with masking tape. Butted ends in successive layers shall be aligned.

Fire Rating of Wall Hr	Max Diam of Throught Penetrant in. (mm)	No. of Wrap Strip Layers	F Rating Hr	T Rating Hr
1	1-1/2 (38)	1	1	1
2	1-1/2 (38)	1	2	1-1/2
1	2 (51)	1	1	1
2	2 (51)	1	2	1-1/2
1	3 (76)	2	1	1
2	3 (76)	2	2	2
1	4 (102)	3	1	1
2	4 (102)	3	2	2

Except as noted in Item 2, the F and T Rating of the firestop system is dependent upon the fire rating of wall, diam of through penetrant and the number of wrap strips as tabulated below:

SPECIFIED TECHNOLOGIES INC - SpecSeal BLU Wrap Strip, SpecSeal BLU2 Wrap Strip or SpecSeal RED Wrap Strip

C. Steel Collar - Collar fabricated from coils of precut 0.016 in. (0.4 mm) thick (30 MSG) galv sheet steel available from wrap strip manufacturer. Collar shall be min 1-1/2 in. (38 mm) deep with 1 in. (25 mm) wide by 2 in. (51 mm) long anchor tabs for securement to the concrete floor or wall. Retainer tabs, 3/4 in. (19 mm) wide tapering down to 1/4 in. (6 mm) wide and located opposite the anchor tabs, are folded 90 degree toward pipe surface to maintain the annular space around the pipe and to retain the wrap strips. Steel collar wrapped around wrap strips and pipe with a 1 in. (25 mm) wide overlap along its perimeter joint and secured together by means of a min 1/2 in. (13 mm) wide by 0.028 in. (0.7 mm) thick stainless steel hose clamp installed at mid-depth of the steel collar. As an alternate to the steel hose clamp, the steel collar may be secured together by means of three No. 8 by 1/4 in. (6 mm) long steel sheet metal screws when more than one layer of wrap strip is used.

Wrap strip/collar assembly is slid along the through-penetrant until abuts the surface of the wall. Collar secured to wall by 1/8 in. (3.2 mm) diam by 1-3/4 in. (44 mm) long steel molly bolts in conjunction with 1-1/4 in. (32 mm) diam steel fender washers. The number of molly bolts used is dependent upon the nom diam of the through penetrant. Two molly bolts, symmetrically located, are required for nom 1-1/2 in. (38 mm) and 2 in. (51 mm) diam through penetrants. Three molly bolts, symmetrically located, are required for nom 2-1/2 in. (64 mm) and 3 in. (76 mm) diam through penetrants. Four molly bolts, symmetrically located, are required for nom 3-1/2 in. (89 mm) and 4 in. (102 mm) diam through penetrants. Steel collars are installed on each side of wall.

D. Firestop Device* - (Optional, Not Shown) - As an alternate to Item 3B and 3C, galv steel collar lined with an intumescent material sized to fit the specific diam of the through-penetrant. Device shall be installed around through-penetrant in accordance with accompanying installation instructions. Device incorporates anchor tabs for securement to each surface of wall assembly by means of 1/8 in. (3 mm) diam by 1-3/4 in. (45 mm) long steel molly bolts in conjunction with 1/4 in. (6 mm) diam by 1-1/2 in. (38 mm) diam steel fender washers.

SPECIFIED TECHNOLOGIES INC - SpecSeal Firestop Collar, SpecSeal LCC Collar or SpecSeal SSC Collar . When SpecSeal LCC Collar or SpecSeal SSC Collar are used, the max annular space shall be 1/8 in. (3 mm) for max 2-1/2 in. (64 mm) diam pipe and shall be max 1/4 in. (6 mm) for pipe larger than 2-1/2 in. (64 mm) diam.

*Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

Reproduced courtesy of Underwriters Laboratories, Inc.
Created or Revised: November 27, 2012

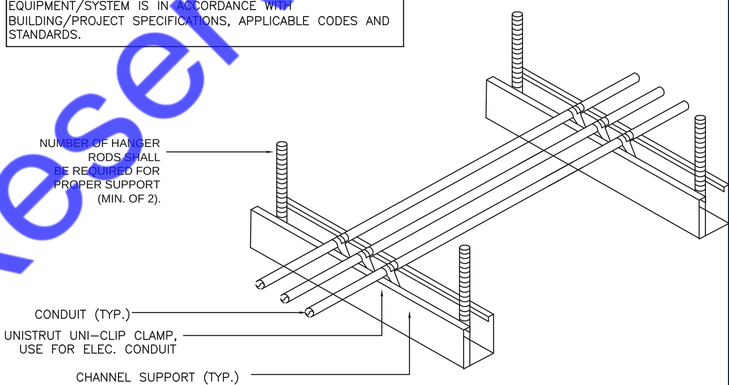
(800)992-1180 (908)526-8000 FAX (908)231-8415 E-Mail:techserv@stifirestop.com Website:www.stifirestop.com

W-L-2059

3 FIRE STOP DETAIL

E-201.00 N.T.S

NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.

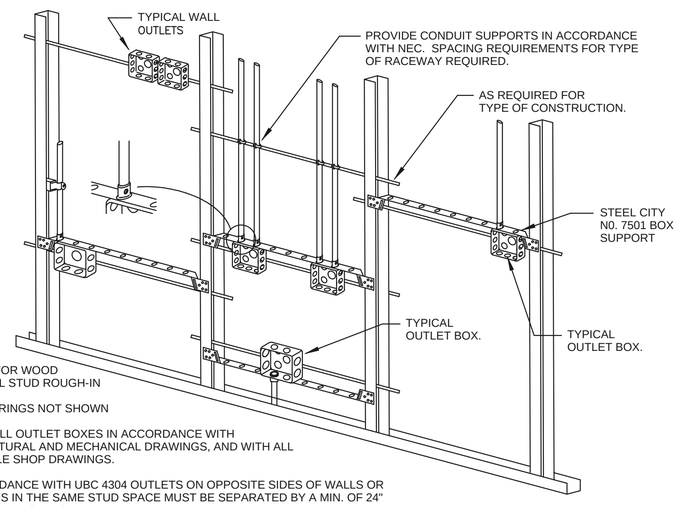


NOTES:

1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
4. UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.

2 CONDUIT SUPPORT DETAIL

E-201.00 N.T.S



NOTES:

(1) TYPICAL FOR WOOD AND METAL STUD ROUGH-IN

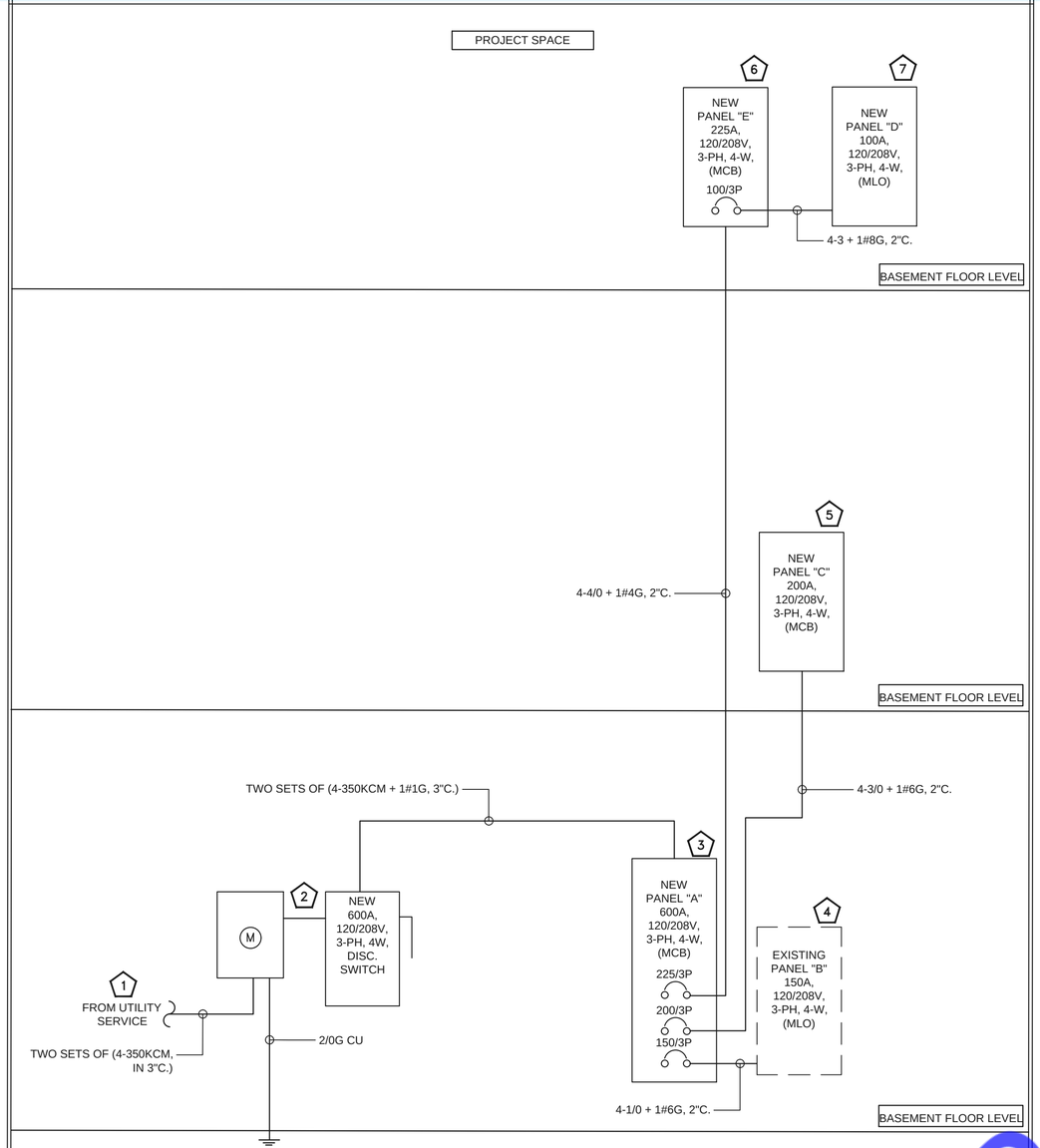
(2) PLASTER RINGS NOT SHOWN

(3) LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.

(4) IN ACCORDANCE WITH UBC 4304 OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

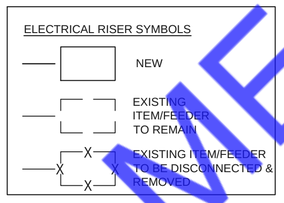
1 DETAIL TYPICAL ROUGH-IN REQUIREMENTS

E-201.00 N.T.S



ELECTRICAL RISER KEYED NOTES:

1. NEW 600A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL SERVICE FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH OWNER/UTILITY COMPANY FOR THE EXACT LOCATION IN FIELD. E.C SHALL COORDINATE WITH UTILITY COMPANY FOR EXACT INCOMING SERVICE CONDUCTOR SIZE IN FIELD. REPORT TO ENGINEER ON RECORD FOR ANY DISCREPANCIES. E.C TO COORDINATE ALL INSTALLATION REQUIREMENT WITH UTILITY COMPANY PRIOR TO BIDDING. BASE BID ACCORDINGLY.
2. NEW 600A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL METER, THE DISCONNECT & CT CABINET FOR THE PROJECT SPACE. E.C SHALL COORDINATE WITH UTILITY FOR CT CABINET EQUIPMENT & ITS REQUIREMENT. PROVIDE PER UTILITY SPECIFICATIONS. E.C. SHALL ALSO COORDINATE WITH OWNER /LANDLORD/UTILITY COMPANY FOR LOCATION AND EQUIPMENT INSTALLATION. BASE BID ACCORDINGLY.
3. NEW 600A(MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A". E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
4. EXISTING 200A(M.L.O), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B"(NAME TO BE VERIFY ON FIELD) TO REMAIN. E.C. TO FIELD VERIFY THE EXACT SIZE, LOCATION & OPERABLE CONDITION OF THE PANEL, REPLACE IF INOPERABLE. BASE BID ACCORDINGLY.
5. NEW 100A(MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "C". E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
6. NEW 200A(MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "E". E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
7. NEW 100A(MLO), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "D". E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.



ELECTRICAL GENERAL NOTES:

A. ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (ISC) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.

B. ABOVE RISER DIAGRAM IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD & CONFIRM ENGINEER ON RECORD FOR ANY DISCREPANCY.

C. E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.

D. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER/ LANDLORD/BASE BUILDING FOR THE EXACT SCOPE OF WORK/LIABILITIES.

RISER DIAGRAM

SCALE: N.T.S

PANEL: A(N) — MOUNTING: SURFACE

208Y/120 VOLTS, 3 PHASE, 4 WIRE — PANEL LOCATION: BASEMENT FLOOR

MAIN CB 600A — MLO: NA — BUS: 600A MIN, — FED FROM: NEW METER & DISCONNECT

NOTE: L : LIGHTING, R : RECEPTACLES, H : HVAC LOAD, M : MOTOR LOAD, E : EQUIPMENTS, O : OTHER/MISC. (TYPICAL)

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	40/2P	HP-1(N)	H	3.33	2-8 + 1#10G, 3/4"C.	13.33			3-3 + 1#8G, 1"C.	10.00	H	EDH-1(N)	100/3P	2
3			H	3.33			13.33			10.00	H			4
5	40/2P	HP-2(N)	H	3.33	2-8 + 1#10G, 3/4"C.			13.33		10.00	H			6
7			H	3.33		4.33			2#12, #12G, 3/4"C	1.00	M	MOTORISED DAMPER	20	8
9	40/2P	HP-3(N)	H	3.33	2-8 + 1#10G, 3/4"C.		3.87		2#12, #12G, 3/4"C	0.54	R	RECEPTACLE - LEFT BASEMENT -3	20	10
11			H	3.33				4.33	2#12, #12G, 3/4"C	1.00	L	LIGHTING - BASEMENT	20	12
13	35/2P	HP-4(N)	H	3.33	2-8 + 1#10G, 3/4"C.	4.05			2#12, #12G, 3/4"C	0.72	R	RECEPTACLE - ATTIC	20	14
15			H	3.33			3.33					SPARE	20	16
17	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C			1.25				SPARE	20	18
19			H	1.25		2.50			2#12, #12G, 3/4"C	1.25	H	BBH-1(N)	20/2P	20
21	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C		2.50			1.25	H			22
23			H	1.25				1.75	2#12, #12G, 3/4"C	0.50	O	FIRE SUPRESSION SYSTEM	20	24
25	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C	11.25			4-1/0 + 1#6G, 2"C.	10.00	O	PANEL B(E)	150/3P	26
27			H	1.25			11.25			10.00	O			28
29	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C			11.25		10.00	O			30
31			H	1.25		15.89				14.64	O			32
33	20/2P	EWH-2(N)	H	0.86	2-12 + 1#12G, 3/4"C.		15.50		4-3/0 + 1#6G, 2"C.	14.64	O	PANEL C(N)	200/3P	34
35			H	0.86				15.50		14.64	O			36
37	20/2P	EWH-2(N)	H	0.86	2-12 + 1#12G, 3/4"C	10.95			4-4/0 + 1#4G, 2"C.	10.09	O	PANEL E(N)	225/3P	38
39			H	0.86			10.95			10.09	O			40
41	20	SPARE						10.09		10.09	O			42
TOTAL CONNECTED LOAD (KVA)						62.29	60.72	57.49						

LOAD CLASSIFICATION		CONNECTED LOAD (KVA)	DEMAND FACTOR	DEMAND LOAD (KVA)
TOTAL LIGHTING	L	1.00	125%	1.25
TOTAL RECEPTACLE	R	1.26	>10KW=10+[0.4*(KW-10)]	1.26
TOTAL HVAC	H	72.56	100%	72.56
TOTAL MOTOR	M	1.00	100%	1.00
TOTAL KITCHEN/EQUIPMENTS	E	0.00	100%	0.00
TOTAL OTHER/MISCILLANEOUS	O	104.69	100%	104.69

PANEL TOTAL LOAD		
TOTAL CONNECTED LOAD	180.50	KVA
TOTAL DEMAND LOAD (NEC 220.82)	185.25	KVA
TOTAL CONNECTED CURRENT	501.05	AMP
TOTAL DEMAND CURRENT	514.21	AMP
SYSTEM VOLTAGE	120/208V	

PANEL: B(E) — MOUNTING: SURFACE

208Y/120 VOLTS, 3 PHASE, 4 WIRE — PANEL LOCATION: BASEMENT FLOOR

MAIN CB NA — MLO: 150A — BUS: EXISTING MIN, — FED FROM: PANEL A

NOTE: L : LIGHTING, R : RECEPTACLES, H : HVAC LOAD, M : MOTOR LOAD, E : EQUIPMENTS, O : OTHER/MISC. (TYPICAL)

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20/2P	BBH-4(N)	H	0.50	2#12, #12G, 3/4"C	1.00			2#12, #12G, 3/4"C	0.50	O	GAS WATER HEATER	20	2
3			H	0.50			0.58		2#12, #12G, 3/4"C	0.08	O	RCP	20	4
5	20/2P	BBH-4(N)	H	0.50	2#12, #12G, 3/4"C			0.70	2#12, #12G, 3/4"C	0.20	M	EF-10(N)	20	6
7			H	0.50		1.00			2#12, #12G, 3/4"C	0.50	H	BBH-4(N)	20/2P	8
9	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C		1.54			0.50	H			10
11			H	1.04				1.54	2#12, #12G, 3/4"C	0.50	H	BBH-4(N)	20/2P	12
13	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C	1.54				0.50	H			14
15			H	1.04			1.54		2#12, #12G, 3/4"C	0.50	H	BBH-4(N)	20/2P	16
17	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C			1.54		0.50	H			18
19			H	1.04		1.76			2#12, #12G, 3/4"C	0.72	R	RECEPTACLE - RIGHT BASEMENT	20	20
21	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C		2.84		2#12, #12G, 3/4"C	1.80	O	WASHER-1	20	22
23			H	1.04				2.84	2#12, #12G, 3/4"C	1.80	O	WASHER-2	20	24
25	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C	1.94			2#12, #12G, 3/4"C	0.90	R	RECEPTACLE - LEFT BASEMENT -1	20	26
27			H	1.04			2.30		2#12, #12G, 3/4"C	1.26	R	RECEPTACLE - LEFT BASEMENT -2	20	28
29	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C			1.54	2#12, #12G, 3/4"C	0.50	H	BBH-4(N)	20/2P	30
31			H	1.04		1.54				0.50	H			32
33		SPACE					0.00					SPACE		34
35		SPACE						0.00				SPACE		36
37		SPACE				0.00						SPACE		38
39		SPACE					0.00					SPACE		40
41		SPACE						0.00				SPACE		42
TOTAL CONNECTED LOAD (KVA)						8.78	8.80	8.16						

PANEL: C(N) — MOUNTING: SURFACE

208Y/120 VOLTS, 3 PHASE, 4 WIRE — PANEL LOCATION: FIRST FLOOR

MAIN CB 200A — MLO: NA — BUS: 225A MIN, — FED FROM: PANEL A

NOTE: L : LIGHTING, R : RECEPTACLES, H : HVAC LOAD, M : MOTOR LOAD, E : EQUIPMENTS, O : OTHER/MISC. (TYPICAL)

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	RECEPTACLE - MUSIC ROOM	R	1.08	2#12, #12G, 3/4"C	2.28			2#12, #12G, 3/4"C	1.20	E	DISHWASHER	20	2
3	20	RECEPTACLE - DINING	R	1.44	2#12, #12G, 3/4"C		2.54		2#12, #12G, 3/4"C	1.10	E	MICROWAVE	20	4
5	20	RECEPTACLE - BREAKFAST SPACE	R	1.08	2#12, #12G, 3/4"C			2.28	2#12, #12G, 3/4"C	1.20	E	FRIDGE	20	6
7	20	RECEPATCLE - EXISTING LIVING ROOM-1	R	0.72	2#12, #12G, 3/4"C	2.22			2#12, #12G, 3/4"C	1.50	E	FREEZER	20	8
9	20	RECEPTACLE - SMALL APPLIANCES	R	1.50	2#12, #12G, 3/4"C		1.86		2#12, #12G, 3/4"C	0.36	R	RECEPTACLE -GARAGE	20	10
11	20	RECEPTACLE - SMALL APPLIANCES	R	1.50	2#12, #12G, 3/4"C			2.40	2#12, #12G, 3/4"C	0.90	R	RECEPTACLE - PANTRY & KITCHEN	20	12
13	20	RECEPATCLE - EXISTING LIVING ROOM-2	R	0.90	2#12, #12G, 3/4"C	1.98			2#12, #12G, 3/4"C	1.08	R	LIGHTING- EXTERIOR	20	14
15	20	LIGHTING + EF-7(N)	L	1.10	2#12, #12G, 3/4"C		2.00		2#12, #12G, 3/4"C	0.90	R	RECEPTACLE - MAIN HALLWAY	20	16
17	20	LIGHTING, EF-8 & 9(N)	L	1.20	2#12, #12G, 3/4"C			1.56	2#12, #12G, 3/4"C	0.36	R	RECEPTACLE - FIRST FLOOR BATHROOM	20	18
19	20	LIGHTING	L	1.00	2#12, #12G, 3/4"C	1.90			2#12, #12G, 3/4"C	0.90	R	RECEPTACLE - KITCHEN & NEAR STAIR	20	20
21	60/2P	ELECTRIC RANGE	E	4.80	2-6 + 1#10G, 3/4"C.		6.88		2-10 + 1#10G, 3/4"C.	2.08	H	EWH-1(N)	30/2P	22
23			E	4.80				6.88		2.08	H			24
25		SHUNT TRIP				4.16			2-8 + 1#10G, 3/4"C.	4.16	R	EV CHARGER	50/2P	26
27	20	EWH-3(N)	H	1.00	2#12, #12G, 3/4"C		5.16			4.16	R			28
29	20	EWH-3(N)	H	1.00	2#12, #12G, 3/4"C			3.08	2-10 + 1#10G, 3/4"C.	2.08	H	EWH-1(N)	30/2P	30
31	40/2P	ELECTRIC BOILER	R	3.00	2-8 + 1#10G, 3/4"C.	5.08				2.08	H			32
33			R	3.00			5.08		2-10 + 1#10G, 3/4"C.	2.08	H	EWH-1(N)	30/2P	34
35		SHUNT TRIP						2.08		2.08	H			36
37	20	RECEPTACLE- EXTERIOR	R	1.62	2#12, #12G, 3/4"C	7.62			2-4 + 1#8G, 1"C.	6.00	E	ELECTRIC FRYER	80/2P	38
39	30/2P	EWH-1(N)	H	2.08	2-10 + 1#10G, 3/4"C.		8.08			6.00	E			40
41			H	2.08				2.08				SHUNT TRIP		42
TOTAL CONNECTED LOAD (KVA)						12.54	18.44	16.20						

PANEL SCHEDULE

SCALE: N.T.S

PANEL:	D(N)											MOUNTING:	SURFACE	
208Y/120	VOLTS,	3	PHASE,	4	WIRE							PANEL LOCATION:	SECOND FLOOR	
MAIN CB	NA	MLO:	100A	BUS:	125A	MIN,						FED FROM:	PANEL A	
NOTE: L : LIGHTING, R : RECEPTACLES, H : HVAC LOAD, M : MOTOR LOAD, E : EQUIPMENTS, O : OTHER/MISC. (TYPICAL)														

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	PER PHASE (KVA) B	PER PHASE (KVA) B	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	RECEPTACLE- MAID'S ROOM 1	R	1.08	2#12, #12G, 3/4"C	2.16			2#12, #12G, 3/4"C	1.08	R	RECEPTACLE - SECOND FLOOR HALLWAY -1	20	2
3	20	RECEPTACLE- MAID'S ROOM 2	R	1.08	2#12, #12G, 3/4"C		2.34		2#12, #12G, 3/4"C	1.26	R	RECEPTACLE - SECOND FLOOR HALLWAY -2	20	4
5	20	RECEPTACLE- MAID'S ROOM 3	R	1.08	2#12, #12G, 3/4"C			1.44	2#12, #12G, 3/4"C	0.36	R	RECEPTACLE - SECOND FLOOR BALCONY	20	6
7	20	RECEPTACLE- MAID'S ROOM 4	R	1.08	2#12, #12G, 3/4"C	2.16			2#12, #12G, 3/4"C	1.08	R	RECEPTACLE - OWNER'S BEDROOM	20	8
9	20	RECEPTACLE- HOUSEKEEPER'S ROOM	R	0.90	2#12, #12G, 3/4"C		1.80		2#12, #12G, 3/4"C	0.90	R	RECEPTACLE - DRESSING ROOM	20	10
11	20	RECEPTACLE- DAUGHTER'S ROOM	R	0.90	2#12, #12G, 3/4"C			1.62	2#12, #12G, 3/4"C	0.72	R	RECEPTACLE - DRESSING ROOM	20	12
13	20	RECEPTACLE- NURSE'S ROOM	R	0.90	2#12, #12G, 3/4"C	1.65			2#12, #12G, 3/4"C	0.75	H	BBH-3(N)	20/2P	14
15	20	RECEPTACLE- NEW BEDROOM	R	0.90	2#12, #12G, 3/4"C		1.65			0.75	H			16
17	20	RECEPTACLE- SONS'S ROOM	R	0.90	2#12, #12G, 3/4"C			1.65	2#12, #12G, 3/4"C	0.75	H	BBH-3(N)	20/2P	18
19	20	RECEPTACLE - SECOND FLOOR BATHROOMS	R	1.08	2#12, #12G, 3/4"C	1.83				0.75	H			20
21	20	LIGHTING + EF-1 TO 4	L	1.30	2#12, #12G, 3/4"C		2.05		2#12, #12G, 3/4"C	0.75	H	BBH-3(N)	20/2P	22
23	20	LIGHTING + EF-5 & 6	L	1.20	2#12, #12G, 3/4"C			1.95		0.75	H			24
25	20	LIGHTING	L	1.00	2#12, #12G, 3/4"C	1.75			2#12, #12G, 3/4"C	0.75	H	BBH-3(N)	20/2P	26
27	20/2P	BBH-3(N)	H	0.75	2#12, #12G, 3/4"C		1.50			0.75	H			28
29			H	0.75				1.50	2#12, #12G, 3/4"C	0.75	H	BBH-3(N)	20/2P	30
31	20/2P	BBH-3(N)	H	0.75	2#12, #12G, 3/4"C	1.50				0.75	H			32
33			H	0.75			1.50		2#12, #12G, 3/4"C	0.75	H	BBH-3(N)	20/2P	34
35	20/2P	BBH-3(N)	H	0.75	2#12, #12G, 3/4"C			1.50		0.75	H			36
37			H	0.75		2.00			2#12, #12G, 3/4"C	1.25	H	BBH-1(N)	20/2P	38
39	20/2P	BBH-3(N)	H	0.75	2#12, #12G, 3/4"C		2.00			1.25	H			40
41			H	0.75				0.95	2#12, #12G, 3/4"C	0.20	M	EF-11(N)	20	42
TOTAL CONNECTED LOAD (KVA)						9.55	9.34	8.16						

PANEL:	E(N)											MOUNTING:	SURFACE	
208Y/120	VOLTS,	3	PHASE,	4	WIRE							PANEL LOCATION:	SECOND FLOOR	
MAIN CB	225A	MLO:	NA	BUS:	225A	MIN,						FED FROM:	PANEL A	
NOTE: L : LIGHTING, R : RECEPTACLES, H : HVAC LOAD, M : MOTOR LOAD, E : EQUIPMENTS, O : OTHER/MISC. (TYPICAL)														

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	PER PHASE (KVA) B	PER PHASE (KVA) B	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C	2.29			2#12, #12G, 3/4"C	1.25	H	BBH-1(N)	20/2P	2
3			H	1.04			2.29			1.25	H			4
5	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C			2.29	2#12, #12G, 3/4"C	1.25	H	BBH-1(N)	20/2P	6
7			H	1.04		2.29				1.25	H			8
9	20/2P	BBH-2(N)	H	1.04	2#12, #12G, 3/4"C		2.29		2#12, #12G, 3/4"C	1.25	H	BBH-1(N)	20/2P	10
11			H	1.04				2.29		1.25	H			12
13	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C	1.75			2#12, #12G, 3/4"C	0.50	H	BBH-4(N)	20/2P	14
15			H	1.25			1.75			0.50	H			16
17	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C			2.25	2#12, #12G, 3/4"C	1.00	M	MOTORISED DAMPERS	20	18
19			H	1.25		1.68			3-3 + 1#8G, 1"C.	0.43	H			20
21	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C		1.68			0.43	H	MUA-1(N)	20/3P	22
23			H	1.25				1.68		0.43	H			24
25	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C	2.04			3-3 + 1#8G, 1"C.	0.79	H			26
27			H	1.25			2.04			0.79	H	EF-1(N)	20/3P	28
29	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C			2.04		0.79	H			30
31			H	1.25		2.25			2#12, #12G, 3/4"C	1.00	L	LIGHTING -ATTIC	20	32
33	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C		2.82		2#12, #12G, 3/4"C	1.57	H	SAUNA	20/2P	34
35			H	1.25				2.82		1.57	H			36
37	20/2P	BBH-1(N)	H	1.25	2#12, #12G, 3/4"C	11.34			4-3 + 1#8G, 1 1/2"C.	10.09	O	PANEL D(N)	100/3P	38
39			H	1.25			11.34			10.09	O			40
41	20	SPARE						10.09		10.09	O			42
TOTAL CONNECTED LOAD (KVA)						10.04	10.04	10.54						

Location	NEC 2008	NEC 2011	NEC 2014	NEC 2017	NEC 2020
Family Rooms	AFCI	AFCI	AFCI	AFCI	AFCI
Dining Rooms	AFCI	AFCI	AFCI	AFCI	AFCI
Kitchens - 125V Receptacles	GFCI	GFCI	AF/GF	AF/GF	AF/GF
Kitchens - 250V Receptacles	TM	TM	TM	TM	GFCI1
Bedrooms	AFCI	AFCI	AFCI	AFCI	AF/GF1
Living Rooms	AFCI	AFCI	AFCI	AFCI	AFCI
Garage – 125V Receptacles	GFCI	GFCI	GFCI	GFCI	GFCI
Garage – 250V Receptacles	TM	TM	TM	TM	GFCI
Sunrooms	AFCI	AFCI	AFCI	AFCI	AFCI
Parlors	AFCI	AFCI	AFCI	AFCI	AFCI
Libraries	AFCI	AFCI	AFCI	AFCI	AFCI
Dens	AFCI	AFCI	AFCI	AFCI	AFCI
Recreation Rooms	AFCI	AFCI	AFCI	AFCI	AFCI
Closets	AFCI	AFCI	AFCI	AFCI	AFCI
Hallways	AFCI	AFCI	AFCI	AFCI	AF/GF1
Laundry Areas – 125V	GFCI3	GFCI3	AF/GF	AF/GF	AF/GF
Laundry Areas – 250V	TM	TM	TM	TM	GFCI
Basements	GFCI2	GFCI2	GFCI2	GFCI2	AF/GF
Bathrooms	GFCI	GFCI	GFCI	GFCI	GFCI
Dishwasher	TM	TM	AFCI	AF/GF	AF/GF
Outdoor Outlets4 (i.e. A/C unit)	TM	TM	TM	TM	GFCI
Sump Pump	TM	TM	TM	TM	GFCI
Outdoor Receptacles – 125V	GFCI	GFCI	GFCI	GFCI	GFCI
Outdoor Receptacles – 250V	TM	TM	TM	TM	GFCI

TM = Thermal-Magnetic Breaker
AF / AFCI = Arc-Fault Circuit-Interrupter
GF / GFCI = Ground-Fault Circuit-Interrupter
1: GFCI protection required if receptacle outlet is within 6ft of edge of sink (i.e. bedroom bathroom; hallway bathroom, etc.)
2: Unfinished basements
3: Where the receptacle is installed within 6ft of the outside edge of the sink
4: Example of outdoor outlet loads (150V to ground or less; 50A or less; single-phase) are Air Conditioner unit, Septic Aerator, etc.
Refer to the appropriate section of the NEC for further details on the specific requirements.

PANEL SCHEDULE

SCALE: N.T.S