## ELECTRICAL SPECIFICATIONS

- 16.01 A. TI THESE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS UPON WHICH THE CONTRACTOR SHALL SUBMIT PRICE FOR MATERIAL AND LABOR PROVISIONS.
- B. IT IS NOT INTENDED THAT THE PLANS OR SPECIFICATION SHOW OR STATE EVERY DETAILED REQUIREMENT OF THE WORK, BUT RATHER THAT THEY FURNISH ADEQUATE INFORMATION FOR AN EXPERIENCED CONTRACTOR TO PROVIDE A COMPLETELY ACCEPTABLE INSTALLATION. THE GENERAL CONDITIONS FROM A PART OF THESE SPECIFICATIONS WHETHER ATTACHED HERETO OR NOT, SHALL BE CAREFULLY EXAMINED BEFORE SUBMITTING A PROPOSAL. WHERE GENERAL CONDITIONS CLAUSES ARE REPEATED IN THIS SECTION, IT SHALL BE UNDERSTOOD AS CALLING SPECIAL ATTENTION TO THEM, OR AS A FURTHER QUALIFICATION, AND SHALL NOT BE ASSUMED AS OMITTING ANY OTHER CLAUSES. NO GENERAL CONDITIONS REFERRING TO THE WORK INCLUDED HEREIN SHALL BE CONSIDERED AS WAIVED UNLESS SPECIFICALLY STATED HEREIN. ဂ

16.03

WORK NOT INCLUDED

- <sub>D</sub> C. BEFORE SUBMITTING PROPOSAL, EXAMINE ALL PLANS RELATING TO THIS WORK, VERIFY ALL GOVERNING CONDITIONS AT THE SITE, BECOME FULLY INFORMED AS TO THE EXTENT AND CHARACTER OF THE WORK REQUIRED AND ITS RELATION TO THE WORK OF OTHER TRADES.

  SUBMISSION OF A COST PROPOSAL (BID) WILL BE JUDGED AS EVIDENCE THAT THE SITE EXAMINATION HAS BEEN MADE. NO CONSIDERATION WILL BE GRANTED FOR ANY ALLEGED MISUNDERSTANDING OF THE MATERIALS TO BE FURNISHED FOR WORK TO BE DONE. IT BEING UNDERSTOOD THAT THE SUBMISSION OF A PROPOSAL IS IN AGREEMENT TO ALL CONDITIONS REFERRED TO HEREIN OR INDICATED ON THE PLANS.
- ANY DISCREPANCIES BETWEEN THESE SPECIFICATIONS AND THE ACCOMPANYING PLANS, OR THESE SPECIFICATIONS AND PLANS AND THE SPECIFICATIONS OF OTHER TRADES, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO THE SUBMISSION OF THE BID. FAILURE TO COMPLY WITH THE ABOVE SHALL ALLOW THE ARCHITECT TO MAKE A FINAL AND BINDING DECISION AT A LATER DATE AND NO ALLOWANCE WILL BE GIVEN IF THE MORE EXPENSIVE OF THE ITEM IN QUESTION IS SELECTED.

- EXACT LOCATION OF ALL EQUIPMENT, PANELS, PULL BOXES, FEEDERS, FIXTURES, ETC., SHALL BE APPROVED BY THE ARCHITECT, AND OWNER PRIOR TO THE INSTALLATION OF THE SAME.
- CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS, AND ACCESSORIES TO FULFILL APPLICABLE CODES, REGULATIONS, AND THE BEST PRACTICES OF THE TRADE FOR INSTALLATION OF ALL
- J. EXPOSED CONDUITS CAN BE INSTALLED BUT IN NO CASE SHALL BE INSTALLED LESS THAN NINE FEET ABOVE THE FINISHED FLOOR OR AS NOTED. CONDUITS INSTALLED IN THE AREA WHERE HUNG CEILING OR OTHER FURRED SPACES ARE INDICATED SHALL BE INSTALLED CONCEALED. SHOULD ANY WORK REQUIRE SUBSEQUENT MODIFICATION OR RELOCATION TO AVOID INTERFERENCE OR CONFLICTS WITH OTHER WORK, SUCH CHANGES SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER.
- ALL PENETRATIONS THROUGH SLABS AND FIRE RATED PARTITIONS SHALL BE FIRE STOPPED USING APPROVED METHOD TO MAINTAIN L BE FIRE STOPPED USING RESISTANCE RATING. MAINTAIN THE
- THE E.C. SHALL CALL FOR A FINAL PUNCH-LIST WHEN ALL ELECTRICAL WORK IS COMPLETE. IN THE EVENT REPRESENTATIVES OF THIS OFFICE ARRIVE AT THE SITE AND DEEM WORK IS NOT SUFFICIENTLY COMPLETE, NO REVIEW/PUNCH-LIST WILL OCCUR. THE E.C. WILL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH RESCHEDULING THE PUNCH-LIST.
- FURNISHING AND INSTALLING NEW LIGHTING FIXTURES AND LAMPS
- FURNISHING AND INSTALLING NEW FEEDERS, CONDUITS, BRANCH
- ELECTRICAL EQUIPMENT FURNISHED AND RECEPTACLES
- POWER WIRING FOR ALL MOTORS, INCLUDING INSTALLING ALL REQUIRED DISCONNECT SWITCHES AND MOUNTING OF STARTERS

- SLEEVES AND AND INSTALLING TELEPHONE/DATA SYSTEM CONDUITS
- TEMPORARY LIGHT AND POWER CUTTING, CHANNELING, AND PATCHING GROUNDING.
- REMOVAL OF ELECTRICAL SYSTEM AS REQUIRED AND AS INDICATED PLANS. FIRE ALARM SYSTEM MODIFICATIONS

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B. NOTHING CONTAINED IN THESE SPECIFICATIONS OR PLANS SHALL BE SO CONSTRUED AS TO CONFLICT WITH ANY LOCAL, MUNICIPAL, AND NATIONAL BOARD OF THE FIRE UNDERWRITERS REGULATIONS GOVERNING THE INSTALLATION OF WORK SPECIFIED HEREIN. ALL SUCH LAWS, ORDINANCES, AND REGULATIONS, WHERE THEY APPLY TO THIS WORK, ARE HEREBY INCORPORATED INTO AND MADE A PART OF THE SPECIFICATIONS. ALL SUCH REQUIREMENTS SHALL BE SATISFIED AT NO ADDITIONAL EXPENSE TO THE OWNER.

ELECTRICAL WORK SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE STATE ELECTRICAL CODE, LOCAL ORDINANCES, AND OTHER AUTHORITIES EXERCISING JURISDICTION OVER ALL ELECTRICAL

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AND OTHER AUTHORITIES EXERCISING JUFF CONSTRUCTION WORK AND THE PROJECT.

TELEPHONE/DATA WIRING AND DEVICES

CODES, PERMITS, AND INSPECTIONS

FINISH PAINTING.

- F. THE WORK CALLED FOR IN THESE PLANS AND SPECIFICATIONS SHALL
  BE COORDINATED WITH THE STRUCTURE, WORK OF ALL RELATED TRADES,
  AND SHALL BE SO ARRANGED THAT THERE WILL BE NO DELAY IN THE
  PROPER INSTALLATION AND COMPLETION OF ANY PART OF EACH
  RESPECTIVE WORK. WHEREIN IT MAY BE INTERRELATED WITH THIS
  CONTRACT ALL WORK CAN PROCEED IN ITS NATURAL SEQUENCE WITHOUT
  UNNECESSARY DELAY. THE CONTRACTOR IS RESPONSIBLE FOR ANY
  ADDITIONAL COST AND DELAYS IN THE WORK RESULTING FROM
  SUBSTITUTION UNDER THIS DIVISION: INCLUDING, BUT NOT LIMITED TO, ANY
  CHANGES, INDECISION, INSTALLATION OR THE WORK OF OTHER TRADES.
- G. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC (EXCEPT WHERE DIMENSIONED) AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEM AND WORK. FOLLOW ARCHITECTURAL, STRUCTURAL, AND MANUFACTURER'S SHOP DRAWINGS FOR GREATER ACCURACY. CONSULT ENGINEER IN CASE OF DOUBT OR CONFLICT, UNLESS, NOTED, FIXED DIMENSIONS ARE BASED ON THE PRODUCT OF ONE MANUFACTURER, VERIFY DIMENSIONS WITH THE SHOP DRAWINGS OF THE MATERIAL ACTUALLY APPROVED OR PURCHASED.

LIGHTING FIXTURES.

WIRING DEVICES AND PLATES.

- ANY NECESSARY ELECTRICAL SERVICE INTERRUPTIONS SHALL BE AT A TIME CONVENIENT TO THE BUILDING OWNER.

- ຺≻ SCOPE OF WORK
- WITHOUT INTENDING TO LIMIT AND/OR RESTRICT THE VOLUME OF WORK REQUIRED AND SOLELY FOR THE CONVENIENCE OF THE CONTRACTOR, THE WORK OF THIS DIVISION SHALL, IN GENERAL OF THIS DIVISION SHALL OF

- FURNISHING AND INSTALLING NEW RACEWAYS, AND CONNECTIONS FOR LIGHTING FIXTURES, SWITCHES, AND R
- PROVIDE CONNECTIONS TO ALL ELEGOTHER TRADES OR BY THE OWNER.

- INSTALLATION OF NEW ELECTRICAL DISTRIBUTION SYSTEM AND PANELS.

16.09

<u>TESTS</u>

- ANY DEFECTS OR DEFICIENCIES DISCOVERED IN ANY OF THE ELECTRICAL WORK SHALL BE CORRECTED.

- PROPOSAL MUST INCLUDE EVERYTHING REQUIRED TO PROVIDE A COMPLETE INSTALLATION AS CONTEMPLATED IN A SPECIFICATIONS AND PLANS, WHETHER SPECIFICALLY SHOWN OR SPECIFIED OR NOT. INCLUDED ARE LABOR, MATERIALS, EQUIPMENT, LIGHTS, TOOLS, SCAFFOLDING, ETC. NECESSARY TO COMPLETE INSTALLATION OF EVERYTHING DESCRIBED, SHOWN OR REASONABLY IMPLIED.
- 16.05 ALL REQUIRED PERMITS AND INSPECTION CERTIFICATES SHALL BE OBTAINED, PAID FOR, AND MADE AVAILABLE AT THE COMPLETION ALL WORK SHALL BE GUARANTEED TO BE FREE FROM DEFECTS DEFECTIVE MATERIALS OR WORKMANSHIP, AS WELL AS DAMAGE GUARANTEES AND CERTIFICATIONS
- THE DATE OF ACCEPTANCE SHALL BE THE DATE OF THE FINAL PAYMENT FOR THE WORK OR THE DATE OF A FORMAL NOTICE WORK OF ANY/ALL TRADES RESULTING FROM THE SAME, SHALL BE REPLACED OR REPAIRED AS DIRECTED FOR DURATION OF ONE YEAR, FROM THE DATE OF ACCEPTANCE. ACCEPTANCE, WHATEVER IS EARLIER. A FORMAL NOTICE

- NON-DURABLE ITEMS, SUCH AS ELECTRIC LAMPS, SHALL BE REPLACED UP TO THE DATE OF ACCEPTANCE, SUCH THAT THEY SHALL HAVE HAD NO MORE THAN 100 HOURS USE PRIOR TO THIS DATE.
- 16.06 PRIOR TO ASSEMBLING OR INSTALLING THE WORK, CATALOG INFORMATION AND FACTORY ASSEMBLY DRAWINGS, AS REQUIRED FOR PRIOR TO PURCHASING ANY EQUIPMENT OR MATERIAL, A LIST THEIR MANUFACTURERS SHALL BE SUBMITTED FOR APPROVAL SHOP DRAWINGS AND EQUIPMENT SUBMISSIONS
- FIELD INSTALLATION DRAWINGS AS REQUIRED TO EXPLAIN FULLY ALL PROCEDURES INVOLVED IN ERECTING, MOUNTING AND CONNECTING  $^{\prime}$ COMPLETE DEVICES AT TE EXPLANATION AND DESCRIPTION OF ALL FIXTURES, DEVICES, AND ITEMS OF EQUIPMENT, SHALL BE SUBMITTED FOR APPROVAL ₽
- ITEMS OF EQUIPMENT.
- NO EQUIPMENT SHALL BE FABRICATED, DELIVERED, ERECTED, OR RECONNECTED THAN FROM DRAWINGS APPROVED BY THE ENGINEER. SHOP DRAWING IN THE NUMBER DIRECTED SHALL BE SUBMITTED FOR THE PANEL BOARDS AND CIRCUIT BREAKERS
- WIRE AND CABLE AND FITTINGS. FIRE ALARM SYSTEM INCLUDING BATTERY CALCULATIONS AND SAFETY SWITCHES AND MOTOR STARTERS IRING DIAGRAMS
- 16.07 IT SHALL BE UNDERSTOOD THAT APPROVAL OF DRAWINGS WILL NOT BIND THE ENGINEER OR THE OWNER TO THE FINAL ACCEPTANCE OF SUCH EQUIPMENT AS THE COMPLETED INSTALLATION AND TEST OF EQUIPMENT AS A WHOLE MUST BE PROVIDED AND GUARANTEED HEREIN AS SPECIFIED. SAMPLES
- UPON REQUEST BY ARCHITECT OR OWNER, ONE SAMPLE OF EACH OF THE FOLLOWING: SUBMIT FOR APPROVAL
- EACH TYPE OF LIGHTING FIXTURE.

  EACH TYPE OF WIRING DEVICE.

  EACH TYPE OF WIRING DEVICE PLATE.

  RECORD DRAWINGS
- REPRODUCIBLE RECORD DRAWINGS SHALL BE SUPPLIED BY THE CONTRACTOR UPON WHICH CORRECTIONS SHALL BE MADE TO PROVIDE ACCURATE AND COMPLETE RECORD OF THE WORK INSTALLED.
- BEFORE AN APPLICATION FOR THE FINAL ACCEPTANCE OF THE WORK WILL BE CONSIDERED, ALL TESTS DEEMED NECESSARY BY THE ARCHITECT TO SHOW PROPER EXECUTION OF THE WORK SHALL HAVE BEEN PERFORMED AND COMPLETED IN THE PRESENCE OF AN ARCHITECT'S REPRESENTATIVE. SCHEDULE OF ALL TESTING PROCEDURES SHALL BE ARRANGED TO SUIT THE CONVENIENCE OF THE ARCHITECT.

- 16.10
- ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL TYPEWRITTEN DIRECTORIES BEHIND TRANSPARENT PLASTIC COVERS IN METAL FRAMES, IN ALL NEW AND EXISTING PANELS INDICATING TYPE AND LOCATION OF LOAD BEING SERVED BY INDIVIDUAL CIRCUIT BREAKERS.
- ALL PARTS OF EQUIPMENT, SUCH AS PANELS, JUNCTION BOXES, SAFETY SWITCHES, MOTOR STARTER, CIRCUIT BREAKERS, CONDUCTORS . SIMILAR ITEMS SHALL BE IDENTIFIED BY NAME, AT SUPPLY END, "LOAD SUPPLIED", AND AT LOAD END "LOAD SUPPLIED FROM". AND
- 16.11 EQUIPMENT AND MATERIALS
- EQUIPMENT AND MATERIALS FOR PERMANENT INSTALLATION SHALL BE THE PRODUCTS OF RECOGNIZED MANUFACTURER'S AND SHALL BE

FURNISHING MOTORS, MOTOR STARTER AND CONTROL DEVICES CONNECTED TO EQUIPMENT FURNISHED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS. HOWEVER, ELECTRICAL CONTRACTOR WILL ERECT AND WIRE SAME, FURNISH AUXILIARY MOTOR DISCONNECTS AS REQUIRED BY DRAWINGS OR CODE.

- EQUIPMENT AND MATERIALS SHALL:
  WHERE NORMALLY SUBJECTED TO UNDERWRITER'S LABORATORY INC.
  LISTING OR LABELING SERVICES, BE SO LISTED OR LABELED.
  BE WITHOUT BLEMISH OR DEFECT.
- NOT TO BE USED FOR TEMPORARY LIGHT AND POWER PURPOSES WITHOUT ARCHITECT'S AUTHORIZATION.
- BE IN ACCORDANCE WITH THE LATEST APPLICABLE N.E.M.A. STANDARD
- FOR ITEMS WHICH ARE TO BE INSTALLED BUT NOT PURCHASED AS PART OF THE ELECTRICAL WORK, THE ELECTRICAL WORK SHALL INCLUDE: THE COORDINATION OF THEIR DELIVERY.

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- ELECTRICAL RACEWAY AND SUPPORTING SYSTEMS SHALL BE FURNISHED AND INSTALLED COMPLETE, WITH ALL MATERIALS, FITTINGS, CONNECTIONS AND ACCESSORIES NECESSARY TO PROVIDE IN EACH INSTANCE A COMPLETE OPERATING INSTALLATION, AS DESCRIBED HEREIN, AS INDICATED ON THE DRAWINGS, AND/OR AS APPROVED BY THE BUILDING MANAGER OR OWNER.
- E. THE DRAWINGS ARE DIAGRAMMATIC AND GENERALLY INDICATIVE OF THE WORK TO BE INSTALLED, BUT DO NOT SHOW ALL BENDS, FITTINGS, AND BOXES WHICH MAY BE REQUIRED. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE JOB CONDITIONS INCLUDING STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL HIS WORK AND ARRANGE THE SAME ACCORDINGLY, FURNISHING SUCH FITTINGS, BOXES AND SIMILAR ITEMS AS MAY BE REQUIRED TO MEET SUCH CONDITIONS.

16.12

- A. WIRE AND CABLE SHALL BE COPPER, RATED FOR 600 VOLTS, TYPE THHN FOR BRANCH CIRCUITS AND XHHW FOR FEEDERS.

  B. WIRE #10 AWG AND SMALLER SHALL BE SOLID, WIRE #8 AWG AND LARGER SHALL BE STRANDED.

  C. WIRING SHALL BE CONSISTENTLY COLOR CODED THROUGHOUT. FOR 120/208 VOLT SYSTEMS, UTILIZE RED, BLUE, BLACK FOR LINE (PHASE) CONDUCTORS AND WHITE FOR NEUTRAL CONDUCTOR, SWITCH LEG SHALL BE SEPARATELY IDENTIFIED. GROUND CONDUCTOR SHALL BE GREEN. FOR 277/480V SYSTEMS, UTILIZE BROWN, ORANGE, YELLOW FOR LINE (PHASE) CONDUCTORS, AND GREY FOR NEUTRAL CONDUCTOR. GROUND CONDUCTOR SHALL BE GREEN WITH YELLOW TRACER.

  D. MINIMUM SIZE:
- CONTROL: #14 AWG.
- 120 VOLT CIRCUITS OVER 100 FEET IN LENGTH AND 277 VOLT CIRCUITS OVER 200 FEET IN LENGTH FROM THE POINT OF SUP TO THE FIRST OUTLET SHALL BE #10 AWG.
- SPLICES IN BRANCH CIRCUIT WORK SHALL BE MADE TYPE 'R' "SCOTCHLOCK" ELECTRICAL TYPE.
- 王 ALL CONDUCTORS SHALL BE COLOR CODED THROUGHOUT AND NUMBERED AND TAGGED AT EACH JUNCTION BOX, PULL BOX, PANEL, DEVICE WITH SUITABLE FIREPROOF TAGS OR ADHESIVE IDENTIFICATION ₽
- 16.13 힏 CONDUITS AND RACEWAYS
- MOTORS AND A ENCOUNTERED. UID TIGHT FLEXIBLE, GALVANIZED STEEL CONDUIT WITH CONTINUOUS PPER BONDING CONDUCTOR, SHALL BE USED FOR CONNECTIONS TO TORS AND AT OTHER LOCATIONS WHERE VIBRATION MOVEMENT IS
- ₽ UNLESS OTHERWISE INDICATED OR SPECIFIED ALL WIRING SHALL I FURRED SPACES WHENEVER POSSIBLE
- CONDUIT AND FITTINGS SHALL CONFORM TO LATEST ACCEPTABLE STATE CODE AND ALL OTHER CODES HAVING JURISDICTION. CONDUIT SHALL BE 3/4" TRADE SIZE MINIMUM. UNLESS OTHERWISE INDICATED OR SPECIFIED.
- ALL CONDUITS WHICH ARE TO REMAIN EMPTY FOR FUTURE INTRODUCTION OF CONDUCTORS SHALL BE PROVIDED WITH WITH IDENTIFICATION BAND AT BOTH ENDS. A PULL LINE

- BE APPROVED BY BUILDING MANAGER OR OWNER.

- THEIR FIELD MAKE—UP AND INTERNAL WIRING AS MAY BE NECESSARY FOR THEIR OPERATION.

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- LIGHTING AND POWER: #12 AWG, UNLESS OTHERWISE INDICATED.

- ELECTRICAL INSULATION TAPE SHALL BE VINYL PLASTIC TYPE WITH PRESSURE ADHESIVE "SCOTCH" ELECTRICAL TYPE.
- G. BRANCH CIRCUITRY NUMBERS INDICATED ON THE DRAWINGS ON MULTI-CIRCUIT HOMERUNS ARE FOR IDENTIFICATION OF DEVICES OR EQUIPMENT THEY ARE CONNECTED TO AND DO NOT NECESSARILY REFER TO PANELBOARD CIRCUIT NUMBERS. ASSIGNMENT OF BRANCH CIRCUIT NUMBERS SHALL BE PART OF THIS WORK AND INDICATED ON PANEL DIRECTORIES. BRANCH CIRCUITS SHALL BE CONNECTED TO CIRCUITS ON PANELBOARDS SO AS TO SECURE A REASONABLE BALANCE ON THE THREE PHASES. WHERE MORE THAN ONE CIRCUIT WITH A COMMON NEUTRAL IS INSTALLED IN THE SAME CONDUIT, EACH PHASE WIRE SHALL BE CONNECTED TO A DIFFERENT LEG OF THE SYSTEM.

EXIT LIGHTS SHALL BE WIRED ON A SEPARATE CIRCUIT. CIRCUIT BREAKER WITH LOCKING TYPE HANDLE.

TELEPHONE SYSTEM

ALL FLUORESCENT LIGHTING FIXTURES SHALL HAVE ENERGY SAVING LAMPS AND SOLID STATE ELECTRONIC ENERGY SAVING CLASS "P"

STATE CODES.

- 牌 PROVIDE EMPTY CONDUIT WITH PULL LINE 3/4" MINIMUM AT EACH TEL/DATA OUTLET LOCATION. EXTEND IT UP TO 12" ABOVE HUNG CEILING AND TERMINATE WITH PLASTIC BUSHING. PROVIDE 5/8" THICK, 5'-0" WIDE AND 8'-0" HIGH FIRE RETARDANT PLYWOOD BACKBOARD IN TELEPHONE CLOSET. COORDINATE SIZE WITH OWNER'S TELEPHONE SYSTEM VENDOR.
- ALL TELEPHONE/DATA WIRING, JACKS, COVERPLATES, PUNCH DOWN BLOCKS, ETC., ARE FURNISHED AND INSTALLED BY OWNER'S PRIVATE

- STEEL JACKETED METAL CLAD CABLE CAN BE USED FOR LIGHTING AND APPLIANCE BRANCH CIRCUITRY IN VOIDS OF CEILING AND PARTITIONS, PROVIDED THAT THIS TYPE OF WIRING IS ACCEPTABLE TO THE LOCAL BUILDING OFFICIAL OR HIS REPRESENTATIVE.
- JUNCTION BOX AND PULL BOXES SHALL BE PROVIDED WHERE INDICATED OR SPECIFIED AND WHERE NECESSARY TO FACILITATE THE INSTALLATION OF EQUIPMENT OR WIRING .
- OUTLET BOXES
- EACH OUTLET FOR LIGHTING FIXTURE, WALL SWITCH, WALL RECEPTACLE, TELEPHONE, OR OTHER USE SHALL BE PROVIDED WITH AN OUTLET BOX SUITABLE FOR THE USE FOR WHICH THE OUTLET IS TO BE PUT AND TO THE LOCATION IN WHICH IT OCCURS, SECURED FIRMLY IN PLACE AND SET TRUE AND SQUARE WITH THE FINISHED SURFACE.
- CONNECTION TO RECESSED CEILING FIXTURES SUPPLIED WITH PIGTALS MAY BE ARRANGED SO THAT MORE THAN ONE, BUT NOT MORE THAN FOUR, SUCH FIXTURES ARE CONNECTED TO A SINGLE OUTLET BOX. NOT THE SHALL BE SUPPLIED FROM AN OUTLET IN ANOTHER ROOM. THROUGH WALL BOXES FOR BACK TO BACK WIRING NOT PERMITTED. 8
- ALL PARTS OF THE ELECTRICAL INSTALLATION SHALL BE ADEQUATELY SUPPORTED FROM THE BUILDING CONSTRUCTION USING APPROVED CLAMP SCREWS WITH THE INSERTS OF EXPANSION ANCHORS, EXPANSION BOLTS AND TOGGLE BOLTS. "IN NO CASE SHALL THE HUNG CEILING MEMBERS OR WIRES BE USED TO SUPPORT CONDUIT". FASTENINGS, SUPPORTS, AND HANGERS
- ALL FASTENING, SUPPORTS, CLAMPS, ANCHORS, AND SIMILAR ITEMS SHALL BE OF TYPE SUITABLE FOR THE PURPOSE.
- 16.17 WIRING DEVICES
- SINGLE POLE SWITCH, 20 AMP, 120/277 VOLTS. HUBBELL CAT# HBL1221. RECEPTACLE, 20 AMP, 2 POLE, 3 WIRE DUPLEX, 125 VOLT, GROUND TYPE. HUBBELL CAT# 5362 OR APPROVED EQUAL. ALL DEVICES SHALL BE SPECIFICATION GRADE, U.L. APPROVED
- P. COLOR AND TYPE OF ALL DEVICE PLATES SHALL BE APPROVED ARCHITECT PRIOR TO PURCHASE/INSTALLATION.
- THE E.C. SHALL PROGRAM ALL OCCUPANCY SENSORS TO THE SATISFACTION OF THE TENANT. AS A MINIMUM, THE E.C. SHALL PROVIDE (4) HOURS OF TRAINING TO THE TENANT. ALL OCCUPANCY SENSORS SHALL BE FULLY PROGRAMMED AT TIME OF FINAL PUNCH-LIST.
- GROUNDING
- A. ALL ENCLOSURES AND NON CURRENT CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, RACEWAY SYSTEMS AND EQUIPMENT GROUND BUSES SHALL BE EFFECTIVELY GROUNDED TO THE BUILDING GROUNDING SYSTEMS THROUGH THE SYSTEM GROUND CONDUCTORS. METALLIC CONDUITS AND OTHER RACEWAYS AND ENCLOSURES FOR CONDUCTORS SHALL BE METALLIC ALLY JOINED TOGETHER INTO A CONTINUOUS ELECTRICAL CONDUCTOR, AS TO PROVIDE EFFECTIVE ELECTRICAL
- GROUND CONTINUITY SHALL BE MAINTAINED THROUGHOUT CONTINUITY. LIGHTING FIXTURES
- ĖΦ  $\mathcal{C}$ ALL LIGHTING FIXTURES SHALL COMPLY WITH THE STATE ELECTRIC CODE AND SHALL BE U.L. APPROVED.
- ALL LIGHTING FIXTURES SHALL BE APPROVED PRIOR TO PURCHASE. ALL LIGHTING FIXTURES SHALL BE FURNISHED AND INSTALLED
- <sub>D</sub> COMPLETE WITH NECESSARY COMPONENTS, ACCESSORIES, AND LAMPS CORRECT TYPE AND RATING AS INDICATED ON ELECTRICAL DRAWINGS. FIXTURES SHALL BE CAREFULLY SUPPORTED AND ALIGNED WITH NECESSARY HANGERS, SUPPORTING MEMBERS, AND FRAMES FOR PROPER INSTALLATION, ALL AS REQUIRED AND AS APPROVED.
- ALL FIXTURES SHALL BE PROPERLY WIRED AND CONNECTED TO BRANCH CIRCUITS, TESTED AND LEFT READY FOR OPERATION.
- FOR TYPE, MAKE, AND QUANTITIES OF LIGHTING FIXTURES REQUIRED, SEE ELECTRICAL DRAWINGS AND SPECIFICATIONS. FIXTURES AND/OR FIXTURE OUTLET BOXES SHALL BE PROVIDED HANGERS TO ADEQUATELY SUPPORT THE COMPLETE WEIGHT OF FIXTURE. PROVIDE SUPPLEMENTAL SUPPORTS PER ALL LOCAL AND ADDRESS A DEMOLITION AND REMOVAL
  - PROVIDE WATERPROOFING OF ALL EXTERIOR WALL SLAB OR ROOF. OF 3 INCHES ABOVE FLOOR OR L MATERIALS WHICH PENETRATE A FLOOR, ALL SLEEVES SHALL EXTEND A MINIMUM ROOF.

- THE REMOVAL OF MATERIALS AS EQUIPMENT AND MATERIAL FROM NAGER OR OWNER WILL INSPECT AND
- . WHERE EXISTING RECEPTACLES ANI COLUMNS AND/OR EXTERIOR WALL REMOVE RECEPTACLE AND CAP OU PARTITIONS TO BE REMOVED SHAL REMOVED AS WELL. AND/OR SWITCHES ARE LOCATED IN WALLS, AND ARE NOT TO BE REUSED,
  OUTLET BOX. RECEPTACLES SHOWN ON SHALL HAVE ALL WIRING AND CONDUIT

THE SHIPYARD
BREWING COMPANY
86 Newbury Street
Portland, ME 04101
(800) 789-0684

The Shipyard

Main Terminal - Lower Level

Portland International Jetport

1001 Westbrook Street

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- VIDED FOR EACH PANEL. EACH THE SAME MATERIAL AS THE PHASE
- 1. UL STANDARDS

- 16.22 FIRE ALARM EXISTING EQUIPMENT
- ⋋ THE EXISTING FACILITY IS EQUIPPED WITH A FIRE ALARM SYSTEM WHICH IS TO BE EXPANDED IN THE WORK AREA. ALL NEW EQUIPMENT SHALL BE OF THE SAME MANUFACTURER AS OF THE EXISTING SYSTEM, INCLUDING PULL STATIONS, SMOKE DETECTORS, DUCT SMOKE DETECTORS, SPRINKLER FLOW AND TAMPER AND AUDIBLE/VISUAL SIGNALS, ETC.
- IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO REVIEW THE SCOPE OF WORK AND PROPOSED EQUIPMENT WITH THE SUPERINTENDENT OF FIRE ALARMS FOR THE CITY PRIOR TO PURCHASE AND INSTALLATION. THE E.C. SHALL ALSO NOTIFY THE LOCAL FIRE DEPARTMENT AND THE OWNER AT LEAST 48 HOURS IN ADVANCE OF ANY MODIFICATIONS, POSSIBLE DISRUPTION TO, OR ASSOCIATED WORK ON THE EXISTING FIRE ALARM SYSTEM.
- P. THE E.C. SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED DUE TO THE NEW DEVICES/APPLIANCES PROVIDED UNDER THIS CONTRACT.
- ALL FIRE ALARM WIRING SHALL BE INSTALLED IN CONDUIT. ALL CONDUIT SHALL HAVE A RED STRIPE PAINTED EVERY 10"-0". ALL JUNCTION BOXES AND COVERS SHALL BE PAINTED RED. FIRE ALARM RATED "MC" CABLE MAY BE USED WHERE RUN CONCEALED IF ACCEPTABLE TO THE LOCAL FIRE DEPARTMENT.
- FIRESTOPPING, SMOKEPROOFING AND WATERPROOFING
- PROVIDE FIRESTOP OR SMOKESTOP BETWEEN SLEEVES AND CONDUIT MANUFACTURED BY BIO FIRE SHIELD, INC., OR DOW CORNING CORP. AS FOLLOWS:
- DOW CORNING SILICON RTV FOAM.
   DOW CORNING 96-081 RTV SILICON ADHESIVE SEALANT.
   MINERAL FIBER BOARD, MATTING AND PUTTY.

CHITECTS

T E L: (508) 746-4646 F A X: (508) 746-1236 E-M A I L: info@lloydarch.com

- REMOVE ALL ELECTRICAL EQUIPMENT, WIRING AND OTHER ELECTRICAL WORK AS REQUIRED. DISCONNECT LOAD AND LINE END OF CONDUCTORS FEEDING DEVICES WHICH ARE TO BE REMOVED OR ABANDONED, REMOVE CONDUCTORS NO LONGER IN USE. CUT BACK TO FLOOR, WALL, OR CEILING AND PLUG BOTH ENDS OF CONCEALED CONDUITS MADE OBSOLETE BY THIS ALTERATION. REMOVE EXPOSED OR ABANDONED CIRCUITS AND OUTLETS. REMOVE MATERIAL AND EQUIPMENT AND DISPOSE OF AS
- WHEREVER IT IS REQUIRED TO DISCONNECT OR REMOVE ANY PART OF AN EXISTING CIRCUIT, IMMEDIATELY RECONNECT THAT CIRCUIT OR REESTABLISH SERVICE IN THE REMAINING PORTION OF THE CIRCUIT.
- THE WORK SHALL ALSO INCLUDE THE REDIRECTED. PRIOR TO REMOVING EQUIPM PROJECT SITE, THE BUILDING MANAGER (ADVISE WHICH ITEMS WILL BE STORED.
- WHERE PRESENT WORK IS DAMAGED IN THE EXECUTION OF THIS CONTRACT, OR WHERE OPENINGS ARE LEFT DUE TO THE REMOVAL OF CONDUITS, EQUIPMENT, OR APPARATUS, THE SAME SHALL BE REPAIRED OR CLOSED UP TO CORRESPOND IN MATERIAL, QUALITY, SHAPE, AND FINISH WITH THAT OR SIMILAR AND ADJOINING WORK, UNLESS OTHERWISE CALLED FOR.

Specifications

Electrical

Scale:

As Noted

Job No.: 07417

Issued: 12/11/07

- 16.21
- A. PANEL BOARDS SHALL CONSIST OF FACTORY COMPLETED DEADFRONT ASSEMBLIES OF BACK PANS, MAIN BUSSES, OVER CURRENT AND SWITCHING UNITS, SHEET METAL CABINETS AND TRIMS. THEY SHALL BE SO DESIGNED THAT SWITCHING AND OVER CURRENT DEVICES CAN BE REPLACED WITHOUT DISTURBING ADJACENT UNITS AND WITHOUT REMOVING THE MAIN BUS CONNECTORS, SO THAT CIRCUITS MAY BE CHANGED WITHOUT MACHINING, DRILLING, OR TAPPING.

F. SHOULD ANY DAMAGE DUE TO THE EXECUTION OF THIS CONTRACT OCCUR TO THE FURNITURE, FIXTURES, OR ANY OTHER EQUIPMENT OR APPARATUS, SUCH DAMAGES SHALL BE PROPERLY REPAIRED WITH THE SUPPLY OF NEW ARTICLES AND MADE GOOD WITHOUT EXTRA CHARGE.

G. WHERE REMOVAL OF EXISTING ELECTRICAL EQUIPMENT WILL RESULT IN OUTAGES IN AREA NOT TO BE DEMOLISHED, THIS CONTRACTOR SHALL COORDINATE IN ADVANCE AND OBTAIN THE APPROVAL OF THE BUILDING MANAGER OR OWNER.

Item

Date

- B. BUS BARS FOR THEIR MAINS SHALL BE OF COPPER HAVING CURRENT CAPACITIES AS INDICATED AND SIZED FOR SUCH CAPACITIES IN ACCORDANCE WITH UNDERWRITER LABORATORY STANDARDS. UNLESS OTHERWISE NOTED, FULL SIZE NEUTRAL BARS SHALL BE INCLUDED. BUS BAR TAPS FOR PANELS WITH SINGLE POLE BRANCHES SHALL BE ARRANGED FOR SEQUENCE PHASING OF THE BRANCH CIRCUIT DEVICES. BUSSING SHALL BE BRACED THROUGHOUT TO CONFORM TO INDUSTRY STANDARD PRACTICE GOVERNING SHORT CIRCUIT STRESSES IN PANEL BOARDS. PHASE BUSSING SHALL BE FULL HEIGHT WITHOUT REDUCTION.
- A GROUND BUS SHALL BE PROVI GROUND BUS SHALL BE OF TI AND NEUTRAL BUSES.
- PANEL BOARDS SHALL COMPLY STANDARDS: WITH THE FOLLOWING INDUSTRY
- PANEL BOARDS ( CABINET & BOXES UL67 3 — UL50

2. NEMA STANDARD - PB1

- CIRCUIT BREAKERS FOR PANEL O MOLDED CASE TYPE, QUICK-MAKE AUTOMATIC OPERATION. OR INDIVIDUAL MOUNTING SHALL BE KE, QUICK-BREAK, OR MANUAL OR
- AMPERE RATING AND NUMBER OF POLES SHALL BE AS INDICATED ON THE DRAWINGS.
- BREAKERS SHALL BE TYPE AS MANUFACTURED BY SQUARE D APPROVED EQUAL. MINIMUM CIRCUIT BREAKER INTERRUPTING CAPACITY SHALL BE 10,000 SYM RMS AMPERES.
- œ
- THE EXISTING FIRE ALARM SYSTEM SHALL BE REPROGRAMMED AS REQUIRED TO INDICATE THE RENOVATED AREAS, REVIEW ZONING WITH THE OWNER'S REPRESENTATIVE AND LOCAL FIRE MARSHALL. THE E.C. SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THIS WORK
- PROVIDE ALL FIRE ALARM WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THE E.C. SHALL FURNISH BATTERY CALCULATIONS WHICH INCORPORATE ALL EXISTING EQUIPMENT IN ADDITION TO ALL NEW APPLIANCES/DEVICES.

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