1.1 GENERAL REQUIREMENTS

REQUIREMENTS UNDER DIVISION ONE AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS SHALL BE A PART OF THIS SECTION. THE CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH ITS CONTENTS AS TO REQUIREMENTS THAT AFFECT THIS DIVISION OR SECTION. THE WORK REQUIRED UNDER THIS SECTION INCLUDES MATERIAL. EQUIPMENT, APPLIANCES, TRANSPORTATION, SERVICES, AND LABOR REQUIRED TO COMPLETE THE ENTIRE SYSTEM AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS.

THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECTS ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE, SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND/OR OWNER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

1.2 INSPECTION OF SITE

PRIOR TO SUBMITTING BID, VISIT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1.3 MATERIAL AND WORKMANSHIP

PROVIDE NEW MATERIAL, EQUIPMENT, AND APPARATUS UNDER THIS CONTRACT UNLESS OTHERWISE STATED HEREIN, OF BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE, AND FREE FROM ANY DEFECTS. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT NECESSARILY INTENDED TO DESIGNATE THE REQUIRED TRIM, WRITTEN DESCRIPTIONS OF THE TRIM GOVERN MODEL NUMBERS.

WORK PERFORMED UNDER THIS CONTRACT SHALL PROVIDE A NEAT AND "WORKMANLIKE" APPEARANCE WHEN COMPLETED, TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER. WORKMANSHIP SHALL BE THE FINEST POSSIBLE BY EXPERIENCED MECHANICS. INSTALLATIONS SHALL COMPLY WITH APPLICABLE CODES AND LAWS.

THE COMPLETE INSTALLATION SHALL FUNCTION AS DESIGNED AND INTENDED WITH RESPECT TO EFFICIENCY, CAPACITY, NOISE LEVEL, ETC. ABNORMAL NOISE CAUSED BY RATTLING EQUIPMENT, PIPING, DUCTS, AIR DEVICES, AND SQUEAKS IN ROTATING COMPONENTS WILL NOT BE ACCEPTABLE. IN GENERAL, MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY. LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTED.

REMOVE FROM THE PREMISES WASTE MATERIAL PRESENT AS A RESULT OF WORK, INCLUDING CARTONS, CRATING, PAPER, STICKERS, AND/OR EXCAVATION MATERIAL NOT USED IN BACKFILLING, ETC. CLEAN EQUIPMENT INSTALLED UNDER THIS CONTRACT TO PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION OF THE WORK.

REPAIR OR REPLACE PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THE SATISFACTION OF AUTHORITIES AND REGULATIONS HAVING JURISDICTION.

1.4 COORDINATION

COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT THE VARIOUS COMPONENTS OF THE SYSTEMS WILL BE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO THOSE ITEMS REQUIRING MAINTENANCE. COMPONENTS WHICH ARE INSTALLED WITHOUT REGARD TO THE ABOVE SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.

UNLESS OTHERWISE INDICATED, THE GENERAL CONTRACTOR WILL PROVIDE CHASES AND OPENINGS IN BUILDING CONSTRUCTION REQUIRED FOR INSTALLATION OF THE SYSTEMS SPECIFIED HEREIN. THE CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH INFORMATION WHERE CHASES AND OPENINGS ARE REQUIRED, KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND EXECUTE WORK IN A MANNER AS TO NOT INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.

FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALE DIMENSIONS. CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE BUILDING, AS VARIATIONS MAY OCCUR. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION.

PROVIDE MATERIALS WITH TRIM THAT WILL PROPERLY FIT THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT INTENDED TO DESIGNATE THE REQUIRED TRIM.

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR DUCTWORK LAYOUT TO THE CONSTRUCTION MANAGER FOR OWNER APPROVAL PRIOR TO INSTALLATION.

1.5 ORDINANCES AND CODES

WORK PERFORMED UNDER THIS CONTRACT SHALL, AT A MINIMUM, BE IN CONFORMANCE WITH APPLICABLE NATIONAL AND STATE CODES HAVING JURISDICTION. EQUIPMENT FURNISHED AND ASSOCIATED INSTALLATION WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN STRICT COMPLIANCE WITH CURRENT APPLICABLE CODES ADOPTED BY THE LOCAL AHJ INCLUDING ANY AMENDMENTS AND STANDARDS AS SET FORTH BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), UNDERWRITERS LABORATORIES (UL), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AMERICAN SOCIETY OF TESTING MATERIALS (ASTM), AND OTHER NATIONAL STANDARDS AND CODES WHERE APPLICABLE. WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THEIR REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.

PROCURE PERMITS AND LICENSES REQUIRED FOR THE ACCOMPLISHMENT OF THE WORK HEREIN DESCRIBED. WHERE REQUIRED, OBTAIN AND FURNISH CERTIFICATES OF INSPECTION TO THE OWNER. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR VIOLATIONS OF THE LAW.

1.6 PROTECTION OF EQUIPMENT AND MATERIALS

STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE. COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, OR PHYSICAL DAMAGE. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND CONTRACTOR IS OBLIGATED TO FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND AS APPROVED BY OWNER.

KEEP PREMISES CLEAN FROM FOREIGN MATERIAL CREATED DURING WORK PERFORMED UNDER THIS CONTRACT, PIPING. EQUIPMENT, ETC., SHALL HAVE A NEAT AND CLEAN APPEARANCE AT THE TERMINATION OF THE WORK.

PLUG OR CAP OPEN ENDS OF DUCTWORK AND PIPING SYSTEMS WHILE STORED OR INSTALLED DURING CONSTRUCTION WHEN NOT IN USE THE PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

1.7 SUBSTITUTIONS

THE BASE BID SHALL INCLUDE ONLY THE PRODUCTS FROM MANUFACTURERS SPECIFICALLY NAMED IN THE DRAWINGS AND SPECIFICATIONS. NO SUBSTITUTION WILL BE CONSIDERED PRIOR TO RECEIPT OF BIDS UNLESS WRITTEN REQUEST FOR APPROVAL TO BID HAS BEEN RECEIVED BY THE ENGINEER AT LEAST TEN CALENDAR DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS. EACH SUCH REQUEST SHALL INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED AND A COMPLETE DESCRIPTION OF THE PROPOSED SUBSTITUTE INCLUDING DRAWINGS, CUTS, PERFORMANCE AND TEST DATA AND OTHER INFORMATION NECESSARY FOR AN EVALUATION. A STATEMENT SETTING FORTH CHANGES IN OTHER MATERIALS, EQUIPMENT OR OTHER WORK THAT INCORPORATION OF THE SUBSTITUTE WOULD REQUIRE SHALL BE INCLUDED. THE BURDEN OF PROOF OF THE MERIT OF THE PROPOSED SUBSTITUTE IS UPON THE PROPOSER. THE ENGINEER'S DECISION OF APPROVAL OR DISAPPROVAL TO BID OF A PROPOSED SUBSTITUTION SHALL BE FINAL.

THE TERMS "APPROVED", "APPROVED EQUAL", AND "EQUAL" REFER TO APPROVAL BY THE ENGINEER AS AN ACCEPTABLE ALTERNATE BID. NO SUBSTITUTIONS WILL BE CONSIDERED THAT ARE NOT BID AS AN ALTERNATE. NO MATERIAL SUBSTITUTIONS SHALL BE CONSIDERED FOR APPROVAL PRIOR TO AWARD OF CONTRACT.

COORDINATE AND VERIFY WITH OTHER TRADES WHETHER OR NOT THE SUBSTITUTED EQUIPMENT CAN BE INSTALLED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITHOUT MODIFICATION TO ASSOCIATED SYSTEMS OR ARCHITECTURAL OR ENGINEERING DESIGN. INCLUDE ADDITIONAL COSTS FOR ARCHITECTURAL AND ENGINEERING DESIGN FEES IN BID IF DRAWING MODIFICATIONS ARE REQUIRED BECAUSE OF SUBSTITUTED EQUIPMENT.

1.8 OPERATION AND MAINTENANCE INSTRUCTIONS

COLLECT AND COMPILE A COMPLETE BROCHURE OF FIXTURES, MATERIALS, AND EQUIPMENT FURNISHED AND INSTALLED ON THIS PROJECT. INCLUDE OPERATIONAL AND MAINTENANCE INSTRUCTIONS, MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, PARTS LISTS, APPROVED SHOP DRAWINGS, AND DESCRIPTIVE LITERATURE FURNISHED BY THE MANUFACTURER. INCLUDE AN INSIDE COVER SHEET THAT LISTS THE PROJECT NAME, DATE, OWNER, ARCHITECT, ENGINEER, GENERAL CONTRACTOR, SUBCONTRACTOR, AND AN INDEX OF CONTENTS.

SUBMIT COPIES OF LITERATURE BOUND IN APPROVED BINDERS TO THE ARCHITECT AND OWNER AT THE TERMINATION OF THE WORK, PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF MECHANICAL SYSTEMS WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS DEEMED COMPLETE BY THE ARCHITECT, ENGINEER, AND OWNER.

1.9 SPARE PARTS

FURNISH TO OWNER, WITH RECEIPT, THE FOLLOWING SPARE PARTS FOR THE EQUIPMENT FURNISHED FOR THIS PROJECT:

ONE SET OF SPARE FILTERS OF EACH TYPE REQUIRED FOR EACH UNIT. IN ADDITION TO THE SPARE SET OF FILTERS, INSTALL NEW FILTERS PRIOR TO TESTING, ADJUSTING, AND BALANCING WORK AND BEFORE TURNING SYSTEM OVER TO OWNER.

FURNISH ONE COMPLETE SET OF BELTS FOR EACH FAN.

FURNISH THREE OPERATING KEYS FOR EACH TYPE OF AIR OUTLET AND INLET THAT REQUIRES THEM.

1.10 WARRANTIES

WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN, OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 1.

WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO

PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1.11 CUTTING AND PATCHING

PERFORM CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING. DO NO CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

1.12 ROUGH-IN

COORDINATE WITHOUT DELAY ROUGHING-IN WITH GENERAL CONSTRUCTION. CONCEAL PIPING AND CONDUIT ROUGH-IN EXCEPT IN UNFINISHED AREAS WHERE OTHERWISE SHOWN

1.13 STRUCTURAL STEEL

STRUCTURAL STEEL USED FOR PIPE SUPPORTS, EQUIPMENT SUPPORTS, ETC., SHALL BE NEW, CLEAN, AND CONFORM TO ASTM DESIGNATION A-36.

SUPPORT PLUMBING AND MECHANICAL EQUIPMENT AND PIPING FROM THE BUILDING STRUCTURE. DO NOT SUPPORT PLUMBING EQUIPMENT FROM CEILINGS. OTHER MECHANICAL OR ELECTRICAL COMPONENTS, AND OTHER NON-STRUCTURAL ELEMENTS.

1.14 ACCESS DOORS

PROVIDE ACCESS DOORS IN CEILINGS AND WALLS WHERE INDICATED OR REQUIRED FOR ACCESS TO CONCEALED VALVES AND EQUIPMENT INSTALLED UNDER THIS SECTION. PROVIDE CONCEALED HINGES, SCREWDRIVER-TYPE LOCK, ANCHOR STRAPS; MANUFACTURED BY MILCOR, ZURN, TITUS, OR EQUAL. OBTAIN ARCHITECT'S APPROVAL OF TYPE, SIZE, LOCATION, AND COLOR BEFORE ORDERING.

1.15 PENETRATIONS

SEAL FLOOR, EXTERIOR WALL AND ROOF PENETRATIONS WATER AND WEATHER TIGHT WITH APPROPRIATE NON-SHRINK, NON-HARDENING COMMERCIAL CONSTRUCTION SEALANT. SEAL ROOF PENETRATIONS WITH FOUR POUND PER SQUARE FOOT LEAD FLASHING. PROVIDE A SLEEVE, AND SEAL NON-FIRE-RATED FLOOR AND WALL PENETRATIONS WITH FIBERGLASS PACKING AND SILICONE CAULK (FOR ACOUSTICAL INSULATION).

COORDINATE FIRE RATING REQUIREMENTS AND LOCATIONS WITH THE ARCHITECT. SEAL PENETRATIONS OF FIRE-RATED ASSEMBLIES WITH 3M #CP-25 FIRE BARRIER CAULK (PROVIDE THICKNESS AND METHOD AS REQUIRED AND RECOMMENDED BY MANUFACTURER) TO MAINTAIN THE FIRE RESISTANCE RATING OF FIRE-RATED ASSEMBLIES.

SEAL EXTERIOR WALL PENETRATIONS BELOW GRADE WITH CAST IRON WALL PIPES AND MODULAR MECHANICAL SLEEVE SEALS. MANUFACTURED BY THUNDERLINE/LINK SEAL, CALPICO, INC AND METRAFLEX.

PROVIDE SLEEVES FOR HORIZONTAL PIPE PASSING THROUGH OR UNDER THE FOUNDATION. SLEEVES SHALL BE CAST IRON SOIL PIPE TWO NOMINAL PIPE SIZES LARGER THAT THE PIPE SERVED.

PROVIDE SLEEVES FOR VERTICAL PIPE PASSING THROUGH SLAB ON GRADE. SLEEVES SHALL BE SCHEDULE 40 PVC PIPE, TWO NOMINAL PIPE SIZES LARGER THAN THE PIPE SERVED. SEAL WATER-TIGHT WITH SILICONE CAULK.

2: HEATING, VENTILATION, AND AIR CONDITIONING

2.1 DUCTWORK

CONTRACTOR SHALL PROVIDE ANY DUCTWORK NECESSARY FOR A COMPLETE INSTALLATION OF HVAC SYSTEMS (INCLUDING EXHAUST SYSTEMS). ALL DUCTWORK IDENTIFICATION AND INSTALLATION TO ADHERE TO ASHRAE AND SMACNA STANDARDS AND ALL GOVERNING CODES.

DUCTWORK SHALL BE A MINIMUM 26 GAUGE GALVANIZED STEEL SHEET METAL DUCTWORK.

SUPPLY DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS FOR A TWO-INCH POSITIVE PRESSURE RATING AND SEAL CLASS B.

RETURN DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS FOR A ONE-INCH NEGATIVE PRESSURE RATING AND SEAL CLASS C.

EXHAUST DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS FOR A ONE-INCH POSITIVE PRESSURE RATING AND SEAL CLASS C.

ROUND DUCT RUNS SHALL BE CONSTRUCTED OF METAL PIPE WITH EXTERNAL SLEEVE INSULATION.

DUCTWORK CONNECTIONS TO AIR DEVICES MUST BE MADE WITH HARDPIPE ELBOWS, COVERED WITH SLEEVE INSULATION. FLEX DUCT MUST NOT BE UTILIZED FOR A 90 DEGREE CONNECTION TO AN AIR DEVICE.

VOLUME/BALANCING DAMPERS SHALL BE PROVIDED IN ALL BRANCH DUCT TAKE-OFFS FROM THE MAIN TRUNKS, UNLESS NOTED OTHERWISE ON PLANS. LOCATE DAMPERS A MINIMUM OF 4'-0" AWAY FROM AIR DEVICES.

A MAXIMUM OF 5'-0" OF FLEX DUCT MAY BE USED FOR FINAL CONNECTION OF AIR DEVICES.

FLEX DUCT MUST BE PROPERLY SUPPORTED WITH ONE INCH STRAPS AND CUT TO PROPER LENGTH TO PREVENT SAGGING.

FLEX DUCT SHALL BE OWENS-CORNING FOIL-BACK HIGH QUALITY U/L APPROVED OR EQUAL. PLASTIC WRAPPED FLEX DUCT IS NOT ACCEPTABLE.

DUCTWORK SHALL BE CONNECTED TO FANS, FAN CASINGS, AND FAN PLENUMS BY MEANS OF FLEXIBLE CONNECTIONS.

MITERED ELBOWS 45 DEGREES AND GREATER SHALL HAVE SINGLE THICKNESS TURNING VANES OF SAME GAUGE AS DUCTWORK. 2.2 INSULATION

SUPPLY AND RETURN DUCTWORK INSIDE THE BUILDING SHALL BE INSULATED WITH EXTERNALLY WRAPPED 2" THICK GLASS FIBER DUCT WRAP.

SUPPLY AND RETURN DUCTWORK LOCATED OUTSIDE THE BUILDING SHALL BE INSULATED WITH EXTERNALLY WRAPPED 2-1/2" THICK GLASS FIBER DUCT WRAP WITH A MINIMUM R-VALUE OF 8. ADDITIONALLY, THE DUCT AND INSULATION SHALL BE WRAPPED WITH EMBOSSED ALUMINUM JACKETING AND SEALED WEATHER TIGHT.

DEDICATED OUTSIDE AIR SUPPLY AND RELIEF DUCTWORK INSIDE THE BUILDING SHALL BE INSULATED WITH 2" DUCT WRAP WITH A MINIMUM R-VALUE OF 6.

2.3 PIPING

REFER TO PLUMBING SPECIFICATIONS FOR GAS AND CONDENSATE PIPING SPECIFICATIONS.

2.4 FINAL TESTING AND ADJUSTMENTS

AIR BALANCE SHALL BE PERFORMED BY AN INDEPENDENT AIR BALANCE CONTRACTOR. BALANCE EACH SUPPLY, RETURN, OUTSIDE AIR DEVICE WITHIN 5% OF REQUIREMENTS AND FURNISH A REPORT TO THE CONSTRUCTION MANAGER. THE ENTIRE HVAC SYSTEM MUST BE FULLY OPERABLE, BALANCED, AND APPROVED BY OWNER'S REPRESENTATIVE ON THE DAY TENANT OPENS FOR BUSINESS.

ADJUST THERMOSTATS AND CONTROL DEVICES TO OPERATE AS INTENDED. ADJUST BURNERS, PUMPS, FANS, ETC. FOR PROPER AND EFFICIENT OPERATION. CERTIFY TO ARCHITECT THAT ADJUSTMENTS HAVE BEEN MADE AND THAT SYSTEM IS OPERATING SATISFACTORILY. CALIBRATE, SET AND ADJUST AUTOMATIC TEMPERATURE CONTROLS. CHECK PROPER SEQUENCING OF INTERLOCK SYSTEMS, AND OPERATION OF SAFETY CONTROLS.

VERIFY ECONOMIZER OPERATION PER MANUFACTURER PROCEDURE WHEN APPLICABLE.

PROVIDE AIR DEVICES AS SCHEDULED ON THE DRAWINGS.

MAINTAIN NOISE LEVEL OF NC-30 OR LESS.

ALL AIR TERMINAL DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS IN ORDER TO HANDLE THE DESIGNED AIR FLOW CAPACITIES WITH A MINIMUM AMOUNT OF NOISE AND STATIC PRESSURE.

PROVIDE AIR DEVICES WITH WHITE ENAMEL FINISH UNLESS NOTED OTHERWISE.

2.6 CONTROLS

COORDINATE LOCATIONS FOR THERMOSTATS AND SENSORS FOR ROUGH-IN

SMOKE DETECTORS SHALL BE FACTORY INSTALLED AND SHALL DISABLE HVAC UNIT OPERATION UPON ACTIVATION.

2.7 ELECTRICAL WIRING

ALL PROVISIONS FOR LOW VOLTAGE WIRING SHALL BE PERFORMED BY THE CONTRACTOR UNLESS CODES OR LABOR SITUATIONS DO NOT PERMIT. IF THE CONTRACTOR CANNOT PERFORM LOW VOLTAGE WIRING, THE CONTRACTOR SHALL INFORM THE GENERAL CONTRACTOR, AS PART OF THE HVAC BID DOCUMENT, TO HAVE THE ELECTRICAL SUBCONTRACTOR INCLUDE THIS WORK IN THEIR

ALL ELECTRICAL POWER WIRING TO INCLUDE FINAL CONNECTIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR'S **ELECTRICAL SUBCONTRACTOR**

2.8 REMODEL WORK

REMOVE ALL UNUSED EQUIPMENT, DUCTWORK, PIPING AND ASSOCIATED SUPPORTS. CAP DUCTWORK AND PIPING AT MAINS AND SEAL AIR AND WATER TIGHT.

PROVIDE ITEMS OF HVAC SYSTEMS MODIFICATION REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS OR NECESSARY FOR PROPER OPERATION. MATCH EXISTING MATERIALS AND CONSTRUCTION TECHNIQUES WHEN MODIFYING EXISTING SYSTEMS UNLESS SPECIFIED OTHERWISE. COORDINATE ADDITIONAL REQUIREMENTS WITH GENERAL CONTRACTOR

SEAL AIRTIGHT EXISTING DUCTWORK REQUIRED TO BE ABANDONED IN PLACE OR NOT IN USE AT THE TERMINATION OF THE WORK CAP AND SEAL WEATHERTIGHT EXISTING ROOF CURBS AND ROOF OPENINGS TO BE ABANDONED IN PLACE AS A RESULT OF

EQUIPMENT REMOVAL CLEAN AND REBALANCE EXISTING DUCTWORK, DIFFUSERS, REGISTERS, AND GRILLES INTENDED FOR REUSE AS REQUIRED OR AS

CLEAN AND REFURBISH EXISTING HVAC EQUIPMENT INTENDED FOR REUSE AS REQUIRED FOR PROPER OPERATION INCLUDING REPLACEMENT OF FILTERS, BELTS, MOTORS, REMOTE CONTROLS, AND SAFETY INTERLOCKS.

COMPLY WITH THE SCHEDULE OF OPERATIONS AS OUTLINED IN THE ARCHITECTURAL PORTIONS OF THIS SPECIFICATION. BUILDING SHALL BE IN CONTINUOUS OPERATION. ACCOMPLISH WORK REQUIRING INTERRUPTION OF BUILDING OPERATION AT A TIME WHEN THE BUILDING IS NOT IN OPERATION, AND ONLY WITH WRITTEN APPROVAL OF BUILDING OWNER AND/OR TENANT COORDINATE INTERRUPTION OF BUILDING OPERATION WITH THE OWNER AND/OR TENANT A MINIMUM OF SEVEN DAYS IN ADVANCE OF WORK.

2.9 CONTRACTOR RESPONSIBILITIES

INDICATED ON DRAWINGS.

AFTER COMPLETION OF THE WORK DESCRIBED IN THIS SPECIFICATION AND SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVING ALL LABELS AND STICKERS NOT CONTAINING OPERATION INSTRUCTION. CONTRACTOR SHALL REMOVE CRATING DEBRIS, LEAVING THE INSTALLATION FINISHED AND READY FOR OPERATION, INCLUDING CLEAN FILTERS IN AIR HANDLING UNITS.

MECHANICAL GENERAL NOTES

NOTES APPLY TO ALL MECHANICAL SHEETS.

EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK.

PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS.

EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE

. DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.

CONTRACTOR AT NO EXTRA COST TO THE OWNER.

- ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS NOTED OTHERWISE.
- NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
- DUCTWORK IDENTIFICATION AND INSTALLATION SHALL ADHERE TO GOVERNING CODES.

10. INSTALL DUCTWORK AND PIPING PARALLEL TO BUILDING

- COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED. 11. OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK AND PIPING SHALL BE FASTENED TO BUILDING
- JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF. 12. COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO

ENABLE SERVICE OF EQUIPMENT.

- 13. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
- 14. COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
- 15. SPRINKLER HEAD AND LIGHTING FIXTURE LOCATIONS TAKE PRECEDENCE OVER DIFFUSER LOCATIONS. ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID, SPRINKLER, AND LIGHTING LOCATIONS.
- 16. ALL CEILING DIFFUSERS ARE 4-WAY PATTERN UNLESS NOTED OTHERWISE.
- 17. LOCATE AND SET THERMOSTATS AT LOCATIONS SHOWN ON PLANS, VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL DEVICES WITH TOP OF DEVICE AT MAXIMUM 48" AFF TO MEET ADA REQUIREMENTS UNLESS NOTED OTHERWISE ON PLANS. INSTALL WIRING IN CONDUIT PROVIDED BY DIVISION 16.

18. DUCTWORK CROSSING FIRE RATED WALLS OR OTHER FIRE RATED ASSEMBLIES SHALL BE MINIMUM 26 GAUGE SHEET

19. PROVIDE FIRE OR FIRE/SMOKE DAMPERS, AS APPLICABLE, IN

ON THE PLANS. FIRE AND FIRE/SMOKE DAMPERS SHALL

DUCTWORK AT CEILINGS AND WALLS AT LOCATIONS SHOWN

CONFORM TO NFPA AS APPLICABLE. COORDINATE SLEEVE LENGTH WITH REQUIREMENTS OF INSTALLED LOCATION. 20. PROVIDE WALL OR DUCT ACCESS PANELS OR DOORS FOR ACCESS TO FIRE AND FIRE/SMOKE DAMPERS. ACCESS PANEL OR DOOR SHALL BE MINIMUM SIZE OF 10" BY 10" AND SHALL BE INSTALLED WITHIN 12" OF DAMPER, PROVIDE A

REMOVABLE DUCT SECTION WHERE DUCT SIZE IS TOO SMALL

21. PROVIDE A MANUAL BALANCING DAMPER IN EACH BRANCH DUCT TAKEOFF FROM MAIN SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS. LOCATE DAMPERS A MINIMUM 4'-0" AWAY FROM DIFFUSERS. PROVIDE ACCESS AS REQUIRED.

FOR A 10" BY 10" ACCESS DOOR.

- 22. PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING WITH MANUAL BALANCING DAMPER AND LOCKING QUADRANT FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES.
- 23. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS NOTED OTHERWISE. TYPICAL BRANCH DUCT FITTING DETAIL IS APPLICABLE THROUGHOUT.
- 24. RIGID DUCTWORK INSULATION: PROVIDE 3/4 LB DENSITY, 2" R-6 THICK, INSULATION WRAP ON RIGID ROUND AND RECTANGULAR, CONCEALED, SUPPLY AND RETURN AIR DUCTS AND ON OUTSIDE AIR DUCTS.
- 25. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS AND REPRESENTATIVE OF THE INSIDE EQUIVALENT FREE AREA REQUIRED TO MAINTAIN THE AIR FLOW SPECIFIED. IF DUCT LINING IS REQUIRED, INCREASE DUCT SIZE TO MAINTAIN ORIGINAL INSIDE DIMENSIONS. IF DUCT SIZES NEED TO BE ALTERED FOR SPACE REQUIREMENTS, ENSURE THE ORIGINAL INSIDE DUCT EQUIVALENT FREE AREA IS MAINTAINED.
- 26. CONTRACTOR'S OPTION TO SUBSTITUTE ROUND DUCT OF EQUAL FREE AREA FOR RECTANGULAR DUCT AND VICE VERSA. DIMENSIONS OF RECTANGULAR DUCT MAY BE ADJUSTED AS NECESSARY TO INSTALL DUCT IN AVAILABLE SPACE AS LONG AS FREE AREA IS MAINTAINED.
- 27. PROVIDE THERMAFLEX TYPE G-KM, M-KE, FLEXMASTER TYPE 8, OR APPROVED EQUAL FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL BE LISTED UNDER UL 181 AS CLASS 1 AIR DUCT AND BE PROVIDED WITH INTEGRAL R-6, 3/4 LB DENSITY FIBERGLASS INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING.
- 28. FOR ALL EXPOSED DUCTWORK, PROVIDE DUCT THAT IS SUITABLE FOR PAINTING. ENSURE THAT ALL EXPOSED DUCTWORK IS PROPERLY PREPARED AND READY FOR PAINTING. COORDINATE COLOR WITH ARCHITECT. 29. PROVIDE A NEW SET OF AIR FILTERS IN UNITS PRIOR TO
- SYSTEM(S) OVER TO OWNER. 30. PROVIDE A COMPLETE TEST AND BALANCE FOR HVAC SYSTEM. AIR BALANCE SHALL BE WITHIN 5% OF SCHEDULED

TESTING, ADJUSTING AND BALANCING AND BEFORE TURNING

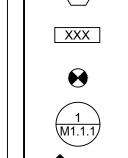
- 31. INSTALL VTR'S AND EXHAUST FANS A MINIMUM OF 10 FT FROM OUTSIDE AIR INTAKE.
- 32. ALL EXISTING FASTENERS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED.

INSULATION SHALL BE PROTECTED BY EMBOSSED ALUMINUM

33. ALL REFRIGERANT PIPING WRAPPED WITH ARMAFLEX

JACKETING. 34. ALL EXTERIOR FASTENERS SHALL BE HOT-DIPPED GALVANIZED OR STAINLESS STEEL.

MECHANICAL SYMBOLS (SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS) SYMBOL DESCRIPTION RECTANGULAR DUCT 18" WIDE BY 12" 18/12 کے DEEP (INSIDE CLEAR DIMENSIONS) 12"Ø DIAMETER ROUND DUCT Ż 12"Ø 🏻 (INSIDE CLEAR DIMENSIONS) SUPPLY DUCT IN SECTION (UP / DOWN) RETURN OR EXHAUST DUCT IN SECTION (UP / DOWN) **ELBOW WITH TURNING VANES** VOLUME/BALANCE DAMPER MOTORIZED DAMPER SUPPLY AIR DIFFUSER RETURN OR EXHAUST AIR GRILLE DIFFUSER OR GRILLE TYPE 12"Ø BRANCH DUCT & NECK SIZE 500 CFM (T) **THERMOSTAT** (s) TEMPERATURE SENSOR (c) CO2 SENSOR (H)HUMIDISTAT (D) SMOKE DETECTOR (TM) **TIMER** FIRE DAMPER ANNOTATION



AFG

BAS

BFF

CD

CFM

DDC

ETR

GC

MAX

MBH

MC

MIN

MS

RAG

RAW

RC

RTU

SAW

TYP

UNO

VTR

IN WC

(CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE) CONNECTION POINT OF NEW WORK TO EXISTING DETAIL REFERENCE: UPPER NUMBER INDICATES DETAIL NUMBER, LOWER

MECHANICAL EQUIPMENT DESIGNATION

SECTION CUT DESIGNATION

CEILING FAN

EXHAUST AIR

MAXIMUM

MINIMUM

MOP SINK

OUTSIDE AIR

RETURN AIR

REFERENCE

SUPPLY AIR

UNIT HEATER

VENT THRU ROOF

WATER HEATER

TYPICAL

RADIANT HEATER

ROOF TOP UNIT

GENERAL CONTRACTOR

1000 BTU PER HOUR

MANUFACTURER

INCHES OF WATER COLUMN

MECHANICAL CONTRACTOR

PLUMBING CONTRACTOR

RETURN AIR WALL GRILLE

REFRIGERATION CONTRACTOR

SUPPLY AIR WALL REGISTER

UNLESS NOTED OTHERWISE

RETURN AIR GRILLE

PLAN KEYNOTE

NUMBER INDICATES SHEET NUMBER **ABBREVIATIONS** ABOVE FINISHED GRADE AUTHORITY HAVING JURISDICTION AIR HANDLING UNIT BUILDING AUTOMATION SYSTEM **BELOW FINISHED FLOOR** CEILING SUPPLY AIR DIFFUSER **CUBIC FEET PER MINUTE** CONDENSING UNIT DIRECT DIGITAL CONTROL EXHAUST AIR GRILLE **ELECTRICAL CONTRACTOR** \mathcal{L} EXHAUST FAN EXISTING TO REMAIN

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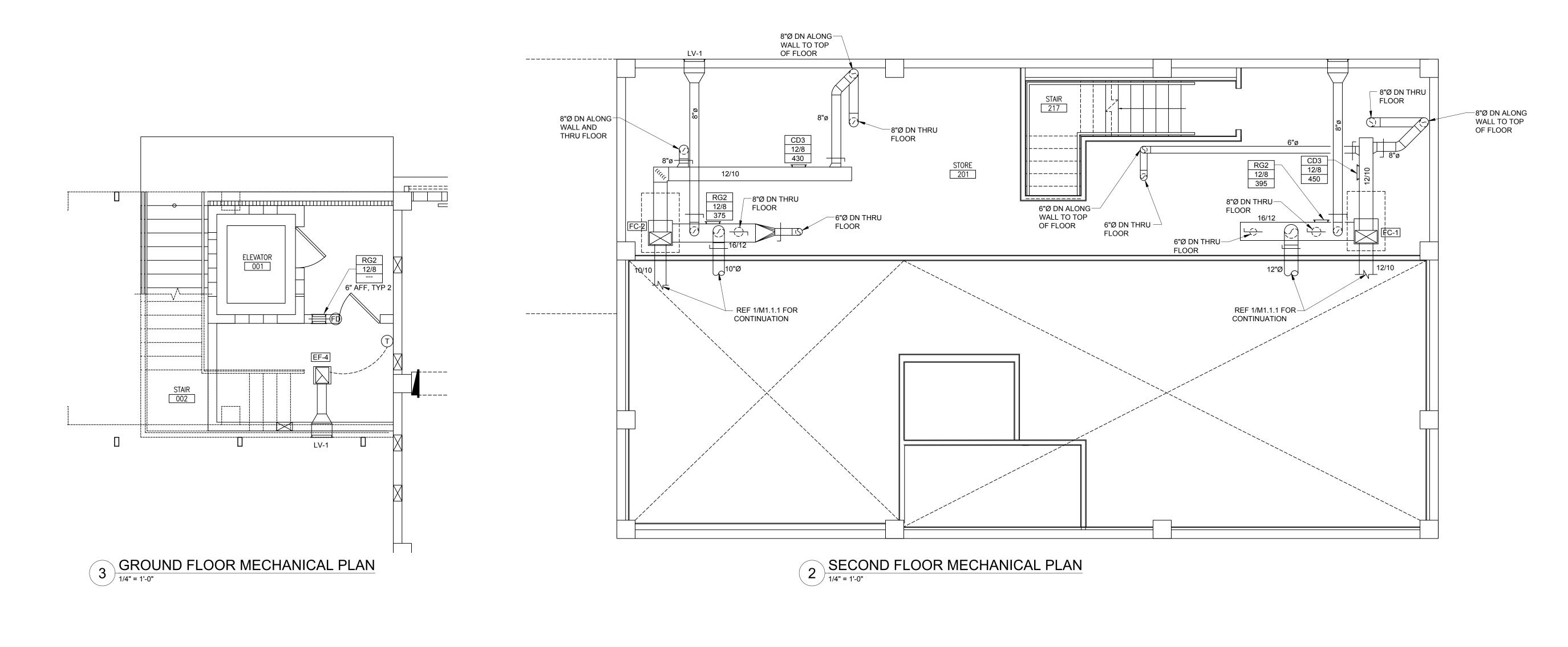
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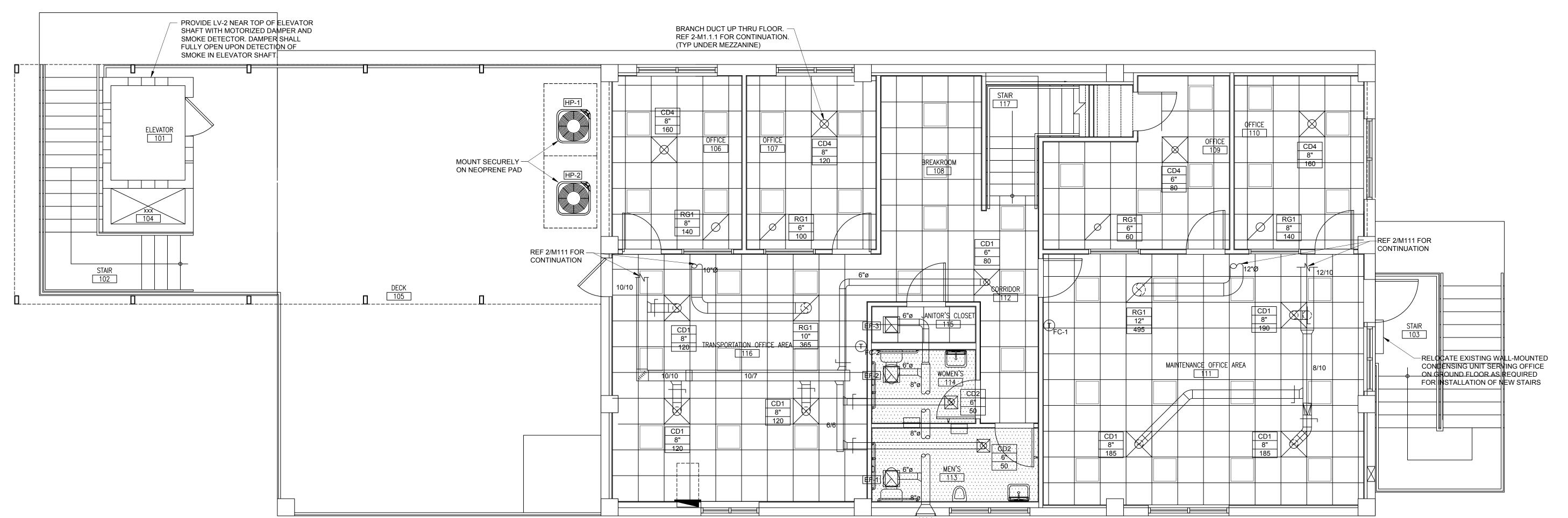
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ARCHITECT:

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COUNTY SCHOOL DISTRICT

NORTH BUILDING REMODE 90050 OVERSEAS HIGHWAY TAVERNIER, FLORIDA, 33070

MONROE

:: MECHANICAL

MECHANICAL PLANS

Sheet Number:

M1.1.

Date: October 31, 2018
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1 FIRST FLOOR MECHANICAL PLAN

FAN COIL UNIT SCHEDULE												
			SUPPLY FAN				ELECTRICAL					
			NOMINAL			E.S.P.	OSA				WEIGHT	
MARK	MANUFACTURER	MODEL	TONS	CFM	HP	(IN. WC)	(CFM)	V/PH	MCA	MOCP	(LBS)	NOTES
FC-1	CARRIER	FX4DNB043	3.5	1250	0.50	0.50"	160	230/1	5.1	15	157	A-G
FC-2	CARRIER	FX4DNB043	3.5	1250	0.50	0.50"	170	230/1	5.1	15	157	A-G

- A. EQUIPMENT COMPONENTS SHALL BE BY THE SAME MANUFACTURER.
- B. PROVIDE WITH FLOAT SWITCH IN AUXILIARY DRAIN PAN TO SHUT OFF WHEN WATER IS PRESENT. C. ROUTE CONDENSATE TO MOP SINK WITH AIR GAP.
- D. PROVIDE UNIT WITH VERTICAL AIRFLOW CONFIGURATION.
- E. PROVIDE FLEXIBLE DUCT CONNECTORS AT ALL CONNECTIONS. F. PROVIDE 1" PANEL THROWAWAY FILTER WITH EACH UNIT.
- G. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
- H. PROVIDE WITH PROGRAMMABLE 7-DAY THERMOSTAT.

	EXHAUST FAN SCHEDULE											
MARK	MANUFACTURER	MODEL	MOUNTING	CFM	E.S.P. (IN. WC)	WATTS	V/Ph	CONTROL	NOTES			
EF-1	GREENHECK	SP-B80	CEILING	75	0.125"	18.6	120/1	LIGHT SWITCH	A, B			
EF-2	GREENHECK	SP-B80	CEILING	75	0.125"	18.6	120/1	LIGHT SWITCH	A, B			
EF-3	GREENHECK	SP-B80	CEILING	75	0.125"	18.6	120/1	LIGHT SWITCH	A, B			
EF-4	GREENHECK	SP-A250	CEILING	250	0.125"	83	120/1	T-STAT	A, B, C			

MANUFACTURER

GREENHECK

GREENHECK

B. FINISH TO BE SELECTED BY ARCHITECT.

A. PROVIDE GRAVITY BACKDRAFT DAMPER, LV-1 ONLY.

C. PROVIDE FULL SIZE SHEET METAL PLENUM, LV-1 ONLY

LOUVER SCHEDULE

MODEL SIZE NET FREE AREA

ESD-635D 18 x 12 0.32 SQ FT

ESD-635D 30 x 30 3.09 SQ FT

GENERAL INFORMATION: 1. ALL EXHAUST FANS SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.

A. PROVIDE GRAVITY BACKDRAFT DAMPER.

NOTES

A-E

A-E

B. PROVIDE SPRING VIBRATION ISOLATORS FOR HANGER ROD SUPPORTS. C. FAN TO OPERATE WHEN ROOM TEMPERATURE IS ABOVE 80°F.

LV-1

LV-2

MARK	OUTSIDE AIR CFM	EXHAUST AIR CFM
FC-1	170	
FC-2	160	
EF-1		75
EF-2		75
EF-3		75
TOTAL	330	225

DESCRIPTION

MIAMI-DADE/FLORIDA PRODUCT APPROVED

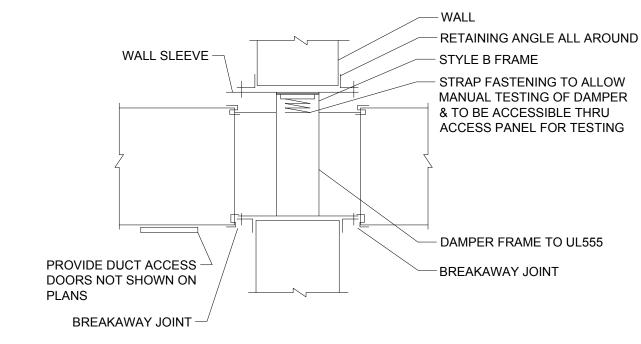
ALUMINUM STATIONARY DRAINABLE BLADE

LOUVER WITH INSECT SCREEN

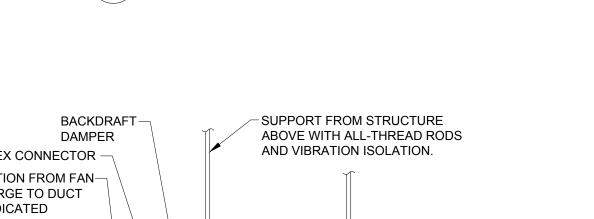
MIAMI-DADE/FLORIDA PRODUCT APPROVED ALUMINUM STATIONARY DRAINABLE BLADE

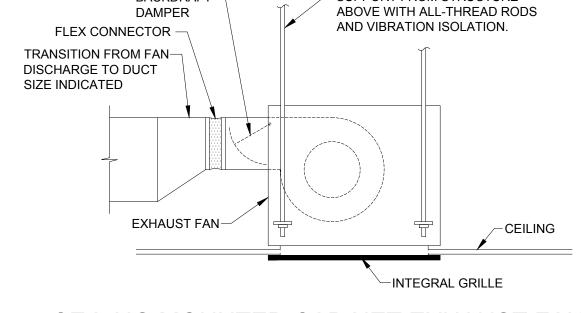
LOUVER WITH INSECT SCREEN

AIR BALANCE SCHEDULE

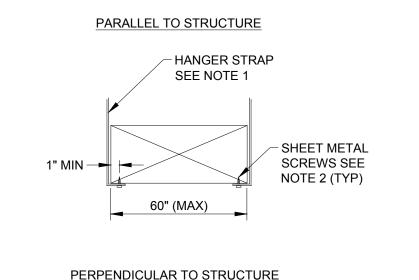


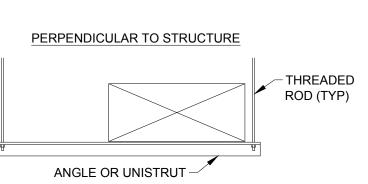
VERTICAL FIRE DAMPER INSTALLATION





7 CEILING MOUNTED CABINET EXHAUST FAN



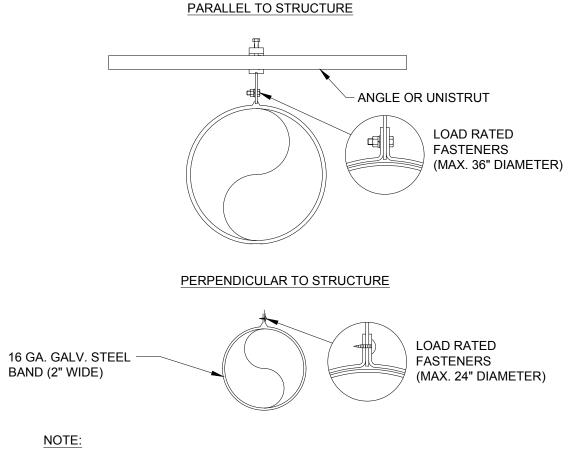


NOTES:

1. USE THREADED ROD FOR ALL DUCTS LARGER THAN 60" DIAMETER WIDE. 2. SHEET METAL SCREWS MAY BE OMITTED IF HANGER STRAP IS CONTINUOUS

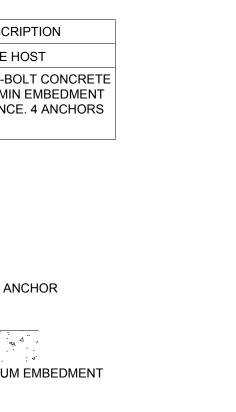
6 RECTANGULAR DUCT SUPPORT

AND LOOPS UNDER ENTIRE DUCT.



1. FOR DUCTS LARGER THAN 36" DIAMETER, USE TWO HANGER RODS, WIRES OR STRAPS TO SUPPORT DUCT FROM EACH SIDE.

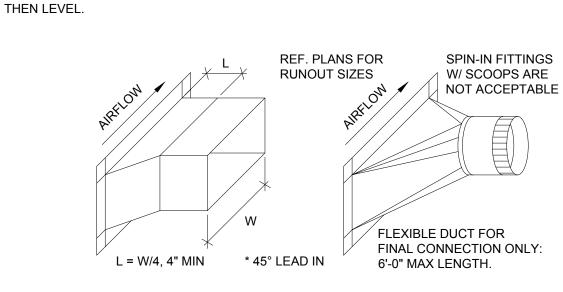
5 ROUND DUCT SUPPORT



- DUCT AS REQUIRED (REF PLANS) REFER TO ARCHITECTURAL AND/OR STRUCTURAL DRAWINGS FOR WALL CONSTRUCTION AND FRAMING DETAILS FOR OPENING LOUVER AS SPECIFIED REMOVABLE BIRD OR INSECT SCREEN AS SPECIFIED LOW-LEAKAGE OR BACKDRAFT DAMPER REF PLANS AND/OR SCHEDULE METAL SILL TO DIRECT WATER -OUTSIDE AND AWAY FROM BASE OF LOUVER SEAL AROUND Z FLASHING BACK TO BEHIND PERIMETER DUCTWORK

WALL MOUNTED LOUVER

N.T.S.



BRANCH DUCT FITTING

HEAT PUMP UNIT SCHEDULE TOTAL CAPACITY REFR. TOTAL CAPACITY NOMINAL (MBH) (MBH) (LBS) MARK MANUFACTURER MODEL TONS TYPE | SEER / EER COP / HSPF V/PH MCA MOCP HP-1 203 CARRIER 25HCE442C 3.5 R-410A 14 / 11.5 42 3.46 / 8.2 230/1 31.2 50 HP-2 CARRIER 3.46 / 8.2 230/1 31.2 50 203 25HCE442C R-410A 14 / 11.5 3.5 42 NOTES: A. PROVIDE CONCRETE EQUIPMENT PAD. B. PROVIDE AND INSTALL DISCONNECT SWITCH. C. PROVIDE WITH CONDENSER COIL COATING. D. COORDINATE WITH THE MANUFACTURER THE HORIZONTAL AND VERTICAL REFRIGERANT PIPE ROUTING TO DETERMINE PIPE SIZES FOR THE REFRIGERANT PIPING. MANUFACTURER SHALL PROVIDE DETAILED REFRIGERANT PIPING DIAGRAMS INCLUDING DIMENSIONAL DATA FOR ALL REFRIGERANT PIPING DEVICES. THE MANUFACTURER SHALL SIZE AND LOCATE THE ASSOCIATED REFRIGERANT TRAPS BASED ON THE ACTUAL ROUTING AND PROVIDE OTHER APPURTENANCES TO PROVIDE A FULLY FUNCTIONAL AND OPERATIONAL SYSTEM. COORDINATE WITH THE MANUFACTURER LOCATIONS FOR ALL REFRIGERANT PIPING DEVICES TO MAINTAIN SERVICEABILITY AND ACCESSIBILITY. E. OTHER ACCEPTABLE MANUFACTURERS: RHEEM, RUUD, BRYANT

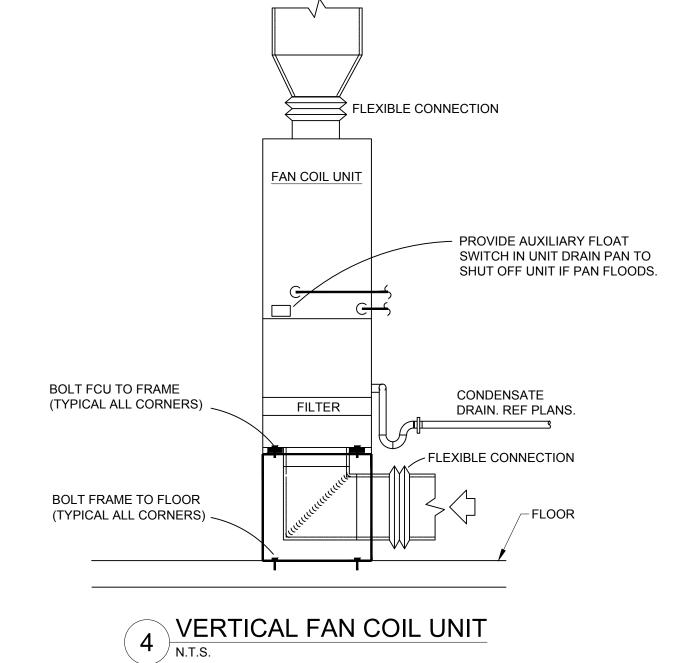
OSA CALCULATIONS AREA OUTDOOR AIRFLOW ZONE PEOPLE OUTDOOR AIRFLOW **BREATHING ZONE** ZONE OUTDOOR SUPPLIED OUTDOOR ZONE FLOOR AREA RATE IN BREATHING POPULATION RATE IN BREATHING ZONE OUTDOOR AIRFLOW RATE AIRFLOW RATE AIRFLOW RATE OCCUPANCY ROOM CLASSIFICATION $FT2(A_7)$ ZONE CFM PER FT2 (R_a) (P_z) CFM PER PERSON (R_D) CFM (V_{bz}) CFM (V_{oz}) CFM OFFICE 106 OFFICE SPACE 126 0.06 20 OFFICE 107 OFFICE SPACE 127 0.06 13 20 **BREAK ROOM 108** BREAK ROOMS 108 0.06 15 149 0.06 OFFICE 109 OFFICE SPACE 20 OFFICE 110 OFFICE SPACE 135 0.06 13 20 MAINTENANCE OFFICE OFFICE SPACE 486 0.06 50 65 AREA 111 CORRIDOR 112 CORRIDORS 118 0.06 10 TRANSPORTATION OFFICE OFFICE SPACE 387 0.06 5 39 50 AREA 116 **MEZZANINE 201** STORAGE ROOMS 704 0.12 107 110 $V_{bz} = R_{D}P_{z} + R_{a}A_{z}$ $E_{z} = 0.8$ $V_{oz} = V_{bz}/E_{z}$

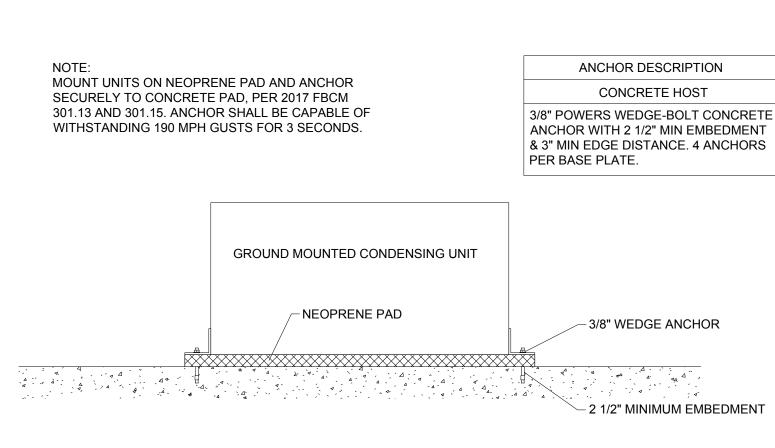
	AIR DEVICE SCHEDULE											
MARK	SERVICE	MANUFACTURER	MODEL	STYLE	FRAME TYPE	FACE SIZE	NECK SIZE	MAX NC	NOTES			
CD1	SUPPLY	TITUS	TMS-AA	ALUMINUM LOUVERED FACE CEILING DIFFUSER	LAY-IN	24 x 24	PER PLAN	30	A-E			
CD2	SUPPLY	TITUS	TMS-AA	ALUMINUM LOUVERED FACE CEILING DIFFUSER	SURFACE	12 x 12	PER PLAN	30	A-E			
CD3	SUPPLY	TITUS	300FS	ALUMINUM DOUBLE DEFLECTION SUPPLY GRILLE	SURFACE	PER PLAN	PER PLAN	30	A-E			
CD4	SUPPLY	ACUTHERM	ST-HC	VAV SUPPLY DIFFUSER W/ DISC DAMPER	LAY-IN	24 x 24	PER PLAN	30	A-G			
RG1	RETURN	TITUS	50F	1/2" x 1/2" ALUMINUM EGGCRATE RETURN GRILLE	LAY-IN	24 x 24	PER PLAN	30	A-E			
RG2	RETURN	TITUS	350FL	ALUMINUM LOUVERED RETURN GRILLE	SURFACE	PER PLAN	PER PLAN	30	A-E			

GENERAL INFORMATION:

1. ALL DIFFUSERS ARE 4-WAY THROW UNLESS NOTED OTHERWISE 2. ALL AIR DEVICES SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.

- A. DIFFUSER NECK SIZE SHALL BE SAME AS BRANCH DUCT SIZE UNLESS NOTED OTHERWISE.
- B. DAMPER AT TAKE-OFF TO DEVICE. C. BAKED ENAMEL FINISH, WHITE TO MATCH CEILING/WALL COLOR.
- D. PROVIDE NECK FOR DUCT CONNECTION.
- E. FRAME TYPE TO MATCH CEILING/WALL CONSTRUCTION, COORDINATE WITH ARCHITECTURAL PLANS.
- F. SET MINIMUM AIRFLOW TO 30% OF DESIGN VALUE. G. PROVIDE REMOTE WALL ADJUSTER.





3 CONDENSING UNIT ANCHOR DETAIL (FL)

- SLOPE DUCT UP 1"

FIRST FIRST 1'

Date: October 31, 2018 ©2018 by K2M Design, Inc.

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MECHANICAL **DETAILS AND**

SCHEDULES

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AND LABOR REQUIRED TO COMPLETE THE ENTIRE SYSTEM AS REQUIRED BY THE DRAWINGS AND

THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECTS ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE, SHALL BE PROVIDED AS IF DESCRIBED IN BOTH, IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND/OR OWNER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

1.2 INSPECTION OF SITE

PRIOR TO SUBMITTING BID, VISIT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1.3 MATERIAL AND WORKMANSHIP

PROVIDE NEW MATERIAL, EQUIPMENT, AND APPARATUS UNDER THIS CONTRACT UNLESS OTHERWISE STATED HEREIN, OF BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE, AND FREE FROM ANY DEFECTS. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT NECESSARILY INTENDED TO DESIGNATE THE REQUIRED TRIM, WRITTEN DESCRIPTIONS OF THE TRIM GOVERN

WORK PERFORMED UNDER THIS CONTRACT SHALL PROVIDE A NEAT AND "WORKMANLIKE" APPEARANCE WHEN COMPLETED, TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER. WORKMANSHIP SHALL BE THE FINEST POSSIBLE BY EXPERIENCED MECHANICS. INSTALLATIONS SHALL COMPLY WITH APPLICABLE CODES AND LAWS.

THE COMPLETE INSTALLATION SHALL FUNCTION AS DESIGNED AND INTENDED WITH RESPECT TO EFFICIENCY. CAPACITY, NOISE LEVEL, ETC. ABNORMAL NOISE CAUSED BY RATTLING EQUIPMENT, PIPING, AND SQUEAKS IN ROTATING COMPONENTS WILL NOT BE ACCEPTABLE. IN GENERAL, MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY. LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTED.

REMOVE FROM THE PREMISES WASTE MATERIAL PRESENT AS A RESULT OF WORK, INCLUDING CARTONS, CRATING, PAPER, STICKERS, AND/OR EXCAVATION MATERIAL NOT USED IN BACKFILLING, ETC. CLEAN EQUIPMENT INSTALLED UNDER THIS CONTRACT TO PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION OF THE

REPAIR OR REPLACE PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THE SATISFACTION OF AUTHORITIES AND REGULATIONS HAVING JURISDICTION.

1.4 COORDINATION

COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT THE VARIOUS COMPONENTS OF THE SYSTEMS WILL BE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO THOSE ITEMS REQUIRING MAINTENANCE. COMPONENTS WHICH ARE INSTALLED WITHOUT REGARD TO THE ABOVE SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.

UNLESS OTHERWISE INDICATED, THE GENERAL CONTRACTOR WILL PROVIDE CHASES AND OPENINGS IN BUILDING CONSTRUCTION REQUIRED FOR INSTALLATION OF THE SYSTEMS SPECIFIED HEREIN. THE CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH INFORMATION WHERE CHASES AND OPENINGS ARE REQUIRED, KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND EXECUTE WORK IN A MANNER AS TO NOT INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.

FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALE DIMENSIONS. CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE BUILDING, AS VARIATIONS MAY OCCUR. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION.

PROVIDE MATERIALS WITH TRIM THAT WILL PROPERLY FIT THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT INTENDED TO DESIGNATE THE REQUIRED TRIM.

1.5 ORDINANCES AND CODES

WORK PERFORMED UNDER THIS CONTRACT SHALL, AT A MINIMUM, BE IN CONFORMANCE WITH APPLICABLE NATIONAL, STATE, AND LOCAL CODES HAVING JURISDICTION, EQUIPMENT FURNISHED AND ASSOCIATED NSTALLATION WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN STRICT COMPLIANCE WITH CURREN APPLICABLE CODES ADOPTED BY THE LOCAL AHJ INCLUDING ANY AMENDMENTS AND STANDARDS AS SET FORTH BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), UNDERWRITERS LABORATORIES (UL), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AMERICAN SOCIETY OF TESTING MATERIALS (ASTM), AND OTHER NATIONAL STANDARDS AND CODES WHERE APPLICABLE. WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THEIR REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE

PROCURE AND PAY FOR PERMITS AND LICENSES REQUIRED FOR THE ACCOMPLISHMENT OF THE WORK HEREIN DESCRIBED, WHERE REQUIRED, OBTAIN, PAY FOR, AND FURNISH CERTIFICATES OF INSPECTION TO THE OWNER. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR VIOLATIONS OF THE LAW.

1.6 PROTECTION OF EQUIPMENT AND MATERIALS

STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE. COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, OR PHYSICAL DAMAGE. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND CONTRACTOR IS OBLIGATED TO FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND AS APPROVED BY OWNER.

KEEP PREMISES CLEAN FROM FOREIGN MATERIAL CREATED DURING WORK PERFORMED UNDER THIS CONTRACT. PIPING, EQUIPMENT, ETC., SHALL HAVE A NEAT AND CLEAN APPEARANCE AT THE TERMINATION OF THE WORK.

PLUG OR CAP OPEN ENDS OF PIPING SYSTEMS WHILE STORED OR INSTALLED DURING CONSTRUCTION WHEN NOT IN USE THE PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

1.7 SUBSTITUTIONS

THE BASE BID SHALL INCLUDE ONLY THE PRODUCTS FROM MANUFACTURERS SPECIFICALLY NAMED IN THE DRAWINGS AND SPECIFICATIONS. NO SUBSTITUTION WILL BE CONSIDERED PRIOR TO RECEIPT OF BIDS UNLESS WRITTEN REQUEST FOR APPROVAL TO BID HAS BEEN RECEIVED BY THE ENGINEER AT LEAST TEN CALENDAR DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS. EACH SUCH REQUEST SHALL INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED AND A COMPLETE DESCRIPTION OF THE PROPOSED SUBSTITUTE INCLUDING DRAWINGS, CUT PERFORMANCE AND TEST DATA AND OTHER INFORMATION NECESSARY FOR AN EVALUATION. A STATEMENT SETTING FORTH CHANGES IN OTHER MATERIALS, EQUIPMENT OR OTHER WORK THAT INCORPORATION OF THE SUBSTITUTE WOULD REQUIRE SHALL BE INCLUDED. THE BURDEN OF PROOF OF THE MERIT OF THE PROPOSED SUBSTITUTE IS UPON THE PROPOSER. THE ENGINEER'S DECISION OF APPROVAL OR DISAPPROVAL TO BID OF A PROPOSED SUBSTITUTION SHALL BE FINAL.

THE TERMS "APPROVED", "APPROVED EQUAL", AND "EQUAL" REFER TO APPROVAL BY THE ENGINEER AS AN ACCEPTABLE ALTERNATE BID. NO SUBSTITUTIONS WILL BE CONSIDERED THAT ARE NOT BID AS AN ALTERNATE. NO MATERIAL SUBSTITUTIONS SHALL BE CONSIDERED FOR APPROVAL PRIOR TO AWARD OF CONTRACT.

COORDINATE AND VERIFY WITH OTHER TRADES WHETHER OR NOT THE SUBSTITUTED EQUIPMENT CAN BE INSTALLED AS SHOWN ON THE CONSTRUCTION DRAWINGS WITHOUT MODIFICATION TO ASSOCIATED SYSTEMS OR ARCHITECTURAL OR ENGINEERING DESIGN. INCLUDE ADDITIONAL COSTS FOR ARCHITECTURAL AND ENGINEERING DESIGN FEES IN BID IF DRAWING MODIFICATIONS ARE REQUIRED BECAUSE OF SUBSTITUTED EQUIPMENT.

1.8 OPERATION AND MAINTENANCE INSTRUCTIONS

COLLECT AND COMPILE A COMPLETE BROCHURE OF FIXTURES, MATERIALS, AND EQUIPMENT FURNISHED AND INSTALLED ON THIS PROJECT. INCLUDE OPERATIONAL AND MAINTENANCE INSTRUCTIONS, MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, PARTS LISTS, APPROVED SHOP DRAWINGS, AND DESCRIPTIVE LITERATURE FURNISHED BY THE MANUFACTURER. INCLUDE AN INSIDE COVER SHEET THAT LISTS THE PROJECT NAME, DATE, OWNER, ARCHITECT, ENGINEER, GENERAL CONTRACTOR, SUBCONTRACTOR, AND AN INDEX OF

SUBMIT COPIES OF LITERATURE BOUND IN APPROVED BINDERS TO THE ARCHITECT AND OWNER AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF PLUMBING SYSTEMS WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS DEEMED COMPLETE BY THE ARCHITECT, ENGINEER, AND OWNER.

1.9 SPARE PARTS

FURNISH TO OWNER, WITH RECEIPT, THE SPARE PARTS TO INCLUDE FAUCET WASHERS AND O-RINGS, FLUSHOMETER REPAIR KITS, AND WATER CLOSET TANK REPAIR KITS FOR THE FIXTURES FURNISHED FOR THIS PROJECT.

1.10 WARRANTIES

WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN, OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 1.

WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.

PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE

1.11 CUTTING AND PATCHING

PERFORM CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING. DO NO CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFINISH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

1.12 ROUGH-IN

COORDINATE WITHOUT DELAY ROUGHING-IN WITH GENERAL CONSTRUCTION. CONCEAL PIPING AND CONDUIT ROUGH-IN EXCEPT IN UNFINISHED AREAS WHERE OTHERWISE SHOWN.

1.13 STRUCTURAL STEEL

STRUCTURAL STEEL USED FOR PIPE SUPPORTS, EQUIPMENT SUPPORTS, ETC., SHALL BE NEW, CLEAN, AND CONFORM TO ASTM DESIGNATION A-36.

SUPPORT PLUMBING AND MECHANICAL EQUIPMENT AND PIPING FROM THE BUILDING STRUCTURE. DO NOT SUPPORT PLUMBING EQUIPMENT FROM CEILINGS, OTHER MECHANICAL OR ELECTRICAL COMPONENTS, AND OTHER NON-STRUCTURAL ELEMENTS.

1.14 ACCESS DOORS

PROVIDE ACCESS DOORS IN CEILINGS AND WALLS WHERE INDICATED OR REQUIRED FOR ACCESS TO CONCEALED VALVES AND EQUIPMENT INSTALLED UNDER THIS SECTION. PROVIDE CONCEALED HINGES, SCREWDRIVER-TYPE LOCK, ANCHOR STRAPS; MANUFACTURED BY MILCOR, ZURN, TITUS, OR EQUAL. OBTAIN ARCHITECT'S APPROVAL OF TYPE, SIZE, LOCATION, AND COLOR BEFORE ORDERING.

1.15 PENETRATIONS

SEAL FLOOR, EXTERIOR WALL AND ROOF PENETRATIONS WATER AND WEATHER TIGHT WITH APPROPRIATE NON-SHRINK, NON-HARDENING COMMERCIAL CONSTRUCTION SEALANT. SEAL ROOF PENETRATIONS WITH FOUR POUND PER SQUARE FOOT LEAD FLASHING. PROVIDE A SLEEVE, AND SEAL NON-FIRE-RATED FLOOR AND WALL PENETRATIONS WITH FIBERGLASS PACKING AND SILICONE CAULK (FOR ACOUSTICAL INSULATION).

COORDINATE FIRE RATING REQUIREMENTS AND LOCATIONS WITH THE ARCHITECT. SEAL PENETRATIONS OF FIRE-RATED ASSEMBLIES WITH 3M #CP-25 FIRE BARRIER CAULK (PROVIDE THICKNESS AND METHOD AS REQUIRED FIXTURES. AND RECOMMENDED BY MANUFACTURER) TO MAINTAIN THE FIRE RESISTANCE RATING OF FIRE-RATED ASSEMBLIES

SEAL EXTERIOR WALL PENETRATIONS BELOW GRADE WITH CAST IRON WALL PIPES AND MODULAR MECHANICAL SLEEVE SEALS, MANUFACTURED BY THUNDERLINE/LINK SEAL, CALPICO, INC AND METRAFLEX.

PROVIDE SLEEVES FOR HORIZONTAL PIPE PASSING THROUGH OR UNDER THE FOUNDATION. SLEEVES SHALL BE CAST IRON SOIL PIPE TWO NOMINAL PIPE SIZES LARGER THAT THE PIPE SERVED.

PROVIDE SLEEVES FOR VERTICAL PIPE PASSING THROUGH SLAB ON GRADE. SLEEVES SHALL BE SCHEDULE 40 PVC PIPE, TWO NOMINAL PIPE SIZES LARGER THAN THE PIPE SERVED. SEAL WATER-TIGHT WITH SILICONE CAULK.

2.1 DOMESTIC WATER PIPING

ABOVE AND BELOW GRADE WATER PIPING SHALL BE PEX TUBING CONFORMING TO ASTM F877 CROSS-LINKED POLYETHYLENE TUBING HOT AND COLD WATER DISTRIBUTION SYSTEMS, ASTM F876 CROSS-LINKED POLYETHYLENE TUBE, ASTM F1807 FITTING AND ASTM F2159 FITTINGS, COMPLY WITH NSF STANDARD 14 AND 61. PEX TUBING SHALL BE WATTS WATERPEX CROSS-LINKED POLYETHYLENE OR EQUAL. ALL PEX TUBING BELOW GRADE SHALL BE SLEEVED WITH PVC PIPE.

FITTINGS SHALL BE MECHANICAL CRIMP FITTINGS IN COMPLIANCE WITH ASTM F1807 AND F2159. PEX FITTINGS SHALL BE WATTS BRASS CRIMPRING FITTINGS USING EITHER WATTS COPPER CRIMPRING OR STAINLESS STEEL CINCHCLAMP OR EQUAL, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

ABOVE AND BELOW GRADE WATER PIPING SHALL BE TYPE "L" AND "M" HARD DRAWN SEAMLESS COPPER TUBING CONFORMING TO ASTM B88.

COPPER UNIONS SHALL BE CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET. METAL-TO-METAL SEATING SURFACE AND SOLDER-JOINT. JOINING MATERIAL SHALL BE ASTM B813 WATER-FLUSHABLE, LEAD-FREE FLUX ALLOY SOLDER.

2.2 FILTERED WATER PIPING

ABOVE AND BELOW GRADE FILTERED WATER PIPING SHALL BE CPVC TUBING CONFORMING TO ASTM D2846 AND CSA B137 CHLORINATED POLY (VINYL CHLORIDE) PLASTIC HOT AND COLD WATER DISTRIBUTION SYSTEMS, ASTM D1784 RIGID AND CHLORINATED PVC COMPOUNDS, ASTM F493 SOLVENT CEMENTS, COMPLY WITH NSF STANDARD 14 AND 61. CPVC TUBING SHALL BE FLOWGUARD GOLD CPVC CTS OR EQUAL

FITTINGS SHALL BE SOCKET TYPE JOINTS IN COMPLIANCE WITH ASTM D2846 AND CSA B137. CPVC FITTINGS SHALL BE FLOWGUARD GOLD CPVC CTS FITTINGS OR EQUAL. JOINING MATERIAL SHALL BE ASTM F493 SOLVENT CEMENT, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

ABOVE AND BELOW GRADE FILTERED WATER PIPING SHALL BE TYPE "L" AND "M" HARD DRAWN SEAMLESS COPPER TUBING CONFORMING TO ASTM B88. COPPER UNIONS SHALL BE CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET,

METAL-TO-METAL SEATING SURFACE AND SOLDER-JOINT. JOINING MATERIAL SHALL BE ASTM B813

2.3 SOIL, WASTE, AND VENT PIPING

WATER-FLUSHABLE, LEAD-FREE FLUX ALLOY SOLDER.

ABOVE AND BELOW GRADE SOIL, WASTE, AND VENT PIPING SHALL BE PVC PLASTIC, SCHEDULE 40 DWV PIPE CONFORMING TO ASTM D2665 WITH PLAIN ENDS. CELLULAR (FOAM) CORE PVC NOT ALLOWED. INSTALL PER ASTM

FITTINGS SHALL BE PVC SOCKET-TYPE DWV PIPE FITTINGS; ASTM D2665 MADE TO ASTM D3311 DRAIN, WASTE, AND VENT PATTERNS.

ABOVE AND BELOW GRADE SOIL, WASTE, AND VENT PIPING SHALL BE HUB-AND-SPIGOT CAST-IRON SOIL PIPE AND FITTINGS CONFORMING TO ASTM A74 WITH ASTM C564 RUBBER GASKETS. INSTALL CAST-IRON SOIL PIPING ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" CHAPTER IV, "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS".

ABOVE GRADE SOIL, WASTE, AND VENT PIPING SHALL BE ALLOWED TO BE COPPER DRAINAGE TUBING CONFORMING TO ASTM B306 AT PLUMBING CONTRACTOR'S OPTION.

2.4 INDIRECT AND CONDENSATE DRAIN LINES

PROVIDE HARD DRAWN, TYPE "M" OR "L" COPPER PIPE FOR ALL CONDENSATE DRAIN PIPING FROM COOLER AND FREEZER EVAPORATORS. PROVIDE HEAT TRACE FOR ALL CONDENSATE DRAIN PIPING LOCATED IN FREEZERS, AND ROUTE TO FLOOR DRAIN IN BUILDING.

PROVIDE PVC PIPE FOR ALL OTHER INDIRECT AND CONDENSATE DRAIN PIPING FROM HVAC, PLUMBING, AND BEVERAGE EQUIPMENT, AND ROUTE TO FLOOR DRAIN IN BUILDING.

2.5 GAS PIPING

GAS PIPING SHALL BE SCHEDULE 40 BLACK CARBON STEEL CONFORMING TO ASTM A53. PIPING 2" AND SMALLER SHALL BE WELDED OR THREADED WITH MALLEABLE IRON FITTINGS. PIPING 2-1/2" AND LARGER SHALL BE WELDED WITH BUTT-WELDED FITTINGS.

FITTINGS SHALL CONFORM TO ASME B16.3, MALLEABLE IRON OR ASTM A234, FORGED STEEL WELDED TYPE.

PROVIDE SHUT-OFF VALVE, DIRT LEG, AND UNION AT EACH ROOFTOP UNIT. PAINT ALL GAS PIPING EXPOSED TO WEATHER WITH ONE COAT OF PRIMER, AND TWO COATS OF RUST-PROOF PAINT. COLOR SHALL MATCH BUILDING COLORS. COORDINATE WITH OWNER'S CONSTRUCTION MANAGER.

PROVIDE TREATED WOOD BLOCKING 6X6X12, 8'-0" OC MAX WITH GALVANIZED PIPE STRAP, 1 1/4" ZINC COATED LAG SCREWS, AND RUBBER WALKPAD ADHERED TO ROOF.

2.6 FLASHING

SHEET LEAD, 4 POUNDS PER SQUARE FOOT, MINIMUM.

2.7 INSULATION

2.7.1 DOMESTIC COLD WATER (WITHIN BUILDING)

COPPER PIPING: 1/2" WALL ONE-PIECE FIBERGLASS COVERING HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 WITH FIRE RESISTANT JACKET WITH SELF-SEALING LAP TO PROVIDE A CONTINUOUS VAPOR BARRIER BY CERTAINTEED, OWENS-CORNING, OR ARMSTRONG. (SEE BELOW FOR PLUMBING FITTING INSULATION REQUIREMENTS.)

PEX TUBING: NO INSULATION REQUIRED.

EXCEPTION: FOR NON-RECIRCULATING HOT WATER SYSTEM, PROVIDE 1/2" WALL ONE-PIECE FIBERGLASS COVERING HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 WITH FIRE RESISTANT JACKET WITH SELF-SEALING LAP TO PROVIDE A CONTINUOUS VAPOR BARRIER BY CERTAINTEED, OWENS-CORNING, OR ARMSTRONG ON THE FIRST 8 FEET OF INLET PIPING AT WATER HEATER.

CPVC TUBING: NO INSULATION REQUIRED.

2.7.2 DOMESTIC HOT WATER

COPPER PIPING: 1/2" WALL ONE-PIECE FIBERGLASS COVERING HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 WITH FIRE RESISTANT JACKET WITH SELF-SEALING LAP TO PROVIDE A CONTINUOUS VAPOR BARRIER BY CERTAINTEED, OWENS-CORNING, OR ARMSTRONG. (SEE BELOW FOR PLUMBING FITTING INSULATION REQUIREMENTS.)

PEX TUBING: 1/2" WALL ONE-PIECE FIBERGLASS COVERING HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 WITH FIRE RESISTANT JACKET WITH SELF-SEALING LAP TO PROVIDE A CONTINUOUS VAPOR BARRIER BY CERTAINTEED, OWENS-CORNING, OR ARMSTRONG. (SEE BELOW FOR PLUMBING FITTING INSULATION REQUIREMENTS.)

FOR HOT WATER PIPING BEING SERVED BY SYSTEM WITH RECRICULATING PUMP, PROVIDE 1" WALL ONE-PIECE FIBERGLASS COVERING HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 WITH FIRE RESISTANT JACKET WITH SELF-SEALING LAP TO PROVIDE A CONTINUOUS VAPOR BARRIER BY CERTAINTEED, OWENS-CORNING, OR ARMSTRONG. (SEE BELOW FOR PLUMBING FITTING INSULATION REQUIREMENTS.)

2.7.3 INDIRECT AND CONDENSATE DRAIN PIPING (WITHIN BUILDING)

COPPER PIPING: PROVIDE 1" FLEXIBLE UNICELLULAR INSULATION BY ARMACELL

PVC PIPING: NO INSULATION REQUIRED.

FOR PIPING AT HANGERS, PROVIDE 8" LONG SECTIONS OF HIGH DENSITY, HIGH TEMPERATURE CALCIUM SILICATE BY JOHNS-MANVILLE, FIBERGLASS BY KNAUF, OR 8" LONG STYROFOAM BILLETS BY DOW. INSULATION SHALL BE CONTINUOUS ALONG THE PIPE SURFACE, EXCEPT AT VALVES, UNIONS, AND WHERE PIPING IS EXPOSED AT

FOR HOT AND COLD WATER PIPING EXPOSED, CONCEALED IN WALLS, AND/OR INSTALLED INSIDE MASONRY UNITS OF WALLS, COVER FITTINGS WITH ZESTON, KNAUF, OR EQUAL ONE-PIECE PVC PREMOLDED INSULATING COVERS. FITTING COVERS, JACKETS, AND ADHESIVES SHALL NOT EXCEED FLAME SPREAD RATING OF 25 AND SMOKE DEVELOPMENT RATING OF 50 PER ASTM E84. AT ALL ELBOWS AND TEES, FILL VOIDS BETWEEN COVERS AND PIPING WITH FIBERGLASS INSULATION AND TAPE JOINTS. INSTALL PIPE INSULATION IN COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS. WHERE PREMOLDED INSULATING FITTINGS ARE NOT APPROVED BY LOCAL AUTHORITIES, MITER INSULATION AT FITTINGS.

3. PIPING INSTALLATION

GENERAL: CLEAN PIPE THOROUGHLY PRIOR TO INSTALLATION, REAM ENDS OF PIPE TO REMOVE BURRS, CUT PIPE ACCURATELY TO MEASUREMENTS TAKEN ON THE JOB. INSTALL WITH ADEQUATE CLEARANCE FOR INSTALLATION OF COVERINGS WHERE REQUIRED. PIPE SHALL NOT BE SPRUNG OR BENT. NEATLY ALIGN PIPE, CONNECT IT SECURELY, AND SUPPORT IT FROM THE BUILDING, AND SUPPORT IT FROM THE BUILDING STRUCTURE WITH HANGERS AS SPECIFIED BELOW. PROVIDE CHROME-PLATED ESCUTCHEONS ON PIPES PASSING THROUGH CEILINGS, FLOORS, OR WALLS OF FINISHED SPACES. RUN PIPES FREELY THROUGH FLOOR AND WALL PENETRATIONS USING PIPE SLEEVES. DO NOT GROUT IN PLACE UNLESS REQUIRED FOR STRUCTURAL FIRE INTEGRITY. INSTALL PIPE CONCEALED IN FINISHED SPACES WHEREVER POSSIBLE. USE A DIELECTRIC UNION WHERE FERROUS AND COPPER PIPE CONNECT. DIELECTRIC UNION SHALL HAVE A ZINC STEEL BODY, A THREADED NYLON INSERT, AND INSULATION PRESSURE GASKET. NO FERROUS METAL-TO-COPPER CONNECTION MADE WITHOUT INSULATING UNIONS WILL BE ALLOWED.

HANGERS & SUPPORTS: PIPE HANGERS SHALL BE AS DESCRIBED IN THE SPECIFICATIONS BY B-LINE OR EQUAL BY ANVIL, MICHIGAN, TRUSCON, OR UNISTRUT. CONNECT HANGERS TO THE STRUCTURE WITH SIDE BEAM CONNECTORS AND ALL THREAD HANGER RODS. PROVIDE ENGINEERED SUPPORT STRUTS BETWEEN JOISTS AND OTHER STRUCTURAL MEMBERS AS REQUIRED TO PROVIDE A RIGID HANGING.

DOMESTIC WATER: ARRANGE COLD, HOT, AND HOT WATER RECIRCULATION PIPING TO DRAIN AT THE LOWEST POINT IN EACH SYSTEM. INSTALL AT LEAST ONE PIPE UNION ADJACENT TO ALL SHUT-OFF VALVES, AT CONNECTION POINT OF EACH PIECE OF EQUIPMENT, AND ELSEWHERE IN THE SYSTEM WHERE REQUIRED TO ALLOW PROPER MAINTENANCE. PROVIDE UNIONS OF THE GROUND JOINT TYPE. MAKE ALLOWANCE FOR EXPANSION AND CONTRACTION WHERE REQUIRED BY THE INSTALLATION. WHERE WATER PIPING OCCURS IN EXTERIOR WALLS, HOLD PIPE AS CLOSE AS POSSIBLE TO THE INTERIOR FACE OF THE WALL AND INSTALL INSULATION BATT OR OTHER INSULATION (MINIMUM R-8) BETWEEN PIPING AND THE EXTERIOR WALL FACE.

4. EXTERIOR UTILITY CONNECTIONS

TERMINATE DOMESTIC WATER, STORM, AND SEWER LINES AT A POINT APPROXIMATELY FIVE FEET FROM THE BUILDING WALL, OR AS SHOWN ON THE DRAWINGS. MAKE CONNECTION TO THE VARIOUS SERVICES PROVIDED BY OTHERS AND COORDINATE CONNECTION REQUIREMENTS WITH CIVIL ENGINEER. VERIFY THAT INSTALLATION WILL TIE INTO THE VARIOUS SERVICE PROVIDED BY OTHERS AT THE INDICATED INVERT ELEVATION POINT PRIOR TO INSTALLATION. IF THE INSTALLATION WILL NOT TIE INTO THE INDICATED INVERT ELEVATION POINT WHILE MAINTAINING PROPER FALL, NOTIFY THE ARCHITECT AND CIVIL ENGINEER SO THAT AN ALTERNATIVE MAY BE

PROVIDE SERVICE PIPING AND ACCESSORIES REQUIRED TO COMPLETE UTILITY CONNECTIONS THAT ARE NOT FURNISHED BY THE SERVING UTILITY.

5. TESTING AND INSPECTION

UPON COMPLETION OF EACH PHASE OF THE INSTALLATION, TEST EACH SYSTEM IN CONFORMANCE WITH LOCAL CODE REQUIREMENTS AND AS NOTED BELOW. FURNISH LABOR AND EQUIPMENT REQUIRED TO TEST PLUMBING WORK INSTALLED UNDER THIS CONTRACT, AND ASSUME COSTS INVOLVED IN MAKING THE TESTS, AND REPAIRING 26. PROVIDE AND INSTALL WATTS 8A VACUUM BREAKER ON AND/OR REPLACING DAMAGE RESULTING THEREFROM.

NOTIFY THE ARCHITECT AND AUTHORITY HAVING JURISDICTION, THREE (3) WORKING DAYS PRIOR TO MAKING PLUMBING SYSTEM TESTS. LEAVE CONCEALED WORK UNCOVERED UNTIL THE REQUIRED TESTS HAVE BEEN COMPLETED, BUT IF NECESSARY DUE TO CONSTRUCTION PROCEDURE, TESTS ON PORTIONS OF THE WORK MAY BE MADE, AND WHEN SATISFACTORY, THE WORK MAY BE CONCEALED. TEST PIPING BEFORE INSULATION IS INSTALLED, AND BEFORE BACKFILL. PIPES, JOINTS, FLANGES, VALVE STEMS, ETC., SHALL BE LEAK TIGHT. REPAIR OR REPLACE SYSTEM DEFECTS WITH NEW MATERIALS. CAULKING OF DEFECTIVE JOINTS, CRACK OR HOLES WILL NOT BE PERMITTED. REPEAT TESTS AFTER DEFECTS HAVE BEEN ELIMINATED. MAKE TESTS IN THE PRESENCE OF THE ADMINISTRATIVE AUTHORITY AND/OR THE OWNER'S AUTHORIZED REPRESENTATIVE.

WORK SHALL BE INSPECTED FOR COMPLIANCE WITH CODES, ORDINANCES, REGULATIONS, AND ADHERENCE TO CONTRACT DOCUMENTS. PLUMBING CONTRACTOR SHALL SUPPLY OWNER WITH SIGNED FORMS OR PROOF OF ACCEPTANCE BY THE LOCAL AUTHORITY BEFORE CONTINUING FROM ONE STAGE TO ANOTHER. FINAL APPROVAL SHALL BE OBTAINED BEFORE FINAL PAYMENT IS MADE ON THE CONTRACT.

6. GUARANTEE

THE WORK TO BE PERFORMED UNDER THIS CONTRACT SHALL INCLUDE THE FURNISHING, INSTALLATION, AND CONNECTION OF PLUMBING SYSTEMS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. BY SIGNING THE CONTRACT, THE PLUMBING CONTRACTOR ACKNOWLEDGES THAT HE HAS ACQUAINTED HIMSELF WITH THE SITE AND THE EXISTING CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, AND THE DRAWINGS AND SPECIFICATIONS PERTAINING THERETO, AND HE INDICATES THAT HE WILL COMPLY WITH THE REQUIREMENTS AND INTENT OF PERTINENT DOCUMENTS IN THE PERFORMANCE OF THE WORK.

PLUMBING GENERAL NOTES

- NOTES APPLY TO ALL PLUMBING SHEETS
- EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.
- PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS. OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY THIS WORK.
- EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
- DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF WORK. REVIEW THE GENERAL NOTES AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER OF ANY CONFLICTS OR DISCREPANCIES.
- PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER REFLECTING ANY VARIANCES OF INSTALLED PIPING LOCATIONS OR EQUIPMENT CONTRARY TO THE CONSTRUCTION DOCUMENTS.
- PROVIDE TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS.

PLANS AND SPECIFICATIONS GOVERN WHERE THEY

AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.

- EXCEED CODE REQUIREMENTS. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION
- DO NOT SCALE FLOOR PLANS FOR EXACT HORIZONTAL LOCATION OF PIPE ROUTING.
- INSTALL CONCEALED PIPING TIGHT TO THE STRUCTURE AND AS HIGH AS POSSIBLE. INSTALL EXPOSED PIPING TIGHT TO THE STRUCTURE, WALL OR CEILING AND AS HIGH AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE LOCATIONS OF PIPING IN EXPOSED AREAS WITH ARCHITECT
- 2. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTINGS, ETC. WHERE REQUIRED AND AS NOTED ON PLANS.
- PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL 14. COORDINATE SEWER AND WATER CONNECTIONS WITH CIVIL AND AHJ. PROVIDE PRESSURE REDUCING VALVE AND BACKFLOW PREVENTER AS SHOWN OR REQUIRED

BY AHJ. VERIFY INVERT AND SLOPE OF INCOMING

SANITARY SEWER BEFORE TRENCHING.

13. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL

- 5. REFER TO RISER DIAGRAMS AND PLUMBING FIXTURE SCHEDULE FOR ALL PIPING AND PIPE SIZES NOT SHOWN ON PLAN.
- 16. SANITARY AND STORM SEWER PIPING SHOWN IS BASED ON 1/4" PER FOOT FALL FOR ALL PIPE SMALLER THAN 3" DIAMETER AND 1/8" PER FOOT FALL FOR PIPE 3" DIAMETER AND LARGER.
- 17. ALL SEWER PIPING BELOW SLAB TO BE 2" DIAMETER MINIMUM
- 18. PROVIDE ACCESS DOORS TO ALL CONCEALED VALVES AND CLEAN-OUTS; AND NOT ABOVE AN ACCESSIBLE CEILING.
- COPPER TUBING CONNECTION TO ALL FLOOR DRAINS AS SHOWN OR AS REQUIRED BY AHJ. CONTRACTOR SHALL VERIFY REQUIREMENTS. 20. INSTALL VTR'S, EXHAUST FANS, AND FLUES A MINIMUM

PROVIDE TRAP GUARDS OR TRAP SEAL PRIMERS AND 1/2"

EQUIPMENT WITH OUTSIDE AIR INTAKE. PROVIDE INSULATION ON HOT AND COLD WATER PIPING, ROOF DRAIN BODIES, AND HORIZONTAL ROOF DRAIN

5'-0" FROM PARAPET OR OUTSIDE WALL AND 10'-0" FROM

- 22. INSTALL WATER PIPE ON INSIDE OF EXTERIOR WALL INSULATION TO PREVENT FREEZING.
- WHEN DEEP FROST LOCATIONS ARE ENCOUNTERED. ROUTE SANITARY LINES UNDER BUILDING AS MUCH AS POSSIBLE.

24. PROVIDE PVC SLEEVE FOR ALL COLD/HOT WATER FLOOR

- PIPE PENETRATIONS. MAKE SLEEVE LARGE ENOUGH FOR INSULATION. SEAL WITH GRAY MASTIC AND ENSURE OF NO WATER PENETRATIONS.
- RATED ASSEMBLY. ANY THREADED EXTERIOR OR INTERIOR FAUCETS.

25. PROVIDE FIRE SEAL WHERE PIPES PENETRATE FIRE

27. VALVES SHALL BE LINE SIZE UNLESS NOTED OTHERWISE.

28. ALL WATER SHUT-OFF VALVES SHALL BE "BALL LOCK"

PONT OF ASSOCIATED EQUIPMENT. 29. WATER HAMMER ARRESTORS SHALL BE SIZE "A" UNLESS NOTED OTHERWISE. PROVIDE WATER HAMMER ARRESTORS AS REQUIRED BY AHJ AND/OR CODE OR AS

TYPE. PROVIDE SHUT-OFF VALVES AT EACH TERMINATION

30. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.

RECOMMENDED BY EQUIPMENT MANUFACTURERS.

- 31. FIELD ADJUST WATER CLOSET FLUSHING MECHANISM FOR PROPER FLUSHING OPERATION.
- 32. PROVIDE SEISMIC BRACING BASED ON APPROPRIATE SEISMIC ZONE REQUIREMENTS PER LOCAL AND NATIONAL CODES. CONTRACTOR'S RESPONSIBILITY INCLUDES STRUCTURAL ENGINEER'S CERTIFICATION ON DETAILS SUBMITTED FOR PERMITTING.

PLUMBING SYMBOLS

DESCRIPTION

— - — — DOMESTIC COLD WATER (CW)

SYMBOL

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—GW—

– FW –

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ANNOTATION

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AFG

AHJ

AHU

BAS

BFF

BFP

ETR

EW

EWC

FCO

FD

FS

IN WC

HB

HS

I.E.

MAX

MBH

MC

MFR

MIN

MS

OA

RPZ

RTU

SOV

TYP

UNO

VBF

VBG

VTR

UH

UR

EC

—О

(SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS)

DOMESTIC HOT WATER (HW)

SANITARY SEWER (SS)

GREASE WASTE (GW)

FILTERED WATER (FW)

COMPRESSED AIR (A)

TEMPERED WATER (110°F)

SHUT-OFF VALVE IN VERTICAL

VACUUM RELIEF VALVE

FLOOR CLEANOUT (FCO)

FLOOR DRAIN, ROUND (FD)

FLOOR DRAIN, SQUARE (FD)

CHECK VALVE

GAS VALVE

HOSE BIBB (HB)

PLAN KEYNOTE

TO EXISTING

DOUBLE CHECK VALVE

FLOOR SINK (FS), FULL / HALF GRATE

REDUCED PRESSURE ZONE (RPZ)

FREEZE PROOF WALL HYDRANT (FPWH

GAS PRESSURE REGULATOR

AUTOMATIC GAS VALVE

WALL CLEANOUT (WCO)

EXISTING ITEMS TO BE

REMOVED OR RELOCATED

(SHOWN HATCHED AND NOTED)

TEPID WATER (T)

NATURAL GAS (G)

LIQUID PROPANE (LP)

CONDENSATE (CD)

→ → PIPE: RISE / FALL / TEE DOWN

UNION

CAP

VENT (V)

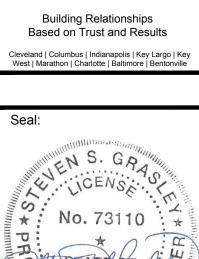
REVERSE OSMOSIS WATER (RO)

DOMESTIC HOT WATER RETURN (HWR)

Architecture. Engineering Interior Design, Asset Management Specialty Consulting

Key Largo, FL Key West, FL Marathon, FL URL: www.k2mdesign.com

PROF. REG. AA26001059



COA: 30945 Steven S. Grasley, FL PE # 73110 Expiration Date: February 28,201

Consultants:

Submissions: 2018.10.31 - PERMIT SET

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PLUMBING EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE) CONNECTION POINT OF NEW WORK DETAIL REFERENCE: UPPER NUMBER INDICATES DETAIL NUMBER, LOWER NUMBER INDICATES SHEET NUMBER

SECTION CUT DESIGNATION

ABBREVIATIONS

AUTHORITY HAVING JURISDICTION

BUILDING AUTOMATION SYSTEM

THREE-COMPARTMENT SINK

ABOVE FINISHED FLOOR

ABOVE FINISHED GRADE

BELOW FINISHED FLOOR

BACKFLOW PREVENTER

EXISTING TO REMAIN

FLOOR CLEANOUT

INVERT ELEVATION

1000 BTU PER HOUR

MANUFACTURER

MIXING HOSE BIBB

FLOOR DRAIN

FLOOR SINK

HOSE BIBB

HAND SINK

MAXIMUM

MINIMUM

MOP SINK

PREP SINK

TYPICAL

URINAL

REFERENCE

RADIANT HEATER

ROOF TOP UNIT

UNIT HEATER

SHUT-OFF VALVE

VENT BELOW FLOOR

VENT BELOW GRADE

VENT THRU ROOF

WATER CLOSET

WATER HEATER

OUTSIDE AIR

EYE WASH

ELECTRICAL CONTRACTOR

ELECTRIC WATER COOLER

GENERAL CONTRACTOR

INCHES OF WATER COLUMN

MECHANICAL CONTRACTOR

PLUMBING CONTRACTOR

REFRIGERATION CONTRACTOR

REDUCED PRESSURE ZONE

UNLESS NOTED OTHERWISE

FREEZE PROOF WALL HYDRANT

AIR HANDLING UNIT

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PLUMBING NOTES AND **SPECIFICATIONS**

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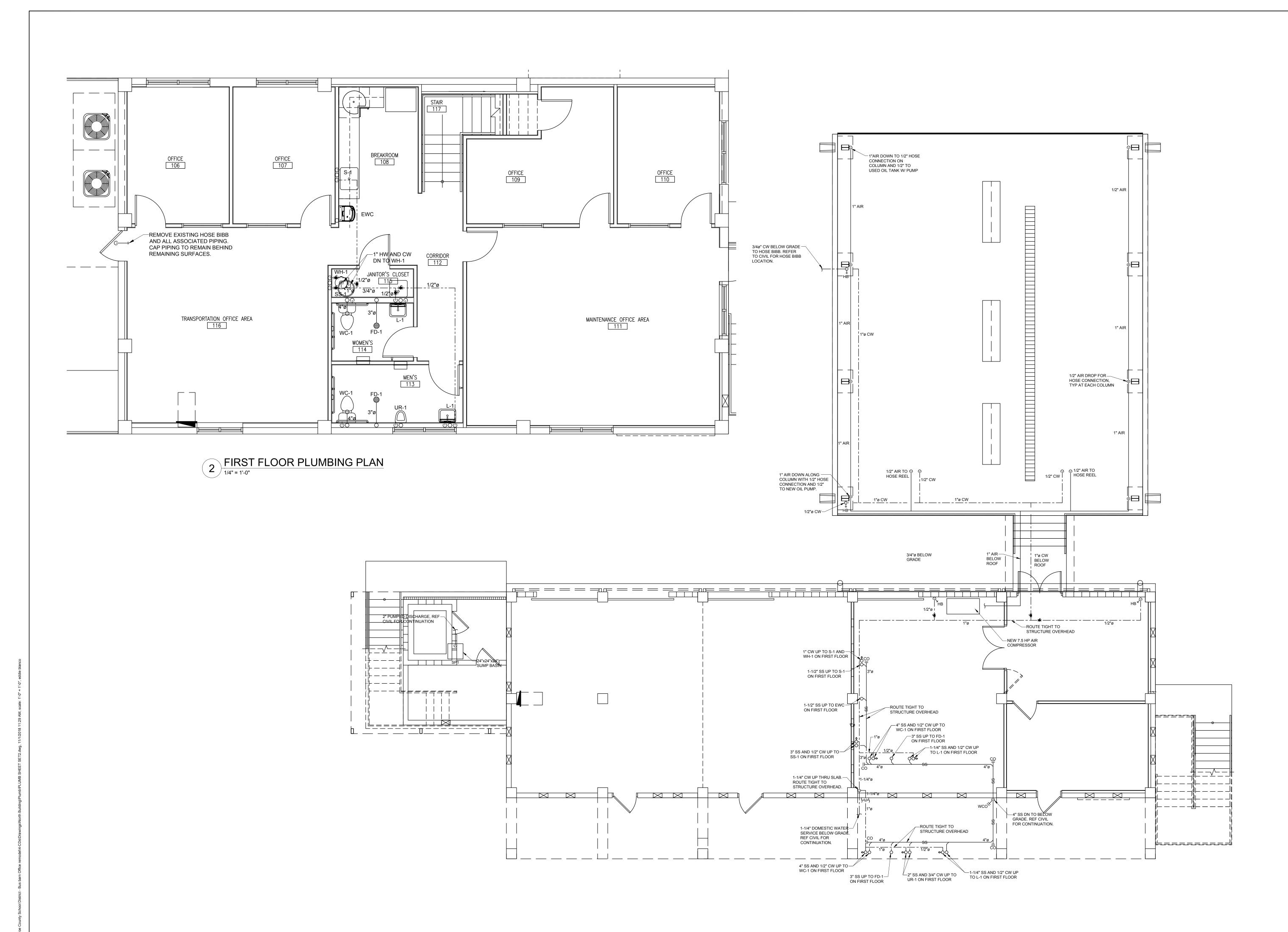
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Sheet Number:

Date: October 31, 2018

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ARCHITECT:

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, Fl

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S. G. A. S. CENS.

No. 73110

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No. 73110

COA: 30945

Steven S. Grasley, FL PE # 73110
Expiration Date: February 28,2017

Consultants:

Submissions: 2018.10.31 - PERMIT SET

R, FLORIDA, 33070

-Y SCHOOL DISTRICT

NOKIT BOIL
90050 OVER
TAVERNIER

MONROE

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Title:
PLUMBING
PLANS

Sheet Number:

P1.1.

					PL	.UMBING FIX	TURE SC	HEDULE
		BF	RANCH	SIZES (M	IIN.)		MODEL	
MARK	FIXTURE	CW	HW	WASTE	VENT	MANUFACTURER	NUMBER	DESCRIPTION
L-1	LAVATORY	1/2"	1/2"	1-1/4"	1-1/4"	AMERICAN STANDARD	0355.012 LUCERNE	WALL MOUNT SINK, 4" CENTERS, FRONT OVERFLOW, COLOR: WHITE, VITREOUS CHINA. FAUCET: AMERICAN STANDARD 6114.116.002, 0.50 GPM. PROVIDE WITH GRID STRAINER. PROVIDE TRUBRO LAV GUARD 2 E-Z SERIES PROTECTIVE PIPE COVERS ON ALL EXPOSED PIPING. PROVIDE WATTS LFUSG-B MIXING VALVE OR EQUAL, SET FOR 105°F DISCHARGE. MOUNT AT ADA HEIGHT.
SS-1	MOP SINK	1/2"	1/2"	3"	1-1/2"	FIAT	MSB2424	PROVIDE NO. 830AA FAUCET WITH INTEGRAL VACUUM BREAKER, NO. 832-AA HOSE AND BRACKET, NO. 1453BB FLOOR STRAINER AND NO. 899-CC MOP HANGER. LOCATE MOP HANGER BRACKET NEAR MOP SINK. COORDINATE FINAL LOCATION WITH OWNER.
S-1	SINK	1/2"	1/2"	1-1/2"	1-1/2"	ELKAY	LRAD191865	TOP MOUNT, SINGLE BOWL, STAINLESS STEEL SINK. DRAIN: ELKAY LK99. FAUCET: ELKA' LK6000, 1.5 GPM, WITH SINGLE LEVER HANDLE, GOOSENECK SPOUT, AND PULL-DOWN SPRAY. PROVIDE TRUBRO LAV GUARD 2 E-Z SERIES PROTECTIVE PIPE COVERS ON ALL EXPOSED PIPING. PROVIDE WATTS LFUSG-B MIXING VALVE OR EQUAL, SET FOR 110°F DISCHARGE. PROVIDE INSINKERATOR EVOLUTION ESSENTIAL GARBAGE DISPOSAL.
UR-1	URINAL	3/4"		2"	1-1/2"	AMERICAN STANDARD	6550.001 ALLBROOK	WALL MOUNT, 3/4" TOP SPUD, COLOR: WHITE, BACK OUTLET, SIPHON JET FLUSH, VITREOUS CHINA. POLISHED CHROME FLUSH VALVE: AMERICAN STANDARD 6045.051.00 MANUALLY OPERATED. 17" RIM HEIGHT FOR ADA COMPLIANCE. CARRIER: WATTS CA-32°
WC-1	WATER CLOSET	1/2"		4"	2"	AMERICAN STANDARD	2467.016 CADET	FLOOR MOUNT, FLUSH TANK, 12" ROUGH-IN, COLOR: WHITE, VITREOUS CHINA, ELONGATED BOWL, AMERICAN STANDARD 5901.100SS CADET OPEN FRONT SEAT LESS COVER. 17" RIM HEIGHT FOR ADA COMPLIANCE. 1.6 GPF. MOUNT CONTROLS ON ACCESSIBLE SIDE OF TOILET. CONTRACTOR TO COORDINATE WITH FIXTURE SUPPLIER FOR LEFT/RIGHT HAND FLUSH LEVER TO COMPLY WITH ADA REQUIREMENTS.
EWC	ELECTRIC WATER COOLER	1/2"		1-1/2"	1-1/4"	ELKAY	EZSTL8LC	FIXTURE AND HARDWARE FURNISHED AND INSTALLED BY PLUMBING CONTRACTOR. STAINLESS STEEL TOP, FRONT AND SIDE PUSH BARS, WATER SAVER BUBBLER WITH PROTECTED ORIFICE MEETING ALL SANITARY CODES, ANGLE STOP VALVE, 3/8"x1/2"x20 SS BRAIDED HOSE, P-TRAP AND ESCUTCHEON. PROVIDE CARRIER.

	DRAIN	/ CLEANOUT	/ HOSE	BIBB / HYDRANT SCHEDULE
MARK	FIXTURE	MANUFACTURER	MODEL NUMBER	DESCRIPTION
CO	CLEANOUT	JR SMITH	4470	CAST BRONZE TAPER THREAD PLUG.
FD-1	FLOOR DRAIN	JR SMITH	2010	DUCO CAST IRON BODY WITH FLASHING COLLAR AND TYPE A ROUND ADJUSTABLE NICKEL BRONZE STRAINER HEAD.
WCO	WALL CLEANOUT	JR SMITH	4472	CAST BRONZE TAPER THREAD PLUG AND STAINLESS STEEL COVER WITH SECURING SCREW. PROVIDE JR SMITH 4768 FIRE RATED ACCESS DOOR AT CLEANOUTS LOCATED IN FIRE RATED WALLS.
НВ	HOSE BIBB	ZURN	Z1341	BRASS THREADED SILLCOCK WITH FLANGE AND QUARTER-TURN OPERATION, 1/2" N.P.T. INLET AND 3/4" H.P.T. OUTLET.

		SPE	CIALTY PLUN	//BING	FIXTURE SCHEDULE	
П	MARK	FIXTURE	MANUFACTURER	MODEL	DESCRIPTION	NOTES
	WHA	WATER HAMMER ARRESTOR	ZURN	1250 SERIES	CONFORM TO PDI WH-201, ANSI A112.26.1M, ASSE 1010; TEMP TO 250°F, MAX 350 PSIG WORKING PRESSURE	A
	TMV	TEMPERATURE MIXING VALVE	WATTS	LFUSG-B	+/- 3°F UP TO 120°F, WITH BUILT-IN CHECK VALVES, BRASS BODY, AND COPPER THERMOSTAT.	
		TRAP PRIMER	SIOUX CHIEF	695	BRONZE PRIMER VALVE WITH REMOVABLE OPERATING PARTS, INTEGRAL VACUUM BREAKER, AND GASKETED ACCESS COVER.	
	RPZ	REDUCED PRESSURE BACKFLOW PREVENTER	WILKINS	975XL	PROVIDE BRONZE BODY, WITH SHUT-OFF VALVES, Y-STRAINER, AND TEST COCKS. PROVIDE DRAIN LINE WITH AIR GAP ASSEMBLY, MINIMUM 175 PSI WORKING PRESSURE.	В
		VALVES	WATTS	LFB6000	FULL PORT BRASS BALL VALVE WITH PLASTIC JACKETED LEVER TYPE HANDLE.	

A. SIZE PER MANUFACTURER'S RECOMMENDATION.

B. ROUTE DRAIN TO FLOOR DRAIN AND PROVIDE WITH INDIRECT CONNECTION AND AIR GAP. C. THIS SCHEDULE IS COMPREHENSIVE. ALL MARKS MAY OR MAY NOT BE USED ON PLANS.

WATER HEATING SYSTEM SCHEDULE									
		1	WATER HEATE	RS					
MARK	MANUFACTURER	MODEL	TANK SIZE (GAL)	HEAT INPUT (KW)	ELECTRICAL V/PH	NOTES			
WH-1	A.O. SMITH	DEL-6	6	2.5	120/1	A-F			
		Е	XPANSION TAI	NKS					
MARK	MANUFACTURER	MODEL		DI	ESCRIPTION				
ET-1	WATTS	PLT-12	FIXED BLADDER TYPE EXPANSION TANK. 4.5 GALLON MINIMUM TOTAL CAPACITY, FACTORY STANDARD PRECHARGE CAPACITY.						

A. PROVIDE INCO-LOY HEATING ELEMENTS.

OR STYROFOAM BILLETS.

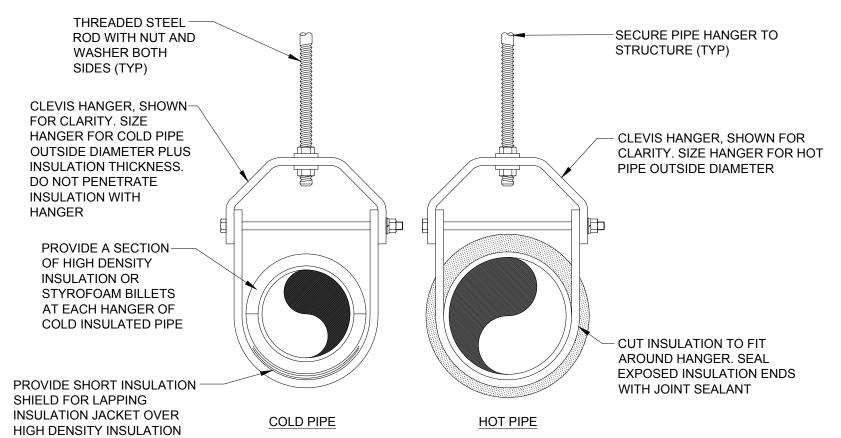
MAINTAIN VAPOR BARRIER

B. PROVIDE ASME TEMPERATURE AND PRESSURE RELIEF VALVE. C. PROVIDE WALL-MOUNTED PLATFORM INSTALLED ABOVE MOP SINK.

D. PROVIDE EXPANSION TANK ET SIZED PER MANUFACTURER'S RECOMMENDATION. E. 120°F OUTLET TEMPERATURE.

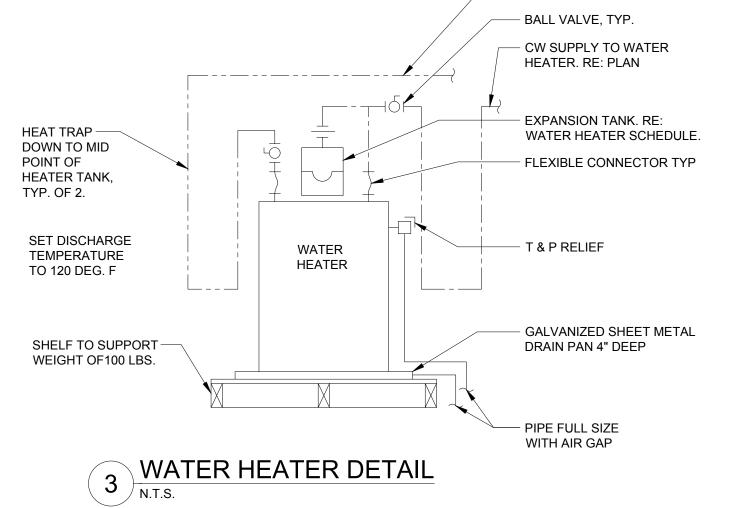
F. ROUTE DRAIN PAN AND T&P DRAIN PIPING TO MOP SINK.

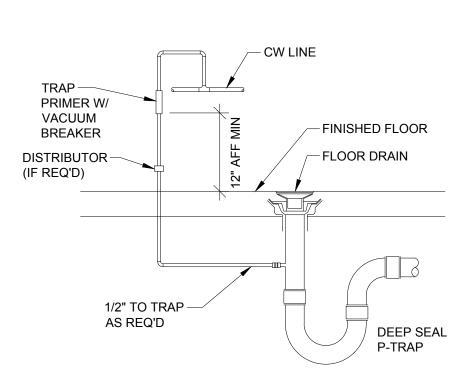
	PUMP SCHEDULE										
MARK	MANUFACTURER	MODEL	TYPE	MOTOR HP	HEAD (FT)	FLOW RATE (GPM)	V/PH/HZ	NOTES			
SP1	STANCOR	SE-50	ELEVATOR SUMP PUMP	0.500	37	74	120/1/60	PROVIDE COMPLETE OIL MINDER SIMPLEX PUMP AND CONTROL SYSTEM WITH OIL MINDER MULTI OPTION CONTROLLER AND REMOTE AUDIBLE AND VISUAL ALARM. PROVIDE BACKWARD CHECK VALVE AND			



REFER TO SPECIFICATIONS FOR INSULATION TYPES, INSULATION THICKNESSES, HANGER TYPES, HANGER ROD CONNECTIONS TO STRUCTURE, AND HANGER SPACING.

INSULATED PIPE HANGER





-1-1/4" DOMESTIC WATER

REF CIVIL FOR CONTINUATION.

PROVIDE LEAD SHEETING AROUND

/ VENT FLASHING SHALL BE PER ROOF

MANUFACTURER'S AND ROOFING

ROOF INSULATION

ROOF DECK

DECK WITH U-BOLT AROUND

WELDED OR SCREWED TO

- MINIMUM 12" BELOW ROOF

FOR TYPE OF PIPE USED

- PIPE CONNECTORS SUITABLE

ANCHOR PIPE TO ROOF

PIPE AND ANGLE IRON

ROOF DECK OR JOIST.

CONTRACTOR'S RECOMMENDATION.

EXPOSED VENT ABOVE FLASHING. TURN DOWN INTO PIPE OPENING.

SERVICE BELOW GRADE.

OPERATION:

THE PUMP IS PIGGY-BACKED ONTO

THE PLUG FOR THE OIL SENSOR. IF

THE PUMP WILL NOT FUNCTION, AND

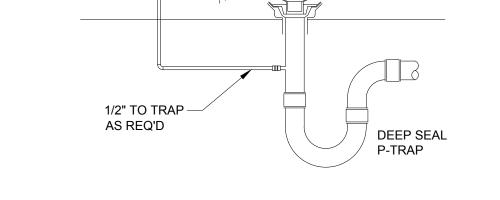
SUMP IN BOTTOM OF

ELEVATOR PIT, SEE

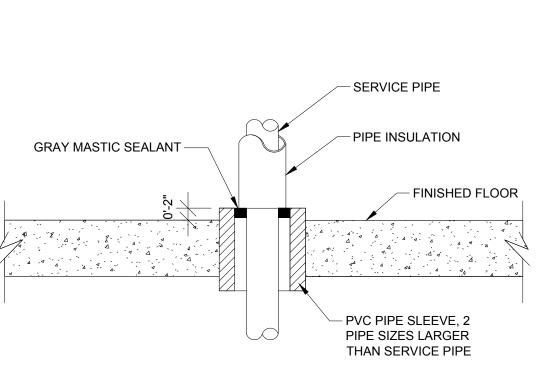
STRUCT. PLANS

OIL IS SENSED IN THE EFFLUENT,

WILL SOUND AN AUDIBLE ALARM.



2 FLOOR DRAIN DETAIL
N.T.S.



PIPE SLEEVE DETAIL

Interior Design, Asset Management Specialty Consulting Key Largo, FL Key West, FL Marathon, FL URL: www.k2mdesign.com PROF. REG. AA26001059 **Building Relationships** Based on Trust and Results Cleveland | Columbus | Indianapolis | Key Largo | K West | Marathon | Charlotte | Baltimore | Bentonvil

3/4ø" CW BELOW GRADE -

 $^{\rm HB} \times$

FINISHED FLOOR SLAB

- STANCOR OIL MINDER

CONTROL PANEL FOR

LOCATE IN MECHANICAL

ROOM. COORDINATE WITH

ELECTRICAL CONTRACTOR.

AUDIBLE AND VISUAL ALARM.

SYSTEM. 115V, WITH

— 2" PUMPED DISCHARGE

TO HOSE BIBB.

7 WATER RISER

AS REQUIRED.

PROVIDE STANCOR MULTI PIN CONNECTOR CABLE

REMOVABLE CAST IRON -

DRAINAGE GRATE & FRAME

STANCOR JUNCTION BOX PIGGYBACK -PLUGS FOR AUTOMATIC CONTROLLING

CLEANOUT-

GATE VALVE -

CHECK VALVE -

ELEVATOR PIT

(HOISTWAY)

ELECTRICAL RECEPTACLE SEE ELECT. PLANS



Consultants:

Submissions: 2018.10.31 - PERMIT SET

DIS REM SCHOOL BUILDING

1050 OVERSEAS HICA

AVERNIER, FLORIDA

Drawn By: Checked By: Title:

PLUMBING RISERS, DETAILS, AND SCHEDULES

Sheet Number:

Date: October 31, 2018

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REFER TO PLANS FOR VTR PIPE SIZES AND LOCATIONS. LOCATE VTR MINIMUM THREE FEET FROM PROPERTY LINE, OR TEN FEET HORIZONTAL OR THREE FEET VERTICAL ABOVE ANY BUILDING OPENING OR FRESH AIR - CONDUIT INTAKE, OR ONE FOOT FROM ANY VERTICAL SURFACE. LOCATE VTR FLOAT OR MINIMUM 18" FROM PARAPET, EXPANSION JOINT, EQUIPMENT CURB, ETC. MICROSWITCH OIL SENSOR OFFSET IN CEILING SPACE WHERE REQUIRED TO MEET THESE CONDITIONS. PROVIDED WITH PUMP 6 VENT THRU ROOF DETAIL
N.T.S. (DISCRIMINATING LIQUID H H SENSOR) — PUMP SHALL BE CAPABLE SHUT-OFF VALVE ON DISCHARGE LINE. OF FLOWING A MINIMUM OF 50 GPM PER ASME 5 ELEVATOR PIT SUMP PUMP DETAIL

N.T.S. - HW SUPPLY TO SYSTEM. RE: PLAN. PLOTTED: 11/1/2018 11:29 AM Drawing Size | Project #:

4" SS BELOW GRADE. REF CIVIL FOR

CLAMP #

CONTINUATION.

8 DWV RISER

EXPOSED VENT

SHALL BE PVC.

PIPE THRU ROOF

HEIGHT ABOVE ROOF -

SHALL EXCEED LOCAL

MAXIMUM SNOW DEPTH

(CONTRACTOR SHALL

VERIFY), 12" MINIMUM.

CORE DRILL ROOF OR-

REQUIRED BY TYPE OF

FIRE STOP SEAL BETWEEN

PIPE AND SLEEVE OR DECK.

PROVIDE PIPE INCREASER-

IF/WHERE CODE REQUIRES A

MINIMUM 3" VENT THRU ROOF.

ROOF DECK. PROVIDE

PROVIDE SLEEVE IF

(16.5 DFU)

ELECTRICAL SPECIFICATIONS

DIVISION 26 - ELECTRICAL

I. GENERAL PROVISIONS

- A. GENERAL CONDITIONS, CODES & STANDARDS
- 1. GENERAL CONDITIONS OF THE CONTRACT FOUND IN THE ARCHITECTURAL DRAWINGS, GENERAL AND SPECIAL CONDITIONS OF THE AMERICAN INSTITUTE OF ARCHITECTS (AIA) AND ANY OF THE OWNER'S GENERAL REQUIREMENTS SHALL APPLY UNLESS NOTED
- OTHERWISE. 2. REFER TO THE GENERAL CONDITIONS ON THE ARCHITECTURAL DOCUMENTS AND THE GENERAL AND SPECIAL CONDITIONS OF THE AIA FOR ADDITIONAL REQUIREMENTS REGARDING; SAFETY, COORDINATION & COOPERATION, WORKMANSHIP, PROTECTION, CUTTING AND PATCHING, DAMAGE TO OTHER WORK, PRELIMINARY OPERATIONS. STORAGE, ADJUSTMENTS, CLEANING, ETC.
- 3. ALL WORK SHALL BE IN CONFORMANCE WITH ALL LOCALLY ENFORCED, FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES INCLUDING ANY SPECIAL THE OWNER REQUIREMENTS IN ADDITION TO THOSE
- SPECIFIED. CONTRACTOR SHALL PAY FOR AND OBTAIN ALL NECESSARY LICENSES, PERMITS AND INSPECTIONS REQUIRED TO PROCEED WITH THE WORK. THIS SHALL INCLUDE ALL REQUIRED COORDINATION WITH THE LOCAL UTILITY COMPANIES AND THEIR ASSOCIATED FEES OR COSTS.

B. SCOPE OF WORK

- 1. THIS CONTRACT SHALL INCLUDE THE FURNISHING, INSTALLING, CONNECTING, AND OPERATION OF ALL EQUIPMENT WHICH IS A PART OF THE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY SIMILAR INSTALLATIONS. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK AND WHICH IS USUALLY INCLUDED IN WORK OF A SIMILAR CHARACTER SHALL BE FURNISHED AND INSTALLED UNDER THIS CONTRACT AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS REQUIRED TO PROVIDE THE OWNER A COMPLETE, CODE APPROVED AND OPERATIONAL FLECTRICAL SYSTEM.
- 2. CAREFULLY READ SPECIFICATION FOR ALL PARTS OF THE WORK SO AS TO BECOME FAMILIAR WITH ALL TRADES' WORK SCOPE. CONSULT WITH OTHER TRADES TO INSURE PROPER LOCATIONS AND AVOID INTERFERENCES. ANY CONFLICT SHALL BE BROUGHT TO THE
- ATTENTION OF THE OWNER BEFORE WORK IS COMMENCED. 3. CONTRACTORS SHALL BE HELD TO HAVE EXAMINED THE PREMISES AND SITE SO AS TO COMPARE THEM WITH THE DRAWINGS AND SPECIFICATIONS, NOTE THE EXISTING CONDITIONS AND OTHER WORK THAT WILL BE REQUIRED, AND THE NATURE OF THE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED. NO ALLOWANCE SHALL BE MADE TO THE CONTRACTOR BY REASON OF THIS FAILURE TO HAVE
- MADE SUCH EXAMINATION OR OF ANY ERROR ON HIS PART. 4. ALL EXISTING UTILITY AND ELECTRICAL SERVICES SHALL BE FIELD VERIFIED. CORRECTIONS TO THE DESIGN AND INSTALLATION SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER.
- PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF ELECTRICAL WORK. ALL CORE DRILLING OR CUTTING OF FIRE RATED FLOORS, SHAFTS, AND WALLS SHALL BE FIRESTOPPED PRIOR TO FINISH PATCHING. ALL PENETRATIONS SHALL BE FIRE SEALED TO MATCH THE FIRE RATING OF THE FLOORS, SHAFTS, AND WALLS PENETRATED. TEMPORARY ELECTRICAL SERVICE, LIGHTING, AND RELATED WIRING
- SHALL BE PROVIDED TO OSHA REQUIREMENTS FOR THE USE OF ALL TRADES DURING CONSTRUCTION. 7. TEMPERATURE AND INTERLOCK CONTROL COMPONENTS AND ALL
- RELATED WIRING AND CONDUIT SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE INDICATED ON THE
- 8. THIS CONTRACT SHALL ALSO INCLUDE ALL LABOR, MATERIALS AND MISCELLANEOUS EXPENSES REQUIRED FOR ALL REQUIRED ELECTRICAL DEMOLITION OF THE EXISTING AREAS BEING RENOVATED.
- a. THE DEMOLITION SHALL CONSIST OF THE COMPLETE REMOVAL (PROPERLY DISPOSED OFF SITE UNLESS OTHERWISE NOTED) OF ALL ELECTRICAL EQUIPMENT, WIRING, CONDUIT, MATERIALS, ETC. NOT REQUIRED IN THE FINAL DESIGN AND INSTALLATION OF THE ELECTRICAL SYSTEMS FOR THE NEW RENOVATED AREAS.
- b. ALL UNDERGROUND SERVICES NOT BEING REUSED SHALL BE CAPPED BELOW THE FLOOR, WIRING REMOVED, AND FLOOR PENETRATIONS REPAIRED TO MATCH ADJACENT SURFACES.
- c. ALL ABOVE GROUND CIRCUITS SHALL BE REMOVED BACK TO THE SOURCE UNLESS INDICATED OTHERWISE. d. COORDINATE ALL DEMOLITION WITH THE ARCHITECTURAL
- DOCUMENTS, THE ARCHITECT, AND THE OWNER'S GENERAL REQUIREMENTS. 9. THE GENERAL CONTRACTOR SHALL VERIFY SITE LIGHTING BASE
- DETAILS WITH STRUCTURAL ENGINEER TO VERIFY APPLICABILITY OF POLE/FIXTURE BASE WITH LOCAL SOIL CONDITIONS.
- 10. ALL WORK INCLUDING, BUT NOT LIMITED TO PARTS, MATERIAL, EQUIPMENT AND LABOR SHALL BE GUARANTEED FOR ONE YEAR AFTER ACCEPTANCE BY THE ENGINEER AND OWNER. WHERE AN EQUIPMENT MANUFACTURER HAS A WARRANTY THAT EXCEEDS ONE YEAR. THAT WARRANTY PERIOD SHALL APPLY TO THIS PROJECT.

C. DOCUMENTS

- 1. THE DRAWINGS ARE DIAGRAMMATIC: ALL WORK SHALL BE PERFORMED AS INDICATED ON THE DRAWINGS UNLESS EXISTING CONDITIONS OR COORDINATION ISSUES REQUIRE CHANGES. THESE CHANGES SHALL BE
- MADE WITH NO ADDITIONAL COST TO THE OWNER. 2. ANY INCIDENTAL ITEMS OR LABOR, ETC. NOT INCLUDED IN THE SPECIFICATIONS OR THE DRAWINGS BUT REASONABLY IMPLIED AS NECESSARY FOR THE COMPLETE INSTALLATION OF ALL APPARATUS SHALL BE INCLUDING IN BID.
- 3. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE FURNISHED EVEN THOUGH NOT MENTIONED IN BOTH.
- 4. IF ERRORS ARE FOUND IN THE DRAWINGS OR SPECIFICATIONS OR DISCREPANCIES OCCUR BETWEEN THE SAME, OR BETWEEN THE FIGURES ON THE DRAWINGS, AND THE SCALE OF SAME OR BETWEEN THE LARGER AND SMALLER DRAWINGS, OR IN THE DESCRIPTIVE MATTER ON THE DRAWINGS SHALL BE REFERRED TO THE OWNER FOR REVIEW AND FINAL DECISION PRIOR TO THE BID DUE DATE.
- 5. THE BIDDING OF THIS WORK WILL CONTEMPLATE THE USE OF EQUIPMENT AND MATERIALS EXACTLY AS SPECIFIED HEREIN. WHERE MORE THAN ONE MANUFACTURER IS MENTIONED ANY ONE MAY BE UTILIZED. SUBSTITUTE MANUFACTURERS MAY BE OFFERED ONLY AS AN ALTERNATE TO THE SPECIFIED EQUIPMENT AND MATERIAL AND MUST BE SUBMITTED AS SPECIFIED IN THE ARCHITECTURAL DOCUMENTS.
- 6. MISCELLANEOUS ITEMS NECESSARY TO COMPLETE THE SYSTEMS CAN BE OF ANY RECOGNIZED MANUFACTURE PROVIDED THESE ITEMS MEET MINIMUM STANDARDS AS SET IN THESE SPECIFICATIONS. REFER TO EACH SECTION FOR ANY SPECIFIC REQUIREMENTS.

D. COORDINATION

1. CONTRACTOR SHALL LOCATE, IDENTIFY AND PROTECT ANY EXISTING SERVICES WHICH ARE REQUIRED TO BE MAINTAINED OPERATIONAL AND SHALL EXERCISE EXTRA CAUTION IN THE PERFORMANCE OF ALL WORK TO AVOID DISTURBING SUCH FACILITIES. ALL COSTS FOR REPAIR OF DAMAGES TO SUCH SERVICES SHALL BE PAID BY THE CONTRACTOR CAUSING THE DAMAGE.

2. FACH CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL DAMAGE TO OTHER WORK CAUSED BY HIS WORK OR THROUGH THE NEGLECT OF HIS. OR HIS SUB-TRADE'S PERSONNEL. ALL PATCHING, REPAIRING, REPLACEMENT AND PAINTING, ETC. SHALL BE DONE AS DIRECTED BY THE OWNER BY THE CRAFTSMEN OF THE TRADES INVOLVED. THE COSTS OF SUCH WORK SHALL BE PAID BY THE CONTRACTOR CAUSING THE DAMAGE.

IT IS ESSENTIAL THAT ALL WORK AT THE PROJECT BE DONE AT SUCH TIME

AND IN SUCH MANNER AS NOT TO INTERFERE WITH THE OPERATIONS OF THE SPACE. ADJACENT SPACES, OR FACILITY. A WORK SCHEDULE SHALL BE ARRANGED WITH THE OWNER, INCLUDING PREMIUM TIME WORK TO FACILITATE WORK WITH A MINIMUM OF INTERFERENCE TO THE OWNER'S OPERATIONS.

E. METHODS

 EXCAVATIONS SHALL BE MADE IN OPEN TRENCHES. FLOORS SHALL BE SAW CUT. CONDUIT SHALL BE LAID ON AN APPROPRIATELY GRADED 6" BED OF CLEAN AND DRY SAND. ENGINEERED FILL SHALL BE USED TO BACKFILL TO 6" ABOVE THE CONDUIT. BACKFILL THE REMAINDER OF THE TRENCH UTILIZING THE EXCAVATED MATERIAL IF APPROVED BY THE ARCHITECT OR THE OWNER. IF THE EXCAVATED MATERIALS ARE NOT ACCEPTABLE, ENGINEERED FILL ACCEPTABLE TO THE ARCHITECT SHALL BE UTILIZED TO BACKFILL THE REMAINDER OF THE TRENCH. BACKFILL SHALL BE ACCOMPLISHED IN 9" LIFTS WITH ALL LIFTS COMPACTED TO 95% PROCTOR. PATCH FLOOR TO MATCH FXISTING.

2. EQUIPMENT, CONDUIT, ETC. SHALL NOT BE SUPPORTED FROM ANY CEILINGS, OTHER PIPING, OTHER CONDUIT OR DUCTWORK, ROOF DECK, OR JOIST BRIDGING. ITEMS SHALL BE SUPPORTED FROM ACCEPTABLE STRUCTURAL BUILDING COMPONENTS AS DETERMINED BY THE ARCHITECT AND STRUCTURAL ENGINEER. ALL ROOF PENETRATIONS, FLASHINGS AND COUNTER FLASHINGS SHALL BE PERFORMED BY THE OWNER'S ROOFING CONTRACTOR AT THE REQUESTING CONTRACTORS COST.

1. SHOP DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT OF ALL EQUIPMENT AND ACCESSORIES PROVIDED FOR THE PROJECT WHETHER SPECIFIED HERE-IN OR ON THE DRAWINGS. REVIEW OF THE SHOP DRAWINGS SHALL BE FOR GENERAL DESIGN CONCEPT AND ADHERENCE WITH THE SPECIFICATIONS. QUANTITY OF SHOP DRAWINGS SUBMITTED SHALL BE AS SPECIFIED BY THE ARCHITECT. SHOP DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR SHOWING LOCATIONS AND MEASUREMENTS FROM COLUMNS OF ALL CONCEALED AND EXPOSED PIPING, DUCTWORK, CONDUIT, EQUIPMENT, ACCESSORIES, ETC., AND SUBMITTED PRIOR TO INSTALLATION. THE OWNER MAY MAKE REPRODUCIBLE COPIES OF THEIR DRAWINGS AVAILABLE FOR USE IN PREPARATION OF SHOP DRAWINGS, HOWEVER THE OWNER SHALL NOT BE HELD RESPONSIBLE FOR NOT CONFIRMING ALL INFORMATION ON THE DRAWINGS PRIOR TO FABRICATION AND/OR INSTALLATION. 2. PROJECT RECORD DOCUMENTS - MAINTAIN AT THE JOBSITE ONE COPY OF ALL CONTRACT DOCUMENTS CLEARLY MARKED AS "PROJECT RECORD COPY". THESE DRAWINGS ARE TO BE MAINTAINED IN GOOD CONDITION, UPDATED DAILY FOR CHANGES ENCOUNTERED AND AVAILABLE AT ALL TIMES FOR INSPECTION BY THE OWNER. DO NOT USE FOR FIELD CONSTRUCTION! PROJECT RECORD DOCUMENTS ARE TO BE KEPT CURRENT WITH EXACT DIMENSIONS OF ALL WORK, EQUIPMENT, DISTRIBUTION CONDUIT, CIRCUITS, ETC. MARK ALL INFORMATION IN RED LINES AND NOTES SO AS TO BE EASILY IDENTIFIED FROM THE BASE DRAWING. UPON COMPLETION OF THE WORK, ONE SET OF THESE DOCUMENTS SHALL BE TURNED OVER TO THE OWNER AS ONE QUALIFICATION FOR FINAL PAYMENT.

3. THREE COMPLETE SETS OF AS-BUILT DOCUMENTATION SHALL BE PROVIDED. IT SHALL INCLUDE, BUT NOT BE LIMITED TO ACCURATE PLAN DRAWINGS, WIRING DIAGRAMS AND OPERATION AND MAINTENANCE MANUALS

II. PRODUCTS

1. CONDUIT SHALL BE HEAVY WALL RIGID GALVANIZED STEEL WHERE EXPOSED AND SUBJECT TO DAMAGE. 8'-0" AFF AND BELOW, AND IN WET LOCATIONS WHERE INDICATED ON THE DRAWINGS. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC AND SHALL BE CONCRETE ENCASED (3' MINIMUM) WHERE INDICATED ON THE DRAWINGS. A TRANSITION SHALL BE MADE TO HEAVY WALL RIGID GALVANIZED STEEL BEFORE PVC CONDUITS PENETRATE THE FLOOR SLAB. INTERIOR CONDUITS SHALL BE ELECTRICAL METALLIC TUBING (EMT). METAL CLAD (MC) CABLE MAY BE USED IF APPROVED BY THE OWNER, AND INSTALLED IN LOCATIONS PERMITTED BY CODE. 2. FLEXIBLE METAL CONDUIT SHALL BE USED FROM OUTLET BOX TO INDIVIDUAL RECESSED LIGHT FIXTURES, AND FOR FINAL CONNECTIONS TO MOTORS AND OTHER DEVICES SUBJECT TO VIBRATION.

B. CONDUIT FITTINGS AND BOXES

- 1. INTERIOR OUTLET BOXES SHALL BE STANDARD GALVANIZED SHEET STEEL TYPE, NOT LESS THAN 14 GAUGE IN THICKNESS, WITH KNOCKOUT OPENINGS, EXTENSIONS, PLASTER RINGS AND COVER PLATES TO ACCOMMODATE THE DEVICES INSTALLED. COVER PLATES SHALL BE SMOOTH PLASTIC TO MATCH DEVICE COLOR. USE STEEL PLATES WITH ROUNDED CORNERS FOR SURFACE BOXES. OUTDOOR (WET LOCATION) OUTLET BOXES SHALL BE CAST ALUMINUM
- TYPE WITH DEVICE COVERS TO SUIT. 2. OUTLET BOXES SHALL NOT BE LESS THAN 4 INCHES SQUARE, 1-1/2 INCHES 3. COUPLINGS AND CONNECTORS FOR EMT SHALL BE DIE CAST ZINC OR

STEEL. BUSHING SHALL BE GROUNDING TYPE WITH INSULATING PLASTIC

C. WIRE AND CABLE

- 1. CONDUCTORS FOR POWER AND LIGHTING SHALL BE NEW 600-VOLT, 90°C, TYPE XHHW, THHN, OR THWN INSULATION, MINIMUM SIZE #12-AWG, EXCEPT FOR CONTROL WIRING WHICH MAY BE #14-AWG. OTHER SIZES SHALL BE AS NOTED ON THE DRAWINGS. CONDUCTORS SHALL BE COPPER, UNLESS OTHERWISE APPROVED BY THE OWNER.
- 2. BRANCH CIRCUIT RUNS EXCEEDING 100 FEET IN TOTAL LENGTH FROM THE PANELBOARD TO THE LAST DEVICE, SHALL BE #10-AWG CONDUCTORS UNLESS OTHERWISE NOTED 3. COMPRESSION TYPE LUGS AND CONNECTORS SHALL BE USED FOR ALL
- TERMINATIONS AND SPLICES. 4. ALL LOW VOLTAGE COMMUNICATIONS, FIRE ALARM, DATA, SECURITY.
- TELEPHONE AND ALL OTHER MISCELLANEOUS LOW VOLTAGE WIRING INSTALLED IN CEILING SHALL BE PLENUM RATED.

D. WIRING DEVICES

- 1. DUPLEX RECEPTACLES SHALL BE GROUNDING TYPE, NEMA 5-20R, RATED FOR 20 AMPS, 125 VOLTS, WITH PROVISIONS FOR BACK AND SIDE WIRING. 2. GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLES SHALL BE PROVIDED WHERE INDICATED.
- 3. SWITCHES SHALL BE TOGGLE OPERATED, QUIET TYPE, RATED FOR 20 AMPS, 120/277 VOLTS, WITH PROVISIONS FOR BACK AND SIDE WIRING. THREE WAY AND FOUR WAY SWITCHES SHALL BE PROVIDED WHERE INDICATED. 4. DIMMERS SHALL BE LUTRON "NOVA T-STAR" SERIES, OF A RATING, VOLTAGE AND WATTAGE SUITABLE FOR LOAD SERVED. 5. COLORS OF DEVICES SHALL BE SELECTED BY ARCHITECT.
- 6. WIRING DEVICES SHALL BE SPECIFICATION GRADE, AS MANUFACTURED

HUBBELL, PASS & SEYMOUR, ARROW HART, LEVITON AND GENERAL ELECTRIC.

E. LIGHTING AND RECEPTACLE PANELBOARDS

1. BRANCH CIRCUIT PANELBOARDS SHALL BE DEAD FRONT TYPE, WITH MAIN LUGS OR MAIN OVERCURRENT DEVICE AS INDICATED, BRANCH

- OVERCURRENT DEVICES AS NOTED AND AN EQUIPMENT GROUND BAR. ALL IN A SURFACE OR FLUSH MOUNTED SHEET STEEL ENCLOSURE. MINIMUM SHORT CIRCUIT CAPACITY SHALL BE 10,000 AMPS SYMMETRICAL FOR 120/208V, AND 18,000 AMPS SYMMETRICAL FOR 277/480V APPLICATION UNLESS NOTED OTHERWISE.
- 2. CIRCUIT BREAKERS SHALL BE BOLT ON TYPE; WITH MOLDED PLASTIC CASE; 1, 2, OR 3 POLE AS INDICATED; QUICK-MAKE, QUICK-BREAK; AND THERMAL-MAGNETIC TRIP DEVICE.
- 3. ALL BREAKERS FEEDING HVAC EQUIPMENT SHALL BE HACR RATED, UNLESS OTHERWISE NOTED.
- 4. ALL BREAKERS IN RESIDENTIAL OCCUPANCIES SHALL BE ARC-FAULT TYPE, UNLESS OTHERWISE NOTED.
- 5. PANELBOARDS SHALL BE AS MANUFACTURED BY SQUARE D. GENERAL ELECTRIC, SIEMENS, AND CUTLER HAMMER.

F. DISTRIBUTION TRANSFORMERS

1. TRANSFORMERS SHALL BE ENERGY SAVING TYPE, DRY TYPE, 115 DEGREE RISE WITH 2 TAPS ABOVE AND 4 TAPS BELOW NORMAL VOLTAGE. TRANSFORMERS SHALL BE AS MANUFACTURED BY SQUARE D, GENERAL ELECTRIC, SIEMENS, CUTLER HAMMER, AND ACME.

G. SAFETY SWITCHES AND MOTOR STARTERS

- 1. SAFETY SWITCHES SHALL BE FUSIBLE OR NON-FUSIBLE AS INDICATED ON THE DRAWINGS. SWITCHES SHALL BE QUICK-MAKE, QUICK-BREAK, HEAVY DUTY VISIBLE BLADE TYPE. ENCLOSURES SHALL BE NEMA 1 TYPE UNLESS OTHERWISE INDICATED ON THE DRAWINGS. FUSES SHALL BE DUAL ELEMENT - TIME DELAY TYPE.
- 2. MAGNETIC MOTOR STARTERS SHALL BE COMBINATION TYPE WITH THERMAL OVERLOAD. INTEGRAL FUSED SAFETY SWITCH. H-O-A SELECTOR SWITCH, CONTROL TRANSFORMER, RUNNING PILOT LIGHT NEMA TYPE 1 ENCLOSURE, AND (2) NORMALLY OPEN AND (2) NORMALLY CLOSED AUXILIARY CONTACTS.
- 3. ALL MOTORS OVER 1/8 HP SHALL BE PROVIDED WITH THERMAL OVERLOAD PROTECTION. OVERLOAD PROTECTION SHALL BE PROVIDED INTEGRAL WITH THE MOTOR WINDINGS AND/OR MOTOR CONTROLLER (PROVIDED BY OTHERS) UNLESS OTHERWISE INDICATED ON DRAWINGS.

H. LUMINAIRES AND LAMPS

- 1. ALL LUMINAIRES SHALL BE SPECIFIED ON THE LUMINAIRE SCHEDULE. BALLASTS SHALL BE INSTANT START. ELECTRONIC TYPE. CLASS P. "A" SOUND RATING AND MAXIMUM HARMONIC CONTENT OF 10%. DIMMING BALLASTS SHALL BE 3-WIRE TYPE, WITH DIMMING CAPABILITY TO 10% OF RATED FULL OUTPUT.
- 3. RECESSED LUMINAIRES WITH INCANDESCENT LAMPS SHALL BE PROVIDED WITH THERMAL PROTECTION.
- 4. FLUORESCENT LAMPS SHALL BE 3500 K. INCANDESCENT LAMPS SHALL BE 130 VOLT. HIGH INTENSITY DISCHARGE LAMPS SHALL BE COATED. 5. EMERGENCY LIGHTING AS INDICATED, SHALL PROVIDE A MINIMUM OF ONE FOOTCANDLE ALONG THE PATH OF EGRESS. EMERGENCY FIXTURE SUPPLIER SHALL PROVIDE FOOTCANDLE PRINTOUT TO VERIFY
- EMERGENCY LIGHT LEVELS. ALL FIXTURE / BALLAST / LAMP COMBINATIONS SHALL BE ENERGY SAVING TYPE.

III. EXECUTION

A. GENERAL MISCELLANEOUS

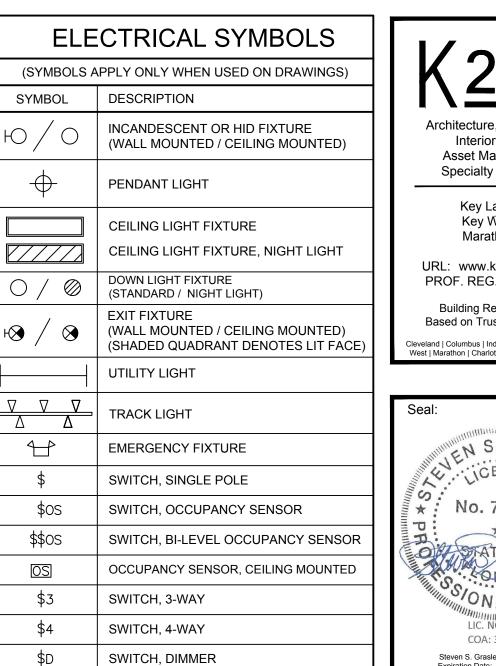
- ALL CONDUIT RUN IN FINISHED AREAS SHALL BE CONCEALED. CONDUIT SMALLER THAN 3/4" SHALL NOT BE USED FOR ANY CIRCUIT HOMERUNS.
- 2. RACEWAYS EXPOSED TO DIFFERENT TEMPERATURES SHALL BE FILLED WITH AN APPROVED MATERIAL IN ACCORDANCE WITH ARTICLE 300.7 OF THE NATIONAL ELECTRICAL CODE.
- 3. HANGERS, SUPPORTS, OR FASTENINGS SHALL BE PROVIDED AT EACH ELBOW, AT THE ENDS OF STRAIGHT RUNS TERMINATING AT BOXES OR CABINETS, AND AT INTERMEDIATE POINTS AS REQUIRED BY CODE. CONDUITS OR BOXES SHALL NOT BE SUPPORTED BY CEILING SUPPORT WIRES OR OTHER CEILING SUPPORTING HARDWARE.
- 4. FIXTURE SUPPORTS SHALL BE IN ACCORDANCE WITH ARTICLE 410-30 OF THE NATIONAL ELECTRICAL CODE, OR ANY LOCAL CODES WHICH MY
- 5. PROVIDE PERMANENT NAMEPLATES WITH DESIGNATIONS FOR PANELBOARDS, FEEDER DEVICES, DISTRIBUTION EQUIPMENT AND
- 6. PROVIDE TYPEWRITTEN DIRECTORY CARDS WITH BRANCH CIRCUIT IDENTIFICATION FOR BRANCH CIRCUIT PANELBOARDS. PANELBOARDS, FEEDER DEVICES, DISTRIBUTION EQUIPMENT AND STARTERS SHALL BE FIELD MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC
- ARC FLASH HAZARDS IN ACCORDANCE WITH NEC 110.16. 7. INSTALL HANDLE GUARDS ON ALL BREAKERS FOR NIGHT LIGHTING. EMERGENCY AND SIMILAR CIRCUITS.
- 8. THE ELECTRICAL CONTRACTOR SHALL BALANCE PANELBOARD LOADING TO WITHIN 10% ON EACH PHASE BASED ON INSTALLED CONDITIONS. LOAD BALANCING CIRCUIT CHANGES SHALL BE PERFORMED OUTSIDE THE NORMAL OCCUPANCY WORKING SCHEDULE AND AT A TIME DIRECTED BY LANDLORD.
- 9. ALL FLUSH MOUNTED PANELBOARDS SHALL HAVE (3) 3/4" EMPTY CONDUITS INSTALLED TO ABOVE ACCESSIBLE CEILING FOR FUTURE 10. THE FINAL LOCATIONS OF ALL EQUIPMENT, OUTLETS, ETC. SHALL BE
- SUBJECT TO REASONABLE CHANGES IN LOCATION UP TO THE TIME OF ROUGHING-IN, AT NO ADDITIONAL COST TO THE OWNER. 11. CONTACT ELECTRIC POWER COMPANY AND MAKE NECESSARY
- ARRANGEMENTS FOR ELECTRIC SERVICE. 12. CONTACT TELEPHONE COMPANY AND MAKE NECESSARY
- ARRANGEMENTS FOR TELEPHONE SERVICE. 13. AT ALL TIMES KEEP PREMISES AND BUILDING IN A NEAT AND ORDERLY CONDITION, FOLLOWING OWNER'S INSTRUCTION IN REGARD TO STORING OF MATERIALS, PROTECTIVE MEASURES AND DISPOSING OF
- 14. RACEWAYS BELOW DRIVEWAYS, PARKING LOTS, AND ANY RACEWAYS INSTALLED BELOW GRADE SHALL BE INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE PER NEC 300-5.
- 15. ALL EXTERIOR FASTENERS TO BE STAINLESS STEEL OR HOT DIPPED GALVANIZED.

B. GROUNDING

- 1. GROUND ALL CONDUITS, CABINETS, MOTORS, PANELS, AND OTHER EXPOSED NON-CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC ARTICLE 250.
- 2. BOND METAL WATER PIPING AND OTHER METAL PIPING (INCLUDING GAS PIPING) AND EXPOSED STRUCTURAL METAL IN ACCORDANCE WITH NEC
- 3. GROUNDING OF THE ELECTRICAL SYSTEM SHALL BE BY MEANS OF AN INSULATED GROUNDING CONDUCTOR INSTALLED WITH ALL FEEDERS AND BRANCH CIRCUIT CONDUCTORS IN ALL CONDUITS

AC	ABOVE COUNTER
-	
AFF I	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
BAS	BUILDING AUTOMATION SYSTEM
BFF	BELOW FINISHED FLOOR
CU	COPPER
DDC	DIRECT DIGITAL CONTROL
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY LIGHTING
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
GC	GENERAL CONTRACTOR
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
GR	GROUND
IG	ISOLATED GROUND
HD	HAND DRYER
LTG	LIGHTING
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MFR	MANUFACTURER
MIN	MINIMUM
MLO	MAIN LUG ONLY
NL DO	NIGHT LIGHT
PC	PLUMBING CONTRACTOR
PNLBD	PANELBOARD
RC BODTS	REFRIGERATION CONTRACTOR
RCPTS REF	RECEPTACLES REFERENCE
RH	RADIANT HEATER
RTU	ROOF TOP UNIT
SC	SECURITY CAMERA
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
WH	WATER HEATER
WP	WEATHER PROOF COVERPLATE
WR	WEATHER RESISTANT RECEPTACLE
XFMR	TRANSFORMER
7	

FIRE ALARM SYMBOLS LEGEND (SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS) SYMBOL DESCRIPTION FIRE ALARM MANUAL STATION. PROVIDE PROTECTION DEVICE ADA COMPLIANT FIRE ALARM SPEAKER WITH STROBE LIGHT, 75cd, UNLESS NOTED OTHERWISE. CEILING MOUNTED SMOKE DETECTOR DUCT MOUNTED SMOKE DETECTOR. FURNISHED AND CONNECTED BY FLECTRICAL CONTRACTOR, INSTALLED BY MECHANICAL CONTRACTOR CUTTING OF DUCT, INSTALLATION OF DETECTOR, AND DETERMINATION OF SAMPLING TUBE LENGTH SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY. PROVIDE REMOTE INDICATING LIGHT WITH EACH CEILING MOUNTED HEAT DETECTOR SPRINKLER SYSTEM FLOW SWITCH TS SPRINKLER SYSTEM TAMPER SWITCH SMOKER DAMPER. FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. CONNECTED TO FIRE ALARM SYSTEM BY ELECTRICAL CONTRACTOR. MAGNETIC DOOR HOLDER, PROVIDED BY GENERAL CONTRACTOR. INSTALLED BY ELECTRICAL CONTRACTOR. PROVIDE A SMOKE DETECTOR WITHIN 5 FT OF BOTH SIDES OF DOORS TO LOCALLY ACTIVATE DOOR UPON SMOKE SIGNAL. FIRE ALARM REMOTE GRAPHIC ANNUNCIATOR FIRE ALARM CONTROL PANEL WITH LOCAL SMOKE DETECTOR. (co)CARBON MONOXIDE DETECTOR ADA COMPLIANT FIRE ALARM STROBE LIGHT, 75CD, UNLESS NOTED OTHERWISE.



SWITCH, MANUAL MOTOR

SWITCH, 3-WAY TIMER

RECEPTACLE, DUPLEX

ISOLATED GROUND

ISOLATED GROUND

ISOLATED GROUND

ISOLATED GROUND

RECEPTACLE, SPECIAL

RECEPTACLE, DUPLEX

ISOLATED GROUND

JUNCTION BOX

CONDUIT SLEEVE

MOTOR

BUZZER

TELEPOWER POLE

SMOKE DETECTOR

TEMPERATURE SENSOR

PUSH BUTTON

THERMOSTAT

HORN / STROBE

PLAN KEYNOTE

TO EXISTING

CONNECTION POINT OF NEW WORK

DETAIL REFERENCE: UPPER NUMBER

INDICATES DETAIL NUMBER, LOWER NUMBER INDICATES SHEET NUMBER

SECTION CUT DESIGNATION

SPEAKER

PANEL HOMERUN

RECEPTACLE, PLUG-MOLD

ALARM JUNCTION BOX

RECEPTACLE, SIMPLEX

SWITCH, TIMER

SWITCH, KEYED

3\$T

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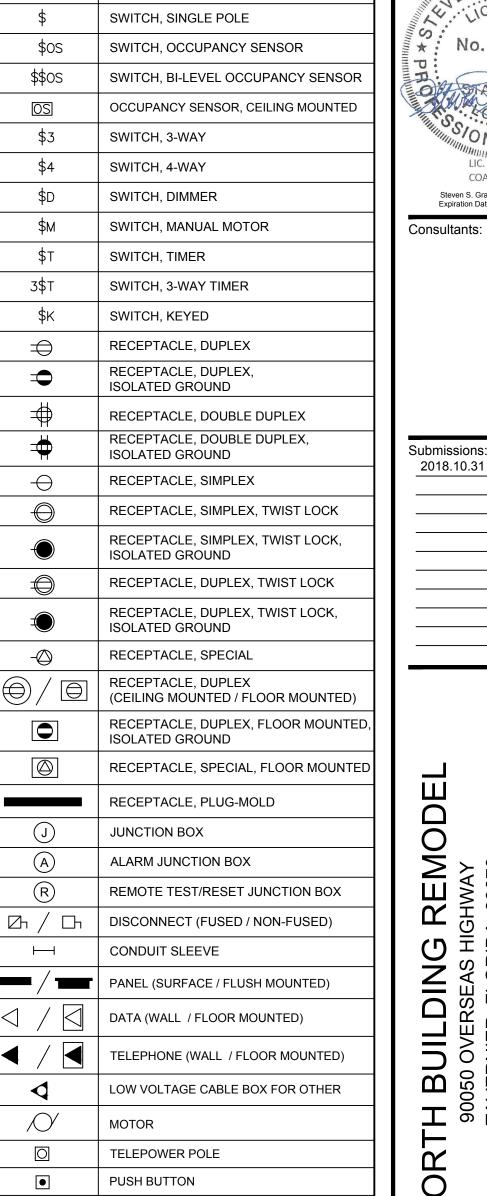
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ANNOTATION



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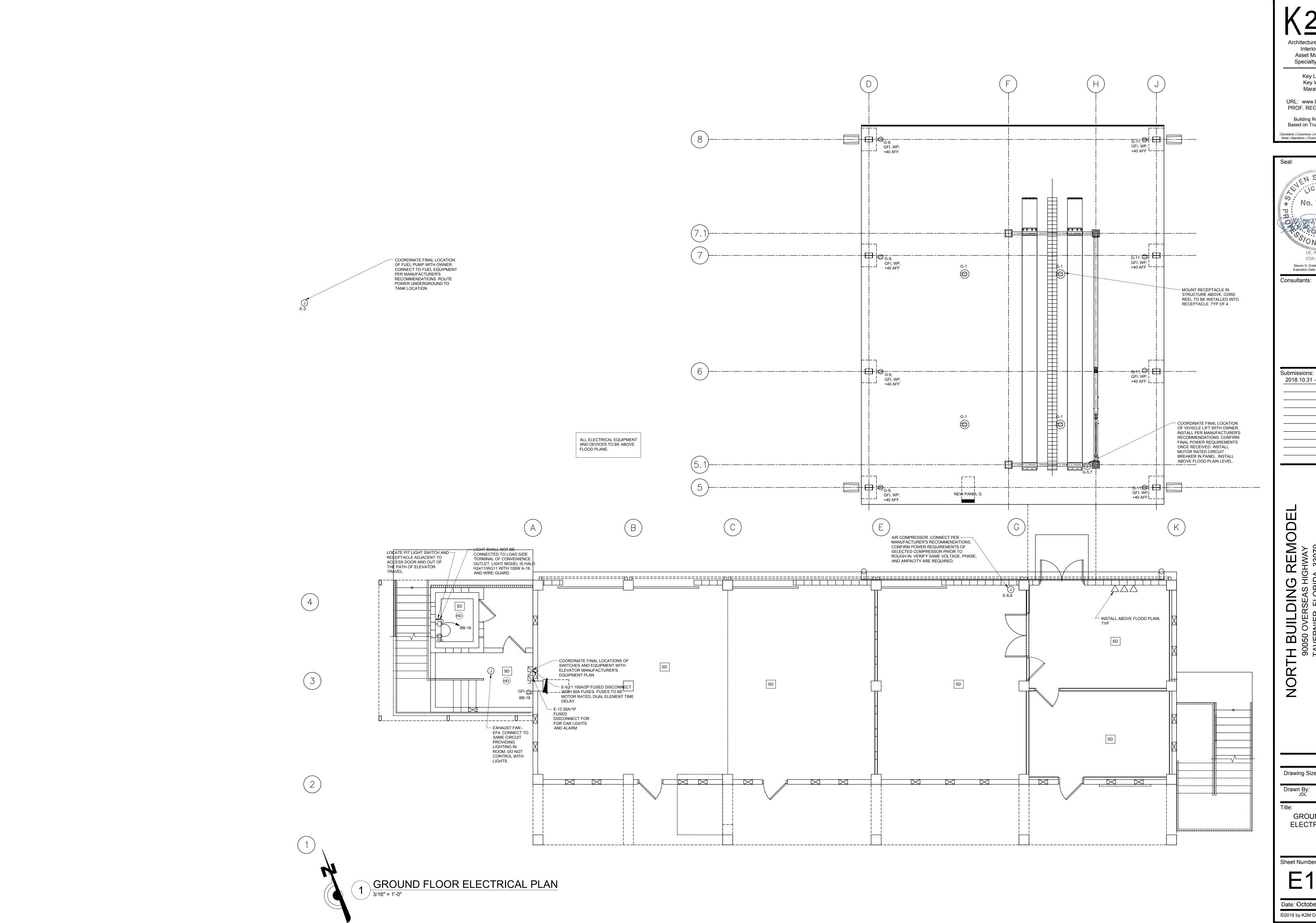
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> **ELECTRICAL** NOTES AND **SPECIFICATIONS**

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DISTRIC

TH BUILDING REMODE 90050 OVERSEAS HIGHWAY TAVERNIER, FLORIDA, 33070 SCHOOL COUNT

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GROUND FLOOR ELECTRICAL PLAN

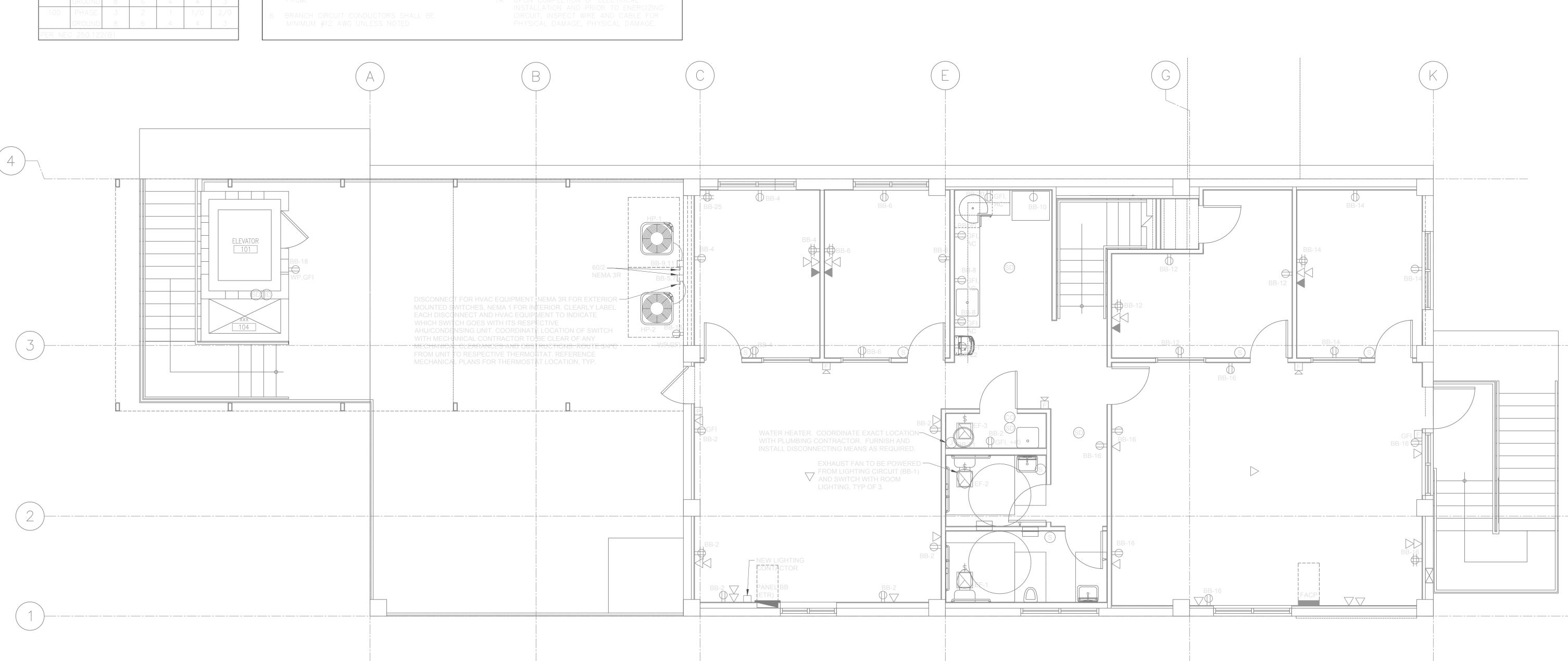
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KEYNOTES

GROUND WIRE SIZING CHART

BRKR						
AMPS			Y	VIIVE SIZ		
15-20	PHASE	12	10	8	6	4
	GROUND	12	10	8	6	4
25-30	PHASE	10	8	6	4	3
	GROUND	10	8	6	4	3
35-50	PHASE	8	6	4	3	2
	GROUND	10	8	4	4	4
60	PHASE	6	4	3	2	1
	GROUND	10	6	6	4	4
70	PHASE	6	4	3	2	1
	GROUND	8	4	4	3	2
80-90	PHASE	4	3	2	1	1/0
	GROUND	8	6	4	4	3
100	PHASE	3	2	1	1/0	2/0
	GROUND	8	6	4	4	3
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GENERAL NOTES



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NORTH 900

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FIRST FLOOR ELECTRICAL PLAN

KEYNOTES

- CONNECT EXHAUST FAN TO LIGHT SWITCH CONTROLLING ROOM LIGHTING. ONLY CONNECT TO MOTOR RATED SWITCH.
- 2. INSTALL JUNCTION BOX FOR WATER HEATER PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE FINAL LOCATION WITH PLUMBING PLANS..

GROUND WIRE SIZING CHART

BRKR			\^	VIRE SIZ	Г	
AMPS			v	VIINE SIZ		
15-20	PHASE	12	10	8	6	4
	GROUND	12	10	8	6	4
25-30	PHASE	10	8	6	4	
	GROUND	10	8	6	4	
35-50	PHASE	8	6	4	3	,
	GROUND	10	8	4	4	2
60	PHASE	6	4	3	2	
	GROUND	10	6	6	4	2
70	PHASE	6	4	3	2	
	GROUND	8	4	4	3	1
80-90	PHASE	4	3	2	1	1,
	GROUND	8	6	4	4	
100	PHASE	3	2	1	1/0	2,
	GROUND	8	6	4	4	
PFR NF	250.122	P(B)	•	•		

GENERAL NOTES

- PROVIDE SEALS AT RACEWAY PENETRATIONS TO THE EXTERIOR. REFER TO ARCHITECTURAL DOCUMENTS FOR SEALING REQUIREMENTS AT ALL EXTERIOR MOUNTED DEVICES, FIXTURES, ENCLOSURES AND RACEWAY PENETRATIONS.
- 2. PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR (SIZE PER NEC) IN PVC TYPE CONDUIT, POWER CIRCUITS, ISOLATED GROUND CIRCUITS, OR AS SHOWN ON PLANS. CONDUIT SHALL BE SIZED PER NEC BASED ON THWN 600 VOLT COPPER SINGLE CONDUCTORS, PLUS THE EQUIPMENT GROUNDING CONDUCTOR.
- 3. WIRING DEVICES: DEVICE MOUNTING HEIGHTS ARE FROM FINISHED FLOOR TO CENTER OF OUTLET BOX UNLESS NOTED OTHERWISE ON PLANS. COORDINATE THE STANDARD MOUNTING HEIGHTS WITH MASONRY:
- A. SWITCHES +46"
- B. RECEPTACLES +20"
- C. VOICE/DATA +20"
- 4. WIRING SHALL INCLUDE FINAL CONNECTION TO ALL EQUIPMENT IN CONFORMANCE WITH EQUIPMENT SUPPLIER WIRING DIAGRAMS.
- . CONTRACTOR IS RESPONSIBLE FOR PROVIDING COMPLETE PANELBOARD IDENTIFICATION SCHEDULES. SCHEDULES SHALL IDENTIFY THE USE OF LOAD SERVED FOR EACH CIRCUIT AND THE DEVICE OR EQUIPMENT THE PANEL IS FED
- BRANCH CIRCUIT CONDUCTORS SHALL BE MINIMUM #12 AWG UNLESS NOTED OTHERWISE IN SCHEDULES. WHERE 20A

- BRANCH CIRCUITS HAVE #8 AND LARGER WIRE SPECIFIED, #10 AWG WIRE SHALL BE USED FOR THE FINAL CONNECTION (15-FT MAXIMUM).
- 7. WHERE BRANCH CIRCUITS ARE GROUPED, SIZE CONDUIT AND DERATE CURRENT CARRYING CONDUCTORS PER NEC.
- 8. PROVIDE HANDLE TIES ON ALL MULTIWIRE BRANCH CIRCUITS TO MEET NEC REQUIREMENTS.
- 9. CONDUITS EXTENDING BEYOND EXTERIOR WALL: STUB OUT 2'-0" BELOW GRADE TO 5'-0" BEYOND EXTERIOR WALLS UNLESS NOTED OTHERWISE. COORDINATE LOCATION AND PROVIDE CONNECTION TO SITE CONDUITS.
- 11. SUPPORTS FROM STRUCTURE: NO ATTACHMENT OF ANY TYPE SHALL BE MADE TO BRIDGING OR JOIST WEB MEMBERS. UTILIZE ONLY THE TOP AND BOTTOM CHORDS FOR SUPPORTING THE ELECTRICAL SYSTEM INSTALLATIONS.
- 12. ALL ATTACHMENTS TO STRUCTURE ARE TO BE MADE IN CONFORMANCE WITH REQUIREMENTS. NO ATTACHMENT TO THE METAL DECOR OR CONCRETE SHALL BE ALLOWED.
- 13. PROVIDE LIQUID-TIGHT FLEXIBLE METAL CONDUIT AND WIRING FROM DISCONNECT SWITCH OR JUNCTION BOX TO EQUIPMENT KNOCKOUT OR ELECTRICAL CONNECTION POINT.
- 14. UPON COMPLETION OF ELECTRICAL INSTALLATION AND PRIOR TO ENERGIZING CIRCUIT, INSPECT WIRE AND CABLE FOR PHYSICAL DAMAGE, PHYSICAL DAMAGE.

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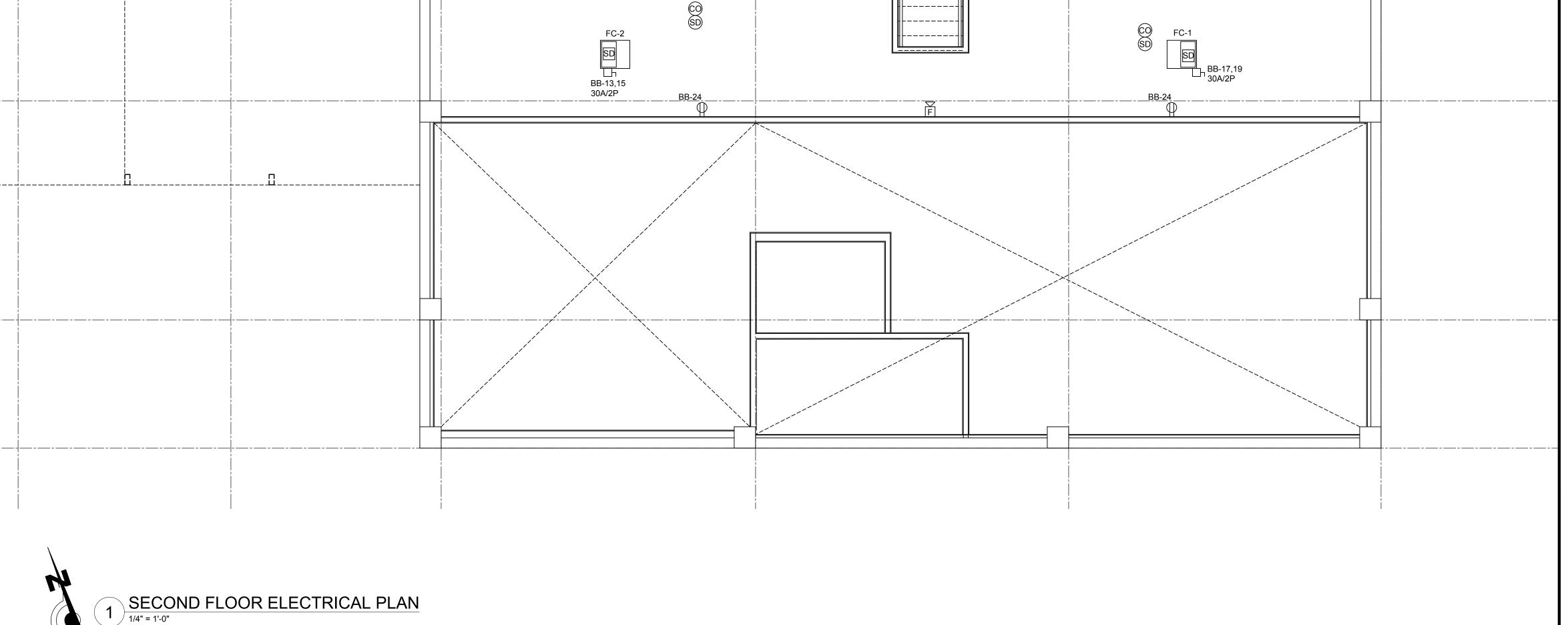
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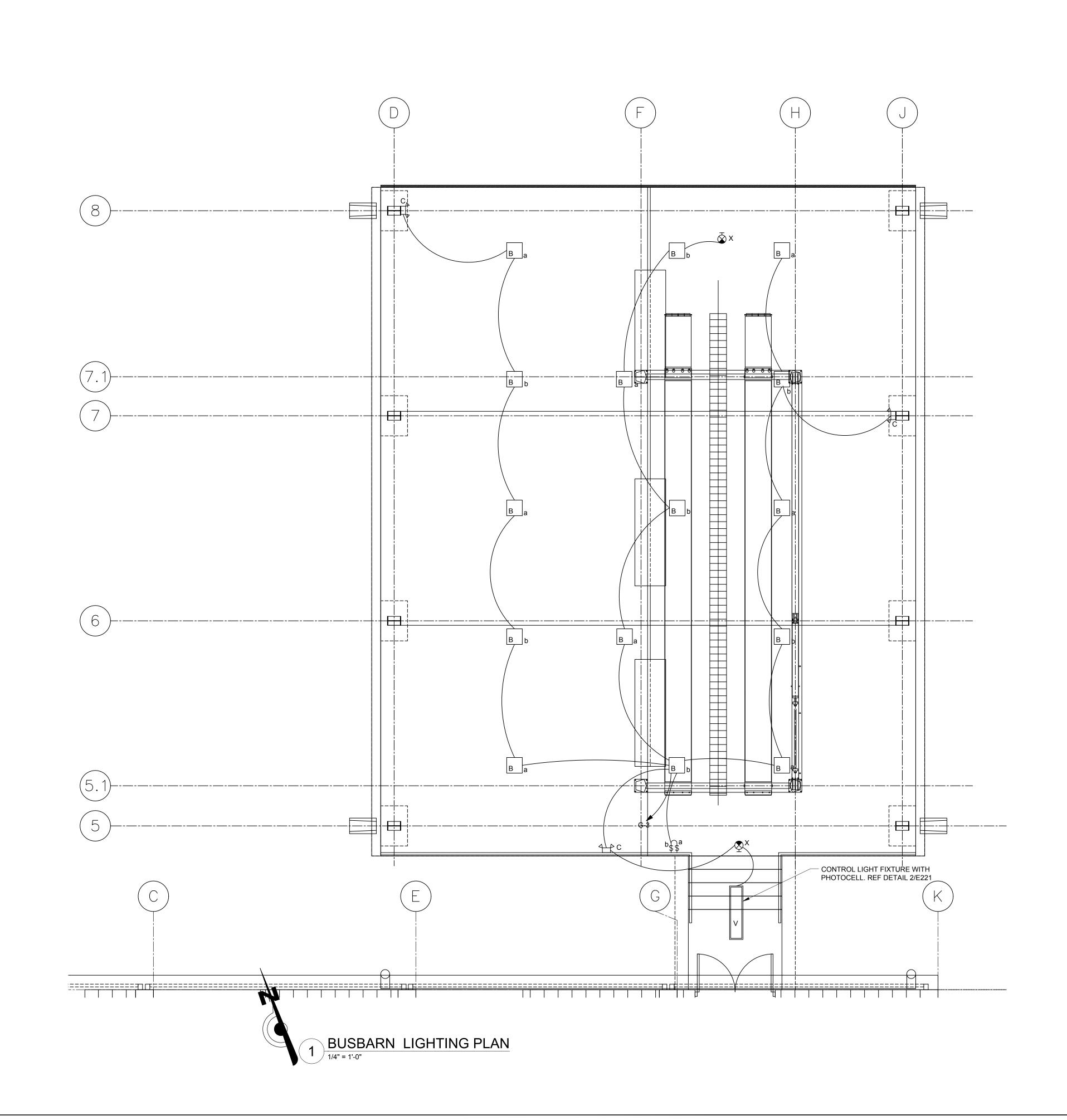
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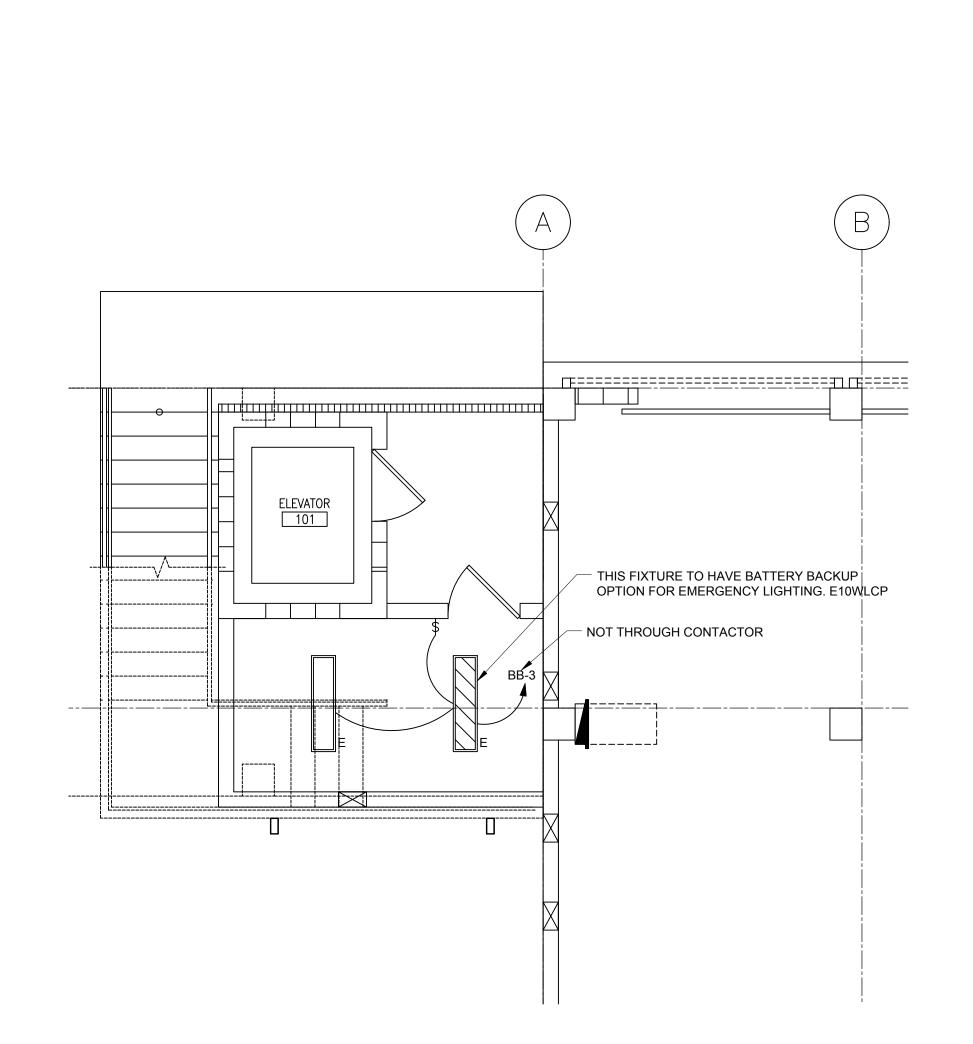
SECOND FLOOR

ELECTRICAL PLAN

Date: October 31, 2018







2 ELEVATOR LIGHTING PLAN
1/4" = 1'-0"

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NORTH BUILDING REMODEL
90050 OVERSEAS HIGHWAY
TAVERNIER, FLORIDA, 33070 SCHOOL

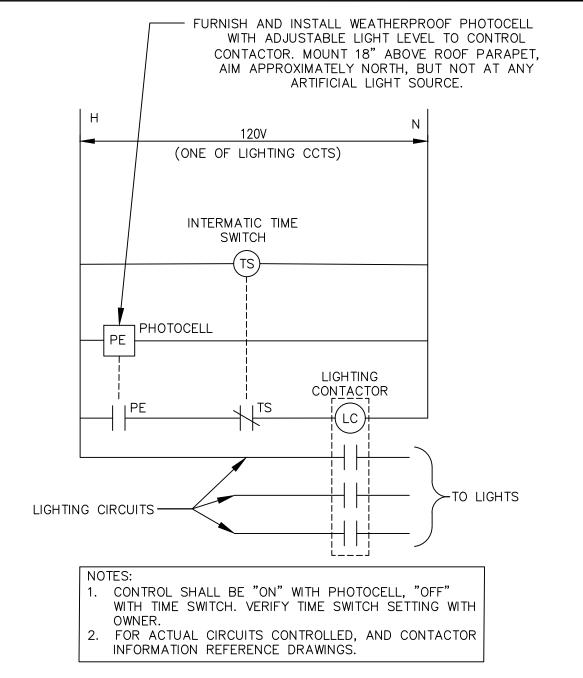
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BUSBARN LIGHTING PLAN

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			LIGHTING FIXT	URE	SCHE[DULE			
TYPE	VENDOR	FURNISHED BY	CATALOG NUMBER	VOLTS	WATTS	LAMP ORDER NUMBER	QTY	MOUNTING	DESCRIPTION
А	ACUITY	CONTRACTOR	2BLT2 40L ADSM EZ1 LP835 N100	120/277	30	INTEGRAL LED	1	RECESSED	2' x 2' LED TROFFER
A-EMER	ACUITY	CONTRACTOR	2BLT2 40L ADSM EZ1 LP835 EL14L	120/277	30	INTEGRAL LED	1	RECESSED	2' x 2' LED TROFFER
В	COOPER	CONTRACTOR	CLCSLED-86-SM-UNV	120/277	92	INTEGRAL LED	1	SURFACE MOUNT	SQUARE GARAGE LED, SURFACE
С	ACUITY	CONTRACTOR	ELM2 LED	120/277	2	INTEGRAL LED	2	WALL/CEILING	EMERGENCY LIGHT
D	ACUITY	CONTRACTOR	THW LED-20C-1000-50K-T3M-MVOLT- PE-ELSW-DDBXD	120/277	25	INTEGRAL LED	_	WALL MOUNTED	4' WALL MOUNT LED W/EMERG
E	ACUITY	CONTRACTOR	ZL1N L48 3000LM FST MVOLT 35K 80CRI	120/277	34	INTEGRAL LED	1	SURFACE	4' LED UTILITY STRIP
F	ACUITY	CONTRACTOR	TZL1N L96 6000LM FST MVOLT 35K 80CRI	120/277	68	INTEGRAL LED	1	WALL VANITY	WALL VANITY
V	ACUITY	CONTRACTOR	VAP LED 4000LM FST MD MVOLT 30K 80CR	120/277	42	INTEGRAL LED	_	CEILING/STRUCTURE	EXTERIOR LINEAR FIXTURE
X	ACUITY	CONTRACTOR	LQM S W 3 R 120/277 EL N	120/277	1	INTEGRAL LED	_	CEILING/WALL	EXIT SIGN



2 TYPICAL LIGHTING CONTACTOR CONTROL DETAIL

$\langle \mathbf{x} \rangle$ keynotes

- 1. PHOTOCELL TO CONTROL DAYLIGHTING CAPABILITY OF 0-10V DIMMING FIXTURES. ACUITY TYPE: nCM ADCX. CONNECT VIA MANUFACTURER'S nLIGHT CONTROL SYSTEM INTEGRAL TO EACH FIXTURE. REFERENCE MANUFACTURER RECOMMENDATIONS AND DOCUMENTATION.
- 2. SWITCH TO BE ACUITY TYPE: nWSX PDT LV. CONNECT TO nLIGHT CAPABLE FIXTURE PER MANUFACTURER'S RECOMMENDATIONS TO CONTROL FIXTURE OPERATION AND DIMMING.
- 3. SWITCH TO BE ACUITY TYPE: nPODM DX.
 SWITCH TO CONTROL ALL FIXTURES IN OPEN
 MERCANTILE AREA.
- 4. CONNECT TO SAME BREAKER SERVING
 GENERAL LIGHTING LOAD, BUT KEEP WIRING
 SEPARATE SO THE FIXTURE CAN BE
 CONTROLLED BY PHOTOCELL AND TIMER.

GENERAL LIGHTING NOTES

- 1. EXIT SIGN MOUNTING
 A. WALL FIXTURE: CENTER 12" ABOVE DOOR OPENING.
 - B. CEILING/PENDANT FIXTURE: ON CEILING OR AT HEIGHT SPECIFIED ON DRAWINGS.
 - 2. EMERGENCY LIGHT INSTALLATION
 - FIXTURE MOUNTING

 A. WALL FIXTURE: 12" BELOW FINISHED

 CEILING OR +10'-0" IN AREAS OF EXPOSED

 STRUCTURE, UNLESS NOTED OTHERWISE.
 - B. PENDANT FIXTURE: BOTTOM CHORD OF BAR JOIST OR AT HEIGHT SPECIFIED ON DRAWINGS.
 - C. REMOTE HEAD FIXTURE: HEADS CENTERED ABOVE DOOR OPENING +9'-0", UNLESS NOTED OTHERWISE AND BATTERY PACK MOUNTED ON INTERIOR SIDE OF WALL 12" BELOW FINISHED CEILING OR AT BAR JOIST IN AREAS OF EXPOSED STRUCTURE.
 - ELECTRICAL CONNECTION

 A. REFER TO MANUFACTURER'S WRITTEN
 INSTRUCTIONS. ALLOW BATTERY TO CHARGE
 CONTINUOUSLY FOR A MINIMUM OF 168
 HOURS BEFORE INITIAL TESTING.
- PERIODS OF TIME.

 3. EXIT SIGNS, EMERGENCY LIGHTS, AND NIGHT

LIGHTS SHALL NOT BE SWITCHED.

B. AFTER EMERGENCY LIGHT HAS BEEN

POWERED DO NOT TURN OFF FOR EXTENDED

4. FURNISH AND INSTALL UNISTRUT AS REQUIRED TO MOUNT FIXTURE TO BAR JOIST.

No. 73110

**No. 73110

COA: 30945

Steven S. Grasley, FL PE # 73110

Expiration Date: February 28,2017

Interior Design, Asset Management,

Specialty Consulting

Key Largo, FL

Key West, FL

Marathon, FL

URL: www.k2mdesign.com

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ING REMODEL SEAS HIGHWAY FLORIDA, 33070

SCHOOL

COUNT

NORTH BUILDING REMOD 90050 OVERSEAS HIGHWAY TAVERNIER, FLORIDA, 33070

Drawing Size | Project #:
16347

Drawn By: Checked By:
JDL SSG

FIRST FLOOR LIGHTING PLAN

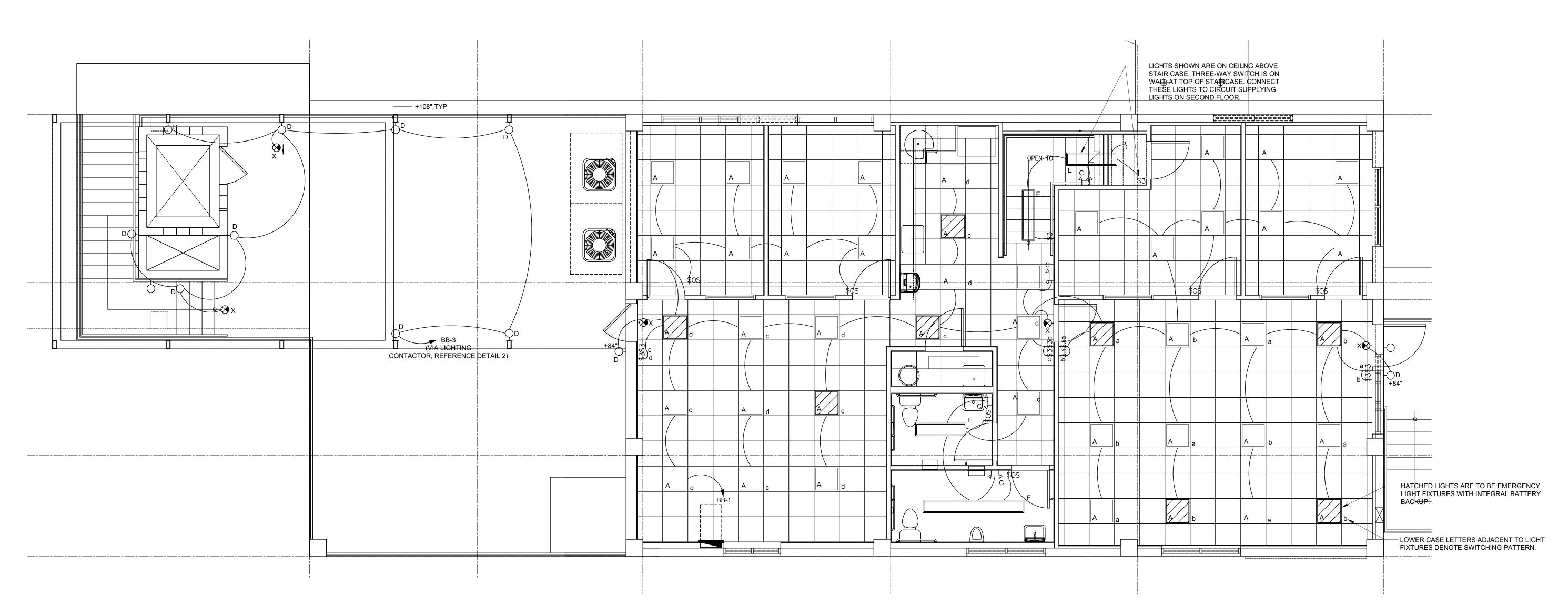
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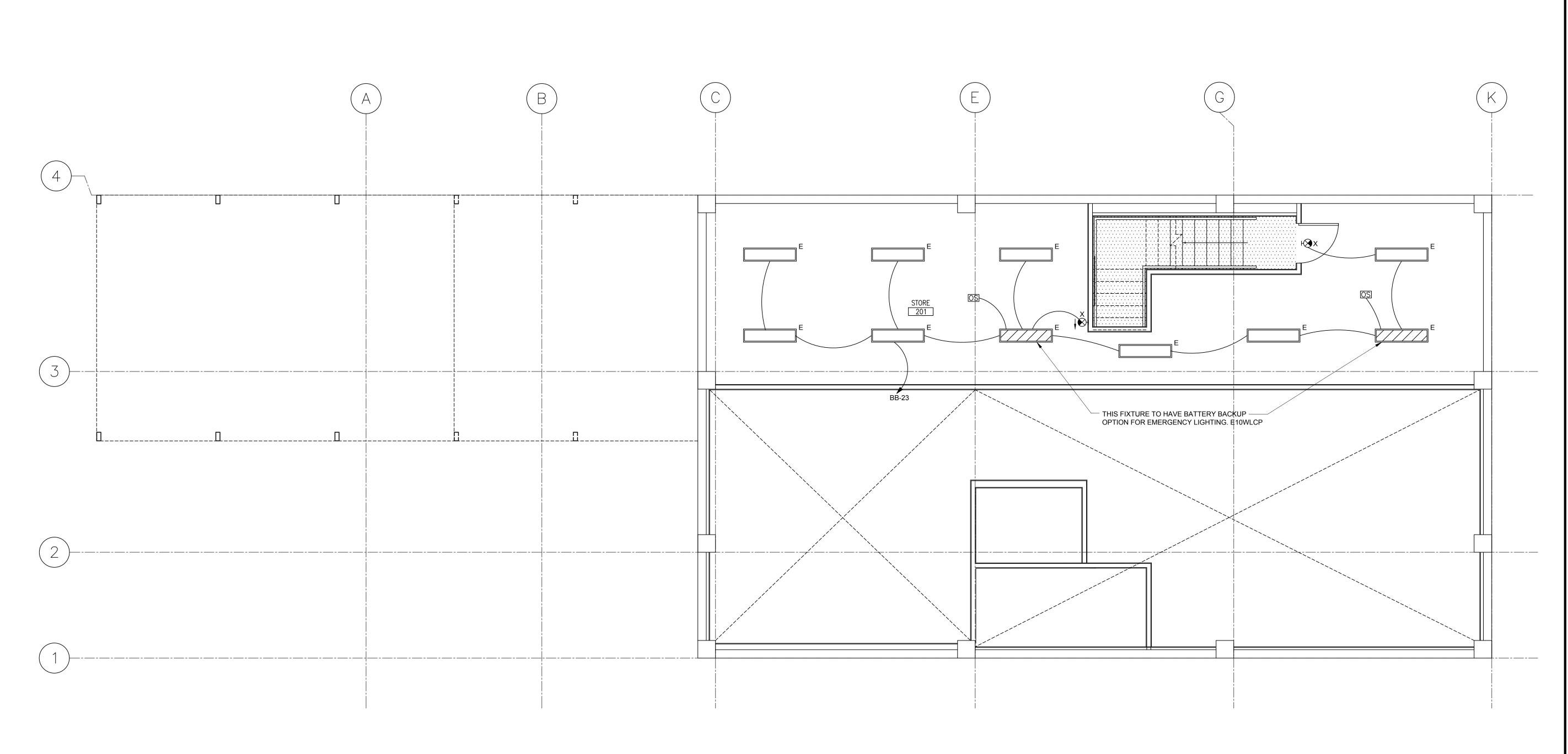
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Date: October 31, 2018

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SECOND LIGHTING PLAN
1/4" = 1'-0"

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COA: 30945 Steven S. Grasley, FL PE # 73110 Expiration Date: February 28,2017

Consultants:

Submissions:

2018.10.31 - PERMIT SET

MONROE COUNTY SCHOOL DISTRIC

NORTH BUILDING REMODEL 90050 OVERSEAS HIGHWAY TAVERNIER, FLORIDA, 33070

Checked By: SSG Drawn By: JDL

SECOND FLOOR LIGHTING PLAN

BB						DAI		120/240V, 1PH, 3W						
B	В					PAI		200A MAIN CIRCUIT BREAKE						
						E '	ут ст	TNC					10,00	0 AIC
		EXISTING											GROUN	D BAR
													2111112	
													SURFACE I	MOUNT
							1/1/7							+-
	DESCRIPTION	MIDE	BRKR	DT			KVA			DI	BRKR	MIDE	DESCRIPTION	
	DESCRIPTION	WIKE	DKKK	ЕП		Α			В	ЕП	DKKK	WIKE	DESCRIFTION	
1	1ST FLOOR LIGHTS	12	20	1	#NAME?					1	20	12	OFFICE RECEPTS	2
3	CANOPY/STAIR LIGHTS		20	1				#NAME?	#NAME?	1	20	12	OFFICE RECEPTS	4
5	HP-1	8	50	2	#NAME?	#NAME?				1	20	12	OFFICE RECEPTS	6
7								#NAME?	#NAME?	1	20	12	BREAKROOM RECEPTS	8
9	HP-2	8	50	2	#NAME?	#NAME?				1	20	12	REFRIGERATOR	10
11								#NAME?	#NAME?	1	20	12	OFFICE RECEPTS	12
13	FC-1	12	15	2	#NAME?	#NAME?				1	20	12	OFFICE RECEPTS	14
15								#NAME?	#NAME?	1	20	12	OFFICE RECEPTS	16
17	FC-2	12	15	2	#NAME?	#NAME?				1	20	12	ELEVATOR RECEPT	18
19								#NAME?	#NAME?	1	20	12	BREAKROOM RECEPTS	20
21	WATER HEATER	10	30	1	#NAME?	#NAME?				1	20	12	WATER COOLER	22
23	2ND FLOOR LIGHTS	12	20	1				#NAME?	#NAME?	1	20	12	MEZZANINE RECEPTS	24
25	DATA RACK	12	20	1	#NAME?	#NAME?							space	26
27	FACP	12	20	1				#NAME?	#NAME?				space	28
29	space				#NAME?	#NAME?							space	30
	TO	red	#NA	ME?	KVA	#NAME?		KV.	A					
	TO	#NAME?		AMPS	#NA	ME?	AMPS							
		TOT	'AL L	DAC	#NA	ME?	KVA	#NA	ME?					
	PER NEC ARTICLE 220	FEED	ER L	OAC	#NA	ME?	KVA	#NA	ME?					

														SURFACE	MOTING
														SORTAGE	HOON.
							K	VA							
	DESCRIPTION	WIRE	BRKR	PT.			It	VA			PT.	BRKR	WIRE	DESCRIPTION	
	2200112121		211111			A			1	В		Ditti		22001121201	
1	EXISTING LOAD		20	1		#NAME?					1	20		EXISTING LOAD	2
3	FUEL PUMP	10	20	1					#NAME?	#NAME?	1	20		EXISTING LOAD	4
5	PANEL G	4	80	2	#NAME?	#NAME?					2	70	4	AIR COMPRESSOR	6
7									#NAME?	#NAME?					8
9	ELEVATOR	3	90	2	#NAME?	#NAME?								SPACE	10
11									#NAME?	#NAME?				SPACE	12
13	CAB LIGHTS AND ALARM	12	20	1	#NAME?	#NAME?								SPACE	14
15	SPACE								#NAME?	#NAME?				SPACE	16
17	SPACE				#NAME?	#NAME?								SPACE	18
19	SPACE								#NAME?	#NAME?				SPACE	20
21	SPACE				#NAME?	#NAME?								SPACE	22
23	SPACE								#NAME?	#NAME?				SPACE	24
25	SPACE				#NAME?	#NAME?								SPACE	26
27	SPACE								#NAME?	#NAME?				SPACE	28
29	SPACE				#NAME?	#NAME?								SPACE	30
	TO	TAL C	ONNEC'	TED	#NA	ME?	KVA		#NA	ME?	KV	A			
	TO	ral C	ONNEC'	TED	#NA	ME?	AMPS		#NA	ME?	AM	PS			
		TOTAL LOAD		#NA	ME?	KVA		#NAME?		AM	PS				
	PER NEC ARTICLE 220	FEE	FEEDER LO		#NA	ME?	KVA		#NAME?		AM	PS			

PANELBOARD

EXISTING

120/240V, 1PH,

10,000 AIC

GROUND BAF

200A MAIN CIRCUIT BREAKE

						D 7 1	TTIT	DA	DD					120/240V, 1	LPH, 3W
G						PAI		80A MAIN CIRCUIT BREAKER							
							NTT			10,000 AIC					
					NEW									GROT	JND BAR
MOUI	TING: SURFACE													SURFACE	MOUNT
ENC:	COSURE: NEMA 3R														
							KV	/A							
	DESCRIPTION	WIRE	BRKR	PL							PL	BRKR	WIRE	DESCRIPTION	
					j	A			1	3					
1	RECEPTACLES (4)	12	20	1	#NAME?	#NAME?								SPACE	2
3	BUS BARN LIGHTS	12	20	1					#NAME?	#NAME?				SPACE	4
5	VEHICLE LIFT	8	35	1	#NAME?	#NAME?								SPACE	6
7									#NAME?	#NAME?				SPACE	8
9	RECEPTACLES	12	20	1	#NAME?	#NAME?								SPACE	10
11	RECEPTACLES	12	20	1					#NAME?	#NAME?				SPACE	12
13	SPACE				#NAME?	#NAME?								SPACE	14
15	SPACE								#NAME?	#NAME?				SPACE	16
17	SPACE				#NAME?	#NAME?								SPACE	18
19	SPACE								#NAME?	#NAME?				SPACE	20
21	SPACE				#NAME?	#NAME?								SPACE	22
23	SPACE								#NAME?	#NAME?				SPACE	24
25	SPACE				#NAME?	#NAME?								SPACE	26
27	SPACE								#NAME?	#NAME?				SPACE	28
29	SPACE				#NAME?	#NAME?								SPACE	30
	TOT	TED	#NA	ME?	KVA		#NA	ME?	KV.	A					
	TOT	'AL C	ONNEC	TED	#NA	ME?	AMPS		#NA	ME?	AM	PS			
		TOT	ral L	OAD	#NA	ME?	KVA		#NAME?			PS			
	PER NEC ARTICLE 220	FEEI	DER L	OAD	#NA	ME?	KVA		#NA	ME?	AM	PS			

TRANSFORMER

240/120V - 1 PHASE

(ETR)

VERIFY LABEL IS PRESENT AT SERVICE ENTRANCE EQUIPMENT IDENTIFYING THE MAXIMUM AVAILABLE FAULT CURRENT PER

NEC 110.24. A LABEL SHOULD

ALSO IDENTIFY THE SOURCE OF

SUPPLY FOR EACH PANEL PER NEC 408.4.

EXISTING POLE MOUNTED

TRANSFORMER. COORDINATE WITH

UTILITY-OWNED SERVICE

UTILITY COMPANY TO NOTIFY OF THE

ADDITIONAL LOADS BEING ADDED TO

COORDINATE CONDUIT

UTILITY COMPANY

(60,000)

EXISTING 400A EXTERIOR PANEL

TO GROUNDING ROD

ELECTRODE AND BUS

DO NOT BOND TO

NEUTRAL.

📥 BARN STRUCTURE.

PANEL

< ETR

REPRESENTS THE PRELIMINARY CALCULATED

AVAILABLE FAULT CURRENT IN RMS

SYMMETRICAL AMPERES AT THE RESPECTIVE

TRANSFORMER, PANEL, OR EQUIPMENT

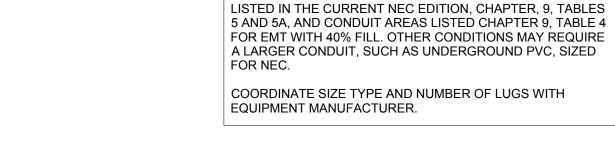
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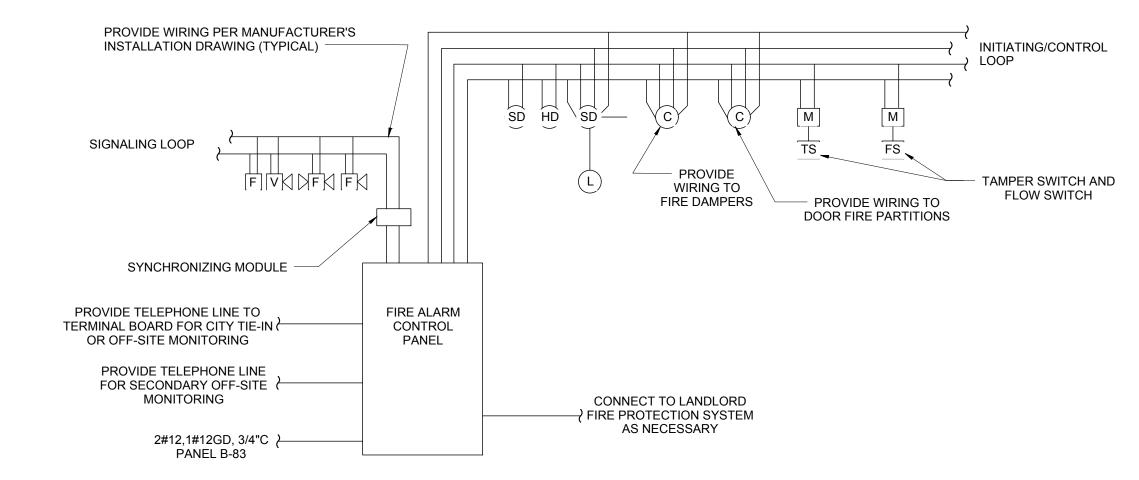
AND MATERIALS.

THE UTILITY AND ESTIMATED FEEDER LENGTH

< ETR

BB





TYPICAL FIRE ALARM SYSTEM WIRING DIAGRAM

FIRE ALARM SYSTEM NOTES

- 1. THIS DIAGRAM REPRESENTS A TYPICAL SYSTEM AND IS NOT INTENDED FOR INSTALLATION. SYSTEM SUPPLIER SHALL PROVIDE INSTALLATION DRAWINGS AND SCHEMATIC WIRING DIAGRAM. EXACT SYSTEM REQUIREMENTS SHALL BE COORDINATED WITH THE SYSTEM SUPPLIER. INSTALLER SHALL BE NICET CERTIFIED.
- 2. SYSTEM SUPPLIER SHALL SUPERVISE INSTALLATION, PROGRAM AND TEST SYSTEM, AND INSTRUCT OWNER ON SYSTEM OPERATION. IT IS SUPPLIER'S RESPONSIBILITY TO INSTALL A SYSTEM THAT MEETS ALL LOCAL FIRE CODE REQUIREMENTS.
- 3. ALL FIRE ALARM WIRING SHALL BE PLENUM RATED. EXPOSED FIRE ALARM WIRING, 10'-0" AFF AND BELOW SHALL BE INSTALLED IN CONDUIT TO ABOVE ACCESSIBLE CEILING SPACE OR STRUCTURE.
- 4. ALL CONTROL CABINETS SHALL BE GROUNDED PER NEC REQUIREMENTS.
 5. COORDINATE CITY TIE—IN REQUIREMENTS WITH LOCAL AUTHORITY HAVING JURISDICTION.
 6. DEVICES THAT MAY BE SHOWN ON PLANS ARE TYPICAL LOCATIONS AND AMOUNTS.
 REVISE AS NECESSARY TO MEET LOCAL CODE REQUIREMENTS. THE FIRE ALARM
 SUBMITTAL IS TO BE A DEFERRED SUBMITTAL THAT IS SUBMITTED BY THE FIRE ALARM
- SYSTEM SUPPLIER.

 7. FIRE ALARM SYSTEM SHALL BE NOTIFIER.
- 8. INSTALL FIRE ALARM PULL STATION AT EACH EXIT.
 9. INSTALL SMOKE DETECTOR IN EACH ROOM, HORN/STROBE IN EACH CORRIDOR, AND DUCT
- SMOKE DETECTORS FOR EACH RTU.

 10. FIRE ALARM SYSTEM SUPPLIER TO PROVIDE ALL MATERIALS NECESSARY TO MAKE A
- FULLY OPERATIONAL AND CODE COMPLIANT SYSTEM.

 11. SUPPLIER AND INSTALLER TO FOLLOW ALL NFPA 72 AND NFPA 13 REQUIREMENTS AND ANY AMENDMENTS BY LOCAL JURISDICTION.





WARNING

ARC FLASH AND SHOCK HAZARD.

APPROPRIATE PERSONAL PROTECTIVE
EQUIPMENT (PPE) REQUIRED.

NOTES:

A. ALL SWITCHBOARDS AND PANELBOARDS SHALL HAVE A COMMERCIALLY PRODUCED PERMANENT LABEL APPLIED, SIMILAR TO THE ABOVE, TO WARN OF POTENTIAL ARC FLASH HAZARDS, IN ACCORDANCE WITH NEC 110.16 AND NFPA 70E.

B. LABELING MAY BE COMPLETED BY EQUIPMENT MANUFACTURER, EQUIPMENT VENDOR/SUPPLIER, OR THE CONTRACTOR SHALL VERIFY THAT ALL SWITCHBOARDS AND PANELBOARDS ARE PROPERLY LABELED IN THE FIELD.



| K2

PANELBOARD NOTES

1. TERMINATE GROUND ON ISOLATED GROUND

WITH PANELBOARD (LOCK-OFF FOR

WITH PANELBOARD (LOCK-ON FOR

2. INSTALL LOCKING DEVICE FURNISHED

3. INSTALL LOCKING DEVICE FURNISHED

4. GFI BREAKER FOR PERSONNEL PROTECTION

5. GFI BREAKER FOR EQUIPMENT PROTECTION

6. CONDUCTOR SIZE SHOWN IN PANEL SCHEDULE HAS BEEN INCREASED FOR VOLTAGE DROP. EQUIPMENT GROUNDING CONDUCTOR SIZE SHALL BE INCREASED PROPORTIONALLY PER NEC. REFERENCE

7. REFER TO ONE-LINE DIAGRAM FOR

8. REFER TO ONE-LINE DIAGRAM FOR WIRE

AVAILABLE FAULT CURRENT FOR

GROUND WIRE SIZING CHART.

INTERRUPT RATINGS.

9. FACTORY WIRED TO LOAD.

11. EXISTING LOAD TO REMAIN

CONDUIT SIZED BASED ON CONDUCTOR PROPERTIES

10. THRU CONTACTOR.

BUS.

MAINTENANCE).

CRITICAL LOAD).

(5 mA).

(30 mA).

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Seal:

S. GRAMMAN S. G

Steven S. Grasley, FL PE # 73110 Expiration Date: February 28,2017

Submissions: 2018.10.31 - PERMIT SET

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90050 OVERSEAS HIGHWAY
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SCHOOL

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JDL SSG

e: ELECTRICAL DNE-LINE DIAGRAM

ONE-LINE DIAGRAM AND SCHEDULES

Sheet Number:

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