RENOVATIONS TO

NEW BRITTON ELEMENTARY SCHOOL

8660 EAST 131 STREET FISHERS, IN 46038

HAMILTON SOUTHEASTERN SCHOOL DISTRICT

1PC-K17-2402

Guaranteed Energy Savings Contract

Prepared by:

Performance

SHEET INDEX:

ELECTRICAL SYMBOLS AND ABBREVIATIONS ELECTRICAL SPECIFICATIONS

ELECTRICAL TEMPORARY CLASSROOMS

ELECTRICAL SITE DEMOLITION PLAN

ELECTRICAL SITE PLAN

UNIT A FIRST FLOOR DEMOLITION PLAN E-101 UNIT B FIRST FLOOR DEMOLITION PLAN UNIT C FIRST FLOOR DEMOLITION PLAN UNIT D FIRST FLOOR DEMOLITION PLAN UNIT E FIRST FLOOR DEMOLITION PLAN

UNIT A FIRST FLOOR LIGHTING PLAN UNIT A FIRST FLOOR POWER PLAN UNIT B FIRST FLOOR LIGHTING PLAN UNIT B FIRST FLOOR POWER PLAN UNIT C FIRST FLOOR LIGHTING PLAN UNIT C FIRST FLOOR POWER PLAN UNIT D FIRST FLOOR LIGHTING PLAN UNIT D FIRST FLOOR POWER PLAN UNIT E FIRST FLOOR LIGHTING PLAN UNIT E FIRST FLOOR POWER PLAN

ENLARGED BOILER ROOM ELECTRICAL PLANS **ENLARGED KITCHEN PLANS**

ELECTRICAL DIAGRAMS

ELECTRICAL SCHEDULES **ELECTRICAL SCHEDULES**

Services

FOR REFERENCE ONLY

SHEET INDEX:

M-001 MECHANICAL SYMBOLS AND ABBREVIATIONS

S-201 ENERGY RECOVERY UNIT STRUCTURAL PLAN

M-002 MECHANICAL SPECIFICATIONS

M-101 UNIT 'A' MECH DEMOLITION PLAN M-102 UNIT 'B' MECH DEMOLITION PLAN

M-103 UNIT 'C' MECH DEMOLITION PLAN

M-104 UNIT 'D' MECH DEMOLITION PLAN

M-105 UNIT 'E' MECH DEMOLITION PLAN

M-201 UNIT 'A' MECH SHEET METAL PLAN

M-202 UNIT 'B' MECH SHEET METAL PLAN

M-203 UNIT 'C' MECH SHEET METAL PLAN

M-204 UNIT 'D' MECH SHEET METAL PLAN

M-205 UNIT 'E' MECH SHEET METAL PLAN

RD-201 REFERENCE PIPING DRAWING - UNIT A RD-202 REFERENCE PIPING DRAWING - UNIT D

RD-204 REFERENCE PIPING DRAWING - UNIT E

M-301 ENLARGED BOILER ROOM MECH PLAN

M-303 ENLARGED ERV PLAN - UNIT A, B, C

M-401 MECHANICAL DETAILS

M-501 MECHANICAL SCHEDULES

RD-203 REFERENCE PIPING DRAWING - UNIT B & C

M-502 MECHANICAL SCHEDULES & PIPING SCHEMATIC

PLUMBING DEMOLITION PLAN

PLUMBING SCHEDULE AND DETAIL

PLUMBING PLAN- UNIT A

PLUMBING PLAN- UNIT B PLUMBING PLAN- UNIT C PLUMBING PLAN- UNIT D

PLUMBING PLAN- UNIT E

M-206 UNIT 'A' MECH PIPING PLAN

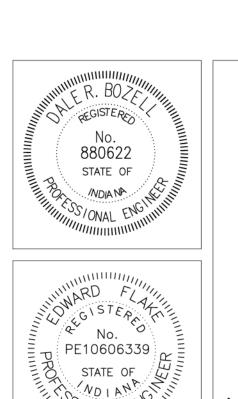
M-207 UNIT 'B' MECH PIPING PLAN

M-208 UNIT 'C' MECH PIPING PLAN

M-209 UNIT 'D' MECH PIPING PLAN

M-210 UNIT 'E' MECH PIPING PLAN

COVER SHEET



NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS MAY APPLY TO THIS PROJECT

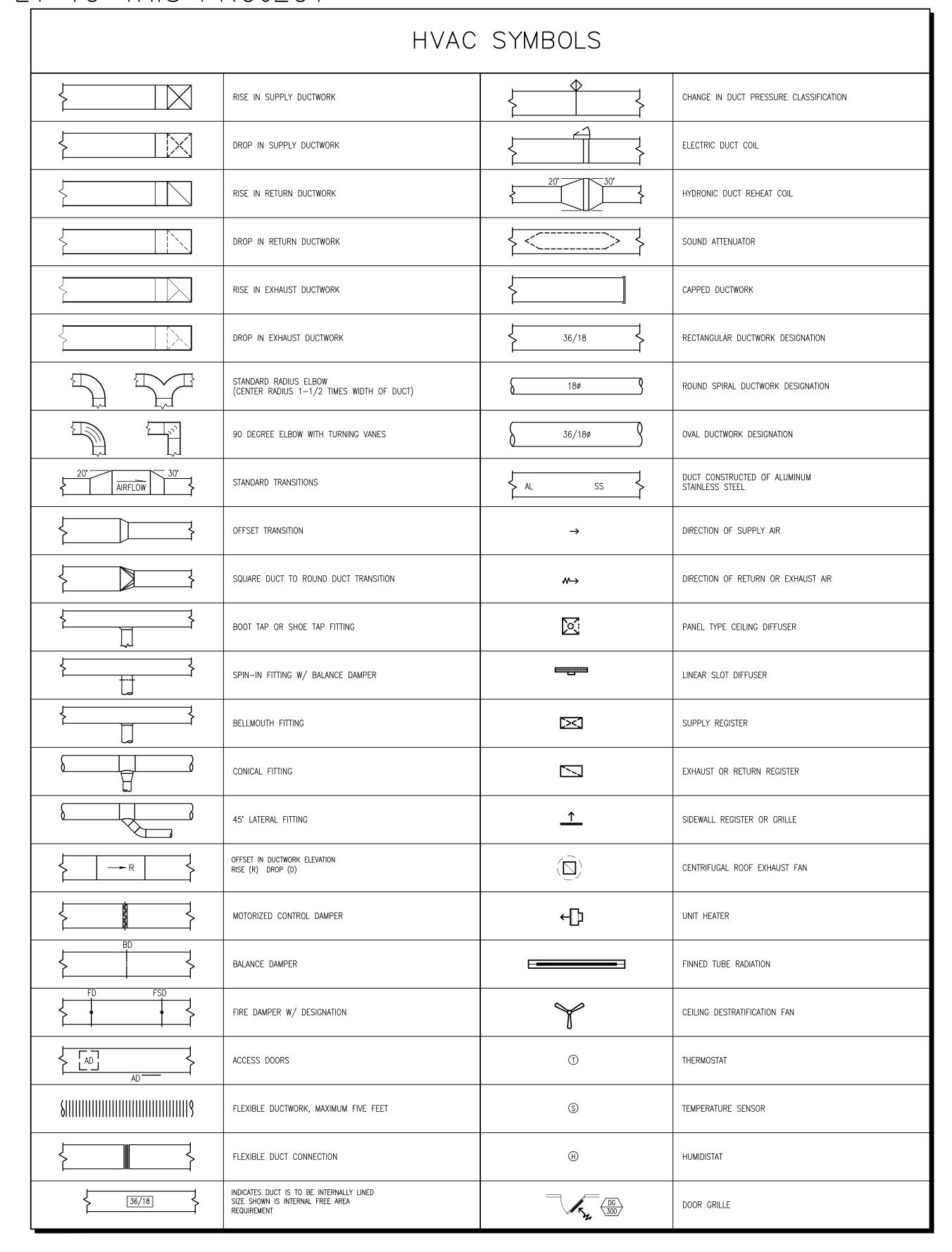
RISE IN PIPING

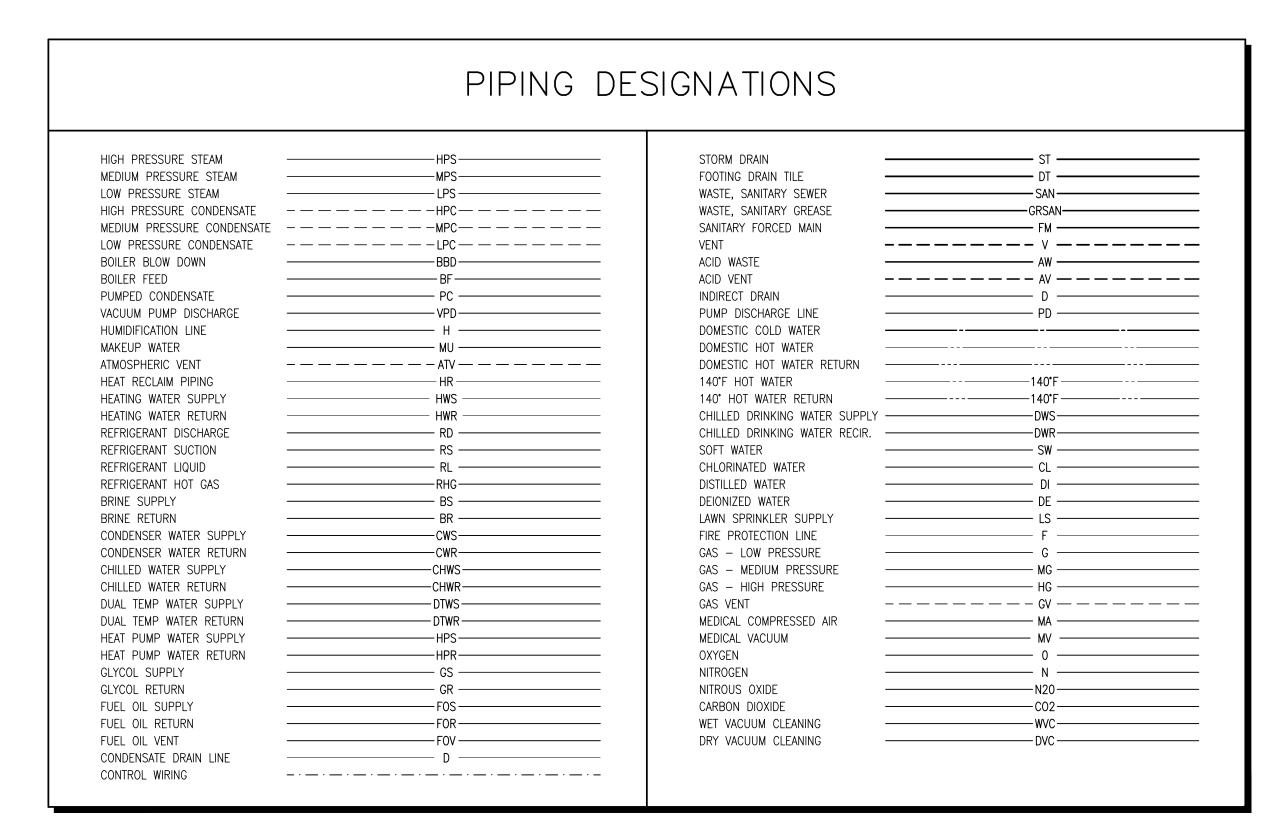
DROP IN PIPING

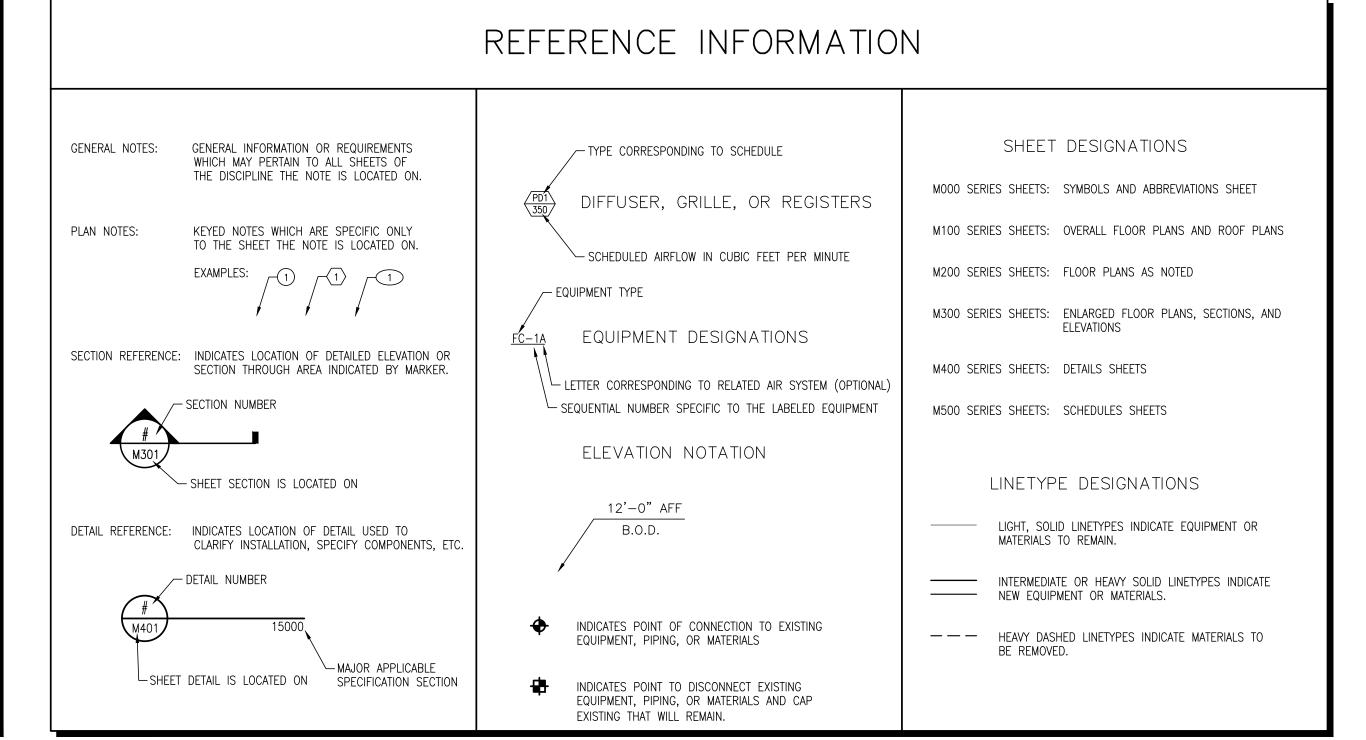
PIPING SYMBOLS

Company Comp

E	CAPPED PIPING
	PIPE CONTINUED ELSEWHERE AS NOTED
	PIPE GUIDES
××	PIPE ANCHORS
	FLEXIBLE PIPE CONNECTOR
	PIPE EXPANSION JOINT
	PIPE EXPANSION LOOP
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	UNION, FLANGED UNION
	PITCH (IN DIRECTION OF ARROW)
	DIRECTION OF FLOW
	GATE VALVE
——————————————————————————————————————	BALL VALVE GLOBE VALVE
	BUTTERFLY VALVES
——————————————————————————————————————	PLUG VALVE
	CHECK VALVE
	PRESSURE REDUCING VALVE
	REDUCED PRESSURE BACKFLOW PREVENTER
	DOUBLE CHECK BACKFLOW PREVENTOR
<u> </u>	ANGLE VALVE
	PRESSURE RELIEF VALVE
<u> </u>	VALVE WITH OUTSIDE STEM & YOKE
——————————————————————————————————————	PNUEMATIC TWO-WAY CONTROL VALVE
\$	PNUEMATIC THREE—WAY CONTROL VALVE
	ELECTRIC TWO—WAY CONTROL VALVE
	ELECTRIC THREE—WAY CONTROL VALVE
[5]	SOLENOID VALVE
E 1	FLOW SWITCH
P	PRESSURE SWITCH
♦	AQUASTAT
	ORIFICE FLOW METER
	VENTURI FLOW METER
	MANUAL BALANCE VALVE
	AUTOMATIC FLOW CONTROL VALVE
——————————————————————————————————————	STRAINER
	STRAINER WITH CAPPED BLOWDOWN
<u> </u>	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	VACUUM BREAKER
	PETE'S PLUG
	THERMOMETER
	PRESSURE GAUGE
F&T	STEAM TRAP WITH DESIGNATION
	REFRIGERATION SIGHT GLASS
	AIR FILTER/DRYER
	REFRIGERATION THERMAL EXPANSION VALVE
	PUMP WATER HAMMER ARRESTOR (DESIGNATION ORTIONAL)
—————————————————————————————————————	WATER HAMMER ARRESTOR (DESIGNATION OPTIONAL)
	FLOOR DRAIN W/ SIZE & TYPE END OF PIPE CLEANOUT
	FLOOR CLEANOUT
	WALL CLEANOUT
——————————————————————————————————————	EXTERIOR CLEANOUT/RODDING HOLE
	UNDERGROUND CONCRETE THRUST BLOCK
<u>▼</u>	THERMOSTATIC MIXING VALVE
——-———————————————————————————————————	HOSE BIBB
	WATER METER
	GAS METER
<u>RD</u> <u>OD</u>	ROOF DRAIN OR OVERFLOW DRAIN
7	POST INDICATOR VALVE
	FIRE DEPARTMENT CONNECTION
	VALVE TAMPER SWITCH
	UPRIGHT SPRINKLER HEAD
<u> </u>	PENDANT SPRINKLER HEAD
•	DRY PENDANT SPRINKLER HEAD
	SIDEWALL SPINKLER HEAD
(•)	CONCEALED SPRINKLER HEAD







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IPC-K17-2402

REVISIONS

New Britton Elementary School
Fishers, IN

Performance Services

M-00 I

MECHANICAL SYMBOLS AND ABBREVIATIONS

SHEET

GENERAL REQUIREMENTS:

INSPECTIONS FOR THE PERFORMANCE OF THEIR WORK.

- EACH SUBCONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL CODES, LAWS, ORDINANCES, RULES AND REGULATIONS, AND ORDERS OF ANY PUBLIC AUTHORITY BEARING ON THE PERFORMANCE OF THE WORK.
- EACH SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE COST AND SCHEDULING OF ANY REQUIRED
- EACH SUBCONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND LICENSES NECESSARY FOR THE PROSECUTION OF THEIR WORK.
- THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE ARRANGEMENTS OF THE PRINCIPAL EQUIPMENT DUCTWORK AND PIPING, AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. BECAUSE OF THE SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, EXPANSION JOINTS, ANCHORS, ISOLATION VALVES AND ACCESSORIES WHICH MAY BE REQUIRED. EACH SUBCONTRACTOR SHALL FURNISH AND INSTALL ALL SUPPLEMENTARY OR MISCELLANEOUS ITEMS, PIPE, VALVES, FITTINGS, APPURTENANCES AND DEVICES INCIDENTAL TO, OR NECESSARY FOR, A SOUND, SECURE, COMPLETE, AND SATISFACTORILY OPERATING SYSTEM. CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING THE WORK AND THE WORK OF OTHER TRADES AND ARRANGE EQUIPMENT, DUCTWORK, AND PIPING ACCORDINGLY. PROVIDE THE BEST POSSIBLE ARRANGEMENT SO AS TO PROVIDE THE MAXIMUM HEADROOM AND ACCESS.
- EACH SUBCONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND SHALL ADJUST THEIR WORK ACCORDING TO ANY VARIATIONS OR DEVIATIONS FROM THOSE SHOWN ON THE PLANS.
- EACH SUBCONTRACTOR IS RESPONSIBLE FOR FURNISHING EQUIPMENT WHICH IS SUITABLE FOR THE SPACE AVAILABLE. SUBCONTRACTOR SHALL PAY FOR ALL MODIFICATIONS TO THEIR WORK AND WORK OF OTHERS REQUIRED TO ACCOMMODATE FURNISHED EQUIPMENT WHICH REQUIRES SPACE DIFFERENT FROM THAT INDICATED ON DRAWINGS.
- EACH SUBCONTRACTOR IS RESPONSIBLE FOR FURNISHING EQUIPMENT WHICH IS SUITABLE FOR THE SERVICES SHOWN ON DRAWINGS. SUBCONTRACTOR SHALL PAY FOR ALL MODIFICATIONS TO THEIR WORK AND WORK OF OTHERS REQUIRED TO ACCOMMODATE EQUIPMENT FURNISHED BY HIM WHICH REQUIRES SERVICES DIFFERENT FROM THOSE INDICATED ON DRAWINGS.
- 8 ELECTRONIC SHOP DRAWINGS (PDF FILE) FOR ALL EQUIPMENT AND WORK SHALL BE SUBMITTED FOR REVIEW.
- THREE BOUND SETS OF INSTRUCTION MANUALS SHALL BE FURNISHED TO PSI PRIOR TO ACCEPTANCE OF THE
- 11 RECORD DRAWINGS SHALL BE KEPT OF ALL DEVIATIONS FROM THE CONTRACT DRAWINGS. RECORD DRAWINGS SHALL BE SUBMITTED TO PSI PRIOR TO ACCEPTANCE OF THE PROJECT. NO SUCH DEVIATIONS FROM THE
- 12 ALL WORK SHALL BE INSTALLED SO AS TO BE ACCESSIBLE FOR OPERATION, MAINTENANCE, AND REPAIR. EACH SUBCONTRACTOR SHALL PROVIDE ACCESS PANELS OF APPROPRIATE SIZE WHEN THEIR WORK IS CONCEALED.

CONTRACT DRAWINGS SHALL BE MADE WITHOUT PRIOR APPROVAL OF PSI.

- 13 EACH SUBCONTRACTOR SHALL PROVIDE ALL CONCRETE PADS AND PIERS REQUIRED FOR THE INSTALLATION OF THEIR WORK. CONCRETE PADS SHALL BE NOT LESS THAN 4" HIGH AND SHALL EXTEND A MINIMUM OF 6" BEYOND THE EQUIPMENT OR PRODUCT MOUNTED THEREON. THE TOP OF THE PAD SHALL BE LEVEL. CONCRETE SHALL BE A MINIMUM OF 3000 PSI WITH AIR ENTRAINMENT UNLESS NOTED OTHERWISE.
- PRIOR TO FINAL ACCEPTANCE, PROVIDE TO PSI AND THE OWNER, INSTRUCTIONS ON THE PROPER OPERATION AND MAINTENANCE OF THE SYSTEMS, EQUIPMENT AND CONTROLS SUPPLIED BY THE SUBCONTRACTOR.
- 15 EACH SUBCONTRACTOR SHALL PROVIDE UL RATED FIRE STOPPING WHEN PENETRATING ANY FIRE-RATED WALL OR FLOOR. FIRE STOPPING MATERIALS SHALL BE OF A TYPE AND THICKNESS TO ACHIEVE THE APPROPRIATE FIRE RATING AND SHALL CONFORM TO ALL CODE AND REGULATORY REQUIREMENTS. FIRE STOPPING MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MAINTAIN FIRE RATING OF WALLS. PARTITIONS. CEILINGS. AND FLOORS AT PENETRATION. MEET REQUIREMENTS OF ASTM E814 THROUGH PENETRATION FIRE TEST BY A NATIONALLY RECOGNIZED TESTING AGENCY AND OTHER ASTM STANDARDS AS APPLICABLE FOR THE INSTALLATION.
- 16 ALL BUILDING SURFACES, WALLS, FLOORS, ETC., WHICH ARE TO BE EXPOSED, DISTURBED, CUT OR PARTIALLY REMOVED BY A SUBCONTRACTOR IN ABANDONING, REMOVING, REPLACING, OR INSTALLING THE WORK, SHALL BE PATCHED AND REPAIRED BY THIS SAME SUBCONTRACTOR, UNLESS OTHERWISE NOTED. THE SUBCONTRACTOR SHALL ONLY EXPOSE, DISTURB, CUT OR REMOVE THE MINIMUM AREA OF SUCH SURFACES NECESSARY TO PERFORM HIS WORK. IF IT BECOMES NECESSARY TO CUT INTO THE WORK OF ANOTHER SUBCONTRACTOR, IT SHALL BE DONE AT THE EXPENSE OF THE CUTTING SUBCONTRACTOR AND WITH THE CONSENT OF THE OTHER SUBCONTRACTOR. CUTTING SHALL BE PERFORMED WITH SUCH TOOLS AND METHODS AS TO PREVENT DAMAGE TO THE SURROUNDING BUILDING STRUCTURE, FINISHES AND EQUIPMENT. NO CUTTING SHALL BE DONE WHICH WILL IN ANYWAY REDUCE THE STRUCTURAL STRENGTH OF THE BUILDING. AS REQUIRED BY THE NATURE OF THE WORK BEING PERFORMED THE CUTTING SUBCONTRACTOR SHALL PROVIDE ALL LINTELS.
- 17 EACH SUBCONTRACTOR SHALL CORE DRILL HOLES THROUGH FLOORS, WALLS, DECKS, ETC., WHERE PASSAGE IS NOT AVAILABLE, TO INSTALL THEIR WORK. PROVIDE STEEL SLEEVES AND PROPERLY SEAL ALL PENETRATIONS AS REQUIRED. SEAL PIPE PENETRATIONS IN EXTERIOR WALLS USING SLEEVES AND MECHANICAL SLEEVE SEALS. MECHANICAL SLEEVE SEALS SHALL BE MODULAR DESIGN, WITH INTERLOCKING RUBBER LINKS SHAPED TO CONTINUOUSLY FILL ANNULAR SPACE BETWEEN PIPE AND SLEEVE. INCLUDE CONNECTING BOLTS AND PRESSURE
- 20 EACH SUBCONTRACTOR SHALL PROVIDE ONE (1) FULL YEAR PARTS AND LABOR WARRANTY COVERING THEIR WORK FROM DATE OF ACCEPTANCE BY PSI AND THE OWNER.
- 21 EACH SUBCONTRACTOR SHALL PROVIDE DUST PROTECTION FOR THEIR OPERATIONS TO PROTECT EXISTING EQUIPMENT, FINISHES, AND FURNISHINGS.
- 22 EXISTING EQUIPMENT WHICH IS TO BE REMOVED AND NOT REUSED SHALL BECOME THE PROPERTY OF THE SUBCONTRACTOR, UNLESS DESIGNATED SPECIFICALLY TO BE RETAINED BY THE OWNER, AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY ACCORDING TO LOCAL CODES. FOR REFRIGERANT CONTAINING EQUIPMENT, RECOVER WITHOUT VENTING ALL REFRIGERANT IN COMPLIANCE WITH EPA RULE 40 CFR PART 80. PROVIDE PSI WITH CERTIFICATION OF RECOVERY AND DISPOSAL OF REFRIGERANT. DELIVER OWNER RETAINED ITEMS TO OWNER'S STORAGE FACILITY.
- 23 EACH SUBCONTRACTOR SHALL PERFORM A STARTUP OF EACH SYSTEM INCLUDED IN THEIR WORK. STARTUP SHALL BE PERFORMED IN STRICT ACCORDANCE WITH MANUFACTURER'S PRINTED PROCEDURE. SUBCONTRACTOR SHALL BE AVAILABLE FOR STARTUP OF EQUIPMENT PROVIDED BY OTHERS AS NECESSARY FOR THEIR WORK.
- 24 EACH SUBCONTRACTOR SHALL CLEAN WORK AREAS DAILY.
- 25 EACH SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL ROOF PENETRATIONS REQUIRED FOR THEIR WORK. WHEN MAKING ROOF PENETRATIONS, MAINTAIN THE INTEGRITY OF ANY GUARANTEE THAT MAY CURRENTLY COVER
- 26 EACH SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL CEILING REMOVAL AND REPLACEMENT REQUIRED FOR THE COMPLETION OF THEIR WORK. THIS RESPONSIBILITY INCLUDES TEMPORARY SUPPORT AND REINSTALLATION OF EXISTING CEILING MOUNTED DEVICES. ALL LOGISTICAL DISCONNECT AND RECONNECT, TEMPORARY AND PERMANENT OPENINGS AND/OR THE RELOCATION OF EXISTING SERVICES. DEVICES OR BUILDING STRUCTURE SHALL BE THE RESPONSIBILITY OF THE SUBCONTRACTOR PERFORMING THE WORK UNLESS SPECIFICALLY NOTED
- EACH SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION AND BACKFILL REQUIRED FOR THE COMPLETION OF THEIR WORK. DETERMINE LOCATION OF UNDERGROUND UTILITIES AND PERFORM WORK IN A MANNER WHICH WILL AVOID POSSIBLE DAMAGE. PROTECT EXISTING TREES, SHRUBS, FENCES, ROADS, SIDEWALKS, ETC., FROM DAMAGE. REPAIR ANY DAMAGE INCURRED.
- 28 EACH SUBCONTRACTOR SHALL TAKE ALL REASONABLE STEPS AND COMPLY WITH ALL APPLICABLE LAWS TO ENSURE THE SAFETY OF ALL PERSONS AFFECTED BY THEIR WORK AND TO PROTECT ALL PROPERTY FORM DAMAGE OR LOSS DUE TO THEIR OPERATIONS.
- 29 THE PROJECT SCHEDULE PROVIDES A NARROW WINDOW OF OPPORTUNITY TO COMPLETE A TREMENDOUS AMOUNT OF WORK. IT IS THE RESPONSIBILITY OF EACH SUBCONTRACTOR TO IDENTIFY THE DURATION REQUIRED FOR THEIR RESPECTIVE SCOPE OF WORK AND ENSURE A TIMELY COMPLETION OF THAT SCOPE OF WORK WITHIN THE SCHEDULED COMPLETION DATE. ALL SUBCONTRACTORS SHALL BE REQUIRED TO COORDINATE THEIR WORK AND MAN THE PROJECT IN A MANNER WHICH COMPLIMENTS THE OVERALL COMPLETION OF THE PROJECT WITHIN THE SCHEDULE AND ALLOWS FOR THE PROPER TIMING AND COMPLETION OF OTHER TRADES.
- UPON AWARD OF THE CONTRACT, EACH SUBCONTRACTOR SHALL PROVIDE A DETAILED PROJECT SCHEDULE OUTLINE OF THE WORK TO BE PERFORMED, INCLUDING DURATION AND MANPOWER REQUIREMENTS TO CORRESPOND WITH THE MASTER SCHEDULE MAINTAINED BY PSI. ALL SCHEDULE DEVIATIONS SHALL BE IDENTIFIED AND EXPLAINED.
- 31 ALL SUBCONTRACTORS SHALL COORDINATE WITH LOCAL UTILITIES TO ENSURE THAT SERVICES ARE AVAILABLE WHEN REQUIRED, BUT NO LATER THAN BY THE TIME OF FINAL ACCEPTANCE BY PSI.
- MATERIALS, EQUIPMENT, LIGHTING AND STORAGE CONTAINERS SUPPLIED BY PSI SHALL BE RECEIVED, STORED AND PROTECTED AS REQUIRED BY THE SUBCONTRACTOR RESPONSIBLE FOR INSTALLATION AND RETROFIT. IF MATERIALS AND EQUIPMENT ARRIVE DAMAGED, DO NOT TAKE RECEIPT OF ITEMS WITHOUT CONTACTING THE PSI PROJECT MANAGER. ALL MATERIALS EQUIPMENT AND RIGGING REQUIRED FOR HANDLING, MOVING, STORING AND INSTALLATION SHALL BE PROVIDED BY THE SUBCONTRACTOR RESPONSIBLE FOR INSTALLATION.
- 33 PSI WILL PROVIDE EQUIPMENT AS IDENTIFIED IN THE QUOTING DOCUMENTS. ALL REQUIRED EQUIPMENT NOT IDENTIFIED IN THE QUOTING DOCUMENTS SHALL BE PROVIDED BY THE SUBCONTRACTOR. ALL VIBRATIONS ISOLATION, EQUIPMENT SUPPORTS AND HANGERS SHALL BE PROVIDED BY THE SUBCONTRACTOR INSTALLING THE
- 34 NOT ALL EXISTING EQUIPMENT AND ROUTINGS ARE SHOWN ON THE DRAWINGS. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR INVESTIGATING ALL THE EXISTING SITE CONDITIONS AND INCLUDING ALL EQUIPMENT AND WORK NECESSARY TO PROVIDE FULLY FUNCTIONAL, LONG TERM SOLUTIONS WITHIN THEIR BID.
- 35 SOUND STOPPING SHALL BE PERFORMED ON ALL COMPONENTS PASSING THROUGH NON-FIRE RATED WALLS OR FLOORS WHICH EXTEND FROM HORIZONTAL STRUCTURE TO HORIZONTAL STRUCTURE. SOUND STOPPING SHALL CONSIST OF AN INSULATING MATERIAL ON THE INSIDE AND THE OUTSIDE SHALL HAVE AN APPROVED SEALANT OR PLASTER. INSULATING MATERIAL SHALL BE NON—ASBESTOS AND NON—FRIABLE, AND SHALL HAVE A FLAME SPREAD RATING OF NO MORE THAN 25 AND A SMOKE DEVELOPING RATING OF NO MORE THAN 50.

MECHANICAL SPECIFICATIONS:

1.0 BASIC MECHANICAL MATERIALS AND METHODS

- 1.1 ALL PIPING SHALL HAVE LABELS STATING CONTENTS AND DIRECTIONAL ARROWS INDICATING FLOW. LABELS SHALL BE APPLIED 50' O.C. IN STRAIGHT RUNS EXCEPT NO MORE 25' O.C. IN EQUIPMENT ROOMS. LABELS SHALL BE APPLIED ON BOTH SIDES OF A WALL WHERE PIPE PASSES THROUGH SAME. LABELS SHALL BE LIKE SETON NAMEPLATE CORP. - SETMARK TYPE SNA OR STR.
- 1.2 INSTALL NUMBERED VALVE TAGS ON ALL VALVES. FURNISH DIRECTORY OF VALVES GIVING FLUID HANDLED, FUNCTION, SIZE, AREA SERVED, NAME AND NUMBER OF ROOM IN WHICH VALVE IS LOCATED, ETC. TAGS SHALL BE MINIMUM 3" X 1" LAMINATED ENGRAVED PLASTIC WITH STAINLESS STEEL CHAIN. TAGS SHALL INDICATE FLUID HANDLED AND FUNCTION OF VALVE.
- 1.3 INSTALL EQUIPMENT LABELS AT EACH MAJOR ITEM OF EQUIPMENT. LABELS SHALL BE LAMINATED ENGRAVED PLASTIC AND SHALL INCLUDE COMPLETE IDENTIFICATION OF EQUIPMENT INCLUDING AREA SERVED, IDENTIFYING NUMBERS AND NAMES USED ON THE DRAWINGS.

- 1.4 INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED
- 1.5 INSTALL UNIONS, IN PIPING 2" AND SMALLER, ADJACENT TO EACH VALVE AND AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT. LOCATE UNIONS AND VALVES TO ALLOW FOR REMOVAL OF PIPING DOWNSTREAM FOR EQUIPMENT ACCESS AND SERVICING.
- 1.6 INSTALL FLANGES IN PIPING 2-1/2" AND LARGER, ADJACENT TO FLANGED VALVES AND AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT. LOCATE FLANGES AND VALVES TO ALLOW FOR REMOVAL OF PIPING DOWNSTREAM FOR EQUIPMENT ACCESS AND SERVICING.
- 1.7 INSTALL DIELECTRIC NIPPLE TO CONNECT PIPING MATERIALS OF DISSIMILAR METALS.
- IT SHALL BE THE RESPONSIBILITY OF THE PIPING SUBCONTRACTOR TO REVIEW THE EXISTING GAS SERVICE AND ENSURE THAT THE NEW AND REMAINING EQUIPMENT ARE SUPPLIED WITH THE APPROPRIATE GAS PRESSURES AND VOLUMES. THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, A LARGER SERVICE OR PRESSURE CHANGES, ADDITIONAL GAS PRESSURE REDUCING VALVES/REGULATORS, INCREASING THE SIZE OF THE GAS SERVICE LINES AS REQUIRED. ALL NEW PRV'S SHALL BE OF TYPE AND SPECIFICATION AS RECOMMENDED BY THE RESPECTIVE EQUIPMENT MANUFACTURER. THE LINE BETWEEN THE PRV AND THE EQUIPMENT GAS TRAIN SHALL PROVIDE A SUFFICIENT AMOUNT OF VOLUME TO PREVENT THE PRV/REGULATOR FROM PULSATING (COORDINATE REQUIREMENTS WITH THE EQUIPMENT MANUFACTURER AND PSI).
- 1.9 GAS TRAINS SHALL BE PROVIDED WITH GAS VENT LINES FOR ALL DIAPHRAGM DEVICES AND DEDICATED VENTS FOR DOUBLE BLOCK AND VENT GAS TRAINS. GAS TRAINS SHALL BE AN APPROVED UL INSTALLATION.
- 1.10 THERE SHALL BE NO COPPER PIPING OR TUBING IN THE ENTIRE GAS SYSTEM INCLUDING VENT LINES. VENTS SHALL TERMINATE OUTSIDE THE BUILDING THROUGH APPROVED GAS VENTS, LIKE FISHERS Y602 SERIES VENT FITTINGS. DIAPHRAGM VENTS AND RELIEF VENTS SHALL NOT TERMINATE IN THE SAME FITTING, VENT LINES SHALL NOT BE COMBINED AND/OR MANIFOLDED TOGETHER.
- 1.11 FLUE PIPE LAYOUT, INSTALLATION AND COORDINATION WITH THE BOILER FLUE SUPPLIER SHALL BE THE RESPONSIBILITY OF THE SHEET METAL SUBCONTRACTOR. THE ROUTING OF FLUE PIPE FOR ALL NEW EQUIPMENT SHALL HAVE PRIORITY OVER ALL OTHER WORK INSTALLED. ALL EQUIPMENT SHALL BE SET AND LOCATED IN A MANNER WHICH PERMITS AS STRAIGHT OF A ROUTE FOR THE FLUE AS POSSIBLE.
- 1.12 INSTALL MANUAL AIR VENTS AT ALL HIGH POINTS IN HEATING HOT WATER, CHILLED WATER AND DUAL TEMPERATURE PIPING SYSTEMS.
- 1.13 ROUTE STEAM AND REFRIGERANT PRESSURE RELIEF VALVES TO EXTERIOR OF BUILDING.
- 1.14 PRIOR TO EQUIPMENT INSTALLATION, VERIFY THERE IS SPACE TO PROVIDE SLOPE IN PIPING OFF OF COOLING COIL CONDENSATE DRAIN PAN, HUMIDIFIER DRAIN PANS, AND STEAM CONDENSATE TRAPS.
- 1.15 FOR REFRIGERANT PIPING SYSTEMS, INSTALL CHARGING VALVES, INSTALL OIL LIFTING TRAPS BASED ON SYSTEM REQUIREMENTS. INSTALL AND SUPPORT PIPING WITH ALLOWANCE FOR EXPANSION, CONTRACTION, AND VIBRATION.
- 1.16 INSTALL ACCESS PANELS IN PLUMBING/MECHANICAL CHASES. ACCESS PANELS SHALL BE A MINIMUM OF 12" SQUARE AND 14 GAUGE STEEL. PAINT ACCESS PANELS TO MATCH.
- 1.17 PIPING SUBCONTRACTOR SHALL SIZE ROOM LEVEL DUCTWORK, DIFFUSERS AND BRANCH PIPING SYSTEMS NOT SHOWN ON THE DRAWINGS BASED ON THE ASSOCIATED EQUIPMENT SCHEDULES AND THE FOLLOWING CRITERIA:
- A. LESS THAN 4' FRICTION PER 100 FOOT OF PIPE FOR CHILLED WATER AND HEATING HOT WATER, BUT NOT LESS THAN 3/4" IN SIZE. AND NOT MORE THAN 10 FT/SEC. FLUID VELOCITY. B. SUPPLY DUCTS - LESS THAN 0.08" STATIC PRESSURE DROP PER 100' OF DUCT AND LESS THAN 1200 FPM C. RETURN DUCTS - LESS THAN 0.05" STATIC PRESSURE DROP PER 100' OF DUCT AND LESS THAN 1200 FPM D. SUPPLY AIR FLOW TO BE EQUALLY SPLIT BETWEEN DIFFUSERS IN EACH CORRESPONDING ROOM. E. FOR ESTIMATION PURPOSES ONLY: PROVIDE AT LEAST ONE DIFFUSER PER ROOM, AND NO LESS THAN ONE
- 1.18 CLEAN EQUIPMENT THOROUGHLY TO ENSURE IT IS FREE OF DIRT. SCALE. WASTE. DEBRIS. ETC. PAINT DAMAGED OR SCRATCHED FACTORY FINISH WITH TOUCHUP PAINT MATCHING FACTORY FINISH.

DIFFUSER PER 300 CFM (ROUND UP IF ROOM AIR IS OVER 300 CFM PER ROOM).

- 1.19 INSTALL EQUIPMENT PLUMB AND LEVEL. INSTALL PUMPS, AIR HANDLING UNITS, CHILLERS, AND BOILERS, ETC. IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, LOCAL CODES AND RECOGNIZED INDUSTRY PRACTICES. INSTALL PUMPS, AIR HANDLING UNIT, CHILLERS, ETC. ON NEOPRENE ISOLATION PADS. ARRANGE INSTALLATION OF EQUIPMENT TO PROVIDE ACCESS AROUND UNIT FOR SERVICE AND MAINTENANCE. ROOFTOP EQUIPMENT SHALL BE INSTALLED ON CURBS IN A WEATHER TIGHT MANNER. COORDINATE ANY REQUIRED PREP WORK WITH SHEET METAL, ELECTRICAL AND CONTROLS SUBCONTRACTOR PRIOR TO INSTALLATION OF EQUIPMENT.
- 1.20 RELEASE/REMOVE SHIPPING BOLTS ON FANS, PUMPS, COMPRESSORS, ETC. BEFORE STARTING EQUIPMENT COORDINATE CHECK OUT OF MOTOR ROTATION WITH ELECTRICAL SUBCONTRACTOR. DISCONNECT PUMPS FROM MOTORS BEFORE CHECKING ROTATION, RECONNECT AFTER CHECK OUT.
- 1.21 CHECK LUBRICATION OF BEARINGS ON FANS, PUMPS, MOTORS, ETC. PRIOR TO STARTUP. CHECK ALIGNMENT OF COUPLINGS AND FAN BELTS. ROUTE DRAINS FROM PUMP DRIP PANS TO FLOOR DRAIN IN AREA.
- 1.22 CONNECT PIPES AND DUCTS TO EQUIPMENT WITH FLEXIBLE CONNECTORS WHERE IT IS INSTALLED ON VIBRATION ISOLATORS. ALL PIPING AND DUCTWORK SHALL BE SUPPORTED INDEPENDENT OF EQUIPMENT.
- 1.23 INSTALL BOILERS, CHILLERS, AND PUMPS ON CONCRETE BASES. ANCHOR EQUIPMENT TO CONCRETE BASES. INSTALL MISCELLANEOUS STRUCTURAL STEEL ON FLOORS, IN CEILINGS OR ON ROOFS TO SUPPORT EQUIPMENT.
- 1.24 INSTALL AND ANCHOR TERMINAL EQUIPMENT TIGHT AND SECURE TO FLOORS AND WALLS.
- 1.25 REFRIGERANT PIPING SYSTEMS, INCLUDING STRAINERS AND DRYER/FILTERS, ETC., SHALL BE CLEANED AND DEHYDRATED. PRESSURE TEST REFRIGERANT SYSTEM FOR LEAKAGE IN MANNER RECOMMENDED BY MANUFACTURER, UTILIZE AN ELECTRONIC OR HALIDE LEAK DETECTOR FOR LEAK CHECKS. PROVIDE AND CHARGE CHILLER OR DX CONDENSING SYSTEM WITH REFRIGERANT IN THE QUANTITY AND MIX RECOMMENDED BY THE CHILLER MANUFACTURER AND UNDER THEIR SUPERVISION. BLEED OUT NONCONDENSABLE GASES. ALL REFRIGERANT WORK SHALL MEET OR EXCEED REQUIREMENTS OF EPA TITLE VI, SUBMIT RECORDS OF REFRIGERANT INSTALLATION TO PSI.
- 1.26 CHECK AND STRAIGHTEN FINS ON ALL COILS IN EQUIPMENT PRIOR TO STARTUP.
- 1.27 INSTALL AIR FILTERS IN EQUIPMENT ONLY AFTER ALL CLEANING HAS BEEN COMPLETED AND PRIOR TO TESTING AND BALANCING. PREVENT PASSAGE OF UNFILTERED AIR AROUND FILTERS WITH FELT, RUBBER OR NEOPRENE GASKETS. INSTALL FILTER GAUGES ON OUTSIDE OF FILTER SECTIONS IN AN ACCESSIBLE POSITION, INSTALL STATIC PRESSURE TIPS UPSTREAM AND DOWNSTREAM OF FILTERS.
- 1.28 THOROUGHLY CLEAN ALL PIPING SYSTEMS AND EQUIPMENT. FLUSH FREE OF DIRT, SCALE, OIL, WASTE, ETC. BLOW-DOWN STRAINERS WHEN FLUSHING.
- 1.29 PROVIDE AND INSTALL VALVES IN ALL SYSTEMS AS REQUIRED TO FACILITATE THE OPERATION OF VARIOUS SYSTEMS AND THE WORK OF OTHER TRADES DURING CONSTRUCTION.
- 1.30 THOROUGHLY TEST FOR LEAKS, OPERATION, ETC.; EACH SYSTEM, DEVICE AND ITEM OF EQUIPMENT INSTALLED AS PART OF THE WORK. TEST THE PIPING SYSTEM IN A MANNER THE ALLOWS THE INSULATOR ACCESS TO INSULATING THE PIPING AT THE EARLIEST POSSIBLE TIME.
- 1.31 INSTALL PIPING COMPONENTS WITH PRESSURE RATINGS EQUAL TO OR GREATER THAN SYSTEM OPERATING PRESSURE.
- 1.32 INSTALL PIPING FREE OF SAGS OR BENDS.

2.0 HANGERS AND SUPPORTS

- 2.1 ALL HANGER AND SUPPORT INSTALLATIONS SHALL MEET THE REQUIREMENTS OF ALL APPLICABLE CODES, ALONG WITH THE FOLLOWING MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY
- A. MSS-SP58 PIPE HANGERS AND SUPPORTS MATERIALS, DESIGN AND MANUFACTURER.
- B. MSS-SP69 PIPE HANGERS AND SUPPORTS SELECTION AND APPLICATION.
- C. MSS-SP89 PIPE HANGERS AND SUPPORTS FABRICATION AND INSTALLATION PRACTICES.
- D. MSS TYPE 39 HARDWOOD BLOCKING SADDLES.
- E. MSS TYPE 40 PROTECTIVE SHIELDS.
- 2.2 IN LOCKER ROOMS AND KITCHENS, WHERE HANGERS ARE EXPOSED IN THE SPACE INSTALL EPOXY COATED ALL-THREAD AND HANGERS OR COAT THEM WITH EPOXY PAINT AFTER INSTALLATION.
- 2.3 CUT EXCESS ALL—THREAD OFF DIRECTLY BELOW FASTENERS ON EQUIPMENT AND PIPING SUPPORTS. 2.4 INSTALL HANGERS AND SUPPORTS TO ALLOW CONTROLLED THERMAL AND SEISMIC MOVEMENT OF PIPING
- SYSTEMS, TO PERMIT FREEDOM OF MOVEMENT BETWEEN PIPE ANCHORS, AND TO FACILITATE ACTION OF EXPANSION JOINTS, EXPANSION LOOPS, EXPANSION BENDS AND SIMILAR UNITS.
- 2.5 INSTALL HANGERS AND SUPPORTS SO THAT PIPING LIVE AND DEAD LOADS AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
- 2.6 INSTALL PROTECTIVE SHIELDS FOR INSULATION ON ALL INSULATED PIPING SYSTEMS.
- 2.7 PROVIDE COPPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.
- 2.8 ARRANGE FOR GROUPING OF PARALLEL RUNS OF HORIZONTAL PIPING SUPPORTED TOGETHER ON FIELD-FABRICATED. HEAVY DUTY TRAPEZE HANBGERS WHERE POSSIBLE.
- 2.9 SUPPORT HORIZINTAL PIPING AS FOLLOWS:
- MAX HANGER SPACING HANGER ROD DIAMETER 1/2" TO 1-1/2" 2-1/2" TO 3" 10'-0" 4" TO 6" 10**'**-0" 8" TO 12" 12'-0" 14" AND OVER 12**'**-0" PVC (ALL SIZES) PER MANUFACTURES RECOMENDATION AND ALL APPLICABLE LOCAL, STATE, AND
- NATIONAL CODES. 2.10 GROOVED PIPE SYSTEMS SHALL BE SUPPORTED AT HANGER SPACINGS RECOMMENDED BY MANUFACTURER, BUT IN NO CASE FARTHER APART THAN THIS CHART.
- 2.11 PLACE A HANGER WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.
- 2.12 SUPPORT VERTICAL PIPING AT EVERY FLOOR.
- 2.13 SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.

3.0 MECHANICAL INSULATION

- 3.1 MECHANICAL INSULATION SHALL COMPLY WITH THE REQUIREMENTS OF THE CURRENT INDIANA ENERGY CODE (ANSI/ASHRAE/IESNA STANDARD 90.1-2007 WITH INDIANA AMENDMENTS).
- 3.2 INSULATE INDOOR CONCEALED SUPPLY AIR, OUTSIDE AIR, COMBUSTION AIR, BOILER INTAKE AIR DUCT, RETURN AIR (IN UNCONDITIONED SPACES ONLY) AND EXHAUST AIR (DOWNSTREAM OF THE BACK DRAFT DAMPER) DUCTWORK WITH 1-1/2" THICK GLASS FIBER BLANKET INSULATION, ASTM C553, TYPE II, K-VALUE OF .27 AT 75°F, .75 LBS/CUBIC FOOT MINIMUM DENSITY, WITH ALL-SERVICE JACKET, VAPOR BARRIER TYPE, INSULATION IN UNHEATED ATTICS AND CRAWL SPACES. OVERLAP INSULATION FACING AT SEAMS AND SEAL WITH VAPOR-RETARDER MASTIC AND PRESSURE-SENSITIVE TAPE HAVING SAME FACING AS INSULATION.
- 3.3 INSULATE EXPOSED SUPPLY AIR, OUTSIDE AIR, COMBUSTION AIR, RETURN AIR (IN UNCONDITIONED SPACES ONLY) AND EXHAUST AIR (DOWNSTREAM OF THE BACK DRAFT DAMPER) DUCTWORK WITH 1-1/2" THICK GLASS FIBER BOARD INSULATION, ASTM C612, TYPE IB, K-VALUE OF 0.23 AT 75°F, 3.0 LBS/CUBIC FOOT MINIMUM DENSITY, WITH ALL-SERVICE JACKET, VAPOR BARRIER TYPE, MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM ALUMINUM FOIL AND VINYL FILM. OVERLAP INSULATION FACING AT SEAMS AND SEAL WITH VAPOR-RETARDER MASTIC AND PRESSURE-SENSITIVE TAPE HAVING SAME FACING AS INSULATION.
- 3.4 INSULATE CHILLED WATER AIR SEPARATORS, CHILLED WATER EXPANSION TANKS, CHILLED WATER PUMPS AND CHILLERS NOT FACTORY INSULATED WITH 1" THICK FLEXIBLE ELASTOMERIC CLOSED-CELL INSULATION, ASTM C534, TYPE II, K-VALUE OF .27 AT 75°F, FOR SHEET MATERIALS. ADHESIVE AND ULTRAVIOLET-PROTECTIVE COATING AS RECOMMENDED BY THE INSULATION MANUFACTURER. APPLY INSULATION AND ADHESIVE OVER ENTIRE SURFACE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. SEAL ALL JOINTS AND SEAMS WITH VAPOR-RETARDER MASTIC AS RECOMMENDED BY THE INSULATION MANUFACTURER.
- 3.5 INSULATE THE FOLLOWING TYPES OF PIPING WITH GLASS FIBER FACTORY MOLDED RIGID INSULATION. ASTM C547 TYPE I. K-VALUE OF .24 AT 75°F, WITH ALL-SERVICE JACKET, VAPOR BARRIER TYPE. THICKNESS' AS LISTED BELOW. OVERLAP INSULATION FACING AT SEAMS AND SEAL WITH VAPOR-RETARDER MASTIC AND PRESSURE SENSITIVE TAPE HAVE SAME FACING AS INSULATION.
- A. DOMESTIC COLD AND HOT WATER: 1" THICKNESS MOLDED FIBERGLASS OR 1/2" ELASTOMERIC. B. LOW PRESSURE STEAM SUPPLY, LOW PRESSURE CONDENSATE RETURN, HEATING HOT WATER, CHILLED WATER (INTERIOR), DUAL TEMP WATER: UP TO 1-1/2" PIPE SIZE - 1" THICKNESS; 2" AND LARGER PIPE SIZE -
- C. CHILLED WATER (EXTERIOR): 2" THICKNESS WITH FIELD-APPLIED ALUMINUM JACKET.
- D. ABOVE GRADE STORM PIPING & UNDERSIDE OF ROOF DRAINS (INCLUDING VERTICAL DROP FROM ROOF DRAIN TO HORIZONTAL) AND HORIZONTAL SANITARY PIPING (EXCEPT PLUMBING CHASES): USE 1/2" THICK ELASTOMERIC OR 1" MOLDED FIGERGLASS.
- E. ALL INSULATED PIPES LOCATED IN OCCUPIED ROOMS THAT ARE EXPOSED SHALL BE FURNISHED WITH A PVC JACKETED COVER. PVC JACKETS SHALL BE HIGH-IMPACT, ULTRAVIOLET-RESISTANT, 30 MILS THICK. APPLY WITH 1" OVERLAP AT JOINTS AND SEAMS.
- 3.6 INSULATE THE FOLLOWING TYPES OF PIPING WITH FLEXIBLE ELASTOMERIC CLOSED-CELL INSULATION, ASTM C534, TYPE I, K-VALUE OF .27 AT 75°F, FOR TUBULAR MATERIALS. ADHESIVE AND ULTRAVIOLET-PROTECTIVE COATING AS RECOMMENDED BY THE INSULATION MANUFACTURER. SEAL ALL JOINTS AND SEAMS WITH VAPOR-RETARDER MASTIC AS RECOMMENDED BY THE INSULATION MANUFACTURER. APPLY TWO COATS OF FINISH IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AS REQUIRED TO PROVIDE A WEATHERPROOF
- A. CONDENSATE DRAIN PIPING: 1/2" THICKNESS

FINISH FOR EXTERIOR INSTALLATION.

2" THICKNESS.

- B. REFRIGERANT SUCTION AND HOT GAS: 1" THICKNESS
- 3.7 ALL EXPOSED PIPING IN LOCKER ROOMS AND KITCHENS SHALL HAVE A FIELD-APPLIED PVC JACKET. 3.8 PVC JACKETS SHALL BE HIGH-IMPACT, ULTRAVIOLET-RESISTANT, 30 MILS THICK. APPLY WITH 1" OVERLAP AT
- JOINTS AND SEAMS. 3.9 ALUMINUM JACKETS SHALL BE 3003 ALLOY, H-14 TEMPER, MINIMUM 0.010 THICK, WITH 1 MIL. THICK HEAT-BONDED POLYETHYLENE AND KRAFT PAPER MOISTURE BARRIER. APPLY WITH 2" OVERLAP AT JOINTS
- AND SEAMS. OVERLAP LONGITUDINAL SEAMS ARRANGED TO SHED WATER. 3.10 APPLY INSULATION OVER FITTINGS, VALVES, AND SPECIALTIES WITH CONTINUOUS THERMAL AND VAPOR-RETARDER INTEGRITY. SEAL PENETRATIONS IN INSULATION AT HANGERS, SUPPORTS, ANCHORS, AND OTHER PROJECTIONS WITH VAPOR-RETARDER MASTIC. APPLY INSULATION CONTINUOUSLY THROUGH HANGERS AND AROUND ANCHOR ATTACHMENTS. EXTEND INSULATION ON ANCHOR LEGS AT LEAST 12" FROM POINT OF
- ATTACHMENT TO PIPE AND TAPER INSULATION ENDS. SEAL TAPERED ENDS WITH A COMPOUND RECOMMENDED BY THE INSULATION MATERIAL MANUFACTURER TO MAINTAIN VAPOR RETARDER. 3.11 APPLY PIPE INSULATION CONTINUOUSLY THROUGH WALLS AND FLOORS. APPLY DUCT INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS, EXCEPT FIRE-RATED WALLS AND PARTITIONS (TERMINATE DUCT INSULATION
- 3.12 ALL INSULATION SHALL HAVE A FLAME-SPREAD RATING OF 25 OR LESS, AND A SMOKE-DEVELOPED RATING OF

AT FIRE/SMOKE DAMPER SLEEVES). TERMINATE DUCT INSULATION AT UNDERSIDE OF FLOOR ASSEMBLY AND AT

FLOOR SUPPORT AT TOP OF FLOOR. TAPER TERMINATION AND SEAL INSULATION ENDS WITH VAPOR-RETARDER

- 3.13 INSTALL ALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 3.14 PUMP BODY, EQUIPMENT, STRAINERS, ETC., INSULATION SHALL BE INSTALLED IN SUCH A MANNER THAT IT CAN BE EASILY REMOVED AND REPLACED WITHOUT DAMAGE.

- 4.1 VALVES IN STEEL PIPING SHALL BE SCREWED 2" AND SMALLER OR FLANGED END 2-1/2" AND LARGER. VALVES IN COPPER TUBING SHALL BE BRONZED BODY, WITH SOLDERED OR BRAZED ENDS. VALVES IN COPPER TUBING 2" AND SMALLER MAY USE PRO-PRESS FITTING SYSTEM.
- 4.2 ALL VALVES SHALL BE DRIP-TIGHT, RATED FOR CONTINUOUS DUTY FOR A MINIMUM OF 50 PSIG AND 50 DEG. F HIGHER THAN DUTY IMPOSED. MINIMUM PRESSURE/TEMPERATURE RATING: ANSI 150 PSIG/250 DEG. F. FOR FLUIDS 99 PSIG AND LESS, ANSI 300 PSIG/350 DEG. F. FOR FLUIDS 100 PSIG AND HIGHER.
- 4.3 CHECK VALVES: NON-SLAM GLOBE TYPE, IRON OR SEMI-STEEL BODY, STAINLESS STEEL SPRING, BRONZE TRIM. 2" AND SMALLER, THREADED OR SOLDERED ENDS; 2-1/2" AND LARGER, FLANGED OR GROOVED END.
- 4.4 BALL VALVES: ANSI 150 PSIG WOG CONSTRUCTION, 250 DEG. F. MINIMUM TEMPERATURE RATING, EQUIPPED WITH REINFORCED TEFLON SEATS AND SEALS, ANTI-BLOWOUT STEM AND FULL PORT (LINE SIZE PORT), CHROME PLATED BALL, BRONZE OR BRASS BODY, SCREWED/SOLDERED PATTERN. 4.5 BUTTERFLY VALVES: LUG OR GROOVED PATTERN WAFER TYPE, ANSI RATED 150 PSIG/250 DEG. F., STAINLESS
- STEEL SHAFTS AND DISC, FLANGE SEALS INTEGRAL WITH SEAT OR SEPARATE O-RINGS AND BRONZE DISC, CAST IRON BODY, EQUIPPED WITH REPLACEABLE SEATS. OPERATOR FOR 6" AND SMALLER VALVES SHALL BE TEN (10) POSITION HANDLE. OPERATOR FOR 8" AND LARGER VALVES SHALL BE ENCLOSED GEAR POSITIONER WITH DIAL INDICATOR AND HAND WHEEL WITH SPINNER.
- 4.6 GATE AND GLOBE VALVES: ANSI CLASS 150 PSIG WOG CONSTRUCTION; 2" AND SMALLER, BRONZE, SCREWED PATTERN WITH RISING STEM, UNION BONNET, SINGLE WEDGE DISC. 2-1/2" AND LARGER, CAST IRON, OS&Y, FLANGED PATTERN WITH BOLTED BONNET, RISING STEM, BRONZE SEATS, STEM AND DISC FACES. GATE VALVES SHALL NOT BE USED ON HVAC PIPING SYSTEMS
- 4.7 BALL VALVES AND BUTTERFLY VALVES INSTALLED IN CHILLED WATER, DUAL TEMPERATURE AND DOMESTIC COLD WATER SYSTEMS SHALL HAVE AN EXTENDED HANDLE WHICH OFFERS VAPOR SEAL, ADJUSTABLE MEMORY STOP AND VALVE PACKING MAINTENANCE WITHOUT DISTURBING THE INSULATION.
- 4.8 INSTALL VALVES WITH UNIONS OR FLANGES AT EACH PIECE OF EQUIPMENT ARRANGED TO ALLOW SERVICING. MAINTENANCE, AND EQUIPMENT REMOVAL WITHOUT SYSEM SHUT-DOWN.

5.0 PIPING AND SPECIALTIES

- 5.1 SCHEDULE 40 BLACK STEEL PIPE: ASTM A53 OR A106, WITH FITTINGS ANSI/ASTM B16.3, MALLEABLE IRON OR ASTM A234, FORGED STEEL WELDING TYPE. SCREWED JOINTS FOR PIPE 2" AND SMALLER, ANSI/ASW D1.1 WELDED OR GROOVED MECHANICAL JOINTS, MEETING ASTM A 536, FOR PIPE LARGER THAN 2".
- A. TEE DRILLING MUST BE APPROVED BY PSI PRIOR TO BEGINNING WORK AND WILL ONLY BE ALLOWED ON A LIMITED BASIS.

B. DIELECTRIC FITTINGS SHALL BE ZINC PLATED WITH DIELECTRIC THERMOPLASTIC LINING MEETING ASTM

- 5.2 TYPE L COPPER: ASTM B88, DRAWN-TEMPER COPPER TUBING.
- 5.3 TYPE K COPPER: ASTM B88, ANNEALED-TEMPER COPPER TUBING.

F. STEAM CONDENSATE RETURN: SCHEDULE 80 BLACK STEEL.

5.4 CAST IRON PIPE: ASTM A74; CISPI 301 HUBLESS SOIL PIPE.

5.5 PIPING APPLICATIONS:

- 5.5 PRO-PRESS COPPER FITTINGS: ASME B16.18, ASME B16.22 (2" & SMALLER)
- A. ABOVE-GROUND HEATING HOT WATER. CHILLED WATER AND CONDENSER WATER (2" AND SMALLER): TYPE-L COPPER OR SCHEDULE 40 BLACK STEEL. B. ABOVE-GROUND HEATING HOT WATER, CHILLED WATER AND CONDENSER WATER (2-1/2) AND LARGER:
- SCHEDULE 40 BLACK STEEL. C. BELOW GROUND HEATING HOT WATER AND CHILLED WATER: TYPE-K COPPER.
- D. CONDENSATE DRAIN LINES: TYPE L COPPER OR SCHEDULE 40 PVC WITH SOLVENT- WELDED JOINTS. E. STEAM SUPPLY AND CONDENSATE PUMP DISCHARGE: SCHEDULE 40 BLACK STEEL.
- G. ABOVE-GROUND DOMESTIC WATER PIPING: TYPE-L, HARD COPPER TUBE, COPPER PRESSURE FITTINGS, SOLDERED JOINTS AND PRO-PRES FITTING SYSTEM ON COPPER 2" & BELOW.
- H. ABOVE GROUND SANITARY WASTE PIPING: HUBLESS CAST IRON SOIL PIPE WITH 304SS COUPLINGS.
- I. ABOVE-GROUND HEATING HOT WATER, CHILLED WATER AND CONDENSER WATER 2" AND SMALLER MAY USE PRO-PRESS COPPER FITTING SYSTEM BY VIEGA. SEALING ELEMENTS FOR PRESS FITTINGS SHALL BE EPDM.

- 5.6 STRAINERS: Y-PATTERN, STAINLESS STEEL SCREEN, CAST IRON BODY IN STEEL PIPING SYSTEM, BRONZE BODY IN COPPER PIPING SYSTEM, 150 PSIG SERVICE RATING. PROVIDE BLOW-OFF CONSISTING OF NIPPLE, GATE VALVE, NIPPLE AND CAP ON ALL STRAINERS.
- 5.7 WALL SEALS: CONSIST OF INTERLOCKING RUBBER LINKS IN COMPRESSION BY PHOSPHATE PLATED CARBON STEEL BOLTS IN CONJUNCTION WITH CATHODIC TYPE DELRIN PLASTIC PRESSURE PLATES, CONSTRUCTED TO PROVIDE AIR TIGHTNESS IN ABOVE GROUND APPLICATIONS AND HYDROSTATIC SEALING IN BELOW GRADE APPLICATIONS. LIKE "LINK-SEAL" BY THUNDERLINE CORP. PROVIDE WALL SEALS ON ALL PIPES PASSING THROUGH EXTERIOR WALLS, BOTH ABOVE AND BELOW GROUND.
- MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRIM, ALUMINUM FOIL AND VINYL FILM. PROVIDE 2" THICK 5.8 BACKFLOW PREVENTERS: REDUCED PRESSURE TYPE WITH TWO INDEPENDENTLY OPERATING SPRING LOADED CHECK VALVES HAVING AN AUTOMATICALLY OPERATING MECHANICALLY INDEPENDENT, HYDRAULICALLY DEPENDENT PRESSURE DIFFERENTIAL RELIEF VALVE LOCATED BETWEEN THE CHECK VALVES WITH TWO SHUT-OFF VALVES, FOUR TEST-COCKS, AND AIR GAP DRAIN FUNNEL. ASSEMBLY SHALL HAVE 210 °F WATER TEMPERATURE RATING WHEN CONNECTED TO HEATING HOT WATER OR DUAL TEMPERATURE SYSTEM: 140 °F WATER TEMPERATURE RATING FOR OTHER SYSTEM. UNIT SHALL BE APPROVED BY THE STATE BOARD OF HEALTH. PIPE TEST COCK DISCHARGE FUNNELS TO NEAREST FLOOR DRAIN.
 - 5.9 PRESSURE REDUCING VALVE FOR FILL CONNECTIONS ON CLOSED LOOP HYDRONIC SYSTEMS: SHALL BE BRONZE OR BRASS BODY CONSTRUCTION WITH REMOVABLE INLET STRAINER, NON-CORROSIVE VALVE SEAT AND STEM, UP TO 300PSIG INLET PRESSURE, ADJUSTABLE 10-35 PSIG OUTLET PRESSURE (PRESET TO 12 PSIG).
 - 5.10 SAFETY RELIEF VALVES: BRONZE OR CAST IRON BODY, TEST LEVER, ASME RATED. SIZE VALVES FOR BTUH CAPACITY OF ENTIRE SYSTEM.
 - A. PROVIDE AN ASME 'UV' MARKED RELIEF VALVE AT EACH ASME CERTIFIED PRESSURE VESSEL AND HEAT EXCHANGER (WHICH INCLUDES EXPANSION TANKS AND AIR SEPARATORS). 5.11 WATER METERS: BRONZE BODY, POSITIVE DISPLACEMENT METER, TOTAL GALLON REGISTER AND 4-20MA
 - 5.12 EXPANSION TANKS: BLADDER TYPE PRESSURIZED TANK CONSTRUCTED OF WELDED BLACK STEEL, ASME CONSTRUCTED AND LABELED FOR MINIMUM 150 PSIG WATER WORKING PRESSURE AND 375 DEG. F. OPERATING TEMPERATURE. HYDROSTATICALLY TESTED AT MINIMUM OF 1-1/2 TIMES WORKING PRESSURE, TAPPED OPENINGS AS REQUIRED, RUSTPROOF EXTERIOR COATING.
 - 5.13 AIR SEPARATOR: CONSTRUCTED OF WELDED BLACK STEEL, ASME CONSTRUCTED AND LABELED FOR MINIMUM 150 PSIG WATER WORKING PRESSURE AND 375 DEG. F. OPERATING TEMPERATURE. TANGENTIAL TYPE, DESIGNED TO DIRECT RELEASED AIR INTO ATMOSPHERE, WITH THREADED BLOWDOWN CONNECTION.
 - 5.14 AIR ELIMINATOR VALVE: CAST IRON BODY, STAINLESS STEEL AIR SEPARATING TRAP, HIGH REMOVAL RATE AT LOW PRESSURE DIFFERENTIAL, MINIMUM 150 PSIG WATER WORKING PRESSURE, MINIMUM 250 DEG F. OPERATING TEMPERATURE.
 - 5.16 FLEXIBLE CONNECTORS: PUMPS/CHILLERS; MINIMUM 150 PSIG WATER WORKING PRESSURE. NYLON REINFORCED NEOPRENE RUBBER WITH STEEL FLANGES. TERMINAL EQUIPMENT: MINIMUM 150 PSIG WATER WORKING PRESSURE, KEVLAR REINFORCED EPDM WITH STAINLESS STEEL BRAID HOSE WITH THREADED OR SOLDERED CONNECTIONS.

5.15 MANUAL AIR VENT: MINIMUM 150 PSIG WATER WORKING PRESSURE, MINIMUM 225 DEG. F. OPERATING

TEMPERATURE, WITH MANUAL SHUTOFF. BRONZE BODY, SCREWED OR SOLDERED BALL TYPE.

- 5.17 PUMP INLET DIFFUSERS AS DETAILED ON PLANS: COMBINATION REDUCING ELBOW AND INLET DIFFUSER, FLANGED CAST IRON BODY, STAINLESS STEEL INLET VANES, 304 STAINLESS STEEL ORIFICE CYLINDER, START UP STRAINER, 150 PSIG WATER WORKING PRESSURE, ADJUSTABLE FOOT SUPPORT, GAUGE PORT AND PLUG ON OUTLET FLANGE.
- 5.18 PUMP INLET AND OUTLET DIFFUSERS BY METRA FLEX AS DETAILED ON PLANS: CRV FLEX INLET DIFFUSER. PROVIDE WITH 150 PSIG PLATE FLANGE OR GROOVED CONNECTIONS. DISCHARGE PATTERN SHALL BE STRAIGHT OR 90° ELBOW AS REQUIRED. DISCHARGE PUMP DIFFUSER SHALL BE VANE FLEX WITH 150 PSIG PLATE FLANGE OR GROOVED CONNECTIONS.

5.19 BALANCE VALVES: PRECISION MACHINED BALL TYPE SUITABLE FOR USE AS A PRESETTABLE BALANCE VALVE,

SETTER PLUS OR EQUAL BY NEXUS. PROVIDE ONE MATCHED FLOW METER FOR EACH FLOW RANGE OF VALVES 5.20 THERMOMETERS: 12" MERCURY-FREE LIQUID IN GLASS. ADJUSTABLE ANGLE DIRECT MOUNT. DIE CAST ALUMINUM FLANGELESS CASE, WITH 3/4" NPT BRASS SOCKET, INSERTION LENGTH SHALL BE 1/2 PIPE OR DUCT DIAMETER. USE 0 DEG. F. TO 120 DEG F. RANGE FOR CHILLED WATER PIPING, 30 DEG. F TO 240 DEG F. FOR HEATING WATER AND DUAL TEMPERATURE WATER PIPING. USE 0 DEG. F TO 120 DEG F. RANGE FOR DUCTS,

PROVIDE DUCT FLANGE ADAPTER FOR MOUNTING. SOLAR POWERED DIGITAL THERMOMETERS WITH 1/2" LCD

VARIABLE ORIFICE FLOW METER AND POSITIVE SHUT-OFF SERVICE VALVE WITH MEMORY STOP, LIKE B&G CIRCUIT

- DISPLAY AND 1% ACCURACY MAY ALSO BE INSTALLED. 5.21 PRESSURE GAUGES: 3-1/2" DIAL, BLACK CAST FLANGELESS CASE, WHITE DIAL WITH BLACK MARKINGS, RED TIPPED ADJUSTABLE POINTER, BRONZE BUSHED BRASS MOVEMENT, PHOSPHOR BRONZE BOURDON TUBE, 1% ACCURACY CLASS "A", ¼" NPT LOWER CONNECTION, BRASS SOAKER, 0-100 PSI RANGE FOR CLOSED LOOP HYDRONIC SYSTEMS. INSTALL GAUGES WHERE SHOWN ON THE DRAWINGS USING NEEDLE VALVES. PROVIDE
- 5.22 DIELECTRIC NIPPLES: ELECTROPLATED STEEL NIPPLE WITH INERT AND NONCORROSIVE, THERMOPLASTIC LINING; PLAIN, THREADED, OR GROOVED ENDS; 300-PSIG MINIMUM WORKING PRESSURE AT 225° F.
- 5.23 FLUSH HYDRONIC PIPING SYSTEMS WITH CLEAN WATER, FLUSH FREE OF DIRT, SCALE, OIL, WASTE, ETC. REMOVE AND CLEAN OR REPLACE ALL STRAINER SCREENS. AFTER CLEANING AND FLUSHING HYDRONIC PIPING SYSTEMS, BUT BEFORE BALANCING, REMOVE DISPOSABLE FINE-MESH STRAINERS IN PUMP SUCTION DIFFUSERS.
- 5.24 CLEAN AND DISINFECT POTABLE DOMESTIC WATER PIPING IN ACCORDANCE WITH APPLICABLE CODES, STANDARDS AND AUTHORITIES HAVING JURISDICTION.

5.25 THOROUGHLY CLEAN AND FLUSH SYSTEM PIPING USING MARATHON #659-H WATER TREATMENT CHEMICAL

6.0 REFRIGERANT PIPING AND SPECIALTIES

- 6.1 TYPE ACR COPPER: ASTM B280, HARD-DRAWN STRAIGHT LENGTHS AND SOFT-ANNEALED COILS, SEAMLESS COPPER TUBING. WROUGHT COPPER FITTINGS AND SILVER SOLDERED JOINTS. MECHANICAL FITTINGS (CRIMP OR FLAIR) ARE NOT PERMITTED.
- 6.2 REFRIGERANT PIPING SPECIALTIES:

BLOW OUT PROOF STEM.

SIPHONS FOR STEAM SERVICE.

- 6.3 BALL VALVES: 500 PSIG MAXIMUM PRESSURE, TEMP. RANGE -40 DEG F TO 300 DEG F, FORGED BRASS BODY. BRASS BALL WITH EQUALIZING ORIFICE, TEFLON BALL SEALS, STEM STOP FOR BALL PORT POSITION, SEALED
- 6.4 GLOBE VAVLES: 450 PSIG MAXIMUM PRESSURE, 275 DEG F MAX. TEMP., CAST BRONZE OR FORGED BRASS, BOLTED BONNET, REPLACEABLE SEAT DISC, SOLDER-END CONNECTIONS.
- 6.5 CHECK VALVES: 450 PSIG MAXIMUM PRESSURE, 300 DEG F MAX. TEMP., CAST BRONZE BODY WITH BOLTED BONNET, FLOATING PISTON WITH MECHANICALLY RETAINED TEFLON SEAT DISC.
- 6.6 STRAINERS: 500 PSIG MAXIMUM PRESSURE, FORGED BRASS BODY WITH MONEL 80-MESH SCREEN, SCREWED CLEANOUT PLUG, SOLDER END CONNECTIONS.
- 6.7 MOISTURE/LIQUID INDICATORS: 500 PSIG MAXIMUM PRESSURE, 200 DEG F MAX. TEMP., FORGED BRASS BODY, SOLDERED END CONNECTIONS, REPLACEABLE POLISHED OPTICAL VIEWING WINDOW.
- 6.8 FILTER-DRIERS: 500 PSIG MAXIMUM PRESSURE, STEEL SHELL, FLANGE RING, DUCTILE IRON COVER PLATE, WROUGHT COPPER FITTINGS FOR SOLDER END CONNECTIONS, REPLACEABLE FILTER-DRIER CORE KIT. 6.9 FLEXIBLE CONNECTORS: 500 PSIG MAXIMUM PRESSURE, SEAMLESS TIN BRONZE OR STAINLESS STEEL CORE, HIGH

HAVING JURISDICTION.

- 7.0 FUEL GAS PIPING
- 7.1 ALL WORK SHALL CONFORM TO ANSI Z223.1, "NATIONAL FUEL GAS CODE".

TENSILE BRONZE BRAIDS, SOLDER CONNECTIONS, DEHYDRATED, MIN. 7 INCH LENGTH.

7.2 PIPING MATERIAL SHALL BE ASTM A53, TYPE E OR S, GRADE B, SCHEDULE 40, BLACK STEEL

7.3 ALL VALVES SHALL BE SUITABLE FOR FUEL GAS SERVICE.

- 7.4 INSTALL DIELECTRIC FITTING DOWNSTREAM FROM AND ADJACENT TO EACH SERVICE METER UNLESS METER IS SUPPORTED FROM SERVICE-METER BAR WITH INTEGRAL DIELECTRIC FITTING. INSTALL SHUTOFF VALVE DOWNSTREAM FROM AND ADJACENT TO DIELECTRIC FITTING.
- PIPE WITH WELDED JOINTS. VENT CONDUIT TO OUTSIDE AND TERMINATE WITH SCREENED VENT CAP. DO NOT INSTALL CONCEALED PIPING IN SOLID PARTITIONS. PROTECT TUBING FROM PHYSICAL DAMAGE WHEN INSTALLED INSIDE PARTITIONS OR HOLLOW WALLS. PIPING SHALL NOT BE RUN IN CONCEALED LOCATIONS UNLESS METHODS AND LOCATIONS ARE PRE-APPROVED BY PSI.

7.5 INSTALL CONCEALED GAS PIPING IN AIRTIGHT CONDUIT CONSTRUCTED OF SCHEDULE 40, SEAMLESS BLACK STEEL

ECCENTRIC REDUCER FITTINGS TO MAKE REDUCTIONS IN PIPE SIZES. INSTALL FITTINGS WITH LEVEL SIDE DOWN. CONNECT BRANCH PIPING FROM TOP OR SIDE OF HORIZONTAL PIPING. 7.7 INSTALL DRIPS AT POINTS WHERE CONDENSATE MAY COLLECT. INCLUDE OUTLETS OF SERVICE METERS. LOCATE WHERE READILY ACCESSIBLE FOR CLEANING AND EMPTYING. DO NO INSTALL WHERE CONDENSATE WOULD BE

7.6 INSTALL FUEL GAS PIPING AT UNIFORM GRADE OF 0.1 PERCENT SLOPE UPWARD TOWARD RISERS. USE

7.8 INSTALL UNIONS IN PIPES 2" AND SMALLER, ADJACENT TO EACH VALVE, AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT, AND ELSEWHERE AS INDICATED. UNIONS ARE NOT REQUIRED ON FLANGED DEVICES.

OPERATED VALVE. INSTALL PRESSURE GAGE UPSTREAM AND DOWNSTREAM FROM EACH LINE PRESSURE

7.9 INSTALL STRAINER ON INLET OF EACH LINE PRESSURE REGULATOR AND AUTOMATIC AND ELECTRICALLY

7.10 INSTALL VENT PIPING FOR GAS PRESSURE REGULATORS AND GAS TRAINS, EXTEND OUTSIDE BUILDING, AND VENT TO ATMOSPHERE. TERMINATE VENTS WITH TURNED-DOWN, REDUCING-ELBOW FITTINGS WITH CORROSION-RESISTANT INSECT SCREENS IN LARGE END.

7.11 CONNECT PIPING TO APPLIANCES WITH SHUTOFF VALVES AND UNIONS. INSTALL VALVE UPSTREAM FROM AND

7.13 INSPECT, TEST, AND PURGE PIPING ACCORDING TO ANSI Z223.1 AND THE REQUIREMENTS OF THE AUTHORITIES

WITHIN 72 INCHES OF EACH APPLIANCE. INSTALL UNION DOWNSTREAM FROM VALVE. INSTALL SEDIMENT TRAP

WITH TEE FITTING AND CAPPED NIPPLE IN BOTTOM AS CLOSE AS PRACTICAL TO INLET OF EACH APPLIANCE. 7.12 PAINT EXTERIOR PIPE, SERVICE METERS, PRESSURE REGULATORS, AND SPECIALTY VALVES GRAY. PAINT INTERIOR PIPE, PRESSURE REGULATORS AND SPECIALTY VALVES YELLOW.

8.0 TESTING AND BALANCING:

AND DUCT PENETRATIONS SEALED).

CONNECTIONS.

B. 8 FEET MAXIMUM LENGTH.

DUCT MOUNTED COILS, HUMIDIFIERS.

FREE AND OPERABLE AFTER INSTALLATION.

- 8.1 PERFORM TOTAL SYSTEM BALANCE IN ACCORDANCE WITH NEBB PROCEDURAL STANDARDS FOR TESTING.
- BALANCING AND ADJUSTING OF ENVIRONMENTAL SYSTEMS. 8.2 ADJUST MOTORS, SHAFTS, PULLEYS TO PROPER ALIGNMENT AND TO RUN VIBRATION-FREE.
- 8.3 SUBMIT FIVE (5) COPIES OF COMPLETE TESTING AND BALANCING REPORT TO PSI FOR REVIEW AND APPROVAL.

9.0 <u>DUCTWORK & SHEET METAL ACCESSORIES</u>

- 9.1 CONSTRUCT RECTANGULAR DUCT OF FIRST QUALITY MATERIALS IN ACCORDANCE WITH CURRENT SMACNA HVAC DUCT CONSTRUCTION STANDARDS, NFPA 90A, NFPA 90B, NFPA 96, ASHRAE AND ALL APPLICABLE CODES. CROSS BREAK SHEET METAL, EXCEPT WHERE RIGID INSULATION IS SPECIFIED.
- A. GALVANIZED MATERIALS SHALL BE LOCK FORMING QUALITY; COMPLYING WITH ASTM A653/A653M AND HAVING A MINIMUM OF A G60 COATING DESIGNATION: DUCTS SHALL HAVE MILL-PHOSPHATIZED FINISH WHERE EXPOSED IN FINISHED SPACES. PROVIDE "GALVANNEAL" OR "PAINT-GRIP" IF DUCTWORK IS TO BE
- B. STAINLESS STEEL MATERIAL SHALL BE 304, 16 GAUGE, CONTINUOUS WELDED CONSTRUCTION. USE FOR KITCHEN DISHWASHER EXHAUST AND WHERE INDICATED ON PLANS. UTILIZE STAINLESS STEEL SUPPORT
- C. ALUMINUM SHALL BE ASTM B209, ALLOY 3003-H14, HEAVY GAUGE CONSTRUCTED WITH ALL JOINTS SEALED
- WATERTIGHT. USE FOR LOCKER/SHOWER ROOM EXHAUST. UTILIZE ALUMINUM SUPPORT MATERIALS. D. SINGLE WALL ROUND AND FLAT OVAL SPIRAL DUCT: SPIRAL LOCKSEAM CONSTRUCTION WITH AN INTERLOCKING HELICAL SEAM RUNNING LENGTH OF DUCT.
- E. DOUBLE WALL ROUND AND FLAT OVAL SPIRAL DUCT: SPIRAL LOCKSEAM CONSTRUCTION WITH A PERFORATED INNER LINER, A 1-INCH, OR AS SPECIFIED, LAYER OF FIBERGLASS INSULATION AND AN OUTER PRESSURE SHELL.
- F. SEALANT: NON-HARDENING, WATER RESISTANT, NON-TOXIC, NON-FLAMNABLE, FIRE RESISTIVE, COMPATIBLE, WITH MATING MATERIALS; LIQUID USED ALONE OR WITH TAPE, OR HEAVY MASTIC.
- G. SEAL ALL LOW PRESSURE DUCTWORK IN ACCORDANCE WITH SMACNA SEAL CLASS 'B' (TRANSVERSE JOINTS & LONGITUDINAL SEAMS SEALED). SEAL ALL MEDIUM PRESSURE DUCTWORK AND DUCTS INSTALLED OUTDOORS IN ACCORDANCE WITH SMACNA SEAL CLASS 'A' (ALL TRAVERSE JOINTS, LONGITUDINAL SEAMS
- 9.2 FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS AND ASHRAE HANDBOOKS, EXCEPT WHERE INDICATED OTHERWISE. PROVIDE DUCT MATERIAL, GAGES, REINFORCING AND SEALING FOR OPERATING PRESSURES INDICATED. REFER TO TABLE ENTITLED "DUCT SEALING REQUIREMENTS" IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
- 9.3 STATIC PRESSURE CLASSIFICATIONS: UNLESS OTHERWISE INDICATED, CONSTRUCT DUCTS TO THE FOLLOWING:
- B. SUPPLY DUCTWORK DOWNSTREAM OF VAV TERMINAL UNITS AND SINGLE-ZONE AIR HANDLING UNITS: 3-INCH W.G.

A. SUPPLY DUCTWORK UPSTREAM OF VAV TERMINAL UNITS: 6-INCH W.G.

D. EXHAUST DUCTS: 2-INCH W.G., NEGATIVE PRESSURE.

C. RETURN AIR DUCTS AND OUTDOOR AIR INTAKE DUCTS: 2-INCH W.G., NEGATIVE PRESSURE.

A. ELBOWS (DUCT VELOCITY 1500 FPM OR LESS): RADIUS ELBOW WITH CENTERLINE RADIUS OF MINIMUM 1.0 TIMES WIDTH OF DUCT OR MITERED ELBOW WITH TURNING VANES.

9.4 FITTINGS: INSTALL FABRICATED FITTINGS FOR CHANGES IN DIRECTION, CHANGES IN SIZE AND SHAPE, AND FOR

B. ELBOWS (DUCT VELOCITY GREATER THAN 1500 FPM): RADIUS ELBOW WITH CENTERLINE RADIUS OF MINIMUM 1.5 TIMES WIDTH OF DUCT. MITERED ELBOWS ARE NOT PERMITTED. C. CONVERGING TRANSITIONS: SIDE OF DUCT SHALL NOT EXCEED 30-DEGREE ANGLE TO PROJECTED SAME

E. BRANCH TAKE-OFFS (VAV DUCT SYSTEMS UPSTREAM OF VAV TERMINALA AND DUCTS WITH VELOCITIES

9.5 BRACE ALL DUCTWORK AS REQUIRED TO PREVENT NOISE AND VIBRATION UNDER ALL OPERATING CONDITIONS.

- D. DIVERGING TRANSITIONS: SIDE OF DUCT SHALL NOT EXCEED 20—DEGREE ANGLE TO PROJECTED SAME SIDE.
- F. BRANCH TAKE-OFFS (VAV DUCT SYSTEMS DOWNSTREAM OF VAV TERMINALS AND DUCTS WITH VELOCITIES 1500 FPM OR LESS): 45-DEGREE TAPERED TAP.

GREATER THAN 1500 FPM): 45-DEGREE CONICAL WYE OR 90-DEGREE CONICAL TEE.

9.6 SLOPE HORIZONTAL DISHWASHER EXHAUST DUCT TOWARDS DISHWASHER CONNECTION AT A MINIMUM OF 1/8-INCH PER FOOT. WELD ALL JOINTS LIQUID TIGHT.

9.7 RECTANGULAR SHEET METAL DUCTWORK: ALL LONGITUDINAL JOINTS SHALL BE "PITTSBURGH" TYPE.

9.8 DUCT SIZES: THE SIZE SHOWN ON DRAWINGS IS THE FREE AREA DIMENSION, AND SHALL BE INCREASED TO ACCOMMODATE ACOUSTICAL LINER WHERE REQUIRED. 9.9 FLEXIBLE CONNECTIONS (FC): PROVIDE AT EACH INLET & OUTLET DUCT CONNECTION ON FAN EQUIPMENT.

FABRIC FASTENED TO METAL W/DOUBLE LOCK SEAM. FABRIC FOR ORDINARY HVAC USES TO BE WATERPROOF,

- FIRE RETARDANT & SUITABLE FOR TEMPS. OF 200 DEG. F. MANUFACTURERS: DURO-DYNE; VENTFABRICS OR APPROVED EQUAL. 9.10 FLEXIBLE DUCT: SPIRAL-WOUND SPRING STEEL WITH FLAMEPROOF VINYL SHEATHING, OR CORRUGATED ALUMINUM, COMPLYING WITH NFPA 90A AND UL 181. INSTALL 1-INCH THICK CONTINUOUS FLEXIBLE FIBERGLASS SHEATH WITH VINYL OR ALUMINUM VAPOR BARRIER JACKET. CLAMPS SHALL BE STAINLESS STEEL WITH HEX SCREW WITH WORM GEAR OR HEAVY NYLON ADJUSTABLE SELF-LOCKING CLAMPS. INSULATION ENDS SHALL BE
 - SEALED WITH VAPOR BARRIER DUCT TAPE. FLAME SPREAD RATING NOT GREATER THAN 25 AND SMOKE DEVELOPED RATING NO HIGHER THAN 50. A. WORKING PRESSURE: 10-INCH W.G. POSITIVE, 1-INCH W.G. NEGATIVE. RATED VELOCITY AT 4000 FPM.
- 9.11 FIRE DAMPERS: DAMPERS SHALL BE DYNAMIC RATED FOR PRESSURE LEVEL OF SYSTEM BEING INSTALLED, UL 555 LABELED, 1-1/2 HOUR RATED UNLESS INDICATED OTHERWISE, MIN. 21 GAUGE GALVANIZED STEEL FRAME WITH MOUNTING SLEEVE, ROLL FORMED INTERLOCKING BLADES, 165 DEG. F. REPLACEABLE FUSIBLE LINK. 9.12 AIR DIFFUSERS, REGISTERS AND GRILLES: PROVIDE DEVISES THAT PROVIDE THE THROW, PRESSURE DROP, AND

NOISE CRITERIA RATINGS EQUAL TO OR BETTER THAN THAT INDICATED ON THE DRAWINGS. BORDER STYLES

STEEL, SHALL NOT EXCEED 12" WIDE & 48" LONG. FRAMES OF SAME GA. METAL ARE REQ'D WHERE TWO

- SHALL BE COMPATIBLE WITH ADJACENT CEILING TYPE. FINISH SHALL BE BAKED ENAMEL WHITE UNLESS INDICATED OTHERWISE. 9.13 BALANCING DAMPERS (BD): FURNISH & INSTALL WHERE SHOWN ON DRAWINGS. CONSTRUCTION SHALL BE GALV. STEEL, GAUGES HEAVIER THAN DUCT. SHAFT SHALL BE STEEL W/BRASS BEARINGS. BLADES SHALL BE
- BLADES OR MORE ARE USED. CHECK THAT DAMPERS ARE FREE AND OPERABLE AFTER INSTALLATION. 9.14 ACCESS DOORS: UL LISTED, 20 GAUGE GALVANIZED STEEL DOOR AND FRAME, 1" THICK INSULATION, 1/2" WIDE GASKET, CAM LOCK LATCH FOR SIZES LESS THAN 12", CONTINUOUS ALUMINUM HINGE FOR SIZES 12" AND LARGER. DOORS DOWNSTREAM OF FIRE OR SMOKE DAMPERS SHALL BE NEGATIVE PRESSURE RELIEF TYPE FOR DUCTS OVER 2000 FPM. INSTALL ACCESS DOORS IN DUCTWORK AT EACH INACCESSIBLE MOTORIZED DAMPER LOCATION, NEXT TO FIRE DAMPERS, SMOKE DAMPERS, FIRE/SMOKE DAMPERS, MOTORIZED CONTROL DAMPERS,
- 9.15 DAMPER OPERATORS: BALANCING DAMPERS TO HAVE LOCK-TYPE DAMPER OPERATOR & LINKAGE AS BEST SUITS CONSTRUCTION AND ACCESS CONDITIONS. DAMPERS W/ACCESSIBLE OPERATORS TO BE PROVIDED W/LOCKING DAMPER QUADRANTS COMPLETE W/LOCKING NUTS & GRADUATED SCALE. DAMPERS W/NON-ACCESSIBLE OPERATORS PROVIDED W/YOUNG SERIES 300 CONCEALED REGULATOR & COVERPLATE COMPLETE W/WORM GEAR OR LINKAGE AS REQUIRED FOR SMOOTH DAMPER OPERATION. DAMPERS IN UNDER SLAB DUCTS PROVIDED W/YOUNG SERIES 335 ADJUSTABLE COVER REGULATORS. CHECK THAT DAMPERS ARE
- 9.16 TURNING VANES DOUBLE WALL VANE CONSTRUCTION SHALL BE CONSTRUCTED & SPACED AS CALLED FOR IN HVAC DUCT CONSTR. STANDARDS.
- 9.17 DUCT LINER: FLEXIBLE OR RIGID GLASS FIBER DUCT LINER SHALL BE COMPOSED OF LONG, FLAME ATTENUATED GLASS FIBER BONDED WITH THERMOSETTING RESIN AND SHALL COMPLY WITH NFPA 90A AND 90B, ASTMC553 AND UL723. DUCT LINER SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL MEET THE FUNGUS AND

BACTERIAL TESTING RESISTANCE PER UL181, ASTM G21, ASTM G22 AND ASTM C1071.

A. MINIMUM 1-INCH THICKNESS, THERMAL CONDUCTIVITY 0.26 AT 75° F MEAN TEMPERATURE, MINIMUM DENSITY 1.5 LB/CU.FT., OPERATING VELOCITY UP TO 5000 FPM.

B. AIR STREAM SURFACE SHALL BE FACED WITH A SMOOTH GLASS-MAT AND CLEANABLE ACRYLIC COATING.

- C. INSULATION ADHESIVE SHALL BE IN ACCORDANCE WITH NFPA 90A, NFPA 90B, AND ASTM C916. D. DUCT LINER SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA — HVAC DUCT CONSTRUCTION
- F. FIRE-HAZARD CLASSIFICATION: MAXIMUM FLAME-SPREAD INDEX OF 25 AND SMOKE DEVELOPED INDEX OF 50 WHEN TESTED ACCORDING TO ASTM E84. 9.18 INSTALL DUCTS WITH FEWEST POSSIBLE JOINTS. USE FABRICATED FITTINGS FOR CHANGES IN DIRECTION, SIZE AND SHAPE AND FOR CONNECTIONS. INSTALL DUCTS PARALLEL AND PERPENDICULAR TO BUILDING LINES;

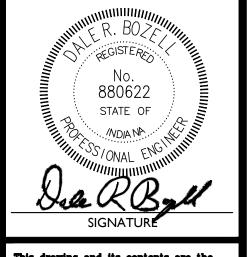
AVOID DIAGONAL RUNS. INSTALL DUCTS WITH A CLEARANCE OF 1-INCH, PLUS ALLOWANCE FOR INSULATION.

COORDINATE LAYOUT WITH CEILINGS, FIRE AND SMOKE DAMPERS, LIGHT FIXTURE LAYOUTS, FIRE PROTECTION SPRINKLERS, ETC. SEAL ALL JOINTS AND SEAMS. DO NOT ROUTE DUCTS OVER ELECTRICAL PANELS.

9.19 CLEAN AND REMOVE SURFACE CONTAMINANTS AND DEPOSITS FROM DUCTS, DIFFUSERS, GRILLES, FANS. INTERNAL SURFACES OF AIR HANDLING UNITS, AND COILS COMPLETE PRIOR TO BALANCING.

REVISIONS

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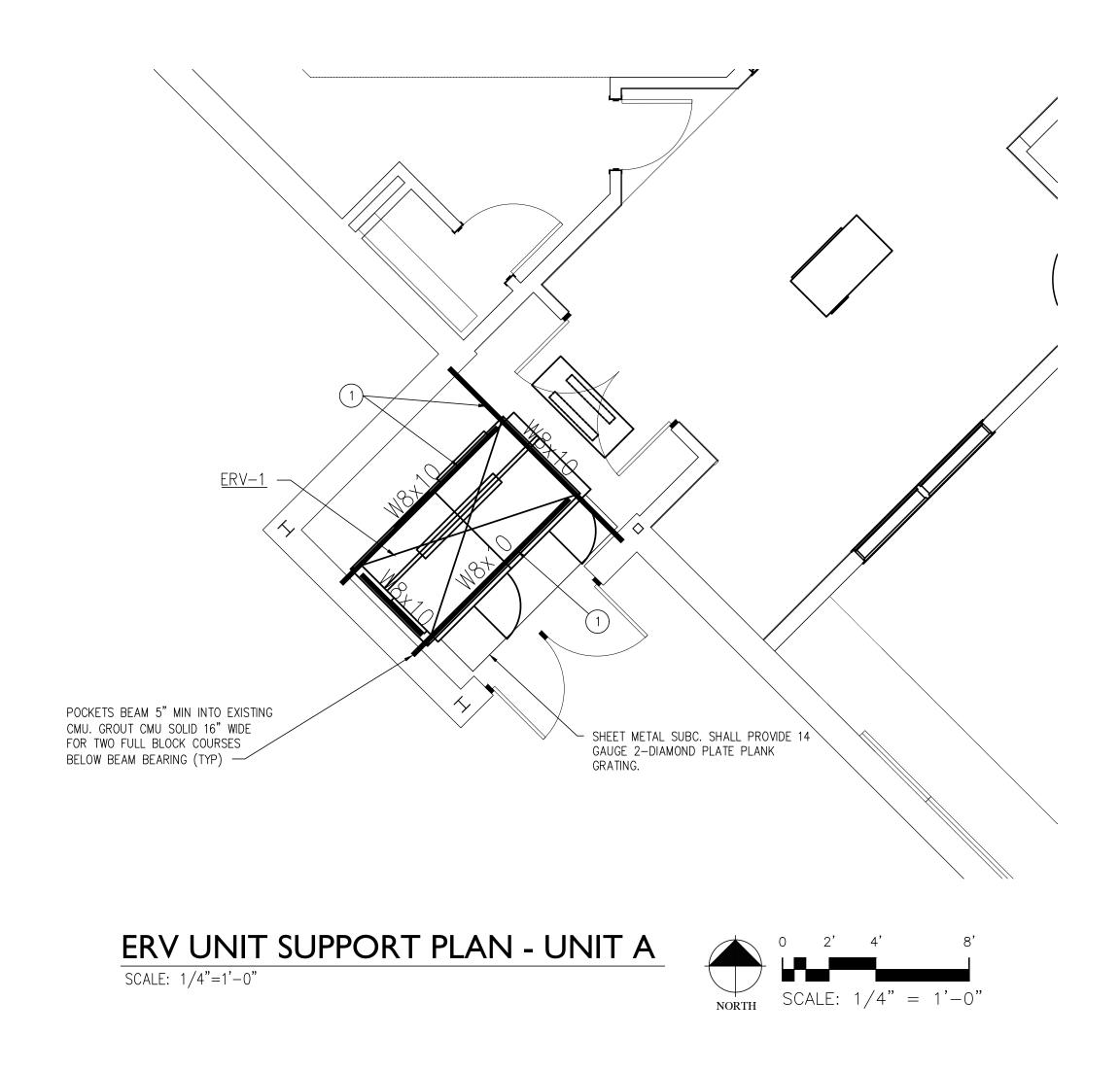
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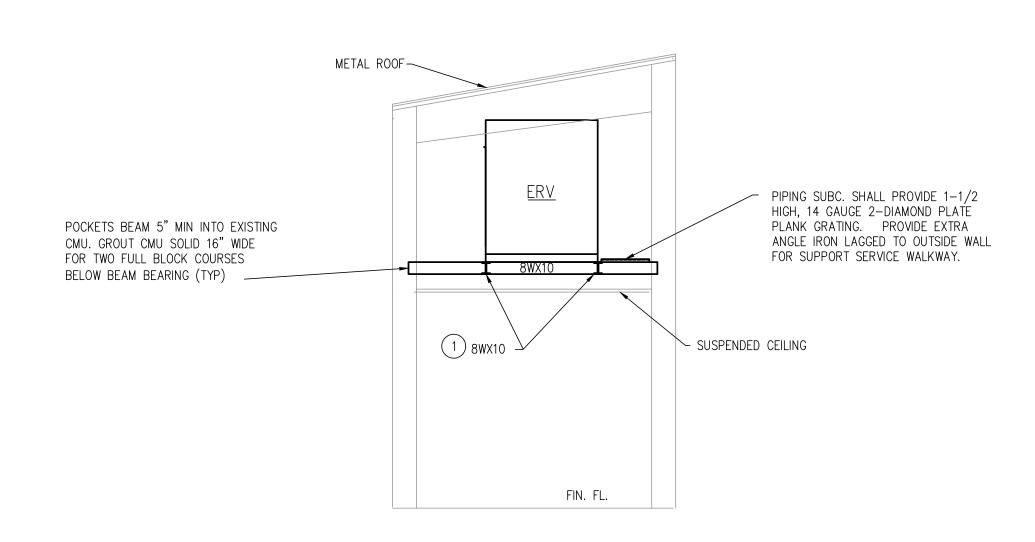
SHEET

MECHANICAL

SPECIFICATIONS

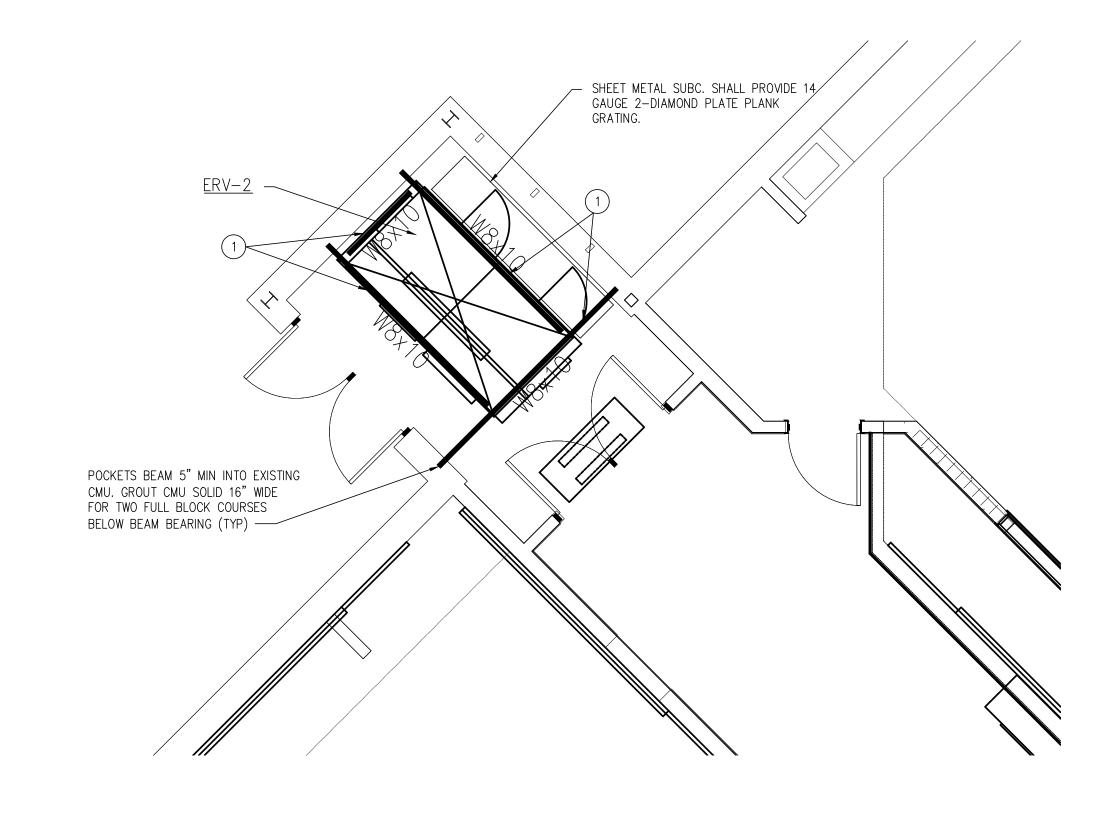
PROPRIETARY AND CONFIDENTIAL



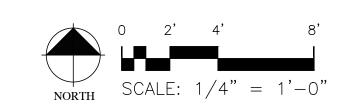


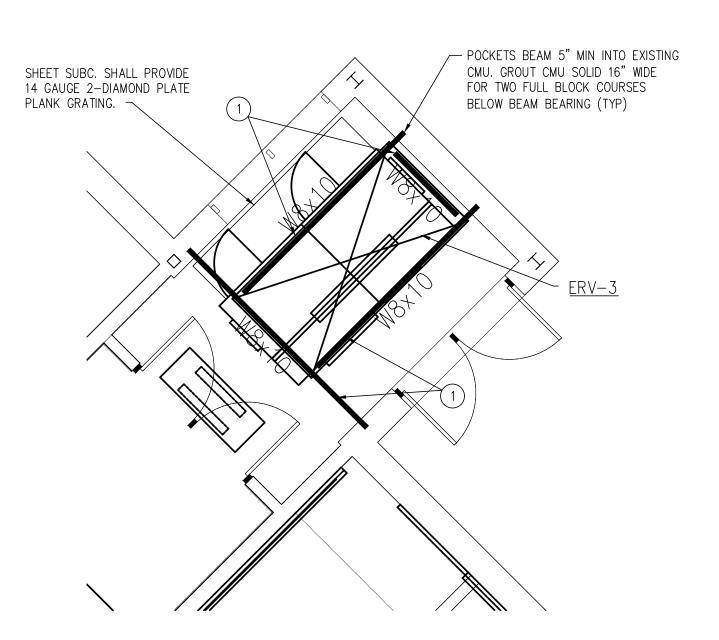
TYPICAL SECTION

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



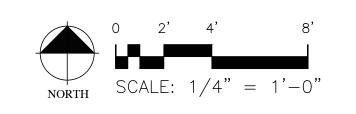






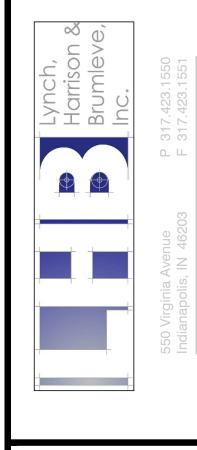
ERV UNIT SUPPORT PLAN - UNIT C

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



MECHANICAL CONTRACTOR NOTES #

1. STEEL ERECTION SHALL BE STAGED WITH EQUIPMENT LIFT REQUIREMENTS.



REVISIONS

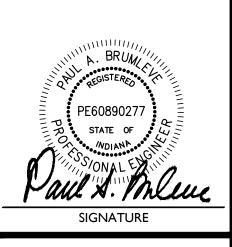
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 JOB NO.:
 IPC-K17-2402

 DATE:
 1-23-2018

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Performance

S-201

STRUCTURAL EQUIPMENT SUPPORT PLAN



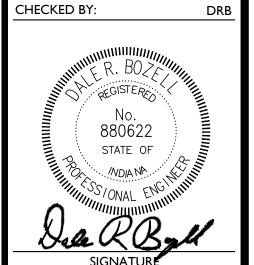
GENERAL DEMOLITION NOTES

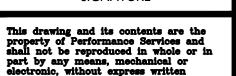
- ALL CONTRACTORS SHALL DISPOSE OF REMOVED MATERIALS OFF SITE. OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL REMOVED EQUIPMENT AND/OR PARTS.
- EXISTING EQUIPMENT AND PIPING SIZES INDICATED ARE AS SHOWN ON ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS AS REQUIRED TO
- PIPING, EQUIPMENT AND/OR DUCTWORK SHOWN AS DARK AND DASHED ON PLAN INDICATES EXISTING EQUIPMENT TO BE REMOVED. PLANS INDICATE EXISTING PIPING AS SHOWN ON ORIGINAL PLAN. SUBCONTRACTORS SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PIPING.
- 4. CONTRACTORS SHALL PATCH HOLES IN WALLS, FLOORS AND CEILINGS WHERE THEY REMOVE PIPING, DUCTWORK, CONDUITS, ETC. MATCH SURROUNDING SURFACE FINISHES.

MECHANICAL CONTRACTOR NOTES

- PIPING SUBC. SHALL REMOVE EXISTING WATER SOURCE HEAT PUMP COMPLETE. BRANCH SUPPLY AND RETURN SHALL BE REMOVED. CONDENSATE DRAIN LINES SHALL BE REMOVED AND REPLACED AS REQUIRED BY THE NEW HEAT PUMP INSTALLATION.
- SHEET METAL SUBC. SHALL REMOVE EXISTING MAKE UP AIR SUPPLY DUCT AND INCREASE SIZE AS REQUIRED
- 3. PIPING SUBC. REMOVE EXISTING MAKE UP AIR HANDLING UNIT AND HOT WATER PIPING.
- ENERGY RECOVERY UNIT AND REHEAT COIL.
- 6. PIPING SUBC. SHALL REMOVE EXISTING CABINET UNIT HEATER AND ASSOCIATED PIPING AS REQUIRED FOR NEW
- 7. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW

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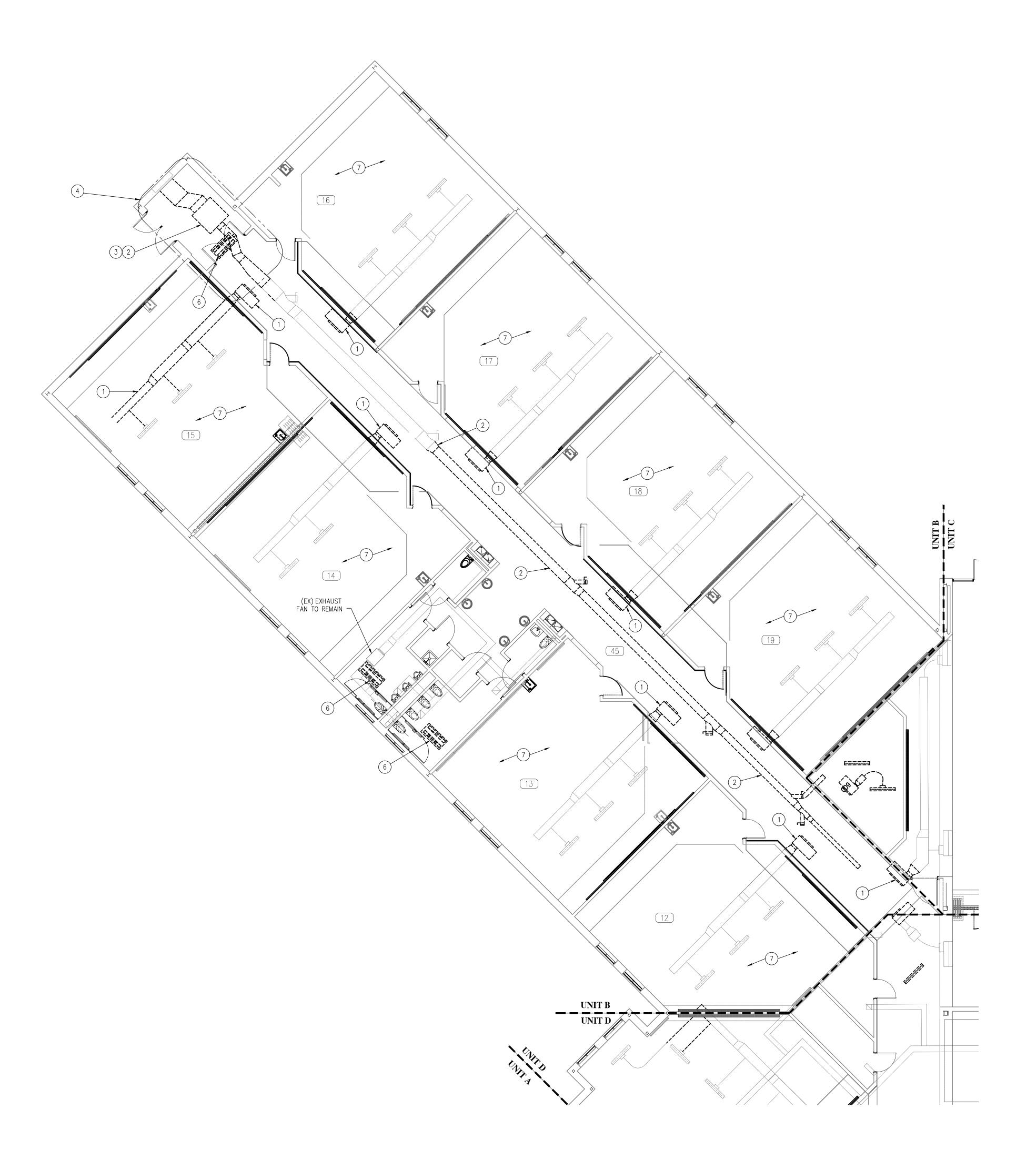


M-101

PROPRIETARY AND CONFIDENTIAL

LEGEND

MECHANICAL DEMOLITION PLAN UNIT A



MECHANICAL DEMOLITION PLAN - UNIT B

NORTH

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

GENERAL DEMOLITION NOTES

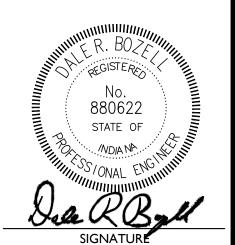
- 1. ALL CONTRACTORS SHALL DISPOSE OF REMOVED MATERIALS OFF SITE. OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL REMOVED EQUIPMENT AND/OR PARTS.
- 2. EXISTING EQUIPMENT AND PIPING SIZES INDICATED ARE AS SHOWN ON ORIGINAL BUILDING PLANS.
 SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS AS REQUIRED TO
- 3. PIPING, EQUIPMENT AND/OR DUCTWORK SHOWN AS DARK AND DASHED ON PLAN INDICATES EXISTING EQUIPMENT TO BE REMOVED. PLANS INDICATE EXISTING PIPING AS SHOWN ON ORIGINAL PLAN. SUBCONTRACTORS SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PIPING.
- 4. CONTRACTORS SHALL PATCH HOLES IN WALLS, FLOORS AND CEILINGS WHERE THEY REMOVE PIPING, DUCTWORK, CONDUITS, ETC. MATCH SURROUNDING SURFACE FINISHES.

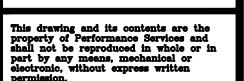
MECHANICAL CONTRACTOR NOTES

- PIPING SUBC. SHALL REMOVE EXISTING WATER SOURCE HEAT PUMP COMPLETE. BRANCH SUPPLY AND RETURN SHALL BE REMOVED. CONDENSATE DRAIN LINES SHALL BE REMOVED AND REPLACED AS REQUIRED BY THE NEW HEAT PUMP INSTALLATION.
- 2. SHEET METAL SUBC. SHALL REMOVE EXISTING MAKE UP AIR SUPPLY DUCT AND INCREASE SIZE AS REQUIRED
- 3. PIPING SUBC. REMOVE EXISTING MAKE UP AIR HANDLING UNIT AND HOT WATER PIPING.
- 4. PIPING SUBC. SHALL MODIFY EXISTING PIPING IN THIS AREA IN PREPARATION FOR INSTALLATION OF NEW ENERGY RECOVERY UNIT AND REHEAT COIL.
- 5. NOT USED.
- 6. PIPING SUBC. SHALL REMOVE EXISTING CABINET UNIT HEATER AND ASSOCIATED PIPING AS REQUIRED FOR NEW
- 7. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW

REVISIONS

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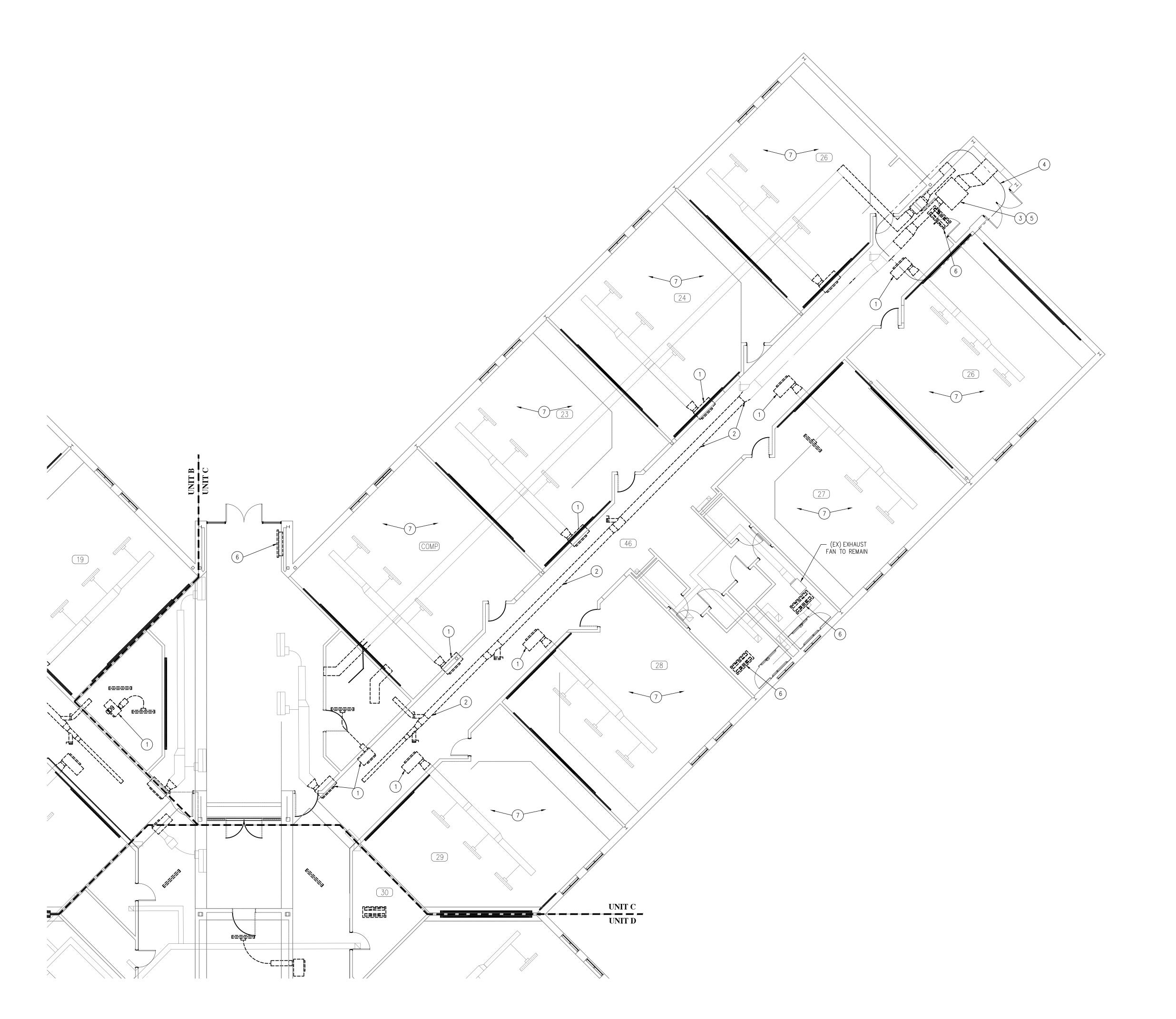
M-102

MECHANICAL DEMOLITION PLAN

UNIT B

PROPRIETARY AND CONFIDENTIAL

<u>LEGEND</u>



MECHANICAL DEMOLITION PLAN - UNIT C

NORTH

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

GENERAL DEMOLITION NOTES

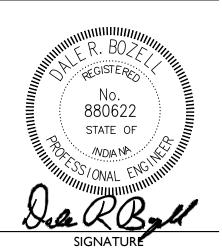
- ALL CONTRACTORS SHALL DISPOSE OF REMOVED MATERIALS OFF SITE. OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL REMOVED EQUIPMENT AND/OR PARTS.
- 2. EXISTING EQUIPMENT AND PIPING SIZES INDICATED ARE AS SHOWN ON ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS AS REQUIRED TO COMPLETE THEIR WORK.
- 3. PIPING, EQUIPMENT AND/OR DUCTWORK SHOWN AS DARK AND DASHED ON PLAN INDICATES EXISTING EQUIPMENT TO BE REMOVED. PLANS INDICATE EXISTING PIPING AS SHOWN ON ORIGINAL PLAN. SUBCONTRACTORS SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PIPING.
- 4. CONTRACTORS SHALL PATCH HOLES IN WALLS, FLOORS AND CEILINGS WHERE THEY REMOVE PIPING, DUCTWORK, CONDUITS, ETC. MATCH SURROUNDING SURFACE FINISHES.

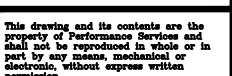
MECHANICAL CONTRACTOR NOTES

- PIPING SUBC. SHALL REMOVE EXISTING WATER SOURCE HEAT PUMP COMPLETE. BRANCH SUPPLY AND RETURN SHALL BE REMOVED. CONDENSATE DRAIN LINES SHALL BE REMOVED AND REPLACED AS REQUIRED BY THE NEW HEAT PUMP INSTALLATION.
- 2. SHEET METAL SUBC. SHALL REMOVE EXISTING MAKE UP AIR SUPPLY DUCT AND INCREASE SIZE AS REQUIRED
- 3. PIPING SUBC. REMOVE EXISTING MAKE UP AIR HANDLING UNIT AND HOT WATER PIPING.
- 4. PIPING SUBC. SHALL MODIFY EXISTING PIPING IN THIS AREA IN PREPARATION FOR INSTALLATION OF NEW ENERGY RECOVERY UNIT AND REHEAT COIL.
- 5. SHEET METAL SUBC. SHALL REMOVE EXISTING INLINE EXHAUST FAN AND DUCT AS NOTE ON PLAN.
- 6. PIPING SUBC. SHALL REMOVE EXISTING CABINET UNIT HEATER AND ASSOCIATED PIPING AS REQUIRED FOR NEW
- 7. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW GRID SYSTEM.

REVISIONS

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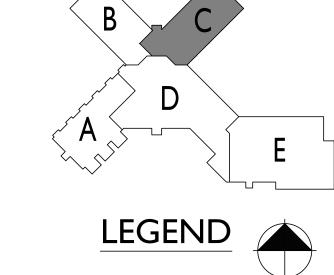


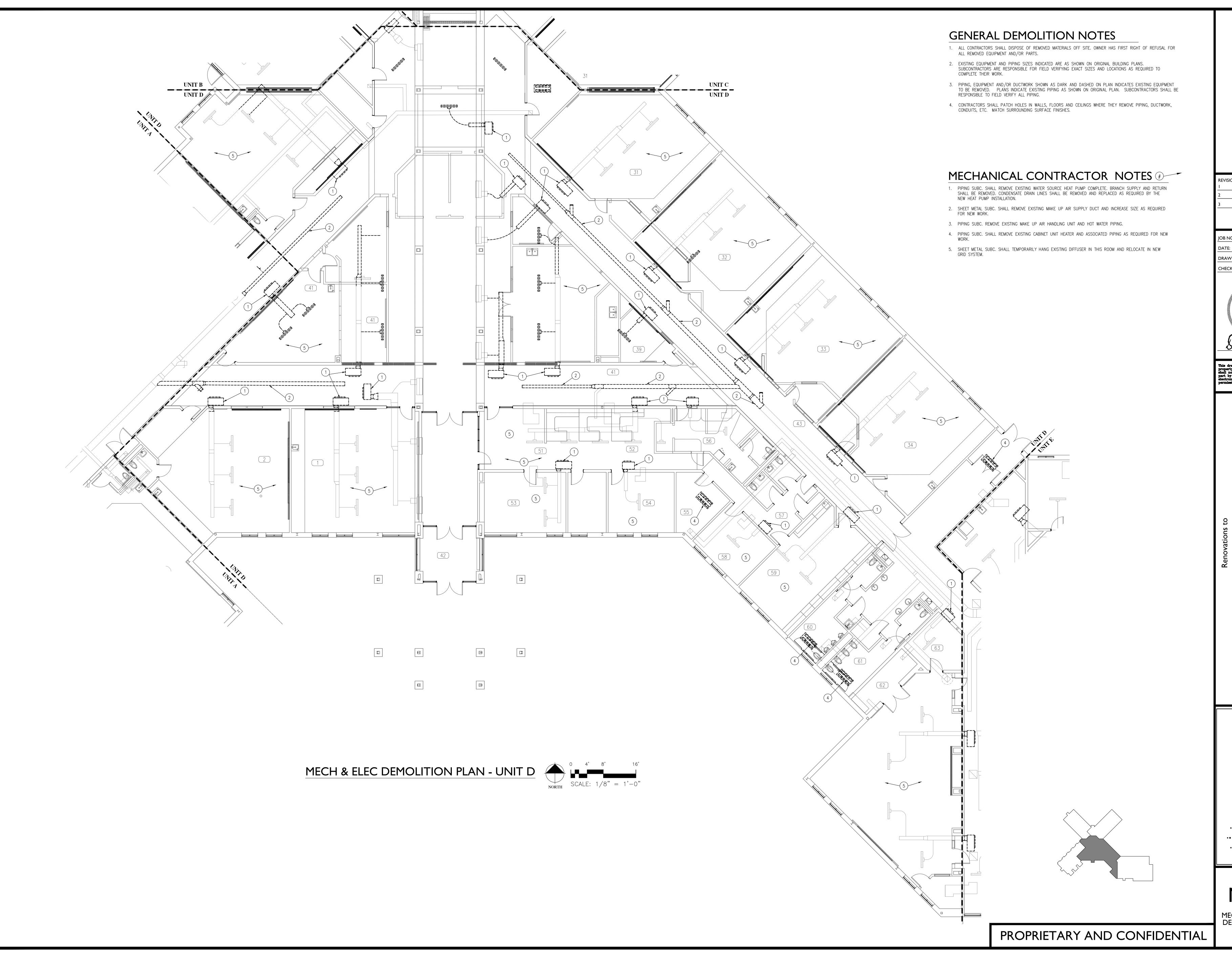


M-103

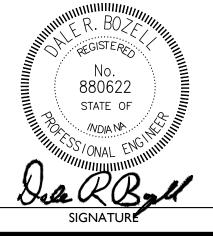
UNIT C

MECHANICAL DEMOLITION PLAN PROPRIETARY AND CONFIDENTIAL



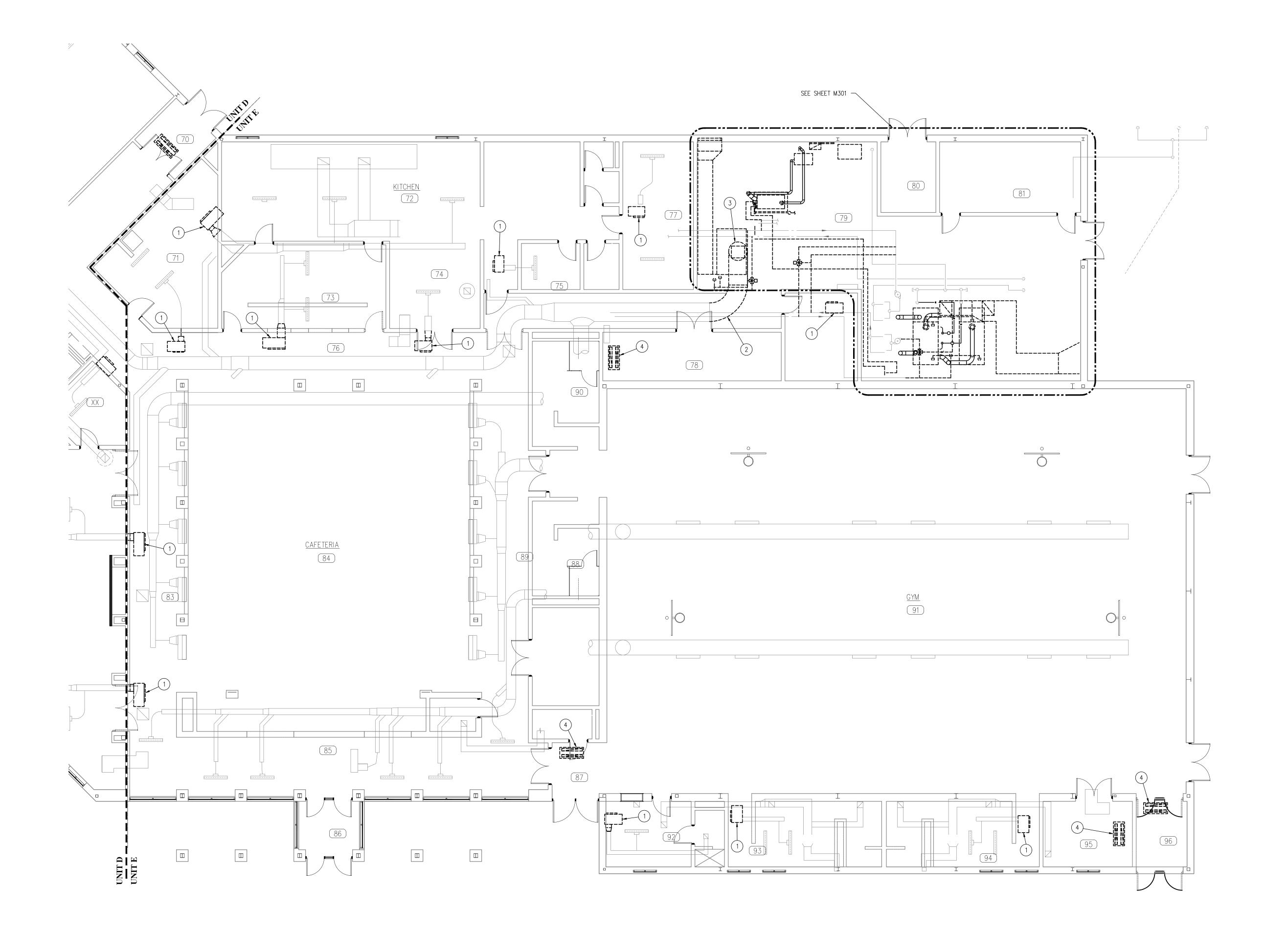


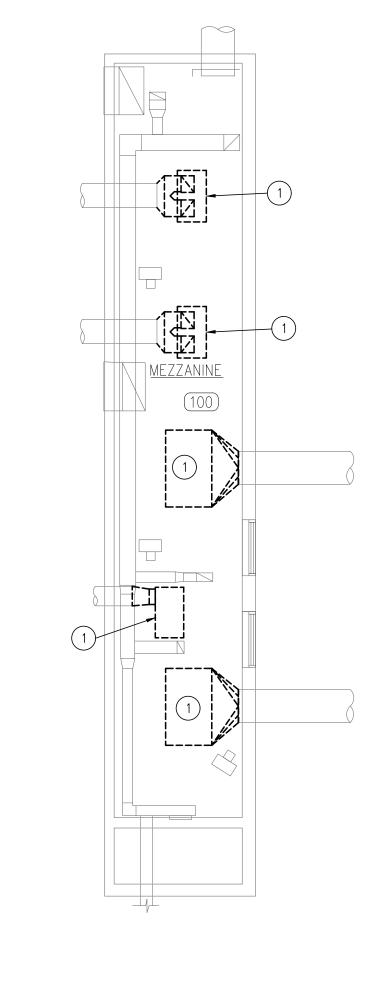
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M-104

MECHANICAL AND DEMOLITION PLAN UNIT D





MEZZANINE PLAN - UNIT E

MECHANICAL DEMOLITION PLAN - UNIT E

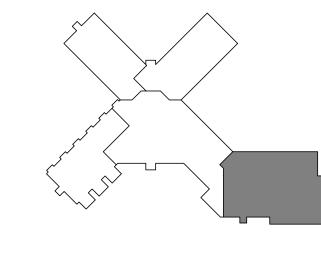


GENERAL DEMOLITION NOTES

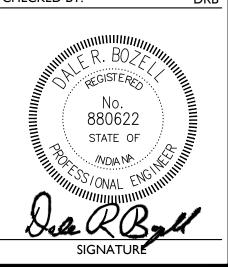
- 1. ALL CONTRACTORS SHALL DISPOSE OF REMOVED MATERIALS OFF SITE. OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL REMOVED EQUIPMENT AND/OR PARTS.
- 2. EXISTING EQUIPMENT AND PIPING SIZES INDICATED ARE AS SHOWN ON ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS AS REQUIRED TO
- 3. PIPING, EQUIPMENT AND/OR DUCTWORK SHOWN AS DARK AND DASHED ON PLAN INDICATES EXISTING EQUIPMENT TO BE REMOVED. PLANS INDICATE EXISTING PIPING AS SHOWN ON ORIGINAL PLAN. SUBCONTRACTORS SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PIPING.
- 4. CONTRACTORS SHALL PATCH HOLES IN WALLS, FLOORS AND CEILINGS WHERE THEY REMOVE PIPING, DUCTWORK, CONDUITS, ETC. MATCH SURROUNDING SURFACE FINISHES.

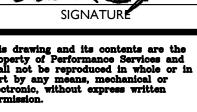
MECHANICAL CONTRACTOR NOTES

- PIPING SUBC. SHALL REMOVE EXISTING WATER SOURCE HEAT PUMP COMPLETE. BRANCH SUPPLY AND RETURN SHALL BE REMOVED. CONDENSATE DRAIN LINES SHALL BE REMOVED AND REPLACED AS REQUIRED BY THE NEW HEAT PUMP INSTALLATION.
- 2. SHEET METAL SUBC. SHALL REMOVE EXISTING MAKE UP AIR SUPPLY DUCT AND INCREASE SIZE AS REQUIRED FOR NEW WORK.
- 3. PIPING SUBC. REMOVE EXISTING MAKE UP AIR HANDLING UNIT AND HOT WATER PIPING.
- 4. PIPING SUBC. SHALL REMOVE EXISTING CABINET UNIT HEATER AND ASSOCIATED PIPING AS REQUIRED FOR NEW
- 5. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW GRID SYSTEM.



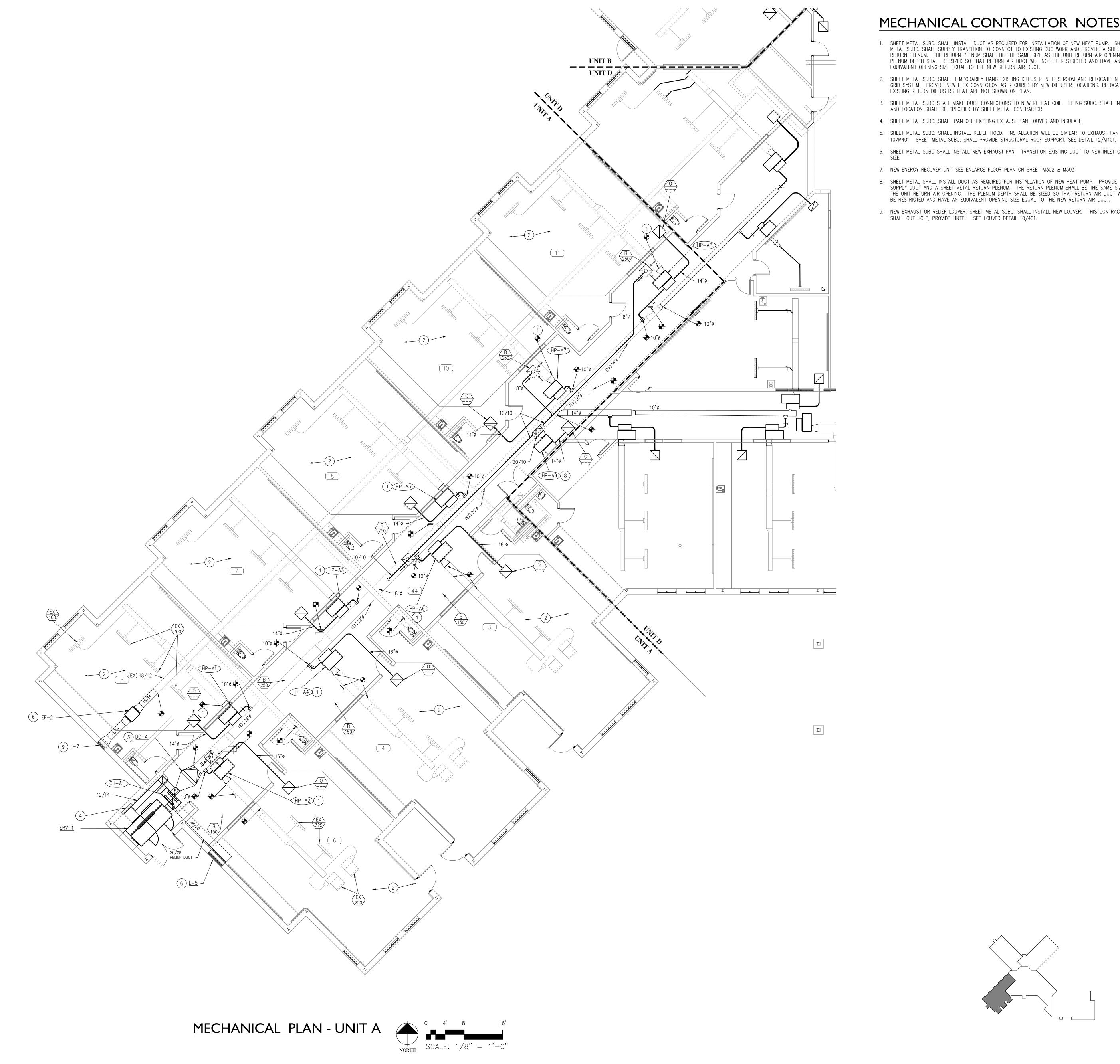
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MECHANICAL DEMOLITION PLAN UNIT E

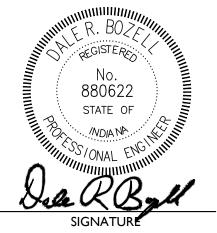


MECHANICAL CONTRACTOR NOTES

- 1. SHEET METAL SUBC. SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. SHEET METAL SUBC. SHALL SUPPLY TRANSITION TO CONNECT TO EXISTING DUCTWORK AND PROVIDE A SHEET METAL RETURN PLENUM. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL BE SIZED SO THAT RETURN AIR DUCT WILL NOT BE RESTRICTED AND HAVE AN
- EQUIVALENT OPENING SIZE EQUAL TO THE NEW RETURN AIR DUCT. 2. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW GRID SYSTEM. PROVIDE NEW FLEX CONNECTION AS REQUIRED BY NEW DIFFUSER LOCATIONS. RELOCATE EXISTING RETURN DIFFUSERS THAT ARE NOT SHOWN ON PLAN.
- 3. SHEET METAL SUBC SHALL MAKE DUCT CONNECTIONS TO NEW REHEAT COIL. PIPING SUBC. SHALL INSTALL AND LOCATION SHALL BE SPECIFIED BY SHEET METAL CONTRACTOR.
- 4. SHEET METAL SUBC. SHALL PAN OFF EXISTING EXHAUST FAN LOUVER AND INSULATE.
- 5. SHEET METAL SUBC. SHALL INSTALL RELIEF HOOD. INSTALLATION WILL BE SIMILAR TO EXHAUST FAN DETAIL
- 6. SHEET METAL SUBC SHALL INSTALL NEW EXHAUST FAN. TRANSITION EXISTING DUCT TO NEW INLET OPENING
- 7. NEW ENERGY RECOVER UNIT SEE ENLARGE FLOOR PLAN ON SHEET M302 & M303.
- 8. SHEET METAL SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. PROVIDE NEW SUPPLY DUCT AND A SHEET METAL RETURN PLENUM. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL BE SIZED SO THAT RETURN AIR DUCT WILL NOT BE RESTRICTED AND HAVE AN EQUIVALENT OPENING SIZE EQUAL TO THE NEW RETURN AIR DUCT.
- 9. NEW EXHAUST OR RELIEF LOUVER. SHEET METAL SUBC. SHALL INSTALL NEW LOUVER. THIS CONTRACTOR SHALL CUT HOLE, PROVIDE LINTEL. SEE LOUVER DETAIL 10/401.

REVISIONS

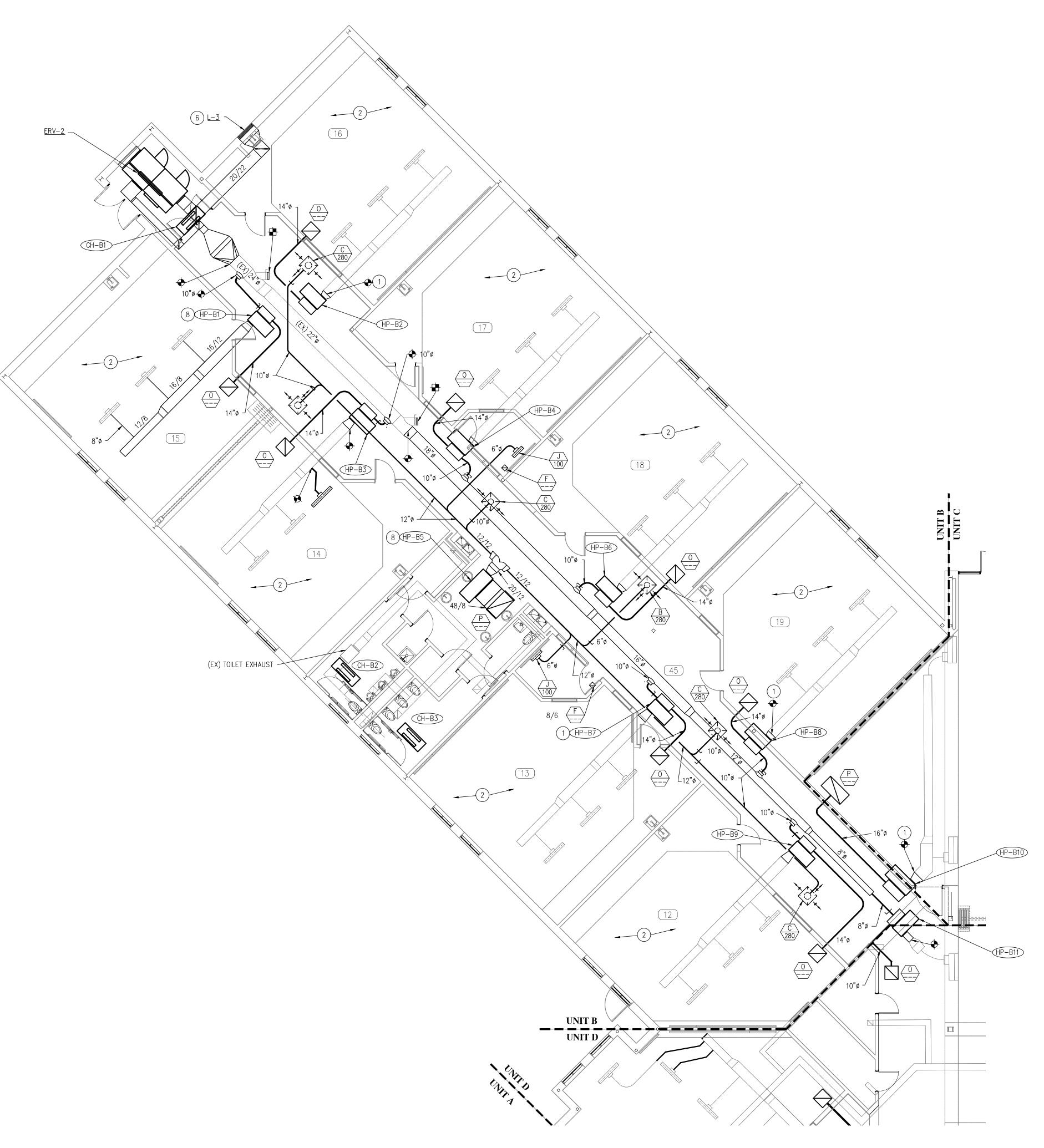
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M-20 I

PROPRIETARY AND CONFIDENTIAL

MECHANICAL PLAN UNIT A



MECHANICAL PLAN - UNIT B

MECHANICAL CONTRACTOR NOTES

- 1. SHEET METAL SUBC. SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. SHEET METAL SUBC. SHALL SUPPLY TRANSITION TO CONNECT TO EXISTING DUCTWORK AND PROVIDE A SHEET METAL RETURN PLENUM ON EACH HEAT PUMP. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL BE SIZED SO THAT RETURN AIR DUCT WILL NOT BE RESTRICTED AND HAVE AN EQUIVALENT OPENING SIZE EQUAL TO THE NEW RETURN AIR DUCT.
- 2. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW GRID SYSTEM. PROVIDE NEW FLEX CONNECTION AS REQUIRED BY NEW DIFFUSER LOCATIONS. RELOCATE EXISTING RETURN DIFFUSERS THAT ARE NOT SHOWN ON PLAN.
- 3. SHEET METAL SUBC SHALL MAKE DUCT CONNECTIONS TO NEW REHEAT COIL. PIPING SUBC. SHALL INSTALL AND LOCATION SHALL BE SPECIFIED BY SHEET METAL CONTRACTOR.
- 4. SHEET METAL SUBC. SHALL PAN OFF EXISTING EXHAUST FAN LOUVER AND INSULATE.
- 5. SHEET METAL SUBC. SHALL INSTALL RELIEF HOOD. INSTALLATION WILL BE SIMILAR TO EXHAUST FAN DETAIL 10/M401. SHEET METAL SUBC, SHALL PROVIDE STRUCTURAL ROOF SUPPORT, SEE DETAIL 12/M401.
- 6. NEW EXHAUST OR RELIEF LOUVER. SHEET METAL SUBC. SHALL INSTALL NEW LOUVER. THIS CONTRACTOR SHALL CUT HOLE, PROVIDE LINTEL. SEE LOUVER DETAIL 10/401
- 7. NEW ENERGY RECOVER UNIT SEE ENLARGE FLOOR PLAN ON SHEET M302 & M303.
- 8. SHEET METAL SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. PROVIDE NEW SUPPLY DUCT AND A SHEET METAL RETURN PLENUM ON EACH HEAT PUMP. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL BE SIZED SO THAT RETURN AIR DUCT WILL NOT BE RESTRICTED AND HAVE AN EQUIVALENT OPENING SIZE EQUAL TO THE NEW RETURN

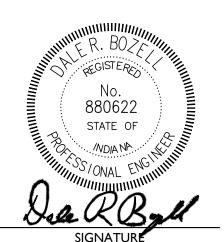
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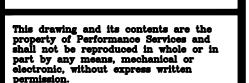
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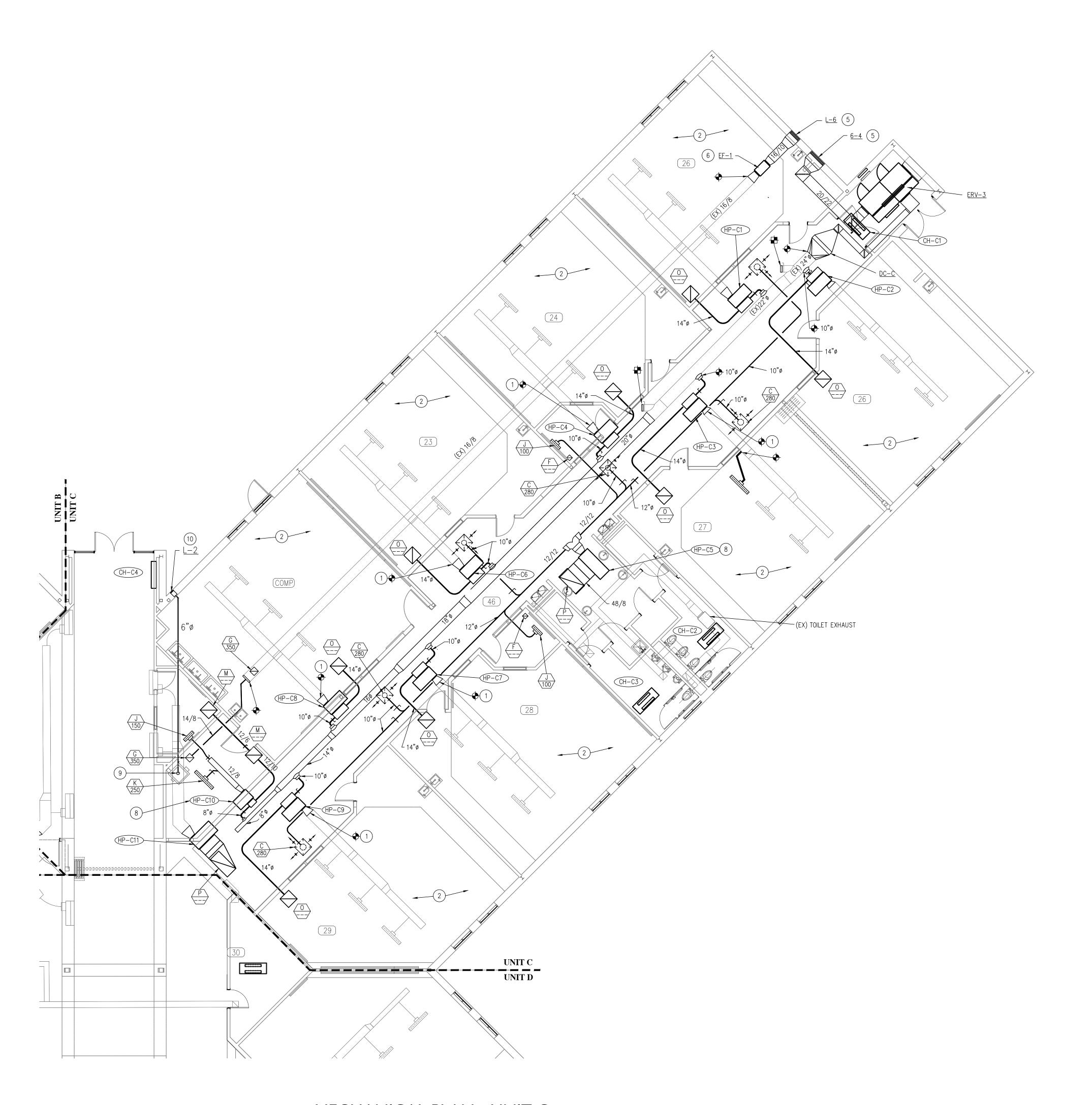
M-202

MECHANICAL PLAN

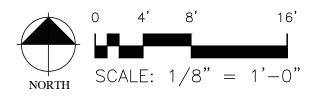
UNIT B

PROPRIETARY AND CONFIDENTIAL

<u>LEGEND</u>



MECHANICAL PLAN - UNIT C

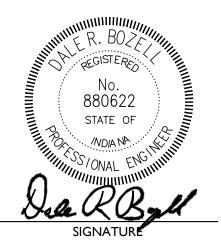


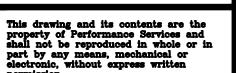
MECHANICAL CONTRACTOR NOTES

- 1. SHEET METAL SUBC. SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. SHEET METAL SUBC. SHALL SUPPLY TRANSITION TO CONNECT TO EXISTING DUCTWORK AND PROVIDE A SHEET METAL RETURN PLENUM ON EACH HEAT PUMP. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL BE SIZED SO THAT RETURN AIR DUCT WILL NOT BE RESTRICTED AND HAVE AN EQUIVALENT OPENING SIZE EQUAL TO THE NEW RETURN AIR DUCT.
- 2. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW GRID SYSTEM. PROVIDE NEW FLEX CONNECTION AS REQUIRED BY NEW DIFFUSER LOCATIONS. RELOCATE EXISTING RETURN DIFFUSER THAT ARE NOT SHOWN ON PLAN.
- 3. SHEET METAL SUBC SHALL MAKE DUCT CONNECTIONS TO NEW REHEAT COIL. PIPING SUBC. SHALL INSTALL AND LOCATION SHALL BE SPECIFIED BY SHEET METAL CONTRACTOR.
- 4. SHEET METAL SUBC. SHALL PAN OFF EXISTING EXHAUST FAN LOUVER AND INSULATE.
- 5. NEW EXHAUST OR RELIEF LOUVER. SHEET METAL SUBC. SHALL INSTALL NEW LOUVER. THIS CONTRACTOR SHALL CUT HOLE, PROVIDE LINTEL. SEE LOUVER DETAIL 10/401.
- 6. SHEET METAL SUBC SHALL INSTALL NEW EXHAUST FAN. TRANSITION EXISTING DUCT TO NEW INLET CURB OPENING SIZE. SHEET METAL SHALL INSTALL CURB PROVIDED BY PSI. SEE EXHAUST FAN DETAIL 10/M401. SHEET METAL SUBC, SHALL PROVIDE STRUCTURAL ROOF SUPPORT, SEE DETAIL 12/M401
- 7. NEW ENERGY RECOVER UNIT SEE ENLARGE FLOOR PLAN ON SHEET M302 & M302.
- 8. SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. PROVIDE NEW SUPPLY DUCT AND A SHEET METAL RETURN PLENUM ON EACH HEAT PUMP. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL BE SIZED SO THAT RETURN AIR DUCT WILL NOT BE RESTRICTED AND HAVE AN EQUIVALENT OPENING SIZE EQUAL TO THE NEW RETURN AIR DUCT
- 9. CONNECT 6"ø EXHAUST DUCT TO KILN EXHAUST HOOD.

REVISIONS

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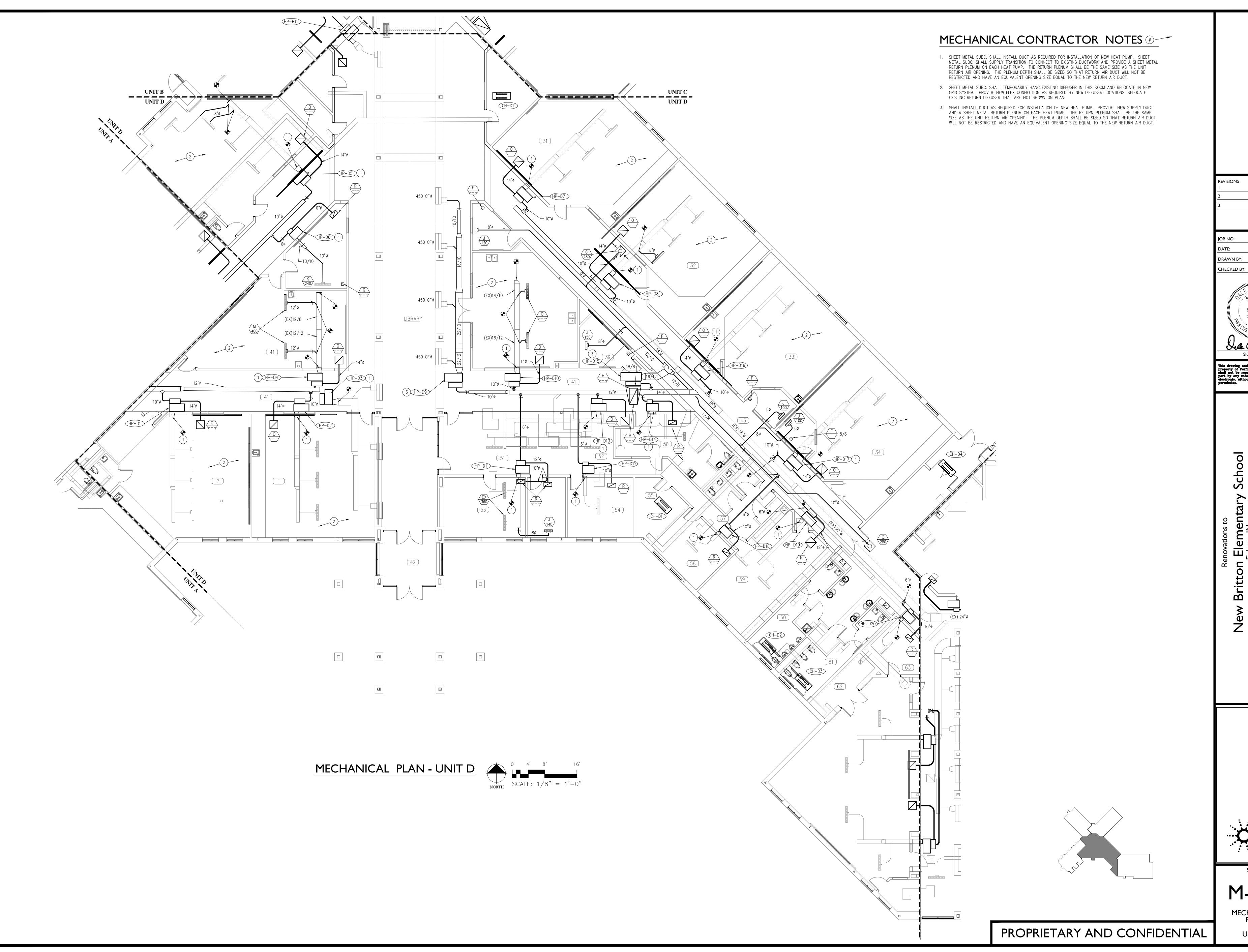


M-203

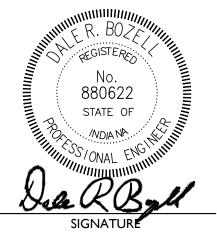
MECHANICAL PLAN UNIT C

PROPRIETARY AND CONFIDENTIAL

<u>LEGEND</u>

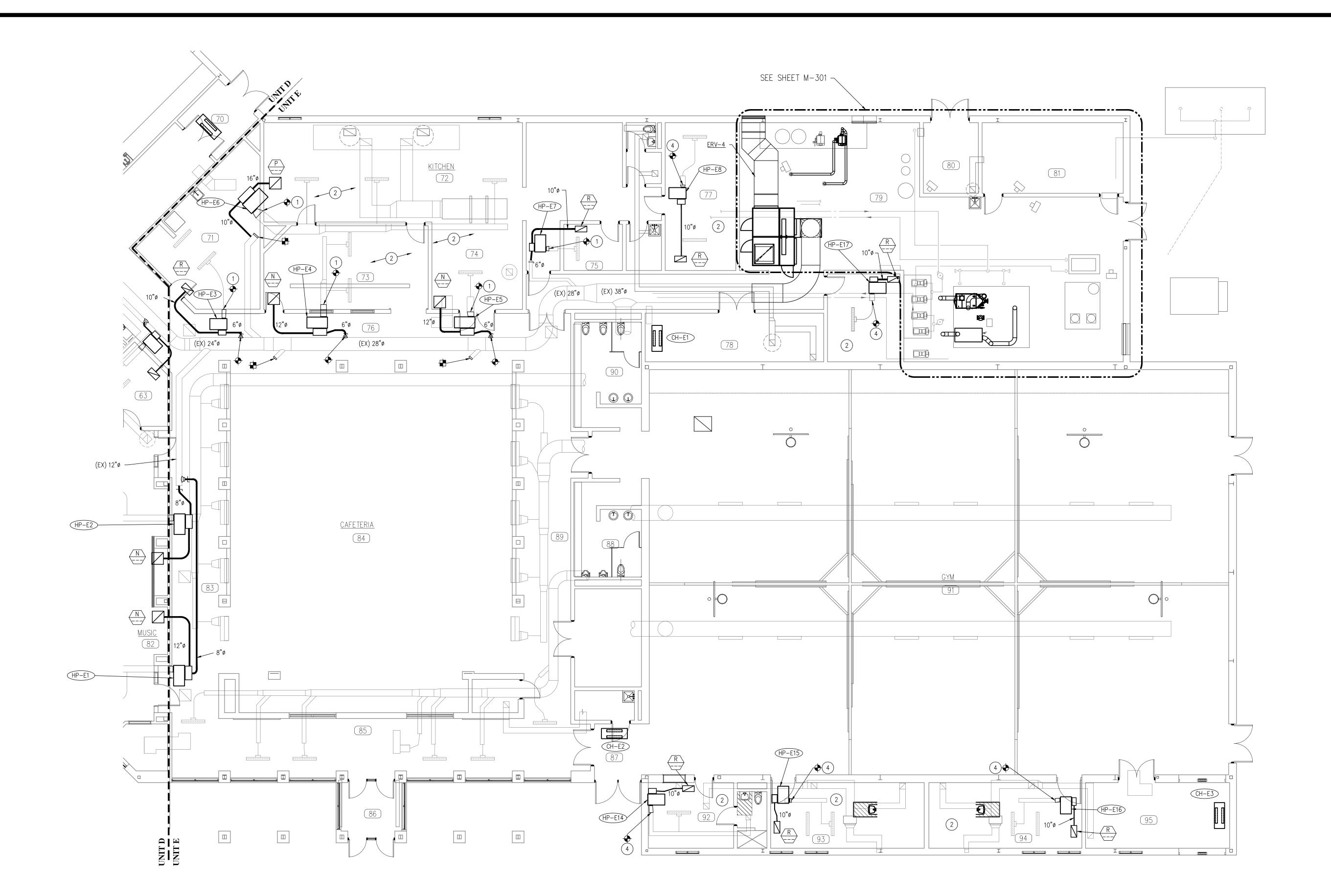


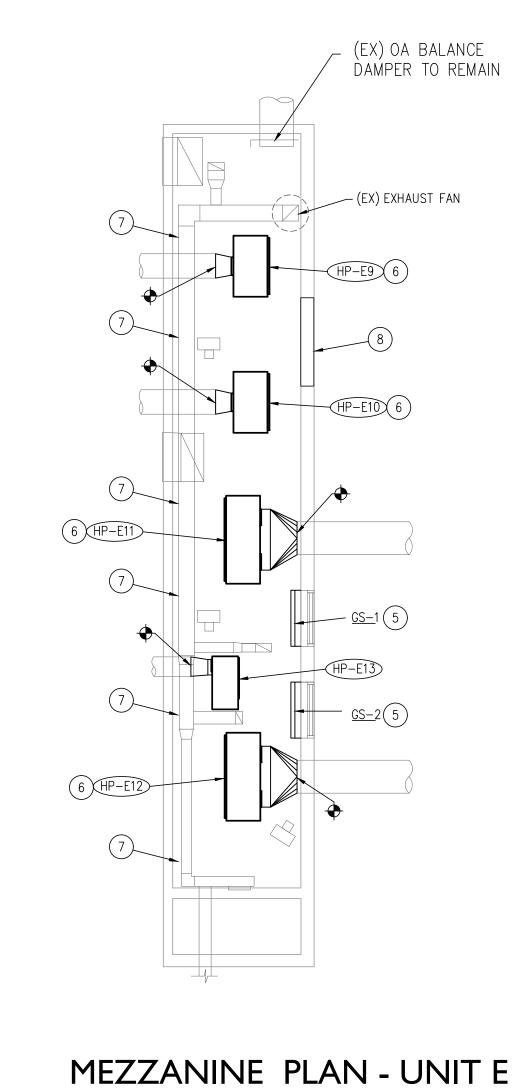
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MECHANICAL PLAN UNIT D





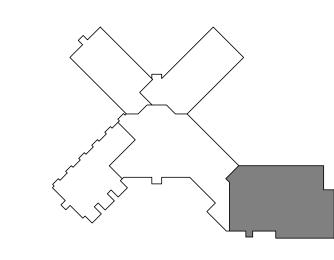
O 4' 8' 16'
NORTH SCALE: 1/8" = 1'-0"

MECH & ELEC PLAN - UNIT E

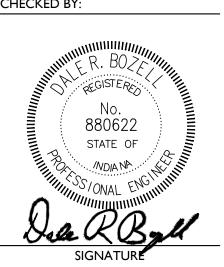


MECHANICAL CONTRACTOR NOTES

- 1. SHEET METAL SUBC. SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. SHEET METAL SUBC. SHALL SUPPLY TRANSITION TO CONNECT TO EXISTING DUCTWORK AND PROVIDE A SHEET METAL RETURN PLENUM. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL BE SIZED SO THAT RETURN AIR DUCT WILL NOT BE RESTRICTED AND HAVE AN EQUIVALENT OPENING SIZE EQUAL TO THE NEW RETURN AIR DUCT.
- 2. SHEET METAL SUBC. SHALL TEMPORARILY HANG EXISTING DIFFUSER IN THIS ROOM AND RELOCATE IN NEW GRID SYSTEM. PROVIDE NEW FLEX CONNECTION AS REQUIRED BY NEW DIFFUSER LOCATIONS. RELOCATE EXISTING RETURN DIFFUSERS NOT SHOWN ON PLAN.
- 3. NEW ENERGY RECOVER UNIT SEE ENLARGE FLOOR PLAN ON SHEET M301.
- 4. SHEET METAL SUBC. SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. SHEET METAL SUBC. SHALL SUPPLY TRANSITION TO CONNECT TO EXISTING DUCTWORK AND PROVIDE A SHEET METAL RETURN PLENUM. THE RETURN PLENUM SHALL BE THE SAME SIZE AS THE UNIT RETURN AIR OPENING. THE PLENUM DEPTH SHALL 10".
- 5. SHEET METAL SUBC SHALL INSTALL GRILLE SILENCER OVER EXISTING 54" ROUND RETURN GRILLE. INSTALL 54"X 54"X 6" DEEP PLENUM. FIELD VERIFY PLENUM DIMENSION.
- 6. SHEET METAL SUBC. SHALL INSTALL DUCT AS REQUIRED FOR INSTALLATION OF NEW HEAT PUMP. SHEET METAL SUBC. SHALL SUPPLY TRANSITION TO CONNECT TO EXISTING DUCTWORK.
- 7. SHEET METAL SUBC. SHALL REWORK EXISTING EXHAUST DUCT AS REQUIRE FOR INSTALLATION OF NEW UNITS. LOCATION OF THE DUCT IS DIFFERENT THAN SHOWN ON PLAN, CONTRACTOR SHALL FIELD VERIFY.
- 8. PIPING SUBC. WILL PROVIDE ACCESS OPEN FOR INSTALLATION OF OF NEW UNITS. PIPING SUBC SHALL CUT NEW OPENING AND THEN RESTORE WALL TO ORIGINAL CONDITION. PAINT TO MATCH ADJACENT COLOR OF WALL.



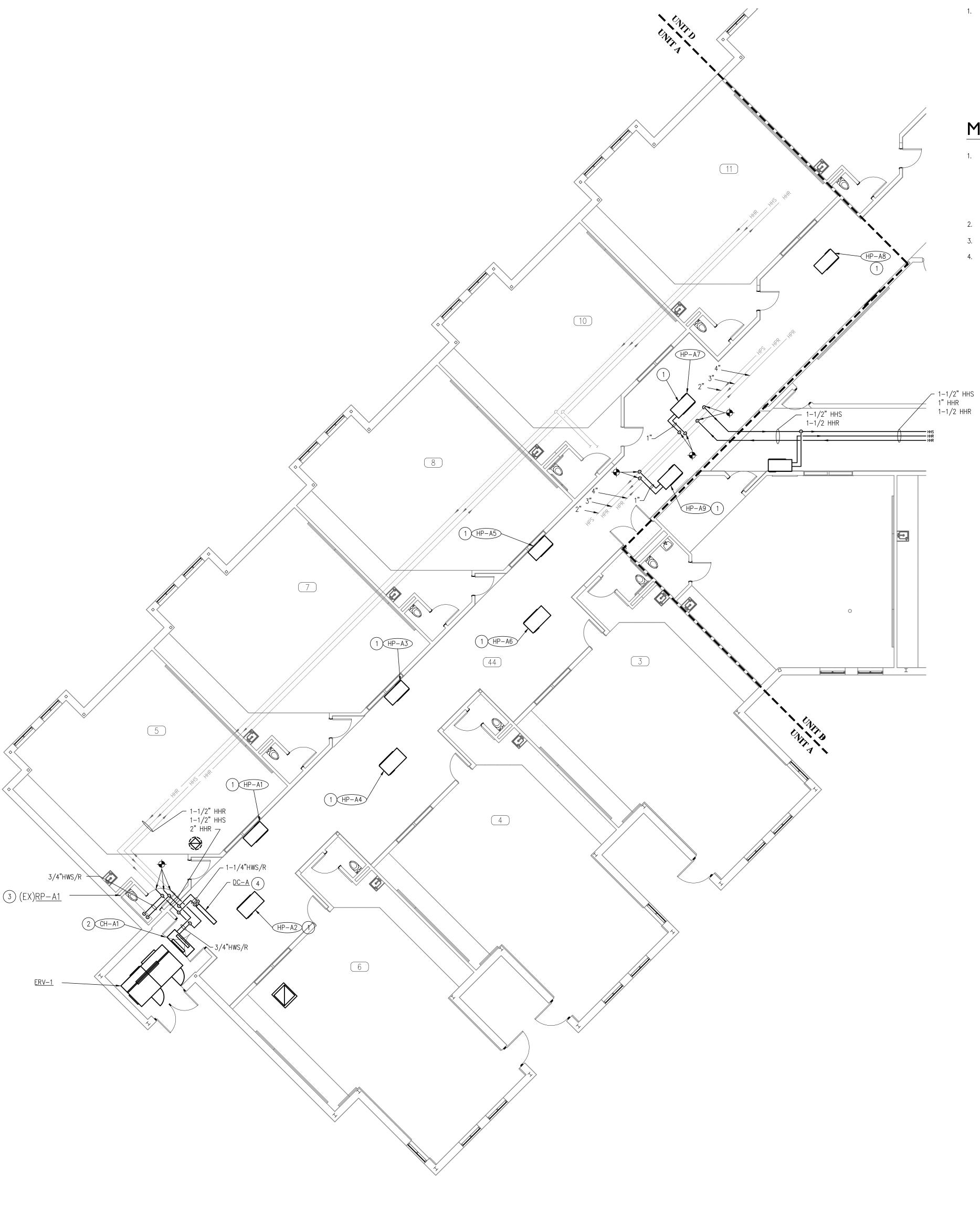
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M-205 MECHANICAL PLAN

UNIT E



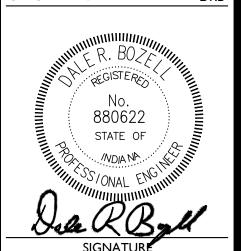
1. PIPING CONTRACTOR SHALL FIELD VERIFY EXISTING PIPING SHOWN ON REFERENCE DRAWINGS RD-M201 THRU RD-M204. THESE PLANS SHALL BE USED TO IN CONJUNCTION WITH NEW PIPING SHEETS M208 THRU M210 TO DETERMINE WHERE PIPING SHALL CHANGED. NOTE THAT EXISTING 1/2" HOT WATER AND HEAT PUMP LOOP BRANCH PIPING SHALL BE CHANGED TO A MINIMUM OF 3/4". SEE DETAILS 13/M401, 14/M401, & 15/M401 FOR DETAILS ON HOW BRANCH PIPING ON THE HEAT PUMP LOOP SHALL BE INCREASED.

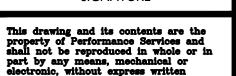
MECHANICAL CONTRACTOR NOTES

- 1. PIPING SUBC. SHALL INSTALL NEW NEW SOURCE HEAT PUMP. CONTRACTOR SHALL COORDINATE ALL INSTALLATION DETAILS WITH MANUFACTURER. ADJUST EXISTING MOUNTING TO ACCOMMODATED LARGER UNITS. USE MINIMUM OF 3/8" HANGER ROD. MANUFACTURER SHALL PROVIDE HANGER BRACKETS WITH VIBRATION ISOLATORS FOR UNIT MOUNTING. SLOPE UNIT 1/4" TO UNIT CONDENSATE DRAIN. PROVIDE NEW "P" TRAP AS SHOWN IN DETAIL 16/401. CONNECT UNIT TO EXISTING CONDENSATE PIPING. FLUSH EXISTING CONDENSATE PIPING AND RE-SLOPE TO ASSURE 1/8" PER FOOT. RUN NEW BRANCH HEAT PUMP LOOP PIPING AND PROVIDE NEW HOSE KITS. SEE DETAILS 8/M401, 13/M401, 14/M401, 15/M401 FOR BRANCH PIPE SIZING.
- 2. PIPING SUBC. SHALL INSTALL NEW CABINET UNIT HEATER, SEE PIPING DETAIL 11/M401.
- 3. PIPING SUBC SHALL RE-PIPE EXISTING RADIANT PANELS AND FIN TUBE RADIATION, SEE PIPING DETAIL7/M401.
- 4. PIPING SUBC. SHALL INSTALL NEW DUCT COIL. COORDINATE LOCATION WITH SHEET METAL SUBC.. SEE PIPING

REVISIONS

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M-206

MECHANICAL PIPING PLAN UNIT A

1. PIPING CONTRACTOR SHALL FIELD VERIFY EXISTING PIPING SHOWN ON REFERENCE DRAWINGS RD-M201 THRU RD-M204. THESE PLANS SHALL BE USED TO IN CONJUNCTION WITH NEW PIPING SHEETS M208 THRU M210 TO DETERMINE WHERE PIPING SHALL CHANGED. NOTE THAT EXISTING 1/2" HOT WATER AND HEAT PUMP LOOP BRANCH PIPING SHALL BE CHANGED TO A MINIMUM OF 3/4". SEE DETAILS 13/M401, 14/M401, & 15/M401 FOR DETAILS ON HOW BRANCH PIPING ON THE HEAT PUMP LOOP SHALL BE INCREASED.

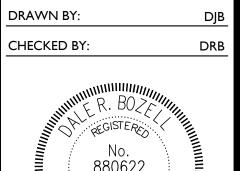
MECHANICAL CONTRACTOR NOTES

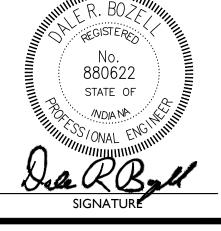
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- 2. PIPING SUBC. SHALL INSTALL NEW CABINET UNIT HEATER, SEE PIPING DETAIL 11/M401.
- 3. PIPING SUBC SHALL RE-PIPE EXISTING RADIANT PANELS AND FIN TUBE RADIATION, SEE PIPING DETAIL7/M401
- 4. PIPING SUBC. SHALL INSTALL NEW DUCT COIL. COORDINATE LOCATION WITH SHEET METAL SUBC. SEE PIPING DETAIL 11/M401.

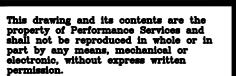
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NO.: IPC-K17-2402

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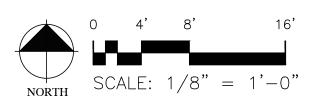
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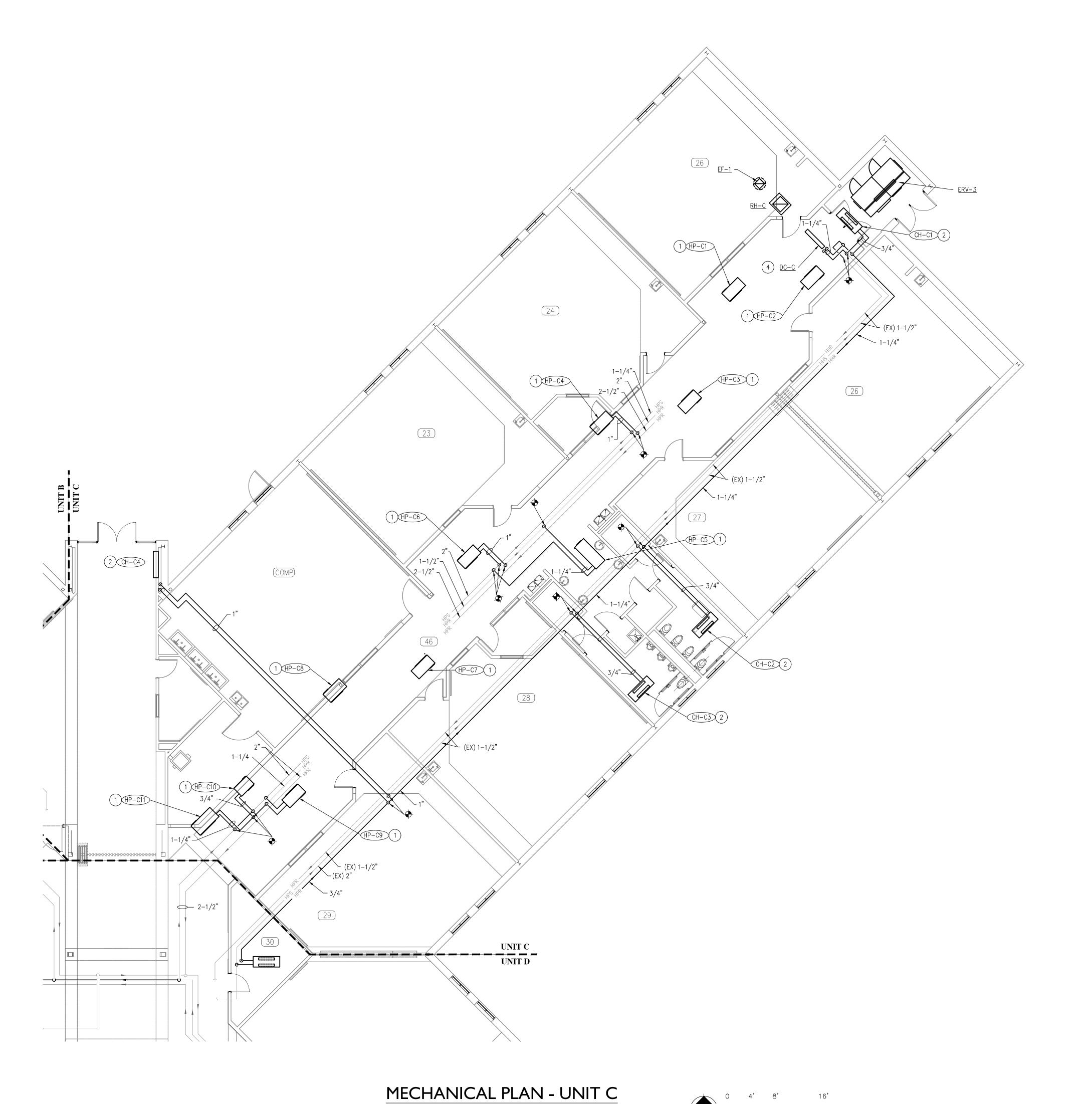
M-207

MECHANICAL PIPING PLAN UNIT B

MECHANICAL PLAN - UNIT B



<u>LEGEND</u>



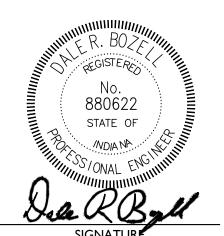
1. PIPING CONTRACTOR SHALL FIELD VERIFY EXISTING PIPING SHOWN ON REFERENCE DRAWINGS RD-M201 THRU RD-M204. THESE PLANS SHALL BE USED TO IN CONJUNCTION WITH NEW PIPING SHEETS M208 THRU M210 TO DETERMINE WHERE PIPING SHALL CHANGED. NOTE THAT EXISTING 1/2" HOT WATER AND HEAT PUMP LOOP BRANCH PIPING SHALL BE CHANGED TO A MINIMUM OF 3/4". SEE DETAILS 13/M401, 14/M401, & 15/M401 FOR DETAILS ON HOW BRANCH PIPING ON THE HEAT PUMP LOOP SHALL BE INCREASED.

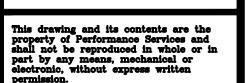
MECHANICAL CONTRACTOR NOTES

- 1. PIPING SUBC. SHALL INSTALL NEW NEW SOURCE HEAT PUMP. CONTRACTOR SHALL COORDINATE ALL INSTALLATION DETAILS WITH MANUFACTURER. ADJUST EXISTING MOUNTING TO ACCOMMODATED LARGER UNITS. USE MINIMUM OF 3/8" HANGER ROD. MANUFACTURER SHALL PROVIDE HANGER BRACKETS WITH VIBRATION ISOLATORS FOR UNIT MOUNTING. SLOPE UNIT 1/4" TO UNIT CONDENSATE DRAIN. PROVIDE NEW "P" TRAP AS SHOWN IN DETAIL 16/401. CONNECT UNIT TO EXISTING CONDENSATE PIPING. FLUSH EXISTING CONDENSATE PIPING AND RE-SLOPE TO ASSURE 1/8" PER FOOT. RUN NEW BRANCH HEAT PUMP LOOP PIPING AND PROVIDE NEW HOSE KITS. SEE DETAILS 8/M401, 13/M401, 14/M401, 15/M401 FOR BRANCH PIPE SIZING.
- 2. PIPING SUBC. SHALL INSTALL NEW CABINET UNIT HEATER, SEE PIPING DETAIL 11/M401.
- 3. PIPING SUBC SHALL RE-PIPE EXISTING RADIANT PANELS AND FIN TUBE RADIATION, SEE PIPING DETAIL7/M401
- 4. PIPING SUBC. SHALL INSTALL NEW DUCT COIL. COORDINATE LOCATION WITH SHEET METAL SUBC. SEE PIPING DETAIL 11/M401.

REVISIONS

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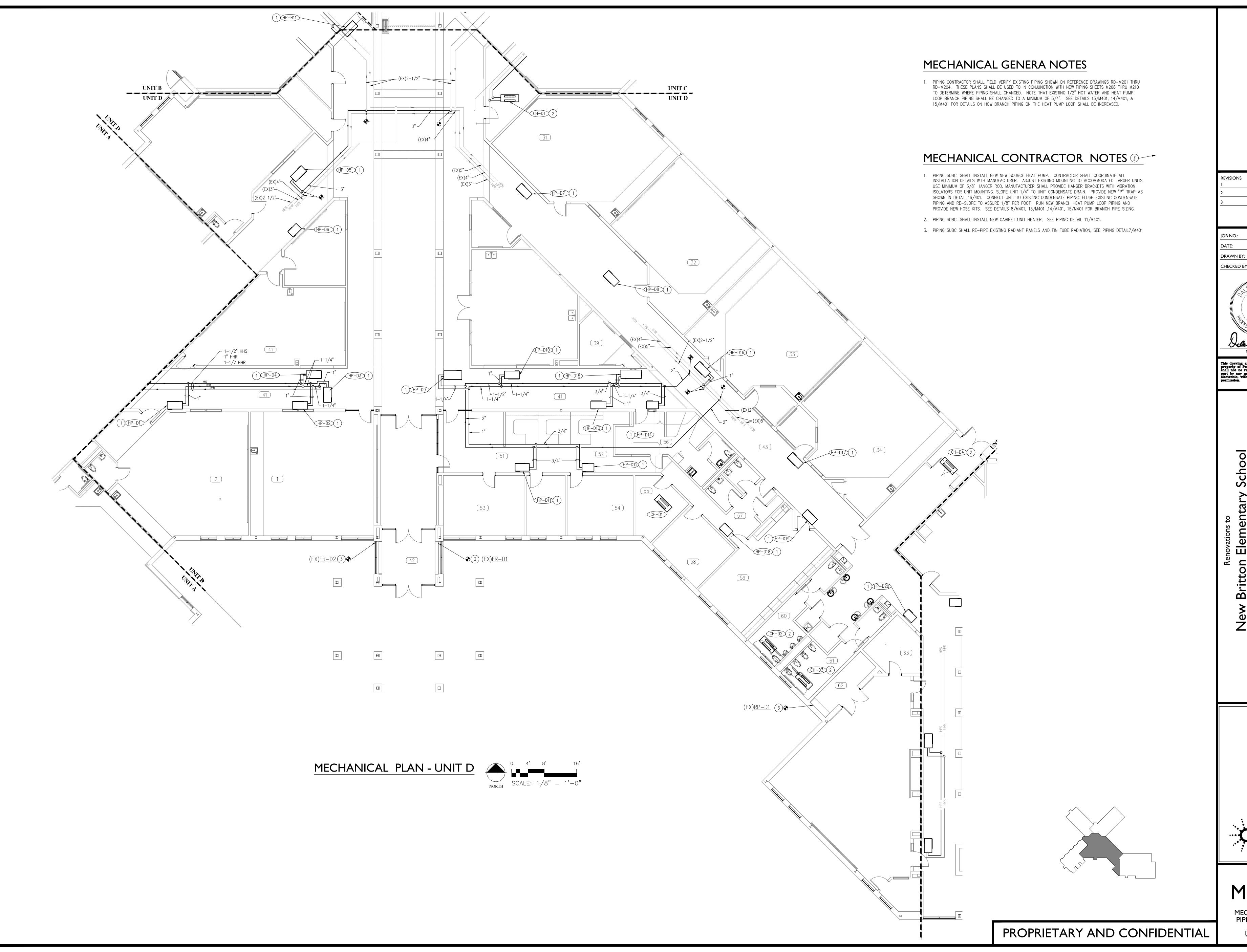


M-208 MECHANICAL PIPING PLAN

UNIT C

PROPRIETARY AND CONFIDENTIAL

<u>LEGEND</u>



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FE: 1-23-2018

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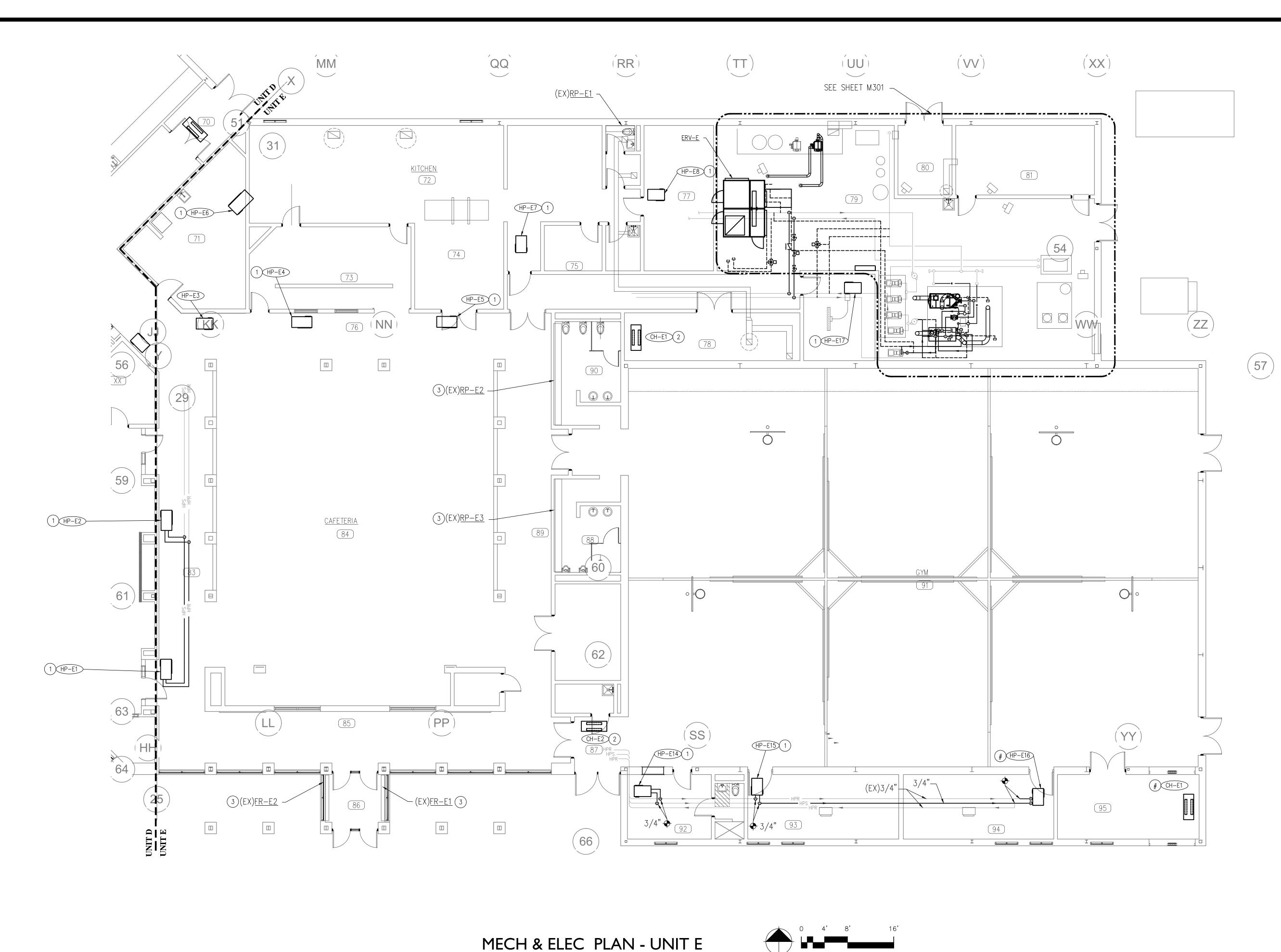
electronic, without express written permission.

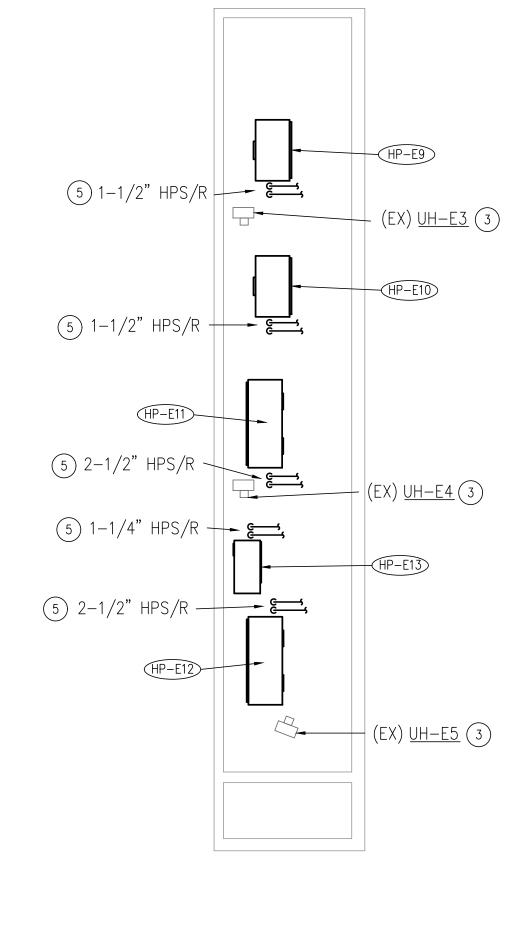
New Britton Elementary School
Fishers, IN

Performance

M-209

MECHANICAL PIPING PLAN UNIT D

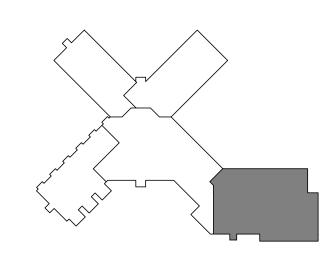




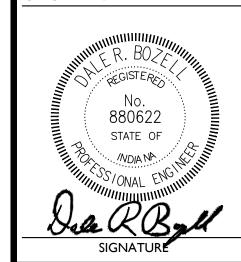
1. PIPING CONTRACTOR SHALL FIELD VERIFY EXISTING PIPING SHOWN ON REFERENCE DRAWINGS RD-M201 THRU RD-M204. THESE PLANS SHALL BE USED TO IN CONJUNCTION WITH NEW PIPING SHEETS M208 THRU M210 TO DETERMINE WHERE PIPING SHALL CHANGED. NOTE THAT EXISTING 1/2" HOT WATER AND HEAT PUMP LOOP BRANCH PIPING SHALL BE CHANGED TO A MINIMUM OF 3/4". SEE DETAILS 13/M401, 14/M401, & 15/M401 FOR DETAILS ON HOW BRANCH PIPING ON THE HEAT PUMP LOOP SHALL BE INCREASED.

MECHANICAL CONTRACTOR NOTES

- 1. PIPING SUBC. SHALL INSTALL NEW NEW SOURCE HEAT PUMP. CONTRACTOR SHALL COORDINATE ALL INSTALLATION DETAILS WITH MANUFACTURER. ADJUST EXISTING MOUNTING TO ACCOMMODATED LARGER UNITS. USE MINIMUM OF 3/8" HANGER ROD. MANUFACTURER SHALL PROVIDE HANGER BRACKETS WITH VIBRATION ISOLATORS FOR UNIT MOUNTING. SLOPE UNIT 1/4" TO UNIT CONDENSATE DRAIN. PROVIDE NEW "P" TRAP AS SHOWN IN DETAIL 16/401. CONNECT UNIT TO EXISTING CONDENSATE PIPING. FLUSH EXISTING CONDENSATE PIPING AND RE-SLOPE TO ASSURE 1/8" PER FOOT. RUN NEW BRANCH HEAT PUMP LOOP PIPING AND PROVIDE NEW HOSE KITS. SEE DETAILS 8/M401, 13/M401, 15/M401 FOR BRANCH PIPE SIZING.
- 2. PIPING SUBC. SHALL INSTALL NEW CABINET UNIT HEATER, SEE PIPING DETAIL 11/M401.
- 3. PIPING SUBC. SHALL RE-PIPE EXISTING RADIANT PANELS AND FIN TUBE RADIATION, SEE PIPING DETAIL
- 4. PIPING SUBC. SHALL RE-PIPE EXISTING PROPELLER UNIT HEATER. SEE PIPING DETAIL 11/M401.
- 5. PIPING SUBC. SHALL PROVIDE NEW BRANCH PIPING AND HOSE KIT FOR HEAT PUMPS IN MEZZANINE. SEE HOSE KIT DETAIL 8/M401. RELOCATE HEAT PUMP MAINS IN THIS ARES IF REQUIRED TO REMOVE AND INSTALL NEW UNITŚ.



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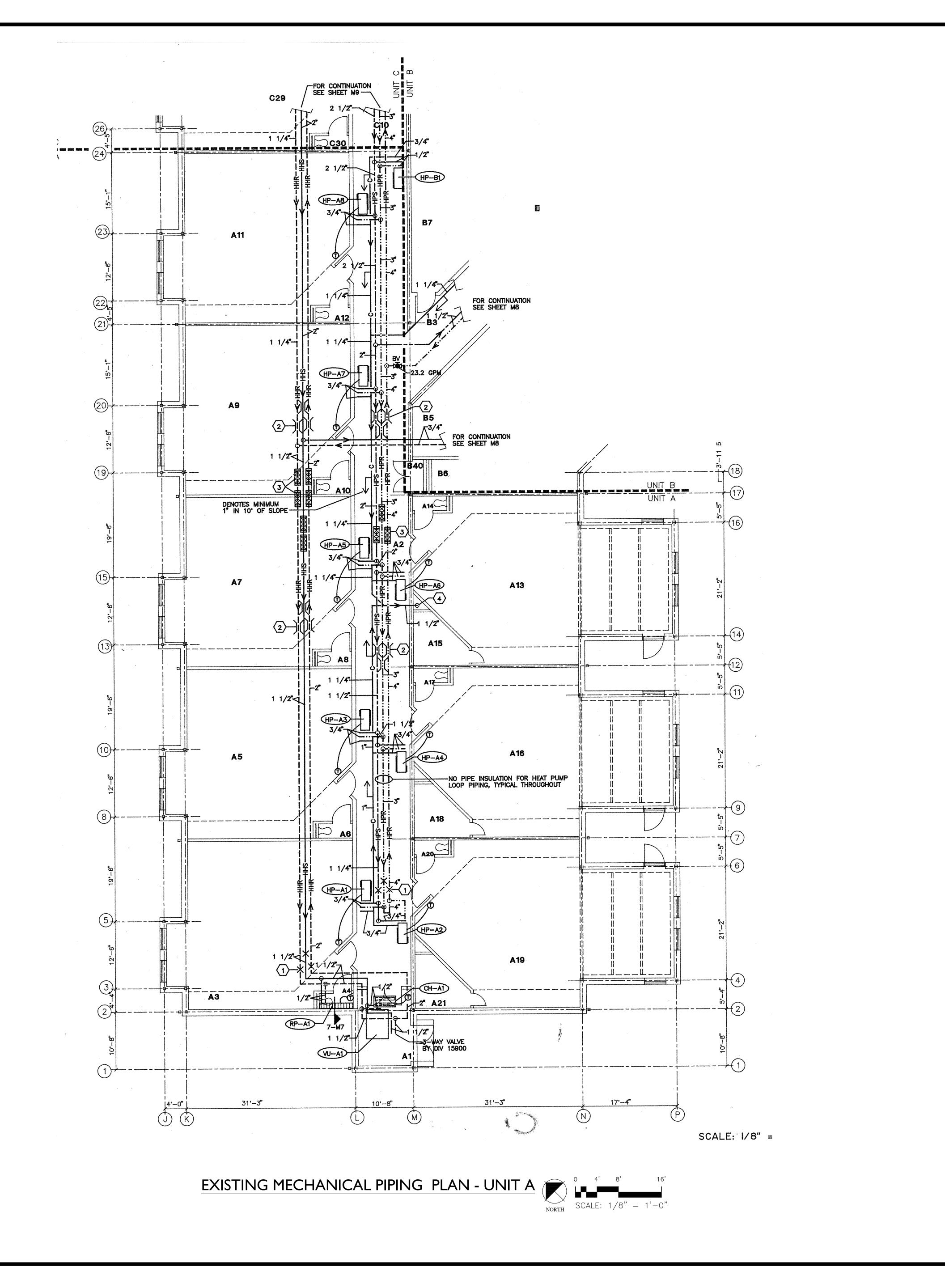
Elementar Fishers, IN $\mathbf{\Omega}$

M-210

MECHANICAL PIPING PLAN

UNIT E

PROPRIETARY AND CONFIDENTIAL



New Britton Elementary School
Fishers, IN

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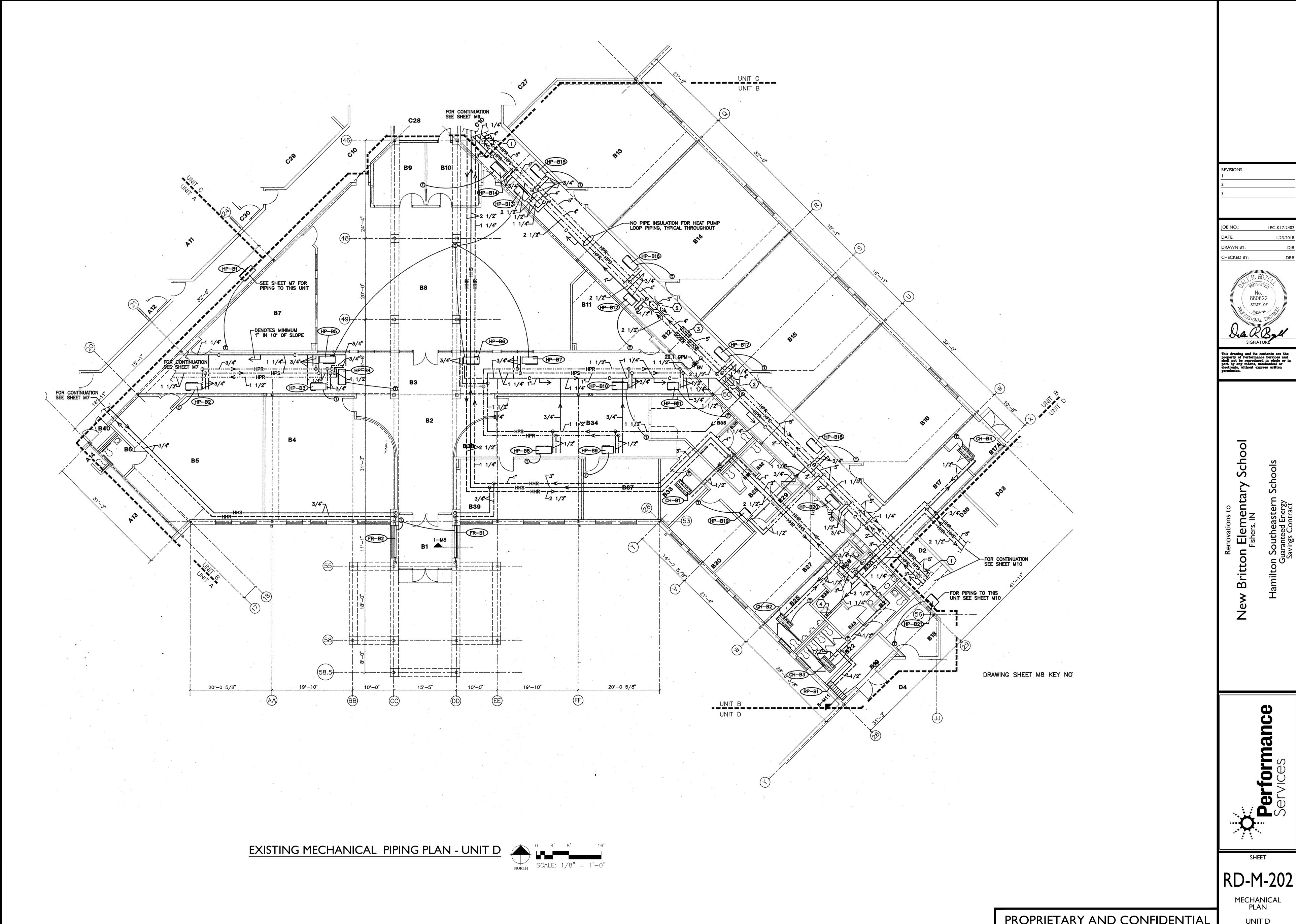
Performance

SHEE

RD-M-201

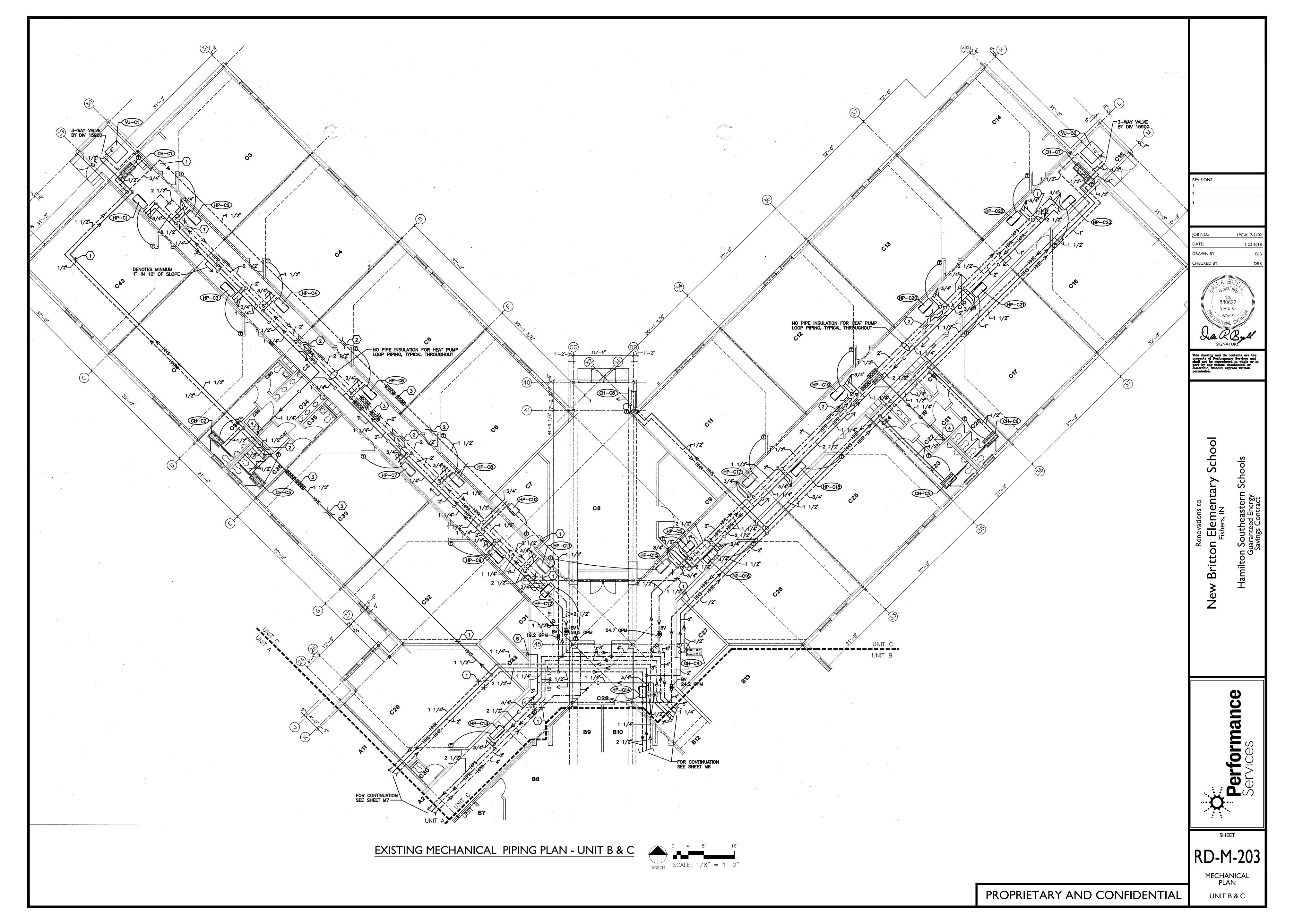
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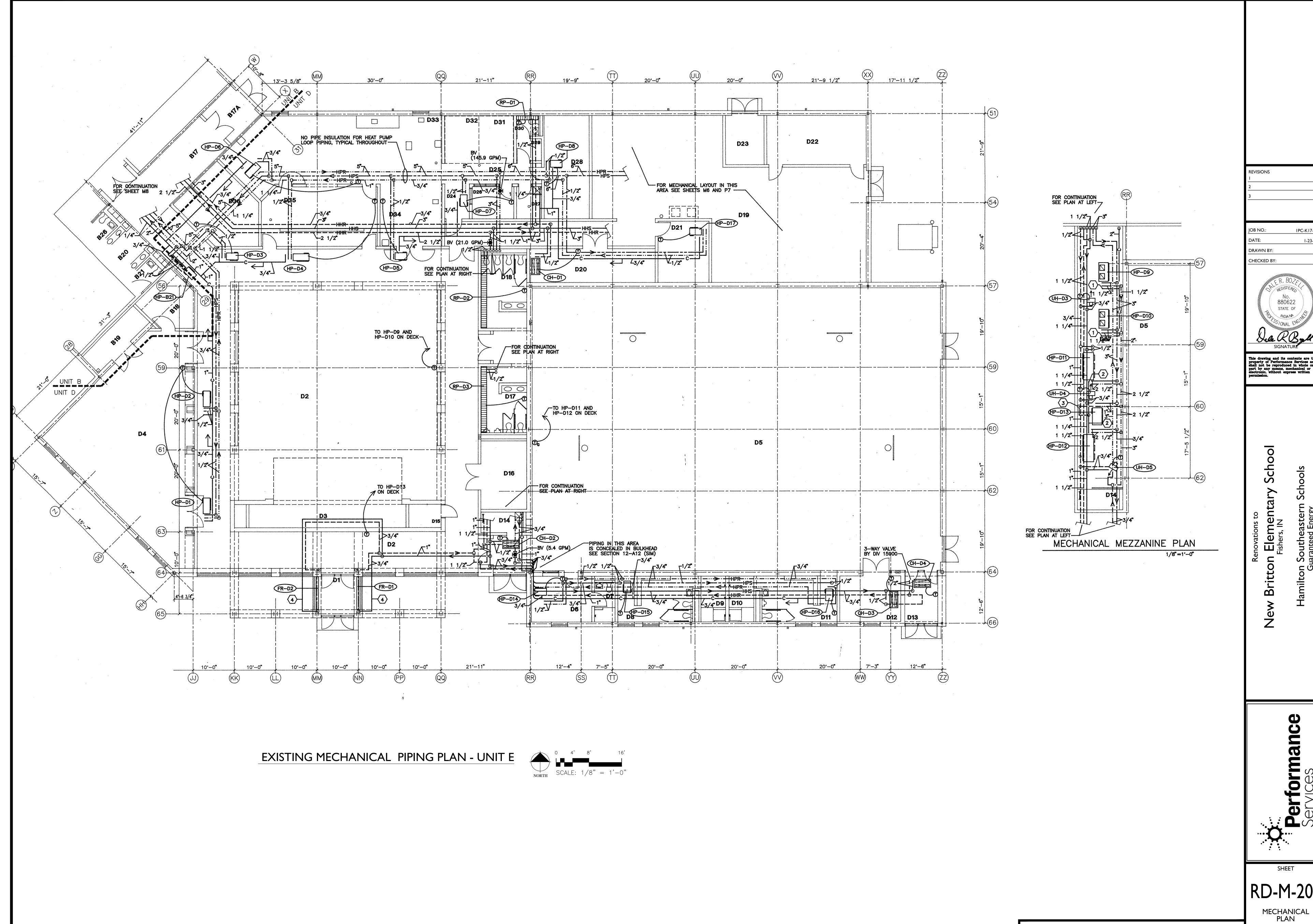
MECHANICAL PLAN UNIT A



PROPRIETARY AND CONFIDENTIAL

MECHANICAL PLAN UNIT D

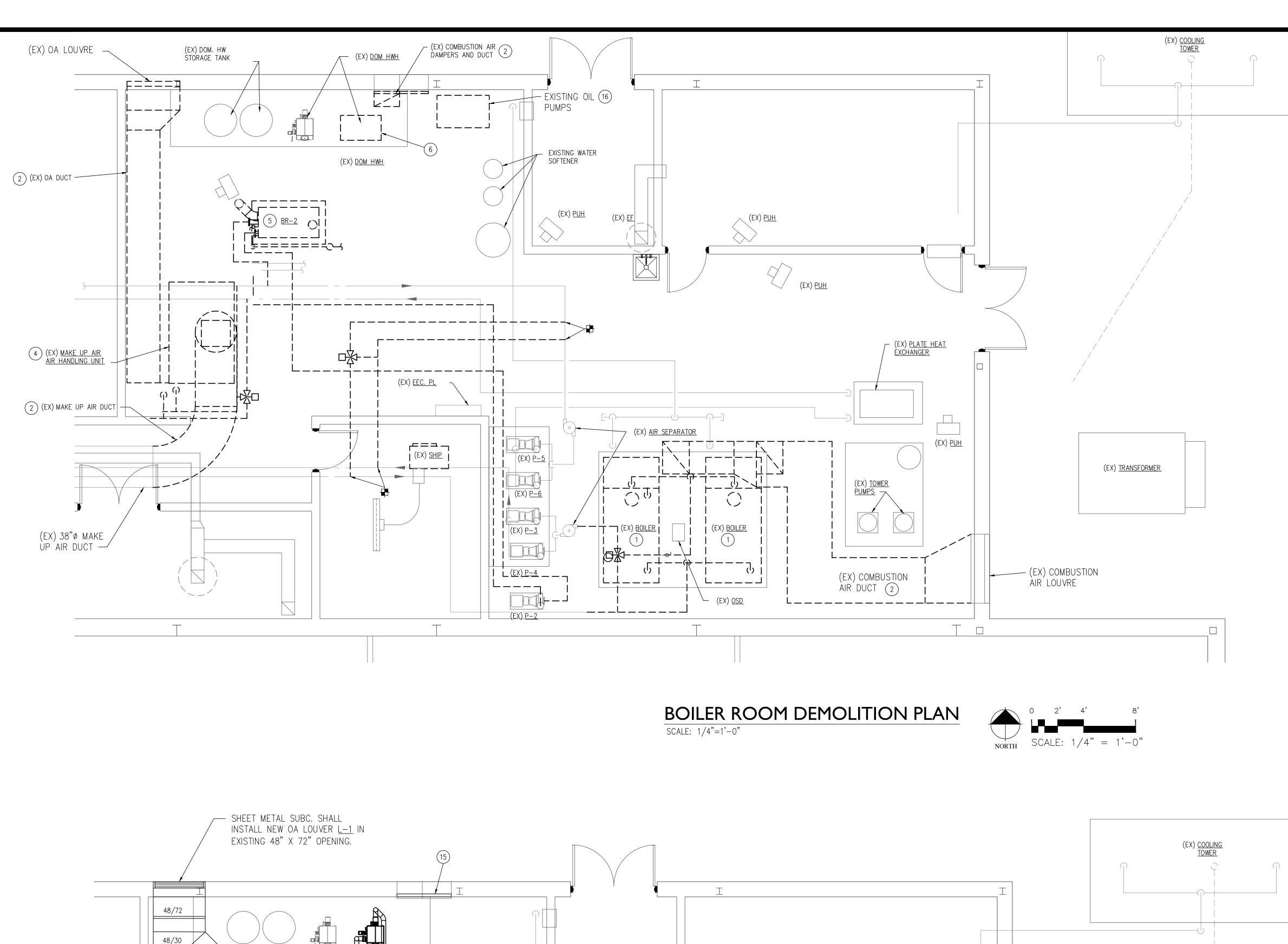


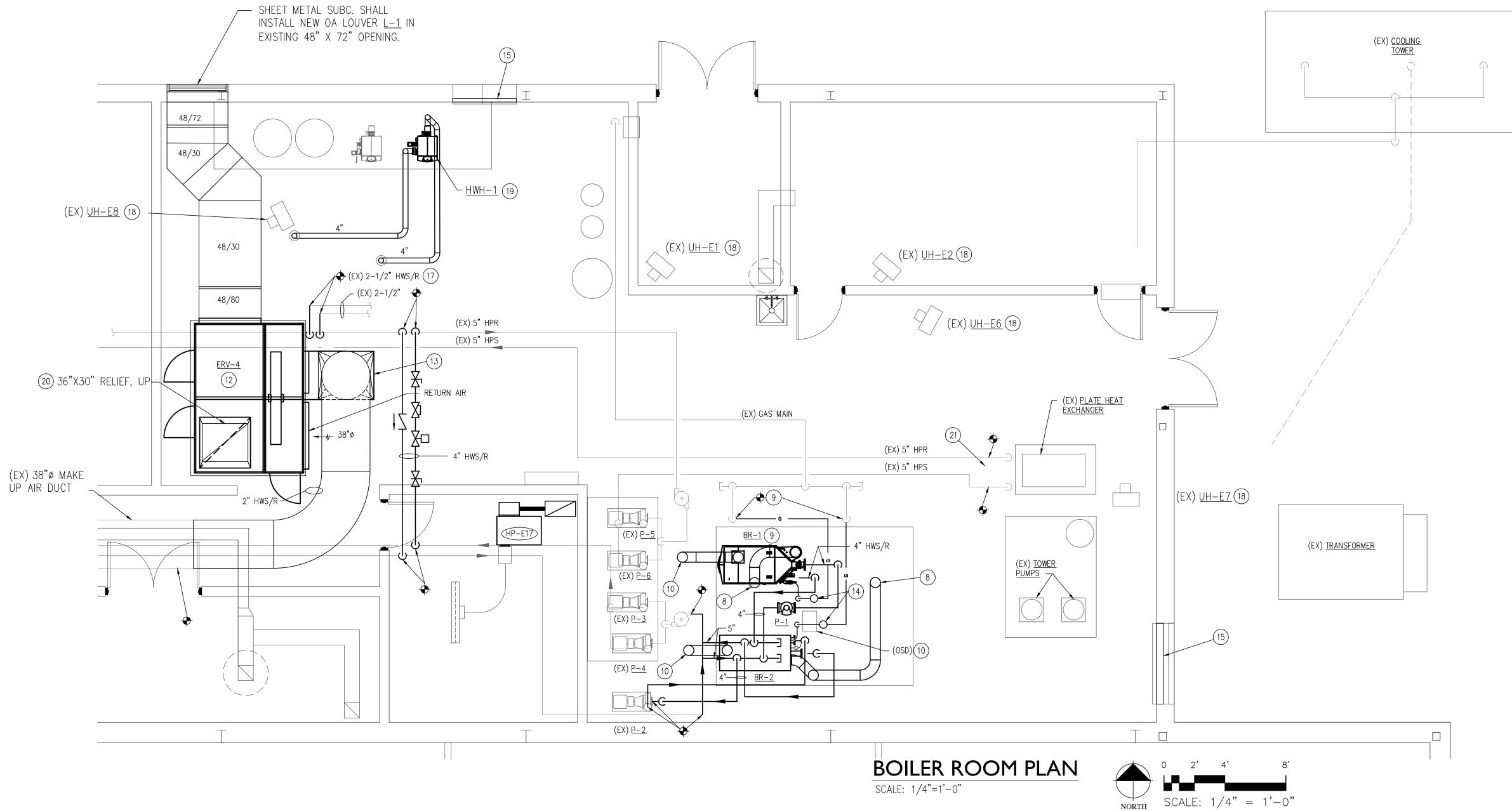


RD-M-204

UNIT E

PROPRIETARY AND CONFIDENTIAL





GENERAL DEMOLITION NOTES

- 1. ALL CONTRACTORS SHALL DISPOSE OF REMOVED MATERIALS OFF SITE. OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL REMOVED EQUIPMENT AND/OR PARTS.
- 2. EXISTING EQUIPMENT AND PIPING SIZES INDICATED ARE AS SHOWN ON ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS AS REQUIRED TO
- 3. PIPING, EQUIPMENT AND/OR DUCTWORK SHOWN AS DARK AND DASHED ON PLAN INDICATES EXISTING EQUIPMENT TO BE REMOVED. PLANS INDICATE EXISTING PIPING AS SHOWN ON ORIGINAL PLAN. SUBCONTRACTORS SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PIPING.
- 4. CONTRACTORS SHALL PATCH HOLES IN WALLS, FLOORS AND CEILINGS WHERE THEY REMOVE PIPING, DUCTWORK, CONDUITS, ETC. MATCH SURROUNDING SURFACE FINISHES.

MECHANICAL CONTRACTOR NOTES

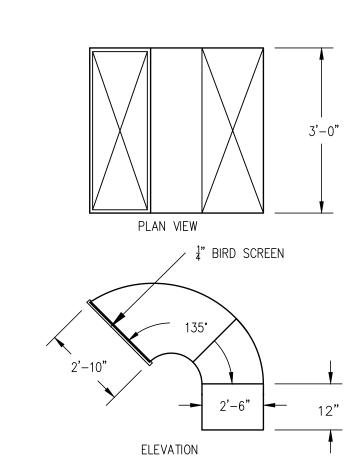
- 1. PIPING SUBC. SHALL REMOVE EXISTING BOILERS AND ASSOCIATED PIPING, VALVES ETC. AS REQUIRE BY INSTALLATION OF NEW BOILERS.
- 2. SHEET METAL SUBC. SHALL REMOVE EXISTING MAKE UP AIR DUCT AND COMBUSTION AIR DUCT.
- 3. PIPING SUBC. REMOVE EXISTING MAKE UP AIR HANDLING UNIT AND HOT WATER PIPING.
- 4. PIPING SUBC. SHALL REMOVE EXISTING MAKE UP AIR UNIT AND ASSOCIATED PIPING COMPLETE.
- 5. PIPING SUBC. SHALL RELOCATE EXISTING BOILER AND PIPING AS REQUIRED FOR NEW WORK.
- 6. PIPING SUBC. SHALL REMOVE EXISTING DOMESTIC HOT WATER HEATER AND REVISE PIPING AS REQUIRE FOR NEW
- MOUNT BOILER ON EXISTING CONCRETE PAD. RUN 3/4" PCV CONDENSATE LINE TO (EX) OPEN SITE DRAIN. SEE BOILER PIPING DIAGRAM 2/M401.

7. SHEET METAL SUBC. SHALL INSTALL NEW CONDENSING BOILER AND ASSOCIATED INLINE PRIMARY HW PUMP.

- 8. SHEET METAL SUBC. SHALL PROVIDE AND INSTALL 10" VENT AND AIR INLET FROM BOILER THRU EXISTING FLUE OPENINGS. PROVIDE FLASHING AS REQUIRED. PROVIDE 29-4C DOUBLE WALL STAINLESS DUCT FOR VENT PIPING. SEE DETAIL 3/M401
- 9. PIPING SUBC SHALL RUN NEW 2" BRANCH GAS PIPING TO BOILER. INSTALL GAS REGULATOR PROVIDED BY
- 10. PIPING SUBC SHALL RUN 3/4" PVC CONDENSATE FROM BOILER TO EXISTING OPEN SITE DRAIN (OSD). PROVIDE ACID NEUTRALIZING KIT PROVIDED BY BOILER MANUF.
- 11. SHEET METAL SUBC. SHALL PROVIDE AND INSTALL 10"Ø AIR INLET FROM BOILER THRU EXISTING ROOF. SHEET METAL SUBC. SHALL CUT HOLE PROVIDE CURB AND FLASH AS REQUIRED. INLET AIR DUCT SHALL BE INSULATED. SEE DETAIL 3/M401.
- 12. PIPING SUBC SHALL INSTALL NEW ENERGY RECOVERY UNIT ERV-4. PROVIDE NEW 4" HOUSEKEEPING PAD. SEE PIPING DIAGRAM 6/M401.
- 13. SHEET METAL SUBC SHALL PROVIDE PLENUM FOR ERV SUPPLY AIR OUTLET. PLENUM SHALL EXTEND OVER OUTLET REHEAT COIL WHICH IS APPROX. 34" WIDE X 76" HIGH. TRANSITION NEW 38" SUPPLY AIR DUCT INTO
- 14. PIPING SUBC. SHALL INSTALL NEW GAS REGULATOR PROVIDED BY BOILER MANUF. ON NEW BOILER BR-1 AND
- RELOCATE EXISTING REGULATOR ON BR-2.
- 15. SHEET METAL SUBC. SHALL PAN OFF AND INSULATE EXISTING LOUVER OPENING. 16. PIPING SUBC. SHALL REMOVE EXISTING OIL PUMPS AND ASSOCIATED PIPING COMPLETE.

ROOM. SEE PIPING DIAGRAN 11/M401

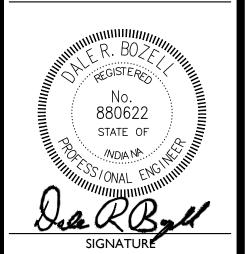
- 17. PIPING SUBC. SHALL CONNECT INTO EXISTING 2-1/2" HWS/R PIPING THAT IS RUN TO THE EXISTING MAKE UP AIR UNIT AND RUN NEW 2" BRANCH PIPING TO ERV-4.
- 18. PIPING SUBC SHALL MAINTAIN THE EXISTING HWS/R PIPING TO EXISTING PROPELLER UNIT HEATERS IN BOILER
- 19. PIPING SUBC. SHALL INSTALL NEW DOMESTIC HOT WATER HEATER. RECONNECT EXISTING GAS LINE FROM REMOVED HWH. RUN 4" CPVC VENT AND 4" PVC AIR INLET PIPE UP TO EXISTING OPENINGS USED FOR THE RELOCATED AERCO BOILER. PROVIDE FLASHING AS REQUIRED. SEE DETAIL 4/M401 & 5/M401. RUN NEW 3/4 PVC CONDENSATE LINE TO OSD.
- 20. SHEET METAL SUBC. SHALL TRANSITION ERV RELIEF OPENING UP TO 36" X 30" OPENING ON ROOF. SHEET METAL SUBC. SHALL PROVIDE SLOPED CURB AND GOOSE NECK RELIEF DUCT FITTING AS SHOWN IN DETAIL 1/M301. SHEET METAL SHALL REINFORCE PERIMETER OF CURB OPENING WITH ANGLE IRON SUPPORT WELDED TO ADJACENT JOIST, SEE DETAIL 12/M401. PAINT EXTERIOR DUCT TO MATCH EXISTING METAL ROOF COLOR.
- 21. PIPING SUBC. SHALL INSTALL CONTROL VALVE PROVIDED BY PSI IN NEW 5" HEAT EXCHANGER BYPASS LINE.



GOOSE NECK OSA DETAIL

REVISIONS

IPC-K17-2402 1-23-2018 **DRAWN BY:** CHECKED BY:



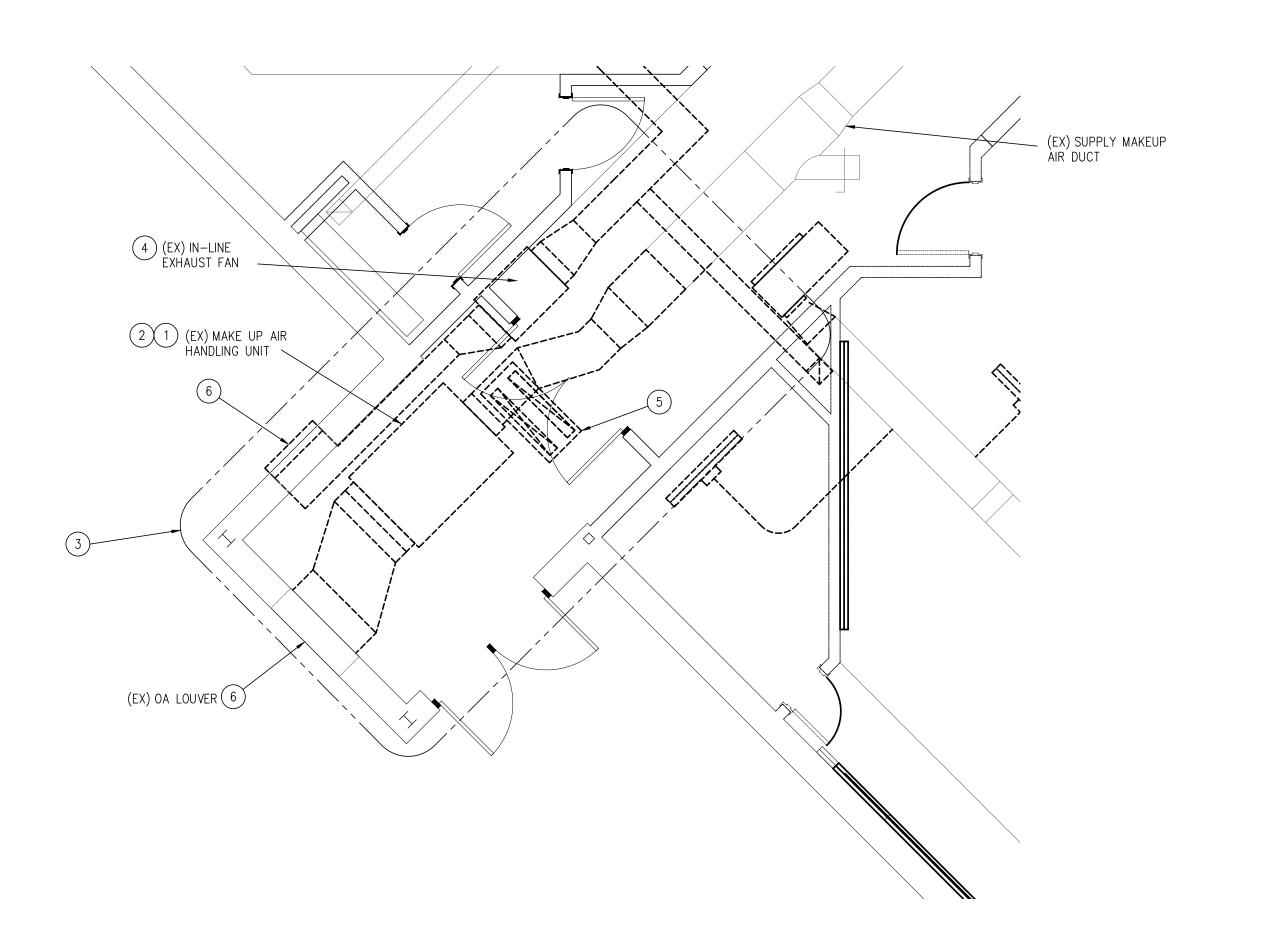
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Element Fishers, IN

M-301

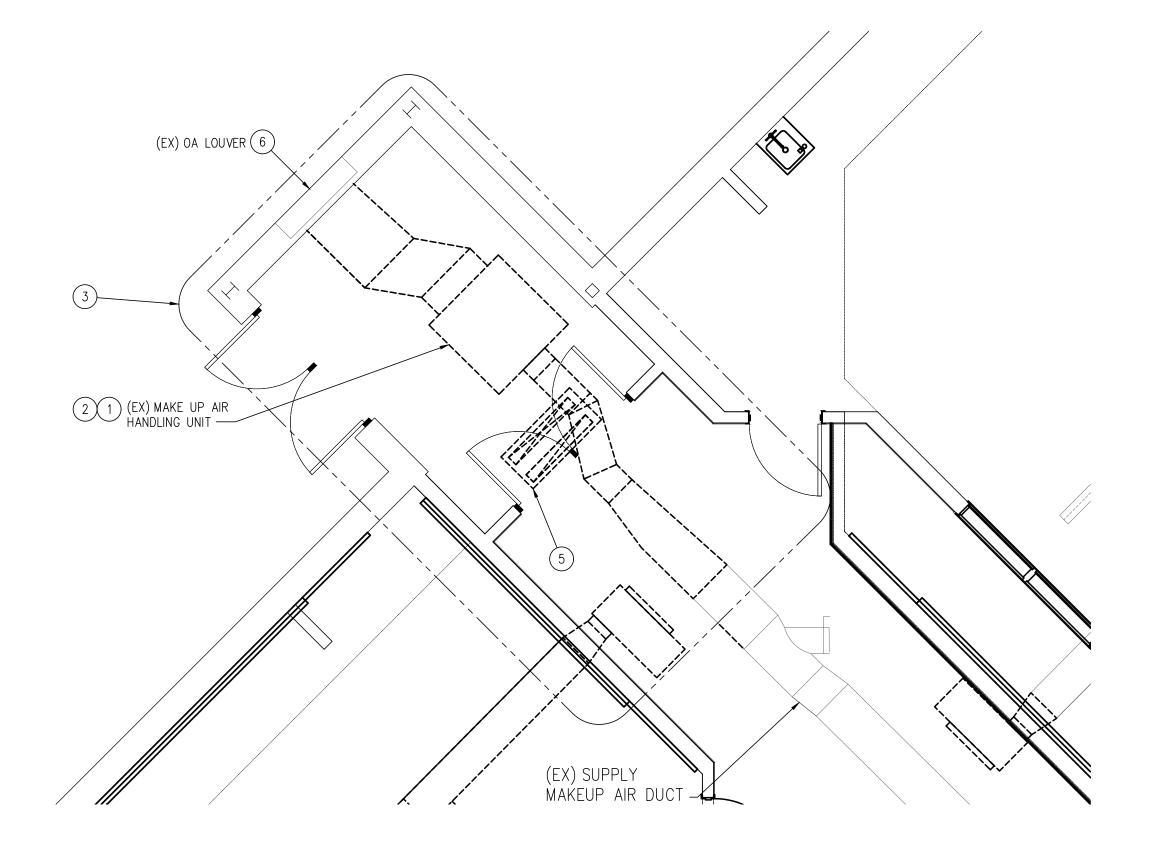
ENLARGED BOILER ROOM PLAN

PROPRIETARY AND CONFIDENTIAL

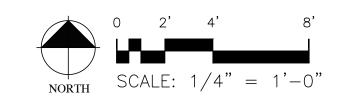


ERV UNIT SUPPORT PLAN - UNIT A

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



ERV UNIT SUPPORT PLAN - UNIT B SCALE: 1/4"=1'-0"



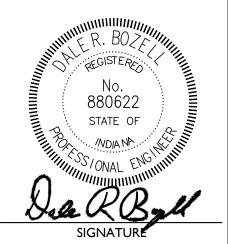
GENERAL DEMOLITION NOTES

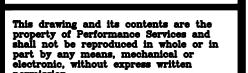
- 1. ALL CONTRACTORS SHALL DISPOSE OF REMOVED MATERIALS OFF SITE. OWNER HAS FIRST RIGHT OF REFUSAL FOR ALL REMOVED EQUIPMENT AND/OR PARTS.
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- 3. PIPING, EQUIPMENT AND/OR DUCTWORK SHOWN AS DARK AND DASHED ON PLAN INDICATES EXISTING EQUIPMENT TO BE REMOVED. PLANS INDICATE EXISTING PIPING AS SHOWN ON ORIGINAL PLAN. SUBCONTRACTORS SHALL BE RESPONSIBLE TO FIELD VERIFY ALL PIPING.
- 4. CONTRACTORS SHALL PATCH HOLES IN WALLS, FLOORS AND CEILINGS WHERE THEY REMOVE PIPING, DUCTWORK, CONDUITS, ETC. MATCH SURROUNDING SURFACE FINISHES.

MECHANICAL CONTRACTOR NOTES

- 1. SHEET METAL SUBC. SHALL REMOVE EXISTING DUCTWORK AS REQUIRE FOR NEW ERV AND DUCT COIL.
- 2. PIPING SUBC. REMOVE EXISTING MAKE UP AIR HANDLING UNIT AND HOT WATER PIPING.
- 3. PIPING SUBC. SHALL MODIFY EXISTING HEAT PUMP AND HOT WATER HEATING PIPING IN THIS AREA, IN PREPARATION FOR INSTALLATION OF NEW ENERGY RECOVERY UNIT AND REHEAT COIL.
- 4. SHEET METAL SUBC. SHALL REMOVE EXISTING INLINE EXHAUST FAN AND DUCT AS NOTE ON PLAN.
- 5. PIPING SUBC. SHALL REMOVE EXISTING CABINET UNIT HEATER AND ASSOCIATED PIPING AS REQUIRED FOR NEW
- 6. EXISTING EXHAUST AND OA LOUVERS SHALL REMAIN.

IPC-K17-2402 DRAWN BY: CHECKED BY:

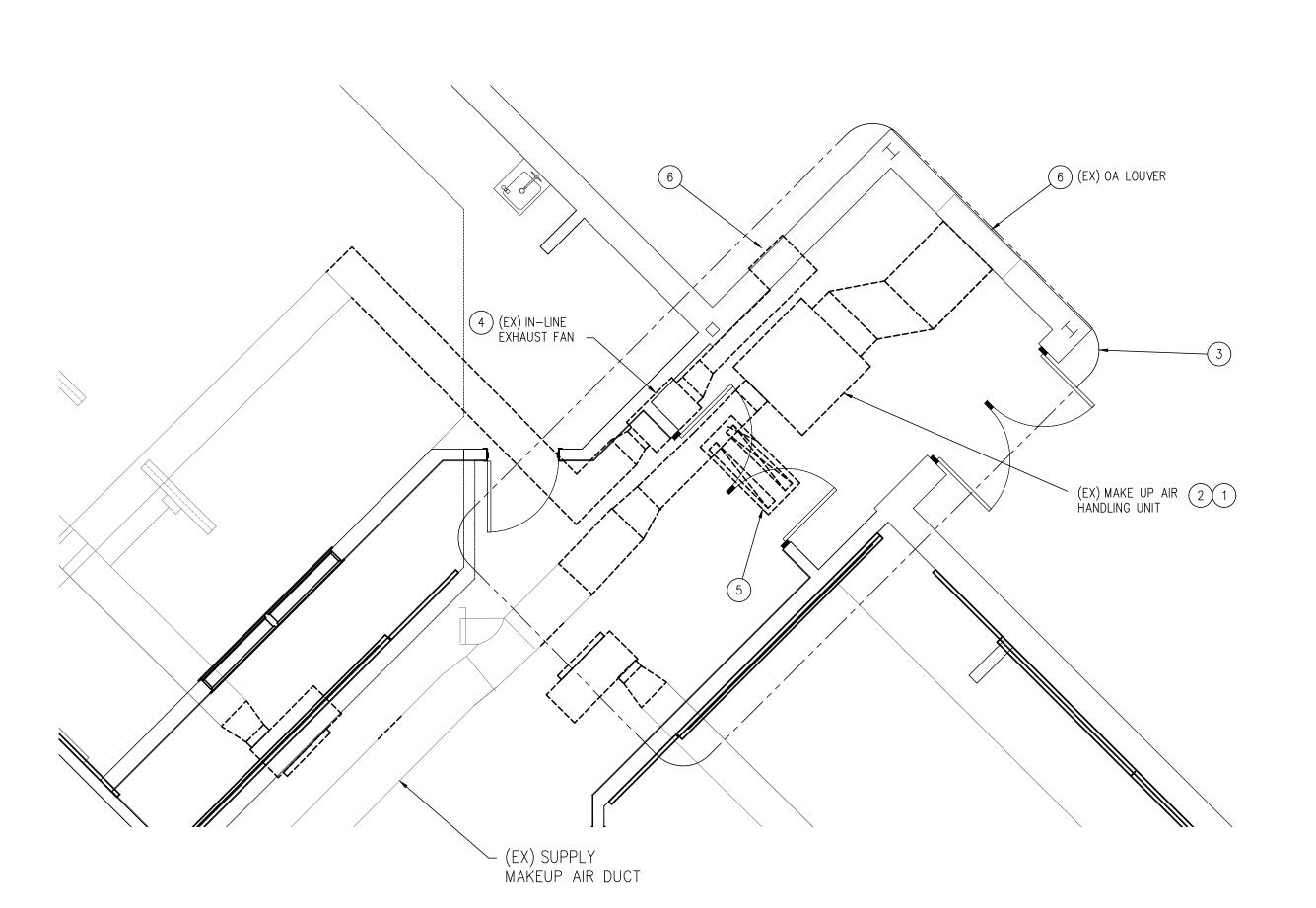




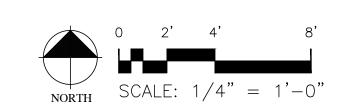
Elementary Fishers, IN

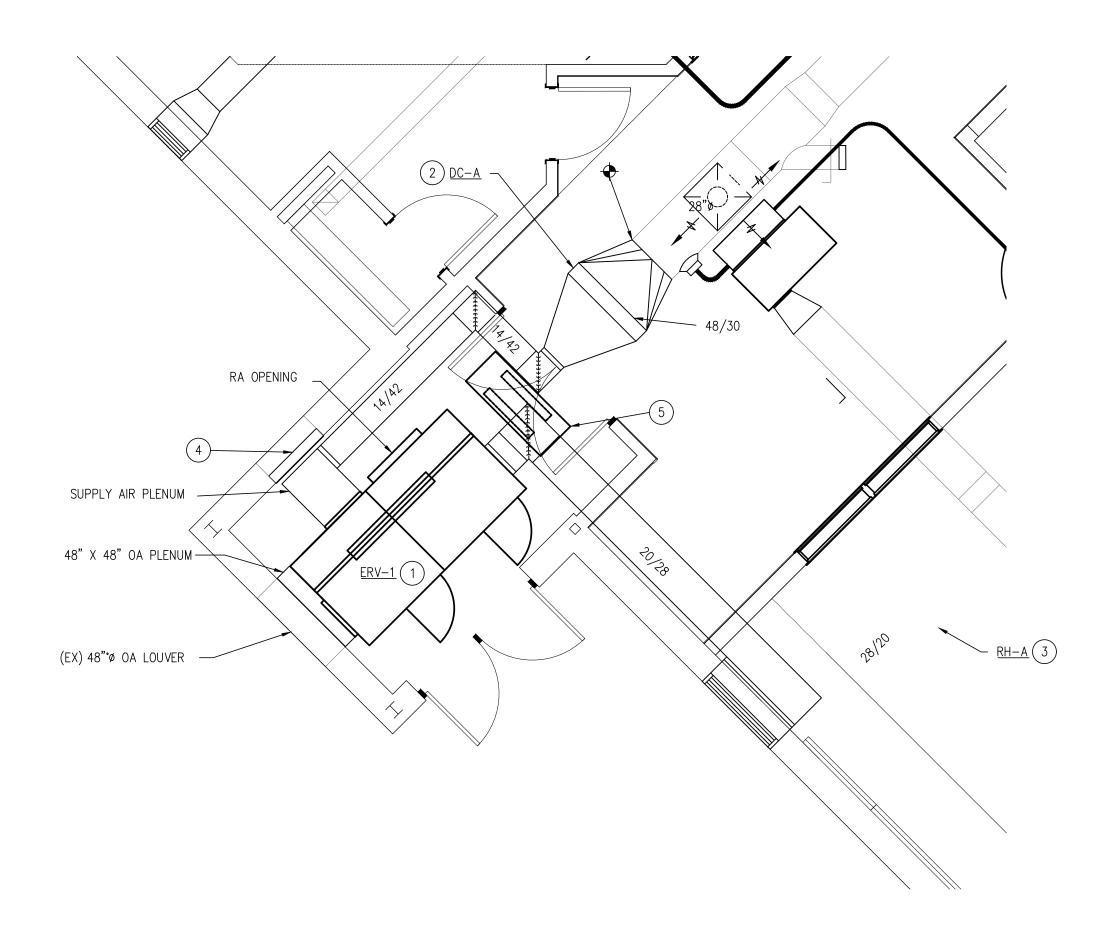
M-302

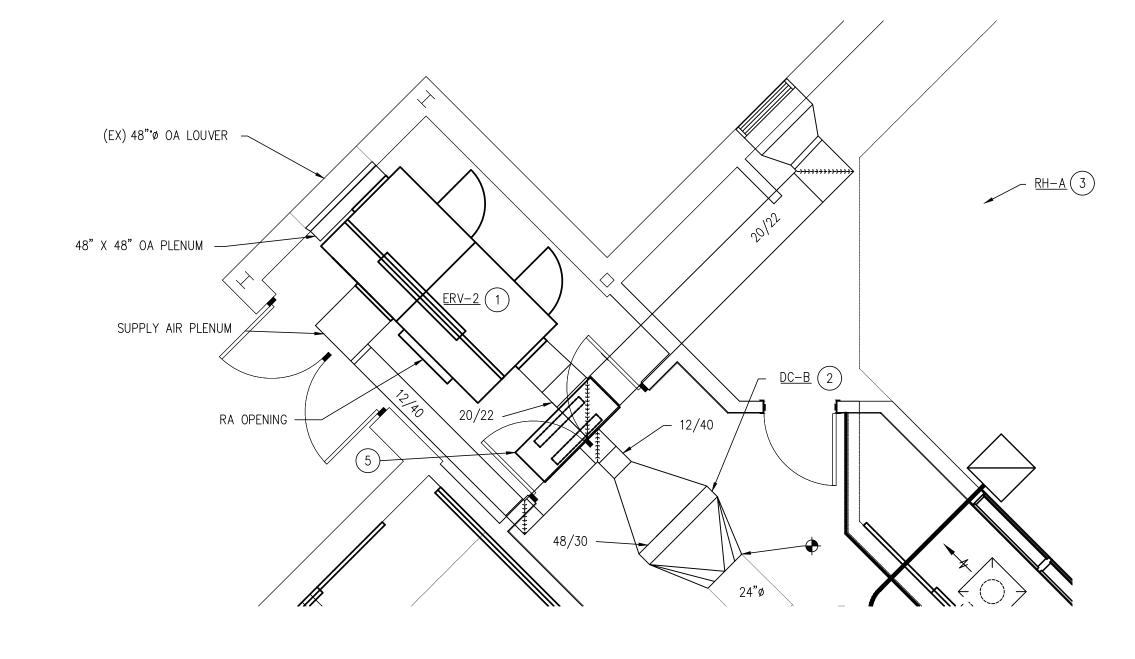
ENLARGED ERV MECHANICAL DEMOLITION PLAN



ERV UNIT SUPPORT PLAN - UNIT C
SCALE: 1/4"=1'-0"

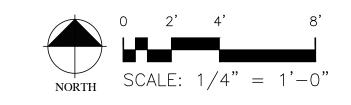


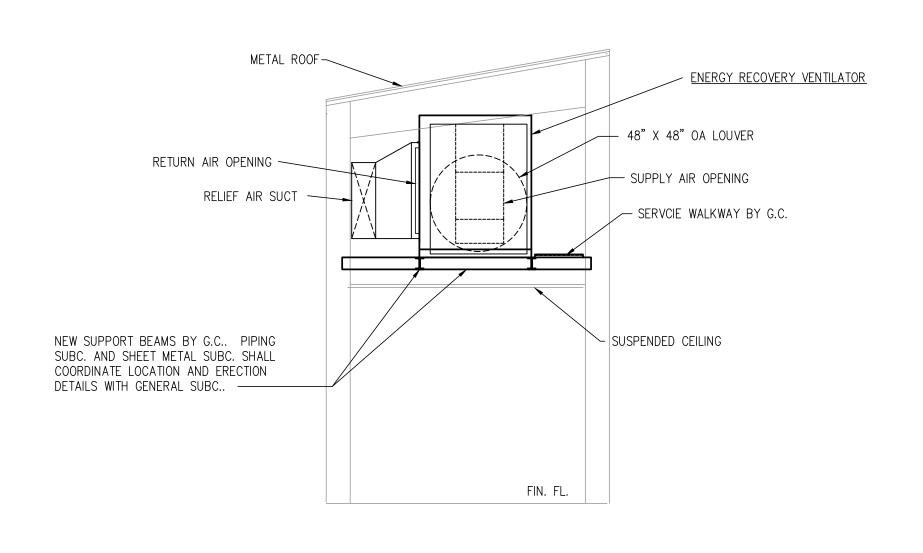




ERV UNIT SUPPORT PLAN - UNIT B

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



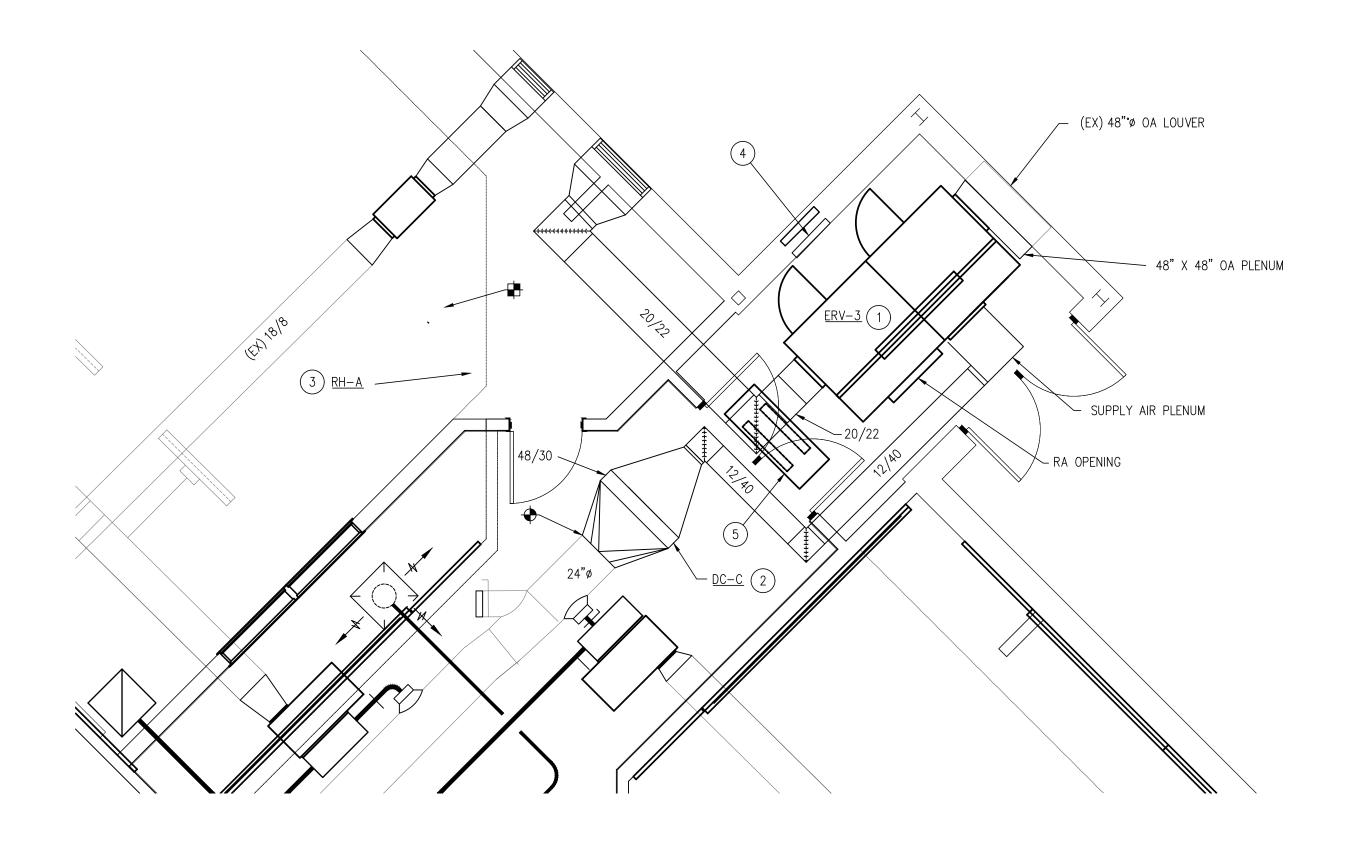


ERV UNIT SUPPORT PLAN - UNIT A

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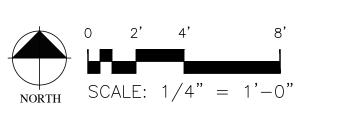
TYPICAL SECTION

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



ERV UNIT SUPPORT PLAN - UNIT C

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



GENERAL NOTES

- 1. PIPING SUBC. SHALL INSTALL ENERGY RECOVERY VENTILATOR (ERV). COORDINATE PLACEMENT WITH SHEET METAL SUBC. AND GENERAL SUBC. SEE SEE SHEET S-201D FOR STRUCTURAL MOUNTING DETAILS.
- 2. PIPING SUBC. SHALL INSTALL DUCT COIL. COORDINATE LOCATION WITH SHEET METAL SUBC.
- 3. SHEET MEAL SUBC SHALL INSTALL RELIEF HOOD COMPLETE. PSI SHALL PROVIDE SLOPED CURB. SEE ROOF OPENING SUPPORT DETAIL 12/M401.
- 4. SHEET METAL SUBC. SHALL PROVIDE INSULATED SHEET METAL CAP BEHIND EXISTING EXHAUST FAN LOUVER.
- 5. PIPING CONTRACTOR SHALL INSTALL NEW CABINET UNIT HEATER. COORDINATE LOCATION WITH NEW ERV SUPPORT STEEL TO ASSURE ACCESSIBILITY OF UNIT FOR SERVICE.

REVISIONS

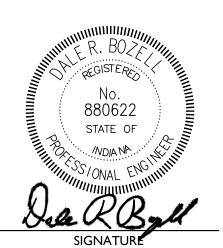
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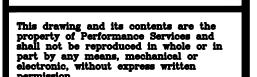
 JOB NO.:
 IPC-K17-2402

 DATE:
 I-23-2018

 DRAWN BY:
 DJB

 CHECKED BY:
 DRB



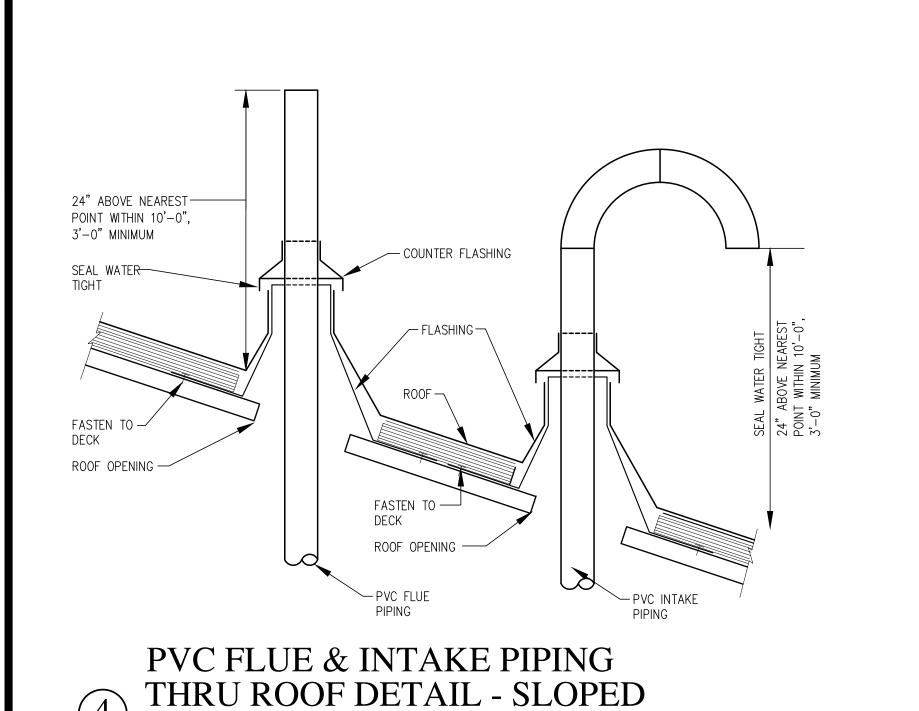


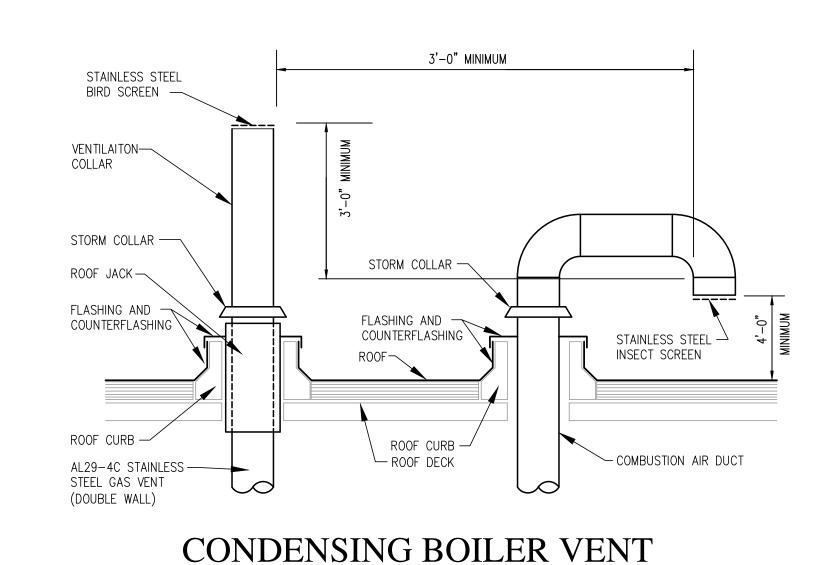
Britton Elementary School
Fishers, IN

Performance Services

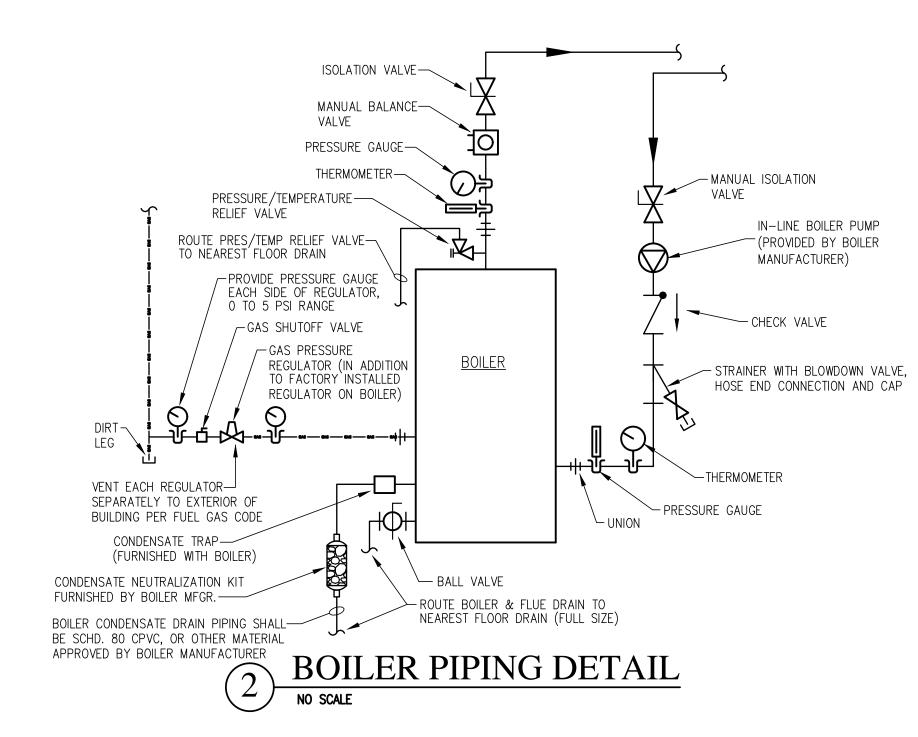
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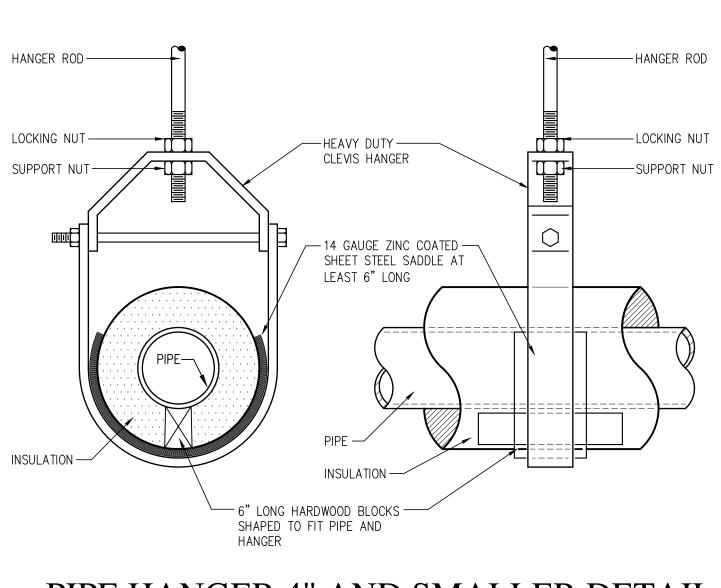
ENLARGED ERV MECHANICAL PLAN



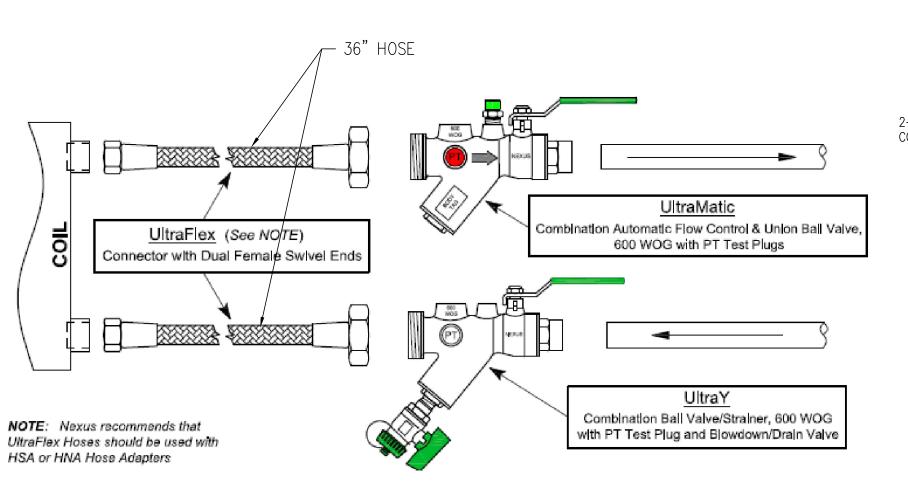


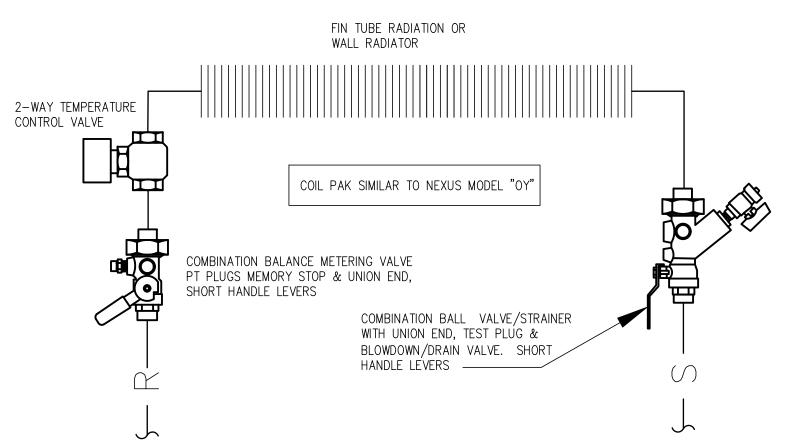
AND COMBUSTION AIR DETAIL

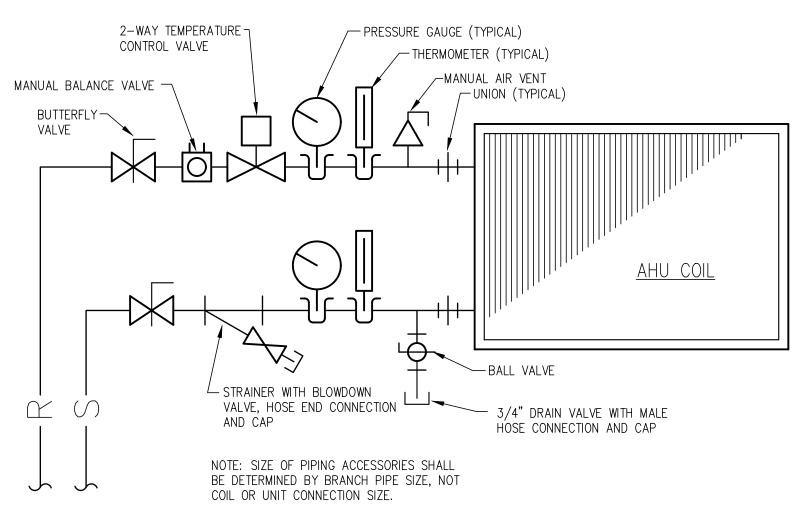


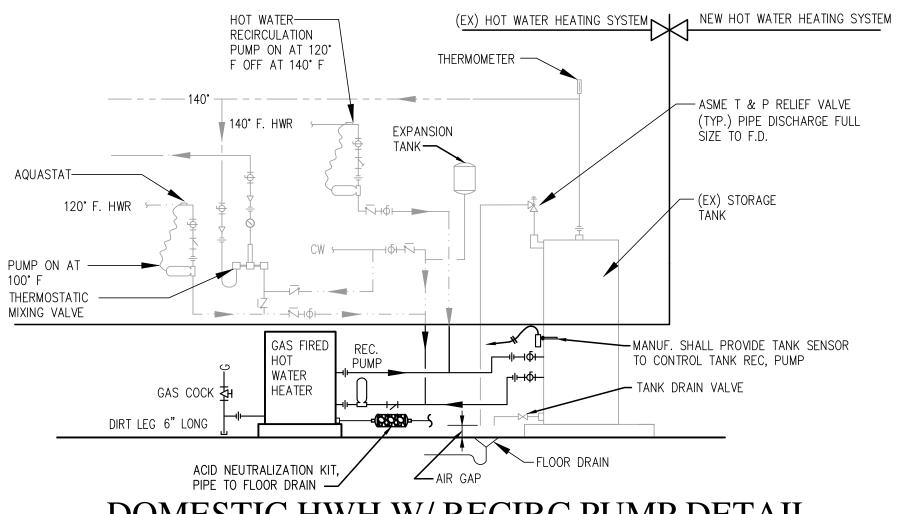


PIPE HANGER 4" AND SMALLER DETAIL



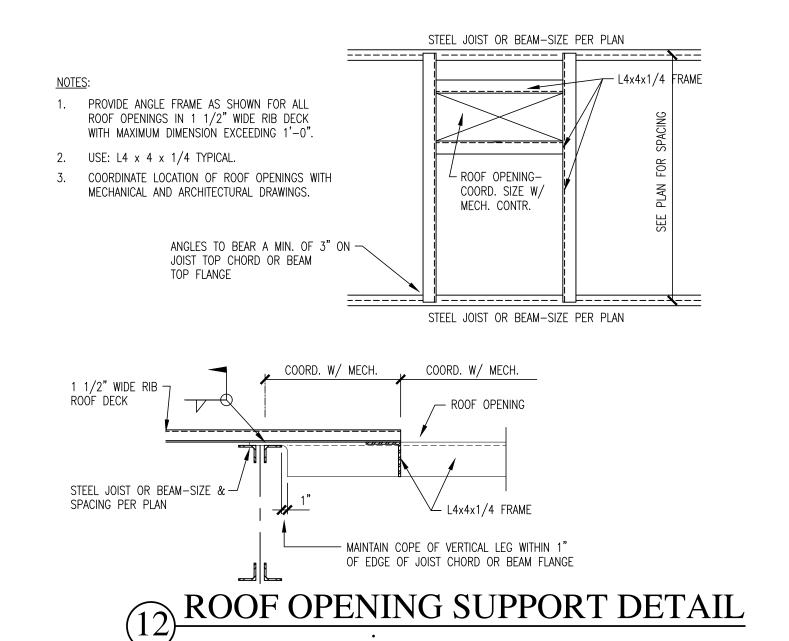


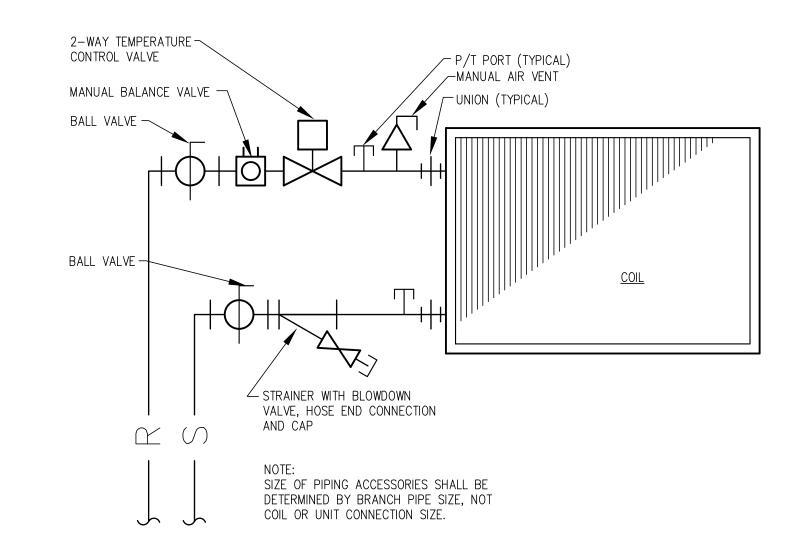




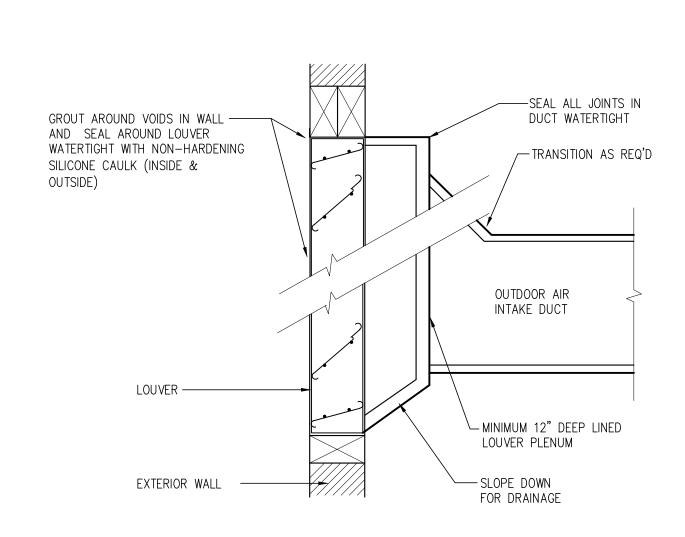


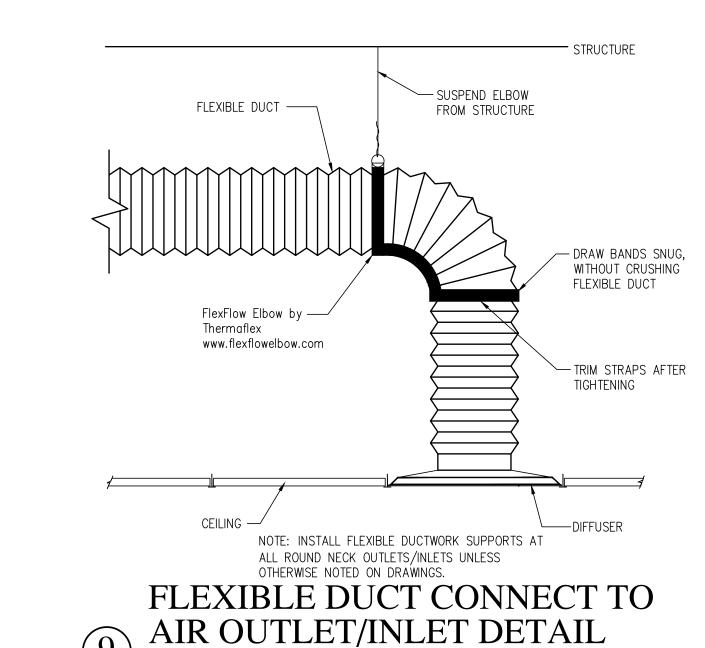
WATER SOURCE 8 HEAT PUMP PIPING DETAIL NO SCALE



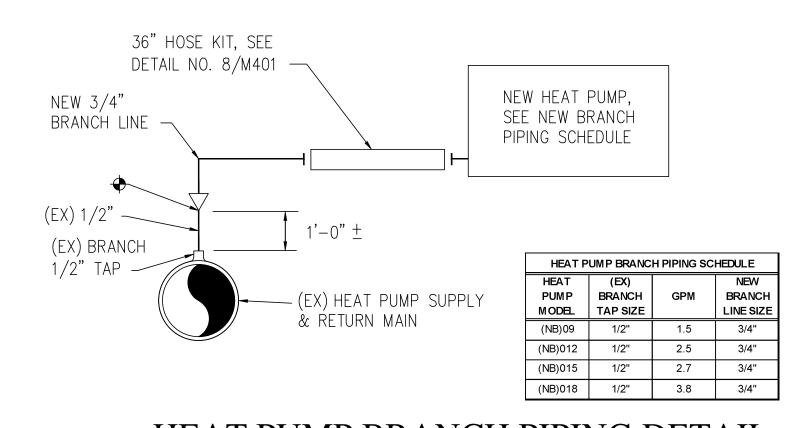


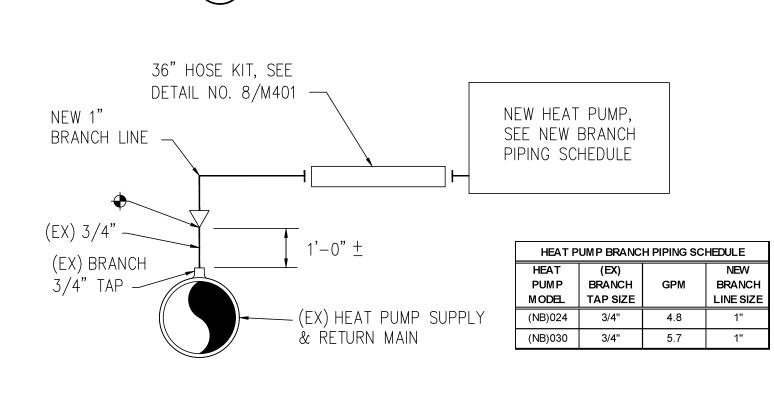
RADIATION AND WALL RADIATOR DETAIL



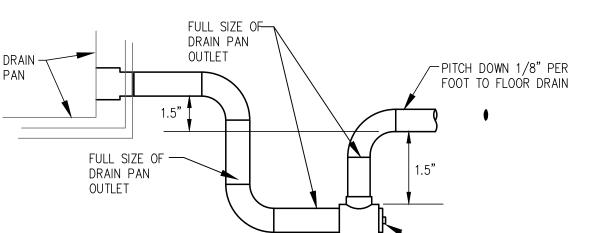








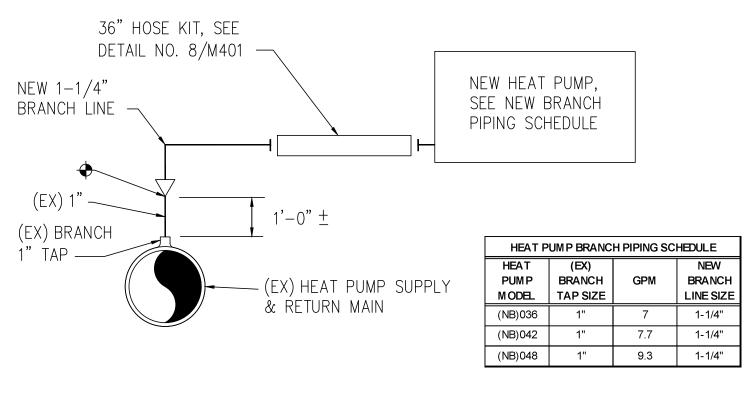
HEAT PUMP BRANCH PIPING DETAIL



15 HEAT PUMP BRANCH PIPING DETAIL

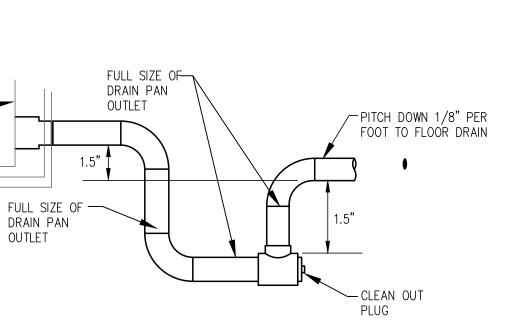
NO SCALE

TERMINAL UNIT PIPING DETAIL



HEAT PUMP BRANCH PIPING DETAIL

PROPRIETARY AND CONFIDENTIAL



COOLING COIL CONDENSATE DRAIN DETAIL

No scale

Element Fishers, IN $\mathbf{\Omega}$

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REVISIONS

DRAWN BY:

CHECKED BY:

880622

STATE OF

IPC-K17-2402

1-23-2018

SHEET M-40 I

MECHANICAL DETAILS

			DU	JCT H	I EA	TIN	G C	OIL	SCH	IEDULI	E				
						HEA	TNG COIL	PERFO	RMANC	E					
MARK NO	(CFM)	FIN HEIGHT (in.)	FIN LENGTH (in.)	EAT-DB (°F)	LAT- DB (°F)	МВН	F.V. (ft/min)	A.P.D. (in. w.g.)	Fluid	EWT (°F)	LWT (°F)	(GPM)	W.P.D. (ft/w.c.)	Rows	FPI
DC-A	5150	30.25	48.00	35.0	71.5	203.6	511	0.22	Water	135.0	98.7	11.4	2.8	2	9
DC-B	3850	30.25	48.00	35.0	72.5	156.5	382	0.13	Water	135.0	99.9	9.1	1.1	2	10
DC-C	3850	30.25	48.00	35.0	72.5	156.5	382	0.13	Water	135.0	99.9	9.1	1.1	2	10

1. The sheetmetal contractor shall make all nessesary ductwork modifications required to properly install the coil.

2. Coils shall have min	mum 0.20" wall thickness	S.		
	DOMEST	IC HOT WA	ATER HEATE	R SCHEDULE
		NI @		LIOT WATER STORAGE

			INPUT			GPH @		SHIP				HOT W	ATER STO	DRAGE TA	NK		
	TAG	LOCATION	BTUH	VOLTS	FLA	100 DEG RISE	EFF %	WEIGHT	MANUF.	MODEL	QTY	TANK DIMENSION	CONF.	GAL	MANUF.	MODEL	NOTES
	HWH-1	Main Boiler Room	285,000	120	4.5	339	95	235	Lochinvar	Armor AWN286		Ex	istiing tank	to remain			1, 2
L										AVVINZOO							

1. Unit manufacture shall provide tank circulating pump and control sensor. Piping contractor shall install pump and electrical contractor shall wire remote mounted sensor. 2. Piping contractor shall run condensate piping to nearest open site drain. Manufacture shall provide acid neutralizing kit for field installation by piping contractor.

				ATTE	ENUATOR SCH	IEDUI	LE						
MARK NO.	CFM	SP IN. H2O	SIZE W X H X D IN.	Manuf./Model	DESCRIPTION	1	2	OCTIVE I	BAND MID- 4	FREQUEN 5	CIES (DB)	7	8
GS-1	6000	0.08	56" X 56" X 4"	Ruskin/GSV	Grille Silencer	3	14	15	19	29	27	21	16
GS-2	6000	0.08	56" X 56" X 4"	Ruskin/GSV	Grille Silencer	3	14	15	19	29	27	21	16

						CA	BINE	T UNI	T HE	ATER	SC	HED	ULE										
MARK NO.	MANURACTURER	MODEL	DESCRIPTION	UNIT SIZE	CFM	TSP	RPM	FAN SPEED	FAN BHP	EAT	LAT	MBH	EWT	LWT	GPM	WPD	APD	Rows UNIT MCA	TYPE MOTOR	Unit MFS	Unit Voltage	FLA	NOTES
CH-A1	Rittling	FFRW-340 CEILING	Front In, Front Out	4	436	0.15	757	High	0.02	60	109.4	23.9	135	97.6	1.5	1.5	0.1	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
OLL D4	Dittling	EEDIM 240 CEILING	Frank In Frank Out	1 4	436	0.45	757	Linh	0.00	60	100.4	22.0	125	07.0	145	145	0.1	4 00	DCC	45	420/00/4	T 0.00	T
CH-B1 CH-B2	Rittling Rittling	FFRW-340 CEILING FFRW-340 CEILING	Front In, Front Out Front In, Front Out	4	338	0.15 0.15	757 757	High Medium	0.02	60 60	109.4	23.9 18.5	135 135	97.6 97.6	1.5	0.7	0.1	4 0.9 4 0.9	PSC PSC	15 15	120/60/1 120/60/1	0.68 0.68	1,2,3,4,5
CH-B3	•	FFRW-340 CEILING	Front In, Front Out	4	338	0.15	757	Medium	0.02	60	109.4	18.5	135	97.6	1	0.7	0.07	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
								1			1			l		ļ		l l				1	
CH-C1	Rittling	FFRW-340 CEILING	Front In, Front Out	4	436	0.15	757	High	0.02	60	109.4	23.9	135	97.6	1.5	1.5	0.1	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
CH-C2	Rittling	FFRW-340 CEILING	Front In, Front Out	4	338	0.15	757	Medium	0.02	60	109.4	18.5	135	97.6	1	0.7	0.07	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
CH-C3	Rittling	FFRW-340 CEILING	Front In, Front Out	4	338	0.15	757	Medium	0.02	60	109.4	18.5	135	97.6	1	0.7	0.07	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
CH-C4	Rittling	FFRW-340 WALL	Front In, Front Out	4	436	0.15	757	High	0.02	60	109.4	23.9	135	97.6	1.5	1.5	0.1	4 0.9	PSC	15	120/60/1	0.68	1,3,4,5
CH-D1	Rittling	FFRW-340 CEILING	Front In, Front Out	4	436	0.15	757	High	0.02	60	109.4	23.9	135	97.6	1.5	1.5	0.1	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
CH-D2	Rittling	FFRW-340 CEILING	Front In, Front Out	4	338	0.15	757	Medium	0.02	60	109.4	18.5	135	97.6	1.0	0.7	0.07	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
CH-D3	Rittling	FFRW-340 CEILING	Front In, Front Out	4	338	0.15	757	Medium	0.02	60	109.4	18.5	135	97.6	1	0.7	0.07	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
CH-D4	Rittling	FFRW-340 CEILING	Front In, Front Out	4	338	0.15	757	Medium	0.02	60	109.4	18.5	135	97.6	1	0.7	0.07	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
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CH-E1	Rittling	FFRW-340 CEILING	Front In, Front Out	4	436	0.15	757	High	0.02	60	109.4	23.9	135	97.6	1.5	1.5	0.1	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5
CH-E2	Rittling	FFRW-340 CEILING	Front In, Front Out	4	338	0.15	757	Medium	0.02	60	109.4	18.5	135	97.6	1	0.7	0.07	4 0.9	PSC	15	120/60/1	0.68	1,2,3,4,5

1. Cabinet heater colors selected from standard color chart by owner.

2. All ceiling unit shall be provided with hinged front panel with safety chains. 3. Provide unit mounted toggle & thermal overload protection with unit mounted three speed switch.

4. Provide 2 sets of replaceable filters.

5. Electrical Subc. shall disconnect and reconnect unit to existing branch circuit.

6. Piping Subc. shall remove existing cabinet unit heater and repipe as require for new unit installation. Piping Subc. shall provide new valve package for each unit, see detail 11/M401. Control valve by PSI.

HP-A2 HP-A3 HP-A4 HP-A5 HP-A6 HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	MANUF. WATER FURNACE	(NB)030 1 (NB) 036 1 (NB) 036 1 (NB) 036 1 (NB) 036 1 (NB) 030 1	FM ES 000 0.8	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	5.7 7 5.7 7 5.7 7 5.7 5.7 5.7 5	26.3 32.66 26.3 32.66 26.3 32.66 26.3 26.3	22.01 28.59 22.01 28.59 22.01 28.59 22.01 22.01 22.01	90 90 90 90 90 90 90 90 90	COOLING DAT WPD FT/HD 4.3 5.2 4.3 5.2 4.3 5.2 4.3 4.3 4.3 4.3	78/64 78/64 78/64 78/64 78/64 78/64 78/64	57.6 57.6 57.6 57.6 57.6 57.6 57.6	15 16.4 15 16.4 15 16.4	30.45 36.54 36.54 36.54 30.45 36.54	60 60 60 60 60	#EATING DAT WPD FT/HD 4.6 4.3 4.6 4.3		COP 6 6	VOLTS	MCA		ICAL DATA	MOTOR TYPE	UNIT CONFIGURATION	OPERATING WEIGHT LBS	PHYSICAL DA CONDENSATE W. CONNECTION SIZE	ATA ATER CONNECTION SIZE	WIDTH	DEPTH	HEIGHT	NOTES
HP-A1 HP-A2 HP-A3 HP-A4 HP-A5 HP-A6 HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 11 (NB) 036 1 (NB) 036 1 (NB) 036 1 (NB) 030 1	000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	5.7 7 5.7 7 5.7 7 5.7 5.7 5.7 5.7	26.3 32.66 26.3 32.66 26.3 32.66 26.3 26.3	22.01 28.59 22.01 28.59 22.01 28.59 22.01 22.01 22.01	90 90 90 90 90 90 90 90 90	4.3 5.2 4.3 5.2 4.3 5.2 4.3 5.2 4.3 4.3	78/64 78/64 78/64 78/64 78/64 78/64 78/64	57.6 57.6 57.6 57.6 57.6	15 16.4 15 16.4 15	30.45 36.54 30.45 36.54 30.45	60 60 60 60	WPD FT/HD 4.6 4.3 4.6	88.2 86	6 6	277	MCA	MAX		MOTOR TYPE	UNIT CONFIGURATION		CONDENSATE W	ATER CONNECTION	WIDTH	DEPTH	HEIGHT	NOTES
HP-A1 HP-A2 HP-A3 HP-A4 HP-A5 HP-A6 HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 11 (NB) 036 1 (NB) 036 1 (NB) 036 1 (NB) 030 1	000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	5.7 7 5.7 7 5.7 7 5.7 5.7 5.7 5.7	26.3 32.66 26.3 32.66 26.3 32.66 26.3 26.3	22.01 28.59 22.01 28.59 22.01 28.59 22.01 22.01 22.01	90 90 90 90 90 90 90 90	4.3 5.2 4.3 5.2 4.3 5.2 4.3 4.3	78/64 78/64 78/64 78/64 78/64 78/64 78/64	57.6 57.6 57.6 57.6 57.6	15 16.4 15 16.4 15	30.45 36.54 30.45 36.54 30.45	60 60 60 60	4.6 4.3 4.6	88.2 86	6 6	277	MCA	MAX FUSE	MOTOR HP	MOTOR TYPE	UNIT CONFIGURATION				WIDTH	DEPTH	HEIGHT	NOTES
HP-A2 HP-A3 HP-A4 HP-A5 HP-A6 HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 036 1 (NB) 030 1 (NB) 030 1 (NB) 036 1 (NB) 030 1	800 0.9 800 0.9	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7 5.7 5.7 5.7 5.7	32.66 26.3 32.66 26.3 32.66 26.3 26.3 26	28.59 22.01 28.59 22.01 28.59 22.01 22.01 22.01	90 90 90 90 90 90 90	5.2 4.3 5.2 4.3 5.2 4.3 4.3	78/64 78/64 78/64 78/64 78/64 78/64	57.6 57.6 57.6 57.6 57.6	16.4 15 16.4 15	36.54 30.45 36.54 30.45	60 60 60	4.3 4.6	86	6									- · 				t.
HP-A2 HP-A3 HP-A4 HP-A5 HP-A6 HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 036 1 (NB) 030 1 (NB) 030 1 (NB) 036 1 (NB) 030 1	800 0.9 800 0.9	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7 5.7 5.7 5.7 5.7	32.66 26.3 32.66 26.3 32.66 26.3 26.3 26	28.59 22.01 28.59 22.01 28.59 22.01 22.01 22.01	90 90 90 90 90 90 90	5.2 4.3 5.2 4.3 5.2 4.3 4.3	78/64 78/64 78/64 78/64 78/64 78/64	57.6 57.6 57.6 57.6 57.6	16.4 15 16.4 15	36.54 30.45 36.54 30.45	60 60 60	4.3 4.6	86	6		16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
HP-A4 HP-A5 HP-A6 HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 036 1 (NB) 030 1	800 0.8 800	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7 5.7 5.7 5.7 5.7	32.66 26.3 32.66 26.3 26.3 26.3	28.59 22.01 28.59 22.01 22.01 22.01	90 90 90 90 90	5.2 4.3 5.2 4.3 4.3	78/64 78/64 78/64 78/64	57.6 57.6 57.6	15	36.54 30.45	60		88.2	_	277	18.1	25	0.5	ECM	HORIZONTAL	368	0.75"	0.75"	25.5	48	21.2	2,3,4
HP-A5 HP-A6 HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 1 (NB) 036 1 (NB) 030 1 (NB) 042 1 (NB) 030 1 (NB) 030 1 (NB) 030 1	000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8 000 0.8	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	7 5.7 5.7 5.7 5.7	26.3 32.66 26.3 26.3 26.3 26.3	22.01 28.59 22.01 22.01 22.01	90 90 90 90	4.3 5.2 4.3 4.3	78/64 78/64 78/64	57.6 57.6	15	30.45		4.3	00	6	277	16.1	25	0.5	ECM	HORIZONTAL	320 368	0.75"	0.75"	22.5	45	19.2	2,3,4
HP-A7 HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 036 1 (NB) 030 1 (NB) 042 1 (NB) 042 1 (NB) 030 1 (NB) 030 1	800 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9	5 5 5 5 5 5 5 5 5 5	5.7 5.7	32.66 26.3 26.3 26.3 26.3	28.59 22.01 22.01 22.01	90 90	4.3 4.3	78/64 78/64	+	16.4	_		4.6	86 88.2	6	277	18.1 16.1	25 25	0.5 0.5	ECM ECM	HORIZONTAL HORIZONTAL	320	0.75" 0.75"	0.75" 0.75"	25.5 22.5	48 45	21.2 19.2	2,3,4 2,3,4
HP-A8 HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 11	000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9	5 5 5 5 5 5 5	5.7 5.7	26.3 26.3 26.3	22.01 22.01	90	4.3		57.6		30.34	60	4.3	86	6	277	18.1	25	0.5	ECM	HORIZONTAL	368	0.75"	0.75"	25.5	48	21.2	2,3,4
HP-A9 HP-B1 HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 1 (NB) 030 1 (NB) 030 1 (NB) 030 1 (NB) 030 1 (NB) 042 1 (NB) 030 1 (NB) 030 1 (NB) 030 1	000 0.9 000 0.9 000 0.9 000 0.9 000 0.9 000 0.9	5 5 5 5 5	5.7 5.7	26.3	22.01			/8/6/		15	30.45	60	4.6	88.2	6	277	16.1	25 25	0.5 0.5	ECM ECM	HORIZONTAL HORIZONTAL	320 320	0.75" 0.75"	0.75" 0.75"	22.5 22.5	45	19.2	2,3,4 2,3,4
HP-B2 HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 1 (NB) 030 1 (NB) 030 1 (NB) 042 1 (NB) 030 1 (NB) 030 1 (NB) 030 1	000 0.8 000 0.8 000 0.8 000 0.8	5 5 5 5	5.7 5.7 5.7 5.7		22.01		1 7.5	78/64 78/64	57.6 57.6	15	30.45 30.45	60 60	4.6 4.6	88.2 88.2	6	277	16.1 16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45 45	19.2 19.2	2,3,4
HP-B3 HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 11 (NB) 030 11 (NB) 042 1 (NB) 030 11 (NB) 030 11 (NB) 030 11	000 0.8 000 0.8 500 0.8 000 0.8	5 5 5	5.7 5.7 5.7	26.3	ı 44.Ul	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
HP-B4 HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE	(NB) 030 11 (NB) 042 1 (NB) 030 11 (NB) 030 11 (NB) 030 11	000 0.5 500 0.5 000 0.5	5	5.7		22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
HP-B5 HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE WATER FURNACE WATER FURNACE WATER FURNACE WATER FURNACE WATER FURNACE	(NB) 042 1. (NB) 030 1. (NB) 030 1. (NB) 030 1.	000 0.5 000 0.5	5	5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL HORIZONTAL	320 320	0.75"	0.75"	22.5	45	19.2	2,3,4
HP-B6 HP-B7 HP-B8 HP-B9 HP-B10	WATER FURNACE WATER FURNACE WATER FURNACE WATER FURNACE WATER FURNACE	(NB) 030 1 (NB) 030 1 (NB) 030 1	000 0.		7.7	26.3 39.26	22.01 33.6	90	3.4	78/64 78/64	57.6	15 15.5	30.45 40.94	60 60	4.6 3.7	88.2 85.3	5.9	277 480	16.1 9.5	25 15	0.5 1	ECM ECM	HORIZONTAL	383	0.75	0.75" 1"	22.5 25.5	45 53	19.2 21.2	2,3,4 1,2,3,4
HP-B8 HP-B9 HP-B10	WATER FURNACE WATER FURNACE WATER FURNACE	(NB) 030 1	nnn I na	5	5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
HP-B9 HP-B10	WATER FURNACE WATER FURNACE	` /			5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL HORIZONTAL	320 320	0.75" 0.75"	0.75" 0.75"	22.5	45	19.2	2,3,4
		(NB) 030 1	000 0.9		5.7	26.3	22.01	90	4.3	78/64 78/64	57.6	15	30.45	60 60	4.6 4.6	88.2 88.2	6	277	16.1 16.1	25 25	0.5 0.5	ECM ECM	HORIZONTAL	320	0.75"	0.75"	22.5 22.5	45 45	19.2 19.2	2,3,4 2,3,4
	WATER FURNACE	<u> </u>	100 0.		7.7	39.26	33.6	90	3.4	78/64	57.3	15.5	40.94	60	3.7	85.3	5.9	480	9.5	15	1	ECM	HORIZONTAL	383	0.75"	1"	25.5	53	21.2	1,2,3,4
HP-BII		(NB) 024 7	85 0.9	5	4.8	22.86	18.71	90	5.5	78/64	55.9	13.9	22.5	60	6	92.5	5.5	277	14.9	20	0.5	ECM	HORIZONTAL	305	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE	\ /	000 0.9	5	5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE	` '	000 0.9		5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE WATER FURNACE	(000 0.9		5.7	26.3 26.3	22.01	90	4.3	78/64 78/64	57.6 57.6	15 15	30.45	60 60	4.6 4.6	88.2 88.2	6	277	16.1 16.1	25 25	0.5 0.5	ECM ECM	HORIZONTAL HORIZONTAL	320 320	0.75" 0.75"	0.75" 0.75"	22.5 22.5	45 45	19.2 19.2	2,3,4 2,3,4
HP-C5	WATER FURNACE	(NB) 042 1	500 0.5	5	7.7	39.26	33.6	90	3.4	78/64	57.3	15.5	40.94	60	3.7	85.3	5.9	480	9.5	15	1	ECM	HORIZONTAL	383	0.75"	1"	25.5	53	21.2	1,2,3,4
	WATER FURNACE	\ /	000 0.5		5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE WATER FURNACE	· /	000 0.9		5.7	26.3 26.3	22.01	90	4.3	78/64 78/64	57.6 57.6	15 15	30.45	60 60	4.6 4.6	88.2 88.2	6	277	16.1 16.1	25 25	0.5 0.5	ECM ECM	HORIZONTAL HORIZONTAL	320 320	0.75" 0.75"	0.75" 0.75"	22.5 22.5	45 45	19.2 19.2	2,3,4 2,3,4
	WATER FURNACE				5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE WATER FURNACE	(NB) 12 4	00 0.4	5	7.7	39.26	33.6	90	3.4	78/64	57.3	15.5	40.94	60	3.7	85.3	5.9	480	6.2 9.5	15 15	1	ECM	HORIZONTAL	383	0.75"	1"	25.5	53	21.2	1,2,3,4
		,	0.0		7.7				5.4		37.3	10.0	40.54	00	5.1			400	3.3	10	<u>'</u>					1		33	21.2	, , ,
	WATER FURNACE WATER FURNACE		000 0.9	5	5.7	26.3 26.3	22.01	90	4.3	78/64 78/64	57.6 57.6	15 15	30.45	60 60	4.6 4.6	88.2 88.2	6	277	16.1 16.1	25 25	0.5 0.5	ECM ECM	HORIZONTAL HORIZONTAL	320 320	0.75" 0.75"	0.75" 0.75"	22.5 22.5	45 45	19.2 19.2	2,3,4 2,3,4
	WATER FURNACE	<u> </u>	800 0.5			32.66	28.59	90	5.2	78/64	57.6		36.54	60	4.3	86	6	277	18.1	25	0.5	ECM	HORIZONTAL	368	0.75"	0.75"	25.5	48	21.2	2,3,4
	WATER FURNACE		85 0.5		4.8	22.86	18.71	90	5.5	78/64	55.9	13.9	22.5	60	6	92.5	5.5	277	14.9	20	0.5	ECM	HORIZONTAL	305	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE WATER FURNACE		00 0.9		1.8 5.7	8.79 26.3	6.37	90	5.6 4.3	78/64 78/64	58.3 57.6	11.9 15	10.28 30.45	60 60	6.1 4.6	917 88.2	4.4	277	6 16.1	10.15 25	0.1 0.5	ECM ECM	HORIZONTAL HORIZONTAL	145 320	0.75" 0.75"	0.5" 0.75"	22.5 22.5	35 45	17.2 19.2	2,3,4 2,3,4
	WATER FURNACE	<u> </u>	000 0.5		5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE	(000 0.	5	5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE WATER FURNACE	_ ` ′	000 0.5 000 0.5		9.3 5.7	44.89 26.3	35.51 22.01	90	5.2 4.3	78/64 78/64	56.1 57.6	14.7 15	54.03 30.45	60 60	5.8 4.6	5.8 88.2	5.6 6	480 277	9.9 16.1	15 25	0.5	ECM ECM	HORIZONTAL HORIZONTAL	423 320	0.75 0.75"	1" 0.75"	25.5 22.5	53 45	21.2 19.2	1,2,3,4,5 2,3,4
	WATER FURNACE	(NB) 030				13.21	10.19	90	2.8	78/64	59.1	12.6	15.38	60	2.8	88.5		+	10.1	15	0.5	ECM	HORIZONTAL	200	0.75"	0.75"	22.5	42	19.2	2,3,4
HP-D12	WATER FURNACE	(NB) 09 3	00 0.	5	1.8	8.79	6.37	90	5.6	78/64	58.3	11.9	10.28	60	6.1	917	4.4	277	6	10.15	0.1	ECM	HORIZONTAL	145	0.75"	0.5"	22.5	35	17.2	2,3,4
	WATER FURNACE WATER FURNACE		00 0.9 40 0.9		4.8 1.5	22.86 8.7	18.71 5.81	90	5.5 3.8	78/64 78/64	55.9 55.6	13.9 12.8	22.5 8.83	60 60	6 4.2	92.5 94.1	5.5 3.7	277	14.9 6	20 10.15	0.5 0.1	ECM ECM	HORIZONTAL HORIZONTAL	305 145	0.75" 0.75"	0.75" 0.5"	22.5 22.5	45 35	19.2 17.2	2,3,4 2,3,4
	WATER FURNACE	· · · · · · · · · · · · · · · · · · ·	000 0.5		5.7	26.3	22.01	90	4.3	78/64 78/64	57.6	15	30.45	60	4.2	94.1 88.2	6	277	16.1	25	0.1	ECM	HORIZONTAL	320	0.75"	0.5	22.5	45	17.2	2,3,4
HP-D16	WATER FURNACE	(NB) 030 1	000 0.	5	5.7	26.3	22.01	90	4.3	78/64	57.6	15	30.45	60	4.6	88.2	6	277	16.1	25	0.5	ECM	HORIZONTAL	320	0.75"	0.75"	22.5	45	19.2	2,3,4
	WATER FURNACE WATER FURNACE	` '	000 0.9 40 0.9		5.7	26.3 8.7	22.01	90	4.3 3.8	78/64 78/64	57.6 55.6	15 12.8	30.45	60 60	4.6 4.2	88.2 94.1	6 3.7	277	16.1 6	25 10.15	0.5 0.1	ECM ECM	HORIZONTAL HORIZONTAL	320 145	0.75" 0.75"	0.75" 0.5"	22.5 22.5	45 35	19.2 17.2	2,3,4 2,3,4
	WATER FURNACE	(NB) 09 2			3.8	16.02	5.81 11.91	90	5.2	78/64 78/64	60.7	13.9	8.83 19.93	60	5.7	88.9	4.8	277	10.6	15.15	0.1	ECM	HORIZONTAL	210	0.75"	0.5	22.5	42	17.2	2,3,4
	WATER FURNACE	(NB) 09 2					5.81	90	3.8	78/64	55.6	<u> </u>	8.83	60	4.2	94.1			6	10.15	0.1	ECM	HORIZONTAL	145	0.75"	0.5"	22.5	35	17.2	2,3,4
HP-E1	WATER FURNACE	(NB) 018 6	35 0.9	5	3.8	16.02	11.91	90	5.2	78/64	60.7	13.9	19.93	60	5.7	88.9	4.8	277	10.6	15	0.5	ECM	HORIZONTAL	210	0.75"	0.75"	22.5	42	19.2	2,3,4
HP-E2	WATER FURNACE	(NB) 018 6	35 0.5		3.8	16.02	11.91	90	5.2	78/64	60.7	13.9	19.93	60	5.7	88.9	4.8	277	10.6	15	0.5	ECM	HORIZONTAL	210	0.75"	0.75"	22.5	42	19.2	2,3,4
	WATER FURNACE WATER FURNACE	_ ` '	00 0.9		2.7	8.79	6.37	90	5.6	78/64 78/64	58.3	11.9	10.28	60	6.1	917 88.5	4.4	277	6	10.15	0.5	ECM ECM	HORIZONTAL HORIZONTAL	145 200	0.75" 0.75"	0.5" 0.75"	22.5	35 42	17.2	2,3,4 2,3,4
	WATER FURNACE		00 0.9 50 0.9			13.21 13.21	10.19	90	2.8	78/64 78/64	59.1 59.1	12.6 12.6	15.38 15.38	60 60	2.8	88.5	5.1 5.1	277	10.4 10.4	15 15	0.5 0.5	ECM	HORIZONTAL	200	0.75"	0.75"	22.5 22.5	42	19.2 19.2	2,3,4
HP-E6	WATER FURNACE	(NB) 036 1	300 0.5	5	7	32.66	28.59	90	5.2	78/64	57.6	16.4	36.54	60	4.3	86	6	277	18.1	25	0.5	ECM	HORIZONTAL	368	0.75"	0.5"	25.5	48	21.2	2,3,4
	WATER FURNACE	(NB) 09 2							_						4.2							ECM	HORIZONTAL	145	0.75"	0.5"	22.5		17.2	
	WATER FURNACE WATER FURNACE	(NB) 09 2 (NL) 080 3					5.81 61.24	90	3.8 15.1	78/64 80/67	55.6 61.1			60 60	4.2 16.7	94.1 96.7		+	6 15.4	10.15 20	0.1 1.5	ECM POLY PHASE	HORIZONTAL VERTICAL	145 664	0.75" 0.75"	0.5" 1.25	22.5 61.3	35 34.1	17.2 56	2,3,4 2,3,4,5
HP-E10	WATER FURNACE	(NL) 080 3	000 0.7	5 1	19.6	78.63	61.24	90	15.1	80/67	61.1	13.9	86.36	60	16.7	96.7	4.8	480	15.4	20	1.5	POLY PHASE	VERTICAL	664	0.75"	1.25	61.3	34.1	56	2,3,4,5
	WATER FURNACE	(NL) 0180 6					124.63		13.4	80/67	60.8			60	14.1	97.8			30	40	1.5	POLY PHASE	VERTICAL	1195	1"	1"	88.1	34	66	2,3,4,5
	WATER FURNACE WATER FURNACE	(NL) 0180 6 (NL) 048 1					124.63 35.51		13.4 5.2	80/67 78/64	60.8 56.1		180.09 54.03	60 60	14.1 5.8	97.8 5.8			30 9.9	40 15	1.5	POLY PHASE ECM	VERTICAL HORIZONTAL	1195 423	0.75	1"	88.1 25.5	34 53	66 21.2	2,3,4,5 1,2,3,4,5
HP-E14	WATER FURNACE	(NB) 09 3	00 0.			8.79	6.37	90	5.6	78/64	58.3		10.28	60	6.1	917	4.4	277	6	10.15	0.5	ECM	HORIZONTAL	145	0.75"	0.5"	22.5	35	17.2	2,3,4
	WATER FURNACE	(NB) 09 3			1.8		6.37	90	5.6	78/64		11.9		60	6.1	917		277	6	10.15	0.5	ECM	HORIZONTAL	145	0.75"	0.5"	22.5	35	17.2	2,3,4
	WATER FURNACE WATER FURNACE	(NB) 09 3 (NB) 09 2			1.8		6.37 5.81	90	5.6 3.8	78/64 78/64	58.3 55.6			60 60	6.1 4.2	917		277 277	6	10.15 10.15	0.5	ECM ECM	HORIZONTAL HORIZONTAL	145 145	0.75"	0.5"	22.5 22.5	35	17.2 17.2	2,3,4 2,3,4

1. Electrical Subc. shall pull in extra wire to convert power on this unit from 277/60/1 to 480/60/30. Provide new breaker an unit disconnect.

2. Piping Subc. shall install new hose kits provided by PSI. See detail 8/M401. 3. Heat Pumps shall be provided with the following factory installed options: 2 way water control valve, BACnet compatable DDC controller, Phase monitor on all 3 phase units, sound kit.

4. All heat pump blower motors scheduled as ECM shall be variable speed constant torque. 5. Manuracturer shall provide 4 sided filter rack with (2) set or Merv 11 filters.

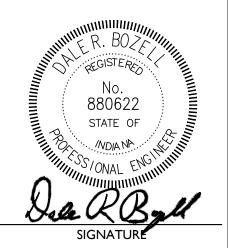
EXIS	STING EQUIPMENT SO	CHED	ULE
MARK NO.	DESCRIPTION	GPM	NOTES.
RP-A1	Radiant Panels	1.0	1, 2
RP-D1	Radiant Panels	1.0	1, 2
RP-E1	Radiant Panels	1.0	1, 2
RP-E2	Radiant Panels	1.0	1, 2
RP-E3	Radiant Panels	1.0	1, 2
FR-D1	Fin Tube Radiation	4.0	1, 2
FR-D2	Fin Tube Radiation	4.0	1, 2
FR-E1	Fin Tube Radiation	4.0	1, 2
FR-E2	Fin Tube Radiation	4.0	1, 2
UH-E1	Propeller Unit Heater	3.0	1, 2
UH-E2	Propeller Unit Heater	6.0	1, 2
UH-E3	Propeller Unit Heater	3.0	1, 2
UH-E4	Propeller Unit Heater	3.0	1, 2
UH-E5	Propeller Unit Heater	3.0	1, 2
UH-E6	Propeller Unit Heater	6.0	1, 2
UH-E7	Propeller Unit Heater	6.0	1, 2
UH-E8	Propeller Unit Heater	6.0	1, 2

Balance Subc. shall balance existing equipment as noted in schedule.
 Piping Subc. shall repipe existing equipent with new new valve package, See Detail 7/M401. Valve package provided by Piping Subc,. Control valve provide by PSI

		DI	MENSIONAL DA	TA	THRO	W DATA							ACCESSORIES			MERV 11 FILTER	
TAG	CFM	MODULE SIZE	SLOT DIFF INFO NO. & SLOT WIDTH	INLET SIZE	DIRECTION	DISTANCE @ 100 FPM	MOUNTING	MAX. PRESS. DROP	MAX. NC SOUND LEVEL	BALANCE DAMPER	PLENUM BOOT	COLOR	MATERIAL	MAANURACTURER	MODEL NO	(QUANTITY)/SIZE - FILTERS PROVIDED BY SHEET METAL SUBC.	NOTES
Α	0-119	24X24		6	4-WAY	3	LAY-IN	0.02	20			WHITE		Titus	OMNI		\dagger
В	120-249	24X24		8	4-WAY	5	LAY-IN	0.06	12			WHITE		Titus	OMNI		
С	250-350	24X24		10	4-WAY	7	LAY-IN	0.07	15			WHITE		Titus	OMNI		
D	350-550	24X24		12	4-WAY	9	LAY-IN	0.11	18			WHITE		Titus	OMNI		
E	550-750	24X24		14	4-WAY	16	LAY-IN	0.15	20			WHITE		Titus	OMNI		
F	0-225	8X8		8X8	N/A	N/A	LAY-IN	0.05	11			WHITE	Alum. Border & Grid 1/2x1/2x1/2 Cube Core	Titus	50F		
G	225-550	12X12		12X12	N/A	N/A	LAY-IN	0.05	13			WHITE	Alum. Border & Grid 1/2x1/2x1/2 Cube Core	Titus	50F		
Н	550-2250	24X24		24X24	N/A	N/A	LAY-IN	0.05	14			WHITE	Alum. Border & Grid 1/2x1/2x1/2 Cube Core	Titus	50F		
J	0-150	2'	(2) 1-1/2"	8	2-WAY	19	LAY-IN	0.08	26		Х	WHITE	Adustable gasketed blade				
K	150-260	4'	(2) 1-1/2"	10	2-WAY	20	LAY-IN	0.09	28		Х	WHITE	Adustable gasketed blade	Titus	TBD-80		
М	260-500	4'	(4) 1-1/2"	12	2-WAY	29	LAY-IN	0.09	28		Х	WHITE	Adustable gasketed blade	Titus	TBD-80		
N	450-675	24x24		24x24	N/A	N/A	LAY-IN	N/A	20			WHITE	Alum. Border & Grid 1/2x1/2x1/2 Cube Core, Hinged filter grille for 2" filter. 1/4 turn fastemer	Titus	50FF	(1)24X24X2	1
0	450-1350	24x36		24x36	N/A	N/A	LAY-IN	N/A	20			WHITE	Alum. Border & Grid 1/2x1/2x1/2 Cube Core, Hinged filter grille for 2" filter. 1/4 turn fastemer	Titus	50FF	(2)18X24X2	1
Р	1350-1800	24x48		24x48	N/A	N/A	LAY-IN	N/A	20			WHITE	Alum. Border & Grid 1/2x1/2x1/2 Cube Core, Hinged filter grille for 2" filter. 1/4 turn fastemer	Titus	50FF	(2)24X24X2	1
R	250-450	12X24		12X24	N/A	N/A	LAY-IN	N/A	20			WHITE	Alum. Border & Grid 1/2x1/2x1/2 Cube Core, Hinged filter grille for 2" filter. 1/4 turn fastemer	Titus	50FF	(1)12X24X2	1

1. Sheet Metal Subc. shall provide 2" MERV 11 pleted filters for grilles.

DRAWN BY:



MECHANICAL SCHEDULES

PRIMARY/SECONDARY HEATING WATER SCHEMATIC
NO SCALE

																		E	ENERGY RE	COVERY (JNIT SCH	EDULE																		
					SUP	PLY FAN	DATA				E	XHAUST F	AN DATA		W	HEEL DATA	UNIT EL	ECTRICAL	-	SUMMER	HEAT EXCHANGER	DATA			W	VINTER HEAT E	XCHANGER D	ATA					HEATI	NG COIL D	ATA					
MARK NO.	BUILDING	MODEL NO	CFM	TYPE	HP	MOTOR TYPE	VOLTS /PHASE	TSP	ESP	CFM	TYPE	НР	VOLTS \PHASE	TSP E	SP HF	VOLTS	FLA	MCA	TYPE	ENT HX RETURN AIR DB°f/ WB°f	ENT HX SUPPLY AIR DB°f/ WB°f	LVG HX SUPPLY AIR DB°f/ WB°f	HX % EFF		ENT HX RETURN AIR DB°f/ WB°f	ENT HX SUPPLY AIR DB°f/ WB°f	LVG HX DB/WB°f	HX % EFF	HX TMBH	FIN FIN HEIGHT LENG	H WPD	APD	EAT	LAT	тмвн	ROW / FIN	GPM	EWT	LWT	NIT WEIGHT LBS.
ERV-1	Area A	NB-IMS	3875	Plug AF	5	ECM	480/3	2.89	1.25	3875	Plug AF	5	460/3	2.14 1	1.0 1/4	460/3	18.2	20	Aluminum 4A wheel	75/62	95/76	80/66.4	73	148.3	70/52.7	-2.0/-2.2	51/41.5	73	277.3				N/A	N/A	N/A	N/A	N/A	N/A	N/A	2459
ERV-2	Area B	NB-IMS	3875	Plug AF	5	ECM	480/3	2.89	1.25	3875	Plug AF	5	460/3	2.14 1	1.0 1/4	460/3	18.2	20	Aluminum 4A wheel	75/62	95/76	80/66.4	73	148.3	70/52.7	-2.0/-2.2	51/41.5	73	277.3				N/A	N/A	N/A	N/A	N/A	N/A	N/A	2459
ERV-3	Area C	NB-IMS	5150	Plug AF	5	ECM	480/3	3.03	1.25	5150	Plug AF	5	460/3	2.48 1	1.0 1/4	460/3	18.2	20	Aluminum 4A wheel	75/62	95/76	80/67.1	69	184.4	70/52.7	-2.0/-2.2	48.7/39.8	69	350.0				N/A	N/A	N/A	N/A	N/A	N/A	N/A	2459
ERV-4	Boiler Room	NB-IMS	11550	Plug AF	20	ECM	480/3	3.77	1.5	11550	Plug AF	10	460/3	2.58 1	1.5 1/4	460/3	46.2	50	Aluminum 4A wheel	75/62	95/76	81.1/67.3	67	408.8	70/52.7	-2.0/-2.2	47.9/39.3	67	769.2	75 33	1.9 FT	0.43	35	75	479.2	2/12	24.4	135	95	4068

1.) Supply and exhaust shall have 2" MERV 6 filters. Unit mfg. to provide two complete sets.

2.) Manufacturer shall provide single unit mounted junction box for each motor. 3.) Enthalpy Wheel shall be provided with factory installed VFD defrost control. Wheel shall be equal sensible/latent aluminum 3 angstrom molecular desiccant sieve type with non contact labyrinth seals. Polymer wheel will not be accepted.

4.) Heating wheel performance is scheduled at reduced wheel RPM as required for defrost mode. 5) Control of ECM motors provided (PSI).

6.) Manufacturer shall provide direct drive plenum fans for outside and exhaust air, low leak outside & relief air dampers and wheel rotation detector sensor.

			RELIE	F HO	OD S	CHEDU	JLE	
MARK NO.	THROAT AREA	THROAT SIZE	CURB SIZE	CFM	S.P.	RELIEF VELOCITY	MANUF. MODEL NO.	NOTES
RH-A	4.33	24X26	30X32	5150	0.19	1,189	Greenheck, FGR	4
RH-B	3.36	22X22	28X28	3850	0.18	1,145	Greenheck, FGR	4
RH-C	3.36	22X22	28X28	3850	0.18	1,145	Greenheck, FGR	4

1. Manufacturer shall provide 24" high curb with 1" 3 lb density insulation and bird screen for all intake hoods. All aluminum construction. 2. Manufacturer shall provide 16" high curb with 1" 3 lb density insulation and bird screen for all relief hoods. All aluminum construction.

3. Sheet metal contractor shall install provide sleeve for mount automatic relief dampers provided by PSI.

4. Manufacturer shall provide sloped 16" high curb with 1" 3 lb density insulation and bird screen for relief hoods. All aluminum construction.

EXHAUST & FAN SCHEDULE ACTUAL PERFORMANCE MOTOR SPECIFICATIONS LOCATION MODEL **MOTOR TYPE ENCLOSURE** Greenheck DD INLINE CENTRIFUGAL 0.5 | 1290 | 3,777 | 1725 0.1 49 5.1 1/4 1750 1,2,3,6 EF-2 UNIT A 115 900 | 1,2,3,6 |

1. All exhaust fans shall be provided with aluminum housing and wheel, aluminum bird screen, NEMA-1 toggle mounted and wired.

2. Units shall be provided with back draft dampers and high efficiency motors. Unit shall be provided with adjustable speed control at unit.

				HOT WAT	ER BOILE	ER SCHE	DULE			
TAG	DESCRIPTION	LOCATION	AREA SERVED	TYPE	MANUFACTURER REFERENCE	CAPACITY DATA	REQUIRED POWER	COMPONENTS	DRAIN	NOTES
BR-1	NEW - High Efficiency Hot Water Boiler	Boiler Room	Entire Building	Condensing Natural Gas Boiler	Lochinvar Crest FB-3000	3,000 MBH input 2,760 MBH output	3.6 FLA 120/60/1	Manufacturer to provide flue/exhaust vent pipe (double wall, stainless steel, AL-294C)	PVC - to nearest floor drain	1 through 6
BR-2	Existing Relocated - High Efficiency Hot Water Boiler	Boiler Room	Entire Building	Condensing Natural Gas Boiler	Hydrotherm KN-20	2,000,000 input	20 amp circuit - 120/60/1	Manufacturer to provide flue/exhaust vent pipe (double wall, stainless steel, AL-294C)	yes - to nearest floor drain	1 through 6

1. Required gas pressure is 8.5" W.C. minimum to 14" maximum.

2. Install on new 4" concrete pad. 9" vent connections, 2" NPT gas connection, 4" flanged water connection

3. Manufacturer to provide startup service and first year labor warranty with diagnostics.

4. Manufacturer shall provide main gas regulator if required by gas input pressure. Piping contractor shall field verify existing gas pressure. 5. Manufacturer to provide inputs to Temperature Control System for Enable/Disable, Status, Alarm, Set point Adjustment and Firing Rate for each boiler. Provide Bacnet interface card.

6. Manufacturer to provide acid neutralizing kit for field installation by piping contractor.

						PUM	P SC	HED	ULE	<u>.</u>						
TAG	LOCATION	TYPE	AREA SERVED	GPM	SYSTEM HEAD	HP	FLA	VOLTS	PHASE	VARIABLE SPEED	FLUID	EWT. H ₂ O	EFF %	MANUFACTURER	MODEL	NOTES
P-1	Boiler Room	In-Line	New Boiler Primary	277	6.0 ft		4.6	208	1	Υ	Note 7	135	75.8	Lochinvar	PUM20079	2
P-2	Boiler Room		(EX) Boiler Primary					460	3					Existing	Existing	
P-3	Boiler Room		(EX) WSHP	460	115	25		460	3					Existing	Existing	
P-4	Boiler Room		(EX) WSHP	460	115	25		460	3					Existing	Existing	
P-5	Boiler Room		(EX) HW Heat secondary	280	90	15		460	3					Existing	Existing	
P-6	Boiler Room		(EX) HW Heat secondary	280	90	15		460	3					Existing	Existing	

1. Pump manufacturer provide Metraflex (CRV Flex) & Vain Flex flow straightener and check valve, all other pump accessories by piping contractor.

2. Pump manufacturer shall provide premium efficiency, ECM variable speed motor to be controlled by boiler output signal.

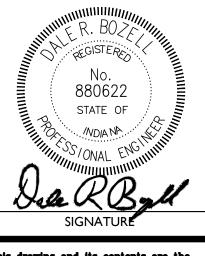
	LOUVER SCHEDULE												
MARK NO.	MANUF.	MODEL	CFM	WIDE	HIGH	FREE AREA FT ²	FREE AREA %	FREE	S.P. IN	FRAME CONSTRUCTION	CONSTRUCTION	TYPE	NOTES
L-1	RUSKIN	ELF635DMP	11500	48	72	15.35	64	749	0.08	INTEGRAL FLANGE	ALUMINUM 0.125"	SINGLE DRAINABLE BLADE	1,2,3
L-2	RUSKIN	ELF15J	500	16	16	0.74	42	678	0.9	INTEGRAL FLANGE	ALUMINUM 0.125"		1,2,3,4
L-3	RUSKIN	ELF637DX	3880	36	32	4.29	54	904	0.1	INTEGRAL FLANGE	ALUMINUM 0.125"	SINGLE DRAINABLE BLADE	1,2,3,4
L-4	RUSKIN	ELF637DX	3880	36	32	4.29	54	904	0.1	INTEGRAL FLANGE	ALUMINUM 0.125"	SINGLE DRAINABLE BLADE	1,2,3,4
L-5	RUSKIN	ELF637DX	5150	48	32	5.81	55	887	0.1	INTEGRAL FLANGE	ALUMINUM 0.125"	SINGLE DRAINABLE BLADE	1,2,3,4
L-6	RUSKIN	ELF637DX	700	16	16	0.77	43	907	0.1	INTEGRAL FLANGE	ALUMINUM 0.125"	SINGLE DRAINABLE BLADE	1,2,3,4
I -7	RUSKIN	FLF637DX	1850	24	24	2.07	48	892	0.1	INTEGRAL ELANGE	ALLIMINIUM 0 125"	SINGLE DRAINABLE BLADE	1234

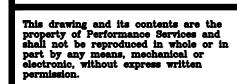
1. Louver shall be painted with 70% Kynar 500 finish from manufacturers color chart.

2. Flangeless louvers shall be provided with extended sill option.

3. Integral flange louver shall shall have 1-1/2" flanges. 4. Sheet metal subc. shall cut hole in masonry wall and provide lintel.

JOB NO.:	IPC-K17-2402
DATE:	1-23-2018
DRAWN BY:	DRB
CHECKED BY:	DRB

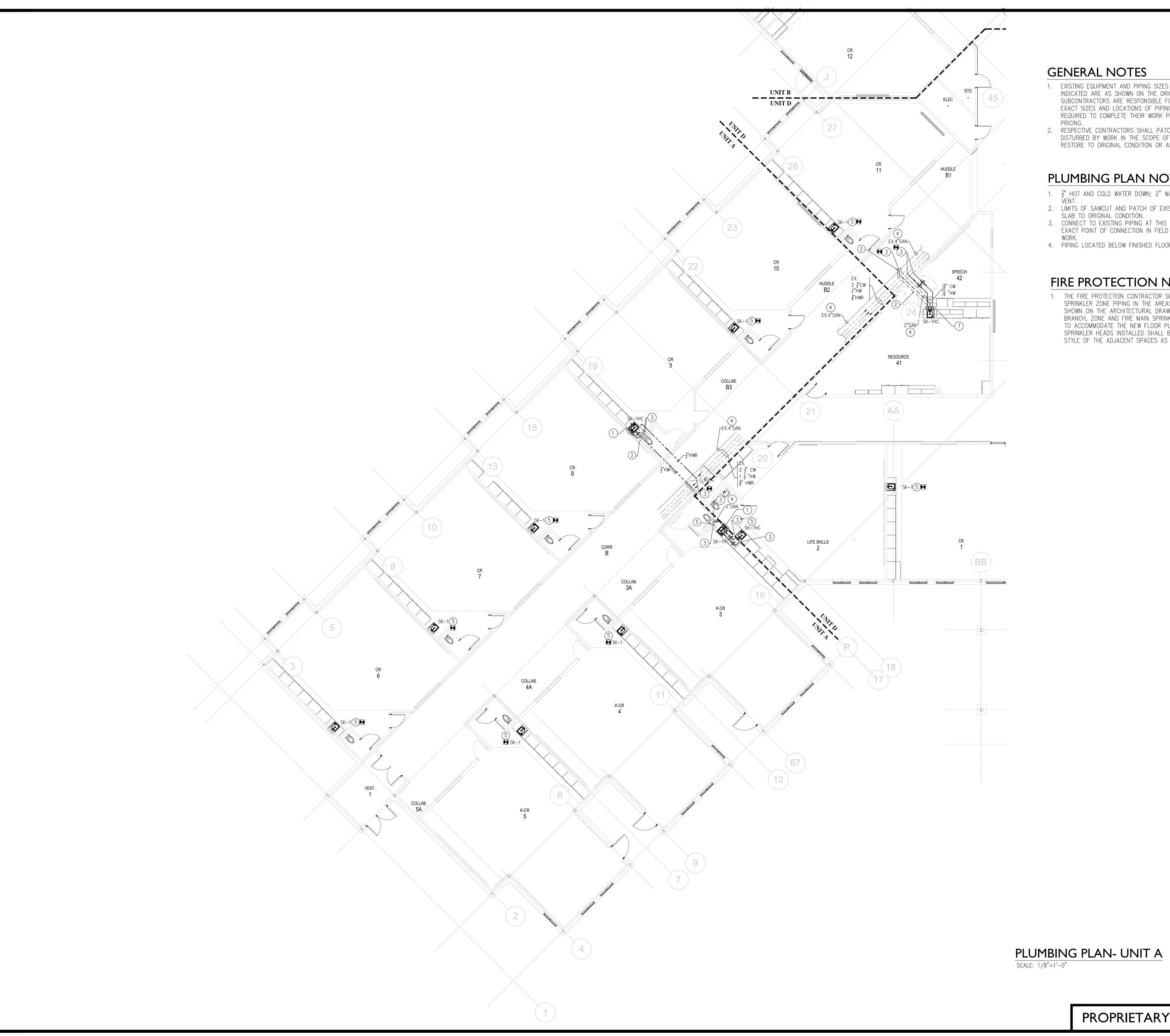




Element Fishers, IN

M-50 I

MECHANICAL SCHEDULES



- 1. EXISTING EQUIPMENT AND PIPING SIZES AND LOCATIONS INDICATED ARE AS SHOWN ON THE ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS OF PIPING OR EQUIPMENT AS REQUIRED TO COMPLETE THEIR WORK PRIOR TO FINAL BID
- 2. RESPECTIVE CONTRACTORS SHALL PATCH ANY SURFACE DISTURBED BY WORK IN THE SCOPE OF THIS PROJECT AND RESTORE TO ORIGINAL CONDITION OR AS NOTED OTHERWISE.

PLUMBING PLAN NOTES

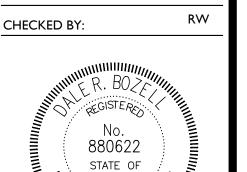
1. $\frac{1}{2}$ " HOT AND COLD WATER DOWN; 2" WASTE DOWN- 1 $\frac{1}{2}$ "

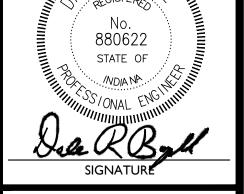
- 2. LIMITS OF SAWCUT AND PATCH OF EXISTIONG SLAB. RESTORE SLAB TO ORIGINAL CONDITION.
- 3. CONNECT TO EXISTING PIPING AT THIS POINT. FIELD VERIFY EXACT POINT OF CONNECTION IN FIELD PRIOR TO START OF
- 4. PIPING LOCATED BELOW FINISHED FLOOR.

FIRE PROTECTION NOTES

1. THE FIRE PROTECTION CONTRACTOR SHALL REWORK EXISTING SPRINKLER ZONE PIPING IN THE AREAS OF RENOVATION AS SHOWN ON THE ARCHITECTURAL DRAWINGS AND PROVIDE NEW BRANCH, ZONE AND FIRE MAIN SPRINKLER PIPING AS REQUIRED TO ACCOMMODATE THE NEW FLOOR PLAN ARRANGEMENT. ALL SPRINKLER HEADS INSTALLED SHALL BE NEW AND MATCH THE STYLE OF THE ADJACENT SPACES AS REQUIRED.

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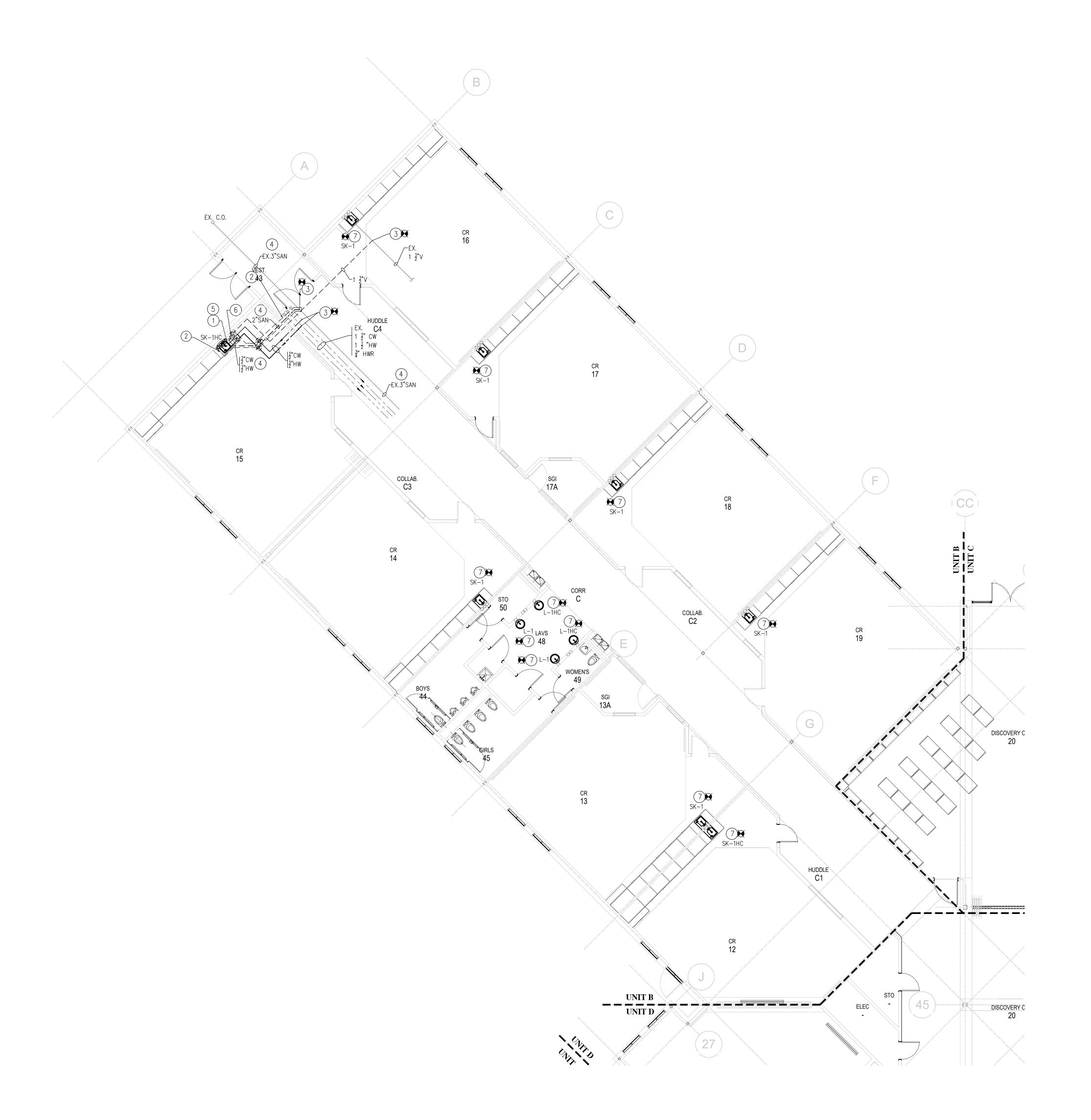




LEGEND (

P-201 PLUMBING PLAN -UNIT A

PROPRIETARY AND CONFIDENTIAL



- 1. EXISTING EQUIPMENT AND PIPING SIZES AND LOCATIONS INDICATED ARE AS SHOWN ON THE ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS OF PIPING OR EQUIPMENT AS REQUIRED TO COMPLETE THEIR WORK PRIOR TO FINAL BID
- 2. RESPECTIVE CONTRACTORS SHALL PATCH ANY SURFACE DISTURBED BY WORK IN THE SCOPE OF THIS PROJECT AND RESTORE TO ORIGINAL CONDITION OR AS NOTED OTHERWISE.

PLUMBING PLAN NOTES

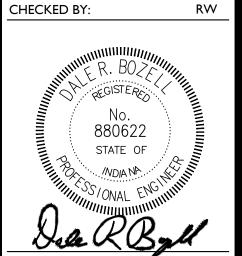
- 1. $\frac{1}{2}$ " HOT AND COLD WATER DOWN; 2" WASTE AND LOOP VENT. 2. LIMITS OF SAWCUT AND PATCH OF EXISTIONG SLAB. RESTORE SLAB TO ORIGINAL CONDITION.
- 3. CONNECT TO EXISTING PIPING AT THIS POINT. FIELD VERIFY EXACT POINT OF CONNECTION IN FIELD PRIOR TO START OF
- 4. PIPING LOCATED BELOW FINISHED FLOOR.5. REFER TO DETAIL ON DRAWING P-301 FOR FURTHER INFORMATION
- 6. 1" HOT AND COLD WATER DOWN; 2" VENT FROM BELOW
- 7. CONNECT NEW PLUMBING FIXTURE TO EXISTING PIPING (I.E.: WASTE, WATER AND VENT) AS REQUIRED. SEE DEMOLITION PLAN ON DRAWING PD-201 FOR FURTHER INFORMATION.

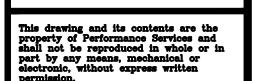
FIRE PROTECTION NOTES

1. THE FIRE PROTECTION CONTRACTOR SHALL REWORK EXISTING SPRINKLER ZONE PIPING IN THE AREAS OF RENOVATION AS SHOWN ON THE ARCHITECTURAL DRAWINGS AND PROVIDE NEW BRANCH, ZONE AND FIRE MAIN SPRINKLER PIPING AS REQUIRED TO ACCOMMODATE THE NEW FLOOR PLAN ARRANGEMENT. ALL SPRINKLER HEADS INSTALLED SHALL BE NEW AND MATCH THE STYLE OF THE ADJACENT SPACES AS REQUIRED.

REVISIONS

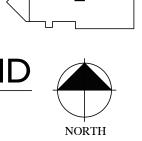
IPC-K17-2402 DRAWN BY:





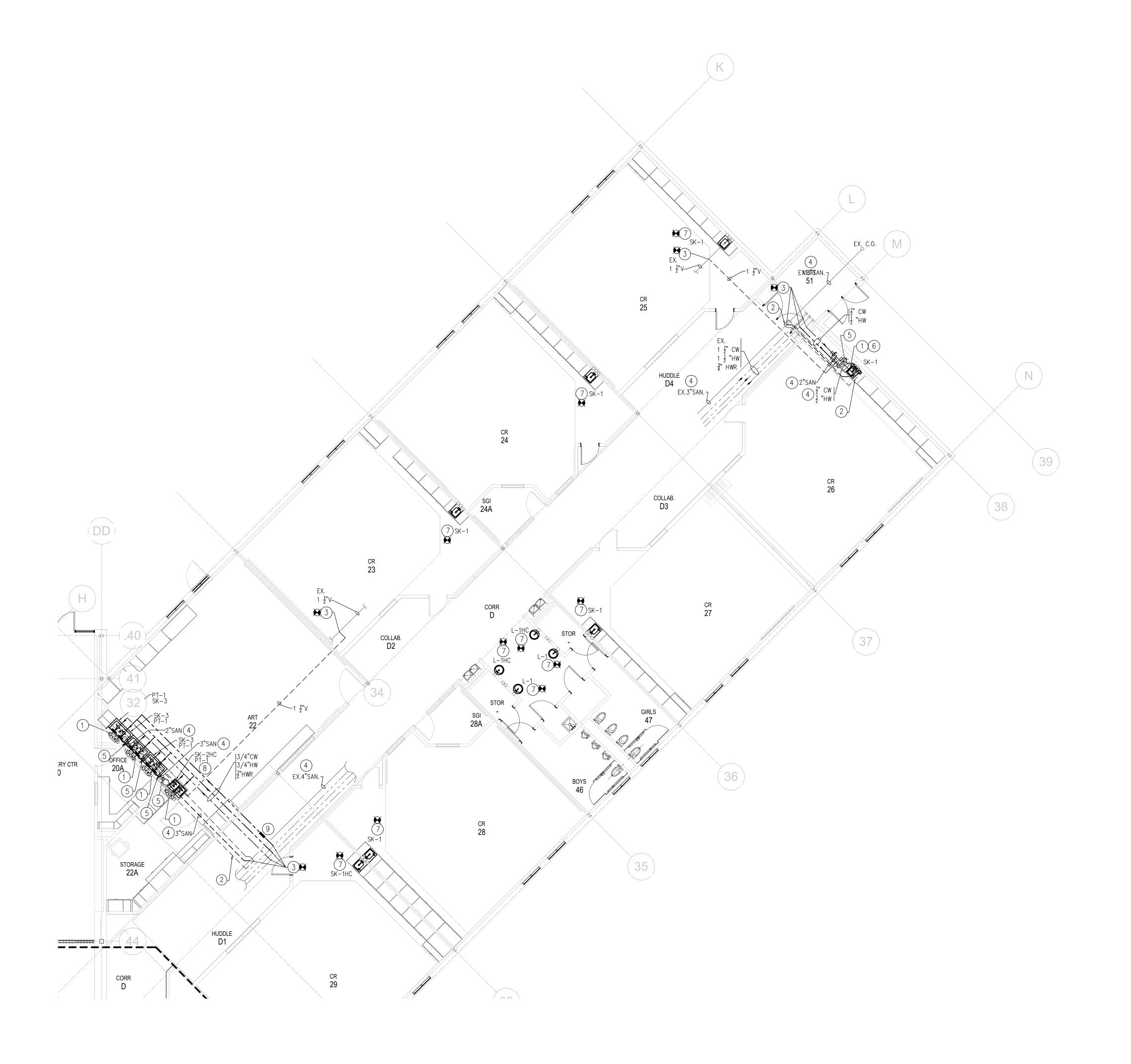
PLUMBING PLAN- UNIT B SCALE: 1/8"=1'-0"





P-202

PLUMBING PLAN -UNIT B



- 1. EXISTING EQUIPMENT AND PIPING SIZES AND LOCATIONS INDICATED ARE AS SHOWN ON THE ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS OF PIPING OR EQUIPMENT AS REQUIRED TO COMPLETE THEIR WORK PRIOR TO FINAL BID
- 2. RESPECTIVE CONTRACTORS SHALL PATCH ANY SURFACE DISTURBED BY WORK IN THE SCOPE OF THIS PROJECT AND RESTORE TO ORIGINAL CONDITION OR AS NOTED OTHERWISE.

PLUMBING PLAN NOTES

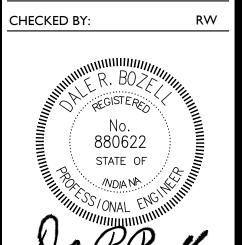
- ½" HOT AND COLD WATER FROM BELOW; 2" WASTE AND LOOP VENT.
- 2. LIMITS OF SAWCUT AND PATCH OF EXISTIONG SLAB. RESTORE SLAB TO ORIGINAL CONDITION.
- 3. CONNECT TO EXISTING PIPING AT THIS POINT. FIELD VERIFY EXACT POINT OF CONNECTION IN FIELD PRIOR TO START OF
- 4. PIPING LOCATED BELOW FINISHED FLOOR.
- 5. $\frac{1}{2}$ " HOT AND COLD WATER DOWN; 2" VENT FROM BELOW. 6. REFER TO DETAIL ON DRAWING P-301 FOR FURTHER INFORMATION.
- 7. CONNECT NEW PLUMBING FIXTURE TO EXISTING PIPING (I.E.: WASTE, WATER AND VENT) AS REQUIRED. SEE DEMOLITION PLAN ON DRAWING PD-201 FOR FURTHER INFORMATION.
- 8. LOCATE SOLIDS TRAP IN CASEWORK SPACE ADJACENT TO HANDICAPPED SINK. COORDINATE INSTALLATION WITH APPROVED CASEWORK DRAWINGS PRIOR TO INSTALLATION TO ACHIEVE MAXIMUM MAINTENANCE CLEARANCES PRIOR TO START OF WORK.
- 9. DOMESTIC MANUAL HOT WATER RETURN BALANCING STATION. PROVIDE THERMOMETER AND FLOW ADJUSTMENT CAPABILITY WITH READ OUT AND ADJUST TO .5 GPM.

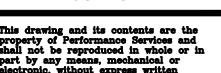
FIRE PROTECTION NOTES

1. THE FIRE PROTECTION CONTRACTOR SHALL REWORK EXISTING SPRINKLER ZONE PIPING IN THE AREAS OF RENOVATION AS BRANCH, ZONE AND FIRE MAIN SPRINKLER PIPING AS REQUIRED TO ACCOMMODATE THE NEW FLOOR PLAN ARRANGEMENT. ALL SPRINKLER HEADS INSTALLED SHALL BE NEW AND MATCH THE STYLE OF THE ADJACENT SPACES AS REQUIRED.

REVISIONS

IPC-K17-2402 DRAWN BY:



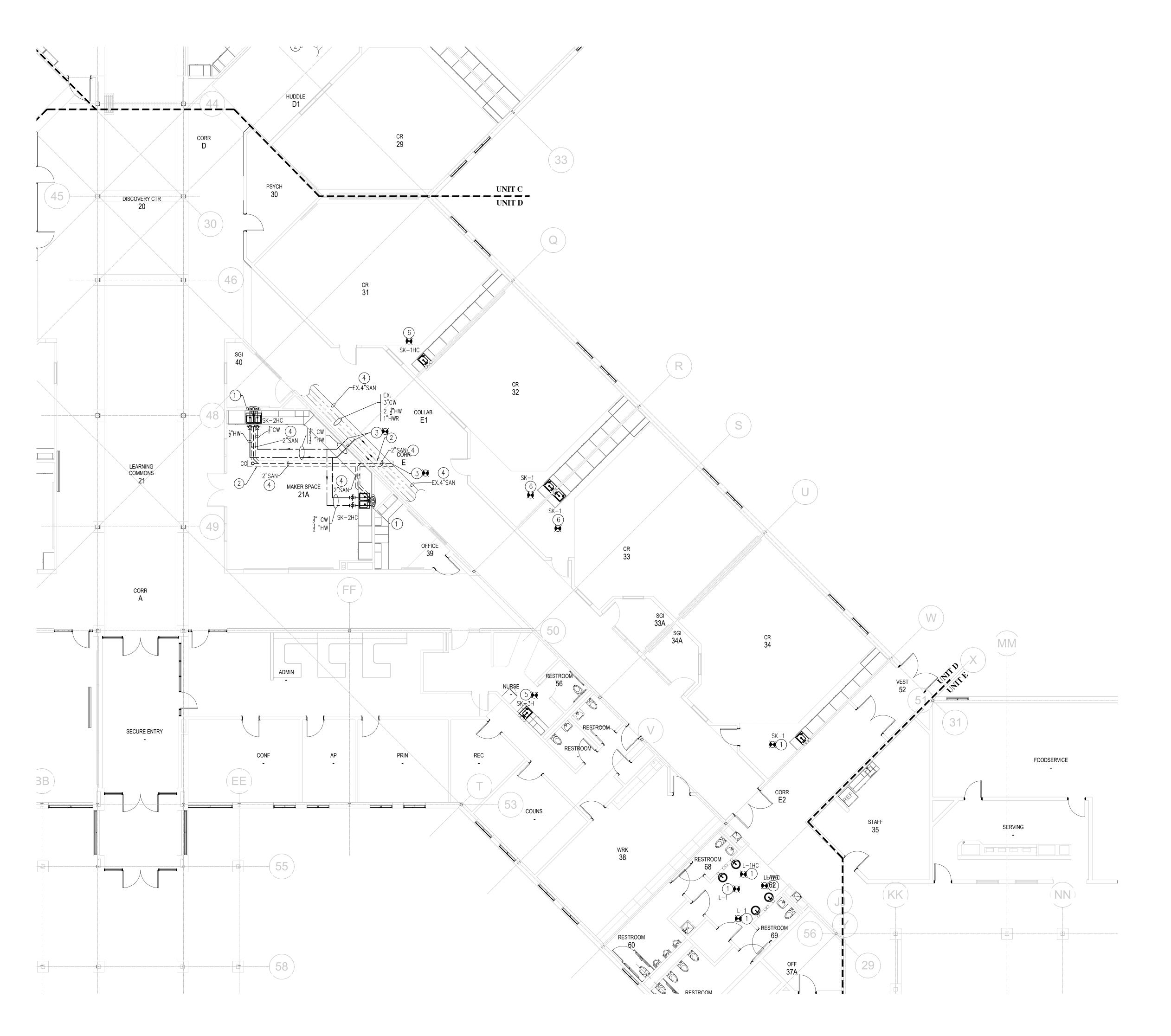


PLUMBING PLAN- UNIT C SCALE: 1/8"=1'-0"

LEGEND ___

P-203

PLUMBING PLAN -UNIT C



- 1. EXISTING EQUIPMENT AND PIPING SIZES AND LOCATIONS INDICATED ARE AS SHOWN ON THE ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS OF PIPING OR EQUIPMENT AS REQUIRED TO COMPLETE THEIR WORK PRIOR TO FINAL BID PRICING.
- 2. RESPECTIVE CONTRACTORS SHALL PATCH ANY SURFACE DISTURBED BY WORK IN THE SCOPE OF THIS PROJECT AND RESTORE TO ORIGINAL CONDITION OR AS NOTED OTHERWISE.

PLUMBING PLAN NOTES

1. $\frac{1}{2}$ " HOT AND COLD WATER FROM BELOW; 2" WASTE AND LOOP

- 2. LIMITS OF SAWCUT AND PATCH OF EXISTIONG SLAB. RESTORE
- SLAB TO ORIGINAL CONDITION.
- 3. CONNECT TO EXISTING PIPING AT THIS POINT. FIELD VERIFY EXACT POINT OF CONNECTION IN FIELD PRIOR TO START OF WORK.
- 4. PIPING LOCATED BELOW FINISHED FLOOR.
- 5. 2" WASTE DOWN TO BELOW FLOOR.
- 6. CONNECT NEW FIXTURE TO EXISTING SERVICES. REFER TO DEMOLITION PLAN PD-201 AND THE ARCHITECTURAL CASEWORK DRAWINGS FOR FURTHER INFORMATION.
- 7. CONNECT NEW LAVATORY TRIM TO NEW COMPOSITE TOP WITH INTEGRAL LAVATORY. REFER TO DEMOLITION DRAWING PD-201 AND THE ARCHITECTURAL CASEWORK DRAWING FOR FURTHER INFORMATION
- 8. $\frac{1}{2}$ " HOT AND COLD WATER DOWN TO BELOW SLAB; 2" VENT FROM BELOW.

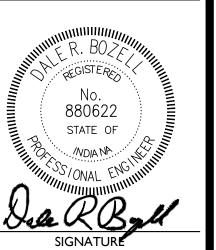
FIRE PROTECTION NOTES

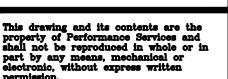
1. THE FIRE PROTECTION CONTRACTOR SHALL REWORK EXISTING

REVISIONS

CHECKED BY:

IPC-K17-2402 DRAWN BY:





Element Fishers, IN

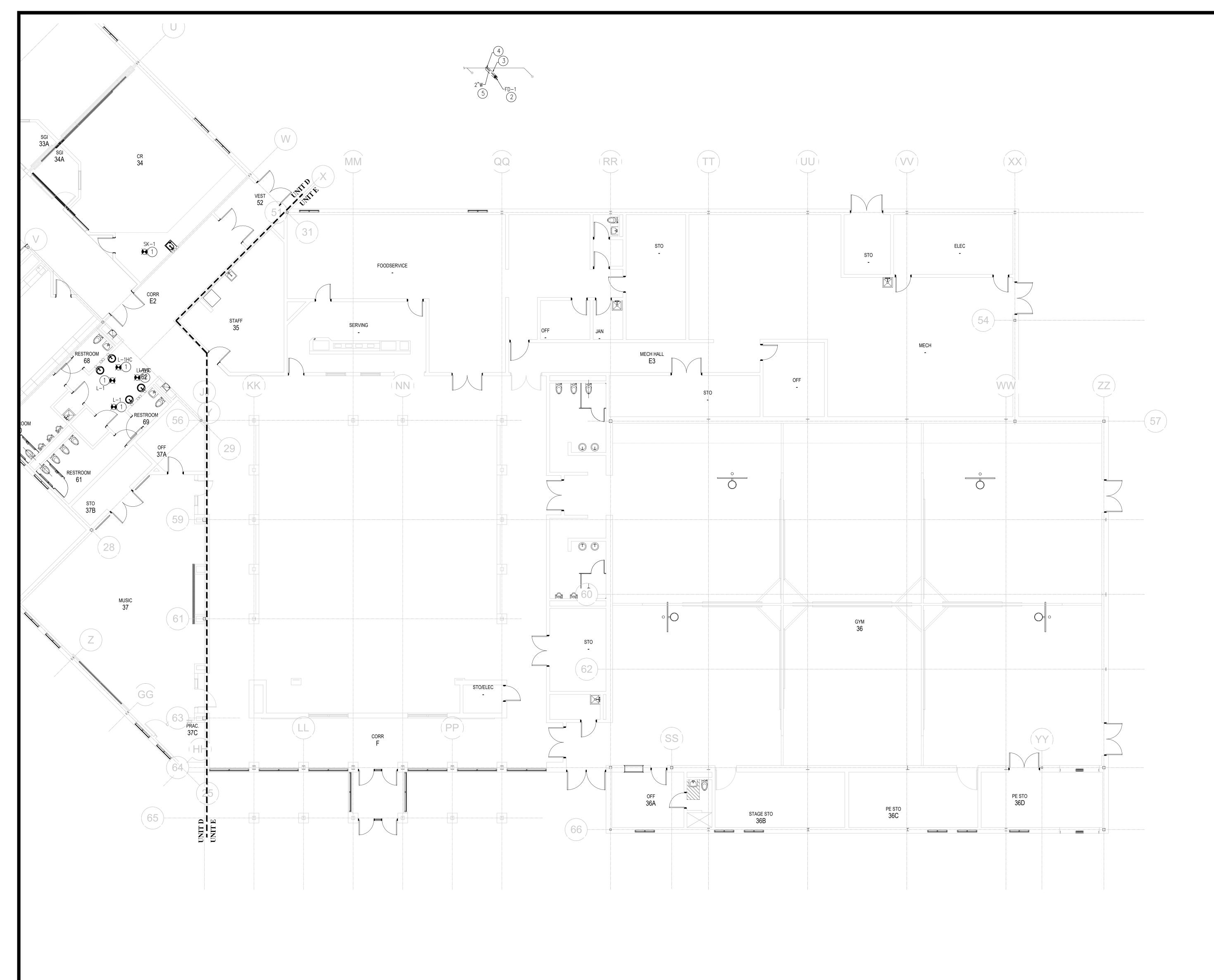
SPRINKLER ZONE PIPING IN THE AREAS OF RENOVATION AS SHOWN ON THE ARCHITECTURAL DRAWINGS AND PROVIDE NEW BRANCH, ZONE AND FIRE MAIN SPRINKLER PIPING AS REQUIRED TO ACCOMMODATE THE NEW FLOOR PLAN ARRANGEMENT. ALL SPRINKLER HEADS INSTALLED SHALL BE NEW AND MATCH THE STYLE OF THE ADJACENT SPACES AS REQUIRED.

PLUMBING PLAN- UNIT C SCALE: 1/8"=1'-0"

LEGEND

P-204

PLUMBING PLAN -UNIT D



- 1. EXISTING EQUIPMENT AND PIPING SIZES AND LOCATIONS INDICATED ARE AS SHOWN ON THE ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS OF PIPING OR EQUIPMENT AS REQUIRED TO COMPLETE THEIR WORK PRIOR TO FINAL BID PRICING.
- 2. RESPECTIVE CONTRACTORS SHALL PATCH ANY SURFACE DISTURBED BY WORK IN THE SCOPE OF THIS PROJECT AND RESTORE TO ORIGINAL CONDITION OR AS NOTED OTHERWISE.

PLUMBING PLAN NOTES

FIRE PROTECTION NOTES

1. THE FIRE PROTECTION CONTRACTOR SHALL REWORK EXISTING SPRINKLER ZONE PIPING IN THE AREAS OF RENOVATION AS

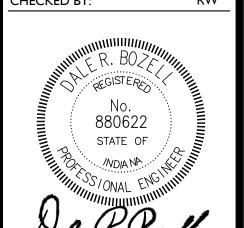
SHOWN ON THE ARCHITECTURAL DRAWINGS AND PROVIDE NEW BRANCH, ZONE AND FIRE MAIN SPRINKLER PIPING AS REQUIRED

TO ACCOMMODATE THE NEW FLOOR PLAN ARRANGEMENT. ALL SPRINKLER HEADS INSTALLED SHALL BE NEW AND MATCH THE STYLE OF THE ADJACENT SPACES AS REQUIRED.

CONNECT TO EXISTING PLUMBING SERVICES (I.E.: WASTE, WATER AND VENT) AS REQUIRED.

JOB NO.:	IPC-K17-2402
DATE:	1-23-2018
DRAWN BY:	MLJ
CHECKED BY:	RW

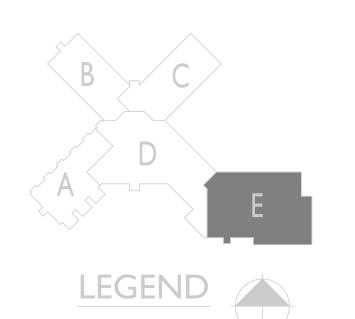
REVISIONS



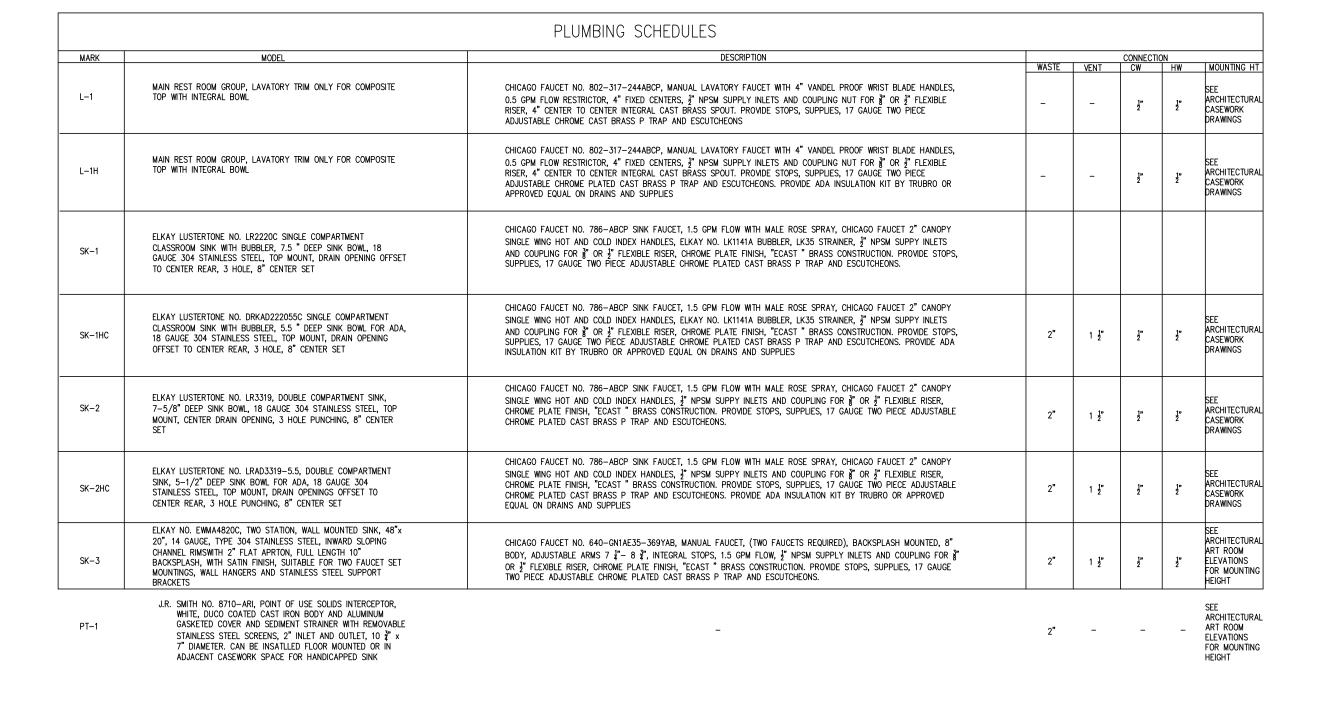
P-205

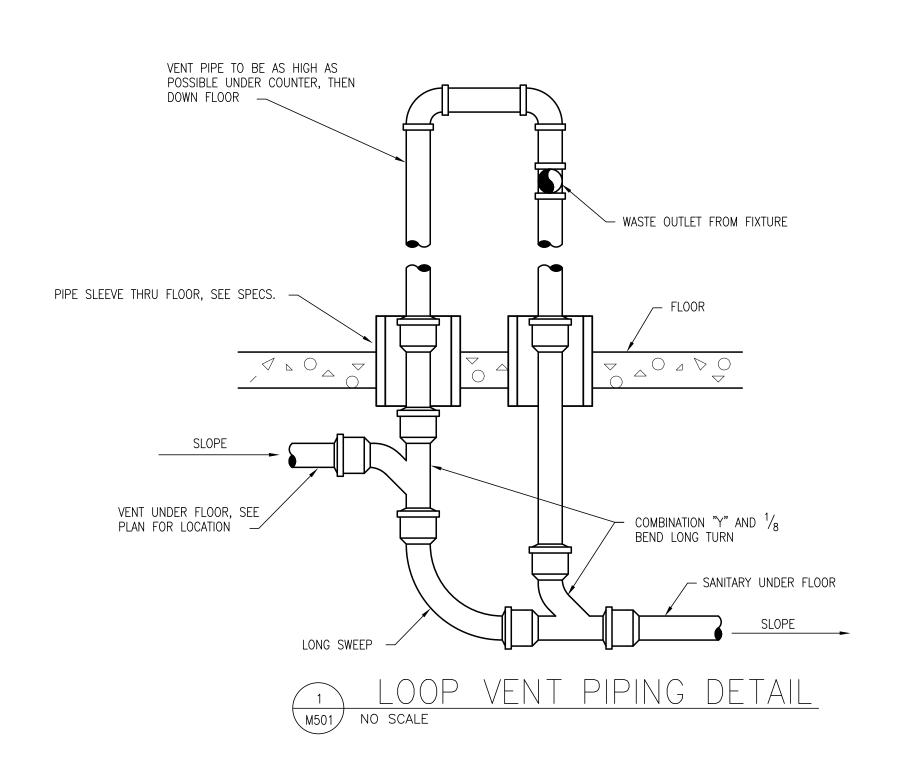
PLUMBING PLAN -UNIT E

PLUMBING PLAN - UNIT E SCALE: 1/8"=1'-0"



PROPRIETARY AND CONFIDENTIAL





ew Britton Elementary School Fishers, IN

REVISIONS

DRAWN BY:

CHECKED BY:

880622

STATE OF

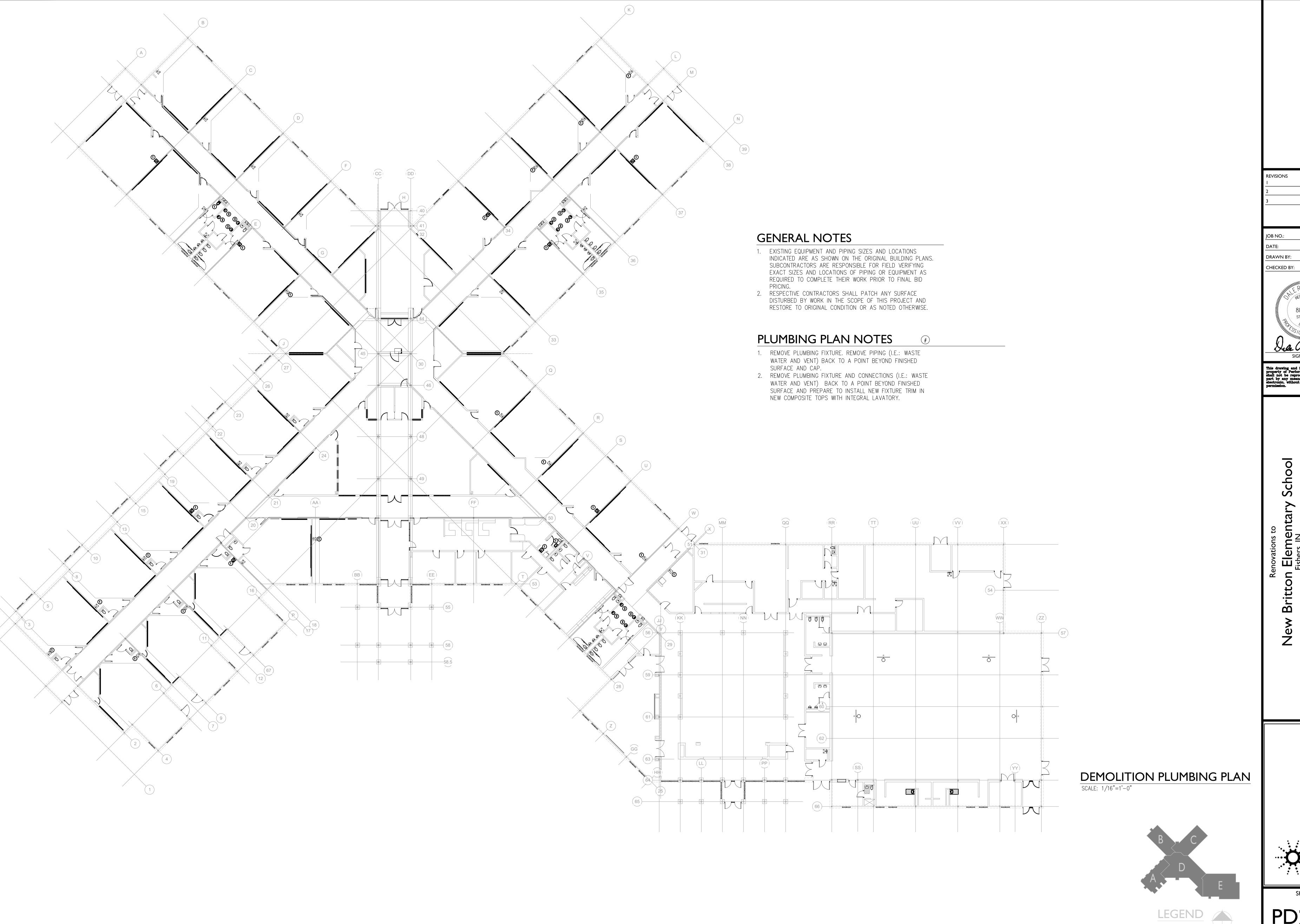
1-23-2018

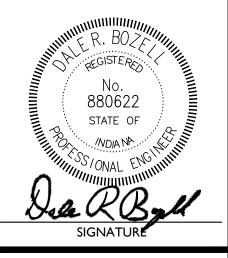
'mance |

Performance Services

P-301

PLUMBING SCHEDULE AND DETAIL





PD201

DEMOLITION PLUMBING PLAN PROPRIETARY AND CONFIDENTIAL

NOTE: NOT ALL SYMBOLS AND ABBREVIATION MAY APPLY TO THIS PROJECT

	TYPICAL ABBREVIATIONS:
A AFF AIC AV C CB CCT COMB CCT COMB EMT EWP FADS GFID HMC MATON MATON NEIC PNC STATE OF POLICY WP	AMPS OR AMPACITY ABOVE FINISHED FLOOR AMPERAGE INTERRUPTING CAPACITY AUDIO-VISUAL CONDUIT CIRCUIT BREAKER CLOSED CIRCUIT TELEVISION SYSTEM CIRCUIT COMBINATION COPPER ENGINE—GENERATOR ELECTRICAL CONTRACTOR ON EMERGENCY SYSTEM ELECTRIC METALLIC TUBING ELECTRIC METALLIC TUBING ELECTRIC WATER COOLER EXPLOSION—PROOF FIRE ALARM FUSIBLE DISCONNECT SWITCH GENERAL CONTRACTOR GROUND FAULT INTERRUPT GROUND GREEN GROUND CONDUCTOR HORSE POWER INTERMEDIATE METAL CONDUIT JUNCTION BOX KILOVOLTS KILOVOLTS KILOVOLTS KILOVOLTS MASTER ANTENNA TELEVISION SYSTEM MECHANICAL CONTRACTOR MAN HOLE MOTOR NATIONAL ELECTRICAL CODE NATION ELECTRICAL CODE NATION ELECTRICAL CODE NATION ELECTRICAL CODE NATION LECTRICAL MANUF. ASSOC. NOT IN THIS CONTRACT PHASE PUSH BUTTON STATION PULL CHAIN PANEL POLYVINYLCHLORIDE RIGID GALVANIZED STEEL CONDUIT ROOM STANDARD STANNLESS STEEL TELEVISION TYPICAL UNGROUNDED UNLESS NOTED OTHERWISE VOLTS WATTS WEATHERPROOF

•	
	POWER LEGEND
	SUBSCRIPTS ASSOCIATED WITH RECEPTACLES:
	(GFI) GROUND FAULT RECEPTACLE.
	(H) HORIZONTALLY MOUNTED 4" ABOVE COUNTER OR ABOVE COUNTER BACKSPLASH TO BOTTOM, UNLESS NOTED OTHERWISE
	(WP) WEATHERPROOF COVER WITH GROUND FAULT RECEPTACLE.
	SPECIAL RECEPTACLE

- SPECIAL RECEPTACLE SINGLE RECEPTACLE WALL OUTLET WITH 20A, 125V SINGLE RECEPTACLE MOUNTED 18" A.F.F. TO
- BOTTOM, UNLESS NOTED OTHERWISE. DUPLEX RECEPTACLE WALL OUTLET WITH 20A, 125V DUPLEX RECEPTACLE MOUNTED 18" A.F.F. TO BOTTOM, UNLESS NOTED OTHERWISE.
- DOUBLE DUPLEX WITH (2) 20A. 125V DUPLEX RECEPTACLES. MOUNT 18" A.F.F TO BOTTOM, UNLESS NOTED OTHERWISE.
- DUPLEX RECEPTACLE WITH 20A, 125V DUPLEX MOUNTED 4" ABOVE COUNTER OR ABOVE COUNTER BACKSPLASH TO BOTTOM, UNLESS NOTED OTHERWISE
- FLOOR OUTLET AS NOTED. JUNCTION BOX.
- SURFACE RACEWAY WITH RECEPTACLES AS SPECIFIED ON DRAWING. PLANS SHALL INDICATE LOCATION OF DEVICE BRACKET AND RECEPTACLE
- S, SWITCH WITH PILOT LAMP S_{WP} WEATHERPROOF SWITCH
- MANUAL MOTOR CONTROLLER WITH THERMAL OVERLOAD TO SUIT MOTOR, P=PILOT, MOUNT 44" A.F.F UNLESS NOTED OTHERWISE.
- PUSH BUTTON STATION AS SPECIFIED. MOUNT 44" A.F.F. TO TOP, UNLESS NOTED OTHERWISE.
- MUSHROOM HEAD OPERATOR. MOUNT 44" A.F.F. TO CENTER, UNLESS NOTED OTHERWISE.
- NON-FUSED DISCONNECT SWITCH MOUNTED AT
- 4'-6" TO TOP, UNLESS NOTED OTHERWISE, SUBSCRIPT INDICATES SWITCH RATING. 30/3. F20 FUSED DISCONNECT, MOUNT 4'-6" A.F.F. TO TOP,
- SUBSCRIPT INDICATES SWITCH RATING & FUSE SIZE, FAR=FUSE AS REQUIRED. FIELD VERIFY FUSE SIZE. COMBINATION MAGNETIC MOTOR CONTROLLER SUIT 30/3, F20 TO MOTOR, MOUNT AT 4'-6" A.F.F. TO TOP, UNLESS INDICATED OTHERWISE. SUBSCRIPT
- INDICATES SWITCH RATING & FUSE SIZE, FAR=FUSE AS REQUIRED. FIELD VERIFY FUSE SIZE. MAGNETIC MOTOR CONTROLLER SUIT TO MOTOR, MOUNT AT 4'-6" A.F.F. TO TOP, UNLESS INDICATED
- OTHERWISE. SUBSCRIPT INDICATES SWITCH RATING.
- MOTOR AS SCHEDULED.
- ELECTRICAL POWER PANEL (SURFACE MOUNTED)

LIGHTING LEGEND

- S SINGLE POLE SWITCH
- THREE WAY SWITCH
- FOUR WAY SWITCH
- AUTOMATIC DOOR SWITCH SWITCH WITH PILOT LAMP
- KEY OPERATED SWITCH
- WEATHER PROOF SWITCH
- X APPLICABLE) (X = VS INTEGRAL SENSOR) OS OCCUPANCY SENSOR MOUNTED AT SWITCH HEIGHT VACANCY SENSOR MOUNTED AT SWITCH HEIGHT

DIMMER (CONNECTED TO OS OR VS WHERE

- "a.b.c" LOWER CASE LETTERS AT LUMINAIRES INDICATE SWITCHING ARRANGEMENT. CEILING MOUNTED LUMINARIES AS SCHEDULED.
- "X" INDICATES FIXTURE TYPE. CEILING MOUNTED LUMINARIES WITH EMERGENCY BATTERY BACKUP. "X" INDICATES FIXTURE TYPE.
- CEILING MOUNTED FIXTURE AS SCHEDULED.
- WALL MOUNTED LUMINAIRE AS SCHEDULED.
- SYMBOL INDICATES NIGHT LIGHT WHEN SHOWN ON LIGHTING PLAN ADJACENT TO LUMINARIES

+20'-0" SYMBOL INDICATED MOUNTING HEIGHT OF WALL

- MOUNTED LUMINARIES FROM A.F.F. TO BOTTOM CEILING MOUNTED SINGLE FACED EXIT LIGHT FIXTURE AS SCHEDULED WITH DIRECTIONAL ARROW AS
- SHOWN ON DRAWINGS. CEILING MOUNTED DOUBLE FACED EXIT LIGHT FIXTURE AS SCHEDULED WITH DIRECTIONAL ARROWS
- AS SHOWN ON DRAWINGS. WALL MOUNTED SINGLE FACED EXIT LIGHT FIXTURE AS SCHEDULED WITH DIRECTIONAL ARROWS AS
- SHOWN ON DRAWINGS, MOUNT 7'-4" A.F.F UNLESS NOTED OTHERWISE. → WALL MOUNTED DOUBLE FACED EXIT LIGHT FIXTURE
- AS SCHEDULED WITH DIRECTIONAL ARROWS AS SHOWN ON DRAWINGS, MOUNT 7'-4" A.F.F UNLESS NOTED OTHERWISE.
- © CEILING MOUNTED OCCUPANCY SENSOR
- © CEILING MOUNTED VACANCY SENSOR (OH) CEILING MOUNTED DAYLIGHT HARVESTING SENSOR

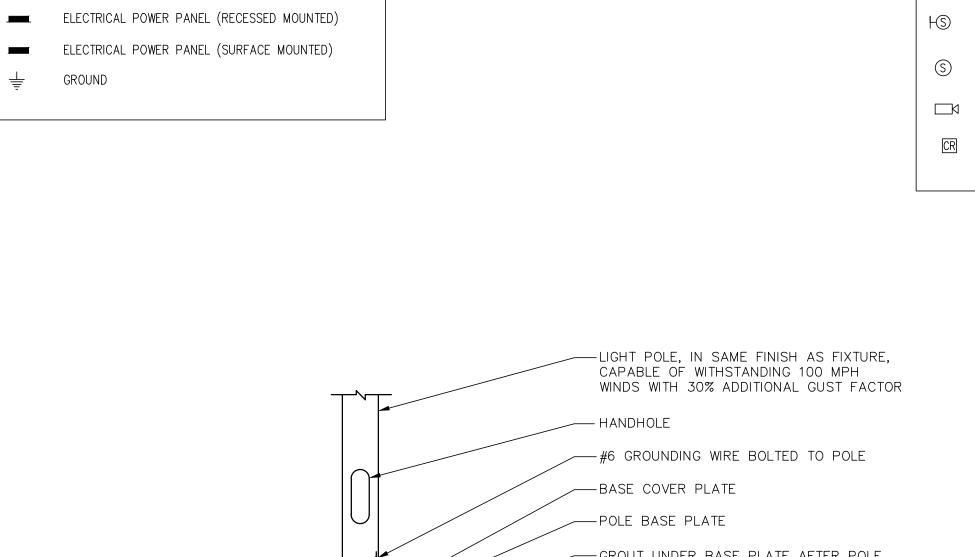
FIRE ALARM LEGEND

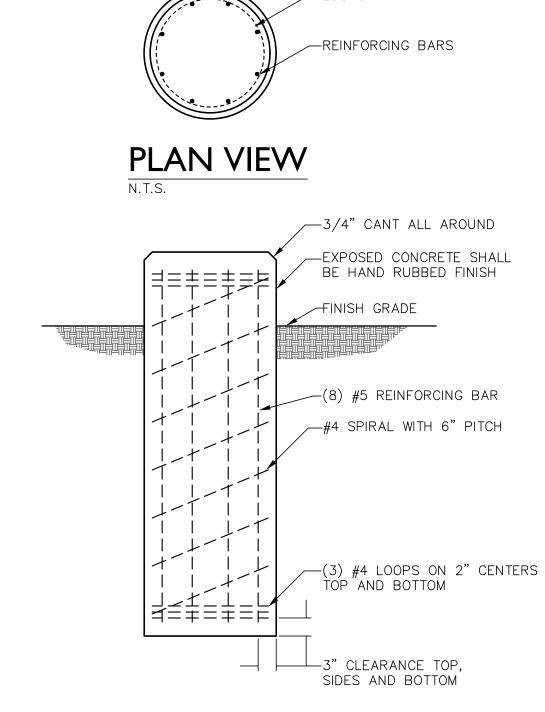
- FIRE ALARM MANUAL PULL STATION, MOUNT 48" TO THE CENTER, UNLESS OTHERWISE NOTED.
- COMBINATION FIRE ALARM HORN / VISUAL ANNUNCIATION DEVICE. MOUNT 80" A.F.F. TO BOTTOM OR 6" BELOW CEILING, WHICHEVER IS
- FIRE ALARM HORN, MOUNT 80" A.F.F. TO BOTTOM (H) OR 6" BELOW CEILING TO BOTTOM, WHICHEVER IS
- FIRE ALARM VISUAL ANNUNCIATION DEVICE, MOUNT 80" A.F.F. TO BOTTOM OR 6" BELOW CEILING TO BOTTOM, WHICHEVER IS LOWER.
- DUCT-TYPE SMOKE DETECTOR. INTERLOCK WITH FIRE ALARM SYSTEM FOR AUTOMATIC FAN SHUTDOWN. LOCATE IN DUCT AS NOTED ON PLAN.
- (F) CEILING MOUNTED RATE OF RISE HEAT DETECTOR.
- (F) CEILING MOUNTED SMOKE DETECTOR. TAMPER SWITCH, PROVIDE ADDRESS MODULE AND MAKE REQUIRED CONNECTION TO SUPERVISE FIRE
- PROTECTION SYSTEM. FLOW SWITCH, PROVIDE ADDRESS MODULE AND MAKE REQUIRED CONNECTIONS TO SUPERVISE FIRE
- PROTECTION SYSTEM. FACP FIRE ALARM CONTROL PANEL.
- FRAPI FIRE ALARM REMOTE ANNUNCIATOR PANEL.
- WATER/GAS SOLENOID AS SPECIFIED. PROVIDE ELECTRICAL CONNECTION AS REQUIRED.
- WALL MOUNTED MAGNETIC DOOR HOLDER. F=FLOOR MOUNTED. A ADDRESSABLE RELAY

- VOICE/DATA OUTLET IN WALL. STUB 1" CONDUIT FROM OUTLET INTO NEAREST ACCESSIBLE CEILING AND BUSH END. MOUNT 18" A.F.F TO BOTTOM,
- DATA OUTLET IN WALL. STUB 1" CONDUIT FROM OUTLET INTO NEAREST ACCESSIBLE CEILING AND
- VOICE OUTLET IN WALL. STUB 1" CONDUIT FROM OUTLET INTO NEAREST ACCESSIBLE CEILING AND BUSH END .MOUNT 18" A.F.F TO BOTTOM, UNLESS
- EMPTY OUTLET FOR WALL MOUNTED SPEAKER BY OTHERS FOR PA/INTERCOM SYSTEM AS SPECIFIED.

TECHNOLOGY LEGEND ▼ INTERCOM SPEAKER VOLUME CONTROL

- INTERCOM CALL SWITCH AS SPECIFIED. MOUNT 44" A.F.F. TO TOP, UNLESS NOTED OTHERWISE.
- UNLESS NOTED OTHERWISE.
- BUSH END. MOUNT 18" A.F.F TO BOTTOM, UNLESS NOTED OTHERWISE.
- NOTED OTHERWISE.
- EMPTY OUTLET FOR CEILING MOUNTED SPEAKER BY OTHERS FOR PA/INTERCOM SYSTEM AS SPECIFIED. CLOSED CIRCUIT TV CAMERA
- CARD READER AS SPECIFIED. MOUNT 44" A.F.F. TO TOP, UNLESS NOTED OTHERWISE.





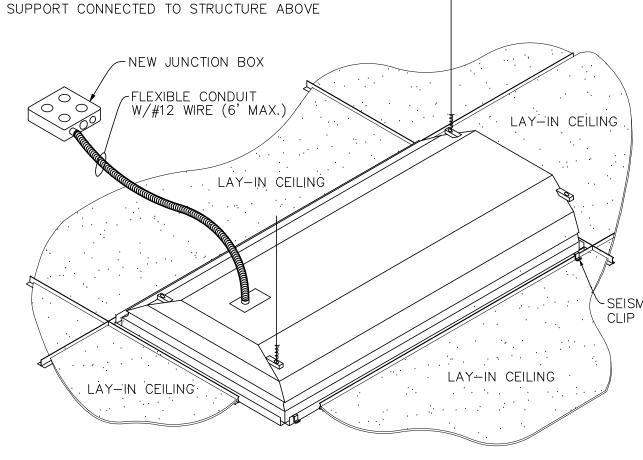
- 1. USE 3000 PSI 28 DAY STRENGTH CONCRETE FOR POLE BASE
- 2. PLACE CONRETE THE SAME DAY BASE IS DRILLED 3. USE SONOTUBE FORM ABOVE GRADE AND EXTEND TO 6" BELOW GRADE
- 4. REFER TO POLE BASE DETAIL FOR DIMENSIONS

GROUT UNDER BASE PLATE AFTER POLE -FINISHED GRADE - ANCHOR BOLTS CONDUIT: SIZE AS NOTED ON PLANS

	DIMENSIONS	
Pole Height	L	D
12'-0"	4'-6"	1'-6"
20'-0"	5'-0"	2'-0"
30'-0"	6'-0"	2'-6"
40'-0"	7'-0"	3'-0"

NOTES:

- 1. VERIFY ANCHOR BOLT LOCATIONS WITH MANUFACTURER'S TEMPLATE PRIOR TO BASE CONSTRUCTION
- 2. REFER TO POLE BASE CONRETE AND REINFORCING DETAIL FOR ADDITIONAL REQUIREMENTS



12 GAUGE HANGER WIRE OR CHAIN FOR FIXTURE

LAY IN	LIGHT	FIXTURE	DETAIL
NOT TO SCALE			

EILING	PULL STRING (TYPICAL) CONDUIT STUB WITH NYLON BUSHING (TYPICAL) CEILING CEILING CONDUIT STUB WITH CEILING CEILING
· \ CLIP	FLOOR

UNIVERSAL

LIGHT FIXTURE SCHEDULE

NO. & TYPE

| 4000K - 30.2 WATTS | RECESSED

4000K - 19.1 WATTS RECESSED

4000K - 28 WATTS RECESSED

4000K - 23 WATTS RECESSED

4000K - 19 WATTS RECESSED

4000K - 42 WATTS SUSPENDED

4000K - 47.4 WATTS | SURFACE

4000K - 32 WATTS | CEILING

RECESSED

RECESSED

| RECESSED | FLUSH

| WALL/TRACK | DIFFUSED

CEILING

SYSTEM

DOWNLIGHT

DIFFUSER

DIFFUSER

FULL VISOR

TYPE 4X4 BEACON

DISTRIBUTION 4K7-4X4

NARROW FLOOD | AL-D-24L-55-

|120/277| 3518 LED LUMENS

|120/277| 2458 LED LUMENS

120/277 3291 LED LUMENS

120/277 2813 LED LUMENS

120/277 2143 LED LUMENS

120/277 2414 LED LUMENS

120/277 22051 LED LUMENS

|120/277| 5411 LED LUMENS

120/277 2400 LED LUMENS

DIRECT/INDIRECT

4000K 62 WATTS

DIRECT/INDIRECT

4000K 31 WATTS

1400 LED LUMENS

4000K 13 WATTS

4000K 74.4 WATTS

5000K - 24.3 WATTS

4000K 74.4 WATTS

| 5000K - 55 WATT

5000K - 90 WATT

| 5000K - 150 WATT

5000K - 80 WATTS

5000K - 80 WATTS

| 5000K - 180 WATT

| 5000K - 180 WATT

5000K - 180 WATT

| 4000K - 13.9 WATTS | CEILING

120/277 1000 LED LUMENS

80 CRI

80 CRI

277 | 11052 LUMEN

277 | 22186 LUMEN

277 | 8415 LED LUMENS

277 8415 LED LUMENS

277 | 20365 LED LUMENS

277 | 20365 LED LUMENS

277 | 20365 LED LUMENS

4000K - 200 WATT

120/277 6222 LED LUMENS CEILING

4000K - 18 WATTS

DESCRIPTION

CODE GAUGE STEEL HOUSING, FLUSH STEEL HINGE

AND LATCH DOOR, GASKETED ACRYLIC LENS. DLC

CODE GAUGE STEEL HOUSING, FLUSH STEEL HINGE

CODE GAUGE STEEL HOUSING, FLUSH STEEL HINGE

AND LATCH DOOR, GASKETED ACRYLIC LENS. DLC

CODE GAUGE STEEL HOUSING, FLUSH STEEL HINGE

AND LATCH DOOR, GASKETED ACRYLIC LENS. DLC

CODE GAUGE STEEL HOUSING, FLUSH STEEL HINGE

AND LATCH DOOR, GASKETED ACRYLIC LENS. DLC

CODE GAUGE STEEL HOUSING, FLUSH STEEL HINGE

AND LATCH DOOR, GASKETED ACRYLIC LENS. DLC

FROSTED ACRYLIC LENS, 6' WHITE CORD, DLC LISTED.

FROSTED PRISMATIC ACRYLIC LENS. FIELD INSTALLED

WIRE GUARD (ONLY IN MECHANICAL SPACES). DLC

FIBERGLASS HOUSING, STAINLESS STEEL RETAINING

DOWNLIGHT, SEMI-DIFFUSED APERTURE, DLC LISTED.

EXTRUDED ALUMINUM HOUSING, DLC LISTED. END

EXTRUDED ALUMINUM HOUSING, DLC LISTED. END

CAPS WHERE REQUIRED. PROVIDE ALL JOINING

COMPONENTS FOR A COMPLETE INSTALLATION.

LI3 | NOMINALLY 11.8"x17.7" DIA. PENDANT MOUNTED.

L 4 NOMINALLY 6" DIAMETER x14"x4-3/4" DEEP LED

DOWNLIGHT. SEMI-DIFFUSED APERTURE, DLC LISTED.

ALUMINUM HOUSING, DLC LISTED. DAMP LOCATION

AS INDICATED, ALUMINUM HOUSING. ONE CIRCUIT

ALUMINUM HOUSING, DLC LISTED. DAMP LOCATION

TRACK. DIMMIABLE, GEO MOUNT.

DIE CAST ALUMINUM HOUSING.

PI-N NOMINALLY 23"X11.25"x4.13" DEEP LED POLE

P2-N NOMINALLY 23"X11.25"x4.13" DEEP LED POLE

P3-N NOMINALLY 29"X14.25"x4.13" DEEP LED POLE

P4-N NOMINALLY 29"X14.25"x4.13" DEEP LED POLE

P5-N NOMINALLY 29"X14.25"x4.13" DEEP LED POLE

BRONZE FINISH, DLC LISTED.

BRONZE FINISH, DLC LISTED.

BRONZE FINISH, DLC LISTED.

BRONZE FINISH, DLC LISTED.

MOUNTED FIXTURE, DIE CAST ALUMINUM HOUSING,

4" STEEL SQUARE NON TAPERED WHERE INDICATED.

ELECTRONIC EDGE LIT EXIT LIGHT, SINGLE OR DOUBLE

BRONZE FINISH, DLC LISTED. NEW 30' POLE

NOMINALLY 8-5/8"x13-5/8"x2" DEEP LED

FACE AS INDICATED ON FLOOR PLANS, THERMOPLASTIC, END, BACK OR TOP MOUNT, DIRECTIONAL ARROW PANEL, RED LETTERS.

NICKEL-CADMIUM BATTERY.

PI | LED RETROFIT KIT.

P2 | LED RETROFIT KIT.

BARN DOOR TYPE HEAD.

DIFFUSED LENS, WIDE FLANGE. PAINTED WHITE

CAPS WHERE REQUIRED. PROVIDE ALL JOINING

COMPONENTS FOR A COMPLETE INSTALLATION.

LII NOMINALLY 8'x4.5"x2" DEEP LINEAR DIRECT/INDIRECT. | 120/277 | 8000 LED LUMENS

LI2 | NOMINALLY 4'x4.5"x2" DEEP LINEAR DIRECT/INDIRECT. | 120/277 | 4000 LED LUMENS

LI5 | NOMINALLY 8'x4"x4" DEEP LINEAR DIRECT. EXTRUDED | 120/277 | 7647 LED LUMENS

L 6 TRACK LIGHTING, BLACK FINISH, QUANTITY OF HEADS | 120 | 1580 LED LUMENS

LI7 | NOMINALLY 8'x4"x4" DEEP LINEAR DIRECT. EXTRUDED | 120/277 | 7647 LED LUMENS

FP| | FLAG POLE GROUND MOUNTED LED, BRONZE FINISH | 277 | 6293 LUMEN

DIFFUSED LENS, WIDE FLANGE. PAINTED WHITE

CLIPS, GASKETED ACRYLIC LENS. DLC LISTED. WET

AND LATCH DOOR, GASKETED ACRYLIC LENS. DLC

L| | NOMINALLY 2'x4'x4" DEEP TROFFER. DIE-FORMED

L2 | NOMINALLY 2'x4'x4" DEEP TROFFER. DIE-FORMED

L3 | NOMINALLY 1'x4'x4" DEEP TROFFER. DIE-FORMED

| 4 | NOMINALLY 2'x2'x4" DEEP TROFFER. DIE-FORMED

| 5 | NOMINALLY 2'x2'x4" DEEP TROFFER. DIE-FORMED

L6 | NOMINALLY 1'x4'x4" DEEP TROFFER. DIE-FORMED

▼ NOMINALLY 47"x28.5'x3.5" DEEP LED HIGHBAY.

L8 | NOMINALLY 4"x4'x3.5" DEEP LED INDUSTRIAL,

L9 NOMINALLY 6-7/9"x4'x4-3/8" DEEP TROFFER.

LIO | NOMINALLY 8" DIAMETER x14"x6" DEEP LED

REFLECTOR.

REFLECTOR.

MOUNT

LENS

| SUSPENDED | POLYCARBONATE | ILP 200WLED SERIES

PRISMATIC

ACRYLIC

ACRYLIC

COLUMBIA

RIBBED FROSTED | COLUMBIA LXEM SERIES

PRESCOLITE

APERTURE

LAMBERTIAN | WALWDI HLO LED 80

LAMBERTIAN | WALWDI HLO LED 80

1000 40

1000 40

LC6SL HOUSING

APERTURE

V-8-4000

6LCSL10L40KS8WH

BRUCK Z25 SPOT

FINELITE HP-4-D-X

ENERGY HARNESS

| ENERGY HARNESS EHK-150W

EHK-90W

BEACON

DISTRIBUTION VP-S-36NB-80

DISTRIBUTION VP-S-36NB-80

DISTRIBUTION VP-L-80NB

DISTRIBUTION VP-L-80NB

DISTRIBUTION VP-L-80NB

DUAL-LITE LX

EMERGILITE

SURE-LITE

TYPE 5 | BEACON

V-8-4000

FINELITE HP-4-D-X

| HIGH EFFICIENCY | LUMENWERX

HIGH EFFICIENCY | LUMENWERX

HAND BLOWN | BOCK LIGHTING

SATIN WHITE | LVGO2-13-4000

EUROPEAN GLASS BARILE

LC8ML HOUSING 8LCML24L40KS8WH

SERIES NO.

COLUMBIA LCAT SERIES | CREE ZR SERIES

| COLUMBIA LCAT SERIES | CREE ZR SERIES

COLUMBIA LCAT SERIES | CREE ZR SERIES

COLUMBIA LCAT SERIES | CREE ZR SERIES

| COLUMBIA LCAT SERIES | CREE ZR SERIES

COLUMBIA LCAT SERIES | CREE ZR SERIES

ACCEPTABLE

MANUFACTURERS

SERIES NO.

METALUX CZ SERIES

REMARKS

NOTE: 1. REFER TO FLOOR PLANS FOR DEVICE LOCATIONS AND QUANTITIES. 2. STUB RACEWAY IN TO SPACE ABOVE NEAREST ACCESSIBLE INTERIOR CEILING UNLESS OTHERWISE 3. PROVIDE ROUGH-IN BOX, TRIM RING, AND RACEWAY AS REQUIRED FOR EACH DEVICE OR EQUIPMENT, COORDINATE EXACT ROUGH-IN REQUIREMENTS WITH EQUIPMENT SUPPLIER PRIOR

PROVIDE ALL MATERIAL

TO MOUNT NEW

TO MOUNT NEW

TO MOUNT NEW

OR NEW POLE.

TO MOUNT NEW

POLE.

FIXTURE TO EXISTING

PROVIDE ALL MATERIAL

FIXTURE TO EXISTING

WIRE GUARDS WHERE

INDICATED (WG)

TO MOUNT NEW

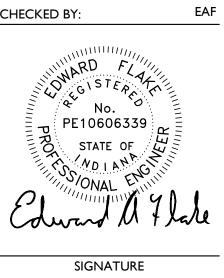
TO ROUGH-IN. 4. ALL DEVICES, EQUIPMENT, CABLING AND TERMINATIONS SHALL BE FURNISHED AND INSTALLED BY OWNER UNLESS OTHERWISE NOTED.

COMMUNICATIONS SYSTEMS ROUGH-IN DIAGRAM

PROPRIETARY AND CONFIDENTIAL

REVISIONS

IPC-K17-2402 1-23-2018 **DRAWN BY:** CHECKED BY:



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Element Fishers, IN

SHEET E-00 I

ELECTRICAL SYMBOLS AND **ABBREVIATIONS**

TYPICAL POLE BASE CONCRETE AND REINFORCING DETAIL

TYPICAL RAISED POLE BASE DETAIL

GENERAL ELECTRICAL REQUIREMENTS

APPLICABLE CODES: CONTRACTOR'S INSTALLATION SHALL COMPLY WITH CURRENT NEC CODE ADOPTED BY STATE/AREA WHERE WORK IS PERFORMED. VERIFY ADOPTED CODE AND STATE'S/AREAS AMENDMENTS TO CODE IF ANY. LOCAL AHJ (AUTHORITY HAVING JURISDICTION) SHALL BE USED AS A RESOURCE DURING CONSTRUCTION WHERE APPLICABLE. ALL REFERENCES TO NEC WITHIN THESE SPECIFICATIONS ARE IN REFERENCE CODE DESCRIBED ABOVE.

1.0 BASIC ELECTRICAL REQUIREMENTS

- MATERIAL SUBSTITUTIONS: MATERIALS, EQUIPMENT AND SPECIALTY ITEMS SHOWN IN THESE DRAWINGS AND SPECIFICATIONS ARE SPECIFIED AROUND A LIST OF BRAND NAMES KNOWN FOR AND PERFORMANCE PROVEN TO THE ENGINEER. ONLY THOSE MANUFACTURERS NAMED IN THESE DRAWINGS AND SPECIFICATIONS OR IN A WRITTEN ADDENDUM WILL BE APPROVED FOR THE PROJECT. THE TERMS "OR EQUAL" AND "APPROVED EQUAL" ARE MEANT TO APPLY ONLY TO THOSE MANUFACTURERS AND BRAND NAMES LISTED HEREIN AND DOES NOT IMPLY "OR EQUAL" OUTSIDE THE LIMITS OF THE NAMED MANUFACTURERS. THE ENGINEER RESERVES THE SOLE RIGHT FOR THE APPROVAL OF PROPOSED ADDITIONAL MANUFACTURERS, MATERIAL, AND/OR EQUIPMENT.
- SUBMITTALS: SUBMIT ONE (1) ELECTRONIC COPY OF BROCHURES, CATALOG CUT SHEETS, TECHNICAL DATA OR DRAWINGS OF ALL EQUIPMENT AND/OR MATERIALS. SUBMITTALS DRAWINGS SHALL STATE CAPACITIES, PHYSICAL DIMENSIONS AND WEIGHTS, AS WELL AS FULLY DESCRIBE ALL OPTIONS AND APPURTENANCES NECESSARY TO DEMONSTRATE THAT THE EQUIPMENT MEETS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS. THE REVIEW OF SHOP DRAWINGS BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF COMPLYING WITH THESE CONTRACT DOCUMENTS.
- PERMITS AND INSPECTIONS: THE CONTRACTOR SHALL OBTAIN AND FURNISH ALL NECESSARY PERMITS AND INSPECTION CERTIFICATES FOR ALL MATERIAL AND LABOR FURNISHED BY HIM. THE COST OF PERMITS, CERTIFICATES, AND ALL INSPECTION FEES REQUIRED IN CONNECTION WITH THE INSTALLATION OF THE ELECTRICAL SYSTEMS SHALL BE BORNE BY THE CONTRACTOR.
- TEMPORARY POWER: THE CONTRACTOR SHALL PROVIDE TEMPORARY POWER CONNECTIONS AND LIGHTING FOR THIS PROJECT AS REQUIRED BY OTHER TRADES. COORDINATE WITH G.C. FOR METERING AND BILLING. IT IS NOT THE RESPONSIBILITY OF THIS CONTRACTOR TO PAY THE MONTHLY BILL BUT ONLY TO COORDINATE ELECTRICAL UTILITY FOR THE G.C. AND PROVIDE LIGHTING AND RECEPTACLES. ALL TEMPORARY POWER RECEPTACLES SHALL BE PROTECTED BY GFCI BREAKERS OR OUTLETS. ALL TEMPORARY POWER AND LIGHTING SHALL BE REMOVED AT END OF PROJECT.
- 1.4.1 PROVIDE TEMPORARY LIGHTING TO OTHER TRADES FOR WORK DURING ELECTRICAL OR LIGHTING SYSTEM DOWNTIME FOR THE DURATION OF THE PROJECT. ALL TEMPORARY LIGHTING SHALL BE REMOVED AT END OF PROJECT.
- DRAWINGS: THE CONTRACTOR SHALL HAVE A COMPLETE SET OF DRAWINGS ON THE SITE AT ALL TIMES. THESE CONTRACT DRAWINGS FOR ELECTRICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND TO INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, CONDUITS, ETC. AND THE APPROXIMATE SIZES AND LOCATIONS OF EQUIPMENT AND MATERIALS. BECAUSE OF THE SCALE OF THE DRAWINGS, CERTAIN BASIC ITEMS SUCH AS CONDUIT FITTINGS, JUNCTION BOXES, PULL BOXES, ETC. MAY NOT BE SHOWN, BUT SHALL BE FURNISHED AND INSTALLED WHERE REQUIRED BY CODE OR BY THE NATURE OF THE WORK. THE CONTRACTOR SHALL LOCATE ALL EQUIPMENT WHICH MUST BE SERVICED, OPERATED OR MAINTAINED IN FULLY ACCESSIBLE POSITIONS. ANY MODIFICATIONS TO DRAWINGS SHALL BE PRESENTED TO ENGINEER FOR APPROVAL.
- STANDARDS OF MATERIALS AND WORKMANSHIP: ALL WORK SHALL CONFORM TO OR EXCEED THE MINIMUM REQUIREMENTS OF THE NATIONAL ELECTRIC CODE (NEC), THE CURRENTLY ENFORCED EDITION, AND ALL FEDERAL, STATE, LOCAL, AND MUNICIPAL ORDINANCES. ALL MATERIALS SHALL BE NEW, COMPLETE WITH UNDERWRITERS LABORATORIES (UL), INC., AND CARRY THE UL LABEL, IF A STANDARD HAS BEEN ESTABLISHED FOR THAT TYPE OF MATERIAL. ALL WORK SHALL BE EXECUTED IN A WORKMANLIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.
- EXISTING CONDITIONS: THIS CONTRACTOR SHALL EXAMINE THE EXISTING PROJECT SITE AND FAMILIARIZE HIMSELF WITH THE CONDITIONS AS THEY EXIST, OR THAT WILL IN ANY MANNER AFFECT HIS WORK UNDER THIS CONTRACT. ALL CONDITIONS SHALL BE CONSIDERED IN THE PREPARATIONS OF BIDS.
- 1.7.1 NOT ALL EXISTING ELECTRICAL EQUIPMENT, DEVICES, LIGHT FIXTURES, ETC. ARE SHOWN ON THE DRAWINGS. THE ELECTRICAL SUBCONTRACTOR IS RESPONSIBLE FOR CONDUCTING A SURVEY OF THE JOB SITE TO DETERMINE THE EXTENT OF THE EXISTING EQUIPMENT, DEVICES, LIGHT FIXTURES, ETC. AND HIS WORK.
- DAMAGES: THIS CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO THE WORK OF OTHER TRADES OR TO THE FACILITY AND ITS CONTENTS CAUSED BY EQUIPMENT INSTALLED BY HIM.
- REMOVE AND REPLACE CEILINGS AS REQUIRED TO PERFORM ALL WORK ASSOCIATED WITH THIS PROJECT. ANY GRID AND/OR TILES

DAMAGED AS PART OF THE REMOVAL OR REINSTALLATION PROCESS SHALL BE REPLACE BY THE ELECTRICAL CONTRACTOR AT HIS

- CLEANUP: THIS CONTRACTOR SHALL KEEP THE PREMISES CLEAN OF ALL DEBRIS CAUSED BY HIS WORK. AT THE CONCLUSION OF
- CONSTRUCTION, THE SITE SHALL BE THOROUGHLY CLEANED OF ALL RUBBLE, DEBRIS AND UNUSED MATERIALS.
- CLOSE-OUT: THIS CONTRACTOR SHALL PROVIDE ALL DOCUMENTS, AFFIDAVITS, GUARANTEES AND TRAINING REQUIRED FOR PROJECT CLOSE-OUT INCLUDING THE FOLLOWING: OPERATING AND MAINTENANCE MANUALS (5 BOUND COPIES) RECORD "AS-BUILT" DOCUMENTS (CD) GUARANTEES AND WARRANTIES
- 1.11 <u>SITE WORK:</u>
- 1.11.1 THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE ALL SITE WORK, TRENCHING BACK FILL, DRIVE/WALK REPAIR, AND ALL OTHER WORK ASSOCIATED WITH THE INSTALLATION OF NEW SERVICES OR CIRCUITS AS PART OF THIS PROJECT.
- 1.11.2 PROTECT LAWN AREAS, TREES, SHRUBS, SIDEWALKS, DRIVES, MONUMENTS, ETC. FROM DAMAGE DURING CONSTRUCTION. RE-GRADE, RESEED, AND RE-PAVE ANY AREAS THAT ARE DISTURBED.
- 1.11.3 THE ELECTRICAL SUBCONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING SITE UTILITIES AS REQUIRED TO PERFORM DESIGNATED WORK AS PART OF THIS PROJECT. REROUTING SERVICES IN CONFLICT OR REROUTE NEW WORK AS REQUIRED TO
- 1.11.4 EACH TRADE SHALL REPAIR ALL DAMAGE CAUSED BY WORK PROMPTLY AND COMPLETELY TO THE SATISFACTION OF THE OWNER AND
- 1.11.5 COORDINATE ALL SITE WORK WITH THE OWNER AND PERFORMANCE SERVICES INC. PRIOR TO EXECUTION.
- 1.11.6 COORDINATE ALL UTILITY WORK WITH LOCAL UTILITIES. ANY MODIFICATIONS DIRECTED BY UTILITY THAT ARE DIFFERENT THAN THAT

SHOWN ON DRAWINGS SHALL BE COORDINATED WITH ENGINEER PRIOR TO EXECUTION.

- 1.12 <u>CUTTING, PATCHING, AND PAINTING:</u>
- 1.12.1 THE SUBCONTRACTOR SHALL PATCH, REPAIR, MATCH TEXTURE, AND PAINT ALL EXISTING SURFACES WHERE ELECTRICAL EQUIPMENT, DEVICES, ETC. ARE BEING REMOVED OR SURFACES THAT ARE DAMAGED DURING INSTALLATION OF NEW EQUIPMENT AND DEVICES.
- 1.12.2 THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE ALL FLOOR, WALL, AND CEILING PENETRATIONS TO COMPLETE HIS WORK. PROVIDE PROPER FIRE STOPPING FOR ALL PENETRATIONS MADE THROUGH RATED WALLS AND ASSEMBLIES.
- 1.12.3 PAINT ALL NEW CONDUIT. JUNCTION BOXES, AND HANGERS TO MATCH ADJACENT SURFACES WHERE INSTALLED IN EXPOSED

2.0 BASIC ELECTRICAL MATERIALS AND METHODS

- SUPPORTS: THIS CONTRACTOR SHALL PROVIDE MISCELLANEOUS LUMBER AND METAL FRAMING FOR THE SUPPORT OF ELECTRICAL MATERIALS AND EQUIPMENT. PROVIDE WOOD OR METAL GROUNDS, NAILERS, BLOCKING, FASTENERS AND ANCHORAGE AS REQUIRED MATERIALS SHALL BE OF COMPARABLE QUALITY AND TYPE USED FOR THE GENERAL CONSTRUCTION IN THE ARE WHERE INSTALLED
- JOINT SEALERS: PROVIDE JOINT SEALERS FOR SEALING AROUND ELECTRICAL MATERIALS AND EQUIPMENT. PROVIDE FIRE RESISTANT SEALERS WHERE CONDUIT AND/OR WIRING EXTENDS THROUGH FIRE AND/OR SMOKE RATED WALLS AND FLOORS. SEAL ALL CONDUIT PENETRATIONS OF THE BUILDING WALLS AND FOUNDATIONS BELOW GRADE.
- 2.2.1 PROVIDE APPROPRIATE SEALANT (I.E. FIRE STOPPING) OR BARRIERS TO MAINTAIN CONSTRUCTION INTEGRITY FOR ANY PENETRATIONS THROUGH FLOORS, STRUCTURAL CEILINGS, AND FIRE WALLS.
- 2.2.2 FIRE STOPPING METHOD SHALL BE UL LISTED AND RATED FOR PENETRATIONS APPLIED.
- 2.2.3 HILTI TYPE FS-ONE FOR MECHANICAL/ELECTRICAL ROOM PENETRATIONS.

3.0 RACEWAYS:

- GENERAL: ALL POWER WIRING, ALL WIRING FOR OVER 24 VOLTS, AND DESIGNATED SYSTEMS WIRING SHALL BE ROUTED IN EMT RACEWAY UNLESS NOTED OTHERWISE. ALL WIRING AND CONDUIT SHALL BE INSTALLED CONCEALED IN FINISHED SPACES EXCEPT WHERE SURFACE WIRE WAYS ARE NOTED. CONDUIT MAY BE ROUTED EXPOSED IN MECHANICAL AND ELECTRICAL ROOMS, ATTIC SPACE AND IN AREAS WHICH HAVE NO CEILINGS.
- 3.2 <u>OUTDOORS:</u> PVC CONDUIT (SCHEDULE 40) BELOW GRADE AND IN CONCRETE.
- INDOORS: USE THE FOLLOWING WIRING METHODS ABOVE FLOOR RIGID METAL CONDUIT (GRC) (WHERE INDICATED OR REQUIRED) ELECTRICAL METALLIC TUBING (EMT) (NOT IN EARTH OR CONCRETE) USE THE FOLLOWING WIRING METHODS — BELOW FLOOR
- SIZES: THE MINIMUM CONDUIT SIZE SHALL BE 3/4" UNLESS NOTED OTHERWISE. DEDICATED SWITCH LEGS MAY BE RUN IN 1/2"
- FITTINGS: PROVIDE CONDUIT BODIES OF THE TYPES, SHAPES AND SIZES AS REQUIRED BY THE INSTALLATION AND THE NEC. USE METALLIC BODIES WITH STEEL CONDUIT AND PLASTIC WITH PLASTIC CONDUIT, RIGID CONDUITS (GRC AND IMC) SHALL BE FOUND WITH THREADED TYPE CONNECTIONS AND COUPLINGS. EMT SHALL BE JOINED WITH CONNECTORS OF STEEL OR MALLEABLE IRON AND SHALL BE OF THE COMPRESSION OR SET SCREW TYPE. INDENTOR, FRICTION AND DIE-CAST METAL CONNECTORS WILL NOT BE PERMITTED. PROVIDE INSULATED BUSHINGS AT ALL ENTRANCES TO PANEL BOARDS, STARTERS, PULL BOXES, ETC.
- VIBRATING EQUIPMENT: CONNECT TO VIBRATING EQUIPMENT AND HYDRAULIC PNEUMATIC OR ELECTRIC SOLENOID OR MOTOR-DRIVEN EQUIPMENT WITH LIQUID TIGHT FLEXIBLE METAL CONDUIT.

4.0 WIRE AND CABLES:

- 4.1 GENERAL: PROVIDE COPPER WIRE AND CABLE WITH 600 VOLT INSULATION SUITABLE FOR THE TEMPERATURE, CONDITIONS, AND LOCATIONS WHERE INSTALLED. MINIMUM SIZE BRANCH CONDUCTORS SHALL BE #12 MINIMUM AND TEMPERATURE RATING SHALL BE 75°C. ALUMINUM CONDUCTORS SHALL BE ALLOWED WITH WRITTEN APPROVAL FROM PERFORMANCE SERVICES INC.
- CONDUCTORS: PROVIDE STRANDED CONDUCTORS FOR SIZES #8 AWG AND LARGER. SOLID FOR #10 AWG AND SMALLER. (THE NTENTION OF THE SOLID WIRE IS FOR TERMINATION AT RECEPTACLES. STRANDED #10 AWG AND SMALLER MAY BE USED IN CONDUITS UP TO DEVICE, BUT TERMINATE WITH SOLID)
- 4.3 <u>INSULATION:</u> PROVIDE THHN OR THWN FOR ALL CONDUCTOR INSULATION. (NOTE THAT CONDUIT SIZE SHOWN ON THESE DRAWINGS IS BASED ON THHN INSULATION. LARGER CONDUIT MAY BE REQUIRED FOR OTHER INSULATIONS.)
- FLEXIBLE CONDUIT (OR MC CABLE): THE USE OF SHALL BE LIMITED TO SERVE NEW RECEPTACLES AND SWITCHES IN EXISTING WALLS OR ON LIGHTING FIXTURES WHERE NOT PROVIDED OR BEING RELOCATED. A JUNCTION BOX MUST BE UTILIZED NEAR THE WALL WITH THE NEW DEVICE. FLEXIBLE CONDUIT MUST BE PLENUM RATED AND HAVE AN APPROPRIATE SIZE NEUTRAL. ADDITIONAL MC CABLE USE SHALL BE ALLOWED WITH WRITTEN APPROVAL FROM PERFORMANCE SERVICES INC., PRIOR TO INSTALLATION. MC CABLE SHALL BE SIMILAR TO SOUTHWIRE ARMORLITE.

5.0 CABINETS, BOXES, AND FITTINGS:

- GENERAL: PROVIDE OUTLET AND DEVICE BOXES, PULL AND JUNCTION BOXES, CABINETS, HINGED DOOR ENCLOSURES AND BOXES AND TTINGS FOR HAZARDOUS LOCATIONS AS INDICATED ON THESE DRAWINGS, AS REQUIRED BY NEC OR BY THE INSTALLATION.
- OUTLET, DEVICE AND SMALL WIRING BOXES: PROVIDE METAL BOXES ON METAL RACEWAYS AND NON-METALLIC BOXES ON NON-METALLIC RACEWAYS. BOXES SHALL BE OF THE TYPE, SHAPE, SIZE AND DEPTH TO SUIT EACH LOCATION AND APPLICATION. BOXES SHALL INCLUDE STAMPED KNOCKOUTS, THREADED SCREW HOLES, AND APPROPRIATE ACCESSORIES SUCH AS MOUNTING BRACKETS AND STRAPS, CABLE CLAMPS. GROUNDING TERMINALS, EXTERIOR RINGS AND FIXTURE STUDS. BOXES SHALL HAVE FIRE RATINGS MATCHING WALL INSTALLATION.
- PULL AND JUNCTION BOXES: PULL AND JUNCTION BOXES SHALL HAVE SCREWED COVERS AND SHALL BE OF THE SIZE AND SHAPE
- CABINETS: CABINETS SHALL CONSIST OF A BOX AND A FRONT WITH A ONE PIECE FRAME AND A LOCKING, HINGED DOOR. PROVIDE A FRONT WITH APPROXIMATELY 3/4" OVERLAP ON ALL EDGES FOR FLUSH CABINETS AND THE SAME SIZE AS THE BOX FOR SURFACE CABINETS, UNLESS NOTED OTHERWISE.
- 5.5 <u>NEMA 1 CONSTRUCTION:</u> PROVIDE THE FOLLOWING: STEEL BOXES - PAINTED - GRAY ENAMEL HOT-DIPPED GALVANIZED STEEL BOXES

STAINLESS SCREWS

- NEMA 3 AND 3R CONSTRUCTION: PROVIDE THE FOLLOWING: STEEL BOXES - PAINTED - GRAY ENAMEL HOT-DIPPED GALVANIZED STEEL BOXES
- ACCESSORIES: PROVIDE DOOR HANDLES, LATCHES, KEY LOCKS, DRIP GUARDS, MOUNTING PANELS, DOOR STOPS, PADLOCK HASPS, GASKETS/SEALS AND OTHER ACCESSORIES AD REQUIRED. ALL BOXES, CABINETS, AND ENCLOSURES WHICH ARE NOT SECURED BY SCREWS OR BOLTS SHALL HAVE PROVISIONS FOR LOCKING THE DOOR OR COVER.

6.0 ELECTRICAL CONNECTIONS FOR EQUIPMENT:

- GENERAL: THIS CONTRACTOR SHALL EXTEND THE ELECTRICAL POWER WIRING TO EACH PIECE OF EQUIPMENT INDICATED ON THESE DRAWINGS AND SCHEDULES. THIS SHALL INCLUDE WIRING AND RACEWAY TO THE TERMINALS OF THE EQUIPMENT OR PLUG RECEPTACLE AS REQUIRED.
- EQUIPMENT: MOTOR STARTERS, DISCONNECT SWITCHES, JUNCTION BOXES, WHICH ARE NOT AN INTEGRAL PART OF THE EQUIPMENT, FURNISHED BY OTHER TRADES, THE OWNER OR PERFORMANCE SERVICES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR AS PART OF THIS PROJECT.
- MOTOR/HVAC EQUIPMENT CONNECTIONS: CONTRACTOR SHALL CONNECT MOTORS WITH WEATHER TIGHT FLEXIBLE CONDUIT/CONNECTIONS PROPERLY SIZE FOR THE WIRE INDICATED ON DRAWINGS. MINIMUM SIZE SHALL BE 3/4". CONTRACTOR SHALL PROVIDE 90° CONNECTION AT MOTOR WHERE A STRAIGHT CONNECTION WOULD PUT A LARGE LOOP IN CONDUIT. MAXIMUM LENGTH FOR MOTOR CONNECTION SHALL BE A MAXIMUM OF 3'-0" UNLESS WRITTEN APPROVAL FROM PERFORMANCE SERVICES INC. CONTRACTOR SHALL HARD WIRE TO A POINT NO FARTHER THAN 3' FROM MOTOR, SECURELY MOUNTING CONDUIT AS REQUIRED THEN EXTENDING TO MOTOR VIA FLEXIBLE CONDUIT DESCRIBED ABOVE.

7.0 WIRING DEVICES:

- 7.1 <u>GENERAL</u>: PROVIDE WIRING DEVICES OF THE TYPE, CHARACTERISTICS, GRADES, COLORS AND ELECTRICAL RATINGS FOR EACH APPLICATIONS INDICATED ON THESE DRAWINGS.
- <u>MANUFACTURERS:</u> EATON/COOPER WIRING DEVICES
- HUBBELL, INC.
- LEGRAND/PASS AND SEYMOUR, INC.
- 7.3 <u>GRADE</u>; SWITCHES AND RECEPTACLES SHALL BE CONSTRUCTED FROM THERMOPLASTIC NYLON. COLOR: GENERAL PURPOSE SWITCHES AND RECEPTACLES SHALL BE AS INDICATED IN COLOR. SPECIAL PURPOSE OUTLETS (DEVICES OTHER THAN 15A OR 20A RATED) SHALL BE BLACK IN COLOR.
- RECEPTACLES: ALL RECEPTACLES SHALL BE HEAVY DUTY GRADE, GROUNDING TYPE DUPLEX RECEPTACLES SHALL BE RATED AT 20
- COVER PLATES: COVER PLATES SHALL BE OF THE APPROPRIATE TYPE AND SIZE TO ACCOMMODATE THE DEVICES. COVER PLATES SHALL BE THERMOSET OR PHENOLIC PLASTIC, NON-COMBUSTIBLE, MAR-PROOF MATERIAL AND SHALL MATCH THE COLOR OF THE GENERAL PURPOSE SWITCHES AND RECEPTACLES. WEATHERPROOF COVER PLATES SHALL BE PROVIDED FOR ALL EXTERIOR RECEPTACLES AND SWITCHES WHERE INDICATED ON THESE DRAWINGS. WET LOCATION COVER PLATES SHALL DIE CAST METAL, GRAY, BE LISTED AS "WET LOCATION WITH COVER CLOSED", IDENTIFIED AS "EXTRA DUTY" AND SHALL HAVE A COVER WHICH CLOSES WITH A CORD SET PLUGGED INTO THE RECEPTACLE. (TAYMAC MX4380S) ISOLATED GROUND AND HOSPITAL GRADE RECEPTACLES (WHERE REQUIRED) SHALL BE LABELED/LISTED AS SUCH.

8.0 <u>CIRCUIT AND MOTOR DISCONNECTS:</u>

- 8.1 <u>GENERAL</u>: PROVIDE CIRCUIT AND MOTOR DISCONNECT SWITCHES IN TYPES, SIZES, DUTIES, FEATURE, RATINGS AND ENCLOSURES AS INDICATED OR AS REQUIRED BY THE NEC OR THE APPLICATION. PROVIDE NEMA 1 ENCLOSURES FOR INDOOR SWITCHES AND NEMA 3R ENCLOSURES WITH RAINTIGHT HUBS FOR EXTERIOR SWITCHES. FOR MOTORS AND STARTER DISCONNECTS, PROVIDE UNITS WITH HORSEPOWER RATINGS SUITABLE FOR THE LOAD.
- MANUFACTURERS: ALLEN-BRADELY COMPANY APPLETON
 - CROUSE-HINDS COMPANY CUTLER-HAMMER GENERAL ELECTRIC
 - ITE/GOULD. INC. SIEMENS ENERGY AND AUTOMATION, INC. SQUARE D COMPANY
- FUSIBLE SWITCHES: PROVIDE HEAVY DUTY SWITCHES WITH FUSES OF THE CLASSES AND CURRENT RATINGS INDICATED OR REQUIRED. PROVIDE UL SERVICE ENTRANCE LABEL WHERE USED AS MAIN SERVICE DISCONNECT. PROVIDE TYPE "RK1" FUSES FOR MOTOR LOADS AND TYPE "L" FOR SERVICE ENTRANCE SWITCHES...
- GROUNDING: PROVIDE EQUIPMENT GROUNDING CONNECTIONS FOR DISCONNECT SWITCH ENCLOSURES AND GROUND IN ACCORDANCE WITH NEC AND AS STATED HEREIN.

9.0 ELECTRICAL IDENTIFICATION:

- GENERAL: PROVIDE IDENTIFICATION OF ELECTRICAL MATERIALS, EQUIPMENT AND INSTALLATIONS. PROVIDE EQUIPMENT LABELS, WARNING AND CAUTION SIGNS, OPERATING INSTRUCTION SIGNS AND IDENTIFYING LABELS FOR THE FOLLOWING:
 - DISCONNECTS, MOTOR STARTERS, AND VARIABLE FREQUENCY DRIVES CONTACTORS AND RELAYS
- CABINETS AND ENCLOSURES CONTROL AND ALARM PANELS SWITCHBOARDS, LIGHTING AND POWER PANELS

(PANEL NAME AND CIRCUIT) IN 1/4" LETTERS.

- WIRE/CABLE MARKERS: PROVIDE VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAP-AROUND, CABLE/CONDUCTOR MARKERS WITH
- PREPRINTED NUMBERS AND LETTERS. ENGRAVED PLASTIC LAMINATE: PROVIDE ENGRAVED PLASTIC LAMINATED LABELS, SIGNS AND INSTRUCTION PLATES OF STOCK MELAMINE PLASTIC. ENGRAVED LEGENDS SHALL BE WHITE LETTERS ON BLACK FACE. PROVIDE 1/16 INCH THICK FOR SIGNS UP TO 20 SQUARE INCHES OR 8 INCHES IN LENGTH AND 1/8 INCH THICK FOR LARGER SIGNS. TAGS FOR EMERGENCY POWER SYSTEMS SHALL BE RED BACKGROUND WITH WHITE ENGRAVED LETTERS. PROVIDE EQUIPMENT LABEL IN 1/2" TALL LETTERS AND POWER SOURCE
- CONDUCTOR COLOR CODES: PROVIDE COLOR CODING FOR SECONDARY SERVICE, FEEDER AND BRANCH CIRCUIT CONDUCTORS THROUGHOUT THE PROJECT. SECONDARY ELECTRICAL SYSTEM AS FOLLOWS: (IDENTIFY THE HIGH—LEG ON ALL OPEN DELTA CONNECTIONS PER NEC 110.15)

	PHASE A B NEUTRAL GROUND	120/240 VOLT BLACK RED WHITE GREEN	PHASE A B C NEUTRAL GROUND	208Y/120 VOLT BLACK RED BLUE WHITE GREEN	PHASE A B C NEUTRAL GROUND	277/480 VOLT BROWN ORANGE YELLOW WHITE/GRAY GREEN
IG GREEN I.G. GREEN I.G. GREEN	IG	GREEN	I.G.	GREEN	I.G.	GREEN

- JUNCTION BOXES: PROVIDE WRITTEN LABEL TO ALL JUNCTION BOXES. LABEL JUNCTION BOX COVERS WITH CIRCUIT NUMBERS LOCATED WITHIN JUNCTION BOXES WITH BLACK SHARPIE.
- COVERPLATES: PROVIDE LABEL TO BACK OF ALL COVERPLATES. LABEL BACK OF COVERPLATES OF SWITCHES AND RECEPTACLES WITH CIRCUIT NUMBER FEEDING DEVICE WITH BLACK SHARPIE.

10.0 GROUNDING:

10.1 <u>GENERAL</u>: THIS CONTRACTOR SHALL EXTEND THE ELECTRICAL POWER WIRING TO EACH PIECE OF EQUIPMENT INDICATED ON THESE DRAWINGS AND SCHEDULES. THIS SHALL INCLUDE WIRING AND RACEWAY TO THE TERMINALS OF THE EQUIPMENT OR PLUG

- EQUIPMENT GROUNDING SYSTEM: THE EQUIPMENT GROUNDING SYSTEM SHALL GROUND ALL ELECTRICAL EQUIPMENT, METALLIC RACEWAYS, ENCLOSURES AND ALL NON CURRENT—CARRYING PARTS OF ELECTRICAL EQUIPMENT, SOUND EQUIPMENT, ALARM SYSTEM EQUIPMENT, MECHANICAL EQUIPMENT AND OTHER BUILDING SYSTEM EQUIPMENT WHICH USES ELECTRICITY OR WHICH COULD BECOME ENERGIZED UNDER FAULT CONDITIONS. AN EQUIPMENT GROUNDING CONDUCTOR, SIZED IN ACCORDANCE WITH NEC TABLE 250-95. SHALL BE PROVIDED IN ALL CONDUIT, RACEWAY CABLE TRAY, ETC. ALL EQUIPMENT SHALL BE GROUNDED WITH AN EQUIPMENT GROUNDING CONDUCTOR CABLE (GREEN OR GREEN WITH YELLOW TRACER).
- EQUIPMENT GROUNDING CONDUCTOR: CONDUCTOR SHALL BE RUN IN THE SAME CONDUIT AND RACEWAY AS THE CURRENT CARRYING CONDUCTORS. WITHOUT EXCEPTION.
- STEEL (MAGNETIC) CONDUIT: USED FOR MECHANICAL PROTECTION OF A GROUNDING CONDUCTOR SHALL BE SECURELY BONDED TO AT CONDUCTOR AT EACH END.

11.0 PANELBOARDS

- 11.1 GENERAL: ELECTRICAL CONTRACTOR TO PROVIDE 120/208 VOLT 30 DISTRIBUTION PANELS AND MAIN SERVICE EQUIPMENT AS SHOWN AND SCHEDULED ON THE DRAWINGS.
- REGULATIONS: CONFORM TO REQUIREMENTS OF NFPA 70. FURNISH PRODUCTS LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES INC. AS SUITABLE FOR THE PURPOSE SPECIFIED AND SHOWN. INSTALL PANELBOARDS IN ACCORDANCE WITH NEMA PB
- 11.3 <u>MANUFACTURES:</u>
 - EATON/CUTLER-HAMMER GENERAL ELECTRIC COMPANY SQUARE D COMPANY SIEMENS
- 11.4 <u>EXECUTION</u>:
- 11.4.1 LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARDS: NEMA PB1, CIRCUIT BREAKER TYPE.
- 11.4.2 PANELBOARD BUS: COPPER, RATINGS AS INDICATED. PROVIDE COPPER GROUND BUS IN EACH PANELBOARD.
- 11.4.3 MINIMUM INTEGRATED SHORT CIRCUIT RATING: 10,000 AMPERES RMS SYMMETRICAL FOR 240V PANELBOARDS: 14,000 AMPERES RMS SYMMETRICAL FOR 480V PANELBOARDS OR AS NOTED.
- 11.4.4 MOLDED CASE CIRCUIT BREAKERS: NEMA AB 1, BOLT ON TYPE THERMAL MAGNETIC TRIP CIRCUIT BREAKERS WITH COMMON TRIP HANDLE FOR ALL POLES. PROVIDE CIRCUIT BREAKERS UL LISTED AS TYPE SWD FOR LIGHTING CIRCUITS. PROVIDE UL A GROUND FAULT INTERRUPTER CIRCUIT BREAKERS WHERE SCHEDULED. DO NOT USE TANDEM CIRCUIT BREAKERS.
- 11.4.5 ENCLOSURE: NEMA PB 1, TYPE 1.

PANELBOARDS.

- 11.4.6 CABINET BOX: 6 INCH DEPTH, 20 INCH WIDTH FOR 240 VOLT AND LESS PANELBOARDS, 20 INCH WIDTH FOR 480 VOLT
- 11.4.7 CABINET FRONT: FLUSH AND SURFACE AS SCHEDULED CABINET FRONT WITH DOOR-IN-DOOR CONSTRUCTION AND FLUSH LOCK ALL KEYED ALIKE. FINISH IN MANUFACTURER'S GRAY ENAMEL.
- 11.4.8 EC TO PROVIDE ENGRAVED IDENTIFICATION TAGS FOR EACH PANEL. TAGS SHALL HAVE BLACK BACKGROUND WITH 4" HIGH WHITE

12.0 <u>FUSES</u>:

- 12.1 <u>GENERAL:</u> PROVIDE FUSES OF THE TYPES, CLASSES AND CURRENT RATINGS AS INDICATED. VOLTAGE RATINGS SHALL BE CONSISTENT
- 12.2 <u>MANUFACTURERS:</u>
 - EATON BUSSMANN LITTELFUSE
- FERRAZ SHAWMUT 12.3 <u>CARTRIDGE FUSES</u>: PROVIDE NON-RENEWABLE CARTRIDGE TYPE FUSES WHICH COMPLY WITH ANSI/IEEE STANDARD FU1.
- CLASS RK1 DUAL ELEMENT TIME DELAY FUSES

WITH THE CIRCUITS ON WHICH THEY ARE USED.

- CONTROL TRANSFORMERS AND BALLAST: PROVIDE NON-RENEWABLE CARTRIDGE TYPE FUSES, CLASS KTK-R, CURRENT LIMITING, COMPLYING WITH UL 198C, CLASS EQUAL. FUSE HOLDERS FOR ALL CLASS KTK-R FUSES. PROVIDE EATON BUSSMANN TYPE HEB SERIES TRON (1 POLE) OR TYPE HEY SERIES TRON (2 POLE) FUSE HOLDERS WHERE APPLICABLE.
- 12.5 <u>APPLICATION</u>: APPLY FUSES AS INDICATED ON THE DRAWINGS, OR AS FOLLOWS:

FUSES RATED 600 AMPERES OR LESS SHALL BE UL CLASS R

13.0 MOTOR CONTROLLERS:

- 13.1 <u>GENERAL</u>: PROVIDE A MOTOR CONTROLLER FOR EVERY MOTOR EXCEPT THOSE MOTORS WHICH ARE FURNISHED WITH CONTROL PANELS WHICH INCLUDE CONTROLLERS. CONTROLLERS SHALL HAVE OVERLOAD PROTECTION FOR EACH PHASE AND SHALL INCLUDE A
- DISCONNECT DEVICE. 13.2 **MANUFACTURERS**:
 - ALLEN-BRADELY COMPANY EATON/CUTLER HAMMER GENERAL ELECTRIC SQUARE D COMPANY
- SIEMENS 13.3 PROVIDE COMBINATION CONTROLLERS CONSISTING OF A CONTROLLER AND A DISCONNECT SWITCH MOUNTED IN A COMMON ENCLOSURE OF THE TYPES, SIZES, RATING AND NEMA RATINGS AS INDICATED. EACH UNIT SHALL HAVE AN OPERATING HANDLE FOR THE DISCONNECT AND A DOOR INTERLOCK TO PREVENT THE DOOR FROM OPENING WHEN THE CONTROLLER IS ENERGIZED.
- 13.3.1 <u>CONTROL POWER TRANSFORMER</u>: PROVIDE A CONTROL POWER TRANSFORMER FOR 120 VOLT CONTROL POWER. TRANSFORMER SHALL HAVE TWO (2) PRIMARY AND ONE (1) SECONDARY FUSES. A GROUNDED SECONDARY NEUTRAL AND SHALL BE SIZED AS REQUIRED TO POWER THE STARTER AND ANY EXTERNAL CONTROL DEVICES (MINIMUM SIZE 75 VA)
- 13.3.2 <u>FUSIBLE SWITCH:</u> PROVIDE FUSIBLE SWITCH ASSEMBLIES UNLESS OTHERWISE INDICATED ON THE DRAWINGS. SWITCH SHALL BE QUICK-MAKE, QUICK-BREAK TYPE WITH EXTERNAL HANDLE WHICH CAN BE PADLOCKED IN THE "ON" AND "OFF" POSITIONS. FUSES SHALL BE CLASS R UNLESS OTHERWISE NOTED.
- MANUAL MOTOR STARTER: PROVIDE SINGLE-PHASE MANUAL MOTOR STARTERS WHERE INDICATED, OF THE SIZES AND RATINGS AS REQUIRED. EQUIPMENT WITH A MANUALLY OPERATED QUICK—MAKE, QUICK—BREAK TOGGLE MECHANISM AND WITH A ONE—PIECE MELTING ALLOY TYPE THERMAL UNIT. EACH UNIT SHALL HAVE A GREEN PILOT LIGHT. SWITCH SHALL BE CAPABLE OF BEING PADLOCKED "OFF". IN FINISHED SPACES PROVIDE A FLUSH UNIT WITH A STAINLESS STEEL COVER PLATE, PILOT LIGHT AND WITHOUT THE PADLOCK OPTION.

14.0 RELAYS, CONTACTORS AND CONTROLS:

- 14.1 GENERAL: PROVIDE RELAYS, CONTRACTORS, TIME CLOCKS, PHOTOCELLS, PUSH BUTTONS, SELECTOR SWITCHES AND PILOT LIGHTS AS
- INDICATED ON THE DRAWINGS, AS REQUIRED IN THESE SPECIFICATIONS OR AS REQUIRED BY THE INSTALLATION. 14.2 <u>MANUFACTURERS:</u>

SIEMENS

ALLEN-BRADLEY COMPANY EATON/CUTLER HAMMER GENERAL ELECTRIC

SQUARE D COMPANY

15.0 PUSH BUTTONS, SELECTOR SWITCHES AND PILOT LIGHTS:

- 15.1 GENERAL:
- 15.2 <u>MANUFACTURERS:</u>
 - EATON/CUTLER HAMMER GENERAL ELECTRIC SQUARE D COMPANY SIEMENS

16.0 <u>RELAYS</u>:

16.1 GENERAL: PROVIDE RELAYS AND CONTROL RELAYS AS SHOWN OR SCHEDULED ON THESE DRAWINGS OR AS REQUIRED BY THE INSTALLATION. PROVIDE THE NUMBER AND TYPE OF CONTACTS WITH PROPER VOLTAGE/AMPERAGE RATINGS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. TIMING RELAYS SHALL BE PLUG-IN, SOLID-STATE, ADJUSTABLE DELAY UNIT COMPLETE WITH SOCKET AND RESTRAINING STRAP.

> MECHANICAL SHEETS HAVE ADDITIONAL FLECTRICAL WORK TO BE PERFORMED BY ELECTRICAL CONTRACTOR CONTRACTOR SHALL REFER TO MECHANICAL SHEETS FOR ADDITIONAL WORK.

17.0 CONTACTORS:

17.1 <u>GENERAL</u>: PROVIDE CONTACTORS AS SHOWN OR SCHEDULED ON THESE DRAWINGS. PROVIDE THE NUMBER AND TYPES OF CONTACTS WITH THE VOLTAGE AND AMPERAGE REQUIRED TO CONTROL THE LOAD. CONTACTORS SHALL BE RATED FOR FULL AMPERAGE TO THE TYPE OF LOAD INDICATED (LIGHTING, HEAT, MOTOR, ETC.).

18.0 MANUAL CONTROLS:

18.1 <u>GENERAL</u>: PUSH BUTTONS, SELECTOR SWITCHES AND PILOT LIGHTS SHALL BE HEAVY DUTY, INDUSTRIAL QUALITY DEVICES. THEY SHALL MOUNT IN 30.5 MM HOLES. PROVIDE CONTACT BLOCKS AND CONFIGURATIONS AS INDICATED. PUSH BUTTONS SHALL BE MOMENTARY CONTACT/BREAK WITH SPRING RETURN AND, UNLESS NOTED OTHERWISE, FLUSH HEADS, SELECTOR SWITCHES SHALL BE MAINTAINED CONTACT WITH THE NUMBER OF POSITIONS INDICATED. KEY OPERATED SWITCHES SHALL BE MOMENTARY CONTACT WITH SPRING RETURN TO CENTER AND KEY WITHDRAW SHALL BE FROM THE CENTER POSITION ONLY. LEGEND PLATES SHALL BE PROVIDED WITH EACH PUSH-BUTTON AND SELECTOR SWITCH TO IDENTIFY THE PURPOSE OF EACH DEVICE. PILOT LIGHTS SHALL BE OF THE COLOR INDICATED, THE VOLTAGE REQUIRED, AND SHALL ALSO HAVE A LEGEND PLATE OR CUSTOM ENGRAVED PLASTIC LAMINATE

19.0 LIGHTING:

COMPLETED.

- 19.1 IN MOST CASES THE LIGHTING FIXTURES AND LAMPS FOR BOTH INDOOR AND OUTDOOR APPLICATIONS WILL BE PROVIDED BY PERFORMANCE SERVICES, INC. THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR HANDLING AND INSTALLATION OF ALL LIGHT FIXTURES FOR THE PROJECT.
- ALL FIXTURES SHALL BE AS SCHEDULED ON THE PLANS. ALL FIXTURES SHALL BE LAMPED AS SCHEDULED ON THE PLANS. LAMPS SHALL BE TRANSPORTED AND HANDLED TO MINIMIZE BREAKAGE.

ANY FIXTURE FOUND NOT TO BE IN REUSABLE CONDITION SHALL BE REPORTED TO PERFORMANCE SERVICE, INC. IMMEDIATELY.

- FIXTURES SCHEDULED ON THE PLANS TO BE CLEANED AND RELAMPED, SHALL BE DISASSEMBLED AND COMPLETELY CLEANED. ALL SURFACES SHALL HAVE ALL ACCUMULATED DIRT REMOVED AND LENSES POLISHED. ANY MISSING FASTENERS SHALL BE REPLACED.
- 19.4 ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HANDLING OF FIXTURES ON SITE. HE SHALL COORDINATE STORAGE LOCATIONS OF FIXTURES ON SITE WITH GENERAL CONTRACTOR. ALL FIXTURES SHALL BE KEPT IN THE SHIPPING PACKAGING UNTIL INSTALLED. ALL INDIRECT/DIRECT LENSED FIXTURES SHALL HAVE PROTECTIVE PLASTIC IN PLACE UNTIL FINAL CLEANING IS
- 19.5 ALL WIRING RUNS IN FIXTURES SHALL BE RATED AT 90°C. ALL CONNECTIONS SHALL BE APPROVED BY THE FIXTURE MANUFACTURER. EACH FIXTURE SHALL BE CONNECTED WITH A FLEXIBLE CONDUIT AND WIRING (WHIP) WITH A LENGTH NOT TO EXCEED 6'-0" IN
- ALL FIXTURES SUPPORTED FROM STEEL STRUCTURE SHALL BE SECURELY ATTACHED TO STRUCTURE WITH STEEL FASTENERS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF BOTH BALLAST AND LENS SAFETY CABLES/CHAINS. HE SHALL ALSO PROVIDE ADDITIONAL SUPPORT STEEL FOR INSTALLATION OF FIXTURES IN LOCATION/PATTERN SHOWN ON PLANS.
- 19.7 FIXTURES INSTALLED IN FIRE RATED CEILINGS SHALL HAVE FIXTURE CLIPS ATTACHED TO CEILING GRID SYSTEM. INSTALL RECESSED LUMINARIES USING ACCESSORIES AND FIRE STOPPING MATERIALS TO MEET AND MAINTAIN CEILING FIRE RATING.
- ELECTRICAL CONTRACTOR SHALL INSTALL ALL ACCESSORIES FURNISHED WITH EACH LUMINARIES. ALL FIXTURES SHALL BE INSTALLED COMPLETE. ANY BROKEN FIXTURES SHALL BE REPORTED TO PERFORMANCE SERVICES, INC. IMMEDIATELY.
- 19.9 ALL FIXTURES SHALL BE GROUNDED AND BOND ALL INTERIOR FIXTURES PER NEC AND LOCAL REQUIREMENTS.
- 19.10 ALL EXTERIOR FIXTURES SHALL BE GROUNDED TO BUILDING ELECTRICAL DISTRIBUTION SYSTEM. FIXTURE, SUPPORT AND BASE SHALL ALL BE BONDED TOGETHER AND ATTACHED TO THE GROUNDING SYSTEM.
- 19.11 ALL LED FIXTURES SHALL FILTERED.

20.0 VARIABLE FREQUENCY DRIVES:

"UNISTRUT" IS APPROVED FOR ADDITIONAL SUPPORT STEEL.

- UNLESS SCHEDULED OTHERWISE ON THE PLANS, ALL VARIABLE FREQUENCY DRIVES WILL BE PROVIDED BY PERFORMANCE SERVICES, INC. THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR HANDLING AND INSTALLATION OF ALL VARIABLE FREQUENCY DRIVES
- VARIABLE FREQUENCY DRIVES SHALL BE LOCATED AS SHOWN ON THE PLANS. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL
- 20.4 LINE SIDE AND LOAD SIDE POWER WIRING FROM THE VARIABLE FREQUENCY DRIVES SHALL BE INSTALLED IN SEPARATE CONDUITS. WHERE DRIVE IS NOT WITHIN SIGHT DISTANCE OF THE MOTOR SERVED. THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH AT THE MOTOR SERVED. PROVIDE INTERLOCK SAFETY WIRING FROM DISCONNECT SWITCH TO DRIVE. DRIVE SHALL TURN "OFF"

ELECTRICAL CONTRACTOR SHALL PROVIDE A NEMA 3R ENCLOSURE FOR DRIVES MOUNTED OUTDOORS. ENCLOSURE SHALL BE

VENTILATED AND HEATED PER THE MANUFACTURERS WRITTEN INSTALLATION INSTRUCTIONS.

VARIABLE FREQUENCY DRIVES SHALL BE INSTALLED PER THE MANUFACTURERS WRITTEN INSTALLATION INSTRUCTIONS.

20.8 ELECTRICAL CONTRACTOR SHALL PROVIDE ENGRAVED PLASTIC IDENTIFICATION PLATE FOR EACH VARIABLE FREQUENCY DRIVE.

- BLOCKING AND SUPPORTS FOR THE INSTALLATION OF DRIVES.
- 20.2 VARIABLE FREQUENCY DRIVES WILL BE PROVIDED WITH INTEGRAL DISCONNECT.
- IF REMOTE DISCONNECT SWITCH IS TURNED OFF.

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E-002

SHEET

ELECTRICAL

SPECIFICATIONS

PROPRIETARY AND CONFIDENTIAL

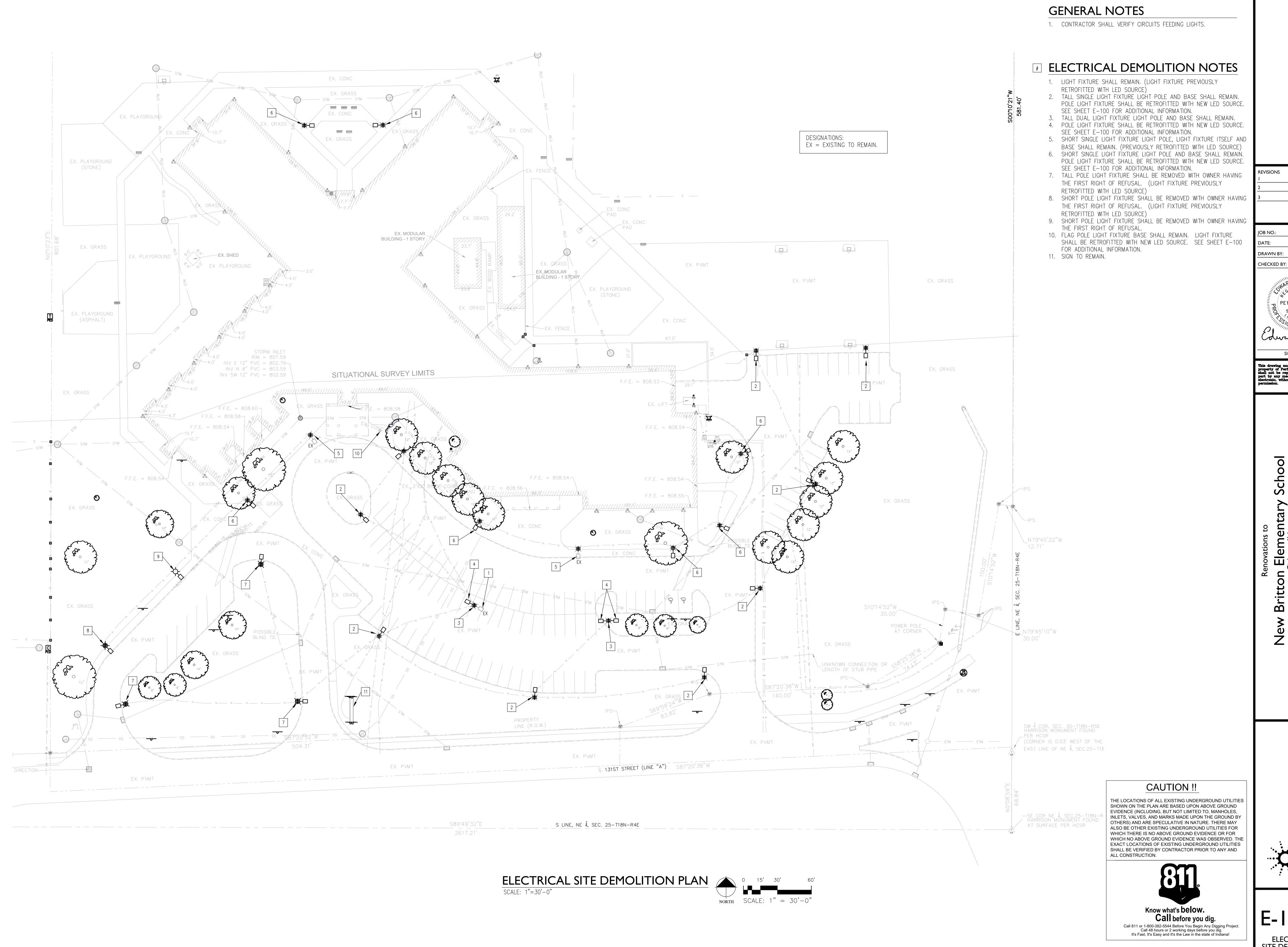
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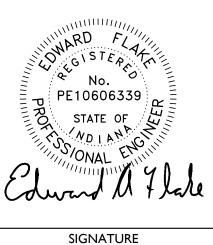
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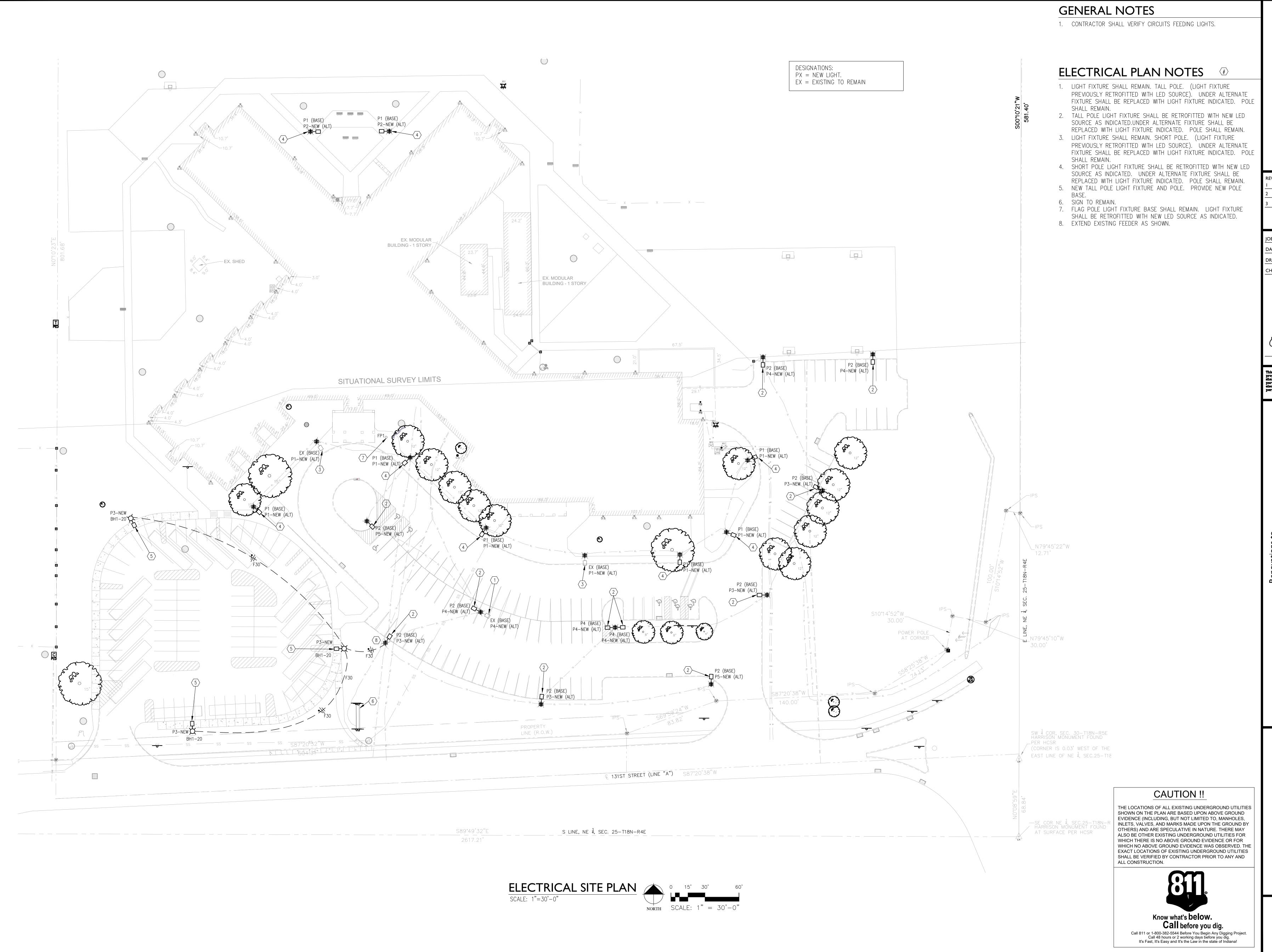
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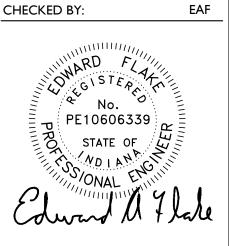


SHEET E-100D

ELECTRICAL SITE DEMOLITION PLAN



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SHEET E-100

ELECTRICAL SITE PLAN



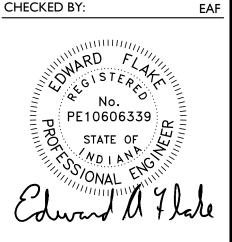
- CONTRACTOR SHALL VERIFY CIRCUITS FEEDING LIGHTS.
 UTILIZE EXISTING CONDUITS WHERE POSSIBLE.
- CONTRACTOR SHALL REFER TO MECHANICAL SHEETS FOR ADDITIONAL WORK.

ELECTRICAL DEMOLITION NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN.
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN. 3. REMOVE ELECTRICAL CONNECTION AND WIRING TO MECHANICAL EQUIPMENT COMPLETE.
- 4. REMOVE LIGHTS IN THIS ROOM. PREP WIRING FOR NEW LIGHT FIXTURES. SEE SHEET E-201L FOR NEW LIGHTING LAYOUT AND SWITCHING PATTERN.
- 5. INTERCOM CALL BUTTON TO BE REMOVED AND RELOCATED. SEE SHEET E-E201P FOR NEW LOCATION.
- 6. REMOVE FIRE ALARM DEVICE. SEE SHEET E-201P FOR ADDITIONAL
- 7. REMOVE LIGHTS IN CORRIDOR. PREP WIRING FOR NEW LIGHT FIXTURES. SEE SHEET E-201L FOR NEW LIGHTING LAYOUT AND
- SWITCHING PATTERN.

REVISIONS 8. REMOVE ELECTRICAL CONNECTION MECHANICAL EQUIPMENT COMPLETE. PREP WIRING FOR INSTALLATION OF NEW EQUIPMENT.

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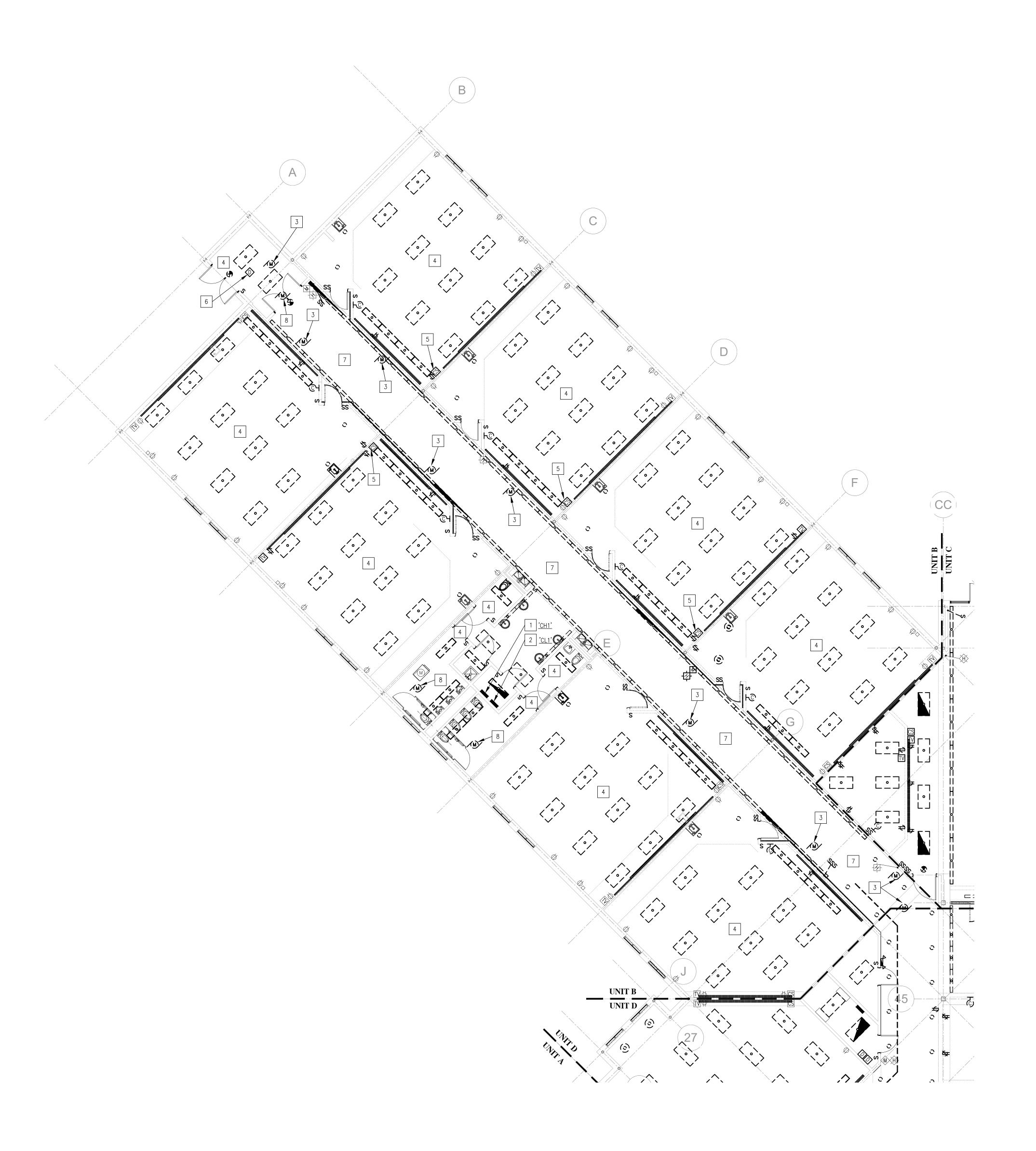


E-101

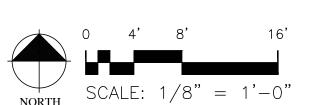
ELECTRICAL DEMOLITION PLAN UNIT A

PROPRIETARY AND CONFIDENTIAL

LEGEND ___



ELECTRICAL DEMOLITION PLAN - UNIT B



GENERAL NOTES

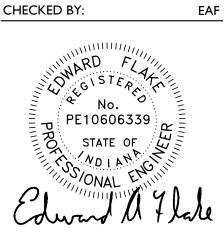
- 1. CONTRACTOR SHALL VERIFY CIRCUITS FEEDING LIGHTS. . UTILIZE EXISTING CONDUITS WHERE POSSIBLE.
- CONTRACTOR SHALL REFER TO MECHANICAL SHEETS FOR ADDITIONAL WORK.

ELECTRICAL DEMOLITION NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN.
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN. 3. REMOVE ELECTRICAL CONNECTION AND WIRING TO MECHANICAL EQUIPMENT COMPLETE.
- 4. REMOVE LIGHTS IN THIS ROOM. PREP WIRING FOR NEW LIGHT FIXTURES. SEE SHEET E-202L FOR NEW LIGHTING LAYOUT AND
- SWITCHING PATTERN. 5. INTERCOM CALL BUTTON TO BE REMOVED AND RELOCATED. SEE
- SHEET E-E202P FOR NEW LOCATION. 6. REMOVE FIRE ALARM DEVICE. SEE SHEET E-202P FOR ADDITIONAL
- 7. REMOVE LIGHTS IN CORRIDOR. PREP WIRING FOR NEW LIGHT
- FIXTURES. SEE SHEET E-202L FOR NEW LIGHTING LAYOUT AND SWITCHING PATTERN.
- 8. REMOVE ELECTRICAL CONNECTION MECHANICAL EQUIPMENT COMPLETE. PREP WIRING FOR INSTALLATION OF NEW EQUIPMENT.

REVISIONS

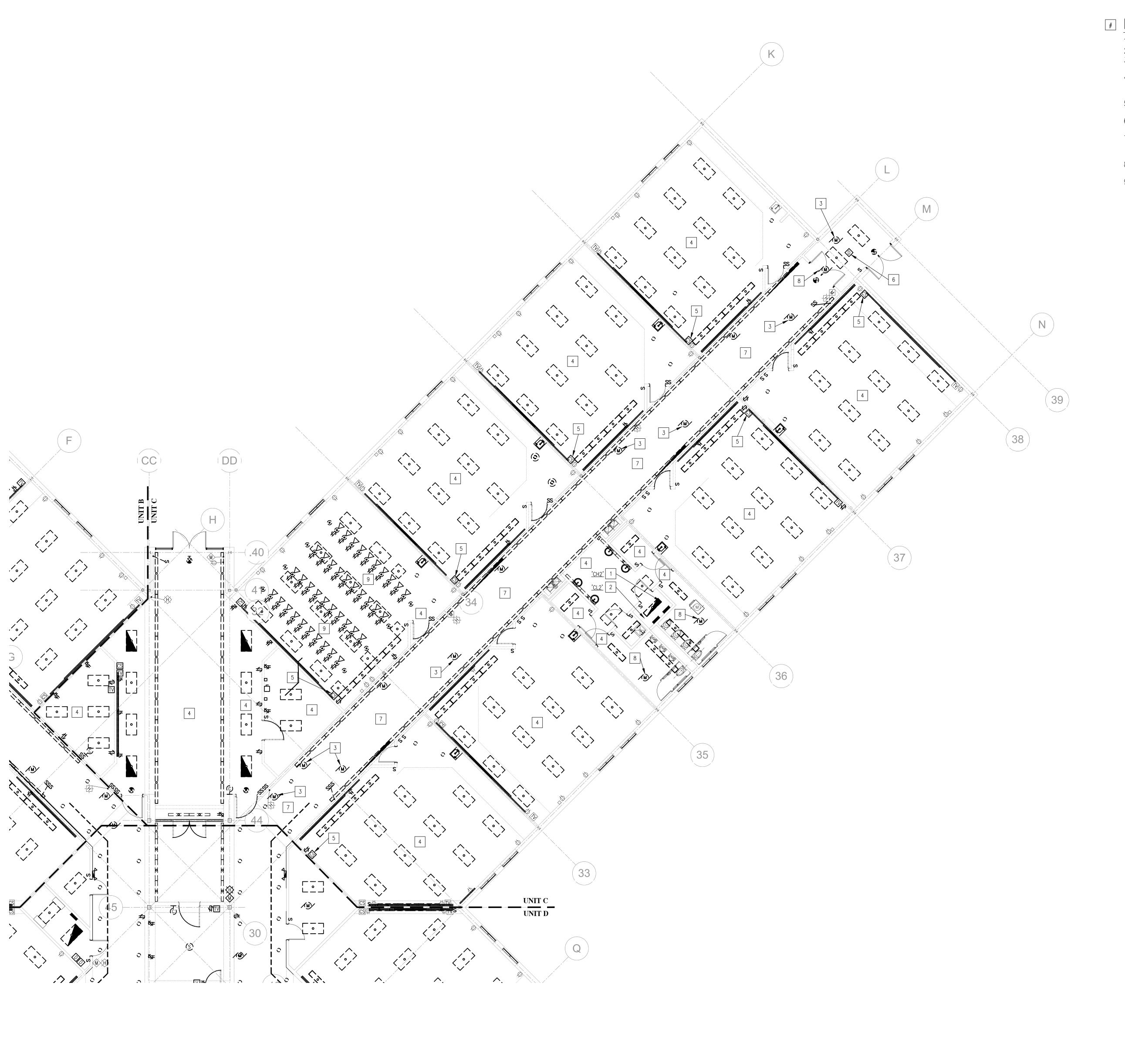
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E-102

ELECTRICAL DEMOLITION UNIT B

PROPRIETARY AND CONFIDENTIAL



ELECTRICAL DEMOLITION PLAN - UNIT C

GENERAL NOTES

SWITCHING PATTERN.

- 1. CONTRACTOR SHALL VERIFY CIRCUITS FEEDING LIGHTS. UTILIZE EXISTING CONDUITS WHERE POSSIBLE.
- 3. CONTRACTOR SHALL REFER TO MECHANICAL SHEETS FOR ADDITIONAL WORK.

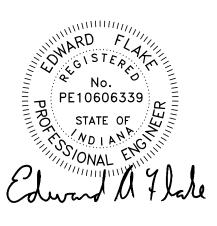
ELECTRICAL DEMOLITION NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN.
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN. 3. REMOVE ELECTRICAL CONNECTION AND WIRING TO MECHANICAL EQUIPMENT COMPLETE.
- 4. REMOVE LIGHTS IN THIS ROOM. PREP WIRING FOR NEW LIGHT FIXTURES. SEE SHEET E-203L FOR NEW LIGHTING LAYOUT AND
- 5. INTERCOM CALL BUTTON TO BE REMOVED AND RELOCATED. SEE SHEET E-E203P FOR NEW LOCATION.
- 6. REMOVE FIRE ALARM DEVICE. SEE SHEET E-203P FOR ADDITIONAL
- 7. REMOVE LIGHTS IN CORRIDOR. PREP WIRING FOR NEW LIGHT FIXTURES. SEE SHEET E-203L FOR NEW LIGHTING LAYOUT AND
- SWITCHING PATTERN. 8. REMOVE ELECTRICAL CONNECTION MECHANICAL EQUIPMENT COMPLETE.
- PREP WIRING FOR INSTALLATION OF NEW EQUIPMENT. 9. REMOVE FLOOR BOXES COMPLETE. REMOVE ALL DATA AND POWER

WIRING AND FIX FLOOR AS REQUIRED.

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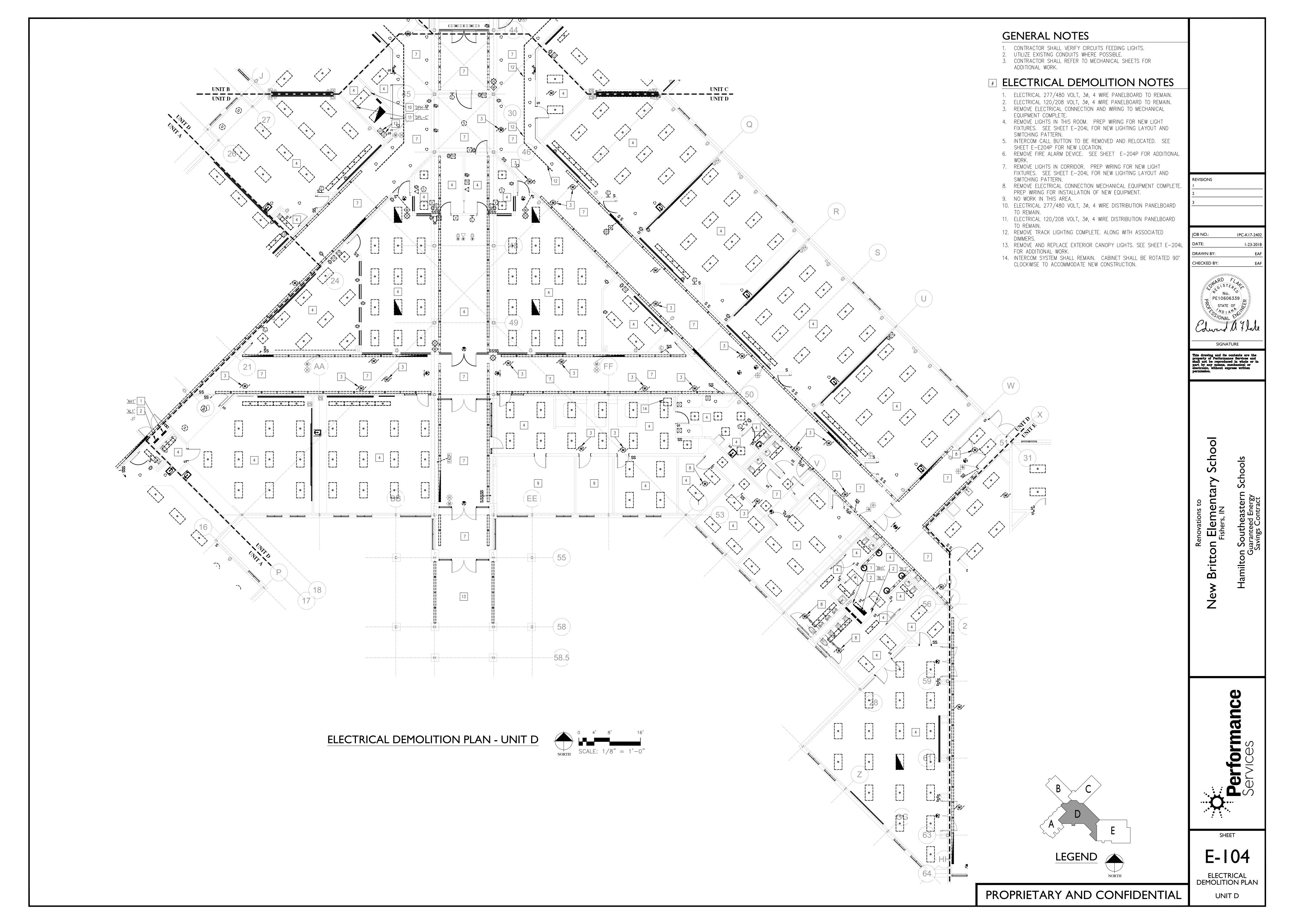
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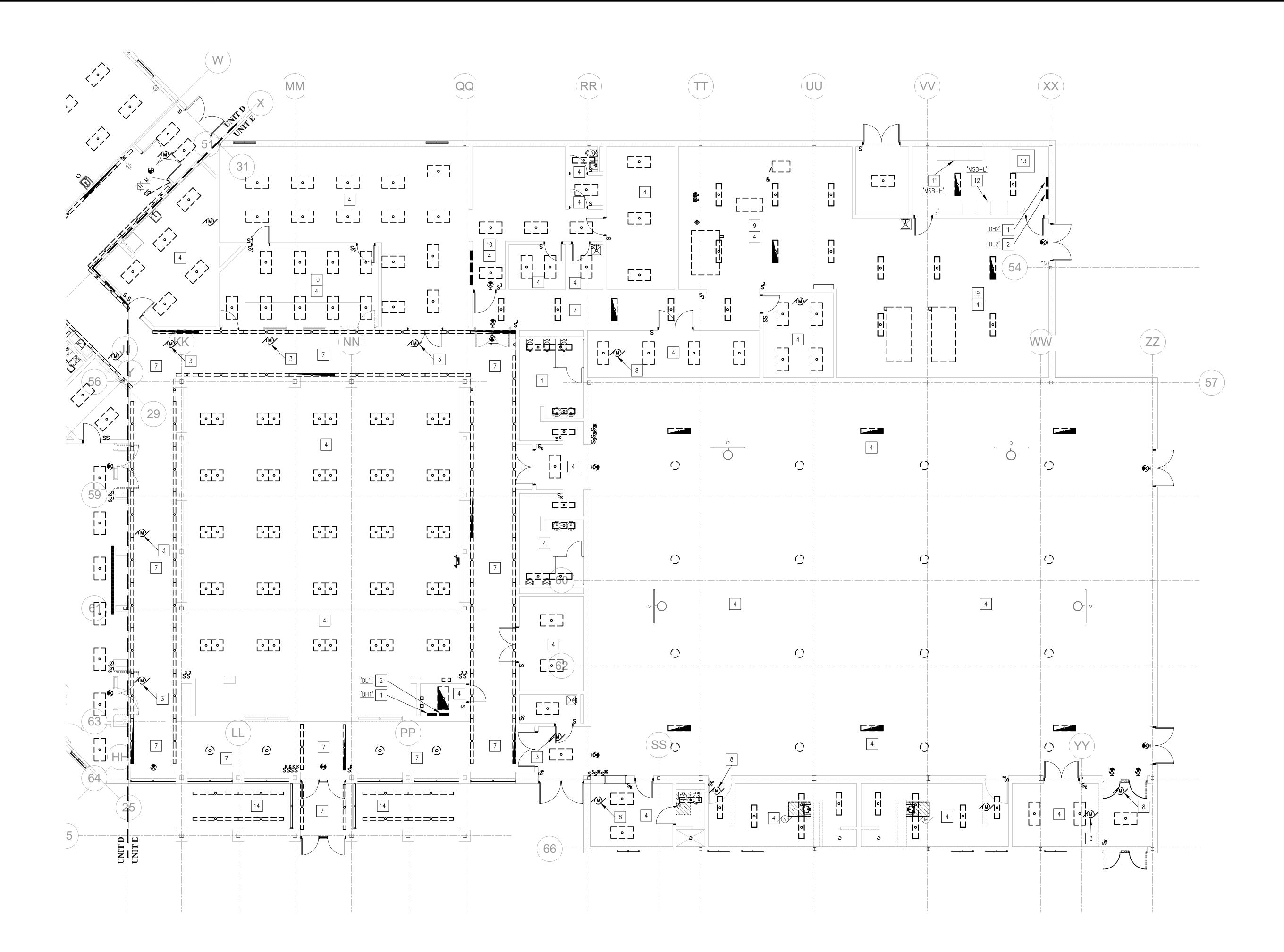


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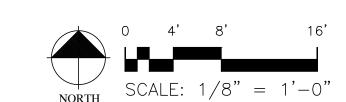
ELECTRICAL DEMOLITION PROPRIETARY AND CONFIDENTIAL UNIT C

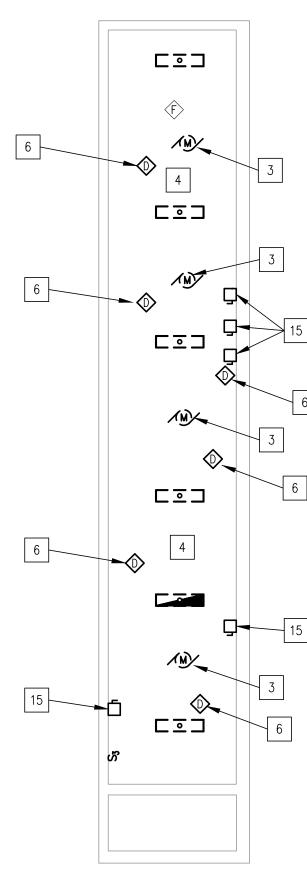
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ELECTRICAL DEMOLITION PLAN - UNIT E





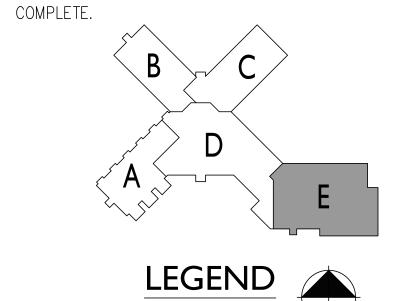
MEZZANINE PLAN - UNIT E

GENERAL NOTES

- CONTRACTOR SHALL VERIFY CIRCUITS FEEDING LIGHTS.
 UTILIZE EXISTING CONDUITS WHERE POSSIBLE.
 CONTRACTOR SHALL REFER TO MECHANICAL SHEETS FOR ADDITIONAL WORK.

ELECTRICAL DEMOLITION NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN. 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN.
- 3. REMOVE ELECTRICAL CONNECTION AND WIRING TO MECHANICAL EQUIPMENT COMPLETE.
- 4. REMOVE LIGHTS IN THIS ROOM. PREP WIRING FOR NEW LIGHT FIXTURES. SEE SHEET E-205L FOR NEW LIGHTING LAYOUT AND
- SWITCHING PATTERN. 5. INTERCOM CALL BUTTON TO BE REMOVED AND RELOCATED. SEE
- SHEET E-E205P FOR NEW LOCATION. 6. REMOVE FIRE ALARM DEVICE. SEE SHEET E-205P FOR ADDITIONAL
- 7. REMOVE LIGHTS IN CORRIDOR. PREP WIRING FOR NEW LIGHT FIXTURES. SEE SHEET E-205L FOR NEW LIGHTING LAYOUT AND
- . REMOVE ELECTRICAL CONNECTION MECHANICAL EQUIPMENT COMPLETE.
- PREP WIRING FOR INSTALLATION OF NEW EQUIPMENT.
- SEE SHEET E-301 FOR ADDITIONAL WORK IN THIS AREA.
- 13. ELECTRIC PAD MOUNTED TRANSFORMER TO REMAIN.
- 14. REPLACE EXTERIOR LIGHT FIXTURE IS CEILING SYSTEM. SEE SHEET E-205L FOR ADDITIONAL WORK.
- 15. REMOVE DISCONNECT SWITCHES ASSOCIATE WITH HEAT PUMPS



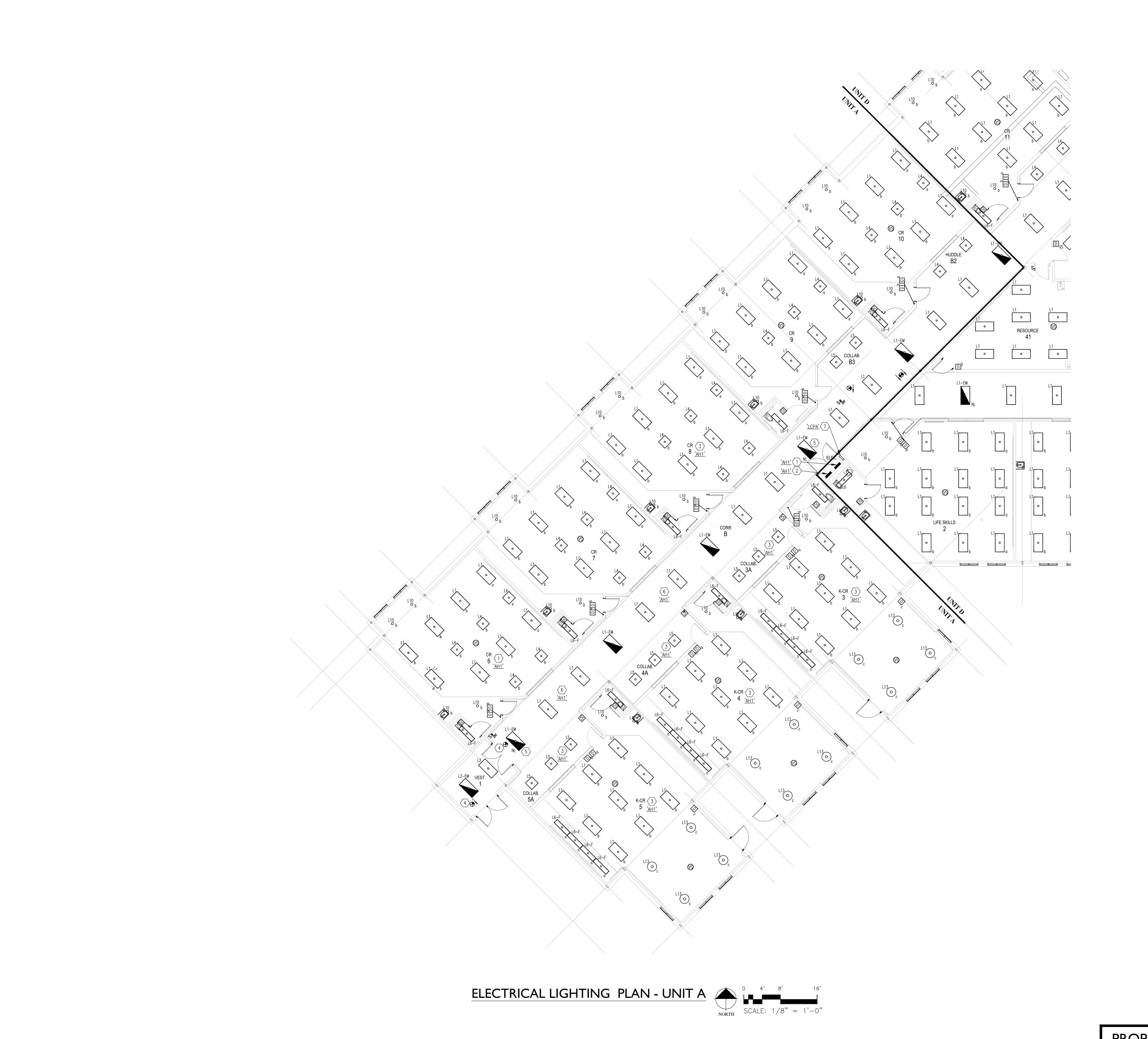
E-105 ELECTRICAL DEMOLITION

UNIT E

PROPRIETARY AND CONFIDENTIAL

School

Elementar Fishers, IN



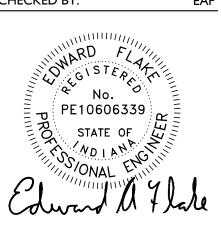
- 1. CEILING SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND RE-INSTALLING CEILING FOR ALL MECHANICAL AND ELECTRICAL WORK.
- CONNECT LIGHTING TO EXISTING ELECTRICAL PANELS.
 CONTRACTOR TO PROVIDE SWITCH COVERPLATES WITH
- APPROPRIATE BLANKS FOR NEW SWITCHING PATTERNS.

ELECTRICAL PLAN NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 3. CONNECT LIGHTING IN THIS ROOM TO EXISTING LIGHTING CIRCUIT IN AREA. CONNECT LIGHTING TO NEW SWITCHING
- 4. CONNECT EXITS TO UNSWITCHED 277 VOLT LIGHTING CIRCUIT. 5. CONNECT NIGHT LIGHTS TO UNSWITCHED 277 VOLT LIGHTING
- 6. CONNECT CORRIDOR LIGHTING TO LIGHTING CIRCUIT IN AREA.
- PROVIDE NEW SWITCHING PATTERN VIA LIGHTING RELAY PANEL AS INDICATED.
- 7. LIGHTING CONTROL PANEL 'LCPA'

REVISIONS

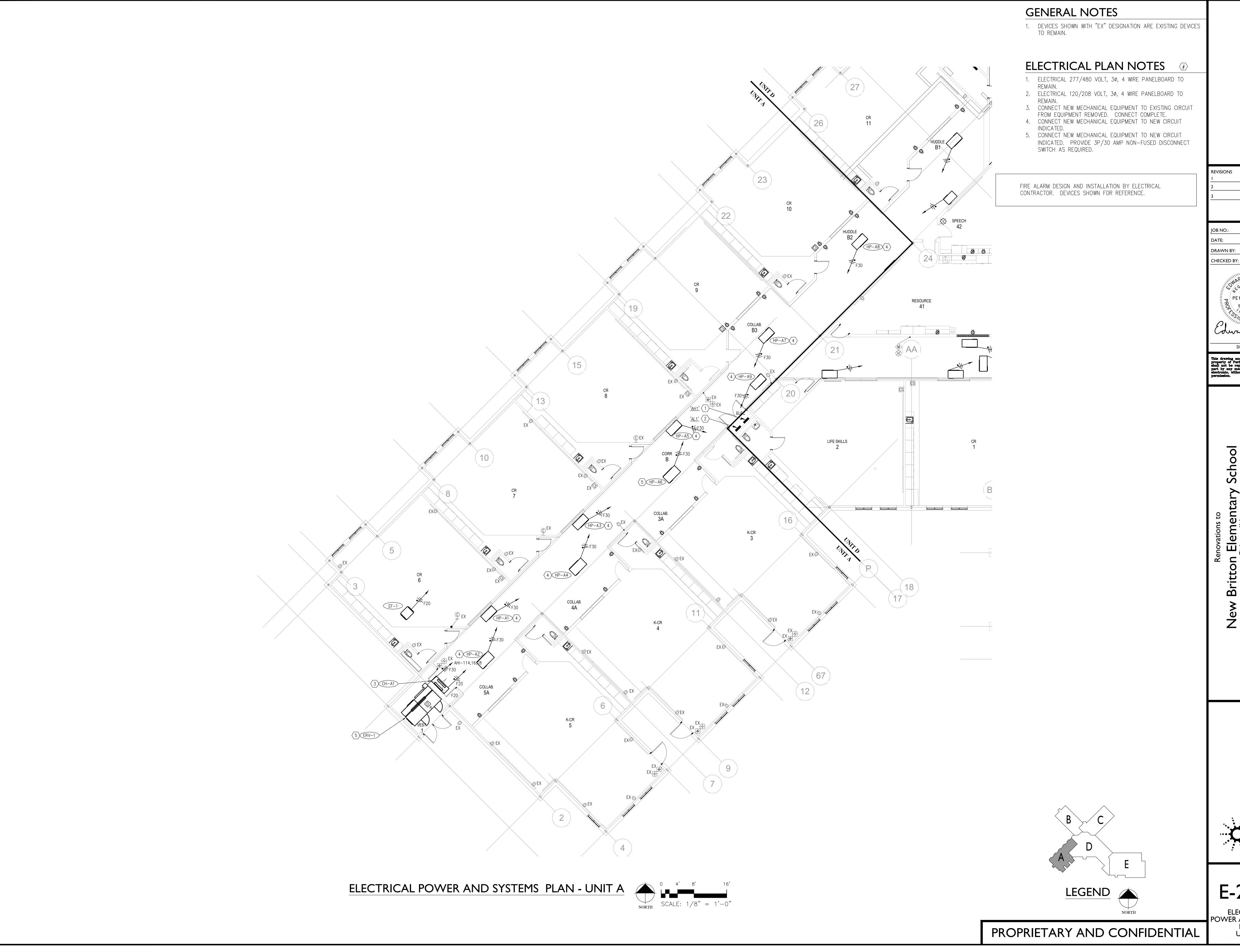
IPC-K17-2402 DRAWN BY: CHECKED BY:



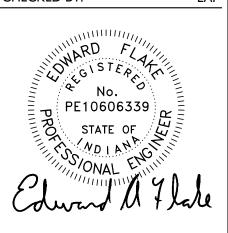
E-201L

ELECTRICAL LIGHTING PLAN UNIT A

PROPRIETARY AND CONFIDENTIAL

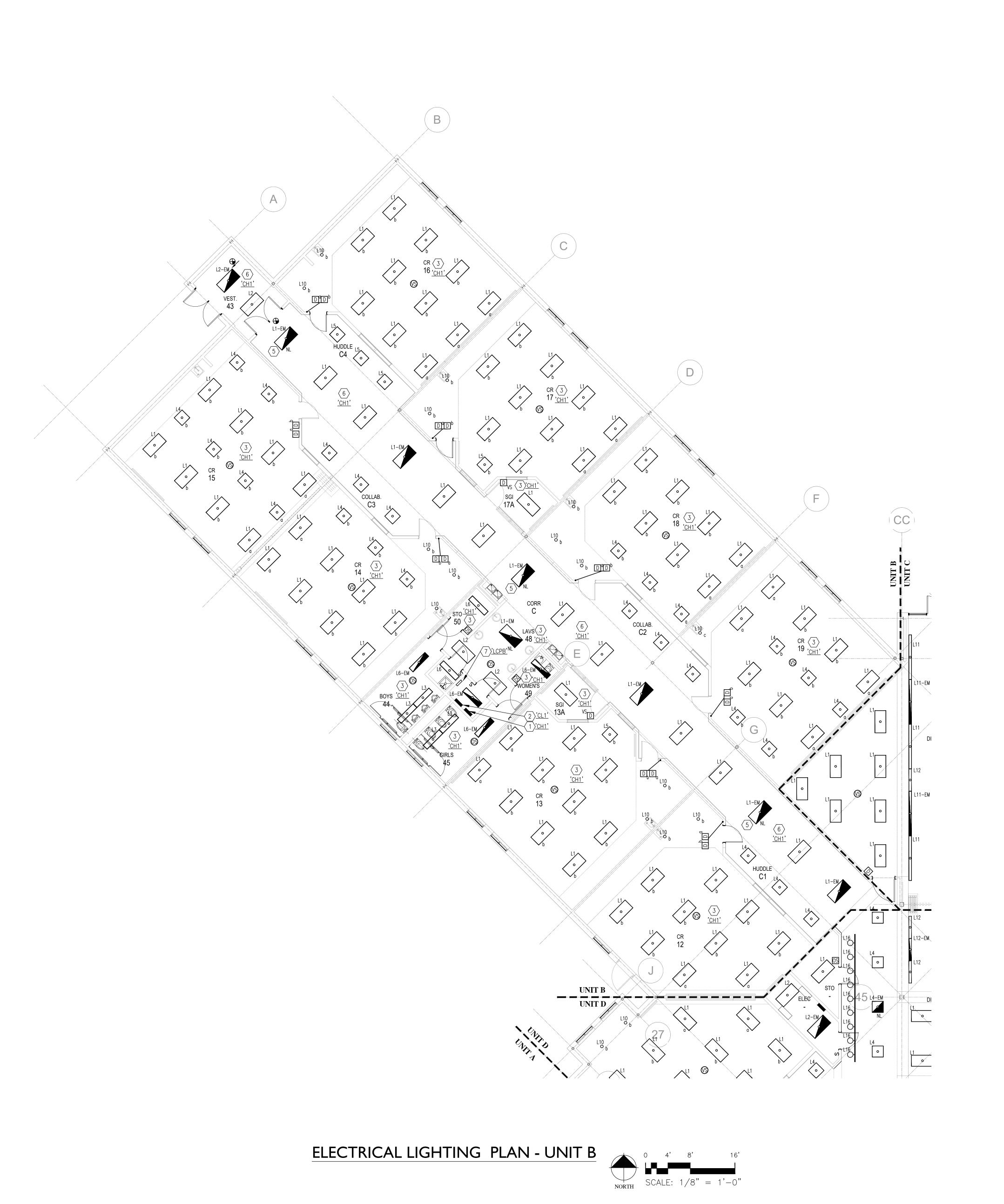


IPC-K17-2402 DRAWN BY:



E-201P

ELECTRICAL POWER AND SYSTEMS PLAN UNIT A

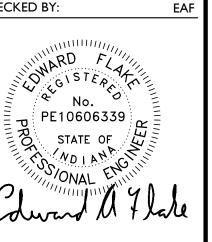


- 1. CEILING SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND RE-INSTALLING CEILING FOR ALL MECHANICAL AND ELECTRICAL WORK.
- CONNECT LIGHTING TO EXISTING ELECTRICAL PANELS.
 CONTRACTOR TO PROVIDE SWITCH COVERPLATES WITH APPROPRIATE BLANKS FOR NEW SWITCHING PATTERNS.
- ELECTRICAL PLAN NOTES #

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 3. CONNECT LIGHTING IN THIS ROOM TO EXISTING LIGHTING CIRCUIT IN AREA. CONNECT LIGHTING TO NEW SWITCHING
- 4. CONNECT EXITS TO UNSWITCHED 277 VOLT LIGHTING CIRCUIT. 5. CONNECT NIGHT LIGHTS TO UNSWITCHED 277 VOLT LIGHTING
- 6. CONNECT CORRIDOR LIGHTING TO LIGHTING CIRCUIT IN AREA. PROVIDE NEW SWITCHING PATTERN VIA LIGHTING RELAY PANEL
- AS INDICATED. 7. LIGHTING CONTROL PANEL 'LCPB'

REVISIONS

IPC-K17-2402 DRAWN BY:

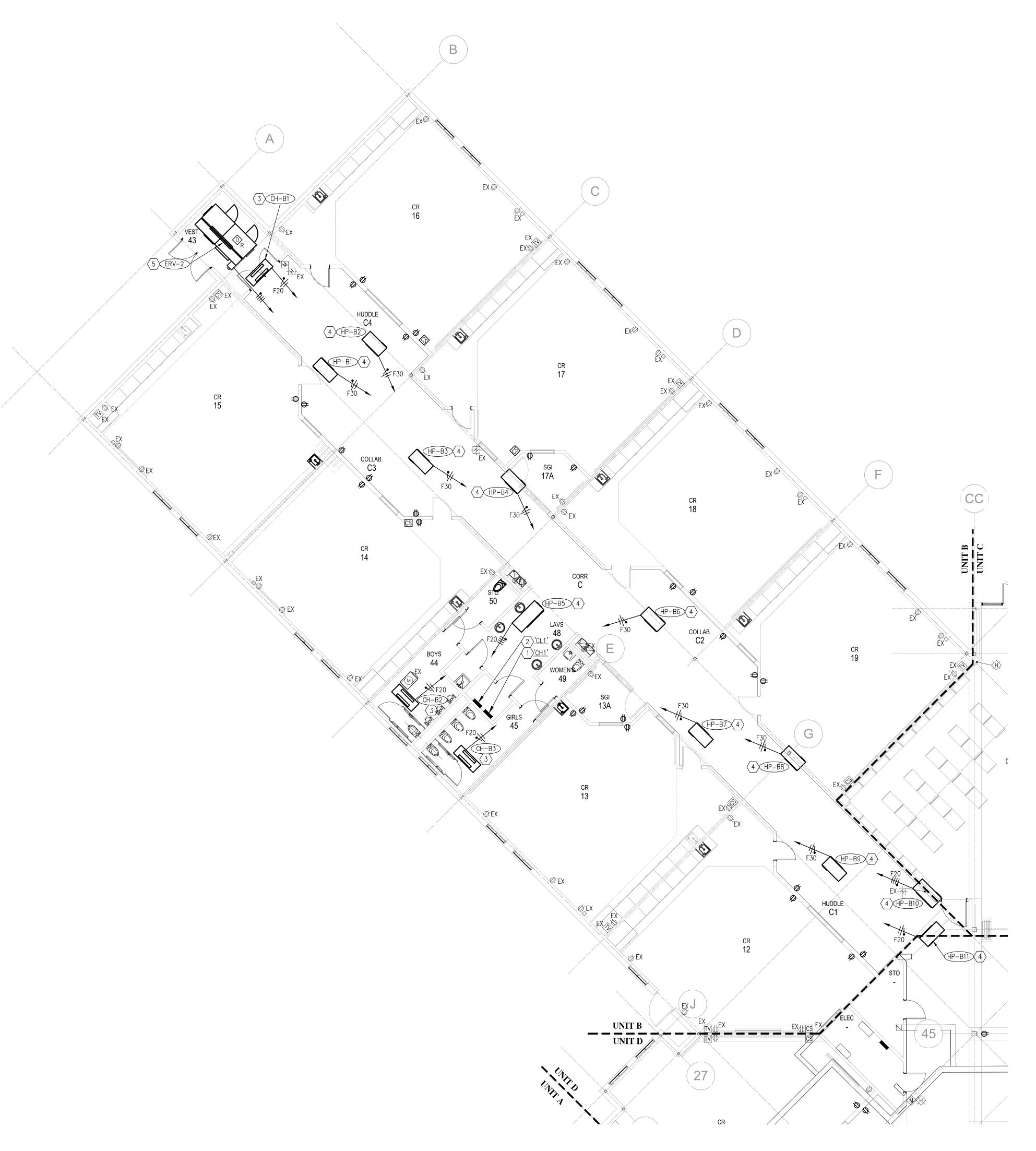


E-202L

ELECTRICAL LIGHTING PLAN

UNIT B

PROPRIETARY AND CONFIDENTIAL



ELECTRICAL POWER AND SYSTEMS PLAN - UNIT B

GENERAL NOTES

1. DEVICES SHOWN WITH "EX" DESIGNATION ARE EXISTING DEVICES TO REMAIN.

ELECTRICAL PLAN NOTES

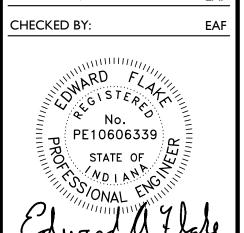
- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 3. CONNECT NEW MECHANICAL EQUIPMENT TO EXISTING CIRCUIT
- FROM EQUIPMENT REMOVED. CONNECT COMPLETE.

 4. CONNECT NEW MECHANICAL EQUIPMENT TO NEW CIRCUIT INDICATED.
- 5. CONNECT NEW MECHANICAL EQUIPMENT TO NEW CIRCUIT INDICATED. PROVIDE 3P/30 AMP NON-FUSED DISCONNECT SWITCH AS REQUIRED.

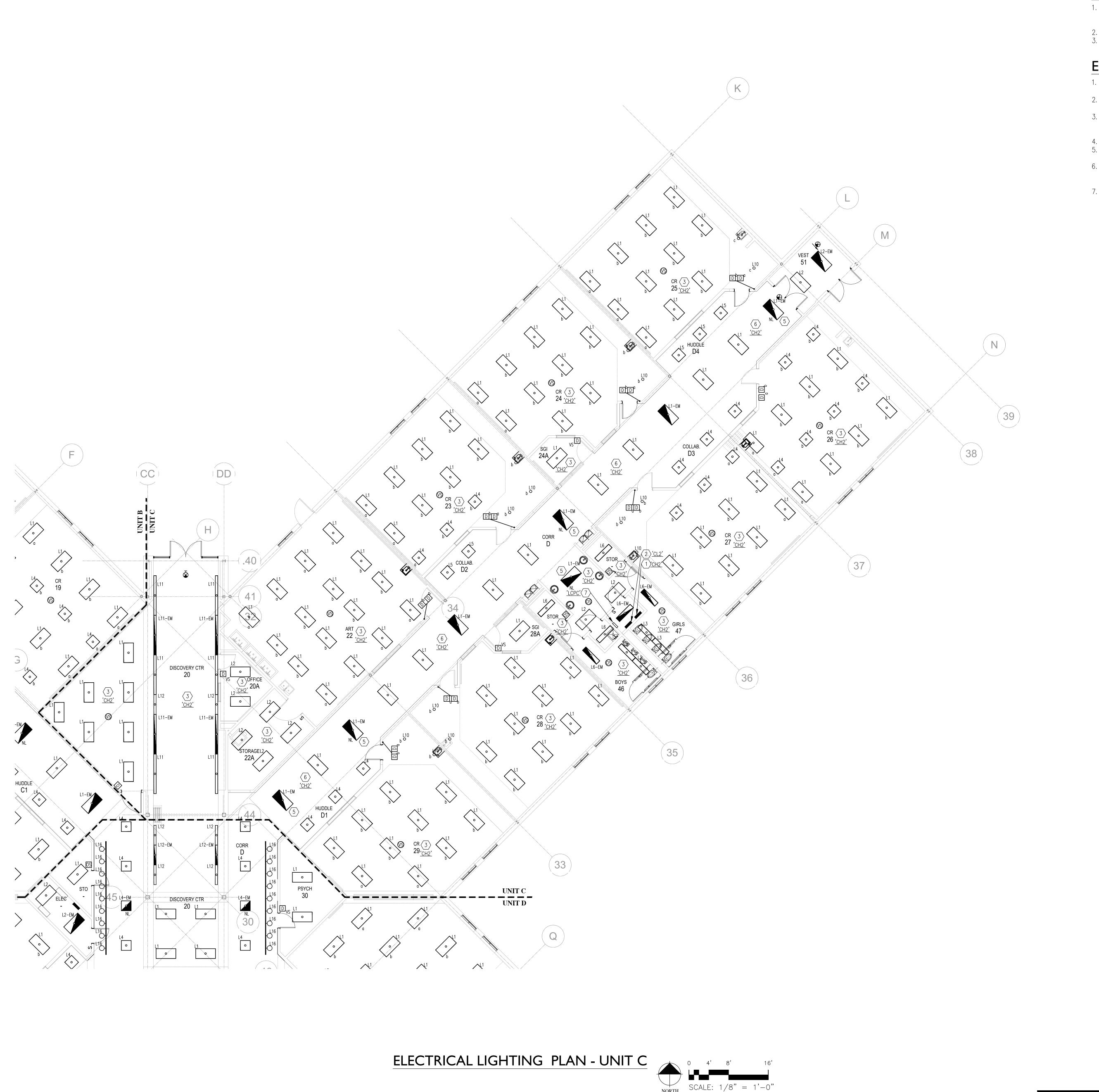
FIRE ALARM DESIGN AND INSTALLATION BY ELECTRICAL CONTRACTOR. DEVICES SHOWN FOR REFERENCE.

REVISIONS

IPC-K17-2402 DRAWN BY:



E-202P ELECTRICAL POWER AND SYSTEMS PLAN UNIT B



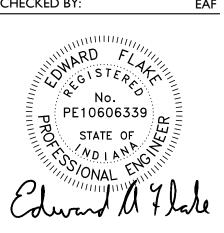
- 1. CEILING SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND RE-INSTALLING CEILING FOR ALL MECHANICAL AND ELECTRICAL WORK.
- 2. CONNECT LIGHTING TO EXISTING ELECTRICAL PANELS.
 3. CONTRACTOR TO PROVIDE SWITCH COVERPLATES WITH
- APPROPRIATE BLANKS FOR NEW SWITCHING PATTERNS.

ELECTRICAL PLAN NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 3. CONNECT LIGHTING IN THIS ROOM TO EXISTING LIGHTING CIRCUIT IN AREA. CONNECT LIGHTING TO NEW SWITCHING
- 4. CONNECT EXITS TO UNSWITCHED 277 VOLT LIGHTING CIRCUIT. 5. CONNECT NIGHT LIGHTS TO UNSWITCHED 277 VOLT LIGHTING
- 6. CONNECT CORRIDOR LIGHTING TO LIGHTING CIRCUIT IN AREA. PROVIDE NEW SWITCHING PATTERN VIA LIGHTING RELAY PANEL AS INDICATED.
- 7. LIGHTING CONTROL PANEL 'LCPC'

REVISIONS

IPC-K17-2402 DRAWN BY:



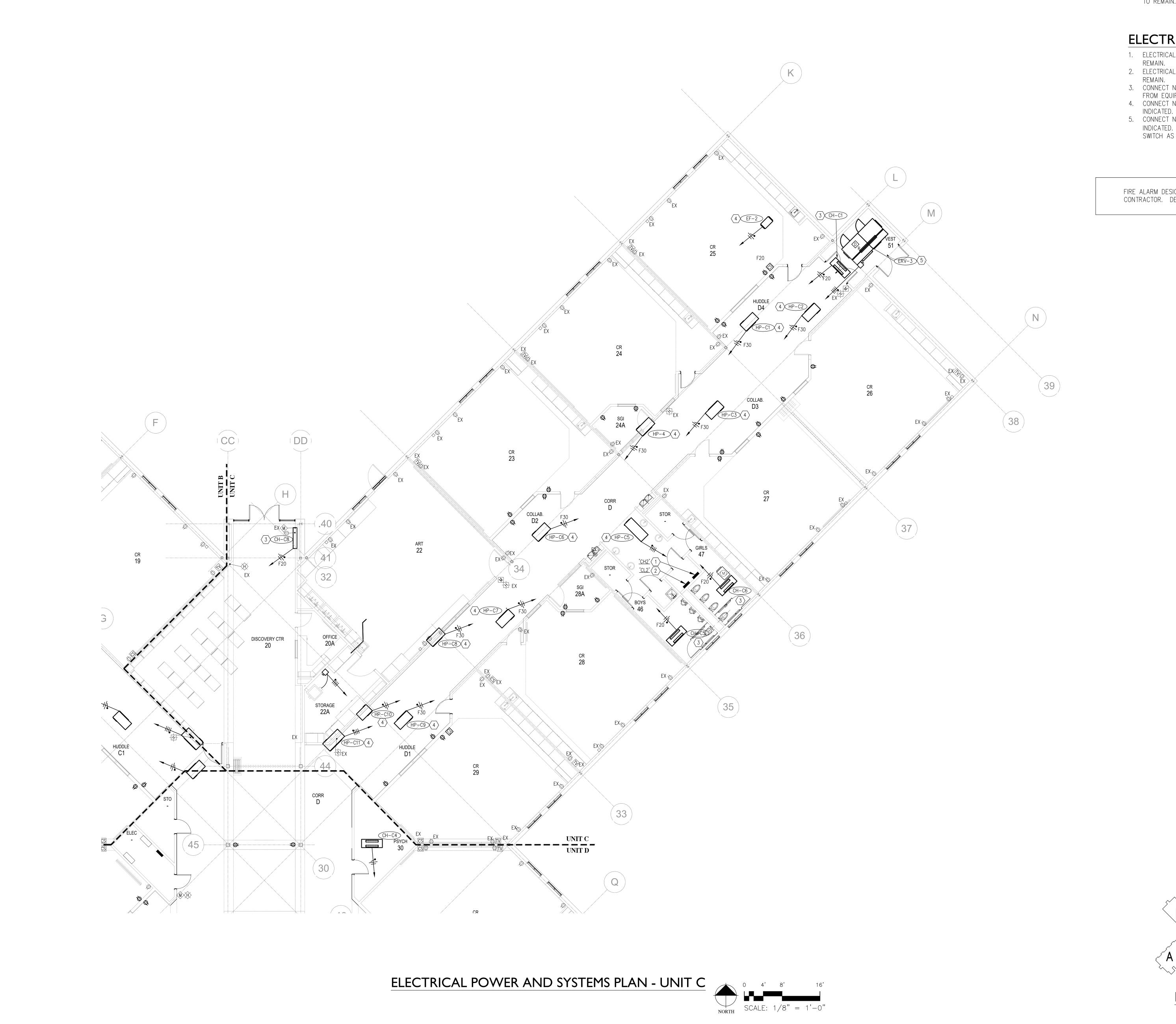
E-203L

ELECTRICAL LIGHTING PLAN

UNIT C

PROPRIETARY AND CONFIDENTIAL

LEGEND ___



1. DEVICES SHOWN WITH "EX" DESIGNATION ARE EXISTING DEVICES TO REMAIN.

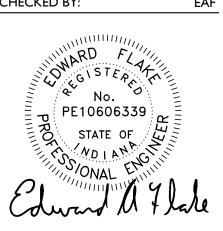
ELECTRICAL PLAN NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 3. CONNECT NEW MECHANICAL EQUIPMENT TO EXISTING CIRCUIT
- FROM EQUIPMENT REMOVED. CONNECT COMPLETE. 4. CONNECT NEW MECHANICAL EQUIPMENT TO NEW CIRCUIT
- 5. CONNECT NEW MECHANICAL EQUIPMENT TO NEW CIRCUIT INDICATED. PROVIDE 3P/30 AMP NON-FUSED DISCONNECT SWITCH AS REQUIRED.

FIRE ALARM DESIGN AND INSTALLATION BY ELECTRICAL CONTRACTOR. DEVICES SHOWN FOR REFERENCE.

IPC-K17-2402 DRAWN BY: CHECKED BY:

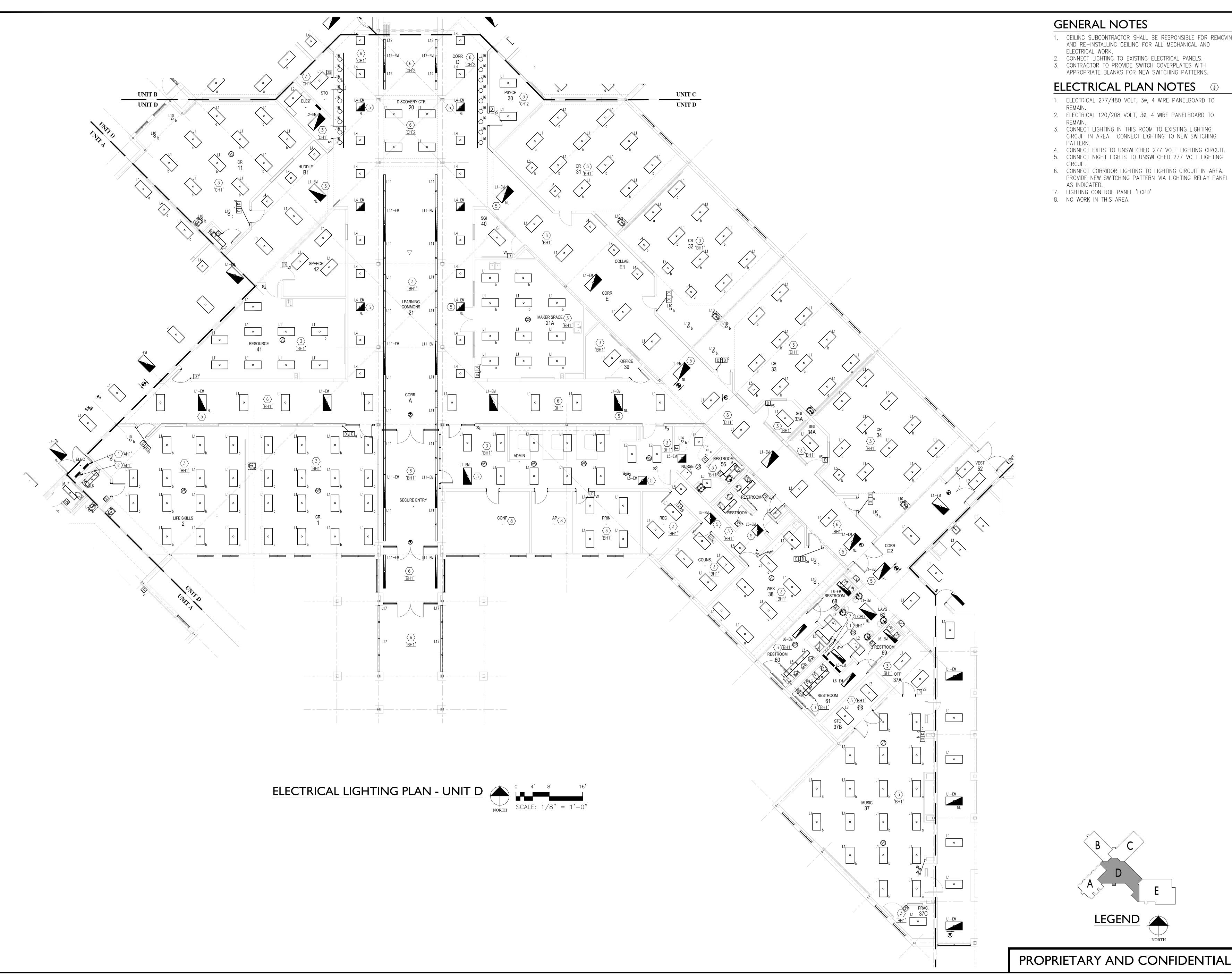
REVISIONS



E-203P

ELECTRICAL POWER AND SYSTEMS PLAN UNIT C

PROPRIETARY AND CONFIDENTIAL

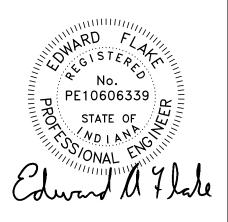


- 1. CEILING SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND RE-INSTALLING CEILING FOR ALL MECHANICAL AND
- CONNECT LIGHTING TO EXISTING ELECTRICAL PANELS.
 CONTRACTOR TO PROVIDE SWITCH COVERPLATES WITH APPROPRIATE BLANKS FOR NEW SWITCHING PATTERNS.

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 3. CONNECT LIGHTING IN THIS ROOM TO EXISTING LIGHTING CIRCUIT IN AREA. CONNECT LIGHTING TO NEW SWITCHING
- 4. CONNECT EXITS TO UNSWITCHED 277 VOLT LIGHTING CIRCUIT. 5. CONNECT NIGHT LIGHTS TO UNSWITCHED 277 VOLT LIGHTING
- 6. CONNECT CORRIDOR LIGHTING TO LIGHTING CIRCUIT IN AREA. PROVIDE NEW SWITCHING PATTERN VIA LIGHTING RELAY PANEL
- 7. LIGHTING CONTROL PANEL 'LCPD'

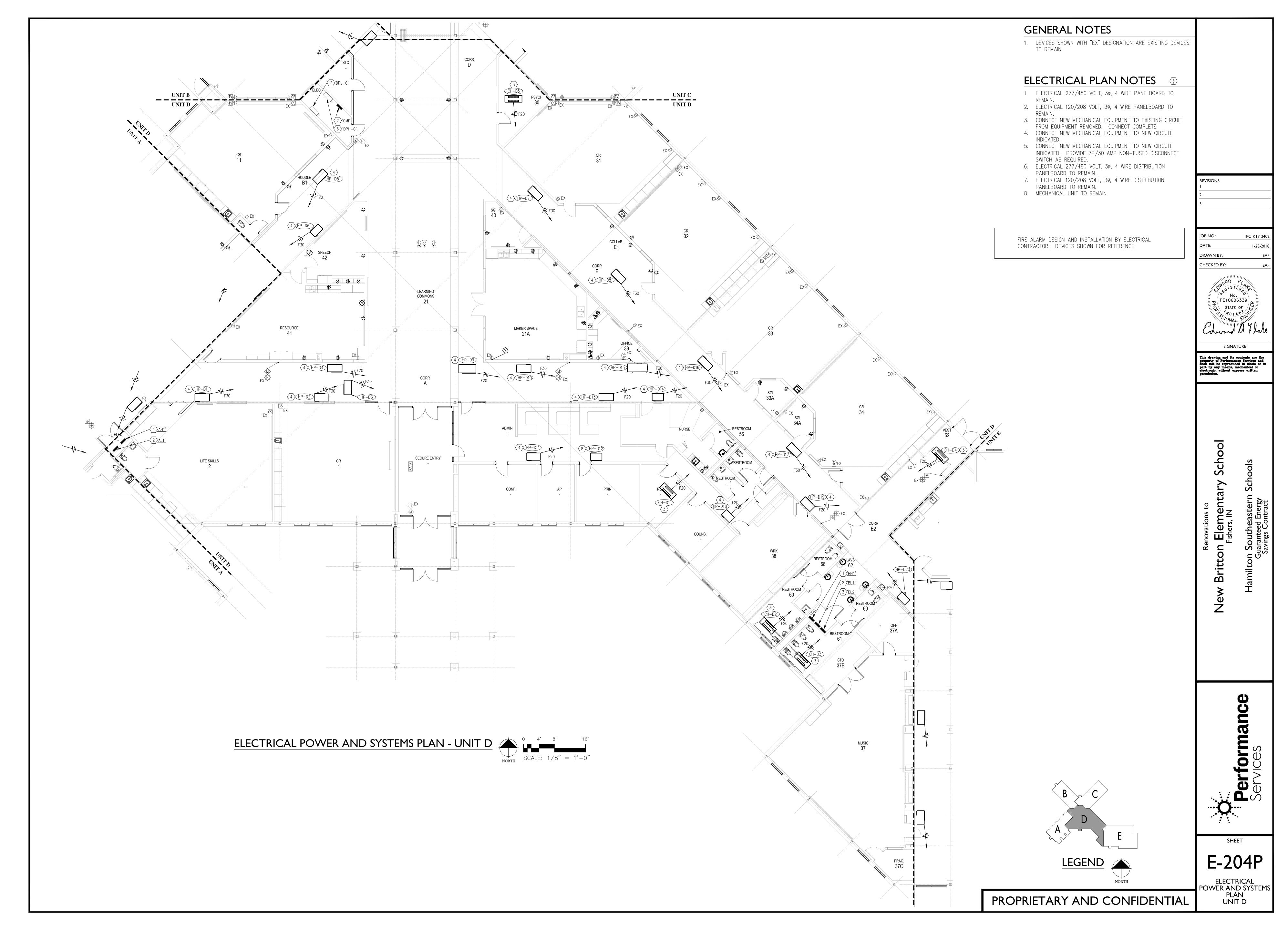
REVISIONS
1
2

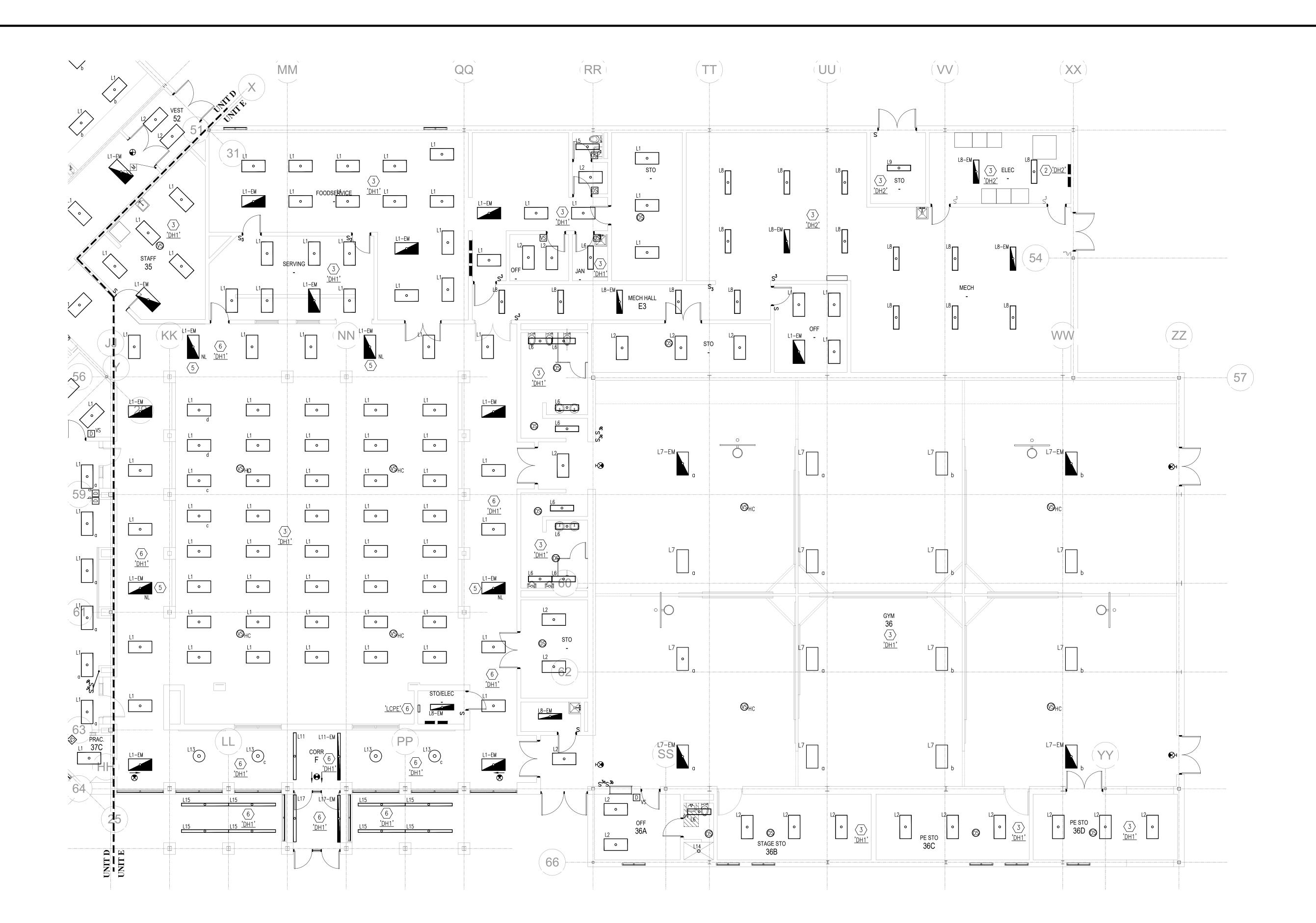
DRAWN BY:



E-204L

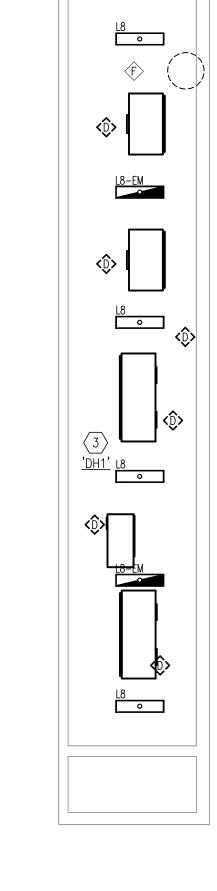
ELECTRICAL LIGHTING PLAN UNIT D





ELECTRICAL LIGHTING PLAN - UNIT E





MEZZANINE PLAN - UNIT D

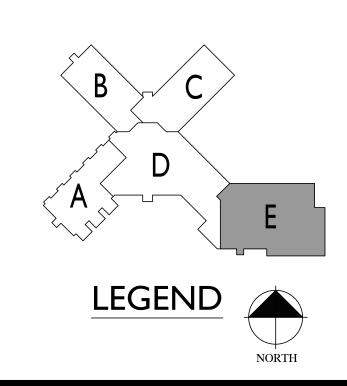
GENERAL NOTES

- 1. CEILING SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND RE-INSTALLING CEILING FOR ALL MECHANICAL AND ELECTRICAL WORK.
- CONNECT LIGHTING TO EXISTING ELECTRICAL PANELS.
 CONTRACTOR TO PROVIDE SWITCH COVERPLATES WITH APPROPRIATE BLANKS FOR NEW SWITCHING PATTERNS.

ELECTRICAL PLAN NOTES (#)

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO REMAIN.
- 3. CONNECT LIGHTING IN THIS ROOM TO EXISTING LIGHTING CIRCUIT IN AREA. CONNECT LIGHTING TO NEW SWITCHING
- 4. CONNECT EXITS TO UNSWITCHED 277 VOLT LIGHTING CIRCUIT.
 5. CONNECT MIGHT LIGHTS TO UNSWITCHED 277 VOLT LIGHTING
- CIRCUIT.

 6. CONNECT CORRIDOR LIGHTING TO LIGHTING CIRCUIT IN AREA.
 PROVIDE NEW SWITCHING PATTERN VIA LIGHTING RELAY PANEL
- AS INDICATED.
 7. LIGHTING CONTROL PANEL 'LCPE'.



PROPRIETARY AND CONFIDENTIAL

Performance Services

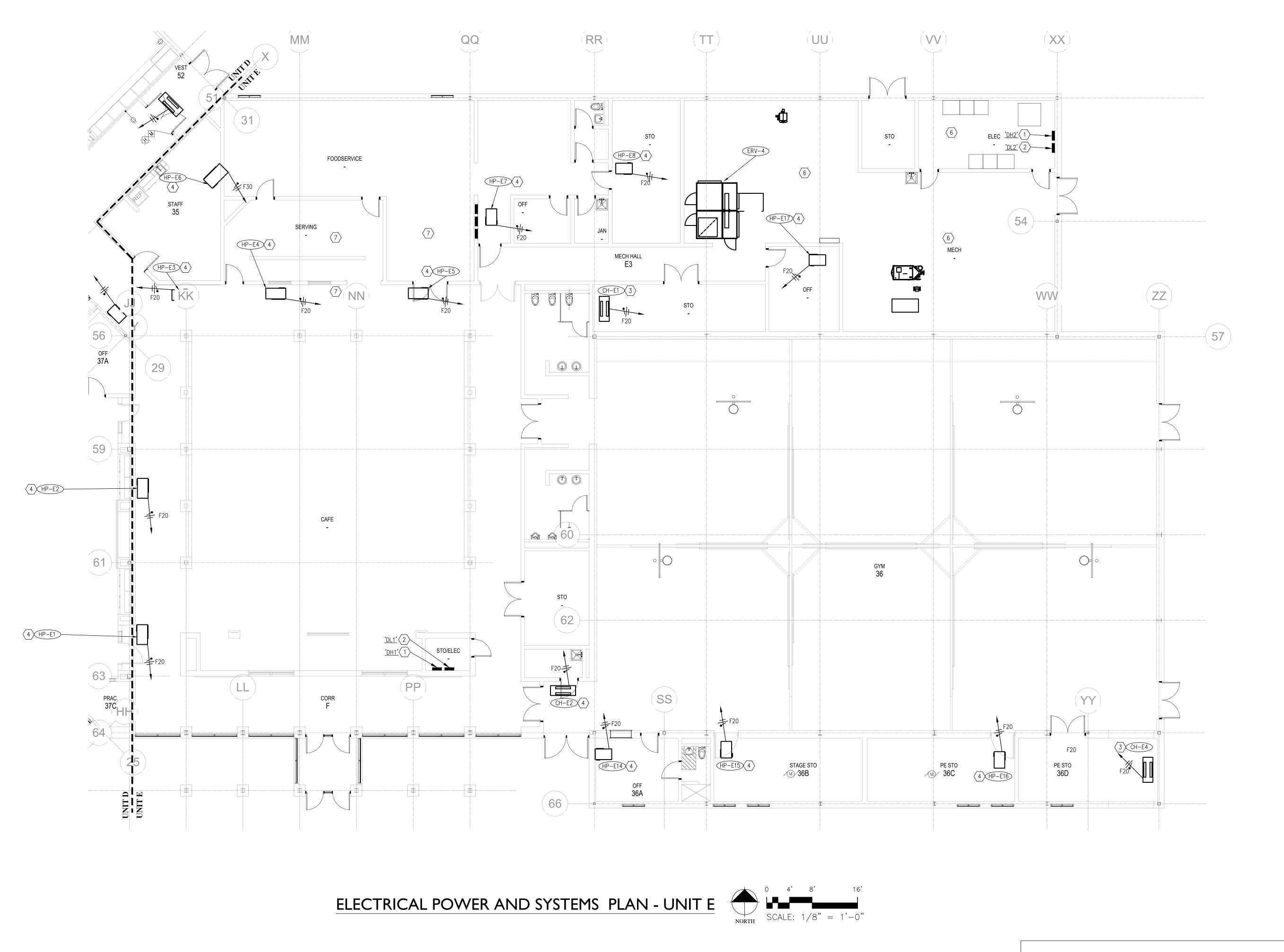
DRAWN BY:

School

Elementary Fishers, IN

E-205L

ELECTRICAL LIGHTING PLAN UNIT E



1. DEVICES SHOWN WITH "EX" DESIGNATION ARE EXISTING DEVICES TO REMAIN.

ELECTRICAL PLAN NOTES

- 1. ELECTRICAL 277/480 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 2. ELECTRICAL 120/208 VOLT, 3ø, 4 WIRE PANELBOARD TO
- 3. CONNECT NEW MECHANICAL EQUIPMENT TO EXISTING CIRCUIT
- FROM EQUIPMENT REMOVED. CONNECT COMPLETE. 4. CONNECT NEW MECHANICAL EQUIPMENT TO NEW CIRCUIT
- 5. CONNECT NEW MECHANICAL EQUIPMENT TO NEW CIRCUIT
- INDICATED. PROVIDE 3P/30 AMP NON-FUSED DISCONNECT SWITCH AS REQUIRED.

REVISIONS

DRAWN BY:

CHECKED BY:

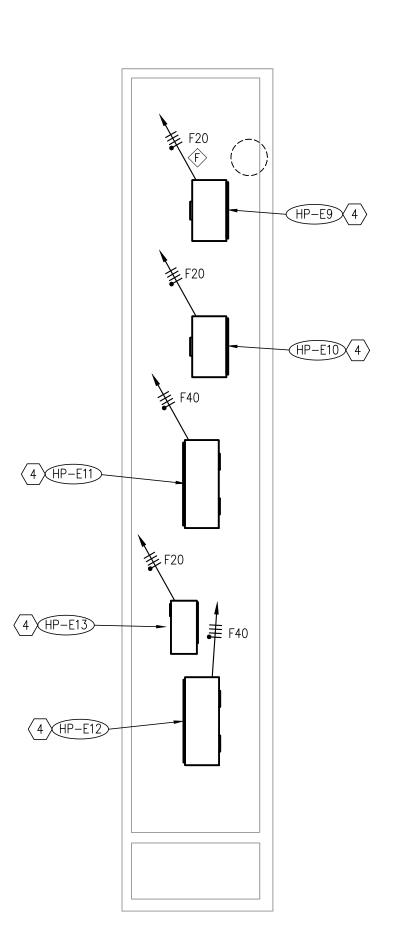
School

Britton Elementary
Fishers, IN

PE10606339

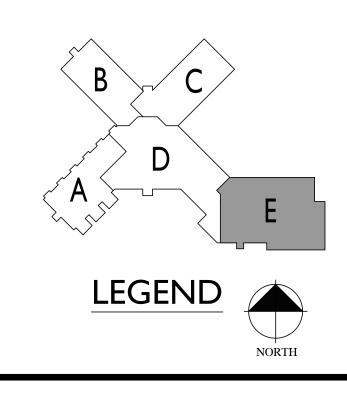
IPC-K17-2402

6. SEE SHEET E-301 FOR WORK IN THIS AREA. 7. SEE SHEET E-302 FOR WORK IN THIS AREA.



MEZZANINE PLAN - UNIT D

FIRE ALARM DESIGN AND INSTALLATION BY ELECTRICAL CONTRACTOR. DEVICES SHOWN FOR REFERENCE.

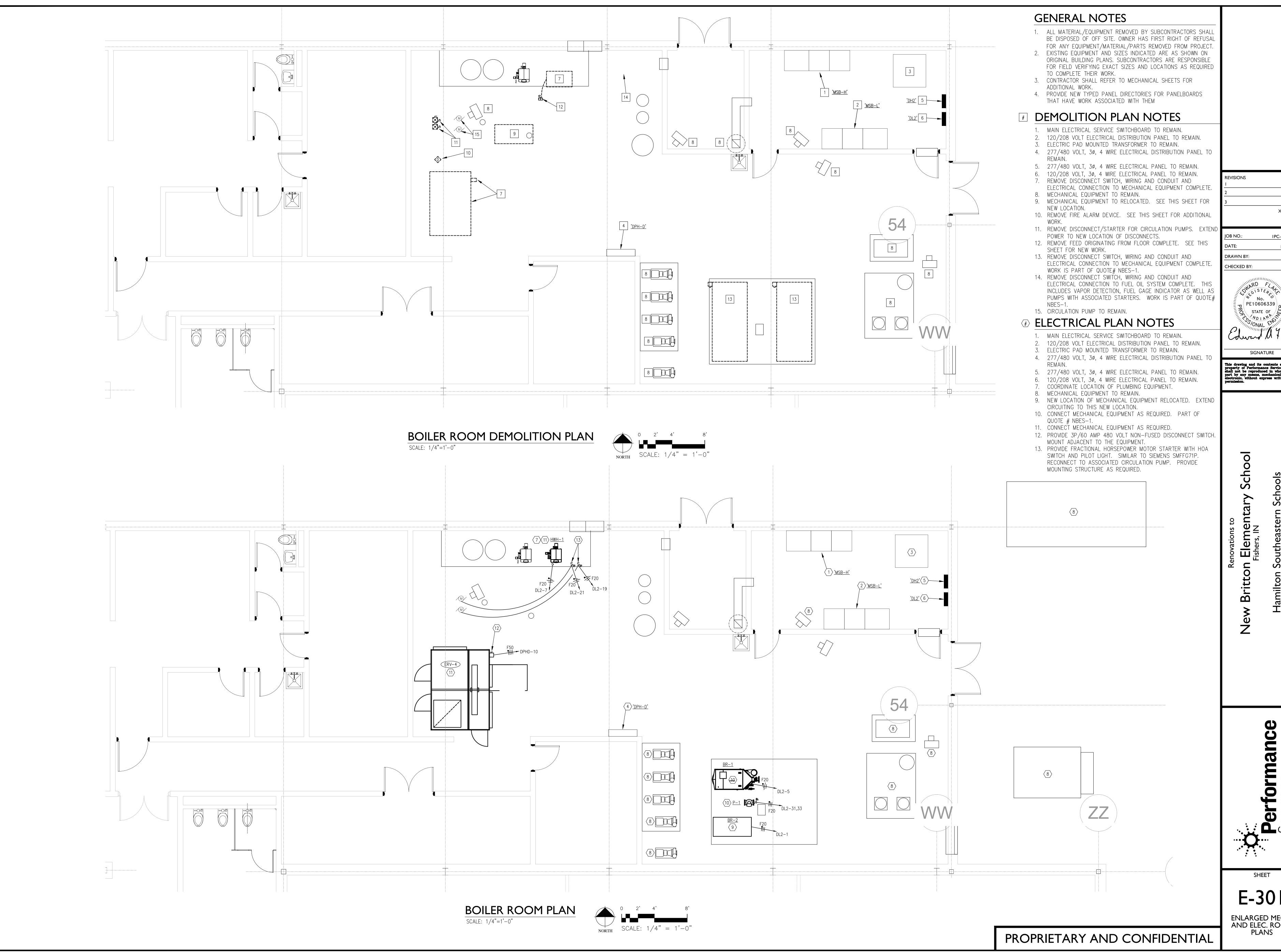


PROPRIETARY AND CONFIDENTIAL



E-205P

ELECTRICAL POWER AND SYSTEMS PLAN UNIT E

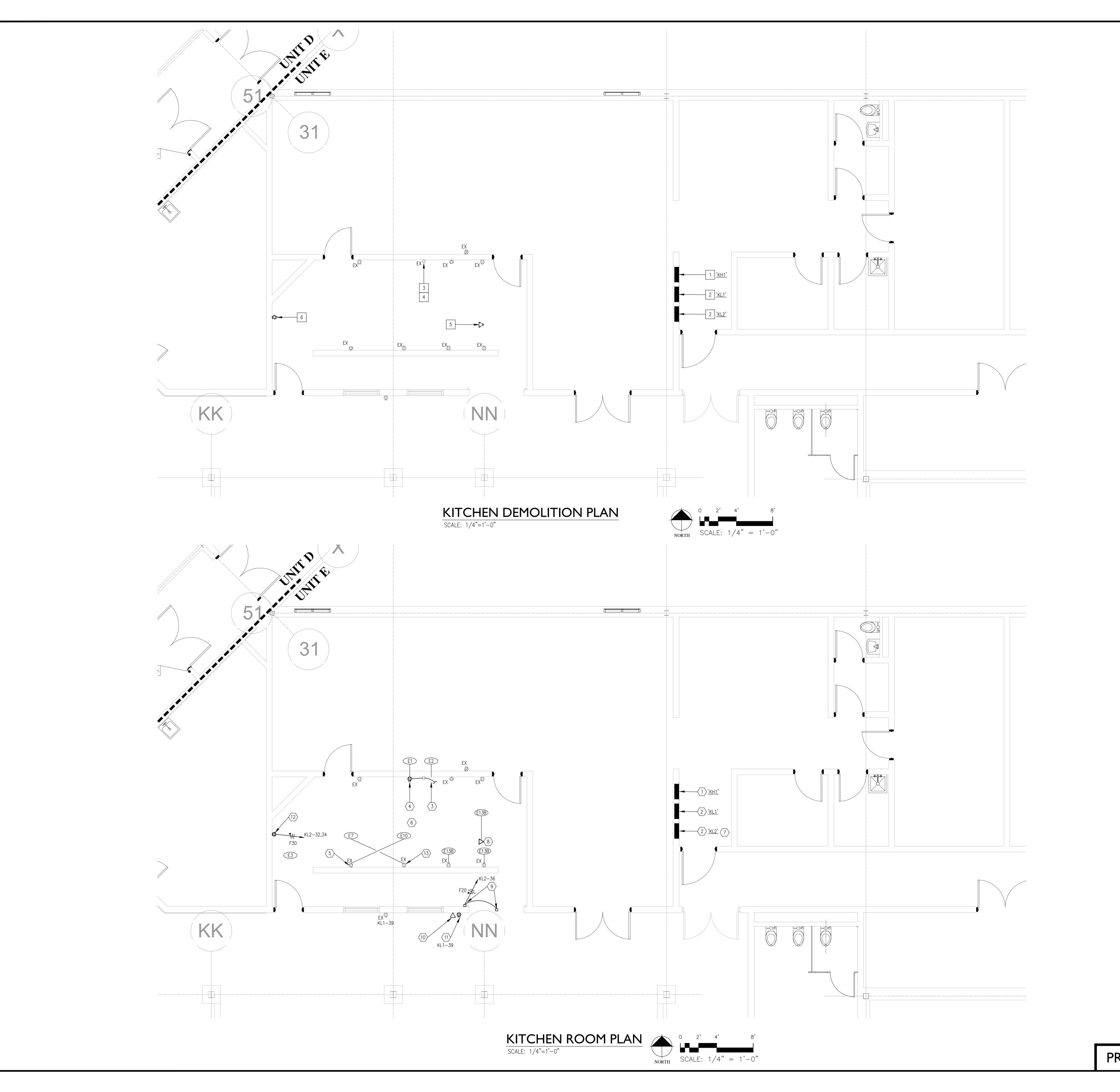


XXX/XXX

IPC-K17-2402

E-301

ENLARGED MECH. AND ELEC. ROOM PLANS



- 1. DEVICES SHOWN WITH "EX" DESIGNATION ARE EXISTING DEVICES
- 2. ALL MATERIAL/EQUIPMENT REMOVED BY SUBCONTRACTORS SHALL BE DISPOSED OF OFF SITE. OWNER HAS FIRST RIGHT OF REFUSAL
- FOR ANY EQUIPMENT/MATERIAL/PARTS REMOVED FROM PROJECT. 3. EXISTING EQUIPMENT AND SIZES INDICATED ARE AS SHOWN ON ORIGINAL BUILDING PLANS. SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFYING EXACT SIZES AND LOCATIONS AS REQUIRED TO COMPLETE THEIR WORK.
- 4. CONTRACTOR SHALL REFER TO FOOD SERVICE DRAWINGS FOR ADDITIONAL WORK AND COORDINATION.
- 5. ITEM DESIGNATION (#) ARE FROM KITCHEN PLANS. COORDINATE EQUIPMENT WITH KITCHEN PLAN.

DEMOLITION PLAN NOTES

- 1. 277/480 VOLT, 3ø, 4 WIRE ELECTRICAL PANEL TO REMAIN. 2. 120/208 VOLT, 3ø, 4 WIRE ELECTRICAL PANEL TO REMAIN.
- 3. REMOVE CONNECTION TO PASS-THRU FOOD WARMER. SEE THIS SHEET FOR NEW CONNECTION REQUIREMENTS. JUNCTION BOX SHALL REMAIN.
- 4. REMOVE CONNECTION TO PASS-THRU REFRIGERATOR. SEE THIS SHEET FOR NEW CONNECTION REQUIREMENTS. JUNCTION BOX
- SHALL REMAIN. 5. CEILING MOUNTED DATA JACK FOR POS SYSTEM SHALL BE
- REMOVED AND RETAINED FOR INSTALLATION INTO NEW CEILING. 6. REMOVE NEMA 5-20 RECEPTACLE. WIRING SHALL BE MODIFIED FOR 208 VOLT FEED. SEE THIS SHEET FOR ADDITIONAL WORK.

ELECTRICAL PLAN NOTES

1. 277/480 VOLT, 3ø, 4 WIRE ELECTRICAL PANEL TO REMAIN. 2. 120/208 VOLT, 3ø, 4 WIRE ELECTRICAL PANEL TO REMAIN. PROVIDE SEAL TIGHT CONNECTION TO FOOD WARMER. RECONNECT TO JUNCTION BOX. (CIRCUIT KL1-22,24) FOR

SERVICE DRAWINGS FOR ADDITIONAL INFORMATION.

4. PROVIDE A NEMA 5-20P FOR CONNECTION TO PASS-THRU REFRIGERATOR. CONNECT TO EXISTING CIRCUIT KL1-26. SEE FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION. 5. EXISTING NEMA 6-30P SHALL SERVE THE ADJACENT HOT FOOD

SERVING COUNTER (ITEM E10). CORD SHALL BE PROVIDED WITH

CONNECTION TO PASS-THRU HEATED CABINET. SEE FOOD

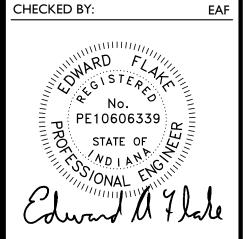
- EQUIPMENT LONG ENOUGH TO ACCOMMODATE RECEPTACLE DISTANCE FOR EQUIPMENT. 6. SEE FOOD SERVICE DRAWINGS FOR ADDITIONAL INFORMATION. PROVIDE 2P/30 AMP BREAKER FOR COLD FOOD MERCHANDISER (SPACES 32,34) AND A 1P/20 AMP BREAKER FOR ROLLING DOOR(SPACE 36). MATCH EXISTING MANUFACTURER FOR
- 8. REINSTALL CEILING MOUNTED DATA JACK FOR POS SYSTEM. 9. NEW COILING DOOR. PROVIDE POWER AS INDICATED. PROVIDE NEW 1P/20 AMP CIRCUIT BREAKER IN PANEL INDICATED. CONNECT CONTROL STATION AS REQUIRED.
- 10. NEW POS STATION DATA JACK. PROVIDE EMPTY $\frac{3}{4}$ " CONDUIT ABOVE ACCESSIBLE CEILING.
- 11. NEW POS STATION RECEPTACLE. CONNECT TO EXISTNG RECEPTACLE CIRCUIT AS SHOWN.

DISTANCE FOR EQUIPMENT.

- 12. PROVIDE A NEMA 6-20P FOR CONNECTION TO REFRIGERATED MERCHANDISER. MODIFY WIRING IN BY MAKING NEUTRAL A PHASE CONDUCTOR. EXTEND TO NEW 2P/20 AMP BREAKER IN
- PANEL KL1. MARK CONDUCTORS AS REQUIRED. 13. EXISTING NEMA 5-20P SHALL SERVE THE ADJACENT COLD FOOD SERVING COUNTER (ITEM E7). CORD SHALL BE PROVIDED WITH EQUIPMENT LONG ENOUGH TO ACCOMMODATE RECEPTACLE

REVISIONS

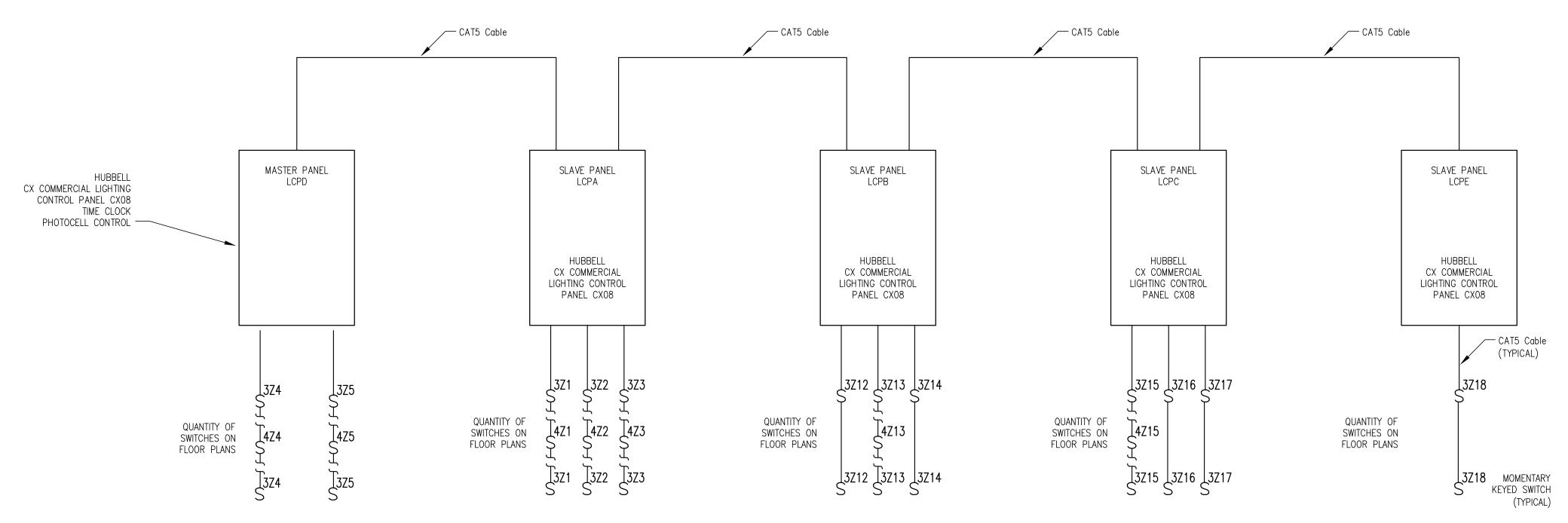
IPC-K17-2402 DRAWN BY:



SIGNATURE

E-302

ENLARGED KITCHEN AREA PLANS



LIGHTING CONTROL DIAGRAM

RELAY	CIRCUIT	AREA CONTROLLED	CONTROLLED
1	BH1	D CORRIDORS	
2	BH1	D CORRIDORS	
3	BH1	D CORRIDORS	
4	BH1	D CORRIDORS	
5	BH1	EXTERIOR POLE LIGHTS	
6	BH1	EXTERIOR POLE LIGHTS	
7	BH1	EXTERIOR SIGN LIGHTS	
8		SPARE	
NOTES:			
		NTARY KEYED OVERRIDE SWITCHES WHERE INDICATED).
2. SL	LAVE PANEL.		

RELAY	CIRCUIT	AREA CONTROLLED	CONTROLLED
1	AH1	A CORRIDORS	
2		SPARE	
3		SPARE	
4		SPARE	
	="	NTARY KEYED OVERRIDE SWITCHES WHERE INDICATED.	

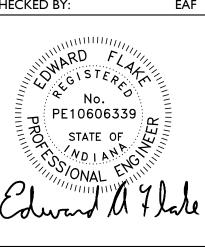
		RELAY SCHEDULE - LCPC	
RELAY	CIRCUIT	AREA CONTROLLED	CONTROLLED
1	CH2	C CORRIDORS	
2		SPARE	
3		SPARE	
4		SPARE	
	_	NTARY KEYED OVERRIDE SWITCHES WHERE INDICATED.	

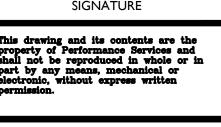
RELAY	CIRCUIT	AREA CONTROLLED	CONTROLLED
1	CH1	B CORRIDORS	
2		SPARE	
3		SPARE	
4		SPARE	
	=	NTARY KEYED OVERRIDE SWITCHES WHERE INDICATED.	

RELAY	CIRCUIT	RELAY SCHEDULE — LCPE AREA CONTROLLED	CONTROLLED
1	DH1	E CORRIDORS	
2		SPARE	
3		SPARE	
4		SPARE	
	_	NTARY KEYED OVERRIDE SWITCHES WHERE INDICATED.	

REVISIONS

1-23-2018 DRAWN BY: CHECKED BY:





E-40 I ELECTRICAL DIAGRAMS

PANEL:	LOCATION:		MOUN		RATIN				MAIN		REMARKS:
AH1	ELECTRICAL		SURFA	4CE	277/	/480 VOLT, 3ø,	4 WIRE		100	AMP MCB	
LOAD DE	SIGNATION	CIR. BKR.	CIR. NO.	A		PHASE B		С	CIR. NO.	CIR. BKR.	LOAD DESIGNATION
LIGHTING		1P-20E	1	_	-				2	1P-20E	EXISTING GEN. BLOCK HTR.
LIGHTING		1P-20E	3						4	1P-20E	EXISTING GEN. BATT CHRG.
LIGHTING		1P-20E	5						6	1P-20E	SPARE
LIGHTING		1P-20E	7	_	_				8	1P-20E	SPARE
BOILER B-1		1P-20E	9						10	1P-20E	EXISTING TECH RACK
BOILER B-2		1P-20E	11				<u> </u>	Τ	12	1P-20E	EXISTING TECH RACK
SPARE		1P-20E	13	_	_				14	1P-30E	EXISTING TECH RACK
SPARE		1P-20E	15						16	1P-30E	EXISTING TECH RACK
SPACE			17				<u> </u>	<u> </u>	18	1P	SPACE
SPACE			19	_					20	1P	SPACE
SPACE			21			_ _			22	1P	SPACE
SPACE	PACE		23					<u> </u>	24	1P	SPACE
PACE			25	_					26	1P	SPACE
SPACE			27						28	1P	SPACE
SPACE			29						30	1P	SPACE
SPACE			31	_	_				32	1P	SPACE
SPACE			33						34	1P	SPACE
SPACE			35				_	T -	36	1P	SPACE
SPACE			37	_	_				38	1P	SPACE
SPACE			39						40	1P	SPACE
SPACE	,		41				_	-	42	1P	SPACE
TOTAL CONI	NECTED LOAD			_		_	1	_		KVA \ /	Ā

			Ε×	(ISTIN(3 P	ANELBOA	RD S	SCHE	DULE			
PANEL: BH1	LOCATION: ELECTRICAL		MOUN		RATI	NG: /480 VOLT, 3ø,	4 WIRE		MAIN 100	: AMP MCB		REMARKS:
LOAD DE	SIGNATION	CIR. BKR.	CIR. NO.	А		PHASE B	(C	CIR. NO.	CIR. BKR.	LO	AD DESIGNATION
SPARE		1P-20E	1		_				2	1P-20E	EXISTIN	G GEN. BLOCK HTR.
		1P-20E	3			_ _			4	1P-20E	EXISTIN	G GEN. BATT CHRG.
SPARE		1P-20E	5				_	_	6	1P-20E	SPARE	
		1P-20E	7	-	_				8	1P-20E	SPARE	
BOILER B-1		1P-20E	9						10	1P-20E	EXISTIN	G TECH RACK
BOILER B-2		1P-20E	11				_	_	12	1P-20E	EXISTIN	G TECH RACK
SPARE		1P-20E	13	-	_				14	1P-20E	EXISTIN	G TECH RACK
SPARE		1P-20E	15						16	1P-20E	EXISTIN	G TECH RACK
		1P-20E	17				_	_	18	1P-20E		
		1P-20E	19	_	_				20	1P-20E		
		1P-20E	21						22	1P-20E		
		1P-20E	23	\bigwedge			_	_	24	1P-20E		
		1P-20E	25	-	_				26	1P-20E		
	1P-		27						28	1P-20E		
	1P		29	\bigwedge			_	_	30	1P-20E		
			31	_	_				32	1P-20E		
		1P-20E	33						34	1P-20E		
		1P-20E	35				_	_	36	1P-20E		
		1P-20E	37	_	_				38	1P-20E		
		1P-20E	39			_ _			40	1P-20E		
		1P-20E	41				_	_	42	1P-20E		
TOTAL CONI	NECTED LOAD	· · · · · ·		_		_		_		KVA \ /	<u>.</u>	
GENERAL N	OTES: * SQUAR * PROVIC * BREAK	E NEW TYP	E DIREC	TORY 1P-20E) II	NDICA.	TES EXISTING BF	REAKER,	"N" (i.e.	1P-20N) INDICATE	S NEW	BREAKER

PANEL:	LOCATION:		MOUN	TING:	RATIN	IG:				MAIN	l :	REMARKS:
DH1	ELECTRICAL		SURFA	ACE	277/	480 VOLT,	3ø, 4	4 WIRE		100	AMP MCB	
LOAD D	ESIGNATION	CIR. BKR.	CIR. NO.	А		PHASE B		C	,	CIR. NO.	CIR. BKR.	LOAD DESIGNATION
SPARE		2P-20E	1	_	_					2	1P-20E	EXISTING GEN. BLOCK H
			3				_		\leq	4	1P-20E	EXISTING GEN. BATT CH
SPARE		2P-20E	5					_		6	1P-20E	SPARE
			7	_					\leq	8	1P-20E	SPARE
BOILER B-1		1P-20E	9						\leq	10	1P-20E	EXISTING TECH RACK
BOILER B-2		1P-20E	11					_		12	1P-20E	EXISTING TECH RACK
SPARE		1P-20E	13	_					\leq	14	1P-30E	EXISTING TECH RACK
SPARE		1P-20E	15						\leq	16	1P-30E	EXISTING TECH RACK
SPACE		1P	17					_		18	1P	SPACE
SPACE		1P	19	_	_				\leq	20	1P	SPACE
SPACE		1P	21						\leq	22	1P	SPACE
SPACE		1P	23					_		24	1P	SPACE
SPACE		1P	25	_	_			\geq	\leq	26	1P	SPACE
SPACE		1P	27			_	_			28	1P	SPACE
SPACE		1P	29					_	-	30	1P	SPACE
SPACE		1P	31	_	_	\geq				32	1P	SPACE
SPACE		1P	33			_	_	\geq		34	1P	SPACE
SPACE		1P	35					_	1	36	1P	SPACE
SPACE		1P	37	_	_					38	1P	SPACE
SPACE		1P	39			-	-			40	1P	SPACE
SPACE		1P	41					_	_	42	1P	SPACE
TOTAL CON	INECTED LOAD	•		_		_		_	_		KVA \	A

PANEL: CH1	LOCATION: ELECTRICAL		MOUN SURF#		RATIN 277/		_T, 3ø, <i>4</i>	4 WIRE		MAIN 100	I: AMP MCB		REMARKS:
LOAD DE	ESIGNATION	CIR. BKR.	CIR. NO.	A		PH <i>A</i> B		C)	CIR. NO.	CIR. BKR.	LO	AD DESIGNATION
SPARE		1P-20E	1	-	_					2	1P-20E	EXISTIN	G GEN. BLOCK HT
		1P-20E	3			_	_			4	1P-20E	EXISTIN	GEN. BATT CHR
SPARE		1P-20E	5					_	_	6	1P-20E	SPARE	
		1P-20E	7	_	_					8	1P-20E	SPARE	
BOILER B-1		1P-20E	9			_	_			10	1P-20E	EXISTIN	G TECH RACK
30ILER B-2		1P-20E	11					_	_	12	1P-20E	EXISTIN(G TECH RACK
SPARE		1P-20E	13	_	_					14	1P-30E	EXISTIN	G TECH RACK
SPARE		1P-20E	15			_	_			16	1P-30E	EXISTIN	G TECH RACK
SPACE		1P	17					_	_	18	1P	SPACE	
SPACE		1P	19	_	_					20	1P	SPACE	
SPACE		1P	21			-	-			22	1P	SPACE	
SPACE		1P	23			\geq	\setminus		1	24	1P	SPACE	
SPACE		1P	25	-	_					26	1P	SPACE	
SPACE		1P	27			_	_			28	1P	SPACE	
SPACE		1P	29	\bigwedge			\setminus	_	1	30	1P	SPACE	
SPACE		1P	31	-	_					32	1P	SPACE	
SPACE		1P	33			_	_			34	1P	SPACE	
SPACE		1P	35					_	_	36	1P	SPACE	
SPACE		1P	37	_	_					38	1P	SPACE	
SPACE		1P	39			_	_			40	1P	SPACE	
SPACE		1P	41					_	_	42	1P	SPACE	
TOTAL CON	NECTED LOAD	•		_		_	-		_		KVA \	<u>-</u> Д	

PANEL: CH2	LOCATION: ELECTRICAL		MOUN SURFA		277/	ng: '480 voi	_T, 3ø, [,]	4 WIRE		100	: AMP MCB		REMARKS:
LOAD DE	SIGNATION	CIR. BKR.	CIR. NO.	А		PH/ B		C	,	CIR. NO.	CIR. BKR.	LOA	AD DESIGNATION
SPARE		2P-20E	1	-	_					2	1P-20E	EXISTING	GEN. BLOCK HTR
			3			_	_			4	1P-20E	EXISTING	GEN. BATT CHRG
SPARE		2P-20E	5					_	_	6	1P-20E	SPARE	
			7	_	_					8	1P-20E	SPARE	
BOILER B-1		1P-20E	9			_	_			10	1P-20E	EXISTING	FIECH RACK
BOILER B-2		1P-20E	11					_	_	12	1P-20E	EXISTING	FIECH RACK
SPARE		1P-20E	13	_	_					14	1P-30E	EXISTING	FIECH RACK
SPARE		1P-20E	15			_	_			16	1P-30E	EXISTING	FIECH RACK
SPACE		1P	17					_	_	18	1P	SPACE	
SPACE		1P	19	_	1					20	1P	SPACE	
SPACE		1P	21		//	-				22	1P	SPACE	
SPACE		1P	23		//	\bigwedge		_	_	24	1P	SPACE	
SPACE		1P	25	_	_	\bigwedge				26	1P	SPACE	
SPACE		1P	27		//	1	-			28	1P	SPACE	
SPACE		1P	29		//	$/ \setminus$		_	_	30	1P	SPACE	
SPACE		1P	31	_	1	\bigwedge				32	1P	SPACE	
SPACE		1P	33			_	_			34	1P	SPACE	
SPACE		1P	35					_	_	36	1P	SPACE	
SPACE		1P	37	_	_					38	1P	SPACE	
SPACE		1P	39			_	_			40	1P	SPACE	
SPACE		1P	41					_	_	42	1P	SPACE	
TOTAL CONN	NECTED LOAD			_		_	-	-	_		KVA \	- Д	

PANEL: DL2	LOCATION: MAIN ELECTR	RICAL ROOM	MOUN SURF		120/	ng: 1208 Volt, 3ø	, 4 WIRE		MAIN 200	AMP MLO		REMARKS:
LOAD [ESIGNATION	CIR. BKR.	CIR. NO.	А		PHASE B		С	CIR. NO.	CIR. BKR.	LC)AD DESIGNATION
EXIST. BOILE	ER BR-1	1P-20E	1	_	_				2	1P-20E	EXIST.	LOAD
EXIST. WATE	R SOFTENER	1P-20E	3						4	1P-20E	EXIST.	BLEACHER
BOILER BR-	1	1P-20E	5					_	6	1P-20E	EXIST.	BLEACHER
SPARE		1P-20E	7	_	_				8	1P-20E	EXIST.	TEMPERATURE PAN
#1 EXIST. FUEL	OIL PUMP	1P-20E	9		//				10	1P-20E	EXIST.	OIL TANK CONTROLS
EXIST. GAS	SOLENOID	1P-20E	11				_	_	12	1P-20E	EXIST.	OIL TANK CONTROLS
2 EXIST. LOAD	1	1P-20E	13	_	1				14	1P-20E	EXIST.	EXHAUST FAN
EXIST. WATE	R HEATER	1P-20E	15						16	1P-20E	EXIST.	SUMP PUMP
HWH-1		1P-20E	17					_	18	1P-20E	EXIST.	CHEM. CONTROLS
EXIST. CIRC	PUMP	1P-20E	19	-	_				20	1P-20E	EXIST.	CHEM. CONTROLS
EXIST. CIRC	EXIST. CIRC. PUMP		21						22	1P-20E	EXIST.	MECH. RM. RECEPTS.
2 EXIST. LOAD			23				_	-	24	1P-20E	EXIST	RECEPT. EXT. STOR.
2 EXIST. LOAD		2P-30E	25	_	_				26	1P-20E	EXIST.	HEATERS MECH RM.
			27						28	1P-20E	EXIST.	HEAT TRACE
2 EXIST. LOAD		1P-20E	29				_	_	30	1P-20E	EXIST.	LOAD
PUMP P-1		2P-30N	31	_	_				32	1P	SPACE	
			33						34	1P	SPACE	
SPACE		1P	35				_	<u> </u>	36	1P	SPACE	
SPACE		1P	37	_	_				38	1P	SPACE	
SPACE		1P	39			_ _		\sim	40	1P	SPACE	
SPACE		1P	41		$\overline{}$		_	<u> </u>	42	1P	SPACE	
TOTAL COL	NNECTED LOAD			_		-		_		KVA \ /	4	

FEEDI	ER AND) BRAN	CH C	CIRCU	IIT S	CHED	ULE	
FEEDER/BRANCH CIRCUIT	CONDUCTOR SIZ	E PER CONDUIT		CC	NDUIT SIZE	AND QUANTI	TY	
DESIGNATION	PHASE & NEUTRAL	EQUIPMENT GROUND	1P, 1N, 1G,	2P, 1N, 1G, 3P, 1G	3P, 1N, 1G	3P, 2N, 1G	3P, 3N, 1G	3P, 1N, 2
F20	12	12	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
F30	10	10	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
F40-50	8	10	3/4"	3/4"	3/4"	1"	1"	3/4"
F60	6	10	3/4"	3/4"	1"	1"	1"	1"
F70-F80	4	8	3/4"	1"	1-1/4"	1-1/4"	1-1/4"	1-1/4"
F90-F100	3	8	1"	1"	1-1/4"	1-1/4"	1-1/2"	1-1/2"
F110	2	6	1"	1-1/4"	1-1/4"	1-1/2"	1-1/2"	1-1/4"
F125	1	6	1-1/4"	1-1/4"	1-1/2"	2"	2"	1-1/2"
F150	1/0	6	1-1/4"	1-1/2"	1-1/2"	2"	2"	2"
F175	2/0	6	1-1/4"	1-1/2"	2"	2"	2-1/2"	2"
F200	3/0	6	1-1/2"	2"	2"	2-1/2"	2-1/2"	2"
F225	4/0	4	1-1/2"	2"	2-1/2"	2-1/2"	3"	2-1/2"
F250	250	4	2"	2"	2-1/2"	3"	3"	2-1/2
F300	350	4	2"	2-1/2"	3"	3"	3-1/2"	3"
F350	500	3	2-1/2"	3"	3-1/2"	3-1/2"	4"	3-1/2
F400	3/0	3	(2) 1-1/2"	(2) 2"	(2) 2"	(2) 2-1/2"	(2) 2-1/2"	(2) 2"
F450	4/0	2	(2) 1-1/2"	(2) 2"	(2) 2-1/2"	(2) 2-1/2"	(2) 3"	(2) 2-1/
F500	250	2	(2) 2"	(2) 2"	(2) 2-1/2"	(2) 3"	(2) 3"	(2) 2-1/
F600	350	1	(2) 2"	(2) 2-1/2"	(2) 3"	(2) 3"	(2) 3-1/2"	(2) 3"
F700-800	500	1/0	(2) 2-1/2"	(2) 3"	(2) 3-1/2"	(2) 3-1/2"	(2) 4"	(2) 3-1/
F900	350	2/0	(3) 2"	(3) 2-1/2"	(3) 3"	(3) 3"	(3) 3-1/2"	(3) 3"
F1000	500	2/0	(3) 2-1/2"	(3) 3"	(3) 4"	(3) 3-1/2"	(3) 4"	(3) 3-1/
F1200	600	3/0	(3) 4"	(3) 4"	(3) 4"	(3) 4"	(3) 4"	(3) 4"
F1600	600	4/0	(4) 4"	(4) 4"	(4) 4"	(4) 4"	(4) 4"	(4) 4"
F2000	600	250	(5) 4"	(5) 4"	(5) 4"	(5) 4"	(5) 4"	(5) 4"
F2500	500	350	(7) 4"	(7) 4"	(7) 4"	(7) 4"	(7) 4"	(7) 4"
F3000	500	500	(8) 4"	(8) 4"	(8) 4"	(8) 4"	(8) 4"	(8) 4"
F3500	500	500	(12) 4"	(12) 4"	(12) 4"	(12) 4"	(12) 4"	(12) 4'

PANEL: DPHD	LOCATION: BOILER ROOM	WALL		RATING: 277/480 3ø, 4 W		MAIN: 800 Ai	MP MLO REMARKS:
LOAD	DESIGNATION	CKT. BKR.	CKT. NO.	A	PHASE B	С	LOAD NOTES
1 E	XISTING PUMP (15 HP)	3P	40E		_	_	
2 E	XISTING PUMP (15 HP)	3P	40E			_	
3 E	XISTING PUMP (25 HP)	3P	50E			_	
4 E	XISTING PUMP (25 HP)	3P	50E			_	
7	XISTING BOOSTER HEATER ITCHEN	3P	70E			_	
6 E	XISTING STEAMER — KITCH	IEN 3P	90E		_	_	
7 E	XISTING PANEL KH1	3P	400	=	_	_	
8 E	XISTING LOAD	3P	200	=		_	
9 S	PACE	2P			}		
10 E	RV-4	3P	501			_	
	CONNECTED LOAD (F	(VA)		_	_	_	KVA TOTAL

E-50 I ELECTRICAL SCHEDULES

PANEL:	LOCATION:		MOUN	TING:	RATII	NG:				MAIN	l:		REMARKS:
AL1	ELECTRICAL		SURF#	/CE	120/	′208 VOL	.T, 3ø, 4	4 WIRE		100	AMP MCB		
LOAD DI	ESIGNATION	CIR. BKR.	CIR. NO.	A		PH <i>A</i> B		C)	CIR. NO.	CIR. BKR.	LOA	D DESIGNATION
SPARE		1P-20E	1	_	_					2	1P-20E	EXISTING	GEN. BLOCK HTF
		1P-20E	3			_	_			4	1P-20E	EXISTING	GEN. BATT CHRO
SPARE		1P-20E	5					_	-	6	1P-20E	SPARE	
		1P-20E	7	-	_					8	1P-20E	SPARE	
BOILER B-1		1P-20E	9			_	_			10	1P-20E	EXISTING	TECH RACK
BOILER B-2		1P-20E	11					-	-	12	1P-20E	EXISTING	TECH RACK
SPARE		1P-20E	13	_	-		\setminus	\bigwedge		14	1P-30E	EXISTING	TECH RACK
SPARE		1P-20E	15	\bigwedge		_	_	$/ \setminus$		16	1P-30E	EXISTING	TECH RACK
SPACE			17	\bigwedge				1	1	18	1P	SPACE	
SPACE			19	_	_			\bigwedge		20	1P	SPACE	
SPACE			21			_	_	\bigwedge		22	1P	SPACE	
PACE			23					-	_	24	1P	SPACE	
PACE			25	_	_					26	1P	SPACE	
PACE			27	\bigwedge		_	_	\bigwedge		28	1P	SPACE	
SPACE			29		<			_	_	30	1P	SPACE	
SPACE			31	_	_					32	1P	SPACE	
SPACE			33	\bigwedge		_	_	$/ \setminus$		34	1P	SPACE	
SPACE			35	\bigwedge			\setminus	_	_	36	1P	SPACE	
SPACE			37		_					38	1P	SPACE	
SPACE			39			_	_			40	1P	SPACE	
SPACE			41					_	_	42	1P	SPACE	
TOTAL CON	NECTED LOAD	•		_		_	-	-	_		KVA \	Ā	

PANEL: BL1	LOCATION: ELECTRICAL		MOUN SURF		120/	NG: '208 VOL	T, 3ø, 4	4 WIRE		MAIN 100	: AMP MCB		REMARKS:
LOAD DE	SIGNATION	CIR. BKR.	CIR. NO.	А		PHA B	SE	(CIR. NO.	CIR. BKR.	LO	AD DESIGNATION
SPARE		1P-20E	1	_	_					2	1P-20E	EXISTING	G GEN. BLOCK HTR.
		1P-20E	3		//	_	_			4	1P-20E	EXISTING	G GEN. BATT CHRG.
SPARE		1P-20E	5	\bigwedge				_	_	6	1P-20E	SPARE	
		1P-20E	7	_	_	\bigwedge				8	1P-20E	SPARE	
BOILER B-1		1P-20E	9			-	_			10	1P-20E	EXISTING	G TECH RACK
BOILER B-2		1P-20E	11					_	_	12	1P-20E	EXISTING	G TECH RACK
SPARE		1P-20E	13	_	_					14	1P-20E	EXISTING	G TECH RACK
SPARE		1P-20E	15			-	_			16	1P-20E	EXISTING	G TECH RACK
		1P-20E	17			\bigwedge		_	_	18	1P-20E		
		1P-20E	19	_	_	\bigwedge				20	1P-20E		
		1P-20E	21			-	_			22	1P-20E		
		1P-20E	23					_	_	24	1P-20E		
		1P-20E	25	_	_	\bigwedge				26	1P-20E		
		1P-20E	27			_	_			28	1P-20E		
		1P-20E	29					_	_	30	1P-20E		
		1P-20E	31	_	_					32	1P-20E		
		1P-20E	33		//	_	_			34	1P-20E		
		1P-20E	35		//			_	_	36	1P-20E		
		1P-20E	37	_	-					38	1P-20E		
		1P-20E	39			_	_			40	1P-20E		
		1P-20E	41					_		42	1P-20E		
TOTAL CONN	ECTED LOAD			_		_		-	_		KVA \	Ā	

PANEL: DL1	LOCATION: ELECTRICAL		MOUN		RATII 120/	NG: '208 VOLT, 3ø,	4 WIRE		MAIN 100	AMP MCB	REMARKS:
LOAD DE	SIGNATION	CIR. BKR.	CIR. NO.	A		PHASE B	(CIR. NO.	CIR. BKR.	LOAD DESIGNATION
SPARE		2P-20E	1	_	_				2	1P-20E	EXISTING GEN. BLOCK HTF
			3		\leq	_ _		\leq	4	1P-20E	EXISTING GEN. BATT CHRO
SPARE		2P-20E	5				_		6	1P-20E	SPARE
			7	_	_			\leq	8	1P-20E	SPARE
BOILER B-1		1P-20E	9		\leq	_ _		\leq	10	1P-20E	EXISTING TECH RACK
BOILER B-2		1P-20E	11				_	<u> </u>	12	1P-20E	EXISTING TECH RACK
SPARE		1P-20E	13	_	_			\leq	14	1P-30E	EXISTING TECH RACK
SPARE		1P-20E	15		\leq			\leq	16	1P-30E	EXISTING TECH RACK
SPACE		1P	17				_		18	1P	SPACE
SPACE			19		_			\leq	20	1P	SPACE
SPACE	PACE		21			_		\leq	22	1P	SPACE
SPACE		1P	23		\leq		_		24	1P	SPACE
SPACE		1P	25	_	_			\leq	26	1P	SPACE
SPACE		1P	27						28	1P	SPACE
SPACE		1P	29				_	_	30	1P	SPACE
SPACE		1P	31	_	-				32	1P	SPACE
SPACE		1P	33						34	1P	SPACE
SPACE		1P	35				_	_	36	1P	SPACE
SPACE		1P	37	_	_				38	1P	SPACE
SPACE		1P	39			_ _			40	1P	SPACE
SPACE		1P	41				_	_	42	1P	SPACE
	NECTED LOAD	•	1	_	_		† .	_		KVA \ /	

SPARE 1P-20E 1 -	PANEL: CL1	LOCATION: ELECTRICAL		MOUN SURF		120/	IG: 208 VOLT, 3ø, -	4 WIRE		MAIN 100	AMP MCB	REMARKS:
1P-20E 3	LOAD DES	IGNATION			A			C				LOAD DESIGNATION
SPARE	SPARE		1P-20E	1	-	-				2	1P-20E	EXISTING GEN. BLOCK HT
1P-20E 7			1P-20E	3			_ _			4	1P-20E	EXISTING GEN. BATT CHR
BOILER B-1	SPARE		1P-20E	5				_	_	6	1P-20E	SPARE
BOILER B-2			1P-20E	7	-	_				8	1P-20E	SPARE
SPARE 1P-20E 13 - - 14 1P-30E EXISTING TECH RACK SPARE 1P-20E 15 - - 16 1P-30E EXISTING TECH RACK SPACE 1P 17 - - 18 1P SPACE SPACE 1P 19 - - 20 1P SPACE SPACE 1P 21 - - 22 1P SPACE SPACE 1P 23 - - - 24 1P SPACE SPACE 1P 25 - - 26 1P SPACE SPACE 1P 27 - - - 28 1P SPACE SPACE 1P 29 - - - 30 1P SPACE SPACE 1P 31 - - - - 32 1P SPACE SPACE 1P 35	BOILER B-1		1P-20E	9						10	1P-20E	EXISTING TECH RACK
SPARE 1P-20E 15 - - 16 1P-30E EXISTING TECH RACE SPACE 1P 17 - - 18 1P SPACE SPACE 1P 19 - - 20 1P SPACE SPACE 1P 21 - - 22 1P SPACE SPACE 1P 23 - - - 24 1P SPACE SPACE 1P 25 - - 26 1P SPACE SPACE 1P 27 - - 28 1P SPACE SPACE 1P 29 - - 30 1P SPACE SPACE 1P 31 - - 32 1P SPACE SPACE 1P 33 - - 36 1P SPACE SPACE 1P 37 - - 36 1P SPACE	BOILER B-2		1P-20E	11				_	_	12	1P-20E	EXISTING TECH RACK
SPACE 1P 17 — — 18 1P SPACE SPACE 1P 19 — — 20 1P SPACE SPACE 1P 21 — — 22 1P SPACE SPACE 1P 23 — — — 24 1P SPACE SPACE 1P 25 — — — 26 1P SPACE SPACE 1P 27 — — — 28 1P SPACE SPACE 1P 29 — — — 30 1P SPACE SPACE 1P 31 — — — 32 1P SPACE SPACE 1P 33 — — — 36 1P SPACE SPACE 1P 37 — — 38 1P SPACE	SPARE		1P-20E	13	-	_				14	1P-30E	EXISTING TECH RACK
SPACE 1P 19 - - 20 1P SPACE SPACE 1P 21 - - - 22 1P SPACE SPACE 1P 23 - - - 24 1P SPACE SPACE 1P 25 - - - 26 1P SPACE SPACE 1P 27 - - - - 28 1P SPACE SPACE 1P 29 - - - 30 1P SPACE SPACE 1P 31 - - - 32 1P SPACE SPACE 1P 33 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPARE		1P-20E	15	\bigwedge					16	1P-30E	EXISTING TECH RACK
SPACE 1P 21 - - 22 1P SPACE SPACE 1P 23 - - - 24 1P SPACE SPACE 1P 25 - - 26 1P SPACE SPACE 1P 27 - - - 28 1P SPACE SPACE 1P 29 - - - 30 1P SPACE SPACE 1P 31 - - - 32 1P SPACE SPACE 1P 33 - - - 34 1P SPACE SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	17	\bigwedge			_	_	18	1P	SPACE
SPACE 1P 23 - - 24 1P SPACE SPACE 1P 25 - - 26 1P SPACE SPACE 1P 27 - - - 28 1P SPACE SPACE 1P 29 - - - 30 1P SPACE SPACE 1P 31 - - - 32 1P SPACE SPACE 1P 33 - - - 34 1P SPACE SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	19	_	_				20	1P	SPACE
SPACE 1P 25 - - 26 1P SPACE SPACE 1P 27 - - - 28 1P SPACE SPACE 1P 29 - - 30 1P SPACE SPACE 1P 31 - - 32 1P SPACE SPACE 1P 33 - - - 34 1P SPACE SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	21			_ _			22	1P	SPACE
SPACE 1P 27 - - - 28 1P SPACE SPACE 1P 29 - - - 30 1P SPACE SPACE 1P 31 - - - 32 1P SPACE SPACE 1P 33 - - - 34 1P SPACE SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	23				_	_	24	1P	SPACE
SPACE 1P 29 - - 30 1P SPACE SPACE 1P 31 - - 32 1P SPACE SPACE 1P 33 - - - 34 1P SPACE SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	25	_	-				26	1P	SPACE
SPACE 1P 31 - - 32 1P SPACE SPACE 1P 33 - - - 34 1P SPACE SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	27			_			28	1P	SPACE
SPACE 1P 33 - - 34 1P SPACE SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	29				_		30	1P	SPACE
SPACE 1P 35 - - - 36 1P SPACE SPACE 1P 37 - - 38 1P SPACE	SPACE		1P	31		-			\leq	32	1P	SPACE
SPACE 1P 37 38 1P SPACE	SPACE		1P	33						34	1P	SPACE
			1P	35				_	_	36	1P	
SPACE 1P 39 40 1P SPACE	SPACE		1P	37	_	-				38		SPACE
	SPACE		1P	39						40	1P	SPACE
SPACE 1P 41 — - 42 1P SPACE	SPACE		1P	41				_	_	42	1P	SPACE

* BREAKERS WITH "E" (i.e. 1P-20E) INDICATES EXISTING BREAKER, "N" (i.e. 1P-20N) INDICATES NEW BREAKER

PANEL: LOCATION: CL2 ELECTRICAL			MOUNTING: SURFACE		RATING: 120/208 VOLT, 3ø, 4 WIRE					MAIN 100	I: AMP MCB	REMARKS:	
LOAD DESIGNATION		CIR. BKR.	CIR. NO.	A	PHASE B		С		CIR. NO.	CIR. BKR.	LOAD DESIGNATION		
SPARE		2P-20E	1	_ _						2	1P-20E	EXISTIN	G GEN. BLOCK HTR.
			3	3				-		4	1P-20E	EXISTING GEN. BATT CHRO	
SPARE		2P-20E	5	\sim				_	_	6	1P-20E	SPARE	
			7	-	_	\bigwedge				8	1P-20E	SPARE	
BOILER B-1		1P-20E	9			_	_			10	1P-20E	EXISTING TECH RACK	
BOILER B-2		1P-20E	11			\bigwedge		_	_	12	1P-20E	EXISTIN	G TECH RACK
SPARE		1P-20E	13	-	_					14	1P-30E	EXISTIN	G TECH RACK
SPARE		1P-20E	15		\langle	_	_			16	1P-30E	EXISTIN	G TECH RACK
SPACE		1P	17	\bigwedge				_	_	18	1P	SPACE	
SPACE		1P	19	_	_					20	1P	SPACE	
SPACE		1P	21	\bigwedge		_	_			22	1P	SPACE	
SPACE		1P	23			\bigwedge		_	_	24	1P	SPACE	
SPACE		1P	25	_	_	\bigwedge		\bigwedge		26	1P	SPACE	
SPACE		1P	27			_	_			28	1P	SPACE	
SPACE		1P	29	\bigwedge		\bigwedge		_	_	30	1P	SPACE	
SPACE		1P	31	_	-				\setminus	32	1P	SPACE	
SPACE		1P	33			_	_		\setminus	34	1P	SPACE	
SPACE		1P	35					_	_	36	1P	SPACE	
SPACE		1P	37	_	_					38	1P	SPACE	
SPACE		1P	39			_	_			40	1P	SPACE	
SPACE		1P	41					_	_	42	1P	SPACE	
TOTAL CONN	IECTED LOAD			_		_	-	_	_		KVA \	Ą	

	PANEL: DL2	: LOCATION: MAIN ELECTRICAL ROOM		MOUNTING: SURFACE		RATING: 120/208 VOLT, 3Ø, 4 WIRE				MAIN 200	AMP MLO	REMARKS:		
	LOAD DI	ESIGNATION	CIR. BKR.	CIR. NO.	A		PHASE B		С	CIR. NO.	CIR. BKR.	LO	AD DESIGNATION	
ı	EXIST. BOILE	R BR-1	1P-20E	1		_				2	1P-20E	EXIST. I	LOAD	NC
Ī	EXIST. WATER SOFTENER		1P-20E	3				-	><	4	1P-20E	EXIST. I	BLEACHER	
	BOILER BR-1		1P-20E	5		//		_	_	6	1P-20E	EXIST. I	BLEACHER	
	SPARE		1P-20E	7	_	_				8	1P-20E	EXIST.	TEMPERATURE PAN	
#1 EXIST. FUEL OIL PL		OIL PUMP	1P-20E	9			-	-		10	1P-20E	EXIST.	OIL TANK CONTROLS	NO
	EXIST. GAS SOLENOID		1P-20E	11			$\bigg / \bigg /$	_	_	12	1P-20E	EXIST.	OIL TANK CONTROLS	NO
#2	EXIST. LOAD		1P-20E	13	_	_				14	1P-20E	EXIST. I	EXHAUST FAN	
	EXIST. WATER	R HEATER	1P-20E	15				-	><	16	1P-20E	EXIST.	SUMP PUMP	
	HWH-1		1P-20E	17						18	1P-20E	EXIST.	CHEM. CONTROLS	
	EXIST. CIRC.		1P-20E	19	_	_			\leq	20	1P-20E	EXIST.	CHEM. CONTROLS	_
	EXIST. CIRC.	PUMP	1P-20E	21				-		22	1P-20E	EXIST. I	MECH. RM. RECEPTS.	1
	EXIST. LOAD		1P-20E	23				_		24	1P-20E	+	RECEPT. EXT. STOR.	1
#2	EXIST. LOAD		2P-30E	25		_			\leq	26	1P-20E	+	HEATERS MECH RM.	1
				27		\leq	_ -	-	$\overline{}$	28	1P-20E		HEAT TRACE	1
F	EXIST. LOAD		1P-20E	29						30	1P-20E	EXIST. I	LOAD	NO
	PUMP P-1		2P-30N	31	_	_			\longrightarrow	32	1P	SPACE		1
				33		\leq		-	\sim	34	1P	SPACE		4
	SPACE		1P	35				_		36	1P	SPACE		4
	SPACE		1P	37	_	-				38	1P	SPACE		1
	SPACE		1P	39		\leq	_ -	-		40	1P	SPACE		_
	SPACE		1P	41				_	_	42	1P	SPACE]
	TOTAL CONNECTED LOAD			_		_		_		KVA \	A			

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ELECTRICAL SCHEDULES