

HVAC RENOVATION

URBANDALE HIGH SCHOOL

URBANDALE COMMUNITY SCHOOL DISTRICT

7111 AURORA AVE.
URBANDALE, IA 50322

COMBINED CONTRACT

INDEX OF DRAWINGS

MARCH 25, 2019

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PROJECT CONTACTS

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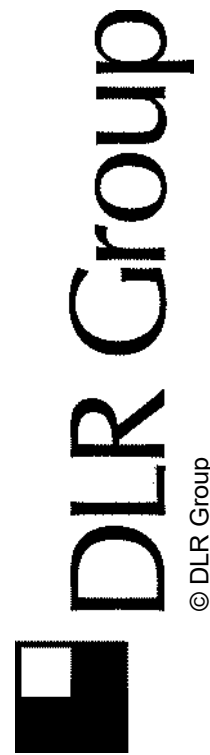
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URBANDALE HS - HVAC RENOVATION

DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20
COVER SHEET

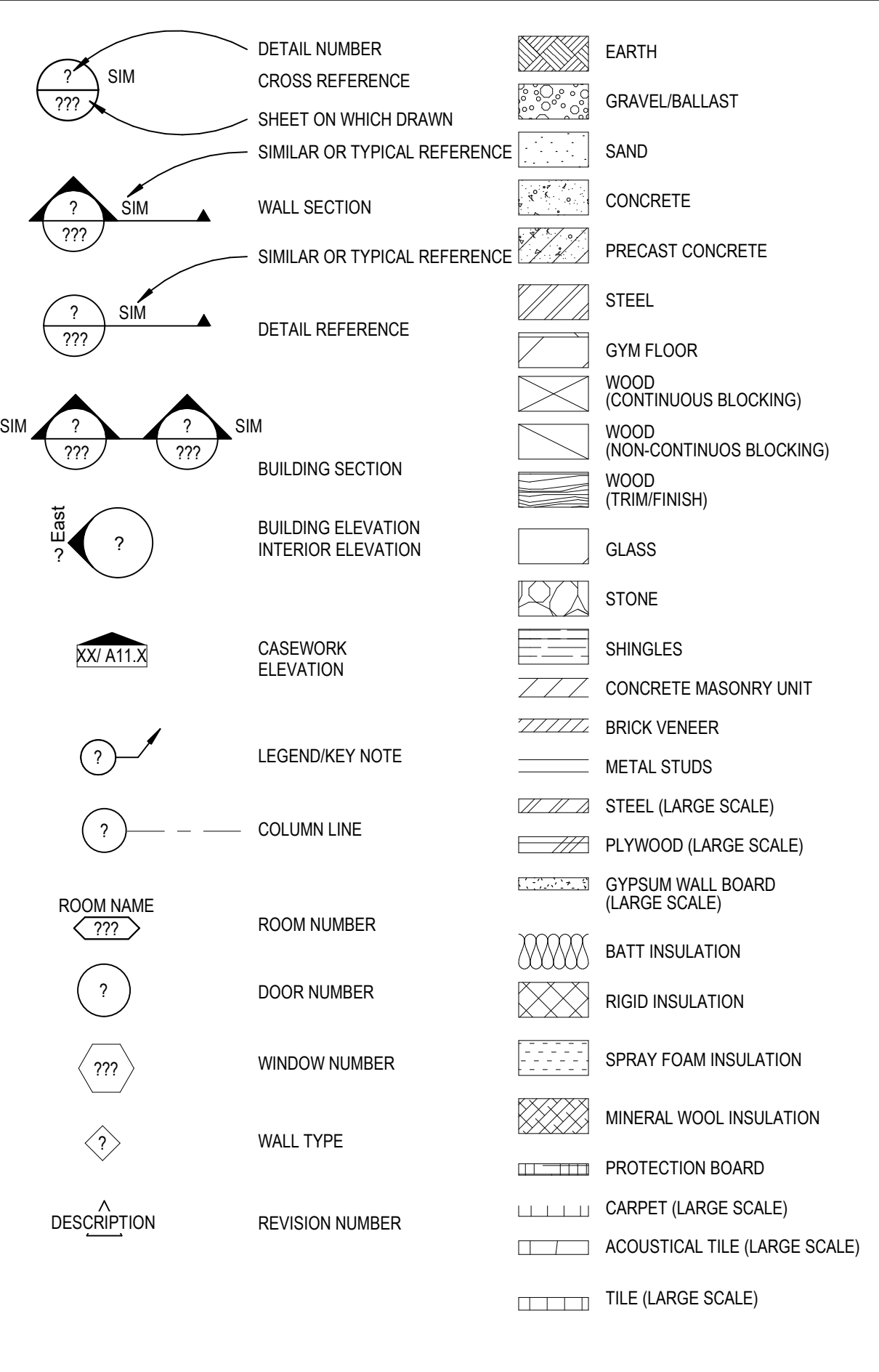
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A AB AB ABS ACC ACR AD ADA ADDN ADJ ADJT ADMIN AEC AFF AFG AHJ AL ALT ALUM ANCH ANSI AP APC APPROX ARCH ASPH AUTO AVG AWP B B.O. BCS BD BLDG BLK BLKG BLKHD BM(S) BOT BRDG BRG BRKT BSMT BT BTWN C C CAB CANT CAP CBD CER CF CFCI CFSF CG CIG CIP CJ CJA CL CLG CLOS CLR CMU COL COM COMB COMM COMPR CONC CONF CONFIG CONN(S) CONST CONT CONTR CORR CP CPT CR CS CSTJ CSWK CT CTG CTIG CTR CU CU CU CV CY CYL	ANCHOR BOLT AIR BARRIER ASBESTOS ADA ACCESSIBLE ACRYLIC ACCESS DOOR AMERICANS WITH DISABILITY ACT ADDITION OR ADDITIONAL ADJUSTABLE ADJACENT ADMINISTRATION AUTOMATED EXTERNAL DEFIBRILLATORS ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AUTHORITY HAVING JURISDICTION ALUMINUM ALTERNATE ALUMINUM ANCHOR AMERICAN NATIONAL STANDARDS INSTITUTE ACCESS PANEL ACOUSTIC PANEL CEILING APPROXIMATE ARCHITECTURAL ASPHALT AUTOMATIC AVERAGE ACOUSTIC WALL PANEL BOTTOM OF BABY CHANGING STATION BOARD BUILDING BLOCK BLOCKING BULKHEAD BEAM(S) BOTTOM BRIDGING BEARING BRACKET BASEMENT BATHTUB BETWEEN CHANNEL CABINET CANTILEVER CAPACITY CHALKBOARD CERAMIC CUBIC FEET CONTRACTOR FURNISHED CONTRACTOR INSTALLED COLD-FORMED STEEL FRAMING CLEAR FLOAT GLASS CAST IRON CLEAR INSULATING GLASS CAST IN PLACE CONTROL JOINT CONTROL JOINT ABOVE CENTER LINE CEILING CLOSET CLEAR CONCRETE MASONRY UNIT COLUMN COMMON COMBINATION COMMUNICATIONS COMPRESSIBLE CONCRETE CONFERENCE CONFIGURATION CONNECTION(S) CONSTRUCTION CONTINUOUS CONTRACT(OR) CORRIDOR COVER PLATE CARPET CHAIR RAIL COUNTERSINK CONSTRUCTION JOINT CASEWORK CERAMIC TILE CLEAR TEMPERED FLOAT GLASS CLEAR TEMPERED INSULATING GLASS CENTER COMBINATION UNIT CUBIC COPPER CONDOM VENDOR CUBIC YARD CYLINDER	E E EA EA EB EC EE EEW EEWS EFF EJ EL ELAS ELEC ELEV EMER ENCL ENG ENTR EQ EQUIP EQUIV ERF EUI EW EWC EXIST EXP EXP EXT F F F.O. F.V. FAB FB FD FDN FE FEC FF FH FHC FIG FIN FIX FL FLASH FLEX FLG FLM FLUOR FO FOC FOF FOM FOS FOW FP FR FRP FRT FS FSS FT FTG FUT FVC FWC G G GA GAL GALV GB GC GD GEN GFA GL GL GMP GOVT GR GR GRS GWB GYP	EAST EACH EACH FACE EXPANSION BOLT ELECTRICAL CONTRACTOR EACH END EMERGENCY EYE WASH EMERGENCY EYE WASH SHOWER EFFICIENCY EXPANSION JOINT ELEVATION ELASTOMERIC ELECTRICAL ELEVATOR EMERGENCY ENCLOSURE ENGINEER ENTRANCE EQUAL EQUIPMENT EQUIVALENT EPOXY RESIN FLOORING ENERGY USE INTENSITY EACH WAY ELECTRIC WATER COOLER EXISTING EXPANSION EXPPOSED EXTERIOR FABRIC FACE OF FIELD VERIFY FABRICATE(D) FACE BRICK FLOOR DRAIN FOUNDATION FIRE EXTINGUISHER FIRE EXTINGUISHER CABINET FINISH FLOOR FIRE HYDRANT FIRE HOSE CABINET FIGURE FINISHED FIXTURE FLOOR FLASHING FLEXIBLE FLOORING FULL LENGTH MIRROR FLUORESCENT FINISH OPENING FACE OF CONCRETE FACE OF FINISH FACE OF MASONRY FACE OF STUD FACE OF WALL FIREPROOFING FIRE RESISTANT FIBERGLASS REINFORCED PANEL FIRE RESISTANCE TREATED FLOOR SINK FOLDING SHOWER SEAT FEET FOOTING FUTURE FIRE VALVE CABINET FABRIC WALL COVERING GROUT GAUGE GALLON GALVANIZED GRAB BAR GENERAL CONTRACTOR GARBAGE DISPOSAL GENERAL GROSS FLOOR AREA GLUE LAMINATED GLASS GUARANTIED MAXIMUM PRICE GOVERNMENT GUARD RAIL GRADE GALVANIZED RIGID STEEL GYPSUM WALL BOARD GYPSUM	I I.e. IAW IBC ID IF IJ IS IN INC INSUL INT J JAN JCT JFB JST JT K KCJ KD KH KIT L LAB LAM LAV LB(S) LBR LDG LF LG LG LIN LINO LKR LOC LONG LSC LTG LV LVT LWC M M MAG MAINT MAN MAS MATL MAX MB MBD MBH MC MECH MEMB MEZZ MFR MH MIN MISC MR/S MTD MTG MTL MUL N N NA NC NFPA NIC NOM NTS NWC O O to O OA OC OCFI OFF OFOI OPG(S) OPP OSHA OTB OVFL OVHD	THAT IS IN ACCORDANCE WITH INTERNATIONAL BUILDING CODE INSIDE DIAMETER INSIDE FACE ISOLATION JOINT IN JOIST SPACE INCH INCLUDE(ING) INSULATION INTERIOR JANITOR JUNCTION JOINT FILLER BOARD JOIST JOINT KEYED CONSTRUCTION JOINT ELECTRICAL KITCHEN HOOD KITCHEN ANGLE LABORATORY LAMINATED LAVATORY POUND(S) LUMBER LOADING LINEAR FOOT LAMINATED GLASS LENGTH (LONG) LINEAR LINOLEUM LOCKER LOCATION LONGITUDINAL LIFE SAFETY CODE LIGHTING LOUVER LUXURY VINYL TILE LIGHT WEIGHT CONCRETE THOUSAND MAGNETIC MAINTENANCE MANUAL MASONRY MATERIAL MAXIMUM MOP BASIN MARKER BOARD MOP/BROOM HOLDER MEDICINE CABINET MECHANICAL MEMBRANE MEZZANINE MANUFACTURER MANHOLE MINIMUM MISCELLANEOUS MIRROR WITH SHELF MOUNTED MOUNTING METAL MULLION NORTH NOT APPLICABLE NOISE CRITERIA NATIONAL FIRE PROTECTION ASSOCIATION NOT IN CONTRACT NOMINAL NOT TO SCALE NORMAL WEIGHT CONCRETE OUT TO OUT OVERALL ON CENTER OWNER FURNISHED CONTRACTOR INSTALLED OFFICE OWNER FURNISHED OWNER INSTALLED OPENING(S) OPPOSITE OPERATIONAL SAFETY AND HEALTH ADMINISTRATION OPEN TO BELOW OVERFLOW OVERHEAD	Q QT QTR RND QTY R RAD RAF RB RC RCP RD REF REFL REM REQ(D) RESIL REV RF RFM RH RHC RM RND S S SAF SAT SAW SB SC SCD SCH SCR SCT SD SECT SECY SG SGL SH SHM SHT SIM SLNT SM SND SNV SPEC SPL SQ SS SSA SSS ST STAG'D STC STD STGR STL STOR STRUCT SUBFL SURF SUSP SV SYM	QUARRY TILE QUARTER ROUND QUANTITY RADIUS RESILIENT ATHLETIC FLOORING RUBBER BASE REMOTE CONTROL REFLECTED CEILING PLAN ROOF DRAIN REFERENCE REFLECTED REMOVABLE REQUIRE(D) RESILIENT REVISION(S) RESILIENT FLOORING RUBBER FLOOR ROBE HOOK ROUGH IN AND CONNECT ROOM LOCKER ROUND SINK SOUTH SELF ADHEARED FLASHING SPRAYED ACOUSTIC TREATMENT SOUND ABSORBING WALL UNITS SPLASH BLOCK SOLID CORE SHOWER CURTAIN SEAT COVER DISPENSER SHOWER CURTAIN HOOK SCHEDULE SHOWER CURTAIN ROD STRUCTURAL CLAY TILE SOAP DISPENSER SECTION SECRETARY SPANDRAL GLASS SINGLE SHOWER SECURITY HOLLOW METAL SHEET SIMILAR SEALANT SHEET METAL SANITARY NAPKIN DISPOSAL SANITARY NAPKIN VENDOR SPECIFICATION(S) SOUND PRESSURE LEVEL SPECIAL SQUARE STAINLESS STEEL SOLID SURFACE STORM SHELTER AREA STAINLESS STEEL SHELF STAIR STONE STAGGERED SOUND TRANSMISSION CLASS STANDARD STRINGER STEEL STORAGE STRUCTURAL SUBFLOOR SURFACE SUSPENDED SHEET VINYL SYMETRICAL	U UL UNEX UNFIN UNO UR US UTIL V VB VCB VERT VEST VF VIF VOC VOL VP VT VWC W W W W/ W/O WAF WB WC WC WCL WD WDF WDF WDW WG WI WOM WR WRB WW WWF X Y YD Z	UNDERWRITERS LABORATORIES UNEXCAVATED UNFINISHED UNLESS NOTED OTHERWISE URINAL UTILITY SHELF UTILITY VAPOR BARRIER VINYL BASE VENTED COVE BASE VERTICAL VESTIBULE VINYL FLOOR VERIFY IN FIELD VOLATILE ORGANIC COMPOUND VOLUME VENEER PLASTER VINYL TILE VINYL WALL COVERING WEST WIDE WITH WOOD ATHLETIC FLOORING WALL BASE WATER CLOSET WALL COVERING WATER CLOSET/LAVATORY COMBINATION WOOD WOOD FLOORING WINDOW POLISHED WIRE GLASS WROUGHT IRON WALK OFF MAT WASTE RECEPTACLE WEATHER RESISTANT BARRIER WARM WHITE WELDED WIRE FABRIC

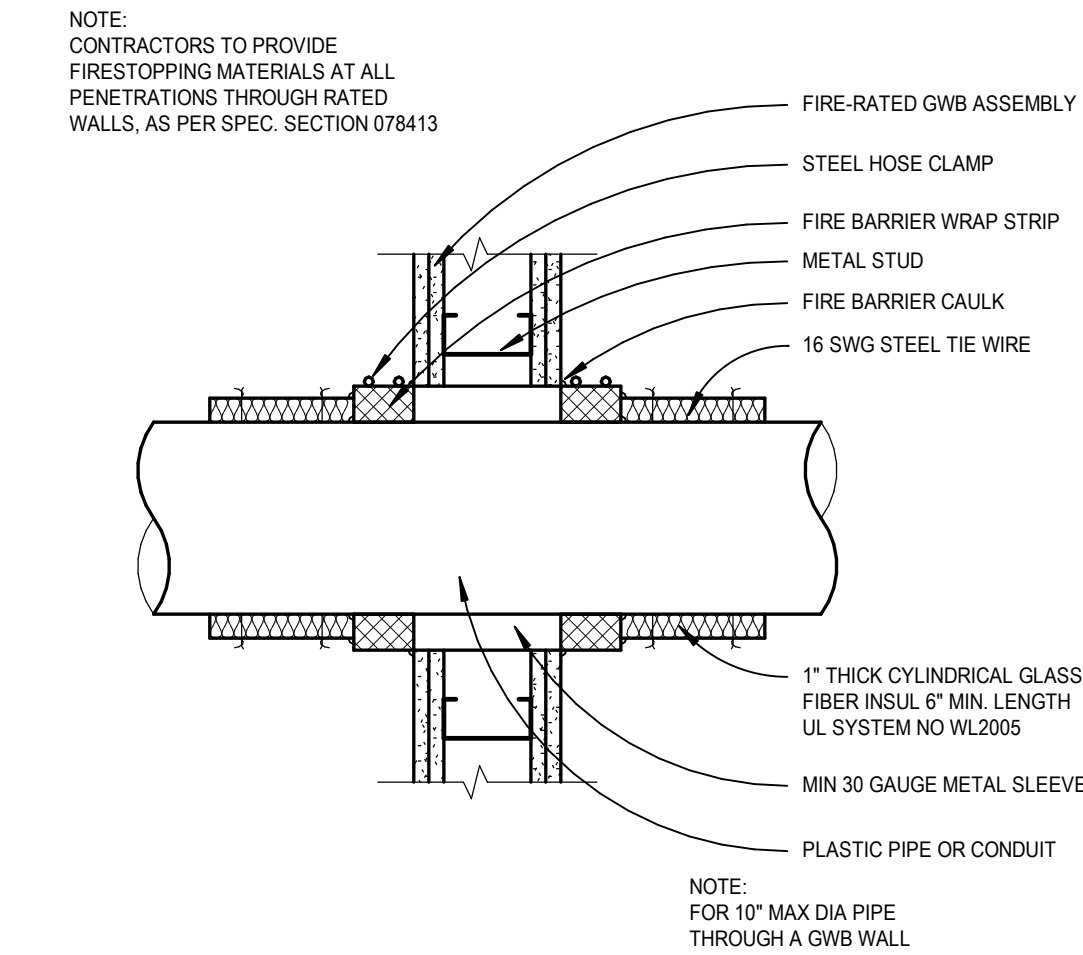
GENERAL SYMBOLS



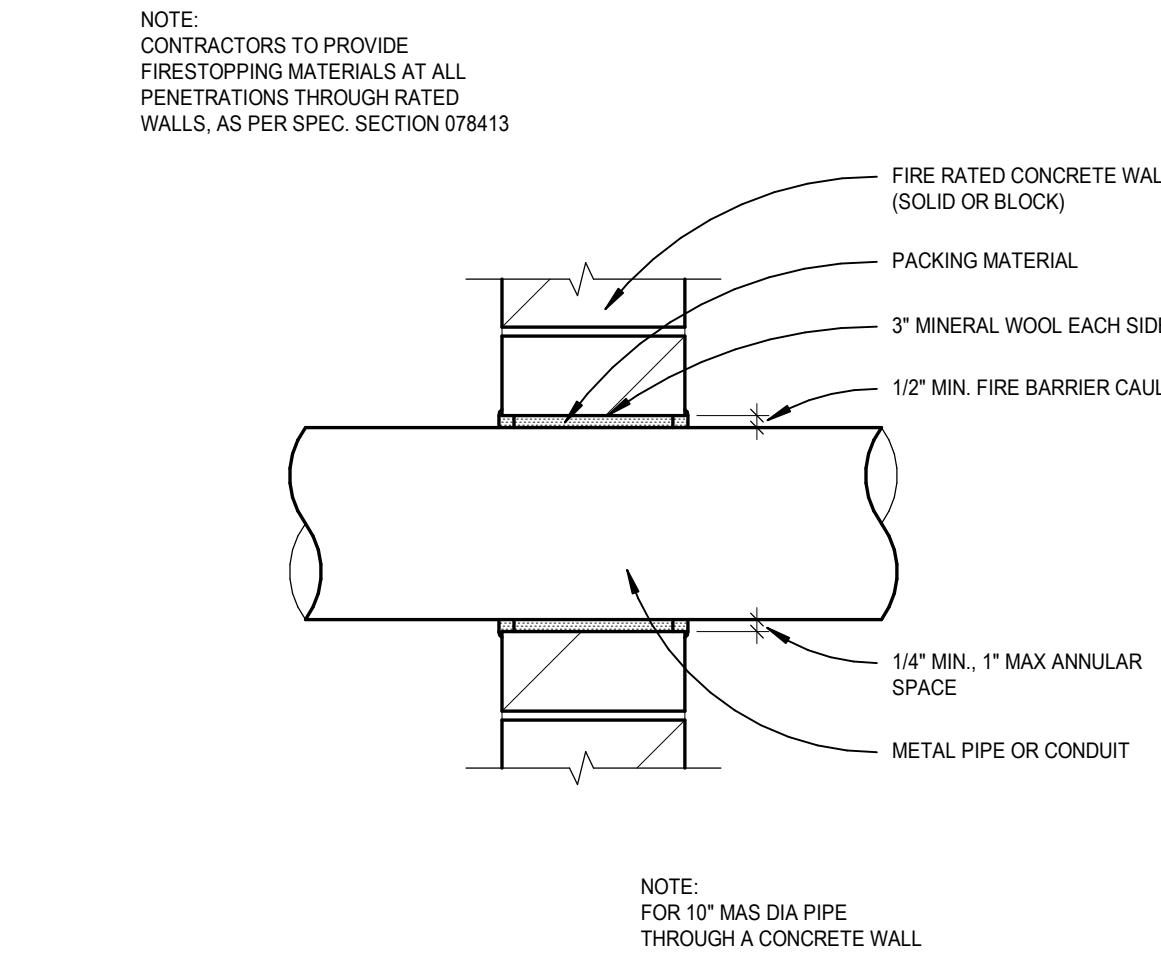
GENERAL NOTES

- GENERAL NOTES APPLY TO ALL DRAWINGS
- ALL DIMENSIONS ARE ACTUAL AND ARE TO FACE OF METAL STUDS, FACE OF MASONRY OR CENTERLINE OF COLUMN, UNLESS NOTED OTHERWISE. DO NOT SCALE DRAWINGS.
- GENERAL CONTRACTOR SHALL FURNISH AND INSTALL 2" X 10" CONTINUOUS WOOD BLOCKING IN STUD PARTITIONS FOR ANCHORAGE OF WALL ATTACHED ITEMS, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING: GRAB BARS, WANTY UNITS, TOILET ACCESSORIES, WALL CABINETS, AND WALL MOUNTED FIXTURES, MARKER BOARDS, TACK BOARDS
- GENERAL CONTRACTOR SHALL COORDINATE ALL MECHANICAL CHASE SIZES WITH MECHANICAL SUBCONTRACTOR.
- WALL OPENINGS FOR FIRE DAMPERS SHALL BE FRAMED PER THE FIRE DAMPER MANUFACTURER'S RECOMMENDATIONS.
- GENERAL CONTRACTOR SHALL COORDINATE SIZES AND LOCATIONS OF 4" HIGH CONCRETE HOUSEKEEPING PADS WITH THE MECHANICAL AND ELECTRICAL EQUIPMENT SUPPLIERS.
- LOCATE CONTROL JOINTS (CJ) AND CONTROL JOINTS ABOVE (CA) WHERE SHOWN ON THE DRAWINGS. SEE DETAILS ON SHEET A10.1 AND STRUCTURAL DRAWINGS. ISOLATE GYPSUM BOARD SURFACES WITH CONTROL JOINTS WHERE:
A) CEILING ABUTS A STRUCTURAL ELEMENT.
B) DISSIMILAR WALL OR PARTITION OR OTHER VERTICAL PENETRATION.
C) CONSTRUCTION CHANGES WITHIN PLANES OF THE CEILING.
D) CEILING RUN EXCEEDS 30 LINEAL FEET.
E) CONTROL JOINTS OCCUR IN STRUCTURAL ELEMENTS OF THE BUILDING.
F) PARTITION OR FURRING RUN EXCEEDING 30 L.F.
- ELECTRICAL PLANS INDICATE THE GENERAL DESIGN AND ARRANGEMENT OF PIPES, CONDUIT, WIRING, EQUIPMENT, SYSTEMS, ETC. INFORMATION SHOWN IS DIAGRAMMATIC IN CHARACTER AND DOES NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING AND EXISTING CONDITION. LOCATION OF THESE ITEMS MAY BE ADJUSTED CONDITIONAL UPON THE SATISFACTORY COMPLIANCE WITH ALL OTHER REQUIREMENTS (SEE NOTES 14 AND 19).
- SEE PLANS FOR FIRE EXTINGUISHER (FE) AND FIRE EXTINGUISHER CABINET (FEC) LOCATIONS. SEE SHEET CP1.2 FOR DETAILS
- SEE SHEET CP1.1 FOR LOCATIONS OF FIRE RATED WALLS WHERE APPLICABLE.
- ALL PENETRATIONS AT RATED LOCATIONS REQUIRED FOR PIPES, CONDUIT, DUCTING ETC. SHALL BE SEALED TO STOP PASSAGE OF FIRE AND / OR SMOKE WITH FIRE RATING AND APPROVED FIRESTOPPING SEALANT PER DETAILS ON SHEETS CP1.2.
- THE GENERAL CONTRACTOR SHALL COORDINATE CUT-OUTS FOR CASEWORK, MILLWORK, OR OTHER EQUIPMENT AS REQUIRED.
- ALL ASPECTS OF THE WORK AND ITEMS NOT SPECIFICALLY MENTIONED, BUT WHICH ARE NECESSARY TO MAKE A COMPLETE WORKING INSTALLATION, SHALL BE INCLUDED, AND INDICATED IN THE CONTRACTORS BID.
- NO ASBESTOS OR PCB CONTAINING MATERIALS SHALL BE USED ON THIS PROJECT.
- THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS ARE RESPONSIBLE FOR CONSTRUCTION OF THIS PROJECT. THE REMOVAL AND DISPOSAL OF ALL CONSTRUCTION DEBRIS SHALL BE IN FULL COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS. THE PREMISES SHALL BE KEPT CLEAN AND FREE FROM ALL WASTE MATERIALS.
- GENERAL CONTRACTOR SHALL PROTECT NEW CONSTRUCTION FROM DAMAGE BY ALL TRADES. ALL SUCH DAMAGE CAUSED BY THE CONTRACTOR DURING THE COURSE OF THIS WORK SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
- CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS AND FIELD CONDITIONS PRIOR TO ORDERING OR INSTALLING MATERIALS OR EQUIPMENT.
- ALL PIPING AND CONDUITS SHALL BE CONCEALED WITHIN WALLS, UNDERGROUND, ABOVE CEILINGS OR IN ARCHITECT APPROVED UTILITY SPACES IN ALL CASES UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS. EXPOSED ITEMS MUST BE LOCATED IN AREAS APPROVED BY THE ARCHITECT. EXPOSED ITEMS SHALL BE INSTALLED AND FINISHED TO PROVIDE MINIMAL VISUAL IMPACT. ALL EXPOSED ITEMS ARE TO BE PAINTED TO MATCH THE ADJACENT SURFACES UNLESS SCHEDULED FOR AN ACCENT COLOR.
- FLOOR SPOT ELEVATIONS ARE SHOWN THUS: 0' 0"
- ARCHITECTURAL FINISH FLOOR ELEVATIONS 100'-0" EQUALS ACTUAL SITE REFERENCE OF FINISH FLOOR: 85.83
- SCRIBE GYPSUM BOARD OF WALLS AND PARTITIONS TO IRREGULARITIES OF STRUCTURE AND ROOF DECK ABOVE.
- PROVISIONS SHALL BE MADE AT FULL HEIGHT NON-BEARING WALLS FOR 2" INCH VERTICAL MOVEMENT OF THE BUILDING STRUCTURE WITHOUT TRANSFER OF COMPRESSIVE LOADS TO WALL. FILL IRREGULARITIES BETWEEN TOP OF WALL AND DECK ABOVE WITH FIRE RATING INSULATION OR FIRE STOPPING MATERIALS AS REQUIRED TO MEET FIRE RATING OF RESPECTIVE WALLS. FILL AT SMOKE PARTITIONS WITH MATERIALS CAPABLE OF RESISTING THE PASSAGE OF SMOKE. SEE DETAILS ON CODE RATING DETAIL SHEETS.
- SEE SECTION 012300 "ALTERNATES" FOR ALTERNATE BID ITEMS.

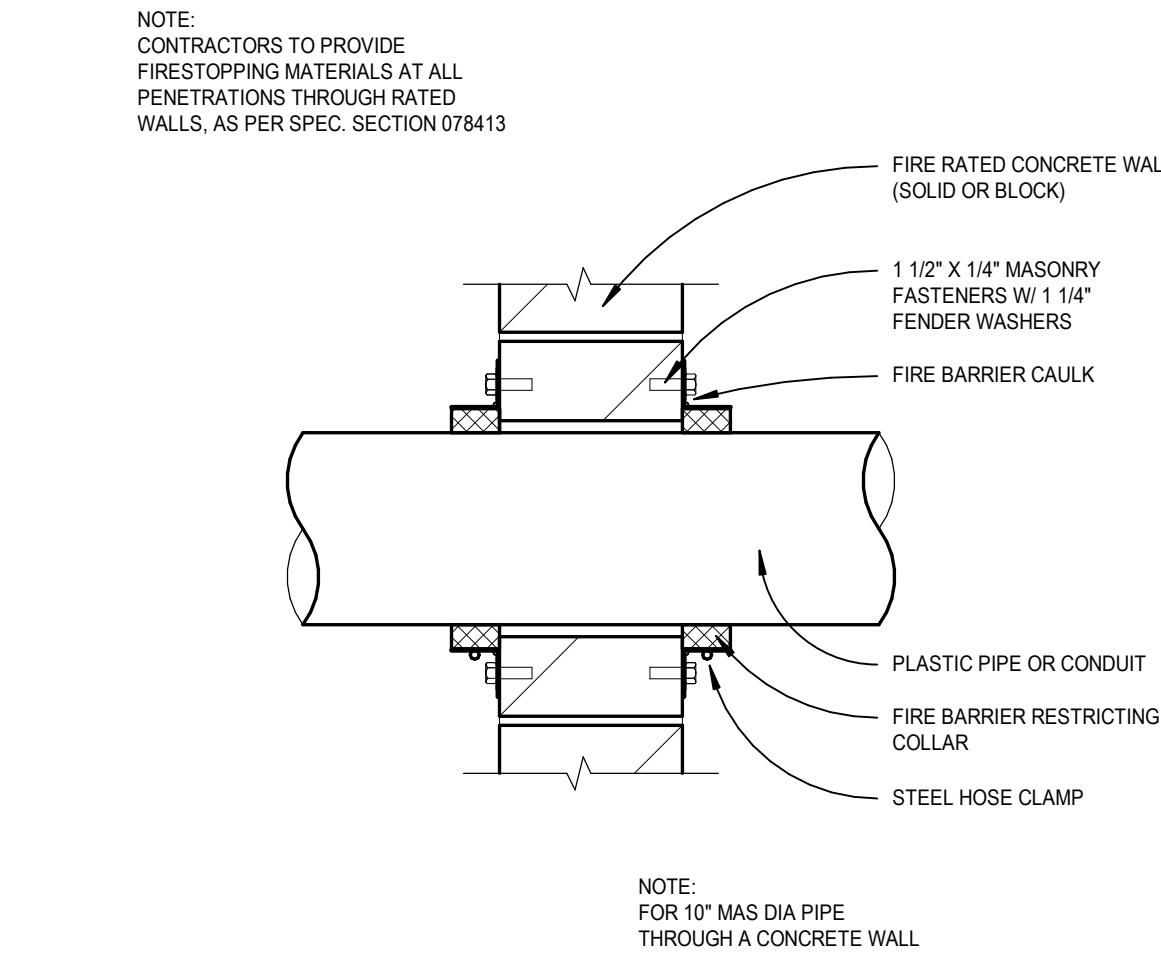
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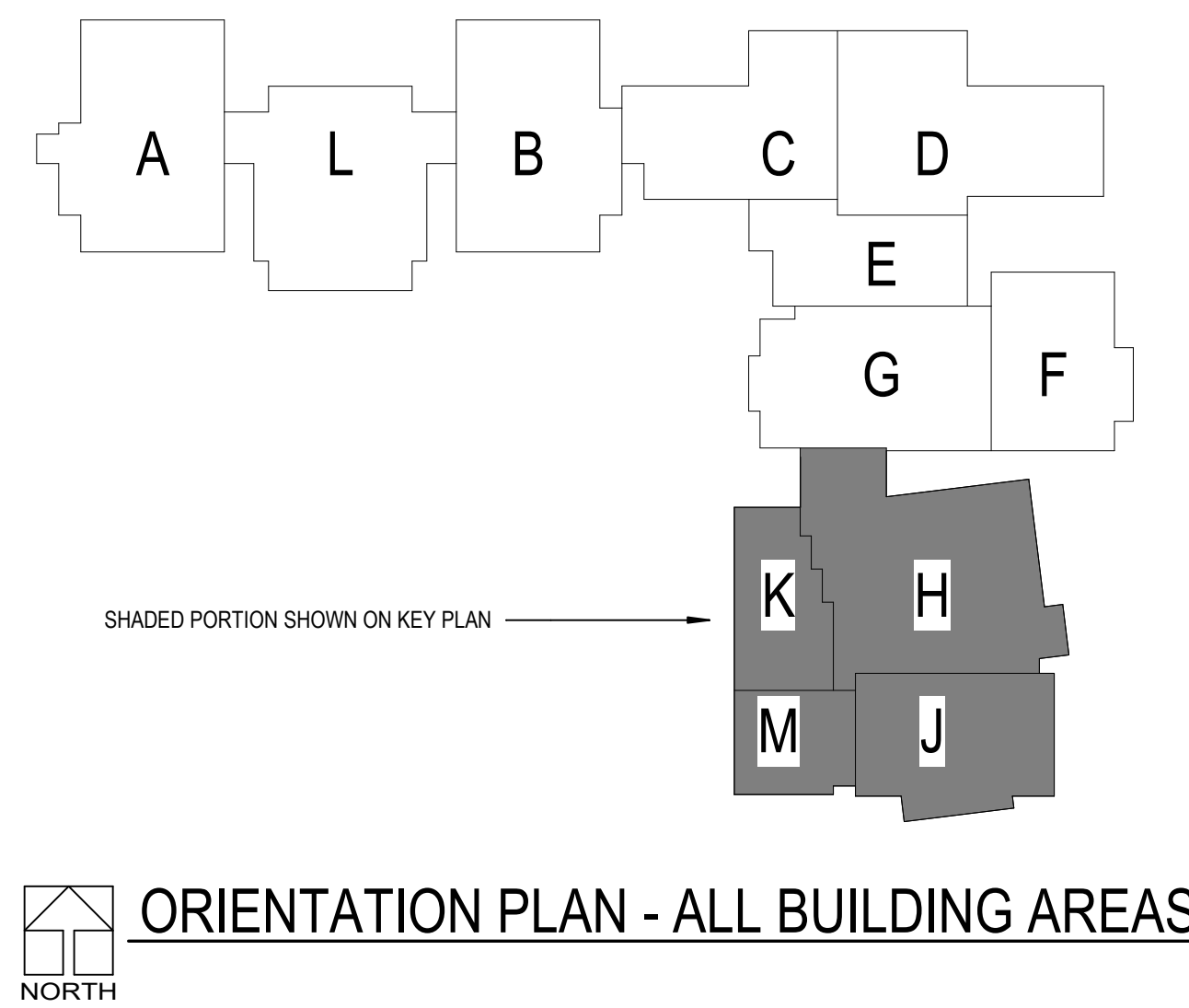
11 FIRESTOP PENETRATION
SCALE: 1 1/2" = 1'-0"



12 FIRESTOP PENETRATION
SCALE: 1 1/2" = 1'-0"



13 FIRESTOP PENETRATION
SCALE: 1 1/2" = 1'-0"



ORIENTATION PLAN - ALL BUILDING AREAS

SYMBOL LEGEND

- OCCUPANCY LOAD

WALL SEPARATION LEGEND

WALL HOURLY RATING	WALL FIRE RATING TYPE
0 = 0 HOUR	C = CORRIDOR
1/2 = 1/2 HOUR	EW = EXTERIOR WALL
1 = 1 HOUR	FB = FIRE BARRIER
2 = 2 HOUR	FP = FIRE PARTITION
3 = 3 HOUR	F3B = FIRE/SMOKE BARRIER
SP = SMOKE PARTITION	FW = FIRE WALL
SW = SMOKE WALL	HX = HORIZONTAL EXIT
	SB = SMOKE BARRIER
	VS = VERTICAL SHAFT
	VX = VERTICAL EXIT
	XP = EXIT PASSAGEWAY

SEPARATION LEGEND

1.0 1-HOUR FIRE BARRIER (1-FB) (---1-FB---1-FB---)

A. 1-HOUR FIRE-RESISTIVE VERTICAL (FLOOR TO FLOOR OR ROOF DECK) AND/OR HORIZONTAL (FLOOR) CONSTRUCTION WITH 34-HOUR RATED DOORS, AUTOMATIC-CLOSING DOORS SHALL HAVE SMOKE DETECTOR ACTIVATED (S-D-A) MAGNETIC HOLD-OPEN DEVICES OR HEAT-ACTUATING (H-A) HOLD-OPEN DEVICES PER IBC 715.4.8. ALL S-D-A AUTOMATIC-CLOSING DOORS AND SMOKE DAMPERS SHALL BE ACTIVATED, BY ACTUATION OF ANY FIRE ALARM DEVICE OR SPRINKLER SYSTEM, WHEN REQUIRED, AND POWER FAILURE. AGGREGATE WIDTH OF ALL OPENINGS SHALL NOT EXCEED 25% OF THE LENGTH OF THE WALL.

B. 3/4-HOUR DOORS MAY HAVE UP TO 1,296 SQUARE-INCH LABELED 1/4-INCH FIRE-RATED GLASS PANELS WITH A MAXIMUM SIDE DIMENSION OF 54 INCHES.

C. SEAL AROUND ALL DUCTS WITHOUT FIRE AND/OR SMOKE DAMPERS, PIPES AND CONDUIT PENETRATIONS WITH UL CLASSIFIED FIRE STOP SYSTEM (SAFING INSULATION AND SEALANT). FIRE AND/OR SMOKE DAMPERS AT DUCT PENETRATIONS SHALL BE MOUNTED AND SEALED IN WALL WITH FACTORY FABRICATED SLEEVES AND PERIMETER MOUNTING ANGLES. SEAL TOP OF WALL TO FLOOR OR ROOF DECK WITH UL CLASSIFIED FIRESTOP SYSTEM (SAFING INSULATION WITH CONTINUOUS SEALANT AT JOINTS AS DETAILED AND AS SPECIFIED IN SECTION 078413 PENETRATION FIRESTOPPING).

1.1 2-HOUR FIRE WALL (2-FW) (---2-FW---2-FW---)

A. 2-HOUR FIRE-RESISTIVE SEPARATION CONTINUOUS FROM EXTERIOR WALL TO EXTERIOR WALL AND EXTENDING A MINIMUM OF 18 INCHES BEYOND THE EXTERIOR WALL. WALL SHALL HAVE SUFFICIENT STRUCTURAL STABILITY UNDER FIRE CONDITIONS TO ALLOW COLLAPSE OF CONSTRUCTION ON EITHER SIDE WITHOUT COLLAPSE OF THE WALL FOR THE DURATION OF THE TIME INDICATED BY THE FIRE RESISTANCE RATING OF THE WALL (FIRE WALL ONLY. SEE 706.5 FOR EXCEPTIONS), WITH 1-1/2 HOUR LABELED AUTOMATIC-CLOSING OR SELF-CLOSING OPENING PROTECTION, AUTOMATIC-CLOSING DOORS AND ALL LABELED ROLL-UP DOORS LOCATED IN CORRIDOR WALLS. LABELED SWINGING DOORS LOCATED IN FW AND FB CORRIDOR WALLS AND FB AND FW USED AS A HORIZONTAL EXIT SHALL HAVE S-D-A MAGNETIC HOLD-OPEN DEVICES OR SHALL BE SELF-CLOSING. 1-1/2 HOUR RATED S-D-A SMOKE DAMPER REQUIRED AT ALL DUCT PENETRATIONS SERVING BOTH SIDES OF FB AND FW. ALL S-D-A AUTOMATIC-CLOSING DOORS AND SMOKE DAMPERS SHALL BE ACTIVATED BY ACTUATION OF ANY FIRE ALARM DEVICE OR SPRINKLER SYSTEM AND POWER FAILURE.

B. DOORS MAY HAVE 100 SQUARE-INCH LABELED 1/4-INCH LAMINATED WIRE GLASS PANELS WITH A MAXIMUM SIDE DIMENSION PER DOOR MANUFACTURER'S TEST.

C. SEAL AROUND ALL DUCTS WITHOUT FIRE AND/OR SMOKE DAMPERS, PIPES AND CONDUIT PENETRATIONS WITH UL CLASSIFIED FIRE STOP SYSTEM (SAFING INSULATION AND SEALANT). FIRE AND/OR SMOKE DAMPERS AT DUCT PENETRATIONS SHALL BE MOUNTED AND SEALED IN WALL WITH FACTORY FABRICATED SLEEVES AND PERIMETER MOUNTING ANGLES. SEAL TOP OF WALL TO FLOOR OR ROOF DECK WITH UL CLASSIFIED FIRESTOP SYSTEM (SAFING INSULATION WITH CONTINUOUS SEALANT AT JOINTS AS DETAILED AND AS SPECIFIED IN SECTION 078413 PENETRATION FIRESTOPPING).

APPLICABLE CODES

THE BUILDING SYSTEMS WILL BE DESIGNED IN ACCORDANCE WITH THE CURRENT APPLICABLE CODES AS FOLLOWS:

INTERNATIONAL BUILDING CODE - 2012 (IBC)
INTERNATIONAL EXISTING BUILDING CODE - 2012 (IEBC)
INTERNATIONAL FIRE CODE - 2012 (IFC)
INTERNATIONAL MECHANICAL CODE - 2015 (IMC)
NATIONAL ELECTRICAL CODE - 2014 (NEC)
INTERNATIONAL PLUMBING CODE - 2012 (IPC) WITH IOWA PROVISIONS FOR 2012 UPC
IOWA ADMINISTRATIVE CODE 641-25
INTERNATIONAL ENERGY CONSERVATION CODE - 2012

STATE CODES

IOWA STATE BUILDING CODE, IAC 661-CHAPTER 301 (2006)
(APPLICABLE ONLY FOR STATE OWNED CONSTRUCTION, PROJECTS FUNDED WITH STATE FUNDS AND WHERE LOCAL JURISDICTIONS HAVE FORMALLY ADOPTED.)

STATE OF IOWA ACCESSIBILITY RULES AND REGULATIONS, IAC CHAPTER 302 (2006)

STATE OF IOWA FIRE SAFETY RULES, IAC 661-CHAPTER 200

STATE OF IOWA BUILDING CODE THERMAL AND LIGHTING EFFICIENCY STANDARDS - IAC 661 CHAPTER 303

STATE OF IOWA MINIMUM TOILET FACILITY STANDARD, IAC 641-CHAPTER 25

ENFORCED BY THE OFFICE OF STATE FIRE MARSHAL AND DEPARTMENT OF PUBLIC HEALTH.

AMERICANS WITH DISABILITIES ACT (ADA)

ADA IS APPLICABLE TO THIS BUILDING UNDER TITLE II AS A PUBLIC ENTITY. TITLE II OF THE ADA SPECIFICALLY REFERS TO ANY STATE OR LOCAL GOVERNMENT SERVICES. THEREFORE, A SCHOOL IS CONSIDERED A "PUBLIC ENTITY".

AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES - 2010 (ADA)

(THESE REGULATIONS ARE ENFORCED BY THE U.S. JUSTICE DEPARTMENT)

OCCUPANT LOAD FACTORS:

OFFICES	100 SF PER OCCUPANT (GROSS)
STORAGE/MECHANICAL	300 SF PER OCCUPANT (GROSS)
EXERCISE ROOMS	50 SF PER OCCUPANT (GROSS)
LOCKER ROOMS	50 SF PER OCCUPANT (GROSS)

BUILDING DATA: NO CHANGE TO BUILDING DATA IN THIS PROJECT

NO CHANGE TO OCCUPANCY USE, CONSTRUCTION, FIRE PROTECTION, OR EXITING

NAME OF PROJECT: URBANDALE HIGH SCHOOL - HVAC RENOVATION
ADDRESS: 7111 AURORA AVE., URBANDALE, IOWA 50322
PROPOSED USE: HIGH SCHOOL
CODE ENFORCEMENT JURISDICTION: CITY OF URBANDALE

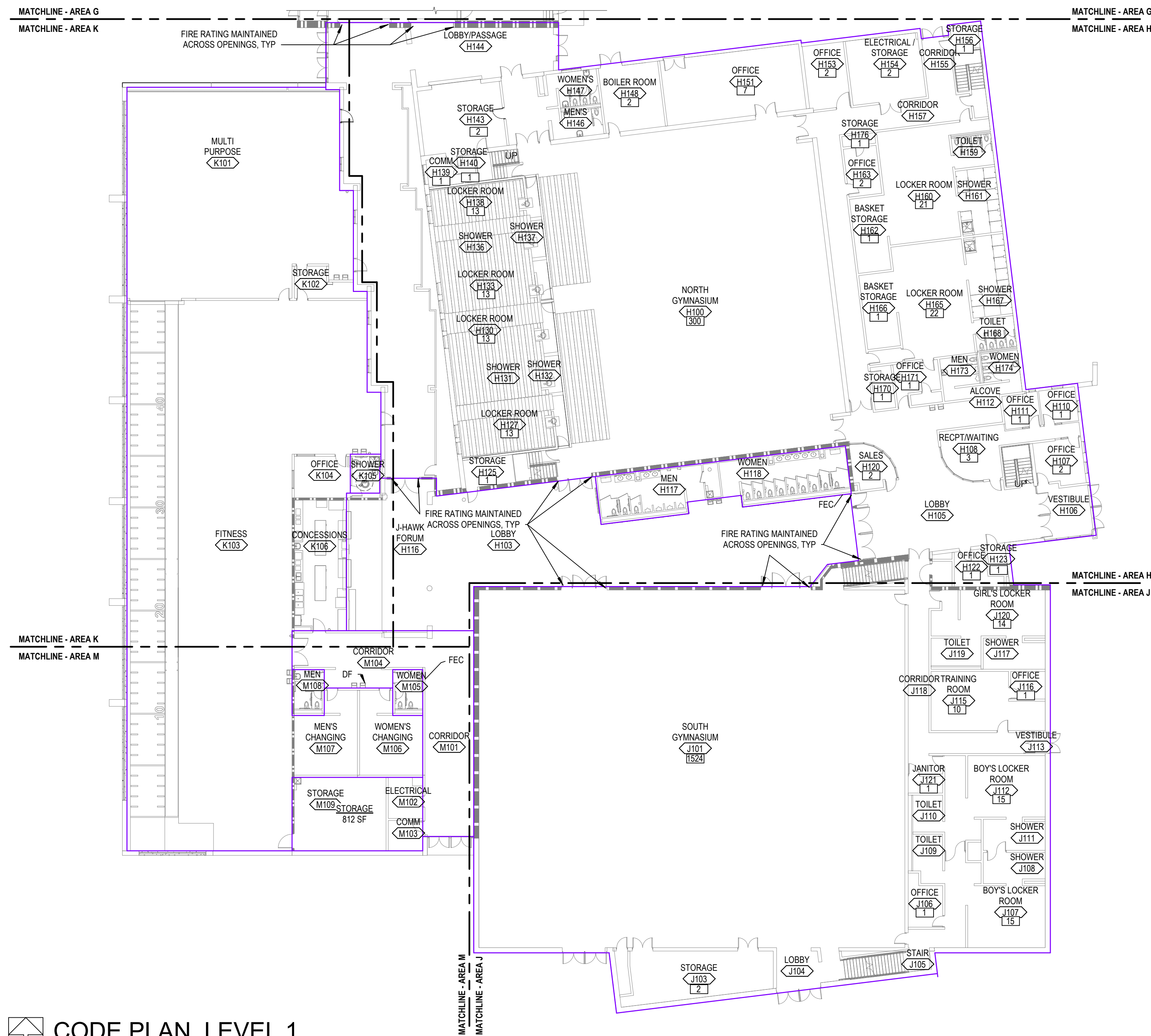
OCCUPANCY GROUP: EDUCATIONAL E
MIXED USE: UNSEPARATED
AUTOMATIC SUPPRESSION: SPRINKLED THROUGHOUT
CONSTRUCTION TYPE: UNPROTECTED, NON-COMBUSTIBLE, TYPE 2B

FIRE RESISTANCE RATINGS FOR BUILDING ELEMENTS	HOURS
STRUCTURAL FRAME	0
BEARING WALLS - EXTERIOR	0
BEARING WALLS - INTERIOR	0
NON-BEARING WALLS - EXTERIOR	0
NON-BEARING - INTERIOR	0
FLOOR CONSTRUCTION	0
ROOF CONSTRUCTION	0

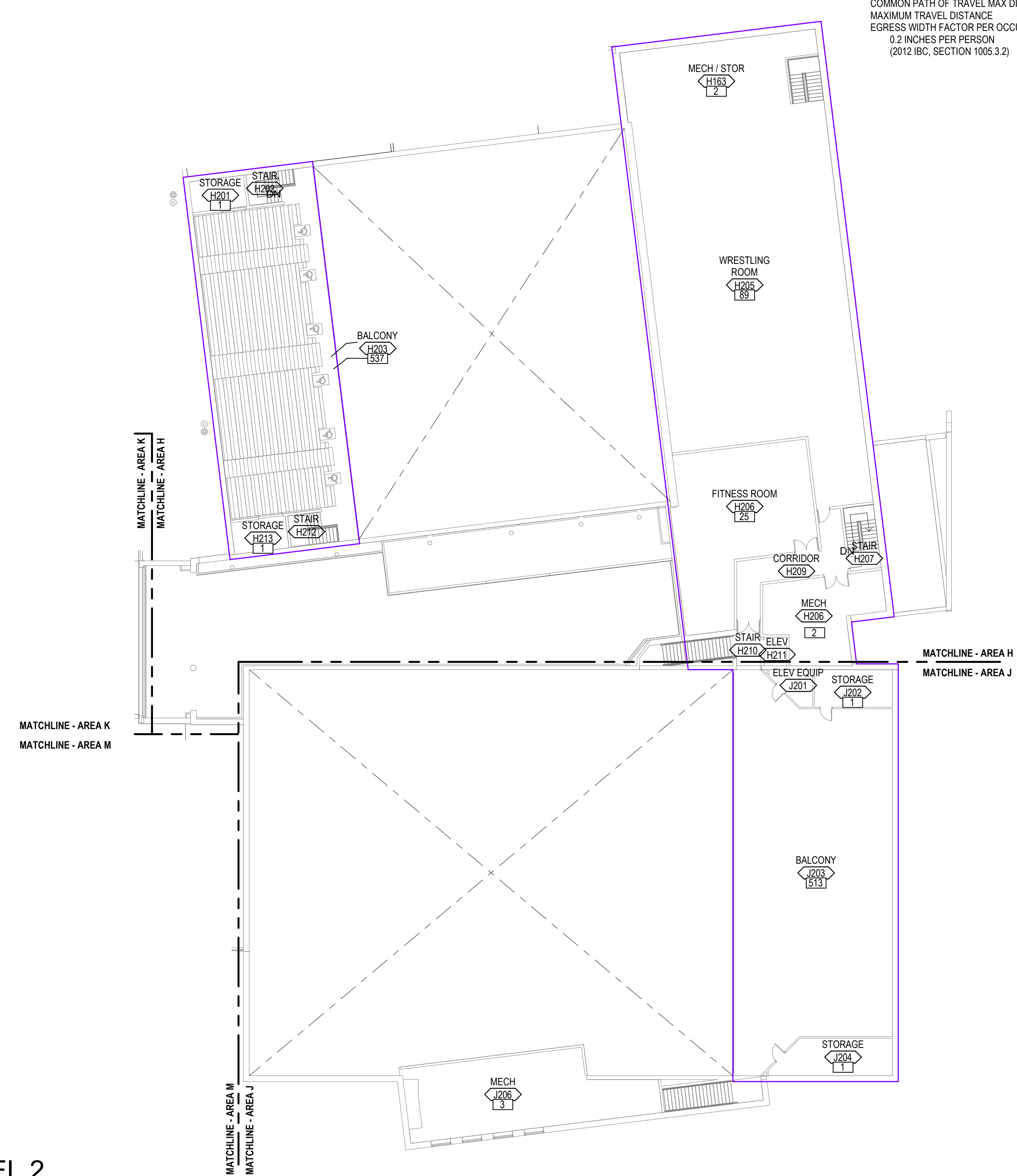
BUILDING HEIGHT / STORIES: 23'-0", 1 STORY

LIFE SAFETY SYSTEMS: EMERGENCY LIGHTING AND EXIT SIGNAGE
FIRE ALARM SYSTEM, NFPA 72
FIRE EXTINGUISHERS, NFPA 10
AUTOMATIC SPRINKLER SYSTEM, NFPA 13

EXITING REQUIREMENTS: DEAD END CORRIDOR MAXIMUM CONDITION
COMMON PATH OF TRAVEL MAX DISTANCE: 50 FEET
MAXIMUM TRAVEL DISTANCE: 75 FEET
EGRESS WIDTH FACTOR PER OCCUPANT: 0.2 INCHES PER PERSON
(2012 IBC, SECTION 1006.3.2) 200 FEET



CODE PLAN, LEVEL 1
SCALE: 1" = 20'-0"



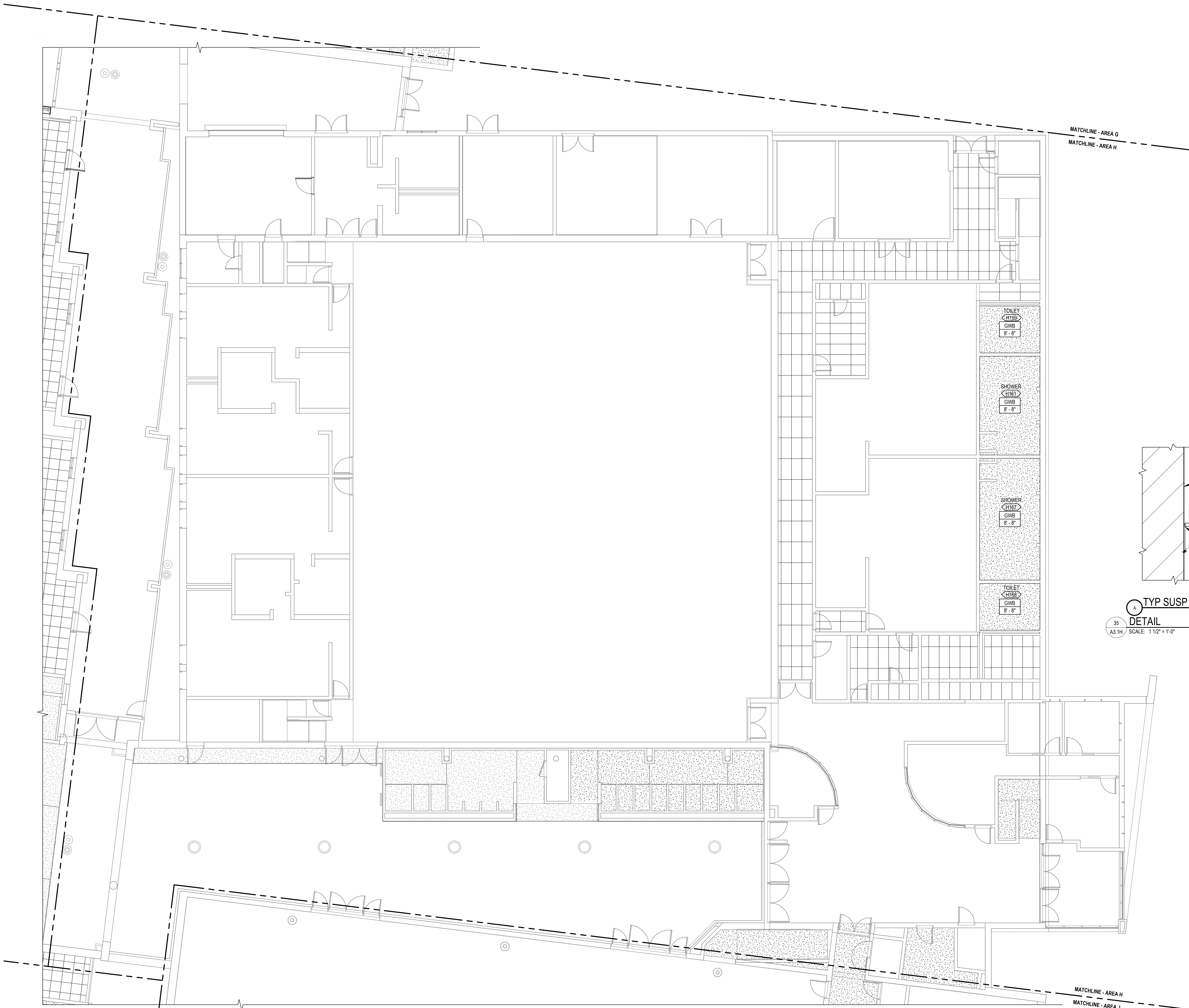
CODE PLAN, LEVEL 2
SCALE: 1" = 20'-0"

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DEMO AND REFLECTED CEILING PLAN, LEVEL 1 - AREA H

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

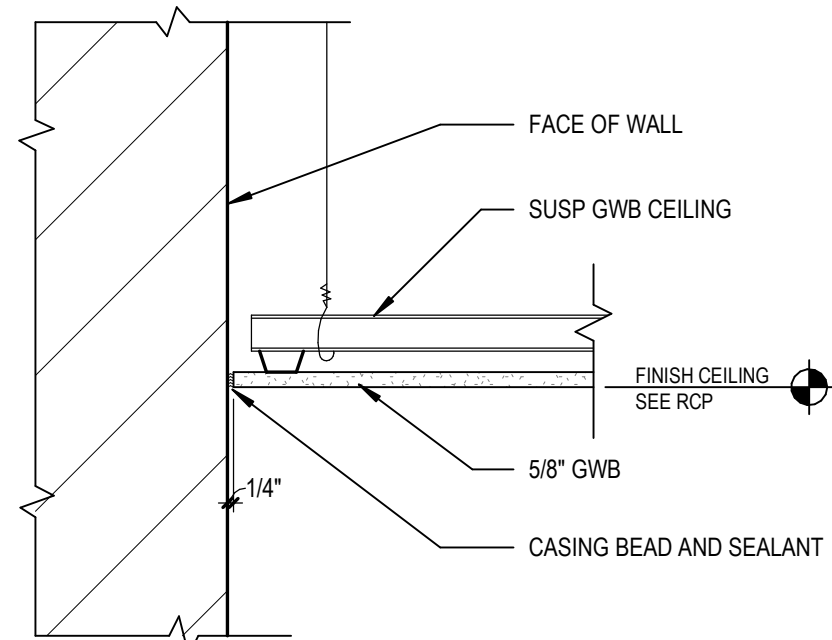


REFLECTED CEILING PLAN GENERAL NOTES

- REFLECTED CEILING PLAN GENERAL NOTES APPLY TO ALL REFLECTED CEILING PLAN SHEETS.
- ALL CEILING GRID/PANELS SHALL BE CENTERED IN EACH ROOM AND AS SPECIFIED.
- CEILING HEIGHTS ARE AS NOTED ON THE REFLECTED CEILING PLAN UNLESS NOTED OTHERWISE.
- ALL ELECTRICAL FIXTURES, SPEAKERS, SMOKE AND THERMAL DETECTORS, MECHANICAL GRILLES, SPRINKLER HEADS, ETC. SHALL BE CENTERED BETWEEN CEILING GRIDS UNLESS NOTED OTHERWISE. SPRINKLER HEADS SHALL BE WITHIN A 3" RADIUS CENTERED BETWEEN CEILING GRIDS.
- IN ACOUSTICAL CEILING PANELS WITH SCORE IN THE CENTER, CENTER DEVICES REFERENCED IN NOTE D IN ONE HALF OF THE TILE. DO NOT LOCATE ON THE SCORE. FOR APC WITH MULTIPLE SCORED PATTERNS, COORDINATE LOCATION WITH ARCHITECT.
- PROVIDE SUSPENSION SYSTEM AROUND ELECTRICAL FIXTURES, MECHANICAL GRILLES, DIFFUSERS, ETC. AT ACOUSTICAL PANEL CEILING.
- ALL DIMENSIONS ON REFLECTED CEILING PLANS ARE ACTUAL AND ARE TO THE FOLLOWING UNLESS NOTED OTHERWISE:
 - FACE OF FINISHED WALL
 - FACE OF FINISHED BULKHEADS
 - CENTERLINE OF COLUMNS
 - CENTERLINE OF TEES
- IN AREAS WITH EXPOSED STRUCTURE CEILINGS, COORDINATE EXACT LOCATIONS OF MECHANICAL GRILLES, DIFFUSERS, DUCTWORK AND ELECTRICAL FIXTURES WITH EACH RESPECTIVE SUBCONTRACTOR.
- ALL WALLS EXTEND TO UNDERSIDE OF DECK EXCEPT THOSE SHOWN SHADED IN WHICH GYPSUM BOARD OR MASONRY EXTENDS MIN 4" ABOVE FINISHED CEILING. ALL METAL STUDS EXTEND TO UNDERSIDE OF FLOOR OR ROOF DECK.

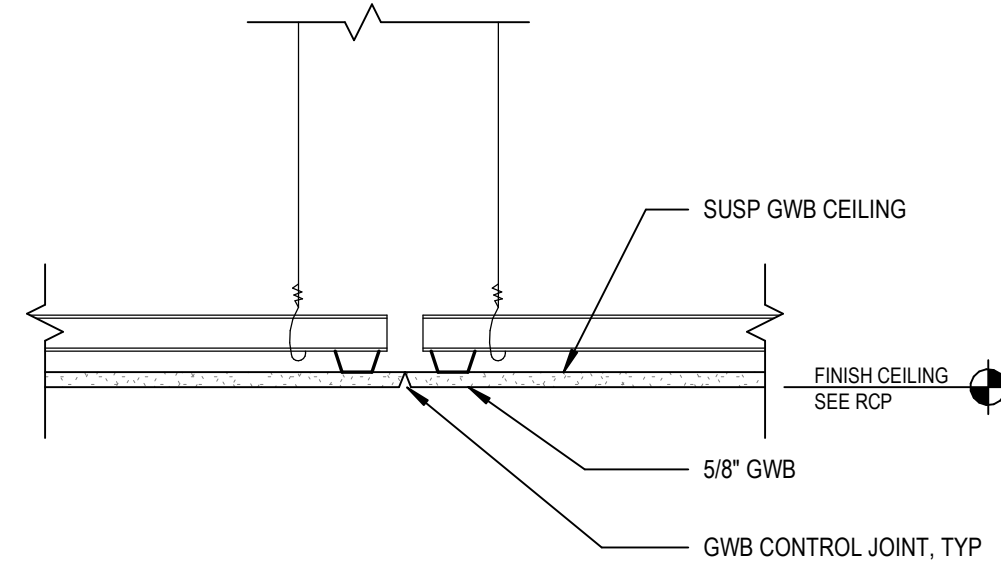
DEMOLITION GENERAL NOTES

- DEMOLITION GENERAL NOTES APPLY TO ALL DEMOLITION SHEETS.
- COORDINATE DISRUPTION OF UTILITY SERVICES WITH OWNER AND AS SPECIFIED.
- CONSTRUCT TEMPORARY CONSTRUCTION PARTITIONS WITHIN EXISTING BUILDING WHICH OFFER A ONE-HOUR ENCLOSURE TO ISOLATE DEMOLITION AND CONSTRUCTION WORK FROM GENERAL PUBLIC AND AS DEEMED NECESSARY BY OWNER AND CODE OFFICIAL HAVING JURISDICTION. COORDINATE LOCATIONS WITH OWNER AND MAINTAIN MEANS OF EGRESS THROUGHOUT THE WORK.
- MAINTAIN A SECURE AND WEATHER-TIGHT ENCLOSURE.
- VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS AND NOTIFY ARCHITECT OF DISCREPANCIES.
- THE OWNER SHALL RESERVE THE RIGHT TO SALVAGE ANY MATERIALS.
- PROVIDE PROTECTION FOR EXISTING BUILDING MATERIALS AND EQUIPMENT FROM DAMAGE DUE TO DEMOLITION OR CONSTRUCTION-RELATED INCIDENT PERFORMED UNDER THIS CONTRACT.
- REPAIR OR REPLACE ITEMS DAMAGED AS A RESULT OF DEMOLITION OR CONSTRUCTION TO MATCH EXISTING FINISH AND/OR CONDITION.
- EXISTING MATERIALS SHALL NOT BE REUSED UNLESS NOTED OTHERWISE OR AS AUTHORIZED BY ARCHITECT.
- VERIFY AND MAINTAIN LOCATION OF EXISTING POWER, COMMUNICATION AND DATA CABLES TO PREVENT INTERRUPTION OF SERVICE.
- PATCH FLOOR, WALL AND CEILING PENETRATIONS RESULTING FROM REMOVAL OR REROUTING OF NEW OR EXISTING PIPING, DUCTWORK, CONDUIT, ETC. AS REQUIRED TO MAINTAIN FIRE SEPARATIONS. MATCH FINISH OF NEW OR EXISTING ADJACENT SURFACES.
- CAP DISCONNECTED MECHANICAL PIPING LINES WITHIN WALL OR FLOOR. PATCH AND FINISH AS REQUIRED TO MATCH NEW OR EXISTING ADJACENT SURFACES.
- SEE MECHANICAL AND ELECTRICAL DRAWINGS AND NOTES FOR FURTHER SEQUENCING AND SCOPE OF WORK.
- AVOID DISTURBING OF SOILS WITHIN ZONE OF INFLUENCE AROUND EXISTING FOOTINGS AND FLOOR SLABS AS DIRECTED BY GEOTECHNICAL ENGINEER.
- WHERE CMU WALLS ARE INDICATED TO BE REMOVED, PREPARE ADJACENT WALLS TO RECEIVE NEW PATCH/FINISH BY REMOVING CMU IN TOOTH-IN PATTERN BOTH SIDES OF DEMOLITION FOR CONTRACTOR TO TOOTH IN NEW CMU PATCHES.
- PATCH AND REPAIR ROOF AT ALL NEW PENETRATIONS THROUGH EXISTING ROOF. MAINTAIN EXISTING WARRANTIES. COORDINATE WITH MECHANICAL AND PLUMBING DRAWINGS.
- COORDINATE ALL DEMOLITION AND PHASING EFFORTS WITH ARCHITECT AND OWNER'S REPRESENTATIVES. EVERY EFFORT SHALL BE MADE TO MINIMIZE DISRUPTION OF OWNER'S OPERATIONS AND TO PROVIDE BUILDING USER'S SAFETY. EXCESSIVE NOISE OR VIBRATION SHALL BE PRE-APPROVED AND COORDINATED WITH OWNER'S REPRESENTATIVE.
- COORDINATE WITH THE OWNER ANY PRE-APPROVED DISRUPTION AND VERIFICATION OF SERVICE WITHIN THE EXISTING BUILDING SO AS TO MINIMIZE THE DISRUPTION OF SERVICE.
- REMOVE ALL DEMOLITION MATERIALS FROM THE SITE UNLESS NOTED OTHERWISE.



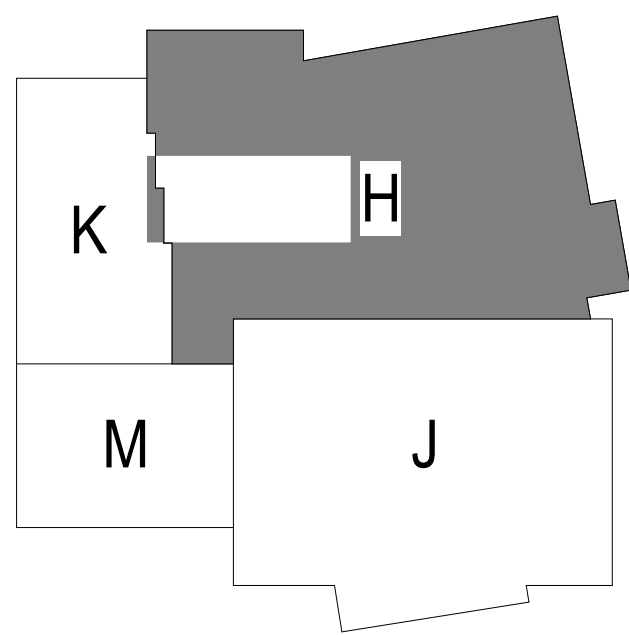
A TYP SUSP GWB PERIMETER JOINT

35
A3.1H SCALE: 1 1/2" = 1'-0"



B TYP SUSP GWB CONTROL JOINT

KEY PLAN



URBANDALE HS - HVAC RENOVATION

7111 Aurora Ave.
Urbandale, IA 50322

DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20
DEMO AND
REFLECTED
CEILING PLAN,
LEVEL 1 - AREA H

A3.1H



URBANDALE HS - HVAC RENOVATION

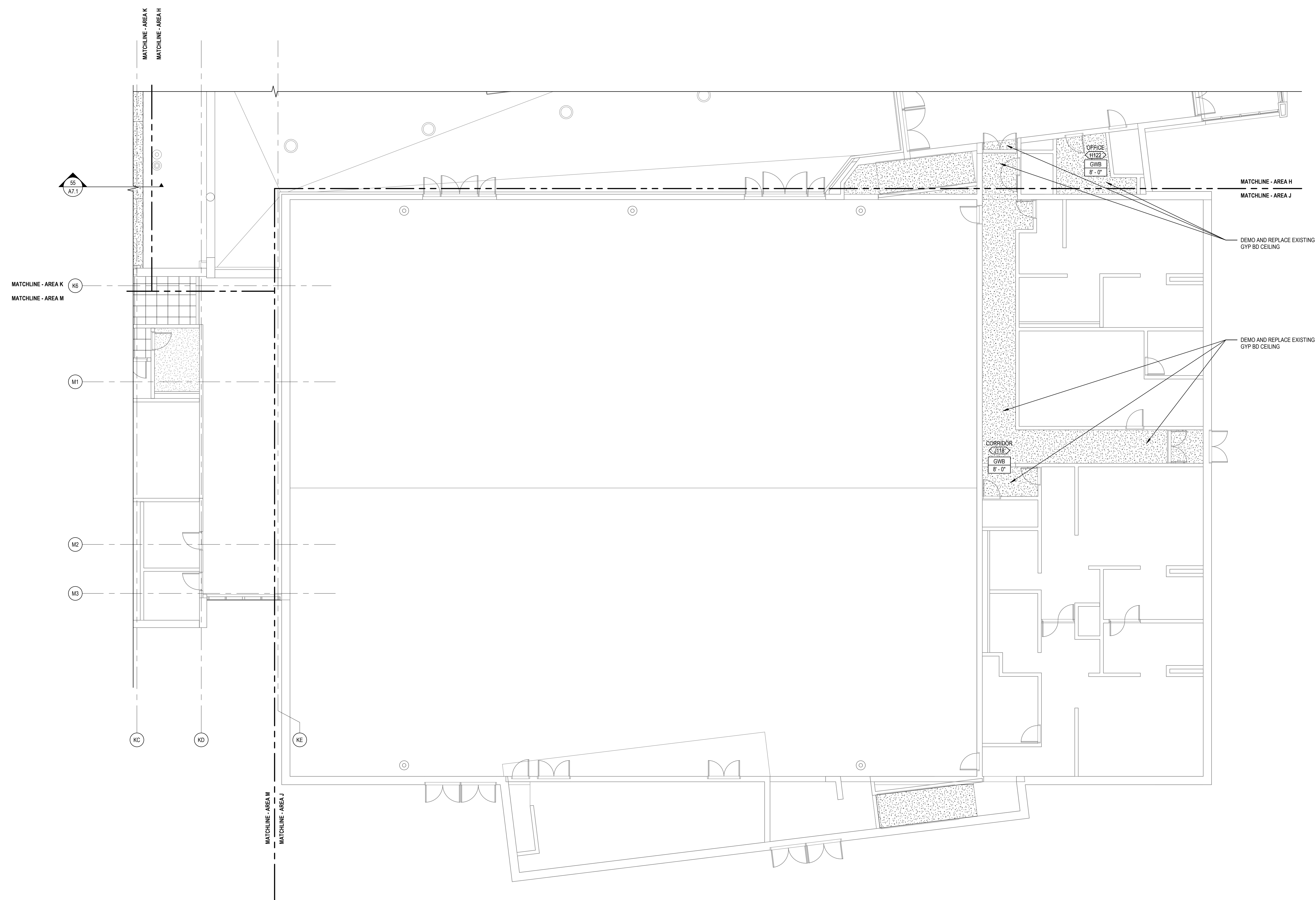
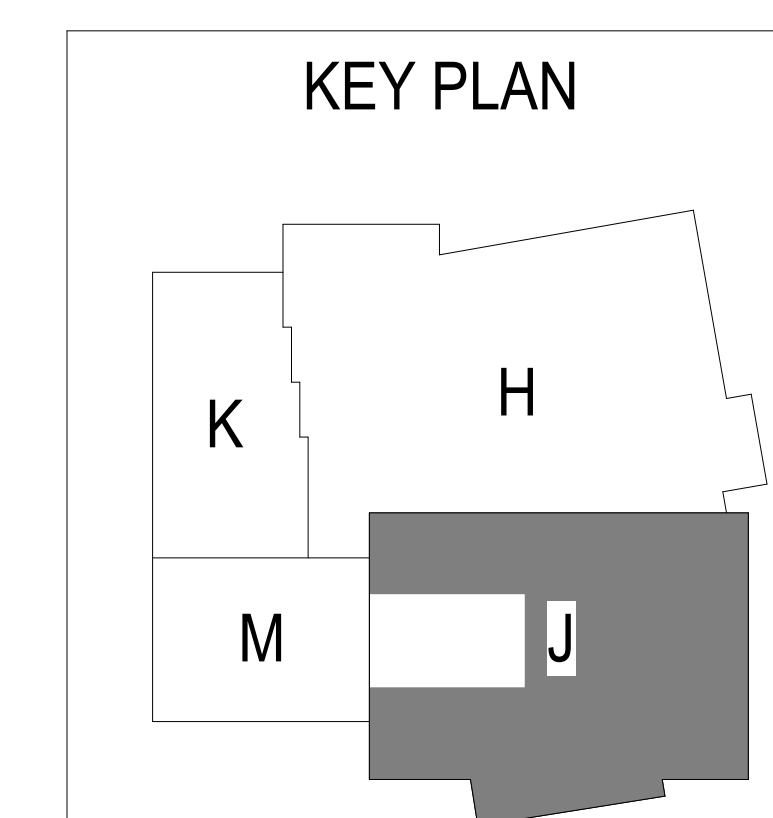
7111 Aurora Ave.
Brooklyn, NY 11222

DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20

DEMO AND
REFLECTED
CEILING PLAN,
LEVEL 1 - AREA J

A3.1J



☒ DEMO AND REFLECTED CEILING PLAN, LEVEL 1 - AREA J - NO WORK, FOR REFERENCE ONLY

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

MECHANICAL (HVAC, PLUMBING AND FIRE PROTECTION) ABBREVIATIONS

#	NUMBER	DW	DISHWASHER	M	THOUSAND	TD	TRANSFER DUCT
&	AND	AT	DRAWING(S)	MA	MIXED AIR	TEMP	TEMPORARY
°	DEGREES CELSIUS	E	EAST	MAINT	MAINTENANCE	THK	THICK(NESS)
°	DEGREES FAHRENHEIT	EA	EACH	MAN	MANUAL	TMV	THERMOSTATIC MIXING VALVE
A	COMPRESSED AIR	EA	EXHAUST AIR	MATL	MATERIAL	TOIL	TOKLET
A AMP	AMPERE	EAT	ENTERING AIR TEMPERATURE	MAU	MAKEUP AIR UNIT	TPV	TRAP PRIMER
A/C	AIR CONDITIONING(ER)	EDH	ELECTRIC DUCT HEATER	MAX	MAXIMUM	TS	TEMPERATURE SENSOR
AABC	ASSOCIATED AIR BALANCE COUNCIL	EER	ENERGY EFFICIENCY RATIO	MBH	THOUSAND BTU PER HOUR	TSP	TOTAL STATIC PRESSURE
AAV	AUTOMATIC AIR VENT	EEW	EMERGENCY EYE WASH	MC	MECHANICAL CONTRACTOR	TT	TEMPERATURE TRANSMITTER
ACC	ACCESSIBLE	EWS	EMERGENCY EYE WASH SHOWER	MECH	MECHANICAL	Typ	TYPICAL
ACCU	AIR COOLED CONDENSING UNIT	EF	EFFICIENCY	MEZZ	MEZZANINE	UC	UNIT COOLER
AD	AREA DRAIN	EFF	ELECTRICITY	MFR	MANUFACTURER	UG	UNDERGROUND
AD	ACCESS DOOR	EH	ELECTRIC HEATER	MFRG	MANUFACTURING	UH	UNIT HEATER
ADA	AMERICANS WITH DISABILITY ACT	EL	ELEVATION	MH	MANHOLE	UL	UNDERWRITERS LABORATORIES
ADON	ADDITION OR ADDITIONAL	ELEC	ELECTRICAL	MIN	MINIMUM	UNEX	UNEXCAVATED
ADJ	ADJUSTABLE	ELEV	ELEVATOR	MISC	MISCELLANEOUS	UNFIN	UNFINISHED
AF	AIR FILTER	EMER	EMERGENCY	ML	MOTORIZED LOUVER	UNO	UNLESS NOTED OTHERWISE
AF	ABOVE FINISHED FLOOR	ENCL	ENCLOSURE	MPG	MEDIUM PRESSURE GAS	UR	URINAL
AF	ABOVE FINISHED GRADE	ENG	ENGINEER	MTD	MOUNTING	UTL	UTILITY
AGF	AIR GAP FITTING	EQ	EQUAL	MTG	MOUNTING	UV	UNIT VENTILATOR
AHJ	AUTHORITY HAVING JURISDICTION	EQUIP	EQUIPMENT	MTWR	MEDIUM TEMP HOT WATER RETURN	V	VOLT
AHRI	AIR-CONDITIONING HEATING AND REFRIGERATION INSTITUTE	EQUIV	EQUIVALENT	MTWS	MEDIUM TEMP HOT WATER SUPPLY	V	VENT
AHU	AIR HANDLING UNIT	ESP	EXTERNAL STATIC PRESSURE	MV	MEDICAL VACUUM	V	VACUUM
AI	AIR INLET	EST	ESTIMATE	N	NITROGEN	VA	VOLT-AMPERE
ALT	ALTERNATE	ET	EXPANSION TANK	N	NORTH	VA	VALVE
AMB	AMBIENT	EWC	ELECTRIC WATER COOLER	N2O	NITROUS OXIDE	VAC	VACUUM
AMBA	AMERICAN BOILER MANUFACTURERS ASSOCIATION	EWT	ENTERING WATER TEMPERATURE	N.C.	NORMALLY CLOSED	VAV	VARIABLE AIR VOLUME
ANCH	ANCHOR	EXH	EXHAUST	N.O.	NORMALLY OPEN	VBF	VENT BELOW FLOOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	EXIST	EXISTING	N/A	NOT APPLICABLE	VCP	VITRIFIED CLAY PIPE
AP	ACCESS PANEL	EXP	EXTERIOR	NEC	NATIONAL ELECTRIC CODE	VD	VOLUME DAMPER
APPROX	APPROXIMATE	F	FAHRENHEIT	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSN.	VEL	VELOCITY
AR	ACID RESISTING	F	FIRE ALARM	NIC	NOT IN CONTRACT	VENT	VENTILATOR(ION)
ARCH	ARCHITECTURAL	F	FIRE ALARM	NO	NUMBER	VERT	VERTICAL
AS	AIR SEPARATOR	F.V.	FIELD VERIFY	NO2	NITROGEN DIOXIDE	VEST	VESTIBULE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS	FA	FIRE ALARM	NOM	NOMINAL	VFD	VARIABLE FREQUENCY DRIVE
ASHRAE	AMERICAN SOCIETY OF HEATING REFRIGERATION AND AIR CONDITIONING ENGINEERS	FA	FIRE ALARM	NTS	NOT TO SCALE	VOL	VOLUME
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	FA	FIRE ALARM ANNUNCIATOR	OSM	OPERATION AND MAINTENANCE	VP	VACUUM PUMP
AUTO	AUTOMATIC	FAB	FABRICATE(D)	OA	OUTSIDE AIR	VSMF	VARIABLE SPEED MOTOR CONTROLLER
AV	AUDIO-VIDEO, AUDIO-VISUAL	FACD	FIRE ALARM CONTROL PANEL	OC	ON CENTER	VTR	VENT THROUGH ROOF
AV	ACID VENT	FCD	FLOOR CLEAN OUT	OD	OUTSIDE DIAMETER	W	WIRE
AV	AIR VENT	FCU	FAN COIL UNIT	OPP	OPPOSITE	W	WEST
AW	ACID WASTE	FD	FLOOR DRAIN	ORD	OVERFLOW ROOF DRAIN	W	WATER SERVICE
AWG	AMERICAN WIRE GAUGE	FD	FLOOR DRAIN	OS&Y	OUTSIDE SCREW AND YOKE	W	WIDE
		FD	FIRE DAMPER	OVFL	OVERFLOW	W	WASTE (PLUG)
		FDC	FIRE DEPARTMENT CONNECTION	OVDH	OVERHEAD	W	WATT
		FDNR	FOUNDATION DRAIN	OX	OXYGEN	W	WITH
		FE	FIRE EXTINGUISHER	P	PUMP	W/O	WITHOUT
		FEC	FIRE EXTINGUISHER CABINET	PIT	PRESSURE/TEMPERATURE TEST PORT	WB	WET BULB
B	BOILER	FF	FINISH FLOOR	PAR	PARALLEL	WC	WATER COLUMN
BAS	BUILDING AUTOMATION SYSTEM	FH	FIRE HYDRANT	PAR	PARALLEL	WC	WATER CLOSET
BAT	BATTERY	FHC	FIRE HOSE CABINET	PB	PUSH BUTTON	WCC	WATER COOLED CONDENSER
BBO	BOILER BLOW OFF	FIN	FINISHED	PC	PUMPED CONDENSATE	WCL	WATER CLOSET/LAVATORY COMBINATION
BBC	BALANCING COCK	FL	FLOOR	PCF	POUNDS PER CUBIC FOOT	WCO	WALL CLEAN OUT
BC	BAKE COOPER	FLEX	FLEXIBLE	PF	PRESSURE DROP	WF	WASH FOUNTAIN
BDD	BACK DRAFT DAMPER	FM	FIRE MAIN	PDI	PUMP DISCHARGE	WFMID	WATER FLOW MEASURING DEVICE
BF	BOILER FEED	FME	FLOW MEASURING EQUIPMENT	PENT	PENTHOUSE	WH	WALL HYDRANT
BFF	BELOW FINISH FLOOR	FOF	FUEL OIL FILL	PERF	PERFORATED	WH	WATER HEATER
BFP	BACKFLOW PREVENTER	FOR	FUEL OIL RETURN	PERF	PERFORATED	WHA	WATER HAMMER ARRESTOR
BFV	BUTTERFLY VALVE	FOS	FUEL OIL SUPPLY	PERP	PERPENDICULAR	WLR	WATER LOOP RETURN
BHP	BREAK HORSEPOWER	FS	FLOOR SINK	PI	POINT OF INTERSECTION	WLS	WATER LOOP SUPPLY
BLDG	BUILDING	FSD	FIRE SMOKE DAMPER	PI	PRESSURE INDICATOR	WP	WEATHER-PROOF (NEMA 3R)
BLKG	BLOCKING	FT	FEET	PIV	POST INDICATOR VALVE	WP	WEATHERPROOF
BLKHD	BLOCKHEAD	FUT	FUTURE	PLB	PLYWOOD	WPB	WHIRLPOOL BATH
BMS	BUILDING MANAGEMENT SYSTEM	FVC	FIRE VALVE CABINET	PLNG	PLYWOOD	WSP	WET STAIN PIPE
BOD	BOTTOM OF DUCT	G	GRILLE	PNEU	PNEUMATIC	WT	WEIGHT
BOT	BOTTOM	G	NATURAL GAS	PNL	PANEL	YH	YARD HYDRANT
BRP	BOILER PLANT INSTRUMENTATION PANEL	G	NATURAL GAS	POC	POINT OF CONNECTION	ZCB	ZONE CONTROL BOX
BSMT	BASEMENT	GAL	GALLON	PR	PAIR	ZCV	ZONE CONTROL VALVE
BTU	BRITISH THERMAL UNIT	GALV	GALVANIZED	PSI	POUNDS PER SQUARE INCH		
BTUH	BRITISH THERMAL UNIT PER HOUR	GALV	GALVANIZED	PT	PLASTER TRAP		
BV	BALL VALVE	GCO	GRADE CLEAN OUT	PVC	POLYVINYL CHLORIDE		
		GFI	GROUND FAULT CIRCUIT INTERRUPTER	PWR	POWER		
		GHR	GLYCOL-WATER HEATING SUPPLY	QTY	QUANTITY		
		GOVT	GOVERNMENT	R	RISER		
		GPH	GALLONS PER HOUR	RA	RETURN AIR		
		GPM	GALLONS PER MINUTE	RAD	RADIUS		
		GV	GATE VALVE	RAD	RADIATOR		
		GW	GREASE WASTE	RCP	REFLECTED CEILING PLAN		
		H	HEIGHT	RCP	REINFORCED CONCRETE PIPE		
		HB	HOSE BIB	RCU	REFRIGERATING CHILLER UNIT		
		HCR	HOT/CHILLED WATER RETURN	RD	ROOF DRAIN		
		HCS	HOT/CHILLED WATER SUPPLY	RD	REFRIGERANT DISCHARGE		
		HCR	HOT/CHILLED WATER SUPPLY	REF	REFERENCE		
		HID	HIGH INTENSITY DISCHARGE	REFR	REFRIGERANT		
		HORIZ	HORIZONTAL	REG	REGISTER		
		HP	HORSE POWER	REM	REMOVABLE		
		HP	HIGH PRESSURE	REQ(D)	REQUIRED(D)		
		HPR	HIGH PRESSURE STEAM RETURN	REV	REVISION(S)		
		HPS	HIGH PRESSURE STEAM SUPPLY	RH	RELATIVE HUMIDITY		
		HR	HOUR	RHC	RELIEF HOOD		
		HTG	HEATING	RHG	REHEAT COIL		
		HTR	HEATER	RHS	REFRIGERANT HOT GAS		
		HTWR	HIGH TEMPERATURE HOT WATER RETURN	RL	REFRIGERANT LIQUID		
		HTWS	HIGH TEMPERATURE HOT WATER SUPPLY	RM	ROOM		
		HUM	HUMIDIFIER	RND	ROUND		
		HV	HEATING VENTILATING UNIT	RPM	REVOLUTIONS PER MINUTE		
		HVAC	HEATING VENTILATING AND AIR CONDITIONING	RS	REFRIGERANT SUCTION		
		HW	DOMESTIC HOT WATER	RTU	ROOF TOP UNIT		
		HWC	DOMESTIC HOT WATER RECIRCULATING	S	SMOKE DAMPER		
		HWS	HEATING WATER SUPPLY	S	SOUTH		
		HZ	HERTZ (FREQUENCY)	SA	SANITARY SEWER		
		I	THAT IS	SAN	SUPPLY AIR		
		I&Q	INDOOR AIR QUALITY	SC	SANITARY WASTE		
		I&W	IN ACCORDANCE WITH	SEC	SECURITY		
		IBC	INTERNATIONAL BUILDING CODE	SCHED	SCHEDULE		
		ID	INVERT ELEVATION	SCW	SOFT COLD WATER		
		IES	ILLUMINATING ENGINEERING SOCIETY	SD	SMOKE DAMPER		
		IH	INTAKE HOOD	SD	STORM DRAIN		
		IN	INCH	SD	SMOKE DETECTOR		
		INSL	INSULATION	SE	STEAM EXHAUST VENT		
		INT	INTERIOR	SECT	SECTION		
		IP	IRON PIPE	SGL	SINGLE		
		IW	INDIRECT WASTE	SH	SHOWER		
		JAN	JANITOR	SHW	SHEET		
		JB	JUNCTION BOX	SHW	SOFT HOT WATER		
		KH	KITCHEN HOOD	SM	SIMILAR		
		LAT	LEAVING AIR TEMPERATURE	SK	SINK		
		LAV	LAVATORY	SM	SPRINKLER MAIN		
		LB(S)	POUND(S)	SP	STATIC PRESSURE (H2O)		
		LF	LINEAR FOOT	SP	STANDARD PIPE		
		LG	LENGTH (LONG)	SPD	SURGE PROTECTION DEVICE (SPECIFICATIONS)		
		LIN	LINEAR	SPEC	SPECIFICATION(S)		
		LOX	LIQUID OXYGEN	SPK	SPRINKLER		
		LPG	LIQUIFIED PETROLEUM GAS	SO	SQUARE		
		LPR	LOW PRESSURE STEAM RETURN	SS	STAINLESS STEEL		
		LPS	LOW PRESSURE STEAM SUPPLY	SS	SERVICE SINK		
		LS	LAWN SPRINKLER	SST	SECONDARY STORM DRAINAGE		
		LTD	LINED TRANSFER DUCT	ST	STORM DRAINAGE		
		LV	LOUVER	STD	STANDARD		
		LWT	LEAVING WATER TEMPERATURE	STL	STEEL		
				STOR	STORAGE		
				STRUCT	STRUCTURAL		
				SUSP	SUSPENDED		
				SV	SOLVED VALVE		
				SWBD	SWITCHBOARD		
				SWP	STEAM WORKING PRESSURE		
				SYM	SYMETRICAL		
				T	TEMPERED		
				T	THERMOSTAT		
				T&B	TOP AND BOTTOM		
				TA	TRANSFER AIR		
				TB	TERMINAL BOX		
				TC	TEMPERATURE CONTROL		

GENERAL NOTES

- GENERAL NOTES APPLY TO ALL MECHANICAL AND PLUMBING DRAWINGS.
- MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL 2" x 10" CONTINUOUS WOOD BLOCKING IN STUD PARTITIONS FOR ANCHORAGE OF WALL ATTACHED ITEMS, INCLUDING BUT NOT LIMITED TO, WALL MOUNTED FIXTURES.
- MECHANICAL CONTRACTOR SHALL COORDINATE ALL MECHANICAL CHASE SIZES WITH GENERAL CONTRACTOR.
- WALL OPENINGS FOR FIRE DAMPERS SHALL BE FRAMED PER THE FIRE DAMPER MANUFACTURER'S RECOMMENDATIONS. COORDINATE WITH GENERAL CONTRACTOR.
- MECHANICAL CONTRACTOR SHALL COORDINATE SIZES AND LOCATIONS OF 4" HIGH CONCRETE HOUSEKEEPING PADS WITH THE MECHANICAL EQUIPMENT SUPPLIERS AND GENERAL CONTRACTOR.
- MECHANICAL AND PLUMBING PLANS INDICATE THE DESIGN AND ARRANGEMENT OF PIPE, DUCTWORK, FAN, PIPES, SYSTEMS, ETC. INFORMATION SHOWN IS DIAGRAMATIC. CHARACTER AND DOES NOT NECESSARILY INDICATE THE REQUIRED OFFSET, FITTING AND EXISTING CONDITIONS. LOCATION OF THESE ITEMS MAY BE ADJUSTED TO MATCH THE SATISFACTORY COMPATIBILITY REQUIREMENTS (SEE NOTE 10 AND 11).
- SEE SHEET CP1.0 AND CP1.1 FOR LOCATION OF FIRE RATED WALLS WHERE APPLICABLE.
- ALL WALL PENETRATIONS THROUGH WALL LOCATIONS REQUIRED FOR PIPES, CONDUIT, DUCTWORK, ETC. SHALL BE SEALED TO STOP THE PASSAGE OF FIRE AND/OR SMOKE WITH FIRE RATING AND APPROVED FIRESTOPPING SEALANT PER DETAILS XXA10.X AND XXA10.X BY THE GENERAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR ALL WALL PENETRATIONS FOR CORRECT SIZES.
- MECHANICAL CONTRACTOR SHALL COORDINATE CUT-OUTS FOR CASEWORK, MILLWORK, OR OTHER EQUIPMENT AS REQUIRED WITH THE GENERAL CONTRACTOR.

PLUMBING NOTATION

PIPES SIZES SHOWN ON THE DRAWINGS CAN BE FOLLOWED BY PIPE SIZING CRITERIA. THIS CRITERIA CAN EITHER BE SQUARE FOOTAGE (FOR STORM DRAIN PIPING), FUTURE UNIT VALUES (FOR DOMESTIC WATER, SANITARY WASTE AND VENT PIPING), GALLONS PER MINUTE (FOR DOMESTIC HOT WATER RECIRCULATING PIPING), OR IN THOUSANDS OF BTUH (MBH, FOR NATURAL GAS PIPING). THE FOLLOWING LEGEND WILL ADD IN UNDERSTANDING THE DRAWINGS.

FOR EXAMPLE:

- 12" SD (32,000 SF): THIS IS A 12" STORM DRAIN PIPE CARRYING 32,000 SQUARE FEET OF ROOF AREA.
- 3" CW (200 FU): THIS IS A 3" DOMESTIC COLD WATER PIPE CARRYING 200 FIXTURE UNITS OF COLD WATER.
- 2" 110-HW (50 FU): THIS IS A 2" DOMESTIC HOT WATER PIPE CARRYING 50 FIXTURE UNITS OF 110° HOT WATER.
- 1" 140-HWC (5.0 GPM): THIS IS A 1" DOMESTIC HOT WATER RECIRCULATING PIPE CARRYING 5.0 GALLONS PER MINUTE OF 140° HOT WATER.
- 4" W (150 FU): THIS IS A 4" SANITARY WASTE PIPE CARRYING 150 FIXTURE UNITS OF WASTE WATER.
- 2" V (20 FU): THIS IS A 2" SANITARY VENT PIPE CARRYING 20 FIXTURE UNITS OF VENT GAS.
- 1-1/4" G (600 MBH): THIS IS A 1-1/4" NATURAL GAS PIPE CARRYING 600,000 BTUH.

SYMBOLS

	DIFFUSER (SUPPLY)
	GRILLE (RETURN OR EXHAUST)
	WALL REGISTER
	SLOT DIFFUSER
	SUPPLY ARROW
	RETURN ARROW
	EXHAUST ARROW
	RECTANGULAR DIFFUSER INDICATION SHOWING CFM
	ROUND DIFFUSER INDICATION SHOWING CFM
	RECTANGULAR GRILLE INDICATION SHOWING CFM
	RECTANGULAR REGISTER INDICATION SHOWING CFM
	FIRE DAMPER
	SMOKE DAMPER
	FIRE/SMOKE DAMPER
	BACKDRAFT DAMPER
	GRAVITY DAMPER
	BAROMETRIC RELIEF DAMPER
	PRESSURE REDUCING DAMPER
	MOTORIZED DAMPER
	VOLUME DAMPER
	VOLUME DAMPER
	OPPOSED BLADE DAMPER
	PARALLEL BLADE DAMPER
	THERMOSTAT - WALL MOUNTED
	THERMOSTAT - CEILING MOUNTED
	CARBON MONOXIDE SENSOR - WALL MOUNTED
	CARBON MONOXIDE SENSOR - CEILING MOUNTED
	CARBON DIOXIDE SENSOR - WALL MOUNTED
	CARBON DIOXIDE SENSOR - CEILING MOUNTED
	HUMIDISTAT - WALL MOUNTED
	HUMIDISTAT - CEILING MOUNTED
	TEMPERATURE SENSOR - WALL MOUNTED
	TEMPERATURE SENSOR - CEILING MOUNTED
	NITROGEN DIOXIDE SENSOR - WALL MOUNTED
	NITROGEN DIOXIDE SENSOR - CEILING MOUNTED
	PRESSURE SENSOR - WALL MOUNTED
	PRESSURE SENSOR - CEILING MOUNTED

PIPING - HEATING

—HWS—	LOW TEMPERATURE HOT WATER SUPPLY
—HWR—	LOW TEMPERATURE HOT WATER RETURN
—HTWS—	HIGH TEMPERATURE HOT WATER SUPPLY
—HTWR—	HIGH TEMPERATURE HOT WATER RETURN
—MHWS—	MEDIUM TEMPERATURE HOT WATER SUPPLY
—MHWR—	MEDIUM TEMPERATURE HOT WATER RETURN
—LPS—	LOW PRESSURE STEAM SUPPLY
—LPR—	LOW PRESSURE STEAM RETURN
—HPS—	HIGH PRESSURE STEAM SUPPLY
—HPR—	HIGH PRESSURE STEAM RETURN
—FOS—	FUEL OIL SUPPLY
—FOR—	FUEL OIL RETURN
—FOV—	FUEL OIL VENT

PIPING - A/C & REFR

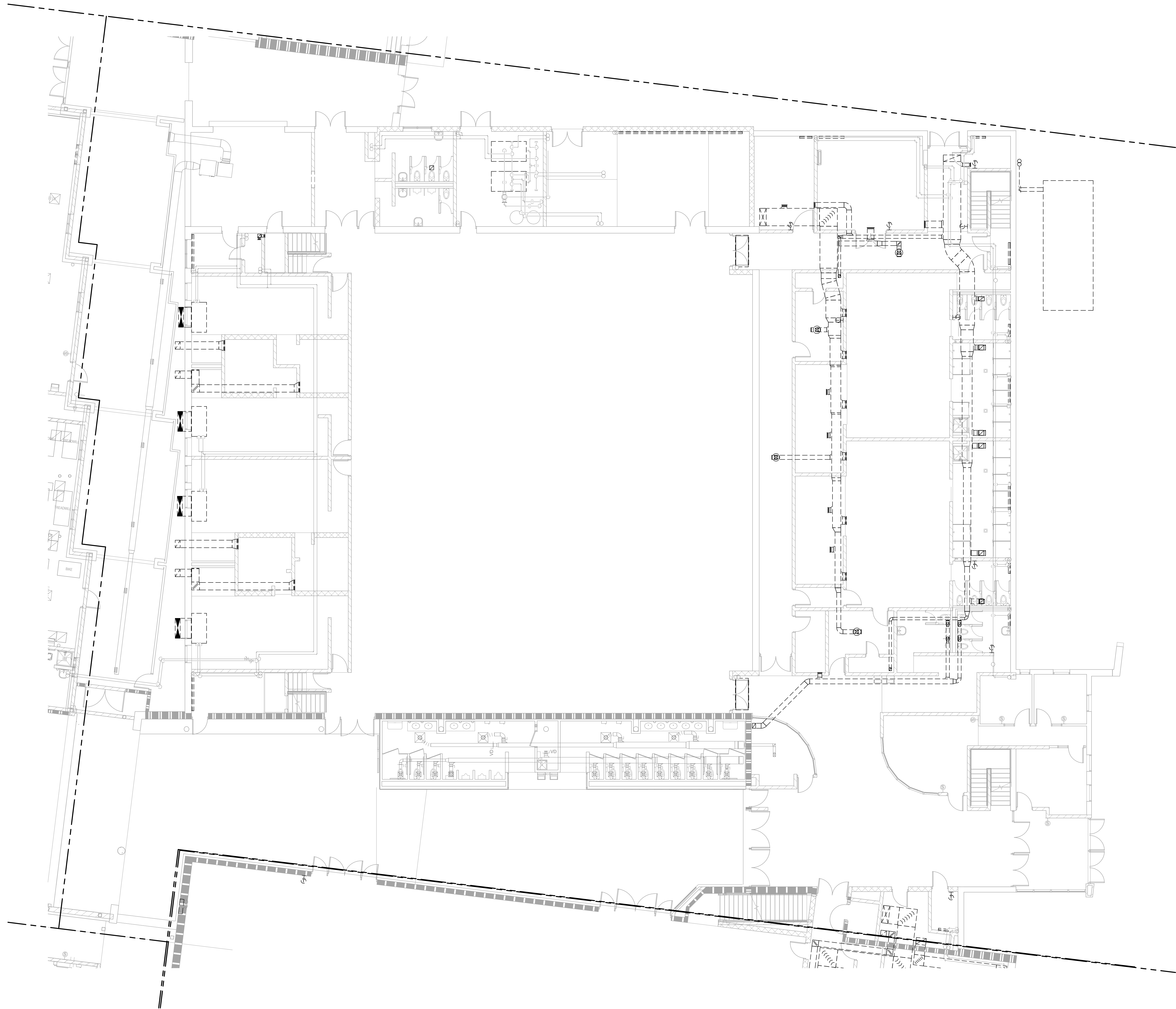
—CWS—	CHILLED WATER SUPPLY
—CWR—	CHILLED WATER RETURN
—HCS—	HOTCHILLED WATER SUPPLY
—HCR—	HOTCHILLED WATER RETURN
—CS—	CONDENSER WATER SUPPLY
—CR—	CONDENSER WATER RETURN
—WLS—	WATER LOOP SUPPLY
—WLR—	WATER LOOP RETURN
—RL—	REFRIGERANT LIQUID
—RS—	REFRIGERANT SUCTION
—RHG—	REFRIGERANT HOT GAS
—RO—	REFRIGERANT DISCHARGE
—CD—	CONDENSATE DRAIN

GENERAL SYMBOLS

	DETAIL NUMBER
	CROSS REFERENCE
	SHEET NUMBER
	SIMILAR OR TYPICAL REFERENCE
	WALL SECTION
	DETAIL REFERENCE
	BUILDING SECTION
	BUILDING ELEVATION
	INTERIOR ELEVATION
	CASEWORK ELEVATION
	KEYNOTE
	COLUMN GRID LINE
	ROOM NUMBER/NAME
	DOOR NUMBER / INTERIOR WINDOW
	EXTERIOR WINDOW NUMBER
	WALL TYPE
	REVISION NUMBER

	EARTH
	GRAVEL
	SAND
	CONCRETE
	PRECAST CONCRETE
	STEEL
	GYM FLOOR
	WOOD (CONTINUOUS BLOCKING)
	WOOD (NON-CONTINUOUS BLOCKING)
	WOOD (TRIM/FINISH)
	GLASS
	STONE
	SHINGLES
	CONCRETE MASONRY UNIT
	BRICK VENEER
	STEEL (LARGE SCALE)
	PLYWOOD (LARGE SCALE)
	GYPSUM WALL BOARD
	BATT INSULATION
	RIGID INSULATION
	SPRAY FOAM INSULATION
	FIRE SAFING INSULATION
	PROTECTION BOARD
	CARPET (LARGE SCALE)
	ACOUSTIC TILE (LARGE SCALE)
	TILE (LARGE SCALE)

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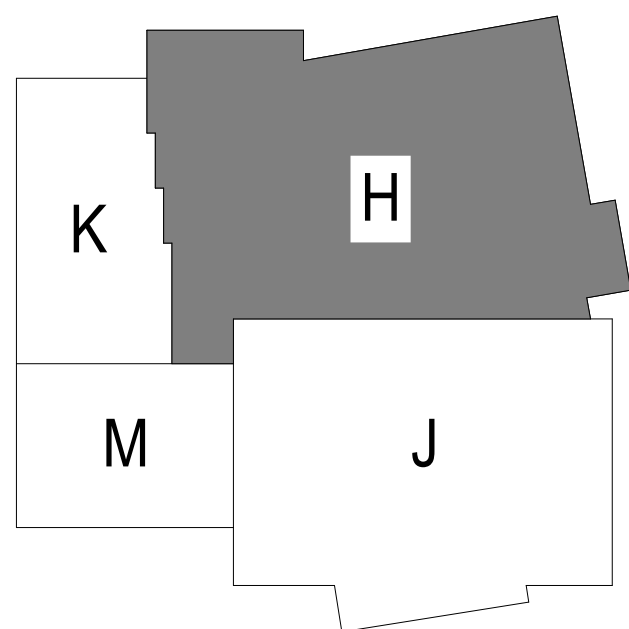
 **MECHANICAL DEMOLITION, FIRST FLOOR - AREA H**
SCALE: 1/8" = 1'-0"

LEGEND NOTES

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 - C. DRAWING ARE INTENDED TO INDICATE THE GENERAL SCOPE OF DEMOLITION REQUIRED AND DOES NOT INDICATE EVERY ITEM THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY THE EXISTING CONDITIONS.
 - D. SEE ARCHITECTURAL DRAWING AND SPECIFICATIONS FOR PHASES OF DEMOLITION AND CONSTRUCTION. COORDINATE REMOVAL OF ALL EQUIPMENT AND UTILITIES WITH OWNER AND GENERAL CONTRACTOR PRIOR TO PERFORMING SHUT DOWN. IN ALL CASES, CONTRACTOR IS TO COORDINATE SHUTDOWN OF ANY EXISTING UTILITIES WITH OWNER A MINIMUM OF 7 DAYS PRIOR TO SHUTDOWN. AT CONTRACTOR'S DISCRETION, CONTRACTOR MAY PHASE SHUTDOWNS OF SYSTEMS IN FASHION TO PREVENT FUTURE SHUTDOWNS IF ACCEPTABLE WITH OWNER'S SCHEDULE. IT IS CONTRACTOR'S RESPONSIBILITY TO COORDINATE THESE WITH EXISTING CONDITIONS, OWNER, AND ALL ASSOCIATED TRADES.
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MECH DEMOLITION KEYNOTES

KEY PLAN



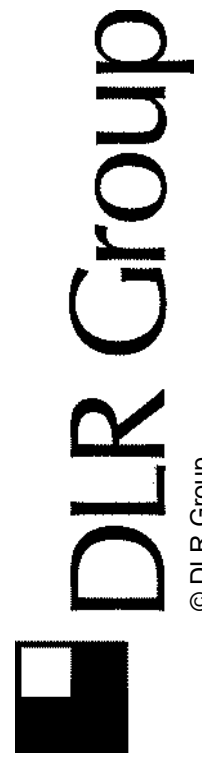
URBANDALE HS - HVAC RENOVATION

7111 Aurora Ave.
Urbankdale, IA 50322

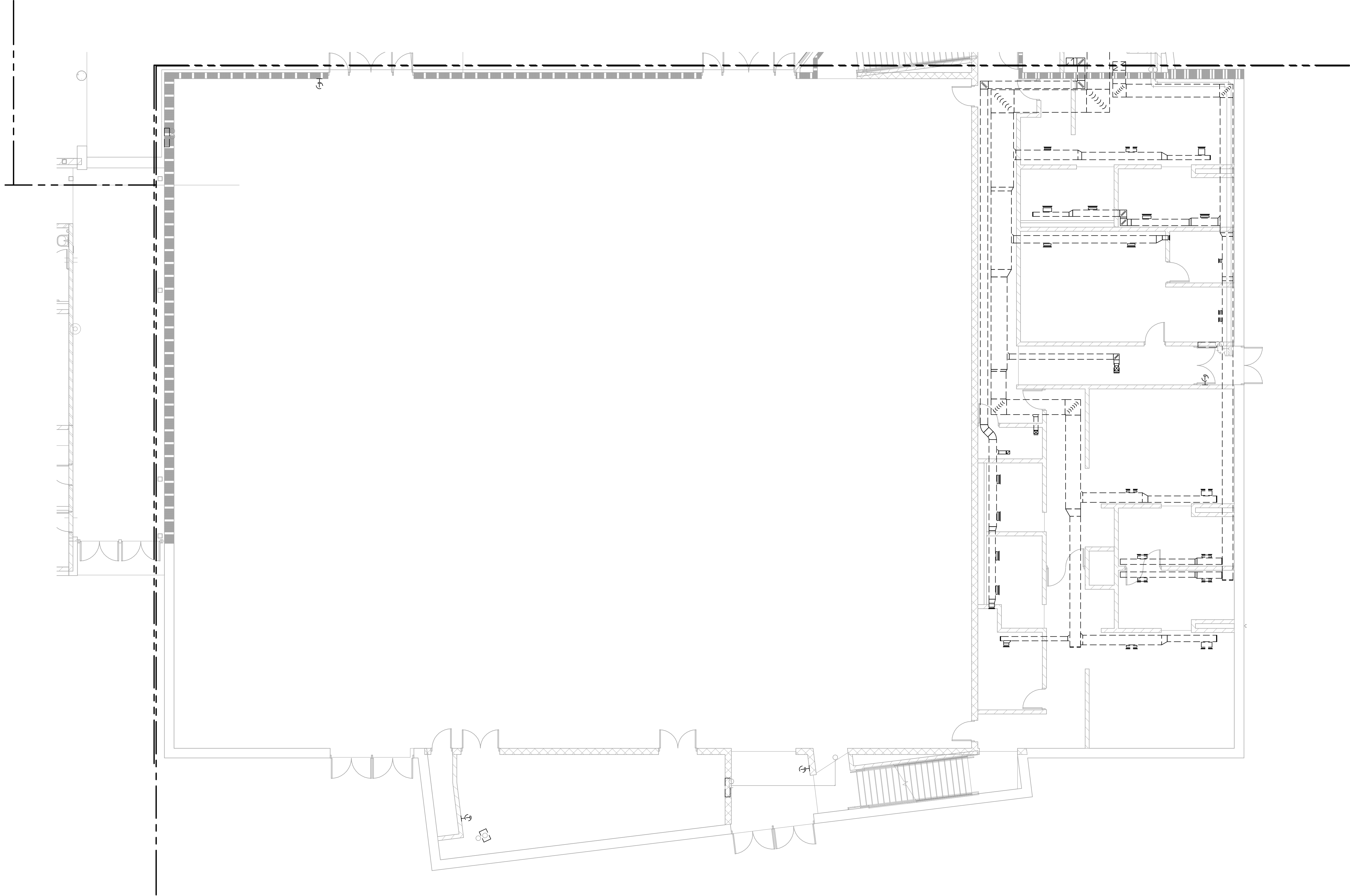
**DESIGN
DEVELOPMENT**
03-20-2019
Revisions

11-18101-20
**MECHANICAL
DEMOLITION,
FIRST FLOOR -
AREA H**

MD1.1H



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MECHANICAL DEMOLITION, FIRST FLOOR - AREA J

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

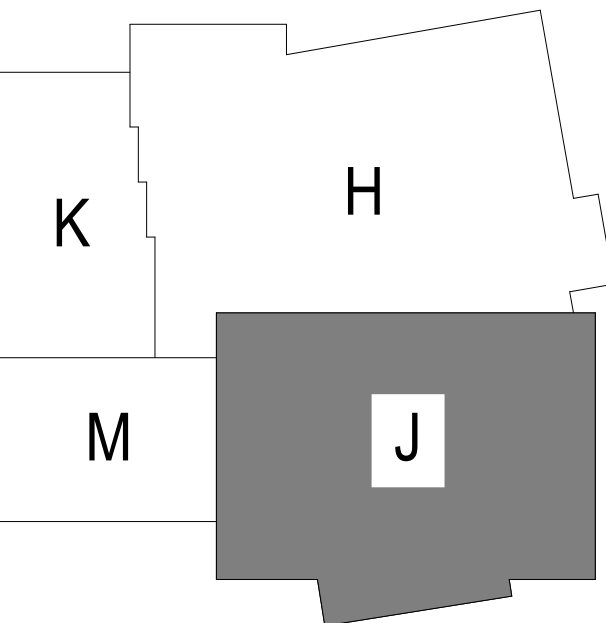
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MECH DEMOLITION KEYNOTES

KEY PLAN



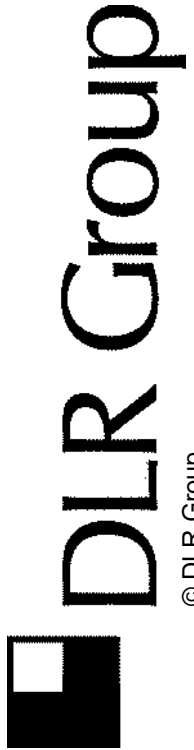
URBANDALE HS - HVAC RENOVATION

7111 Aurora Ave.
Urbandise, IA 50322

DESIGN
DEVELOPMENT
03-20-2019
Revisions

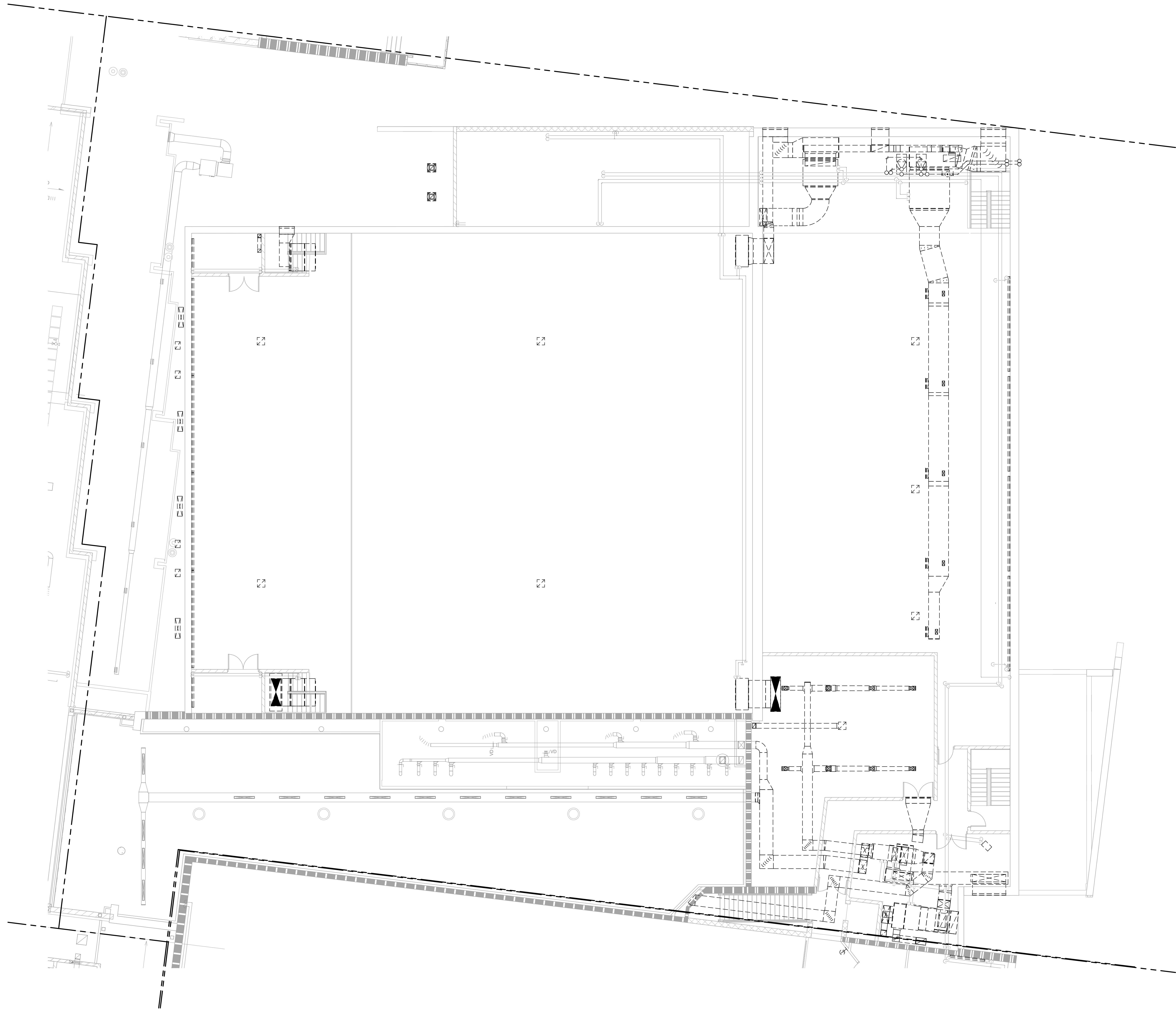
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MECHANICAL
DEMOLITION,
FIRST FLOOR -
AREA J

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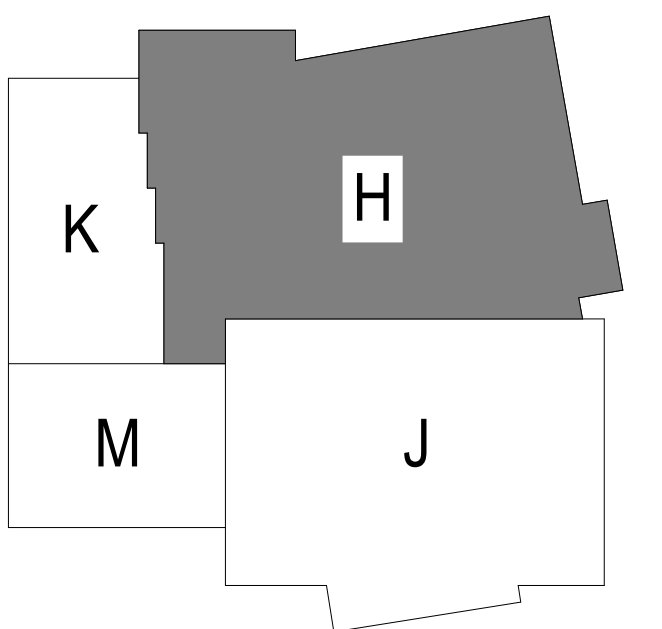


SCALE: 1/8" = 1'-0"

MECHANICAL DEMOLITION, SECOND FLOOR - AREA H

LEGEND NOTES

KEY PLAN



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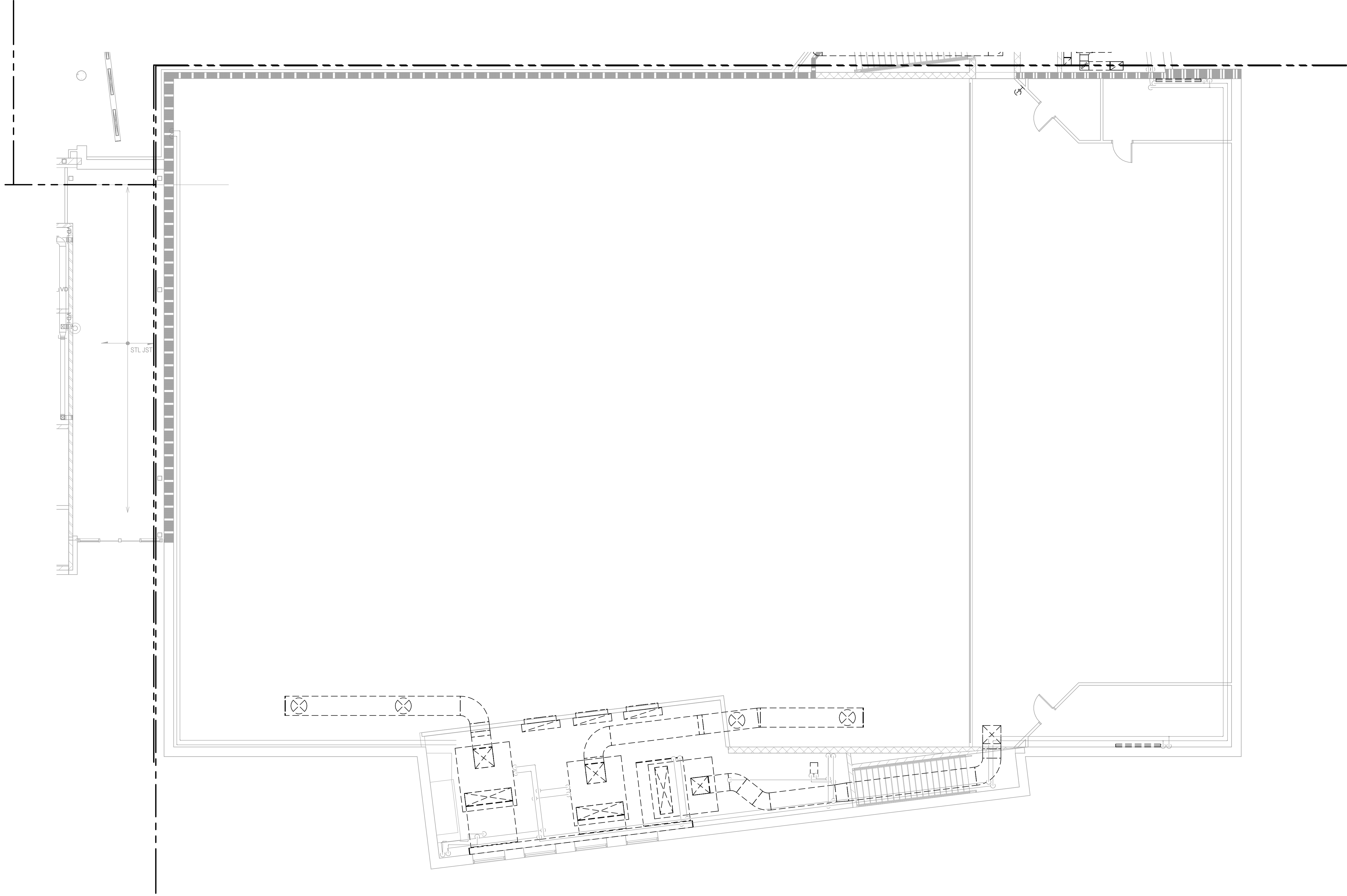
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Revisions

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MECHANICAL
DEMOLITION,
SECOND FLOOR -
AREA H

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MECHANICAL DEMOLITION, SECOND FLOOR - AREA J

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

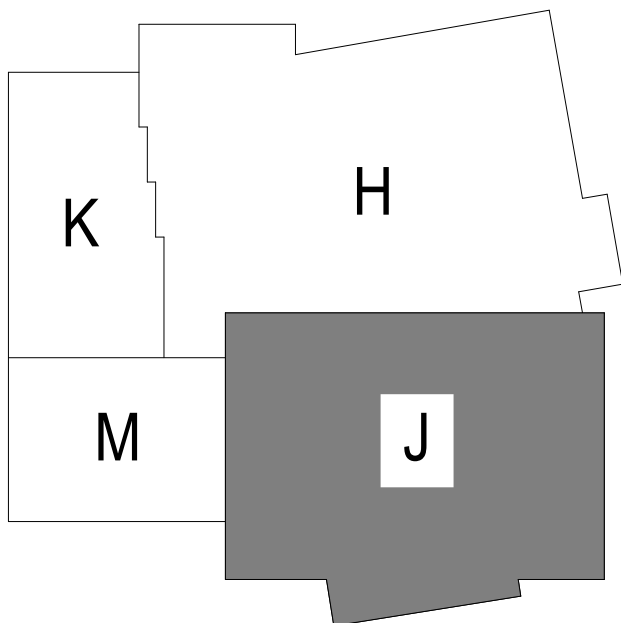
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MECH DEMOLITION KEYNOTES

KEY PLAN



URBANDALE HS - HVAC RENOVATION

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Revisions

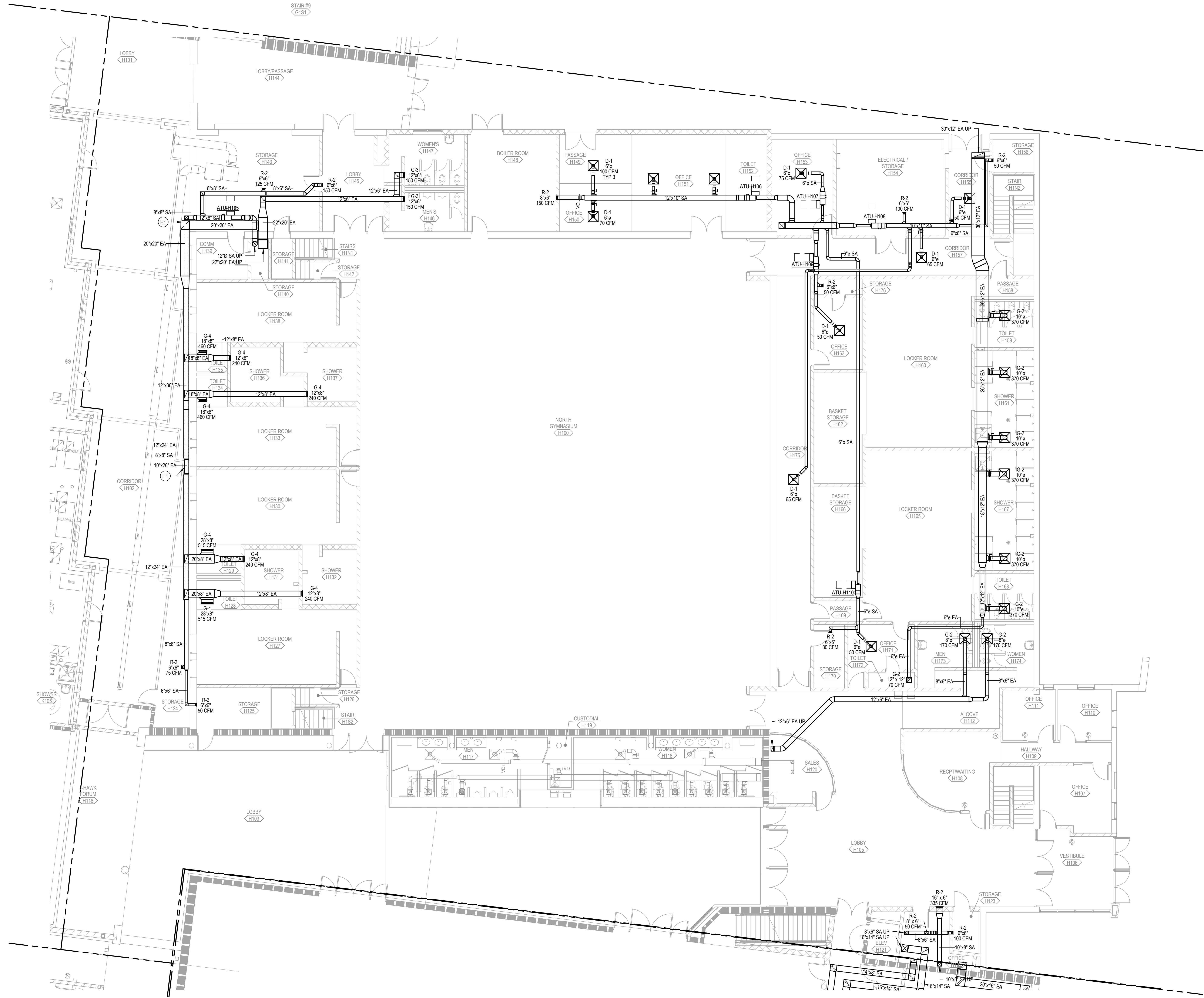
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MECHANICAL
DEMOLITION,
SECOND FLOOR -
AREA J

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 HVAC PLAN, FIRST LEVEL - AREA H
SCALE: 1/8" = 1'-0"

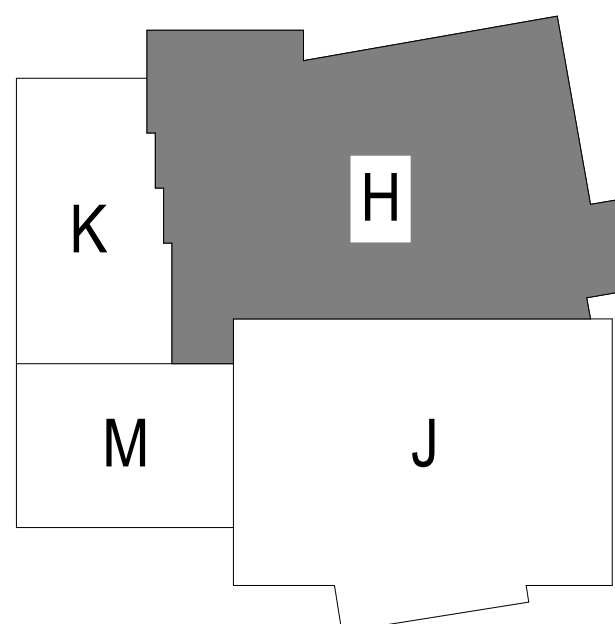
LEGEND NOTES

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- B. COORDINATE PIPING/DUCT PENETRATIONS THRU WALLS, ROOFS, OR CEILING WITH GENERAL CONTRACTOR.
- C. INSTALL EXPANSION COMPENSATORS, GUIDES, AND ANCHORS PER MANUFACTURERS RECOMMENDATIONS.
- D. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING METHODS OF BRINGING IN NEW MECHANICAL EQUIPMENT THROUGH BUILDING INTO MECHANICAL ROOMS. COORDINATE WITH CONSTRUCTION SCHEDULE.
- E. INSULATE REHEAT COILS AND COIL TUBE BENDS WITH INSULATION TO PREVENT CONDENSATION.
- F. THE SUPPLY RUNOUT TO A DIFFUSER IS NOTED BY THE NECK SIZE GIVEN ON PLAN UNLESS OTHERWISE NOTED.
- G. COORDINATE PIPE ROUTING TO AVOID RUNNING PIPING ABOVE ELECTRICAL WIRING AND EQUIPMENT.
- H. PLANS DO NOT INCLUDE ALL OFFSETS FOR COORDINATION WITH DUCT, PIPING, LIGHTING AND STRUCTURAL SYSTEMS. PROVIDE ALLOWANCES FOR REQUIRED OFFSETS.
- I. VARIABLE FREQUENCY DRIVES (VFD'S) TO BE FURNISHED BY DIVISION 23. TURN OVER FIELD MOUNTED VFD'S TO DIVISION 28 FOR MOUNTING, INSTALLATION AND POWER CONNECTION.
- J. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL REMOVING, CUTTING, REINSTALLING, PATCHING AND REPLACEMENT OF ALL EXISTING BUILDING STRUCTURE, SURFACES AND FINISHES (THAT ARE TO REMAIN) REQUIRED TO COMPLETE WORK STATED IN THE CONTRACT DOCUMENTS.
- K. SEE FIRE PROTECTION DRAWINGS FOR ROUTING, MECHANICAL AND FIRE PROTECTION TO COORDINATE ROUTING OF NEW SPRINKLER MAINS WITH MECHANICAL/PLUMBING WORK.
- L. WHEN MOUNTING OR LOCATING EQUIPMENT COORDINATE WITH ALL DISCIPLINES TO ALLOW REQUIRED SPACE NEED FOR COIL ROLL, FILTER FULL, EQUIPMENT REMOVAL WITHOUT PIPE MAIN REMOVAL, ETC. TO FACILITATE REMOVAL OF THIS EQUIPMENT IN FUTURE.
- M. PIPING SHALL NOT BE SUPPORTED FROM OTHER PIPING, CONDUIT OR DUCTWORK.
- N. PROVIDE WIRE GUARD OVER ALL THERMOSTATS, SENSORS, AND HUMIDISTATS LOCATED IN PUBLIC SPACES OTHER THAN INDIVIDUAL CLASSROOMS AND OFFICES. (IE. HALLWAYS, RESTROOMS, SHOP ROOMS).
- O. CHILLED WATER AND HOT WATER PIPING 4" AND LARGER SHALL HAVE THERMAL HANGER SHIELDS INSTALLED AT HANGER LOCATIONS.
- P. ALL BRANCHES FROM MAINS ARE TO HAVE 45° ENTRY FITTINGS (NO 90° SPIN-INS OR CONICAL TAPS). PROVIDE LATERALS, RADIUS FITTINGS AS SHOWN.
- Q. GLYCOL WILL BE PRESENT IN HEATING/COOLING (HWS/HWR/CWS/CWR). REFERENCE SCHEDULES AND SPECIFICATIONS FOR GLYCOL PERCENTAGES.
- R. NO 1/2" PIPING BRANCHES ALLOWED WHERE EQUIPMENT HAS SMALLER THAN 3/4" CONNECTIONS. PROVIDE REDUCER AT UNIT. REFERENCE SCHEDULE FOR BRANCH SIZES.
- S. PAINT INSIDE OF FLEXUM BOXES CONNECTING TO LOUVERS COLOR (BLACK) UNLESS OTHERWISE NOTED.
- T. ROUTE ALL DUCTS IN EXPOSED AREAS AS HIGH AS POSSIBLE. DUCTS IN EXPOSED FINISHED AREAS ARE TO BE CONSTRUCTED OF DOUBLE-WALLED SPIRAL DUCT, UNLESS OTHERWISE NOTED.
- U. PIPES ARE SHOWN SPREAD OUT FOR CLARIFICATION. INSTALL PIPES TIGHT TOGETHER IN THE FIELD.
- V. PROVIDE ALLOWANCES FOR BOTH DUCTWORK OFFSETS AND ADDITIONAL ELBOWS. THIS IS DUE TO MANY BUILDING ANGLES.
- W. ALL DETAILS FOR ITEMS SHOWN ON THIS SHEET ARE REFERRED TO AS FOLLOWS:

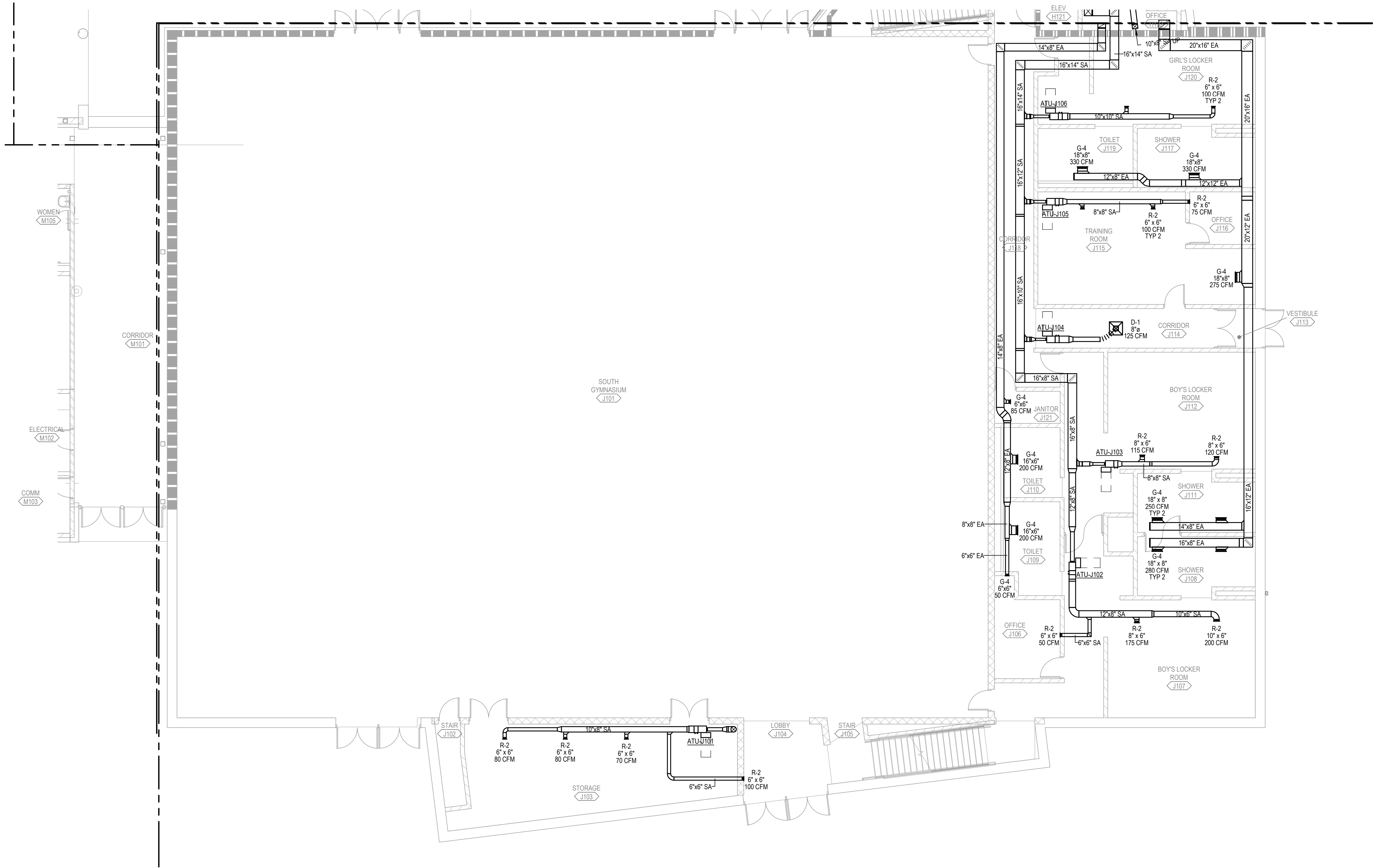
HVAC/PIPING KEYNOTES

H1	MODIFY DUCTWORK AS REQUIRED FOR EXISTING CONDITIONS.
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KEY PLAN



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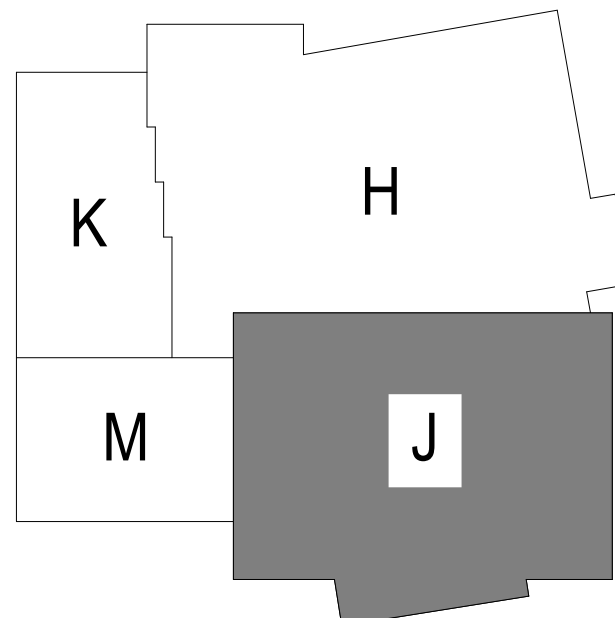
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HVAC/PIPING KEYNOTES

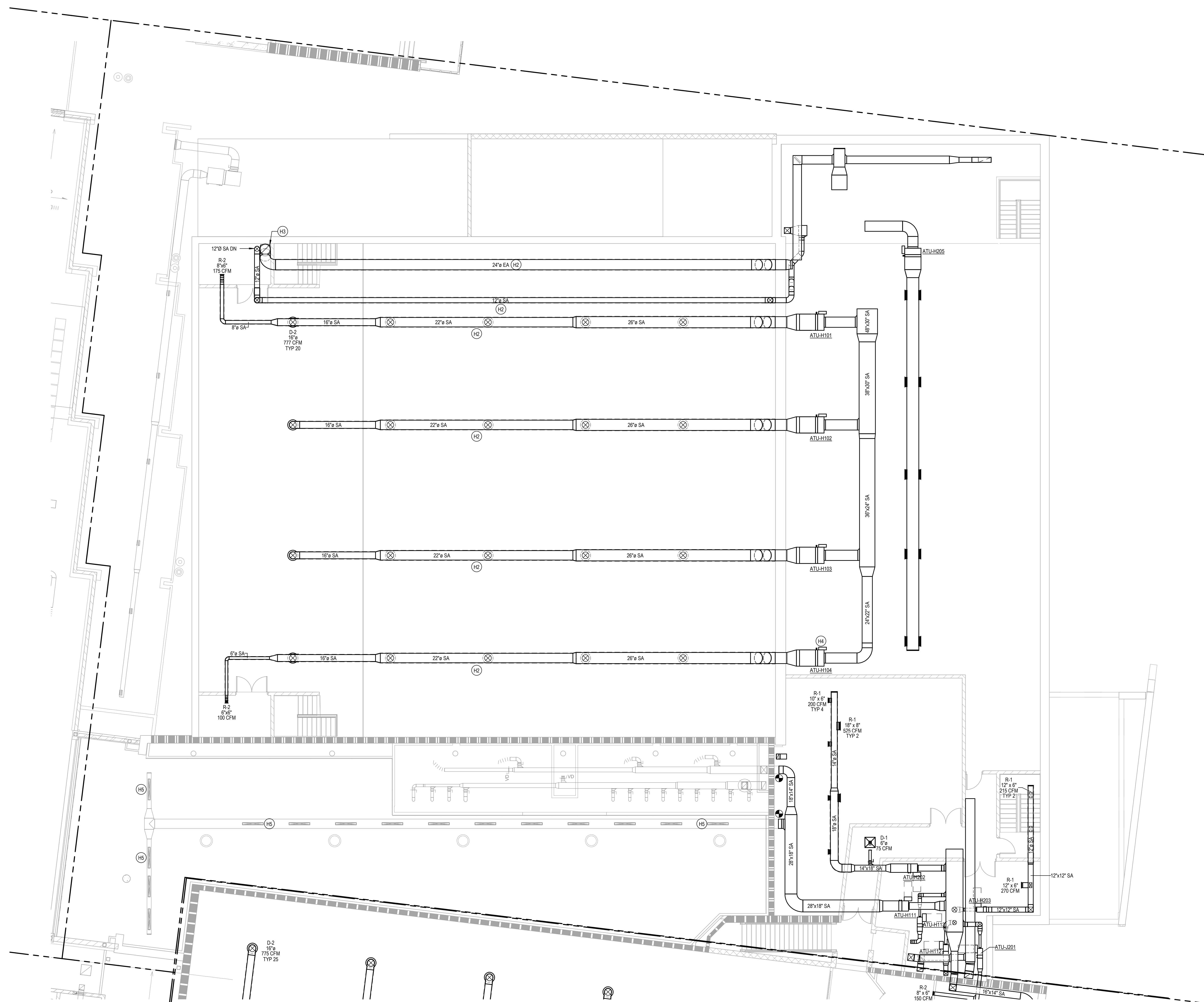
KEY PLAN



HVAC/PIPING GENERAL NOTES

- HVAC/PIPING KEYNOTES

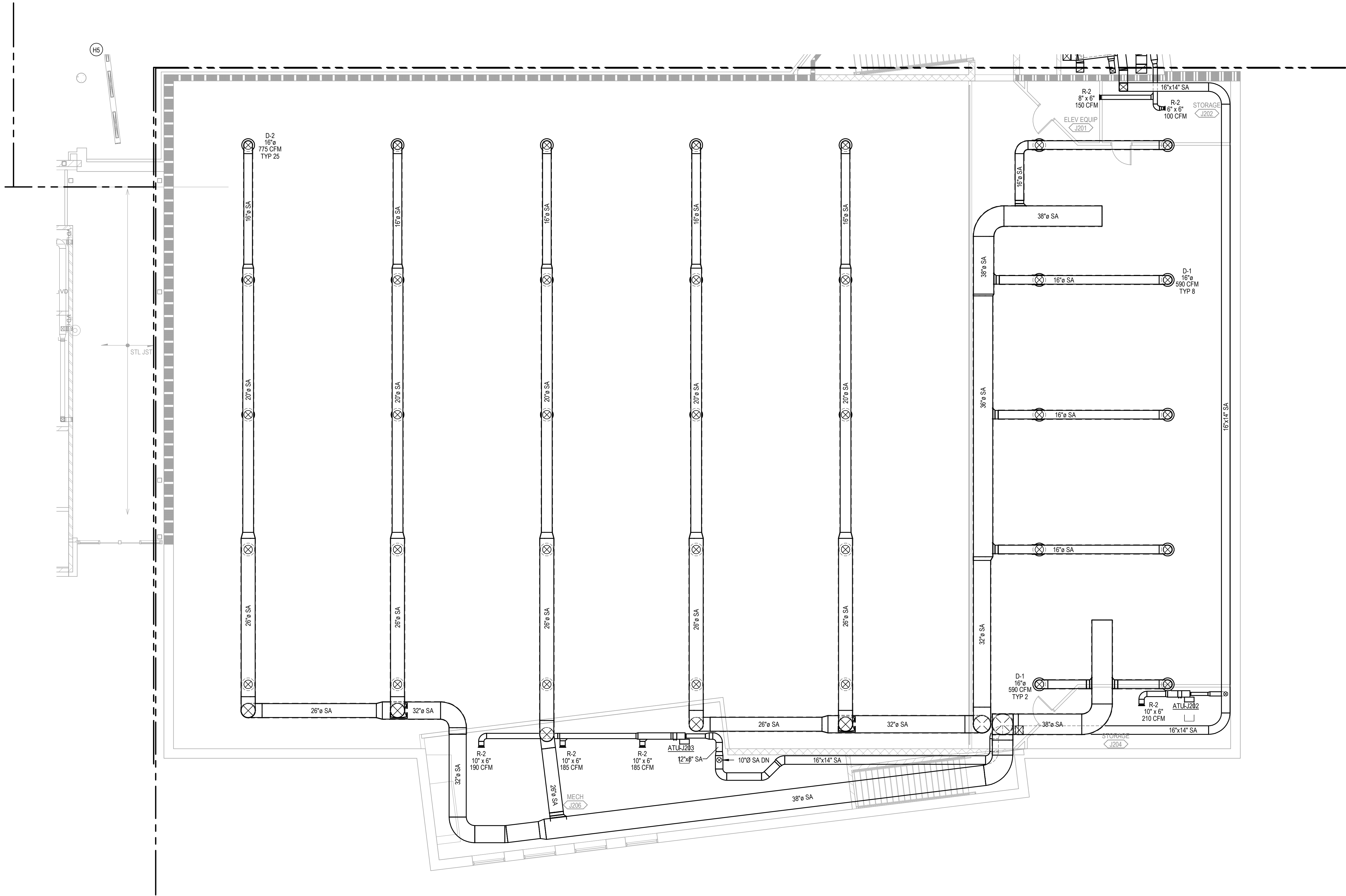
H3	TRANSITION FROM 22"x20" EA TO 24"Ø EA IN VERTICAL.
H4	COORDINATE AIR TERMINAL UNIT MOUNTING WITH EXISTING WRESTLING MAT LIFTING SYSTEM. ADJUST DUCTWORK, PIPING AND EQUIPMENT AS REQUIRED TO MAINTAIN EXISTING LIFT AND MECHANISMS.
H5	REBALANCE ALL EXISTING LINEAR SLOT DIFFUSERS TO 200 CFM.



HVAC PLAN, SECOND LEVEL - AREA H

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

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HVAC PLAN, SECOND LEVEL - AREA J

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

LEGEND NOTES

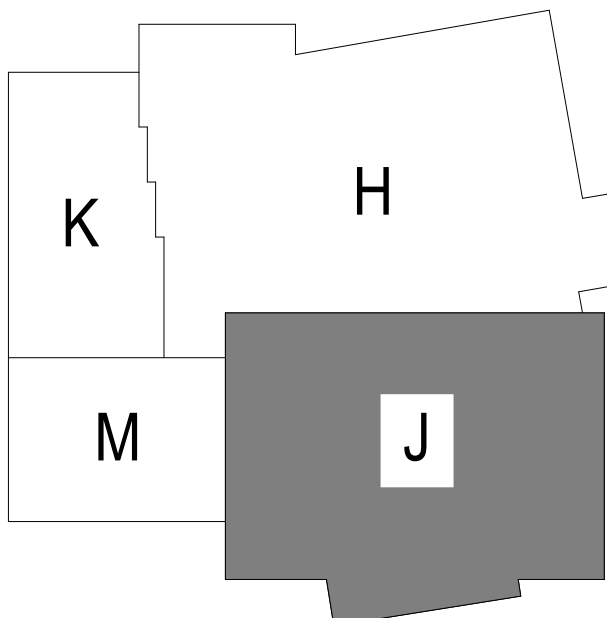
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- | | |
|----|--|
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7111 Aurora Ave.
Urbandale, IA 50322

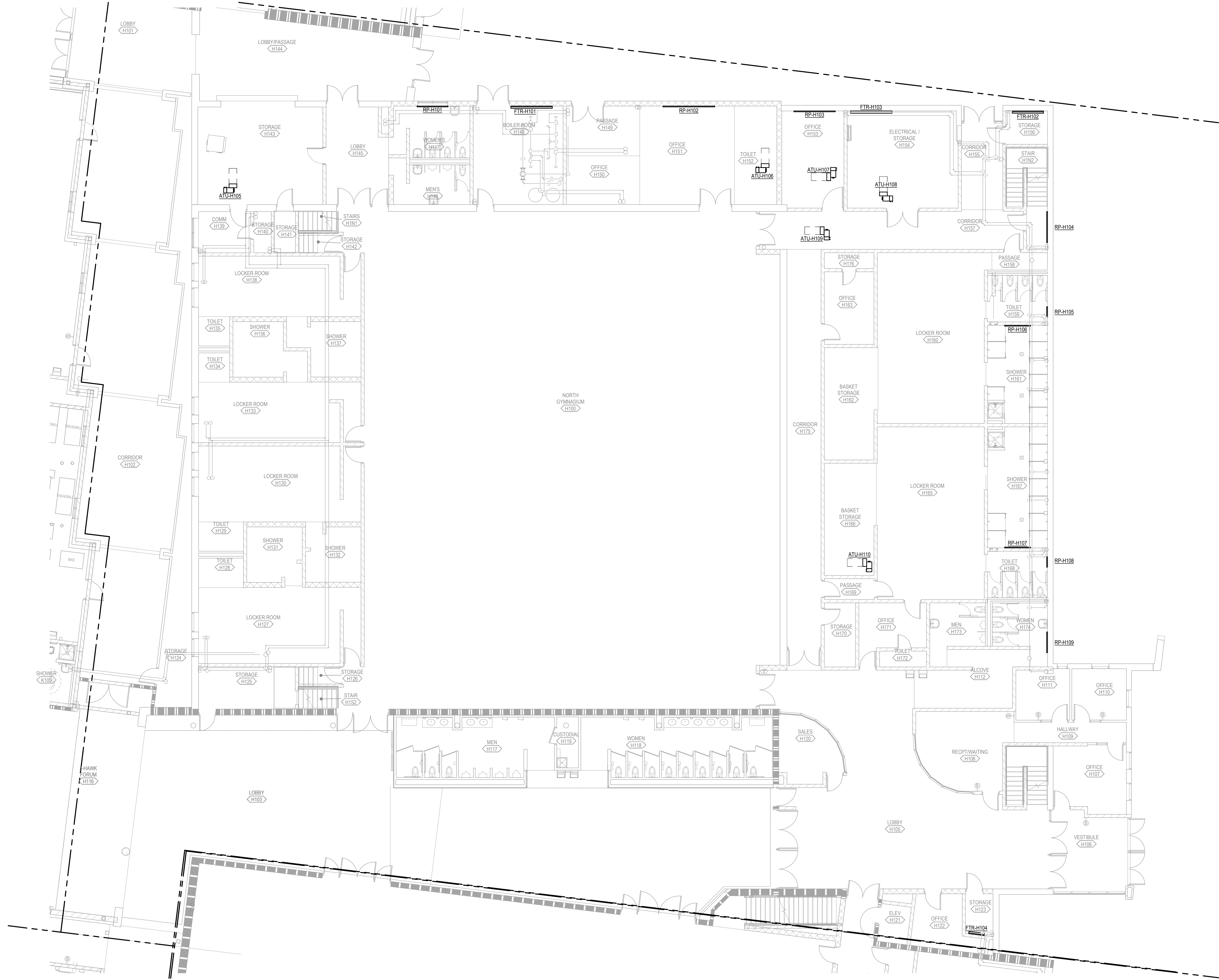
DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20
HVAC PLAN,
SECOND LEVEL -
AREA J

M1.2J



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 HVAC PIPING PLAN, FIRST LEVEL - AREA H
SCALE: 1/8" = 1'-0"

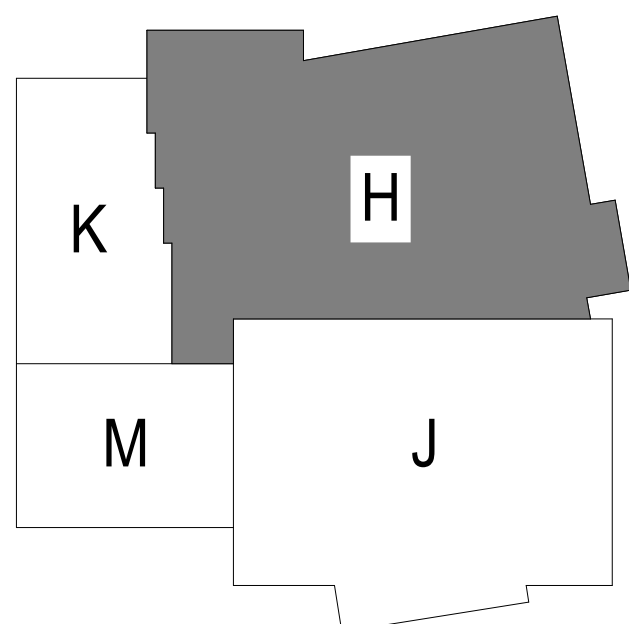
LEGEND NOTES

HVAC/PIPING GENERAL NOTES

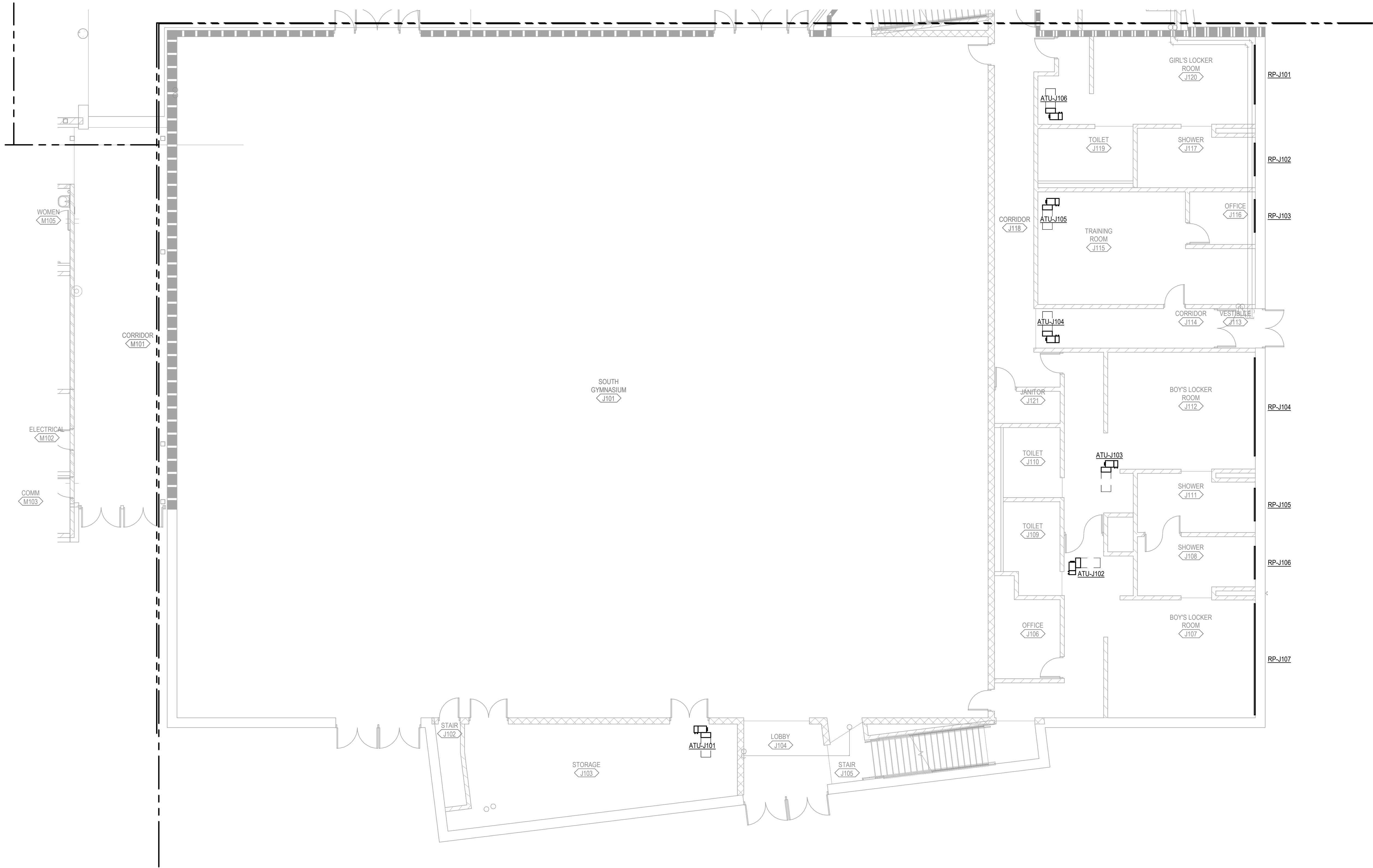
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HVAC PIPING PLAN, FIRST LEVEL - AREA J

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

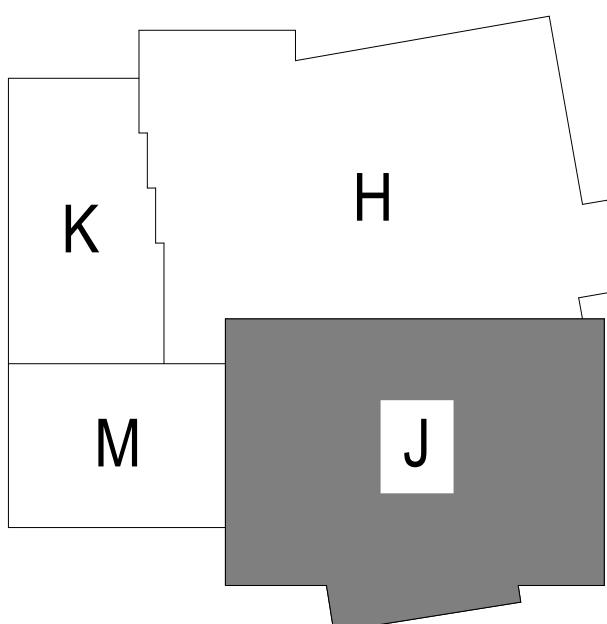
LEGEND NOTES

HVAC/PIPING GENERAL NOTES

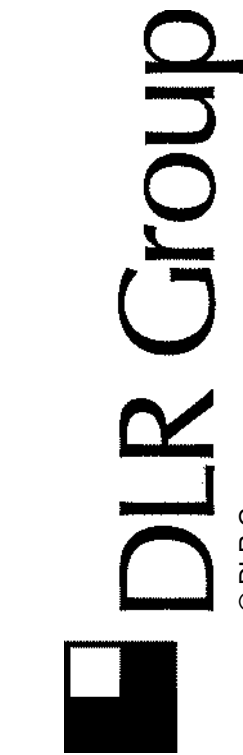
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URBANDALE HS - HVAC RENOVATION



7111 Aurora Ave.
Urbandale, IA 50322

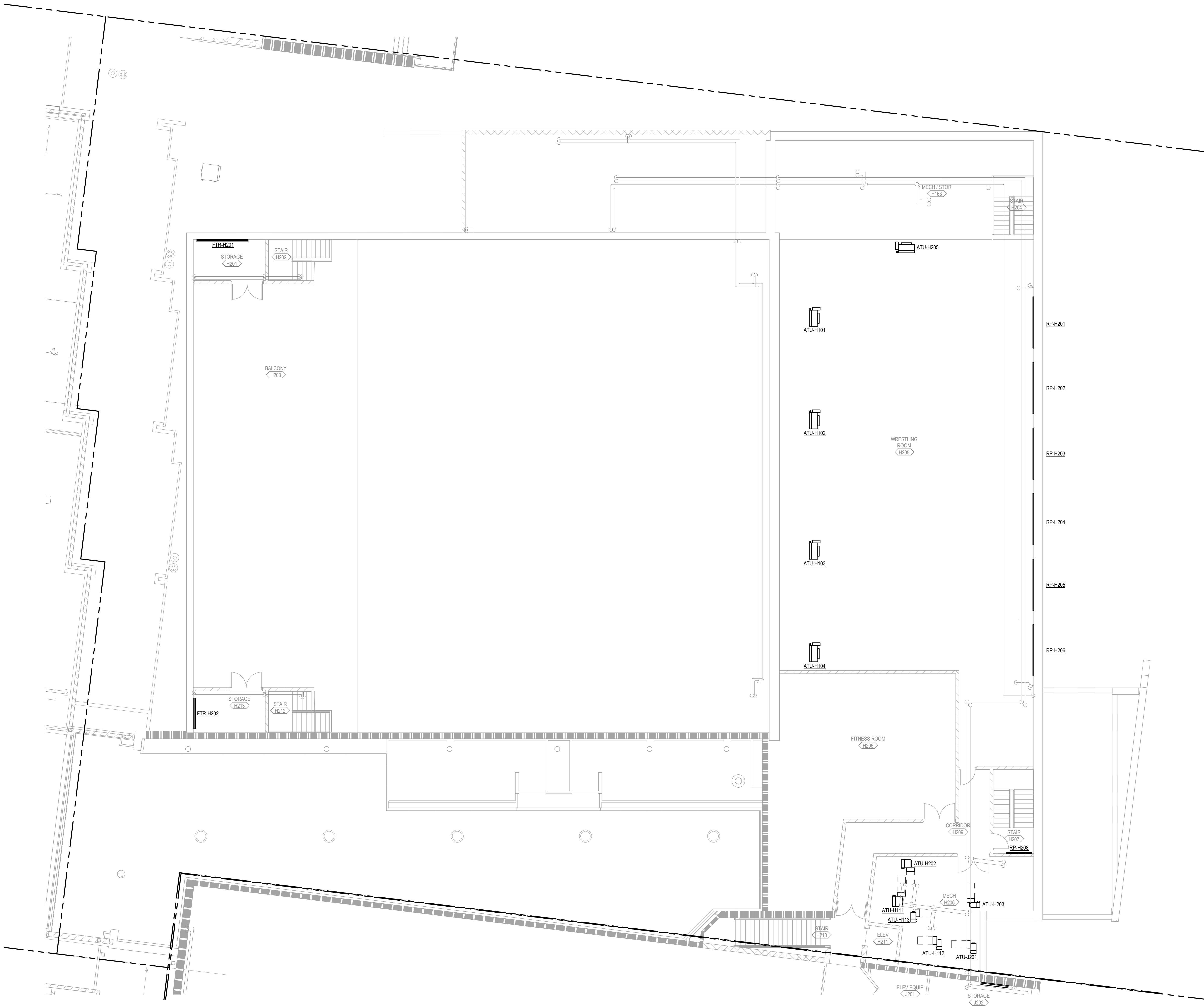
DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20
HVAC PIPING
PLAN, FIRST
LEVEL - AREA J

M2.1J



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HVAC PIPING PLAN, SECOND LEVEL - AREA H

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

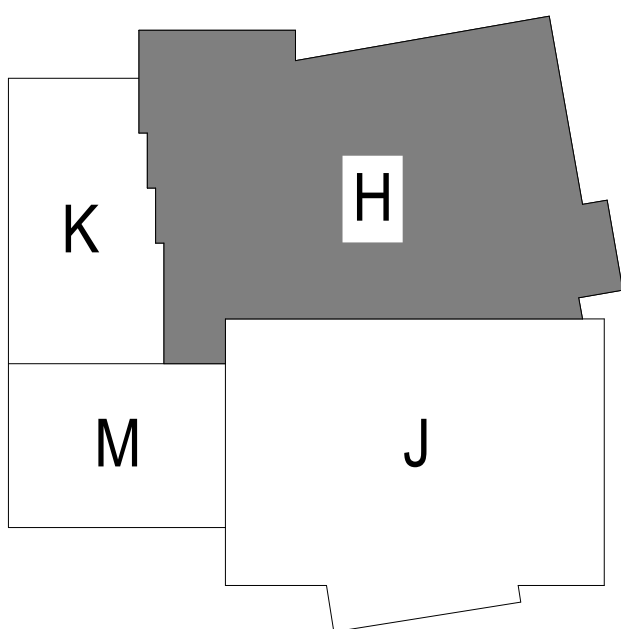
LEGEND NOTES

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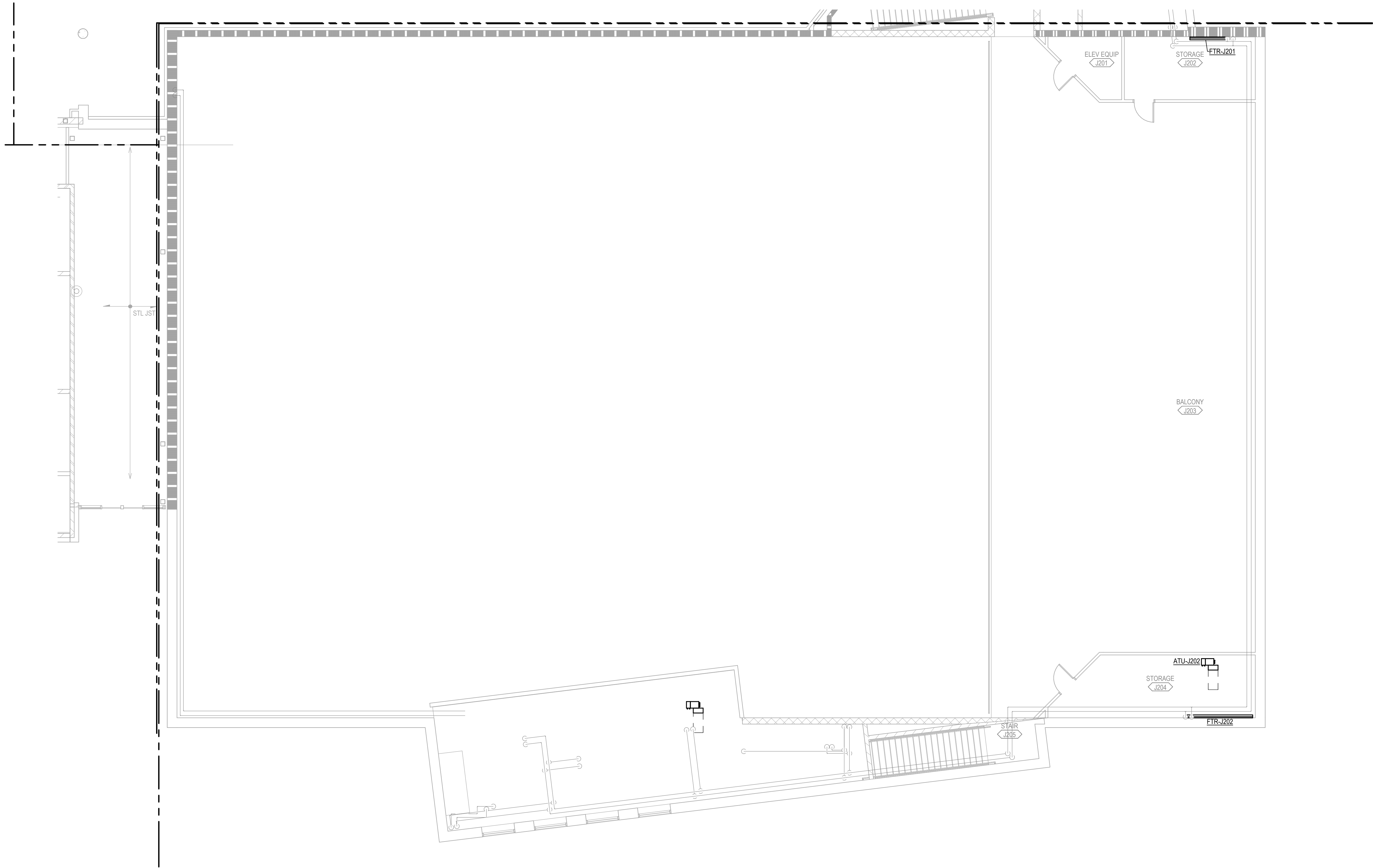
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HVAC PIPING PLAN, SECOND LEVEL - AREA J

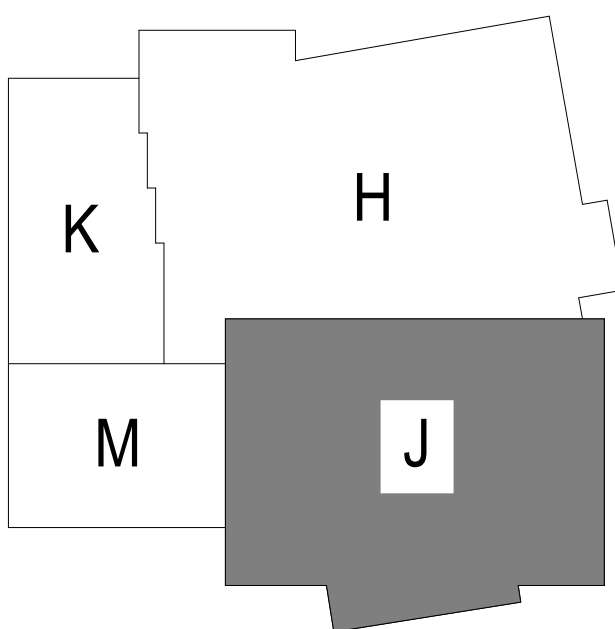
SCALE: 1/8" = 1'-0"

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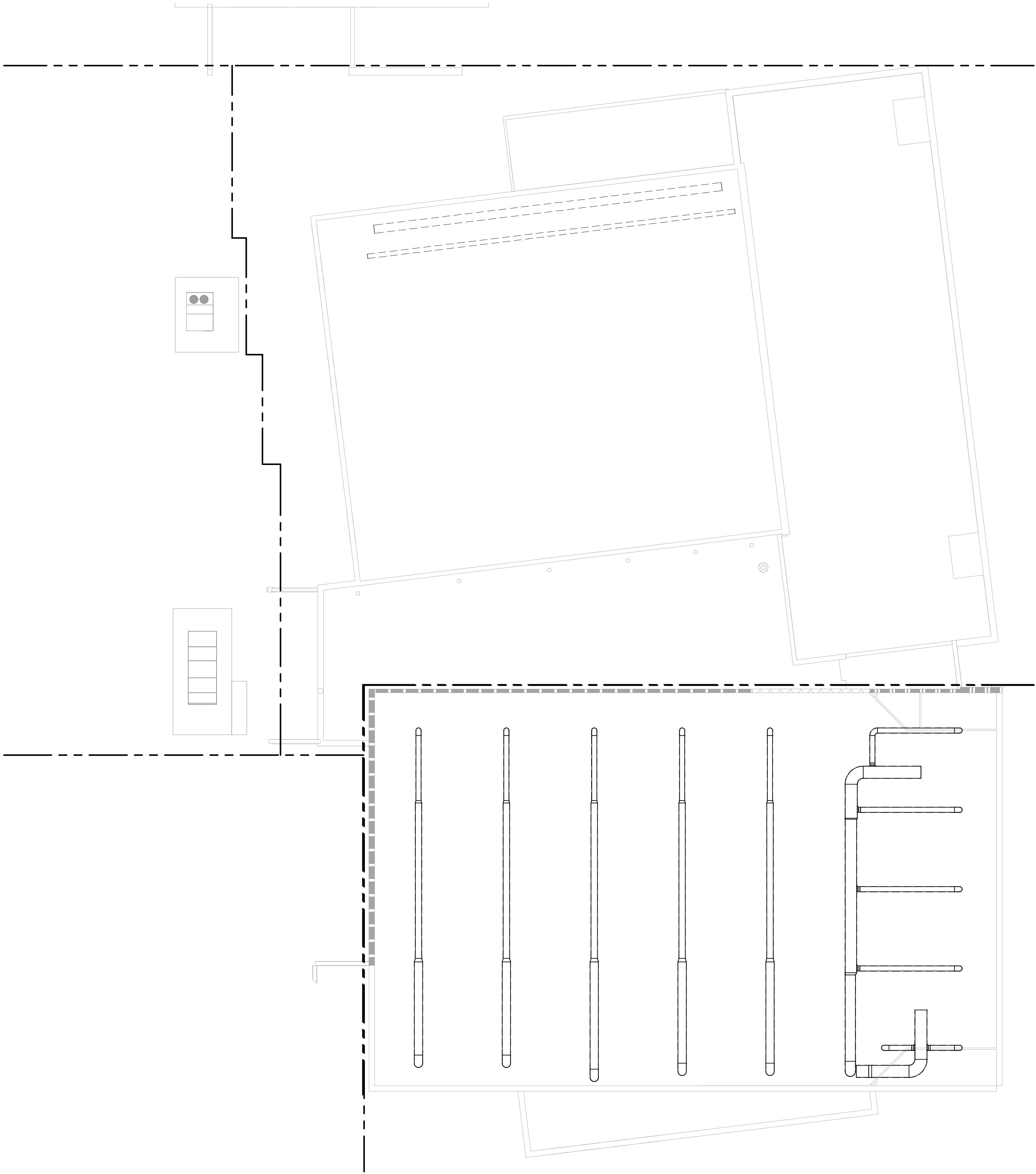


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3/9/2019 4:21:31 PM



MECHANICAL ROOF PLAN

SCALE: 1/16" = 1'-0"

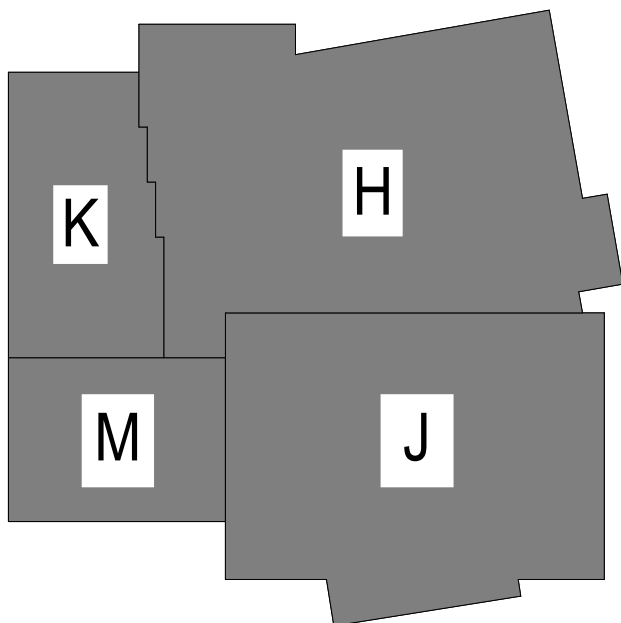


LEGEND NOTES

- HVAC/PIPING GENERAL NOTES**
- A. IT IS THE CONTRACTOR'S RESPONSIBILITY FOR ANY COSTS ASSOCIATED WITH CHANGES NEEDED AS A RESULT OF USING EQUIPMENT DIFFERENT THEN THE BASIS OF DESIGN.
 - B. COORDINATE PIPING/DUCT PENETRATIONS THRU WALLS, ROOFS, OR CEILING WITH GENERAL CONTRACTOR.
 - C. INSTALL EXPANSION COMPENSATORS, GUIDES, AND ANCHORS PER MANUFACTURERS RECOMMENDATIONS.
 - D. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING METHODS OF BRINGING IN NEW MECHANICAL EQUIPMENT THROUGH BUILDING INTO MECHANICAL ROOMS. COORDINATE WITH CONSTRUCTION SCHEDULE.
 - E. INSULATE REHEAT COILS AND COIL TUBE BENDS WITH INSULATION TO PREVENT CONDENSATION.
 - F. THE SUPPLY RUNOUT TO A DIFFUSER IS NOTED BY THE NECK SIZE GIVEN ON PLAN UNLESS OTHERWISE NOTED.
 - G. COORDINATE PIPE ROUTING TO AVOID RUNNING PIPING ABOVE ELECTRICAL WIRING AND EQUIPMENT.
 - H. PLANS DO NOT INCLUDE ALL OFFSETS FOR COORDINATION WITH DUCT, PIPING, LIGHTING AND STRUCTURAL SYSTEMS. PROVIDE ALLOWANCES FOR REQUIRED OFFSETS.
 - I. VARIABLE FREQUENCY DRIVES (VFD'S) TO BE FURNISHED BY DIVISION 23. TURN OVER FIELD MOUNTED VFD'S TO DIVISION 28 FOR MOUNTING, INSTALLATION AND POWER CONNECTION.
 - J. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL REMOVING, CUTTING, REINSTALLING, PATCHING AND REPLACEMENT OF ALL EXISTING BUILDING STRUCTURE, SURFACES AND FINISHES (THAT ARE TO REMAIN) REQUIRED TO COMPLETE WORK STATED IN THE CONTRACT DOCUMENTS.
 - K. SEE FIRE PROTECTION DRAWINGS FOR ROUTING, MECHANICAL AND FIRE PROTECTION TO COORDINATE ROUTING OF NEW SPRINKLER MAINS WITH MECHANICAL/PLUMBING WORK.
 - L. WHEN MOUNTING OR LOCATING EQUIPMENT COORDINATE WITH ALL DISCIPLINES TO ALLOW REQUIRED SPACE NEED FOR COIL FULL, FILTER FULL, EQUIPMENT REMOVAL WITHOUT PIPE MAIN REMOVAL, ETC. TO FACILITATE REMOVAL OF THIS EQUIPMENT IN FUTURE.
 - M. PIPING SHALL NOT BE SUPPORTED FROM OTHER PIPING, CONDUIT OR DUCTWORK.
 - N. PROVIDE WIRE GUARD OVER ALL THERMOSTATS, SENSORS, AND HUMIDISTATS LOCATED IN PUBLIC SPACES OTHER THAN INDIVIDUAL CLASSROOMS AND OFFICES. (IE: HALLWAYS, RESTROOMS, SHOP ROOMS).
 - O. CHILLED WATER AND HOT WATER PIPING 4" AND LARGER SHALL HAVE THERMAL HANGER SHIELDS INSTALLED AT HANGER LOCATIONS.
 - P. ALL BRANCHES FROM MAINS ARE TO HAVE 45° ENTRY FITTINGS (NO 90° SPIN-INS OR CONICAL TAPS). PROVIDE LATERALS, RADIUS FITTINGS AS SHOWN.
 - Q. GLYCOL WILL BE PRESENT IN HEATING/COOLING (HWS/HWR/CWS/CWR). REFERENCE SCHEDULES AND SPECIFICATIONS FOR GLYCOL PERCENTAGES.
 - R. NO 1/2" PIPING BRANCHES ALLOWED. WHERE EQUIPMENT HAS SMALLER THAN 3/4" CONNECTIONS, PROVIDE REDUCER AT UNIT. REFERENCE SCHEDULE FOR BRANCH SIZES.
 - S. PAINT INSIDE OF FLEXUM BOXES CONNECTING TO LOUVERS COLOR (BLACK) UNLESS OTHERWISE NOTED.
 - T. ROUTE ALL DUCTS IN EXPOSED AREAS AS HIGH AS POSSIBLE. DUCTS IN EXPOSED FINISHED AREAS ARE TO BE CONSTRUCTED OF DOUBLE-WALLED SPIRAL DUCT, UNLESS OTHERWISE NOTED.
 - U. PIPES ARE SHOWN SPREAD OUT FOR CLARIFICATION. INSTALL PIPES TIGHT TOGETHER IN THE FIELD.
 - V. PROVIDE ALLOWANCES FOR BOTH DUCTWORK OFFSETS AND ADDITIONAL ELBOWS. THIS IS DUE TO MANY BUILDING ANGLES.
 - W. ALL DETAILS FOR ITEMS SHOWN ON THIS SHEET ARE REFERRED TO AS FOLLOWS:

HVAC/PIPING KEYNOTES

KEY PLAN



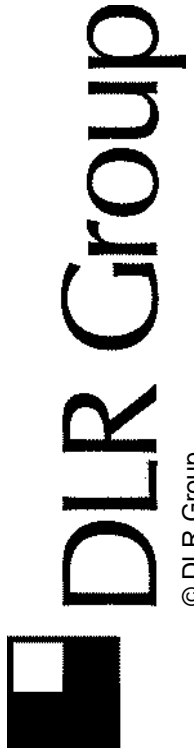
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MECHANICAL
ROOF PLAN

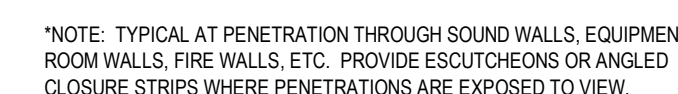
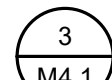

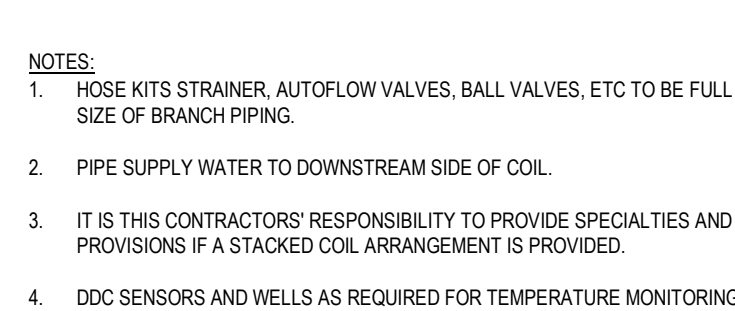

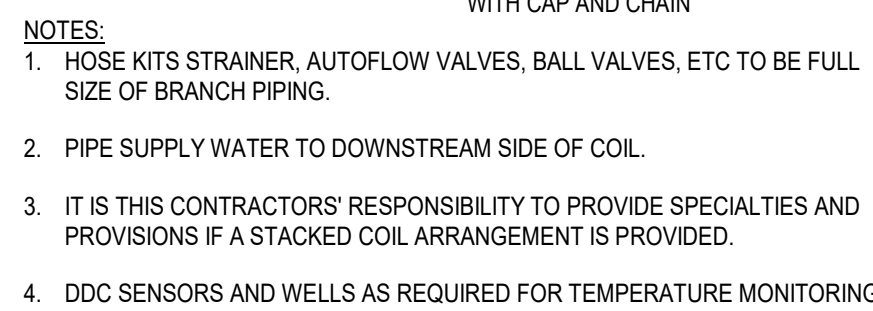
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URBANDALE HS - HVAC RENOVATION

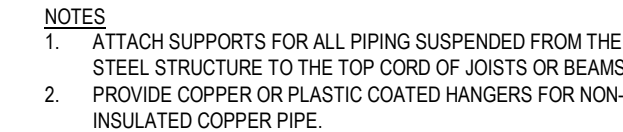
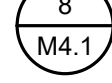

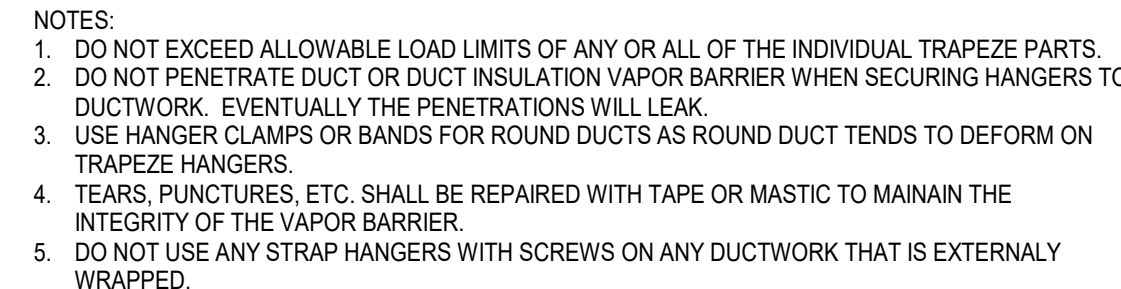
7111 Aurora Ave.
Urbandale, IA 50322

DESIGN
DEVELOPMENT
03-20-2019
Revisions

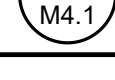
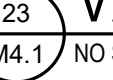
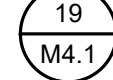
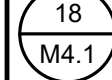
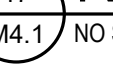
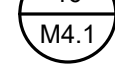
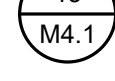
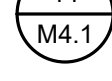
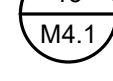
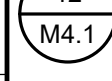
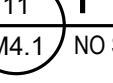




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PLAN MARK	UNIT AIRFLOW (CFM)	UNIT OUTSIDE AIRFLOW (CFM)	ENERGY RECOVERY	PRE-HEAT COIL DATA						DX COOLING COIL DATA								HEATING COIL DATA											
				TYPE	AIRFLOW (CFM)	CAPACITY (KW)	EAT (°F)	LAT (°F)	AIR PRESSURE DROP (IN. W.C.)	NET SENSIBLE CAPACITY (MBH)	NET TOTAL CAPACITY (MBH)	EAT DBWB (°F)	LAT DBWB (°F)	HOT GAS REHEAT LAT DBWB (°F)	SIZE (SQ. FT.)	QUANTITY OF ROWS	AIR PRESSURE DROP (IN. W.C.)	AIR VELOCITY (FPM)	TYPE	AIRFLOW (CFM)	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	MODULATION	EAT (°F)	LAT (°F)	AIR PRESSURE DROP (IN. W.C.)	GAS PRESSURE (MIN IN. W.C.)	GAS PRESSURE (MAX IN. W.C.)	
RTU-U1A																													
RTU-J1A	12,670	8,658	ERW-11A	ELECTRIC	12,670	40	-8	2	2.16	343		548	79.5 / 67.3	52.1 / 52.1	66.4 / 57.9	28.6	6	0.47	443	NAT. GAS	12,670	700	560	16.1	54.9	95.8	2.16	7	14
RTU-J1B	12,670	8,658	ERW-11B	ELECTRIC	12,670	40	-8	2	2.16	343		548	79.5 / 67.3	52.1 / 52.1	66.4 / 57.9	28.6	6	0.47	443	NAT. GAS	12,670	700	560	16.1	54.9	95.8	2.16	7	14
RTU-I2	9,800	9,800	ERW-12	ELECTRIC	9,800	28	-8	1	0.07	302		505	80.9 / 68.5	50.0 / 50.0	66 / 57.1	28.6	6	0.32	342	NAT. GAS	9,800	600	480	20.1	49.8	95.2	1.65	7	14

[illegible]

1. UNIT SHALL BE FURNISHED WITH FACTORY-MOUNTED AND WIRED INTEGRAL VFD FOR EACH FAN MOTOR.
2. UNIT SHALL BE FURNISHED WITH ELECTRICAL PROVISIONS, MAIN DISCONNECT, AND POWER DISTRIBUTION TO ACCOMMODATE A SINGLE-POINT POWER CONNECTION IN THE FIELD.
3. PROVIDE FACTORY-INSTALLED NEMA 5-20R GFI WEATHERPROOF CONVENIENCE RECEPTACLE FOR 120V FIELD CONNECTION BY E.C.
4. PROVIDE SHAFT GROUNDING RINGS ON ALL VFD DRIVEN MOTORS.
5. CO2 SENSORS TO BE PROVIDED BY UNIT MANUFACTURER. MOUNT IN RETURN AIR DUCT OR AS NOTED ON DRAWINGS.

ENERGY RECOVERY SECTION	ENERGY RECOVERY TYPE	DESIGN AIRFLOW				SUMMER CONDITIONS										WINTER CONDITIONS					DAMPERS			MOTOR DATA			
		VENTILATION SUPPLY (CFM)	EXHAUST (CFM)	RETURN (CFM)	SUPPLY (CFM)	OUTSIDE AIR DB / WB (°F)	RETURN AIR DB / WB (°F)	VENT SUPPLY AIR DB / WB (°F)	EXHAUST AIR DB / WB (°F)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	LATENT CAPACITY (MBH)	EFFECTIVENESS		OUTSIDE AIR DB / WB (°F)	RETURN AIR DB / WB (°F)	VENT SUPPLY AIR DB / WB (°F)	EXHAUST AIR DB / WB (°F)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	LATENT CAPACITY (MBH)	EXHAUST AIR BYPASS	DAMPERS AIR BYPASS	RECIRCULATION	MOTOR HP	VOLTAGE	PHASE
													LATENT (%)	SENSIBLE (%)													
ERW-31A	WHEEL	8,658	8,658	4,012	12,670	95 / 78	75 / 63	81.5 / 69.2	88.5 / 73	304.6	128	176.5	60	67	2 / 0.7	70 / 50	47.8 / 36.7	24.1 / 21.1	491.7	435.6	56.1	YES	YES	YES	0.17	460	3
ERW-11B	WHEEL	8,658	8,658	4,012	12,670	95 / 78	75 / 63	81.5 / 69.2	88.5 / 73	304.6	128	176.5	60	67	2 / 0.7	70 / 50	47.8 / 36.7	24.1 / 21.1	491.7	435.6	56.1	YES	YES	YES	0.17	460	3
ERW-12	WHEEL	9,800	9,800	4,363 / 68.5	9,800	95 / 78	75 / 63	80.9 / 68.5	89.1 / 73.6	369.8	152	217	65	71	17 / 0.1	70 / 50	49.8 / 38.1	21.2 / 18.7	593	524	69	YES	YES	YES	0.17	460	3

[illegible]

1. PROVIDE WITH INTEGRAL FACTORY-INSTALLED POWER DISCONNECT SWITCH ATTACHED TO UNIT. SINGLE-PHASE FRACTIONAL-HORSEPOWER MOTORS SHALL BE FURNISHED WITH INTEGRAL MOTOR OVERLOAD PROTECTION.
2. PROVIDE WITH MOUNTED SPEED CONTROLLER WITH INTEGRAL POWER DISCONNECT.
3. PROVIDE WITH UNIT MOUNTED ECM SPEED CONTROLLER.
4. PROVIDE BACKFLOT DAMPER.
5. PROVIDE VIBRATION ISOLATOR KIT.
6. FAN POWER / DISCONNECT IS A 6 FT. CORD AND PLUG.
7. FAN SHALL BE INTERLOCKED WITH DISHWASHER. DISHWASHER AND FAN POWER WIRING BY ELECTRICAL CONTRACTOR.

[illegible]

1. PROVIDE OPTIONAL SEALED COMBUSTION UNIT.
2. GAS REQUIREMENTS 14" WC MINIMUM AT FULL LOAD, 2 PSI MAXIMUM.
3. PROVIDE BOILER MANAGEMENT SYSTEM CAPABLE OF STAND ALONE OPERATION.
4. PROVIDE BOILER SHUTDOWN. COORDINATE W/ ELECTRICAL CONTRACTOR.
5. BOILER MANAGEMENT SYSTEM TO MANAGE STAGING AND FIRING AT PART LOAD.
6. BOILER VENT CONNECTION IS NOT NECESSARILY BOILER FUELE SIZE. SIZE FLUES AS PER MANUFACTURER'S RECOMMENDATIONS FOR RETURNING RETURN. CURRENT PLAN SHOWS 14" FUELE SIZE.
7. PROVIDE CONDENSATE NEUTRALIZATION KIT WITH EACH BOILER.

[illegible]

1. DUCTLESS SYSTEM. MOUNT PER MANUFACTURER'S INSTRUCTIONS.
2. MOUNTING HEIGHT SHOWN IS A MINIMUM, TO FACILITATE CONDENSATE DRAINAGE. FINAL HEIGHT MAY BE HIGHER TO ACCOMMODATE CLEARANCES OR FACILITATE ATTACHMENT TO STRUCTURE.
3. EACH UNIT SHALL BE PROVIDED WITH A WIRED WALL MOUNTED CONTROLLER.
4. 24 VOLT CONTROL VOLTAGE.
5. MINIMUM SEER RATING SHALL BE 13.0 TO MEETING ENERGY CODE. EQUIPMENT SCHEDULED BELOW THIS RATING WILL NOT BE ACCEPTED.
6. INDOOR UNIT IS POWERED FROM OUTDOOR UNIT. SEE SPLIT SYSTEM OUTDOOR UNIT SCHEDULE FOR TOTAL CONNECTED MCA AND MINIMUM LOAD.

[illegible]

1. TOTAL CAPACITY BASED ON INDOOR UNIT FAN SPEED ON HIGH.
2. REFRIGERANT PIPE QUANTITIES AND SIZE TO BE PER MANUFACTURER'S PIPING RECOMMENDATIONS.
3. PROVIDE WITH THE FOLLOWING:
 - A. LOW AMBIENT KIT FOR OPERATION DOWN TO -2 DEG. F.
 - B. WINTER START-UP RELAY TO BYPASS LOW PRESSURE SWITCH TO PERMIT START-UP FOR COOLING OPERATION UNDER LOW AMBIENT CONDITIONS.
 - C. CRANKCASE HEATER THAT CLAMPS ONTO THE COMPRESSOR OIL SUMP.
 - D. WIND BAFFLE TO IMPROVE UNIT OPERATION DURING HIGH WINDS AND FOR LOW AMBIENT CONDITIONS.
4. UNIT TO BE MOUNTED ON EQUIPMENT RAILS. MOUNTING EQUIPMENT ON 4 x 4 LUMBER DIRECTLY ON ROOF IS NOT ACCEPTABLE.
5. INDOOR UNIT IS POWERED FROM OUTDOOR UNIT. MCA TOTAL IS COMBINED FOR OUTDOOR UNIT AND INDOOR UNIT.

UNIT IDENTIFICATION		MOUNTING TYPE	ROOM LOAD REQUIREMENT (BTU/H)	CAPACITY (BTU/H)	HOT WATER COIL DATA						NO. OF FANS	MOTOR DATA				CABINET			BASIS OF DESIGN	NOTES
PLAN MARK	AREA SERVED				AIRFLOW (GPM)	EAT DB (°F)	EWT DB (°F)	FLOW (GPM)	MAX WPD (°F)	PIPE SIZE (IN)		MOTOR POWER (HP)	NO. OF MOTORS	V	PH	SIZE L x W x H (INCHES)	CONFIGURATION	INLET		
CUH-H101	H155 - CORRIDOR	WALL	4,000		70	160					120		SEMI-RECESSED	FRONT	FRONT	TRANS	14			
CUH-J101	J113 - VESTIBULE	WALL	4,000		70	160					120		SEMI-RECESSED	FRONT	FRONT	TRANS	14			
CUH-J102	J104 - LOBBY	WALL	9,000		70	160					120		SEMI-RECESSED	FRONT	FRONT	TRANS	14			

1. PROVIDE INTEGRAL ELECTRICAL DISCONNECT AND MOTOR OVERLOAD PROTECTION
2. PROVIDE WITH SOLID-STATE SPEED CONTROLLER AND INTEGRAL THERMOSTAT.
3. FULLY RECESSED MOUNTING INTO CEILING. PROVIDE RECESS TRIM KIT.
4. PROVIDE WITH 2-WAY COIL CONNECTION.

PLAN MARK	LOCATION	ROOM LOAD REQUIREMENT (BTU/H)	CAPACITY (BTU/H)	COIL DATA				MOTOR DATA			PIPE CONN. SIZE (IN)	THROW DIRECTION	MOUNTING HEIGHT (FT)	BASIS OF DESIGN	MECH NOTES
				GPM	EWT (°F)	MAX PD (FT)	CFM (NOM.)	EAT (°F)	HP [WATT]	V					
UHH201	H206 - MECH	11,000			160			70		120		HORIZONTAL	8	TRANE	1-3
UH-001	J-001 STORAGE	22,500			160			70		120		HORIZONTAL	8	TRANE	1-3
UH-001	J-006 - MECH	26,500			160			70		120		HORIZONTAL	8	TRANE	1-3

1. FURNISH WITH UNIT-MOUNTED MANUAL STARTER WITH MOTOR OVERLOAD PROTECTION.
2. PROVIDE WITH INTEGRAL THERMOSTAT.
3. PROVIDE WITH 2-WAY COIL CONNECTION.

[illegible]

1. PROVIDE VARIABLE FREQUENCY DRIVE WITH INTEGRAL DISCONNECT AND BMS INTERFACE. VFD TO BE MOUNTED AND WIRED BY E.C.
2. COORDINATE MOUNTING LOCATION WITH E.C. SO MFR'S MAXIMUM LOAD-SIDE CONDUCTOR LENGTH IS NOT EXCEEDED. M.C. SHALL BE RESPONSIBLE FOR START-UP AND COMMISSIONING OF VFD.

[illegible]

1. WATER HEATER SHALL INCLUDE ASME RATED TEMPERATURE AND PRESSURE RELIEF VALVE AND DRAIN VALVE WITH A MAXIMUM HYDROSTATIC WORKING PRESSURE OF 160 PSI.

AIR TERMINAL UNIT SCHEDULE

MARK	SYSTEM	SIZE	CFM		ARI NOISE RATING		DISCHARGE ATTENUATOR	HOT WATER REHEAT COIL DATA										BASIS OF DESIGN	MECH NOTES		
			MAX	MIN	RADIATED NC (OCTAVE BAND)	DISCHARGE NC (OCTAVE BAND)		CFM	MIN CAPACITY (MBH)	EAT (°F)	LAT (°F)	APD (IN WG)	GPM	EWT (°F)	LWT (°F)	WPD (FT WG)	ROWS				
ATU-H101	RTU-LH1	24x16	3955	1455	23 (3)	--	-	3955	128.1	55	84.9	0.51	5.64	160	113.6	3.65	2	PRICE - SDV5	1-3		
ATU-H102	RTU-LH1	24x16	3955	1455	23 (3)	--	-	3955	128.1	55	84.9	0.51	5.64	160	113.6	3.65	2	PRICE - SDV5	1-3		
ATU-H103	RTU-LH1	24x16	3955	1455	23 (3)	--	-	3955	127.7	55	84.8	0.51	5.6	160	113.4	3.6	2	PRICE - SDV5	1-3		
ATU-H104	RTU-LH1	24x16	3955	1455	23 (3)	--	-	3955	127.7	55	84.8	0.51	5.6	160	113.4	3.6	2	PRICE - SDV5	1-3		
ATU-H105	RTU-LH1	8	400	360	--	--	-	400	13.1	55	85	0.17	0.5	160	107.3	0.05	2	PRICE - SDV5	1-3		
ATU-H106	RTU-LH1	8	520	185	--	21 (2)	-	520	17	55	85.1	0.27	0.74	160	113.3	0.11	2	PRICE - SDV5	1-3		
ATU-H107	RTU-LH1	4	75	45	--	--	-	75	2.6	55	85.2	0.01	0.07	160	115	0	2	PRICE - SDV5	1-3		
ATU-H108	RTU-LH1	8	330	200	--	--	-	330	10.8	55	84.8	0.12	0.39	160	103.6	0.03	2	PRICE - SDV5	1-3		
ATU-H109	RTU-LH1	4	100	45	--	20 (2)	-	100	3.4	55	85.6	0.02	0.1	160	104.1	0	2	PRICE - SDV5	1-3		
ATU-H110	RTU-LH1	4	80	45	--	--	-	80	2.6	55	84.8	0.02	0.07	160	103.5	0	2	PRICE - SDV5	1-3		
ATU-H201	RTU-LH1	24x16	5710	1830	27 (2)	20 (3)	-	5710	185.4	55	85	1.43	5.92	160	96	1.94	3	PRICE - SDV5	1-3		
ATU-H111	RTU-J2	24x16	4080	1225	23 (3)	--	-	4080	132.6	55	85	0.54	5.98	160	114.7	4.05	2	PRICE - SDV5	1-3		
ATU-H112	RTU-J2	8	335	168	--	--	-	335	10.9	55	84.9	0.13	0.4	160	104	0.04	2	PRICE - SDV5	1-3		
ATU-H113	RTU-J2	4	150	45	--	25 (2)	-	150	5	55	85.1	0.07	0.12	160	78.5	0.01	3	PRICE - SDV5	1-4		
ATU-H202	RTU-J2	14	1925	925	--	--	-	1925	62.6	55	85	0.43	2.95	160	116.7	0.86	2	PRICE - SDV5	1-3		
ATU-H203	RTU-J2	8	700	225	--	22 (2)	-	700	22.8	55	85	0.44	1.21	160	121.5	0.25	2	PRICE - SDV5	1-3		
ATU-J101	RTU-J2	8	330	135	--	--	-	330	10.7	55	84.7	0.16	0.35	160	97.6	0.03	2	PRICE - SDV5	1-3		
ATU-J102	RTU-J2	8	425	150	--	--	-	425	13.9	55	85	0.25	0.48	160	107.1	0.05	2	PRICE - SDV5	1-3		
ATU-J103	RTU-J2	6	235	70	--	23 (2)	-	235	7.8	55	85	0.09	0.28	160	103.8	0.02	2	PRICE - SDV5	1-3		
ATU-J104	RTU-J2	6	195	75	--	--	-	195	4.2	55	85	0.03	0.13	160	106.2	0	2	PRICE - SDV5	1-3		
ATU-J105	RTU-J2	6	275	110	--	24 (2)	-	275	9	55	85	0.12	0.34	160	106.1	0.02	2	PRICE - SDV5	1-3		
ATU-J106	RTU-J2	6	200	85	--	24 (2)	-	200	6.6	55	85	0.07	0.23	160	102.2	0.01	2	PRICE - SDV5	1-3		
ATU-J201	RTU-J2	6	250	75	--	24 (2)	-	250	8.2	55	85	0.1	0.3	160	104.6	0.02	2	PRICE - SDV5	1-3		
ATU-J202	RTU-J2	6	210	85	--	24 (2)	-	210	7	55	85.3	0.08	0.25	160	103.5	0.01	2	PRICE - SDV5	1-3		
ATU-J203	RTU-J2	8	560	170	--	22 (2)	-	560	18.3	55	85	0.3	0.82	160	115	0.13	2	PRICE - SDV5	1-3		

- MECHANICAL NOTES:
- HOT WATER COILS HAVE A MINIMUM OF 2 ROWS WITH A MAXIMUM WATER PRESSURE DROP OF 1 FOOT. (UNLESS APPROVED BY THE ENGINEER OR NOTED OTHERWISE.)
 - FACTORY MOUNT TEMPERATURE CONTROLS. COORDINATE WITH TEMPERATURE CONTROLS CONTRACTOR.
 - PROVIDE WITH 2-WAY COIL CONNECTION.
 - PROVIDE WITH 3-WAY COIL CONNECTION.

DIFFUSER, REGISTER & GRILLE SCHEDULE

MARK	DESCRIPTION	MOUNTING OR FRAME TYPE	MAX STATIC PD (IN WG)	MAX NC (DECIBELS)	MATERIAL	FINISH	BASIS OF DESIGN	MECH NOTES
D-1	SQUARE PLAQUE DIFFUSER	LAY-IN	0.1	25	STEEL	WHITE	PRICE - SPD	1
D-2	ADJUSTABLE CEILING TWIST DIFFUSER	SUSPENDED	0.1	25	STEEL	WHITE	EFFECTIVE/HVAC - AXIS/ACTIF	1,2,7
R-1	SPIRAL DUCT GRILLE	DUCT	0.1	25	ALUMINUM	WHITE	PRICE - SDGE	1,3,4
R-2	DOUBLE DEFLECTION LOUVERED GRILLE	SURFACE	0.1	25	STEEL	WHITE	PRICE - 520	1,3
G-1	EGG CRATE GRILLE	LAY-IN	0.1	25	ALUMINUM	WHITE	PRICE - 80	1
G-2	EGG CRATE GRILLE	SURFACE	0.1	25	ALUMINUM	WHITE	PRICE - 80	1,5,6
G-3	LOUVERED RETURN GRILLE	SURFACE / DUCT	0.1	25	STEEL	WHITE	PRICE - 530	1,9
G-4	LOUVERED RETURN GRILLE	SURFACE / DUCT	0.1	25	ALUMINUM	WHITE	PRICE - 630	1,8,9

- MECHANICAL NOTES:
- CONTRACTOR SHALL COORDINATE MOUNTING AND SURFACE CONSTRUCTION PRIOR TO FURNISHING MATERIAL.
 - SEE PLANS FOR LOCATION, NECK SIZE AND CFM.
 - PROVIDE AUTO CHANGEOVER (SELF-ACTING THERMAL EXPANSION ACTUATOR.)
 - CONFIGURATION TO BE DOUBLE DEFLECTION. FRONT BLADES PARALLEL TO SHORT DIMENSION.
 - PROVIDE WITH AIR SCOOP.
 - FURNISH WITH REMOTE CONTROL VOLUME DAMPER CONTROLLED VIA CABLE.
 - PROVIDE WITH INTEGRATED PLENUM. PLENUM TO BE PREPAINED BLACK WITH TOP INLET FOR DUCT CONNECTION.
 - PROVIDE WITH SECURITY GRILLE FOR SPORTS FACILITIES.
 - PROVIDE WITH INTEGRAL OPPOSED BLADE DAMPER.
 - FRONT BLADES PARALLEL TO LONG DIMENSION.

RADIANT PANEL SCHEDULE

UNIT IDENTIFICATION		ROOM LOAD REQUIREMENT (BTU/H)	UNIT CAPACITY (BTU/H)	CAPACITY PER FOOT (BTU/LF)	GPM	PRESSURE DROP MAX (FT HD)	EWT (°F)	LWT (°F)	ENTERING AIR DB (°F)	PHYSICAL CHARACTERISTICS				MTG TYPE	HEIGHT (IN A.F.F.)	FINISH	BASIS OF DESIG	TES
MARK	AREA SERVED									LENGTH (FT)	HEIGHT (IN)	DEPTH (IN)	NUMBER OF ROWS					
RP-H101	H146 - RESTROOMS	4,000	4434	739	0.30	1	160	130	70	6	14 3/8"	2"	5	WALL	4	WHITE	RUNTAL RF-5	-3
RP-H102	H151 - OFFICE	15,500	16280	1628	1.09	1	160	130	70	10	14 3/8"	5"	5	WALL	4	WHITE	RUNTAL R3F-5	-3
RP-H103	H193 - OFFICE	3,000	3848	481	0.26	1	160	130	70	8	8 5/8"	2"	3	WALL	4	WHITE	RUNTAL RF-3	-3
RP-H104	H205 - WRESTLING STAIR	5,500	6536	1106	0.44	1	160	130	70	6	8 5/8"	5"	3	WALL	4	WHITE	RUNTAL R3F-3	-3
RP-H105	H199 - TOILET	4,500	2650	1325	0.18	1	160	130	70	2	23 1/8"	5"	4	WALL	4	WHITE	RUNTAL R3F-8	-3
RP-H106	H161 - SHOWER	6,500	5530	1106	0.37	1	160	130	70	5	11 1/2"	5"	3	WALL	78	WHITE	RUNTAL R3F-4	-3
RP-H107	H167 - SHOWER	8,000	5530	1106	0.37	1	160	130	70	5	14 3/4"	5"	3	WALL	78	WHITE	RUNTAL R3F-5	-3
RP-H108	H168 - TOILET	3,500	2650	1325	0.18	1	160	130	70	2	14 3/4"	5"	4	WALL	4	WHITE	RUNTAL R3F-5	-3
RP-H109	H173 - RESTROOMS	3,000	2956	739	0.20	1	160	130	70	4	14 3/4"	2"	5	WALL	4	WHITE	RUNTAL RF-5	-3
RP-H201	H205 - WRESTLING	5,000	5810	581	0.39	1	160	130	70	10	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-H202	H205 - WRESTLING	5,000	5810	581	0.39	1	160	130	70	10	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-H203	H205 - WRESTLING	5,000	5810	581	0.39	1	160	130	70	10	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-H204	H205 - WRESTLING	5,000	5810	581	0.39	1	160	130	70	10	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-H205	H205 - WRESTLING	5,000	5810	581	0.39	1	160	130	70	10	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-H206	H205 - WRESTLING	5,000	5810	581	0.39	1	160	130	70	10	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-H207	H205 - WRESTLING	5,000	5810	581	0.39	1	160	130	70	10	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-H208	H207 - STAIR	4,000	4330	866	0.29	1	160	130	70	5	5 3/4"	5"	2	WALL	4	WHITE	RUNTAL R3F-2	-3
RP-J101	J102 - GIRLS LOCKER ROOM	6,000	7794	866	0.52	1	160	130	70	9	5 3/4"	5"	2	WALL	96	WHITE	RUNTAL R3F-2	-3
RP-J102	J117 - SHOWER	2,500	2905	581	0.19	1	160	130	70	5	11 1/2"	2"	4	WALL	96	WHITE	RUNTAL RF-4	-3
RP-J103	J116 - SHOWER	2,500	2905	581	0.19	1	160	130	70	5	11 1/2"	2"	4	WALL	4	WHITE	RUNTAL RF-4	-3
RP-J104	J112 - BOYS LOCKER ROOM	4,500	5595	373	0.37	1	160	130	70	15	5 3/4"	2"	2	WALL	96	WHITE	RUNTAL RF-2	-3
RP-J105	J111 - SHOWER	2,000	2405	481	0.16	1	160	130	70	5	8 5/8"	2"	3	WALL	96	WHITE	RUNTAL RF-3	-3
RP-J106	J108 - SHOWER	2,000	2405	481	0.16	1	160	130	70	5	8 5/8"	2"	3	WALL	96	WHITE	RUNTAL RF-3	-3
RP-J107	J107 - BOYS LOCKER ROOM	16,000	18802	1106	1.25	1	160	130	70	17	8 5/8"	5"	3	WALL	96	WHITE	RUNTAL R3F-3	-3

- MECHANICAL NOTES:
- FINISH WITH GLOSS POWER COAT FINISH.
 - FINISH HOT WATER CONVECTOR WITH NECESSARY TRIM AND SUPPORTS FOR CONTINUOUS LOOK.
 - MANUFACTURER IS TO FIELD MEASURE AND DESIGN CONVECTORS FOR AN AS TIGHT OF FIT IN SPACES AS POSSIBLE.

FINNED TUBE RADIATOR SCHEDULE

UNIT IDENTIFICATION		UNIT CAPACITY (BTU/H)	CAPACITY PER FOOT (BTU/LF)	GPM	EWT (°F)	LWT (°F)	ENTERING AIR DB (°F)	FINNED TUBE DATA				ENCLOSURE DATA			BASIS OF DESIGN	NOTES	
MARK	AREA SERVED							FINNED LENGTH (FT)	ROWS	FIN SIZE L X H (IN)	FINS PER FOOT	TUBE SIZE (IN)	MTG TYPE	MTG HEIGHT (IN)			FINISH
FTR-H101	H148 - BOILER ROOM	9704	1213	0.65	160	130	70	8	2	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S20	1-3
FTR-H102	H156 - STORAGE	4746	791	0.32	160	130	70	6	1	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S14	1-3
FTR-H103	H154 - ELEC	6328	791	0.42	160	130	70	8	1	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S14	1-3
FTR-H104	H122A - ELEC	2373	791	0.16	160	130	70	3	1	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S14	1-3
FTR-H201	H201 - STORAGE	12130	1213	0.81	160	130	70	10	2	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S20	1-3
FTR-H202	H213 - STORAGE	4746	791	0.32	160	130	70	6	1	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S14	1-3
FTR-J201	J202 - STORAGE	7278	1213	0.49	160	130	70	6	2	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S20	1-3
FTR-J202	J204 - STORAGE	12130	1213	0.81	160	130	70	10	2	4 1/4" X 3 5/8"	50	3/4"	WALL	4	WHITE	STERLING JVB-S20	1-3

- MECHANICAL NOTES:
- <

ABBREVIATIONS

#	PHASE
2W	2-WIRE
3W	3-WIRE
4W	4-WIRE
A	AMPERE
AC	ABOVE COUNTER
AIC	AMPERE INTERRUPTING CAPACITY
AF	AMP FRAME (CIRCUIT BREAKER)
AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AUTHORITY HAVING JURISDICTION
AL	ALUMINUM
AWG	AMERICAN WIRE GAUGE
AP	ACCESS POINT FOR WIRELESS NETWORK
AT	ATMP TRIP (CIRCUIT BREAKER / FUSE)
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO-VIDEO
BAC	BUILDING AUTOMATION CONTRACTOR
BAS	BUILDING AUTOMATION SYSTEM
BFF	BELOW FINISHED FLOOR
BJ	BONDING JUMPER
BKR	BREAKER
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CB	CIRCUIT BREAKER
CATV	CABLE TELEVISION
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLS	CEILING
CR	CORD REEL
CSWK	CASEWORK
CU	COPPER
DB	DECIBEL
DC	DIRECT CURRENT
DC	DROP CORD
DDC	DIRECT DIGITAL CONTROLS (BMS)
DISC	DISCONNECT
DIV	SPECIFICATION DIVISION
DP	DISTRIBUTION PANELBOARD
DW	DISHWASHER
EA	EACH
EC	ELECTRICAL CONTRACTOR
ECS	EMERGENCY COMMUNICATIONS SYSTEM
ELEC	ELECTRIC / ELECTRICAL
EMD	ESTIMATED MAXIMUM DEMAND
EP	EXPLOSION PROOF
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EXISTING TO BE RELOCATED (ALSO RRR)
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH
EWC	ELECTRIC WATER COOLER
EXT	EXTERIOR
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FB	FLOOR BOX
FC	FOOT CANDLE
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FS	FLOW SWITCH
FSD	FIRE / SMOKE DAMPER
FT	FEET / FOOT
G	EQUIPMENT GROUNDING CONDUCTOR
GC	GC GENERAL CONTRACTOR
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	EQUIPMENT GROUNDING CONDUCTOR
HH	HANDHOLE
HDA	HAND-OFF-AUTO SELECTOR SWITCH
HP	HORSEPOWER
IC	INTERCOM
IG	ISOLATED GROUND
IN	INCH / INCHES
INT	INTERIOR
IT	INFORMATION TECHNOLOGY (TELECOM)
IO	INFORMATION (IT) OUTLET
JB	JUNCTION BOX
KAIC	THOUSAND AMPERE INTERRUPTING CURRENT
KV	KILOVOLT
KVA	KILOVOLT-AMPERES
KW	KILOWATT
LED	LIGHT-EMITTING DIODE
LM	LUMENS
LT	LIGHT
LTG	LIGHTING
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MLO	MAN LIFT ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MRTS	MOTOR RATED TOGGLE SWITCH
MPS	MOTORIZED (VIDEO) PROJECTION SCREEN
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE OVEN
N	NEUTRAL
NAC	NOTIFICATION APPLIANCE CIRCUIT (FA)
N.C.	NORMALLY CLOSED (WHEN DE-ENERGIZED)
N.O.	NORMAL OPEN (WHEN DE-ENERGIZED)
NEP	NAC EXTENDER PANEL (FA)
NF	NON-FUSED
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OCFCI	OWNER FURNISHED / CONTRACTOR INSTALLED OVERHEAD
OH	OVERHEAD
P	POLE / POLES
PA	PUBLIC ADDRESS
PB	PULL BOX
PH	PHASE
PIV	POST INDICATOR VALVE
PNL	PANEL
PWR	POWER
RECEP	RECEPTACLE
RRR	REMOVE AND REINSTALL
SCOR	SHORT CIRCUIT CURRENT RATING
SD	SMOKE DAMPER
SEC	SECONDARY
SIM	SIMILAR
SLC	SIGNALING LINE CIRCUIT (FA)
SPD	SURGE PROTECTION DEVICE
SPEC	SPECIFICATIONS
SWBD	SWITCHBOARD
TBB	TELECOM BONDING BACKBONE
TC	TIME CLOCK
TCC	TEMPERATURE CONTROL CONTRACTOR
TGB	TELECOM GROUNDING BUSBAR
TMSB	TELECOM MAIN GROUNDING BUSBAR
TO	TELECOM (IT) OUTLET
TR	TELECOM ROOM / TECH EQUIP ROOM
TS	TAMPER SWITCH
TV	TELEVISION (VIDEO DISPLAY)
TYP	TYPICAL
UG	UNDERGROUND
UGE	UNDERGROUND ELECTRICAL
UNO	UNLESS NOTED OTHERWISE
UON	UNLESS OTHERWISE NOTED
V	VOLT
VA	VOLT-AMPERE
VD	VIDEO DISPLAY (TV)
VFD	VARIABLE FREQUENCY DRIVE
VP	VIDEO PROJECTOR
W	WATTS
WA	(TELECOM) WORK AREA
W	WIRELESS (NETWORK) ACCESS POINT
WG	WIREGUARD
WP	WEATHER-PROOF (NEMA 3R)
XFMR	TRANSFORMER

NOTES

GENERAL ELECTRICAL NOTES

(TYPICAL ALL SHEETS)

- SEE SYMBOLS LEGEND THIS SHEET FOR MOUNTING HEIGHTS UNLESS NOTED OTHERWISE ON DRAWINGS. ALL MOUNTING HEIGHTS ARE TO CENTERLINE OF BOXES UNLESS NOTES OTHERWISE.
- PROVIDE BOX EXTENDER FOR FLUSH INSTALLATION OF DEVICES LOCATED IN ARCHITECTURAL CASEWORK THAT IS FLUSH WITH ADJACENT WALL (SUCH AS RECEPTABLES FOR GARBAGE DISPOSERS).
- DEVICES RECESSED IN MILLIONS: BACK BOXES TO BE RECESSED FOR FLUSH INSTALLATION OF DEVICE AND WALLPLATE. EXTEND CONCEALED CONDUIT IN MILLION UP TO WALL ABOVE AND STUB OUT ABOVE ACCESSIBLE CEILING. IN AREAS WITH NO CEILING, EXTEND CONDUIT TOWARDS CABLING SOURCE TO ABOVE NEAREST ACCESSIBLE CEILING.
- ALL PENETRATIONS OF FIRE RATED FLOORS OR WALLS SHALL BE PROTECTED BY MATERIALS AND INSTALLATION DETAILS THAT CONFORM TO UNDERWRITER LABORATORIES LISTINGS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS. SUBMIT SHOP DRAWING DETAILS TO THE ARCHITECT/ENGINEER SHOWING COMPLETE CONFORMANCE. THESE DRAWINGS SHALL BE SPECIFIC FOR EACH PENETRATION WILL ALL VARIABLE DEFINED, AND SHALL BE AVAILABLE AT THE JOB SITE FOR REVIEW BY ENFORCING AUTHORITY INSPECTORS.
- PROVIDE ROUGH-IN WORK TO ACCOMMODATE WALL-MOUNTED TEMPERATURE SENSORS, CO2 SENSORS, CO SENSORS, HUMIDISTATS, THERMOSTATS, AND OTHER WIRED DEVICES SHOWN ON THE MECHANICAL PLANS. REFER TO THE MECHANICAL SYMBOLS LIST TO IDENTIFY THESE ITEMS. INSTALL A DOUBLE-GANG J-BOX WITH A SINGLE-GANG PLASTER RING AT 42" AFF, UNLESS OTHERWISE NOTED ON THE MECHANICAL PLANS. ROUTE 3/4" CONDUIT STUBBED OUT TO ABOVE ACCESSIBLE CEILING WITH A NYLON BUSHING AND A PULL STRING. COORDINATE WITH MC EXACT REQUIREMENTS AND SCOPE OF WORK PRIOR TO SUBMITTING BID.

GENERAL POWER NOTES

(TYPICAL ALL POWER SHEETS)

- ELECTRICAL INSTALLATIONS SHALL NOT HINDER THE REGULAR MAINTENANCE OF OR REPLACEMENT OF MECHANICAL UNITS. CONTRACTORS SHALL COORDINATE PRIOR TO INSTALLATION. ELECTRICAL EQUIPMENT AND CONDUIT SHALL NOT BE INSTALLED BENEATH SUSPENDED MECHANICAL UNITS.
- PROVIDE DEDICATED 120-VOLT CIRCUITS TO ALL HVAC BAS CONTROL DEVICES AND PANELS. COORDINATE QUANTITY WITH DIVISION 23. UTILIZE NEAREST SPARE 120-VOLT, 201 BREAKER. LABEL TYPED PANEL DIRECTORY ACCORDING TO LOAD BEING SERVED.
- IN ADDITION TO DEVICES SHOWN, SEE SCHEDULE SHEETS FOR CONNECTIONS TO ALL MECHANICAL EQUIPMENT.
- PROVIDE #10AWG CONDUCTORS FOR ALL HAND DRYER CIRCUITS. PROVIDE LOCKOUT DEVICE AT ALL BREAKERS SERVING HAND DRYERS.
- SEE ARCHITECTURAL CASEWORK ELEVATIONS FOR ADDITIONAL INFORMATION REGARDING THE MOUNTING OF WIRING DEVICES LOCATED IN OR NEAR CASEWORK. COORDINATE EXACT LOCATIONS PRIOR TO PERFORMING ROUGH-IN WORK.
- REFER TO THE SCHEDULE SHEETS FOR ELECTRICAL PROVISIONS AND CONNECTIONS ASSOCIATED WITH MECHANICAL EQUIPMENT AND OTHER EQUIPMENT FURNISHED BY OTHER CONTRACTORS. COORDINATE EXACT REQUIREMENTS WITH CONTRACTORS SUPPLYING AND INSTALLATION SUCH EQUIPMENT.
- VERIFY WHETHER NEUTRAL WIRES ARE REQUIRED FOR ACTUAL EQUIPMENT INSTALLED. IF REQUIRED, PROVIDE NEUTRAL WIRE IN THIS CONTRACT.
- THE BRANCH CIRCUIT WIRING RATING SHALL MATCH THE RATING OF THE OVERCURRENT PROTECTION DEVICE, UNLESS SPECIFICALLY INDICATED OTHERWISE, IN ACCORDANCE WITH THE FEEDER AND BRANCH CIRCUIT SCHEDULE.
- COORDINATE ROUGH-IN AND VOLTAGE REQUIREMENTS FOR DOOR HOLD-OPEN DEVICES FURNISHED UNDER DIVISION 8. PROVIDE BOTH POWER, FIRE ALARM CONNECTIONS, AND OTHER PROVISIONS AS REQUIRED FOR OPERATION IN ACCORDANCE WITH THE FIRE ALARM OPERATION MANUAL. CONNECT TO BRANCH CIRCUIT 1 FOR 120V POWER AS INDICATED ON THE PANEL SCHEDULE SERVING THE AREA. SEE DETAILS.

GENERAL SYSTEMS NOTES

DIVISION 28 WORK

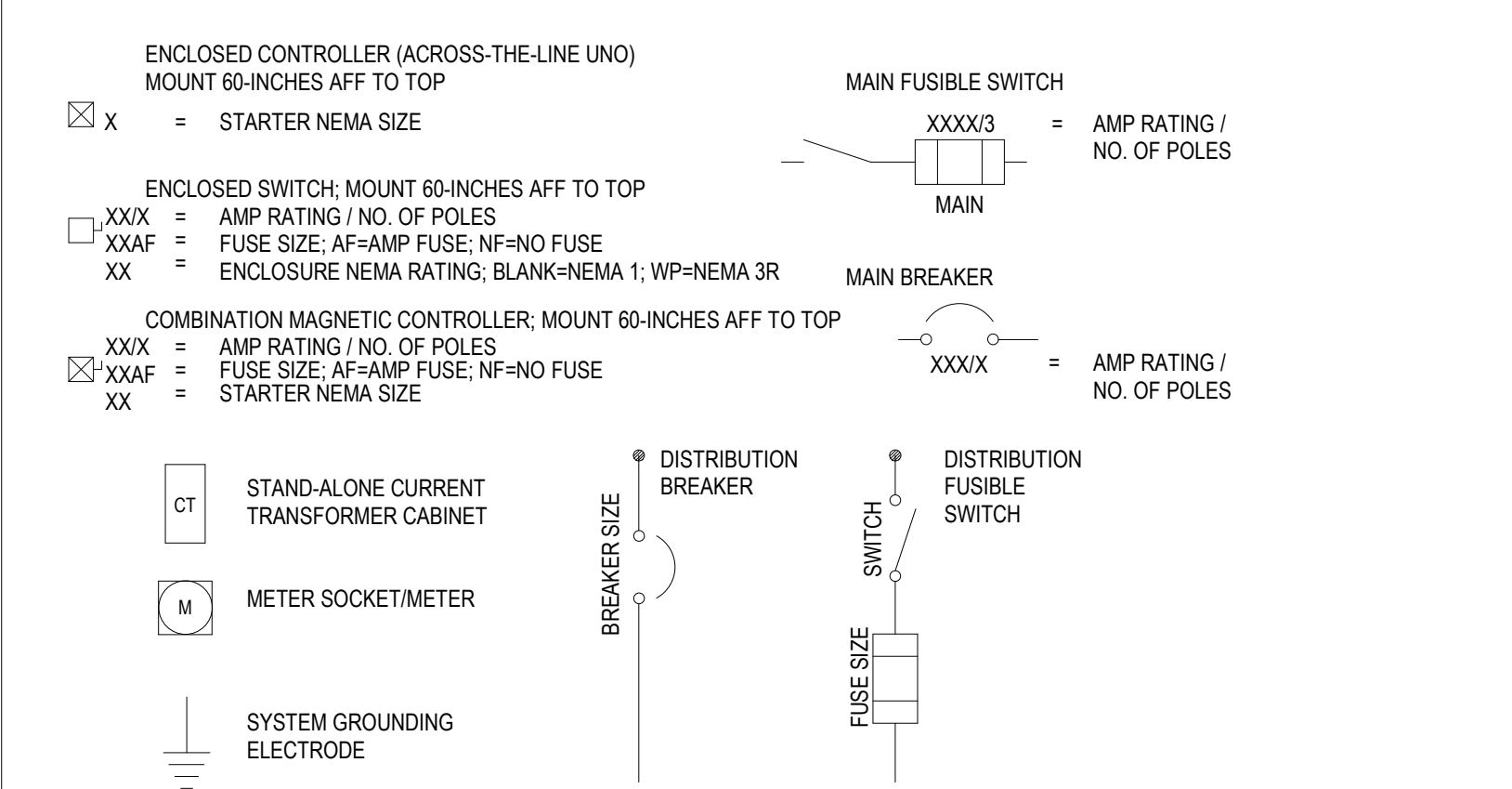
(TYPICAL ALL SPECIAL SYSTEMS SHEETS)

- IN ADDITION TO DEVICES SHOWN, SEE SCHEDULE SHEETS FOR FIRE ALARM SYSTEM DEVICES CONNECTIONS TO MECHANICAL EQUIPMENT.
- PROVIDE FIRE ALARM MONITORING OF ALL FLOW AND TAMPER SWITCHES. CONFIRM QUANTITIES AND LOCATION WITH DIVISION 21.
- UTILIZE SLEEVES AND FIRE RATED SLEEVES AT RATED WALLS PROVIDED UNDER DIVISION 26 FOR INSTALLATION OF ALL LOW VOLTAGE CABLING. FOLLOW INDUSTRY STANDARDS TO MAINTAIN 40% FILL REQUIREMENTS IN ALL SLEEVES (SUPERSEDES NEG. DO NOT FILL SLEEVES TO CAPACITY). PROVIDE ADDITIONAL SLEEVES MEETING DIVISION 26 REQUIREMENTS AS REQUIRED.
- PROVIDE DUCT-TYPE SMOKE DETECTORS FOR AIR-HANDLING EQUIPMENT AS SPECIFIED ON THE MECHANICAL EQUIPMENT ELECTRICAL CONNECTIONS SCHEDULES. DUCT-TYPE SMOKE DETECTORS ARE NOT SHOWN ON THE PLANS. SEE CONNECTIONS SCHEDULES LEGEND FOR REQUIREMENTS, INCLUDING PLACEMENT, DETERMINE QUANTITY AND PLACEMENT OF DETECTORS REQUIRED FOR COVERAGE OF DUCTWORK BASED ON NFPA REQUIREMENTS. PROVIDE MECHANICAL EQUIPMENT FAN SHUTDOWN RELAY AT ALL DUCT DETECTORS. SEE HVAC PLANS FOR EQUIPMENT LOCATIONS, COORDINATE SHUTDOWN CONTROL WITH DIVISION 23.
- FIRE-SMOKE DAMPERS: PROVIDE FIRE ALARM CONNECTION AND 120-VOLT POWER TO EACH FIRE/SMOKE DAMPER SHOWN ON HVAC PLANS. PROVIDE DEDICATED CIRCUIT TO DAMPERS, ROUTED THROUGH NORMALLY OPEN FIRE ALARM RELAY. MOUNTED ON WALL IN NEAREST ELECTRICAL ROOM. COORDINATE WITH DAMPER MANUFACTURER FOR SPECIFIC DAMPER LOAD REQUIREMENTS. RELAY SHALL BE CONTROLLED BY FACP. SUCH THAT, ON GENERAL ALARM DAMPERS ARE DEENERGIZED AND CLOSE. FIRE ALARM CONNECTION TO DAMPER SHALL BE A SUPERVISORY CIRCUIT MONITORING STATUS OF INTEGRAL SMOKE DETECTOR, AND SHALL PROVIDE REMOTE FIRE/SMOKE DAMPER RESET. FACP SHALL INITIATE A SUPERVISORY SIGNAL WHEN INTEGRAL DETECTOR GOES INTO ALARM. FIRE/SMOKE DAMPERS MAY BE GROUPED TOGETHER ON SUPERVISORY CIRCUITS TO SIMPLIFY WIRING. COORDINATE REQUIREMENTS WITH FIRE/SMOKE DAMPER MANUFACTURER. UTILIZE SPARE 201 BREAKERS. LABEL TYPED PANEL DIRECTORY FIRE/SMOKE DAMPERS (INDICATE AREA SERVED).
- FIRE ALARM CABLING SHALL NOT BE INSTALLED IN A CABLE TRAY WITH OTHER COMMUNICATIONS CABLING. FIRE ALARM CABLING SHALL BE SUPPORTED SEPARATELY AND INDEPENDENTLY USING CABLE HOOKS OR CONDUIT IN ACCORDANCE WITH THE SPECIFICATIONS. UTILIZE J-HOOKS ROUTED ALONG WALL JUST ABOVE OR ALONG THE SIDE OF CABLE TRAY FOR PRIMARY CORRIDOR FIRE ALARM CABLE SLCs AND NACs.

SYMBOLS

POWER	
	CIRCUIT HOME RUN
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	CONDUIT STUB-UP
	CONDUIT SLEEVE, (1) 3/4". UNLESS NOTED OTHERWISE
	CONDUIT SEAL
	CONDUIT CONCEALED IN CEILING, WALLS, IN FLOOR OR UNDERGROUND, POWER
	CONDUIT CONCEALED IN FLOOR OR UNDERGROUND, OTHER (* = SEE ABBREVIATIONS)
	EXPOSED CONDUIT, POWER
	EXPOSED CONDUIT, OTHER (* = SEE ABBREVIATIONS)
	TRANSFORMER
	BRANCH CIRCUIT PANELBOARD MOUNT 72-INCHES TO TOP
	DISTRIBUTION PANELBOARD MOUNT 72-INCHES TO TOP
	CONTROL PANEL MOUNT 72-INCHES TO TOP
	EQUIPMENT CABINET, AS NOTED
	SWITCHBOARD
	CURRENT TRANSFORMER ENCLOSURE
	METER
	GENERATOR
	GENERATOR ANNUNCIATOR PANEL
	AUTOMATIC TRANSFER SWITCH
	SYSTEM GROUND ELECTRODE
	MUSHROOM PUSHBUTTON CONTROL SWITCH
	ELECTRICAL MANHOLE
	ELECTRICAL HAND HOLE
	MANUAL CONTROLLER WITH THERMAL OVERLOAD
	MANUAL CONTROLLER W/O THERMAL OVERLOAD
	CIRCUIT BREAKER ENCLOSURE
	PULL BOX
	EQUIPMENT CONNECTION
	CABLE TRAY, POWER
	MULTI-OUTLET ASSEMBLIES MOUNT 18-INCHES AFF, UNO WHERE DENOTED 'AC', MOUNT ABOVE COUNTER
	RECEPTABLES: MOUNT 18-INCHES AFF, UNO
	DIAGONAL LINE THROUGH SYMBOL OR DENOTED 'AC' EQUALS MOUNT DEVICE ABOVE COUNTER. WHERE INDICATED AS 'MOUNT ABOVE COUNTER' MOUNT BOTTOM OF BOX 2-INCHES ABOVE TOP OF BACKSPLASH OR 6-INCHES ABOVE COUNTER TOP IF NO BACKSPLASH EXISTS.
	LABELS SHALL BE MACHINE PRINTED, UNO
	SIMPLEX RECEPTACLE
	DUPLEX RECEPTACLE
	DUPLEX RECEPTACLE, GFI TYPE
	DUPLEX RECEPTACLE, MOUNT ABOVE COUNTER
	DUPLEX RECEPTACLE, GFI TYPE, MOUNT ABOVE COUNTER
	FOURPLEX RECEPTACLE
	FOURPLEX RECEPTACLE, GFI TYPE
	FOURPLEX RECEPTACLE, MOUNT ABOVE COUNTER
	FOURPLEX RECEPTACLE, GFI TYPE, MOUNT ABOVE COUNTER
	DUPLEX RECEPTACLE, FLUSH IN CEILING
	DUPLEX RECEPTACLE, HORIZ. MTD. GFI TYPE
	DUPLEX RECEPTACLE, HORIZ. MTD. ABOVE COUNTER
	DUPLEX RECEPTACLE, HORIZ. MTD. GFI TYPE, MOUNT ABOVE COUNTER
	WEATHER RESISTANT GFI DUPLEX RECEPTACLE, MOUNT 18-INCHES AFF WITH A WEATHERPROOF, WEATHERPROOF WHILE IN USE COVER
	STD DUPLEX RECEPTACLE TO SERVE ELECTRIC WATER COOLER, MOUNT AT HEIGHT PER EQUIPMENT MANUFACTURER'S INSTALLATION GUIDELINES. CIRCUIT TO GFCI BKR IN PANELBOARD.
	DUPLEX RECEPTACLE TO SERVE VIDEO DISPLAY. PROVIDE BOXES PER DETAILS ON ES-2, POSITION 66" AFF, UNLESS SPECIFICALLY DENOTED OTHERWISE.
	RANGE RECEPTACLE, NEMA 14-50R, MOUNT 8-INCHES AFF
	SPECIAL RECEPTACLE, DEEP WELL BOX
	FLUSH FLOOR OUTLET BOX UNO
	FLUSH FLOOR BOX WITH DUPLEX RECEPTACLE UNO
	MULTI-DEVICE FLOOR BOX WITH DUPLEX RECEPTACLE AND TELECOMMUNICATIONS OUTLETS
	USB ONLY RECEPTACLE
	RECEPTACLE WITH USB PORTS
	FLUSH JUNCTION BOX, CEILING MOUNTED
	CEILING JUNCTION BOX WITH DROP CORD ATTACHED. SEE DETAILS FOR MOUNTING PROVISIONS.
	JUNCTION BOX ABOVE ACCESSIBLE CEILING W/ FLEX CONNECTION
	FLUSH JUNCTION BOX, WALL MOUNTED
	SURFACE JUNCTION BOX, WALL MOUNTED
	SURFACE JUNCTION BOX INSTALL ABOVE ACCESSIBLE CEILING WHERE APPLICABLE

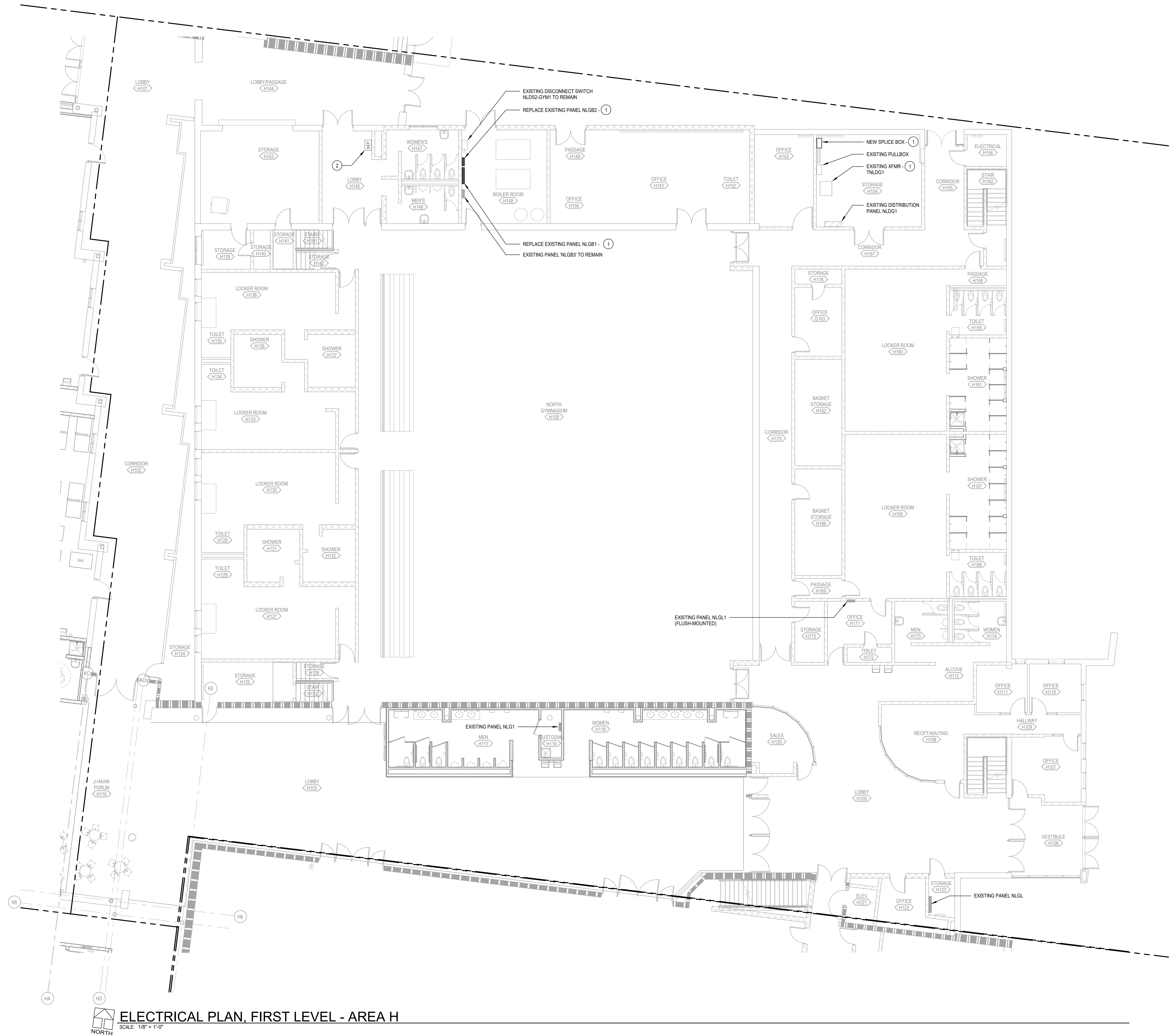
ONE-LINE DIAGRAM



SAFETY

	FIRE ALARM CONTROL PANEL MOUNT CENTER OF DISPLAY 54-INCHES AFF
	FIRE ALARM ANNUNCIATOR PANEL MOUNT CENTER OF DISPLAY 54-INCHES AFF
	FIRE ALARM AV DEVICES: MOUNT 94-INCHES AFF, OR 6-INCHES BELOW CEILING, WHICHEVER IS HIGHER, UNO
	# INDICATES MINIMUM CANDELA RATING
	FIRE ALARM HORN
	FIRE ALARM VISUAL WARNING SIGNAL
	FIRE ALARM BELL WITH VISUAL WARNING SIGNAL
	FIRE ALARM HORN WITH VISUAL WARNING SIGNAL
	MINI FIRE ALARM HORN WITH VISUAL WARNING SIGNAL
	FIRE ALARM SPEAKER WITH VISUAL WARNING SIGNAL
	FIRE ALARM SPEAKER, FLUSH IN CEILING
	FIRE ALARM SPEAKER WITH VISUAL WARNING SIGNAL, CEILING OR SUSPENDED WHERE NO CEILING EXISTS, PROVIDE SURFACE MOUNT ENCLOSURE WHERE EXPOSED STRUCTURE.
	FIRE ALARM VISUAL WARNING SIGNAL, CEILING
	FIRE ALARM LOCAL OPERATOR'S CONSOLE MOUNT CENTER OF DISPLAY 54-INCHES AFF
	DUAL PATH IP CELLULAR COMMUNICATOR
	MANUAL FIRE ALARM PULL STATION MOUNT 42-INCHES AFF
	SPRINKLER SYSTEMS ELECTRIC BELL ALARM
	FIRE ALARM MAGNETIC DOOR HOLDER MOUNT 74-INCHES AFF
	OS&Y VALVE
	WATER FLOW ALARM SWITCH
	TAMPER SWITCH
	FIRE FIGHTERS TELEPHONE MOUNT 54-INCHES AFF
	SMOKE DETECTOR - PHOTOELECTRIC TYPE (D = DUCT)
	SMOKE DETECTOR - PHOTOELECTRIC TYPE
	DETECTOR - PHOTOELECTRIC TYPE
	HEAT DETECTOR RATE-OF-RISE AND FIXED TEMPERATURE, 135°F
	HEAT DETECTOR, FIXED TEMPERATURE ONLY, 200°F

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ELECTRICAL PLAN, FIRST LEVEL - AREA H

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

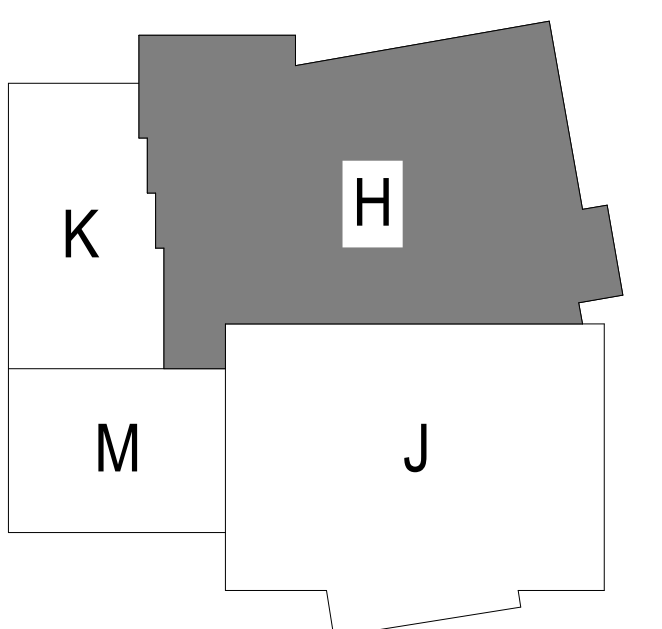
LEGEND NOTES

KEYED NOTES

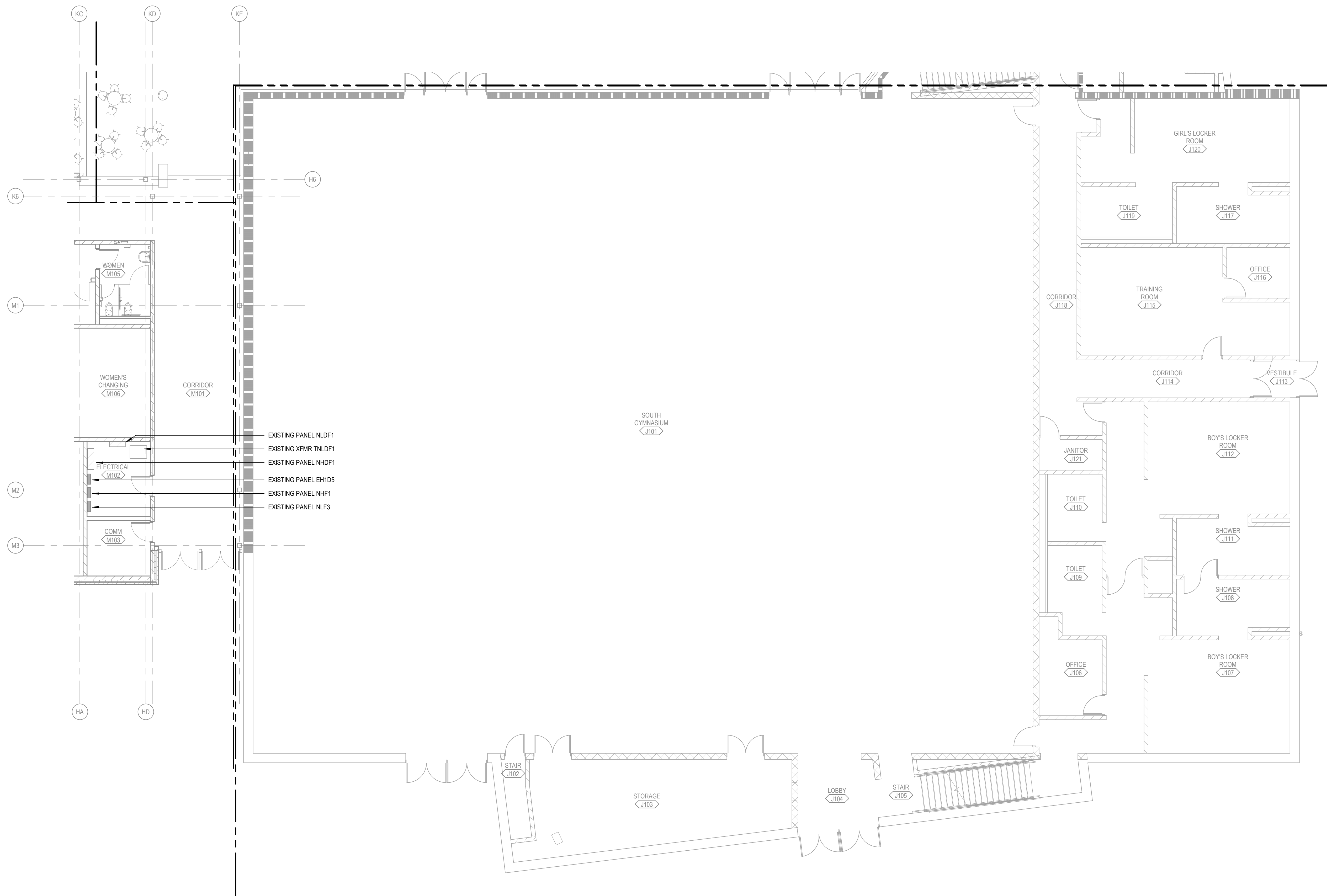
(TYPICAL FOR ALL ELECTRICAL PLANS.)

1. SEE ONE-LINE DIAGRAM FOR NEW WORK ASSOCIATED WITH EXISTING POWER DISTRIBUTION EQUIPMENT.
2. LOCATION OF EXISTING FIRE ALARM NAC EXTERIOR PANEL (NEP). SEE ELECTRICAL OVERALL PLAN FIRST LEVEL ON SHEET E4.1 FOR LOCATION OF MAIN FIRE ALARM CONTROL PANEL.
3. EXTEND EXISTING FIRE ALARM SYSTEM FOR NEW DUCT-TYPE SMOKE DETECTORS AND HVAC UNIT SHUTDOWN FUNCTIONS. SEE ELECTRICAL CONNECTIONS SCHEDULES, SPECIFICATIONS, AND FIRE ALARM OPERATIONS MATRIX.
4. SPAN HORIZONTAL STRUCTURAL BEAM ABOVE AND CONCRETE CURB BELOW WITH CHANNEL SUPPORTS (UNISTRUT) SIZED TO SECURELY MOUNT PANEL.

KEY PLAN



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ELECTRICAL PLAN, FIRST LEVEL - AREA J

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

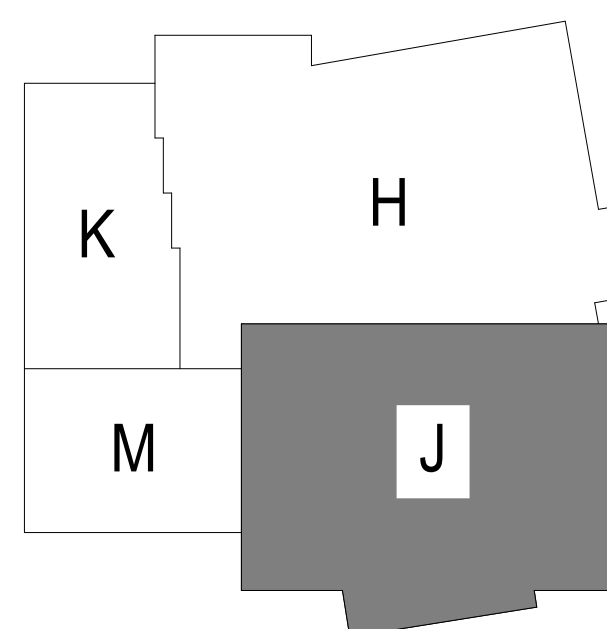
LEGEND NOTES

KEYED NOTES

(TYPICAL FOR ALL ELECTRICAL PLANS.)

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2. LOCATION OF EXISTING FIRE ALARM NAC EXTERDOR PANEL (NEP). SEE ELECTRICAL OVERALL PLAN, FIRST LEVEL, ON SHEET E4.1 FOR LOCATION OF MAIN FIRE ALARM CONTROL PANEL.
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KEY PLAN



URBANDALE HS - HVAC RENOVATION

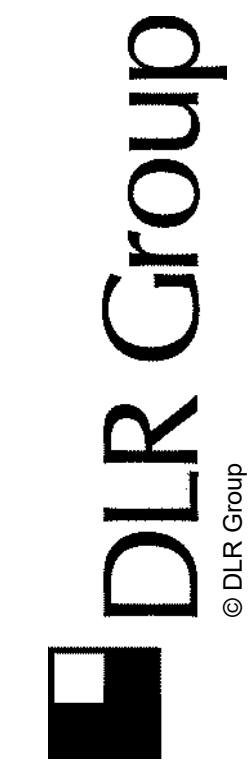
7111 Aurora Ave.
Urbandale, IA 50322

DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20
ELECTRICAL
PLAN, FIRST
LEVEL - AREA J

E1.1J

NOT FOR
CONSTRUCTION



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ELECTRICAL PLAN, SECOND LEVEL - AREA H

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

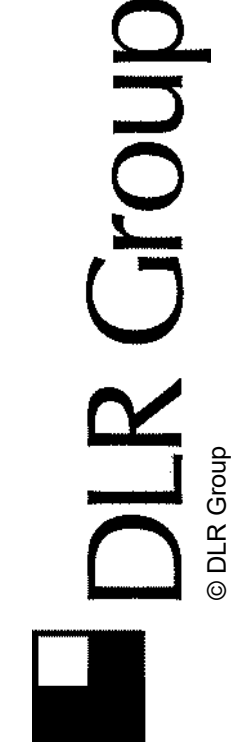
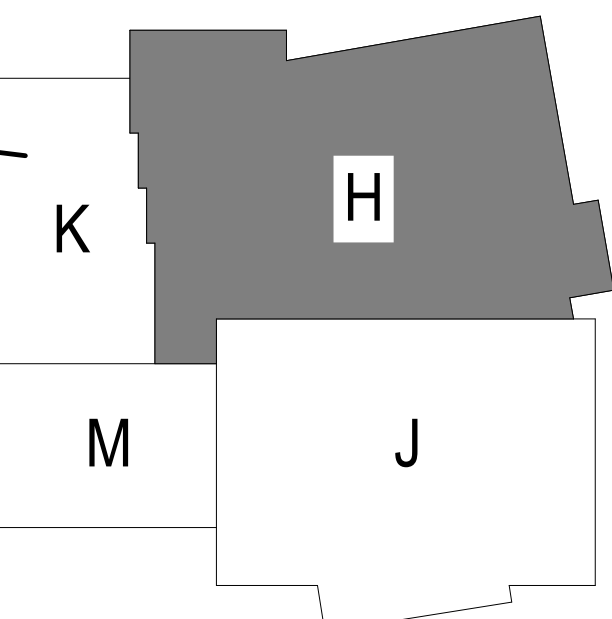
LEGEND NOTES

KEYED NOTES

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KEY PLAN



NOT FOR CONSTRUCTION

URBANDALE HS - HVAC RENOVATION

7111 Aurora Ave.
Urbandale, IA 50322

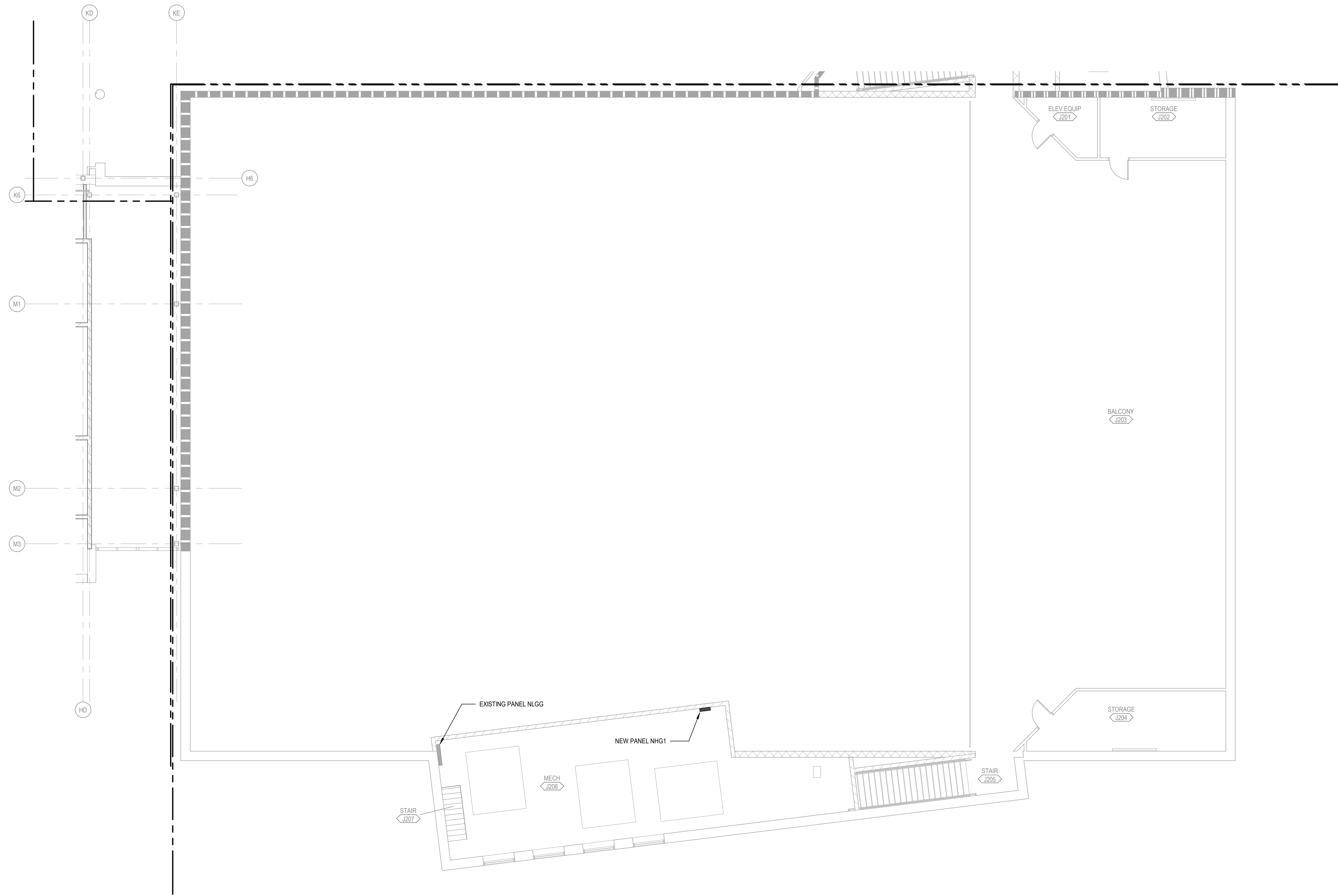
DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20
ELECTRICAL
PLAN, SECOND
LEVEL - AREA H

E1.2H



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

ELECTRICAL PLAN, SECOND LEVEL - AREA J

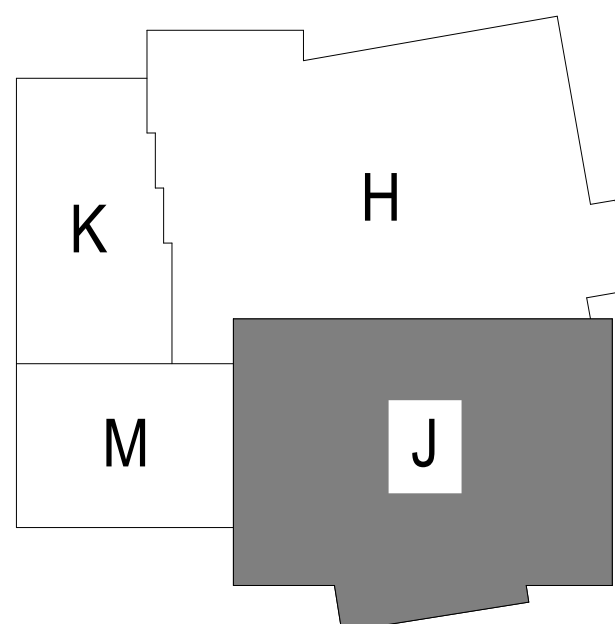
LEGEND NOTES

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KEY PLAN



URBANDALE HS - HVAC RENOVATION

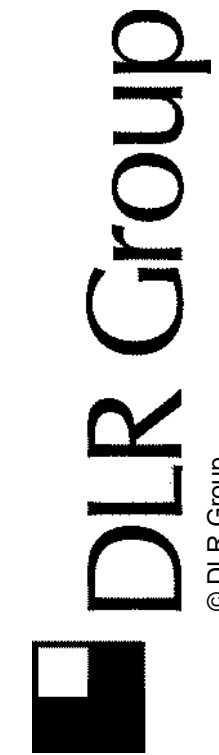
7111 Aurora Ave.
Urbandale IA 50322

DESIGN
DEVELOPMENT
03-20-2019
Revisions

11-18101-20
ELECTRICAL
PLAN, SECOND
LEVEL - AREA J

E1.2J

NOT FOR
CONSTRUCTION





QUICK REFERENCE KEY

NHDG1	NHG1
LGB1(B)	NLGB2

[illegible][illegible][illegible]

PANEL NLGB1 (B)

AMP MAIN BRK:

AMP MCO: 400

LOCATION: H148

VOLTS: 208 V/

120

PH: 3-Phase

R: 4-Wire

CIRCUIT DESCRIPTION

LOAD VA

QWT BRK

P

QWT A

SCRS

10,000

P

QWT BRK

LOAD VA

(EXISTING BRANCH CIRCUIT)

20

1

45

A

44

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

45

B

46

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

47

C

48

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

49

A

50

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

51

B

52

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

53

C

54

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

55

A

56

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

57

B

58

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

59

C

60

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

61

A

62

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

63

B

64

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

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66

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20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

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A

68

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20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

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69

B

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(EXISTING BRANCH CIRCUIT)

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C

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(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

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(EXISTING BRANCH CIRCUIT)

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B

76

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(EXISTING BRANCH CIRCUIT)

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78

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(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

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79

A

80

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

81

B

82

1

20

(EXISTING BRANCH CIRCUIT)

(EXISTING BRANCH CIRCUIT)

20

1

83

C

84

1

20

(EXISTING BRANCH CIRCUIT)

PANEL: NLGB2

AMP MAIN BRKR:

LOCATION: H148

VOLTS

208 V/

120

PH: 3-Phase

W: 4-Wire

AMP M.C.B. 400

10,000

SCCR

MOUNT: SURFACE

FEED FROM: NLGB1 (A)

CIRCUIT DESCRIPTION	LOAD VA	OKT BRK	F	OKR	P	H	OKT BRK	LOAD VA	CIRCUIT DESCRIPTION
(EXISTING BRANCH CIRCUIT)		20	1	A	2	1	20		(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	3	B	4	1	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	5	C	6	1	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	7	A	8	1	15	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	9	B	10	1	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	11	C	12	1	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	13	A	14	1	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	15	B	16	2	20	(EXISTING BRANCH CIRCUIT - 208V 3PH)
(EXISTING BRANCH CIRCUIT)		20	1	17	C	18	*	*	(EXISTING BRANCH CIRCUIT - 208V 3PH)
(EXISTING BRANCH CIRCUIT)		20	1	19	A	20	2	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	21	B	22	*	*	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	23	A	24	1	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	25	B	26	1	20	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT)		20	1	27	A	28	2	20	(EXISTING BRANCH CIRCUIT - 208V 3PH)
(EXISTING BRANCH CIRCUIT)		20	1	29	C	30	*	*	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT) #1		30	*	31	A	32	3	30	(EXISTING PUMP #1)
*		*	*	33	B	34	*	*	(EXISTING BRANCH CIRCUIT)
*		*	*	35	C	36	*	*	(EXISTING BRANCH CIRCUIT)
(EXISTING BRANCH CIRCUIT) #2		30	*	37	A	38	3	30	(EXISTING PUMP #2)
*		*	*	39	B	40	*	*	(EXISTING BRANCH CIRCUIT)
*		*	*	41	C	42	*	*	(EXISTING BRANCH CIRCUIT)

LOAD SUMMARY:

CONNECTED

FEEDER / SERVICE CALCULATION

LIGHTING	0.00 KVA	0.00 KVA (100%)
LARGEST MOTOR	0.00 KVA	0.00 KVA (100%)
MOTORS	0.00 KVA	0.00 KVA (100%)
KITCHEN EQUIPMENT	0.00 KVA	0.00 KVA (100% + 100% REMAIN @ 50%)
ELECTRONIC LOADS	0.00 KVA	0.00 KVA (100%)
ELECTRIC HEATING	0.00 KVA	0.00 KVA (100%)
MISC.	0.00 KVA	0.00 KVA (100%)
TOTALS	0 KVA 0 AMPS	0 KVA 0 AMPS 0 A

NOTES:

1. REPLACE EXISTING PANEL AT SAME LOCATION AND RECONNECT EXISTING CIRCUITS THAT REMAIN.

2. 20-A - 20A GFCI BREAKER TO BE PROVIDED IF LOAD SERVED REQUIRES GFCI PROTECTION.

3. IDENTIFY BREAKERS AS "SHARED" WHERE NO BRANCH CIRCUIT EXISTS.

4. BREAKERS SERVING LOADS WITH HERMETIC MOTORS (COMPRESSORS, ETC) SHALL BE HACR TYPE.

5. FIELD-VERIFY EXISTING LOADS TO DETERMINE PROPER BREAKER RATINGS PRIOR TO SHOP DRAWINGS.

WARNING LABEL (SEE SPEC.)

POTENTIAL FAULT CURRENT: 10,000 AMPERES

04-18-2019

10.2