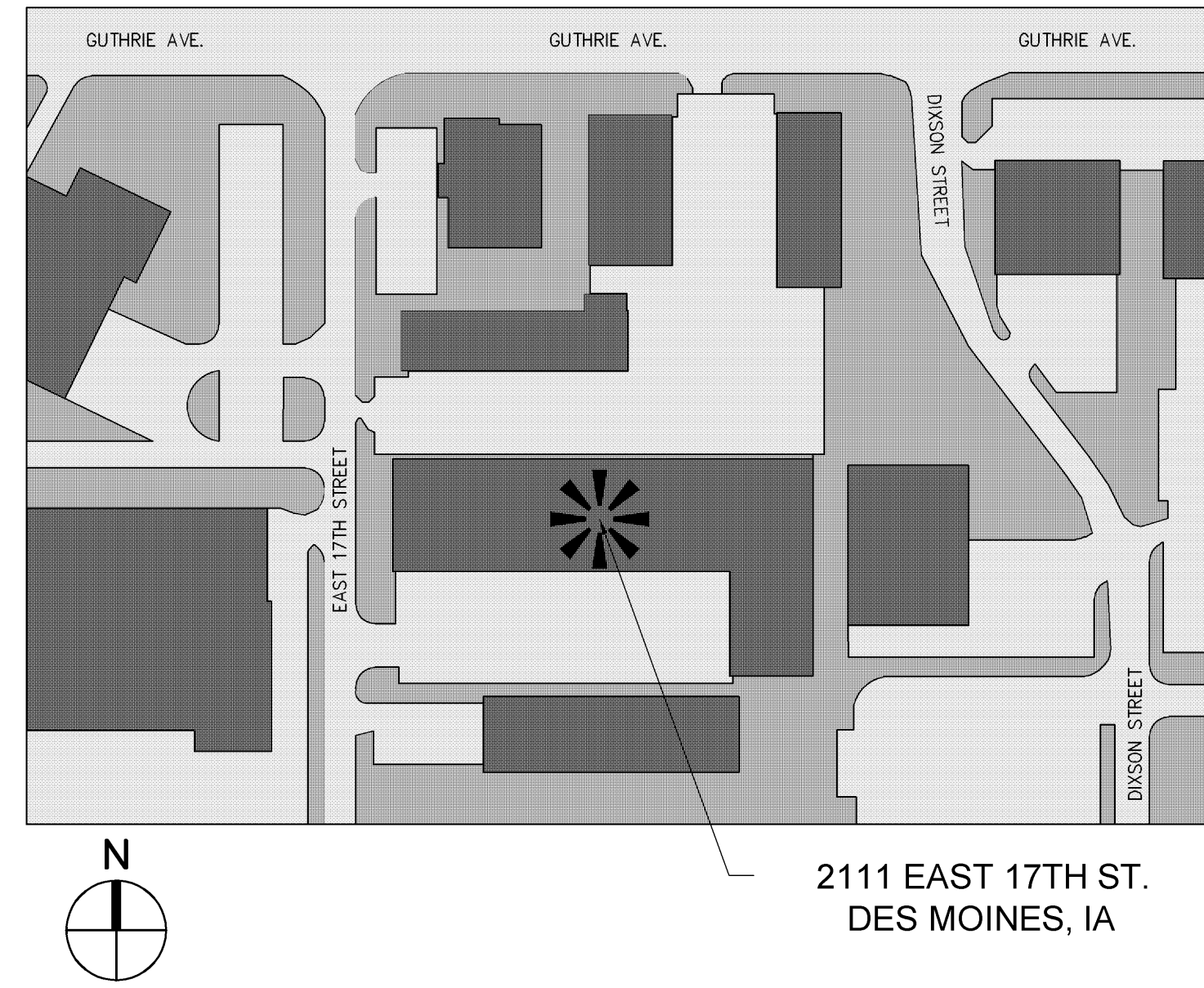


**PROJECT LOCATION MAP**



# KEMIN PILOT PLANT

## 2111 EAST 17TH ST. DES MOINES, IA

**INDEX OF DRAWINGS**

**GENERAL**

- G0.00 COVER SHEET, INDEX & GENERAL INFORMATION
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- A1.00 ORIENTATION PLAN
- A1.01 MAIN LEVEL - DEMOLITION AND MAIN LEVEL FLOOR PLANS
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**MECHANICAL / PLUMBING**

- P1.01 MAIN LEVEL PLUMBING DEMOLITION AND NEW WORK FLOOR PLANS
- P5.01 PLUMBING DETAILS AND SCHEDULES
- P6.01 PLUMBING SYMBOLS AND SCHEDULES
- P6.02 PIPING AND INSTRUMENTATION DIAGRAM
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- M1.01 MAIN LEVEL MECHANICAL FLOOR PLAN AND SCHEDULES

**ELECTRICAL**

- E1.01 MAIN LEVEL ELECTRICAL LIGHTING AND POWER FLOOR PLANS
- E2.01 ELECTRICAL SCHEDULES AND DETAILS

**GENERAL INFORMATION**

**PROJECT SCOPE**

RENOVATION OF EXISTING SPACE TO PROVIDE FOR NEW PILOT PLANT.

TOTAL RENOVATION OF EXISTING SPACE = 4909 SQ.FT.

**CODE**

FOR CODE INFORMATION SEE SHEET G0.01 "CODE PLAN AND INFORMATION"

**CERTIFICATIONS**

**ARCHITECTURAL**

	I HEREBY CERTIFY THAT THE PORTION OF THIS TECHNICAL SUBMISSION DESCRIBED BELOW WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND RESPONSIBLE CHARGE. I AM A DULY REGISTERED ARCHITECT UNDER THE LAWS OF THE STATE OF IOWA.
	TODD C. WEHR <small>Printed or typed name</small>
	_____ <small>Signature</small>
	_____ <small>Date</small>
	Registration expires _____ Date issued _____ PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL: G0.00, G0.01, A1.00, A1.01, A2.01

**MECHANICAL / PLUMBING**

	I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT DESCRIBED BELOW WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.
	SIGNATURE: _____ NAME: CHARLES S. HELDENBRAND DATE: _____ LICENSE NUMBER: 13865 MY LICENSE RENEWAL DATE IS: DECEMBER 31, 2013 PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL: P1.01, P5.01, P6.01, P6.02, G1.12, M1.01
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KEMIN  
PILOT PLANT

2111 EAST 17TH ST  
DES MOINES, IA

DRAWN: BWB  
APPROVED: TCW  
ISSUED FOR: CONSTRUCTION DOCUMENT  
DATE: 06-08-2012  
FIELD BOOK

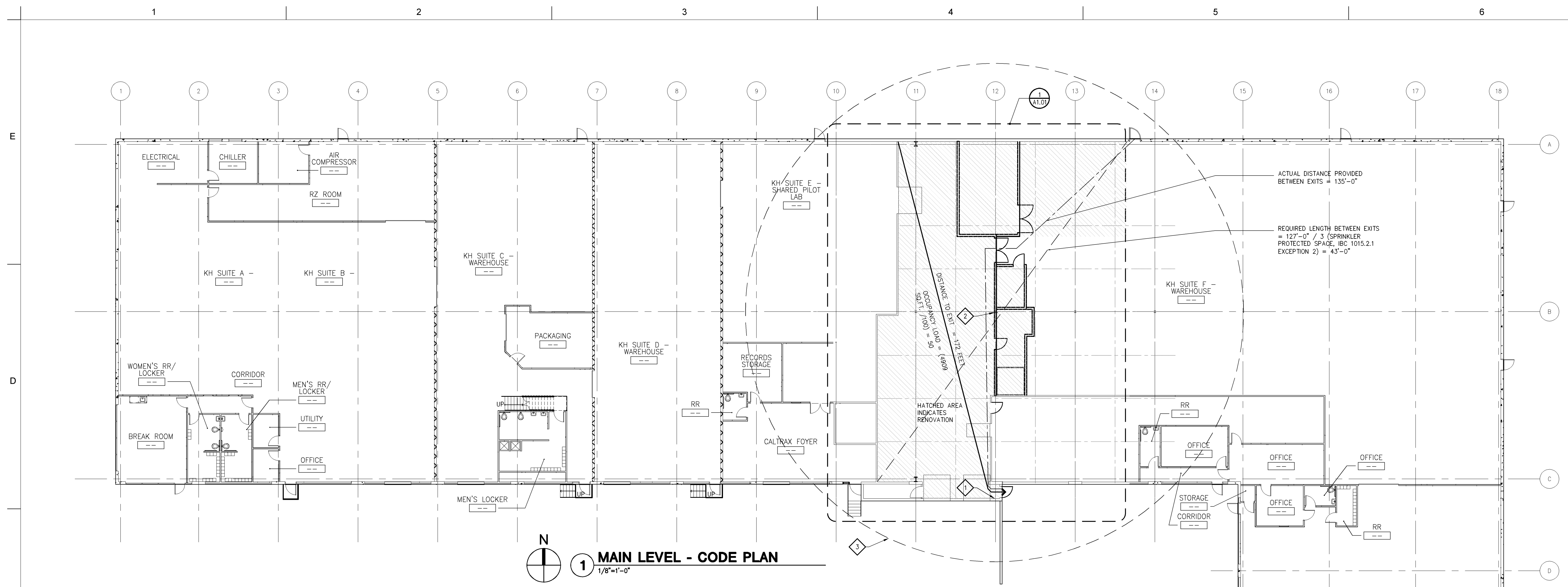
PROJECT NO.: 412128-0

COVER SHEET, INDEX &  
GENERAL INFORMATION

**G0.00**

**KEMIN  
PILOT PLANT**

2111 EAST 17TH ST  
DES MOINES, IA



**1 MAIN LEVEL - CODE PLAN**  
1/8"=1'-0"

**CODE**

**APPLICABLE CODES**

BUILDING CODE:	2006 IBC	MECHANICAL CODE:	2006 IMC
ENERGY CODE:	2006 IECC	PLUMBING CODE:	2006 UPC
ELECTRICAL CODE:	2005 NEC	FIRE CODE:	2009 NFPA
FUEL GAS CODE:	2006 IFGC		

**ARCHITECT:** TODD C. WEHR, AIA IOWA REGISTRATION NO. 5669  
**ENGINEER (STRUCTURAL):** N/A  
**ENGINEER (PLUMBING, MECHANICAL SYSTEMS):** CHARLES S. HELDENBRAND IOWA REGISTRATION NO. 13865  
**ENGINEER (ELECTRICAL):** NORMAN E. SUTTON IOWA REGISTRATION NO. 1679

**AUTOMATIC SPRINKLER SYSTEM:** TYPE NFPA 13 PROVIDED (EXISTING)  
**BUILDING TYPE:** IIB  
**TYPE OF CONSTRUCTION FOR NEW BUILDING:** N/A, ALL CONSTRUCTION IS WITHIN EXISTING BUILDING NO ADDITIONAL SQUARE FOOTAGE ADDED WITH PROJECT

**OCCUPANCY GROUPS:**  
 GROUP F-1 OCCUPANCY (EXISTING) UNKNOWN SQ. FT.  
 GROUP B OCCUPANCY (EXISTING) UNKNOWN SQ. FT.  
 GROUP F-1 (RENOVATED) 4538 SQ. FT.  
 NO SEPARATION REQUIRED FOR OCCUPANCY GROUPS.

**FLOORS, HEIGHTS, AND STORIES:**  
 TOTAL ALLOWABLE FLOORS = 2  
 ACTUAL FLOORS = 2 (EXISTING), 1 (AT RENOVATED AREA)  
 TOTAL ALLOWABLE HEIGHT = 55'-0"  
 TOTAL BUILDING HEIGHT IN FEET: UNKNOWN, EXISTING, NO ADDITIONAL HEIGHT TO BE ADDED

**TOTAL ALLOWABLE STORIES = TWO**  
 BUILDING HEIGHT IN STORIES = 1 (EXISTING), NO ADDITIONAL STORIES TO BE ADDED  
 ALLOWABLE SQUARE FOOTAGE PER FLOOR = 15,000 SQUARE FEET WITHOUT AREA MODIFICATION OR MODIFICATION FOR SPRINKLERS  
 TOTAL BUILDING PERIMETER: UNKNOWN, EXISTING

**BUILDING FRONTAGE:** NOT APPLICABLE/UNKNOWN. ALL CONSTRUCTION WITHIN EXISTING STRUCTURE.  
**ACTUAL BUILDING AREA:** NOT APPLICABLE/UNKNOWN. ALL CONSTRUCTION WITHIN EXISTING STRUCTURE. PROJECT WILL ADD

**BUILDING QUALIFIES FOR UNLIMITED AREA:**  
 OPEN YARD WIDTHS - NORTH: 60 FT, SOUTH: 60 FT, EAST: 60 FT, WEST: 60 FT.  
 REDUCED YARD WIDTHS - NOT APPLICABLE  
 FIRE RATING OF WALL - NOT APPLICABLE  
 PROVIDE RATED WALL ASSEMBLY - NOT APPLICABLE

**INCIDENTAL USE AREAS:** NOT APPLICABLE / EXISTING BUILDING  
**ACCESSORY USE AREAS:** NOT APPLICABLE / EXISTING BUILDING

**FIRE RESISTANT RATING REQUIREMENTS (IBC TABLE 601):**

	RATING REQUIRED	RATING PROVIDED
STRUCTURAL FRAME	0	0
BEARING WALLS (EXTERIOR)	0	0
BEARING WALLS (INTERIOR)	0	0
NON-BEARING WALLS (EXTERIOR)	0	0
NON-BEARING WALLS (INTERIOR)	0	0
FLOOR CONSTRUCTION	0	0
ROOF CONSTRUCTION	0	0

**FIRE RATING REQUIREMENTS PER IBC TABLE 602:**  
 RATED ASSEMBLIES REQUIREMENTS NOT APPLICABLE TO PROJECT WITHIN EXISTING STRUCTURE. EXISTING FIRE RESISTANT STRUCTURES NOT AFFECTED BY PROJECT.

**EXTERIOR WALL OPENING REQUIREMENTS PER IBC TABLE 602:**  
 NOT APPLICABLE TO PROJECT

**FIRE RESISTIVE ASSEMBLIES:** EXISTING FIRE AND RATED WALLS ARE NOT ALTERED BY PROJECT SCOPE THROUGH ADDITION OF SQUARE FOOTAGE OR OCCUPANCIES OR OTHER METHODS.  
 ANY EXISTING FIRE WALLS, FIRE BARRIERS, SHAFT ENCLOSURES, FIRE PARTITIONS, SMOKE PARTITIONS, SMOKE BARRIERS, OR HORIZONTAL ASSEMBLIES ARE OUTSIDE THE SCOPE OF THIS PROJECT.

**FIRE AREAS FOR NONSPRINKLED BUILDINGS:**  
 NO ALTERATION OF ANY EXISTING FIRE AREAS IS TO BE INCLUDED IN THE SCOPE OF THIS PROJECT.

**FIRE DEPARTMENT REQUIREMENTS:**  
 FIRE EXTINGUISHERS ARE PROVIDED IN AREA OF PROJECT SCOPE. ALL OTHER AREAS ARE TO REMAIN UNCHANGED WITH REGARD TO LOCATION AND NUMBER OF PROVIDED EXTINGUISHERS. SEE CODE PLAN 1/GO.01 FOR LOCATION OF FIRE EXTINGUISHERS IN PROJECT CONSTRUCTION AREA.

**HAZARD CLASS PER NFPA 10:** LOW  
 MAXIMUM FLOOR AREA PER EXTINGUISHER: 6,000 SQ.FT. (3,000 SQ.FT. PER UNIT OF "A" WITH A MINIMUM OF 2A REQUIRED FOR SINGLE EXTINGUISHER)

MAXIMUM FLOOR TRAVEL DISTANCE TO EXTINGUISHERS 75 FT.  
 MANUAL FIRE ALARM SYSTEM IS PROVIDED. SEE CODE PLAN 1/GO.01 FOR LOCATIONS

AUTOMATIC FIRE ALARM SYSTEM IS PROVIDED.

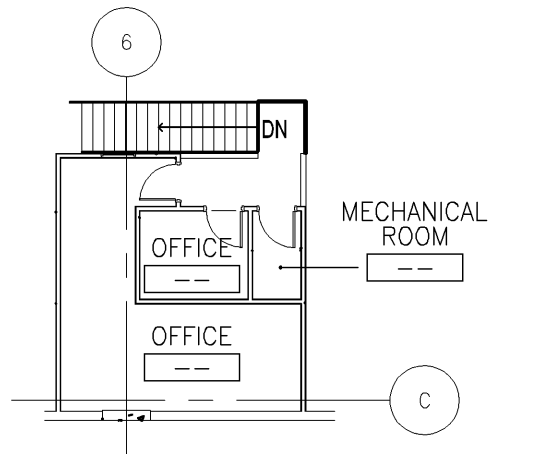
**APPROVED LOCK BOX:** TO BE AS EXISTING TO BUILDING

**FIRE DEPARTMENT CONNECTION:** TO BE AS EXISTING TO BUILDING.

**OCCUPANT LOAD AND EXITING (REMODELED AREA):**  
 OCCUPANCY = F1  
 AREA = 4583 SQ.FT.  
 OCCUPANT LOAD FACTOR = 100 GROSS

**TRAVEL AREAS AND DISTANCES:**  
 REMODELED AREA COMMON PATH OF TRAVEL 250 FT ALLOWED  
 REMODELED AREA COMMON PATH OF TRAVEL 172 FT PROVIDED  
 MAXIMUM TRAVEL DISTANCE = 172 FT  
 NUMBER OF EXITS REQUIRED = 2  
 DISTANCE BETWEEN EXITS REQUIRED = 43'-0"  
 DISTANCE BETWEEN EXITS PROVIDED = 135'-0"

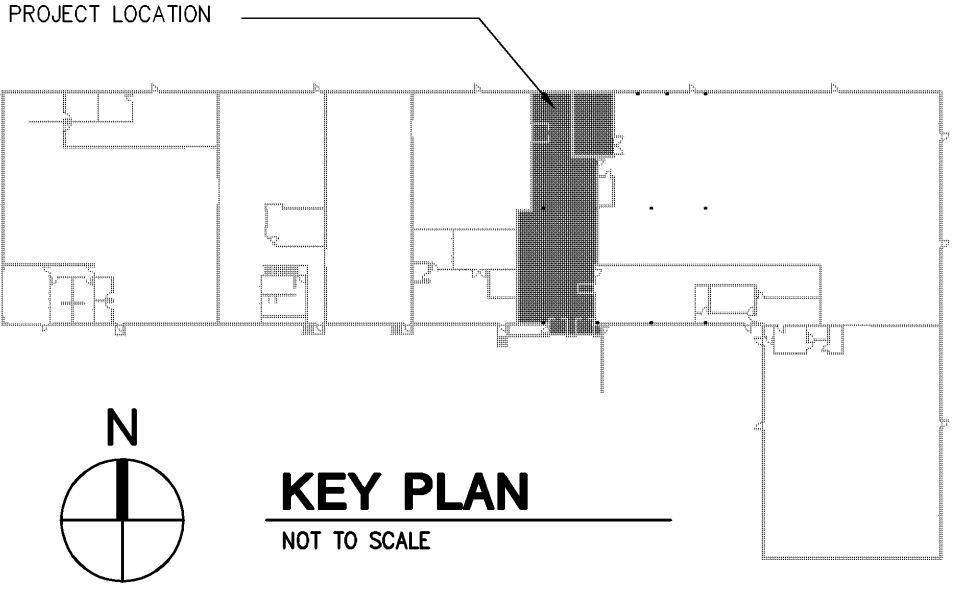
REQUIRED EXIT WIDTH (EGRESS) = 44"  
 PROVIDED EXIT WIDTH (EGRESS) PROVIDED = 72"



**2 UPPER LEVEL (EXISTING) - CODE PLAN**  
1/8"=1'-0"

**CODE PLAN KEYNOTES**

- 1 MANUAL PULL FOR FIRE ALARM SYSTEM REQUIRED LOCATION (WITHIN 5 FEET OF DOOR.)
- 2 LOCATE NFPA APPROVED SURFACE MOUNTED FIRE EXTINGUISHER OF MINIMUM CLASS 2A TO SERVE 6,000 SQUARED FEET (3,000 PER UNIT OF "A")
- 3 WHERE INDICATED CIRCLE FALLS WITHIN BOUNDS OF THE BUILDING STRUCTURE THAT AREA IS SERVED BY THE FIRE EXTINGUISHER LOCATED BY "CODE PLAN KEYNOTES" KEYNOTE 2.



**KEY PLAN**  
NOT TO SCALE

DRAWN	BWB
APPROVED	TCW
ISSUED FOR	CONSTRUCTION DOCUMENT
DATE	06-08-2012
FIELD BOOK	

PROJECT NO.: 412128-0

**CODE PLAN AND INFORMATION**

Reference Files: KEMIN 4121280 > \\dmfile\vol2\data\projects\dm\4121280\DWG\KEMIN 4121280.dwg | XR-AP-01-OVERALL-SDES > .dwg | XR-AP-01-OVERALL-MID > \\dmfile\vol2\data\projects\dm\4121280\DWG\XR-AP-01.dwg | XR-MEYPLAN > .dwg | \\dmfile\vol2\data\projects\dm\4121280\DWG\XR-AP-01.dwg | \\dmfile\vol2\data\projects\dm\4121280\DWG\XR-AP-01.dwg | DATE: 06/08/2012 | TIME: 15:26 | \\dmfile\vol2\data\projects\dm\4121280\DWG\KEMIN 4121280.dwg | XR-AP-01-OVERALL-SDES > .dwg | XR-AP-01-OVERALL-MID > \\dmfile\vol2\data\projects\dm\4121280\DWG\XR-AP-01.dwg | XR-MEYPLAN > .dwg | \\dmfile\vol2\data\projects\dm\4121280\DWG\XR-AP-01.dwg | DATE: 06/08/2012 | TIME: 15:26



# GENERAL MECHANICAL SPECIFICATIONS:

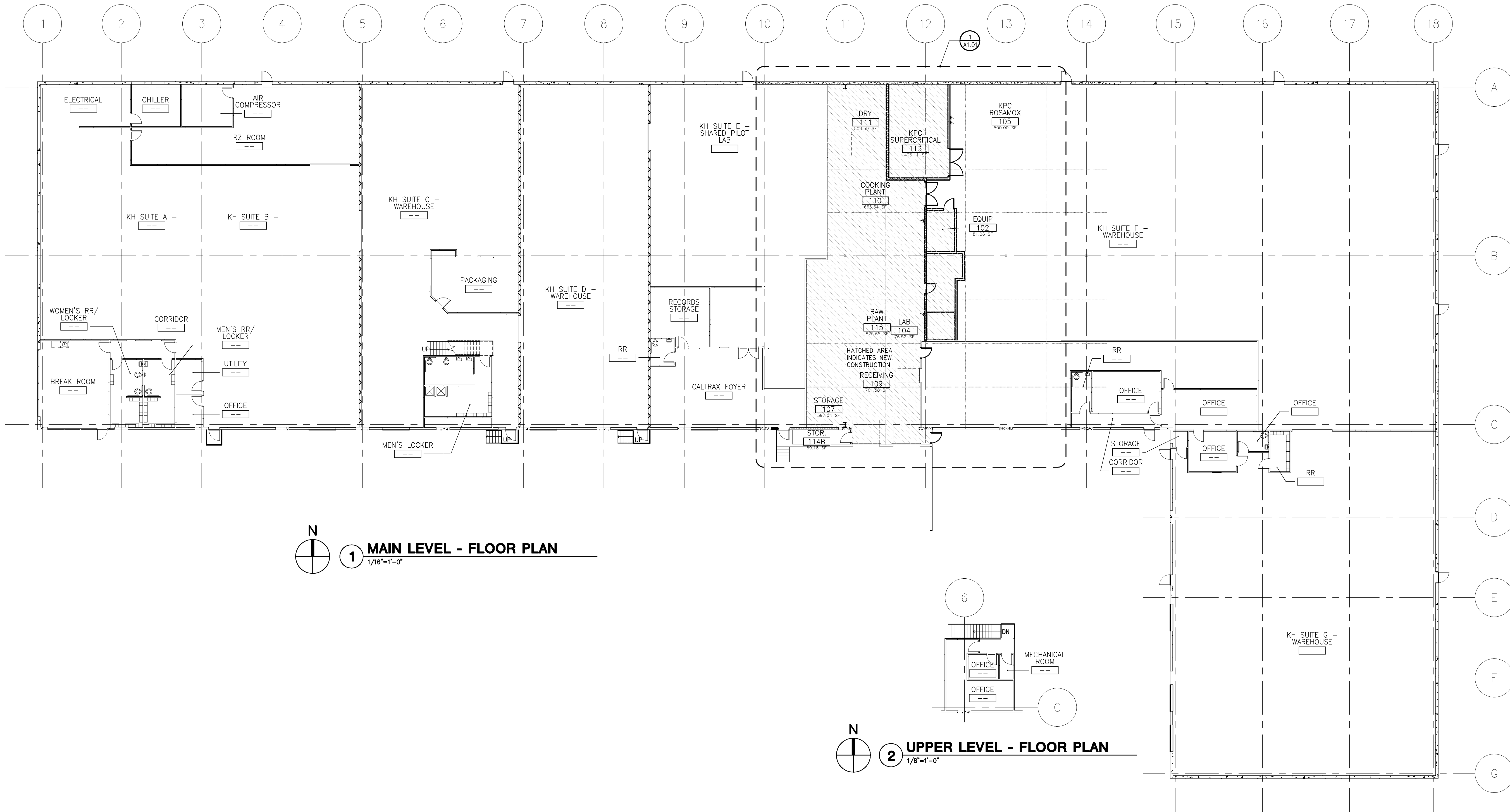
GENERAL NOTES:	DIVISION 22- PLUMBING	DIVISION 22- PLUMBING CONT.	DIVISION 23 - HEATING, VENTILATION, AND AIR-CONDITIONING
<p>1. CONTRACTOR SHALL OBSERVE ALL PLANT RULES AND REGULATIONS. ACCESS TO WORK AREA SHALL BE AS DIRECTED BY THE OWNER.</p> <p>2. THE CONTRACTOR SHALL HAVE ON FILE, BE REQUIRED TO EXECUTE AND SUBMIT, AND PARTICIPATE IN THE FOLLOWING:  A. CONTRACTOR SAFETY PLAN  B. PRE-JOB SAFETY REVIEW OF CONTRACTOR SAFETY PLAN</p> <p>3. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMISSION OF A BID TO ASCERTAIN THE AMOUNT OF ACCESSIBILITY TO THE AREA AND OTHER RESTRICTIONS THAT MAY OCCUR IN THE AREA. EXISTING MACHINES AND EQUIPMENT GENERALLY ARE NOT SHOWN ON THE PLANS.</p> <p>4. CONTRACTOR SHALL VERIFY ALL EXISTING BUILDING DIMENSIONS AND/OR ELEVATIONS FOR CONFORMANCE TO THE DRAWINGS. NOTIFY THE OWNER OR OWNER'S REPRESENTATIVE IMMEDIATELY UPON DISCOVERY OF ANY DISCREPANCY IN DIMENSIONS AND/OR ELEVATIONS FROM THOSE SHOWN ON THE DRAWINGS.</p> <p>5. ALL CONTRACTORS SHALL COORDINATE THEIR WORK WITH THAT OF ALL OTHER TRADES SO AS TO INSURE PROPER SEQUENCING AND INSTALLATION.</p> <p>6. DAMAGE TO EXISTING BUILDING MATERIALS SHALL BE REPAIRED OR REPLACED TO OWNER'S SATISFACTION AT CONTRACTOR'S EXPENSE.</p> <p>7. AT NO TIME SHALL THE CONTRACTOR INTERFERE WITH THE NORMAL PLANT OPERATIONS. CONTRACTOR SHALL CONFINE HIS/HER OPERATIONS TO THE DESIGNATED AREAS AND SHALL KEEP THE CONSTRUCTION AREA CLEAN, AND SHALL KEEP ALL AISLES AND PATHWAYS UNOBSTRUCTED.</p> <p>8. THE CONTRACTOR, IN COORDINATION WITH THE OWNER, SHALL LOCATE ALL UTILITIES BEFORE COMMENCING WORK.</p> <p>9. THE CONTRACTOR, SHALL PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO ALLOW OWNER TO OPERATE IN NORMAL BUSINESS CONDITIONS. DO NOT INTERRUPT UTILITIES AND BUILDING SERVICES WITHOUT COORDINATING WITH OWNER.</p>	<p>PIPING:</p> <p>1. DRAWINGS INDICATE APPROXIMATE ROUTING OF PIPING AND DO NOT INCLUDE ALL OFFSETS, FITTINGS, VALVES, ETC. CONTRACTOR TO FIELD VERIFY EXISTING PIPE SIZES, LOCATION, AND SERVICE PRIOR TO FINAL CONNECTION. LIGHT LINES INDICATE EXISTING PIPING AND EQUIPMENT TO REMAIN. BOLD LINES INDICATE WORK THIS CONTRACT UNLESS NOTED OTHERWISE. COORDINATE ROUGH-IN AND FINAL LOCATIONS OF NEW AND RELOCATED PIPING WITH EXISTING STRUCTURE, NEW STRUCTURE, PIPING, SPRINKLER, DUCTWORK, LANDSCAPING, ETC. PROVIDE OFFSETS AS REQUIRED TO AVOID CONFLICTS WITH WORK OF OTHER TRADES. PROVIDE CHROME-PLATED ESCUTCHEONS WHERE PIPES PENETRATE WALLS.</p> <p>2. GENERAL PIPING: INSTALL DIELECTRIC UNIONS BETWEEN ALL LOCATIONS WHERE DISSIMILAR METALS ARE JOINED. FIRESTOP ALL NEW OR EXISTING PIPING PENETRATIONS THROUGH THE FLOORS AND FIRE RATED WALLS. PROVIDE PIPE HANGERS TO SUPPORT AND SECURE PIPE AND TO PREVENT VIBRATION. PIPE HANGER MATERIAL SHALL MATCH PIPE. WHERE HANGERS ARE ATTACHED TO CONCRETE OR OTHER STRUCTURAL MEMBERS, TAKE CARE TO AVOID DAMAGE OR WEAKENING OF THE STRUCTURE. PROVIDE SLEEVES WHERE PIPING PENETRATES FLOORS AND WALLS. PROVIDE GALVANIZED OR CAST IRON PIPE SLEEVES WHERE PIPING PENETRATES LOAD-BEARING WALLS. SLEEVE SHALL BE SIZED TO ACCOMMODATE PIPE AND INSULATION. PROVIDE FIRE PROOFING WHERE PIPES PENETRATE FIRE RATED PARTITIONS.</p> <p>3. DOMESTIC HOT,COLD WATER, AND TEMPERED WATER PIPING SHALL BE COPPER WATER TUBE, HARD TEMPER, ASTM B88. FITTINGS SHALL BE CAST BRONZE OR WROUGHT COPPER, SOLDER JOINT TYPE. ANSI B16.18 AND B16.22.</p> <p>3.1. TYPE "L" - ABOVE GROUND  3.2. TYPE "M" - ABOVE GROUND CONDENSATE DRAINS.</p> <p>4. PROVIDE P-TRAP ASSEMBLY FOR COOLING COIL DRAIN PAN PER MANUFACTURER REQUIREMENTS.</p> <p>5. VALVES:  ALL VALVES SHALL CONFORM TO ANSI STANDARD DIMENSIONS. MATERIALS FOR VALVES INCLUDING DISCS, GASKETS, PACKINGS, SEALS, DIAPHRAGMS AND LUBRICANTS SHALL CONFORM TO RECOMMENDATIONS OF THE VALVE MANUFACTURER FOR THE INTENDED USE. PROVIDE LOCAL GAS SHUTOFF AND GAS REGULATOR FOR RTU-1 SIZED PER MANUFACTURER REQUIREMENTS. MOUNT ON ROOF ADJACENT TO RTU-1.</p> <p>6. INSULATION:  ABOVE GROUND DOMESTIC COLD WATER, DOMESTIC HOT WATER, STEAM, STEAM CONDENSATE, AND CONDENSATE PIPE, AND EQUIPMENT INSULATION SHALL BE PREFORMED, SECTIONAL, HEAVY DENSITY FIBERGLASS INSULATION, SUITABLE FOR OPERATING TEMPERATURES FROM -20 DEGREES F TO +850 DEGREES F. EQUIPPED WITH FACTORY APPLIED, ALL-SERVICE VAPOR BARRIER JACKET CONSTRUCTED OF WHITE KRAFT PAPER BONDED TO ALUMINUM FOIL REINFORCED WITH FIBERGLASS YARN, WITH PRESSURE-SENSITIVE, SELF-SEALING LONGITUDINAL LAPS AND BUTT STRIPS. THERMAL CONDUCTIVITY OF 0.23 BTU-IN/HR-FT<sup>2</sup>-OF-750 F MEAN TEMPERATURE. WATER VAPOR PERMEANCE OF 0.02 PERMS. MANVILLE "MICRO-LOK AP-1" OR APPROVED EQUIVALENT. PIPE INSULATION SCHEDULE SHALL BE AS FOLLOWS FOR SERVICE-THICKNESS-PIPE SIZES:  DOMESTIC COLD WATER, 1/2"- ALL SIZES  DOMESTIC HOT WATER, 1/2" - UP THROUGH 1"  DOMESTIC HOT WATER, 3/4" - 1-1/4"  1-1/2", 2"  DOMESTIC HOT WATER, 1" - GREATER THAN 2"  STEAM AND STEAM CONDENSATE, 1-1/2" - UP THROUGH 2" PIPE SIZE  STEAM AND STEAM CONDENSATE, 2" - GREATER THAN 2" UP THROUGH 6" PIPE SIZE</p> <p>6.1. INSULATION JACKETS SHALL BE 20MIL HIGH IMPACT PVC SECURED WITH SPRAY CONTACT ADHESIVE. MANVILLE "ZESTON 2000" OR EQUIVALENT. FITTING AND VALVE JACKETS SHALL BE PREMOULDED PVC WITH JOINTS AND SEAMS SEALED WITH A SPRAY CONTACT ADHESIVE OR VAPOR BARRIER MASTIC. PREMOULDED JACKETS SHALL BE MANVILLE "ZESTON 2000" OR APPROVED EQUIVALENT. AT WALL PENETRATIONS AND ON EXTERIOR PIPE, PROVIDE AND ADDITIONAL JACKET OF 0.020-INCH THICK CORRUGATED ALUMINUM WITH 0.015 INCH THICK, 3/8" WIDE ALUMINUM BANDS. METAL JACKET SHALL HAVE FACTORY APPLIED MOISTURE BARRIER. FITTING AND VALVE COVERS TO B E PREFORMED OF SAME MATERIAL AS ADJACENT METAL JACKET. WHERE PVC OR METAL JACKETS ARE USED, DELETE THE FACTORY APPLIED ASL. PIPE INSULATION SHALL CONTINUE THROUGH SLEEVES AND HANGARS WITH VAPOR BARRIER AND/OR JACKET.</p> <p>7. NATURAL GAS PIPING:  7.1. NATURAL GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL SEAMLESS, ASTM A53. ALL PIPING SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 54.  7.2. GAS PIPING WITH PRESSURE GREATER THAN 1 PSIG SHALL BE WELDED.  7.3. GAS PIPING WITH GREATER THAN 1" IN SIZE SHALL BE WELDED.  7.4. PROVIDE GAS SHUT-OFF COCK IN MAIN, AND AT EACH HEATER. PROVIDE GAS PRESSURE REGULATOR AND AGA CERTIFIED FLEXIBLE CONNECTOR FOR EACH HEATER. COORDINATE REGULATOR PRESSURE WITH MANUFACTURER'S WRITTEN REQUIREMENTS. PRESSURE REGULATOR SHALL BE FISHER, ROOKWELL, OR APPROVED EQUIVALENT.  7.5. INDIVIDUALLY VENT GAS PRESSURE REGULATOR RELIEFS THROUGH THE EXTERIOR WALL TO A SAFE EXTERIOR LOCATION, FULL PORT SIZE, USING BLACK CARBON STEEL PIPE. TERMINATE WITH VENT ASSEMBLY.</p> <p>8. RO WATER PIPING  8.1. RO WATER SYSTEM SHALL BE SHALL BE SCHEDULE 40, CPVC PIPE AND FITTINGS: ASTM D 1785 PIPE; WITH PLAIN ENDS FOR SOLVENT-CEMENTED JOINTS AND ASTM D 2466, SOCKET-TYPE FITTINGS</p> <p>9. COMPRESSED AIR PIPING  9.1. COMPRESSED AIR PIPING SHALL BE COPPER TUBE, ASTM B 88, TYPE K OR L SEAMLESS, DRAWN-TEMPER, WATER TUBE WITH WROUGHT COPPER FITTINGS WITH SOLDERED JOINTS.  9.2. PIPE SHALL BE TESTED TO MEET FACTORY MUTUAL REQUIREMENTS WITH COMPRESSED AIR AT 1.5 TIMES SYSTEM DESIGN PRESSURE (200 PSI) FOR 30 MINUTES, WHILE UNDER PRESSURE CONTRACTOR SHALL VISUALLY INSPECT PIPING FOR LEAKS AND REPEAT THE TEST IF LEAKS ARE DISCOVERED.</p> <p>10. ABOVE GROUND AND BELOW GROUND SANITARY SEWER:  10.1. SHALL BE CAST IRON SOIL PIPE, SERVICE WEIGHT, BELL AND SPIGOT, ASTM A74 UNCOATED OR CAST IRON SOIL PIPE, SERVICE WEIGHT, NO HUB, CISPI 301.  10.2. MINIMUM GRADE FOR PIPES SHALL BE 1/8 INCH PER FOOT FOR PIPE SIZES 3 INCHES IN DIAMETER AND LESS; 1/4 INCH PER FOOT FOR PIPES GREATER THE 4 INCHES IN DIAMETER.</p> <p>11. BELOW GROUND PROCESS WASTE PIPING:  11.1. SHALL BE PVC, SCH 40 DWV, MINIMUM GRADE FOR PIPES SHALL BE 1/8 INCH PER FOOT FOR PIPE SIZES 3 INCHES IN DIAMETER AND LESS; 1/4 INCH PER FOOT FOR PIPES GREATER THE 4 INCHES IN DIAMETER.</p> <p>12. GAS PIPE TESTING:  12.1. LOW PRESSURE - UP TO 1 PSI: APPLY COMPRESSED AIR, 20 PSI PRESSURE, TO THE GAS PIPING SYSTEM. PIPING SYSTEM MUST HOLD THIS PRESSURE WITHOUT THE INTRODUCTION OF ADDITIONAL AIR FOR A PERIOD OF FOUR (4) HOURS.  12.2. HIGH PRESSURE - ABOVE 1 PSI: APPLY COMPRESSED AIR, TWICE THE OPERATING GAS PRESSURE, BUT NOT LESS THAN 20 PSI, TO THE GAS PIPING SYSTEM. PIPING SYSTEM MUST HOLD THIS PRESSURE WITHOUT THE INTRODUCTION OF ADDITIONAL AIR FOR A PERIOD OF SIX (6) HOURS.  12.3. AN ODORANT, SUCH AS OIL OF WINTERGREEN (ETHER OR OTHER COMBUSTIBLE MATERIALS SHALL NOT BE USED), MAY BE ADDED TO THE AIR TO EXPEDITE LOCATION OF LEAKS. IF COMPRESSED AIR IS NOT AVAILABLE, USE CARBON DIOXIDE OR NITROGEN GAS (COMBUSTIBLE GASES NOT PERMITTED) WITH A SUITABLE REGULATOR AND PRESSURE RELIEF VALVE.</p> <p>13. LABELING:  13.1. LABEL ALL PIPING INDICATING FLUID AND DIRECTION OF FLOW IN ACCORDANCE WITH ISO STANDARDS.  13.2. LABELS SHALL BE PLACED AT ALL PENETRATIONS BOTH ENTERING AND LEAVING A ROOM AND AT DISTANCES NOT LESS THAN 20' OR MORE THAN 50'.</p> <p>14. PIPE IDENTIFICATION AND COLOR CODE:  14.1. ALL PIPE SHALL BE PAINTED TO MATCH EXISTING PLANT COLOR CODING WITH BLACK PAINT SERVICE STENCILING.</p>	<p>15. PIPE SUPPORTS:</p> <p>15.1. HANGERS SHALL BE CLEVIS TYPE WITH INSULATION SHIELDS WHERE REQUIRED. PIPE HANGER MATERIAL SHALL MATCH PIPE. SUPPORT ALL PIPING FROM THE PANEL POINTS ON EXISTING TRUSSES AND BOTTOM FLANGE OF NEW ROOF STRUCTURE. HANGERS ROOF FOR PIPING SHALL BE CONTINUOUS THREADED ROD AND SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING:  15.1.1. STEEL OR IRON WITH PIPE SIZE UP TO 1-1/4" USE ROD DIAMETER OF 3/8" WITH A MAXIMUM SPACING OF 8'-0".  15.1.2. STEEL OR IRON WITH PIPE SIZE 1-1/2" &amp; 2" USE ROD DIAMETER OF 3/8" WITH A MAXIMUM SPACING OF 10'-0".  15.1.3. STEEL OR IRON WITH PIPE SIZE 2-1/2" &amp; 3" USE ROD DIAMETER OF 1/2" WITH A MAXIMUM SPACING OF 10'-0".  15.1.4. STEEL OR IRON WITH PIPE SIZE 4" &amp; 5", USE ROD DIAMETER OF 5/8" WITH A MAXIMUM SPACING OF 12'-0".  15.1.5. STEEL OR IRON WITH PIPE SIZE 6" USE ROD DIAMETER OF 3/4" WITH A MAXIMUM SPACING OF 12'-0".</p> <p>DUCTWORK:  1. DRAWINGS INDICATE APPROXIMATE ROUTING OF DUCTWORK AND DO NOT INCLUDE ALL OFFSETS, FITTINGS, ETC. CONTRACTOR TO FIELD VERIFY EXISTING DUCT SIZES AND LOCATION PRIOR TO FINAL CONNECTION. LIGHT LINES INDICATE EXISTING DUCTWORK AND EQUIPMENT ARE TO REMAIN. BOLD LINES INDICATE WORK THIS CONTRACT UNLESS NOTED OTHERWISE. COORDINATE ROUGH-IN AND FINAL LOCATIONS OF NEW AND RELOCATED DUCTWORK WITH EXISTING STRUCTURE, NEW STRUCTURE, PIPING, SPRINKLER, DUCTWORK, ETC.  2. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND TESTING AS REQUIRED FOR THE COMPLETE AND OPERABLE INSTALLATION OF ENTIRE DISTRIBUTION DUCTWORK, DIFFUSERS, DAMPERS, EXHAUST AIR DUCTWORK, AND RELATED WORK. DUCT SIZES NOTED ARE AIRWAY DIMENSIONS. DUCTWORK AND CONSTRUCTION SHALL BE A MINIMUM 18 GAGE STAINLESS STEEL COMPLYING WITH ASTM A167; TYPE 302, 304, OR 316, WITH NO. 1 FINISH. PROTECT FINISHED SURFACES WITH MILL-APPLIED ADHESIVE PROTECTIVE PAPER, MAINTAINED THROUGH FABRICATION AND INSTALLATION. CONSTRUCTION SHALL BE IN ACCORDANCE WITH SMACNA STANDARDS FOR 2.0" PRESSURE DUCTS. ALL DUCTWORK SHALL BE FABRICATED FROM PRIME, STAINLESS STEEL SHEETS. WELDED STEEL DUCTWORK SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF SMACNA INDUSTRIAL DUCT CONSTRUCTION STANDARDS FOR CLASS 2 DUCT.  3. BRANCH DUCTS TAP SHALL BE CONICAL FITTINGS FOR ROUND TAPS FROM A RECTANGULAR MAIN AND 45 DEGREE ENTRY FITTINGS FOR RECTANGULAR TAPS FROM A RECTANGULAR MAIN.  4. ELBOWS SHALL HAVE A CENTERLINE RADIUS OF NOT LESS THAN THE DUCT WIDTH; WHERE SPACE CONDITIONS WILL NOT PERMIT THIS RADIUS, SQUARE ELBOWS WITH AIR TURNS MAY BE USED. PROVIDE SINGLE THICKNESS AIR TURNS IN ALL SQUARE ELBOWS.  5. TRANSITIONS OR OTHER CHANGES IN DIMENSION SHALL BE A MINIMUM 1 TO 4 RATIO.</p> <p>ROOF MOUNTED EXHAUST FAN (EF-1, EF-2):  1. THE FAN HOUSING AND WHEEL SHALL BE CONSTRUCTED OF ALUMINUM. FANS SHALL INCLUDE EXPANDED ALUMINUM BRID SCREEN, DISCONNECT DEVICE, SELF ACTING BACKDRAFT DAMPER, AND PREFABRICATED ALUMINUM ROOF CURB. FANS SHALL BE DIRECT DRIVE. FANS SHALL BEAR THE AMCA CERTIFIED RATINGS SEAL FOR SOUND AND AIR PERFORMANCE. ALL FANS SHALL BE BY THE SAME MANUFACTURER. FANS SHALL BE PENN VENTILATOR, COOK, ACME, CARNES, GREENHECK, OR APPROVED EQUIVALENT.</p> <p>ROOFTOP UNITS (RTU-1):  1. PROVIDE ROOFTOP UNITS AS A COMPLETE FACTORY - ASSEMBLED SINGLE ZONE HEATING AND AIR CONDITIONING UNIT BY JOHNSON CONTROLS, MCGUAY, TRANE, OR ENGINEER APPROVED EQUIVALENT. ALL UNITS SHALL BE FACTORY ASSEMBLED AND FULLY CHARGED WITH R-410A AND 100% RUN TESTED BEFORE LEAVING THE FACTORY. THE UNITS SHALL BE COMPLETELY FACTORY WIRED WITH ALL NECESSARY CONTROLS AND SAFETY SHUT-OFF. EACH ROOFTOP UNIT SHALL BE PROVIDED WITH A ROOF CURB, FIXED POSITION OUTDOOR AIR DAMPER. PROVIDE HUMIDITY SENSOR AS A RETURN AIR SENSOR FOR HOT GAS RETURN SHUT-OFF. THE ROOF CURB SHALL BE DESIGNED TO MATE WITH THE DOWNFLOW UNIT AND SHALL COMPLY WITH NRCA REQUIREMENTS. ROOF CURB SHALL BE FURNISHED BY THIS CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR. THE COMPRESSOR SECTION SHALL HAVE A CRANKCASE HEATER, INTERNAL TEMPERATURE AND CURRENT SENSITIVE MOTOR OVERLOADS, AND SHALL HAVE INTERNAL SPRING ISOLATION AND SOUND MUFFLING TO MINIMIZE VIBRATION TRANSMISSION AND NOISE. THE FILTER SHALL BE 30X 2" PLEATED MEDIA EQUAL TO FARR 30/30. THE EVAPORATOR AND CONDENSER COIL SHALL BE 100% LEAK TESTED AT THE FACTORY. THE EVAPORATOR AND CONDENSER COIL SHALL BE LEAK TESTED AT 200 PSIG AND PRESSURE TESTED TO 450 PSIG. UNIT SHALL HAVE 2-STAGE GAS VALVE. THE HEAT EXCHANGERS SHALL BE CONSTRUCTED OF STAINLESS STEEL WITH STAINLESS STEEL COMPONENTS AND SHALL MEET THE STANDARDS REQUIRED BY BOTH UL AND AGA. THE UNITS SHALL BE SUITABLE FOR USE WITH NATURAL GAS. PROVIDE A PROGRAMMABLE DIGITAL THERMOSTAT WITH REMOTE TEMPERATURE SENSOR. COORDINATE LOCATION ON ROOF WITH STRUCTURE AND OWNER. PROVIDE UNIT MOUNTED GFCI CONVENIENCE OUTLET ON UNIT.</p> <p>ROOFTOP UNITS (RTU-2):  1. PROVIDE ROOFTOP UNITS AS A COMPLETE FACTORY - ASSEMBLED SINGLE ZONE HEATING AND AIR CONDITIONING UNIT BY JOHNSON CONTROLS, MCGUAY, TRANE, OR ENGINEER APPROVED EQUIVALENT. ALL UNITS SHALL BE FACTORY ASSEMBLED AND FULLY CHARGED WITH R-410A AND 100% RUN TESTED BEFORE LEAVING THE FACTORY. THE UNITS SHALL BE COMPLETELY FACTORY WIRED WITH ALL NECESSARY CONTROLS AND SAFETY SHUT-OFF. EACH ROOFTOP UNIT SHALL BE PROVIDED WITH A ROOF CURB, FIXED POSITION OUTDOOR AIR DAMPER. THE ROOF CURB SHALL BE DESIGNED TO MATE WITH THE DOWNFLOW UNIT AND SHALL COMPLY WITH NRCA REQUIREMENTS. ROOF CURB SHALL BE FURNISHED BY THIS CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR. THE COMPRESSOR SECTION SHALL HAVE A CRANKCASE HEATER, INTERNAL TEMPERATURE AND CURRENT SENSITIVE MOTOR OVERLOADS, AND SHALL HAVE INTERNAL SPRING ISOLATION AND SOUND MUFFLING TO MINIMIZE VIBRATION TRANSMISSION AND NOISE. THE FILTER SHALL BE 30X 2" PLEATED MEDIA EQUAL TO FARR 30/30. THE EVAPORATOR AND CONDENSER COIL SHALL BE 100% LEAK TESTED AT 200 PSIG AND PRESSURE TESTED TO 450 PSIG. UNIT SHALL HAVE SINGLE STAGE ELECTRIC HEAT. PROVIDE A PROGRAMMABLE DIGITAL THERMOSTAT WITH REMOTE TEMPERATURE SENSOR. COORDINATE LOCATION ON ROOF WITH STRUCTURE AND OWNER. PROVIDE UNIT MOUNTED GFCI CONVENIENCE OUTLET ON UNIT.</p> <p>TESTING AND BALANCING:  1. PROVIDE TESTING, ADJUSTMENT, AND BALANCING OF HYDRONIC AND STEAM SYSTEMS. SUBMIT COPIES OF REPORT TO THE ENGINEER.  AN INDEPENDENT, CERTIFIED TESTING AND BALANCING CONTRACTOR SHALL PERFORM TESTING AND BALANCING. THE CONTRACTOR SHALL BE CERTIFIED BY AABC, NEBS, OR SMARTA. THE BALANCING CONTRACTOR SHALL PROVIDE LABOR, SERVICES, AND TEST EQUIPMENT REQUIRED TO TEST, ADJUST, AND BALANCE THE SPECIFIED SYSTEMS. PERSONNEL INVOLVED IN THE EXECUTION OF THE WORK UNDER THE BALANCING CONTRACTOR SHALL BE EXPERIENCED AND TRAINED IN THE TOTAL BALANCING OF MECHANICAL SYSTEMS, AS WELL AS BEING REGULAR EMPLOYEES OF BALANCING CONTRACTOR.  2. AIR TESTING AND BALANCING: UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL TEST AND BALANCE THE INSTALLATION OF ALL AIR MOVING DEVICES AND TERMINAL OUTLETS, INCLUDING, BUT NOT LIMITED TO ROOFTOP UNITS, EXHAUST FANS, AND EACH SUPPLY AND RETURN DIFFUSER/GRILLE. FAN RPM, MOTOR HORSEPOWER, AMP DRAW, DISCHARGE AIR TEMPERATURE (HEATING AND COOLING), AND STATIC PRESSURE EXTERNAL TO THE FAN SHALL BE TESTED AFTER BALANCING DIFFUSERS TO DESIGN CFM. TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.  3. ELECTRIC MOTORS DATA SHALL INCLUDE MANUFACTURER, MODEL/FRAME, HP/BHP, PHASE, VOLTAGE, AMPERAGE, NAMEPLATE, ACTUAL, NO LOAD, RPM, SERVICE FACTOR, STARTED SIZE, RATING, HEATER ELEMENT, SHEAVE MAKE/SIZE, BORE.</p> <p>SEQUENCE OF OPERATION:  1. RTU-1 AND RTU-2 SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE.  2. THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.  3. COOLING: THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE COOLING TO MAINTAIN ITS COOLING SETPOINT. TO PREVENT SHORT CYCLING, THE STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.  4. HEATING:  4.1. RTU-1 - GAS HEATING: THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE HEATING TO MAINTAIN ITS HEATING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.  4.2. RTU-2 - ELECTRIC HEATING: THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND CYCLE THE HEATING TO MAINTAIN ITS HEATING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.  5. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM POSITION (ADJ.) DURING BUILDING OCCUPIED HOURS AND BE CLOSED DURING UNOCCUPIED HOURS.  6. DEHUMIDIFICATION (RTU-1 ONLY): THE CONTROLLER SHALL MEASURE THE RETURN AIR HUMIDITY AND OVERRIDE THE COOLING SEQUENCE TO MAINTAIN RETURN AIR HUMIDITY AT OR BELOW 50% RH (ADJ.). DEHUMIDIFICATION SHALL BE ENABLED WHENEVER THE SUPPLY FAN STATUS IS ON.  7. EF-1 SHALL RUN ANYTIME THE SUPPLY FAN IS ON FOR RTU-1.  8. EF-2 TO BE ON A MANUAL SWITCH.</p>	<p>SHIVE-HATTERY  ARCHITECTURE+ENGINEERING</p> <p>1601 48th St. Suite 200   West Des Moines, Iowa 50266  515.223.8104   fax: 515.223.0622   shive-hattery.com</p> <p>Iowa   Illinois   Missouri   Illinois Firm Number: 184-000214</p> <p>KEMIN  PILOT PLANT</p> <p>2111 EAST 17TH ST  DES MOINES, IA</p> <p>DRAWN JDN  APPROVED CSH  ISSUED FOR CONSTRUCTION DOCUMENT  DATE 06-08-2012  FIELD BOOK</p> <p>PROJECT NO.: 412128-0</p> <p>SPECIFICATIONS  AND GENERAL NOTES</p> <p>G1.12</p>
<p>GENERAL REQUIREMENTS</p> <p>1. MECHANICAL CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND TESTING AS REQUIRED FOR THE COMPLETE AND OPERABLE INSTALLATION OF MECHANICAL EQUIPMENT AND RELATED WORK. THE MECHANICAL CONTRACTOR SHALL OBTAIN AND PAY ALL FEES, PERMITS, AND LICENSES REQUIRED FOR HIS WORK. ALL WORK SHALL BE IN ACCORDANCE WITH STATE AND LOCAL CODES AND NFPA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND COORDINATE THE WORK OF ANY SUBCONTRACTORS FOR THIS PROJECT.</p> <p>2. COORDINATE WITH THE GENERAL CONTRACTOR AND THE OWNER'S DESIGNATED REPRESENTATIVE FOR THIS PROJECT. WORK SHALL BE SCHEDULED TO MINIMIZE INTERRUPTIONS TO THE OWNER'S OPERATIONS. PROVIDE PROTECTION FOR EQUIPMENT AND MATERIALS TO BE INSTALLED AS A PART OF THIS PROJECT AS WELL AS THE OWNER'S EQUIPMENT AND FACILITIES.</p> <p>3. ALL MATERIALS SHALL BE NEW UNLESS INDICATED OTHERWISE. WORK SHALL BE PERFORMED BY SKILLED TRADESMEN. ALL MATERIAL, EQUIPMENT, AND SYSTEMS SHALL BE KEPT IN REPAIR AND PROPER OPERATING CONDITION UNTIL FINAL ACCEPTANCE BY THE OWNER'S DESIGNATED REPRESENTATIVE. WARRANTY ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.</p> <p>4. PROVIDE FOR THE PROTECTION OF EQUIPMENT AND MATERIALS TO BE INSTALLED AS PART OF THIS PROJECT. PROTECTION SHALL BE REQUIRED FOR THE OWNER'S EXISTING EQUIPMENT AND FACILITIES TO PREVENT DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PATCHING, REPAIR, AND PAINTING OF ALL WALLS, FLOORS, ETC. DAMAGED AS A RESULT OF CONTRACTOR'S OPERATIONS. REPAIR, PATCHING, AND PAINTING, AS REQUIRED, SHALL BE PERFORMED BY THE RESPECTIVE TRADES TO MATCH EXISTING CONSTRUCTION.</p> <p>5. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND EQUIPMENT PRIOR TO BEGINNING WORK. WORK MAY NEED TO BE SCHEDULED AT NIGHT AND DURING WEEKENDS TO MINIMIZE INTERRUPTIONS TO THE OWNER'S OPERATIONS. COORDINATE WORK SCHEDULE WITH THE OWNER'S REPRESENTATIVE.</p> <p>6. SUBMIT THREE (3) COPIES OF SHOP DRAWINGS, MANUFACTURER'S EQUIPMENT DATA SHEETS, AND PERFORMANCE DATA FOR APPROVAL. SUBMIT ON ALL MATERIAL SPECIFIED.</p>			
<p>DIVISION 21- FIRE PROTECTION</p>			
<p>1. THE SPRINKLER DESIGN FOR THIS SHALL BE, ORDINARY HAZARD, GROUP 1 OCCUPANCY.</p> <p>2. SPRINKLER SYSTEM SHALL MEET THE REQUIREMENTS OF NFPA 13. PIPING SHALL BE BLACK STEEL, SPRINKLER PIPE, AND SHALL MEET ASTM A135, ASTM A795, NFPA 13, OR SCHEDULE 40, ASTM A120. FITTINGS SHALL BE THREADED, MALLEABLE IRON, 125 POUND STANDARD FLAT BAND WATER PATTERN. SPRINKLER PIPING SHALL BE AN EXTENSION OF THE EXISTING SYSTEM. CONTRACTOR SHALL PROVIDE NEW BRANCH MAINS AS REQUIRED TO MEET NEW ROOF LAYOUT. PROVIDE NEW HEADS AND PIPING AS REQUIRED FOR AN ORDINARY HAZARD OCCUPANCY.</p> <p>3. CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER, AUTHORITY HAVING JURISDICTION AND THE OWNERS FIRE INSURANCE CARRIER: WATER FLOW TEST RESULTS, HYDRAULIC CALCULATIONS, PRODUCT DATA SHEETS, AND SCALED LAYOUT SHOP DRAWINGS. COORDINATE WITH THE OWNER'S DESIGNATED REPRESENTATIVE AND THE FIRE DEPARTMENT FOR FIRE PROTECTION PIPING WORK. SUBMIT RECORD DRAWINGS AND A CERTIFICATE OF INSTALLATION IN ACCORDANCE WITH NFPA 13 UPON COMPLETION OF FIRE PROTECTION PIPING WORK. SPRINKLER HEADS SHALL BE COORDINATED WITH CEILING CONDITIONS, UPRIGHT FOR EXPOSED CONDITIONS.</p>			

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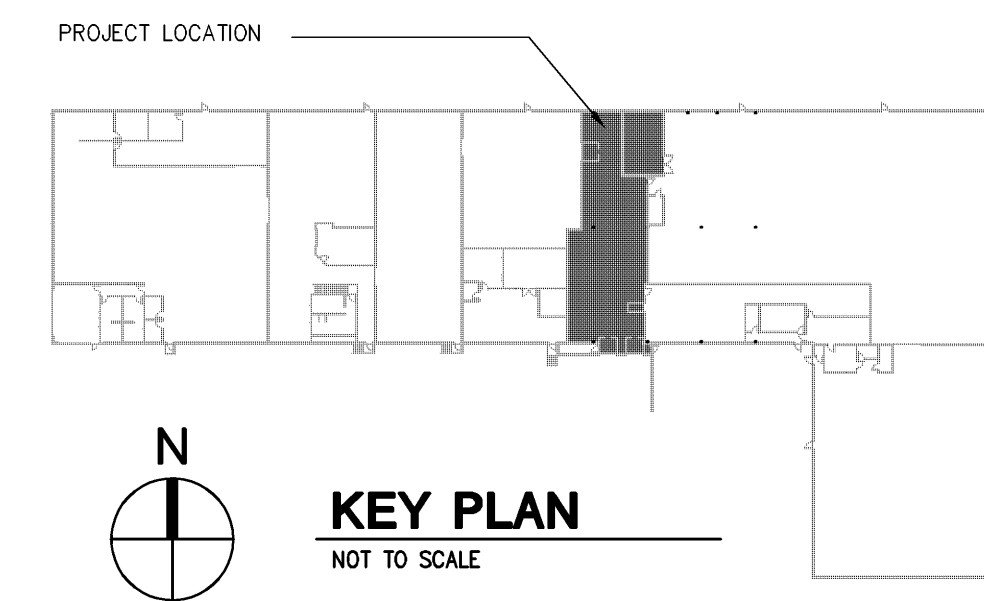
**KEMIN  
PILOT PLANT**

2111 EAST 17TH ST  
DES MOINES, IA



**1 MAIN LEVEL - FLOOR PLAN**  
1/16"=1'-0"

**2 UPPER LEVEL - FLOOR PLAN**  
1/8"=1'-0"



DRAWN BWB  
APPROVED TCW  
ISSUED FOR CONSTRUCTION DOCUMENT  
DATE 06-08-2012  
FIELD BOOK

PROJECT NO.: 412128-0

**ORIENTATION PLAN**

Reference Files: KEMIN\_4121280 > \DMFILE\VOL2\DATA\PROJECTS\DM\_4121280\DWG\KEMIN\_4121280.Dwg | XR-AP-01-OVERALL-SDES > .Dwg | XR-AP-01-OVERALL-MID > \DMFILE\VOL2\DATA\PROJECTS\DM\_4121280\DWG\XR-AP-01.Dwg | XR-MEYPLAN > .Dwg |  
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**GENERAL NOTES:**

- ALL WORK SHALL BE PERFORMED AND COMPLETED IN COMPLIANCE WITH APPLICABLE BUILDING CODES AND ORDINANCES.
- NOTIFY ARCHITECT PROMPTLY IF ANY CONDITIONS CONFLICT WITH THE CONSTRUCTION DOCUMENTS.
- REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION REGARDING ITEMS PENETRATING FLOORS, WALLS, AND CEILING.
- COORDINATE EXACT LOCATIONS OF LIGHT FIXTURES, ACCESS PANELS, SPRINKLER HEADS, HVAC DUCTS, CEILING REGISTERS AND ANY ADDITIONAL CEILING ITEMS WITH MECHANICAL AND ELECTRICAL CONTRACTORS AND ARCHITECT. NOTIFY ARCHITECT PROMPTLY IF ANY LOCATIONS CONFLICT WITH ARCHITECTURAL REFLECTED CEILING PLANS.
- EXPOSED CONCRETE STRUCTURAL FLOOR SLABS AND EXPOSED FLOOR SLABS-ON-GRADE AND SLABS TO RECEIVE CARPETING SHALL FINISH AT THE FLOOR LINE.
- PROVIDE BOND SEPARATION, WITH 6 MIL PLASTIC SHEETING, BETWEEN ALL SLABS ON GRADE AND PENETRATING ELEMENTS SUCH AS BEARING WALLS, COLUMNS, ETC.
- CONTRACTORS AND SUB-CONTRACTORS OF EACH TRADE SHALL BE RESPONSIBLE FOR INCLUDING WORK ASSOCIATED WITH FIRE PROTECTION OF ALL SPECIFIC TRADE RELATED PENETRATIONS THROUGH RATED WALLS AND CEILING ASSEMBLIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING FROM THE PREMISES ALL CONSTRUCTION DEBRIS.
- PROVIDE IN-WALL BACKING FOR ALL WALL MOUNTED EQUIPMENT, SHELVING AND CABINETS.
- ALL DOORS TO BE MOUNTED 4" OFF INSIDE CORNER OR CENTERED IN WALL - UNLESS NOTED OTHERWISE

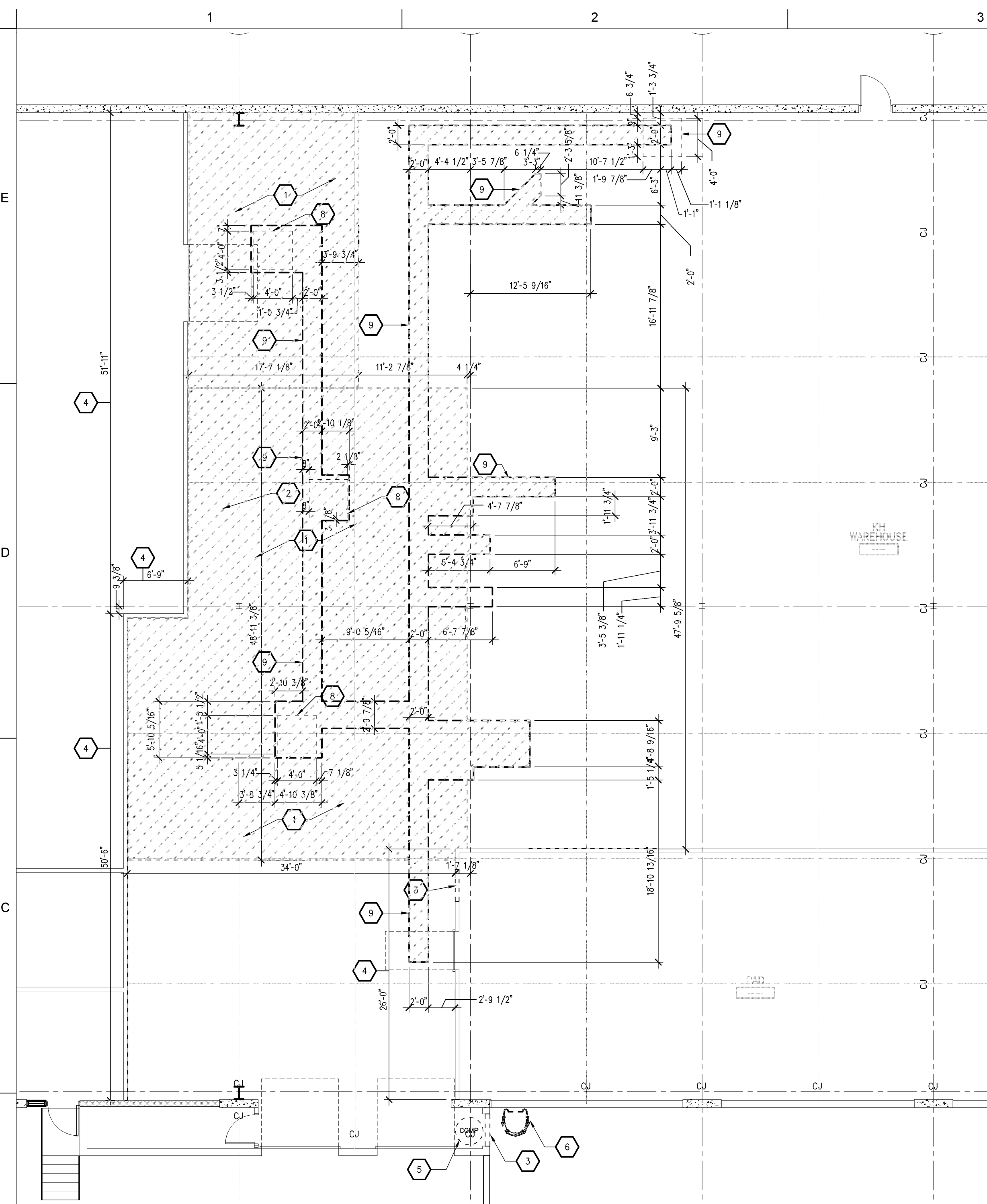
**KEY NOTES**

**DEMOLITION**

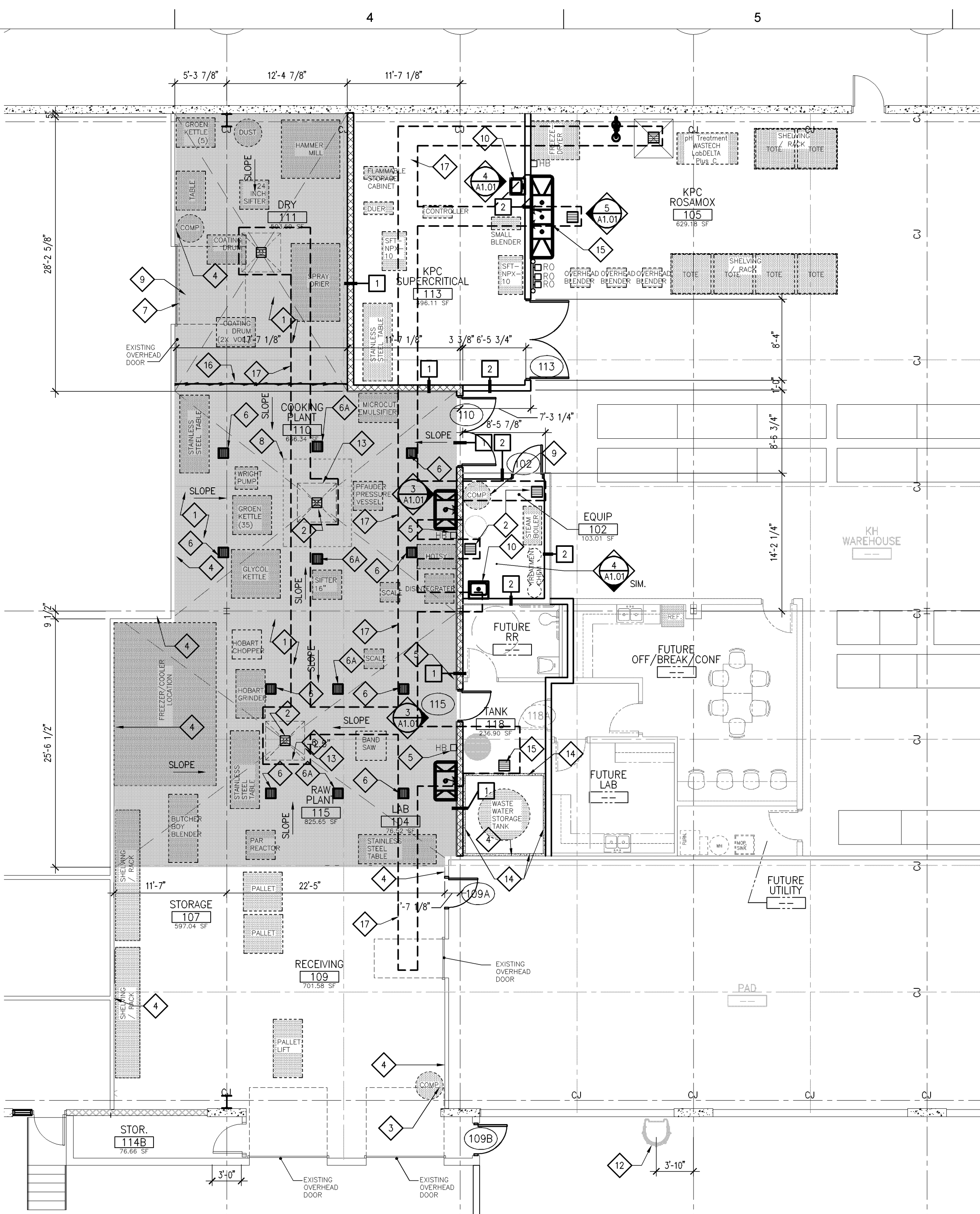
- ① DEMOLISH EXISTING FLOOR AND PREPARE AREA FOR NEW CONSTRUCTION (HATCHED AREA)
- ② UNUSED.
- ③ DEMOLISH PORTION OF WALL TO CREATE OPENING FOR NEW DOOR. MATCH DIMENSION OF ROUGH OPENING TO DOOR REQUIREMENTS.
- ④ DEMOLISH EXISTING PLYWOOD FURRING / LINER ALONG WALL.
- ⑤ REMOVE AND SALVAGE EXISTING COMPRESSOR. PREPARE FOR RELOCATION. PATCH FLOOR AND OTHER SURFACES DAMAGED IN REMOVAL OF ITEM.
- ⑥ REMOVE AND SALVAGE EXISTING LADDER. CLEAN AND REPAIR AS REQUIRED. PREPARE FOR RELOCATION. PATCH WALL AND OTHER SURFACES DAMAGED IN REMOVAL OF ITEM.
- ⑦ LOCATION OF SAW CUT FOR 4'-0"x4'-0" SLOPE TO NEW DRAIN.
- ⑧ SPECIFIC TO ALTERNATE #4: DEMOLISH EXISTING FLOOR AND PREPARE AREA FOR NEW CONSTRUCTION. IMPLEMENT ONLY IF ALTERNATE #4 IS CHOSEN.
- ⑨ SAW CUT FLOOR FOR INSTALLATION OF PLUMBING ITEMS. COORDINATE WITH PLUMBING DRAWINGS.

**NEW CONSTRUCTION**

- ① NEW SEALED CONCRETE FLOOR - SLOPE TO DRAIN. AREA INCLUDES GRAY SOLID HATCH PATTERN.
- ② FLOOR DRAIN
- ③ RELOCATE EXISTING COMPRESSOR SALVAGED IN DEMOLITION NOTE #5 TO THIS LOCATION.
- ④ INSTALL FULL HEIGHT FRP AT THIS WALL.
- ⑤ HOSE BIB AND RELATED EQUIPMENT.
- ⑥ UTILITY DROP LOCATION
- ⑥A SPECIFIC TO ALTERNATE #3 ONLY: UTILITY DROP LOCATION WHEN ALTERNATE #3 IS CHOSEN.
- ⑦ ADD BARRIER THRESHOLD AT DOOR.
- ⑧ LOCATION OF HOOD ABOVE.
- ⑨ COMPRESSOR PROVIDED BY OWNER
- ⑩ WALL MOUNTED SINK.
- ⑪ UNUSED.
- ⑫ LOCATE LADDER SALVAGED IN DEMOLITION NOTE #6 TO THIS LOCATION
- ⑬ SPECIFIC TO ALTERNATE #4 ONLY: SLOPE FLOOR TO DRAIN 4'-0"x4'-0". CENTER ON FLOOR DRAIN.
- ⑭ 30" TALL 0'-3" WIDE CONCRETE CONTAINMENT CURB.
- ⑮ STAINLESS STEEL 3 BASIN SINK
- ⑯ STRIP CURTAIN, CLEAR PVC. LOCATE A SUPPORTING METAL CHANNEL AT THE CEILING TO AFFIX MOUNTING BRACKET ON. SEE SPECIFICATIONS FOR MORE INFORMATION.
- ⑰ PATCH AREA SAW CUT IN DEMOLITION TO MATCH CONTIGUOUS CONSTRUCTION. MATCH ALL REQUIRED SLOPES AT DRAIN AREAS. COORDINATE WITH PLUMBING DRAWINGS.



**1 MAIN LEVEL - DEMOLITION - FLOOR PLAN**  
 1/8"=1'-0"



**2 MAIN LEVEL - NEW CONSTRUCTION - FLOOR PLAN**  
 1/8"=1'-0"

**ALTERNATES**

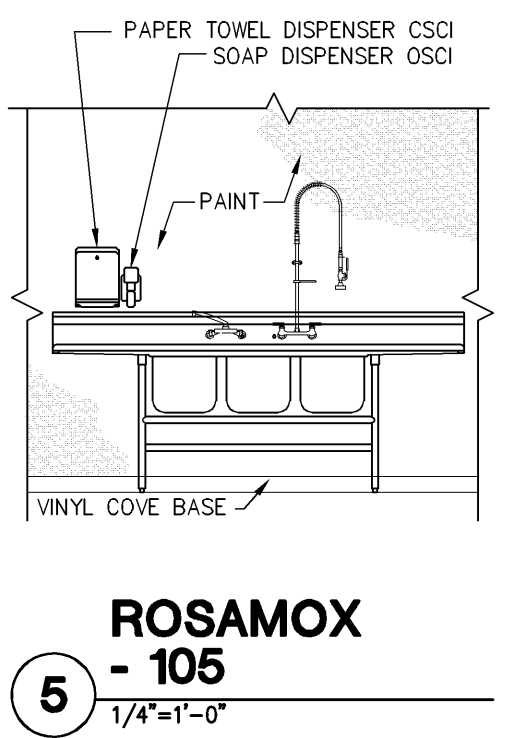
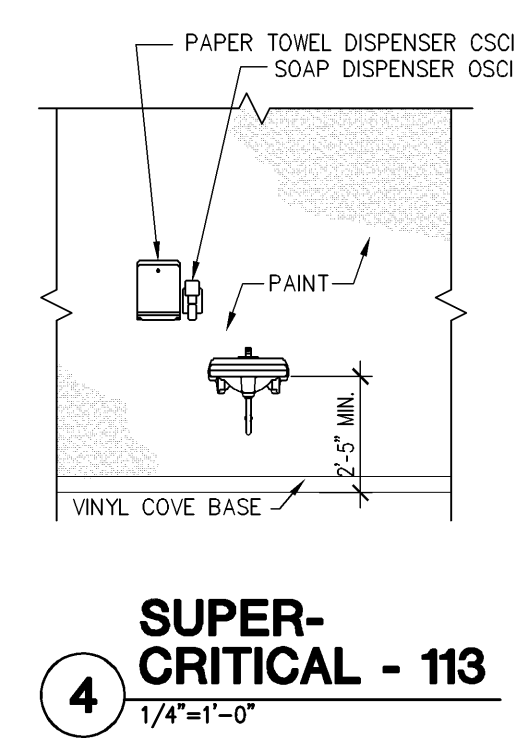
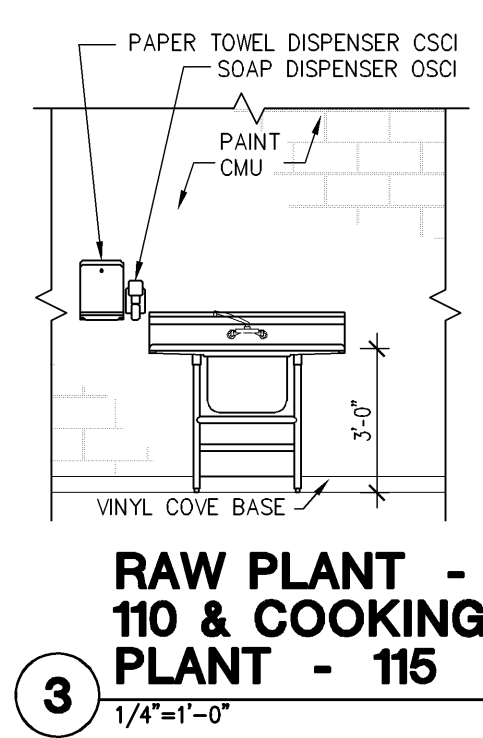
**ALTERNATE #1:**  
 PROVIDE 1/8" FIBERGLASS REINFORCED PANEL (FRP), WITH 5/8" GREEN GYPSUM BOARD PANEL AT INDICATED STUD WALLS.  
 DEMOLITION, KEYNOTE #4: DELETE AND REPLACE TEXT WITH THE FOLLOWING: DEMOLISH EXISTING BACKING GYPSUM BOARD PANEL TO 4'-0" A.F.F. & DEMOLISH EXISTING COMPLETE PLYM. FURRING / LINER ALONG WALL.  
 NEW CONSTRUCTION, KEYNOTE #4: DELETE AND REPLACE TEXT WITH THE FOLLOWING: INSTALL 5/8" GREEN GYPSUM BOARD AT LOCATION OF DEMOLISHED GYPSUM BOARD TO 4'-0" A.F.F. THIS WALL. INSTALL FRP BOARD OVER GYPSUM BOARD AND GREEN BOARD TO FULL HEIGHT OF WALL.

**ALTERNATE #2:**  
 PROVIDE METAL STUD WALLS IN LIEU OF CMU WALLS.  
 SUBSTITUTE WALLS NOTED ON PLAN 2/A1.01 AS WALL TYPE 1 WITH ALTERNATE DESCRIPTION OF WALL CONSTRUCTION DESCRIBED BY "WALL TYPE A1" PROVIDED UNDER "WALL TYPES - ALTERNATE" HEADING, ALTERNATE #2 SUBHEADINGS. DESCRIPTION OF WALL TYPE 1. UTILIZE DOOR FRAME TYPES A2 AND B2 FOR DOORS LOCATED IN WALLS ALTERED BY THIS ALTERNATE.

**ALTERNATE #3:**  
 OMIT UTILITY DROPS NOTED BY NEW CONSTRUCTION KEYNOTE 6.  
 LOCATE DROPS AS SHOWN BY KEYNOTE 6A.  
 SEE ALSO ELECTRICAL DRAWINGS.

**ALTERNATE #4:**  
 REDUCE AREA OF CONCRETE FLOOR REMOVAL/REPLACEMENT; DO NOT SAW CUT FLOOR FOR IMPLEMENTATION OF SLOPE INDICATED BY DEMOLITION KEYNOTE #1. DO NOT IMPLEMENT NEW CONSTRUCTION KEYNOTE #1. IN LIEU OF KEYNOTE #1 (BOTH DEMOLITION AND NEW CONSTRUCTION) VERIFY LOCATION OF NEW FLOOR DRAINS. DEMOLISH EXISTING CONCRETE FLOOR AT THESE LOCATIONS FOR A 4'-0"x4'-0" AREA. PROVIDE SLOPE CENTERED ON NEW FLOOR DRAINS IN LIEU OF SLOPE SHOWN. SEE DEMOLITION KEYNOTE #8 AND NEW CONSTRUCTION KEYNOTE #13.

**ALTERNATE #5:**  
 CONSTRUCTION OF ACCESSIBLE TOILET ROOM AT AREA SHOWN AS "FUTURE RR" CONSTRUCTION TO BE DESIGN/BUILD.  
 PROVIDE ONE FLOOR MOUNTED-TANK TYPE ADA WATERCLOSET, WITH 4" WASTE TO EXISTING SANITARY SEWER. PROVIDE (1) WALL MOUNT ADA LAVATORY SINK WITH FAUCET, INSTANTANEOUS ELECTRIC WATER HEATER AND THERMOSTATIC MIXING VALVE. EXTEND VENT PIPING THROUGH ROOF OR EXISTING VENT RISER. CONNECT 1" WATER PIPING TO EXISTING AND EXTEND TO NEW FIXTURE. SAWCUT AND PATCH ALL FLOORS AS REQUIRED FOR NEW FLOOR PIPING. PROVIDE PRIMP INSULATION FOR ALL HOT WATER PIPING.  
 SEPARATE TOILET ROOM OFF FROM TANK 118 ROOM WITH WALL OFF STUD WALL CONSTRUCTION AND ADA COMPLIANT DOOR AND HARDWARE. PROVIDE GYPSUM BOARD CEILING AT 8'-0" A.F.F.  
 OMIT DOOR 109A FROM CONSTRUCTION. CONSTRUCT DOOR 118A TO BE LOCATED AS SHOWN. DOOR HARDWARE AND HARDWARE TO BE EQUAL TO DOOR 104.  
 EPOXY PAINT GYPSUM BOARD WALLS. SHEET GOOD FLOORING. RUBBER BASE. ACCESSIBLE GRAB BARS. TOILET ACCESSORIES.  
 PROVIDE LIGHTING AND POWER.



**WALL TYPES**

- ① 8" CMU, TO STRUCTURE ABOVE, PAINTED.
- ② 6" METAL STUD WALL, INSULATED, WITH 5/8" GYPSUM WALLBOARD EACH SIDE. INCLUDE FRP TO STRUCTURE ABOVE, AT ANY FACE LOCATED ALONG THE PERIMETER OF THE FOLLOWING ROOMS/AREAS: 104, 105, 110, 111, 113, AND 115. SEE ROOM FINISH SCHEDULE FOR FINISH TREATMENT.

**WALL TYPES - ALTERNATES**  
 (EACH DESCRIPTION PROVIDES A SUBSTITUTION FOR A STANDARD WALL TYPE IS LISTED PER ALTERNATE.)

**ALTERNATE #2**

- A1 6" METAL STUD WALL, INSULATED, WITH 5/8" GYPSUM WALLBOARD EACH SIDE. INCLUDE FRP TO STRUCTURE ABOVE, AT ANY FACE LOCATED ALONG THE PERIMETER OF THE FOLLOWING ROOMS/AREAS: 104, 105, 110, 111, 113, AND 115. SEE ROOM FINISH SCHEDULE FOR FINISH TREATMENT.

**LEGEND**

PLAN MARK	DESCRIPTION
XXXXX	DOOR NUMBER TAG
①	WALL TYPE DESIGNATION, SEE SHEET 15/A1.08
①	SECTION/DETAIL/ELEVATION REFERENCE
ITEM	EQUIPMENT ITEM

**SHIVEHATTERY**  
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 Iowa | Illinois | Missouri | Illinois Firm Number: 184-000014

**KEMIN  
 PILOT PLANT**

2111 EAST 17TH ST  
 DES MOINES, IA

**MAIN LEVEL DEMOLITION &  
 MAIN LEVEL FLOOR PLANS**

**A1.01**

DRAWN	BWB
APPROVED	TCW
ISSUED FOR	CONSTRUCTION DOCUMENT
DATE	06-08-2012
FIELD BOOK	
PROJECT NO.	412128-0



**ARCHITECTURAL SPECIFICATION NOTES:**

- DIVISION 1**
- A. CERTIFICATES, PERMITS AND INSPECTION NOTES:**
- THE CONTRACTOR SHALL MAINTAIN AND PAY FOR ALL INSURANCE AS REQUIRED BY THE LAWS OF THE STATE. THE CONTRACTOR SHALL PAY ALL SOCIAL SECURITY AND OTHER TAXES REQUIRED BY FEDERAL, STATE, AND LOCAL LAWS.
  - ALL PERMITS AND LICENSES NECESSARY FOR THE PROPER EXECUTION OF THE WORK SHALL BE SECURED AND PAID FOR BY THE CONTRACTOR.
  - THE CONTRACTOR SHALL FILE FOR AND SECURE ALL INSURANCE, INSPECTIONS, AND CERTIFICATES OF COMPLIANCE AS REQUIRED BY LAW.
  - THE CONTRACTOR SHALL PURCHASE AND MAINTAIN INSURANCE TO PROTECT HIMSELF FROM LOSS BY FIRE, LIGHTNING, EXTENDED COVERAGE, AND VANDALISM IN THE FULL AMOUNT OF THE CONTRACT.
  - THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE OWNER AND THE ARCHITECT AND THEIR AGENTS FROM CLAIMS, DAMAGES, LOSSES, AND EXPENSES INCLUDING ATTORNEY'S FEES RESULTING FROM THE PERFORMANCE OF THE WORK.
- B. PREMISES NOTES:**
- THE CONTRACTOR SHALL BE FAMILIAR WITH THE JOBSITE CONDITIONS AND UTILITY LOCATIONS. THE LACK OF SPECIFIC INFORMATION ON THE DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY.
  - THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS, BOTH EXISTING AND NEW, REPORTING ANY AND ALL DISCREPANCIES TO THE OWNER BEFORE BEGINNING ANY PHASE OF CONSTRUCTION.
  - THE CONTRACTOR SHALL CONFINE OPERATIONS AT THE BUILDING TO THE AREAS PERMITTED UNDER THE CONTRACT. DO NOT USE PUBLIC AREAS FOR STORAGE OF MATERIALS OR WASTE.
  - MAINTAIN THE EXISTING BUILDING IN A SAFE AND SECURE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. REPAIR DAMAGES CAUSED BY CONSTRUCTION OPERATIONS.
- C. MATERIALS AND WORKMANSHIP NOTES:**
- ALL MANUFACTURED ARTICLES, MATERIALS, AND EQUIPMENT SHALL BE APPLIED AS RECOMMENDED BY THE MANUFACTURERS, AND UNLESS OTHERWISE SPECIFIED SHALL BE NEW AND FREE FROM DEFECT.
  - ALL WORK SHALL BE PERFORMED BY SKILLED WORKERS AND MECHANICS AND EXECUTED IN A MANNER ACCEPTABLE TO THE OWNER. WORK SHALL BE PROTECTED DURING CONSTRUCTION, AND UPON COMPLETION, THE INSTALLATION SHALL BE THOROUGHLY CLEANED AND ALL DEBRIS PRESENT SHALL BE REMOVED FROM THE PREMISES.
  - THE CONTRACTOR IS RESPONSIBLE FOR HAVING THE SUBCONTRACTORS COORDINATE THEIR WORK WITH THE WORK OF OTHER TRADES INCLUDING WORK NOT IN THE CONTRACT.
  - THE CONTRACTOR IS TO REPAIR, REPLACE, PATCH AND MATCH ANY MATERIALS, AREAS, OR SYSTEMS AS REQUIRED FOR PROPER INSTALLATION AND NEAT APPEARANCE OF THE WORK. CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND APPROVED MANNER. RESTORE EXISTING WORK TO ORIGINAL CONDITION.
- D. CODE REQUIREMENTS:** ALL WORK UNDER THIS CONTRACT SHALL SATISFY ALL APPLICABLE CODES, ORDINANCES, OR REGULATIONS OF THE GOVERNING BODIES, WHETHER SO SHOWN OR NOT, AND ALL MODIFICATIONS REQUIRED BY SUCH AUTHORITIES SHALL BE MADE BY THE CONTRACTOR WITHOUT ANY ADDITIONAL COST TO THE OWNER.

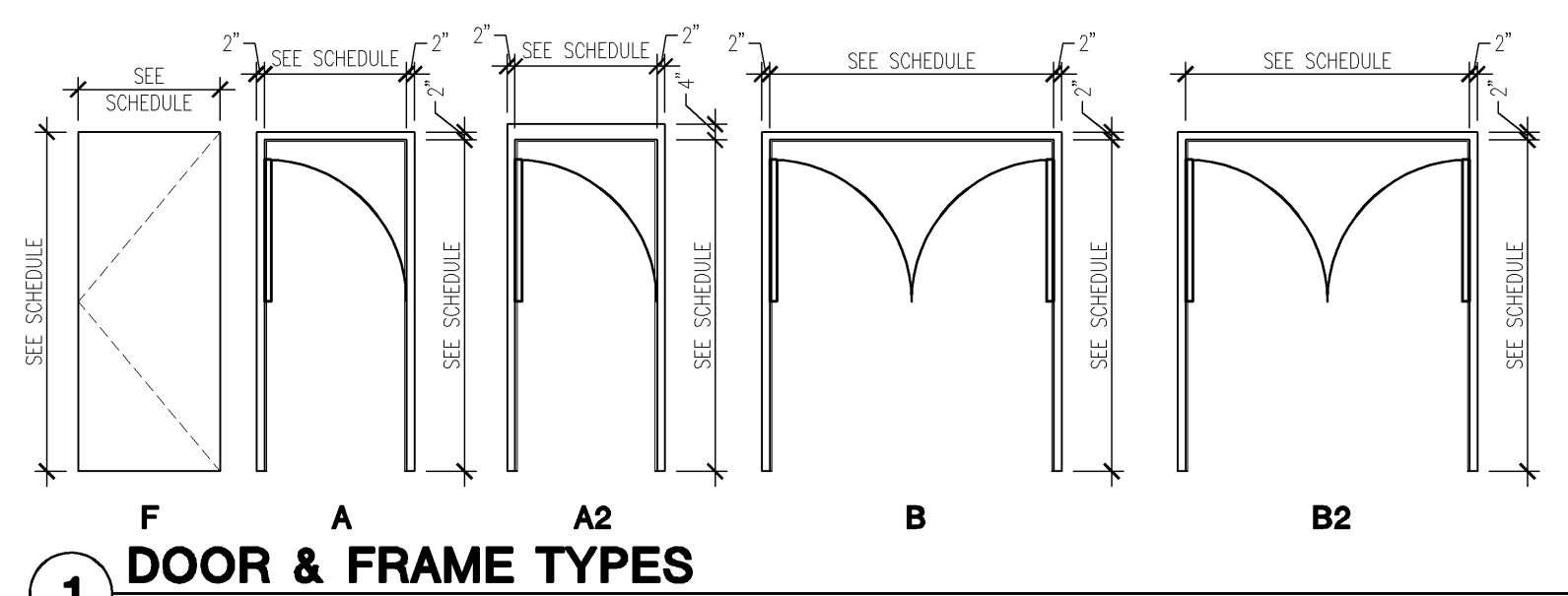
- DIVISION 4**
- A. MASONRY**
- MASONRY CONSTRUCTION AND MATERIALS SHALL CONFORM TO ALL REQUIREMENTS OF "SPECIFICATION FOR MASONRY STRUCTURES (ACI 530.1/ASCE 8/M5602)", PUBLISHED BY THE ACI, EXCEPT AS MODIFIED BY THE REQUIREMENTS OF THESE CONTRACT DOCUMENTS.
  - COMPRESSIVE STRENGTH OF MASONRY SHALL BE (F<sub>m</sub>) = 2000 PSI.
  - LAY MASONRY IN RUNNING BOND PATTERN USING FACE SHELL BEDDING IN 3/8" MORTAR JOINT.
  - ALL CONCRETE MASONRY UNITS TO BE TYPE I - GRADE N MOISTURE CONTROLLED PER ASTM-C90 - COMPRESSIVE STRENGTH 2800 PSI. PROVIDE NORMAL WEIGHT UNITS EVERYWHERE U.N.O. MORTAR TO BE TYPE S IN ACCORDANCE WITH ASTM C270.
  - GROUT FOR BOND BEAMS AND FILLED CORES TO BE PER ASTM A476(COARSE) - 2500 PSI - 28 DAY COMPRESSIVE STRENGTH.
  - WIRE JOINT REINFORCING SHALL BE GALVANIZED, TRUSS TYPE CONFORMING TO ASTM A82 AND SHALL BE INSTALLED CONTINUOUSLY AT 16" O.C. VERTICALLY SPACING.
  - BED WEBS IN MORTAR IN STARTING COURSE ON FOOTINGS, FOUNDATION WALLS, OR SLABS AND WHERE ADJACENT TO CELLS OR CAVITIES TO BE REINFORCED OR FILLED WITH CONCRETE OR GROUT.
  - GROUT MASONRY FULLY A MINIMUM OF THREE BLOCK COURSES BELOW UNTEL OR BEAM BEARING.
  - ALL EXPOSED JOINTS SHALL BE TOOLED TO A DENSE CONCAVE SURFACE.
- DIVISION 6**
- A. ROUGH CARPENTRY:**
- PROVIDE BLOCKING IN NEW AND EXISTING WALLS AS REQUIRED TO SECURELY SUPPORT ALL WALL MOUNTED FIXTURES, ACCESSORIES, OR MILLWORK. REPAIR WALLS TO MATCH EXISTING WHERE DEMOLITION IS REQUIRED TO INSTALL BLOCKING.
  - STANDARDS FOR LUMBER SHALL COMPLY WITH PS-20. STANDARDS FOR PLYWOOD SHALL COMPLY WITH PS-1. MOISTURE CONTENT SHALL NOT EXCEED 19%.

- DIVISION 7**
- A. SEALANTS:**
- CLEAN AND PRIME JOINTS AND INSTALL SEALANT IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS.
  - PROVIDE ACRYLIC EMULSION LATEX SEALANT ON INTERIOR NON-MOVING JOINTS.
  - PROVIDE SELF-LEVELING MULTI-COMPONENT POLYURETHANE IN GRAY COLOR AT CONCRETE SLAB LOCATIONS.
  - PROVIDE JOINT BACK-UP MATERIAL EQUIVALENT TO ETHAFOAM SB ROD BY DOW CORNING CORP.
- B. CONCRETE SEALER**
- URETHANE RESIN SEALER
  - APPROVED PRODUCTS AND MANUFACTURERS OR AN EQUIVALENT APPROVED IN ADVANCE BY THE ARCHITECT/ENGINEER.
    - BASE BUILDING SYSTEMS TYPICAL CONCRETE SEALER - HEAVY DUTY, SONNEBORN KURE-N-HARDEN
    - ULTRADEC URETHANE SEALER BY ULTRADEC, INC., ARNOLD, MISSOURI.
- C. CORRUGATED METAL PANEL SIDING:**
- MATCH EXISTING AS REQUIRED FOR PATCHING.
  - INSTALL PER MANUFACTURER'S INSTRUCTIONS OR TO MATCH EXISTING CONSTRUCTION AS REQUIRED.
- D. INSULATION (INTERIOR PARTITIONS):**
- WALL INSULATION SHALL BE UNFACED FIBERGLASS BATT INSULATION BY OWENS-CORNING FIBERGLASS OR APPROVED EQUIVALENT. FULL THICKNESS OF WALL CAVITY - SEE DRAWINGS FOR WALL THICKNESSES. INSTALL AS PER MANUFACTURERS WRITTEN INSTRUCTIONS.

- DIVISION 8**
- A. STANDARD STEEL DOORS AND FRAMES**
- QUALITY ASSURANCE: CONFORM TO REQUIREMENTS OF SDI 100. PRODUCTS:
    - EXTERIOR DOORS: SDI 100, GRADE III, EXTRA HEAVY DUTY, (16 GAUGE FACES) 1-3/4 INCH THICK, GALVANIZED TO ASTM A525 CLASS G90, INTERNAL CONSTRUCTION IN ACCORDANCE WITH SDI 100, 2.2.3.4 OR 2.2.3.5, INSULATED.
    - INTERIOR DOORS: SDI 100, GRADE II - HEAVY DUTY (18 GAUGE FACES) 1-3/4 INCH THICK, INTERNAL CONSTRUCTION IN ACCORDANCE WITH SDI 100, 2.2.3. EXCEPT 2.2.3.2. (POLYURETHANE CORE) NOT ACCEPTABLE.
    - EXTERIOR FRAMES: 16 GAUGE STEEL, GALVANIZED TO ASTM A525 CLASS G90.
    - INTERIOR FRAMES: 16 GAUGE STEEL, COLOR OR HOT ROLLING MILL FINISH. BEARING FIRERATING LABEL ACCEPTABLE TO AUTHORITY HAVING JURISDICTION WHERE SCHEDULED.
    - ACCESSORIES: RUBBER SILENCERS: ANSI A156.16, TYPE L03011.
    - PREPARATION AND FINISH: REINFORCE AND PREPARE DOORS AND FRAMES TO RECEIVE HARDWARE. PREPARE RACKWAYS FOR WIRING WHERE REQUIRED. CHEMICALLY TREAT SURFACES AND APPLY ONE COAT OF PRIMER.
- B. DOOR HARDWARE:**
- EXTENT OF FINISH HARDWARE REQUIRED COVERS ALL DOOR REQUIRED TO MAKE A COMPLETE JOB IN EVERY RESPECT WHETHER OR NOT EVERY ITEM IS SPECIFICALLY MENTIONED. COORDINATION WITH THE OWNER REGARDING REUSING EXISTING HARDWARE. HARDWARE TO MATCH EXISTING LAB BUILDING HARDWARE TO THE EXTENT POSSIBLE. SUBMIT DETAILED HARDWARE SCHEDULE AND PRODUCT DATA ON EACH COMPONENT FOR REVIEW. SEE HARDWARE GROUPS BELOW.
  - HARDWARE FOR DOOR OPENINGS WHICH HAVE LABEL REQUIREMENTS SCHEDULED SHALL BE LISTED BY UNDERWRITERS LABORATORIES AS ACCEPTABLE FOR THE CLASS OF OPENING SCHEDULED.
  - ALL DOORS TO HAVE HEAVY DUTY HARDWARE. INSTALL HARDWARE IN STRICT ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.
  - ALL FINISH HARDWARE ITEMS NOT REQUIRING PAINT SHALL BE FITTED AND REMOVED BEFORE PAINTING AND FINISHING IS DONE AND REPLACED AS DIRECTED AFTER PAINTING HAS BEEN COMPLETED.
  - ALL BUTTS, LOCK FRONTS, STRIKES, KEEPERS, ETC. SHALL BE NEATLY AND ACCURATELY MORTISED FLUSH, PROPERLY PLACED AND ALIGNED TO ALLOW QUIET AND SMOOTH OPERATION WITHOUT STICKING, BINDING, OR RATTLING.
  - ALL LOCKS MUST BE MASTERKEYED. FURNISH THE OWNER WITH AT LEAST TWO MASTER KEYS AND TWO KEYS FOR EACH LOCK.

- DIVISION 8 (CONTINUED)**
- LOCKSET AND LATCHSET TRIM: MATCHING ADA COMPLIANT LEVER HANDLES AND ROSES.
  - HARDWARE FINISH:
    - ANSI A156.18, 626 (SATIN CHROME PLATED ON BRASS OR BRONZE) OR 652 (SATIN CHROME PLATED ON STEEL), EXCEPT STAINLESS STEEL ITEMS 630 (SATIN).
    - CLOSERS AND CLOSER ARMS MAY HAVE LAQUOER FINISH TO BLEND WITH DOORS AND FRAMES.
  - LOCKSETS AND LATCHSETS: ALL OF ONE MANUFACTURER: YALE, SARGENT, RUSSWMN, OR SCHLAGE. MASTERKEY BUILDING AS PER CLIENT INSTRUCTION.
- C. HARDWARE GROUPS:**
- (GROUP A) EXTERIOR DOORS (HM X HM), OUTSWINGING:
- BUTTS: 1-1/2 PR. ANSI A156.1, TYPE A5112 (FULL MORTISE, STANDARD WEIGHT, BALL BEARING, STAINLESS STEEL), NRP, 4.5 X 4.5.
  - 1 CLOSER: ANSI A156.4, TYPE C72021 - PT 40,4G,4H, SIMILAR TO LCN 4040-CUSH.
  - 1 MORTISE LOCKSET: ANSI A156.13, GRADE 1, FUNCTION FD4 (ENTRY).
  - KICKPLATE INTERIOR SIDE - FINISH TO MATCH HARDWARE.
  - 1 ADA COMPLIANT THRESHOLD
- (GROUP B) INTERIOR DOORS (36 INCHES WIDE) (WD X HM):
- BUTTS: 1-1/2 PR ANSI A156.1, TYPE AB111 (FULL MORTISE, HEAVY WEIGHT, BALL BEARING) OR 2 PR ANSI A156.1, TYPE AB112 (FULL MORTISE, STANDARD WEIGHT, BALL BEARING), 4.5 X 4.5.
  - 1 CLOSER: ANSI A156.4, SIMILAR TO LCN 4040. (MTG AS REQ'D).
  - 1 CYLINDRICAL LATCHSET: ANSI A156.2, SERIES 4000, FUNCTION F75 (PASSAGE).
  - 1 KICK PLATE, 10 INCHES HIGH.
  - FINISH TO MATCH HARDWARE.
- (GROUP C) INTERIOR DOUBLE DOORS (2 PAIR, 36 INCHES WIDE EACH) (HM):
- BUTTS: 1-1/2 PR ANSI A156.1, TYPE AB111 (FULL MORTISE, HEAVY WEIGHT, BALL BEARING) OR 2 PR ANSI A156.1, TYPE AB112 (FULL MORTISE, STANDARD WEIGHT, BALL BEARING), 4.5 X 4.5.
  - 2 CLOSER: ANSI A156.4, SIMILAR TO LCN 4040. (MTG AS REQ'D).
  - 1 CYLINDRICAL LATCHSET: ANSI A156.2, SERIES 4000, FUNCTION F75 (PASSAGE).
  - 1 KICK PLATE, 10 INCHES HIGH.
  - FINISH TO MATCH HARDWARE.

- D. GLAZING:**
- COMPLY WITH FGMA GLAZING MANUAL FOR GLAZING INSTALLATION METHODS.
  - SAFETY GLASS: ASTM C1048; MONOLITHIC TEMPERED, CONFORM TO SGGC REQUIREMENTS.
  - INSULATED GLASS: TWO PANE, 1 INCH THICK, INSULATING GLASS, IGCC LABEL "CLASS CBA", DUAL SEAL THAT DOES NOT EXPOSE POLYSULFIDE SEALANT TO ULTRAVIOLET LIGHT; CLEAR INNER AND OUTER PANES.
  - GLAZING COMPOUND: SILICONE SEALANT ASTM C920, TYPE S, GRANDE NS, CLASS 25, COLOR TO MATCH EXISTING.
  - INTERIOR GLASS AT BORROW LITES: 6 MM THICK CLEAR GLASS. TEMPER WHERE REQUIRED BY APPLICABLE CODES.
- DIVISION 9**
- A. GYPSUM WALLBOARD AND STEEL STUD FRAMING:**
- INSTALL GYPSUM WALLBOARD IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND STANDARDS.
    - WALLBOARD SHALL BE FIRE-RESISTIVE 5/8" THICK TYPE X MEETING REQUIREMENTS OF ASTM C36.
    - GALVANIZED METAL STUDS TO BE 22-GAUGE, 3-5/8" (UNLESS NOTED OTHERWISE) WITH GALVANIZED TOP AND BOTTOM RUNNER TRACKS AS MANUFACTURED BY UNITED STATES GYPSUM COMPANY OR EQUAL.
    - PROVIDE TWO 20-GAUGE STUDS FROM SLAB-TO SLAB ON EACH SIDE OF DOOR OPENINGS WITH STUDS NESTED OPEN-END TO OPEN-END FORMING A BOX COLUMN. PROVIDE OTHER SUPPORT MEMBERS AS NOTED AND DETAILED, INCLUDING HAT CHANNELS, Z-CHANNELS, AND C-H STUDS FOR SHAFT WALL ASSEMBLIES.
    - INSTALL ALL TRIM IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
    - WALL BOARD SHALL BE FINISHED (TAPED, FLOAT, SAND) AND SURFACES SHALL HAVE A SMOOTH FINISH AND BE LEFT IN CONDITION TO RECEIVE NEW FINISH PAINTING OR WALL COVERING.
  - WATER RESISTIVE (GREEN BOARD) GYPSUM BOARD SHALL BE THICKNESS INDICATED, TYPE "X", 4"-0" BY PARTITION HEIGHT OR REQUIRED ELEVATION, WITH TAPERED EDGES. PROVIDED PRODUCT TO BE WATER RESISTANT AND RESISTANT TO ROT, STAINING DENTING, PEELING.
  - FIBERGLASS REINFORCED WALL PANELS PROVIDE UNFINISHED WALLBOARD WITH ADHERED PRE-FINISHED POLYESTER GLASS REINFORCED PLASTIC SHEETS CONFORMING TO ASTM D 5319 NOMINAL DIMENSIONS 4'-0" WIDE x LENGTH NOMINALLY CALLED OUT FOR ON DRAWINGS.
  - COLOR TO BE CHOSEN FROM MANUFACTURER'S STANDARD LINE BASIS OF DESIGN: MARLITE STANDARD FRP BY MARLITE 202 HARGER STREET, DOVER, OH 44622.
- D. PAINTING NOTES:**
- PAINTING WORK SHALL COVER EVERYTHING USUALLY PAINTED OR FINISHED TO MAKE A COMPLETE JOB IN EVERY RESPECT, WHETHER EACH ITEM IS HEREINAFTER SPECIFICALLY IDENTIFIED OR NOT. (NOTE: THIS INCLUDES ALL EXPOSED STRUCTURAL STEEL IN PROJECT AREA, NEW OR EXISTING)
  - FINISH TO MATCH ALL ADJACENT RETURNS, EDGES, AND RECESSES WHICH WILL BE SEEN FROM ANY ANGLE.
  - DO NOT PAINT OVER ANY CODE-REQUIRED LABELS.
  - PAINT PRODUCTS SHALL BE AS INDICATED ON THE ROOM FINISH SCHEDULE. SUBMIT SAMPLES FOR OWNER SELECTION OF COLOR, SHEEN, AND TEXTURE.
  - DO NOT PAINT CONDITIONS DETRIMENTAL TO THE FINAL PAINT PERFORMANCE.
  - REMOVE OR PROTECT DURING PAINTING ALL ACCESSORIES, FIXTURES, AND SIMILAR ITEMS INSTALLED PRIOR TO PAINTING AND NOT REQUIRED TO BE PAINTED. CAREFULLY REPLACE AND ADJUST AFTER COMPLETION OF PAINTING.
  - ALL PAINT MATERIALS AND EQUIPMENT SHALL BE COMPATIBLE.
- DIVISION 10**
- A. FIRE EXTINGUISHERS AND CABINETS:**
- FIRE EXTINGUISHERS TO BE A-B-C TYPE, MULTI-PURPOSE DRY CHEMICAL, 20 POUND SIZE.
  - CABINETS SHALL BE STEEL TUB, WITH GLASS DOOR (TEMPERED GLASS), SIZED FOR 20 POUND EXTINGUISHER.
  - CABINET STYLE SHALL BE TO MEET ADA (MAXIMUM PROJECTION 4" INTO ACCESSIBLE ROUTE) WHERE WALL CONSTRUCTION ALLOWS. SURFACE MOUNTED CABINETS AT OTHER LOCATIONS NOT ON ACCESSIBLE ROUTE.
  - LOCATE AS SHOWN AT HEIGHT TO MEET ADA (TOP OF HANDLE AT +48" MAX).
- B. STRIP CURTAIN AND STRIP CURTAIN ACCESSORIES:**
- INSTALL STRIP CURTAIN IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND STANDARDS.
  - STRIP CURTAIN TO BE OF 16" WIDE, DOUBLE RIBBED, .145/.345" THICK P.V.C. BASIS OF DESIGN IS TMI SAVE-T OFFSET DOUBLE RIBBED STRIP MODEL #RC516145.
  - MOUNTING BRACKET TO BE OF HEAVY DUTY .09" THICK ALUMINUM WITH PRE-DRILLED HOLES FOR MOUNTING. BASIS OF DESIGN IS TMI SAVE-T LOC UNIVERSAL HEADER AND WALL MOUNT MODEL #JM-UL-UC.
  - PROVIDE SUPPORT AT EXISTING STRUCTURE WITH CHANNEL TO AFFIX MOUNTING BRACKET.



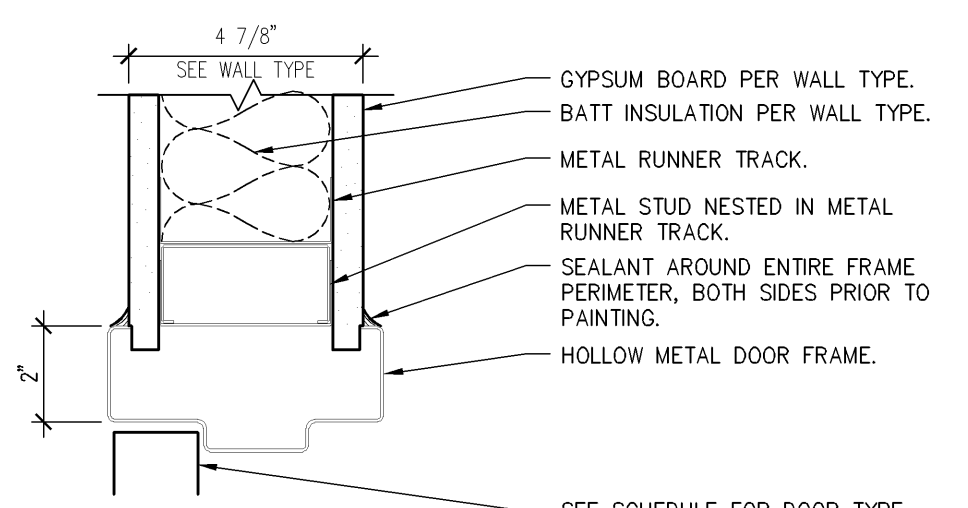
**1 DOOR & FRAME TYPES**  
1/4"=1'-0"

**DOOR AND FRAME SCHEDULE**

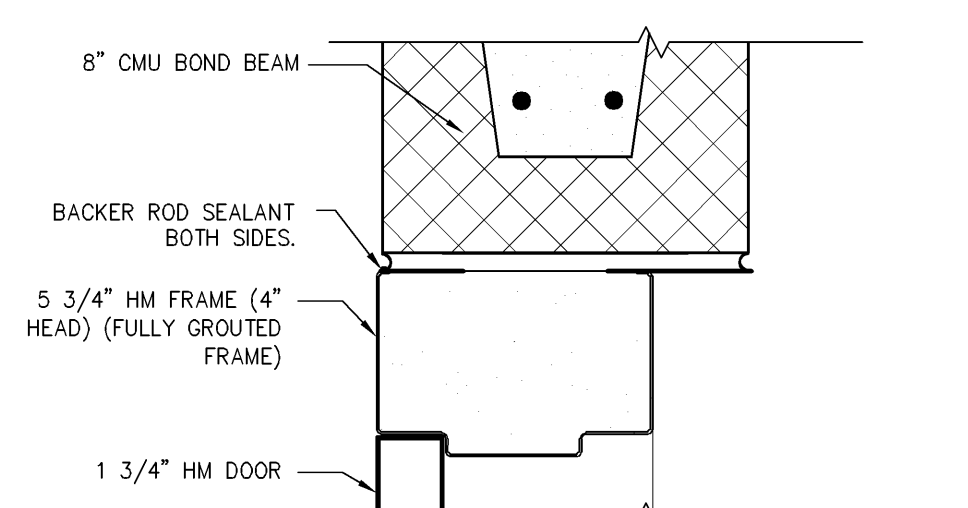
DOOR NO	ROOM NAME	DOOR					FRAME		RATING	HDWR	REMARKS
		WD	HT	TK	MTRL	TYPE	GLAZ	MTRL			
102	EQUIP	3'-0"	7'-0"	2"	HM	F	---	HM	A/A	---	GROUP B
104	COOKING PLANT	3'-0"	7'-0"	2"	HM	F	---	HM	A2/A	---	GROUP B
109A	RECEIVING	3'-0"	7'-0"	2"	HM	F	---	HM	A/A	---	GROUP B
109B	RECEIVING	3'-0"	7'-0"	2"	HM	F	---	HM	A/A	---	GROUP A
110	COOKING PLANT	3'-0"	7'-0"	2"	HM	F	---	HM	A2/A	---	GROUP B
113	KPC SUPERCRITICAL	PR 4'-0"	7'-0"	1 3/4"	HM	F	---	HM	B/B	---	GROUP C

**ROOM FINISH SCHEDULE**

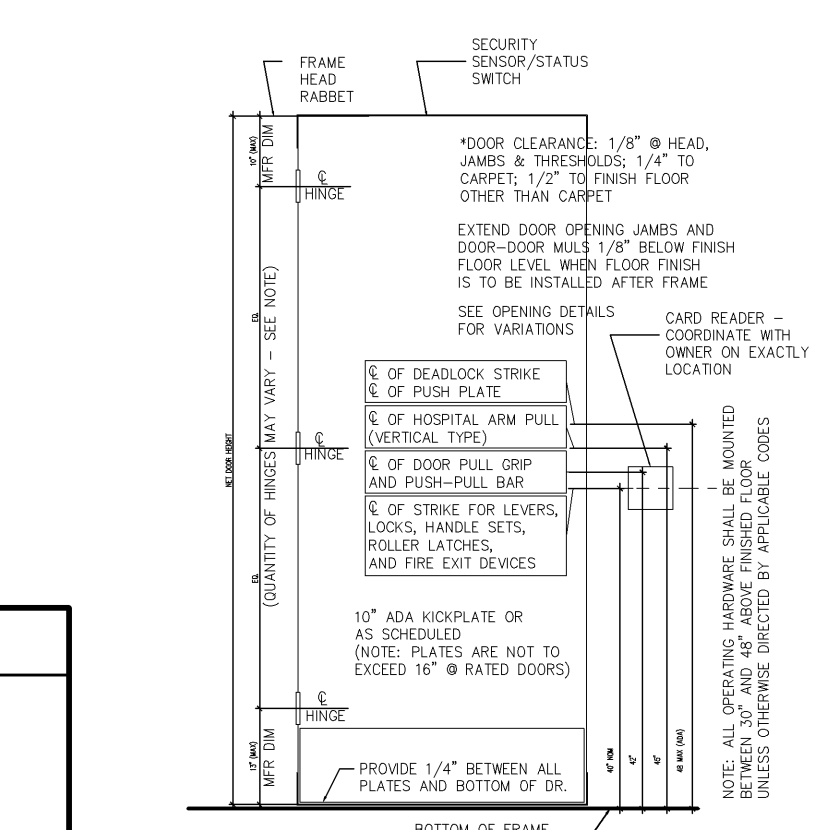
ROOM NO	ROOM NAME	FLR	BASE	WALLS				CEILING		REMARKS
				NORTH	SOUTH	EAST	WEST	MTRL	HT	
102	EQUIP	SC	RB	EPT	EPT	EPT	EPT	EXP	EX	
104	LAB	SC	RB	EPT	EPT	EPT	EPT	EXP	EX	
105	KPC ROSAMOX	SC	RB	EX	N/A	N/A	EPT	EXP	EX	
107	STORAGE	SC	RB	EPT	EX	EPT	EPT	EXP	EX	
109	RECEIVING	SC	RB	N/A	EX	EPT	EPT	EXP	EX	
110	COOKING PLANT	SC	RB	EPT	N/A	EPT	EPT	EXP	EX	
111	DRY	SC	RB	EPT	N/A	EPT	EPT	EXP	EX	
113	KPC SUPERCRITICAL	SC	RB	EPT	EPT	EPT	EPT	EXP	EX	
115	RAW PLANT	SC	RB	EPT	EPT	EPT	EPT	EXP	EX	
118	TANK	SC	RB	EPT	EPT	EPT	EPT	EXP	EX	



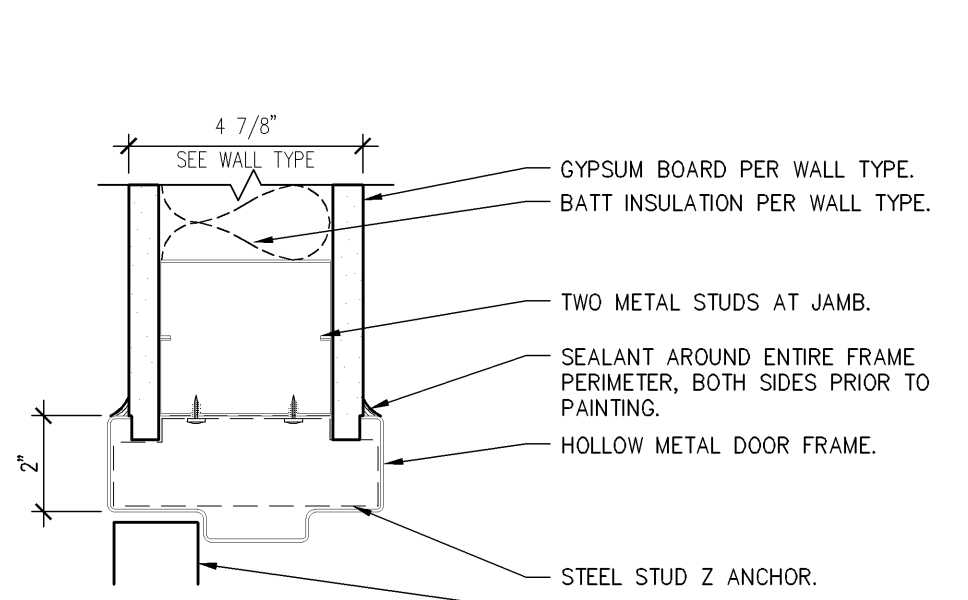
**3 TYPICAL HM FRAME HEAD**  
3\"/>



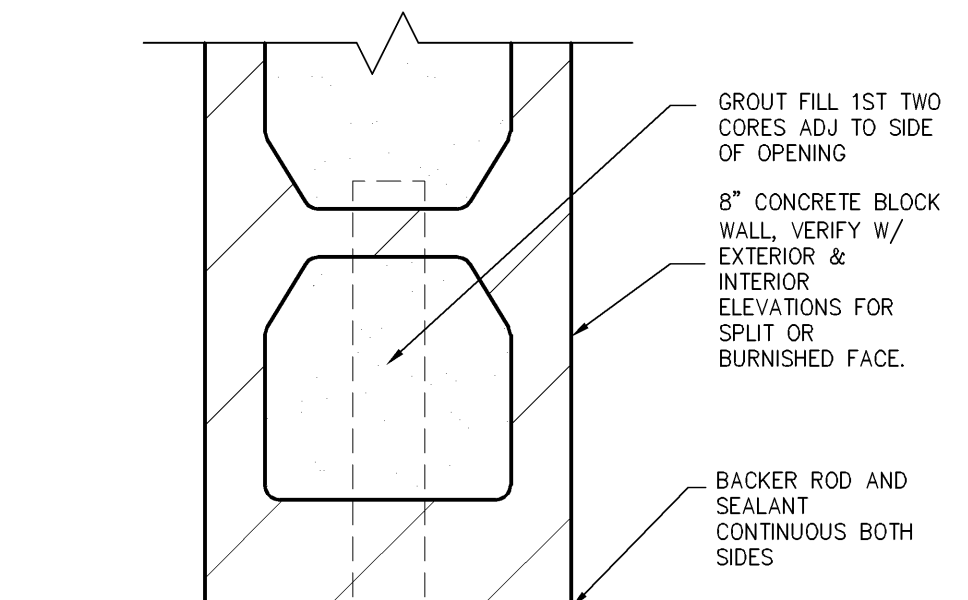
**6 HM FRAME HEAD @ CMU WALL**  
3\"/>



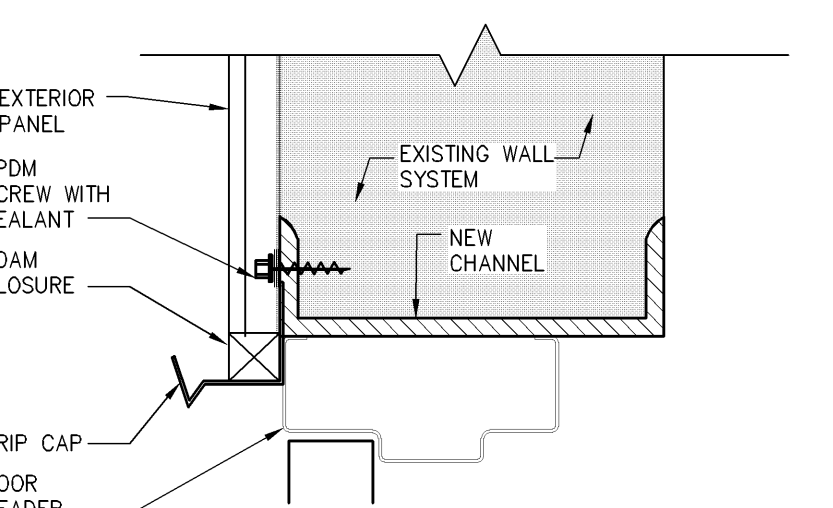
**2 DOOR MOUNTING HTS.**  
1/4\"/>



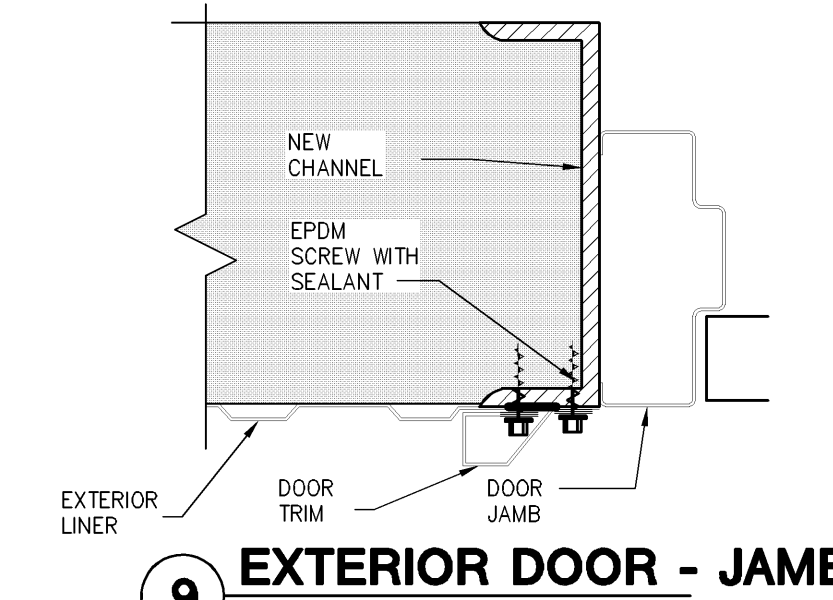
**4 TYPICAL HM FRAME JAMB**  
3\"/>



**7 HM FRAME JAMB @ CMU WALL**  
3\"/>



**8 EXTERIOR DOOR - HEAD**  
3\"/>



**9 EXTERIOR DOOR - JAMB**  
3\"/>

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Iowa | Illinois | Missouri | Illinois Firm Number: 184-000214

**KEMIN  
PILOT PLANT**

2111 EAST 17TH ST  
DES MOINES, IA

DRAWN	BWB
APPROVED	TCW
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DATE	06-08-2012
FIELD BOOK	

PROJECT NO.: 412128-0

**ARCHITECTURAL  
SCHEDULES,  
SPECIFICATIONS AND  
DETAILS**

**A2.01**



**KEMIN  
PILOT PLANT**

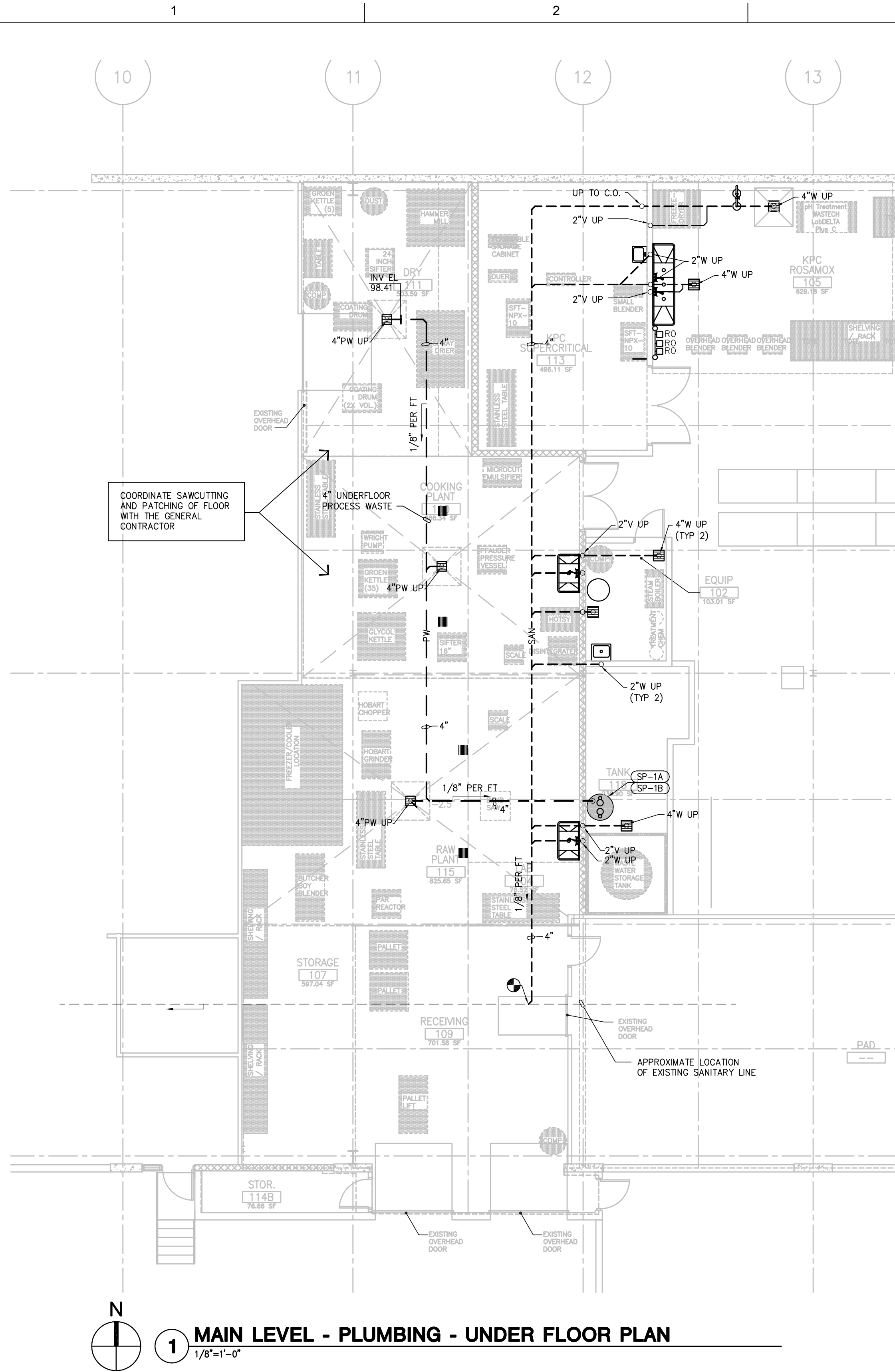
2111 EAST 17TH ST  
DES MOINES, IA

DRAWN BAF  
APPROVED CSH  
ISSUED FOR CONSTRUCTION DOCUMENT  
DATE 06-08-2012  
FIELD BOOK

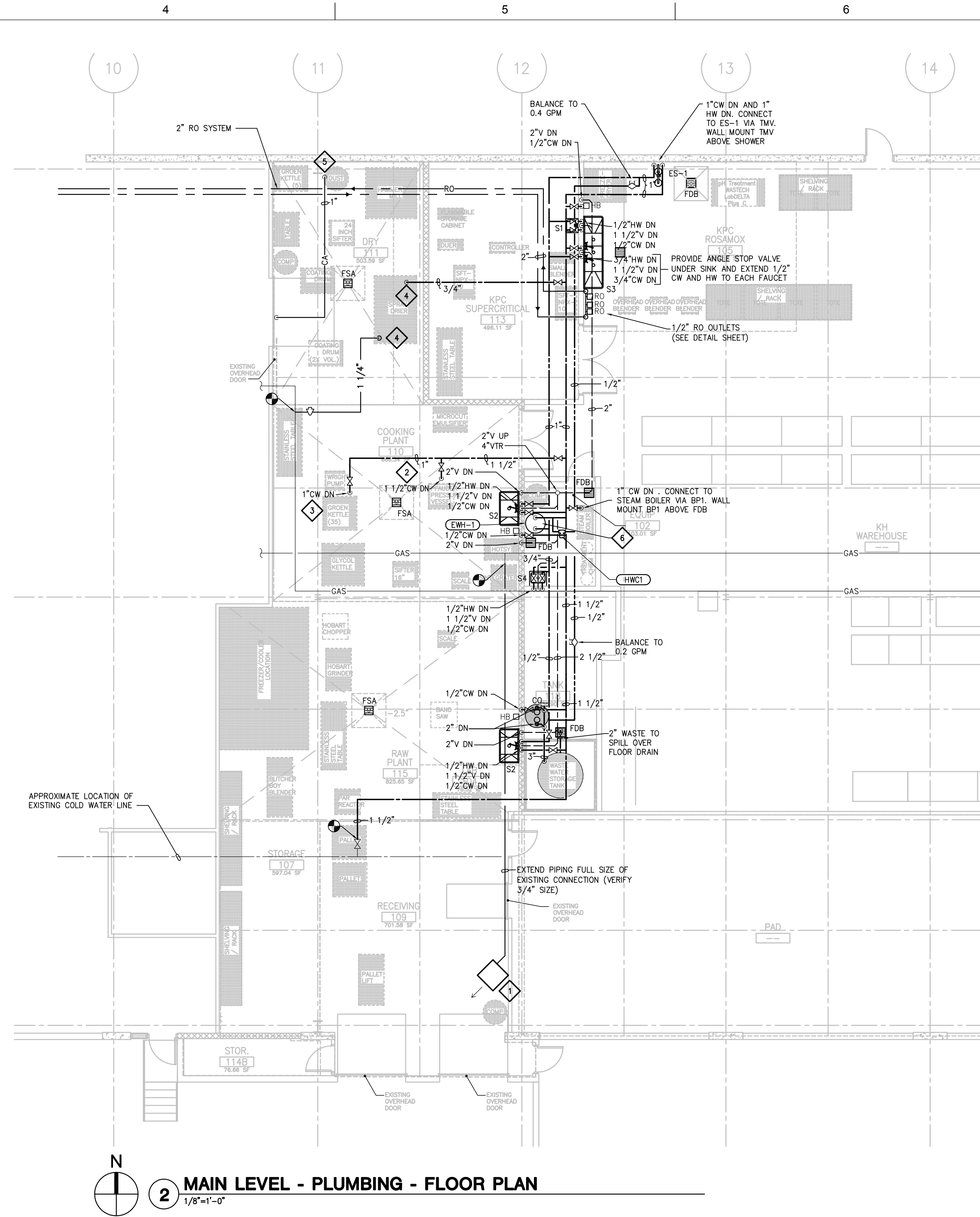
PROJECT NO.: 412128-0

**MAIN LEVEL  
PLUMBING DEMOLITION  
AND NEW WORK  
FLOOR PLANS**

**P1.01**



**1 MAIN LEVEL - PLUMBING - UNDER FLOOR PLAN**  
1/8"=1'-0"



**2 MAIN LEVEL - PLUMBING - FLOOR PLAN**  
1/8"=1'-0"

**GENERAL NOTES**

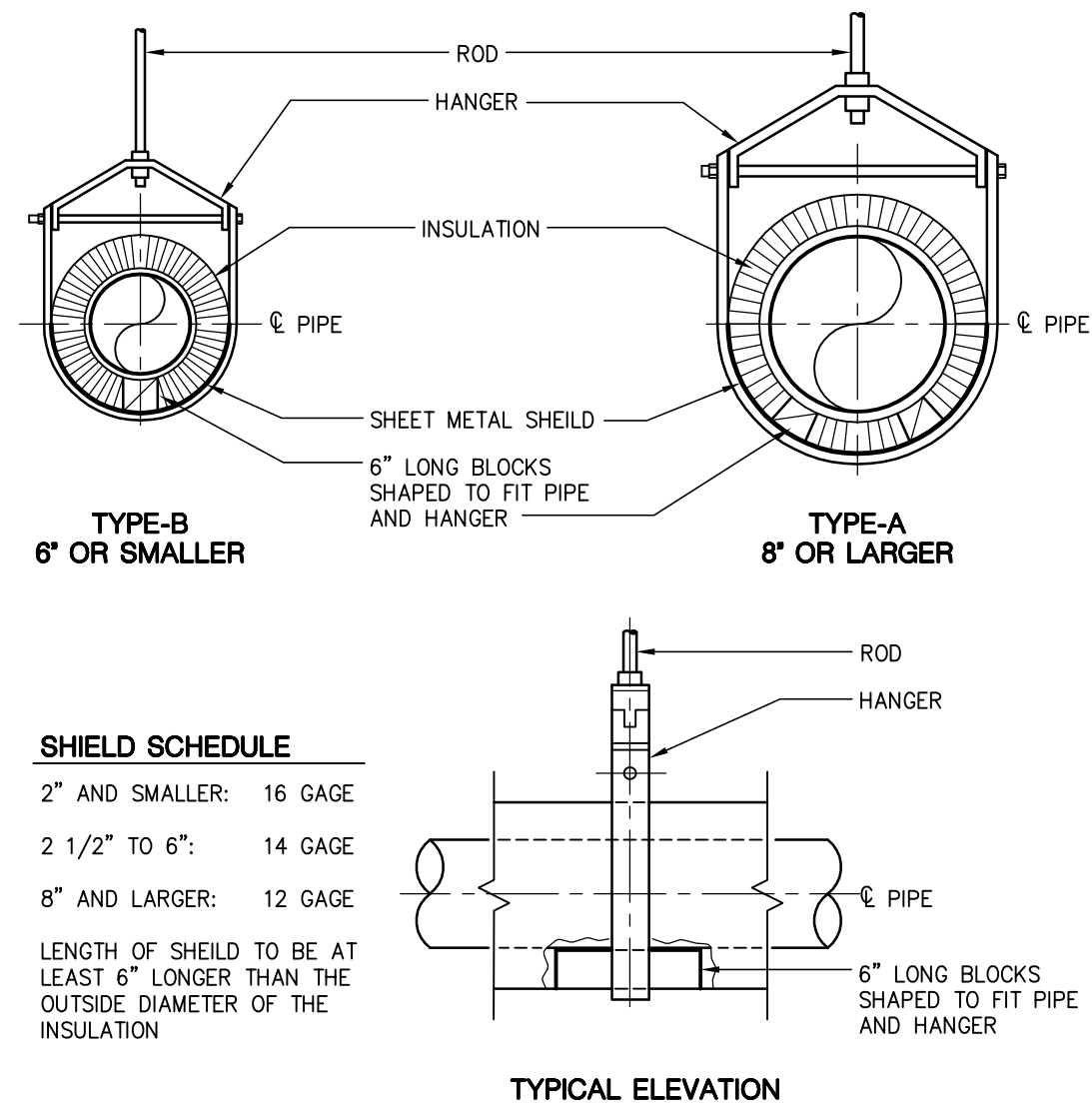
1. THIS DRAWING DIAGRAMMATICALLY REPRESENTS THE LAYOUT OF NEW PLUMBING EQUIPMENT AND PIPING. COORDINATE WORK WITH ALL OTHER TRADES AND PROVIDE OFFSETS OR RELOCATE AS REQUIRED TO AVOID CONFLICTS.
2. COORDINATE NEW WORK OF ALL UTILITIES TO REDUCE DOWNTIME, I.E.; EQUIPMENT, NATURAL GAS, AND PIPING.
3. COORDINATE BACKFLOW REQUIREMENTS WITH FINAL EQUIPMENT.
4. REFERENCE DRAWING M1.01 FOR GAS PIPING DEMOLITION REQUIREMENTS.

**PLUMBING KEYNOTES**

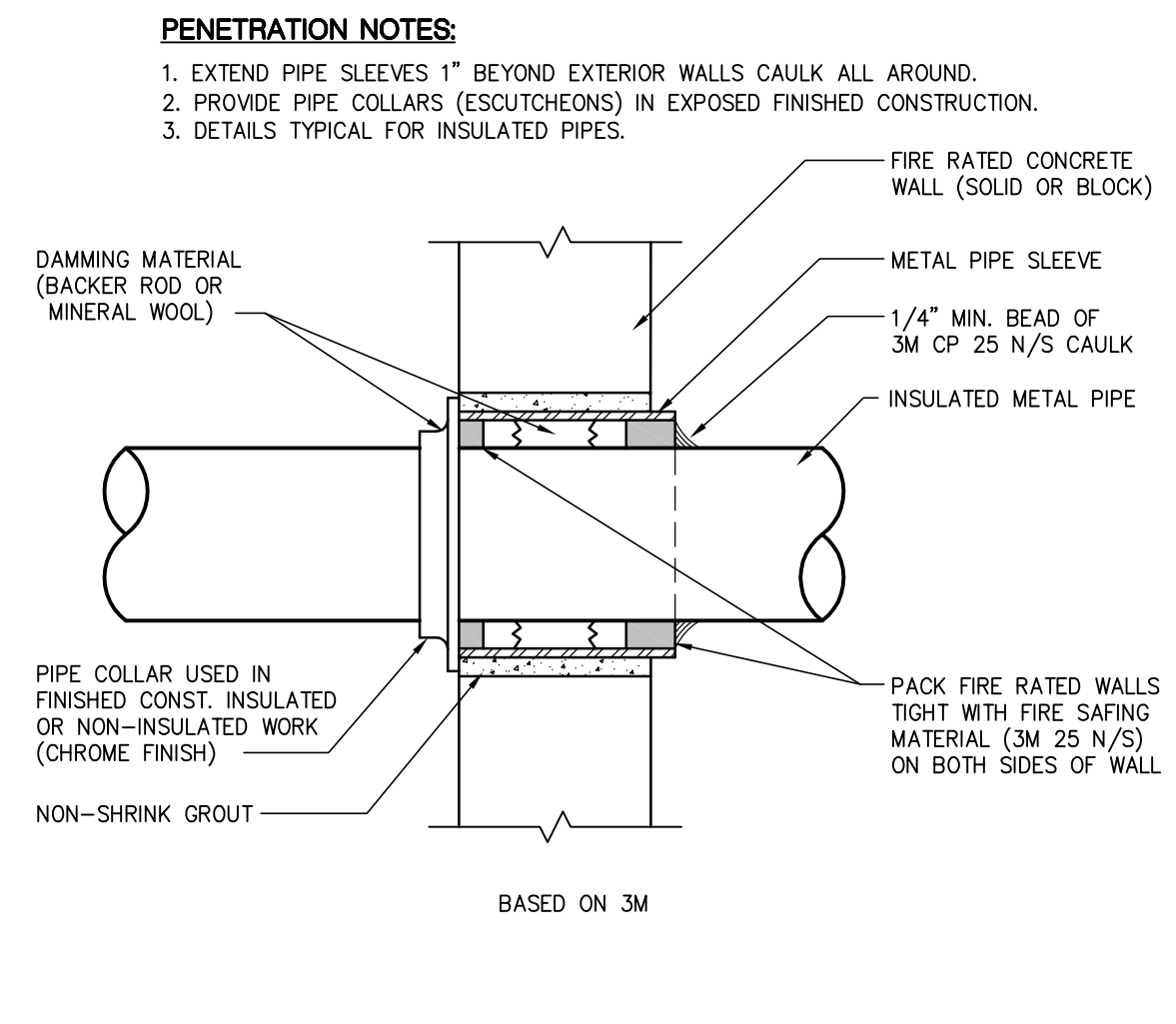
- 1 EXISTING GAS FIRED UNIT HEATER TO BE RELOCATED TO THIS LOCATION. EXTEND NEW BRANCH GAS PIPE AND CONNECT TO EXISTING GAS SERVICE.
- 2 PRESSURE VESSEL (OFC) - CONTRACTOR SHALL CONNECT 1 1/2" CW TO PRESSURE VESSEL. COORDINATE BACKFLOW REQUIREMENTS WITH FINAL EQUIPMENT. VERIFY FINAL LOCATION OF UTILITY DROP WITH OWNER PRIOR TO INSTALLATION.
- 3 KETTLE (OFC) - CONTRACTOR SHALL CONNECT 1" CW TO KETTLE. COORDINATE BACKFLOW REQUIREMENTS WITH FINAL EQUIPMENT. VERIFY FINAL LOCATION OF UTILITY DROP WITH OWNER PRIOR TO INSTALLATION.
- 4 SPRAYER DRYER (OFC) - CONTRACTOR SHALL CONNECT 3/4" COLD WATER AND 1 1/4" NATURAL GAS TO SPRAYER DRYER. COORDINATE BACKFLOW REQUIREMENTS WITH FINAL EQUIPMENT. VERIFY FINAL LOCATION OF UTILITY DROP WITH OWNER PRIOR TO INSTALLATION.
- 5 DUST COLLECTOR (OFC) - CONTRACTOR SHALL CONNECT 1" COMPRESSED AIR TO THE COLLECTOR. COORDINATE REQUIREMENTS WITH THE FINAL EQUIPMENT. COMPRESSOR IS OFCI.
- 6 EXTEND 1 1/4" CW DN AND 1 1/4"HW DN TO WATER HEATER EWH-1. PROVIDE VALVES IN VERTICAL DROPS TO HEATER.

Reference Files: XR-AP-01 - NEW CONST > .dwg | KEMIN\_4121280 TITLE BLOCK > P:\PROJECTS\DM\4121280\KEMIN\_4121280 TITLE BLOCK.dwg | jhewms | P:\Projects\DM\4121280\Drawings\01.dwg | DATE: 06/08/2012 | TIME: 07:21

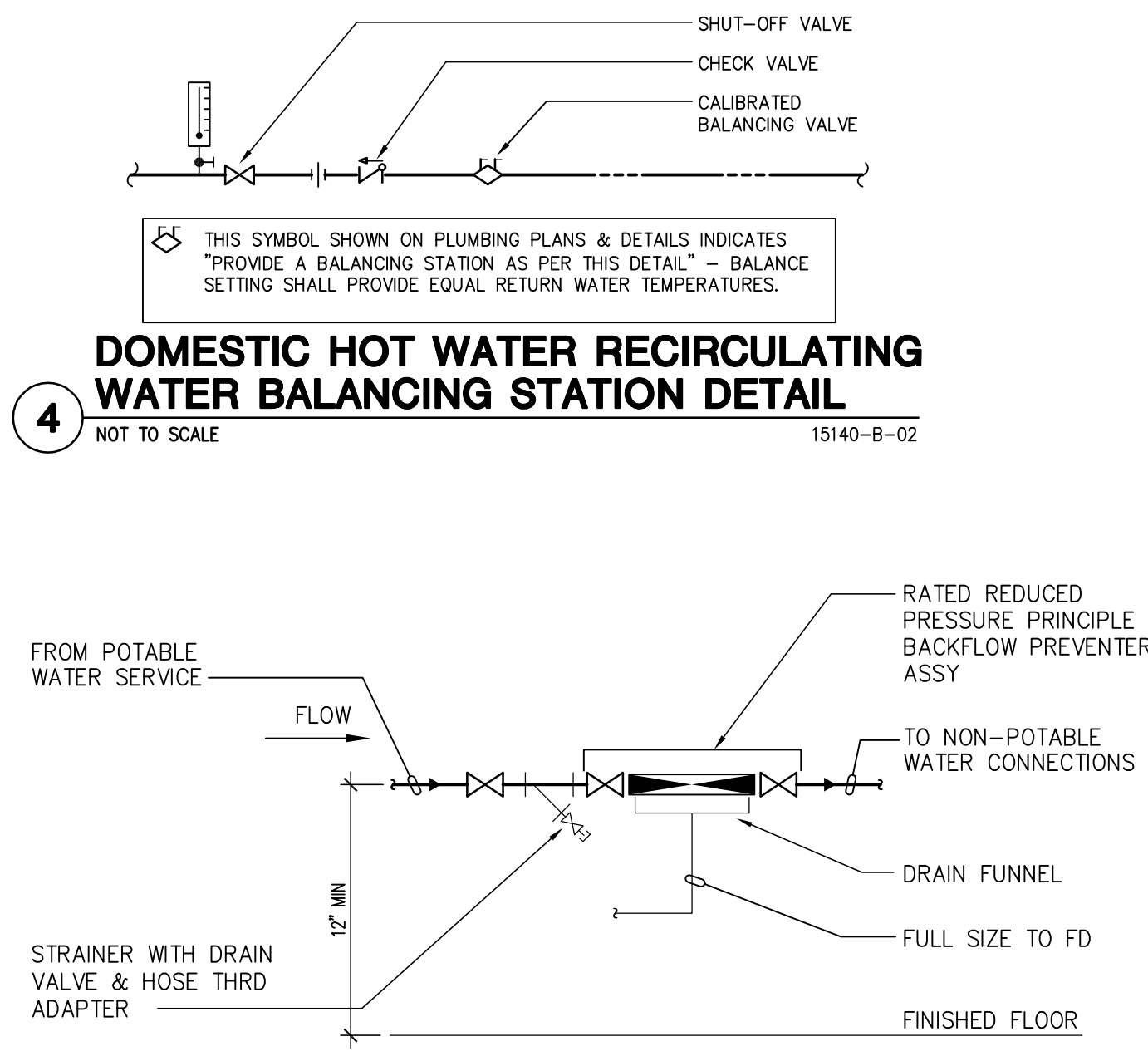




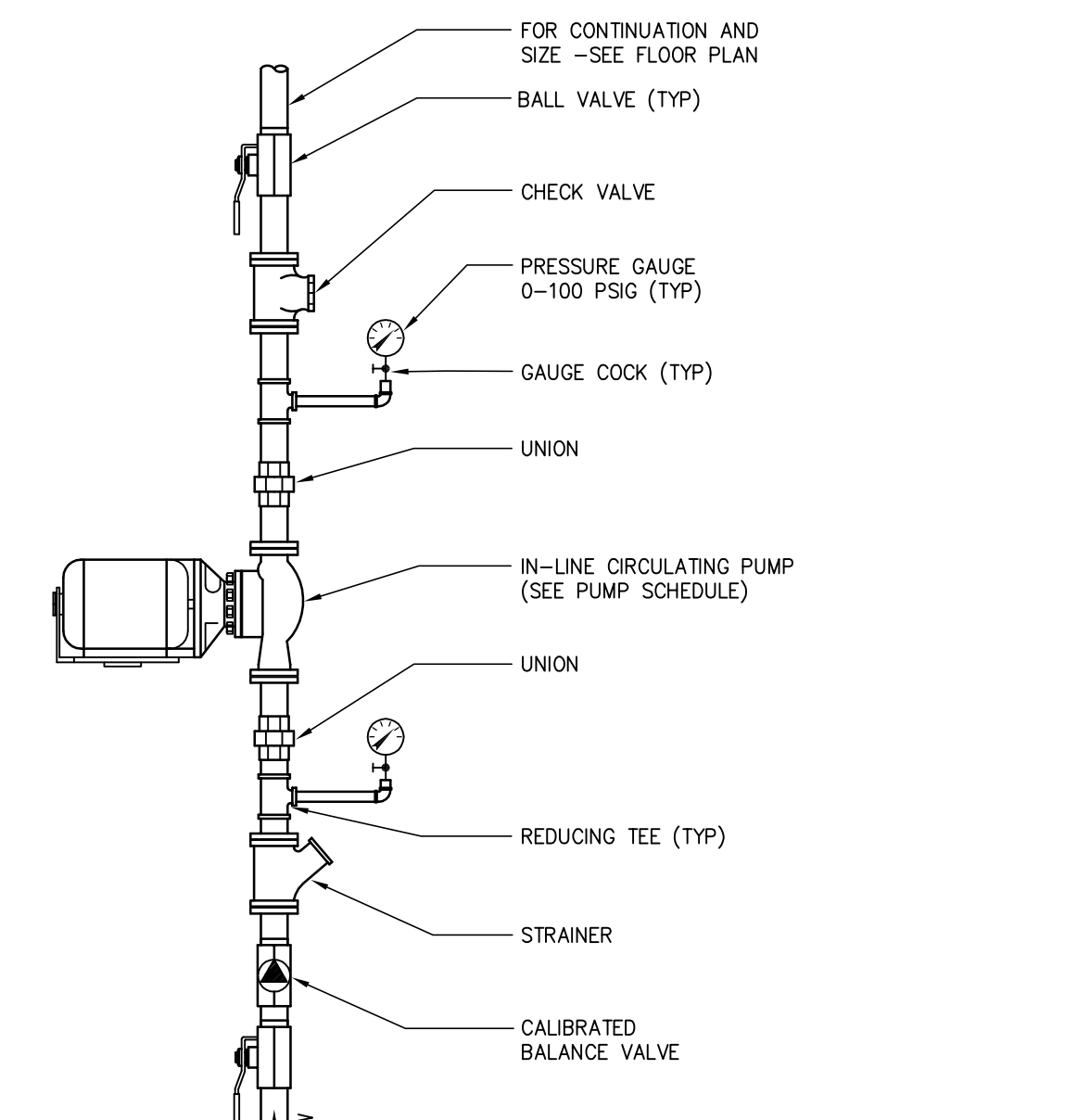
**1 INSULATED PIPE HANGER DETAIL**  
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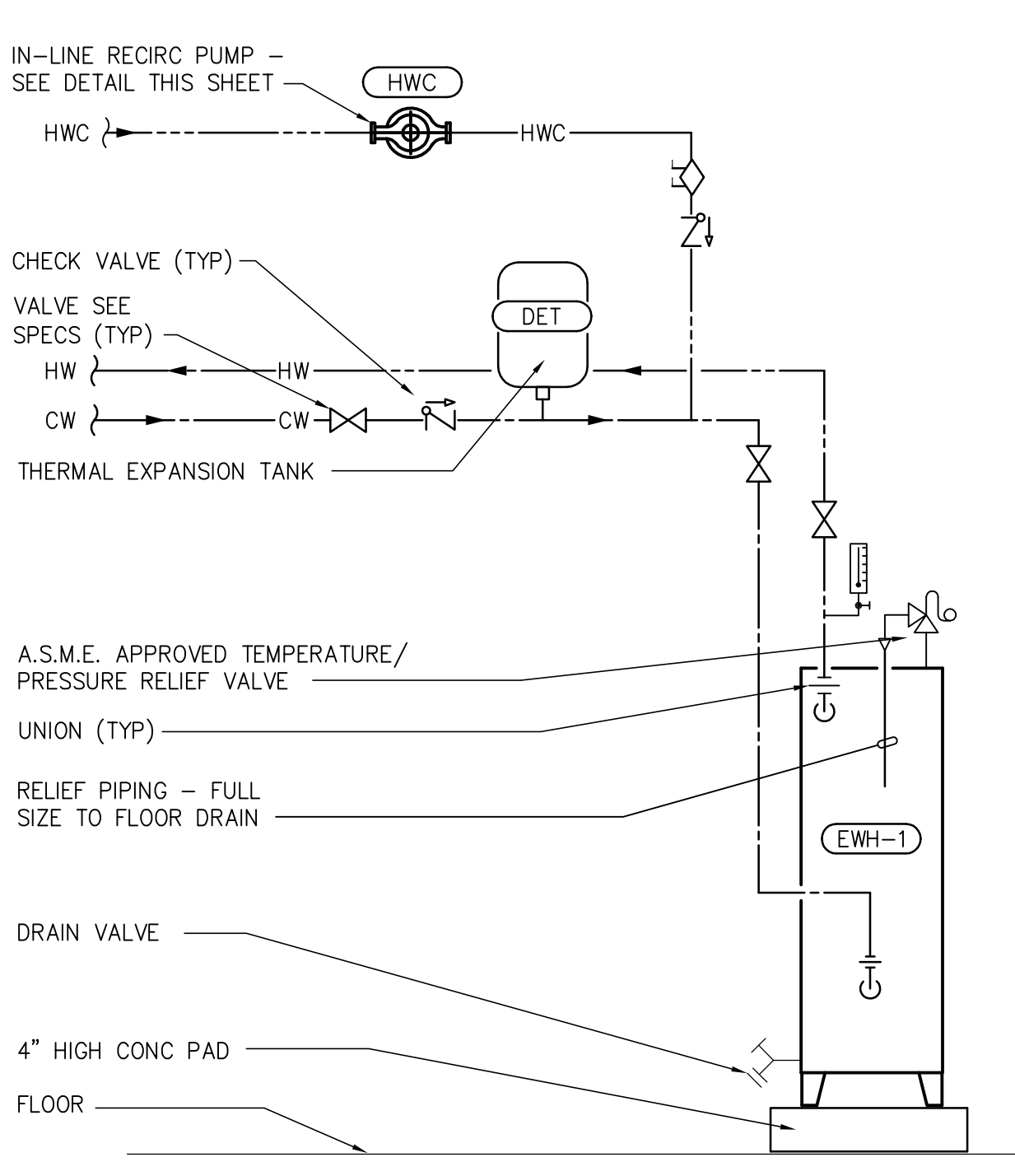
**2 WALL PENETRATION - U.L. RATED**  
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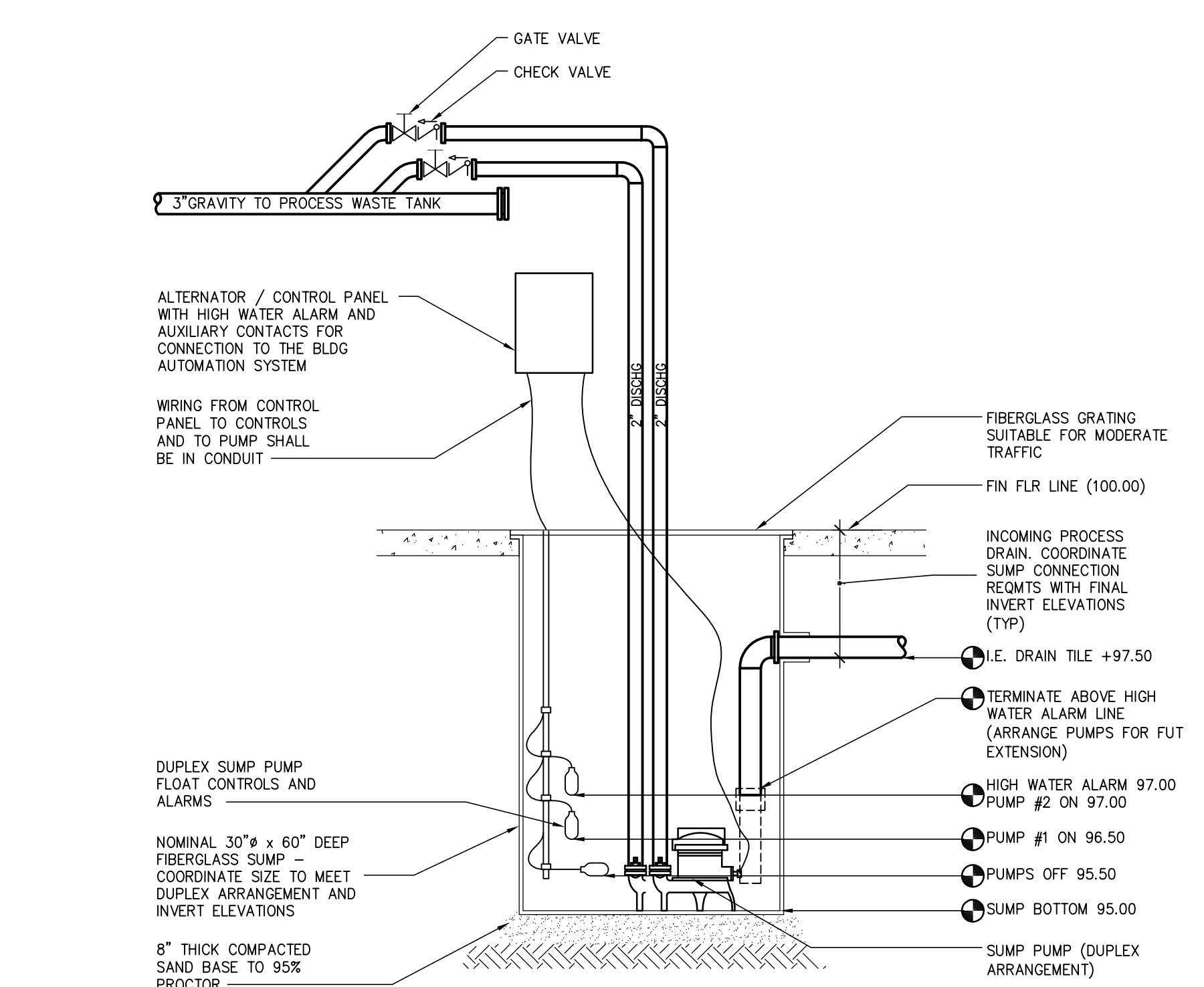
**4 DOMESTIC HOT WATER RECIRCULATING WATER BALANCING STATION DETAIL**  
NOT TO SCALE 15140-B-02



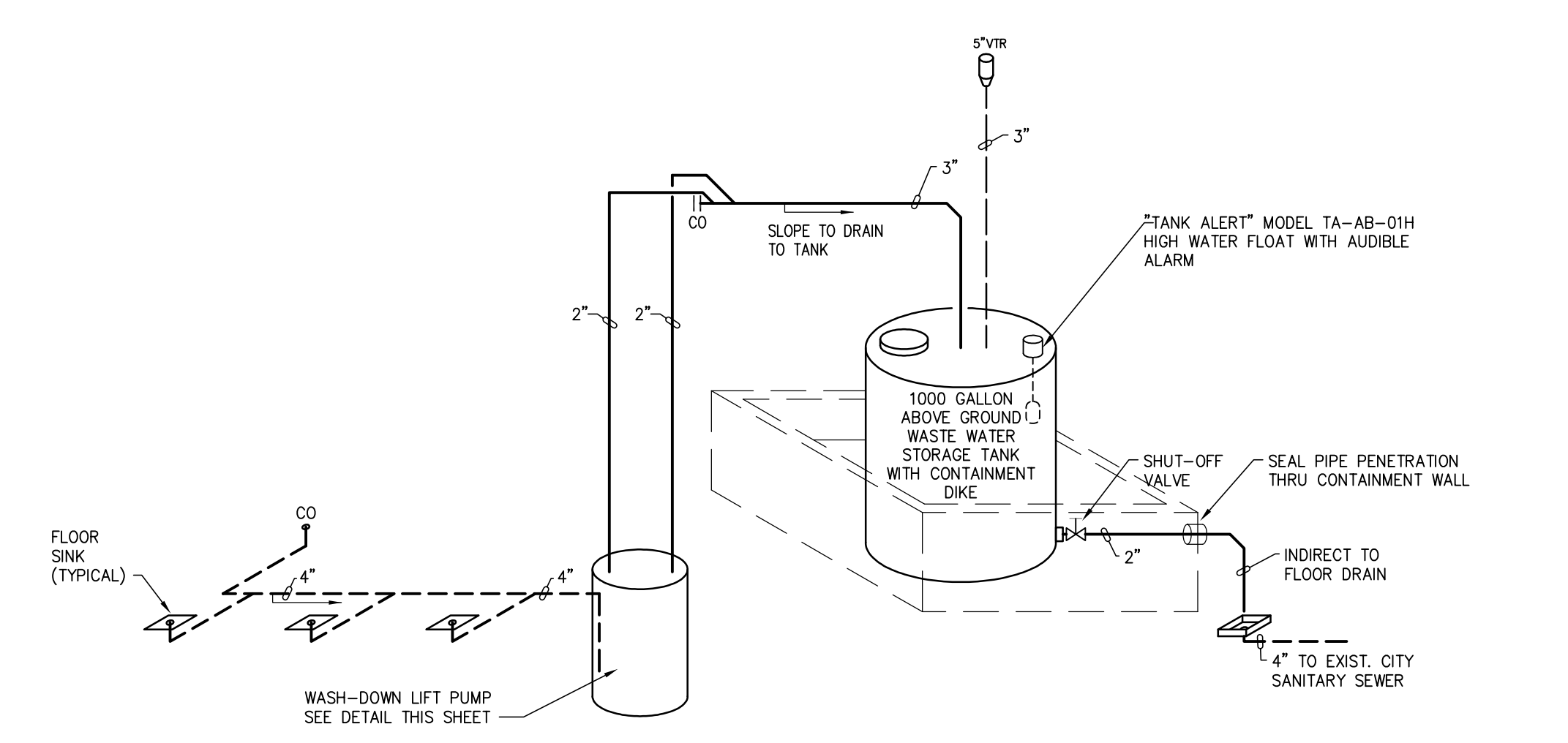
**5 CIRCULATING PUMP DETAIL**  
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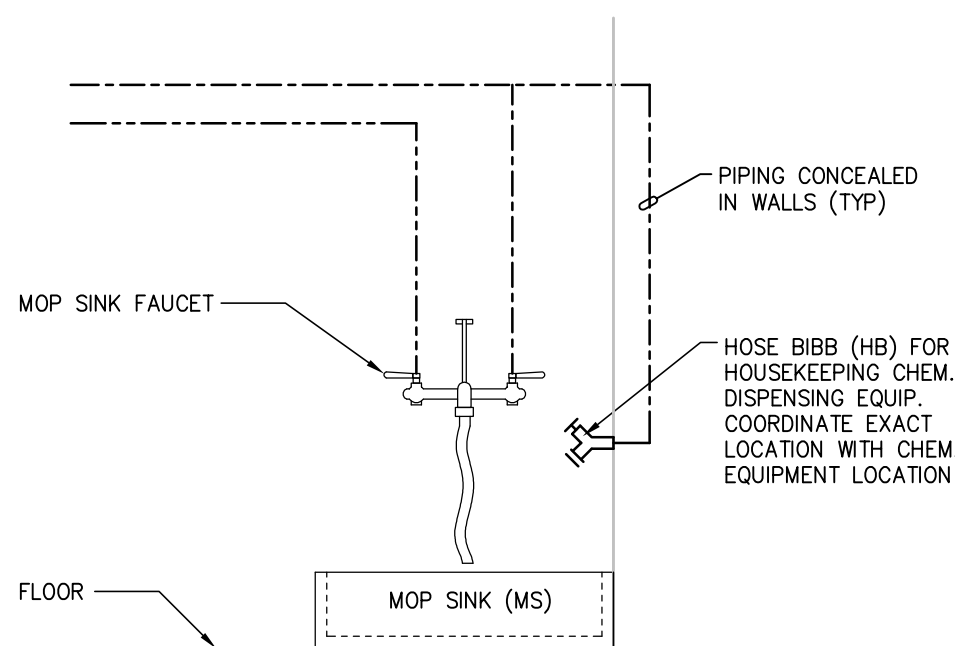
**6 ELECTRIC WATER HEATER DETAIL**  
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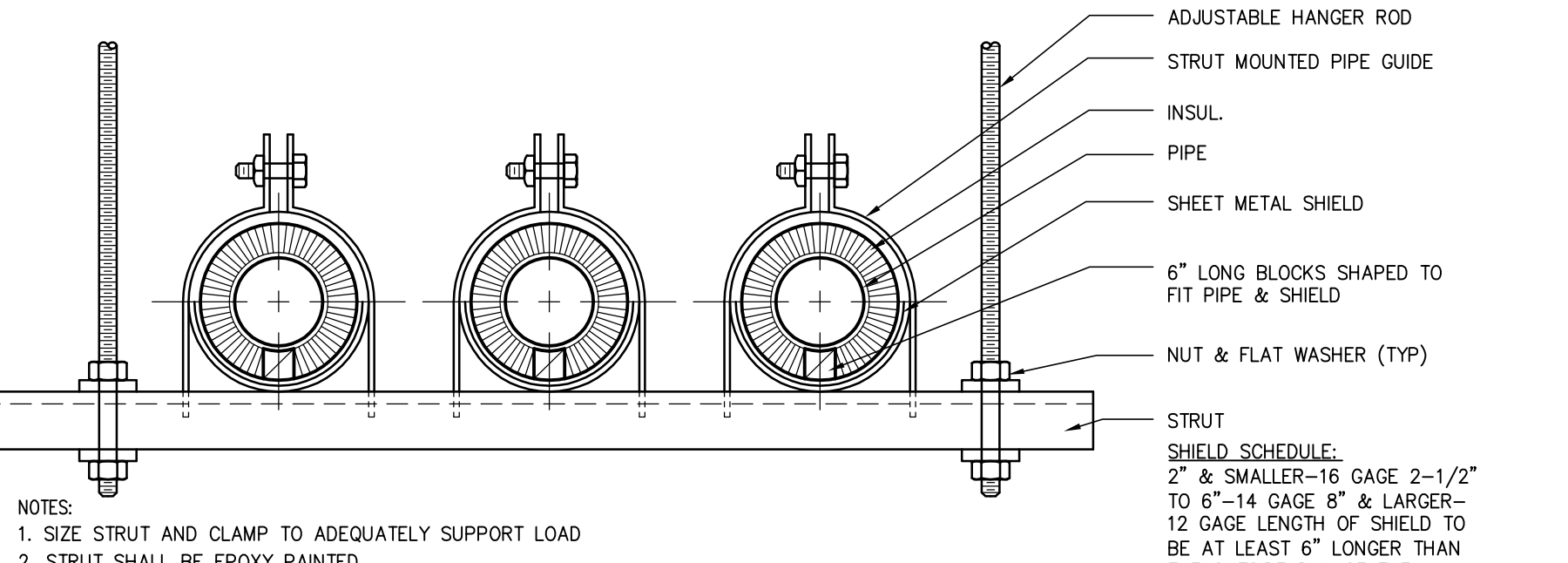
**7 DUPLEX WASH-DOWN LIFT PUMP DETAIL**  
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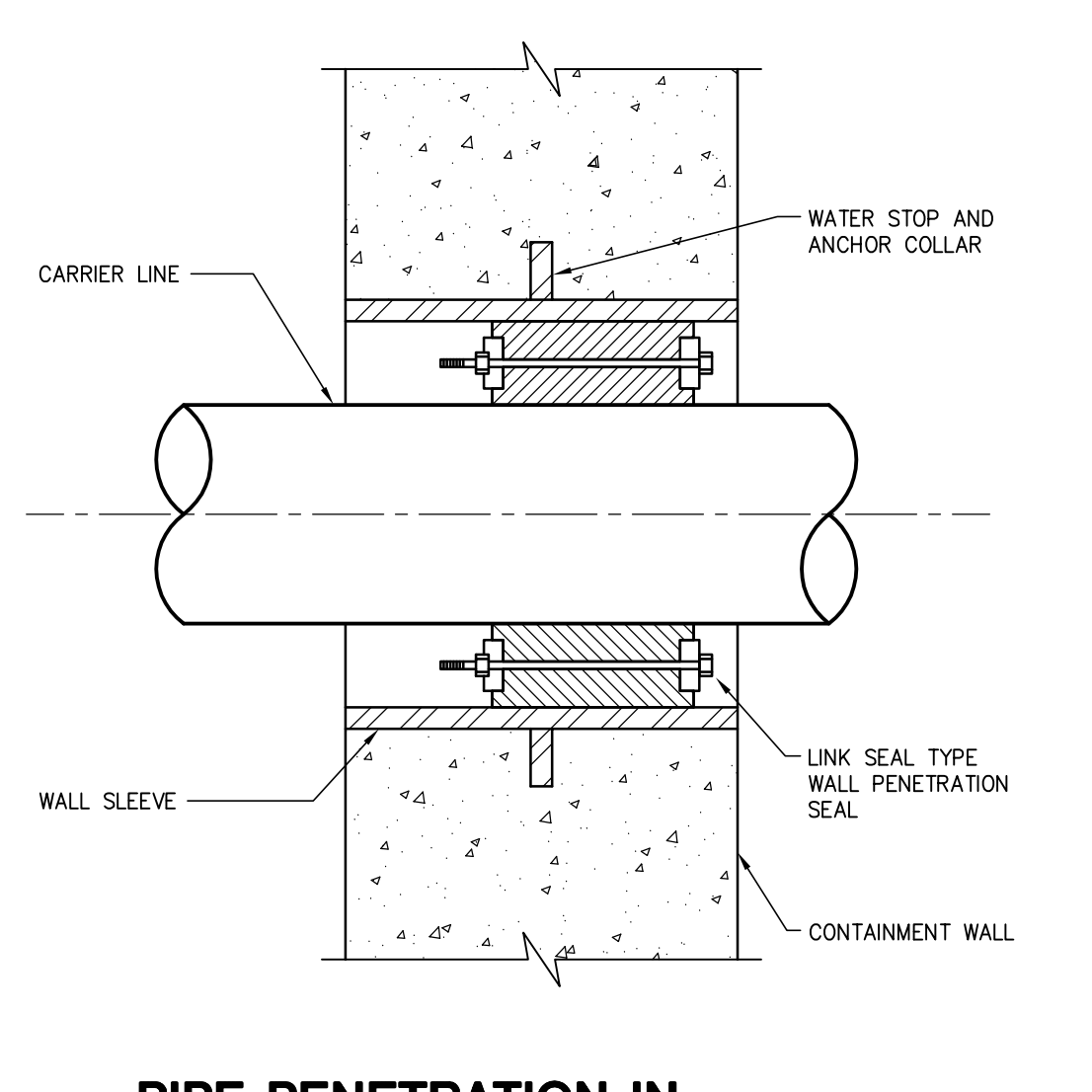
**8 SANITARY WASTE SCHEMATIC**  
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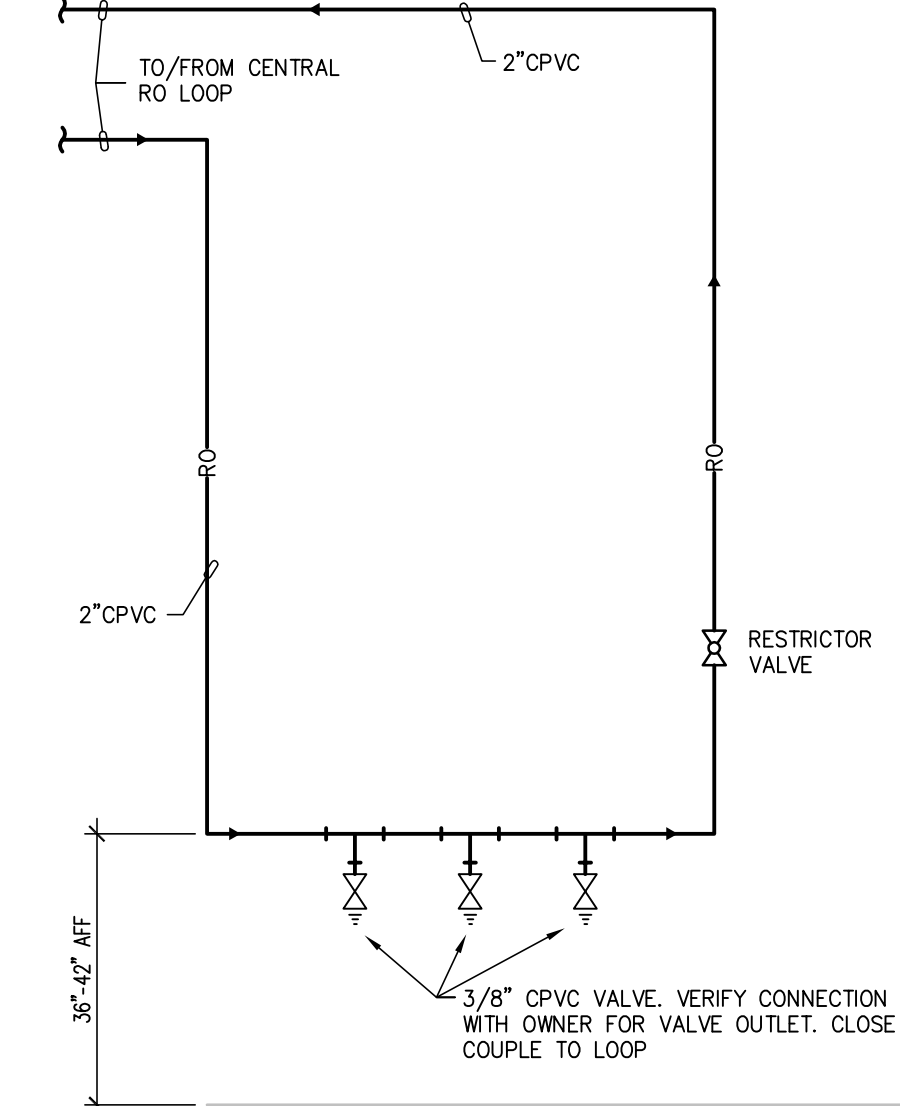
**9 MOP SINK PIPING DETAIL**  
NOT TO SCALE 15480-C-01



**10 TRAPEZE TYPE HANGER DETAIL**  
NOT TO SCALE 15106-C-02



**11 PIPE PENETRATION IN CONCRETE CONTAINMENT WALL**  
NOT TO SCALE 15107-C-02



**12 RO HOSE CONNECTION SCHEMATIC**  
NOT TO SCALE

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DATE	06-08-2012
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PROJECT NO.	412128-0

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PLUMBING FIXTURE SCHEDULE

S1 (HANDWASH SINK):

FIXTURE: ELKAY, LUSTERTONE ELVWO SERIES WASH-UP SINK, WALL HUNG, 18 GAUGE, 304 STAINLESS STEEL, SATIN FINISH, FAUCET EDGE, FRONT OVERFLOW, 3 FAUCET HOLES ON 4" CENTERS, NOMINAL SIZE 22"x19", SELF DRAINING DECK AREA, BACKSPASH AND ARRON, WALL HANGER AND SUPPORT BRACKETS, SOUND DEADENING UNDERSEAL, MOUNT RIM OF BASIN AT 34" AFF

FAUCET: CHICAGO FAUCETS, 834 SERIES WALL MOUNTED PEDAL VALVES WITH PUSH BUTTON CARTRIDGES, EXTENDED PEDALS, LOOSE KEY STOPS, WALL FLANGES, 1/2" INLETS, 3/8" OUTLET, DECK MOUNTED GOOSENECK SPOUT WITH 2 GPM LAMINAR FLOW OUTLET.

MIXING VALVE: POWERS, HYDROGUARD SERIES 480 THERMOSTATIC MIXING VALVE, 1/2" INLETS AND OUTLET, SET VALVE TO DELIVER 105 DEG WATER TO HW SIDE OF FAUCET. COORDINATE INSTALLATION FOR WHEELCHAIR ACCESS

CHROME PLATED WHEELCHAIR LAVATORY GRID DRAIN, 17 GAUGE - 1 1/4" CHROME PLATED BRASS ADJUSTABLE P-TRAP AND WASTE-TO-WALL. OFFSET DRAIN PIPING ASSEMBLY FOR WHEELCHAIR ACCESS

NOTE: INSTALL STOPS CLOSE TO WALL TO AVOID KNEES OF USERS IN WHEELCHAIRS AND PROVIDE WHITE PREFABRICATED VINYL COVER FOR WATER SUPPLY LINES AND WASTE (TRUEBRO OR EQUIVALENT)

S2 (SINGLE COMPARTMENT SINK):

FIXTURE: ELKAY, WELDBILT SERIES CUSTOM SINGLE COMPARTMENT SCULLERY SINK WITH 12" LONG INTEGRAL DRAINBOARD ON LEFT AND RIGHT SIDES, 48"x27 1/2" OVERALL WITH 24"x24"x14" DEEP SINK COMPARTMENT, 14 GAUGE - 316 STAINLESS STEEL, FULL LENGTH 8" HIGH BACKSPASH WITH SLOPED TOP, WELDED RADIUS COVED CORNERS, SATIN FINISH, (4) STAINLESS STEEL LEGS WITH ADJUSTABLE FEET, ONE SET OF FAUCET HOLES CENTERED ABOVE SINK COMPARTMENT. PROVIDE 3 1/2" DIAMETER COUNTERSUNK DRAIN HOLE IN SINK COMPARTMENT.

FAUCET: CHICAGO FAUCETS, 540 SERIES BACK MOUNTED SINK FAUCET, CERAMIC CARTRIDGES, BLADE HANDLES, 1/2" INLETS ON 8" CENTERS, 12" SWING SPOUT, 2 GPM FLOW OUTLET, CHROME PLATED. PROVIDE 1/2" CHROME PLATED ANGLE STOPS WITH WHEEL HANDLE AND FLEXIBLE RISERS.

WASTE: ELKAY, WASTE FITTINGS WITH LEVER HANDLE, 316 STAINLESS STEEL STRAINER, BRASS BODY, ROTO HANDLE, 2" O.D. TAILPIECE, 17 GAUGE - 2" CHROME PLATED INTERCONNECTING PIPING ROUTED TO SPILL OVER FLOOR SINK

S3 (THREE-COMPARTMENT SINK):

FIXTURE: ELKAY, WELDBILT SERIES THREE COMPARTMENT SCULLERY SINK WITH 24" LONG INTEGRAL DRAINBOARD ON LEFT AND RIGHT SIDES, 102"x27 1/2" OVERALL WITH 24"x18"x14" DEEP SINK COMPARTMENTS, 14 GAUGE - 316 STAINLESS STEEL, FULL LENGTH 8" HIGH BACKSPASH WITH SLOPED TOP, WELDED RADIUS COVED CORNERS, SATIN FINISH, (4) STAINLESS STEEL LEGS WITH ADJUSTABLE FEET, ONE SET OF 2 FAUCET HOLES CENTERED ABOVE EACH SINK COMPARTMENT PARTITION. PROVIDE 3 1/2" DIAMETER COUNTERSUNK DRAIN HOLE IN SINK COMPARTMENT.

PRE-RINSE FAUCET (RIGHT SIDE): CHICAGO FAUCETS, 923 SERIES BACK MOUNTED PRE-RINSE FITTING, CERAMIC CARTRIDGES, BLADE HANDLES, 1/2" INLETS ON 8" CENTERS, INTEGRAL CHECK SUPPLY ARMS, 3/8"x23" PRE-RINSE RISER WITH SUPPORT BRACKET AND 36" LONG STAINLESS STEEL FLEXIBLE HOSE, SELF-CLOSING VALVE WITH INSULATED HANDLE AND HOLD-DOWN RING, RUBBER BUMPER ON SPRAY HEAD, CHROME PLATED. INSTALL PRE-RINSE ASSEMBLY IN SINK LEFT HAND FAUCET OPENINGS. PROVIDE 1/2" CHROME PLATED ANGLE STOPS WITH WHEEL HANDLE AND FLEXIBLE RISER

STANDARD FAUCET (LEFT SIDE): CHICAGO FAUCETS, 540 SERIES BACK MOUNTED SINK FAUCET, CERAMIC CARTRIDGES, BLADE HANDLES, 1/2" INLETS ON 8" CENTERS, 12" SWING SPOUT, 2 GPM FLOW OUTLET, CHROME PLATED. PROVIDE 1/2" CHROME PLATED ANGLE STOPS WITH WHEEL HANDLE AND FLEXIBLE RISERS.

WASTE: ELKAY, WASTE FITTINGS WITH LEVER HANDLE, 316 STAINLESS STEEL STRAINER, BRASS BODY, ROTO HANDLE, 2" O.D. TAILPIECE, 17 GAUGE - 2" CHROME PLATED INTERCONNECTING PIPING ROUTED TO SPILL OVER FLOOR SINK

S4 (UTILITY SINK):

FIXTURE: FIAT, SERV-A-SINK LAUNDRY TUB SERIES SINGLE COMPARTMENT, MOLDED STONE, (2) FAUCET HOLES ON 4" CENTERS, NOM. 23"x21" OVERALL WITH 23"x21"x13 1/2" DEEP TUB SIZE, DRAIN OPENING WITH STRAINER AND STOPPER, WHITE FINISH, SELF-LEVELING LEGS WITH FLOOR ANCHORS

FAUCET: CHICAGO FAUCETS, 895 SERIES DECK MOUNTED LAVATORY FAUCET, CERAMIC CARTRIDGES, METAL LEVER HANDLES, 1/2" INLETS ON 4" CENTERS, 5 3/4" VACUUM BREAKER SWING SPOUT WITH 3/4" HOSE THREAD OUTLET, CHROME PLATED. PROVIDE 1/2" CHROME PLATED ANGLE STOPS WITH WHEEL HANDLE AND FLEXIBLE RISERS.

STRAINER AND STOPPER FURNISHED WITH FIXTURE, 17 GAUGE - 1 1/2" CHROME PLATED BRASS TAILPIECE, ADJUSTABLE P-TRAP AND WASTE-TO-WALL

FLOOR CLEANOUT:

FIXTURE: ZURN, Z-1400 LEVEL-TROL SERIES FLOOR CLEANOUT, CAST IRON, INSIDE CAULK CONNECTION, ADJUSTABLE, THREADED ABS PLUG, SECURED SATIN NICKEL BRONZE TOP. SET TOP FLUSH WITH FINISHED CONCRETE. PROVIDE EXTRA HEAVY DUTY FLOOR CLEANOUT COVER

WALL CLEANOUT:

FIXTURE: ZURN, Z-1446 SERIES, ROUND STAINLESS STEEL WALL COVER WITH CENTER SCREW, CAST IRON HUB AND SPOGOT CLEANOUT TEE, RECESSED BRONZE TAPPED PLUG

FSA (SANITARY FLOOR SINK):

FIXTURE: 4" ZURN ZN-1900 SERIES, 12"x12"x8" DEEP, CAST IRON, MEMBRANE CLAMP, BOTTOM CAULK OUTLET, PROVIDE WHITE ACID RESISTING ENAMEL HEEL-PROOF HINGED GRATE, A.R.E. INTERIOR, AND A.R.E. DOME STRAINER. SET TOP FLUSH WITH FINISHED FLOOR. ROUTE PROCESS WASTE DISCHARGE FROM DRAIN TO SUMP BASIN. DO NOT PROVIDE A P-TRAP.

FDB (FLOOR DRAIN):

FIXTURE: 4" ZURN Z-566-Y SERIES, 12" SQUARE OPEN TOP CAST IRON DRAIN, BOTTOM OUTLET, HEAVY DUTY CAST IRON TOP GRATE, CAST IRON SECONDARY DOME STRAINER, SEDIMENT BUCKET, FLASHING FLANGE

WASTE: CAST IRON DEEP SEAL P-TRAP

ES2 (EMERGENCY SHOWER AND EYEWASH):

FIXTURE: BRADLEY, S19-310 SERIES, FREE STANDING EMERGENCY SHOWER AND EYE WASH STATION, ABS PLASTIC SHOWERHEAD, STAINLESS STEEL EYEWASH RECEPTOR, TWIN ABS PLASTIC HEADS MOUNTED ON CHROME PLATED BRASS SUPPLY, STEADY FLOW UNDER VARYING PRESSURE, UNIVERSAL EMERGENCY SIGN

CONTROL VALVE: EYEWASH CONTROL VALVE SHALL BE PUSH-TYPE CHROME PLATED BRASS BALL VALVE, STAYS OPEN UNTIL MANUALLY CLOSED, UNIVERSAL EMERGENCY SIGN TO OPERATE VALVE

CONTROL VALVE: SHOWER CONTROL VALVE SHALL BE PULL ROD TYPE CHROME PLATED BRASS BALL VALVE, STAYS OPEN UNTIL MANUALLY CLOSED, UNIVERSAL EMERGENCY SIGN TO OPERATE VALVE

MIXING VALVE: PROVIDE ONE LEONARD TM-800 SERIES TEMPERATURE WATER CONTROL SYSTEM SET TO DELIVER 85 DEG F. MAX, SURFACE MOUNTED TO WALL ABOVE SHOWER.

FILTER: PROVIDE AN IN-LINE FILTER/STRAINER UPSTREAM FROM THE SERVICE TO THE EYEWASH.

NOTE: PROVIDE BRADLEY S19-330ST SERIES SHOWER TEST KIT.

BP1 (REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER):

FIXTURE: WATTS, 009 SERIES, FULL LINE SIZE, REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER, TWO INDEPENDENTLY OPERATING CHECK VALVES WITH INTERMEDIATE RELIEF VALVE, BALL VALVE TEST COCKS, COMPLIANT WITH USCFE MANUAL FOR CROSS CONNECTION CONTROL, ASSE STANDARD 1013, AWWA STANDARD C506-78. PROVIDE WATTS DRAIN CONNECTION WITH AIR GAP

WATER HAMMER ARRESTERS:

FIXTURE: SIOUX CHIEF MANUFACTURING COMPANY, HYDRA-RESTER, PISTON TYPE ARRESTER, TYPE L COPPER CHAMBER WITH PERMANENT 60 PSI AIR CHARGE ABOVE A TWO O-RING PISTON, CERTIFIED TO FUNCTION IN ACCORDANCE WITH STANDARDS, PDI-WB201 AND ASSE-1010

HB (HOSE BIB):

FIXTURE: WOODFORD MODEL 24 SERIES, ANTI-CONTAMINATION, WALL FAUCET, VACUUM BREAKER, 3/4" HOSE THREAD OUTLET, BRASS FINISH, 3/4" INLET, POLYCARBONATE WHEEL HANDLE. MOUNT AT 36" AFF

HOSE AT NORTH HOSE BIB (COOKING PLANT 110):

FIXTURE: HOTSY 3/8" TUFF-FLEX 1-WIRE, 75' LENGTH HIGH PRESSURE HOSE, RATED TO 275° F AND 3000 PSI. FURNISH WITH POWDER COATED STEEL HOSE REEL, CAPABLE OF 360 DEGREE ROTATION, 100' HOSE STORAGE CAPACITY. PROVIDE HOTSY GUN AND HOT WATER LANCE.

RO (RO OUTLET):

FIXTURE: SPEARS 3/8" CPVC LAB BALL VALVE WITH TEE HANDLE OPERATION. VERIFY CONNECTION TYPE WITH OWNER FOR VALVE OUTLET. VALVE SHALL CLOSE COUPLE TO RO LOOP PIPING TO MINIMIZE LENGTH OF DEAD LEG. MOUNT AT 36-42" AFF

Table with 2 columns: SYMBOL and DESCRIPTION. Lists plumbing symbols for sanitary sewer, vent, domestic cold/hot water, valves, unions, strainers, thermometers, gauges, bibbs, floor drains, cleanouts, flow arrows, pipe caps, water hammer arrestors, and ball valves.

Table with 2 columns: ABBREVIATION and TERM. Lists abbreviations for AFF, AW, BLDG, BTU, CONT, CW, DEG, DN, DWG, ELEV, EQUIP, GPM, GC, HB, HORIZ, HW, HWC, HZ, IN, IN WC, MAX, MBH, MECH, MFR, MIN, MISC, NOM, PH, PRESS, PSI, PSIG, RPM, SAN, W/, W, WTR and their corresponding terms.

WATER HEATER (ELECTRIC) SCHEDULE

Table with columns: PLAN MARK, STORAGE (GAL), RECOVERY (GPH), IN °F, OUT °F, KW INPUT, VOLTS, Ø, HZ, DESIGN BASIS, REMARKS. Includes entry EWH-1.

EXPANSION/COMPRESSION TANK SCHEDULE

Table with columns: PLAN MARK, SYSTEM SERVED, TYPE, TANK CAPACITY (GAL), ACCEPTANCE CAPACITY (GAL), DESIGN BASIS, REMARKS. Includes entry DET1.

PUMP SCHEDULE

Table with columns: PLAN MARK, SYSTEM SERVED, TYPE, GPM, HEAD (FT), SHUTOFF HEAD (FT), MOTOR DATA (HP, VOLTS, Ø, RPM), DESIGN BASIS, REMARKS. Includes entry HWC1.

NOTES: 1. "W" INDICATES CONNECTED LOAD IN WATTS FOR RECIRC PUMPS.

WASH-DOWN SUMP PUMP SCHEDULE

Table with columns: PLAN MARK, CAPACITY (GPM), HEAD (FT H2O), MOTOR DATA (HP, VOLTS, Ø, RPM), BASIN, DESIGN BASIS, REMARKS. Includes entries SP-1A and SP-1B.

NOTES: 1. DUPLEX CONFIGURATION - PROVIDE FLOAT SWITCHES, LEAD/LAG PUMP ALTERNATOR, AND HIGH WATER FLOAT SWITCH WITH LOCAL AUDIBLE AND VISUAL ALARM, NEMA 1, ALARM HORN WITH TEST AND SILENCE SWITCH. PROVIDE AUXILIARY CONTACTS FOR CONNECTION TO THE BUILDING AUTOMATION SYSTEM. COORDINATE POWER CONNECTIONS TO ALARM WITH ELECTRICAL CONTRACTOR. HIGH WATER FLOAT SHALL "START" THE LAG PUMP. 2. PROVIDE NORMALLY OPEN FLOAT SWITCHES AS DETAILED TO CONTROL PUMP OPERATION. 3. PROVIDE FIBERGLASS FRAME AND MEDIUM DUTY FIBERGLASS GRATE

SHIVEHATTERY ARCHITECTURE+ENGINEERING

1601 48th St, Suite 200 | West Des Moines, Iowa 50266 515.223.8104 | fax: 515.223.0622 | shive-hattery.com

Iowa | Illinois | Missouri | Illinois Firm Number: 184-000214

KEMIN PILOT PLANT

2111 EAST 17TH ST DES MOINES, IA

DRAWN BAF APPROVED CSH ISSUED FOR CONSTRUCTION DOCUMENT DATE 06-08-2012 FIELD BOOK

PROJECT NO.: 412128-0

PLUMBING SYMBOLS AND SCHEDULES

P6.01

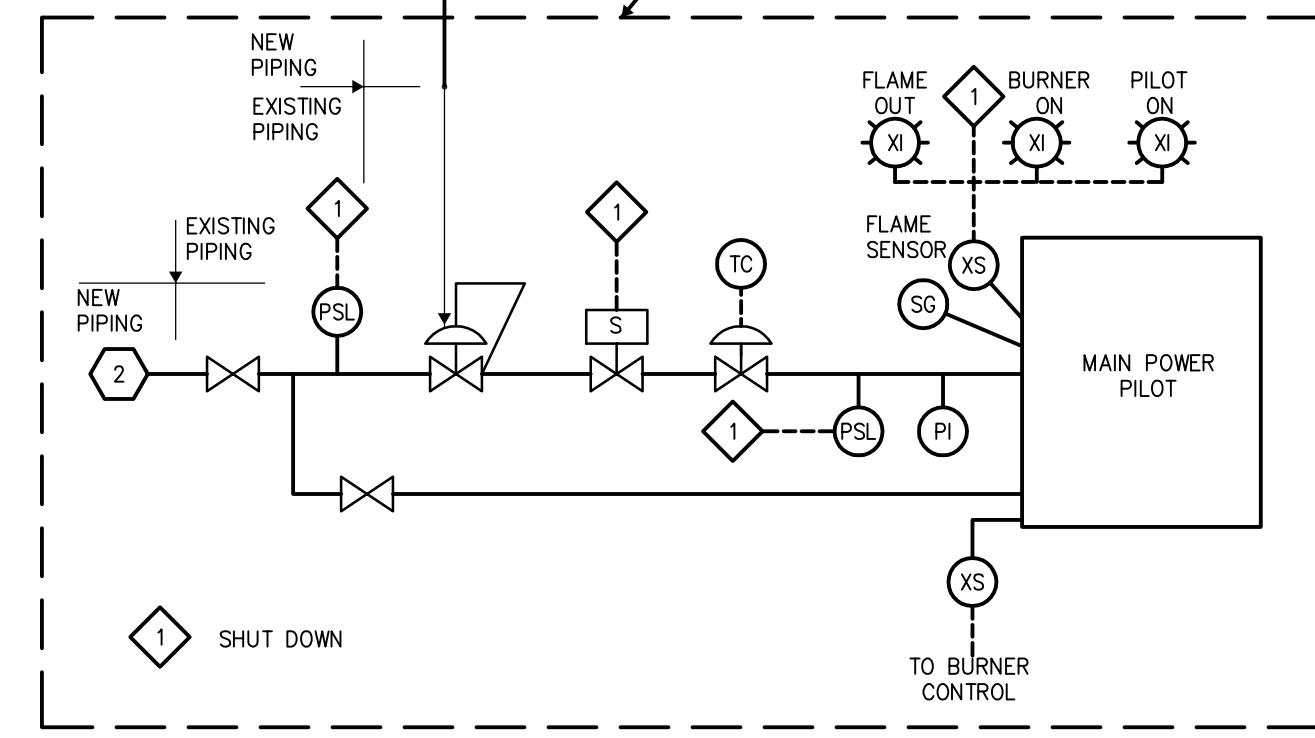
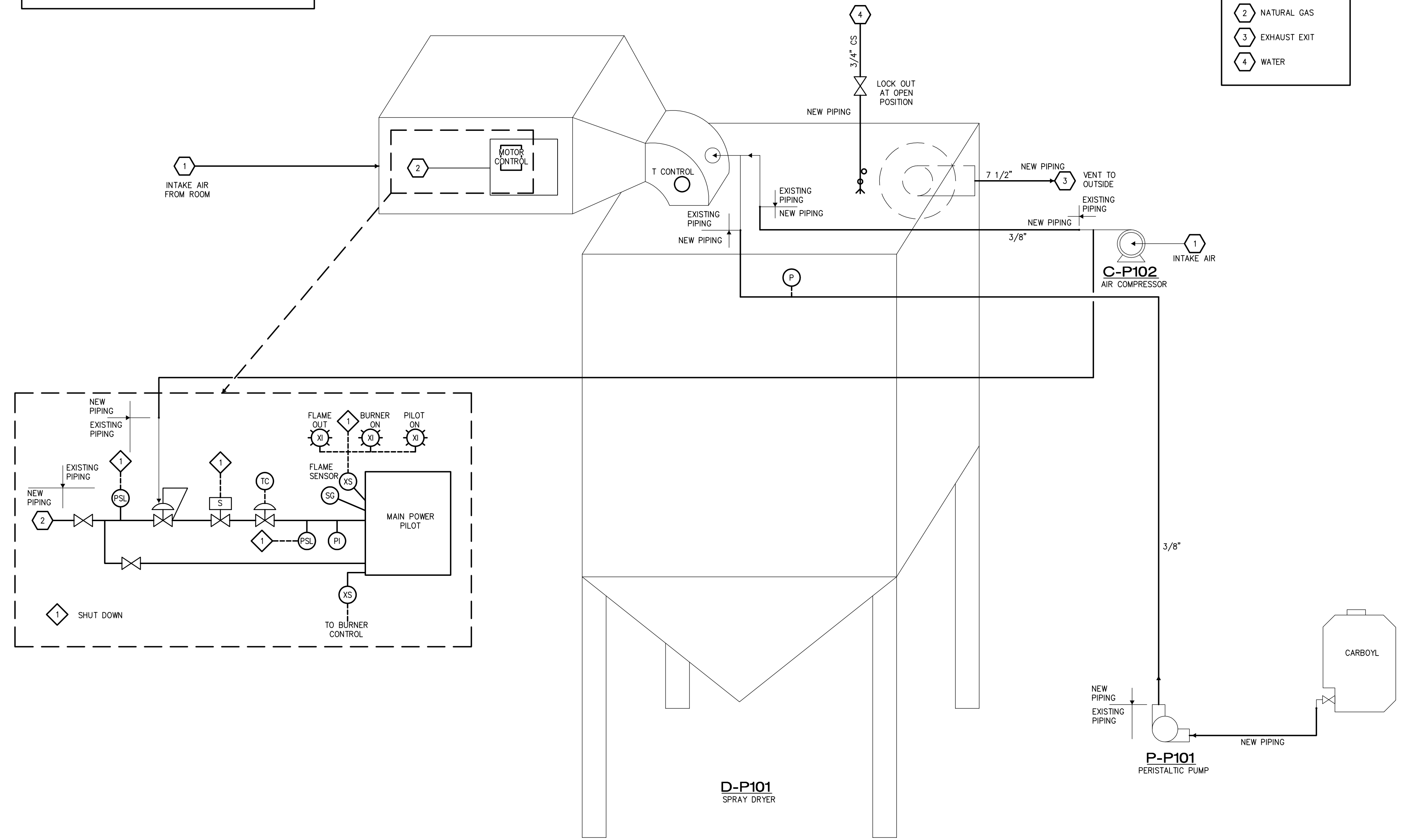
**KEMIN  
PILOT PLANT**

2111 EAST 17TH ST  
DES MOINES, IA

**NOTE**  
1. USE EXISTING PIPING PART AS POSSIBLE

**LEGEND**

- 1 INTAKE AIR
- 2 NATURAL GAS
- 3 EXHAUST EXIT
- 4 WATER



EQ. NO.	D-P101	EQ. NO.	P-P101	EQ. NO.	C-P102
TITLE	SPRAY DRYER	TITLE	PERISTALTIC PUMP	TITLE	AIR COMPRESSOR
TYPE	310272	TYPE	---	TYPE	---
VENDOR	CUSTOM MADE	VENDOR	---	VENDOR	---
MAT'L	STAINLESS STEEL	MAT'L	---	MAT'L	---
SIZE	---	SIZE	---	SIZE	---
HP	---	HP	---	HP	---
RPM	---	RPM	---	RPM	---
CAPACITY	---	CAPACITY	---	CAPACITY	20 GAL.
TEMP.	---	TEMP.	---	TEMP.	---
PRESS.	---	PRESS.	---	PRESS.	---

**1 PIPING AND INSTRUMENTATION DIAGRAM**  
NOT TO SCALE

DRAWN	BAF
APPROVED	CSH
ISSUED FOR	CONSTRUCTION DOCUMENT
DATE	06-08-2012
FIELD BOOK	
PROJECT NO.	412128-0

**PIPING AND INSTRUMENTATION  
DIAGRAM**

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# ELECTRICAL SPECIFICATIONS

BASIC MATERIALS AND METHODS

PROVIDE LABOR, MATERIAL AND EQUIPMENT REQUIRED TO INSTALL ELECTRICAL WORK.

ORIGIN, FURNISH AND INCLUDE COSTS OF NECESSARY PERMITS AND INSPECTION CERTIFICATES FOR MATERIAL AND LABOR FURNISHED.

WORK SHALL CONFORM TO OR EXCEED THE MINIMUM REQUIREMENTS OF THE CURRENTLY ENFORCED EDITION OF THE NATIONAL ELECTRICAL CODE AND STATE, LOCAL AND MUNICIPAL ORDINANCES.

SMALLTALS SHALL BE FURNISHED FOR MOTOR STARTERS, PANELBOARDS, DISCONNECT SWITCHES, FIRE ALARM SYSTEM, TRANSFORMERS AND LIGHT FIXTURES.

MATERIAL SHALL BE AS LISTED BY UNDERWRITERS' LABORATORIES, INC. IF A STANDARD HAS BEEN ESTABLISHED BY THE AGENCY FOR THE TYPE OF MATERIAL.

WHEN CHANGES REQUIRE SHUT-DOWN OF ELECTRICAL SERVICES, THE CONTRACTOR SHALL NOTIFY THE OWNER, PROPER BUILDING AUTHORITIES, OR OWNER'S REPRESENTATIVE NOT LESS THAN 24 HOURS IN ADVANCE AND OBTAIN APPROVAL FROM THESE AUTHORITIES BEFORE MAKING CHANGES.

PROVIDE TEMPORARY ELECTRICAL UTILITIES INCLUDING LIGHTING AND POWER RECEPTACLES FOR SINGLE PHASE, 120 AND 240 VOLT EQUIPMENT DURING CONSTRUCTION.

COLOR CODING OF WIRING SHALL BE BLACK (A PHASE), RED (B PHASE), BLUE (C PHASE), AND WHITE (NEUTRAL) FOR 120/208 VOLT THREE-PHASE SYSTEMS.

COLOR CODING OF 277/480 VOLT SYSTEMS SHALL BE BROWN (A PHASE), ORANGE (B PHASE), YELLOW (C PHASE) WITH GRAY NEUTRAL.

GROUND WIRES SHALL BE GREEN OR BARE COPPER.

IDENTIFY EACH PANELBOARD, STARTER, CONTACTOR, DISCONNECT SWITCH, DISBURTMENT STATION AND RELAY WITH THE NAME, NUMBER OF DEVICES AND CIRCUIT NUMBER. USE AN ENGRAVED LAMINATED PLASTIC PLATE WITH WHITE LETTERS ON A BLACK BACKGROUND.

MATERIALS AND EQUIPMENT SHALL BE GUARANTEED BY THE CONTRACTOR TO BE FREE FROM DEFECTS.

CONDUIT

CONDUIT SMALLER THAN 1/2-INCH DIAMETER SHALL NOT BE USED ON THIS PROJECT.

WHERE CONNECTIONS ARE MADE TO WIRING EQUIPMENT, FLEXIBLE STEEL CONDUIT WITH APPROPRIATE FITTINGS SHALL BE USED. IN WET LOCATIONS, USE LIQUID-TIGHT FLEXIBLE STEEL CONDUIT.

BUILDING CONDUIT SHALL BE ELECTRICAL METAL TUBING (EMT) INSTALLED WITH STEEL HEX NUT COMPRESSION TYPE FITTINGS AND STEEL SUPPORT STRAPS.

HOLES OR VOIDS USED TO EXTEND CONDUIT OR WIRING THROUGH FLOOR AND WALLS SHALL BE SEALED WITH A FIRE RESISTANT FLOW SEALANT TO PREVENT THE PASSAGE OF SMOKE, FIRE, TOXIC GASES OR WATER THROUGH THE PENETRATION EITHER BEFORE, DURING OR AFTER A FIRE. CHASE TECHNOLOGY CHASE-FORM CTC PR-855.

CONDUIT SHALL NOT BE USED AS THE SOLE GROUNDING MEANS.

WIRES AND CABLES

CONDUCTORS USED THROUGHOUT THIS PROJECT SHALL BE COPPER OF MINIMUM SIZE #12 UNLESS NOTED OTHERWISE.

CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED.

CONDUCTORS SHALL BE RATED 600 VOLTS WITH INSULATION OF THE THERMOPLASTIC TYPE THHN OR THHN.

WIRING SHALL BE IN CONDUIT OR APPROVED RACEWAYS.

WIRING DEVICES

SWITCHES SHALL BE "SPECIFICATION GRADE", QUIET TYPE, 20 AMPERE, 120/277 VOLTS WITH HORN BODIES.

RECEPTACLES SHALL BE "SPECIFICATION GRADE", 20 AMPERE, 125 VOLT, GROUND, NEMA#5-20R, WITH HORN PLASTIC BODIES.

INTERIOR COVERPLATES SHALL BE .040 INCH, 18-8 STAINLESS STEEL, TYPE 302 IN SATIN OR BRUSHED FINISH.

DRY LOCATION BACK BOXES SHALL BE 4" X 4", GALVANIZED STEEL.

WET LOCATION COVERPLATES SHALL BE CAST METAL WITH SPRING HINGED WATERPROOF CAPS AND FACE PLATE GASKETS.

CEILING CABLE DROPS IN THE PILOT PLANT SHALL CONSIST OF (3) INDIVIDUAL DROPS AT (8) INDICATED LOCATIONS ALL AT 78" AFF. THE FIRST CABLE SHALL BE (2) DUPLEX 120V NEMA #5-20R (ON SEPARATE CIRCUITS) RECEPTACLES MOUNTED IN A 4" SQUARE BOX WITH RASSED COVER HANGING FROM A CEILING J-BOX WITH 1/2" SEALTIGHT CONDUIT AND WIRING. THE SECOND DROP SHALL BE A NEMA #15-50R, 120/208V/3 GROUNDING 30A 5 WIRE RECEPTACLE IN SIMILAR TYPE OF BOX AND SEALTIGHT CONDUIT UP TO CEILING MOUNTED J-BOX. THE THIRD DROP SHALL BE A NEMA #21-30R, 480V/3 GROUNDING 4 WIRE RECEPTACLE MOUNTED IN A SIMILAR BOX TO ABOVE.

MOTOR STARTERS

FRACTIONAL HORSEPOWER MANUAL STARTERS, UNLESS NOTED OTHERWISE, SHALL BE TOGGLE SWITCH TYPE WITH THERMAL OVERLOAD PROTECTION AND PILOT LIGHT.

DISCONNECT SWITCHES

SAFETY SWITCHES SHALL BE NEHA HEAVY DUTY TYPE WITH QUICK-MAKE/QUICK-BREAK OPERATING HANDLES AND SHALL HAVE A COVER INTERLOCK TO PREVENT UNAUTHORIZED OPENING OF THE SWITCH IN THE ON POSITION.

GROUNDING

THE EQUIPMENT GROUNDING SYSTEM SHALL GROUND ELECTRICAL EQUIPMENT, PANELBOARDS, STARTERS, AND METAL NON-CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT AND RACEWAYS.

A GROUNDING CONDUCTOR SHALL BE RUN IN THE RACEWAY, WITH THE CURRENT CARRYING CONDUCTORS, IN ALL FEEDER AND BRANCH CIRCUITS.

TRANSFORMERS

DRY TYPE TRANSFORMERS SHALL BE AS MANUFACTURED BY SQUARE-D CO., GENERAL ELECTRIC CO., OR CUTLER HAMMER CO.

TRANSFORMERS SHALL BE STANDARD NON-K FACTOR RATED UL LISTED, TWO WINDING, DRY TYPE IN ACCORDANCE WITH ANSI, IEEE, NEC & NEHA STANDARDS.

TRANSFORMERS SHALL NOT EXCEED 115 DEGREES C RISE ABOVE A 40 DEGREES C AMBIENT WHEN CARRYING RATED LOAD.

INSTALL TRANSFORMERS USING ENTIRE VARIATION PADS, FLEXIBLE CONDUIT CONNECTIONS, AND GROUNDING IN ACCORDANCE WITH THE NEC. PROVIDE PRIMARY SIDE NON-FUSED DISCONNECT SWITCH AND SECONDARY SIDE OVER CURRENT PROTECTION CIRCUIT BREAKER AS REQUIRED BY CODE AND AS INDICATED ON THE DRAWINGS.

PANELBOARDS

PANELBOARDS SHALL BE AS MANUFACTURED BY SQUARE-D CO., GENERAL ELECTRIC CO., OR CUTLER HAMMER CO.

CIRCUIT BREAKERS SHALL BE MOLDED CAST, QUICK-MAKE/QUICK-BREAK TYPE DESIGNED FOR PLUG TO THE BUS FOR 120/208 VOLT 3 PHASE PANELS AND BOLT TO THE BUS FOR 277/480 VOLT 3 PHASE PANELS.

PROVIDE MAIN BREAKER, MAIN LUGS ONLY, AND BRANCH CIRCUIT BREAKERS AS SCHEDULED ON THE DRAWINGS.

LIGHTING FIXTURES

FURNISH AND INSTALL LIGHT FIXTURES AS PER SCHEDULE ON THE DRAWINGS, COMPLETE WITH LAMPS, BALLASTS, AND APPURTENANCES, WIRED AND READY FOR OPERATION.

FIRE ALARM SYSTEM

THE EXISTING FIRE ALARM SYSTEM SHALL BE EXTENDED TO INCLUDE NEW PHOTO ELECTRIC SMOKE DETECTORS, MANUAL ALARM STATIONS, AUDIO/VISUAL ALARMS, AIR HANDLING UNIT SHUTDOWN CONNECTIONS, AND ALL WIRING/CONDUIT FOR A COMPLETE AND FUNCTIONING SYSTEM.

FIRE ALARM STATIONS SHALL BE SINGLE ACTION, PULL LEVER, BREAK PLASTIC ROD, NON-CODED, SEMI-FLUSH TYPE.

SMOKE DETECTORS SHALL BE PHOTOELECTRIC TYPE WITH MATCHING BASES.

FURNISH AND INSTALL NON-CONTACT VIBRATING, FIRE ALARM HORNS AND XENON FLASHING ALARM INDICATORS WHERE SHOWN ON THE DRAWINGS. HORNS SHALL BE 24 VDC RATED AT .083 AMPS.

INTERNAL XENON STROBE SHALL PROVIDE ADJUSTABLE OUTPUT OF 15, 30, 75, AND 110 CANDELA TO MEET ADA REQUIREMENTS.

FURNISH AND INSTALL WIRING, CONDUIT, PULL BOXES, OUTLETS, AND MOUNTING BODIES REQUIRED FOR THE INSTALLATION AND OPERATION OF A COMPLETE FIRE ALARM SYSTEM AS SPECIFIED.

OUTLETS AND MOUNTING BODIES REQUIRED AS A PART OF THE MOUNTING ARRANGEMENT FOR STATIONS, CONTROL CABINETS, AND SIGNALS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. EQUIPMENT SHALL BE INSTALLED AS DIRECTED BY THE MANUFACTURER'S INSTRUCTIONS AND DIAGRAMS, AND AT THE LOCATIONS AND HEIGHTS SPECIFIED.

EXPLOD WIRING AND WIRING CONCEALED IN FLOORS OR WALLS FOR THE FIRE ALARM SYSTEM SHALL BE ENCLOSED IN A METAL RACEWAY, EMT CONDUIT.

FINAL WIRING CONNECTIONS BETWEEN EQUIPMENT SHALL BE MADE UNDER THE DIRECT SUPERVISION OF A REPRESENTATIVE OF THE EQUIPMENT MANUFACTURER.

TELECOM WIRING SYSTEMS

RACEWAY SYSTEM SHALL INCLUDE 4" X 4" X 1-1/2" DEEP TELECOM OUTLET BOXES, COMPLETE WITH EXTENSION RINGS, COVERPLATES TO MATCH OTHER DEVICES, 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILINGS.

PROVIDE CATEGORY 6 4 PAIR 24 GAUGE FIBER OPTIC CABLE AND RJ-45 JACKS AT LOCATIONS AS INDICATED ON THE DRAWINGS. EXTEND WIRING BACK TO OWNER'S EXISTING TERMINAL BOARD OR RACK.

CLASS I DIVISION I EXPLOSION PROOF REQUIREMENTS

FOR THE KPC SUPERFICIAL ROOM PROVIDE CLASS I DIVISION I EXPLOSION PROOF RATED WIRING, SEALERS, 120V GROUNDING RECEPTACLES, AND LIGHT FIXTURES. INSTALL WIRING IN RIGID SCHEDULE 40 STEEL CONDUIT.

# ELECTRICAL SYMBOLS

LIGHTING FIXTURE MOUNTED ON WALL - TYPE AS NOTED

FLUORESCENT FIXTURE - TYPE AS NOTED

EXIT SIGN MOUNTED ON CEILING - TYPE AS NOTED

EXIT SIGN MOUNTED ON WALL - TYPE AS NOTED

SWITCH, SINGLE POLE, 480V, O.C. UNO

SWITCH, SINGLE POLE, 277V, O.C. UNO

SWITCH, SINGLE POLE, 120V, O.C. UNO

DUPLEX RECEPTACLE, 115V, O.C. UNO

INDICATES SWITCH LEG CONNECTIONS

ELECTRICAL HOME RUN

CONCEALED CONDUIT (ABOVE CEILING, IN WALLS, UNDERFLOOR)

MANUAL MOTOR STARTER WITH THERMAL OVERLOAD AND PILOT LIGHT +48" UNO

LIGHTING/PANELBOARD, FLUSH OR SURFACE MOUNTED, REFER TO SCHEDULE

SPECIAL CABINET OR ENCLOSURE AS NOTED

FIRE ALARM MANUAL STATION +48" O.C. UNO

FIRE ALARM HORN & STROBE, +48" O.C. UNO

FIRE ALARM PHOTOELECTRIC SMOKE DETECTOR

FIRE ALARM PHOTOELECTRIC SMOKE DETECTOR

AWALL BRACKET FLUORESCENT, SIMILAR TO THE F1 EXCEPT FINISHED WITH BATTERY EMERGENCY

DATA OUTLET (1 DATA), +18" O.C. UNO

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# LIGHTING FIXTURE SCHEDULE

120/208 VOLTS 3 PH 4W

225A TRPS 225A

10000 THRS

400A TRPS

400A TRPS

400A TRPS

400A TRPS

400A TRPS

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