

WARNING: ALL INDIVIDUALS INTERESTED IN BIDDING ON THIS PROJECT MUST OBTAIN THE FINAL PLANS AND SPECIFICATIONS FROM THE DEPARTMENT MANAGING THE PROJECT OR AS OTHERWISE STATED IN THE ADVERTISEMENT FOR BIDS FOR THE PROJECT. DO NOT USE THE PLANS AND SPECIFICATIONS POSTED ON THE CLERK OF THE BOARD'S WEBSITE FOR BIDDING ON THIS PROJECT.

22.05.00 BASIC REQUIREMENTS.

SCOPE OF WORK
THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE MECHANICAL WORK A FINISHED AND WORKING SYSTEM.

PLUMBING WORK SHALL INCLUDE BUT IS NOT NECESSARILY LIMITED TO:
REMOVING AND INSTALLING PIPE FROM AND TO THE EXISTING AND NEW BOOSTER PUMP, CONNECTING THE BOOSTER PUMP. COORDINATING THE DOWNTIME REQUIRED WHILE CHANGING THE BOOSTER PUMP SYSTEM.

ALL WORK THAT WILL PRODUCE EXCESSIVE NOISE OR INTERFERENCE WITH NORMAL BUILDING OPERATIONS, AS DETERMINED BY THE OWNER/LANDLORD, SHALL BE SCHEDULED WITH THE OWNER/LANDLORD. IT MAY BE NECESSARY TO SCHEDULE SUCH WORK DURING UNOCCUPIED HOURS. THE OWNER/LANDLORD RESERVES THE RIGHT TO DETERMINE WHEN RESTRICTED CONSTRUCTION HOURS WILL BE REQUIRED. CONTRACTOR SHALL COORDINATE WITH THE LANDLORD DURING THE BIDDING PROCESS.

ALL CONTRACTORS SHALL ESTABLISH UTILITY ELEVATIONS PRIOR TO FABRICATION AND SHALL COORDINATE THEIR MATERIAL AND EQUIPMENT WITH OTHER TRADES.

THE MECHANICAL CONTRACTOR (FIRE PROTECTION/PLUMBING/HVAC/TEMPERATURE CONTROLS CONTRACTOR) SHALL:

BE RESPONSIBLE FOR ALL WIRING NOT SHOWN ON ELECTRICAL DRAWINGS BUT REQUIRED FOR MECHANICAL SYSTEMS.

VERIFY ALL EXISTING EQUIPMENT SIZES AND CAPACITIES WHERE UNITS ARE TO BE MODIFIED, MOVED, OR REPLACED. CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING NEW UNITS OR REPLACEMENT UNITS.

QUALITY ASSURANCE
THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING COMPLETE AND OPERATING SYSTEMS. THE CONTRACTOR ACKNOWLEDGES AND UNDERSTANDS THAT THE CONTRACT DOCUMENTS ARE A TWO-DIMENSIONAL REPRESENTATION OF A THREE-DIMENSIONAL OBJECT, SUBJECT TO HUMAN INTERPRETATION. THIS REPRESENTATION MAY INCLUDE IMPERFECT DATA, INTERPRETED CODES, UTILITY GUIDELINES, THREE-DIMENSIONAL CONFLICTS, AND REQUIRED FIELD COORDINATION ITEMS. SUCH DEFICIENCIES CAN BE CORRECTED WHEN IDENTIFIED PRIOR TO ORDERING MATERIAL AND STARTING INSTALLATION. THE CONTRACTOR AGREES TO CAREFULLY STUDY AND COMPARE THE INDIVIDUAL CONTRACT DOCUMENTS AND REPORT AT ONCE IN WRITING TO THE DESIGN TEAM ANY DEFICIENCIES THE CONTRACTOR MAY DISCOVER. THE CONTRACTOR FURTHER AGREES TO REQUIRE EACH SUBCONTRACTOR TO LIKEWISE STUDY THE DOCUMENTS AND REPORT AT ONCE ANY DEFICIENCIES DISCOVERED.

THE CONTRACTOR SHALL RESOLVE ALL REPORTED DEFICIENCIES WITH THE ARCHITECT/ENGINEER PRIOR TO AWARDDING ANY SUBCONTRACTS, ORDERING MATERIAL, OR STARTING ANY WORK WITH THE CONTRACTORS OWN EMPLOYEES. ANY WORK PERFORMED PRIOR TO RECEIPT OF INSTRUCTIONS FROM THE DESIGN TEAM WILL BE DONE AT THE CONTRACTOR'S RISK.

ONLY PRODUCTS OF REPUTABLE MANUFACTURERS ARE ACCEPTABLE.

ALL CONTRACTORS AND SUBCONTRACTORS SHALL EMPLOY ONLY WORKERS SKILLED IN THEIR TRADES.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING AUTOCAD MEP. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS. THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

CODES AND STANDARDS
CONFORM TO ALL REQUIREMENTS OF HCAI, FORMERLY OSHPD, LAWS, ORDINANCES AND OTHER REGULATIONS HAVING JURISDICTION.

CONFORM TO ALL STATE CODES.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION. IF THERE IS INSUFFICIENT TIME FOR THIS PROCEDURE, CONTRACTOR SHALL SUBMIT WITH THE PROPOSAL A SEPARATE PRICE TO MAKE THE SYSTEM COMPLY WITH THE CODES AND REGULATIONS.

ALL CHANGES TO THE SYSTEM MADE AFTER LETTING OF THE CONTRACT, TO COMPLY WITH CODES OR REQUIREMENTS OF INSPECTORS, SHALL BE MADE BY THE CONTRACTOR WITHOUT COST TO THE OWNER.

IF THERE IS A DISCREPANCY BETWEEN MANUFACTURERS RECOMMENDATIONS AND THESE SPECIFICATIONS, THE MANUFACTURERS RECOMMENDATIONS SHALL GOVERN.

ALL ROTATING SHAFTS AND/OR EQUIPMENT SHALL BE COMPLETELY GUARDED FROM ALL CONTACT. PARTIAL GUARDS AND/OR GUARDS THAT DO NOT MEET ALL APPLICABLE OSHA STANDARDS ARE NOT ACCEPTABLE. CONTRACTOR IS RESPONSIBLE FOR PROVIDING THIS GUARDING IF IT IS NOT PROVIDED WITH THE EQUIPMENT SUPPLIED.

PERMITS AND FEES
PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE LISTED BY UNDERWRITERS LABORATORIES, INC. AND APPROVED BY FM GLOBAL.

SUBMITTALS
SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS. ASSEMBLE ALL SUBMITTALS IN SETS BASED ON APPLICABLE SPECIFICATION SECTION. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER, WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

PRODUCT DELIVERY, STORAGE, AND HANDLING
EXERCISE CARE IN TRANSPORTING AND HANDLING TO AVOID DAMAGE TO MATERIALS. STORE MATERIALS ON THE SITE TO PREVENT DAMAGE. KEEP MATERIALS CLEAN, DRY AND FREE FROM HARMFUL CONDITIONS. IMMEDIATELY REMOVE ANY MATERIALS THAT BECOME WET OR THAT ARE SUSPECTED OF BECOMING CONTAMINATED WITH MOLD OR OTHER ORGANISMS.

KEEP ALL BEARINGS PROPERLY LUBRICATED AND ALL BELTS PROPERLY TENSIONED AND ALIGNED.

COORDINATE THE INSTALLATION OF HEAVY AND LARGE EQUIPMENT WITH THE GENERAL CONTRACTOR AND/OR OWNER. IF THE MECHANICAL CONTRACTOR DOES NOT HAVE PRIOR DOCUMENTED EXPERIENCE IN RIGGING AND LIFTING SIMILAR EQUIPMENT, HE/SHE SHALL CONTRACT WITH A QUALIFIED LIFTING AND RIGGING SERVICE THAT HAS SIMILAR DOCUMENTED EXPERIENCE. FOLLOW ALL EQUIPMENT LIFTING AND SUPPORT GUIDELINES FOR HANDLING AND MOVING.

CONTRACTOR IS RESPONSIBLE FOR MOVING EQUIPMENT INTO THE BUILDING AND/OR SITE. CONTRACTOR SHALL REVIEW SITE PRIOR TO BID FOR PATH LOCATION AND ANY REQUIRED BUILDING MODIFICATIONS TO ALLOW MOVEMENT OF EQUIPMENT. CONTRACTOR SHALL COORDINATE HIS/HER WORK WITH OTHER TRADES.

WARRANTY
PROVIDE MINIMUM ONE-YEAR WARRANTY COMMENCING ON DATE OF FINAL ACCEPTANCE FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. WARRANTY REQUIREMENTS SHALL EXTEND TO CORRECTION, WITHOUT COST TO OWNER, OF ALL WORK FOUND TO BE DEFECTIVE OR NONCONFORMING TO THE CONTRACT DOCUMENTS. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION
WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A CATALOG NUMBER IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

OBSERVATION OF WORK

IN ORDER TO PREVENT THE FINAL JOBSITE OBSERVATION FROM OCCURRING TOO EARLY, THE CONTRACTOR SHALL REVIEW THE COMPLETION STATUS OF THE PROJECT AND CERTIFY IN WRITING THAT THE JOB IS READY FOR THE FINAL JOBSITE OBSERVATION.

22.05.00 CONT.

PROJECT CLOSEOUT
SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS INCLUDING REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD, SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, AND INSPECTION BY STATE BOILER INSPECTOR.

OPERATION AND MAINTENANCE MANUALS
SUBMIT AN ELECTRONIC COPY OF THE O&M MANUALS TO THE OWNER. OPERATION AND MAINTENANCE DATA SHALL CONSIST OF WRITTEN INSTRUCTIONS FOR THE CARE, MAINTENANCE, AND OPERATION OF THE EQUIPMENT AND SYSTEMS. INSTRUCTION BOOKS, CARDS, MANUALS FURNISHED WITH THE EQUIPMENT SHALL BE INCLUDED.

ALL TEXT SHALL BE SEARCHABLE AND BOOKMARKS SHALL BE USED, DIVIDING INFORMATION BY SPECIFICATION SECTION.

RECORD DOCUMENTS
MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF MECHANICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS; CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB, AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING
THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

22.10.00 PLUMBING PIPING

SECTION INCLUDES
PIPE AND PIPE FITTINGS
VALVES
DOMESTIC WATER PIPING SYSTEM

QUALITY ASSURANCE
VALVES: MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY. REMANUFACTURED VALVES ARE NOT ACCEPTABLE.

WELDING MATERIALS AND PROCEDURES: CONFORM TO ASME CODE AND APPLICABLE STATE LABOR REGULATIONS.

WELDERS CERTIFICATION: IN ACCORDANCE WITH ANSI/ASME SEC 9 OR ANSI/AWS D1.1.

PIPING, FITTINGS, VALVES, AND FLUX FOR POTABLE WATER SYSTEMS: ALL COMPONENTS SHALL BE LEAD FREE PER FEDERAL ACT S.3874, REDUCTION OF LEAD IN DRINKING WATER ACT.

COLD WATER _POTABLE AND NON-POTABLE
DESIGN PRESSURE: 175 PSI.
MAXIMUM DESIGN TEMPERATURE: 200F.

PIPING _ALL SIZES:
1. TUBING: TYPE K HARD DRAWN SEAMLESS COPPER TUBE, ASTM B88.
2. JOINTS: SOLDER WITH 100% LEAD-FREE SOLDER AND FLUX, ASTM B32.
3. FITTINGS: WROUGHT COPPER SOLDER JOINT, ANSI B16.22.

DOMESTIC WATER BUTTERFLY VALVES:
4" AND OVER, 150 PSI SATURATED STEAM, 600 PSI CWP, FULL PORT, SCREWED OR SOLDER ENDS (ACCEPTABLE ONLY IF RATED FOR SOLDERING IN LINE WITH 470F MELTING POINT OF LEAD-FREE SOLDER), BRONZE BODY OF A COPPER ALLOY CONTAINING LESS THAN 15% ZINC, STAINLESS STEEL BALL AND TRIM, TEFLON SEATS AND SEALS. APOLLO #77C 140, STOCKHAM #S 255-FB-P-UL BR1_R, MILWAUKEE #BA-400, WATTS, NIBCO #585-70-66, NATIONAL UTILITIES CO., RUB.

UNIONS
COPPER PIPE _ WROUGHT COPPER FITTING _ GROUND JOINT.

AIR VENTS
PROVIDE MEANS FOR VENTING AIR AT ALL HIGH POINTS IN THE PIPING SYSTEM AND AT ALL OTHER POINTS WHERE AIR MAY BE TRAPPED.

DRAIN VALVES
DRAIN VALVES SHALL BE SHUTOFF VALVES AS SPECIFIED FOR THE INTENDED SERVICE WITH ADDED 3/4" MALE HOSE THREAD OUTLET AND CAP.

CONNECTIONS BETWEEN DISSIMILAR METALS
CONNECTIONS BETWEEN DISSIMILAR METALS SHALL BE INSULATING DIELECTRIC TYPES THAT PROVIDE A WATER GAP BETWEEN THE CONNECTED METALS, AND THAT EITHER ALLOW NO METAL PATH FOR ELECTRON TRANSFER OR THAT PROVIDE A WIDE WATER GAP LINED WITH A NON-CONDUCTIVE MATERIAL TO IMPEDE ELECTRON TRANSFER THROUGH THE WATER PATH.

JOINTS SHALL BE RATED FOR THE TEMPERATURE, PRESSURE, AND OTHER CHARACTERISTICS OF THE SERVICE IN WHICH THEY ARE USED, INCLUDING TESTING PROCEDURE.

ALUMINUM, IRON, STEEL, BRASS, COPPER, BRONZE, AND STAINLESS STEEL ARE COMMONLY USED AND REQUIRE ISOLATION FROM EACH OTHER WITH THE FOLLOWING EXCEPTIONS:

1. IRON, STEEL, AND STAINLESS STEEL CONNECTED TO EACH OTHER.
2. BRASS, COPPER, AND BRONZE CONNECTED TO EACH OTHER.
3. BRASS OR BRONZE VALVES AND SPECIALTIES CONNECTED TO STEEL, IRON, OR STAINLESS STEEL IN CLOSED SYSTEMS. WHERE TWO OR MORE BRASS OR BRONZE ITEMS OCCUR TOGETHER, THEY SHALL BE CONNECTED WITH BRASS NIPPLES.
DIELECTRIC PROTECTION IS REQUIRED AT CONNECTIONS TO EQUIPMENT OF A MATERIAL DIFFERENT THAN THE PIPING.

FLANGED JOINTS (ANY SIZE):
1. USE 1/8" MINIMUM THICKNESS, NON-CONDUCTIVE, FULL-FACE GASKETS.
2. EMPLOY ONE-PIECE MOLDED SLEEVE-WASHER COMBINATIONS TO BREAK THE ELECTRICAL PATH THROUGH THE BOLTS.
3. SLEEVE-WASHERS ARE REQUIRED ON ONE SIDE ONLY, WITH SLEEVES MINIMUM 1/32" THICK AND WASHERS MINIMUM 1/8" THICK.
4. INSTALL STEEL WASHERS ON BOTH SIDES OF FLANGES TO PREVENT DAMAGE TO THE SLEEVE WASHER.
5. SEPARATE SLEEVES AND WASHERS MAY BE USED ONLY IF THE SLEEVES ARE MANUFACTURED TO EXACT LENGTHS AND INSTALLED CAREFULLY SO THE SLEEVES MUST EXTEND PARTIALLY PAST EACH STEEL WASHER WHEN TIGHTENED.
6. ACCEPTABLE MANUFACTURERS: EPCO, CENTRAL PLASTICS, PIPELINE SEAL AND INSULATOR, F. H. MALONEY, OR CALPICO.

VALVE CONNECTIONS
PROVIDE ALL CONNECTIONS TO MATCH PIPE JOINTS. VALVES SHALL BE SAME SIZE AS PIPE UNLESS NOTED OTHERWISE.

INSTALLATION PREPARATION
INSTALL ALL PRODUCTS PER MANUFACTURER'S RECOMMENDATIONS. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN END FERROUS PIPE. REMOVE SCALE AND DIRT, ON INSIDE AND OUTSIDE, BEFORE ASSEMBLY. CONNECT TO EQUIPMENT WITH FLANGES OR UNIONS. E.G. DO NOT PIPE PVC FOR DISHWASHER DRAINAGE OR PIPING THAT RECEIVES BOILER BLOWDOWN.

TESTING PIPING
COLD WATER _POTABLE AND NON-POTABLE:
1. TEST PIPES AS DESCRIBED IN THE 2019 CPC

CLEANING PIPING
BEFORE ASSEMBLING PIPE SYSTEMS, REMOVE ALL LOOSE DIRT, SCALE, OIL AND OTHER FOREIGN MATTER ON INTERNAL OR EXTERNAL SURFACES BY MEANS CONSISTENT WITH GOOD PIPING PRACTICE SUBJECT TO APPROVAL OF THE ARCHITECT/ENGINEER'S REPRESENTATIVE. BLOW CHIPS AND BURRS FROM MACHINERY OR THREAD CUTTING OPERATION OUT OF PIPE BEFORE ASSEMBLY. WIPE CUTTING OIL FROM INTERNAL AND EXTERNAL SURFACES.

DURING FABRICATION AND ASSEMBLY, REMOVE SLAG AND WELD SPATTER FROM BOTH INTERNAL AND EXTERNAL JOINTS BY PEENING, CHIPPING AND WIRE BRUSHING.

22.10.00 PLUMBING PIPING

PRIOR TO BLOWING OR FLUSHING ERECTED PIPING SYSTEMS, DISCONNECT ALL INSTRUMENTATION AND EQUIPMENT, OPEN WIDE ALL VALVES, AND BE CERTAIN ALL STRAINER SCREENS ARE IN PLACE.

GENERAL INSTALLATION REQUIREMENTS
PROVIDE DIELECTRIC CONNECTIONS BETWEEN DISSIMILAR METALS. ROUTE PIPING IN ORDERLY MANNER AND MAINTAIN GRADIENT. INSTALL TO CONSERVE BUILDING SPACE. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR EQUIPMENT. SLOPE WATER PIPING AND ARRANGE TO DRAIN AT LOW POINTS.

WHERE PIPE SUPPORTS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPE, BRUSH CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDS. SEAL PIPES PASSING THROUGH EXTERIOR WALLS WITH A WALL SEAL PER SECTION 22.05.29. PROVIDE SCHEDULE 40 GALVANIZED SLEEVE AT LEAST 2 PIPE SIZES LARGER THAN THE PIPE.

ALL NON-POTABLE OUTLETS SHALL BE CLEARLY MARKED WITH A PERMANENTLY AFFIXED LAMINATED SIGN WITH 3/8" HIGH LETTERING SAYING "NON-POTABLE WATER NOT FOR HUMAN CONSUMPTION." SIGN SHALL HAVE BLACK LETTERING ON A YELLOW BACKGROUND.

INSTALLATION REQUIREMENTS IN ELECTRICAL ROOMS:
1. DO NOT INSTALL PIPING OR OTHER EQUIPMENT ABOVE ELECTRICAL SWITCHBOARDS OR PANELBOARDS. THIS INCLUDES A DEDICATED SPACE EXTENDING 25 FEET FROM THE FLOOR TO THE STRUCTURAL CEILING WITH WIDTH AND DEPTH EQUAL TO THE EQUIPMENT.

VALVES/FITTINGS AND ACCESSORIES:
1. INSTALL SHUTOFF VALVES THAT PERMIT THE ISOLATION OF EQUIPMENT/FIXTURES IN EACH ROOM WITHOUT ISOLATING ANY OTHER ROOM OR PORTION OF THE BUILDING. INDIVIDUAL FIXTURE ANGLE STOPS DO NOT MEET THIS REQUIREMENT. EXCEPTION: BACK-TO-BACK ROOMS IN NO MORE THAN TWO ADJACENT ROOMS. [SPECIFIER: REQUIRED IN ILLINOIS, GOOD PRACTICE IN OTHER STATES.]
2. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
3. PROVIDE ACCESS DOORS FOR CONCEALED VALVES AND FITTINGS.
4. INSTALL VALVE STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.
5. PROVIDE ONE PLUG VALVE WRENCH FOR EVERY TEN PLUG VALVES 2" AND SMALLER, MINIMUM OF ONE. PROVIDE EACH PLUG VALVE 2 1/2" AND LARGER WITH A WRENCH WITH SET SCREW.

PIPE ERECTION AND LAYING
CAREFULLY INSPECT ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES BEFORE INSTALLATION. ANY ITEMS THAT ARE UNSUITABLE, CRACKED OR OTHERWISE DEFECTIVE SHALL BE REMOVED FROM THE JOB IMMEDIATELY.

ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES SHALL HAVE FACTORY APPLIED MARKINGS, STAMPINGS, OR NAMEPLATES WITH SUFFICIENT DATA TO DETERMINE THEIR CONFORMANCE WITH SPECIFIED REQUIREMENTS.

EXERCISE CARE AT EVERY STAGE OF STORAGE, HANDLING, LAYING AND ERECTING TO PREVENT ENTRY OF FOREIGN MATTER INTO PIPING, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES. DO NOT INSTALL ANY ITEM THAT IS NOT CLEAN.

UNTIL SYSTEM IS FULLY OPERATIONAL, ALL OPENINGS IN PIPING AND EQUIPMENT SHALL BE KEPT CLOSED EXCEPT WHEN ACTUAL WORK IS BEING PERFORMED ON THAT ITEM OR SYSTEM. CLOSURES SHALL BE PLUGS, CAPS, BLIND FLANGES OR OTHER ITEMS SPECIFICALLY DESIGNED AND INTENDED FOR THIS PURPOSE. MAKE CHANGES IN DIRECTION OF PIPES ONLY WITH FITTINGS OR PIPE BENDS. CHANGES IN SIZE ONLY WITH FITTINGS. DO NOT USE MITER FITTINGS, FACE OR FLUSH BUSHINGS, OR STREET ELBOWS. ALL FITTINGS SHALL BE OF THE LONG RADIUS TYPE, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED.

PROVIDE FLANGES OR UNIONS AT ALL FINAL CONNECTIONS TO EQUIPMENT, TRAPS AND VALVES.

ARRANGE PIPING AND CONNECTIONS SO EQUIPMENT SERVED MAY BE TOTALLY REMOVED WITHOUT DISTURBING PIPING BEYOND FINAL CONNECTIONS AND ASSOCIATED SHUTOFF VALVES.

USE FULL AND DOUBLE LENGTHS OF PIPE WHEREVER POSSIBLE.

UNLESS OTHERWISE INDICATED, INSTALL ALL PIPING, INCLUDING SHUTOFF VALVES AND EQUIPMENT AT LINE SIZE WITH REDUCTION IN SIZE BEING MADE ONLY AT CONTROL VALVE OR EQUIPMENT.

CUT ALL PIPE TO EXACT MEASUREMENT AND INSTALL WITHOUT SPRINGING OR FORCING EXCEPT IN THE CASE OF EXPANSION LOOPS WHERE COLD SPRINGING IS INDICATED ON THE DRAWINGS.

UNLESS OTHERWISE INDICATED, BRANCH TAKE-OFFS SHALL BE FROM TOP OF MAINS OR HEADERS AT EITHER A 45 OR 90 ANGLE FROM THE HORIZONTAL PLANE FOR AIR LINES, AND FROM TOP, BOTTOM OR SIDE FOR LIQUIDS.

DRAINING AND VENTING
UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL HORIZONTAL WATER AND COMPRESSED AIR LINES, INCLUDING BRANCHES, SHALL PITCH 1" IN 40 FEET 12 TO LOW POINTS FOR COMPLETE DRAINAGE, REMOVAL OF CONDENSATE AND VENTING.

MAINTAIN ACCURATE GRADE WHERE PIPES PITCH OR SLOPE FOR VENTING AND DRAINAGE. NO PIPES SHALL HAVE POCKETS DUE TO CHANGES IN ELEVATION.

PROVIDE DRIP LEGS AT LOW POINTS AND AT THE BASE OF ALL RISERS IN COMPRESSED AIR PIPES. DRIP LEGS SHALL BE FULL LINE SIZE ON PIPES THROUGH 1" AND AT LEAST 4", BUT NOT LESS THAN HALF LINE SIZE OVER 4". DRIP LEGS SHALL BE 12" MINIMUM LENGTH, CAPPED WITH A REDUCER TO A DRAIN VALVE.

USE ECCENTRIC REDUCING FITTINGS ON HORIZONTAL RUNS WHEN CHANGING SIZE OF PIPES FOR PROPER DRAINAGE AND VENTING. INSTALL COMPRESSED AIR AND GRAVITY DRAIN PIPES WITH BOTTOM OF PIPE AND ECCENTRIC REDUCERS IN A CONTINUOUS LINE; ALL OTHER LIQUID LINES WITH TOP OF PIPE AND ECCENTRIC REDUCERS IN A CONTINUOUS LINE.

PROVIDE AIR VENTS AT HIGH POINTS AND WHEREVER ELSE REQUIRED TO ELIMINATE AIR IN ALL WATER PIPING SYSTEMS.

INSTALL AIR VENTS IN ACCESSIBLE LOCATIONS. IF NECESSARY TO TRAP AND VENT AIR IN A REMOTE LOCATION, INSTALL A 1/8" PIPE FROM THE TAPPING LOCATION TO AN ACCESSIBLE LOCATION AND TERMINATE WITH A VENTING DEVICE.

BRANCH CONNECTIONS
FOR DOMESTIC WATER SYSTEMS ONLY. MAKE BRANCH CONNECTIONS WITH STANDARD TEE OR CROSS FITTINGS OF THE TYPE REQUIRED FOR THE SERVICE.

REDUCERS ARE GENERALLY NOT SHOWN. WHERE PIPE SIZES CHANGE AT TEE, THE TEE SHALL BE THE SIZE OF THE LARGEST PIPE SHOWN CONNECTING TO IT.

BRANCH CONNECTIONS FROM HEADERS AND MAINS MAY BE CUT INTO BLACK STEEL PIPE USING FORGED WELD ON FITTINGS.

FORGED WELD-ON FITTINGS ARE LIMITED AS FOLLOWS:
1. MUST HAVE AT LEAST SAME PRESSURE RATING AS THE MAIN.
2. MAIN MUST BE 2 1/2" OR LARGER.
3. BRANCH LINE IS AT LEAST TWO PIPE SIZES UNDER MAIN SIZE.

JOINING OF PIPE
SOLDER JOINTS:
MAKE UP JOINTS WITH 100% LEAD-FREE SOLDER, ASTM B32. CUT TUBING SO ENDS ARE PERFECTLY SQUARE AND REMOVE ALL BURRS INSIDE AND OUTSIDE. THOROUGHLY CLEAN SOCKETS OF FITTINGS AND ENDS OF TUBING TO REMOVE ALL OXIDE, DIRT AND GREASE JUST PRIOR TO SOLDERING. APPLY FLUX EVENLY, BUT SPARINGLY, OVER ALL SURFACES TO BE JOINED. HEAT JOINTS UNIFORMLY SO SOLDER WILL FLOW TO ALL MATED SURFACES. WIPE EXCESS SOLDER, LEAVING A UNIFORM FILLET AROUND CUP OF FITTING. FLUX SHALL BE NON-ACID TYPE.

SOLDER END VALVES MAY BE INSTALLED DIRECTLY IN THE PIPING SYSTEM IF THE ENTIRE VALVE IS SUITABLE FOR USE WITH 470F MELTING POINT SOLDER. REMOVE DISCS AND SEALS DURING SOLDERING IF THEY ARE NOT SUITABLE FOR 470F.

DISINFECTION OF DOMESTIC WATER PIPING SYSTEM
DISINFECT WATER PIPE PER CPC 2019

ARROWHEAD REGIONAL MEDICAL CENTER


400 N. PEPPER AVE.
COLTON, CA. 92324

ARMC SKID MOUNTED BOOSTER PUMP

WBSE NO.	10.10.0722
CIP NO.	***
IMEG PROJECT NO.	21006908.00
BUILDING (CAFM) NO.	***
APN NO.	***


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CONSULTANT

AGENCY APPROVAL

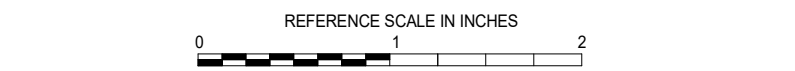


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REVISIONS

No.	Date	Revision / Issue
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SHEET INFORMATION	
Issue	HCAI SUBMITTAL
Date	05/10/2022
Job Number	21-31
Drawn	Author
Checked	Checker
Approved	Approver
SHEET TITLE	
SPECIFICAIONS	
SCALE	
Scale:	
SHEET NUMBER	

SECTION 22 30 00 - PLUMBING EQUIPMENT
PART 1 - GENERAL

1. SECTION INCLUDES
- A. PRESSURE BOOSTER SYSTEM.
1. QUALITY ASSURANCE
- A. PRODUCTS AND INSTALLATION OF SPECIFIED PRODUCTS SHALL CONFORM TO RECOMMENDATIONS AND REQUIREMENTS OF THE FOLLOWING ORGANIZATIONS:

1. AMERICAN GAS ASSOCIATION (AGA).

2. NATIONAL SANITATION FOUNDATION (NSF).

3. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).

4. NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS (NBBPV).

5. NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION (NEMA).

6. UNDERWRITERS' LABORATORIES (UL).
- B. PERFORM WORK IN ACCORDANCE WITH STATE OF CALIFORNIA PLUMBING CODES AND MUNICIPALITY OF LOCAL AREA STANDARDS.
1. SUBMITTALS
- A. SUBMIT SHOP DRAWINGS UNDER PROVISIONS OF SECTION 22 05 00.
- B. INCLUDE DIMENSION DRAWINGS OF BOOSTER PUMP INDICATING COMPONENTS AND CONNECTIONS TO OTHER EQUIPMENT AND PIPING.
- C. INCLUDE DIMENSIONS OF TANKS, TANK LINING METHODS, ANCHORS, ATTACHMENTS, LIFTING POINTS, TAPPINGS, AND DRAINS.
- D. FOR EQUIPMENT CONNECTED TO AN ELECTRIC POWER SOURCE, SUBMIT SHORT CIRCUIT RATING (SCCR) OF INTEGRATED UNIT.
- E. SUBMIT MANUFACTURER'S INSTALLATION INSTRUCTIONS INCLUDING CONTROL AND ELECTRICAL POWER/CONTROLS WIRING DIAGRAMS.
- F. SUBMIT MANUFACTURER'S CERTIFICATE THAT PRESSURE VESSELS MEET OR EXCEED SPECIFIED REQUIREMENTS.
- G. SUBMIT OPERATION, MAINTENANCE, AND INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY, AND SERVICE DEPOT LOCATION AND TELEPHONE NUMBER.
- H. SUBMIT CERTIFICATION THAT PRESSURE BOOSTER SYSTEM ACCESSORIES, AND COMPONENTS WILL WITHSTAND SEISMIC FORCES DEFINED WITH HCAI(OSHPD) OSP NUMBER.

1. DIMENSIONED OUTLINE DRAWINGS OF EQUIPMENT UNIT: IDENTIFY CENTER OF GRAVITY AND LOCATE AND DESCRIBE MOUNTING AND ANCHORAGE PROVISIONS.

2. DETAILED DESCRIPTION OF EQUIPMENT ANCHORAGE DEVICES ON WHICH THE CERTIFICATION IS BASED AND THEIR INSTALLATION REQUIREMENTS.
- I. MANUFACTURER SHALL PROVIDE SPECIAL SEISMIC CERTIFICATION PER OSHPD CAN 2-1708A.5 WITH SUBMITTAL. SUBMITTALS WITHOUT CERTIFICATION WILL BE RETURNED AND NOT REVIEWED.
1. DELIVERY, STORAGE, AND HANDLING
- A. PROVIDE TEMPORARY INLET AND OUTLET CAPS. MAINTAIN CAPS IN PLACE UNTIL INSTALLATION.

PART 2 - PRODUCTS

- 2.1 PRESSURE BOOSTER SYSTEMS
- A. PACKAGED PRESSURE BOOSTING SYSTEM SHALL BE COMPLETELY FACTORY ASSEMBLED, RUN-TESTED, AND SHIPPED TO SITE AS AN INTEGRAL UNIT ASSEMBLED ON A STEEL SKID INCLUDING PUMPS, MOTORS, VALVES STAINLESS STEEL SUCTION AND DISCHARGE MANIFOLDS, ALL INTERCONNECTING PIPING, WIRING, VARIABLE FREQUENCY DRIVES WITH LOGIC AND POWER CONTROLS. SIZE AND CAPACITY SHALL BE AS SCHEDULED ON THE DRAWINGS.
- B. SHUTOFF VALVES SHALL BE PROVIDED ON THE SUCTION AND DISCHARGE OF EACH PUMP. SILENT SPRING- LOADED CHECK VALVES SHALL BE INSTALLED ON THE DISCHARGE OF EACH PUMP.
- C. PRESSURE GAUGES SHALL BE PROVIDED ON THE FRONT COVER OF THE CONTROL PANEL INDICATING SYSTEM SUCTION AND DISCHARGE PRESSURE. PRESSURE GAUGES SHALL BE 4-1/2 INCH (15 MM) DIAMETER, GRADE 1A, HAVING 1% TOTAL RANGE SPAN ACCURACY AND INSTALLED WITH SHUTOFF VALVE AND PRESSURE SNUBBER AT GAUGE CONNECTION TO SYSTEM PIPING. ALL SKID- MOUNTED COMPONENTS SHALL BE FACTORY FINISHED WITH ENAMEL PAINT. INDIVIDUAL PUMPS, MOTORS, VARIABLE FREQUENCY DRIVES, AND CHECK VALVES SHALL BE SERVICEABLE WITH THE BOOSTER SYSTEM IN OPERATION, AND ALL COMPONENTS SHALL BE SUITABLE FOR THE MAXIMUM SYSTEM WORKING PRESSURE.
- D. SYSTEM SHALL INCLUDE **THREE VERTICAL** MOUNTED PUMPS WITH ANSI FLANGED OR NPT THREADED CONNECTIONS, REPLACABLE CASING WEAR RINGS, AND HYDRAULICALLY BALANCED IMPELLERS. PUMPS SHALL BE CAST IRON, BRONZE OR STAINLESS STEEL FITTED CONSTRUCTION WITH REPLACABLE SHAFT SLEEVES AND MECHANICAL SEALS SUITABLE FOR 175 PSIG (1,207 KPA) WORKING PRESSURE.
- E. PRESSURE REGULATING VALVES TO CONTROL SYSTEM PRESSURE AT THE UNIT ARE NOT ALLOWED PER ASHRAE 90.1.
- F. EACH PUMP SHALL INCLUDE A PRESSURE RELIEF VALVE, SET TO RELIEVE 15 PSI (103 KPA) ABOVE THE HIGH LIMIT PRESSURE SWITCH SETTING, WHICH SHALL BE PIPED TO A FLOOR DRAIN BY THE INSTALLING CONTRACTOR.
- G. PROVIDE EACH PUMP WITH A PREMIUM EFFICIENT TOTALLY ENCLOSED FAN- COOLED MOTOR LABELED FOR USE WITH VARIABLE FREQUENCY DRIVES (VFDs) AND SIZED FOR OPERATION AT ANY POINT OF THE PUMP CURVE, INCLUDING PUMP RUN- OUT (NON-OVERLOADING OPERATION).
- H. PROVIDE AND MOUNT ON THE SYSTEM SKID THREE VFDs SUITABLE FOR VARIABLE TORQUE APPLICATIONS. MINIMUM ACCEPTABLE VFD FULL LOAD/FULL SPEED EFFICIENCY SHALL BE 97%, WITH A FUNDAMENTAL POWER FACTOR OF 0.98. VFDs SHALL MEET THE FOLLOWING:

1. PULSE WIDTH MODULATED (PWM).

2. STARTS INTO ROTATING LOAD.

3. OVERCURRENT PROTECTION.

4. ADJUSTABLE CARRIER SWITCHING FREQUENCY OF UP TO 8 KHZ.

5. KEYPAD OPERATOR DEVICE OR TOUCHSCREEN THAT INCLUDES THE FOLLOWING:

a. 2-LINE BACKLIT DISPLAY.

b. POWER ON AND ALARM/FAULT INDICATORS

c. HAND-OFF-AUTO SWITCH ON VFD FRONT PANEL COVER

d. WHEN SWITCHED TO "AUTO" OPERATION, THE VFDs SHALL FOLLOW THE SIGNAL FROM THE CONTROL PANEL LOGIC SECTION.

e. WHEN SWITCHED TO "HAND", THE VFD SPEED IS DETERMINED BY THE SETTING OF THE MANUAL SPEED ADJUSTMENT LOCATED ON THE VFD FRONT PANEL COVER.

f. AUTOMATIC VFD SHUTDOWN FOR ELECTRICAL FAULT

g. AUTOMATIC RESTART AFTER ELECTRICAL POWER IS RESTORED FROM A LOSS OF POWER

h. SERVICE DIAGNOSTICS WITH FAULT HISTORY LOG.

SECTION 22 30 00 - PLUMBING EQUIPMENT CONT.

- I. PROVIDE A HIGH LIMIT PRESSURE SWITCH COMPATIBLE WITH THE SYSTEM CONTROLS, TEMPERATURE, AND PRESSURE REQUIREMENTS. THE PRESSURE SWITCH SHALL BE MOUNTED AND WIRED ON THE CONTROL PANEL, WITH SENSING LINE CONNECTED TO THE SYSTEM DISCHARGE MANIFOLD. THE HIGH LIMIT PRESSURE SWITCH SHALL SHUT DOWN THE SYSTEM IF THE SYSTEM PRESSURE IS MORE THAN 30 PSI (207 KPA) ABOVE THE NORMAL OPERATING PRESSURE.
- J. PROVIDE A PRESSURE SENSOR/TRANSMITTER, SHIPPED LOOSE FOR FIELD INSTALLATION, THAT PROVIDES A MODULATING OUTPUT COMPATIBLE WITH THE SYSTEM CONTROLS. THE PRESSURE SENSOR/TRANSMITTER SHALL BE USED TO CONTROL BOOSTER PUMP VFDs TO MAINTAIN A CONSTANT SYSTEM PRESSURE.
- K. PROVIDE A FACTORY-MOUNTED PRESSURE SENSOR/TRANSMITTER IN THE DISCHARGE HEADER THAT PROVIDES A MODULATING OUTPUT COMPATIBLE WITH THE SYSTEM CONTROLS. THE PRESSURE SENSOR/TRANSMITTER SHALL BE USED TO CONTROL BOOSTER PUMP VFDs TO MAINTAIN A CONSTANT SYSTEM PRESSURE. CONTROL LOGIC SHALL BE CAPABLE OF ADJUSTING THE PRESSURE SETPOINT USING A SYSTEM PRESSURE DROP ALGORITHM BASED ON REAL-TIME FLOW DATA.
- L. USE OF A SINGLE PRESSURE SENSOR/TRANSMITTER TO CONTROL SYSTEM PRESSURE AND HIGH LIMIT PRESSURE CUTOFF IS NOT ACCEPTABLE. BOTH THE HIGH LIMIT PRESSURE SWITCH AND THE PRESSURE SENSOR/TRANSMITTER SHALL BE SEPARATELY WIRED BACK TO THE BOOSTER PUMP CONTROL PANEL.
- M. THE LEAD PUMP SHALL RUN ONLY AS NECESSARY TO MAINTAIN SYSTEM PRESSURE AND WILL BE AUTOMATICALLY CONTROLLED BY MEANS OF A PRESSURE SENSOR/TRANSMITTER AND CONTROL PROGRAMMING TO PREVENT SHORT CYCLING.
- N. IF THE LEAD PUMP IS UNABLE TO MAINTAIN SYSTEM PRESSURE AT THE PRESSURE SENSOR/TRANSMITTER, THE LAG PUMP WILL BE CALLED ON AFTER A TIME DELAY AND WILL OPERATE IN PARALLEL WITH THE LEAD PUMP IN ACCORDANCE WITH CONTROL PROGRAMMING. WHEN A LOW OR NO-FLOW CONDITION IS REACHED, THE CONTROLS WILL SHUT DOWN THE LAG PUMP IF RUNNING AND ACCELERATE THE LEAD PUMP TO CHARGE THE SYSTEM AND HYDRO- PNEUMATIC TANK TO 20 PSI ABOVE NORMAL OPERATING PRESSURE, THEN SHUT THE LEAD PUMP DOWN AND ALTERNATE. SHOULD ANY PUMP FAIL TO OPERATE, THE NEXT PUMP IN SEQUENCE SHALL START AUTOMATICALLY.
- O. PROVIDE, MOUNT AND WIRE ON THE SKID A PROGRAMMABLE LOGIC CONTROLLER IN A NEMA 1 ENCLOSURE. THE CONTROLLER SHALL INTERFACE THE SIGNALS FROM THE SENSORS TO THE VFDs AND SHALL PROVIDE A STABILIZED RESPONSE TO SPEED UP OR SLOW DOWN THE PUMP OR ADD ADDITIONAL PUMPS TO MEET SYSTEM REQUIREMENTS. THE CONTROLLER SHALL PROVIDE SETPOINT CONTROL THAT CAN BE CHANGED BY A KEYPAD ENTRY ON THE CONTROL FACEPLATE. THE CONTROLLER SHALL HAVE AN ALPHANUMERIC DISPLAY, PID FUNCTIONS AND BOTH SYSTEM AND CONTROLLER SELF-DIAGNOSTICS. CONTROLLER SHALL BE PROVIDED WITH DUAL FUNCTION PID LOOP FOR STARTUP MODE AND NORMAL OPERATION. STARTUP MODE SHALL PROVIDE A QUICK RESPONSE FROM SHUTDOWN AND NORMAL OPERATION IS TUNED TO ELIMINATE HUNTING. CONTROLLER SHALL HAVE A REAL-TIME CALENDAR/CLOCK AND MEMORY TRANSFER CARTRIDGE.
- P. PROVIDE A UL LISTED CONTROL PANEL IN A NEMA 1 ENCLOSURE, FACTORY MOUNTED AND WIRED ON THE STEEL SKID. THE PANEL SHALL BE FURNISHED WITH INDIVIDUAL PUMP DISCONNECTS WITH THROUGH-THE-DOOR HANDLES, PUMP RUN LIGHTS, H-O-A SELECTOR SWITCHES, 120-VOLT FUSED CONTROL TRANSFORMER, AND NECESSARY RELAYS, TIMERS AND A PROGRAMMABLE CONTROLLER WITH PUMP START, STOP AND SEQUENCE CONTROLS.
- Q. THE CONTROLLER SHALL BE CAPABLE OF OUTPUTTING SYSTEM PRESSURE AND A GENERAL ALARM SIGNAL TO THE BUILDING AUTOMATION SYSTEM.
- R. NON-MERCURY LOW PRESSURE CONTROL TO STOP PUMP OPERATION IF INCOMING WATER PRESSURE DROPS TO ATMOSPHERIC.
- S. SIZE AND CAPACITY SHALL BE AS SCHEDULED ON THE DRAWINGS.
- T. MANUFACTURERS:

1. GOULDS

2. XYLEM B&G

3. GRUNDFOS

END OF SECTION

PART 3 - EXECUTION

- 3.1 INSTALLATION
- A. INSTALL ALL ITEMS IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
- 3.2 PRESSURE BOOSTER INSTALLATION
- A. PROVIDE STARTUP BY FACTORY AUTHORIZED START-UP TECHNICIAN.
- B. MOUNT PRESSURE SENSOR/TRANSMITTER USED TO CONTROL PRESSURE BOOSTER PUMP VFDs REMOTE FROM BOOSTER PUMP SKID NEAR THE MOST REMOTE CRITICAL PLUMBING FIXTURE AS INDICATED ON THE DRAWINGS, AND WIRE SIGNAL DIRECTLY BACK TO PRESSURE BOOSTER CONTROL PANEL. PRESSURE SENSOR/TRANSMITTER SIGNAL SHALL NOT INTERFACE WITH OR BE TRANSMITTED ACROSS ANY BUILDING INFORMATION SYSTEM NETWORK. PROVIDE SIGNAL AMPLIFIERS OR REPEATERS AS REQUIRED TO ENSURE PROPER CONTROL OPERATION.
- C. PROVIDE FOUR (4) HOURS OF INSTRUCTION AND ORIENTATION TO THE OWNER'S MAINTENANCE STAFF BY FACTORY TRAINED PERSONNEL. SYSTEM WALK-THROUGH, INCLUDING PROGRAMMING OF ANY SYSTEM CONTROLLERS, SHALL BE INCLUDED IN THE TRAINING.
- D. SUPPORT PIPING ADJACENT TO PUMPS SO THAT NO WEIGHT IS CARRIED BY PUMP CASINGS. PROVIDE SUPPORTS UNDER ELBOWS ON 4" AND LARGER.
- E. ENSURE PUMPS OPERATE AT SPECIFIED FLUID TEMPERATURES WITHOUT VAPOR BINDING OR CAVITATION, ARE NON-OVERLOADING IN PARALLEL OR INDIVIDUAL OPERATION, AND OPERATE WITHIN 25% OF MIDPOINT OF PUBLISHED MAXIMUM EFFICIENCY CURVE.
- F. PUMPS SHALL BE FACTORY ALIGNED. IF ALIGNMENT IS NOT SATISFACTORY, AS DETERMINED BY THE ARCHITECT/ENGINEER, MANUFACTURER SHALL PROVIDE A FACTORY TRAINED REPRESENTATIVE TO FIELD ALIGN THE SHAFTS.
- G. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, MOUNT ALL PUMP SKIDS ON 4" HIGH CONCRETE PADS AND ANCHOR FRAMES TO PADS WITH CAST-IN-PLACE ANCHORS.
- H. ALL PUMP SKIDS SHALL BE GROUTED IN. FOLLOW MANUFACTURER'S INSTRUCTIONS FOR GROUTING.
- I. INSTALL ON VIBRATION ISOLATORS AS SCHEDULED ON DRAWINGS.
- J. COORDINATE INSTALLATION TO ENSURE MANUFACTURER'S RECOMMENDED SERVICE CLEARANCES ARE MET.

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ARMC
SKID MOUNTED
BOOSTER PUMP

WBSE NO.	10.10.0722
CIP NO.	***
IMEG PROJECT NO.	21006908.00
BUILDING (CAFM) NO.	***
APN NO.	***



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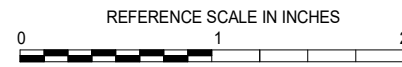
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Approved	Approver

SHEET TITLE

SPECIFICATIONS

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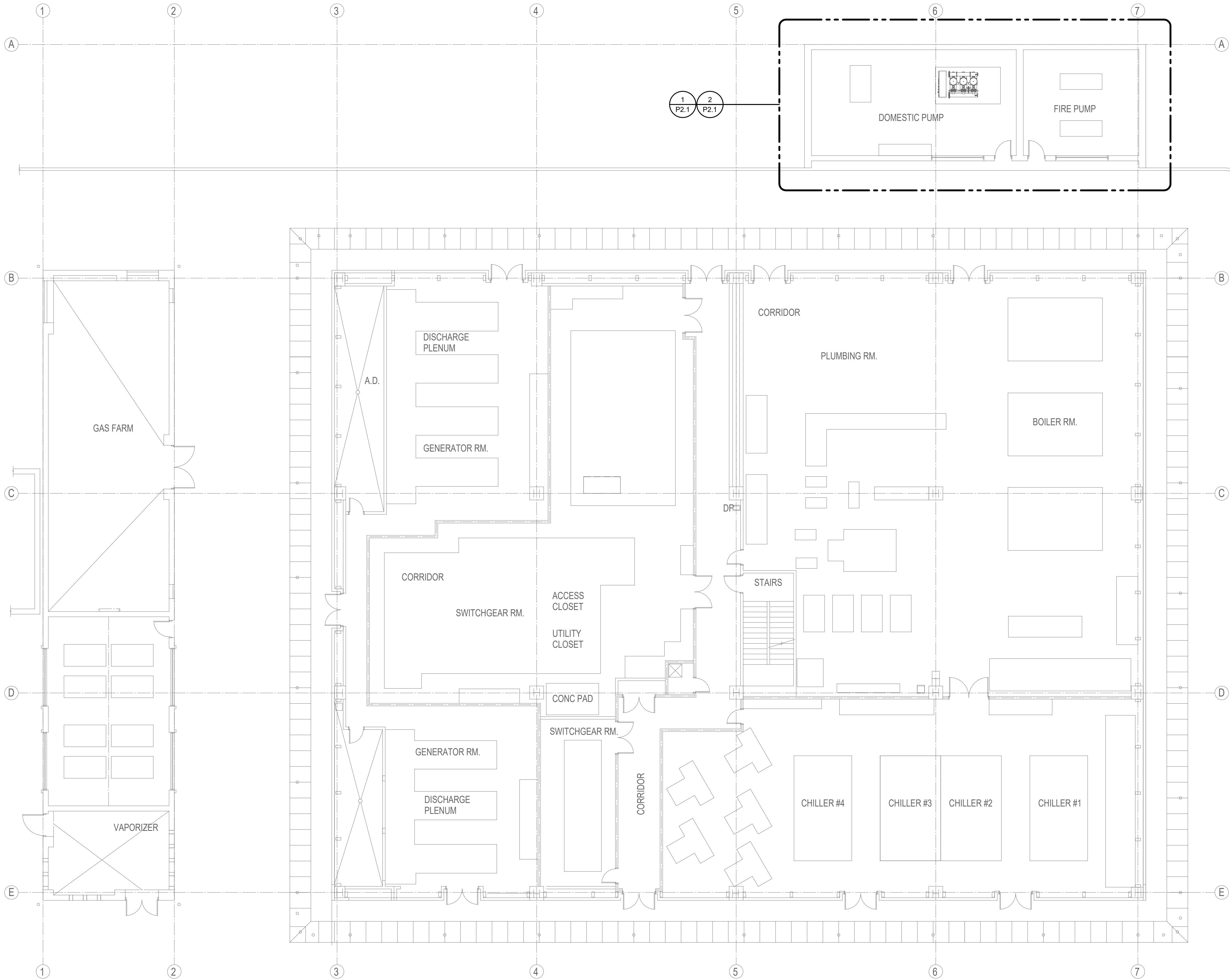
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P0.3

Project Number 5/10/2022 4:05:45 PM

Project Name



1 OVERALL FIRST FLOOR PLAN - PLUMBING

1" = 10'-0"

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ARMC SKID MOUNTED BOOSTER PUMP

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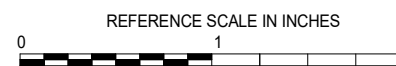
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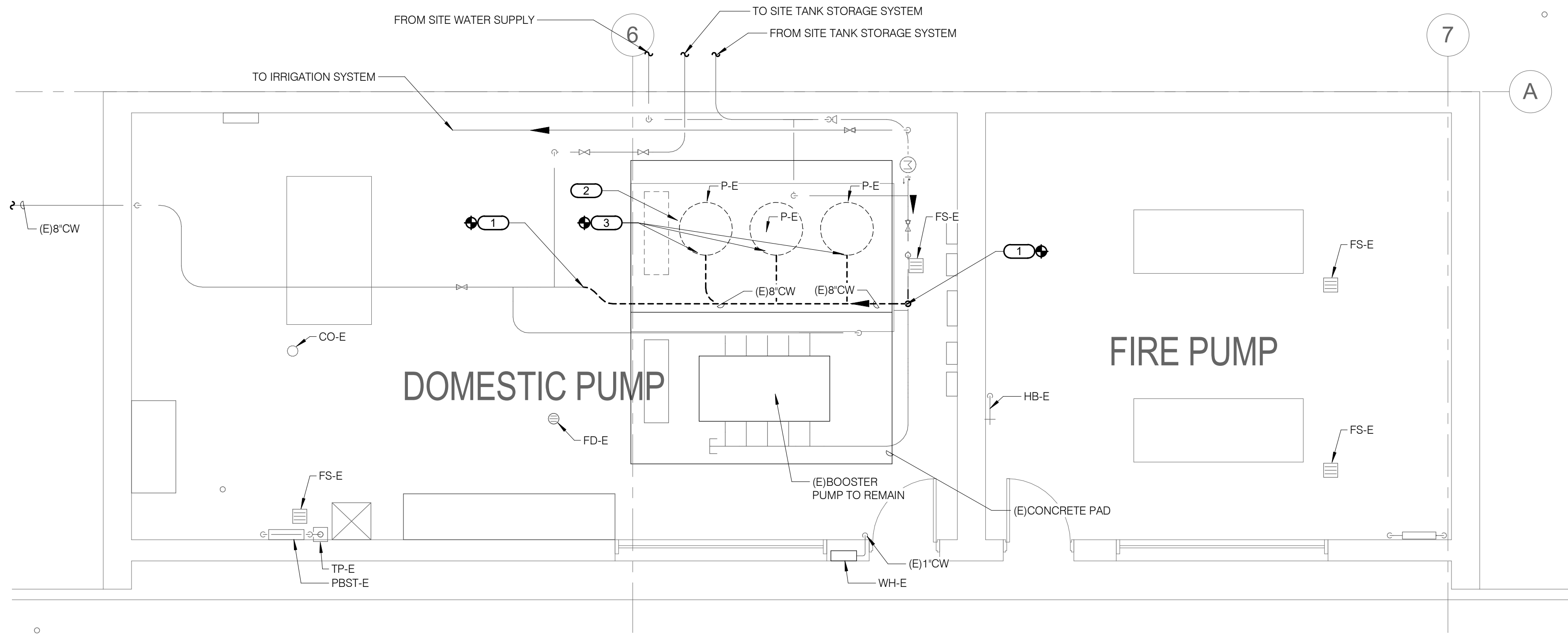
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PLUMBING

SCALE

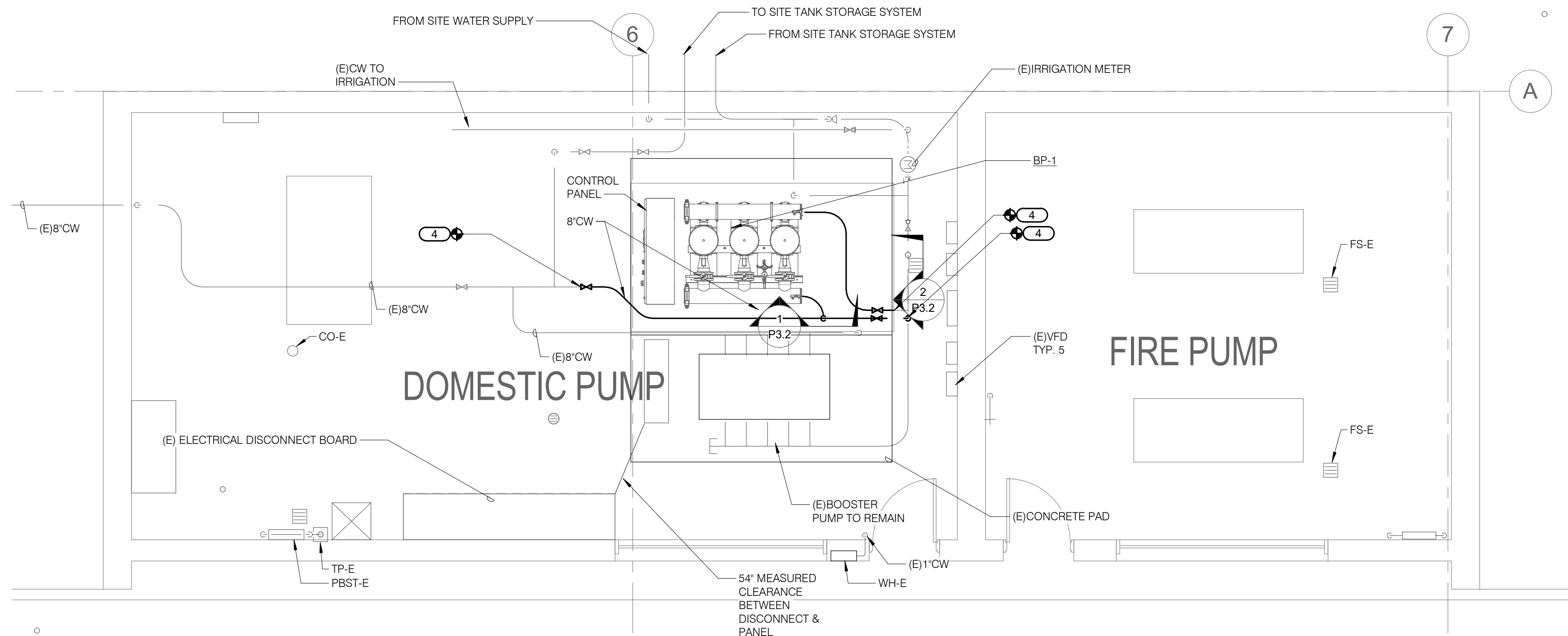
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SHEET NUMBER

P1.0



1 DEMOLITION FIRST FLOOR - PLUMBING
1/4" = 1'-0"



2 REMODEL FIRST FLOOR - PLUMBING
1/4" = 1'-0"

KEY NOTES (#)

1. DISCONNECT AND SAFE OFF 8" COPPER WATER PIPES.
2. REMOVE EXISTING SKID MOUNTED BOOSTER PUMP. DISCONNECT AND SAFE OFF FROM EXISTING UTILITIES.
3. DISCONNECT AND REMOVE WATER PIPE BETWEEN SAFED OFF SECTIONS.
4. INSTALL NEW SOV AT POINT OF CONNECTION TO EXISTING 8" CW MAIN.

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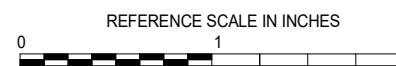
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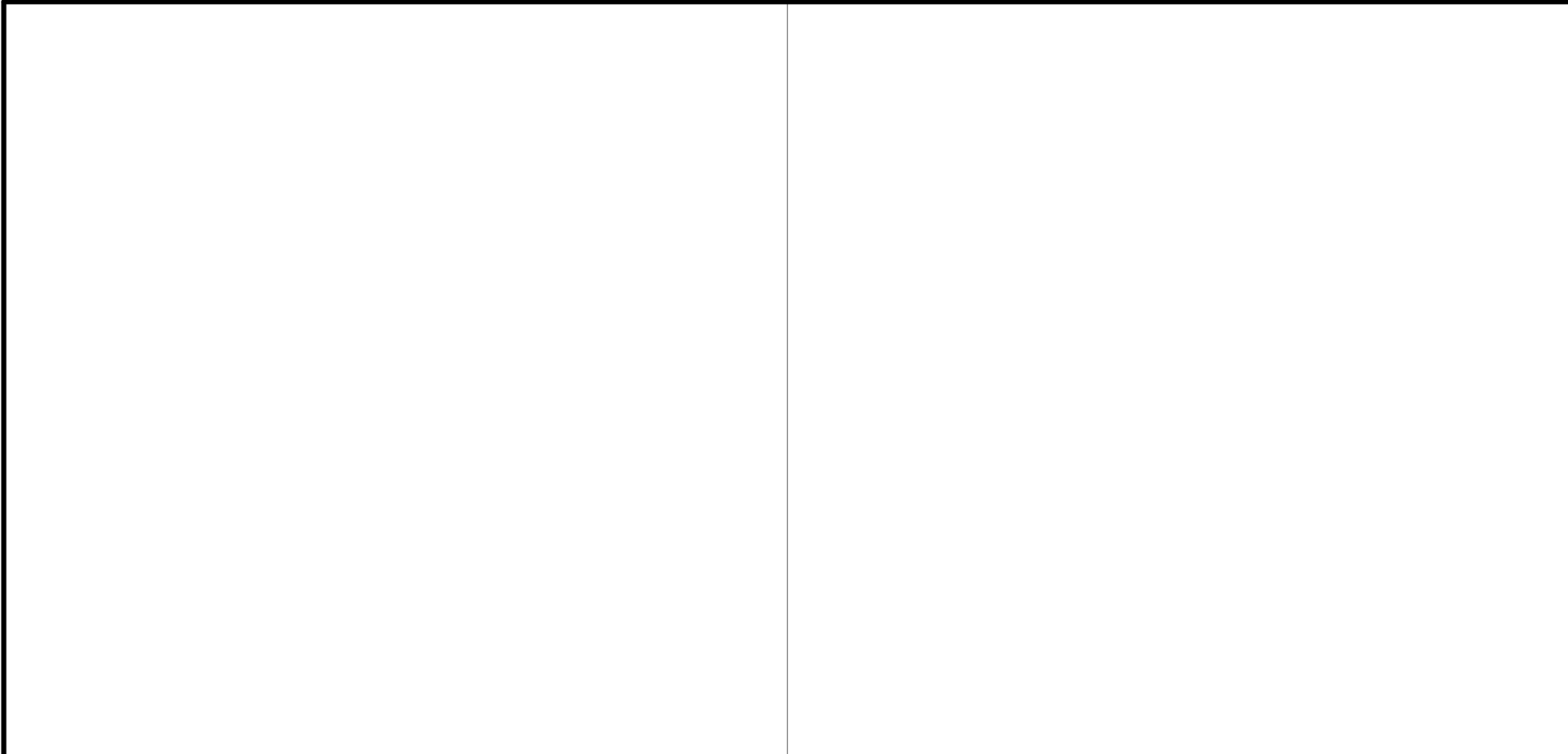
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REMODEL PLANS - PLUMBING**

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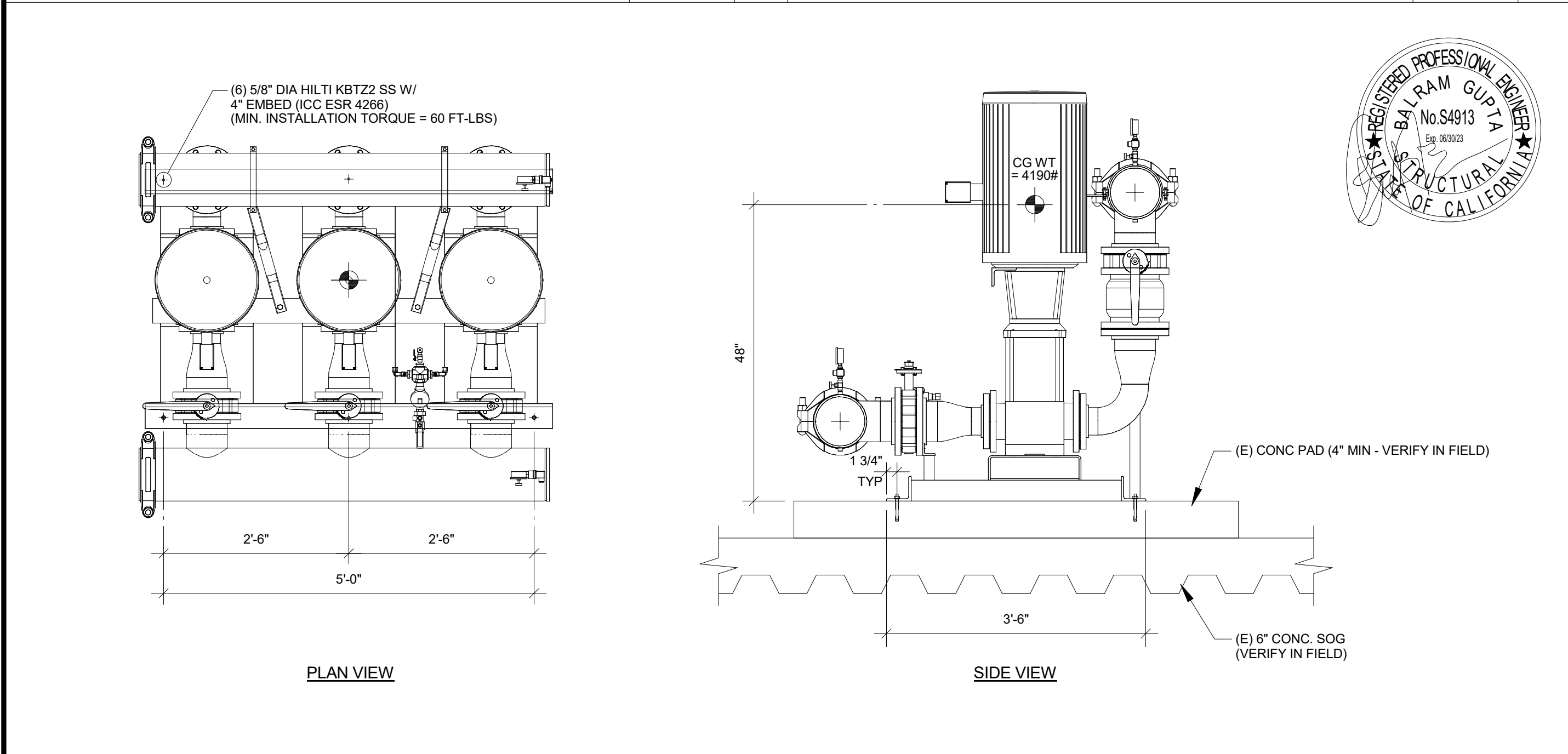
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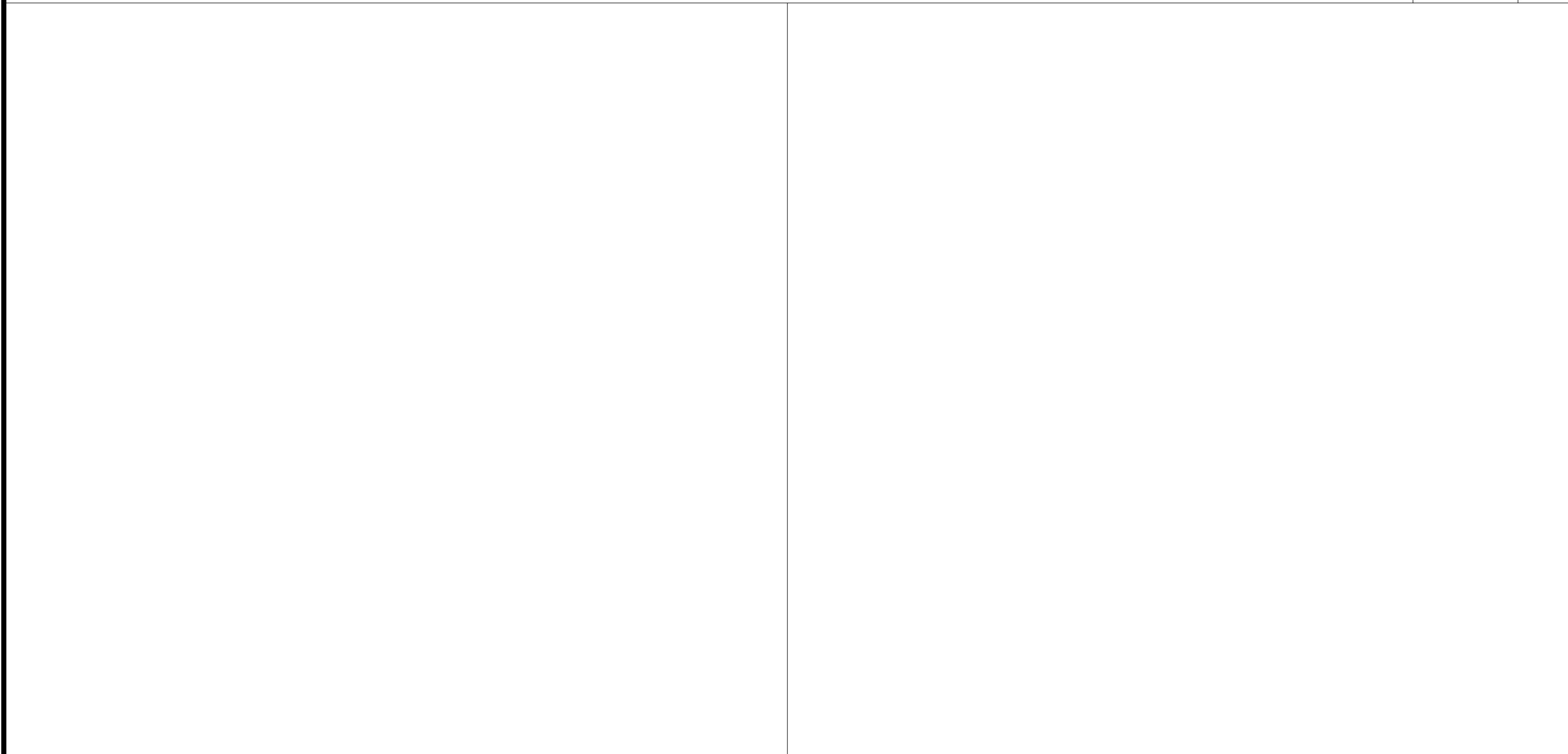
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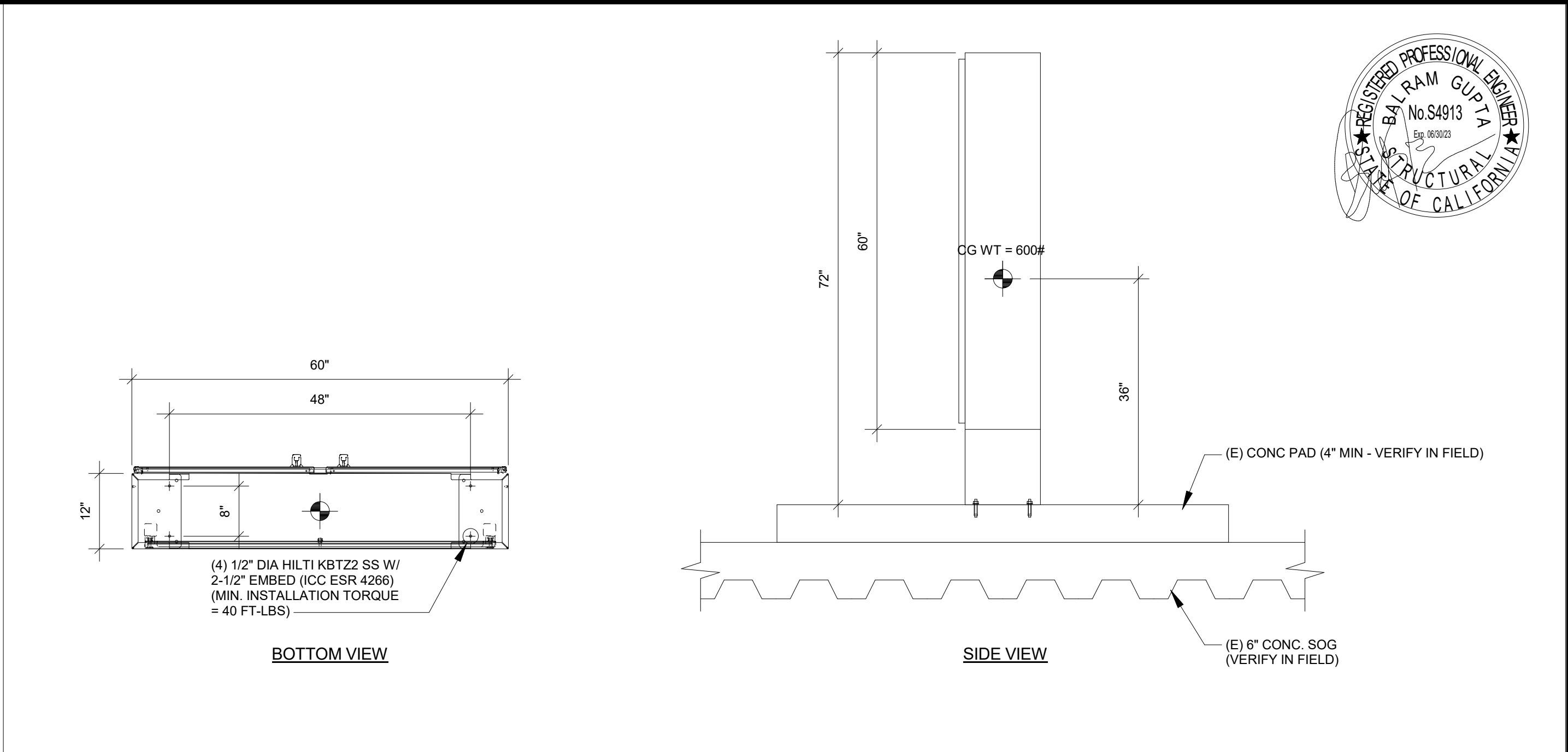
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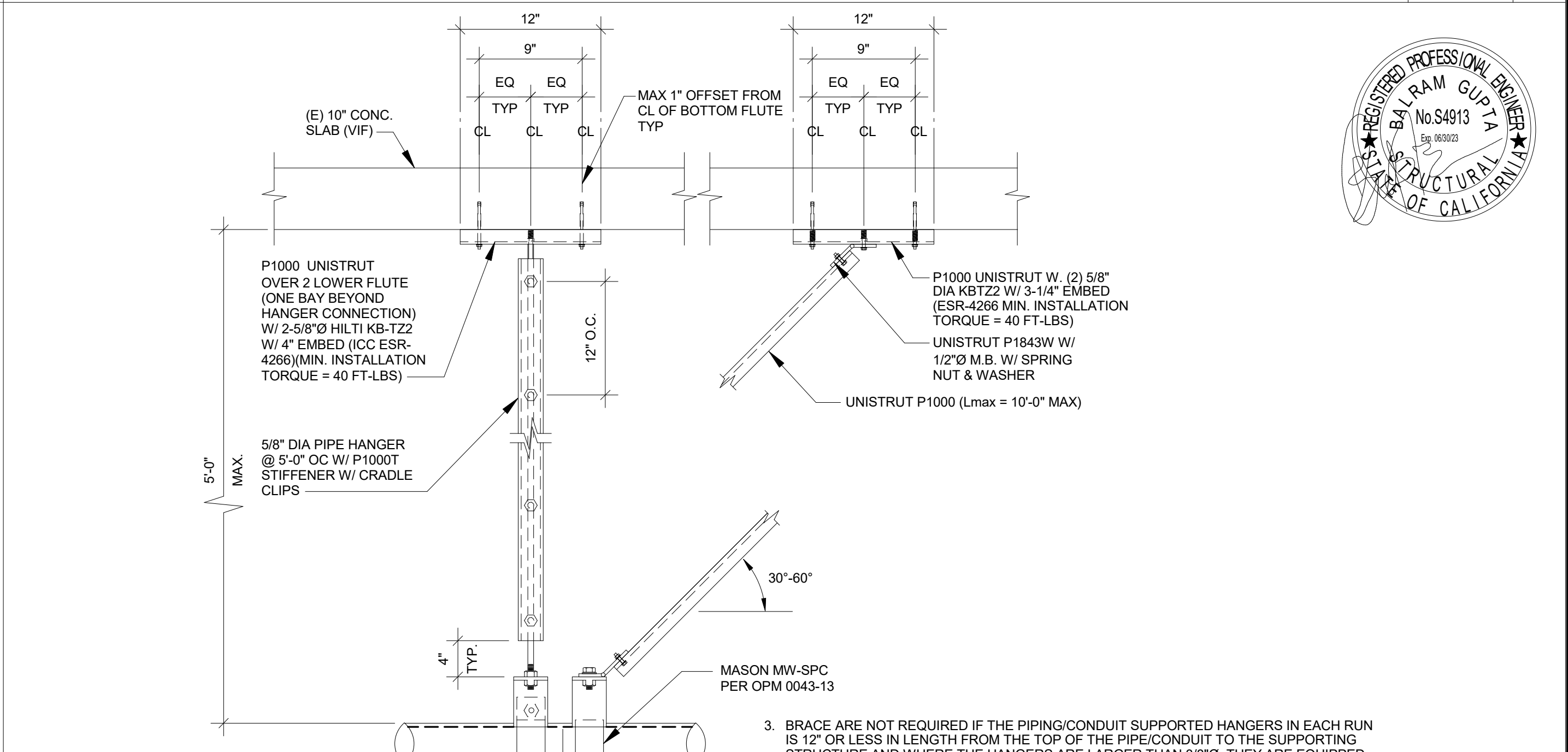
BOOSTER PUMP ANCHORAGE NTS 4



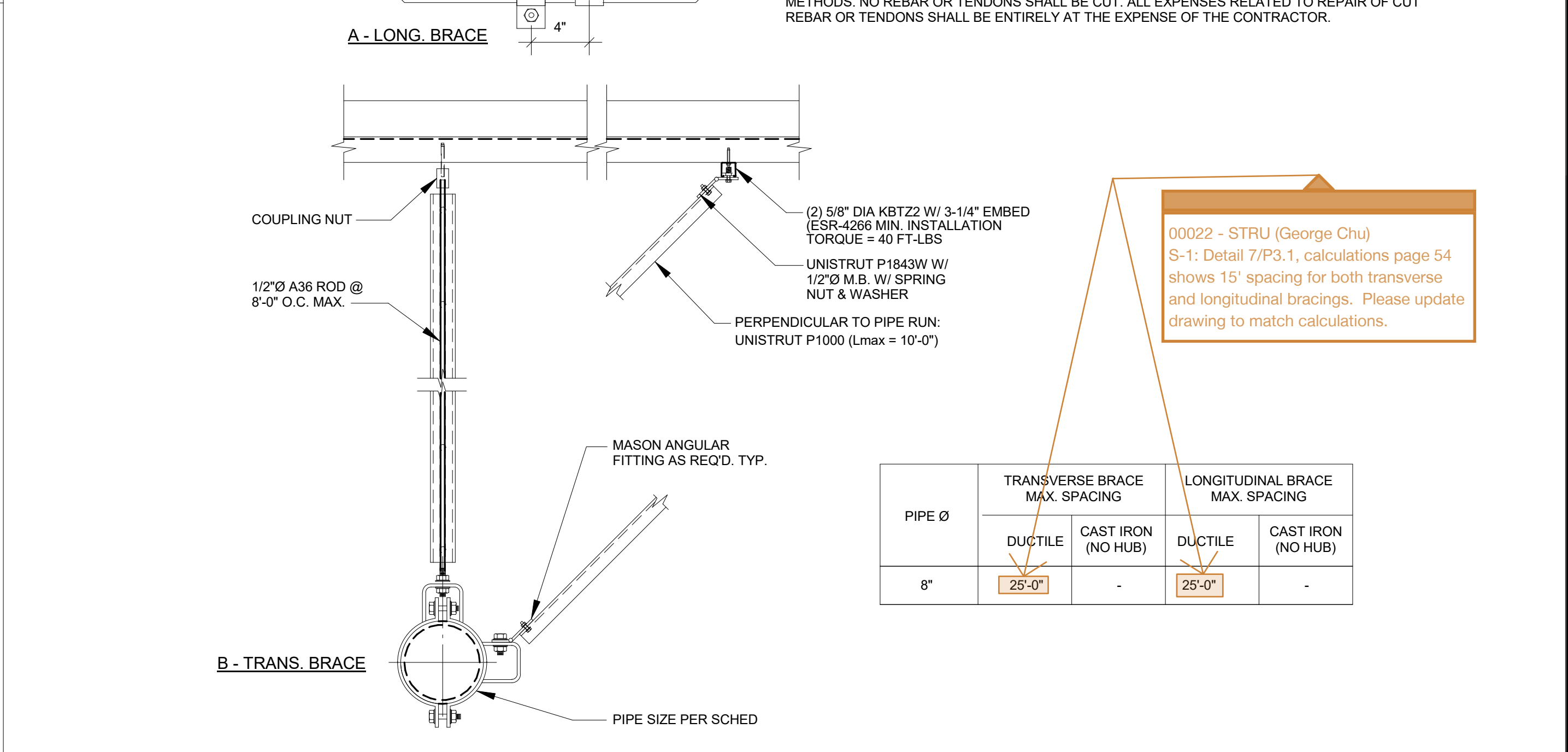
NOT USED NTS 5 NOT USED NTS 6



BOOSTER CONTROL PANEL ANCHORAGE NTS 3



PIPE SUPPORT DETAIL NTS 7



PIPE SUPPORT DETAIL NTS 7

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REVIEWED IN ACCORDANCE WITH THE REQUIREMENTS OF T24.001
APPROVED
with comments
Department of Health Care Access and Information
FACILITIES DEVELOPMENT DIVISION
8/19/2022, 7:12:46 AM
S220638-36-00
Allen Cheng

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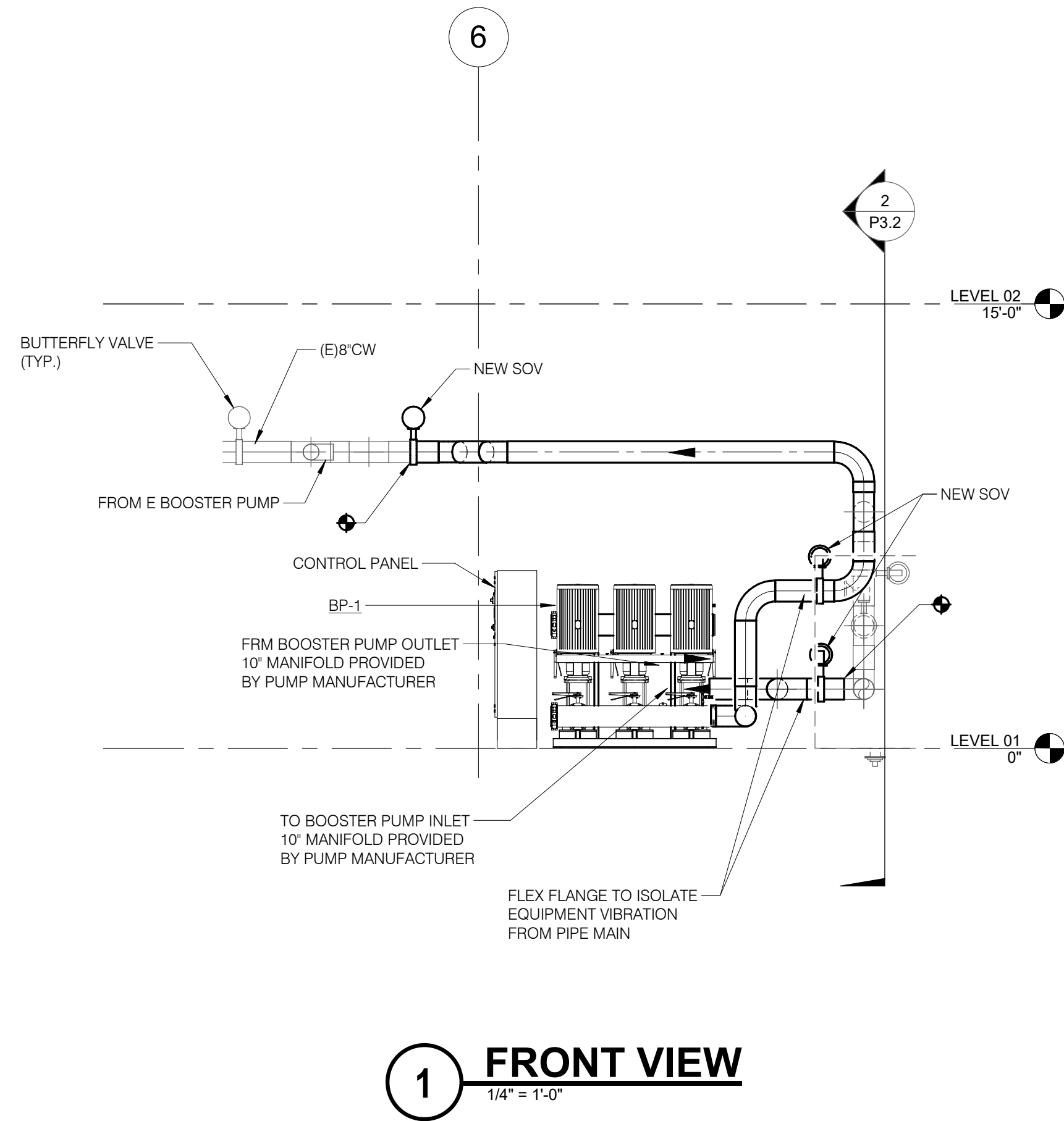
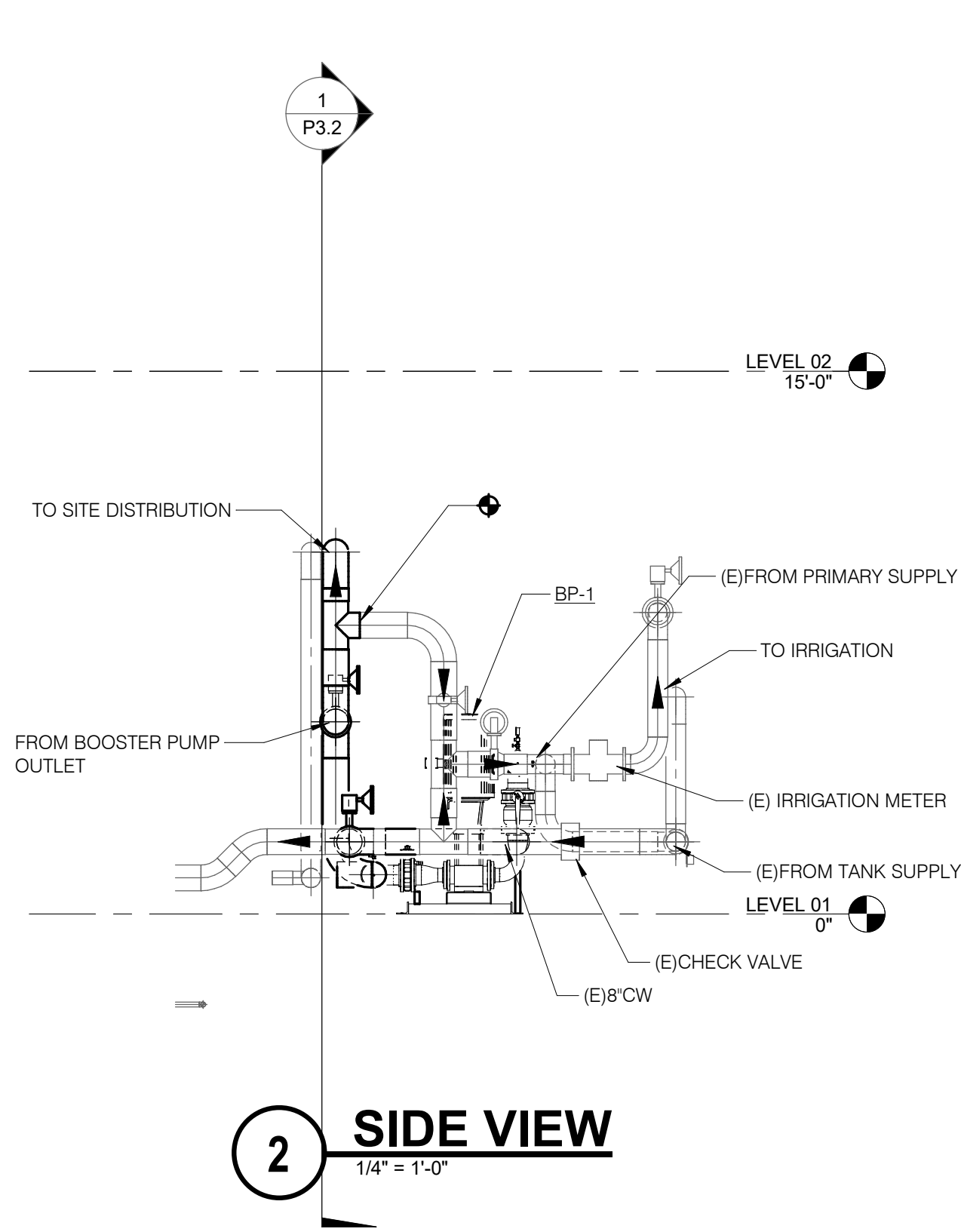
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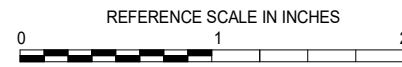
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Approved Approver

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ELEVATION VIEWS

SCALE

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

SHEET NUMBER

P3.2

GENERAL NOTES

1.

ALL ELECTRICAL MATERIALS AND EQUIPMENT INDICATED ON THE CONTRACT DOCUMENTS SHALL BE NEW AND SHALL BE LISTED BY UNDERWRITERS' LABORATORIES (UL) AND BEAR THEIR LABEL, OR LISTED AND CERTIFIED BY A NATIONALLY RECOGNIZED TESTING AUTHORITY WHERE UL DOES NOT HAVE A LISTING. CUSTOM MADE EQUIPMENT SHALL HAVE COMPLETE TEST DATA SUBMITTED BY THE MANUFACTURER ATTESTING TO ITS SAFETY. IN ADDITION, THE MATERIALS, EQUIPMENT, AND INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE FOLLOWING:

AMERICAN SOCIETY OF TESTING MATERIALS (ASTM)
INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
AMERICAN STANDARD ASSOCIATION (ASA)
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)
CALIFORNIA ELECTRICAL CODE (CEC) - 2019 EDITION
INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
ALL LOCAL CODES HAVING JURISDICTION.
WHERE THE CODES HAVE DIFFERENT LEVELS OF REQUIREMENTS, THE MOST STRINGENT CODE SHALL APPLY.
2.

THE CONTRACTOR SHALL VISIT THE SITE INCLUDING ALL AREAS INDICATED ON THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS, AND BY SUBMITTING HIS BID, ACCEPTS THE CONDITIONS UNDER WHICH HE SHALL BE REQUIRED TO PERFORM HIS WORK.
3.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A COMPLETE SET OF CONTRACT DOCUMENTS AND ADDENDA. HE SHALL CHECK THE CONTRACT DOCUMENTS OF THE OTHER TRADES AND DETERMINE HIS RESPONSIBILITIES. FAILURE TO DO SO SHALL NOT RELEASE THE CONTRACTOR FROM DOING THE WORK IN COMPLETE ACCORDANCE WITH THE CONTRACT DOCUMENTS.
4.

THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, FEES, CHARGES, AND INCIDENTAL COSTS NECESSARY FOR EXECUTION AND COMPLETION OF ALL WORK, INCLUDING ALL COUNTY AND LOCAL GOVERNMENTAL AGENCIES. CHARGES BY STATE.
5.

THE CONTRACTOR SHALL PROVIDE AND KEEP UP-TO-DATE A COMPLETE RECORD SET OF DRAWINGS. THESE PRINTS SHALL BE CORRECTED DAILY AND SHOW EVERY CHANGE FROM THE ORIGINAL DRAWINGS. THIS SET OF DRAWINGS SHALL BE KEPT ON THE JOB SITE AND SHALL BE USED ONLY AS A RECORD SET. UPON COMPLETION OF THE WORK, A SET OF REPRODUCIBLE CONTRACT DRAWINGS SHALL BE OBTAINED FROM THE ENGINEER ALL CHANGES AS NOTED ON THE RECORD SET OF DRAWINGS SHALL BE INCORPORATED THEREON WITH BLACK INK IN A NEAT, LEGIBLE, UNDERSTANDABLE AND PROFESSIONAL MANNER.
6.

IN SOME INSTANCES, IT MAY BE NECESSARY TO DEFER WORK IN CERTAIN AREAS AND LOCATIONS UNTIL SUCH TIME AS EXISTING FACILITIES CAN BE TEMPORARILY OR PERMANENTLY REARRANGED BY THE OWNER. THEREFORE, WHENEVER IT BECOMES NECESSARY FOR THE CONTRACTOR TO PERFORM WORK UNDER THIS CONTRACT IN EXISTING AREAS IN WHICH THE OWNER'S WORK IS BEING PERFORMED, THE CONTRACTOR SHALL ADVISE AND THE OWNER RELATIVE TO THIS REQUIREMENT AND SHALL FOLLOW CLOSELY THE DIRECTIVE ISSUED BY THE ARCHITECT INSOFAR AS TIME AND PROCEDURE ARE CONCERNED. THE CONTRACTOR SHALL INCLUDE IN HIS BID ALL PREMIUM TIME TO WHICH HE MAY BE SUBJECT FOR PERFORMING WORK IN SUCH PROCEDURE AND AT SUCH TIMES AS MAY BE NECESSARY TO CAUSE THE LEAST INTERFERENCE WITH THE OPERATIONS OF THE OWNER.
7.

ALL INTERRUPTIONS OF ELECTRICAL, SIGNAL AND COMMUNICATION SYSTEMS SHALL BE KEPT TO A MINIMUM. WHEN AN INTERRUPTION IS NECESSARY THE SHUTDOWN SHALL BE COORDINATED WITH THE OWNER 14 CALENDER DAYS PRIOR TO THE OUTAGE. ANY OVERTIME PAY SHALL BE INCLUDED IN THE CONTRACTOR'S BID. WORK IN EXISTING SWITCHBOARDS OR PANELBOARDS SHALL BE COORDINATED WITH THE OWNER PRIOR TO REMOVING ACCESS PANELS OR DOORS.
8.

SHOP DRAWINGS SHALL BE SUBMITTED WITHIN TEN DAYS AFTER AWARD OF THE CONTRACT. THE CONTRACTOR SHALL SUBMIT EIGHT COPIES OF A COMPLETE LIST OF ALL MATERIALS AND EQUIPMENT INCLUDING MANUFACTURER AND MODEL NUMBER PROPOSED FOR THE JOB. SHOP DRAWINGS SHALL INCLUDE JOB DESCRIPTION, ARCHITECT AND ENGINEER IDENTIFICATION, AND ALL DATA WITH CAPACITIES, SIZES, DIMENSIONS, CATALOG NUMBERS AND MANUFACTURERS' BROCHURES.
9.

AFTER ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS HAVE BEEN FULLY COMPLETED, REPRESENTATIVES OF THE OWNER WILL INSPECT THE WORK. THE CONTRACTOR SHALL PROVIDE COMPLETE TO DEMONSTRATE THE OPERATION OF ANY ITEM OR SYSTEM TO THE FULL SATISFACTION OF EACH REPRESENTATIVE. FINAL ACCEPTANCE OF THE WORK WILL BE MADE BY THE OWNER AFTER RECEIPT OF APPROVAL AND RECOMMENDATION OF ACCEPTANCE FROM EACH REPRESENTATIVE.
10.

THE CONTRACTOR SHALL FURNISH A ONE YEAR WRITTEN GUARANTEE OF MATERIALS AND WORKMANSHIP FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER.
11.

ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE CEILING SPACES PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT A NEAT APPEARANCE.
12.

THE CONTRACTOR SHALL LOCATE ELECTRICAL EQUIPMENT AND BOXES, IN ACCESSIBLE CEILING SPACE OR PROVIDE AN ACCESS PANEL FOR INACCESSIBLE CEILING SYSTEMS. ACCESS DOORS SHALL BE A MINIMUM DIMENSION OF 24"x26". ACCESS DOORS LOCATIONS SHALL SUIT ACCESSIBILITY AND CONSTRUCTION CONDITIONS. ACCESS DOORS SHALL HAVE A FIRE RATING EQUAL TO THE CEILING ASSEMBLY IN WHICH THEY ARE INSTALLED.
13.

WHENEVER A DISCREPANCY ARISES ON THE CONTRACT DOCUMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIAL AND SERVICES TO THE STRICTER CONDITION OR HIGHER QUALITY OR QUANTITY.
14.

ALL RECESSED POWER, LIGHTING, AND SIGNAL EQUIPMENT MOUNTED IN FIRE RATED CEILINGS OR WALLS SHALL BE ENCLOSED WITH AN APPROVED UL LISTED ENCLOSURE CARRYING THE SAME FIRE RATING.
15.

STRAIGHT FEEDER, BRANCH CIRCUIT, AND CONDUIT RUNS SHALL BE PROVIDED WITH SUFFICIENT PULL BOXES OR JUNCTION BOXES TO LIMIT THE MAXIMUM LENGTH OF ANY SINGLE CABLE PULL TO 100 FEET. PULL BOXES SHALL BE SIZED PER CODE UNLESS NOTED OTHERWISE. LOCATIONS SHALL BE DETERMINED IN THE FIELD OR AS INDICATED ON THE DRAWINGS.
16.

MAXIMUM NUMBER OF CONDUCTORS IN OUTLET OR JUNCTION BOXES SHALL CONFORM TO THE CALIFORNIA ELECTRICAL CODE, ARTICLE 314-16, BUT IN NO CASE SHALL CONTAIN MORE THAN THE FOLLOWING NUMBER OF #12 AWG CONDUCTORS FOR THE SIZE OF BOX INDICATED. THE MINIMUM SIZE OUTLET OR JUNCTION BOX PERMITTED IN A WALL IS FOUR INCHES SQUARE BY 1-1/2" DEEP.

4"SQ. BY 1-1/2" D	=	9	CONDUCTORS
4"SQ. BY 2-1/8" D	=	13	CONDUCTORS
4 11/16"SQ. BY 1-1/2" D	=	11	CONDUCTORS
4 11/16"SQ. BY 2-1/8" D	=	18	CONDUCTORS

ALL OUTLET BOXES CONTAINING MORE THAN ONE DEVICE SHALL BE GANGED. TWO DEVICES DOUBLE GANGED, MINIMUM.
17.

THE EXACT LOCATION OF ALL ELECTRICAL DEVICES AND EQUIPMENT SHALL BE COORDINATED WITH THE ARCHITECTURAL ELEVATIONS, DETAILS, OR SECTIONS PRIOR TO INSTALLATION. ALL ELECTRICAL DEVICES AND EQUIPMENT SHALL BE RECESSED IN WALLS UNLESS NOTED OTHERWISE. OUTLETS NOT INDICATED ON ARCHITECTURAL ELEVATIONS SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO ROUGH-IN. MOUNT ELECTRICAL DEVICES AT THE FOLLOWING HIGHTS UNLESS NOTED OTHERWISE:

WALL SWITCH	+4'-0"	SET VERTICALLY TO TOP OF BOX
CONVENIENCE RECEPTACLE	+1'-6"	SET VERTICALLY TO BOTTOM OF BOX
TELEPHONE/DATA OUTLETS	+1'-6"	SET VERTICALLY TO BOTTOM OF BOX
OUTLETS AND ALL SWITCHES AT COUNTERS	+6"	ABOVE COUNTERS WITHOUT SPLASHES OR CENTERED IN SPLASH SET HORIZONTALLY
18.

DRAWINGS ARE DIAGRAMMATIC ONLY. ROUTING OF RACEWAYS SHALL BE AT THE OPTION OF THE CONTRACTOR UNLESS NOTED OTHERWISE AND SHALL BE COORDINATED WITH OTHER SECTIONS. DO NOT SCALE THE ELECTRICAL DRAWINGS FOR LOCATIONS OF ANY ARCHITECTURAL, STRUCTURAL, CIVIL, OR MECHANICAL ITEMS OR FEATURES.
19.

THE EQUIPMENT GROUNDING CONDUCTOR SHOWN ON CONDUIT RUNS SHALL RUN CONTINUOUS FROM PANEL TO LAST OUTLET. THIS WIRE SHALL BE PIGTAILED IN EACH OUTLET FOR CONNECTION TO BOX AND DEVICE SO THAT IF DEVICE IS REMOVED, GROUND WILL NOT BE INTERRUPTED. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE INSULATED GREEN CONDUCTORS - ALTERNATE METHODS OF IDENTIFICATION SHALL NOT BE USED.
20.

ALL CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM SIZE, TYPE THHN/THWN THERMOPLASTIC, 900 VOLT, 75 DEGREES CELSIUS WET AND 90 DEGREES CELSIUS DRY AND UL LISTED UNLESS NOTED OTHERWISE. CONDUCTORS #12 AWG AND SMALLER SHALL BE SOLID. CONDUCTORS #10 AWG AND LARGER SHALL BE STRANDED.
21.

RECEPTACLES SHALL BE HOSPITAL GRADE, 20 AMP, NEMA 5-20R GROUNDING TYPE HUBBELL, OR EQUAL. COLOR. EMERGENCY RECEPTACLES SHALL BE RED IN COLOR.
22.

SWITCHES SHALL BE 20 AMP, 120/277 VOLT RATED SILENT TYPE SPECIFICATION GRADE HUBBELL OR EQUAL BY PASS & SEYMOUR OR GENERAL ELECTRIC. COLOR TO MATCH EXISTING TYPE EMERGENCY SWITCHES SHALL BE RED IN COLOR.
23.

DEVICE PLATES SHALL BE STAINLESS STEEL FOR THE NUMBER OF GANGS AND TYPE OF OPENINGS NECESSARY. HUBBELL OR EQUAL BY PASS & SEYMOUR OR GENERAL ELECTRIC. COLOR SHALL BE SELECTED BY ARCHITECT. EMERGENCY RECEPTACLE PLATES SHALL BE RED IN COLOR. NORMAL AND EMERGENCY DEVICE PLATES SHALL BE ENGRAVED WITH PANEL AND CIRCUIT NUMBER.
24.

RIGID GALVANIZED STEEL CONDUIT SHALL BE USED FOR ALL EXPOSED INSTALLATION AND SHALL BE FULL WEIGHT THREADED TYPE ALUMINUM OR STEEL. ELECTRICAL METALLIC TUBING (EMT) SHALL BE USED IN WALLS OR CEILING SPACES WHERE NOT SUBJECT TO MECHANICAL DAMAGE. PVC COATED RIGID GALVANIZE CONDUIT SHALL BE USED FOR POWER IN OR BELOW CONDUCTOR SLAB. PVC SCH 40 CONDUIT SHALL BE USED FOR LOW VOLTAGE IN OR BELOW CONDUIT SLAB. FLEXIBLE STEEL CONDUIT SHALL BE USED AT FIXTURE AND OUTLET CONNECTIONS WITH NO RUNS LONGER THAN SIX FEET. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE PROVIDED IN ALL CONDUIT RUNS.
25.

RIGID GALVANIZED STEEL CONDUIT FITTINGS SHALL BE THREADED AND THOROUGHLY GALVANIZED. ELECTRICAL METALLIC TUBING (EMT) CONDUIT FITTINGS SHALL BE STEEL, RAINTIGHT THREADLESS COMPRESSION TYPE, DIE CAST, SET SCREW, OR INDENTER TYPES ARE NOT ACCEPTABLE. FLEXIBLE STEEL CONDUIT FITTINGS SHALL BE MALLEABLE IRON CLAMP, SQUEEZE TYPE OR STEEL TWIST-IN TYPE WITH INSULATED THROAT. SET SCREW TYPE IS NOT ACCEPTABLE.
26.

FURNISH AND INSTALL POWER PANELBOARDS AS INDICATED ON THE DRAWINGS. PANELBOARDS SHALL COMPLY WITH NEMA STANDARD FOR PANELBOARDS AND FEDERAL SPECIFICATION W-P-115A. PANELBOARDS SHALL BE COMPLETE WITH COPPER BUS BARS AND 40 DEGREE CELSIUS THERMAL MAGNETIC BOLT-ON TYPE CIRCUIT BREAKERS AND OSP CERTIFICATION AS INDICATED ON DRAWINGS. PANELBOARDS SHALL BE EATON, SQUARED OR EQUAL BY SIEMENS. CONDUITS TO BE INSTALLED IN ACCORDANCE WITH MASON OPM #0043-13 PRE-APPROVED ANCHORING AND BRACING SYSTEM.
27.

WHERE MULTI-HOMERUNS ARE INDICATED ON DRAWINGS INDICATION THE SAME PANELBOARD CIRCUIT NUMBER, PROVIDE JUNCTION BOX ACCESSIBLE CEILING AND ROUTE ONE SET OF WIRES TO CIRCUIT BREAKERS.
29.

ALL PANEL BOARD CIRCUIT DIRECTORIES ARE TO TYPE WRITTEN AND UPDATED PER THE NEW WORK.
30.

RUN ALL CONDUITS CONCEALED IN WALL AND CEILING UNLESS NOTED OTHERWISE. CUT/PATCH/PAINT EXISTING WALL AND CEILING AS REQUIRED.
31.

ALL BRANCH CIRCUITS SERVING PATIENT CARE AREAS SHALL BE PROVIDED WITH AN EFFECTIVE GROUND-FAULT CURRENT PATH BY PROVIDING GREEN INSULATED GROUND CONDUCTOR IN ALL METAL CONDUIT RUNS. THE GROUND TERMINALS OF ALL RECEPTACLES AND ALL NON-CURRENT-CARRYING CONDUCTIVE SURFACES OF FIXED ELECTRICAL EQUIPMENT LIKELY TO BECOME ENERGIZED THAT ARE SUBJECT TO PERSONAL CONTACT, OPERATING AT OVER 100 VOLTS, SHALL BE CONNECTED TO AN INSULATED COPPER EQUIPMENT GROUNDING CONDUCTOR. THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH TABLE 250.122 AND INSTALLED IN METAL RACEWAY WITH THE BRANCH CIRCUIT CONDUCTORS SUPPLYING THESE RECEPTACLES OR FIXED EQUIPMENT PER CEC 517.13 (A) & (B).

UTILITY PENETRATIONS OF ANY KIND IN FIRE AND SMOKE PARTITIONS AND CEILING ASSEMBLIES, SHALL BE FIRESTOPPED AND SEALED WITH AN APPROVED MATERIAL, SECURELY INSTALLED.

STEEL ELECTRICAL OUTLET BOXES WHICH DO NOT EXCEED 16 SQUARE INCHES IN AREA, NEED NOT BE PROTECTED IN ONE HOUR OR TWO HOUR FIRE RATED WALLS, PARTITIONS, CEILINGS, OR AREA SEPARATION UNLESS THEY OCCUR ON OPPOSITE SIDES OF THE WALL WITHIN 24 INCH HORIZONTAL DISTANCE OF ONE ANOTHER. IN THIS CASE, ONLY ONE OUTLET BOX NEED TO PROTECTED BY AN APPROVED FIRESTOP MATERIAL OR DETAIL TO CORRECT THIS CONDITION.

OCCUR IN COMBINATION WITH OUTLET BOXES OF ANY SIZE SUCH THAT THE AGGREGATE AREA OF UNPROTECTED OUTLET BOXES EXCEEDS 100 SQUARE INCHES IN ANY 100 SQUARE FEET OF WALL AREA. IN THIS CASE, ONLY A SUFFICIENT NUMBER OF OUTLET BOXES NEED BE PROTECTED BY AN APPROVED MATERIAL OR DETAIL TO DECREASE THE AGGREGATE AREA OF UNPROTECTED UTILITY BOXES TO LESS THAN 100 SQUARE INCHES IN ANY 100 SQUARE FEET
28.

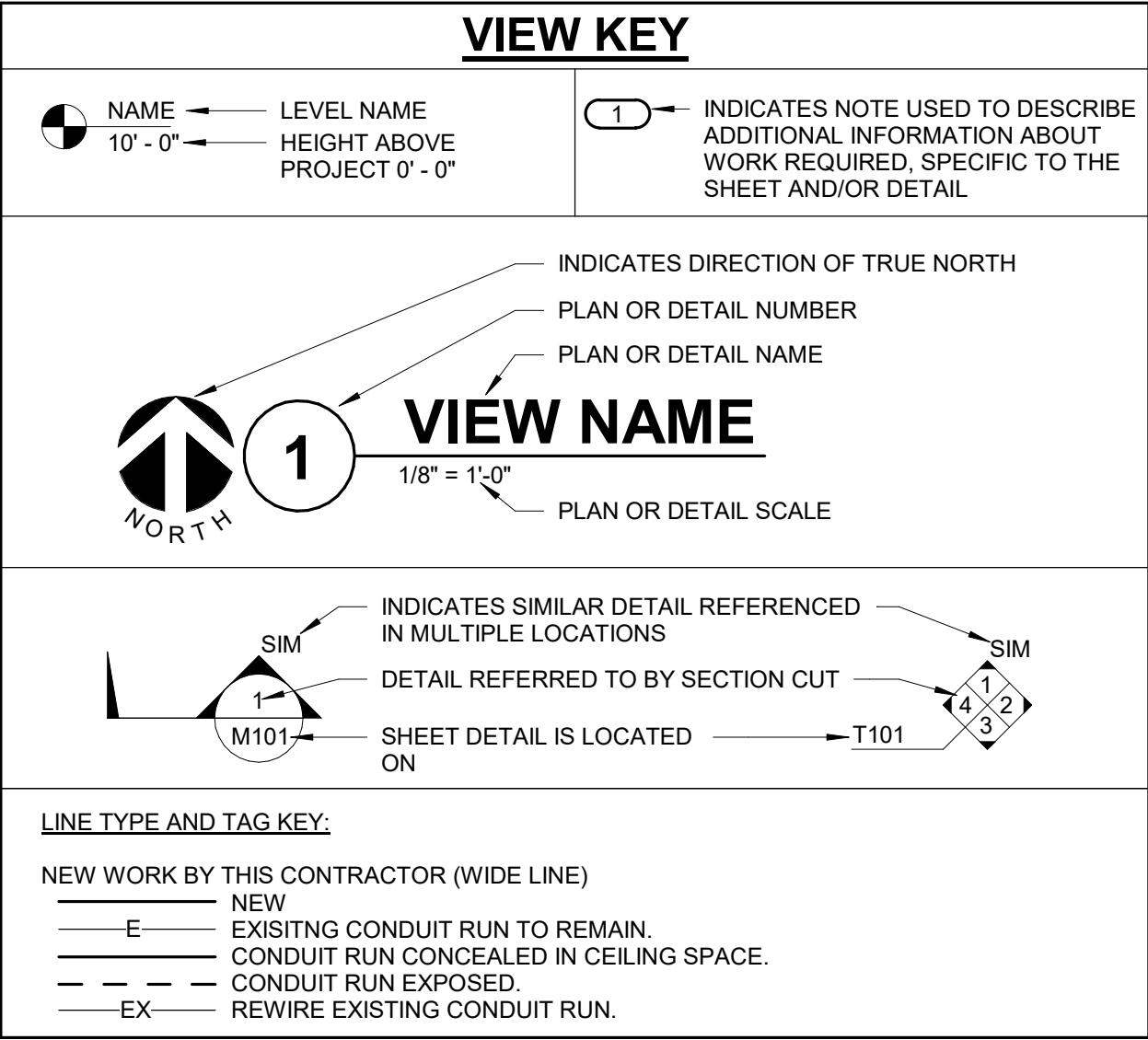
STEEL ELECTRICAL OUTLET BOXES WHICH EXCEED 16 SQUARE INCHES IN AREA, AND ALL OTHER STEEL UTILITY OUTLET BOXES REGARDLESS OF SIZE, SHALL BE PROTECTED BY AN APPROVED FIRESTOP MATERIAL AS LISTED OR EQUAL.
29.

FIRESTOPPING MATERIAL: MPP-1 MOLDABLE PUTTY PADS 3M CONTRACTOR PRODUCTS MINNEAPOLIS, MN 3M TEST REPORT NO. 1167 DATED AUGUST 21, 1987
- OF WALL.

FSP FIRESTOP PUTTY PADS HEVI-DUTY NELSON PRODUCTS TULSA, OK

FLAMESAFE FSP 1077 FIRESTOP PADS INTERNATIONAL PROTECTIVE COATINGS OAKHURST, NJ
28.

STEEL UTILITY BOXES WHICH EXCEED 100 SQUARE INCHES IN AREA SHALL BE PROTECTED BY ENCASEMENT.
- UTILITY AND ELECTRICAL OUTLETS OR BOXES SHALL BE SECURELY FASTENED TO THE STUD OF FRAMING OF THE WALL, PARTITION OR CEILING ASSEMBLY. THE OPENING IN THE GYPSUM BOARD FACING SHALL BE CUT SO THAT THE CLEARANCE BETWEEN THE BOX AND THE GYPSUM BOARD DOES NOT EXCEED 1/8 INCH. IN SMOKE WALLS OR PARTITIONS, THE 1/8 INCH CLEARANCE SHALL BE FILLED WITH AN APPROVED FIRE-RATED SEALANT.

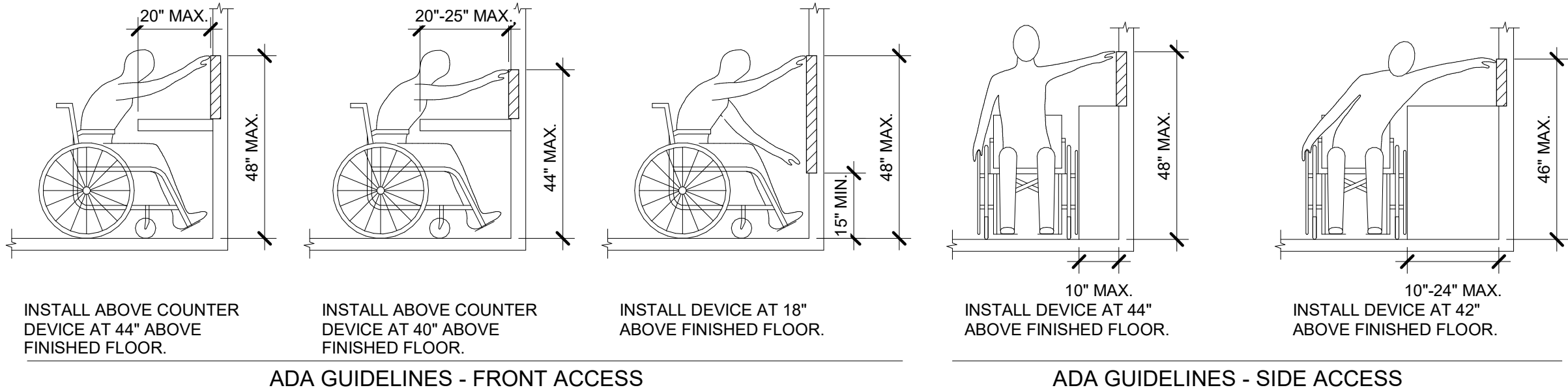


ELECTRICAL ABBREVIATION KEY	
ABBR:	DESCRIPTION:
AFF	ABOVE FINISHED FLOOR
C	CONDUIT
GFI	GROUND FAULT INTERRUPTER
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
SV	SOLENOID VALVE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED

- APPLICABLE CODES**
- 2019 CALIFORNIA ADMINISTRATIVE CODE (CAC)
 - PART 1, TITLE 24, CALIFORNIA CODE OF REGULATIONS (CCR)
 - 2019 CALIFORNIA BUILDING CODE (CBC)
 - PART 2, TITLE 24, CRC.
 - BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC)
 - 2019 CALIFORNIA ELECTRICAL CODE (CEC)
 - PART 3, TITLE 24, (CCR).
 - BASED ON THE 2017 NATIONAL ELECTRICAL CODE (NEC)
 - 2019 CALIFORNIA MECHANICAL CODE (CMC)
 - PART 4, TITLE 24, (CCR).
 - BASED ON THE 2018 UNIFORM MECHANICAL CODE (UMC)
 - 2019 CALIFORNIA PLUMBING CODE (CPC)
 - PART 5, TITLE 24, (CCR).
 - BASED ON THE 2018 UNIFORM PLUMBING CODE (UPC)
 - 2019 CALIFORNIA ENERGY CODE (CEC)
 - PART 6, TITLE 24, (CCR).
 - 2019 CALIFORNIA HISTORICAL BUILDING CODE (CHBC)
 - PART 8, TITLE 24, (CCR)
 - 2019 CALIFORNIA FIRE CODE (CFC)
 - PART 9, TITLE 24, (CCR)
 - BASED ON THE 2017 NATIONAL FIRE CODE (NFC)
 - 2019 CALIFORNIA EXISTING BUILDING CODE (CEBC)
 - PART 10, TITLE 24, (CCR)
 - BASED ON THE 2018 INTERNATIONAL BUILDING CODE (IBC)
 - 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE (CAL GREEN)
 - PART 11, TITLE 24, (CCR)
 - 2019 CALIFORNIA REFERENCED STANDARDS CODE (CRSC)
 - PART 12, TITLE 24, (CCR)

- ELECTRICAL INSTALLATION NOTES:**
- THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADA STANDARDS FOR ACCESSIBLE DESIGN. REFER TO THE ADA GUIDELINES FOR ALL CONFIGURATION DETAILS ON THIS PAGE FOR ADDITIONAL INFORMATION.
 - CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL PROVIDED. COMMON NEUTRALS MAY NOT BE USED FOR BRANCH CIRCUITS. BALANCE THE LOAD ON PANEL AS EVENLY AS POSSIBLE BETWEEN EACH PHASE.
 - EMERGENCY POWER BRANCH WIRING FOR FEEDERS AND BRANCH CIRCUITS SHALL BE ROUTED IN SEPARATE RACEWAY, JUNCTION BOXES, PULL BOXES, AND CABINETS. WIRING FOR EACH BRANCH SHALL BE INDEPENDENT FROM OTHER BRANCHES, INCLUDING THE NORMAL BRANCH.
 - ALL MATERIALS USED TO SEAL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE TESTED AND CERTIFIED AS A SYSTEM PER ASTM E814 STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS.
 - CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS AND OCCUPANCY/VACANCY SENSORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
 - CONTRACTOR SHALL REMOVE AND REINSTALL ALL CEILING TILES AS REQUIRED FOR THE EXECUTION OF ELECTRICAL WORK. CONTRACTOR SHALL REPLACE CEILING TILES WITH IDENTICAL MATERIAL WHERE DAMAGED BY THIS CONTRACTOR.

ELECTRICAL SHEET INDEX	
E0.1	ELECTRICAL COVERSHEET
E0.2	DEMOLITION SINGLE LINE DIAGRAM
E0.3	REMODEL SINGLE LINE DIAGRAM
E1.0	OVERALL FIRST FLOOR PLAN - ELECTRICAL
E2.1	FIRST FLOOR DEMOLITION AND REMODEL PLANS - ELECTRICAL
GRAND TOTAL: 5	



ELECTRICAL SYMBOL LIST	
SYMBOL:	DESCRIPTION:
	JUNCTION BOX
	FLOOR BOX - DUPLEX RECEPTACLE
	SURFACE MOUNTED PANEL
	EXISTING EQUIPMENT TO REMAIN.
	EXISTING EQUIPMENT TO BE REMOVED.
	VARIABLE FREQUENCY DRIVE
	CIRCUIT BREAKER
	CONDUIT HOME RUN TO PANEL. PROVIDE DEDICATED NEUTRAL FOR EACH 120V CIRCUIT. ALL CONDUITS RUN SHALL CONTAIN GROUND WIRE.

ELECTRICAL SYMBOL LIST	
SYMBOL:	DESCRIPTION:
	HOSPITAL GRADE DUPLEX RECEPTACLE CONNECTED TO EMERGENCY POWER
	HOSPITAL GRADE QUAD RECEPTACLE CONNECTED TO EMERGENCY POWER
	30A/125V/2P/3W SINGLE GROUNDING TYPE NEMA L5-30R RECEPTACLE WITH STAINLESS STEEL ENGRAVED COVER PLATE CONNECTED TO EMERGENCY POWER RECEPTACLE FOR APC SMART 3000VA UPS RECEPTACLE. TYPE TO MATCH UPS PLUG.
	BYPASS ISOLATION TYPE AUTOMATIC TRANSFER SWITCH
	DRY TYPE TRANSFORMER
	ENCLOSED CIRCUIT BREAKER
	KEYNOTE

ARROWHEAD REGIONAL MEDICAL CENTER

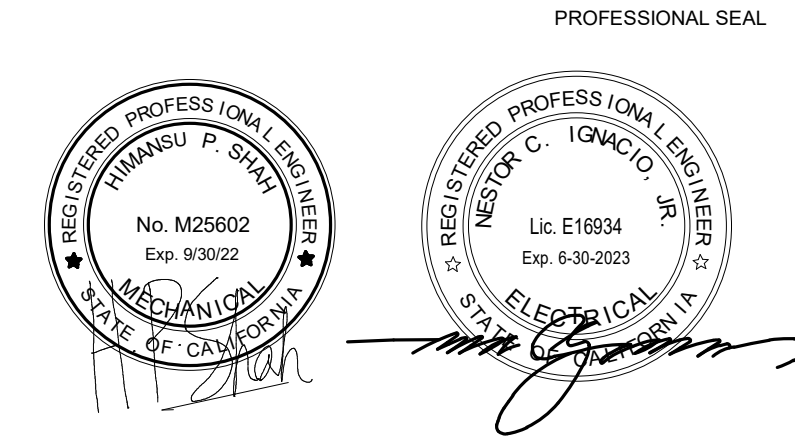
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ARMC SKID MOUNTED BOOSTER PUMP

WBSE NO. 10.10.0722
CIP NO. ***
IMEG PROJECT NO. 21006908.00
BUILDING (CAFM) NO. ***
APN NO. ***



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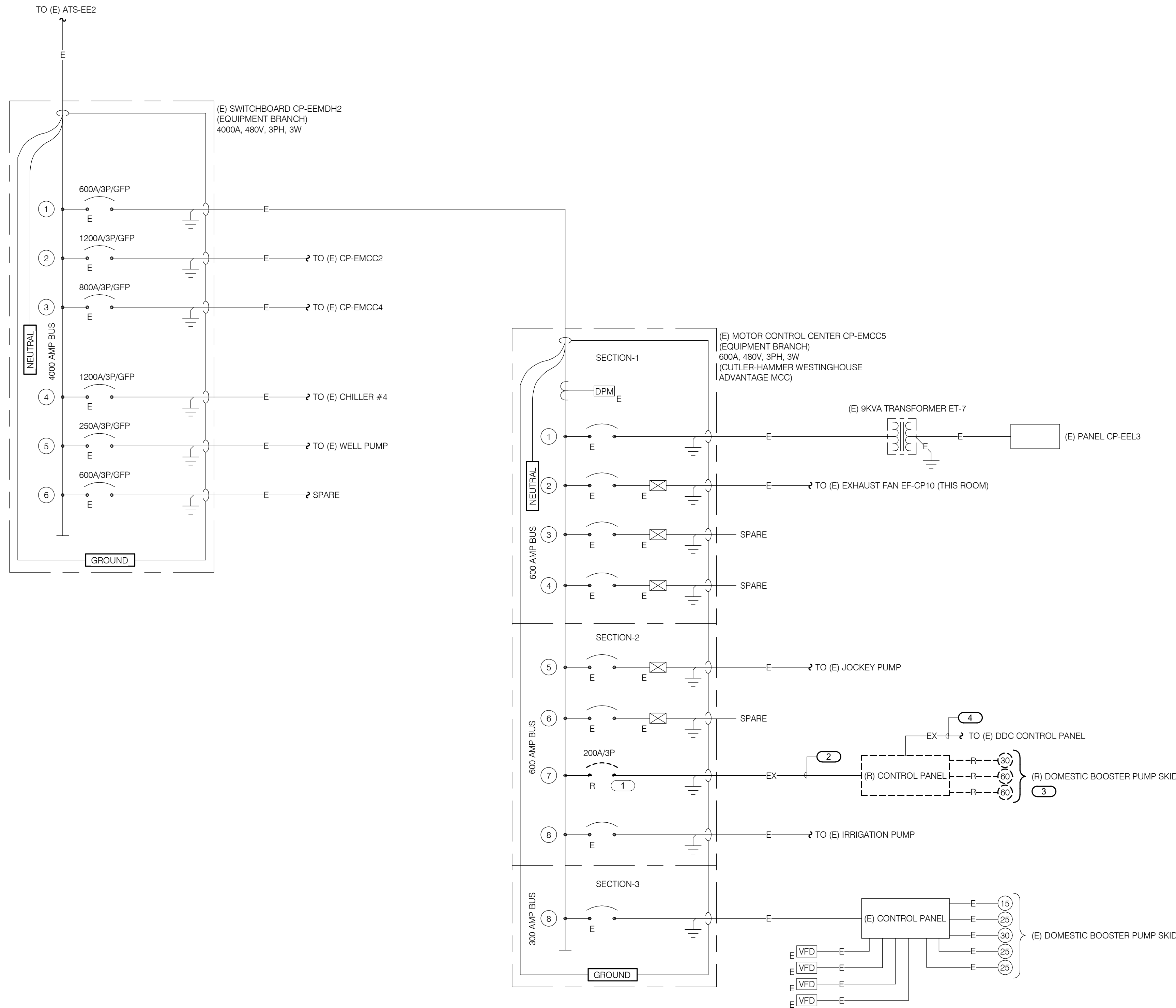
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REVISIONS			
No.	Date	Revision / Issue	

SHEET INFORMATION	
Issue	HCAI SUBMITTAL
Date	05/10/2022
Job Number	21-31
Drawn	PDP
Checked	NCL
Approved	NCL
SHEET TITLE	
ELECTRICAL COVERSHEET	
SCALE	
Scale:	As indicated
SHEET NUMBER	



DEMOLITION SINGLE LINE DIAGRAM
12" = 1'-0"

KEYNOTES: (#)

1. REMOVE EXISTING BREAKER.
2. PULLOUT CONDUCTORS AND RE-WIRING EXISTING 3" CONDUIT RUN. REMOVE PORTION OF CONDUIT (SEAL TIGHT STEEL FLEX CONDUIT) AND PROTECT REMAINING CONDUIT.
3. EXISTING BOOSTER PUMP SKID TO BE REMOVED BY PLUMBING CONTRACTOR.
4. PULLOUT CONTROL CABLE FROM EXISTING 2" CONDUIT AND REMOVE PORTION OF CONDUIT TO CONTROL PANEL.

**ARROWHEAD REGIONAL
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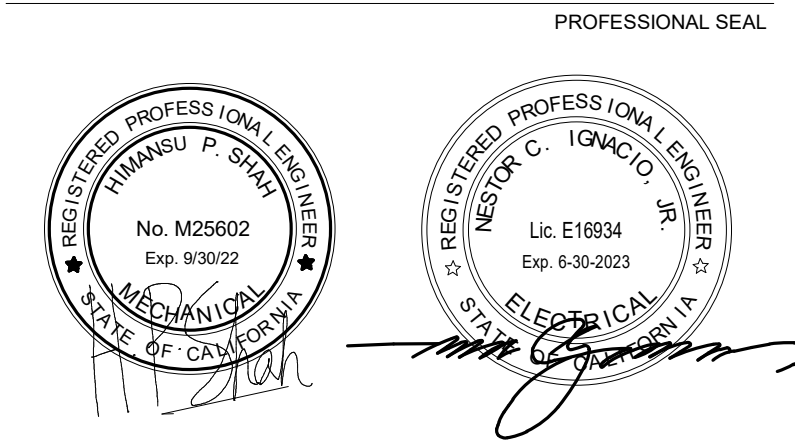
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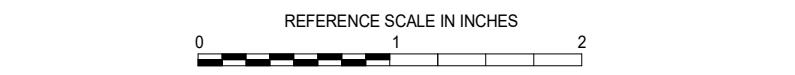


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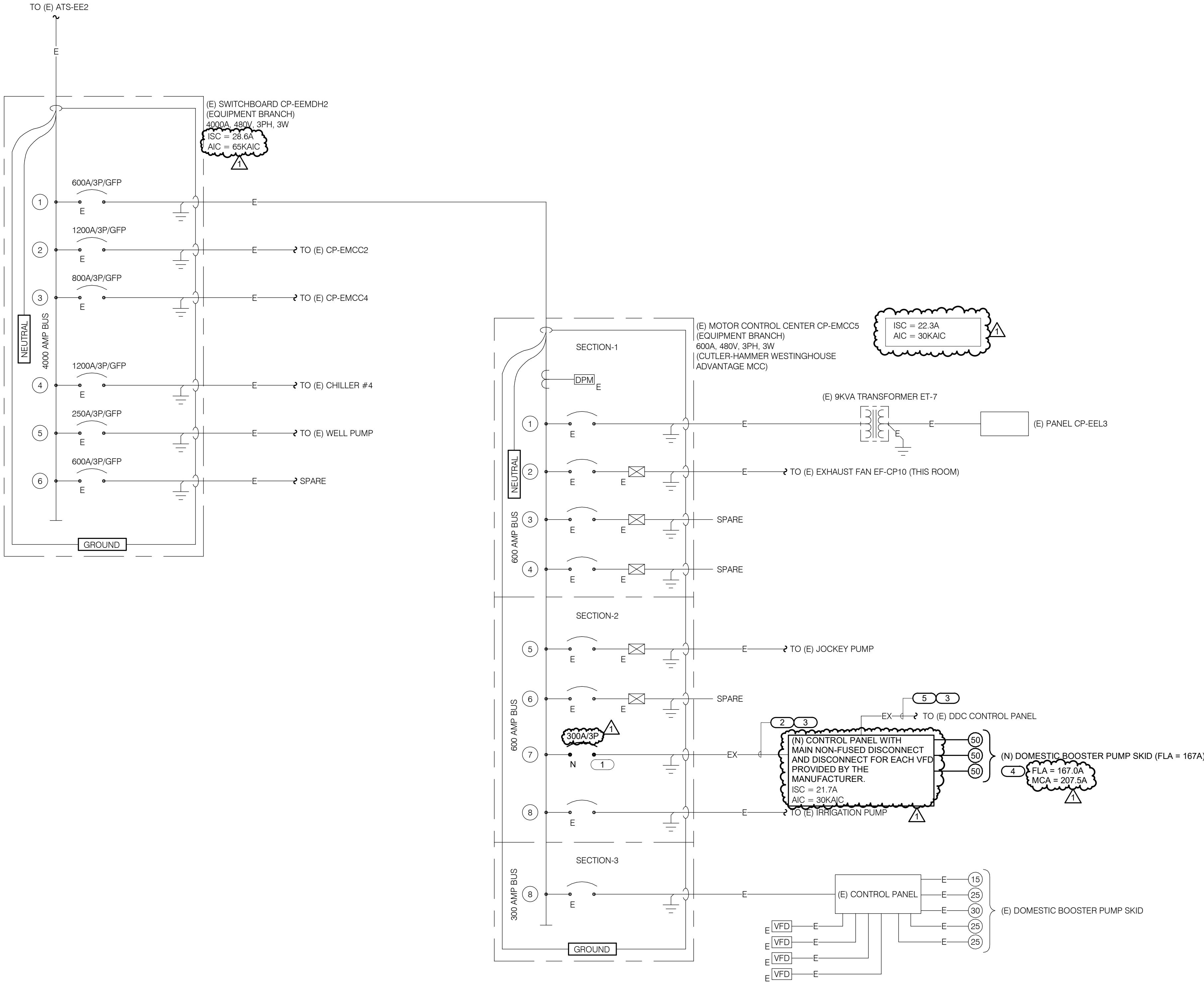
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SHEET INFORMATION		
Issue	HCAI SUBMITTAL	
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Job Number	21-31	
Drawn	PDP	
Checked	NCI	
Approved	NCI	

SHEET TITLE
DEMOLITION SINGLE LINE DIAGRAM

SCALE
Scale: 12" = 1'-0"

SHEET NUMBER
E0.2



1 12" = 1'-0" REMODEL SINGLE LINE DIAGRAM

KEYNOTES: (#

1. PROVIDE NEW MATCHING BREAKER WITH SAME MANUFACTURER AND AIC RATING.
2. PULL 350MCM & 1#2 GND. IN EXISTING 3" CONDUIT.
3. PROVIDE 4'-0" LONG SEAL TIGHT STEEL FLEX CONDUIT FROM FINAL CONNECTION TO CONTROL PANEL.
4. NEW DOMESTIC BOOSTER PUMP SKID. REFER TO PLUMBING DRAWINGS.
5. EXTEND EXISTING 2" CONDUIT AND PULL NEW CONTROL CABLES.

LOAD SUMMARY FOR (E) SWITCHBOARD CP-EEMDH2

EXISTING MAXIMUM DEMAND LOAD: (30 DAYS LOAD READING DATED 1-10-22)	=	1480 A
EXISTING CONNECTED LOAD: (X 1.25)	=	1825 A
EXISTING LOAD REMOVED	=	157 A
NEW ADDED LOAD:	=	207.5 A
TOTAL CONNECTED LOAD:	=	1875.5 A
EXISTING SWITCHBOARD RATING:	=	4000 A

LOAD SUMMARY FOR MOTOR CONTROL CENTER CP-EMCC5

EXISTING MAXIMUM DEMAND LOAD: (30 DAYS LOAD READING DATED 1-10-22)	=	250 A
EXISTING CONNECTED LOAD: (X 1.25)	=	312.5 A
EXISTING LOAD REMOVED	=	157 A
NEW ADDED LOAD:	=	207.5 A
TOTAL CONNECTED LOAD:	=	367 A
EXISTING MCC RATING:	=	600 A

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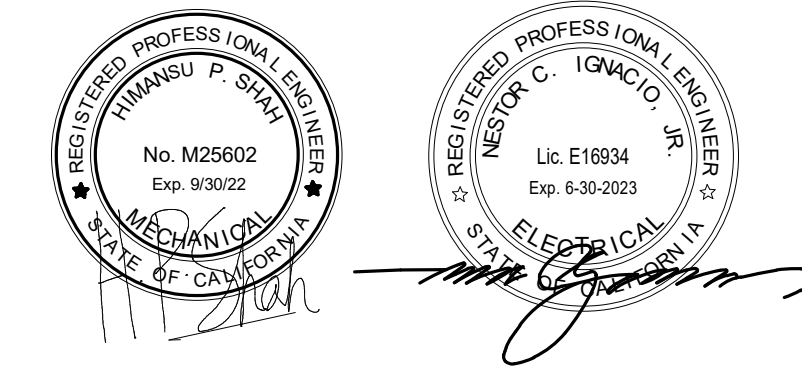
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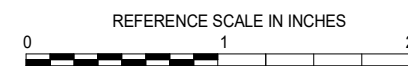
AGENCY APPROVAL



HCAI # S220638-36-00

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REVISIONS

No.	Date	Revision / Issue
1	08/03/22	BACK CHECK NO.1

SHEET INFORMATION

Issue	HCAI SUBMITTAL
Date	05/10/2022
Job Number	21-31
Drawn	PDP
Checked	NCI
Approved	NCI

SHEET TITLE

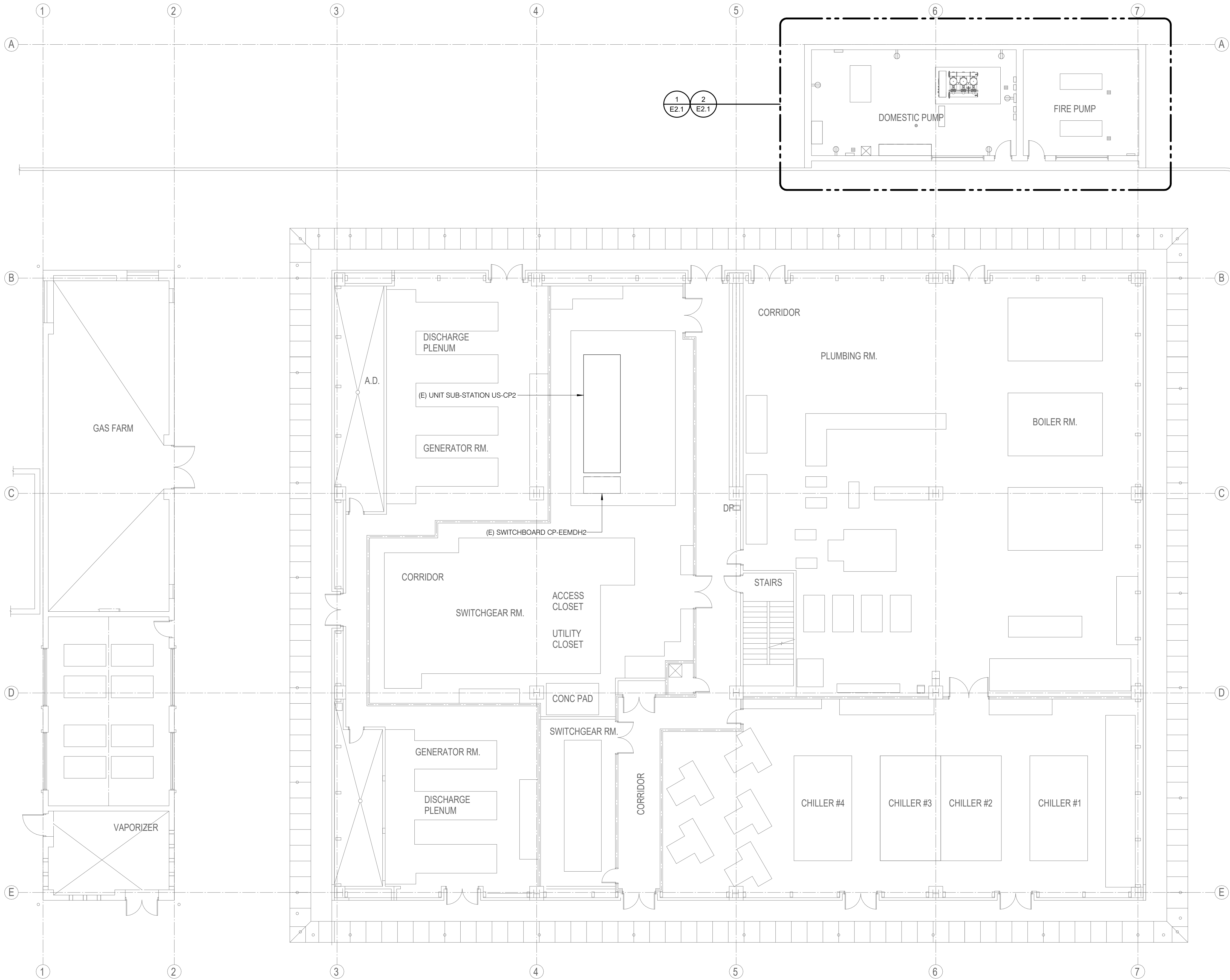
REMODEL SINGLE LINE DIAGRAM

SCALE

Scale: 12" = 1'-0"

SHEET NUMBER

E0.3



1

1" = 10'-0"

OVERALL FIRST FLOOR PLAN - ELECTRICAL

ARROWHEAD REGIONAL MEDICAL CENTER

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COLTON, CA. 92324

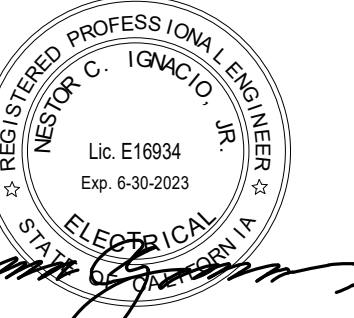
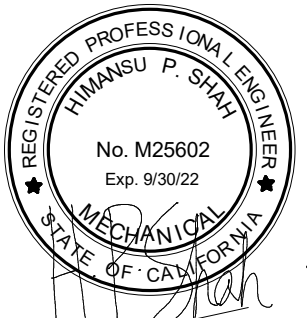
ARMC SKID MOUNTED BOOSTER PUMP

WBSE NO. 10.10.0722
CIP NO. ***
IMEG PROJECT NO. 21006908.00
BUILDING (CAFM) NO. ***
APN NO. ***



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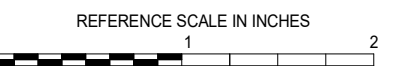
AGENCY APPROVAL



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SHEET TITLE

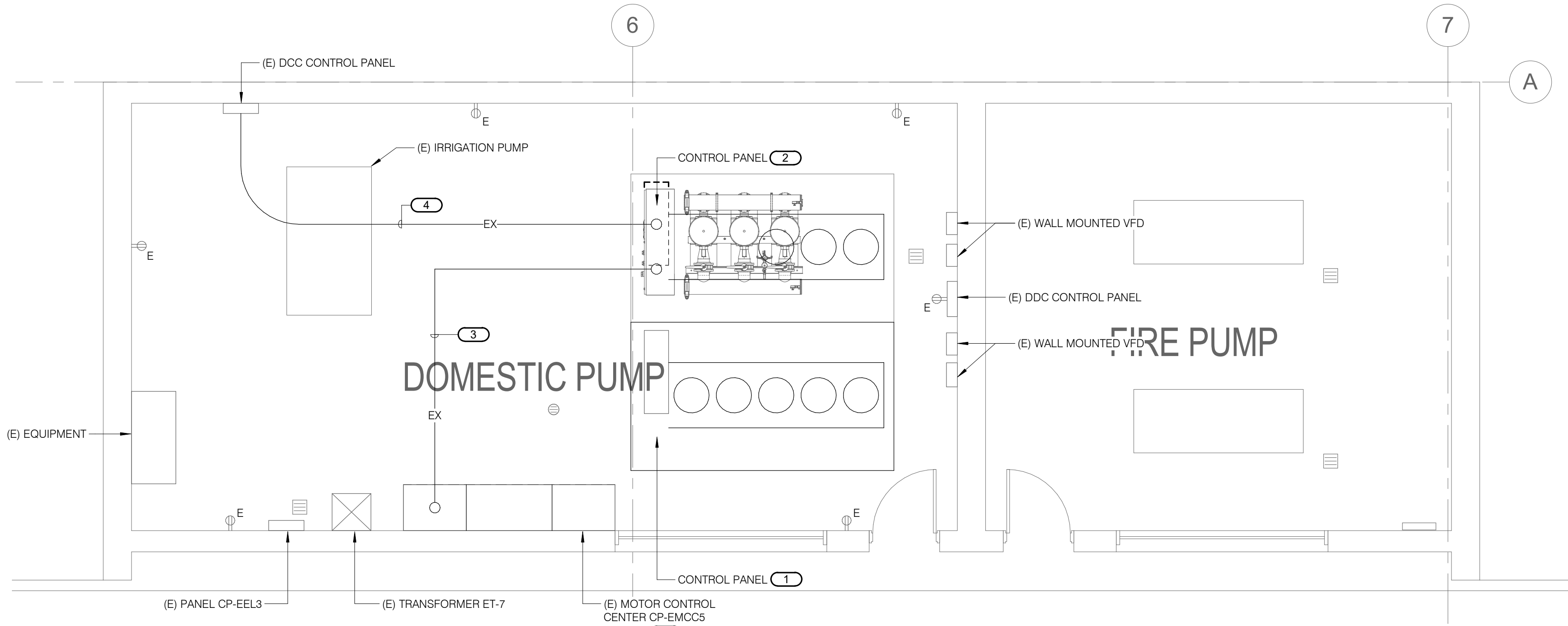
OVERALL FIRST FLOOR PLAN -
ELECTRICAL

SCALE

Scale: 1" = 10'-0"

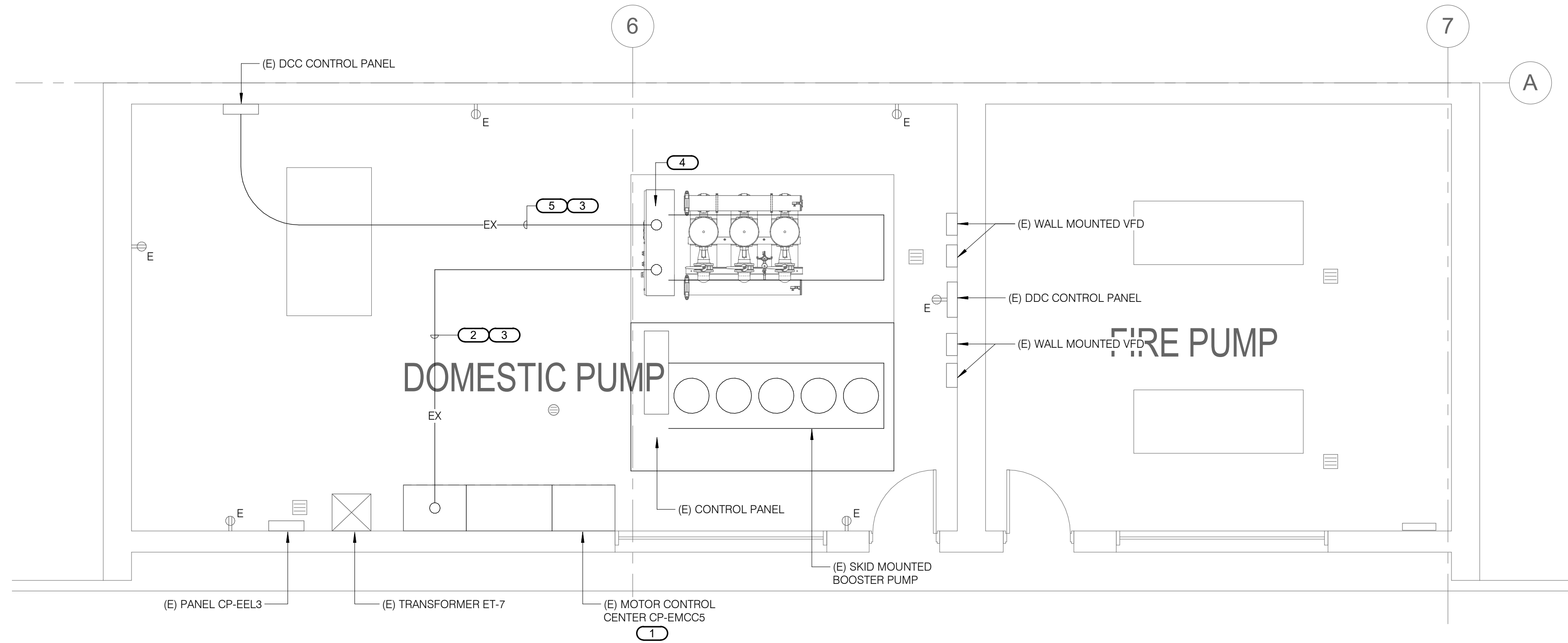
SHEET NUMBER

E1.0



1 DEMOLITION FIRST FLOOR - ELECTRICAL

1/4" = 1'-0"



2 REMODEL FIRST FLOOR - ELECTRICAL

1/4" = 1'-0"

DEMOLITION KEYNOTES: (#)

1. EXISTING SKID MOUNTED DOMESTIC BOOSTER PUMP SYSTEM TO REMAIN.
2. EXISTING SKID MOUNTED DOMESTIC BOOSTER PUMP SYSTEM TO BE REMOVED BY PLUMBING CONTRACTOR.
3. PULLOUT CONDUCTORS AND RE-WIRING EXISTING 3" CONDUIT RUN. REMOVE PORTION OF CONDUIT (SEAL TIGHT STEEL FLEX CONDUIT) AND PROTECT REMAINING CONDUIT.
4. PULLOUT CONTROL CABLE FROM EXISTING 2" CONDUIT AND REMOVE PORTION OF CONDUIT TO CONTROL PANEL.
5. REPLACE EXISTING BREAKER FOR SKID MOUNTED BOOSTER PUMP.

REMODEL KEYNOTES: (#)

1. PROVIDE NEW MATCHING BREAKER WITH SAME MANUFACTURER AND AIC RATING.
2. PULL 3#4/0 & 1#4 GND. IN EXISTING 3" CONDUIT.
3. PROVIDE 4'-0" LONG SEAL TIGHT STEEL FLEX CONDUIT FROM FINAL CONNECTION TO CONTROL PANEL.
4. NEW DOMESTIC BOOSTER PUMP SKID. REFER TO PLUMBING DRAWINGS.
5. EXTEND EXISTING 2" CONDUIT AND PULL NEW CONTROL CABLE.

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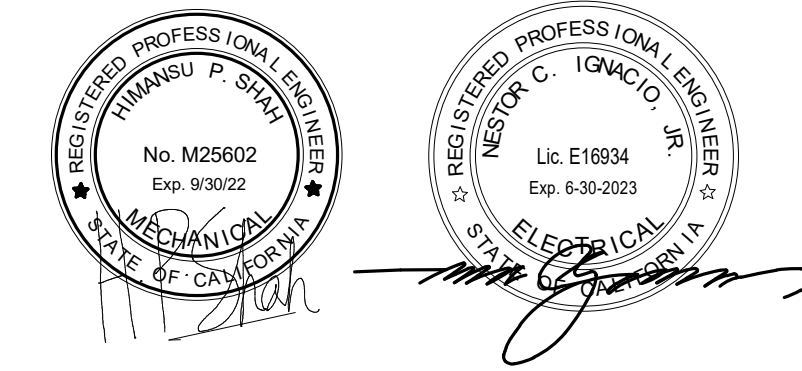
ARMC SKID MOUNTED BOOSTER PUMP

WBSE NO. 10.10.0722
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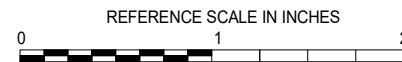
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SHEET INFORMATION

Issue HCAI SUBMITTAL
Date 05/10/2022
Job Number 21-31
Drawn PDP
Checked NCI
Approved NCI

SHEET TITLE

FIRST FLOOR DEMOLITION AND
REMODEL PLANS - ELECTRICAL

SCALE

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

SHEET NUMBER

E2.1