

WORCESTER DCU CENTER  
DOMESTIC HOT WATER  
TANK REPLACEMENT  
NV5 PROJECT: 0230060



DCU CENTER MAP  
N.T.S

SUBCONSULTANT LOGO AREA

This CAD/DWG document is an instrument of professional service, and shall not be used, in whole or in part, for any project other than for which it was created without the expressed, written consent of the NV5. Any unauthorized use, modification or alteration, including automated conversion of the document shall be at the users sole risk without liability or legal exposure to the NV5.

REVISIONS

DATE	DESCRIPTION
2023-04-03	OWNER'S REVIEW 75% CD'S
2023-05-05	CONSTRUCTION DOCUMENTS

SEAL

PROJECT

NUMBER  
0230060

DATE  
05 MAY 2023

WORCESTER  
DCU CENTER  
DHW TANK

50 FOSTER STREET  
WORCESTER, MA 01608

DRAWINGS

DRAWN BY  
EK

CHECKED BY  
JS

SCALE  
N.T.S

PLUMBING  
COVER SHEET

Sheet List	
Sheet Name	Sheet Number
PLUMBING COVER SHEET	PL00
PLUMBING LEGEND	PL01
PLUMBING SPECIFICATIONS	PL02
PLUMBING FIRST PLAN	PL03

P0.00

ABBREVIATIONS	
ACT	ACOUSTICAL TILE
AFF	ABOVE FINISH FLOOR
AP	ACCESS PANEL
ARCH	ARCHITECT
BT	BATH TUB
BLDG	BUILDING
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CI	CAST IRON
CLG	CEILING
CLDI	CEMENT LINED DUCTILE IRON
CO	CLEANOUT
CONC	CONCRETE
CONT	CONTINUATION
CONTR	CONTRACTOR
CP	CHROME PLATED
CTE	CONNECT TO EXISTING
CW	COLD WATER
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DF	DRINKING FOUNTAIN-FIXTURE IDENTIFICATION
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
ELE/ELEV	ELEVATION
EWC	ELECTRIC WATER COOLER-FIXTURE IDENTIFICATION
EX	EXISTING
FCO	FLOOR CLEANOUT
FFE	FINISH FLOOR ELEVATION
P-#	FIXTURE NUMBER
FLR	FLOOR
FP	FIRE PROTECTION
FS	FLOW SWITCH
FT	FOOT
FV	FLUSH VALVE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GI	GREASE INTERCEPTOR
GPF	GALLON PER FLUSH
GPM	GALLONS PER MINUTE
HC	HANDICAPPED
HW	HOT WATER
HWC	HOT WATER CIRCULATION
ID	INSIDE DIAMETER
INV	INVERT
IW	INDIRECT WASTE
LPC	LIMIT OF PLUMBING CONTRACTOR
MECH	MECHANICAL
MSB	MOP SERVICE BASIN-FIXTURE IDENTIFICATION
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
NIC	NOT IN CONTRACT
OD	OUTSIDE DIAMETER
OED	OPEN END DRAIN
PC	PLUMBING CONTRACTOR
PLBG	PLUMBING
PSI	POUNDS PER SQUARE INCH
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
SA	SHOCK ABSORBER
SH	SHOWER-FIXTURE IDENTIFICATION
SK	SINK-FIXTURE IDENTIFICATION
SPEC	SPECIFICATION
SS	SOIL STACK
ST.ST.	STAINLESS STEEL
TW	TEMPERED WATER
TYP	TYPICAL
U	URINAL-FIXTURE IDENTIFICATION
V	VENT
VB	VACUUM BREAKER
VS	VENT STACK
VTR	VENT THRU ROOF
W	WASTE
WC	WATER CLOSET-FIXTURE IDENTIFICATION

VALVES	
	BALL VALVE
NC	BALL VALVE (NORMALLY CLOSED)
	GATE VALVE
NC	GATE VALVE (NORMALLY CLOSED)
	OUTSIDE SCREW AND YOKE VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	BALL VALVE (GAS)
	GAS COCK
	PLUG VALVE
	MIXING VALVE
	BALANCING VALVE
	ANGLE VALVE
	TEMPERATURE AND PRESSURE RELIEF VALVE
	VACUUM RELIEF VALVE
	AQUASTAT
	THERMOMETER
	PRESSURE REDUCING/REGULATING VALVE
	PRESSURE GAUGE
	BACK WATER VALVE
	GLOBE VALVE
	FLOW SWITCH

GENERAL	
	FLOOR DRAIN
	ROOF DRAIN
	TRENCH DRAIN
	AREA DRAIN
	CLEANOUT
	FLOOR CLEANOUT
	GRADE CLEANOUT
	P-TRAP
	ELBOW UP OR RISE
	ELBOW DOWN OR DROP
	CAP OR END OF PIPE
	HOSE BIBB
	WALL HYDRANT
	LAB TURRET
	TEE LOOKING UP
	TEE LOOKING DOWN
	UNION
	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
	STRAINER
	WATER HAMMER ARRESTOR/SHOCK ABSORBER
	CONNECT TO EXISTING
	DISCONNECT TO EXISTING
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	FLAT REMOVE EXISTING ITEM
	ROUND REMOVE EXISTING ITEM
	FLOW IN DIRECTION OF ARROWS
	DIRECTION OF SLOPE
	REDUCER
	PIPE SLEEVE
	PIPE ANCHOR
	PIPE GUIDE
	EXPANSION JOINT
	FLEXIBLE CONNECTOR
	IN-LINE FILTER
	FLOW METER
	LIMIT OF DEMOLITION
	LIMIT OF WORK

PIPING LEGEND			
	CW	DOMESTIC COLD WATER	
	HW	DOMESTIC HOT WATER	
	HWC	DOMESTIC HOT WATER CIRCULATING	
	140°	140° F DOMESTIC HOT WATER	

DEMOLITION NOTES	
1.	THE LOCATIONS OF EXISTING EQUIPMENT INCLUDING PIPING, DUCTWORK, EQUIPMENT, CONDUITS, ETC ARE SHOWN IN AN APPROXIMATE WAY ONLY. VISIT THE SITE PRIOR TO SUBMISSION OF THE BIDS AND COMMENCEMENT OF WORK TO BECOME FAMILIAR WITH THE ACTUAL CONDITIONS AND EXTENT OF THE WORK.
2.	TRACE AND LABEL ALL EXISTING SYSTEMS WITHIN THE DEMOLITION AREA AND BEYOND PRIOR TO DISCONNECTION AND REMOVAL TO ENSURE THAT NO AREA OUTSIDE THE DEMOLITION AREA IS AFFECTED. REVIEW IN DETAIL WITH THE GENERAL CONTRACTOR AND OWNER WHAT IS TO BE REMOVED AND REMAIN PRIOR TO WORK COMMENCING THE DEMOLITION. THERE SHALL BE NO INTERRUPTION OF SERVICES OUTSIDE THE DEMOLITION AREA WITHOUT APPROVAL FROM THE OWNER'S REPRESENTATIVE.
4.	COORDINATE EQUIPMENT REMOVAL WITH ALL PARTIES TO PROVIDE DISCONNECTION. REMOVE EQUIPMENT BY UNFASTENING AT THE SUPPORTS OR ATTACHMENTS. ALSO REMOVE THE ATTACHMENTS FROM THE BUILDING, LEAVING NO COMPONENT OF THE ORIGINAL INSTALLATION.
4.	EXERCISE CARE WITH EQUIPMENT THAT IS TO BE RELOCATED OR TURNED OVER TO THE OWNER. EXAMINE THE EQUIPMENT BEFORE REMOVAL IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE TO DETERMINE ITS CONDITION. DELIVER OWNER-RETAINED EQUIPMENT TO AN ON-SITE LOCATION DESIGNATED BY THE OWNER AND OBTAIN ACKNOWLEDGMENT OF RECEIPT IN ORIGINAL CONDITION.
5.	INSTALL RELOCATED EQUIPMENT IN ORIGINAL CONDITION ENSURING NO DAMAGE.
6.	PROMPTLY REPAIR ANY DAMAGE CAUSED DURING/BY THE EXECUTION OF WORK. DAMAGE INCLUDES BUT IS NOT LIMITED TO DESTRUCTION OF ITEMS INTENDED TO REMAIN OR TO BE SALVAGED.
7.	NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY UNANTICIPATED HIDDEN CONDITIONS ENCOUNTERED DURING THE DEMOLITION.
8.	ALL ITEMS REMOVED SHALL BE OFFERED TO THE OWNER FOR SALVAGE. IF THE OWNER DOES NOT TAKE POSSESSION, DISPOSE OF THE ITEMS IN A SAFE AND LEGAL MANNER. ALL ITEMS CLASSIFIED AS HAZARDOUS SHALL BE DISPOSED AS HAZARDOUS WASTES AND A UNIFORM HAZARDOUS WASTE MANIFEST SHALL BE PROVIDED TO THE OWNER.
9.	CONTRACTOR SHALL OWNS ALL PROTECTION OF EXISTING FINISHES FROM THE WORK SITE TO THEIR EQUIPMENT BEING USED TO REMOVE THE DEMOLISHED MATERIALS AND EQUIPMENT OFF SITE FOR DISPOSAL. THIS INCLUDES INTERIOR AND EXTERIOR FINISHES THAT MAY APPLY.
10.	GENERAL CONTRACTOR, PLUMBING CONTRACTOR, AND PRIME CONTRACTOR ARE ALL CONSIDERED THE SAME FOR THIS PROJECT.

GENERAL NOTES	
1.	DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS. EXACT LOCATION SHALL BE COORDINATED WITH ALL TRADES, THE STRUCTURAL DRAWINGS, ARCHITECTURAL DRAWINGS, AND/OR GENERAL CONTRACTOR AND CONSTRUCTION MANAGER.
2.	LOCATION AND SIZES OF EXISTING PIPING ARE APPROXIMATE. VERIFY THE LOCATIONS AND SIZES OF EXISTING PIPING IN THE FIELD. IF ANY DISCREPANCIES OCCUR WITH THE CONTRACT DRAWINGS, NOTIFY THE ARCHITECT AND/OR THE ENGINEER PRIOR TO COMMENCEMENT OF NEW WORK, WHICH INCLUDES PURCHASING OF NEW EQUIPMENT OR MATERIALS BASED ON EXISTING TO REMAIN SIZES OR LOCATIONS.
3.	ALL EXPOSED PIPING PENETRATIONS THROUGH WALLS OR CEILINGS SHALL BE PROVIDED WITH APPROPRIATE FIRE RETARDANT SEALANT AND ESCUTCHEONS.
4.	SEAL OPENINGS AROUND PLUMBING WORK AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH NON-COMBUSTIBLE MATERIAL AND ESCUTCHEONS.
5.	SUBMISSION OF A PROPOSAL SHALL BE EVIDENCE THAT A CAREFUL EXAMINATION OF THE SITE, DRAWINGS & SPECIFICATIONS HAVE BEEN MADE AND THE CONTRACTOR IS FAMILIAR WITH THOSE ITEMS AND AREAS THAT WILL PRESENT DIFFICULTY TO THE PERFORMANCE OF THIS CONTRACT. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT, ETC. NECESSARY TO COMPLETE ALL WORK AS A RESULT OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN. A. CONTRACTOR TO VERIFY THE EXISTING CONDITIONS BEFORE CONSTRUCTION; CONFIRMING SIZES AND LOCATIONS OF ALL EXISTING PIPING PRIOR TO START OF WORK. B. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE BEFORE PROCEEDING WITH ANY WORK. C. PRIOR TO STARTING DEMOLITION, DETERMINE LOCATIONS AND EXISTING CONDITIONS.
6.	THIS CONTRACTOR SHALL PAY FEES, GIVE NOTICE, FILE NECESSARY DRAWINGS AND OBTAIN PERMITS AND CERTIFICATES OF APPROVAL REQUIRED IN CONNECTION WITH WORK UNDER THIS CONTRACT AND COMPLY WITH LOCAL LAWS AND ORDINANCES.
7.	PROVIDE ALL REQUIRED LABOR, MATERIALS, EQUIPMENT, AND SERVICES NECESSARY FOR A COMPLETE AND SAFE INSTALLATION OF PLUMBING IN FULL CONFORMITY WITH REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION; ALL AS INDICATED ON DRAWINGS AND/OR HEREIN SPECIFIED FOR THE SYSTEMS INCLUDED. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER. INCLUDE ALL COSTS FOR PERMITS, LICENSES, CERTIFICATES, FILING AND INSPECTIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION.
8.	UNDER NO CIRCUMSTANCES WILL THIS CONTRACTOR, OR HIS WORKMEN, BE PERMITTED TO USE ANY PART OF THE BUILDING AS A SHOP EXCEPT PARTS AS DESIGNATED FOR SUCH USE.
9.	ALL EXISTING WATER PIPING WITHIN FIVE (5) FT. OF NEW CONNECTIONS SHALL BE PROVIDED WITH NEW INSULATION.
10.	ALL WORK MUST BE COORDINATED AROUND THE OPERATION OF THE FACILITY.
11.	STORE MATERIALS IN DESIGNATED SPACES.
12.	UNNECESSARY NOISE SHALL BE AVOIDED AT ALL TIMES AND NECESSARY NOISE SHALL BE REDUCED TO A MINIMUM.
13.	ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE CONSTRUCTION DOCUMENTS AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
14.	THE CONTRACTOR SHALL RESTORE ALL AREAS DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL STATE.

REVISIONS

▲	DATE	DESCRIPTION
	2023-04-03	OWNER'S REVIEW 75% CD'S
	2023-05-05	CONSTRUCTION DOCUMENTS

SEAL

PROJECT

NUMBER	0230060
DATE	05 MAY 2023

WORCESTER  
DCU CENTER  
DHW TANK

50 FOSTER STREET  
WORCESSTER, MA 01608

DRAWINGS

DRAWN BY	EK
CHECKED BY	JS
SCALE	NONE

PLUMBING  
LEGEND



REVISIONS

▲	DATE	DESCRIPTION
	2023-04-03	OWNER'S REVIEW 75% CD'S
	2023-05-05	CONSTRUCTION DOCUMENTS

SEAL

PROJECT

NUMBER 0230060  
DATE 05 MAY 2023

WORCESTER  
DCU CENTER  
DHW TANK

50 FOSTER STREET  
WORCESTER, MA 01608

DRAWINGS

DRAWN BY EK  
CHECKED BY JS  
SCALE NTS

PLUMBING  
SPECIFICATIONS

P0.02

PLUMBING SPECIFICATIONS

PART 1 - GENERAL

- GENERAL PROVISIONS: DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK IN CONTRACT.
- SCOPE: PERFORM WORK AND PROVIDE NEW MATERIAL AND EQUIPMENT AS SHOWN ON DRAWINGS AND AS SPECIFIED IN THIS SECTION OF THE SPECIFICATIONS. PROVIDE ALL COMPONENTS AND MATERIALS, WHETHER SPECIFICALLY SHOWN OR NOT, THAT ARE NECESSARY TO MAKE THE SYSTEMS COMPLETE AND FULLY OPERATIONAL AS INTENDED IN THE CONSTRUCTION DOCUMENTS. WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
  - THE DESIGN INTENT AS ILLUSTRATED ON THESE DRAWING
  - ALL TESTING AND CERTIFICATIONS NECESSARY FOR COMPLIANCE AND ANY REQUIRED REMEDIAL ACTIONS AND RETESTING DUE TO FAILURE.
- SITE VISIT: VISIT AND CAREFULLY EXAMINE SITE TO IDENTIFY EXISTING CONDITIONS THAT MAY AFFECT WORK OF THIS SECTION BEFORE SUBMITTING BID. NO EXTRA PAYMENT WILL BE ALLOWED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY DISCERNED BY AN EXPERIENCED OBSERVER.
- RELATED WORK: THE FOLLOWING WORK IS NOT INCLUDED IN THIS SECTION AND WILL BE PROVIDED UNDER OTHER SECTIONS:
  - PAINTING, EXCEPT AS SPECIFIED.
  - TEMPORARY LIGHT, POWER, WATER, HEAT, GAS AND SANITARY FACILITIES FOR USE DURING CONSTRUCTION.
  - ELECTRICAL POWER WIRING TO ALL EQUIPMENT.
- CODES, STANDARDS, AUTHORITIES AND PERMITS: CODES, LAWS AND ORDINANCES PROVIDE A BASIS FOR THE MINIMUM INSTALLATION CRITERIA. THESE DRAWINGS AND SPECIFICATIONS ILLUSTRATE THE SCOPE REQUIRED FOR THIS PROJECT, WHICH MAY EXCEED MINIMUM CODE, LAW AND STANDARDS CRITERIA. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACKCHARGES AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES HAVING JURISDICTION AS REQUIRED FOR THE EXECUTION OF ALL WORK ASSOCIATED WITH THIS PROJECT. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITIONS OF:
  - THE STATE BUILDING CODE
  - THE STATE PLUMBING AND FUEL GAS CODE
  - THE STATE ELECTRICAL CODE
  - NFPA
  - DEPARTMENT OF ENVIRONMENTAL PROTECTION
  - DEPARTMENT OF PUBLIC SAFETY CODES
  - ARCHITECTURAL ACCESS BOARD
  - ALL OTHER APPLICABLE CODES, REGULATIONS, STANDARDS AND LAWS OF LOCAL, STATE AND FEDERAL GOVERNMENT AND OTHER AUTHORITIES HAVING JURISDICTION.
  - APPLICABLE BASE BUILDING STANDARDS AND SPECIFICATIONS.
- INTERPRETATIONS OF DOCUMENTS: WHERE DRAWINGS OR SPECIFICATIONS DO NOT COINCIDE WITH MANUFACTURER'S RECOMMENDATIONS, OR ARE UNCLEAR AS TO INTENT, OR REQUIRED MATERIAL QUALITY, ADVISE THE ENGINEER IN WRITING BEFORE PROCEEDING WITH THE WORK. ALL COST FOR REWORK NECESSARY TO RESOLVE DISCREPANCIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- REQUESTS FOR INFORMATION: ANY RFI FOR RESOLVING AN APPARENT CONFLICT OR UNCLEARITY, OR A REQUEST FOR AN ADDITIONAL DETAIL, SHALL INCLUDE A SKETCH OR EQUIVALENT DESCRIPTION OF CONTRACTOR'S PROPOSED SOLUTION.
- SUBMITTALS: PROVIDE SPECIFIED ITEMS AND EQUIPMENT UNLESS "EQUAL" OR "APPROVED EQUAL" IS EXPLICITLY INDICATED ON THE DRAWINGS. DEVIATIONS TO SPECIFIED ITEMS SHALL BE AT THE SOLE RISK OF THE CONTRACTOR, WHO SHALL BE RESPONSIBLE FOR ALL ASSOCIATED CHANGES TO THIS AND OTHER TRADES. REVIEW OF THE SHOP DRAWINGS BY THE ENGINEER SHALL NOT ABSOLVE THE CONTRACTOR FROM MEETING THE FULL DESIGN INTENT OF THE ASSOCIATED SYSTEM(S). SUBMITTALS SHALL INDICATE PRIOR REVIEW AND APPROVAL BY THE RESPONSIBLE CONTRACTOR. SUBMIT ELECTRONIC COPIES FOR REVIEW OF MANUFACTURER'S PRODUCT DATA FOR THE FOLLOWING ITEMS:
  - FIXTURES
  - PIPE MATERIALS
  - FITTINGS
  - VALVES
  - WATER HEATERS AND DRAIN PANS
  - PUMPS
  - DRAINS
  - BACKFLOW PREVENTERS
  - LEAK DETECTION
  - COORDINATION DRAWINGS
  - INSULATION
  - HANGERS
  - TEST REPORTS
  - ALL CERTIFICATES ALLOW ENGINEER A MINIMUM OF 10 WORKING DAYS FOR PROCESSING AND REVIEW OF EACH SUBMISSION.
- OPERATION AND MAINTENANCE DATA: SUBMIT ELECTRONIC COPIES OF OPERATING AND MAINTENANCE MANUALS PRIOR TO THE COMPLETION OF THE PROJECT. O&M MANUALS SHALL INCLUDE SYSTEM DESCRIPTIONS, WIRING DIAGRAMS, WRITTEN WARRANTIES, RECOMMENDED SPARE PARTS AND ROUTINE MAINTENANCE REQUIREMENTS WITH RECOMMENDED INTERVALS FOR ALL THE FOLLOWING:
  - SUMP PUMPS
  - BACKFLOW PREVENTERS
  - WATER HEATERS
  - RECIRCULATION PUMP
  - FIXTURES
  - LEAK DETECTION
- RECORD DRAWINGS: CAD RECORD DRAWING FILES SHALL BE SUBMITTED AT THE COMPLETION OF THE PROJECT SHOWING THE "AS-BUILT" CONDITION INCLUDING WORK INSTALLED AND ALL MODIFICATIONS OR ADDITIONS TO ORIGINAL DESIGN. OBTAIN THE AUTOCAD FILES FOR PREPARATION OF AS-BUILT DRAWINGS FROM THE ARCHITECT. THE ARCHITECT AND ENGINEER ARE NOT GRANTING ANY OWNERSHIP OR PROPERTY INTEREST IN THE CAD DRAWINGS BY THE DELIVERY OF THE CAD FILES. THE USE OF THE CAD FILES AND DRAWINGS ARE LIMITED FOR THE SOLE PURPOSE OF ASSISTING IN THE CONTRACTOR'S PERFORMANCE IN ITS CONTRACTUAL OBLIGATIONS WITH RESPECT TO THIS PROJECT. ANY REUSE AND/OR OTHER USE BY THE CONTRACTOR WILL BE AT THE CONTRACTOR'S SOLE RISK AND WITHOUT LIABILITY TO THE ARCHITECT AND ENGINEER.
- WARRANTIES: WARRANTY INSTALLATION IN WRITING FOR ONE YEAR FROM DATE OF OWNERS' ACCEPTANCE OF CERTIFICATE OF SUBSTANTIAL COMPLETION. WHERE INDIVIDUAL EQUIPMENT SECTIONS SPECIFY LONGER WARRANTIES, PROVIDE THE LONGER WARRANTY. REPAIR, REPLACE OR PROVIDE TEMPORARY ACCOMMODATIONS FOR DEFECTIVE MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION THAT DEVELOP WITHIN 24 HOURS OF NOTIFICATION. WARRANTY SHALL INCLUDE A CONTACT PERSON (NAME AND 24 HOUR TELEPHONE NUMBER) FOR SERVICE REQUESTS. CORRECT DAMAGE CAUSED WHILE MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER WARRANTY PERIOD AT NO ADDITIONAL COST.

- COORDINATION: CONFER WITH ALL OTHER TRADES RELATIVE TO LOCATION OF ALL APPARATUS AND EQUIPMENT TO BE INSTALLED AND SELECT LOCATIONS SO AS NOT TO CONFLICT WITH OR HINDER THE PROGRESS OF THE WORK OF OTHER SECTIONS. WORK INSTALLED THAT CREATES INTERFERENCE OR RESTRICTS ACCESS REQUIRED BY CODE OR MAINTENANCE AND/OR ADJUSTMENTS SHALL BE MODIFIED AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE A SET OF COORDINATION DRAWINGS FOR USE IN VERIFYING REQUIRED CODE CLEARANCES (AS WELL AS CLEARANCES FOR OPERATION, REPAIR, REMOAL AND TESTING) OF ALL EQUIPMENT AND FOR USE IN COORDINATING INSTALLATION OF EQUIPMENT WITH OTHER TRADES, THE INTENT OF FABRICATION AND INSTALLATION OF ANY MEP TRADE. THE HVAC CONTRACTOR'S FLOOR PLANS SHALL BE THE BASIS FOR THE FLOOR PLAN COORDINATION. THE ELECTRICAL CONTRACTOR'S REFLECTED CEILING SHALL BE THE BASIS FOR THE REFLECTED CEILING COORDINATION.
- SUPPORTS: INCLUDE ALL STRUCTURAL STEEL SUPPORTS, HANGER BRACKETS, ETC., REQUIRED FOR THE EXECUTION OF THE WORK OF THIS SECTION. THE WELDS AND EDGES OF ALL BRACKETS SHALL BE FILED OR GROUND SMOOTH FOR PAINTING.
- CUTTING AND PATCHING: INCLUDE ALL CORING, CUTTING, PATCHING AND FIREPROOFING NECESSARY FOR THE EXECUTION OF THE WORK OF THIS SECTION. STRUCTURAL ELEMENTS SHALL NOT BE CUT WITHOUT WRITTEN APPROVAL OF THE ARCHITECT. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING ALL PRECAUTIONS REQUIRED TO IDENTIFY HIDDEN PIPING, CONDUITS, ETC. BEFORE ANY CORE DRILLING AND/OR CUTTING OF SLABS COMMENCES, INCLUDING X-RAYING THE AFFECTED SLABS. PROVIDE FIRE STOPPING TO MAINTAIN THE FIRE RATING OF THE FIRE RESISTANCE-RATED ASSEMBLY. ALL PENETRATIONS AND ASSOCIATED FIRE STOPPING SHALL BE INSTALLED IN ACCORDANCE WITH THE FIRE STOPPING MANUFACTURER'S LISTED INSTALLATION DETAILS AND BE LISTED BY UL OR FM.
  - HOISTING, SCAFFOLDING AND PLANKING: INCLUDE THE FURNISHING, SET-UP AND MAINTENANCE OF ALL HOISTING MACHINERY, CRANES, SCAFFOLDS, STAGING AND PLANKING AS REQUIRED FOR THE EXECUTION OF WORK FOR THIS SECTION.
- SAFETY PRECAUTIONS: LIFE SAFETY AND ACCIDENT PREVENTION SHALL BE A PRIMARY CONSIDERATION. COMPLY WITH ALL OF THE SAFETY REQUIREMENTS OF THE OWNER AND OSHA THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD OF THE PROJECT. FURNISH, PLACE AND MAINTAIN PROPER GUARDS AND ANY OTHER NECESSARY CONSTRUCTION REQUIRED TO SECURE SAFETY OF LIFE AND PROPERTY.
- ACCESSIBILITY: ALL WORK PROVIDED UNDER THIS SECTION OF THE SPECIFICATION SHALL BE INSTALLED SO THAT PARTS REQUIRING PERIODIC INSPECTION, MAINTENANCE AND REPAIR ARE READILY ACCESSIBLE. WORK OF THIS TRADE SHALL NOT INFRINGE UPON CLEARANCES REQUIRED BY EQUIPMENT OF OTHER TRADES, ESPECIALLY CODE REQUIRED CLEARANCES TO ELECTRICAL EQUIPMENT.
- PROTECTION OF WORK AND PROPERTY: THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE CARE AND PROTECTION OF ALL WORK INCLUDED UNDER THIS SECTION UNTIL THE COMPLETION AND FINAL ACCEPTANCE OF THIS PROJECT. PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE FROM ALL CAUSES INCLUDING, BUT NOT LIMITED TO, FIRE, VANDALISM AND THEFT. ALL MATERIALS AND EQUIPMENT DAMAGED OR STOLEN SHALL BE REPAIRED OR REPLACED WITH EQUAL MATERIAL OR EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER. PROTECT ALL EQUIPMENT, OUTLETS AND OPENINGS, AND ROOF PENETRATIONS WITH TEMPORARY PLUGS, CAPS AND COVERS. PROTECT WORK AND MATERIALS OF OTHER TRADES FROM DAMAGE THAT MIGHT BE CAUSED BY WORK OR WORKMEN UNDER THIS SECTION AND MAKE GOOD DAMAGE THUS CAUSED. DAMAGED MATERIALS ARE TO BE REMOVED FROM THE SITE; NO SITE STORAGE OF DAMAGED MATERIALS WILL BE ALLOWED. ANY DAMAGE TO EXISTING SYSTEMS AND EQUIPMENT CAUSED BY THIS CONTRACTOR DURING INSTALLATION SHALL BE REPAIRED AND/OR REPLACED AT THIS CONTRACTOR'S EXPENSE TO THE COMPLETE SATISFACTION OF THE BUILDING OWNER.
- SEISMIC RESTRAINT REQUIREMENTS: PROVIDE SEISMIC RESTRAINTS AS REQUIRED IN ACCORDANCE WITH THE STATE BUILDING CODE. A REGISTERED PROFESSIONAL STRUCTURAL ENGINEER, LICENSED IN THE APPLICABLE STATE FOR THE PROJECT LOCATION, SHALL PREPARE THE SEISMIC RESTRAINT DESIGN AND CERTIFY THAT THE DESIGN IS IN COMPLIANCE WITH THE STATE BUILDING CODE REQUIREMENTS.
- PROJECT CLOSEOUT: A CERTIFICATE OF COMPLETION SHALL BE ISSUED BY THE CONTRACTOR INDICATING THAT THE INSTALLATION IS IN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS AND ALL APPLICABLE LOCAL, STATE AND FEDERAL STATUTES AND CODES. ALL SUBMITTALS, AS-BUILTS, O&M MANUALS, AND TESTING AND BALANCING REPORTS ARE TO BE PROVIDED, FOR ENGINEER'S REVIEW, PRIOR TO REQUEST FOR COMPLETION CERTIFICATES. IN ADDITION, AND ALSO PRIOR TO REQUEST FOR COMPLETION CERTIFICATES, ALL PUNCH LIST ITEMS MUST BE COMPLETED TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR MUST VERIFY THAT ALL SEQUENCES OF OPERATIONS AND CONTROLS HAVE BEEN INCORPORATED AND ALL SYSTEMS AND EQUIPMENT ARE WORKING PER THE SPECIFIED SEQUENCES OF OPERATIONS. A BLANK CONTRACTOR'S CERTIFICATE FORM CAN BE FURNISHED BY RDK ENGINEERS UPON REQUEST. FINAL INSPECTION BY THE ENGINEER SHALL BE CONDUCTED AFTER RECEIPT OF THE CERTIFICATE OF COMPLETION. PREMATURE REQUESTS FOR FINAL INSPECTIONS THAT REQUIRE REINSPECTION OF DEFICIENT ITEMS WILL RESULT IN BACK CHARGES OF THE COSTS ASSOCIATED WITH THE REINSPECTION.
- ELECTRICAL WORK: ALL ELECTRICAL APPARATUS AND CONTROLS FURNISHED AND THE INSTALLATION THERE OF, AS A PART OF PLUMBING WORK, SHALL CONFORM TO APPLICABLE REQUIREMENTS UNDER THE ELECTRICAL DRAWINGS AND SPECIFICATION.

PART 2 - PRODUCTS

- PLUMBING FIXTURES AND TRIM: REFER TO ARCHITECTURAL AND PLUMBING DRAWINGS FOR TYPE, QUANTITIES, LOCATIONS AND MOUNTING HEIGHTS OF FIXTURES PROVIDED UNDER THIS SECTION. FIXTURE TRIM, TRAPS, FAUCETS, ESCUTCHEONS AND WASTE PIPES EXPOSED TO VIEW IN THE FINISHED SPACES SHALL BE 1/2" S. BRASS WITH POLISHED CHROMIUM PLATING OVER NICKEL FINISH.
- PIPE MATERIALS (REFER TO SCHEDULES ON DRAWINGS):
- ALL PIPE, FITTINGS, AND VALVES USED IN THIS DISTRIBUTION SYSTEM AND INSTALLED AFTER JANUARY 4, 2014 MUST COMPLY WITH THE NEW FEDERAL MANDATE KNOWN AS THE "REDUCTION OF LEAD IN DRINKING WATER ACT-2014". THEREFORE, AFTER THE ENACTMENT DATE OF 1/4/14, ALL PRODUCTS INSTALLED MUST COMPLY. ANY PRODUCT PIPE, FITTINGS OR VALVE INSTALLED AFTER THE ENACTMENT DATE THAT DOES NOT COMPLY, SHALL BE REMOVED AND CHANGED BY THIS CONTRACTOR AT HIS/HER OWN EXPENSE TO COMPLY WITH THE FEDERAL LAW.
- VALVES (DOMESTIC WATER SYSTEMS):

- GENERAL - VALVES IN THE INTERIOR DOMESTIC WATER PIPING SYSTEMS (COLD WATER, HOT WATER, AND HOT WATER RETURN) SHALL BE AS MANUFACTURED BY APOLLO, MILWAUKEE, NIBCO OR CONBRACO. MANUFACTURER'S MODEL NUMBERS USED HEREIN ARE INTENDED AS A GUIDE TO QUALITY AND TYPE OF VALVE TO BE PROVIDED.
  - VALVES USED FOR THROTTLING OF FLOW SHALL BE BUTTERFLY TYPE WITH MEMORY STOP. BALL VALVES SHALL NOT BE ACCEPTABLE ON HOT WATER RETURN PIPING.
  - VALVES SHALL BE PROVIDED WITH BUNA-N, TFE OR EPDM SEATS SUITABLE FOR THE SERVICE INTENDED.
  - THE PRESSURE CLASSIFICATION FOR VALVES SPECIFIED HEREIN ARE WORKING STEAM OR WATER, OIL, GAS (WOG) PRESSURE RATINGS.
  - LEVER HANDLES ON ALL VALVES SHALL BE COLOR CODED IN CONFORMANCE WITH ANSI STANDARD A-13.1.
  - SHUT-OFF VALVES ON THE INCOMING WATER SERVICE AND ON THE DISCHARGE OF THE WATER METER SHALL BE A GATE VALVE OR OTHER FULL-WAY VALVE.
- BALL VALVES (2" AND SMALLER) SHALL HAVE THREADED OR SOLDER ENDS WITH A BRONZE BODY, FULL PORT STAINLESS STEEL BALL AND STEM, RPTFE SEATS, A LEVER HANDLE WITH A 1 1/4 INCH ZINC PLATED CARBON STEEL STEM EXTENSION ASSEMBLY AND BE RATED FOR 600 PSI WOG. BALL VALVES SHALL BE EQUAL TO APOLLO SERIES 82LF-200.
- BALL VALVES USED TO ISOLATE EMERGENCY EQUIPMENT SHALL BE EQUIPPED WITH A "LATCH
- BUTTERFLY VALVES, 2.5 INCHES AND LARGER: APOLLO LUG TYPE MODEL 143, CAST IRON BODY, EPDM OR BUNA-N SEAT, 10 POSITION LEVER HANDLE.
- DRAIN VALVES: APOLLO 70LF-100-HC SERIES 3/4 INCH ALL BRONZE HOSE END BALL VALVE WITH CAP AND CHAIN, PROVIDE HOSE END VACUUM BREAKER.
- BALANCING VALVES FOR THE DOMESTIC HOT WATER SYSTEM SHALL BE OF ALL LEAD FREE NSF 61 BRONZE BODY/BRASS BALL CONSTRUCTION, WITH DIFFERENTIAL READ OUT PORTS, MEMORY STOP WITH CALIBRATED NAMEPLATE, AND DRAIN PORT. BY TACO ACCU-FLO WITH PRESSURE GAUGE DUAL READOUT METER (NO. 779), BELL & GOSSETT CIRCUIT SETTER PLUS, WATTS SERIES G5M-61-M1 OR CIRCUIT SOLVER CSUA ASSEMBLY WITH THERMOMETER. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.
- VALVES (NATURAL GAS)
  - GENERAL - VALVES IN THE GAS PIPING SYSTEM SHALL BE AS MANUFACTURED BY APOLLO, MILWAUKEE, NIBCO, WALWORTH MILLIKEN OR NORDSTROM.
  - FOR PIPE SIZES 2-INCH AND SMALLER: VALVES SHALL BE BRONZE BODY, UL LISTED GAS SERVICE BALL VALVE WITH SCREWED END T-HANDLE, AND RATED FOR 250 PSIG LP-GAS. GAS VALVE SHALL BE EQUAL TO APOLLO 80-100 SERIES
  - FOR PIPE SIZES 2 1/2 INCH AND LARGER: VALVES SHALL BE AN IRON BODY LUBRICATED PLUG VALVE WITH FLANGED ENDS. VALVE SHALL BE WALWORTH 1797F OR EQUAL BY MILLIKEN VALVE CO., INC. OR NORDSTROM VALVE CO., INC.
- INSULATION:

- ALL INTERIOR COLD WATER, TEMPERED WATER, TEMPERED WATER RETURN, HOT WATER AND HOT WATER RETURN PIPING SHALL BE INSULATED WITH A PREFORMED FIBERGLASS INSULATION WHICH MEETS THE PROPERTY REQUIREMENTS OF ASTM C547, "STANDARD SPECIFICATION FOR MINERAL FIBER PIPE INSULATION". PIPE INSULATION SHALL HAVE A WHITE, FACTORY APPLIED, FIRE RETARDANT, REINFORCED VAPOR BARRIER JACKET.
  - INSULATION SHALL BE CONTINUOUS THROUGH SLEEVES AND HAVE A THICKNESS OF 1-INCH.
  - ENDS OF INSULATION AT TERMINATION POINTS SHALL BE SEALED TO THE PIPE WITH A PRE-MOLDED PVC TYPE FITTING. PIPE FITTINGS AND VALVES SHALL BE PROVIDED WITH PRE-MOLDED PVC COVERS WITH FIBERGLASS INSERTS.
  - PIPE INSULATION WITHIN 6'-0" OF FINISHED FLOOR, IN EXPOSED INSTALLATIONS, SHALL BE PROVIDED WITH 20 MIL. PVC CONTINUOUS COVERS IN ADDITION TO THE VAPOR BARRIER JACKET. FITTINGS AND SEAMS SHALL BE SOLVENT WELDED.
  - INSULATION SHALL BE MANUFACTURED BY OWENS-CORNING FIBER GLASS CORP., KNAUF FIBERGLASS, CERTAINTED OR EQUAL.
- DOMESTIC WATER SOTRAGE TANKS:

THE STORAGE TANK SHALL BE A LOCHINVAR LOCK-TEMP "ENERGY SAVER" TANK, MODEL RJA-200 OR EQUAL BY A.O. SMITH OR BRADFORD WHITEWIT VERTICAL CONSTRUCTION HAVING A STORAGE CAPACITY OF 200 GALLONS. THE TANK SHALL BE CONSTRUCTED WITH AN INNER CHAMBER BAFFLE DESIGNED TO RECEIVE ALL CIRCULATION TO AND FROM THE WATER HEATER TO ELIMINATE TURBULENCE IN THE TANK. THE BAFFLED TANK SHALL SUPPLY 80% OF TANK CAPACITY WITHOUT A DROP IN OUTLET TEMPERATURE, REGARDLESS OF RATE OF DRAW.

THE STORAGE TANK SHALL BE CONSTRUCTED IN ACCORDANCE WITH (STANDARD) (ASME BOILER AND PRESSURE VESSEL CODE) REQUIREMENTS, (IF ASME - "HLW" STAMPED AND REGISTERED WITH THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS). THE TANK SHALL BE FURNISHED WITH THE FOLLOWING CONNECTIONS: TWO 2-1/2" NPT DIELECTRIC CIRCULATING CONNECTIONS, ONE 2" NPT DIELECTRIC HOT WATER OUTLET, ONE 1-1/4" NPT RELIEF VALVE CONNECTION, ONE 3/4" NPT AQUASTAT OPENING AND ONE 1" NPT DRAIN CONNECTION.

THE STORAGE TANK SHALL HAVE A WORKING PRESSURE OF 150 PSI. THE INTERIOR OF THE STORAGE TANK SHALL BE GLASS LINED AND FIRED TO 1600º F TO ENSURE A MOLECULAR FUSING OF GLASS AND STEEL. FURNISHED WITH MAGNESIUM ANODES AND CARRY A FIVE (5) YEAR LIMITED WARRANTY.

THE STORAGE TANK SHALL BE CONSTRUCTED WITH A HEAVY GAUGE GALVANIZED STEEL JACKET ASSEMBLY, PRIMED AND PRE-PAINTED ON BOTH SIDES WITH A MINIMUM DRY FILM THICKNESS OF 0.70 MILLS. THE STORAGE TANK SHALL BE COMPLETELY ENCASED IN A MINIMUM OF 2" THICK, HIGH DENSITY POLYURETHANE FOAM INSULATION TO MEET THE ENERGY EFFICIENCY REQUIREMENTS OF THE LATEST EDITION OF THE ASHRAE 90.1 STANDARD.

THE JACKET DIMENSIONS SHALL BE 32" WIDE, 32" DEEP AND 71.25" HIGH.

STORAGE TANKS SHALL BE FURNISHED WITH A MANWAY FOR EASE OF INSPECTION, CLEANOUT, AND SERVICE.

- HANGERS, ANCHORS, CLAMPS AND INSERTS:
  - HANGERS SHALL BE INSTALLED, AS REQUIRED, TO MEET CODE COMPLIANCE AS TO LOCATION/SPACING AND MANUFACTURER'S STANDARDIZATION SOCIETY (MSS), STANDARD PRACTICE BULLETINS SP-58 & 69.
  - HANGER MATERIAL SHALL BE COMPATIBLE WITH PIPING MATERIALS WITH WHICH IT COMES INTO CONTACT.
  - HANGERS SHALL BE INSTALLED, IN ADDITION TO THE ABOVE, AT ALL CHANGES OF DIRECTION (HORIZONTAL AND VERTICAL), VALVES AND EQUIPMENT CONNECTIONS. HANGERS SHALL BE LOCATED SO THAT THEIR REMOVAL IS NOT REQUIRED TO SERVICE, ASSEMBLE OR REMOVE EQUIPMENT.

REVISIONS

▲ DATE	DESCRIPTION
2023-04-03	OWNER'S REVIEW 75% CD'S
2023-05-05	CONSTRUCTION DOCUMENTS

SEAL

PROJECT

NUMBER 0230060  
  
DATE 05 MAY 2023

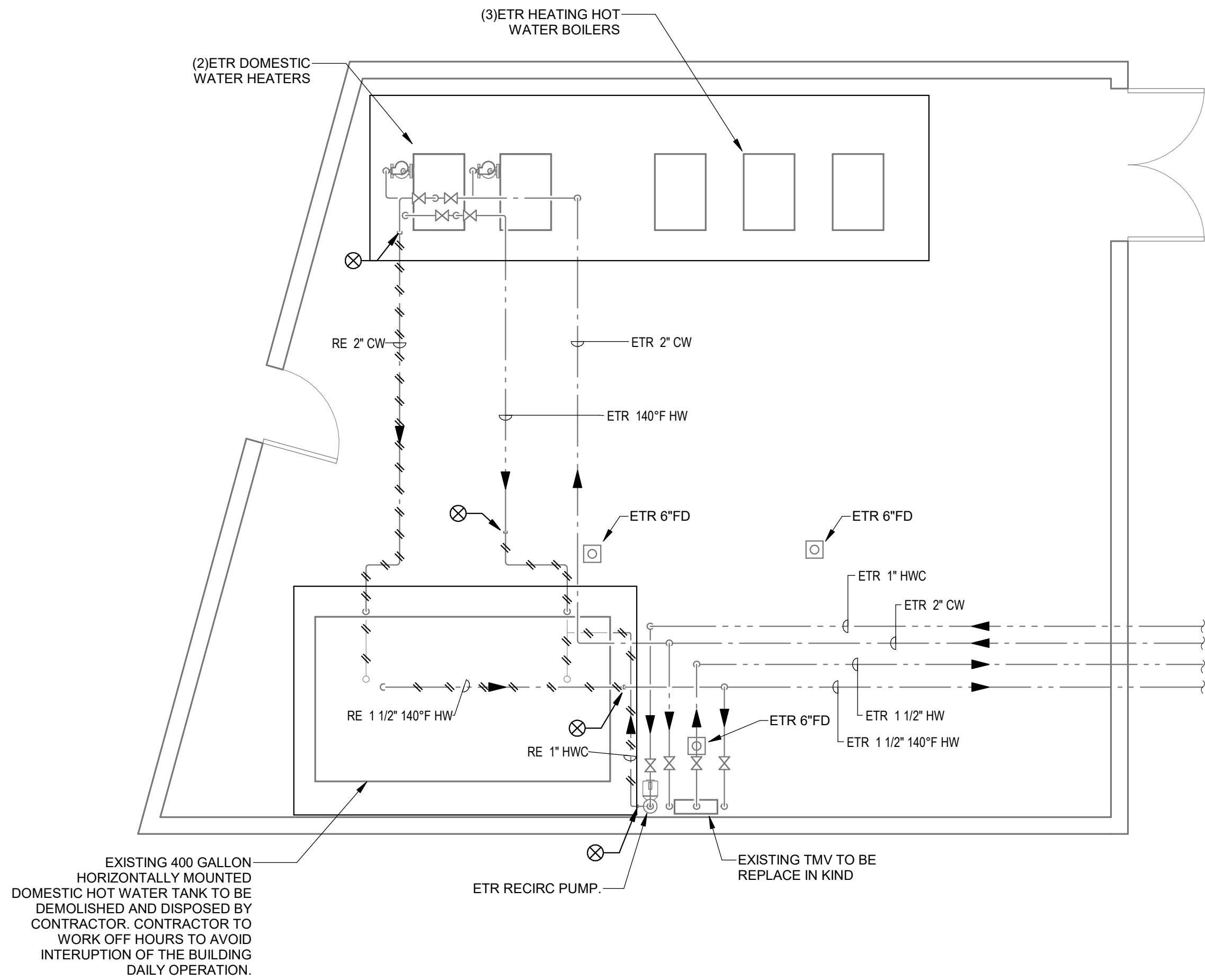
WORCESTER  
DCU CENTER  
DHW TANK

50 FOSTER STREET  
WORCESSTER, MA 01608

DRAWINGS

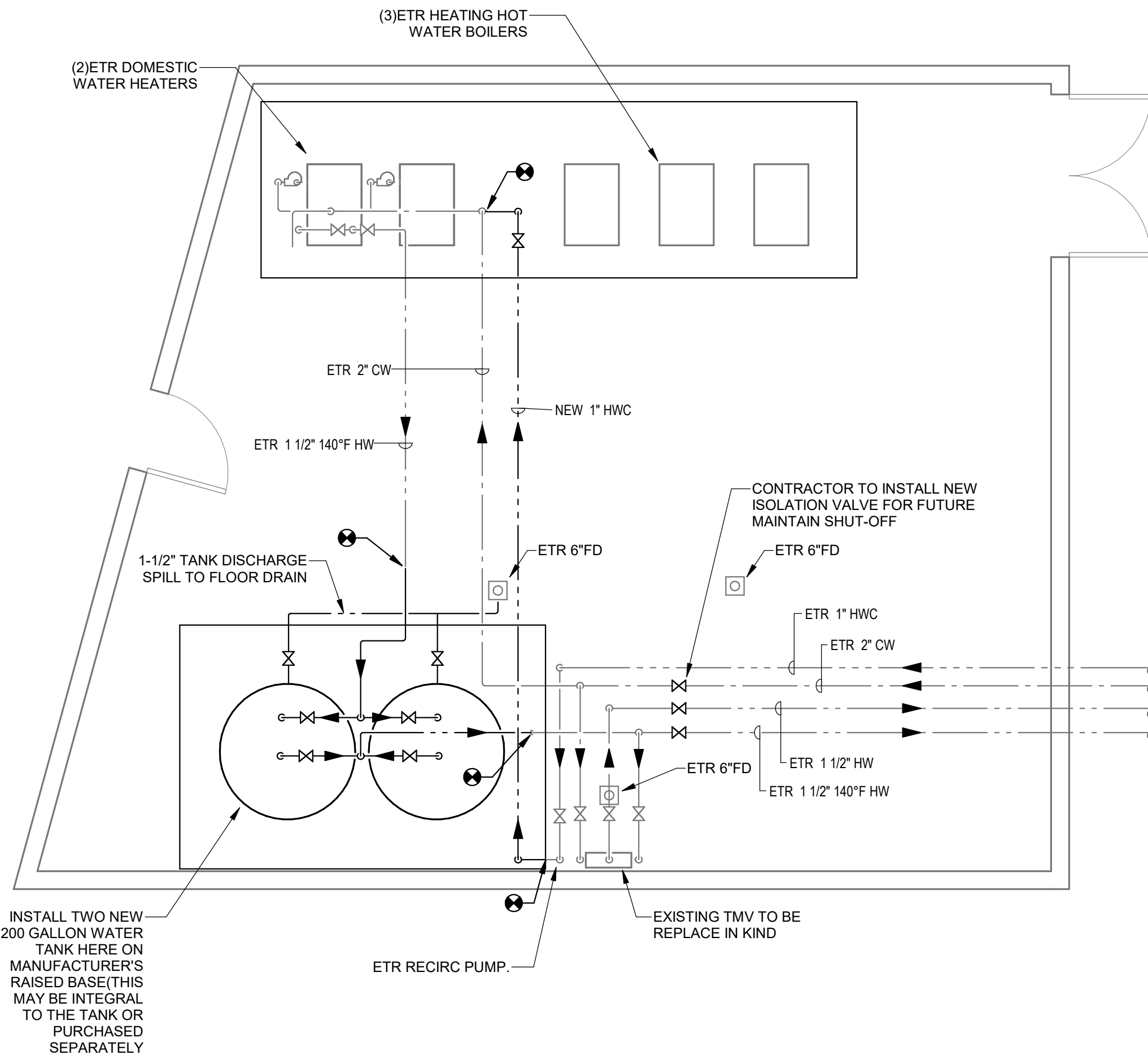
DRAWN BY EK  
CHECKED BY JS  
SCALE 1/4" = 1'-0"

PLUMBING  
PART PLAN



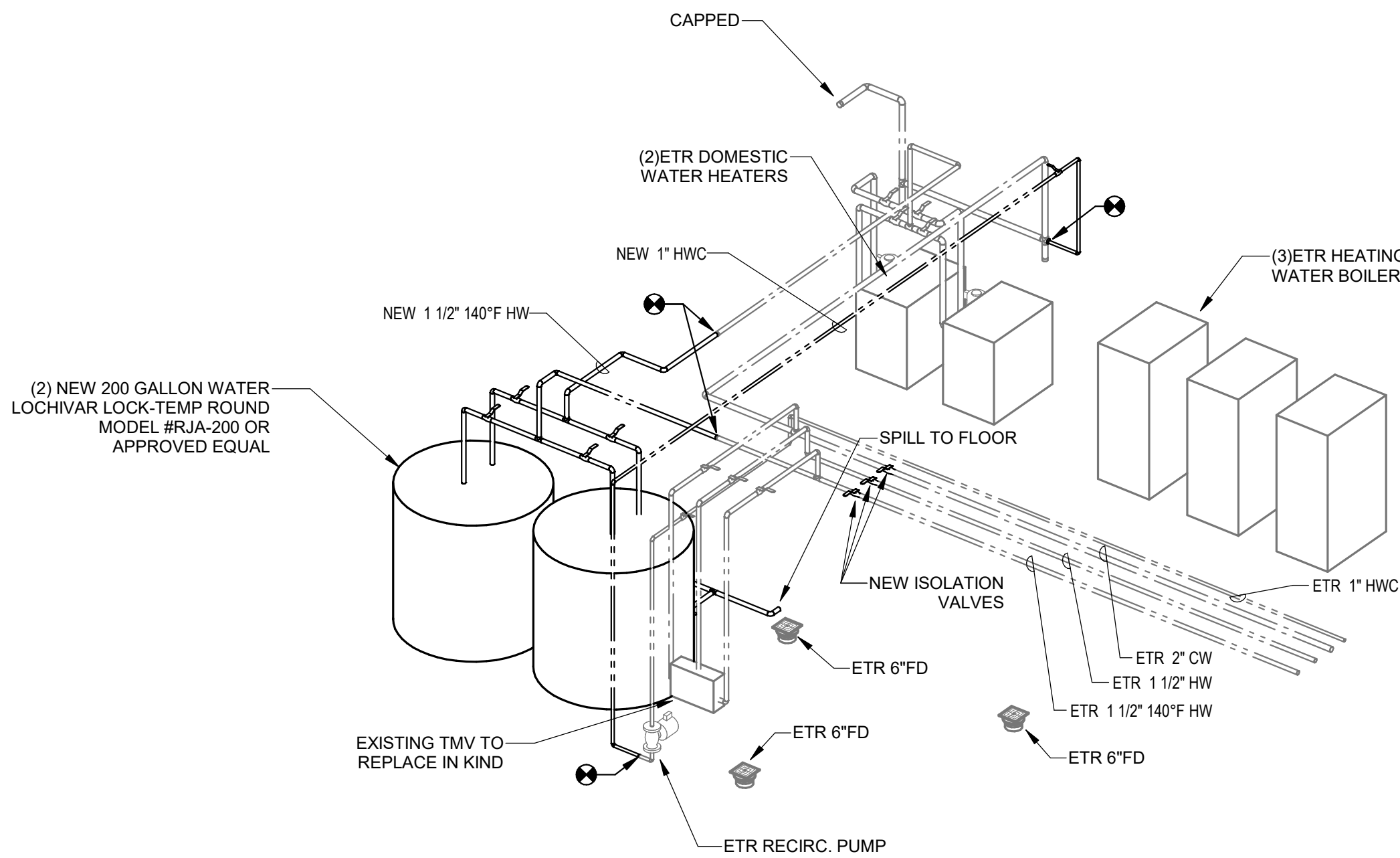
2 PLUMBING PLAN - BASEMENT DEMO - BOILER ROOM ENLARGED PLAN

P1.00 1/4" = 1'-0"



1 PLUMBING PLAN - BASEMENT NEW - BOILER ROOM ENLARGED PLAN

P1.00 1/4" = 1'-0"



3 NEW PLUMBING - ISOMETRIC RISER DIAGRAM

P1.00

GENERAL NOTE:  
  
1. CONTRACTOR SHALL PROVIDE MEANS AND METHODS TO ENSURE BUILDING DOMESTIC HOT WATER SUPPLY IS MAINTAINED. MEANS AND METHODS MAY INCLUDE BUT ARE NOT LIMITED TO OFF HOURS WORK, PRE-FABRICATION OF PIPING ASSEMBLIES, OR TEMPORARY POTABLE WATER HOSE BEARING NSF LISTING AND RATED TO 150 F OR MORE.



1/4" = 1' - 0" 0 4' 8'