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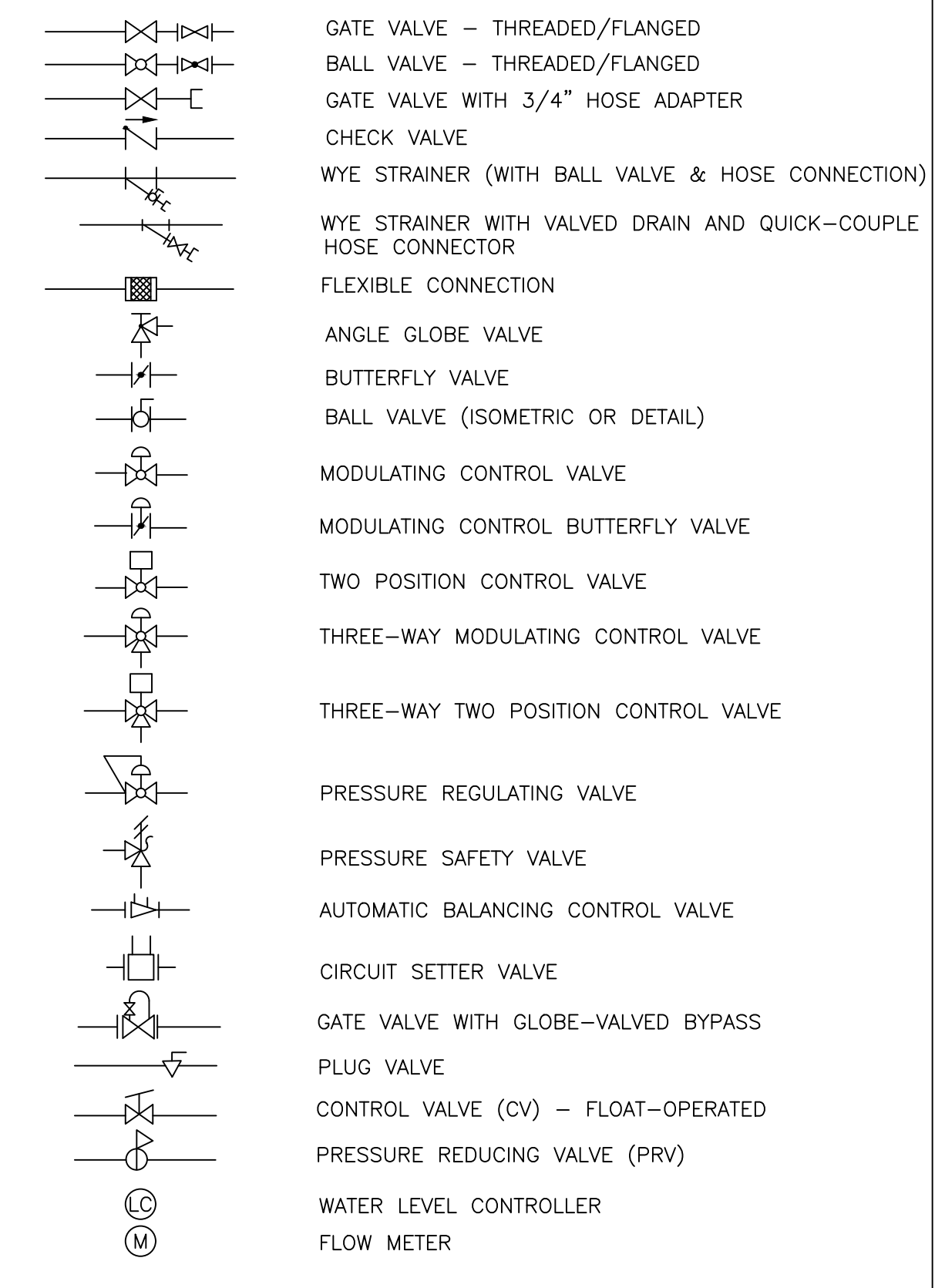
ABBREVIATIONS

(NOT ALL SYMBOLS WILL APPLY TO THIS WORK)

Table of abbreviations including Architect/Engineer, Area Drain, Above Finish Floor, Air Gas, Access Panel, Automatic Sprinkler, Adjustable Speed Drives, Automatic Sprinkler Drain, American Society Heating, Refrigeration, Air Conditioning Engineers, American Society Mechanical Engineers, American Society Plumbing Engineers, Automatic Sprinkler Riser, Acid Vent, Acid Waste, Reduced Pressure Backflow Preventer, Break Horsepower, Black Steel Pipe, Bathtub, British Thermal Unit, British Thermal Unit per Hour, Celsius, Condensate Drain, Compressed Gas Association, Cast Iron, Cleanout, Clinical Sink, Control Valve, Existing Item to be Demolished, Domestic Cold Water, Domestic Hot Water, Domestic Hot Water Return, Domestic Water Return, Domestic Hot Water Supply, Deionized Water, Down, Department of Energy, Downspout, Dishwasher, Drawing, Domestic Water Heater, Drinking Water Return, Drinking Water Supply, Drain Waste Vent, Existing Item to Remain, Elevation, Energy Monoserrat and Central System, Environmental Protection Agency, Energy Policy Act, Escutcheon, Emergency Shower, Expansion Tank, Electric Water Cooler, Electric Water Cooler, Electric Water Heater, Eye Wash Station, Existing, Fahrenheit, Floor Cleanout, Filtered Cold Water, Floor Drain, Fire Department (Hose) Connection, Flow Meter, Fuel Oil Pump, Fuel Oil Return, Fuel Oil Supply, Fuel Oil Vent, Floor Sink, Flow Switch, Fixture Units, Gallon, Grade Cleanouts, Gallons per Day, Gallons per Hour, Gallons per Minute, Gas Pressure Regulator, Gas Regulator Station, Grease Trap, Gas Vent Through Roof, Gas Fired Water Heater, Hot and Cold Water, Hose Bibb, Hub Drain, Heat Exchanger, Horsepower, Hand Sink, Hot Water Storage Tank (Domestic), Hot Water Boiler, Hot Water Circulating Pump, Hot Water Pump, Hydrant, Industrial Cold Water, Invert, International Plumbing Code, Irrigation Water, Indirect Waste, Instantaneous Water Heater, Industrial Water Return, Industrial Water Supply, Kilowatt, Kilowatt-hour, Liter per Second, Laboratory Air, Lavatory, Pounds per Hour, Laboratory Cold Water, Laboratory Hot Water, Liquid Natural Gas, Liquid Oxygen, Laboratory Vacuum, Low Water, Meter, Medical Air, Manual Air Vent, Manual, Medical, Mechanical Equipment Room, Manhole, Memorandum of Understanding, Mop Service Basin, Medical Vacuum, Nitrogen, Nitrous Oxide, Normally Closed, Natural Gas, Not in Contract, Normally Open, Nominal, Non Potable Water, Not to Scale.

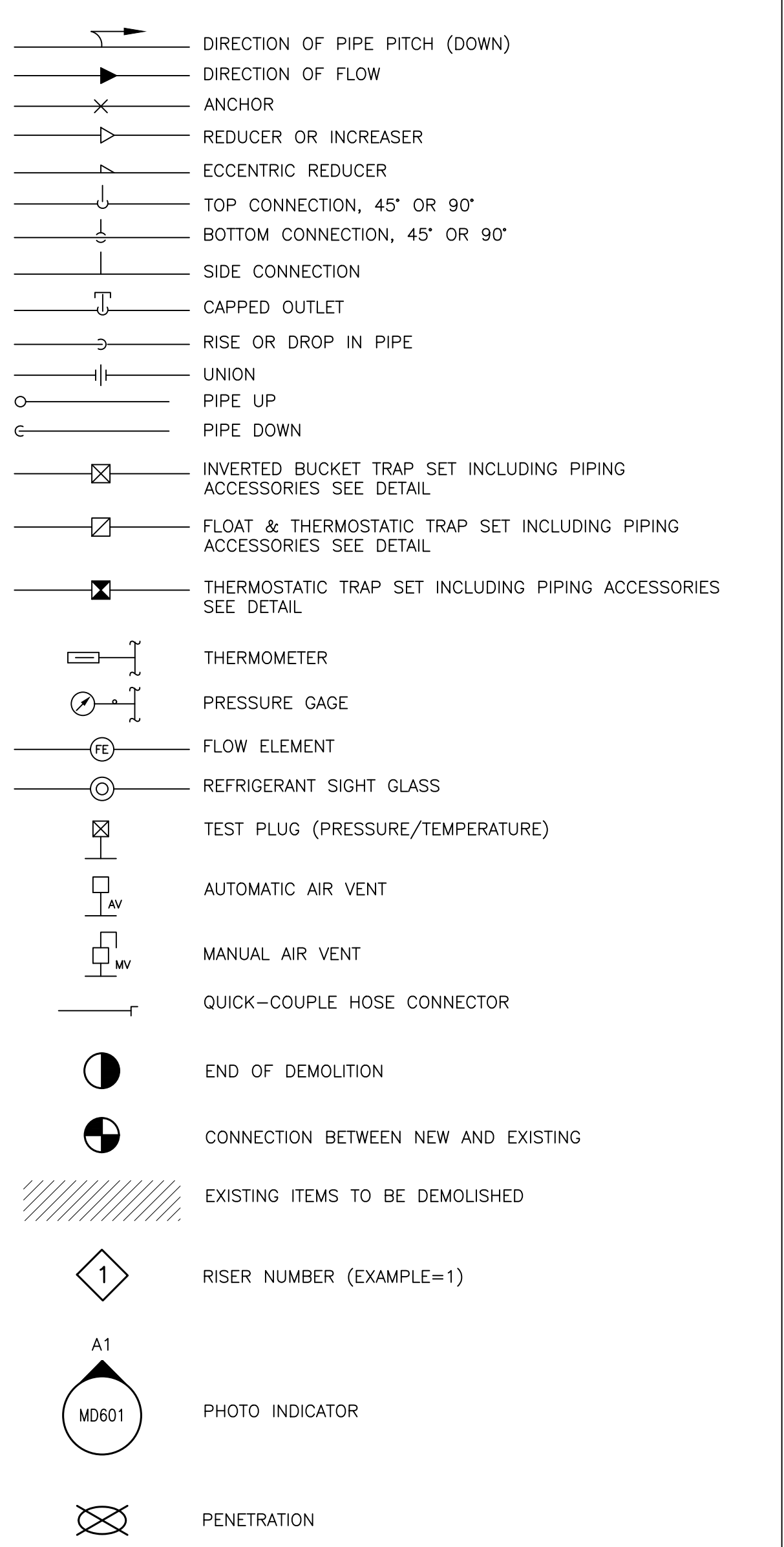
VALVE SYMBOLS

(NOT ALL SYMBOLS WILL APPLY TO THIS WORK)



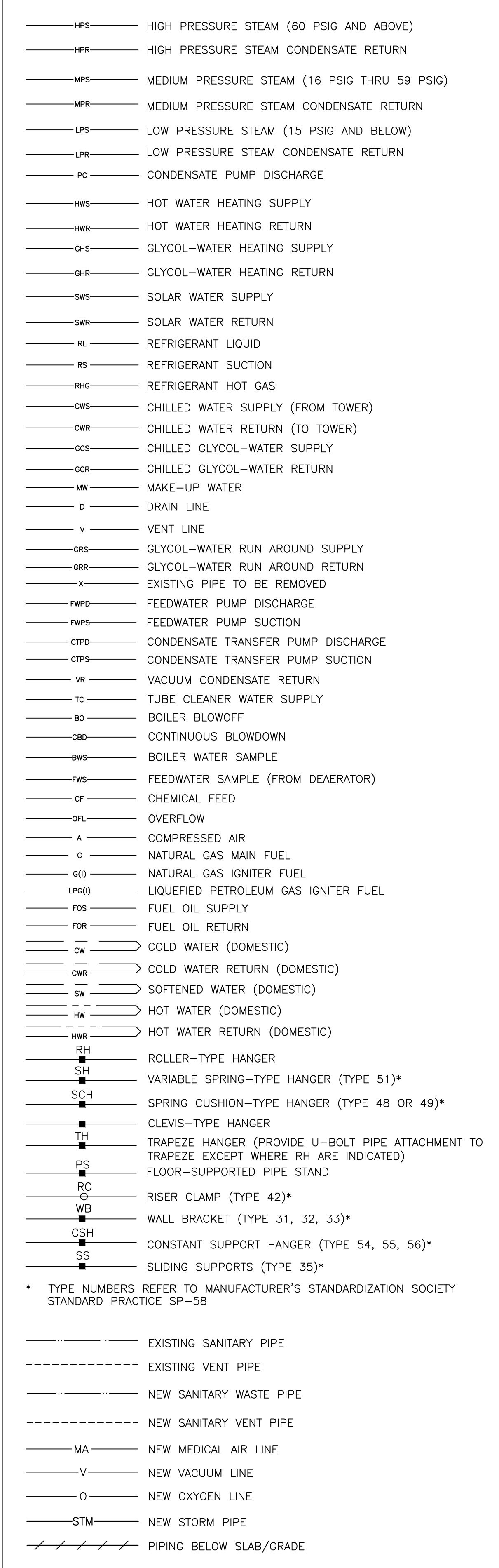
GENERAL PIPING SYMBOLS

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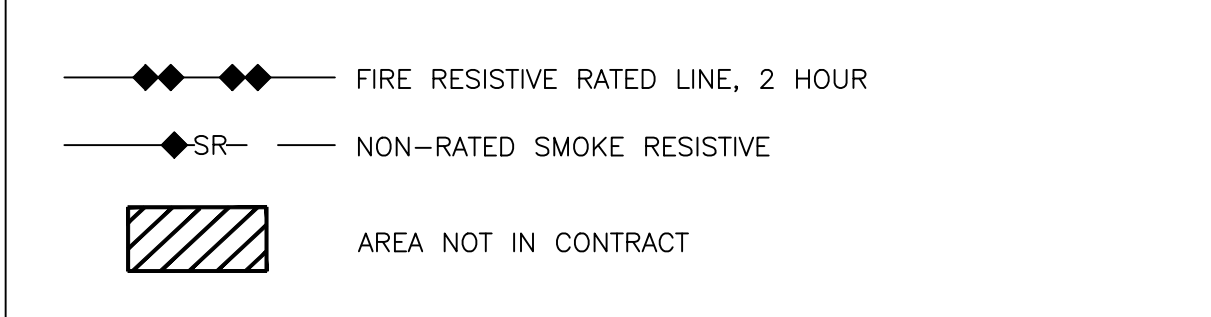
PIPING SYMBOLS

(NOT ALL SYMBOLS WILL APPLY TO THIS WORK)



ARCHITECTURAL LEGEND

(REFER ARCHITECTURAL DRAWINGS FOR LOCATIONS AND DETAILS)



EXECUTION

- 1. LAYOUT PLUMBING
a. PRIOR TO INSTALLATION, LAYOUT ALL PLUMBING WORK IN A MANNER THAT WILL ALLOW INSTALLATION OF ALL OTHER WORK INDICATED.
b. COORDINATE AND COMMUNICATE INSTALLATION OF PLUMBING WORK WITH THAT OF OTHER TRADES, SO THAT ALL WORK MAY BE INSTALLED IN SPACE AVAILABLE.
c. PROVIDE ALL ADA INSULATION PROTECTION AS REQUIRED.
2. EQUIPMENT:
a. INSTALL ALL MATERIAL AND EQUIPMENT IN A NEAT AND WORK-MANLIKE MANNER IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND PROVIDE FOR THE FOLLOWING:
i. CONNECTION OF PIPING AND ACCESSORIES TO EQUIPMENT SHALL PERMIT EASY REMOVAL WITH MINIMUM OF DISTURBANCE TO OTHER EQUIPMENT AND MATERIALS.
ii. ITEMS REQUIRING INSPECTION, ADJUSTMENT, MAINTENANCE, SERVICING OR REPLACEMENT SHALL BE EASILY ACCESSIBLE.
b. SLEEVE TO BE INSTALLED (2" MINIMUM AFF) FOR ALL PENETRATIONS.

TESTS AND INSPECTIONS

- 1. DOMESTIC WATER SYSTEM - STERILIZE THE ENTIRE WATER DISTRIBUTION SYSTEM THOROUGHLY WITH A SOLUTION CONTAINING NOT LESS THAN 50 PARTS PER MILLION OF AVAILABLE CHLORINE. USE EITHER LIQUID CHLORINE OR CALCIUM HYPOCHLORITE CONFORMING TO FEDERAL SPECIFICATIONS. ALLOW THE STERILIZING SOLUTION TO REMAIN IN THE SYSTEM FOR EIGHT HOURS, DURING WHICH TIME ALL VALVES AND FAUCETS SHALL BE OPENED AND CLOSED SEVERAL TIMES. AFTER STERILIZATION, THE SOLUTION SHALL BE FLUSHED FROM THE SYSTEM WITH CLEAN WATER UNTIL THE RESIDUAL CHLORINE CONTENT IS NOT GREATER THAN 0.2 PARTS PER MILLION UNLESS DIRECTED OTHERWISE. TEST SYSTEM HYDROSTATICALLY AT 100 PSIG MINIMUM FOR A PERIOD OF 24 HOURS WITH A PRESSURE LOSS NOT TO EXCEED 1 PSIG.
2. SANITARY DRAINAGE SYSTEM - SHALL BE WATER TESTED BEFORE FINAL CONNECTION TO THE SANITARY SEWER. ALL OPENINGS SHALL BE PLUGGED EXCEPT THE HIGHEST OPENING WHICH SHALL PRODUCE A MINIMUM OF A 10 FOOT HEAD. THE SYSTEM SHALL RETAIN THE WATER LEVEL FOR AT LEAST 15 MINUTES AT WHICH TIME ALL JOINTS SHALL BE INSPECTED AND ALL OBSERVED LEAKS CORRECTED.
3. FINAL INSPECTION - BEFORE FINAL INSPECTION, CERTIFY IN WRITING THAT ALL SYSTEMS ARE INSTALLED, ADJUSTED, TESTED AND READY FOR USE.

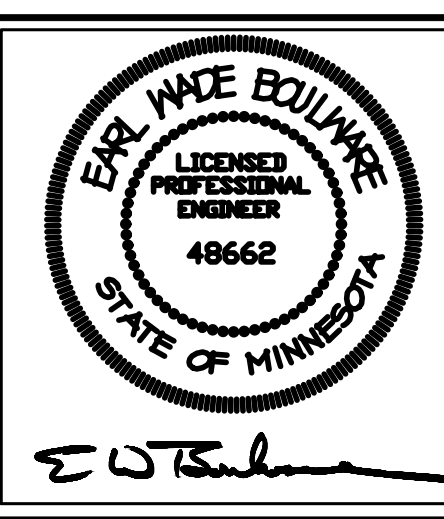
GENERAL NOTES

- 1. DRAWINGS:
a. PLUMBING DRAWINGS ARE TO BE CONSIDERED DIAGRAMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK AND SYSTEMS. IT IS NOT POSSIBLE TO INDICATE EVERY FITTING, VALVE, OFFSET, TRAP, ACCESS PANEL, ETC. THAT IS REQUIRED FOR A PROPER WORKING SYSTEM AND MAINTENANCE THEREOF. NO ADDITIONAL COST WILL BE ALLOWED FOR SUCH ITEMS.
b. FOR EXISTING SYSTEMS, ALL LINES AND CONDITIONS SHOWN ON THE DRAWING HAVE BEEN SHOWN IN GOOD FAITH. HOWEVER, THERE IS NO IMPLIED GUARANTEE AS TO THEIR SIZE, LOCATION, ELEVATION, COMPLIANCE WITH CURRENT CODES OR CONDITIONS. THE CONTRACTOR SHALL INVESTIGATE ALL EXISTING CONDITIONS AND SHALL MODIFY THE PROPOSED WORK AS REQUIRED OR DIRECTED.
c. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT EQUIPMENT LOCATIONS, ETC. AND OTHER SPACE CONDITIONS. CHECK DRAWINGS OF OTHER TRADES TO COORDINATE PLUMBING WORK.
2. FEES/INSPECTIONS:
a. PAY ALL FEES AND ARRANGE FOR ALL INSPECTIONS. SUCH INSPECTIONS ARE TO BE CONDUCTED BY AUTHORITIES HAVING JURISDICTION, ADVISE THE CORP.G. OF ANY MODIFICATION TO OR DEVIATION FROM THE CONTRACT DOCUMENTS IN ORDER TO COMPLY WITH CODES. ENTERING INTO A CONTRACT WILL BE DEEMED AS EVIDENCE OF COMPLIANCE WITH THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION OVER THE WORK.
3. QUALITY ASSURANCE:
a. ALL PLUMBING WORK SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AS WELL AS ALL UTILITY COMPANY REGULATIONS. THESE CODES SHALL SUPERCEDE ANY INFORMATION CONTAINED WITHIN THE DRAWING SET CONTRADICTING THESE CODES.
b. EACH PIECE OF EQUIPMENT SHALL HAVE MANUFACTURER'S NAME, ADDRESS, SERIAL, AND MODEL NUMBERS ON A PLATE SECURELY ATTACHED TO IT.
c. ALL PIPING ABOVE GRADE SHALL HAVE AN EXPOSED TAG TO IDENTIFY THE PIPE.
d. EACH PIECE OF EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR AS INDICATED ON PLANS.
e. ALL PLUMBING WORK SHALL BE PERFORMED BY INDIVIDUALS SKILLED IN THIS TRADE AND COMPLETED IN A PROFESSIONAL MANNER.
f. EACH PIECE OF EQUIPMENT SHALL BE INSTALLED AS FREE FROM NOISE AND VIBRATION AS POSSIBLE.
4. EQUIPMENT DELIVERY AND STORAGE:
a. DELIVER EQUIPMENT TO THE SITE IN MANUFACTURER'S ORIGINAL PACKAGING. CLEARLY MARK EACH ITEM WITH THE PROPER IDENTIFICATION NUMBER. STORE IN SAFE DRY AREA.
PRODUCTS/MATERIALS
1. PLUMBING FIXTURES/EQUIPMENT
a. ALL PLUMBING FIXTURES/EQUIPMENT SHALL BE AS INDICATED ON THE FIXTURE SCHEDULE AND IN SPECIFICATIONS.

Table with 2 columns: Revisions, Date. Row 1: ADDENDUM 1 - BID AND CONSTRUCTION DOCUMENTS, 05/29/20. Row 2: Revisions, Date.

CONSULTANTS: DAE DESIGN-AIRE ENGINEERING, INC. 220 North College Avenue, Indianapolis, Indiana 46202. Voice: (317) 464-9090, Fax: (317) 464-9393. Website: www.daengineering.com, Email: dae@design-aire.com. Mechanical, Electrical, and Energy Engineering.

ARCHITECT/ENGINEERS: paradigm Architecture | Engineering | Design-Build. 200 Envoy Circle #201, Louisville KY 40299 - PH: 502.339.8511 - www.paradigmusa.com.



Drawing Title: PLUMBING SYMBOLS AND SCHEDULES. Approved Project Director: [Signature].

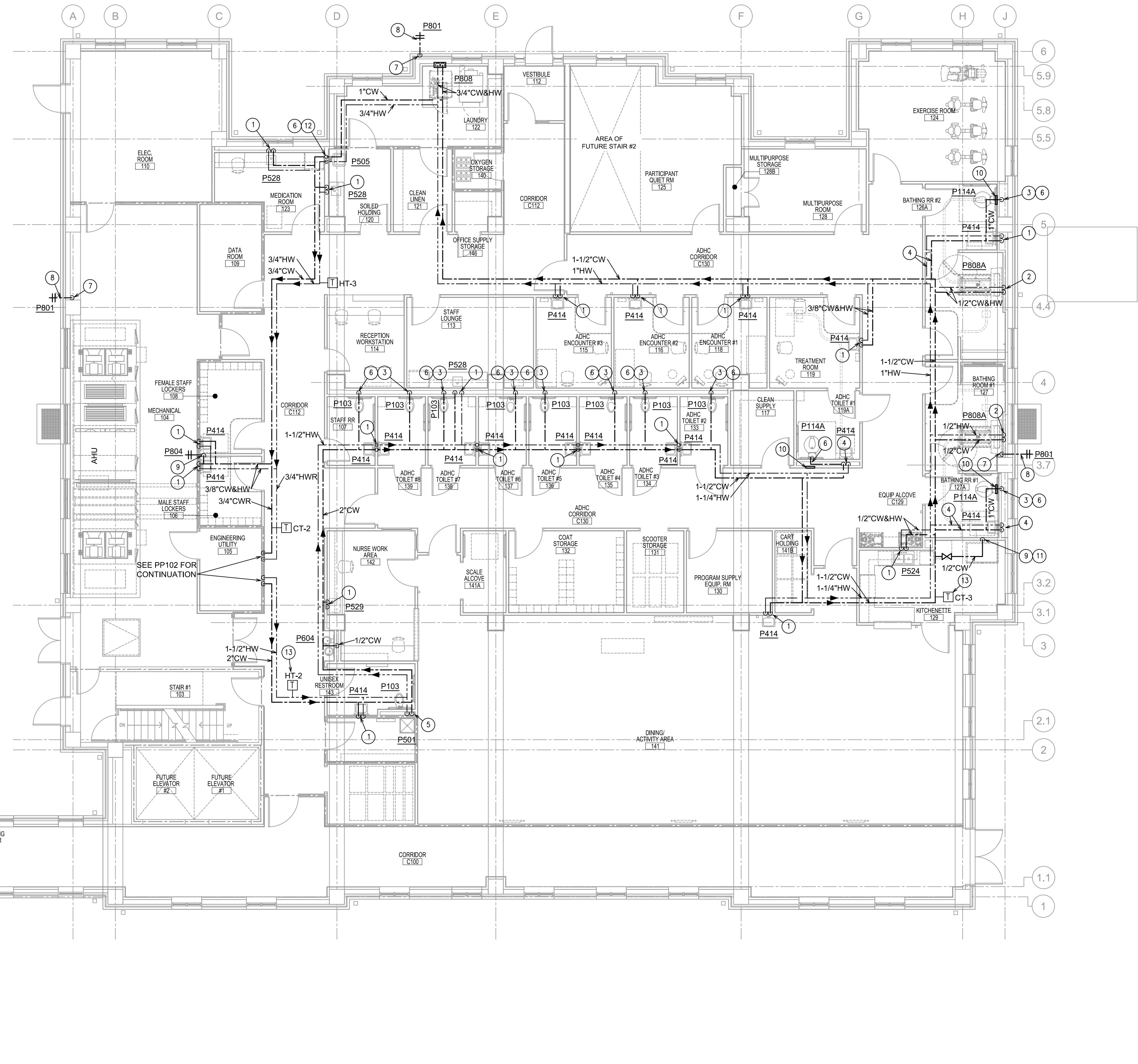
Project Title: ST CLOUD ADH AND EC SUPPORT. Project Number: 656-343. Building Number: ---. Location: ST CLOUD VA HEALTH CARE SYSTEM, 4801 VETERANS DRIVE, ST. CLOUD MN 56303. Date: 12-27-2019. Checked: DEH, Drawn: JMS. Drawing Number: P-001.

Office of Construction and Facilities Management, Department of Veterans Affairs. FULLY SPRINKLED BID DOCUMENTS FOR CONSTRUCTION.

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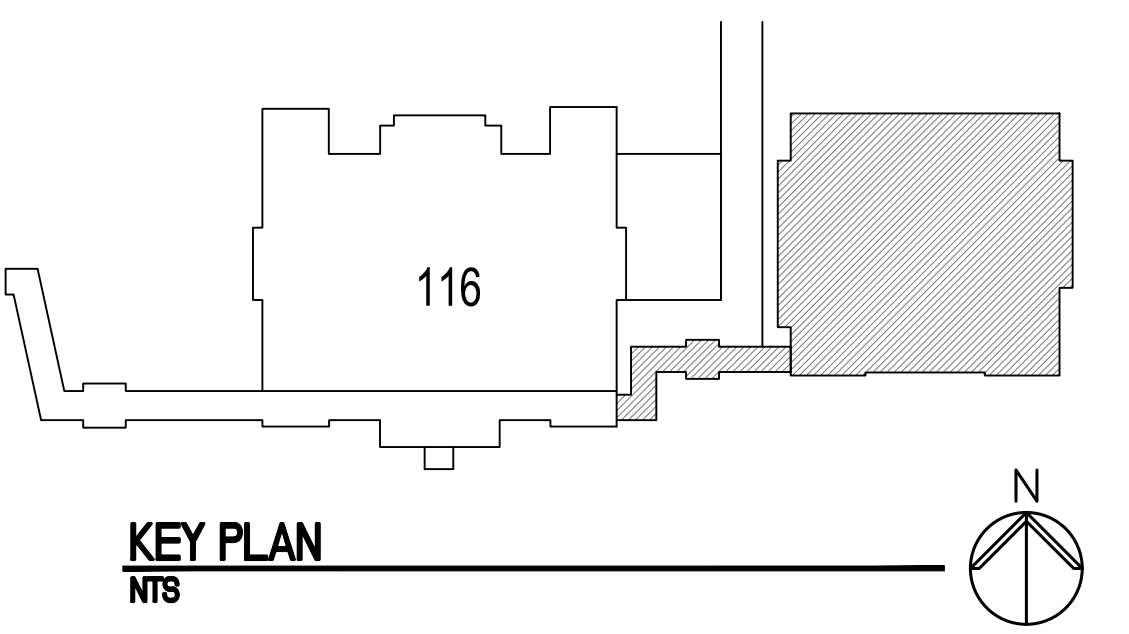


B2 NON-POTABLE SIGN NT&



- GENERAL NOTES:**
- A. ALL WASTE PIPING SHOWN IS LOCATED BELOW FINISHED FLOOR UNLESS NOTED OTHERWISE. ALL VENT GAS AND WATER PIPING SHOWN ARE LOCATED ABOVE FINISHED FLOOR/CEILING.
 - B. CONTRACT DOCUMENTS CONSIST OF BOTH THE PROJECT MANUAL AND DRAWINGS, AND BOTH ARE INTENDED TO BE COMPLEMENTARY - ANYTHING APPEARING ON EITHER MUST BE EXECUTED THE SAME AS IF SHOWN ON BOTH.
 - C. THE CONTRACTOR SHALL INCLUDE IN BID PROPOSAL ALL COSTS REQUIRED TO COMPLETELY AND PROPERLY INSTALL ALL WORK REQUIRED FOR THE PROJECT, AND SHALL EXAMINE THE SCOPE OF WORK OF OTHER TRADES PRIOR TO SUBMITTING A BID PROPOSAL.
 - D. AFF = ABOVE FINISHED FLOOR.
 - E. PROVIDE PIPE MARKERS ON ALL PIPING; SEE SPECIFICATIONS.
 - F. FIRE CAULK WHERE REQUIRED.

- PLAN NOTES:**
- 1) 3/8" CW&HW TO FIXTURE(S), PROVIDE MIXING VALVE AT FIXTURE.
 - 2) 1/2" CW&HW TO P-808A BOX, CHANGE TO 3/4" PIPE 12" BEFORE CONNECTION BOX.
 - 3) 1" CW TO FIXTURE.
 - 4) 1" CW AND 3/8" HW, PIPE 1" CW TO W.C. AND 3/8" CW&HW TO LAV. PROVIDE MIXING VALVE AT LAV.
 - 5) 1" CW AND 1/2" HW DOWN, PIPE 1" CW TO W.C. AND 1/2" CW&HW TO MOP SINK.
 - 6) WHA-B AT THIS LOCATION.
 - 7) 1/2" CW (NON-POTABLE) DOWN; SEE SHEET PP102 FOR CONTINUATION.
 - 8) INSTALL AN OSHA CAUTION SIGN LIKE COMPLIANCE SIGNS.COM NON-POTABLE WATER DO NOT DRINK BILINGUAL SIGN OCB-4980, ALUMINUM 7"x 5"; SEE DETAIL B2/PP101. PLACE SIGN 3" ABOVE HYDRANT ON WALL.
 - 9) 1/2" CW DOWN.
 - 10) 14"x 14" HINGED STAINLESS STEEL AND LOCKABLE ACCESS PANEL FOR FLUSH VALVE.
 - 11) CONNECT TO ICE MAKER FILTER AND ICE MAKER AS REQUIRED.
 - 12) 1" CW AND 1/2" HW DOWN. PIPE 1" CW TO FLUSH VALVE AND 1/2" CW&HW TO FAUCET.
 - 13) SENSOR(S) TYPICAL. SEE SHEET PP501.



F1 DOMESTIC WATER PIPING PLAN FIRST FLOOR 1/8" = 1'-0"

FULLY SPRINKLED BID DOCUMENTS FOR CONSTRUCTION

ADDENDUM 1 - BID AND CONSTRUCTION DOCUMENTS 05/29/20 Revisions	CONSULTANTS: DESIGN-AIRE ENGINEERING, INC. 220 North College Avenue Indianapolis, Indiana 46202 voice (317) 464-9090 fax (317) 464-9393 www.daengineering.com Email: dao@design-aire.com Mechanical, Electrical, and Energy Engineering	ARCHITECT/ENGINEERS: paradigm Architecture Engineering Design-Build 200 Envoy Circle #201, Louisville KY 40299 - PH: 502.339.8511 - www.paradigmusa.com		Drawing Title DOMESTIC WATER PIPING PLAN FIRST FLOOR	Project Title ST CLOUD ADH AND EC SUPPORT	Project Number 656-343	Office of Construction and Facilities Management
	Approved Project Director 	Location ST CLOUD VA HEALTH CARE SYSTEM 4801 VETERANS DRIVE, ST. CLOUD MN 56303	Building Number ---	Date 12-27-2019	Checked DEH	Drawn JMS	

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Legionella Management Notes

- The length of branch piping from the hot water main to fixture mixing faucet shall be such that the piping will maintain a maximum of 32 oz of hot water according to the table below:

Pipe Size	Copper Type M	Copper Type L	CPVC Type K	CPVC Type B	PEX AL-PEX	PE SCH 80	PE SCH 40	PP SCH 80	PP SCH 40	PP	PP
1/2"	19.93	20.65	23.07	25.60	16.93	24.43	24.43	21.92	27.32	32.00	35.00
3/4"	9.33	9.84	11.03	13.99	8.47	8.44	8.44	11.68	13.62	13.62	15.00
1"	5.51	5.89	6.59	7.72	5.79	5.76	5.76	7.90	8.98	8.79	9.74
1 1/4"	3.66	3.89	4.36	4.84	3.51	3.77	3.77	5.38	5.51	5.51	5.98
1 1/2"	2.63	2.79	3.17	3.42	2.51	2.51	2.51	3.95	3.96	3.94	4.28
2"	1.52	1.55	1.80	2.09	1.46	1.49	1.49	2.31	2.31	2.31	2.48
- Stored Hot Water shall be maintained at 140 degrees F (60 deg. C) or higher.
- Hose-end ball valves shall be provided such that hot water distribution system may be flushed with biocide. Location of ports will be in vicinity of downstream of the hot water mixing valve and at the farthest end of the distribution system.
- Prior to use of the domestic water distribution system by the public OR if water quality test deem necessary, proper and effective shock-chlorination procedure requires:
 - A dosage of 50 to 200 ppm of free chlorine evenly distributed throughout the piping and fixtures
 - Testing of the residual to verify that the levels are present at the fixtures and hose bib or valves sections.
 - Contact time with the piping, undisturbed for 12 hours and retesting of the chlorine residual after 12 hours. 1
 - If the chlorine residual is less than 10 ppm after 12 hours, repeat the entire procedure above. If the beginning dose is 50 to 100 ppm and the remaining residual after 12 hours is less than 10 ppm, this indicates severe bio-fouling or large amounts of dirt or slime present requiring system flushing and repeating the sanitizing process.

Domestic Cold Water Sequence of Operation
(See schematic detail CA and service detail B4)

Water will flow as required for fixture use. Water temperature will be measured at a minimum of three locations: CT-1 at the meter; CT-2 on the return pipe; CT-3 near the midpoint of piping, and CT-4 at main tap in the rehab building basement.

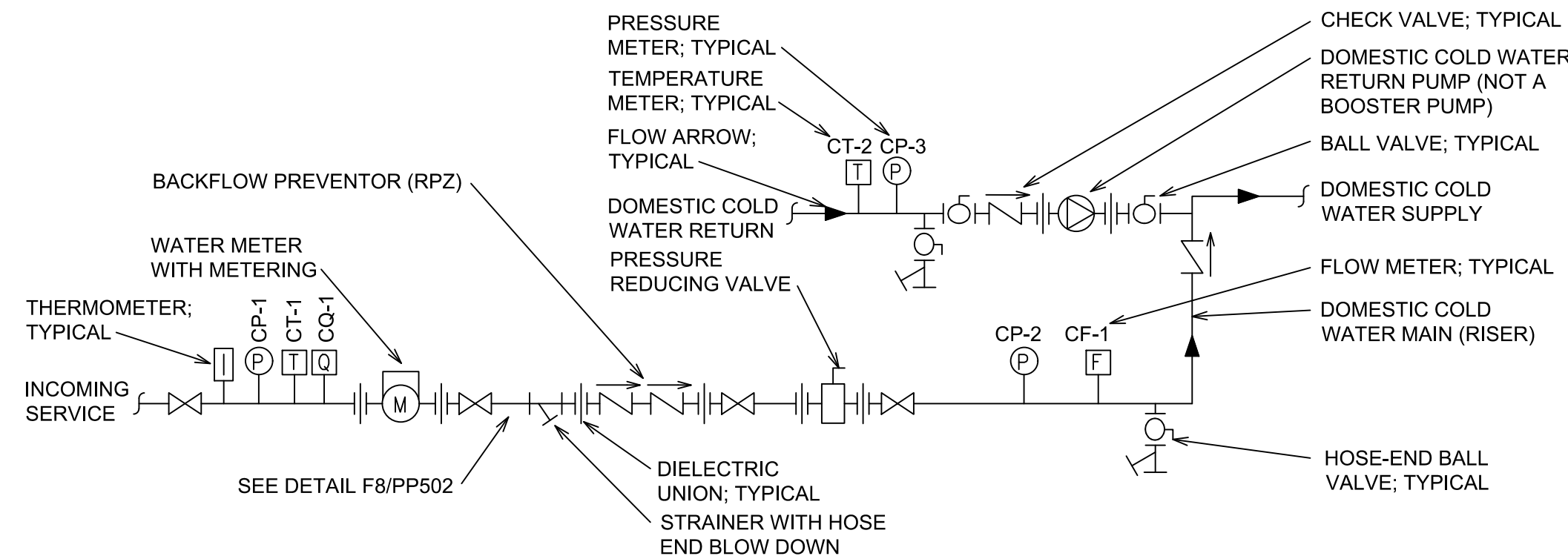
Once all fixture use has stopped as measured by flow meter CF-1, the flow meter will send a signal to the Domestic Cold Water Pump to start. Pump will circulate domestic cold water until flow meter CF-1 senses fixture usage and pump will stop.

Water pressure will be monitored at 3 locations, before and after meter/RPZ and at suction size of return pump. Water quality shall be monitored before meter, CQ-1.

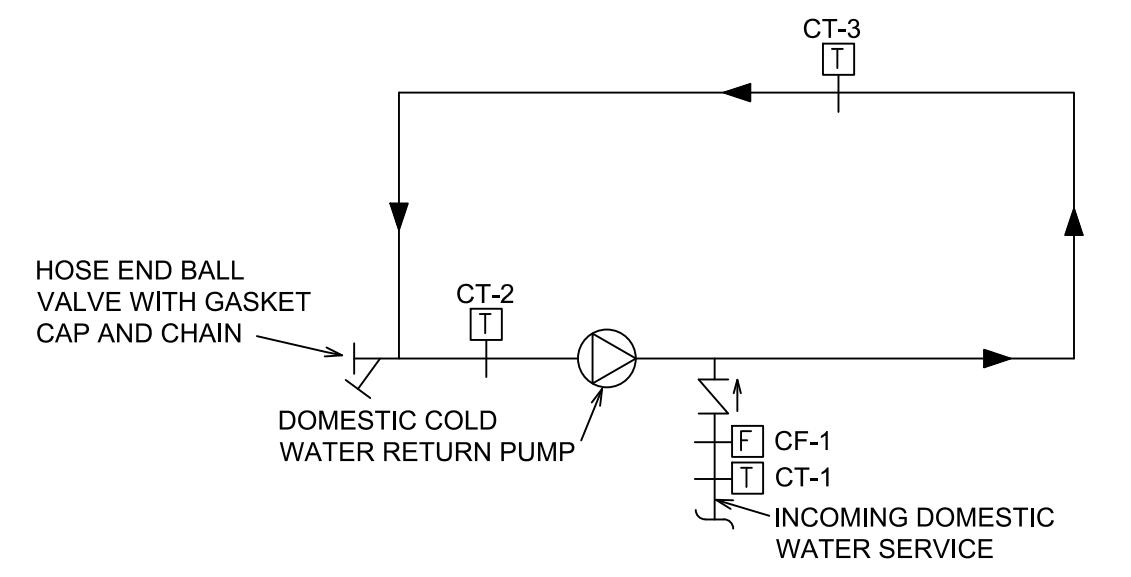
Domestic Hot Water Sequence of Operation
(SEE SCHEMATIC D4)

Water will flow as required for fixture use. Water temperature will be measured at a minimum of four locations: HT-1 near the water heating source; HT-2 after mixing valve; and HT-3 near the middle of the domestic hot water piping; and HT-4 at the farthest point from the heating source. Domestic hot water piping will be looped to feed all fixtures before returning back to the water heating source.

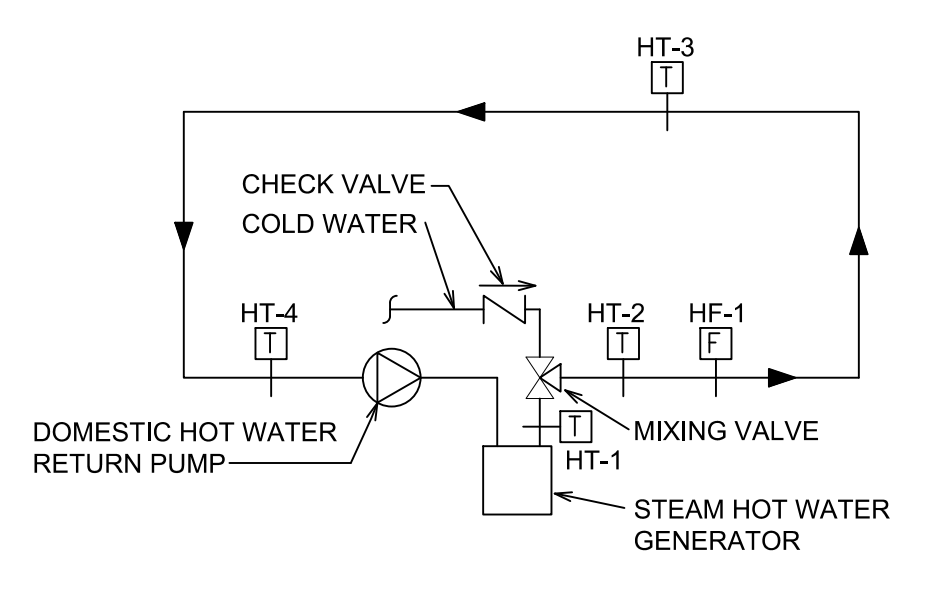
Domestic Hot Water Return Pump shall circulate hot water continuously (no shut down or aqua sensor). Water flow shall be monitored by HF-1. Once flow stops, HF-1 shall send a signal to the Building Control System indicating a flow failure.



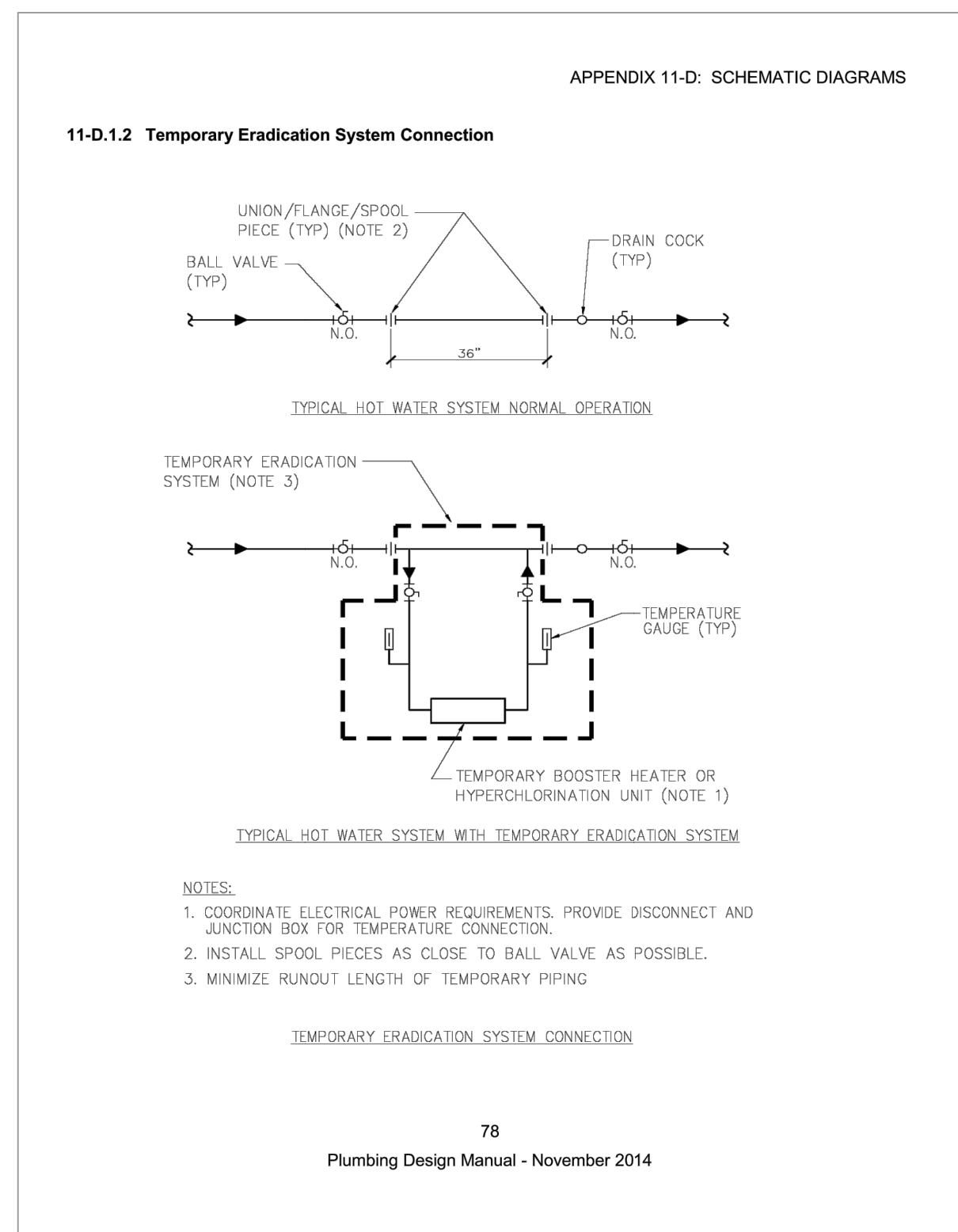
B4 BUILDING WATER SERVICE
NTS



C4 DOMESTIC COLD WATER SCHEMATIC
NTS



D4 DOMESTIC HOT WATER SCHEMATIC
NTS



F4 DOMESTIC HOT WATER SCHEMATIC
NTS

Purpose
Veterans Health Administration (VHA) Policy establishes guidelines for the prevention and control of healthcare-associated Legionella disease in VHA buildings.

The efficacy of biocides on suppressing or killing waterborne pathogens is dependent on multiple factors such as water quality, organic and inorganic contaminants, pH levels, disinfectant concentrations, and contact time. Water entering the building shall be continuously monitored for the following by means of gauges, sensors, and a grab sample port:

Temperature, Oxidant level (water disinfectant), pH, and Pressure

Water systems within the building shall be monitored as follows in the table below. Temperature and oxidant levels are the two primary engineering controls to limit bacterial growth. Oxidant levels shall be measured continuously as water enters the building and through grab samples taken from building plumbing fixtures. Temperature shall be measured throughout the domestic water system (hot and cold). In addition to being a primary control measure, temperature can be a secondary indicator of flow since temperature of stagnant water will lower for hot water and rise for cold water.

Background
Legionella is a bacterium that causes respiratory diseases collectively referred to as Legionellosis that includes Legionnaire pneumonia, Legionnaire pneumonia is also known as Legionnaires Disease (LD). Legionella bacteria are found naturally in water and have been associated with disease from building water distribution systems. LD occurs after inhalation or aspiration of contaminated water. Legionella bacteria are not transmitted from person to person. The elderly and persons with immune compromised systems are most at risk. Legionella bacteria growth increases in tepid water in a range from 20 deg C (68 deg F) to 50 deg C (123 deg F).

Given the various factors and complexities associated with LD, 100% prevention of LD is likely not possible. However, prevention and control practices can be implemented to reduce the risk of exposing people to Legionella in building water distribution systems. The following are engineering controls that will suppress Legionella growth. More than one control may be necessary for successful inhibition of Legionella growth.

- (a) Temperature
 - Maintenance of appropriate water temperatures is required. Water above 51.1 deg. C [124 deg. F] inhibits growth of Legionella in hot water systems. Precautions for the prevention of scalding shall be included in the hot water distribution system.
 - Cold water temperatures below 19.4 deg. C [67 deg. F] inhibit the growth of Legionella.
- (b) Flow
 - Recirculation of water distribution systems is a means of limiting Legionella growth due to low flow or no-use periods. Recirculation aids in maintaining required water temperatures. Hot and cold water distribution systems shall be continuously circulated and piping insulated.
- (c) Oxidant (Disinfectant)
 - Maintenance of disinfectant at a sufficient level to control Legionella growth may be required. The minimum level required to suppress bacterial growth will vary from building to building and by the type of oxidant (disinfectant) used. Monitoring of levels is required.

Piping Installation Guidelines for Legionella Mitigation:

- The need to chill or cool the domestic cold water supply shall be evaluated at the schematic phase. Legionella can propagate in temperatures exceeding 20 deg C (67 deg F). The domestic cold water distribution system shall have a recirculation system. For cold water systems, although recirculation back to the source location for the building is ideal, for renovation efforts, recirculation within the department (or floor) area of renovation would be acceptable.
- Ice maker water supply lines shall be copper and insulated. Avoid routing water lines near source of heat such as the compressor system of the ice maker.
- Cold and hot water piping systems shall be insulated in accordance with the latest version of ASHRAE 90.1.
- To enable thermal eradication and emergency shock chlorination, consider providing taps for connection of temporary booster heaters. Provide adequate electrical connections.
- PVC pipe shall not be used for sanitary and vent lines because of the high temperature water during thermal eradication. Cast iron shall be used.
- Aerators are prohibited in order to reduce exposure to Legionella contaminated water.
- Piping materials shall be in accordance with VA Master Spec 22 11 00 Facility Water Distribution.
- Piping and components must be cleaned and protected from accumulation of debris and contamination prior to and during installation.
- Ensure that newly installed piping and components are flushed of debris and disinfected prior to being placed into service.

Supplemental Water Disinfection Methods
In addition to maintaining the appropriate water temperatures, minimum concentrations of various biocides (e.g., oxidizing agents such as chlorine) can inhibit the growth of Legionella in building potable water distribution systems. When considering the use of supplemental water disinfection methods for the prevention of Legionella, plumbing designers and the VA project manager (in collaboration with other facility stakeholders such as infectious diseases and infection prevention and control) shall review the merits of the many types of supplemental systems available prior to making a final selection. VHA recognizes United States (U.S.) Environmental Protection Agency (EPA) approved oxidants (chlorine, monochloramine, and chlorine dioxide) as acceptable disinfectants for use in potable water distribution systems.

Selection of the necessary equipment, piping and controls and adequate space for the maintenance and operations, are a must. The EPA regulates contaminant levels and disinfectant treatment for use under the Safe Drinking Water Act. Usually, the EPA delegates primary to States for the regulation and enforcement of the Act within individual State boundaries. Systems must be specifically approved or recognized for the intended use by the State regulatory water authority. Federal and state safety regulations and permitting shall be followed. Designers shall coordinate permitting requirements with the local authority having jurisdiction. The facility must consult with the State (or its delegated local water authority) for regulating drinking water for guidance on system selection, achieving an appropriate biocide residual level at building outlets for Legionella growth suppression, system design, system operation, and ensuring compliance with regulations regarding water treatment system(s) and safety. Once a type of system is selected, either the State (or its delegated local water authority) or the manufacturer of the system must provide the minimum and maximum outlet biocide levels in writing for both hot and cold water.

Design parameters to evaluate for supplemental water disinfection include:

- Potential impact of supplemental disinfectant on special use water systems.
- Need for emergency power.
- System may need to be duplex for redundancy and maintenance.
- Spare parts may need to be purchased and stored locally.
- Federal and state safety regulations and permitting must be observed.
- Installation of supplemental disinfection if shock chlorination is used as an emergency remediation method.
- Ensure enough maintenance access is provided around equipment.
- Provide sample points throughout the system to monitor effectiveness. Some critical points should be provided with automated data collection and alarm.
- Operational and maintenance requirements must be maintained to ensure system effectiveness.
- System must be equipped with automated features to ease of use and proper maintenance and operation.
- Requirements for off gassing associated with the specific chemicals (for example Sodium hypochlorite).
- Chemical spill containment systems must be provided.
- Chemical storage requirements.

Emergency Water Disinfection Methods
Emergency disinfection is the process of implementing immediate, temporary actions to reduce the amount of Legionella in a water distribution system.

Thermal Eradication
Requires potable water in the system to be raised to 71 - 77 deg C [160 - 170 deg F] and flushed through every fixture for 30 minutes. Some design considerations are as follows:

- Central water heating equipment must be capable of raising water temperature to 82 deg C [180 deg F].
- Master thermostatic mixing valve located in the hot water distribution system may have to be bypassed to allow hot water to circulate in the distribution system.
- Select point-of-use thermostatic mixing valves that are amenable to thermal eradication procedures. See VA Master Specification 22 05 23 for required mixing valves.
- Provide a connection for temporary booster heaters to facilitate thermal eradication.
- Provide adequate electrical connections for temporary booster heaters. Coordinate with electrical engineer.
- All equipment and appurtenances in the system will need to be reviewed for operation at elevated temperature (e.g. ensure water supply stops can withstand required temperatures).
- Means of tempering discharge will need to be considered to accommodate code requirements on discharge to sanitary sewer (max temp of 60 deg C [140 deg F]). Ensure discharge is compliant with the local requirements.

Shock Chlorination
Installation of a chlorinator is required. Shock chlorination involves the addition of chlorine to the water system in one of the forms listed above.

Some design considerations are as follows:

- Provide taps for connection of temporary equipment.
- All equipment and appurtenances in the system will need to be reviewed for operation at elevated oxidant levels.

Special Use Water Systems (e.g., hemodialysis, laboratory, pharmacy compounding)
It is important to consider the implications of Legionella mitigation strategies on special use water systems within the building. Special use water systems include: Hemodialysis, Laboratory Service, Pharmacy Compounding, and Supply Process Service (SPS). Water treatment strategies and chemical disinfectants may result in the introduction of byproducts in the building water supply at concentrations that may be toxic to patients on hemodialysis. Accordingly, the impact of mitigation strategies must account for potential toxicity, methods for removal of the chemical agent and byproducts from the special use water system, and availability of assay methods to measure the chemical agent and byproducts for assuring patient safety. VA authorities responsible for the oversight of special use water systems are to be consulted during design development of the project and prior to any final decisions regarding water treatment strategies for Legionella.

INSPECTIONS AND WITNESS OF TESTS
The inspection plan needs the approval of the project technical COR. Frequency and requirements for inspections and testing must be added to the construction documents. Regarding inspections and test witnessing, the plumbing drawings and specifications shall coordinate with the VA Manual on Systems Commissioning and the project's commissioning specifications.

Ensure that newly installed piping and distribution system components are flushed of debris and disinfected prior to being placed into service. Piping and components must be cleaned and protected from accumulation of debris and contamination prior to and during installation. Documentation of flushing and disinfection must be maintained. Disinfection for new installations or maintenance of piping, equipment, and components shall be conducted in accordance with the requirements of the IPC, American Water Works Association (AWWA C651-05), and VA Master Construction Specifications.

WATER DISTRIBUTION SYSTEMS
Water Storage Tanks: Provide adequate space for maintenance access to clean the interior of all water storage tanks. Tanks shall be provided with a man way access to allow for inspection, maintenance and cleaning. Tanks shall be constructed to minimize stagnation and thermal gradients. Mechanical cooling may be needed to maintain water temperature.

Measuring and Indicating Devices
Analog gauge and electronic sensors/devices will be used in tandem as much as is practicable. The gauge device will provide a local or immediate indicator of current conditions for troubleshooting and verification purposes. The electronic sensor/device will be used for continuous monitoring of water conditions and shall be connected to the building automation system. All electrical devices shall be on emergency power. All measuring devices shall be calibrated in accordance with the manufacturer's recommendations.

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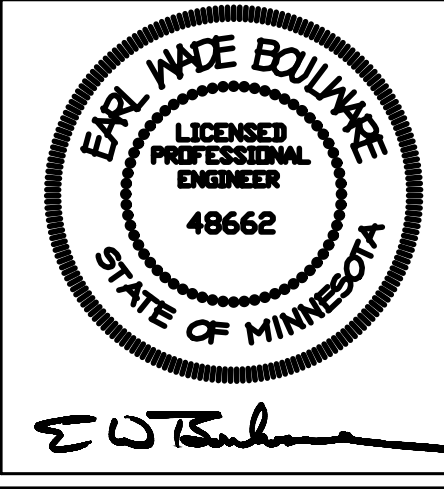
Department of
Veterans Affairs

CONSULTANTS:

DAE
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220 North College Avenue
Indianapolis, Indiana 46202
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Drawing Title
LEGIONELLA MANAGEMENT DETAILS

Approved Project Director
E. W. Bujwiler

Project Title
ST CLOUD ADH AND EC SUPPORT

Project Number
656-343

Building Number

Drawing Number
PP501

Location
ST CLOUD VA HEALTH CARE SYSTEM
4801 VETERANS DRIVE, ST. CLOUD MN 56303

Date
12-27-2019

Checked
DEH

Drawn
JMS

ADDENDUM 1 - BID AND CONSTRUCTION DOCUMENTS	05/29/20
Revisions	Date

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WATER HAMMER ARRESTOR SCHEDULE			
MARK	FIXTURE UNIT RATING	I.P.S.	SIoux CHIEF MODEL NO. (BASIS OF DESIGN)
WHA-A	1-11	3/4"	600 SERIES
WHA-B	12-32	1"	600 SERIES
WHA-C	33-60	1"	600 SERIES
WHA-D	61-113	1"	600 SERIES
WHA-E	114-154	1"	600 SERIES
WHA-F	155-330	1"	600 SERIES

EXPANSION TANK SCHEDULE		
TAG	BASIS OF DESIGN MODEL	NOTES
ET-1	AMTROL ST-42V-C	ASME, 250 PSI

CIRCULATING PUMPS														
PUMP NO.	LOCATION	SYSTEM	CIRCULATING FLUID				% EFF. (MIN)	PIPING CIRCUIT SERVED	TYPE	MOTOR			REMARKS	MANUFACTURER/MODEL BASIS OF DESIGN
			FLUID	GPM	PUMP HEAD FT. FLUID	TEMP F				SP. GR.	NOM. HP.	VOLTS PHASE		
DCWP-1	B001	DCW	WATER	12	18	48	1	54	DCW	INLINE	1/4	120-1	1750	TACO VR3452
DCWP-2	B001	DCW	WATER	12	18	48	1	54	DCW	INLINE	1/4	120-1	1750	STAND-BY TACO VR3452
DHWP-1	B001	DHW	WATER	12	18	140	1	54	DHW	INLINE	1/4	120-1	1750	TACO VR3452
DHWP-2	B001	DHW	WATER	12	18	140	1	54	DHW	INLINE	1/4	120-1	1750	STAND-BY TACO VR3452

FIXTURE SCHEDULE							
MARK	FIXTURE	CW	HW	WASTE	REMARKS	SPECIFICATION	BASIS OF DESIGN
P-103	WATER CLOSET, ADA, WALL MOUNTED	1"	4"	4"	ADA	22-40-00	AMERICAN STANDARD 2856.016
P-114A	WATER CLOSET, BARIATRIC, WALL MOUNTED	1"	4"	4"	ADA	22-40-00	ACORN 2105BARW1-1.6FVL-HSBJ-BL
P-301	HYBRID MASSAGE TUB	1/2"	1/2"	2"		22-40-00	APOLLO 6000 SERIES
P-414	LAVATORY WALL MOUNTED	3/8"	3/8"	1-1/2"	ADA	22-40-00	AMERICAN STANDARD 0355.912
P-502	SERVICE SINK, FLOOR MOUNTED	1/2"	1/2"	1-1/2"	MOP SINK	22-40-00	FIAT TSB3011
P-505	CLINIC SERVICE SINK	1"	1/2"	2"		22-40-00	AMERICAN STANDARD 9512.999.020
P-524	STAINLESS STEEL 2-COMP. SINK	3/8"	3/8"	1-1/2"		22-40-00	DAYTON DXR3322
P-528	STAINLESS STEEL 1-COMP. SINK	3/8"	3/8"	1-1/2"		22-40-00	DAYTON DXR2522
P-604	WATER COOLER WITH BOTTLE FILLER	3/8"		1-1/4"	INTEGRAL BOTTLE FILLER	22-40-00	ELKAY LZSTL8WSLP
P-801	WALL HYDRANT NON-POTABLE	1/2"			CONNECTED TO IRRIGATION	22-40-00	WOODFORD MODEL 65
P-804	HOSE BIBB	1/2"				22-40-00	WOODFORD MODEL 26
P-808	WASHING MACHINE CONNECTION BOX	1/2"	1/2"	3" or 4"	W/ QUARTER TURN ARRESTER VALVES	22-40-00	GUY GREY 5SWB3
P-808A	WALK-IN TUB BOX	3/4	3/4		1/2"x3/4" VALVES WITH ARRESTER	22-40-00	TUB BY VA, SIOUX CHIEF G96G2313MH
FD-1	FLOOR DRAIN				ROUND TOP	22-13-00	SMITH 2005
FD-2	FLOOR DRAIN - LARGE CAPACITY			3" or 4"	12"x12" W/ SEDIMENT BUCKET	22-13-00	SMITH 2415
TD-1	TRENCH DRAIN			3"	6"W x 48"L x 12"D	22-13-00	SMITH TRENCH DRAIN
LT-1	LINT SEPARATOR			3"		22-13-00	SMITH 8910-25

CONVERTORS															
CONVERTOR NO.	LOCATION	CIRCULATING FLUID					STEAM PSIG		STEAM SUPP. PIPE SIZE (IN.)	COND. RET. PIPE SIZE (IN.)	TRAP LBS/HR	MANUFACTURER/MODEL BASIS OF DESIGN	REMARKS	NOTES	
		FLUID	GPM	TEMP. IN F	TEMP. OUT F	MAX. LOSS FT. FLUID	RUN-OUT SIZE	ENT. CONTR. VALVE							ENT. CONV.
HE-1	B-001	WATER	32	40	140	7'	3"	25	10	3"	1-1/2"	1671	ARMSTRONG FRT535PR	DOMESTIC HOT WATER	1

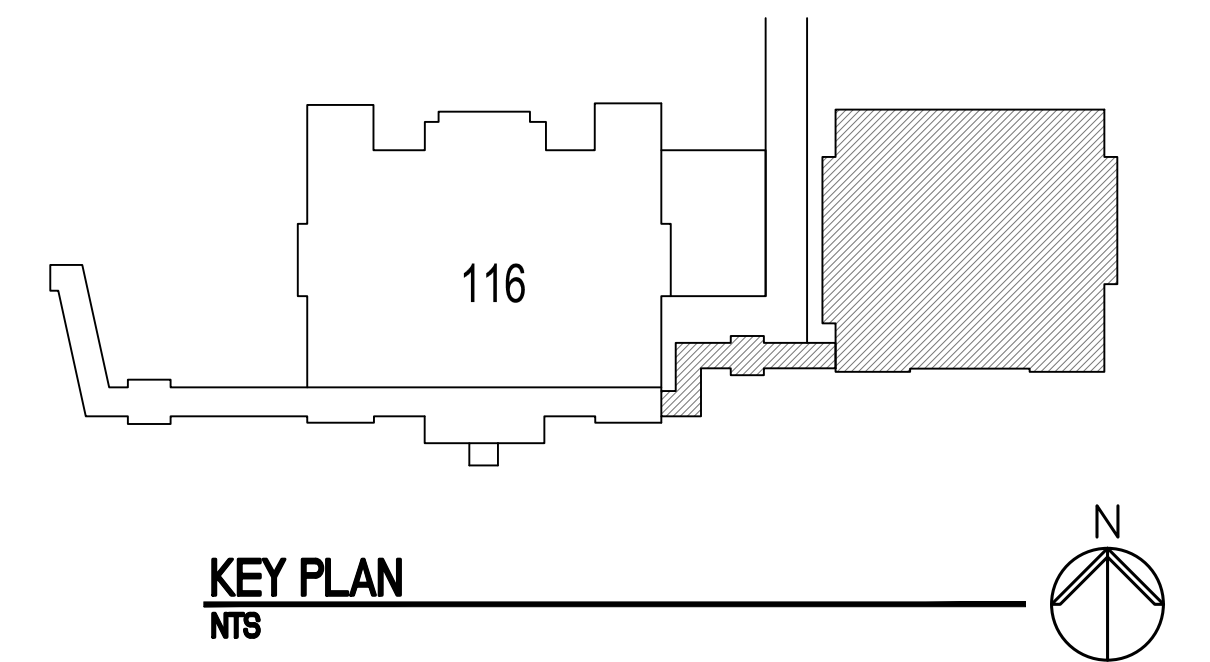
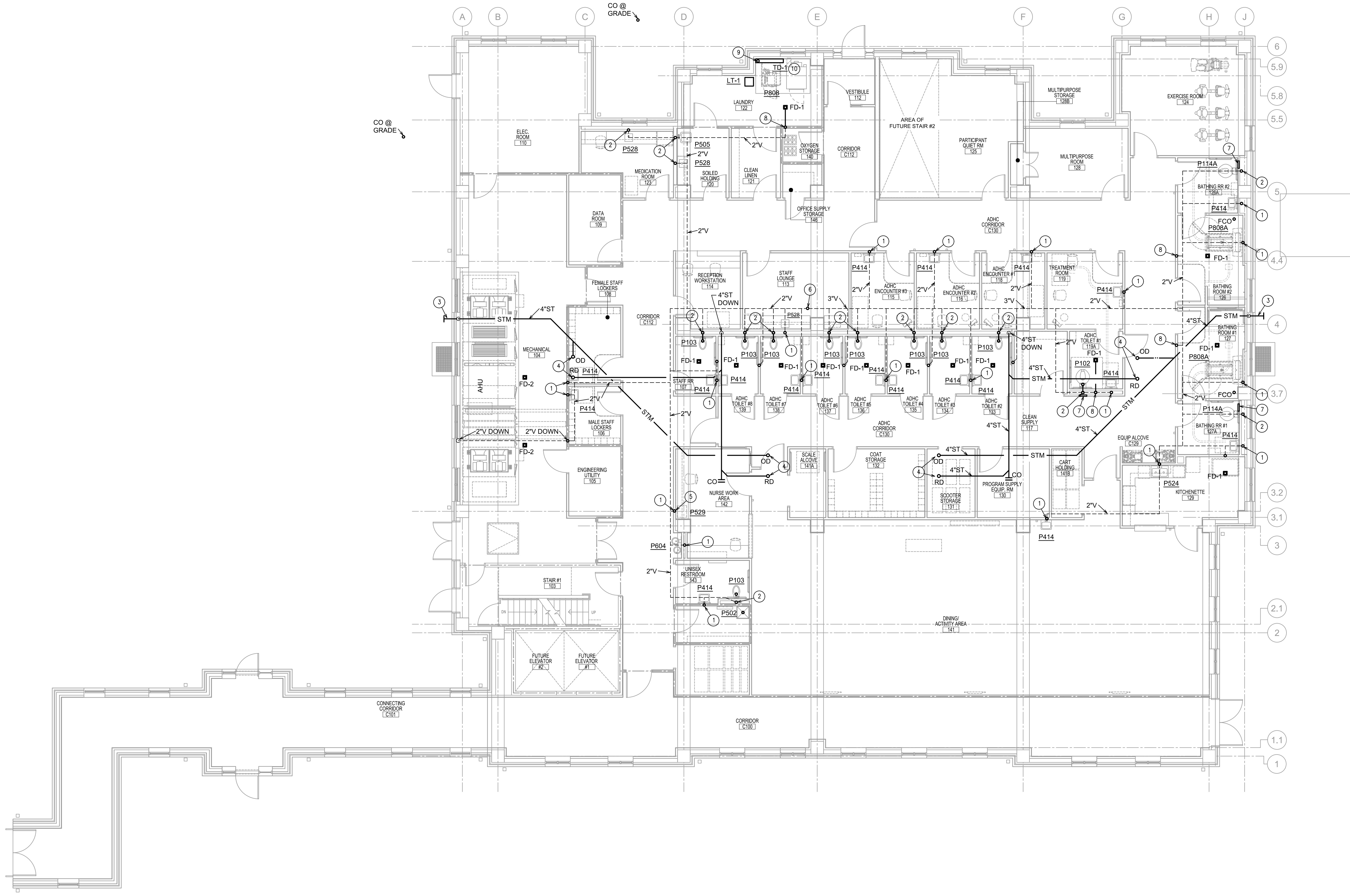
NOTES
 1. 2 CONTROL VALVES REQUIRED, 1 @ 261 LBS. PER HOUR, 1 @ 531 LBS. PER HOUR. INSTANTANEOUS STEAM WATER HEATER

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 BID DOCUMENTS
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ADDENDUM 1 - BID AND CONSTRUCTION DOCUMENTS 05/29/20 Date	CONSULTANTS: DESIGN-AIRE ENGINEERING, INC. 220 North College Avenue Indianapolis, Indiana 46202 voice (317) 464-9090 fax (317) 464-9393 www.daengineering.com Email: dae@design-aire.com Mechanical, Electrical, and Energy Engineering	ARCHITECT/ENGINEERS: paradigm Architecture Engineering Design-Build 200 Envoy Circle #201, Louisville KY 40299 - PH: 502.339.8511 - www.paradigmusa.com	 Approved Project Director	Drawing Title PLUMBING SCHEDULES	Project Title ST CLOUD ADH AND EC SUPPORT	Project Number 656-343	Building Number ---	Drawing Number PP601	Date 12-27-2019	Checked DEH	Drawn JMS	Office of Construction and Facilities Management Department of Veterans Affairs
	VA FORM 08-6231	1	2	3	4	5	6	7	8	9		

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- GENERAL NOTES:**
- A. ALL WASTE PIPING SHOWN IS SERVING THE FLOOR ABOVE UNLESS NOTED OTHERWISE. ALL VENT, GAS, AND WATER PIPING SHOWN ARE LOCATED ABOVE FINISHED FLOOR/CEILING.
 - B. CONTRACT DOCUMENTS CONSIST OF BOTH THE PROJECT MANUAL AND DRAWINGS, AND BOTH ARE INTENDED TO BE COMPLEMENTARY - ANYTHING APPEARING ON EITHER MUST BE EXECUTED THE SAME AS IF SHOWN ON BOTH.
 - C. THE CONTRACTOR SHALL INCLUDE IN BID PROPOSAL ALL COSTS REQUIRED TO COMPLETELY AND PROPERLY INSTALL ALL WORK REQUIRED FOR THE PROJECT, AND SHALL EXAMINE THE SCOPE OF WORK OF OTHER TRADES PRIOR TO SUBMITTING A BID PROPOSAL.
 - D. AFF = ABOVE FINISHED FLOOR. EX = EXISTING.
 - E. INVERT IS SHOWN IN ELEVATION (FEET).
 - F. PROVIDE PIPE MARKERS ON ALL PIPING; SEE SPECIFICATIONS.
 - G. PIPE COOLING CONDENSATE WITH P-TRAP; SEE DETAIL.
 - H. ALL SANITARY AND STORM PIPING TO BE CAST IRON UNLESS NOTED OTHERWISE.
- PLAN NOTES:**
- ① 2"W DOWN AND 2"V UP.
 - ② 4"W DOWN AND 2"V UP.
 - ③ SEE ROOF OVERFLOW NOZZLE DETAIL ON PP502. PROVIDE AND INSTALL SPLASH BLOCK UNDER SPOUT.
 - ④ 4"ST UP TO ROOF DRAIN/OVERFLOW DRAIN. SEE ROOF PLAN PS103.
 - ⑤ 2"V UP TO 4"VTR.
 - ⑥ 3"V UP TO 4"VTR.
 - ⑦ 14"x14" HINGED STAINLESS STEEL AND LOCKABLE ACCESS PANEL FOR FLUSH VALVE.
 - ⑧ 2"V DOWN.
 - ⑨ 3"V DOWN.
 - ⑩ SEE DETAIL B6/PP502.



F1 WASTE AND VENT PLAN FIRST FLOOR
 1/8" = 1'-0"

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 FOR CONSTRUCTION

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	Approved Project Director 	Location ST CLOUD VA HEALTH CARE SYSTEM 4801 VETERANS DRIVE, ST. CLOUD MN 56303	Building Number ---	Drawing Number PS101	Date 12-27-2019	Checked DEH	

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GENERAL NOTES:

A. ALL WASTE PIPING SHOWN IS SERVING THE FLOOR ABOVE UNLESS NOTED OTHERWISE. ALL VENT, GAS, AND WATER PIPING SHOWN ARE LOCATED ABOVE FINISHED FLOOR/CEILING.

B. CONTRACT DOCUMENTS CONSIST OF BOTH THE PROJECT MANUAL AND DRAWINGS, AND BOTH ARE INTENDED TO BE COMPLEMENTARY. ANYTHING APPEARING ON EITHER MUST BE EXECUTED THE SAME AS IF SHOWN ON BOTH.

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E. INVERT IS SHOWN IN ELEVATION (FEET).

F. PROVIDE PIPE MARKERS ON ALL PIPING; SEE SPECIFICATIONS.

G. PIPE COOLING CONDENSATE WITH P-TRAP; SEE DETAIL.

H. ALL SANITARY AND STORM PIPING TO BE CAST IRON UNLESS NOTED OTHERWISE.

PLAN NOTES:

1 2'W UP.

2 2'W UP TO FLOOR DRAIN TRAP.

3 4'W UP AND 2'V UP.

4 SEE CIVIL DRAWINGS FOR CONTINUATION.

5 4'W UP TO FCO.

6 SANITARY PIPE/STORM PIPE CAN BE PVC UNDER GROUND AT THIS LOCATION AND/OR EXTERIOR OF BUILDING.

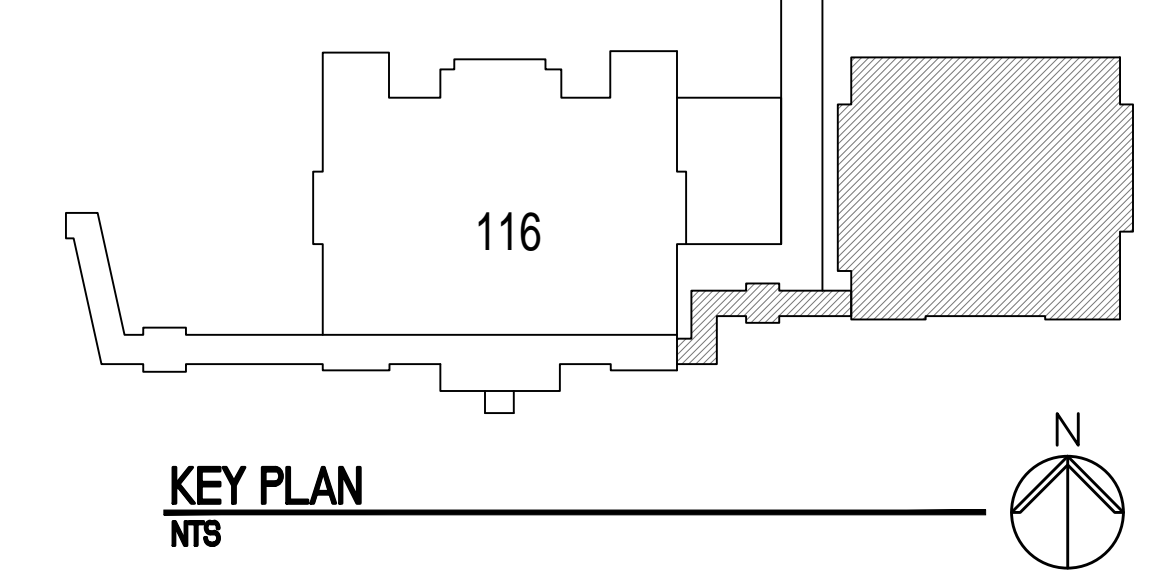
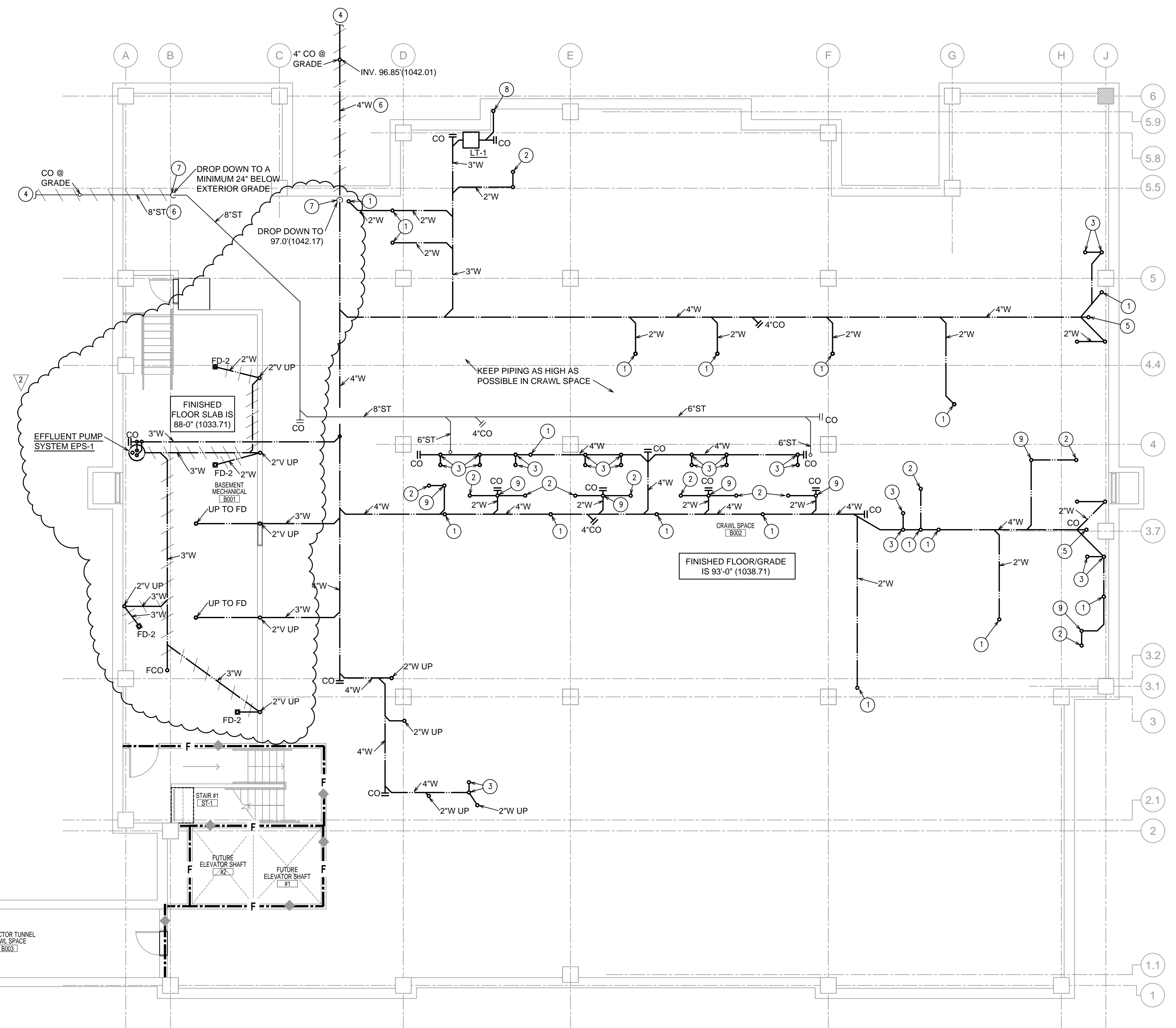
7 PVC CAN START AT THIS POINT DOWNSTREAM.

8 3'W UP.

9 2'V UP.

EQUIPMENT NOTES:

1. EFFLUENT PUMP SYSTEM EPS-1
 BASIS OF DESIGN:
 (2) LIBERTY PUMPS LE51M, 120V, 1/2 HP, 10'-0" POWER CORD.
 (1) LIBERTY PUMPS AE211-4 NEMA DUPLEX ALTERNATING CONTROL PANEL INCLUDING FOUR FLOATS, AUX. CONTACTS, AND INTEGRAL AUDIOVISUAL HIGH LEVEL ALARM
 (1) LIBERTY PUMPS K001210 BASIN, 36"X48" FIBERGLASS W/ ANTI-FLOAT, INLET HUM, 4" PIPE SEAL, GR20 LUGS.
 (1) LIBERTY PUMPS K001639 36" DUPLEX STEEL COVER WITH ACCESS INCLUDING TWO 2" DISCHARGE FLANGES, 2" VENT FLANGE AND CORD GROMMETS.
 (2) LIBERTY PUMPS BV200, 2 INCH SOCKET WELD BALL AND CHECK COMBINATION VALVE.

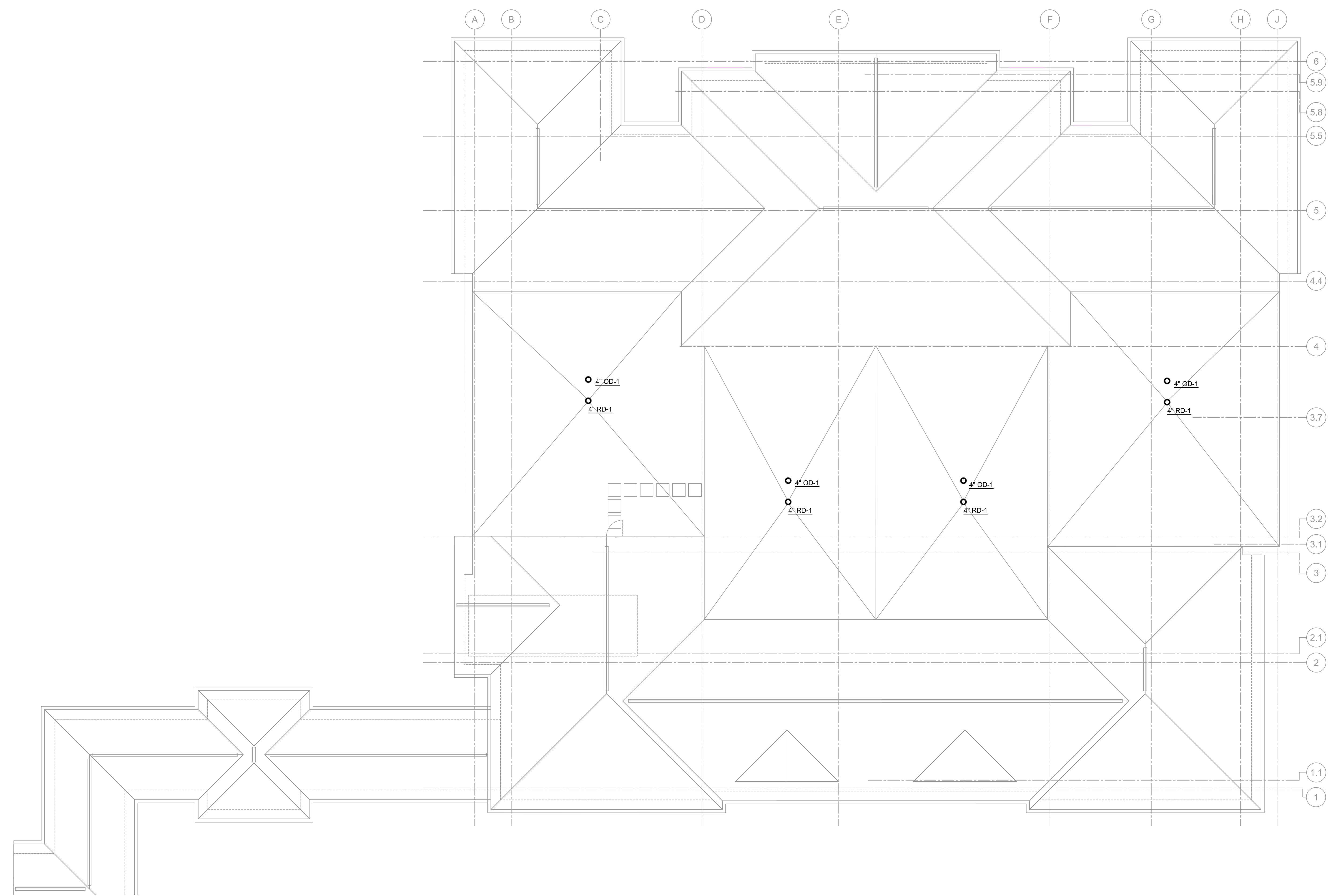


F1 WASTE AND VENT PLAN BASEMENT
 1/8" = 1'-0"

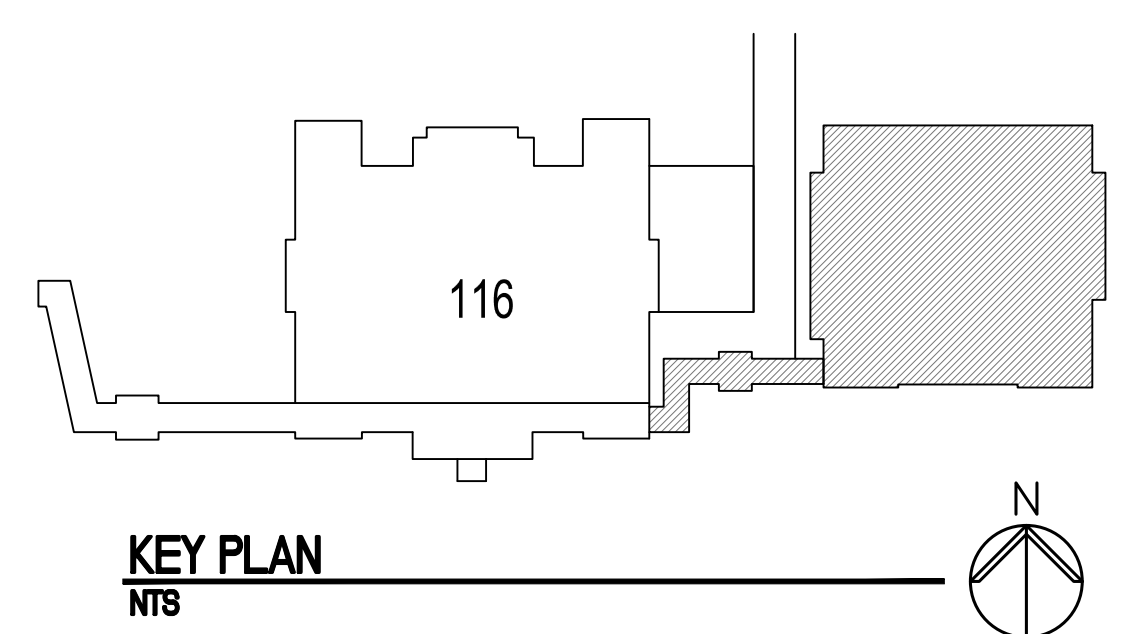
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ADDENDUM 2 - EPS PUMPS, WASTE PIPING CHANGES 04/09/21 ADDENDUM 1 - BID AND CONSTRUCTION DOCUMENTS 05/29/20 Revisions: _____ Date: _____	CONSULTANTS: DESIGN-AIRE ENGINEERING, INC. 220 North College Avenue Indianapolis, Indiana 46202 voice: (317) 464-9090 fax: (317) 464-9393 www.daeengineering.com Email: dae@design-aire.com Mechanical, Electrical, and Energy Engineering	ARCHITECT/ENGINEERS: paradigm Architecture Engineering Design-Build 200 Envoy Circle #201, Louisville KY 40299 - PH: 502.339.8511 - www.paradigmusa.com	 Approved Project Director: <i>E. Wade Bollwerk</i>	Drawing Title: WASTE AND VENT PLAN BASEMENT	Project Title: ST CLOUD ADH AND EC SUPPORT	Project Number: 656-343 Building Number: _____ Drawing Number: PS102	Location: ST CLOUD VA HEALTH CARE SYSTEM 4801 VETERANS DRIVE, ST. CLOUD MN 56303	Date: 12-27-2019 Checked: DEH Drawn: JMS	Office of Construction and Facilities Management
	VA FORM 08-6231								

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F1 WASTE AND VENT PLAN ROOF
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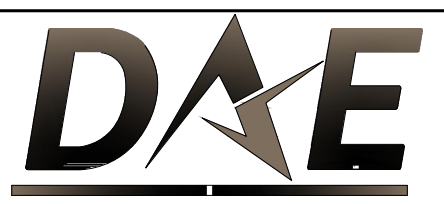
KEY PLAN
 NTS


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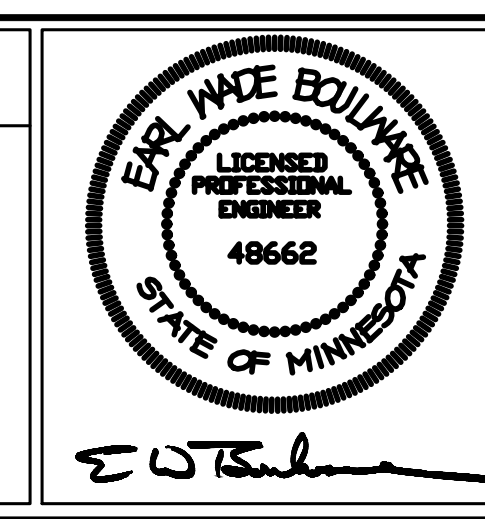
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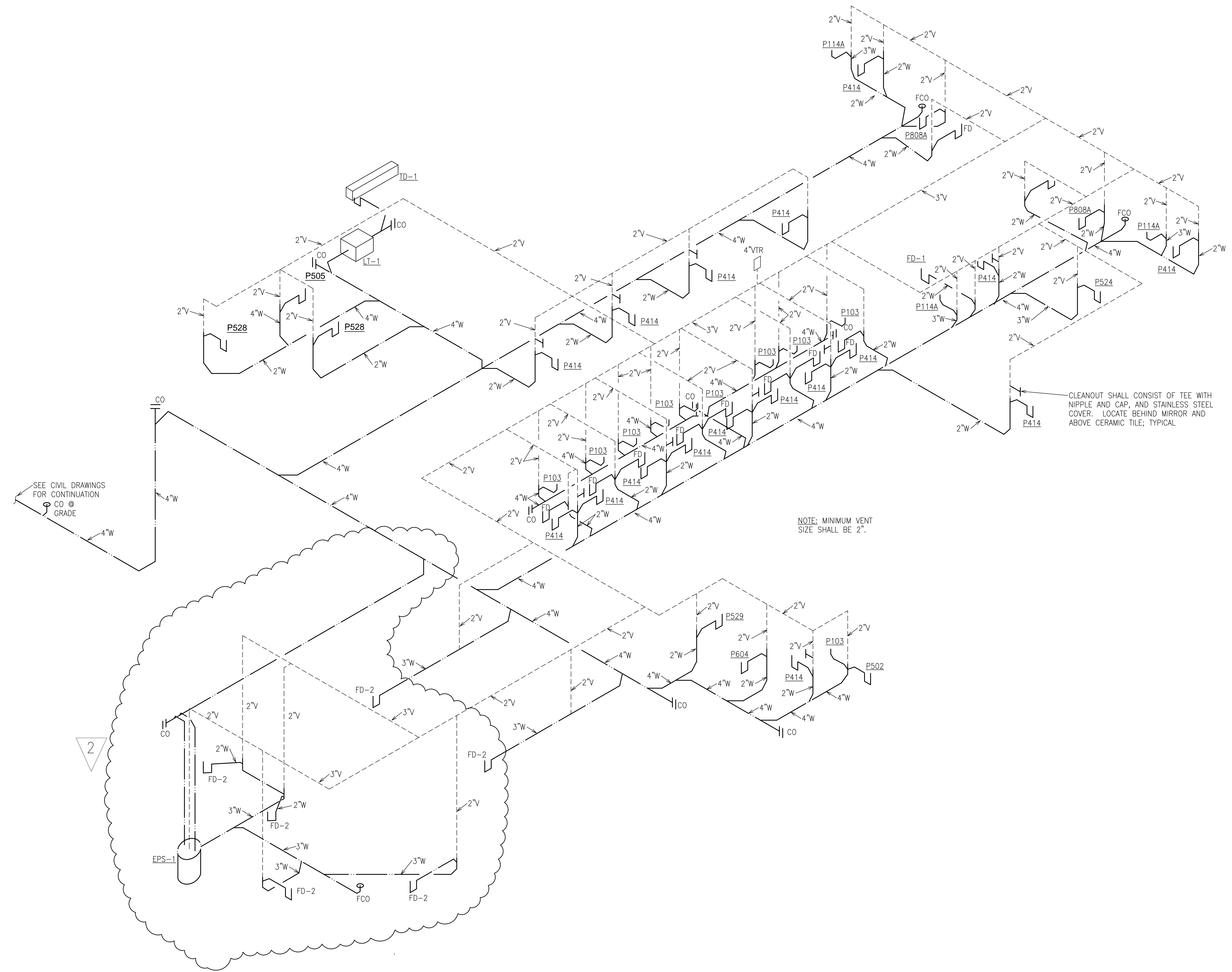


Drawing Title	WASTE AND VENT PLAN ROOF
Approved Project Director	<i>E. W. Boukree</i>

Project Title	ST CLOUD ADH AND EC SUPPORT
Location	ST CLOUD VA HEALTH CARE SYSTEM 4801 VETERANS DRIVE, ST. CLOUD MN 56303
Date	12-27-2019
Checked	DEH
Drawn	JMS

Project Number	656-343
Building Number	---
Drawing Number	PS103

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SEE CIVIL DRAWINGS FOR CONTINUATION CO @ GRADE

NOTE: MINIMUM VENT SIZE SHALL BE 2\"/>

CLEANOUT SHALL CONSIST OF TEE WITH NIPPLE AND CAP, AND STAINLESS STEEL COVER. LOCATE BEHIND MIRROR AND ABOVE CERAMIC TILE; TYPICAL

2

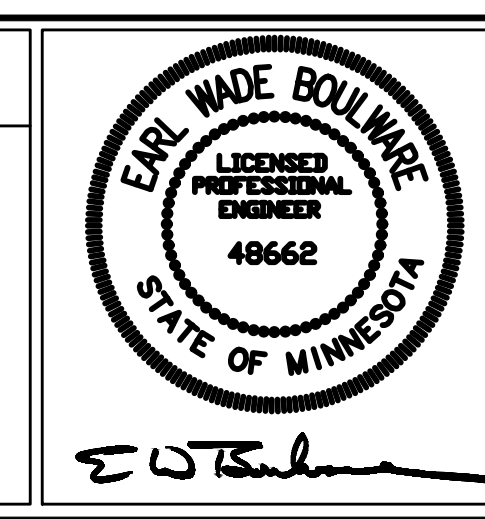
ADDENDUM 2 - EPS PUMPS, WASTE PIPING CHANGES	04/09/21
ADDENDUM 1 - BID AND CONSTRUCTION DOCUMENTS	05/29/20
Revisions	Date

CONSULTANTS:

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Drawing Title	WASTE AND VENT ISOMETRIC
Approved Project Director	<i>[Signature]</i>

Project Title	ST CLOUD ADH AND EC SUPPORT
Location	ST CLOUD VA HEALTH CARE SYSTEM 4801 VETERANS DRIVE, ST. CLOUD MN 56303
Date	12-27-2019
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