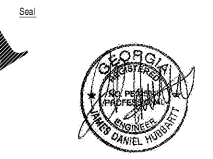


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**SPECIFICATIONS**

**SECTION 220100 - PLUMBING GENERAL:**

**A. GENERAL**

- CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, TOOLS AND LABOR NECESSARY TO PROVIDE A COMPLETE PLUMBING SYSTEM COMPLIANT WITH ALL REQUIRED CODES & STANDARDS.
- DRAWINGS ARE SCHEMATIC IN NATURE AND SHALL NOT BE SCALED.
- ALL REQUIRED PERMITS & INSPECTIONS SHALL BE SECURED & PAID FOR UNDER THIS CONTRACT. INSPECTION CERTIFICATIONS SHALL BE PROVIDED TO THE OWNER.
- CONTRACTOR SHALL VISIT THE SITE TO THOROUGHLY EXAMINE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. IF EXISTING CONDITIONS DIFFER FROM DESIGN DOCUMENTS IN SUCH A MANNER THAT AFFECTS PRICING, THE CONTRACTOR SHALL NOTIFY THE BID ACCORDINGLY AND NOTIFY THE OWNER & ENGINEER PRIOR TO SUBMITTING THE BID. NO ALLOWANCES WILL BE MADE FOR LACK OF KNOWLEDGE REGARDING THE EXISTING CONDITIONS.

**C. IDENTIFICATION**

- PERMANENT BAKELITE TAGS WITH 1" TALL LETTERS SHALL BE PROVIDED FOR ALL EQUIPMENT. EQUIPMENT NUMBERING SHALL MATCH BUILDING STANDARDS.

**D. STARTERS**

- ALL MOTORS SHALL BE PROVIDED WITH MAGNETIC MOTOR STARTERS WITH OVERLOAD PROTECTION.
- STARTERS SHALL BE PROVIDED WITH HAND-OFF-AUTO SWITCHES.
- INDOOR MOTOR STARTERS SHALL BE FURNISHED WITHIN A NEMA 1 ENCLOSURE.
- OUTDOOR MOTOR STARTERS SHALL BE FURNISHED WITHIN A NEMA 3R ENCLOSURE.

**E. SUBMITTALS & SHOP DRAWINGS**

- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS & PRODUCT DATA FOR ALL PLUMBING EQUIPMENT & SYSTEMS TO BE PROVIDED AND/OR INSTALLED.

**F. SUBSTITUTE MANUFACTURERS**

- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION & COST OF ALL CHANGES REQUIRED FOR INSTALLATION OF EQUIPMENT & PRODUCTS MANUFACTURED BY THOSE OTHER THAN WHAT IS SPECIFIED IN THE CONTRACT DOCUMENTS.
- CAREFULLY COORDINATE SUBSTITUTE MANUFACTURER'S INSTALLATION REQUIREMENTS WITH ALL OTHER TRADES INCLUDING BUT NOT LIMITED TO STRUCTURE, ELECTRICAL, PLUMBING AND ARCHITECTURAL. ALL INSTALLATION COSTS ASSOCIATED WITH INSTALLATION OF SUBSTITUTE MANUFACTURER SHALL BE INCLUDED IN BID. NO ALLOWANCES SHALL BE GIVEN FOR CHANGES ASSOCIATED WITH INSTALLATION OF SUBSTITUTE EQUIPMENT & SYSTEMS.
- LISTING OF A MANUFACTURER AS AN "EQUAL" DOES NOT RELIEVE CONTRACTOR'S RESPONSIBILITY OF COORDINATION & COST ASSOCIATED WITH CHANGES REQUIRED TO OTHER TRADES.

**G. WARRANTY**

- CONTRACTOR SHALL WARRANT ALL EQUIPMENT, MATERIALS AND WORKMANSHIP FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR.
- ALL HVAC COMPRESSORS SHALL BE WARRANTED FOR A PERIOD OF NOT LESS THAN 5 YEARS.

**H. AS-BUILT DRAWINGS**

- CONTRACTOR SHALL KEEP REDLINE SET OF DRAWINGS ON SITE DURING CONSTRUCTION TO UPDATE LOCATION OF ALL EQUIPMENT AND SYSTEMS AS THE CONSTRUCTION PROGRESSES. REDLINE SET OF DRAWINGS SHALL BE TURNED OVER TO OWNER AT COMPLETION OF CONSTRUCTION.

**I. OPERATION & MAINTENANCE MANUALS**

- CONTRACTOR SHALL PROVIDE AN ELECTRONIC SET AND ONE (1) SET OF HARD COPIES OF INSTALLATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT & SYSTEMS PROVIDED UNDER THIS CONTRACT.

**J. INSTRUCTION**

- CONTRACTOR SHALL THOROUGHLY INSTRUCT OWNER ON OPERATION AND RECOMMENDED MAINTENANCE PROCEDURES OF ALL INSTALLED EQUIPMENT & SYSTEMS.

**SECTION 24000 PLUMBING SYSTEMS**

- ALL SANITARY PIPING SHALL BE SLOPED AT 1/8" PER FOOT.
- SANITARY & VENT PIPING SHALL BE SCHEDULE 40 PVC BELOW GRADE.
- SANITARY & VENT PIPING SHALL BE HUBLESS CAST IRON ABOVE GRADE.
- ACID WASTE & ACID VENT PIPING SHALL MATCH BUILDING STANDARD ACID WASTE & VENT PIPING MATERIALS.
- DOMESTIC WATER & CONDENSATE PIPING SHALL BE TYPE L HARD COPPER WITH LEAD FREE SOLDERED JOINTS. CONDENSATE PIPING SHALL BE INSTALLED WITH DWV TYP FITTINGS.
- ALL CONDENSATE, HOT & COLD WATER PIPING SHALL BE INSULATED WITH 1/2" THICK FIBERGLASS INSULATION WITH WHITE ALL SERVICE JACKET.
- WATER HAMMER ARRESTORS SHALL BE PROVIDED & SIZED PER PDI GUIDELINES AT ALL QUICK CLOSING VALVES. ALL PIPING SHALL BE PRESSURE TESTED PRIOR TO CONCEALING OR INSULATING THE PIPING.
- ALL PIPING SHALL BE CONCEALED WITHIN WALLS OR ABOVE CEILING.
- PPING INSTALLED ABOVE CEILING SHALL BE INSTALLED AS HIGH AS POSSIBLE.
- ALL VALVES LOCATED ABOVE CEILING SHALL BE LOCATED WITHIN 1' OF ACCESS PANEL OR 1' ACCESSIBLE CEILING.
- REFER TO ARCHITECTURAL FLOOR PLANS & ELEVATIONS FOR EXACT LOCATIONS OF PLUMBING FIXTURES.
- PLUMBING SYSTEMS SHALL NOT BE INSTALLED WITHIN OR PASSING THROUGH ELECTRICAL CLOSETS, SWITCHGEAR ROOMS, TELEPHONE ROOMS, ELEVATOR EQUIPMENT ROOMS OR ABOVE ELECTRICAL PANELS.
- INSTALL IDENTIFICATION MARKERS ON ALL PIPING SYSTEMS & VALVES THAT INCLUDE SERVICE TYPE & DIRECTION OF FLOW PER ASME A13.1.
- ALL DOMESTIC WATER PIPING SYSTEMS SHALL BE FLUSHED & DISINFECTED. SYSTEMS SHALL BE FILLED WITH AN EVENLY DISTRIBUTED DOSE OF 50 TO 200 PPM CHLORINE. ALL FIXTURES & OUTLETS SHALL BE TESTED TO ENSURE EVEN DISTRIBUTION. AFTER 12 HOURS THE RESIDUAL CHLORINE LEVEL SHALL BE TESTED. DISINFECTION PROCEDURE SHALL BE REPEATED UNTIL RESIDUAL CHLORINE LEVEL IS GREATER THAN 10 PPM AFTER SITTING UNDISTURBED FOR 12 HOURS. ONCE DISINFECTION PROCEDURE IS COMPLETE, SYSTEM SHALL BE THOROUGHLY FLUSHED WITH CLEAR WATER.

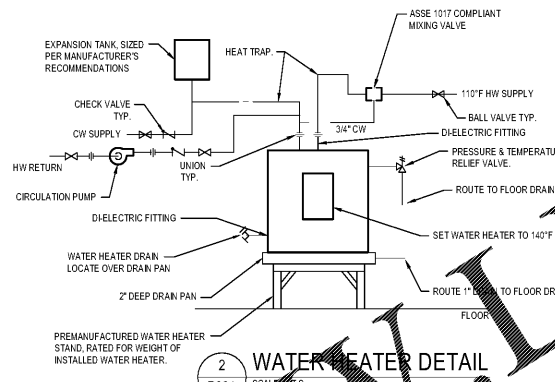
**SECTION 21525 FIRE PROTECTION SYSTEMS**

- FIRE PROTECTION SYSTEM SHALL BE DESIGNED BY A LICENSED FIRE PROTECTION ENGINEER.
- FIRE PROTECTION SYSTEM SHALL CONFORM TO NFPA 13 AND ALL LOCAL CODE REQUIREMENTS.
- FIRE PROTECTION SYSTEM DESIGN SHALL BE SUBJECT TO THE APPROVAL OF THE FIRE DEPARTMENT AND THE OWNER'S UNDERWRITER.
- DOUBLE CHECK BACKFLOW PREVENTER SHALL BE INSTALLED AT EACH WATER EQUAL.
- PPING 2" AND LARGER SHALL BE SCHEDULE 10 WITH ALL GRY AND PNEUMATIC JOINTS.
- PPING SMALLER THAN 2" SHALL BE SCHEDULE 40 STEEL WITH THREADED JOINTS AND MALIBAL IRON FITTINGS.
- THE USE OF LIGHTWALL PIPING WITH AS ALLED JOINTS, IS NOT ACCEPTABLE.
- SPRINKLER HEADS LOCATED IN LAYERS SHALL BE SEMI-RECESSED CHROME PLATED.
- SPRINKLER HEADS LOCATED IN HARD CEILINGS SHALL BE FULLY RECESSED WITH COVER MATCHING THE COLOR OF THE CEILING.
- AREAS WITH NO CEILINGS SHALL HAVE UPRIGHT, BRASS HEADS.
- FIRE PROTECTION SYSTEM SHALL BE TESTED PRIOR TO OWNER ACCEPTANCE.

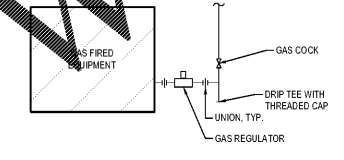
LEGEND		
TAG	SYMBOL	DESCRIPTION
A/C		ABOVE CEILING
AFF		ABOVE FINISHED FLOOR
AHU		AIR HANDLING UNIT
B/F		BELOW FLOOR
B/G		BELOW GRADE
CO		CLEAN OUT
CW		DOMESTIC COLD WATER
CV		CHECK VALVE
NEW		NEW WORK
EXIST.		EXISTING PIPE / EQUIPMENT
FCU		FAN COIL UNIT
FCO		FLOOR CLEAN OUT
FD		FLOOR DRAIN
FDC		FIRE DEPARTMENT CONNECTION
FS		FLOOR SINK
HB		HOSE BIB
HD		HUB DRAIN
HW		DOMESTIC HOT WATER
HWR		HOT WATER RETURN
NFWH		NON FREEZE WALL HYDRANT
SAN		SANITARY PIPING
ST		STORM PIPING
V		VENT PIPING
VTR		VENT THROUGH ROOF
WCO		WALL CLEAN OUT
W		WASTE PIPING
WSPH		WATER SOURCE HEAT PUMP

**GENERAL NOTES (APPLY TO ALL SHEETS):**

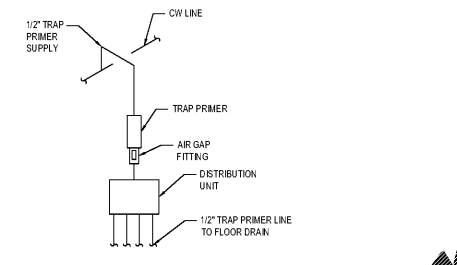
- DRAWINGS ARE SCHEMATIC IN NATURE. CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, TOOLS AND LABOR NECESSARY TO PROVIDE A COMPLETE PLUMBING SYSTEM COMPLIANT WITH ALL REQUIRED CODES & STANDARDS.
- CONTRACTOR SHALL VISIT THE SITE TO THOROUGHLY EXAMINE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. IF EXISTING CONDITIONS DIFFER FROM DESIGN DOCUMENTS IN SUCH A MANNER THAT AFFECTS PRICING, THE CONTRACTOR SHALL NOTIFY THE BID ACCORDINGLY AND NOTIFY THE OWNER & ENGINEER PRIOR TO SUBMITTING THE BID. NO ALLOWANCES WILL BE MADE FOR LACK OF KNOWLEDGE REGARDING THE EXISTING CONDITIONS.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT FIXTURE MOUNTING HEIGHTS & LOCATIONS.
- COORDINATE ALL SAN, VENT, CW, HW, ETC. WITH EXISTING CONDITIONS & ALL OTHER TRADES.
- ALL SANITARY PIPING SHALL BE SLOPED AT 1/8" PER FOOT.
- MATERIALS EXPOSED IN RETURN AIR PLENUMS SHALL BE NON COMBUSTIBLE WITH A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50.



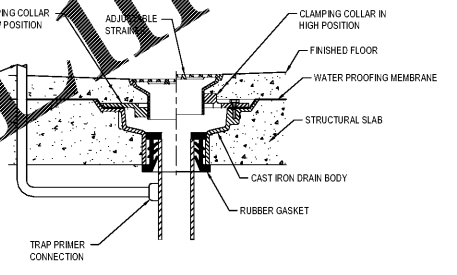
**2 WATER HEATER DETAIL**  
 SCALE: N.T.S.



**4 GAS CONNECTION DETAIL**  
 SCALE: N.T.S.



**1 TRAP PRIMER DETAIL**  
 SCALE: N.T.S.



**3 FLOOR DRAIN DETAIL**  
 SCALE: N.T.S.

ELECTRIC WATER HEATER SCHEDULE						
TAG	CAPACITY (GAL)	ELEMENT KW	RECOVERY RATE (GPH @ 100F)	VOLTS/ PHASE	BASIS OF DESIGN	NOTES
WH-1	80	36	934	480/3	AO SMITH DRE-80	1

NOTES:  
 1. PROVIDE WITH ASSE 1017 COMPLIANT MIXING VALVE. BASIS OF DESIGN IS LEONARD MODEL 370.

PLUMBING FIXTURES & CONNECTION SCHEDULE						
TAG	FIXTURE	CW	HW	WASTE	VENT	FIXTURE SPECIFICATION
P-1	WATER CLOSET	1-1/2"	-	4"	2"	WHITE VITREOUS CHINA, FLOOR MOUNT, 19" HIGH, ELONGATED BOWL WITH TOP SPRING, 1.28 GPF FLUSH VALVE, AND SOLID PLASTIC OPEN FRONT SEAT. BASIS OF DESIGN KOHLER K-4406 BOWL, KOHLER K-4731 SEAT AND SLOAN 111-1-28 FLUSH VALVE
P-1H	ADA WATER CLOSET	1-1/2"	-	4"	2"	ADA COMPLIANT, WHITE VITREOUS CHINA, FLOOR MOUNT, 19" HIGH, ELONGATED BOWL, WITH TOP SPRING, 1.28 GPF FLUSH VALVE, AND SOLID PLASTIC OPEN FRONT SEAT. BASIS OF DESIGN KOHLER K-4406 BOWL, KOHLER K-4731 SEAT AND SLOAN 111-1-28 FLUSH VALVE
P-2H	LAVATORY	1/2"	1/2"	2"	1-1/2"	ADA COMPLIANT, LAVATORY WITH OVERFLOW GRID STRAINER, TAIL PIECE, OFFSET P-TRAP, SERVICE STOPS, AIR REGULATOR KIT 0.5 GPM ELECTRONIC FAUCET. SINK AND FAUCET SHALL BE AS SPECIFIED BY ARCHITECT ON SHEET A201
P-3	URINAL	1"	-	2"	2"	ADA COMPLIANT, WHITE VITREOUS CHINA, WALL MOUNT, WITH TOP SPRING, FLOOR MOUNTED FIXTURE CARRIER AND 0.125 GPF FLUSH VALVE. BASIS OF DESIGN KOHLER K-5452-E AND SLOAN 186-G 125 FLUSH VALVE
P-4	MCP SINK	3/4"	3/4"	3"	2"	30X30 TERRAZO FLOOR MOUNTED MCP SINK WITH FILL PERIMETER STAINLESS STEEL CAP, 1/2" CALKED DRAIN CONNECTION, STAINLESS STEEL GRID STRAINER, 30X30 STAINLESS STEEL WALL PANELS ON ALL ADJACENT WALLS, 36" LONG HOSE, HOSE HOOK SERVICE SINK FAUCET WITH BUCKET HOOK AND 3/4" HOSE CONNECTION. BASIS OF DESIGN STERN WILLIAMS - 38700 SINK AND STERN WILLIAMS 1.2919 FAUCET
P-5H	DRINKING FOUNTAIN	1/2"	-	2"	1-1/2"	ADA COMPLIANT, SHIELD BARRIER FREE DRINKING FOUNTAIN. DRINKING FOUNTAIN SHALL PRODUCE 8.0 GPH OF 50° WATER AT 90° AMBIENT TEMPERATURE. BASIS OF DESIGN HALSEY TAYLOR HAC8FB-BL-Q DRINKING FOUNTAIN

GAS WATER HEATER SCHEDULE							
TAG	CAPACITY (GAL)	INPUT (MBH)	RECOVERY RATE (GPH @ 100F)	EFFICIENCY	VOLTS/ PHASE	BASIS OF DESIGN	NOTES
WH-1	100	199	235	97%	--	AO SMITH BTH-199	1

NOTES:  
 1. PROVIDE WITH CONDENSATE NEUTRALIZATION KIT AND CONCENTRIC ROOF TERMINATION KIT.

Project Number  
**1817**

Revisions

Number	Date	Description
1	08/30/19	ISSUED FOR CONSTRUCTION

Drawing Title  
**LEGEND, NOTES, DETAILS & SCHEDULES - PLUMBING**

Drawing Status  
**ISSUED FOR CONSTRUCTION**

Drawing Number