#### PIPE MATERIAL SCHEDULE WORKING PIPE MATERIAL FITTINGS JOINTS PRESSURE HUBLESS CAST IRON — PLAIN | C.I.S.P.I. STAINLESS STEEL BAND CLAMP | 10 FEET STATIC HEAD SANITARY ABOVE GROUND HUBLESS CAST IRON END (SEE NOTE NO. 1) WITH NEOPRENE GASKET (SEE NOTE NO. 1) BELL AND SPIGOT CAST SANITARY BELOW GROUND HUBLESS CAST IRON NEOPRENE COMPRESSION 25 FEET STATIC HEAD COLD WATER TYPE "L" HARD DRAWN | WROT COPPER WITH SWEAT 95 % TIN- 5% ANTIMONY SOLDER 125 PSIG. HYDROSTATIC ABOVE GROUND COPPER TUBING SOLDER ENDS

95 % TIN- 5% ANTIMONY SOLDER

125 PSIG. HYDROSTATIC

1. HUBLESS CAST IRON PIPE SHALL NOT BE USED.

COPPER TUBING

A) IN EXPOSED AREAS

DOMESTIC HOT WATER &

HOT WATER CIRCULATION

B) FOR HOUSE DRAINS. FOR THESE CONDITIONS EXTRA HEAVY CAST IRON PIPE SHALL BE USED.

2. FOR THE CONDITIONS LISTED IN NOTE 1 EXTRA HEAVY CAST IRON SHALL BE USED.

SOLDER ENDS

TYPE "L" HARD DRAWN | WROT COPPER WITH SWEAT

	GAS-FIRED WATER HEATERS									
				TAI DA	NK TA	90 ₺	ELECT	RICAL	DATA	
DESIGNATION		MANUFACTURER AND MODEL No.	GAS INPUT (MBH)	STORAGE CAP., GALS.	WEIGHT, LB.	RECOVERY IN GPH AT 9 TEMP RISE FOR A 140 OUTLET TEMP.	RATING IN AMPS	VOLTS	PHASE	REMARKS
WH-1	1	A.O. SMITH BTX-80	76	50	225	95	5	120	1	IN MECHANICAL MEZZANINE. PROVIDE SUPPORTS, EXPANSION TANK, ETC.
WH-2	1	A.O. SMITH BTXL-100	100	75	382	129	5	120	1	IN MECHANICAL MEZZANINE. PROVIDE SUPPORTS, EXPANSION TANK, ETC.
WH-3	1	A.O. SMITH BTH-150A	150	100	523	198	5	120	1	IN MECHANICAL MEZZANINE. PROVIDE SUPPORTS, EXPANSION TANK, ETC.

- 1. INSTALL AS PER MANUFACTURER RECOMMENDATIONS. 2. COORDINATE ALL POWER REQUIREMENTS, CONTROLS & CONTROL
- WIRING WITH THE ELECTRICAL CONTRACTOR. PROVIDE DRIP PAN WITH LEAK DETECTION BELOW WATER HEATER.
- 4. TEMPERATURE SHALL BE SET TO 140 DEGREES. POINT OF USE TMV

SHALL BE SET TO 105 DEGREES.

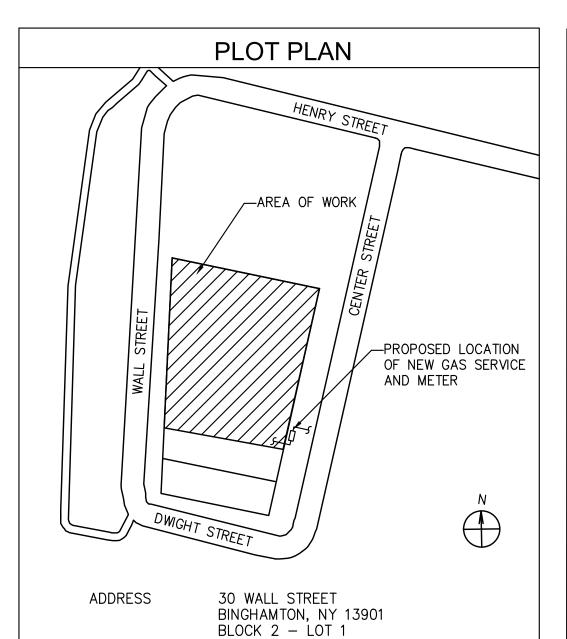
	PUMPS SCHEDULE															
TAG	DESIGNATION	No. REQUIRED	GPM EACH PUMP	TDH , FEET	GAS PRESSURE, "W.C.	MODEL NO. (BASED ON)	SUSPENDED WET PIT	VERT. CLOSE—COUPLED HORIZ SPLIT		R.P.M.	VOLTS	PHASE	CYCLE	EFFICIENCY	FACTORY PACKAGE	REMARKS
RCP-1,2,3	H.W. RECIRCULATION PUMP	1	15	25	_	B&G SERIES PR		•	1/6	1725	115	1	60	80%	_	FOR LOCATION SEE DETAILS

- 1. PUMPS SHALL BE MAINTENANCE FREE/SELF LUBRICATED TYPE WITH LEAD FREE/BRONZE FITTED CONSTRUCTION. 2. COORDINATE ALL POWER REQUIREMENTS, CONTROLS & CONTROL WIRING OF AQUASTAT WITH THE ELECTRICAL CONTRACTOR.
- 3. INSTALL AS PER MANUFACTURER RECOMMENDATIONS.
- 4. ALL CONTROL WIRING BY PLUMBING CONTRACTOR. 5. PROVIDE TIME CLOCK FOR RE-CIRCULATION PUMP OPERATION.

	PLUMBING FIXTURE CONNECTION SCHEDULE (TYPICAL)							
ID. #	FIXTURE	COLD WATER	HOT WATER	WASTE	VENT	MODEL #	REMARKS	
<u>WC</u>	WATER CLOSET	1/2"		4"	2"	SPECIFIED BY ARCHITECT	FLOOR MOUNTED, FLOOR OUTLET, TANK TYPE	
LAV	LAVATORY	1/2"	1/2"	1½"	1½"	SPECIFIED BY ARCHITECT		
<u>UR</u>	URINAL	1/2"		4"	2"	SPECIFIED BY ARCHITECT		
<u>SK</u>	SINK	1/2"	½"	2"	1½"	SPECIFIED BY ARCHITECT		
<u>DF</u>	DRINKING FOUNTAIN	1/2"		1½"	1½"	SPECIFIED BY ARCHITECT		
<u>FD</u>	FLOOR DRAIN	1/2"		3"	2"		PROVIDE WITH GREEN DRAIN TRAP SEAL	

# NOTES:

- PIPE SIZES SHOWN ARE MINIMUM. PIPE SIZES AS PER APPROVED EQUIPMENT SUBMITTALS ALL FIXTURES SHALL COMPLY WITH NYS PLUMBING CODE REQUIREMENTS.
- PLUMBING CONTRACTOR SHALL VERIFY SPECIFICATIONS OF ACTUAL FIXTURES FROM ARCHITECT/OWNER AND OBTAIN CUT-SHEET APPROVAL FROM ARCHITECT/OWNER BEFORE
- CV CHECK VALVE, AG AIR GAP, VB VACUUM BREAKER, DCV DOUBLE CHECK VALVE



## GENERAL PLUMBING NOTES

- THE PLUMBING SYSTEM AND ALL ASSOCIATED EQUIPMENT SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH FULL REQUIREMENTS OF ALL STATE AND LOCAL AUTHORITIES HAVING JURISDICTION.
- 2. DO NOT SCALE FROM THESE DRAWINGS.
- DO NOT MAKE ANY CHANGES OR SUBSTITUTIONS WITHOUT SPECIFIC WRITTEN APPROVAL FROM THE ARCHITECT AND/OR ENGINEER.
- ALL INDICATED WORK SHALL BE PERFORMED BY THE PLUMBING CONTRACTOR UNLESS OTHERWISE NOTED.
- 5. THE CONTRACTOR FOR THIS WORK SHALL CAREFULLY INSPECT AND ACQUAINT HIMSELF WITH SITE CONDITIONS IN ORDER THAT HE FULLY UNDERSTANDS THE WORK REQUIRED. HE SHALL FIELD MEASURE AND VERIFY ALL DIMENSIONS AND CONDITIONS BEFORE PROCEEDING WITH THE WORK. LACK OF THOROUGH UNDERSTANDING OF THE PROJECT SCOPE AND CONDITIONS SHALL NOT CONSTITUTE AN EXCUSE FOR ERRORS OR OMISSIONS, NOR FOR A REQUEST FOR EXTRA COMPENSATION.
- PIPING LAYOUTS ARE DIAGRAMMATIC AND INTEND TO SHOW GENERAL ARRANGEMENT, SIZE AND CAPACITY. ALL OFFSETS ARE NOT NECESSARILY SHOWN. CONTRACTOR SHALL ARRANGE AND COORDINATE THE WORK, FURNISH NECESSARY OFFSETS, VALVES, VENTS AND FITTINGS TO AVOID CONFLICTS WITH OTHER MECHANICAL AND ELECTRICAL SERVICES AND WITH STRUCTURAL AND ARCHITECTURAL
- ANY DISCREPANCIES OR INADEQUACIES WITHIN THESE BID DOCUMENTS OR BETWEEN THESE BID DOCUMENTS AND THE RELATED HVAC, FIRE PROTECTION, ELECTRICAL, STRUCTURAL, ARCHITECTURAL AND INTERIOR DECOR DRAWINGS OR BETWEEN THESE BID DOCUMENTS AND FIELD CONDITIONS MUST BE BROUGHT TO THE ATTENTION OF THE OWNER. ARCHITECT AND ENGINEER PRIOR TO BID SUBMISSION.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS INCLUDING BUT NOT LIMITED TO NATIONAL, STATE AND LOCAL CODES ALONG WITH ORDINANCES WHICH MAY BE IN AFFECT. ALL PLUMBING MATERIALS, INSTALLATION PROCEDURES AND SYSTEM LAYOUTS SHALL BE APPROVED BY ALL APPLICABLE CODE ENFORCEMENT AUTHORITIES HAVING JURISDICTION AND IT SHALL BE THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FOR THIS INSTALLATION.
- . THE PLUMBING CONTRACTOR SHALL PROVIDE A COMPLETE SET OF RECORD "AS-BUILT" DRAWINGS INDICATING THE PRECISE LOCATION OF ALL NEW SYSTEMS, EQUIPMENT CONCEALED OR EMBEDDED PIPING AND PIPING CONNECTIONS. THESE DRAWINGS SHALL ALSO INCLUDE ALL CHANGES AND DEVIATIONS FROM BID DOCUMENTS.
- 10. ALL PLUMBING FIXTURES SHALL HAVE THEIR OWN INDEPENDENT SHUT-OFF VALVES, INSTALLED IN AN EASILY ACCESSIBLE AND CONVENIENT LOCATION.
- 11. ALL PLUMBING FIXTURES SHALL BE A.D.A. COMPLIANT.

## LEAD-FREE NOTES

ALL PIPES, PIPE FITTINGS, PLUMBING FITTINGS AND FIXTURES SHALL HAVE 0.25% WEIGHTED LEAD CONTENT OF WETTED COMPONENTS, IN COMPLIANCE WITH THE REDUCTION OF LEAD IN DRINKING WATER ACT. PIPES, PIPE FITTINGS, PLUMBING FITTINGS OR FIXTURES USED EXCLUSIVELY FOR NON—POTABLE SERVICES ARE EXCLUDED FROM THIS LEAD CONTENT REQUIREMENT. TOILETS, BIDETS, URINALS, FILL VALVES, FLUSHOMETER VALVES, TUB FILLERS, SHOWER VALVES, SERVICE SADDLES, OR WATER DISTRIBUTION MAIN GATE VALVES THAT ARE 2 INCHES IN DIAMETER OR LARGER ARE ALSO EXCLUDED FROM THIS REQUIREMENT.

# CONNECTION TO EXISTING WORK

- PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO ENSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING MANAGEMENT AND CLIENT. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY PIPING CONNECTIONS AS REQUIRED TO MINIMIZE SHUTDOWN TIME.
- CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT AND BUILDING MANAGER.
- MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES.

#### THERMOSTATIC MIXING VALVE SCHEDULE **PRESSURE** CONNECTION (inches) TEMPERATURE (F°) MAXIMUM DROP AT | MIN. FLOW FLOW RATE LISTED FLOW (GPM) TAG DESCRIPTION LOCATION REMARKS (GPM) CW HW I TW HW IN | CW IN | TW OUT THERMOSTATIC UNDER HAND SINK AND 1/2 105 1/2 140 40 N/A 0.5 SIMILAR TO POWERS LFG480 MIXING VALVE | LAVATORY AS NEEDED |

# PLUMBING SCHEDULE

- WHA WATER HAMMER ARRESTER: PRECISION PLUMBING PRODUCTS OR SIOUX CHIEF, WITH PISTON AND O-RING CONSTRUCTION, HAVING PDI AND ASSE CERTIFICATION. PROVIDE PDI SIZES AS REQUIRED BY PDI STANDARDS AND SHOWN ON PLANS, SIZES "A" THROUGH "F".
- WCO WALL CLEANOUT SIMILAR TO J.R. SMITH MODEL 4402 DUCO CAST IRON WITH ROUND ADJUSTABLE SCORIATED NICKEL BRONZE TOP. VANDAL PROOF.
- FD 3" J.R.SMITH # 9700 WITH STAINLESS STEEL BODY, 7" ADJUSTABLE STRAINER HEAD AND FLASHING CLAMP. AND POLISH GRATE AFTER INSULATION. USE A CAULK JOINT OUTLET. PROVIDE A DEEP SEAL P-TRAP, SIZE OF TRAP AND WASTE ARM AS SHOWN ON DRAWINGS.
- FFD 3" J.R.SMITH # 3710 WITH DUCO CAST IRON FLANGED RECEPTOR, BAR GRATE, 6" FUNNEL & 8-1/2" STRAINER. USE A CAULK JOINT OUTLET. PROVIDE A DEEP SEAL P-TRAP, SIZE OF TRAP AND WASTE ARM AS SHOWN ON DRAWINGS.
- MTMV MASTER THERMOSTATIC MIXING VALVES: WATTS LEAD FREE SERIES LFN170 MODEL # LFN170-M3 OR EQUAL THERMOSTATIC TYPE WITH BRASS BODY CONSTRUCTION, SET TEMPERATURE AT 110°F FOR HAND WASHING. PROVIDE ON HW SUPPLY AT EACH WATER HEATER.
- TMV THERMOSTATIC MIXING VALVES: POWERS LEAD FREE #LFG-480 OR EQUAL THERMOSTATIC TYPE WITH BRASS BODY CONSTRUCTION W/ CHECKS, SET TEMPERATURE AT 105°F FOR HAND WASHING UNDER THE SINKS AND LAVS SET AWAY FROM ADA CLEARANCES AND ADA COVERS.
- ET EXPANSION TANK: AMTROL THERM-X-TROL ASME MODEL ST-12C WITH AMTROL AIR PURGE TEE.THERMAL EXPANSION ABSORBER FOR DOMESTIC WATER SYSTEM. 150 PSIG MAXIMUM WORKING PRESSURE, 6.4 GALLON CAPACITY, 3/4" PIPE CONNECTION SIZE. SET AIR CHARGE PRESSURE TO MATCH EXISTING WATER SYSTEM PRESSURE. INSTALL AND TEST PER MANUFACTURER'S INSTRUCTIONS. REFER TO DETAIL ON DRAWINGS.
- HD 3" J.R.SMITH # 9654BW03 STAINLESS STEEL BODY, HUB DRAIN
- TP FLOOR DRAIN TRAP PRIMER: PRECISION PLUMBING PRODUCTS PRIME-RITE WITH CORROSION RESISTANT BRASS BODY AND INTEGRAL VACUUM BREAKER. MODEL PR-500. PROVIDE DISTRIBUTION UNIT WHERE MORE THAN ONE TRAP IS INDICATED ON DRAWINGS.
- VACUUM ANTI-SIPHON PRESSURE VACUUM BREAKER SHALL BE BREAKER WATTS SERIES 800M4QT. INSTALL 12" ABOVE HIGHEST POINT OF DOWNSTREAM PIPING. DEVICE MUST BE INSTALLED IN EXPOSED LOCATION.
- J.R.SMITH # 1010-C-CID WITH DUCO CAST IRON BODY, ALUMINUM UNDERDECK CLAMP, CAST IRON DOME AND FLASHING CLAMP.
- J.R.SMITH # 1410-C-NBM-U WITH DUCO CAST IRON BODY, ALUMINUM UNDERDECK CLAMP, NICKEL-BRONZE TOP, VANDAL PROOF GRATE AND FLASHING

PLUMBI	NG DRAWING LIST
DRAWING NO.	DRAWING TITLE
P-001.00	PLUMBING COVER SHEET
P-199.00	PLUMBING CELLAR FLOOR PLAN
P-200.00	PLUMBING FIRST FLOOR PLAN
P-201.00	PLUMBING ROOF PLAN
P-500.00	PLUMBING RISER DIAGRAMS
P-600.00	PLUMBING SCHEDULES
P-700.00	PLUMBING DETAILS I
P-701.00	PLUMBING DETAILS II
P-800.00	PLUMBING SPECIFICATIONS I
P-801.00	PLUMBING SPECIFICATIONS II
P-802.00	PLUMBING SPECIFICATIONS III

SYMBOLS	ABBREV.	DESCRIPTION
		EXISTING PIPING TO REMAIN
	S. OR W.	SOIL OR WASTE (SANITARY) PIPING ABOVE FLOOP
	S. OR W.	SOIL OR WASTE (SANITARY) PIPING BELOW FLOOP
	٧	VENT PIPING
	C.W.	COLD WATER PIPING
	H.W.	HOT WATER PIPING
	H.W.R.	HOT WATER RETURN PIPING
	co/wco	CLEANOUT/WALL CLEANOUT
<b>-</b>	CODP	CLEANOUT DECK PLATE
φ		VACUUM BREAKER
Q	WHA	WATER HAMMER ARRESTER
<b>∅</b> 1/1		CHECK VALVE
⋈ -		GATE (SHUT OFF) VALVE
₹		GAS COCK
. —		CAPPED OUTLET
₫- 🗢	FD	FLOOR DRAIN
<b>∳</b> - ▽	FD/TR	FLOOR DRAIN WITH TRAP PRIMER
	FS	FLOOR SINK
		ROOF DRAIN
∝- ŀ		TRAP
$\rightarrow$		STRAINER
<u> </u>		PIPING DROP OR DOWN
_0		PIPING RISE OR UP
<del>- C</del>		PIPING CONNECTION BELOW
_ <del>`</del>		PIPING CONNECTION ABOVE
<u> </u>		FLUSH VALVE
<u> </u>		CONNECT TO EXISTING PIPING
		WATER METER
W		GAS METER
		BALANCING VALVE
	TD	TRENCH DRAIN

%	PERCENT	EA	EACH	NTS	NOT TO SCALE
&	AND	EQUIP	EQUIPMENT		
0	AT	F.VIOT		PC	PLUMBING CONTRACTOR
A ===	ADOVE FINISHED FLOOD	EXIST,	EVICTING	PD	PUMP DISCHARGE
AFF	ABOVE FINISHED FLOOR	(E)	EXISTING	PLBG	PLUMBING
AM. STD. APP	AMERICAN STANDARD APPROVED	FD	FLOOR DRAIN	QTY	QUANTITY
APPROX	APPROVED APPROXIMATE	FFE	FLOOR DRAIN FINISH FLOOR ELEVATION	REQ	REQUIRED
ARCH	ARCHITECTURAL	FT	FEET	RG	RANGE
AICH	ANGITTECTONAL	FUD	FUNNEL DRAIN	RM	ROOM
BFF	BELOW FINISHED FLOOR	1 00	TORNEL BRAIN	RPZ	REDUCED PRESSURE
BLDG	BUILDING	G	NATURAL GAS	101 2	ZONE
BSMT	BASEMENT	ĞC	GENERAL CONTRACTOR		20112
20	D/ (OLINE) (1	HGT	HEIGHT	SFU	SUPPLY FIXTURE UNIT
CFH	CUBIC FEET PER HOUR		.,	SHT	SHEET
CLG	CEILING	lнw	HOT WATER	SPEC	SPECIFICATION
CO	CLEANOUT	HWR	HOT WATER RECIRCULATING	SQ FT	SQUARE FOOT
CODP	CLEANOUT W/DECK PLATE	H&CW	HOT & COLD WATER	SRV	SAFETY RELIEF VALVE
CONN	CONNECTION '			ST	STOVE
CONT	CONTINUATION	I.E.	INVERT ELEVATION		
CW	COLD WATER			TYP	TYPICAL
		MFR	MANUFACTURER		
DF	DRINKING FOUNTAIN	MIN	MINIMUM	VIF	VERIFY IN FIELD
DFU	DRAINAGE FIXTURE UNIT	MTG	MOUNTING	VTR	VENT THRU ROOF
DIA, ∼	DIAMETER	1		<b></b> ,	
DN	DOWN	NIC "	NOT IN CONTRACT	W/	WITH
DWG	DRAWING	NO., #	NUMBER	wco	WALL CLEANOUT
DCV	DOUBLE CHECK VALVE				

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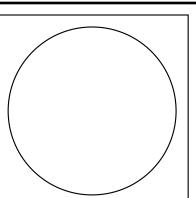
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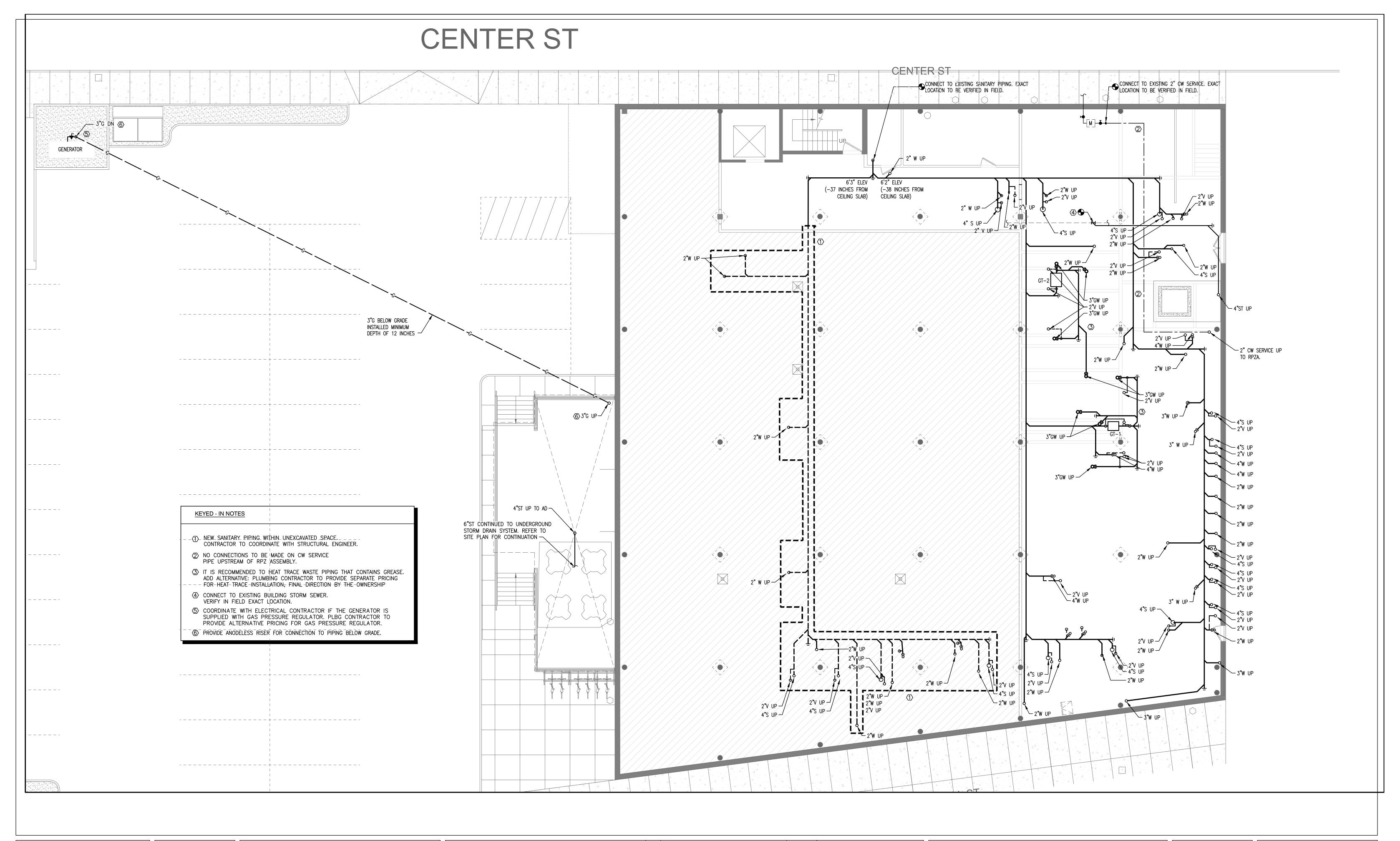
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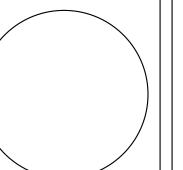
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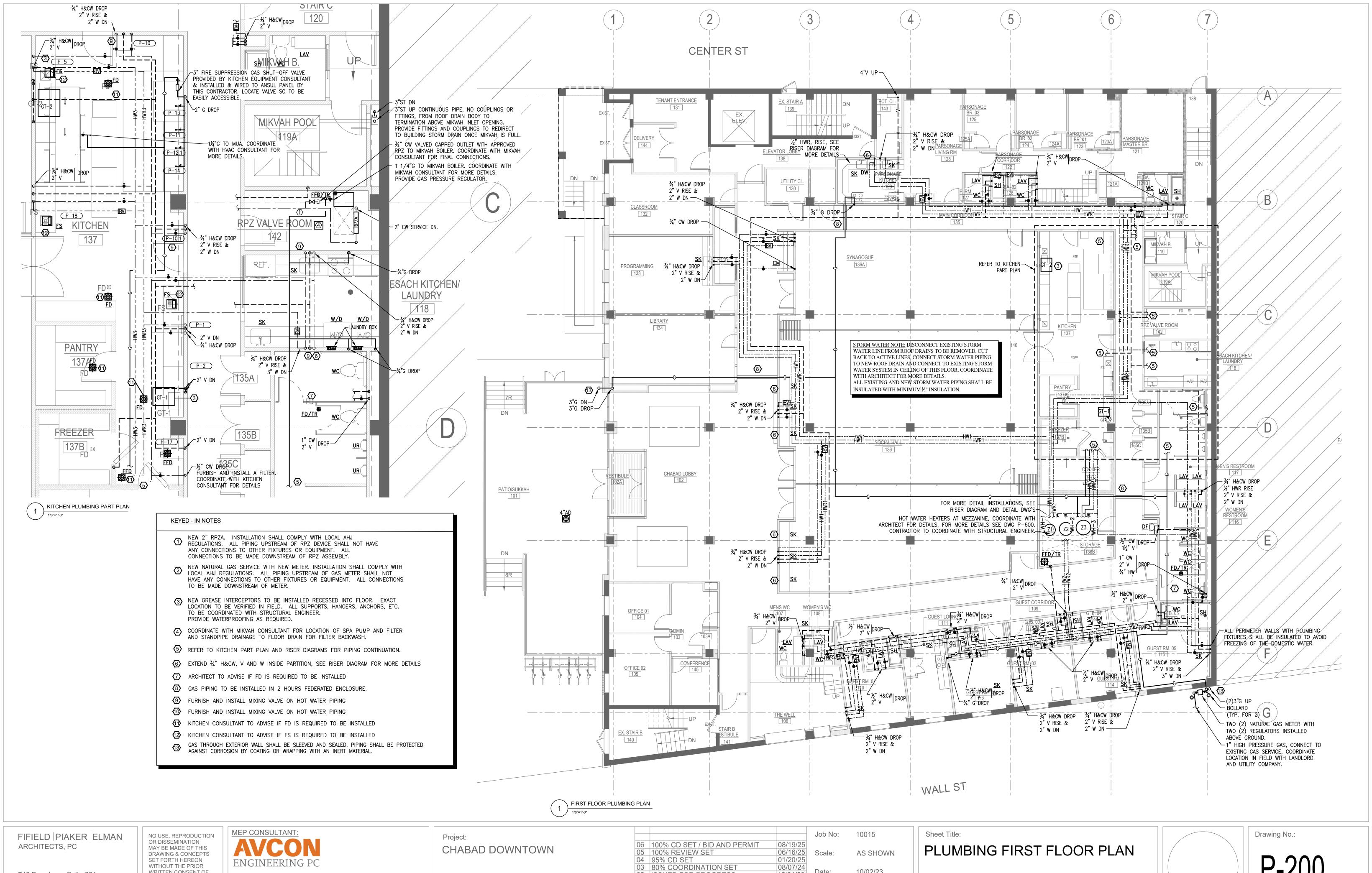
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PLUMBING CELLAR FLOOR PLAN



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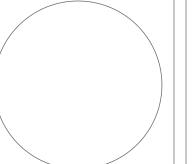
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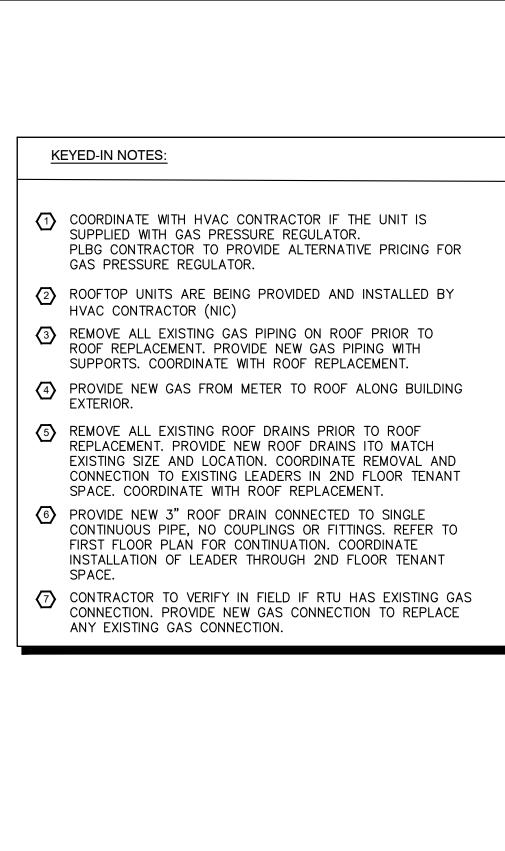
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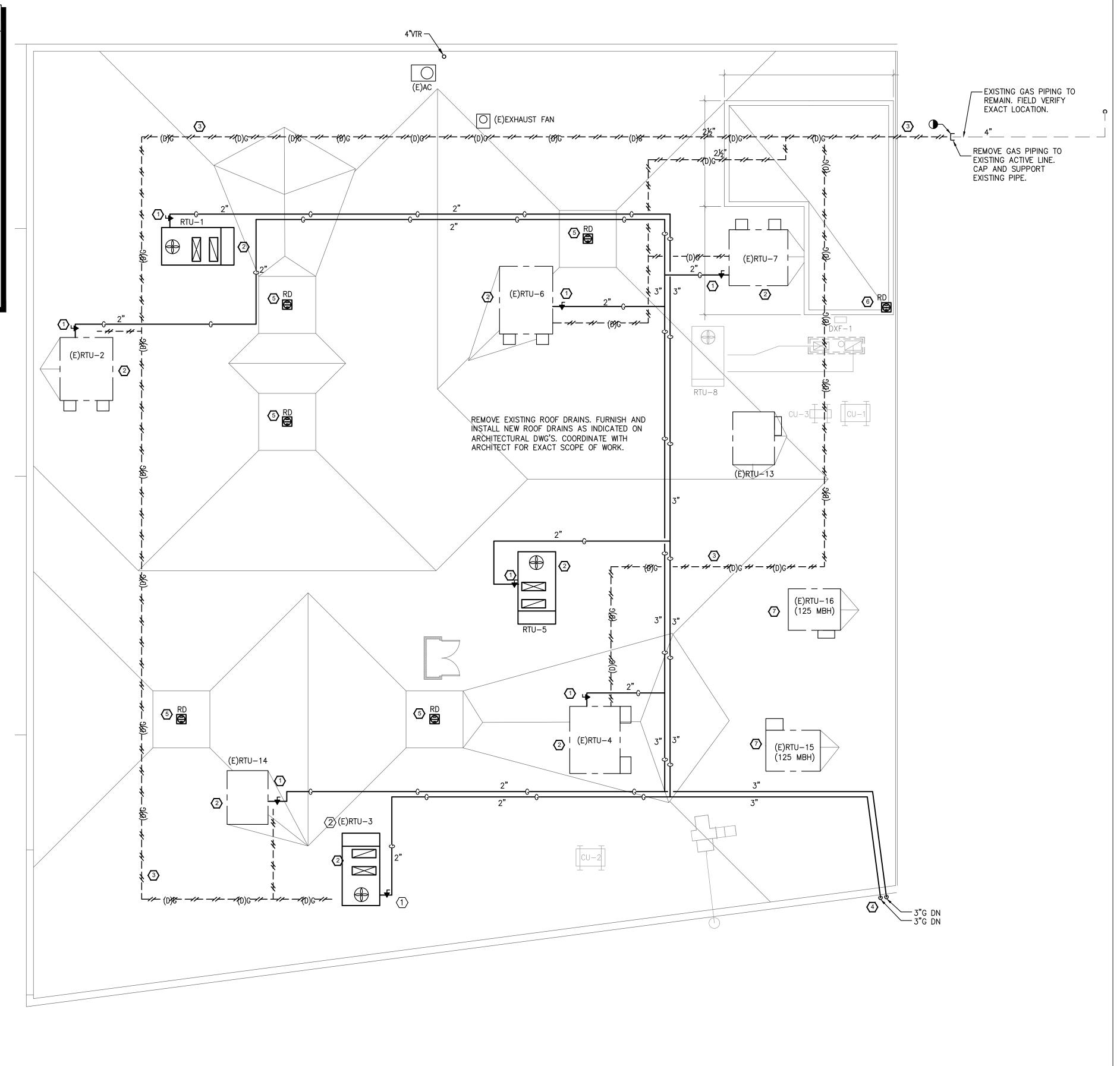
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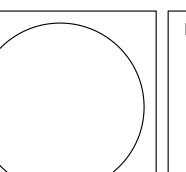
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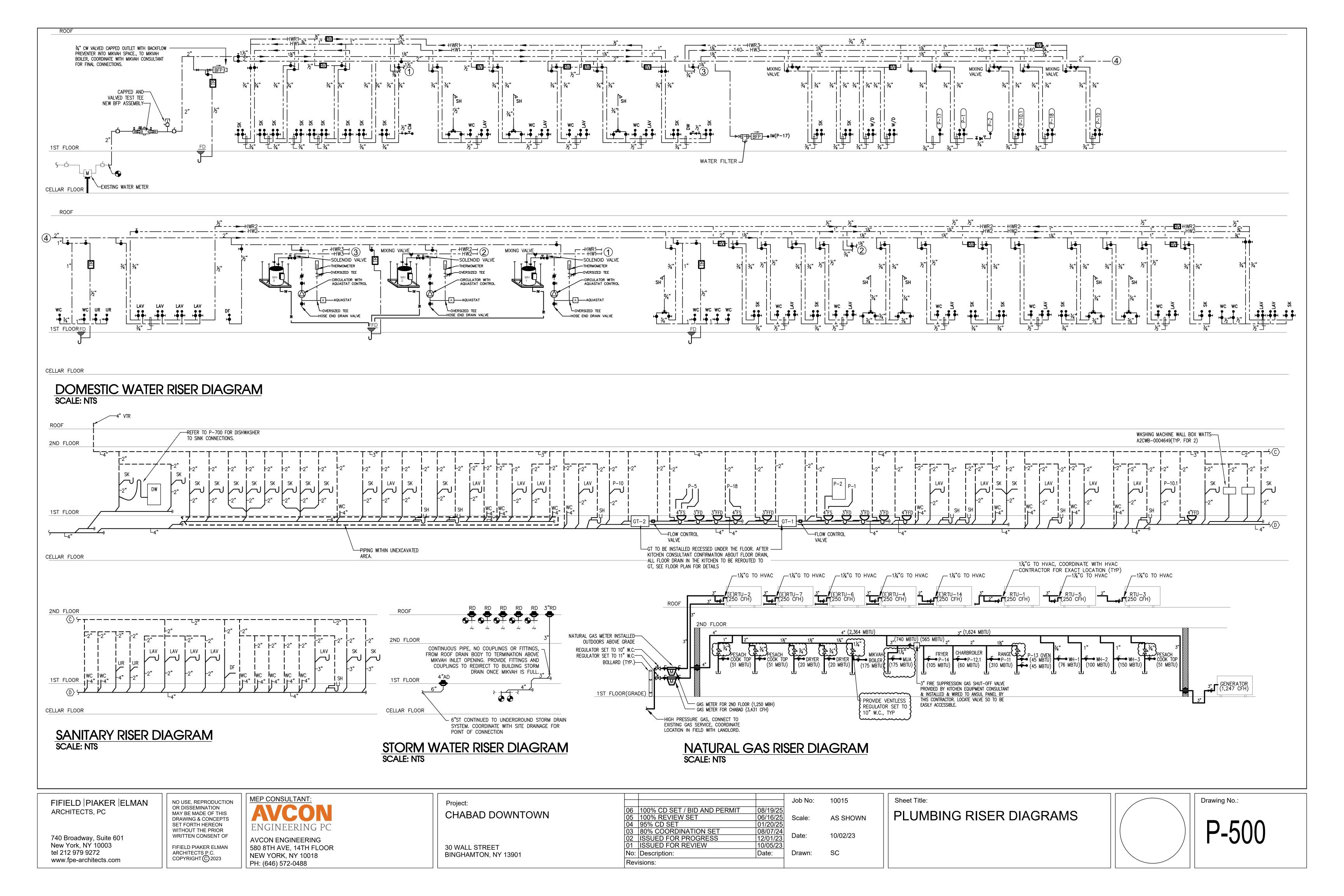
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			PLUMBING SCHEDUL	E
ITEM NO QTY EQUIPMENT CATEGORY	MANUFACTURER	MODEL NUMBER	COLD WATER SIZE (IN) BIRECT DRAIN SIZE (IN) SIZE (IN) SIZE (IN) GAS GAS SIZE (IN)	PLUMBING REMARKS
1 1 SOILED DISHTABLE	BK RESOURCES	BKSDT-48-L-SS-P-G	1.5	
2 1 DISHWASHER, DOOR TYPE	JACKSON WWS	CONSERVER XL-E-LTH	0.5 0.75 - 2	WATER TEMP: 140 DEGREES; PROVIDE 1/2" DRAINWATER TEMPERING VALVE W/ CW FEED AND BFP
3 1 CLEAN DISHTABLE	BK RESOURCES	BKCDT-48-RR-SS	1	
3.1 1 GREASE TRAP	BK RESOURCES	BK-GT-20		
5 1 THREE COMPARTMENT SINK	BK RESOURCES	BKS-3-20-12-18T	0.5 0.5 - (3)1.5	WATER TEMP: 140 DEGREES
5.1 1 GREASE TRAP	BK RESOURCES	BK-GT-40		
10 1 HAND SINK	SERV-WARE	HS10-CWP-SSR	1.5 -	WATER TEMP: 105 DEGREES
11 1 RANGE, 48", 8 OPEN BURNERS	AMERICAN RANGE	AR-8	0.75	
12.1 1 CHARBROILER, GAS, COUNTERTOP	SERV-WARE	SCBS-24		
13 1 CONVECTION OVEN, GAS	BLODGETT	ZEPH-100-G-ES DBL	(2)0.75	
14 1 GAS FLOOR FRYER	ASBER	AEF-4050-S-E		
17 1 ICE MAKER WITH BIN, CUBE STYLE	HOSHIZAKI	KM-231BAJ	0.5 0.75	

GREASE	INTER	RCEPTOR GI	-2 TABLE I	(18	ST FLOOR )
ITEM	QUAN	DESCRIPTION	VOL CUBIC IN	TOTAL CU.IN	
P-5	1	THREE COMP. SINK (20"x20"x12")	4,800x3	14,400	TABLE I
18	1	WORK TABLE W/SINK (20"x16"x10")	3,200	3,200	TABLE I
FD	2	3" FLOOR DRAIN	1,540	3,040	TABLE I
TOTAL VOLUMI TOTAL GREASE	•	I) = 2x(TABLE II)		20,040 70 LBS	
DIMENSIONS EXTENSION <u>NOTES:</u> 1. PROVID	S WIDTH 23 DIMENSION OF WITH AC	/ EXTENSION, 35 GPM ", LENGTH 29", HEIGH S: WIDTH"23, LENGTH ID RESISTANT COATING UBLE WALL CONSTRUC	T 19" WITH 4" IN 26", HEIGHT AS G INSIDE AND OUT	LET AND OUTL REQUIRED.	

*DEP CHAPTER 19 USE PUBLIC SEWERS, PARAGRAPH 19-11 (RCNY TITLE 15)								
GREASE INTERCEPTOR GI-1 TABLE II (1ST FLOOR)								
ITEM	QUAN	DESCRIPTION	VOL CUBIC IN	TOTAL CU.IN				
P-1	1	(20"x20"x8") SOILED DISH	3,200	3,200	TABLE I			
P-1	1	DISHWASHER	1,100	1,100	TABLE II			
FD	3	3" FLOOR DRAIN	1,540	4,620	TABLE I			
	TOTAL VOLUME: (TABLE I) + 2x(TABLE II)  TOTAL GREASE LBS:  10,020  40 LBS							

ZURN LOW BOY Z2700-20, W/ EXTENSION, 20 GPM FLOW RATE, 40 LBS GREASE CAPACITY. DIMENSIONS WIDTH 18", LENGTH 25", HEIGHT 15" WITH 3" INLET AND OUTLET SIZE EXTENSION DIMENSIONS: WIDTH 22", LENGTH 17", HEIGHT AS REQUIRED.

NOTES:

1. PROVIDE WITH ACID RESISTANT COATING INSIDE AND OUTSIDE.

2. PROVIDE WITH DOUBLE WALL CONSTRUCTION.

3. PROVIDE EXTENSION LENGTH REQUIRED FOR PROPER INSTALLATION. COORDINATE FLOOR OPENING WITH STRUCTURAL CONTRACT.

PROVIDE EXTENSION LENGTH REQUIRED FOR PROPER INSTALLATION. COORDINATE FLOOR OPENING WITH STRUCTURAL CONTRACT.

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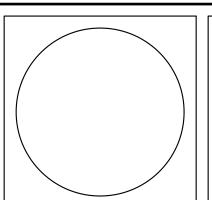
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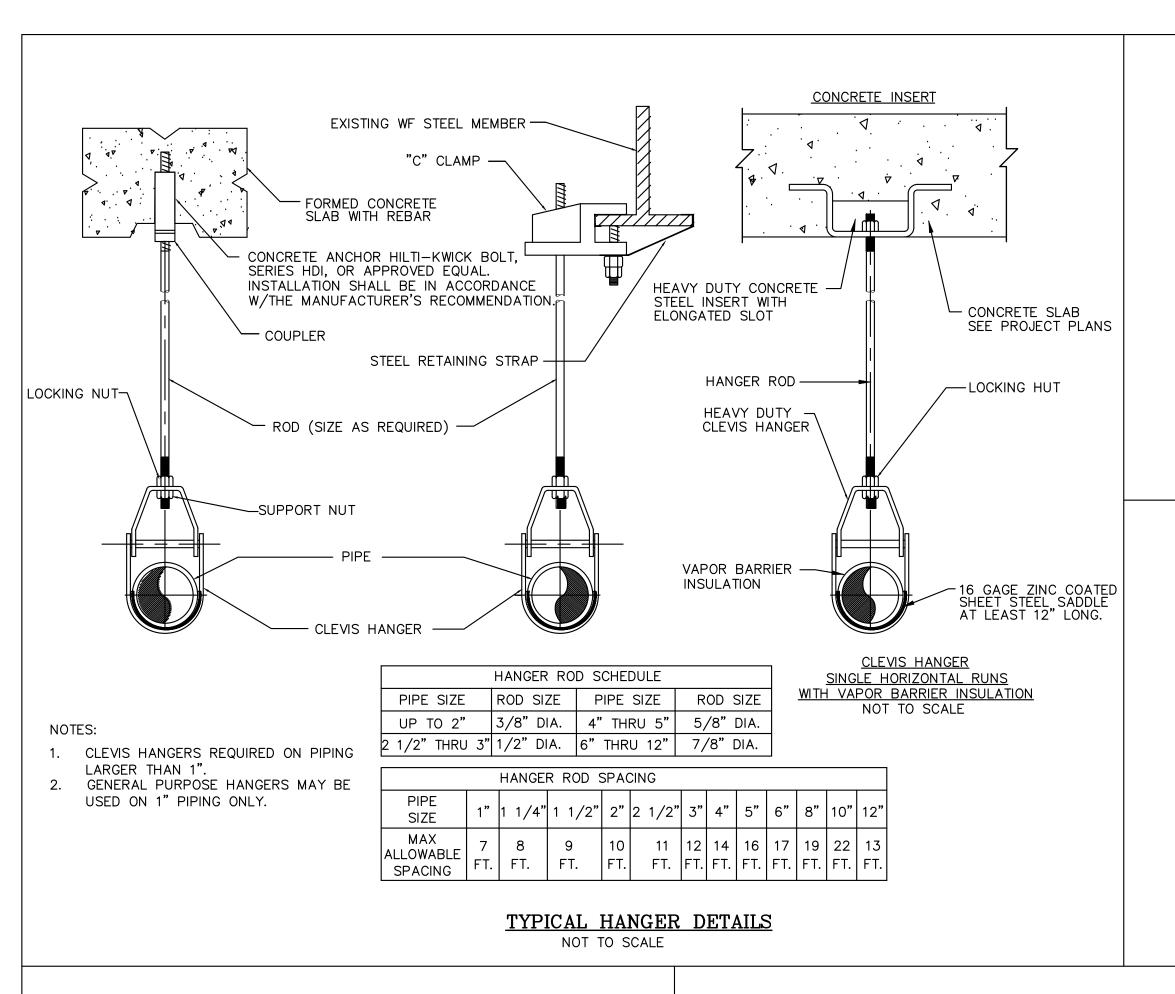
30 WALL STREET BINGHAMTON, NY 13901 06 100% CD SET / BID AND PERMIT
05 100% REVIEW SET
04 95% CD SET
03 80% COORDINATION SET
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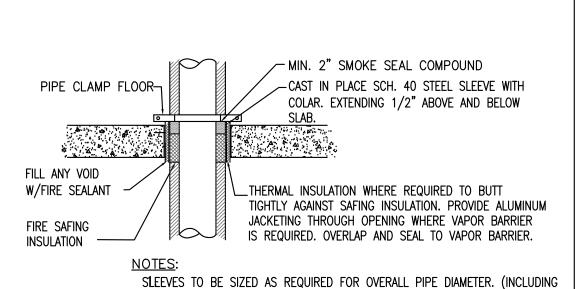
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Sheet Title:

PLUMBING SCHEDULES

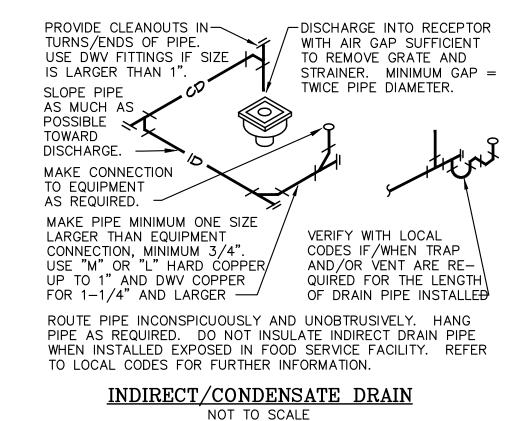


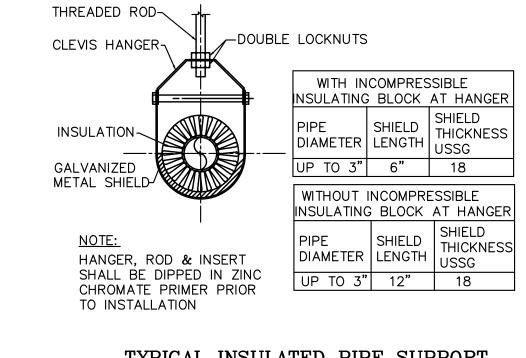




INSULATION, WHERE APPLICABLE)

FLOOR PENETRATION DETAIL





TERMINATE SLEEVE

WALL SURFACES

SEAL OR CAULK SLEEVE

A SMOKE TIGHT MANNER

SEALING AND ANCHORING COLLAR-

SEAL WATERTIGHT WITH -

CENTER PIPE IN SLEEVE-

STANDARD WEIGHT STEEL PIPE SLEEVE INSTALLED DURING

MASTIC OR ASPHALT

CONTINUOUS WELD -

WALL CONSTRUCTION

THRU FIRE WALLS IN

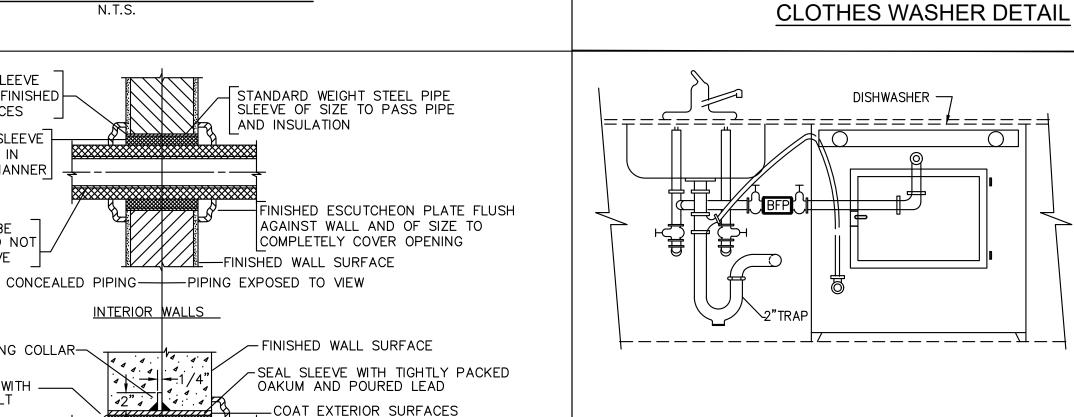
PIPE AND INSULATION TO BE

SUPPORT PIPE FROM SLEEVE

CENTERED IN SLEEVE - DO NOT

FLUSH WITH FINISHED





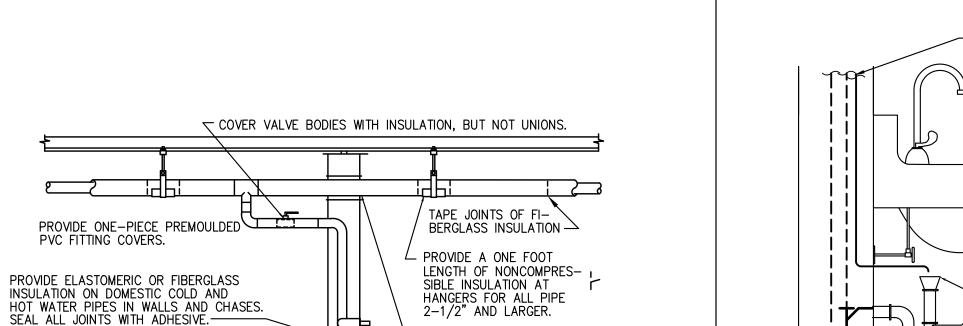
MAX.

1. BFP SHALL BE WATTS LF7 2. PORTION OF DRAIN HOSE SHALL BE RAISED BETWEEN MIN.33" AND MAX 43" ABOVE CABINET FLOOR

# PIPE SLEEVES THRU WALL

N.T.S.

EXTERIOR WALLS



2-1/2" AND LARGER.

REFER TO OTHER DETAILS FOR TREATMENT OF INSU-LATION AT PENETRATION

WITH TAR COMPOUND

1. PIPE SLEEVE FOR EXTERIOR

WALL ABOVE OR BELOW GRADE.

2. FOR GAS SERVICE EXTEND SLEEVE 1" PAST INSIDE FACE OF WALL &

4" PAST OUTSIDE FACE OF WALL.

OF WALLS. PROVIDE FIBERGLASS INSULATION WITH ALL-SERVICE JACKET WITH VAPOR BARRIER ON ALL SIZES OF HOT AND COLD WATER AND CONDENSATE PIPING. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION REGARDING INSULATION. INSTALL ALL ITEMS PER SPECIFICATIONS AND MANUFACTURER'S INSTRUCTIONS. MAINTAIN VAPOR BARRIER ON COLD PIPING BY MEANS OF SEALANT AND TAPE FLAME—SPREAD AND SMOKE—DEVELOPED INDEXES SHALL NOT EXCEED 25/50. SEAL EXPOSED ENDS OF FIBERGLASS INSULATION WITH ADHESIVE MASTIC.

Sheet Title:

PIPE INSULATION N.T.S.

# TYPICAL DISHWASHER & SINK INSTALLATION N.T.S.

3/4"\

DRAIN-

HOSE

*y*−3/4"

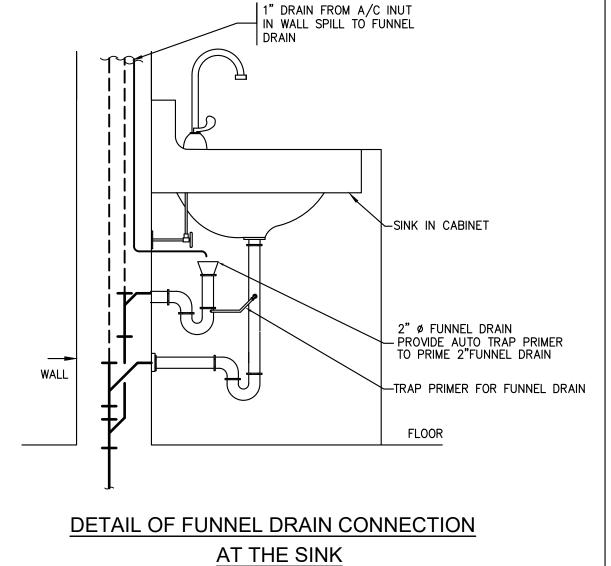
-COMBINATION

MODEL#60558)

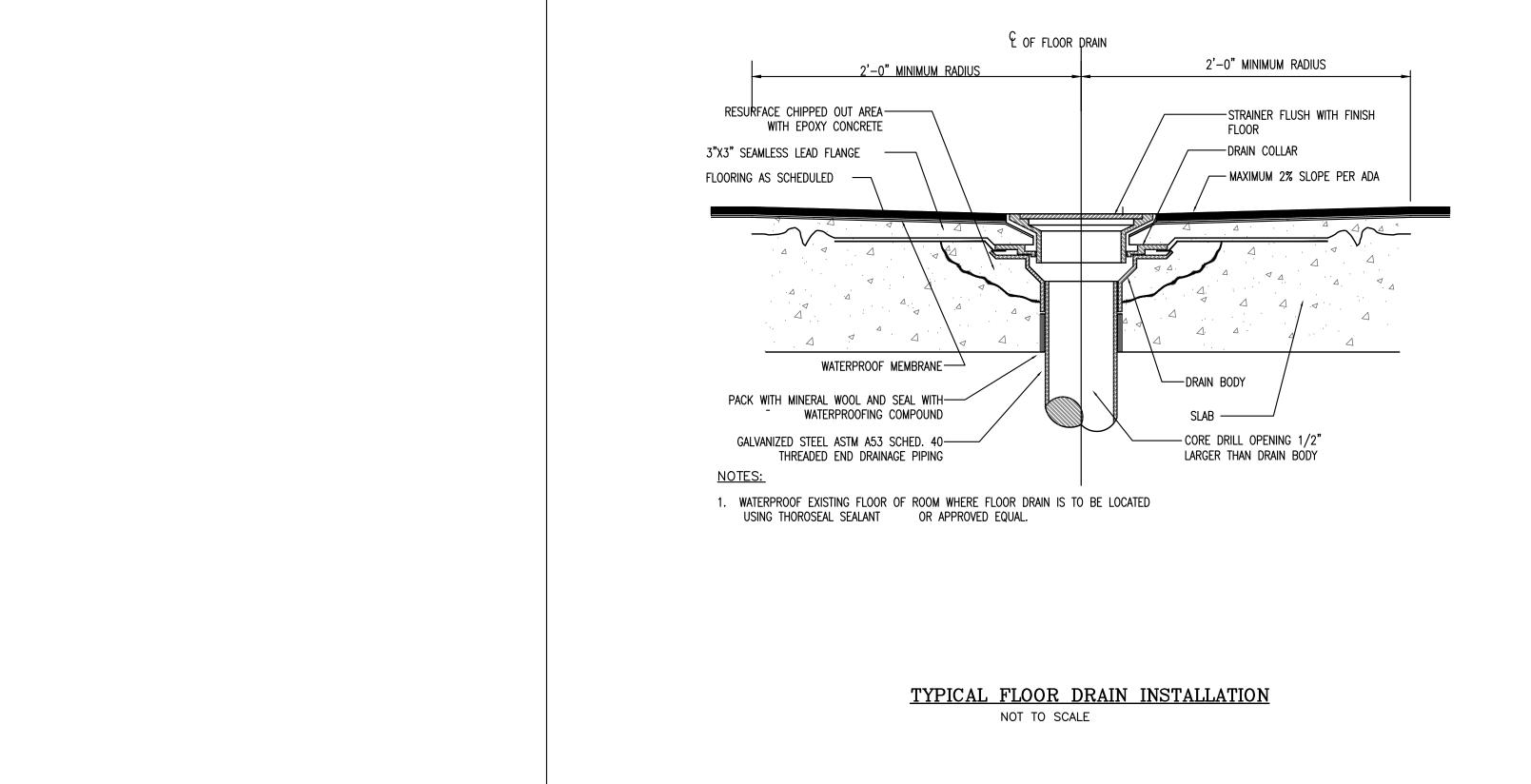
←CLOTHES WASHER

(DUAL DRAIN WASHING MACHINE OUTLET BOX

W/HAMMER ARRESTOR



N.T.S.



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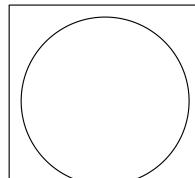
 
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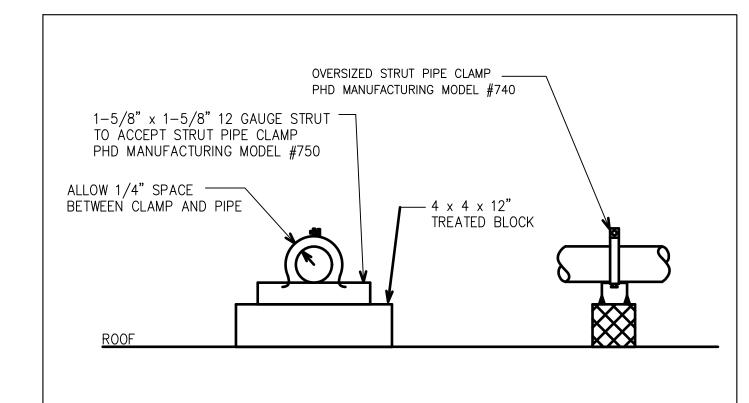
 05
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 04 95% CD SET 03 80% COORDINATION SET 02 ISSUED FOR PROGRESS Date: 12/01/2 01 ISSUED FOR REVIEW 10/05/23 Date: No: Description: Drawn: Revisions:

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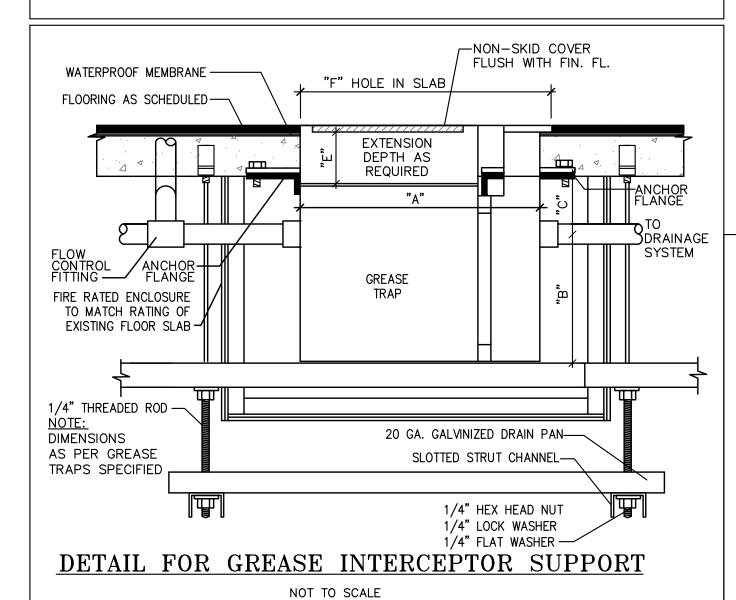
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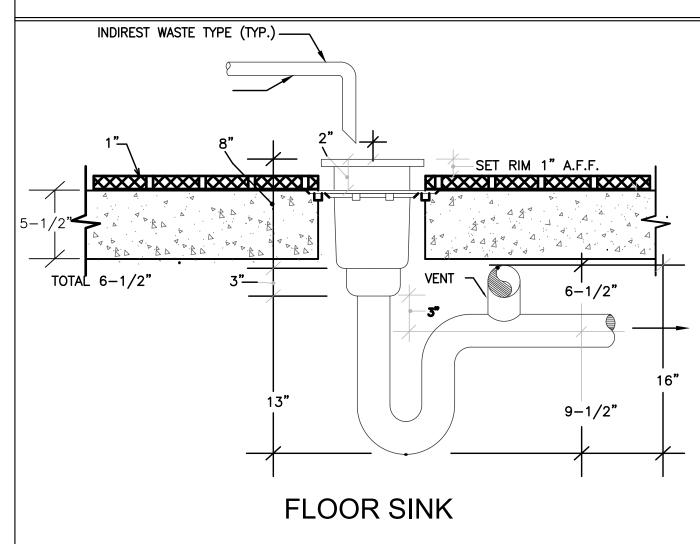
PLUMBING DETAILS II

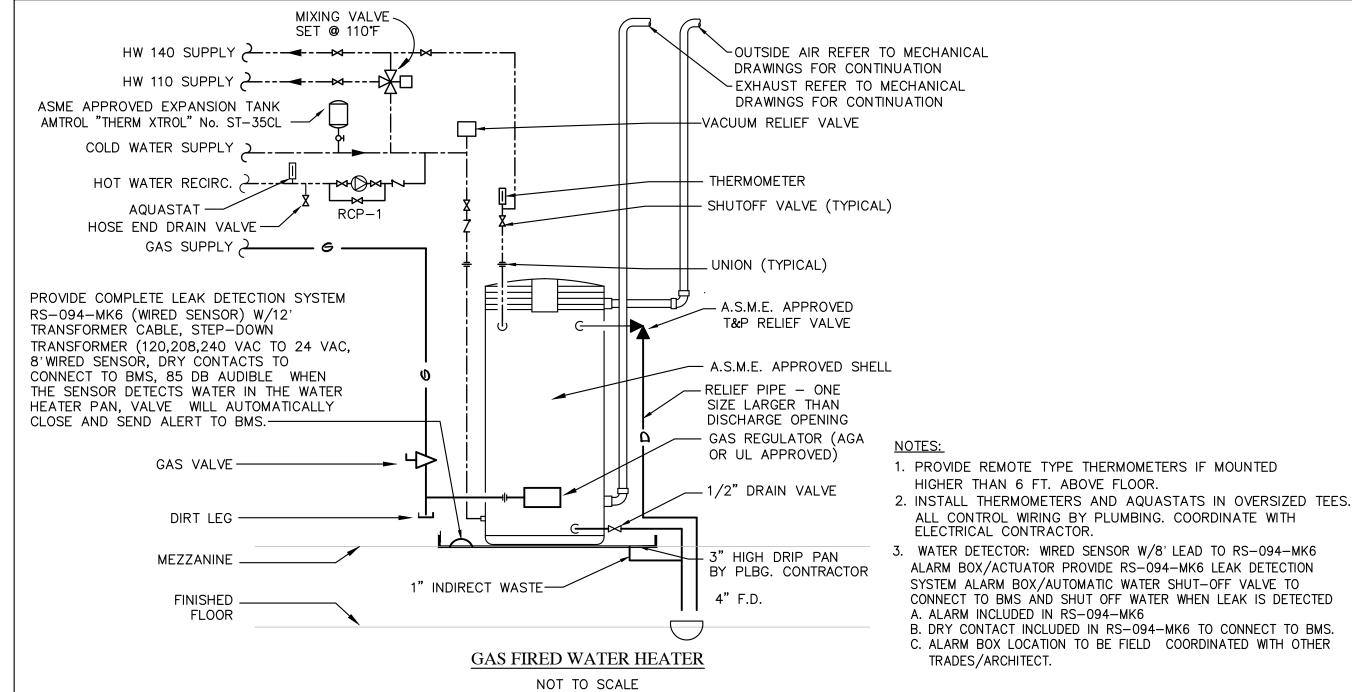


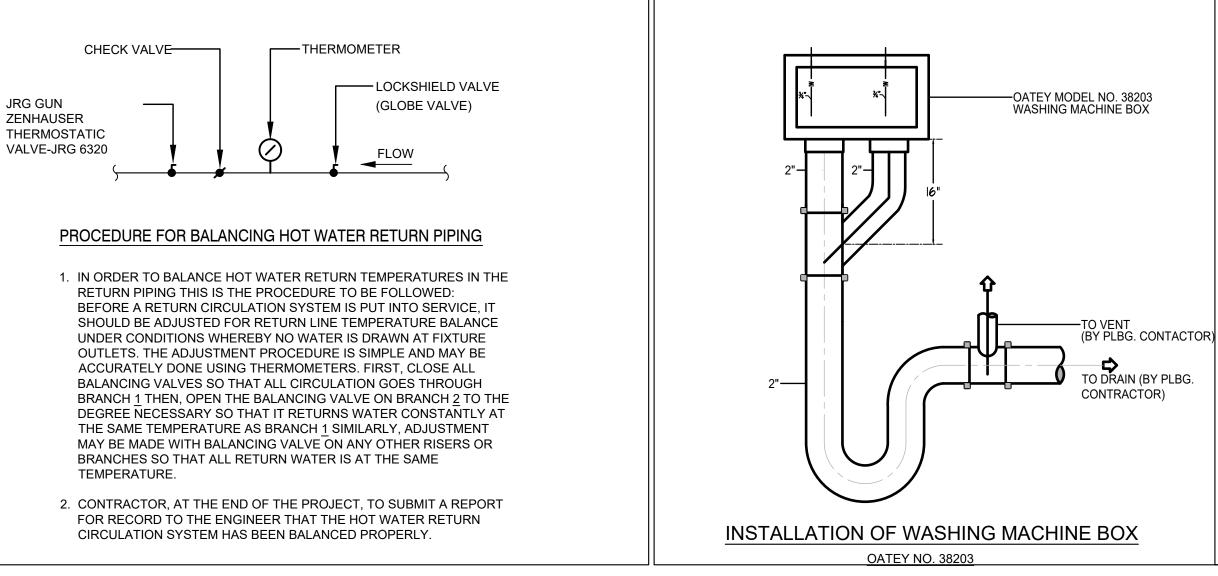


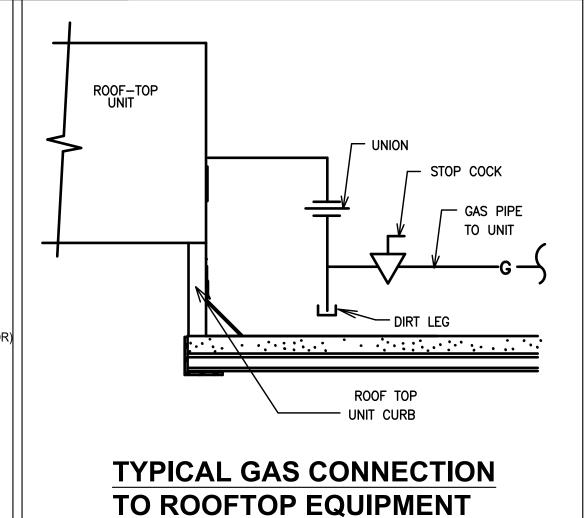
# GAS PIPING SUPPORT ON ROOF











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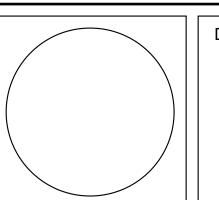
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PLUMBING DETAILS I



Drawing No.:

P-701

PART 1 — GENERAL

- 1.1 GENERAL A. THE WORK OF THIS SECTION SHALL CONFORM TO THE REQUIREMENTS OF THE GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT AND BASED ON THE REQUIREMENTS IN THE LATEST EDITION OF AIA DOCUMENTS. THEY SHALL BE ADHERED TO WHEREVER APPLICABLE UNLESS OTHERWISE INDICATED SPECIFICALLY ON THE CONTRACT DRAWINGS WHICH ARE PART OF THIS CONTRACT.
- B. BIDDER SHALL REVIEW ALL CONSTRUCTION DOCUMENTS ASSOCIATED WITH THIS PROJECT, INCLUDING GENERAL CONSTRUCTION, DEMOLITION, ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND SPRINKLER PLANS AND SPECIFICATIONS. IF A CONFLICT OCCURS IN THE BID SPECIFICATIONS AND/OR ON THE DRAWINGS, THE MORE STRINGENT SITUATION OR THE HIGHER QUANTITY SHALL APPLY.
- C. BIDDERS SHALL FAMILIARIZE THEMSELVES WITH PROPOSED WORK AND WITH ALL EXISTING CONDITIONS. BEFORE SUBMITTING PROPOSALS. BIDDERS SHALL VISIT AND CAREFULLY EXAMINE AREAS AFFECTED BY PROPOSED WORK AND THE DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BID. IF DISCREPANCIES ARE NOT RESOLVED TO CONTRACTORS SATISFACTION THEY SHALL BE QUALIFIED IN THEIR BID SUBMISSION.
- D. WITHIN THREE (3) DAYS AFTER AWARD OF CONTRACT, CONTRACTOR SHALL SUBMIT A DETAILED SCHEDULE FOR HIS WORK, FROM START TO FINISH, AND SHALL UPDATE THIS SCHEDULE AS NECESSARY. THE SCHEDULE SHALL INDICATE THE EFFORT MADE TO MINIMIZE THE DURATION OF ALL NECESSARY INTERRUPTIONS IN OPERATION OF EXISTING SYSTEMS. ALL OVERTIME WORK AND WORK ON WEEKENDS AND HOLIDAYS MUST BE IDENTIFIED AND SCHEDULED WITH A MINIMUM OF ONE (1) WEEK IN ADVANCE, WITH THE PROJECT MANAGER. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM NEW YORK CITY BUILDING DEPARTMENT, INCLUDING AFTER HOURS VARIANCES (AHV) FOR OVERTIME WORK AND WORK ON WEEKENDS. CONTRACTOR SHALL CLOSELY COORDINATE ALL WORK TO MINIMIZE INTERFERENCE WITH NORMAL BUILDING OPERATIONS. IF PREMIUM TIME IS REQUIRED FOR CERTAIN ITEMS OR WORK ON THIS PROJECT, THEN SUCH TIME SHALL BE INCLUDED IN THE BID. CONTRACTOR IS TO OBTAIN A COPY OF THE BUILDING RULES AND REGULATIONS FOR CONSTRUCTION WORK IN THE BUILDING PRIOR TO BID SUBMISSION.
- E. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN CONTRACT. IT IS NOT INTENDED TO SPECIFY OR TO SHOW EVERY OFFSET, FITTING, OR COMPONENT. HOWEVER, CONTRACT DOCUMENTS REQUIRE COMPONENTS AND MATERIALS WHETHER OR NOT INDICATED OR SPECIFIED AS NECESSARY TO MAKE THE INSTALLATION COMPLETE AND OPERATIONAL. FINAL LOCATIONS OF DIFFUSERS, GRILLES, REGISTERS. THERMOSTATS, SENSORS, SWITCHES AND ANY WALL MOUNTED DEVICES SHALL BE AS PER THE ARCHITECT. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID CONFLICT.
- F. ANY EQUIPMENT DETAILS AND ACCESSORIES, MATERIAL ACCESSORIES OR LABOR REQUIRED FOR A CODE COMPLIANT AND COMPLETE INSTALLATION, NOT DETAILED ON DRAWINGS OR SPECIFICATIONS, SHALL BE FURNISHED AND INSTALLED AS PART OF ORIGINAL BID.
- G. ALL CUTTING AND PATCHING FOR THE INSTALLATION OF WORK IN THIS CONTRACT SHALL BE PERFORMED BY THIS CONTRACTOR.
- H. CONTRACTOR SHALL MAINTAIN HIS WORK AREA IN AN ORGANIZED MANNER, SHALL NOT ALLOW DEBRIS TO ACCUMULATE, SHALL CLEAN UP THE SITE AFFECTED BY HIS WORK DAILY, AND SHALL NOT CAUSE INTERFERENCE WITH THE ACTIVITIES OF OTHER ENGAGED ON THIS
- I. OPEN ENDS OF PIPE, EQUIPMENT AND SPECIALTIES SHALL BE KEPT PROPERLY CLOSED DURING CONSTRUCTION AND INSTALLATION SO AS TO AVOID CONTAMINATIONS.
- J. CONTRACTOR SHALL CLOSELY COORDINATE ALL WORK TO MINIMIZE INTERFERENCE WITH NORMAL BUILDING OPERATIONS. IF PREMIUM TIME IS REQUIRED FOR CERTAIN ITEMS OR WORK ON THIS PROJECT, THEN SUCH TIME SHALL BE INCLUDED IN THE BID.
- K. ALL EQUIPMENT AND NEW SYSTEMS CONNECTIONS TO EXISTING BUILDING SYSTEMS AND INFRASTRUCTURE SHALL BE APPROVED BY THE BUILDING PRIOR TO INSTALLATION OF WORK.
- L. **BUILDING REQUIREMENTS**.

THE CONTRACTOR SHALL NOT DRILL INTO SLABS OR STRUCTURAL MEMBERS FOR THE PURPOSE OF SUPPORTING ANY LOADS, UNLESS WRITTEN APPROVAL IS OBTAINED BY THE ARCHITECT. THE CONTRACTOR SHALL REPAIR OR REPLACE EXISTING CONSTRUCTION DAMAGED IN THE PERFORMANCE OF THIS CONTRACT. SEE DRAWINGS FOR DUCT HANGER DETAILS.

- M. VIBRATION CONTROL FREEDOM FROM VIBRATION AND NOISE IS ESSENTIAL. TAKE PARTICULAR CARE IN INSTALLING VIBRATION ISOLATION MOUNT AND HANGERS SO THAT VIBRATION FROM OPERATING EQUIPMENT IS NOT TRANSMITTED TO THE STRUCTURE OR OTHER WORK.
- N. SUPPLEMENTARY STEEL PROVIDE ALL NECESSARY SUPPLEMENTARY STEEL FOR SUPPORT OF EQUIPMENT, PIPING, DUCTWORK ATTACHMENT OF HANGERS AND PIPE IN SHAFTS AND BETWEEN BUILDING STRUCTURAL MEMBERS, STEEL SHALL BE PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER.
- O. SUPERVISION MAINTAIN A FIELD REPRESENTATIVE ON THE PREMISES AT ALL TIMES DURING THE COURSE OF CONSTRUCTION WORK.
- P. GUARANTEE ALL SYSTEMS AND COMPONENTS SHALL BE PROVIDED WITH A MINIMUM ONE (1) YEAR WARRANTY FROM THE TIME OF FINAL ACCEPTANCE OR BENEFICIAL OCCUPANCY. THE WARRANTY SHALL COVER ALL MATERIALS AND WORKMANSHIP. DURING THIS WARRANTY PERIOD, ALL DEFECTS IN MATERIALS AND WORKMANSHIP SHALL BE CORRECTED BY REPAIR OR REPLACEMENT WITHOUT INCURRING ADDITIONS TO THE CONTRACT. ALL AIR CONDITIONING COMPRESSORS SHALL BE WARRANTED FOR AN ADDITIONAL FOUR YEARS.

- THE REPLACEMENT OR REPAIR SHALL BE PERFORMED THE SAME DAY OF NOTIFICATION IN AN EMERGENCY FASHION WHEN NOTIFIED BY THE OWNER OR AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ALSO REPAIR ALL DAMAGE TO SURROUNDING WORK CAUSED BY THE FAILURE, REPAIR OR REPLACEMENT OF DEFECTIVE EQUIPMENT. ALL FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS DEMONSTRATED THAT HIS WORK FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND HAS FURNISHED ALL THE REQUIRED DOCUMENTATION AND APPROVALS.
- Q. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS, AS SPECIFIED HEREIN AND AS SHOWN. IF ANY CONFLICT ARISES BETWEEN THESE INSTRUCTIONS, NOTIFY THE ENGINEER IMMEDIATELY FOR GUIDANCE.
- R. PROVIDE ADEQUATE ACCESS TO EQUIPMENT AND APPARATUS REQUIRING OPERATION, SERVICE, OR MAINTENANCE WITHIN THE LIFE OF THE SYSTEM, AND AS REQUIRED BY ALL CODES AND REGULATED AS PER THE LOCAL BUILDING DEPARTMENT OFFICIAL.
- S. PROVIDE LABELS FOR EACH EQUIPMENT, EQUIPMENT STARTER AND CONTROL SWITCHES. EQUIPMENT SHALL BE LABELED USING DESIGNATORS IN SCHEDULES ON DRAWINGS.
- T. DO NOT RUN PIPING, OR LOCATE EQUIPMENT, IN SPACES WITH SWITCHBOARDS, PANEL BOARDS, POWER PANELS, MOTOR CONTROL CENTERS OR DRY TYPE TRANSFORMERS. NO PIPING SHALL RUN OVER OR THROUGH COMMUNICATIONS ROOMS.
- U. PROVIDE PROTECTIVE COVERS, SKIDS, PLUGS, OR CAPS TO PROTECT EQUIPMENT AND MATERIALS FROM DAMAGE AND DETERIORATION DURING CONSTRUCTION.
- V. COORDINATE INSTALLATION OF STARTERS, CONTRACTORS, THERMAL OVERLOAD SWITCHES AND REMOTE PUSH BUTTONS.
- W. COORDINATE INSTALLATION OF ELECTRICAL POWER, INTERLOCK AND CONTROL WIRING, EXCEPT AS SPECIFIED HEREIN.
- X. START-UP AND TESTING OF THE FOLLOWING EQUIPMENT SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF A REPRESENTATIVE OF THE MANUFACTURER.
- Y. FACTORY PAINTED EQUIPMENT THAT HAS BEEN SCRATCHED OR MARRED SHALL BE REPAINTED TO MATCH ORIGINAL FACTORY COLOR.
- Z. ALL UN-INSULATED BLACK FERROUS METAL ITEMS EXPOSED TO SIGHT INSIDE THE BUILDING EQUIPMENT SUCH AS HANGERS AND SUPPORTS, NOT PROVIDED WITH FACTORY FINISH SHALL BE CLEANED AND PAINTED WITH ONE (1) COAT OF RUST INHIBITING PRIMER. IN ADDITION, SUCH ITEMS IN FINISHED SPACES SHALL ALSO BE PAINTED WITH TWO (2) COATS OF FINISH PAINT IN A COLOR TO MATCH ADJACENT SURFACES OR AS OTHERWISE SELECTED BY THE ARCHITECT.
- AA. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR HOSTING AND RIGGING OF ALL EQUIPMENT, MATERIALS AND EQUIPMENT FURNISHED UNDER THIS SECTION OF THE SPECIFICATIONS, IN ACCORDANCE WITH ALL CITY, STATE AND FEDERAL RULES AND REGULATIONS.

#### 1.2 CODES AND REGULATIONS

- A. ALL WORK SHALL BE GOVERNED BY AND INSTALLED IN COMPLIANCE
- 1. THE 2020 NEW YORK STATE BUILDING CODE.
- 2. THE 2020 NEW YORK STATE PLUMBING CODE. 3. THE 2020 NEW YORK STATE ENERGY CODE.
- 4. THE ALL OTHER CURRENT RULES AND REGULATIONS
- B. IN ADDITION TO THE REQUIREMENTS SHOWN OR SPECIFIED, COMPLY WITH THE LATEST CURRENT APPLICABLE STANDARDS, SPECIFICATIONS OR CODES PUBLISHED BY: AMERICAN SOCIETY OF MECHANICAL ENGINEERS ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
- AWWA AMERICAN WATER WORKS ASSOCIATION ASHRAE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING
- ASTM AMERICAN SOCIETY FOR TESTING MATERIALS NATIONAL ELECTRICAL MANUFACTURER & ASSOCIATION NFPA UNDERWRITER S LABORATORIES
- NEMA NATIONAL ELECTRICAL MANUFACTURER S ASSOCIATION OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION OSHA
- C. UNLESS THE CONTRACTOR, BEFORE SIGNING THIS CONTRACT, HAS NOTIFIED THE ARCHITECT/ENGINEER IN WRITING OF ANY ITEMS IN CONFLICT WITH CODES, THEY SHALL THEREAFTER MAKE ANY ADJUSTMENTS NECESSARY TO MEET CODES AT NO COST TO THE OWNER.
- D. CONTRACTOR SHALL INCLUDE ALL ITEMS OF LABOR AND MATERIAL REQUIRED TO COMPLY WITH SUCH STANDARDS AND CODES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. WHERE QUANTITIES, SIZES OR OTHER REQUIREMENTS INDICATED ON THE DRAWINGS OR HEREIN SPECIFIED ARE IN EXCESS OF THE STANDARD OR CODE REQUIREMENTS, THE SPECIFICATIONS AND/OR DRAWINGS SHALL
- CONTRACTOR IS RESPONSIBLE FOR TIMELY NOTIFICATION OF READINESS FOR SPECIAL PROGRESS AND FINAL INSPECTIONS.

# 1.3 SCOPE OF WORK

- A. THE WORK SPECIFIED SHALL BE TO PROVIDE A COMPLETE OPERATIONAL PLUMBING SYSTEM. ALL ITEMS OF WORK, OF COST AND EXPENSE OF ANY NATURE WHATSOEVER BELONGING WITH OR NECESSARY TO THE COMPLETION OF WORK CALLED FOR IN THIS SPECIFICATION OR IN THE CONTRACT DOCUMENTS ARE HEREBY SPECIFIED TO BE INCLUDED IN THIS CONTRACT.
- WORK COVERED BY THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS CONSISTS IN FURNISHING ALL LABOR, EQUIPMENT, APPLIANCES AND MATERIALS AND IN PERFORMING ALL OPERATIONS IN CONNECTION WITH INSTALLATION OF A COMPLETE SYSTEM FOR THIS PROJECT AS INDICATED AND SPECIFIED. THIS WORK SHALL ALSO INCLUDE ALL INCIDENTAL ITEMS NOT ORDINARILY SPECIFIED, BUT NECESSARY FOR THE COMPLETE INSTALLATION.

- C. ALL EQUIPMENT AND MATERIALS MENTIONED IN THESE SPECIFICATIONS AND/OR SHOWN ON THE DRAWINGS SHALL BE FURNISHED, EXCEPT WHERE OTHERWISE SPECIFICALLY NOTED, COMPLETELY INSTALLED, ADJUSTED, AND LEFT IN A SAFE AND SATISFACTORY OPERATING CONDITION. ALL ACCESSORIES, APPLIANCES AND CONNECTIONS NECESSARY FOR THE OPERATION OF THE EQUIPMENT SHALL BE FURNISHED AND INSTALLED.
- D. THE PLUMBING SYSTEMS CONSIST OF THE FOLLOWING PRINCIPAL
- 1. SANITARY WASTE, AND VENT SYSTEMS. DOMESTIC COLD AND HOT WATER SYSTEMS.
- 3. INSULATION OF PLUMBING SYSTEMS.

#### 1.4 DRAWINGS AND SPECIFICATIONS

- A. THE COMMENCEMENT OF WORK UNDER THIS SECTION INDICATES THAT THE CONTRACTOR HAS EXAMINED AND HAS KNOWLEDGE OF THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL, PLUMBING, AND SITE WORK DRAWINGS AND SPECIFICATIONS. THE FAILURE OF THE CONTRACTOR TO ACQUAINT HIMSELF WITH ALL AVAILABLE INFORMATION SHALL NOT RELIEVE HIM OF ANY RESPONSIBILITY FOR PERFORMING HIS WORK PROPERLY.
- B. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED BECAUSE OF CONDITIONS THAT OCCUR DUE TO THE CONTRACTOR'S FAILURE TO BECOME THOROUGHLY FAMILIAR WITH ALL OF THE CONTRACT DOCUMENTS FOR THIS PROJECT, AS DESCRIBED ABOVE, AND WITH THE JOB SITE.
- C. UNLESS EXPRESSLY STIPULATED, NO ADDITIONAL ALLOWANCE WILL BE MADE IN THE CONTRACTOR'S AND/OR MANUFACTURER'S FAVOR BY VIRTUE OF ERRORS, AMBIGUITIES, AND/OR OMISSIONS WHICH WERE KNOWN TO OR WHICH SHOULD HAVE BEEN KNOWN OR DISCOVERED DURING THE PREPARATION OF THE BID ESTIMATE OR DURING THE COURSE OF THE WORK AND DIRECTED TO THE ARCHITECT'S ATTENTION IN A TIMELY MANNER.
- D. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT ONE ANOTHER. ANY MATERIAL OR LABOR CALLED FOR IN ONE BUT NOT THE OTHER SHALL BE FURNISHED AS IF BOTH WERE MENTIONED IN THE SPECIFICATIONS AND SHOWN ON THE DRAWINGS. LABOR AND/OR MATERIALS NEITHER SHOWN NOR SPECIFIED, BUT NECESSARY FOR THE COMPLETION AND PROPER FUNCTIONING OF THE SYSTEMS, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO DEPICT THE APPROXIMATE LOCATIONS OF EQUIPMENT, PIPING, AND APPARATUS AND SHALL NOT BE USED AS SHOP DRAWINGS. ALL DIMENSIONS, WHETHER IN FIGURES OR SCALED, SHALL BE VERIFIED IN
- F. THE CONTRACTOR SHALL KEEP A RECORD OF ALL FIELD CHANGES AND CONCEALED WORK AND, UPON COMPLETION OF THE JOB, SHALL SUPPLY AS-BUILT DRAWINGS SHOWING ANY DEVIATIONS FROM THE ORIGINAL DRAWINGS.
- SHOP DRAWINGS, EQUIPMENT SUBMISSION, MAINTENANCE MANUALS
  - A. ALL MATERIALS AND EQUIPMENT WHICH THE CONTRACTOR PROPOSES TO FURNISH SHALL BE SUBMITTED FOR REVIEW. DATA SHALL BE COMPLETE IN ALL RESPECTS AND SHALL REFERENCE, WHERE APPLICABLE, TO THE UNIT SYMBOL UTILIZED ON THE DRAWINGS AND SPECIFICATIONS.
  - SUBMITTAL REVIEW IS CONSIDERED AS GENERAL ACCEPTANCE OF THE BASIC APPLICABILITY OF THE SUBSTITUTED EQUIPMENT. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF THE SUBSTITUTED EQUIPMENT AND/OR ALTERNATE ARRANGEMENT OF THE EQUIPMENT WITHIN A GIVEN SPACE. WHEN THE CONTRACTOR DESIRES TO USE SUBSTITUTED EQUIPMENT. HE SHALL BE RESPONSIBLE FOR PRODUCING HIS OWN COORDINATED WORK DRAWINGS WHICH DEPICT THE SUBSTITUTED EQUIPMENT ACCOMMODATED IN THE SPACE. WHERE THE SUBSTITUTED EQUIPMENT CREATES THE NEED FOR ALTERATIONS IN ANY PORTION OF THE WORK DEPICTED IN THE CONTRACT DOCUMENTS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL OF THE AFFECTED PARTIES AND COORDINATE THESE ITEMS WITH ALL OTHER TRADES. FURTHER, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ASSUME ANY ADDITIONAL COST TO THE CONTRACT CREATED BY THE SUBSTITUTED EQUIPMENT.
  - SUBSTITUTED EQUIPMENT IS CONSIDERED TO BE ANY EQUIPMENT OTHER THAN THE FIRST NAMED ITEM IN THE SPECIFICATIONS OR ON THE DRAWINGS.
  - D. CONTRACTOR FURTHER AGREES THAT IF DEVIATIONS, DISCREPANCIES OR CONFLICTS BETWEEN SHOP DRAWINGS AND SPECIFICATIONS ARE DISCOVERED EITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND SHALL BE FOLLOWED. REVIEW OF SUBMITTAL DATA SHALL IN NO WAY RELIEVE THE CONTRACTOR OF HIS DUTY TO PERFORM ALL WORK AND PROVIDE ALL EQUIPMENT IN STRICT COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN THE CONTRACT DOCUMENTS.
  - E. EACH INDIVIDUAL SUBMITTAL ITEM FOR MATERIALS AND EQUIPMENT SHALL BE MARKED TO SHOW SPECIFICATION SECTION AND PARAGRAPH NUMBER WHICH PERTAINS TO THE ITEM. FAILURE TO MARK SUBMITTALS IN ACCORDANCE WITH THE ABOVE FORMAT SHALL BE CONSIDERED DUE CAUSE FOR REJECTION OF SHOP DRAWINGS.
  - SUBMIT FOR REVIEW COMPLETE DATA AND DRAWINGS FOR THE
  - FOLLOWING ITEMS: VALVES.
  - PIPING AND PIPING SPECIALTIES. DRAINS, CLEANOUTS
  - PIPE SUPPORTS AND ATTACHMENTS 5. WATER HAMMER ARRESTORS
  - 6. INSULATION 7. HEATERS, PUMPS
  - G. SUBMITTALS SHALL BE SUPPORTED BY DESCRIPTIVE MATERIAL, SUCH AS CATALOG CUTS, DIAGRAMS, PERFORMANCE CURVES AND CHARTS PUBLISHED BY THE MANUFACTURER, TO SHOW CONFORMANCE TO SPECIFICATION AND DRAWING REQUIREMENTS; MODEL NUMBERS ALONE WILL NOT BE ACCEPTABLE. ALL LITERATURE SHALL CLEARLY INDICATE THE SPECIFIED MODEL NUMBER, DIMENSIONS, ARRANGEMENT, RATING

- AND CHARACTERISTICS OF THE PROPOSED EQUIPMENT. CAPACITIES AND RATINGS SHALL BE BASED ON CONDITIONS INDICATED OR SPECIFIED HEREIN. ANY DEVIATIONS FROM SPECIFIED EQUIPMENT (PARTICULARLY THOSE WHICH REQUIRE COORDINATION WITH OTHER TRADES) SHALL BE CLEARLY NOTED IN A CONCISE LIST ON A SEPARATE SHEET.
- SUBMITTALS AND SHOP DRAWINGS SHALL NOT CONTAIN THE AVCON ENGINEERING NAME OR LOGO, NOR SHALL THEY CONTAIN THE AVCON ENGINEERING SEAL AND SIGNATURE. THE SHOP DRAWINGS SHALL NOT BE COPIES OF AVCON'S WORK. A CONTRACTOR CAN USE ELEMENTS OF ENGINEER'S DRAWINGS IF HE OBTAINS ELECTRONIC FILES FROM
- IN PREPARATION OF SHOP OR RECORD DRAWINGS, CONTRACTOR MAY, AT HIS OPTION, OBTAIN ELECTRONIC DRAWING FILES IN AUTOCAD OR DXF FORMAT FROM THE ENGINEER FOR A FEE UP TO \$350 FOR A DRAWING SET UP TO 15 SHEETS AND \$20 PER SHEET FOR EACH ADDITIONAL SHEET. CONTRACTOR SHALL CONTACT THE ARCHITECT AND ENGINEER FOR WRITTEN AUTHORIZATION. CONTRACTOR SHALL SEND A REQUEST WITH AN ATTACHED CHECK MADE PAYABLE TO AVOON ENGINEERING, PC. CONTRACTOR SHALL INDICATE THE DESIRED SHIPPING METHOD AND DRAWING FORMAT IN THE REQUEST. IN ADDITION TO PAYMENT, ARCHITECT'S WRITTEN AUTHORIZATION AND ENGINEER'S RELEASE AGREEMENT FORM MUST BE RECEIVED BEFORE ELECTRONIC DRAWING FILES WILL BE SENT.
- THE ENGINEER'S CHECKING AND SUBSEQUENT APPROVAL OF SUCH SHOP DRAWINGS WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS. DETAILS. SIZE OF MEMBERS, QUANTITIES, OMISSIONS OF COMPONENTS OR FITTINGS; COORDINATION OF ELECTRICAL REQUIREMENTS; OR FOR COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS.
- 1.6 AS-BUILT DRAWINGS
  - I. THE CONTRACTOR SHALL MAINTAIN, ON A DAILY BASIS AT THE PROJECT SITE, A COMPLETE SET OF "RECORD DRAWINGS" REFLECTING AN ACCURATE DIMENSIONAL RECORD OF ALL BURIED OR CONCEALED WORK. IN ADDITION, THE "RECORD DRAWINGS" SHALL BE MARKED TO SHOW THE PRECISE LOCATION OF CONCEALED WORK OR EQUIPMENT, INCLUDING CONCEALED OR EMBEDDED PIPING AND VALVES, AND ALL CHANGES AND DEVIATIONS IN THE PLUMBING WORK FROM THAT SHOWN ON THE CONTRACT DOCUMENTS. THIS REQUIREMENT SHALL NOT BE CONSTRUED AS AUTHORIZATION FOR THE CONTRACTOR TO MAKE CHANGES IN THE LAYOUT OR WORK WITHOUT DEFINITE INSTRUCTIONS FROM THE ARCHITECT. THE "RECORD DRAWINGS" SHALL BE ELECTRONICALLY SAVED TO BE USED TO PROVIDE A SET OF "AS-BUILT" DOCUMENTS TO THE OWNER UPON COMPLETION OF THE
  - J. RECORD DIMENSIONS SHALL CLEARLY AND ACCURATELY DELINEATE THE WORK AS INSTALLED; LOCATIONS SHALL BE SUITABLY IDENTIFIED BY AT LEAST TWO (2) DIMENSIONS TO PERMANENT STRUCTURES.
  - K. THE CONTRACTOR SHALL MARK ALL "RECORD DRAWINGS" ON THE FRONT LOWER RIGHT HAND CORNER WITH A RUBBER STAMP IMPRESSION THAT STATES THE FOLLOWING:
  - L. THE CONTRACTOR SHALL MAINTAIN ON A DAILY BASIS AT THE PROJECT SITE A COMPLETE SET OF "RECORD DRAWINGS" REFLECTING AN ACCURATE DIMENSIONAL RECORD OF ALL BURIED OR CONCEALED WORK. IN ADDITION THE "RECORD DRAWINGS" SHALL BE MARKED TO SHOW THE PRECISE LOCATION OF CONCEALED WORK OR EQUIPMENT INCLUDING CONCEALED OR EMBEDDED PIPING AND VALVES, AND ALL CHANGES AND DEVIATIONS IN THE PLUMBING WORK FROM THAT SHOWN ON THE CONTRACT DOCUMENTS. THIS REQUIREMENT SHALL NOT BE CONSTRUED AS AUTHORIZATION FOR THE CONTRACTOR TO MAKE CHANGES IN THE LAYOUT OR WORK WITHOUT DEFINITE INSTRUCTIONS FROM THE ARCHITECT. THE "RECORD DRAWINGS" SHALL BE ELECTRONICALLY SAVED TO BE USED TO PROVIDE A SET OF "AS-BUILT" DOCUMENTS TO THE OWNER UPON COMPLETION OF THE
  - M. RECORD DIMENSIONS SHALL CLEARLY AND ACCURATELY DELINEATE THE WORK AS INSTALLED; LOCATIONS SHALL BE SUITABLY IDENTIFIED BY AT LEAST TWO (2) DIMENSIONS TO PERMANENT STRUCTURES.

# 1.7 OPERATION AND MAINTENANCE MANUALS

- A. CONTRACTOR SHALL FURNISH AT THE TIME OF REQUEST FOR FINAL PAYMENT, COPIES OF A BROCHURE CONTAINING THE FOLLOWING INFORMATION AS CALLED FOR IN THESE SPECIFICATIONS: LETTER OF GUARANTEE
- OPERATING INSTRUCTIONS. APPROVED BY ARCHITECT OR ENGINEER TESTING AND AIR OR
- WATER BALANCING REPORTS. 4. MANUFACTURER'S PARTS DATA AND SERVICE INSTRUCTIONS ON ALL ITEMS OF EQUIPMENT.
- . MANUFACTURER'S GUARANTEES AND WARRANTIES. 6. MANUFACTURER'S EQUIPMENT START-UP REPORTS
- 1.8 DEMOLITION A. CONTRACTOR TO REVIEW AND COORDINATE WITH BUILDING MANAGEMENT THE COMPLETE EXTEND OF DEMOLITION WORK INDICATED
  - ON DRAWINGS AND NECESSARY TO INSTALL THE NEW SYSTEMS. B. CONTRACTOR IS RESPONSIBLE THAT ALL EXISTING SYSTEMS OUTSIDE OF THIS PROJECT ARE REMAIN IN SERVICE.
- C. ALL EXISTING EQUIPMENT AND COMPONENTS OF BUILDING SERVICE SYSTEMS THAT ARE SECURED TO EXISTING WALLS, CEILING TO BE
- DEMOLISHED, SHOULD BE RELOCATED. D. ALL DEMOLISHED EQUIPMENT AND SYSTEM COMPONENTS SHALL BE REMOVED AND PROPERLY DISPOSED.
- E. ALL DEMOLITION WORK SHALL BE PERFORMED WITH MINIMUM NOISE, DUST AND DISTURBANCE.

# 1.9 ORDINANCES, PERMITS AND CODES

- A. IT SHALL BE THE CONTRACTOR'S DUTY TO PROVIDE ALL THE LABOR AND MATERIALS COVERED BY THESE SPECIFICATIONS IN CONFORMANCE WITH ALL ORDINANCES AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.
- B. THE CONTRACTOR SHALL FILE, OBTAIN AND PAY FOR ALL PERMITS, CONNECTION AND SPECIFICATION FEES AS REQUIRED FOR THE COMPLETE INSTALLATION OF THE FIRE PROTECTION SYSTEMS.
- C. ALL WORK HEREIN SHALL CONFORM TO ALL APPLICABLE LAWS, ORDINANCES AND REGULATIONS OF THE LOCAL UTILITY COMPANIES.
- D. THE WORK SHALL BE IN ACCORDANCE WITH, BUT NOT LIMITED TO, THE REQUIREMENTS OF FM GLOBAL AND NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET 13.

Job No:

Drawn:

E. CODES AND REGULATIONS REFERRED TO ARE MINIMUM STANDARDS. WHERE THE REQUIREMENTS OF THESE SPECIFICATIONS OR DRAWINGS EXCEED THOSE OF THE CODES AND REGULATIONS, THE DRAWINGS AND SPECIFICATIONS GOVERN. CONFLICTS WITH LOCAL REGULATORY CODES SHOULD BE BROUGHT TO THE ATTENTION OF RISK MANAGEMENT AND FM GLOBAL.

#### 1.10 COORDINATION AND CONFLICTS

- A. THE CONTRACTOR SHALL COORDINATE HIS WORK SO THAT IT WILL NOT INTERFERE WITH THE WORK OF OTHER TRADES. IT SHALL BE THE CONTRACTOR'S DUTY TO SEE THAT HIS WORK IS INSTALLED IN A TIMELY MANNER TO AVOID CONFLICT WITH OTHER TRADES OR OWNER DATE TO OCCUPY.
- B. WHERE MINOR DEVIATIONS FROM PLANS ARE REQUIRED TO CONFORM TO SPACE LIMITATIONS, SUCH CHANGES SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER AND SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT.

#### PART 2 - PRODUCTS

- 2.1 DOMESTIC WATER PIPING
- A. POTABLE-WATER PIPING AND COMPONENTS SHALL COMPLY WITH NSF 14 AND NSF 61.
- B. PIPING SCHEDULE:
- 1. TRANSITION AND SPECIAL FITTINGS WITH PRESSURE RATINGS AT LEAST EQUAL TO PIPING RATING MAY BE USED IN APPLICATIONS BELOW UNLESS OTHERWISE INDICATED.
- 2. FLANGES AND UNIONS MAY BE USED FOR ABOVEGROUND PIPING JOINTS UNLESS OTHERWISE INDICATED. 3. FITTING OPTION:
- EXTRUDED-TEE CONNECTIONS AND BRAZED JOINTS MAY BE USED ON ABOVEGROUND COPPER TUBING.
- 4. ABOVEGROUND DOMESTIC WATER PIPING SHALL BE ASTM B 88, TYPE L;

#### 2.2 COPPER TUBE AND FITTINGS

- A. HARD COPPER TUBE: ASTM B 88, TYPE L WATER TUBE, DRAWN TEMPER, ABOVE GRADE
- B. WROUGHT-COPPER, SOLDER-JOINT FITTINGS: ASME B16.22, ABOVE
- C. BRONZE FLANGES: ASME B16.24, CLASS 150, WITH SOLDER-JOINT
- D. JOINTS: JOINTS IN COPPER PIPING SHALL UTILIZE 95-5 TIN SOLDER.

E. COPPER UNIONS:

- 1. MSS SP-123. CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY. 3. BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES.
- 4. SOLDER-JOINT OR THREADED ENDS.
- 2.3 PIPING JOINING MATERIALS
- A. PIPE-FLANGE GASKET MATERIALS: 1. AWWA C110/A21.10. RUBBER, FLAT FACE, 1/8 INCH THICK OR ASME B16.21, NONMETALLIC AND ASBESTOS FREE UNLESS OTHERWISE INDICATED.
- 2. FULL-FACE OR RING TYPE UNLESS OTHERWISE INDICATED.
- B. METAL, PIPE-FLANGE BOLTS AND NUTS: ASME B18.2.1, CARBON STEEL UNLESS OTHERWISE INDICATED.
- C. SOLDER FILLER METALS: ASTM B 32, LEAD-FREE ALLOYS.
- D. FLUX: ASTM B 813, WATER FLUSHABLE.
- E. BRAZING FILLER METALS: AWS A5.8/A5.8M. BCUP SERIES. COPPER-PHOSPHORUS ALLOYS FOR GENERAL-DUTY BRAZING UNLESS OTHERWISE INDICATED.

# 2.4 TRANSITION FITTINGS

- A. GENERAL REQUIREMENTS:
- 1. SAME SIZE AS PIPES TO BE JOINED.
- 2. PRESSURE RATING AT LEAST EQUAL TO PIPES TO BE JOINED. 3. END CONNECTIONS COMPATIBLE WITH PIPES TO BE JOINED.
- B. FITTING-TYPE TRANSITION COUPLINGS:
- MANUFACTURED PIPING COUPLING OR SPECIFIED PIPING SYSTEM FITTING.

# 2.5 DIELECTRIC FITTINGS

- A. GENERAL REQUIREMENTS: ASSEMBLY OF COPPER ALLOY AND FERROUS MATERIALS WITH SEPARATING NONCONDUCTIVE INSULATING MATERIAL. INCLUDE END CONNECTIONS COMPATIBLE WITH PIPES TO BE JOINED.
- B. DIELECTRIC UNIONS:
- 1. STANDARD: ASSE 1079. 2. PRESSURE RATING: 125 PSIG MINIMUM AT 180 DEG F. 3. END CONNECTIONS: SOLDER-JOINT COPPER ALLOY AND THREADED
- C. DIELECTRIC FLANGES:

FERROUS.

- STANDARD: ASSE 1079. 2. FACTORY-FABRICATED, BOLTED, COMPANION-FLANGE ASSEMBLY.
- 3. PRESSURE RATING: 125 PSIG MINIMUM AT 180 DEG F. 4. END CONNECTIONS: SOLDER-JOINT COPPER ALLOY AND THREADED FERROUS; THREADED SOLDER-JOINT COPPER ALLOY AND THREADED
- D. DIELECTRIC-FLANGE INSULATING KITS:
- 1. NON-CONDUCTING MATERIALS FOR FIELD ASSEMBLY OF COMPANION
- FLANCES. 2. PRESSURE RATING: 150 PSIG.
- 3. GASKET: NEOPRENE OR PHENOLIC.

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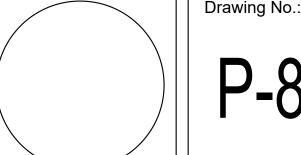
PH: (646) 572-0488

Project:

06	100% CD SET / BID AND PERMIT	08/19/25				
05	100% REVIEW SET	06/16/25				
04	95% CD SET	01/20/25				
03	80% COORDINATION SET	08/07/24				
02	ISSUED FOR PROGRESS	12/01/23				
01	ISSUED FOR REVIEW	10/05/23				
No:	Description:	Date:				
Rev	Revisions:					

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**Sheet Title:** 



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4. BOLT SLEEVES: PHENOLIC OR POLYETHYLENE.
       5. WASHERS: PHENOLIC WITH STEEL BACKING WASHERS
2.6 VACUUM BREAKERS
    A. PIPE-APPLIED, ATMOSPHERIC-TYPE VACUUM BREAKERS:
       1. STANDARD: ASSE 1001.
       2. SIZE: NPS 1/4 TO NPS 3, AS REQUIRED TO MATCH CONNECTED
       3. BODY: BRONZE.
       4. INLET AND OUTLET CONNECTIONS: THREADED.
       5. FINISH: ROUGH BRONZE.
    B. HOSE-CONNECTION VACUUM BREAKERS:
       1. STANDARD: ASSE 1011.
       2. BODY: BRONZE, NON-REMOVABLE, WITH MANUAL DRAIN.
       3. OUTLET CONNECTION: GARDEN-HOSE THREADED COMPLYING WITH
          ASME B1.20.7.
       4. FINISH: ROUGH BRONZE
2.7 STRAINERS FOR DOMESTIC WATER PIPING
    A. Y-PATTERN STRAINERS:
       1. PRESSURE RATING: 125 PSIG MINIMUM UNLESS OTHERWISE INDICATED.
       2. BODY: BRONZE FOR NPS 2 AND SMALLER; CAST IRON WITH INTERIOR
          LINING THAT COMPLIES WITH AWWA C550 OR THAT IS FDA APPROVED,
          EPOXY COATED AND FOR NPS 21/2 AND LARGER.
       3. END CONNECTIONS: THREADED FOR NPS 2 AND SMALLER; FLANGED
         FOR NPS 2½ AND LARGER.
       4. SCREEN: STAINLESS STEEL WITH ROUND PERFORATIONS UNLESS
          OTHERWISE INDICATED.
       5. PERFORATION SIZE:
           a. STRAINERS NPS AND SMALLER: 0.020 INCH.
            b. STRAINERS NPS 2½ TO NPS 4: 0.045 INCH.
       6. DRAIN: FACTORY-INSTALLED, HOSE-END DRAIN VALVE.
2.8 HOSE BIBBS
    A. MANUFACTURERS:

    CHICAGO MFG.

       2. T&S BRASS WORKS -720
           g. STANDARD: ASME A112.18.1 FOR SEDIMENT FAUCETS.
                BODY MATERIAL: BRONZE.
               SEAT: BRONZE, REPLACEABLE
                SUPPLY CONNECTIONS: NPS 1/2 OR NPS 3/4 THREADED OR
                 SOLDER-JOINT INLET.
           e. OUTLET CONNECTION: GARDEN-HOSE THREAD COMPLYING WITH
                ASME B1.20.7.
                PRESSURE RATING: 125 PSIG.
                VACUUM BREAKER: INTEGRAL, NONREMOVABLE, DRAINABLE,
                 HOSE-CONNECTION VACUUM BREAKER COMPLYING WITH ASSE
           h. FINISH FOR EQUIPMENT ROOMS: ROUGH BRONZE, OR CHROME
                OR NICKEL PLATED.
                FINISH FOR SERVICE AREAS: ROUGH BRONZE
                FINISH FOR FINISHED ROOMS: POLISHED CHROME PLATED.
                OPERATION FOR EQUIPMENT ROOMS: WHEEL HANDLE OR
                 OPERATING KEY.
                OPERATION FOR SERVICE AREAS: WHEEL HANDLE
                OPERATION FOR FINISHED ROOMS: REMOVABLE TEE HANDLE
                INCLUDE OPERATING KEY WITH EACH OPERATING-KEY HOSE
```

# 2.9 DRAIN VALVES

HOSE BIBB.

3. SIZE: NPS 3/4.

A. BALL-VALVE-TYPE, HOSE-END DRAIN VALVES: STANDARD: MSS SP-110 FOR STANDARD-PORT, TWO-PIECE BALL

2. PRESSURE RATING: 125-PSIG MINIMUM CWP.

INCLUDE INTEGRAL WALL FLANGE WITH EACH CHROME-PLATED

4. BODY: COPPER ALLOY. 5. BALL: CHROME-PLATED BRASS. 6. SEATS AND SEALS: REPLACEABLE.

7. HANDLE: VINYL-COVERED STEEL. 8. INLET: THREADED OR SOLDER JOINT 9. OUTLET: THREADED, SHORT NIPPLE WITH

SARDEN-HOSE THREAD COMPLYING WITH ASME B1.20.7 AND CAP WITH BRASS CHAIN.

# 2.10 WATER-HAMMER ARRESTERS

1. STANDARD: ASSE 1010 OR PDI-WH 201. 2. TYPE: COPPER TUBE WITH PISTON.

3. SIZE: ASSE 1010, SIZES AA AND A THROUGH F, OR PDI-WH 201, SIZES A THROUGH F.

# 2.11 TRAP-SEAL PRIMER DEVICE

1. PRECISION PLUMBING PRODUCTS CO. MODEL NO. P-2.; JOSAM, J.R. SMITH, ZURN, OR APPROVED EQUAL

2. STANDARD: ASSE 1018.

3. PRESSURE RATING: 125 PSIG MINIMUM. 4. BODY: BRONZE.

5. INLET AND OUTLET CONNECTIONS: NPS 1/2 THREADED, UNION, OR SOLDER JOINT.

6. GRAVITY DRAIN OUTLET CONNECTION: NPS 1/2 THREADED OR SOLDER

7. FINISH: CHROME PLATED, OR ROUGH BRONZE FOR UNITS USED WITH

PIPE OR TUBE a. THAT IS NOT CHROME FINISHED. 8. AUTOMATIC TYPE.

9. INTEGRAL VACUUM BREAKER. 10.STRAINER.

# 2.12 WASTE PIPING MATERIALS

A. HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS:

1. SYSTEMS: ALL SOIL, WASTE, AND VENT PIPING 8" AND LARGER THROUGHOUT THE BUILDING.

2. PIPE AND FITTINGS: ASTM A 74, 72 CLASS.

3. GASKETS: ONE PIECE ELECTROMETRIC COMPRESSION TYPE GASKET; ASTM C-564-76.

B. HUBLESS, CAST-IRON SOIL PIPE AND FITTING: 1. SYSTEMS: SOIL, WASTE, AND VENT PIPING ABOVE GRADE THROUGHOUT THE BUILDING, 8" AND SMALLER. 2. PIPE AND FITTINGS: ASTM A 888 OR CISPI 301 78.

3. CISPI, HUBLESS-PIPING COUPLINGS: HUSKY HEAVY WEIGHT COUPLINGS.

#### C. COPPER TUBE AND FITTINGS:

1. COPPER DWV TUBE: ASTM B 306, DRAINAGE TUBE, DRAWN TEMPER. 2. COPPER DRAINAGE FITTINGS: ASME B16.23, CAST COPPER OR ASME B16.29, WROUGHT COPPER, SOLDER-JOINT FITTINGS. 3. COPPER FLANGES: ASME B16.24, CLASS 150, CAST COPPER WITH

SOLDER-JOINT END. a. FLANGE GASKET MATERIALS: ASME B16.21, FULL-FACE, FLAT, NONMETALLIC, ASBESTOS-FREE, 1/8-INCH MAXIMUM THICKNESS

THICKNESS OR SPECIFIC MATERIAL IS INDICATED. FLANGE BOLTS AND NUTS: ASME B18.2.1, CARBON STEEL UNLESS OTHERWISE INDICATED.

4. SOLDER: ASTM B 32, LEAD FREE WITH ASTM B 813, WATER-FLUSHABLE FLUX.

#### 2.13 SPECIALTY PIPE FITTINGS

A. TRANSITION COUPLINGS:

1. GENERAL REQUIREMENTS: FITTING OR DEVICE FOR JOINING PIPING WITH SMALL DIFFERENCES IN OD'S OR OF DIFFERENT MATERIALS. INCLUDE END CONNECTIONS SAME SIZE AS AND COMPATIBLE WITH PIPES TO

2. FITTING-TYPE TRANSITION COUPLINGS: MANUFACTURED PIPING

COUPLING OR SPECIFIED PIPING SYSTEM FITTING. 3. UNSHIELDED, NONPRESSURE TRANSITION COUPLINGS: HUSKY HEAVY WEIGHT COUPLINGS.

4. SLEEVE MATERIALS: FOR CAST-IRON SOIL PIPES: ASTM C 564, RUBBER.

HUSKY HEAVY WEIGHT COUPLINGS.

5. SHIELDED, NONPRESSURE TRANSITION COUPLINGS:

## 2.14 PIPING INSULATION MATERIALS AND SCHEDULES

A. INSULATION FOR HOT WATER PIPING, HOT WATER CIRCULATION MAINS AND RISERS. MINIMUM PIPE INSULATION THICKNESS:

1. PIPE SIZES:  $\langle 1\frac{1}{2}" - 1"$ INSULATION. 2½"AND LARGER -1.5"INSULATION.

COMPLY WITH REQUIREMENTS IN "PIPING INSULATION SCHEDULE, GENERAL", "INDOOR PIPING INSULATION SCHEDULE", AND "OUTDOOR, ABOVEGROUND PIPING INSULATION SCHEDULE" ARTICLES FOR WHERE INSULATING MATERIALS SHALL BE APPLIED.

C. PRODUCTS SHALL NOT CONTAIN ASBESTOS, LEAD, MERCURY, OR MERCURY COMPOUNDS.

D. PRODUCTS THAT COME IN CONTACT WITH STAINLESS STEEL SHALL HAVE A LEACHABLE CHLORIDE CONTENT OF LESS THAN 50 PPM WHEN TESTED ACCORDING TO ASTM C 871.

INSULATION SHALL BE ONE-PIECE FIBROUS GLASS SECTIONAL PIPE INSULATION WITH FACTORY APPLIED GLASS REINFORCED ALUMINUM FOIL AND WHITE KRAFT PAPER FLAME RETARDANT VAPOR BARRIER JACKET. LONGITUDINAL JACKET LAPS AND BUTT STRIPS SHALL BE SELF-SEALING. INSULATION SHALL HAVE AN AVERAGE THERMAL CONDUCTIVITY NOT TO EXCEED 0 23 BTU-IN PER SQUARE FOOT, PER °F, PER HOUR, AT A MEAN TEMPERATURE OF 75°F. INSULATION SHALL

1. JOHNS-MANVILLE FLAME SAFE AP-T.

2. OWENS-CORNING FIBERGLASS 25 ASJ/SSL

3. CERTAIN TEED FIBERGLASS 500° SNAP-ON ASJ/SSL.

F. ACCEPTABLE PREFORMED PIPE AND TUBULAR INSULATION MATERIALS AND THICKNESSES ARE IDENTIFIED FOR EACH PIPING SYSTEM AND PIPE SIZE RANGE. IF MORE THAN ONE MATERIAL IS LISTED FOR A PIPING SYSTEM, SELECTION FROM MATERIALS LISTED IS CONTRACTOR'S OPTION.

G. ITEMS NOT INSULATED: UNLESS OTHERWISE INDICATED, DO NOT INSTALL INSULATION ON THE FOLLOWING:

# 1. UNIONS SHALL NOT BE INSULATED

2.15 SANITARY WASTE PIPING SPECIALTIES

PROVIDE CLEANOUTS IN SOIL AND WASTE LINES AS SHOWN. AS REQUIRED BY THE GOVERNING CODE AS FOLLOWS:

1. AT THE BOTTOM OF EACH EXPOSED FIXTURE TRAP WHICH IS NOT INTEGRAL WITH THE FIXTURE.

2. AT THE END OF EACH BRANCH DRAINAGE LINE.

3. AT EACH CHANGE OF HORIZONTAL DIRECTION GREATER THAN 45°. 4. IN HORIZONTAL DRAIN LINES AT INTERVALS OF NOT MORE THAN 75' FOR INSIDE PIPING.

FOR WALL: CLEANOUTS SHALL BE EXTRA HEAVY CLEANOUT TEE WITH COUNTERSUNK BRONZE PLUG TAPPED FOR MACHINE SCREW, SHALLOW STAINLESS STEEL FACE-OF-WALL ACCESS COVER, SECURING SCREW. CLEANOUTS SHALL BE:

1. J.R. SMITH 58790-25 2. JOSAM 3. ZURN Z-1445-1 4. WADE W-8460-R

C. FOR PIPING CONCEALED IN PIPE CHASE OR SHAFT: CLEANOUT SHALL HAVE CAST IRON FERRULE, BRONZE PLUG TRAPPED FOR MACHINE SCREW, SHALL STAINLESS STEEL FACE-OF-WALL ACCESS COVER, AND SECURING SCREW. CLEANOUTS SHALL BE:

1. J.R. SMITH 4402 58710 2. JOSAM 3. ZURN ZN-1440-1 W-8550-R 4. WADE

D. FOR CONCRETE FLOORS: CLEANOUTS SHALL HAVE CAST IRON BODY, ADJUSTABLE ROUND SCORIATED NICKEL BRONZE COVER AND RIM, SECURING SCREW, AND COUNTERSUNK PLUG. CLEANOUTS SHALL BE:

1. J.R. SMITH 56040 2. JOSAM Z-1415-2 3. ZURN WADE W-6010-Z FOR TILE FLOORS: CLEANOUTS SHALL HAVE CAST IRON BODY, ADJUSTABLE SQUARE SCORIATED NICKEL BRONZE COVER AND RIM, SECURING SCREW, AND COUNTERSUNK PLUG. CLEANOUTS SHALL BE:

1. J.R. SMITH 2. JOSAM 56020 Z-1405-3 3. ZURN

4. WADE

4. WADE

FOR CARPETED FLOORS: CLEANOUTS SHALL HAVE CAST IRON BODY, ADJUSTABLE SQUARE NICKEL BRONZE COVER AND RIM, CARPET MARKER, AND COUNTERSUNK PLUG. CLEANOUTS SHALL BE:

W-6010-S

1. J.R. SMITH 4045-Y 56020-14 2. JOSAM 3. ZURN Z-1405-15 4. WADE W-6010-S-NH

G. SLOTTED STRAINERS, OUTLETS SAME SIZE AS WASTE PIPE. SET TOP FLUSH WITH FINISHED FLOORS

DRAINS IN WATER-PROOFING MEMBRANES SHALL HAVE A FLASHING CLAMPING DEVICE.

ALL FLOOR DRAINS, EXPECT SHOWER DRAINS, SHALL HAVE TRAP PRIMER CONNECTIONS.

DRAINS SHALL ALL BE OF THE SAME MANUFACTURER, UNLESS OTHERWISE SPECIFIED.

K. DRAINS LOCATED IN FINISHED AREAS SHALL BE:

1. J.R. SMITH 30000-A 2. JOSAM ZN-415 3. ZURN

DRAINS IN MECHANICAL EQUIPMENT ROOMS AND ADJACENT TO

W-1100-STD

MECHANICAL EQUIPMENT SHALL BE: 1. J.R. SMITH 2. JOSAM 32120 3. ZURN Z-550-Y 4. WADE W-1310-STD

DRAINS IN MECHANICAL ROOMS, AND SIMILAR AREAS:

1. DRAIN RECEIVING DISCHARGE AND/OR DRIP PIPING FROM EQUIPMENT: CAST IRON FLOOR DRAIN WITH FLANGE, SEE-PAGE OPENINGS, POLISHED BRASS RIM, CLAMPING DEVICE, LESS TOP GRATE WITH METAL INTERNAL BUCKET.

2. DRAIN NOT RECEIVING DISCHARGE AND/OR DRIP PIPING FROM EQUIPMENT: CAST IRON FLOOR DRAIN WITH FLANGE, SEEPAGE OPENING, 8" GALVANIZED GRATE, AND CLAMPING DEVICE.

FLOOR SINK (SQUARE): 3150 SERIES CAST IRON 8" DEEP FLOOR SINK WITH 12" SQUARE TOP, DOUBLE DRAINAGE FLANGE, WEEPHOLES, ACID RESISTING INTERIOR, ALUMINUM INTERNAL DOME STRAINER, CLAMPING DEVICE, NIKALOY SLOPE RIM, AND SECURED NIKALOY GRATE.

O. REFER TO DRAWINGS FOR GREASE INTERCEPTORS INFORMATION.

#### 2.16 NATURAL-GAS SYSTEMS

THE GENERAL PROVISION OF THE CONTRACT AND THE GENERAL REQUIREMENTS OF PLUMBING SECTION APPLY TO THE WORK IN THIS

PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.

SHOP DRAWINGS: FOR FACILITY NATURAL-GAS PIPING LAYOUT. INCLUDE PLANS, PIPING LAYOUT AND ELEVATIONS, SECTIONS, AND DETAILS FOR FABRICATION OF PIPE ANCHORS, HANGERS, SUPPORTS FOR MULTIPLE PIPES, ALIGNMENT GUIDES, EXPANSION JOINTS AND LOOPS, AND ATTACHMENTS OF THE SAME TO BUILDING STRUCTURE. DETAIL LOCATION OF ANCHORS, ALIGNMENT GUIDES, AND EXPANSION JOINTS AND LOOPS.

D. STEEL PIPE AND FITTINGS:

1. SYSTEMS: NATURAL GAS PIPING SYSTEMS. 4" & SMALLER: PIPING: SCHEDULE 40 BLACK STEEL PIPING. ASTM A106. FITTINGS: STANDARD WEIGHT, BANDED BLACK STEEL MALLEABLE

IRON FITTINGS ANSI B16.3-71. COATINGS: PIPING INSTALLED BELOW GRADE AND PIPING EXPOSED TO WEATHER SHALL BE PROTECTED WITH TWO COATS OF COAL-TAR ENAMEL AWWA STANDARD C-302.

E. PLASTIC PIPE, TUBING AND FITTINGS:

1. SYSTEMS: NATURAL GAS PIPING SYSTEMS, BELOW GRADE: a. PIPING: POLYETHYLENE. ASTM D2513. MARKED "GAS" & "ASTM D2513"

ANODELESS RISERS: FACTORY ASSEMBLED, RECOMMENDED BY THE MANUFACTURER FOR THE GAS USED. SHALL BE LEAK TESTED BY THE MANUFACTURER IN ACCORDANCE WITH WRITTEN PROCEDURES. HEAT FUSION JOINTS SHALL BE MADE GAS TIGHT AND STRONGER THAN THE PIPING OR TUBING BEING JOINED, JOINTS SHALL BE MADE WITH THE JOINING METHOD RECOMMENDED BY THE PIPE

MANUFACTURER. WHERE COMPRESSION TYPE MECHANICAL JOINTS ARE USED, THE GASKET MATERIAL IN THE FITTING SHALL BE COMPATIBLE WITH THE PLASTIC PIPING AND WITH THE GAS DISTRIBUTED BY THE SYSTEM. AN INTERNAL TUBULAR STIFFENER SHALL BE USED IN CONJUNCTION WITH THE FITTING. THE STIFFENER SHALL BE FLUSH WITH THE END OF THE PIPE OR TUBING AND SHALL EXTEND TO OR BEYOND THE OUTSIDE END OF THE COMPRESSION FITTING WHEN INSTALLED. THE STIFFENER SHALL BE FREE OF ROUGH OR SHARP EDGES AND SHALL NOT BE FORCE-FIT IN THE PLASTIC. SPLIT

TUBULAR STIFFENERS SHALL NOT BE USED CONNECTIONS MADE OUTDOORS AND UNDERGROUND BETWEEN METALLIC AND PLASTIC PIPING SHALL BE MADE ONLY WITH TRANSITION FITTINGS CONFORMING TO ASTM D2513 CATERGORY OR ASTM F1973

f. A YELLOW INSULATED COPPER TRACER WIRE OR OTHER APPROVED CONDUCTOR, OR A PRODUCT SPECIFICALLY DESIGNED FOR THAT PURPOSE, SHALL BE INSTALLED ADJACENT TO UNERGROUND NONMETALLIC PIPING. ACCESS SHALL BE PROVIDED TO THE TRACER WIRE OR THE TRACER WIRE SHALL TERMINATE ABOVE GROUND AT EACH END OF THE NONMETALLIC PIPING. THE TRACER WIRE SHALL BE NOT LESS THAN 18 AWG AND THE INSULATION TYPE SHALL BE SUITABLE FOR DIRECT BURIAL.

F. JOINING MATERIALS: 1. JOINT COMPOUND AND TAPE: SUITABLE FOR NATURAL GAS.

### 2.17 SHUTOFF VALVES

A. VALVES OF THE SAME TYPE ON THE PROJECT SHALL OF ONE

VALVES SHALL HAVE THE NAME OR TRADEMARK OF THE MANUFACTURERS AND THE WORKING PRESSURE STAMPED OR CAST ON THE VALVE BODY.

C. VALVE HAND WHEELS SHALL BE ORIENTED, WHEN INSTALLED, TO PROVIDE MAXIMUM ACCESSIBILITY FOR OPERATION.

D. PLUG VALVES 3"IN SIZE AND LARGER SHALL BE THE SEMI-STEEL TYPE WITH CAST IRON BODY, LUBRICATED CAST IRON PLUG, FLANGED ENDS, AND WRENCH OPERATED FOR #175 W.O.G. VALVES SHALL BE:

ROCKWELL NORDSTROM NO. 143 WALWORTH 1797 F

PLUG VALVES 2½" IN SIZE AND SMALLER SHALL HAVE BRONZE BODY AND PLUG, THREADED ENDS, AND SQUARE HEAD FOR #125 W.O.G. VALVES SHALL BE: CRANE

NO. 250

LUBRICATED PLUG VALVES SHALL BE LUBRICATED AT THE FACTORY AND SEALANT SHALL BE SUITABLE FOR NATURAL GAS. PROVIDE SIX (6) STICKS OR TUBES OF SEALANT UTILIZED AND TURN SUCH OVER TO THE OWNER'S REPRESENTATIVE.

PROVIDE ONE (1) VALVE WRENCH FOR EACH SIZE AND TYPE OF VALVE HEAD AND TURN SUCH WRENCHES OVER TO THE OWNER'S REPRESENTATIVE.

H. MILWAUKEE 'BUTTERBALL' VALVE NO. BB1-100 MAY BE SUBSTITUTED FOR PLUG VALVES 2" AND SMALLER.

GAS COCKS: PROVIDE A GAS COCK IN AN EASILY ACCESSIBLE LOCATION, IN EACH BRANCH LINE, AND AT EACH INDIVIDUAL PIECE OF GAS CONSUMING EQUIPMENT. FOR SIZE 2" AND SMALLER, COCK SHALL BE AN ALL BRASS, LEVER HANDLE GAS COCK. FOR SIZE LAMER THAN 2", IT SHALL BE A LUBRICATED SEMI-STEEL PLUG VALVE WITH HANDLE.

#### PART 3 — EXECUTION

WALWORTH

3.1 DOMESTIC WATER PIPING INSTALLATION

A. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DOMESTIC WATER PIPING. INDICATED LOCATIONS AND ARRANGEMENTS ARE USED TO SIZE PIPE AND CALCULATE FRICTION LOSS, EXPANSION, AND OTHER DESIGN CONSIDERATIONS. INSTALL PIPING AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON COORDINATION DRAWINGS.

B. INSTALL SHUTOFF VALVE, HOSE—END DRAIN VALVE, STRAINER, PRESSURE GAGE, AND TEST TEE WITH VALVE INSIDE THE BUILDING AT EACH DOMESTIC WATER-SERVICE ENTRANCE. COMPLY WITH REQUIREMENTS FOR DRAIN VALVES AND STRAINERS.

C. INSTALL SHUTOFF VALVE IMMEDIATELY UPSTREAM OF EACH DIELECTRIC

D. INSTALL DOMESTIC WATER PIPING LEVEL WITH 0.25 PERCENT SLOPE DOWNWARD TOWARD DRAIN.

E. ROUGH-IN DOMESTIC WATER PIPING FOR WATER-METER INSTALLATION ACCORDING TO UTILITY COMPANY'S REQUIREMENTS.

F. INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.

G. INSTALL PIPING ABOVE ACCESSIBLE CEILINGS TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL, AND COORDINATE WITH OTHER SERVICES OCCUPYING THAT SPACE.

H. INSTALL PIPING TO PERMIT VALVE SERVICING.

INSTALL NIPPLES. UNIONS. SPECIAL FITTINGS. AND VALVES WITH PRESSURE RATINGS THE SAME AS OR HIGHER THAN THE SYSTEM PRESSURE RATING USED IN APPLICATIONS BELOW UNLESS OTHERWISE INDICATED.

J. INSTALL PIPING FREE OF SAGS AND BENDS

K. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH CONNECTIONS.INSTALL UNIONS IN COPPER TUBING AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT, MACHINE, AND SPECIALTY.

INSTALL SLEEVES FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND

M. INSTALL SLEEVE SEALS FOR PIPING PENETRATIONS OF CONCRETE WALLS AND SLABS.

N. NSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS. COMPLY WITH REQUIREMENTS FOR ESCUTCHEONS SPECIFIED IN SECTION 220518 "ESCUTCHEONS FOR PLUMBING PIPING."

ENDS OF STEEL PIPE. P. REMOVE SCALE, SLAG, DIRT, AND DEBRIS FROM INSIDE AND OUTSIDE OF PIPES, TUBES, AND FITTINGS BEFORE ASSEMBLY

O. REAM ENDS OF PIPES AND TUBES AND REMOVE BURRS. BEVEL PLAIN

Q. TREADED JOINTS:

THREAD PIPE WITH TAPERED PIPE THREADS ACCORDING TO ASME B1.20.1. CUT THREADS FULL AND CLEAN USING SHARP DIES. REAM THREADED PIPE ENDS TO REMOVE BURRS AND RESTORE FULL ID. JOIN PIPE FITTINGS AND VALVES AS FOLLOWS: a. APPLY APPROPRIATE TAPE OR THREAD COMPOUND TO EXTERNAL PIPE THREADS.

b. DAMAGED THREADS: DO NOT USE PIPE OR PIPE FITTINGS WITH THREADS THAT ARE CORRODED OR DAMAGED.

S. BRAZED JOINTS FOR COPPER TUBING: COMPLY WITH CDA'S "COPPER TUBE HANDBOOK," "BRAZED JOINTS" CHAPTER.

SOLDERED JOINTS FOR COPPER TUBING: APPLY ASTM B 813, WATER-FLUSHABLE FLUX TO END OF TUBE. JOIN COPPER TUBE AND FITTINGS ACCORDING TO ASTM B 828 OR CDA'S "COPPER TUBE HANDBOOK."

U. FLANGED JOINTS: SELECT APPROPRIATE ASBESTOS-FREE, NONMETALLIC GASKET MATERIAL IN SIZE, TYPE, AND THICKNESS SUITABLE FOR DOMESTIC WATER SERVICE. JOIN FLANGES WITH GASKET AND BOLTS ACCORDING TO ASME B31.9.

V. INSTALL TRANSITION COUPLINGS AT JOINTS OF DISSIMILAR PIPING.

X. DIELECTRIC FITTING INSTALLATION

INSTALL DIELECTRIC FITTINGS IN PIPING AT CONNECTIONS OF

DISSIMILAR METAL PIPING AND TUBING. DIELECTRIC FITTINGS FOR NPS 2 AND SMALLER: USE DIELECTRIC COUPLINGS OR NIPPLES, OR UNIONSDIELECTRIC FITTINGS FOR

NPS 2½ TO NPS 4: USE DIELECTRIC FLANGES. DIELECTRIC FITTINGS FOR NPS 5 AND LARGER: USE DIELECTRIC

#### 3.2 HANGER AND SUPPORT INSTALLATION

A. COMPLY WITH REQUIREMENTS FOR PIPE HANGER, SUPPORT PRODUCTS AND INSTALLATION IN SECTION 220529 "HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT."

VERTICAL PIPING: MSS TYPE 8 OR 42, CLAMPS. INDIVIDUAL, STRAIGHT, HORIZONTAL PIPING RUNS:

a. 100 FEET AND LESS: MSS TYPE 1, ADJUSTABLE, STEEL CLEVIS

b. BASE OF VERTICAL PIPING: MSS TYPE 52, SPRING HANGERS. B. SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH FLOOR

C. ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, TO A MINIMUM OF 3/8 INCH.

D. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING MAXIMUM

HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: NPS 3/4 AND SMALLER: 60 INCHES WITH 3/8-INCH ROD.

NPS 1 AND NPS 11/4: 72 INCHES WITH 3/8-INCH ROD. NPS 1½ AND NPS 2: 96 INCHES WITH 3/8-INCH ROD.

4. NPS 2½: 108 INCHES WITH ½ INCH ROD. 5. NPS 3 TO NPS 5: 10 FEET WITH ½ INCH ROD.

E. INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 FEET. F. INSTALL HANGERS FOR STEEL PIPING WITH THE FOLLOWING MAXIMUM

HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: NPS 11/4 AND SMALLER: 84 INCHES WITH 3/8-INCH ROD.

NPS 1½: 108 INCHES WITH 3/8-INCH ROD. NPS 2: 10 FEET WITH 3/8-INCH ROD. 4. NPS 2½: 11 FEET WITH ½ INCH ROD.

5. NPS 3 AND NPS 3½: 12 FEET WITH ½ INCH ROD.

G. INSTALL SUPPORTS FOR VERTICAL STEEL PIPING EVERY 15 FEET. H. SUPPORT PIPING AND TUBING NOT LISTED IN THIS ARTICLE ACCORDING TO MSS SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.

IDENTIFICATION MATERIALS AND INSTALLATION IN SECTION 220553

ALLOW SPACE FOR SERVICE AND MAINTENANCE. M. IDENTIFY SYSTEM COMPONENTS. COMPLY WITH REQUIREMENTS FOR

J. WHEN INSTALLING PIPING ADJACENT TO EQUIPMENT AND MACHINES,

"IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT." N. LABEL PRESSURE PIPING WITH SYSTEM OPERATING PRESSURE.

O. PERFORM THE TESTS AND INSPECTIONS AS REQUIRED BY PLUMBING

 PIPING INSPECTIONS: a. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT HAS BEEN INSPECTED AND APPROVED BY AUTHORITIES HAVING

JURISDICTION. b. DURING INSTALLATION. NOTIFY AUTHORITIES HAVING JURISDICTION AT LEAST ONE DAY BEFORE INSPECTION MUST BE MADE. CHECK WITH LOCAL AUTHORITIES. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION. c. ARRANGE FOR ROUGHING-IN INSPECTION OF PIPING BEFORE

CONCEALING OR CLOSING IN AFTER ROUGHING IN AND BEFORE SETTING FIXTURES. d. ARRANGE FINAL INSPECTION FOR AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED IN "PIPING TESTS"

SUBPARAGRAPH BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS. e. ARRANGE RE-INSPECTION: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TESTS OR INSPECTIONS, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR RE-INSPECTION. f. PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION.

2. PIPING TESTS: a. FILL DOMESTIC WATER PIPING. CHECK COMPONENTS TO DETERMINE THAT THEY ARE NOT AIR BOUND AND THAT PIPING IS FULL OF

PERFORMED IN SEGMENTS, SUBMIT A SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING c. LEAVE DOMESTIC WATER PIPING UNCOVERED AND UNCONCEALED

b. TEST FOR LEAKS AND DEFECTS IN PIPING. IF TESTING IS

UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT WAS COVERED OR CONCEALED BEFORE IT WAS TESTED. d. CAP AND SUBJECT PIPING TO STATIC WATER PRESSURE OF 50 PSIG ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS. ISOLATE TEST SOURCE AND ALLOW IT TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE

REPAIRED. e. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS, AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE

OBTAINED f. PREPARE REPORTS FOR TESTS AND FOR CORRECTIVE ACTION

REQUIRED. g. DOMESTIC WATER PIPING WILL BE CONSIDERED DEFECTIVE IF IT

DOES NOT PASS TESTS AND INSPECTIONS. h. PREPARE TEST AND INSPECTION REPORTS.

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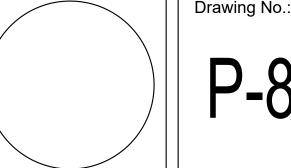
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PLUMBING SPECIFICATIONS II



- 3. PERFORM THE FOLLOWING ADJUSTMENTS BEFORE OPERATION:
- a. CLOSE DRAIN VALVES, HYDRANTS, AND HOSE BIBBS b. OPEN SHUTOFF VALVES TO FULLY OPEN POSITION.
- c. OPEN THROTTLING VALVES TO PROPER SETTING. d. REMOVE PLUGS USED DURING TESTING OF PIPING AND FOR TEMPORARY SEALING OF PIPING DURING INSTALLATION. e. REMOVE AND CLEAN STRAINER SCREENS. CLOSE DRAIN VALVES
- AND REPLACE DRAIN PLUGS. f. REMOVE FILTER CARTRIDGES FROM HOUSINGS AND VERIFY THAT CARTRIDGES ARE AS SPECIFIED FOR APPLICATION WHERE USED AND ARE CLEAN AND READY FOR USE. g. CHECK PLUMBING SPECIALTIES AND VERIFY PROPER SETTINGS, ADJUSTMENTS, AND OPERATION.
- 4. CLEAN AND DISINFECT POTABLE DOMESTIC WATER PIPING.
- 5. INSTALL BACKFLOW PREVENTERS TO EQUIPMENT AND WATER SYSTEMS THAT MAY BE SOURCES OF CONTAMINATION. COMPLY WITH AUTHORITIES HAVING JURISDICTION.
- a. LOCATE BACKFLOW PREVENTERS IN SAME ROOM AS CONNECTED EQUIPMENT OR SYSTEM
- b. ALL DRAIN FOR BACKFLOW PREVENTERS WITH ATMOSPHERIC-VENT DRAIN CONNECTION WITH AIR-GAP FITTING, FIXED AIR-GAP FITTING, OR EQUIVALENT POSITIVE PIPE SEPARATIONAT LEAST TWO PIPE DIAMETERS IN DRAIN PIPING AND PIPE-TO-FLOOR DRAIN. LOCATE AIR-GAP DEVICE ATTACHED TO OR UNDER BACKFLOW PREVENTER. SIMPLE AIR BREAKS ARE UNACCEPTABLE FOR THIS
- c. DO NOT INSTALL BYPASS PIPING AROUND BACKFLOW PREVENTERS.
- 6. INSTALL BALANCING VALVES IN LOCATIONS WHERE THEY CAN EASILY BE ADJUSTED.
- 7. INSTALL WATER-HAMMER ARRESTERS IN WATER PIPING ACCORDING TO PDI-WH 201.
- INSTALL SUPPLY-TYPE, TRAP-SEAL PRIMER VALVES WITH OUTLET PIPING PITCHED DOWN TOWARD DRAIN TRAP A MINIMUM OF 1 PERCENT, AND CONNECT TO FLOOR-DRAIN BODY, TRAP, OR INLET FITTING. ADJUST VALVE FOR PROPER FLOW. PROVIDE A TRAP PRIMER FOR EACH FLOOR DRAIN AND EACH HUB DRAIN THAT IS ATTACHED TO THE SANITARY SEWER.
- 9. PERFORM THE FOLLOWING TESTS AND INSPECTIONS: 10. TEST EACH PRESSURE VACUUM BREAKER, ACCORDING TO

AUTHORITIES HAVING JURISDICTION AND THE DEVICE'S

- REFERENCE STANDARD. 11. DOMESTIC WATER PIPING SPECIALTIES WILL BE CONSIDERED DEFECTIVE IF THEY DO NOT PASS TESTS AND INSPECTIONS.
- PREPARE TEST AND INSPECTION REPORTS.
- 13. SET FIELD-ADJUSTABLE FLOW SET POINTS OF BALANCING

#### 3.3 INSULATION

#### A. PREPARATION:

APPLICATION.

- 1. SURFACE PREPARATION: CLEAN AND DRY SURFACES TO RECEIVE INSULATION. REMOVE MATERIALS THAT WILL ADVERSELY AFFECT INSULATION APPLICATION.
- 2. COORDINATE INSULATION INSTALLATION WITH THE TRADE INSTALLING HEAT TRACING. COMPLY WITH REQUIREMENTS FOR HEAT TRACING WHICH APPLY TO INSULATION.
- MIX INSULATING CEMENTS WITH CLEAN POTABLE WATER; IF INSULATING CEMENTS ARE TO BE IN CONTACT WITH STAINLESS-STEEL SURFACES, USE DE-MINERALIZED WATER.

# B. GENERAL INSTALLATION REQUIREMENTS:

- INSTALL INSULATION MATERIALS, ACCESSORIES, AND FINISHES WITH SMOOTH, STRAIGHT, AND EVEN SURFACES; FREE OF VOIDS THROUGHOUT THE LENGTH OF PIPING INCLUDING FITTINGS, VALVES. AND SPECIALTIES.
- INSTALL INSULATION MATERIALS, FORMS, VAPOR BARRIERS OR RETARDERS, JACKETS, AND THICKNESSES REQUIRED FOR EACH ITEM OF PIPE SYSTEM AS SPECIFIED IN INSULATION SYSTEM
- SCHEDULES. INSTALL ACCESSORIES COMPATIBLE WITH INSULATION MATERIALS AND SUITABLE FOR THE SERVICE. INSTALL ACCESSORIES THAT DO NOT CORRODE. SOFTEN. OR OTHERWISE ATTACK INSULATION
- OR JACKET IN EITHER WET OR DRY STATE. INSTALL INSULATION WITH LONGITUDINAL SEAMS AT TOP AND
- BOTTOM OF HORIZONTAL RUNS. DO NOT WELD BRACKETS, CLIPS, OR OTHER ATTACHMENT DEVICES TO PIPING, FITTINGS, AND SPECIALTIES.
- KEEP INSULATION MATERIALS DRY DURING APPLICATION AND
- FINISHING. INSTALL INSULATION WITH TIGHT LONGITUDINAL SEAMS AND END JOINTS. BOND SEAMS AND JOINTS WITH ADHESIVE RECOMMENDED
- BY INSULATION MATERIAL MANUFACTURER. INSTALL INSULATION WITH LEAST NUMBER OF JOINTS PRACTICAL WHERE VAPOR BARRIER IS INDICATED, SEAL JOINTS, SEAMS, AND PENETRATIONS IN INSULATION AT HANGERS, SUPPORTS,
- ANCHORS, AND OTHER PROJECTIONS WITH VAPOR-BARRIER 10. INSTALL INSULATION CONTINUOUSLY THROUGH HANGERS AND
- AROUND ANCHOR ATTACHMENTS. 11. FOR INSULATION APPLICATION WHERE VAPOR BARRIERS ARE INDICATED, EXTEND INSULATION ON ANCHOR LEGS FROM POINT OF ATTACHMENT TO SUPPORTED ITEM TO POINT OF

ATTACHMENT TO STRUCTURE. TAPER AND SEAL ENDS AT

- ATTACHMENT TO STRUCTURE WITH VAPOR-BARRIER MASTIC. 12. INSTALL INSERT MATERIALS AND INSTALL INSULATION TO TIGHTLY JOIN THE INSERT. SEAL INSULATION TO INSULATION INSERTS WITH ADHESIVE OR SEALING COMPOUND RECOMMENDED BY INSULATION MATERIAL MANUFACTURER.COVER INSERTS WITH JACKET MATERIAL MATCHING ADJACENT PIPE INSULATION. INSTALL SHIELDS OVER JACKET, ARRANGED TO PROTECT JACKET
- FROM TEAR OR PUNCTURE BY HANGER, SUPPORT, AND SHIELD. 13. APPLY ADHESIVES, MASTICS, AND SEALANTS AT MANUFACTURER'S RECOMMENDED COVERAGE RATE AND WET AND DRY FILM THICKNESSES.

# 14. INSTALL INSULATION WITH FACTORY-APPLIED JACKETS AS

- a. DRAW JACKET TIGHT AND SMOOTH. b. COVER CIRCUMFERENTIAL JOINTS WITH 3-INCH- WIDE STRIPS, OF SAME MATERIAL AS INSULATION JACKET. SECURE STRIPS WITH ADHESIVE AND OUTWARD CLINCHING STAPLES ALONG BOTH EDGES OF STRIP, SPACED 4 INCHES O.C.
- c. OVERLAP JACKET LONGITUDINAL SEAMS AT LEAST 1½ INCHES. INSTALL INSULATION WITH LONGITUDINAL SEAMS AT BOTTOM OF PIPE. CLEAN AND DRY SURFACE TO RECEIVE SELF-SEALING LAP. STAPLE LAPS WITH OUTWARD CLINCHING STAPLES ALONG EDGE AT 2 INCHES O.C.
- d. FOR BELOW-AMBIENT SERVICES, APPLY VAPOR-BARRIER MASTIC
- OVER STAPLES. e. COVER JOINTS AND SEAMS WITH TAPE. ACCORDING TO INSULATION MATERIAL MANUFACTURER'S WRITTEN INSTRUCTIONS, TO MAINTAIN
- f. WHERE VAPOR BARRIERS ARE INDICATED, APPLY VAPOR-BARRIER MASTIC ON SEAMS AND JOINTS AND AT ENDS ADJACENT TO PIPE FLANGES AND FITTINGS.
- 15. CUT INSULATION IN A MANNER TO AVOID COMPRESSING INSULATION MORE THAN 75 PERCENT OF ITS NOMINAL
- 16. FINISH INSTALLATION WITH SYSTEMS AT OPERATING CONDITIONS. REPAIR JOINT SEPARATIONS AND CRACKING DUE TO THERMAL MOVEMENT
- 17. REPAIR DAMAGED INSULATION FACINGS BY APPLYING SAME FACING MATERIAL OVER DAMAGED AREAS. EXTEND PATCHES AT LEAST 4 INCHES BEYOND DAMAGED AREAS. ADHERE, STAPLE, AND SEAL PATCHES SIMILAR TO BUTT JOINTS.
- 18. FOR ABOVE-AMBIENT SERVICES, DO NOT INSTALL INSULATION TO THE FOLLOWING: . VIBRATION—CONTROL DEVICES.
- b. TESTING AGENCY LABELS AND STAMPS. c. NAMEPLATES AND DATA PLATES. d. CLEANOUTS.

#### C. PENETRATIONS:

INSULATION INSTALLATION AT INTERIOR WALL AND PARTITION PENETRATIONS (THAT ARE NOT FIRE RATED): INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS.

2. INSULATION INSTALLATION AT FIRE—RATED WALL AND PARTITION

- INSTALL INSULATION CONTINUOUSLY THROUGH PENETRATIONS OF FIRE-RATED WALLS AND PARTITIONS.
- a. COMPLY WITH REQUIREMENTS IN SECTION 078413 "PENETRATION FIRESTOPPING" FOR FIRESTOPPING AND FIRE-RESISTIVE JOINT
- 6. INSULATION INSTALLATION AT FLOOR PENETRATIONS:
  - a. PIPE: INSTALL INSULATION CONTINUOUSLY THROUGH FLOOR PENETRATIONS. b. SEAL PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES. COMPLY WITH REQUIREMENTS IN SECTION 078413 "PENETRATION FIRESTOPPING."

#### D. INSTALLATION OF MINERAL-FIBER PREFORMED PIPE INSULATION:

- INSULATION INSTALLATION ON STRAIGHT PIPES AND TUBES:
- a. SECURE EACH LAYER OF PREFORMED PIPE INSULATION TO PIPE WITH WIRE OR BANDS AND TIGHTEN BANDS WITHOUT DEFORMING INSULATION MATERIALS.
- b. WHERE VAPOR BARRIERS ARE INDICATED, SEAL LONGITUDINAL SEAMS, END JOINTS, AND PROTRUSIONS WITH VAPOR-BARRIER MASTIC AND JOINT SEALANT.
- c. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON ABOVE-AMBIENT SURFACES, SECURE LAPS WITH OUTWARD CLINCHED STAPLES AT 6 INCHES O.C.
- d. FOR INSULATION WITH FACTORY-APPLIED JACKETS ON BELOW-AMBIENT SURFACES, DO NOT STAPLE LONGITUDINAL TABS. INSTEAD, SECURE TABS WITH ADDITIONAL ADHESIVE AS RECOMMENDED BY INSULATION MATERIAL MANUFACTURER AND SEAL WITH VAPOR-BARRIER MASTIC AND FLASHING SEALANT.

# 2. INSULATION INSTALLATION ON PIPE FLANGES:

- a. INSTALL PREFORMED PIPE INSULATION TO OUTER DIAMETER OF
- PIPE FLANGE. b. MAKE WIDTH OF INSULATION SECTION SAME AS OVERALL WIDTH OF FLANGE AND BOLTS, PLUS TWICE THE THICKNESS OF PIPE
- c. FILL VOIDS BETWEEN INNER CIRCUMFERENCE OF FLANGE INSULATION AND OUTER CIRCUMFERENCE OF ADJACENT STRAIGHT PIPE SEGMENTS WITH MINERAL-FIBER BLANKET INSULATION. d. INSTALL JACKET MATERIAL WITH MANUFACTURER'S RECOMMENDED ADHESIVE, OVERLAP SEAMS AT LEAST 1 INCH, AND SEAL JOINTS WITH FLASHING SEALANT.
- 3. INSULATION INSTALLATION ON PIPE FITTINGS AND ELBOWS:
- a. INSTALL PREFORMED SECTIONS OF SAME MATERIAL AS STRAIGHT SEGMENTS OF PIPE INSULATION WHEN AVAILABLE.
- b. WHEN PREFORMED INSULATION ELBOWS AND FITTINGS ARE NOT AVAILABLE, INSTALL MITERED SECTIONS OF PIPE INSULATION, TO A THICKNESS EQUAL TO ADJOINING PIPE INSULATION. SECURE INSULATION MATERIALS WITH WIRE OR BANDS. 4. INSULATION INSTALLATION ON VALVES AND PIPE SPECIALTIES:
- a. INSTALL PREFORMED SECTIONS OF SAME MATERIAL AS STRAIGHT SEGMENTS OF PIPE INSULATION WHEN AVAILABLE.
- b. WHEN PREFORMED SECTIONS ARE NOT AVAILABLE, INSTALL MITERED SECTIONS OF PIPE INSULATION TO VALVE BODY.
- c. ARRANGE INSULATION TO PERMIT ACCESS TO PACKING AND TO ALLOW VALVE OPERATION WITHOUT DISTURBING INSULATION.
- d. INSTALL INSULATION TO FLANGES AS SPECIFIED FOR FLANGE INSULATION APPLICATION.

#### E. FIELD QUALITY CONTROL:

- PERFORM TESTS AND INSPECTIONS.
- TESTS AND INSPECTIONS: a. INSPECT PIPE, FITTINGS, STRAINERS, AND VALVES, RANDOMLY SELECTED BY ARCHITECT, BY REMOVING FIELD-APPLIED JACKET AND INSULATION IN LAYERS IN REVERSE ORDER OF THEIR
- INSTALLATION. 3. ALL INSULATION APPLICATIONS WILL BE CONSIDERED DEFECTIVE WORK IF SAMPLE INSPECTION REVEALS NONCOMPLIANCE WITH

#### 3.4 WASTE PIPING INSTALLATION

- A. DRAWING PLANS, SCHEMATICS, AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF PIPING SYSTEMS. INDICATED LOCATIONS AND ARRANGEMENTS WERE USED TO SIZE PIPE AND CALCULATE FRICTION LOSS AND OTHER DESIGN CONSIDERATIONS. INSTALL PIPING AS INDICATED UNLESS DEVIATIONS TO LAYOUT ARE APPROVED ON COORDINATION DRAWINGS.
- B. INSTALL PIPING IN CONCEALED LOCATIONS UNLESS OTHERWISE INDICATED AND EXCEPT IN EQUIPMENT ROOMS AND SERVICE AREAS:
  - INSTALL PIPING INDICATED TO BE EXPOSED AND PIPING IN EQUIPMENT ROOMS AND SERVICE AREAS AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE PROHIBITED UNLESS SPECIFICALLY INDICATED OTHERWISE.
  - INSTALL PIPING ABOVE ACCESSIBLE CEILINGS TO ALLOW SUFFICIENT SPACE FOR CEILING PANEL REMOVAL. INSTALL PIPING AT INDICATED SLOPES.
  - INSTALL PIPING FREE OF SAGS AND BENDS. INSTALL FITTINGS FOR CHANGES IN DIRECTION AND BRANCH
  - CONNECTIONS. 6. MAKE CHANGES IN DIRECTION FOR SOIL AND WASTE DRAINAGE AND VENT PIPING USING APPROPRIATE BRANCHES, BENDS, AND LONG-SWEEP BENDS. SANITARY TEES AND SHORT-SWEEP 1/4 BENDS MAY BE USED ON VERTICAL STACKS IF CHANGE IN DIRECTION OF FLOW IS FROM HORIZONTAL TO VERTICAL. USE LONG-TURN, DOUBLE Y-BRANCH AND 1/8-BEND FITTINGS IF TWO FIXTURES ARE INSTALLED BACK TO BACK OR SIDE BY SIDE WITH COMMON DRAIN PIPE. STRAIGHT TEES, ELBOWS, AND CROSSES MAY BE USED ON VENT LINES. DO NOT CHANGE DIRECTION OF FLOW MORE THAN 90 DEGREES. USE PROPER SIZE
  - PIPING IN DIRECTION OF FLOW IS PROHIBITED. INSTALL SOIL AND WASTE DRAINAGE AND VENT PIPING AT THE FOLLOWING MINIMUM SLOPES UNLESS OTHERWISE INDICATED:

OF STANDARD INCREASERS AND REDUCERS IF PIPES OF

DIFFERENT SIZES ARE CONNECTED. REDUCING SIZE OF DRAINAGE

- a. BUILDING SANITARY DRAIN: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 3 AND SMALLER; 2 PERCENT DOWNWARD IN DIRECTION OF FLOW FOR PIPING NPS 4 AND
- b. HORIZONTAL SANITARY DRAINAGE PIPING: 2 PERCENT DOWNWARD IN DIRECTION OF FLOW. c. VENT PIPING: 1 PERCENT DOWN TOWARD VERTICAL FIXTURE VENT
- OR TOWARD VENT STACK. 8. INSTALL CAST-IRON SOIL PIPING ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK," CHAPTER IV,
- "INSTALLATION OF CAST IRON SOIL PIPE AND FITTINGS." 9. INSTALL ABOVEGROUND COPPER TUBING ACCORDING TO CDA'S "COPPER TUBE HANDBOOK."
- 10. INSTALL ABOVEGROUND ABS PIPING ACCORDING TO ASTM D
- 11. DO NOT ENCLOSE, COVER, OR PUT PIPING INTO OPERATION UNTIL IT IS INSPECTED AND APPROVED BY AUTHORITIES HAVING JURISDICTION.
- 12. INSTALL SLEEVES FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FLOORS. COMPLY WITH REQUIREMENTS FOR SLEEVES SPECIFIED IN SECTION 220517 "SLEEVES AND SLEEVE
- SEALS FOR PLUMBING PIPING." 13. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS. CEILINGS. AND FLOORS. COMPLY WITH REQUIREMENTS FOR ESCUTCHEONS SPECIFIED IN SECTION 220518 "ESCUTCHEONS FOR PLUMBING PIPING
- JOINTS ACCORDING TO CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK" FOR COMPRESSION JOINTS. 15. JOIN HUBLESS, CAST-IRON SOIL PIPING ACCORDING TO CISPI 310 AND CISPI'S "CAST IRON SOIL PIPE AND FITTINGS HANDBOOK"

14. JOIN HUB-AND-SPIGOT, CAST-IRON SOIL PIPING WITH GASKET

- FOR HUBLESS-PIPING COUPLING JOINTS. 16. JOIN COPPER TUBE AND FITTINGS WITH SOLDERED JOINTS ACCORDING TO ASTM B 828. USE ASTM B 813, WATER-FLUSHABLE, LEAD-FREE FLUX AND ASTM B 32,
- LEAD-FREE-ALLOY SOLDER. 17. FLANGED JOINTS: ALIGN BOLT HOLES. SELECT APPROPRIATE GASKET MATERIAL, SIZE, TYPE, AND THICKNESS. INSTALL GASKET CONCENTRICALLY POSITIONED. USE SUITABLE LUBRICANTS ON BOLT THREADS, TORQUE BOLTS IN CROSS
- 18. TRANSITION COUPLINGS:
- a. INSTALL TRANSITION COUPLINGS AT JOINTS OF PIPING WITH
- SMALL DIFFERENCES IN OD'S. b. IN DRAINAGE PIPING: SHIELDED, NONPRESSURE TRANSITION COUPLINGS.
- 19. PIPE HANGERS AND SUPPORT DEVICES INSTALLATION
- a. INSTALL CARBON-STEEL PIPE HANGERS FOR HORIZONTAL PIPING IN NONCORROSIVE ENVIRONMENTS.
- b. INSTALL STAINLESS-STEEL PIPE HANGERS FOR HORIZONTAL PIPING IN CORROSIVE ENVIRONMENTS. c. INSTALL CARBON-STEEL PIPE SUPPORT CLAMPS FOR VERTICAL PIPING IN NONCORROSIVE ENVIRONMENTS.
- 20. SUPPORT HORIZONTAL PIPING AND TUBING WITHIN 12 INCHES OF EACH FITTING, VALVE, AND COUPLING.
- 21. SUPPORT VERTICAL PIPING AND TUBING AT BASE AND AT EACH
- 22. ROD DIAMETER MAY BE REDUCED ONE SIZE FOR DOUBLE-ROD HANGERS, WITH 3/8-INCH MINIMUM RODS.

- 23. INSTALL HANGERS FOR CAST-IRON SOIL PIPING WITH THE FOLLOWING MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD
- a. NPS 1½ AND NPS 2: 60 INCHES WITH 3/8-INCH ROD.
- b. NPS 3: 60 INCHES WITH 1/2-INCH ROD. c. NPS 4 AND NPS 5: 60 INCHES WITH 5/8-INCH ROD.
- d. NPS 6 AND NPS 8: 60 INCHES WITH 3/4-INCH ROD.
- e. SPACING FOR 10-FOOT LENGTHS MAY BE INCREASED TO 10 FEET. SPACING FOR FITTINGS IS LIMITED TO 60 INCHES.
- 27. INSTALL SUPPORTS FOR VERTICAL CAST-IRON SOIL PIPING
- EVERY 15 FEET. 28. INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING
- MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: a. NPS 11/4: 72 INCHES WITH 3/8-INCH ROD. b. NPS 11/2 AND NPS 2: 96 INCHES WITH 3/8-INCH ROD.
- c. NPS 2½: 108 INCHES WITH 1/2-INCH ROD.
- d. NPS 3 AND NPS 5: 10 FEET WITH 1/2-INCH ROD.
- 29. INSTALL SUPPORTS FOR VERTICAL COPPER TUBING EVERY 10 30. INSTALL HANGERS FOR ABS PIPING WITH THE FOLLOWING
- MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS: a. NPS 1½ AND NPS 2: 48 INCHES WITH 3/8-INCH ROD.
- b. NPS 3: 48 INCHES WITH 1/2-INCH ROD. c. NPS 4 AND NPS: 48 INCHES WITH 5/8-INCH ROD.
- d. NPS 6 AND NPS 8: 48 INCHES WITH 3/4-INCH ROD. INSTALL SUPPORTS FOR VERTICAL ABS PIPING EVERY 48 INCHES.
- 32. SUPPORT PIPING AND TUBING NOT LISTED ABOVE ACCORDING TO MSS SP-69 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.
- 33. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES. 34. CONNECT SOIL AND WASTE PIPING TO BUILDING SEWERAGE
- PIPING. USE TRANSITION FITTING TO JOIN DISSIMILAR PIPING 35. CONNECT DRAINAGE AND VENT PIPING TO THE FOLLOWING:
- a. PLUMBING FIXTURES: CONNECT DRAINAGE PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING b. PLUMBING FIXTURES AND EQUIPMENT: CONNECT ATMOSPHERIC
- VENT PIPING IN SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY AUTHORITIES HAVING JURISDICTION. c. PLUMBING SPECIALTIES: CONNECT DRAINAGE AND VENT PIPING IN
- SIZES INDICATED, BUT NOT SMALLER THAN REQUIRED BY PLUMBING CODE. d. INSTALL TEST TEES (WALL CLEANOUTS) IN CONDUCTORS NEAR
- FLOOR AND FLOOR CLEANOUTS WITH COVER FLUSH WITH FLOOR. e. INSTALL HORIZONTAL BACKWATER VALVES WITH CLEANOUT COVER FLUSH WITH FLOOR, WHERE SPECIFIED. f. COMPLY WITH REQUIREMENTS FOR BACKWATER VALVES,
- CLEANOUTS, AND DRAINS SPECIFIED IN SECTION 221319 "SANITARY WASTE PIPING SPECIALTIES." g. EQUIPMENT: CONNECT DRAINAGE PIPING AS INDICATED. PROVIDE SHUTOFF VALVE IF INDICATED AND UNION FOR EACH CONNECTION. USE FLANGES INSTEAD OF UNIONS FOR CONNECTIONS NPS 21/2
- AND LARGER.
- 36. WHERE INSTALLING PIPING ADJACENT TO EQUIPMENT, ALLOW SPACE FOR SERVICE AND MAINTENANCE OF EQUIPMENT. 37. MAKE CONNECTIONS ACCORDING TO THE FOLLOWING UNLESS
- OTHERWISE INDICATED: a. INSTALL UNIONS, IN PIPING NPS 2 AND SMALLER, ADJACENT TO EACH VALVE AND AT FINAL CONNECTION TO EACH PIECE OF
- b. INSTALL FLANGES, IN PIPING NPS 21/2 AND LARGER, ADJACENT TO FLANGED VALVES AND AT FINAL CONNECTION TO EACH PIECE OF EQUIPMENT. 38. INSTALL CLEANOUTS IN ABOVEGROUND PIPING AND BUILDING
- DRAIN PIPING ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE INDICATED: a. SIZE SAME AS DRAINAGE PIPING UP TO NPS 4. USE NPS 4 FOR
- LARGER DRAINAGE PIPING UNLESS LARGER CLEANOUT IS INDICATED. b. LOCATE AT EACH CHANGE IN DIRECTION OF PIPING GREATER
- THAN 45 DEGREES c. LOCATE AT MINIMUM INTERVALS OF 50 FEET FOR PIPING NPS 4 AND SMALLER AND 100 FEET FOR LARGER PIPING d. LOCATE AT BASE OF EACH VERTICAL SOIL AND WASTE STACK
- 39. FOR FLOOR CLEANOUTS FOR PIPING BELOW FLOORS, INSTALL CLEANOUT DECK PLATES WITH TOP FLUSH WITH FINISHED FLOOR. 40. FOR CLEANOUTS LOCATED IN CONCEALED PIPING, INSTALL CLEANOUT WALL ACCESS COVERS, OF TYPES INDICATED, WITH
- FRAME AND COVER FLUSH WITH FINISHED WALL. 41. INSTALL FLOOR DRAINS AT LOW POINTS OF SURFACE AREAS TO BE DRAINED, SET GRATES OF DRAINS FLUSH WITH FINISHED

FLOOR, UNLESS OTHERWISE INDICATED

a. POSITION FLOOR DRAINS FOR EASY ACCESS AND MAINTENANCE. b. SET FLOOR DRAINS BELOW ELEVATION OF SURROUNDING FINISHED FLOOR TO ALLOW FLOOR DRAINAGE. c. INSTALL FLOOR-DRAIN FLASHING COLLAR OR FLANGE SO NO

LEAKAGE OCCURS BETWEEN DRAIN AND ADJOINING FLOORING.

- MAINTAIN INTEGRITY OF WATERPROOF MEMBRANES WHERE PENETRATED. d. INSTALL INDIVIDUAL TRAPS FOR FLOOR DRAINS CONNECTED TO SANITARY BUILDING DRAIN, UNLESS OTHERWISE INDICATED.
- 42. INSTALL ROOF FLASHING ASSEMBLIES ON SANITARY STACK VENTS AND VENT STACKS THAT EXTEND THROUGH ROOF. 43. INSTALL FLASHING FITTINGS ON SANITARY STACK VENTS AND
- 44. ASSEMBLE OPEN DRAIN FITTINGS AND INSTALL WITH TOP OF HUB 2 INCHES ABOVE FLOOR. 45. INSTALL DEEP-SEAL TRAPS ON FLOOR DRAINS AND OTHER
- WASTE OUTLETS, IF INDICATED. 46. INSTALL FLOOR-DRAIN, TRAP-SEAL PRIMER FITTINGS ON INLET TO FLOOR DRAINS THAT REQUIRE TRAP-SEAL PRIMER

a. EXCEPTION: FITTING MAY BE OMITTED IF TRAP HAS TRAP-SEAL

PRIMER CONNECTION b. SIZE: SAME AS FLOOR DRAIN INLET.

CONNECTION:

VENT STACKS THAT EXTEND THROUGH ROOF.

- 47. INSTALL AIR-GAP FITTINGS ON DRAINING-TYPE BACKFLOW PREVENTERS AND ON INDIRECT-WASTE PIPING DISCHARGE INTO
- SANITARY DRAINAGE SYSTEM. 48. INSTALL SLEEVE FLASHING DEVICE WITH EACH RISER AND STACK
- PASSING THROUGH FLOORS WITH WATERPROOF MEMBRANE. 49. INSTALL VENT CAPS ON EACH VENT PIPE PASSING THROUGH
- INSTALL GREASE INTERCEPTORS, INCLUDING TRAPPING, VENTING, AND FLOW-CONTROL FITTING, ACCORDING TO AUTHORITIES
- HAVING JURISDICTION AND WITH CLEAR SPACE FOR SERVICING.

AND CONNECT FLOW-CONTROL FITTING AND VENT TO UNIT INLET

- INSTALL TRAPS ON PLUMBING SPECIALTY DRAIN OUTLETS. OMIT TRAPS ON INDIRECT WASTES UNLESS TRAP IS INDICATED
- INSTALL PIPING ADJACENT TO EQUIPMENT TO ALLOW SERVICE AND MAINTENANCE. 53. GREASE INTERCEPTORS: CONNECT INLET AND OUTLET TO UNIT,
- PIPING. INSTALL VALVE ON OUTLET OF AUTOMATIC DRAWOFF-TYPE UNIT FABRICATE FLASHING FROM SINGLE PIECE UNLESS LARGE PANS. SUMPS, OR OTHER DRAINAGE SHAPES ARE REQUIRED. JOIN
- FLASHING ACCORDING TO THE FOLLOWING IF REQUIRED: a. LEAD SHEETS: BURN JOINTS OF LEAD SHEETS 6.0-LB/SQ. FT.
- 0.0938-INCH THICKNESS OR THICKER. SOLDER JOINTS OF LEAD SHEETS 4.0-LB/SQ. FT., 0.0625-INCH THICKNESS OR THINNER. 55. INSTALL SHEET FLASHING ON PIPES, SLEEVES, AND SPECIALTIES
- PASSING THROUGH OR EMBEDDED IN FLOORS AND ROOFS WITH WATERPROOF MEMBRANE. a. PIPE FLASHING: SLEEVE TYPE, MATCHING PIPE SIZE. WITH
- MINIMUM LENGTH OF 10 INCHES, AND SKIRT OR FLANGE EXTENDING AT LEAST 8 INCHES AROUND PIPE. b. SLEEVE FLASHING: FLAT SHEET, WITH SKIRT OR FLANGE
- EXTENDING AT LEAST 8 INCHES AROUND SLEEVE. c. EMBEDDED SPECIALTY FLASHING: FLAT SHEET, WITH SKIRT OR
- FLANGE EXTENDING AT LEAST 8 INCHES AROUND SPECIALTY. 56. SET FLASHING ON FLOORS AND ROOFS IN SOLID COATING OF BITUMINOUS CEMENT.
- 57. SECURE FLASHING INTO SLEEVE AND SPECIALTY CLAMPING RING OR DEVICE. INSTALL FLASHING FOR PIPING PASSING THROUGH ROOFS WITH COUNTERFLASHING OR COMMERCIALLY MADE FLASHING FITTINGS, ACCORDING TO SECTION 076200 "SHEET METAL FLASHING AND
- 59. EXTEND FLASHING UP VENT PIPE PASSING THROUGH ROOFS AND TURN DOWN INTO PIPE, OR SECURE FLASHING INTO CAST-IRON
- SLEEVE HAVING CALKING RECESS. 60. EQUIPMENT NAMEPLATES AND SIGNS: INSTALL ENGRAVED PLASTIC-LAMINATE EQUIPMENT NAMEPLATE OR SIGN ON OR
- NEAR EACH GREASE INTERCEPTOR. 61. DISTINGUISH AMONG MULTIPLE UNITS, INFORM OPERATOR OF OPERATIONAL REQUIREMENTS, INDICATE SAFETY AND EMERGENCY PRECAUTIONS, AND WARN OF HAZARDS AND IMPROPER OPERATIONS, IN ADDITION TO IDENTIFYING UNIT. NAMEPLATES AND SIGNS ARE SPECIFIED IN SECTION 220553 "IDENTIFICATION
- FOR PLUMBING PIPING AND EQUIPMENT." 62. PROTECT DRAINS DURING REMAINDER OF CONSTRUCTION PERIOD TO AVOID CLOGGING WITH DIRT OR DEBRIS AND TO PREVENT DAMAGE FROM TRAFFIC OR CONSTRUCTION WORK.
- EACH DAY OR WHEN WORK STOP. IDENTIFY EXPOSED SANITARY WASTE AND VENT PIPING. COMPLY WITH REQUIREMENTS FOR IDENTIFICATION SPECIFIED IN SECTION 65. DURING INSTALLATION, NOTIFY AUTHORITIES HAVING JURISDICTION

63. PLACE PLUGS IN ENDS OF UNCOMPLETED PIPING AT END OF

INSPECTION MUST BE MADE. PERFORM TESTS SPECIFIED BELOW IN PRESENCE OF AUTHORITIES HAVING JURISDICTION: a. ROUGHING-IN INSPECTION: ARRANGE FOR INSPECTION OF PIPING BEFORE CONCEALING OR CLOSING-IN AFTER ROUGHING-IN AND

AT LEAST 24 HOURS (CHECK WITH LOCAL AUTHORITIES) BEFORE

- BEFORE SETTING FIXTURES. b. FINAL INSPECTION: ARRANGE FOR FINAL INSPECTION BY AUTHORITIES HAVING JURISDICTION TO OBSERVE TESTS SPECIFIED
- BELOW AND TO ENSURE COMPLIANCE WITH REQUIREMENTS. 66. RE-INSPECTION: IF AUTHORITIES HAVING JURISDICTION FIND THAT PIPING WILL NOT PASS TEST OR INSPECTION, MAKE REQUIRED CORRECTIONS AND ARRANGE FOR RE-INSPECTION.
- 67. REPORTS: PREPARE INSPECTION REPORTS AND HAVE THEM SIGNED BY AUTHORITIES HAVING JURISDICTION. 68. TEST SANITARY DRAINAGE AND VENT PIPING ACCORDING TO PROCEDURES OF AUTHORITIES HAVING JURISDICTION OR, IN ABSENCE OF PUBLISHED PROCEDURES, AS FOLLOWS:
- a. TEST FOR LEAKS AND DEFECTS IN NEW PIPING AND PARTS OF EXISTING PIPING THAT HAVE BEEN ALTERED, EXTENDED, OR REPAIRED. IF TESTING IS PERFORMED IN SEGMENTS, SUBMIT SEPARATE REPORT FOR EACH TEST, COMPLETE WITH DIAGRAM OF PORTION OF PIPING TESTED.
- OR REPLACED DRAINAGE AND VENT PIPING UNTIL IT HAS BEEN TESTED AND APPROVED. EXPOSE WORK THAT WAS COVERED OR CONCEALED BEFORE IT WAS TESTED. c. ROUGHING-IN PLUMBING TEST PROCEDURE: TEST DRAINAGE AND VENT PIPING EXCEPT OUTSIDE LEADERS ON COMPLETION OF ROUGHING-IN. CLOSE OPENINGS IN PIPING SYSTEM AND FILL WITH WATER TO POINT OF OVERFLOW, BUT NOT LESS THAN 10-FOOT HEAD OF WATER. FROM 15 MINUTES BEFORE INSPECTION STARTS

TO COMPLETION OF INSPECTION, WATER LEVEL MUST NOT DROP.

b. LEAVE UNCOVERED AND UNCONCEALED NEW, ALTERED, EXTENDED,

- INSPECT JOINTS FOR LEAKS. d. FINISHED PLUMBING TEST PROCEDURE: AFTER PLUMBING FIXTURES HAVE BEEN SET AND TRAPS FILLED WITH WATER, TEST CONNECTIONS AND PROVE THEY ARE GASTIGHT AND WATERTIGHT. PLUG VENT-STACK OPENINGS ON ROOF AND BUILDING DRAINS WHERE THEY LEAVE BUILDING. INTRODUCE AIR INTO PIPING SYSTEM EQUAL TO PRESSURE OF 1-INCH WG. USE U-TUBE OR MANOMETER INSERTED IN TRAP OF WATER CLOSET TO MEASURE THIS PRESSURE. AIR PRESSURE MUST REMAIN CONSTANT WITHOUT INTRODUCING ADDITIONAL AIR THROUGHOUT PERIOD OF INSPECTION. INSPECT PLUMBING FIXTURE CONNECTIONS FOR GAS
- AND WATER LEAKS. e. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING, OR PORTION THEREOF, UNTIL SATISFACTORY RESULTS ARE
- f. PREPARE REPORTS FOR TESTS AND REQUIRED CORRECTIVE

- 69. CLEAN INTERIOR OF PIPING. REMOVE DIRT AND DEBRIS AS WORK
- 70. PROTECT DRAINS DURING REMAINDER OF CONSTRUCTION PERIOD TO AVOID CLOGGING WITH DIRT AND DEBRIS AND TO PREVENT
- DAMAGE FROM TRAFFIC AND CONSTRUCTION WORK.
- 71. PLACE PLUGS IN ENDS OF UNCOMPLETED PIPING AT END OF DAY AND WHEN WORK STOPS.
- 72. EXPOSED ABS PIPING: PROTECT PLUMBING VENTS EXPOSED TO SUNLIGHT WITH TWO COATS OF WATER-BASED LATEX PAINT. 73. FLANGES AND UNIONS MAY BE USED ON ABOVEGROUND
- PRESSURE PIPING UNLESS OTHERWISE INDICATED. 74. SOIL AND WASTE PIPING, NPS 4 AND SMALLER, SHALL BE ANY
- OF THE FOLLOWING: a. SERVICE CLASS, CAST-IRON SOIL PIPE AND FITTINGS; GASKETS;
- AND GASKETED JOINTS. b. HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS; CISPI
- HUBLESS-PIPING COUPLINGS: AND COUPLED JOINTS. c. COPPER DWV TUBE, COPPER DRAINAGE FITTINGS, AND SOLDERED
- d. SOLID-WALL ABS PIPE, ABS SOCKET FITTINGS, AND
- SOLVENT-CEMENTED JOINTS. e. DISSIMILAR PIPE-MATERIAL COUPLINGS: SHIELDED, NONPRESSURE
- TRANSITION COUPLINGS. 75. SOIL AND WASTE PIPING, NPS 5 AND LARGER, SHALL BE ANY
- OF THE FOLLOWING: a. SERVICE CLASS, CAST-IRON SOIL PIPE AND FITTINGS; GASKETS; AND GASKETED JOINTS.
- HUBLESS-PIPING COUPLINGS; AND COUPLED JOINTS. c. DISSIMILAR PIPE-MATERIAL COUPLINGS: SHIELDED, NONPRESSURE TRANSITION COUPLINGS.
- 76. VENT PIPING, NPS 4 AND SMALLER, SHALL BE ANY OF THE a. SERVICE CLASS, CAST-IRON SOIL PIPE AND FITTINGS; GASKETS;

b. HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS: CISPI

AND GASKETED JOINTS. b. HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS; CISPI HUBLESS-PIPING COUPLINGS: AND COUPLED JOINTS.

c. COPPER DWV TUBE, COPPER DRAINAGE FITTINGS, AND SOLDERED

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PLUMBING SPECIFICATIONS III

