.PLUMBING SPECIFICATIONS.

PART I - GENERAL

A. CONDITIONS

GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, SPECIAL CONDITIONS, AND OTHER RELATED PORTIONS OF DIVISION I APPLY TO THIS SECTION.

B. SUMMARY OF WORK

 THE WORK INCLUDED IN THIS SECTION CONSISTS OF LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE PLUMBING SYSTEM AS INDICATED ON THE DRAWINGS AND AS DESCRIBED HEREIN. INSTALL SYSTEM IN PERFECT WORKING ORDER AND IN FULL ACCORDANCE WITH THE INTENT AND MEANING OF THE DRAWINGS AND SPECIFICATIONS. THE WORK IN GENERAL CONSISTS OF FURNISHING AND INSTALLING NEW PLUMBING FIXTURES AND TRIM INCLUDING CONNECTION OF NEW WASTE, VENT AND WATER PIPING TO EXISTING SERVICES AS REQUIRED TO PUT NEW FIXTURES INTO

C. REGULATIONS, CODES, PERMITS AND INSPECTIONS

- 1. COMPLY WITH NATIONAL, STATE, COUNTY, AND CITY CODES, ORDINANCES, ETC., HAVING JURISDICTION, INCLUDING RULES AND REQUIREMENTS OF UTILITY SERVING AGENCIES.
- 2. INCORPORATE CODES, ORDINANCES, ETC., INTO THE BASE BID AND INSTALLATION OF WORK. NO ADDITIONAL FUNDS WILL BE ALLOCATED FOR WORK REQUIRED TO CONFORM TO REGULATIONS AND REQUIREMENTS OR TO OBTAIN APPROVAL OF WORK
- 3. OBTAIN AND PAY FOR REQUIRED PERMITS AND LICENSES. WHEN REQUIRED BY CODE, WORK MUST BE INSPECTED AND APPROVED BY LOCAL AUTHORITIES. PRIOR TO FINAL APPROVAL, FURNISH ARCHITECT WITH CERTIFICATES OF INSPECTION AND APPROVALS BY LOCAL AUTHORITIES.
- 4. IN ADDITION, THE LATEST ADOPTED EDITION OF THE FOLLOWING CODES AND PUBLISHED STANDARDS SHALL BE ADHERED TO:
- A. 2016 CALIFORNIA BUILDING CODE (CBC)
- B. 2016 CALIFORNIA MECHANICAL CODE (CMC) NFPA STANDARDS
- ASHRAE HANDBOOKS E. SMACNA DUCT CONSTRUCTION STANDARDS F. 2016 CALIFORNIA PLUMBING CODE (CPC)
- G. 2016 CALIFORNIA ELECTRICAL CODE (CEC)
- H. 2016 CALIFORNIA ENERGY CODE (TITLE 24, PART 6) 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE

D. DESIGN DRAWINGS

- 1. DESIGN DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED ONLY TO DEFINE THE BASIC FUNCTIONS REQUIRED. PROVIDE LABOR, MATERIAL, ETC., NECESSARY TO ACCOMPLISH THESE REQUIREMENTS. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED A PART OF THE WORK INCLUDED. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE PERMITTED. DO NOT SCALE THE DESIGN DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS.
- 2. IF A CONFLICT OCCURS BETWEEN THE DESIGN DRAWINGS AND SPECIFICATIONS, PROMPTLY NOTIFY THE ARCHITECT AND/OR ENGINEER. AT THAT POINT, AN INTERPRETATION WILL BE MADE BY THE ARCHITECT AND/OR ENGINEER AND SAID DECISION SHALL BE CONSIDERED PART OF THE CONTRACT DOCUMENTS.

E. QUALIFICATIONS OF CONTRACTOR AND WORKMEN

- 1. CONTRACTOR SHALL BE PROPERLY LICENSED TO PERFORM THE WORK.
- 2. USE SUFFICIENT JOURNEYMEN, CRAFTSMEN AND SUPERVISORS TO ENGURE PROMPT, PROPER, AND SAFE EXECUTION OF THE WORK

F. BASE BID

- 1. BASE BID SHALL INCLUDE MATERIALS AND EQUIPMENT SPECIFIED OR SCHEDULED ON THE DRAWINGS. REQUESTS FOR SUBSTITUTION OF MATERIALS AND EQUIPMENT SHALL BE BY ADDITIVE OR DEDUCTIVE ALTERNATE BID ONLY, WITH THE FOLLOWING DATA CLEARLY WRITTEN AT THE BEGINNING OF THE ALTERNATE PROPOSAL:
- A. ADDITIVE OR DEDUCTIVE AMOUNT CLEARLY WRITTEN IN WORDS AND NUMERALS. B. INCREASED OR REDUCED CONSTRUCTION TIME IN DAYS. OTHER DEMONSTRABLE BENEFIT, FOR WHICH THE SUBSTITUTION OF SUCH ITEM WILL
- 2. ONLY THOSE MATERIALS AND EQUIPMENT WHICH ARE SUBMITTED AS AN ALTERNATE BID AND WHICH ARE ACCOMPANIED BY THE SUPPORTING DATA INDICATED BELOW WILL BE

REVIEWED AND CONSIDERED.

G. SUBSTITUTIONS

BE IN THE OWNER'S INTEREST.

- MATERIALS AND EQUIPMENT THAT ARE A SUBSTITUTE FROM THE LISTED MANUFACTURES MAY BE CONSIDERED. PRIOR TO PROPOSING ANY SUBSTITUTE ITEM, CONTRACTOR SHALL SATISFY HIMSELF THAT THE ITEM PROPOSED IS, IN FACT, EQUAL TO THAT SPECIFIED, THAT SUCH ITEM WILL FIT INTO THE SPACE ALLOCATED, THAT SUCH ITEM AFFORDS COMPARABLE EASE OF OPERATION, MAINTENANCE AND SERVICE, THAT THE APPEARANCE, LONGEVITY, CAPACITY, SUITABILITY, AND ELECTRICAL CHARACTERISTICS ARE COMPARABLE, AND THAT BY REASON OF COST SAVINGS, REDUCED CONSTRUCTION TIME, OR SIMILAR DEMONSTRABLE BENEFIT, THE SUBSTITUTION OF SUCH ITEM WILL BE IN THE OWNER'S INTEREST.
- 2. THE BURDEN OF PROOF OF EQUALITY OF A PROPOSED SUBSTITUTION FOR A SPECIFIED ITEM SHALL BE UPON THE CONTRACTOR. CONTRACTOR SHALL SUPPORT HIS REQUEST WITH SUFFICIENT TEST DATA AND OTHER MEANS TO PERMIT THE ENGINEER TO MAKE A FAIR AND EQUITABLE DECISION ON THE MERITS OF THE PROPOSED SUBSTITUTION. INSUFFICIENT SUBMITTAL DATA WILL RESULT IN REJECTION OF THE PROPOSED SUBSTITUTION. ANY ITEM BY A MANUFACTURER OTHER THAN THOSE SPECIFIED, OR OF BRAND NAME OR MODEL NUMBER, OR OF GENERIC SPECIES OTHER THAN THOSE SPECIFIED, WILL BE CONSIDERED A SUBSTITUTION. ENGINEER WILL BE THE SOLE JUDGE OF WHETHER OR NOT THE SUBSTITUTION IS EQUAL IN QUALITY, UTILITY AND ECONOMY TO THAT SPECIFIED.
- 3. APPROVAL OF A SUBSTITUTION SHALL NOT RELIEVE CONTRACTOR FROM RESPONSIBILITY FOR COMPLIANCE WITH ALL REQUIREMENTS OF THE CONTRACT. CONTRACTOR SHALL BEAR THE EXPENSE FOR ANY CHANGES IN OTHER PARTS OF THIS WORK OR OTHER WORK CAUSED BY THE PROPOSED SUBSTITUTION, INCLUDING BUT NOT LIMITED TO STRUCTURAL, ELECTRICAL, PLUMBING, AND ACCESS REQUIREMENTS.
- 4. IF ENGINEER REJECTS CONTRACTOR'S SUBSTITUTE ITEM ON THE FIRST SUBMITTAL, CONTRACTOR MAY MAKE ONLY ONE ADDITIONAL REQUEST FOR SUBSTITUTION IN THE SAME CATEGORY.

H. SUBMITTALS 1. EQUIPMENT AND MATERIALS:

- A. CONTRACTOR SHALL HAVE APPROVED SUBMITTALS PRIOR TO FABRICATION OR DELIVERY OF ANY MATERIAL AND/OR EQUIPMENT TO THE JOB SITE, SUBMIT A MINIMUM OF 8 (EIGHT) COPIES, COMPREHENSIVELY INDEXED SUBMITTALS IN A 3-RING BINDER, COMPLETELY DESCRIBING EACH MAJOR SYSTEM, MATERIAL AND EQUIPMENT PROPOSED TO BE USED. ANY PIECE OF EQUIPMENT PLACED ON THE JOB WITHOUT PRIOR APPROVAL WILL BE SUBJECT TO REMOVAL AT THE SOLE EXPENSE OF THE CONTRACTOR.
- B. SUBMITTALS ARE FOR INFORMATION AND COORDINATION ONLY. REVIEW OF MATERIAL AND/OR EQUIPMENT SUBMITTALS SHALL IN NO WAY RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO COMPLY WITH PLANS AND SPECIFICATIONS REQUIREMENTS. POINTS OF NON-COMPLIANCE WHICH ARE NOT NOTED SHALL NOT BE CONSTRUED TO BE AN APPROVAL OF THE NON-COMPLIANCE. SUBMITTALS SHALL CLEARLY STATE WHERE EQUIPMENT DOES NOT AGREE WITH THE CONTRACT DOCUMENTS.
- C. ARCHITECTURAL PLANS AND SPECIFICATIONS SHALL BE REVIEWED FOR ADDITIONAL SUBMITTAL REQUIREMENTS.
- INCLUDE DETAILED DRAWINGS WHERE REQUIRED FOR PROPER COORDINATION WITH OTHER TRADES. INDICATE EQUIPMENT LAYOUTS, ELECTRICAL CHARACTERISTICS, WIRING AND CONTROL DIAGRAMS, SIZES AND LOCATIONS OF PIPING, DUCTS, CONDUITS, AND OTHER ITEMS WHICH EFFECT THE SPACE AVAILABLE. SUBMIT ITEMS AT ONE TIME IN A NEAT AND ORDERLY MANNER WITHIN 15 DAYS OF AWARD OF CONTRACT. PARTIAL LIST WILL NOT BE ACCEPTABLE. SUBMITTALS SHALL INCLUDE MANUFACTURER'S SPECIFICATIONS, PHYSICAL DIMENSIONS, WEIGHTS AND RATINGS OF EQUIPMENT SUBMITTED. SUBMITTALS SHALL BE INDEXED AND SECURELY BOUND IN A SUITABLE MANNER. SUBMIT THE FOLLOWING ITEMS FOR APPROVAL: 1) CLEANOUTS 2) PIPING AND FITTINGS 3) VALVES.

3. RECORD DRAWINGS: MAINTAIN ACCURATE RECORDS OF ANY CHANGES FROM THE CONTRACT DOCUMENTS AND SHOP DRAWINGS. UPON COMPLETION OF THE PROJECT, DELIVER TO THE OWNER ONE (1) SET OF LEGIBLE AND REPRODUCIBLE COPIES OF THESE RECORD DRAWINGS.

4. WARRANTY:

UNLESS SPECIFIED OTHERWISE BY ARCHITECT, ENGINEER, OWNER OR OWNER'S REPRESENTATIVE, UPON COMPLETION OF THE PROJECT, DELIVER TO THE OWNER A WRITTEN ONE (1) YEAR WARRANTY ON THE SYSTEMS, MATERIALS AND ALL WORK PERFORMED, WHICH INCLUDES THE ENTIRE COST, INCLUDING MATERIALS AND/OR LABOR, OF CORRECTIVE WORK REQUIRED AND NECESSITATED BY DEFECTS IN MATERIALS AND/OR WORKMANSHIP. CONTRACTOR SHALL ALSO PRESENT THE OWNER W/ A COPY OF ALL MANUFACTURER'S WARRANTIES THAT EXCEED THE WARRANTY PERIOD, SUCH AS WATER HEATERS.

5. OPERATION AND MAINTENANCE INSTRUCTIONS:

UPON THE COMPLETION OF THE PROJECT, DELIVER TO THE OWNER THE REQUIRED NUMBER OF COPIES OF HARD BOUND O & M MANUALS. INCLUDE IN THE MANUAL INSTRUCTIONS PREPARED SPECIFICALLY FOR THE SYSTEMS PROVIDE, ALONG WITH DESCRIPTIONS, PARTS LIST, INSTRUCTIONS, AND WARRANTIES. START-UP REPORTS FOR ALL EQUIPMENT WILL BE DELIVERED WITH THE MATERIALS AND EQUIPMENT WILL BE DELIVERED WITH THE MATERIALS AND EQUIPMENT UTILIZED IN THE PROJECT. IDENTIFY EACH ITEM BY THE DESIGNATION APPEARING ON THE DRAWINGS.

H. SUBMITTALS (CONT'D.)

6. OWNER TRAINING: AT A TIME DESIGNATED BY THE OWNER, PROVIDE A SUITABLE TECHNICIAN, MECHANIC OR ENGINEER TO REVIEW THE SYSTEMS WITH OWNER'S REPRESENTATIVE TO THOROUGHLY FAMILIARIZE HIM WITH THE OPERATIONS AND MAINTENANCE OF THE SYSTEMS. UP TO (8) EIGHT HOURS TOTAL TRAINING TIME SHALL BE REQUIRED WITHOUT ADDITIONAL COST TO THE OWNER PRIOR TO TRAINING THE OWNER SHALL HAVE TAKEN POSSESSION OF THE O & M MANUALS, AND SHALL HAVE HAD A REASONABLE AMOUNT OF TIME FOR HIS PERSONNEL TO FAMILIARIZE THEMSELVES WITH THE CONTENTS OF THE

PART II - PRODUCTS

A. GENERAL PRODUCTS 1. SEISMIC RESTRAINTS:

- A. WHERE REQUIRED BY THE BUILDING OFFICIALS/BUILDING CODES, FURNISH AND INSTALL SEISMIC RESTRAINTS FOR PIPING, AND EQUIPMENT. SEISMIC RESTRAINTS SHALL BE DESIGNED TO RESIST SEISMIC FORCES PRESCRIBED IN THE BUILDING
- CODES FOR THE PROJECT LOCATION. B. WHERE REQUIRED BY THE BUILDING OFFICIAL, PROVIDE STRUCTURAL CALCULATIONS SEALED AND SIGNED BY A LICENSED STRUCTURAL ENGINEER.
- 2. FURNISH AND INSTALL NEW PRODUCTS OF ESTABLISHED AND REPUTABLE MANUFACTURERS. SEE LIST OF ACCEPTABLE MANUFACTURERS ELSEWHERE IN THIS SPECIFICATION. MAKE NO EQUIPMENT SUBSTITUTIONS THAT WOULD LEAVE INADEQUATE OPERATING OR SERVICING SPACE. REFER TO SUBSTITUTION SECTION OF THE SPECIFICATIONS.
- 3. ACCESSORIES REQUIRED FOR PROPER OPERATION OF THE SYSTEMS, EVEN THOUGH NOT SPECIFICALLY INDICATED, SHALL BE INCLUDED AND INSTALLED. SUCH ACCESSORIES MAY INCLUDE, BUT ARE NOT LIMITED TO, FILTERS, CONDENSATE DRAINS, RELIEF VALVES, SERVICE VALVES, AQUASTATS, VIBRATION ISOLATORS, ETC. STARTERS FOR NON-PREWIRED EQUIPMENT, I.E., FANS, PUMPS ETC., ARE UNDER THE ELECTRICAL CONTRACTOR'S SCOPE OF WORK, UNLESS NOTED OTHERWISE.
- 4. SPECIFIC REFERENCE TO A MANUFACTURER'S PRODUCT IS ONLY TO ESTABLISH TYPE, QUALITY, AND PERFORMANCE REQUIRED. THESE QUALIFICATIONS ARE IN ADDITION TO THE REQUIREMENTS SHOWN ON THE PLANS AND ELSEWHERE IN THESE SPECIFICATIONS. LISTING OF ALTERNATE EQUIPMENT MANUFACTURERS SHALL NOT BE CONSTRUED AS AN UNCONDITIONAL APPROVAL OF THE PRODUCTS OF THOSE MANUFACTURERS.

B. PIPING MATERIALS

- 1. SOIL, WASTE, AND VENT PIPING AND FITTINGS SHALL BE:
- A. CAST IRON, NO HUB. B. PLASTIC PIPE (WHERE ALLOWED BY THE CODE): (1) PVC ASTM D2665-82. JOINTS: SOLVENT WELD ASTM D2564-80. (2) PENETRATION OF FIRE RESISTIVE CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE BUILDING CODES AND LOCAL AMENDMENTS ADOPTED BY THE BUILDING DEPT., HAVING JURISDICTION.

2. WATER PIPING ABOVE GRADE:

- A. COPPER TUBING: ASTM B88, TYPE L, HARD DRAWN. B. FITTINGS: ANSI/ASME B1623, CAST BRASS, OR ANSI/ASME B1629, WROUGHT COPPER.
- C. JOINTS: SOLDER AND FLUXES SHALL HAVE A LEAD CONTENT OF LESS THAN 0.2 OF 1

3. COOLING COIL CONDENSATE DRAIN PIPING:

A. COPPER TUBING: ASTM B306, DWY. B. FITTINGS: ASME 16.23, CAST BRONZE, OR ASME B16.29, WROUGHT COPPER. C. JOINTS: ASTM B32, SOLDER, GRADE 50B. WHERE BRANCH DRAINS ARE SMALLER THAN AVAILABLE SIZES IN DWV, USE ASTM B88, TYPE M COPPER TUBING.

4. WATER VALVES:

SHALL BE BY THE SAME MANUFACTURER WITH MANUFACTURER'S NAME AND PRESSURE RATING CLEARLY MARKED ON OUTSIDE OF BODY. PROVIDE VALVES SUITABLE TO CONNECT TO ADJOINING PIPE AS SPECIFIED FOR PIPE JOINTS. USE PIPE SIZE GATE VALVES WITH RISING STEM OR BALL VALVES, VALVES SHALL BE 125 * CLASS.

<u>C. PIPE SUPPORTS</u> 1. SEISMIC RESTRAINTS:

- A. ATTACHMENTS FOR PIPING AND EQUIPMENT SUPPORTED BY THE BUILDING STRUCTURE SHALL BE DESIGNED TO RESIST SEISMIC FORCES PRESCRIBED IN ALL APPLICABLE BUILDING CODES AND LOCAL AMENDMENTS ADOPTED BY THE
- BUILDING DEPT. HAYING JURISDICTION. B. WHERE REQUIRED BY THE BUILDING OFFICIAL, PROVIDE STRUCTURAL CALCULATIONS SIGNED BY A LICENSED STRUCTURAL ENGINEER.
- 2. SOIL, WASTE, AND VENT PIPING: AS REQUIRED BY LOCAL BUILDING CODE HAVING
- 3. WATER PIPING: AS REQUIRED BY LOCAL BUILDING CODE HAVE JURISDICTION.

D. CLEANOUTS

1. INTERIOR FINISHED FLOOR AREAS (FCO): TWO PIECE BODY WITH DOUBLE DRAINAGE FLANGE, WEEP HOLES, REVERSIBLE CLAMPING COLLAR, AND ADJUSTABLE NICKEL-BRONZE, ROUND SCORIATED COVER IN SERVICE AREAS AND ROUND OR SQUARE WITH DEPRESSED COVER TO ACCEPT FLOOR FINISH IN FINISHED FLOOR AREAS. (MATERIALS SPECIFIED UNDER PART 2, PARAGRAPH B.)

PART III - EXECUTION

<u>A. GENERAL</u>

- 1. INSTALL MATERIALS AND EQUIPMENT IN AN ARRANGEMENT THAT WILL GIVE THE GREATEST PRACTICAL EASE OF OPERATION AND SERVICE TO THE OWNER
- P. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.
- 3. PERFORM WORK IN ACCORDANCE WITH THE BEST TRADE PRACTICES. INSTALL MATERIALS AND EQUIPMENT SQUARELY WITH THE BUILDING LINES. PROVIDE RIGID PERMANENT BASES AND SUPPORTS FOR WORK. CONSTRUCT AND BRACE EQUIPMENT, PIPING, ETC, SO THAT THERE WILL BE NO VIBRATION AND/OR RATTLING WHEN THE SYSTEM IS IN OPERATION.
- 4. COVER AND PROTECT EQUIPMENT AND MATERIALS FROM WEATHER, THEFT, ETC., UNTIL DATE OF COMPLETION. PLUG AND/OR CAP OPEN ENDS OF INSTALLED PIPING.

B. INSTALLATION

- 1. CONCEAL PIPING IN WALLS, FURRED SPACES, PIPE SPACES, OR ABOVE SUSPENDED CEILINGS, AS SHOWN ON THE DRAWINGS. GROUP PIPING WHEREVER PRACTICAL AND INSTALL UNIFORMLY IN STRAIGHT PARALLEL LINES, SQUARELY WITH BUILDING LINES.
- 2. SUPPORT HORIZONTAL PIPING WITH PIPE HANGERS. DO NOT USE PERFORATED METAL TAPE. ARRANGE PIPING SO THAT THERMAL EXPANSION DOES NOT CAUSE STRESS. INSTALL AND SECURE PIPING SO THAT HOT AND COLD LINES, AND LINES OF DISSIMILAR METALS, ARE NOT IN CONTACT.
- 3. VERIFY EQUIPMENT DIMENSIONS AND REQUIREMENTS FOR ROUGH-IN WORK. BENDING OR OFFSETTING OF FINISHED PIPING CONNECTIONS AND "COCKING" OF FITTINGS OR TRIM WILL NOT BE ACCEPTABLE. DO NOT SUPPORT ANY PIPING WEIGHT FROM EQUIPMENT.
- 4. SANITARY: LAY PIPING AT A UNIFORM GRADE. MAKE JOINTS CLOSE AND SQUARE. USE FITTINGS FOR TURNS AND OFFSETS. UNIFORMLY GRADE AND COMPACT TRENCHES PRIOR TO LAYING PIPING. PROVIDE CONTINUOUS SUPPORT FOR PIPING.
- 5. PIPING CONNECTIONS TO PLUMBING FIXTURES, EXPOSED PIPING AND FITTINGS SHALL BE CHROME PLATED.
- 6. CUTTING AND PATCHING SHALL BE APPROVED BY THE ARCHITECT PRIOR TO
- 7. INGULATE ALL PIPING CONVEYING FLUIDS ABOVE OR BELOW AMBIENT TEMPERATURES, ALL CONDENSATE PIPING AND THE UNDERSIDE OF ROOF DRAINS/OVERFLOW ROOF DRAINS AND THE UNDERSIDE OF HORIZONTAL RAINWATER PIPING. WHERE EXPOSED, COVER INSULATION WITH ALUMINUM JACKET.

C. TESTING REQUIREMENTS

PERFORMING THE WORK.

1. TEST SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, ORDINANCES, ETC. MINIMUM REQUIREMENTS ARE AS FOLLOWS:

D. GAS PIPING: OVER 14-INCH WATER COLUMN, 60 PSI FOR ONE (1) HOUR

- A. SANITARY: STATIC WATER PRESSURE FOR ONE (1) HOUR. B. POTABLE WATER: AVAILABLE PRESSURE FOR ONE (1) HOUR C. GAS PIPING: PRESSURE 14-INCH WATER COLUMN OR LESS, 10 PSI FOR ONE (1)
- 2. IF ANY TEST SHOWS THE WORK TO BE DEFECTIVE IN ANY WAY OR AT VARIANCE WITH SPECIFICATION REQUIREMENTS, MAKE NECESSARY CHANGES AND REMEDY DEFECTS.
- 3. TEST PIPING SYSTEMS AFTER INSTALLATION AND PRIOR TO BEING PUT INTO USE, COVERED OR CONCEALED BY INSULATION, BACKFILLING OR BUILDING CONSTRUCTION.

D. DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

I. DISINFECT WATER PIPING IN STRICT CONFORMANCE WITH THE REQUIREMENTS OF THE STATE OF CALIFORNIA "WATER SUPPLY REGULATIONS", SECTION 3 AND IN ACCORDANCE TO ALL APPLICABLE PLUMBING CODES AND LOCAL AMENDMENTS ADOPTED BY THE BUILDING DEPT., HAVING JURISDICTION.

PLUMBING LEGEND

CD COMPRISATE DRAIN DOMESTIC COLD WATER DOMESTIC HOT WATER RETURN WO DOMESTIC HOT WATER RETURN (A0° F) WO DOMESTIC HOT WATER WO DOMESTIC HOT WAT	DESCRIPTION
DOMESTIC HOT MATER DOMESTIC HOT MATER RETURN HAD DOMESTIC HOT MATER RETURN (140° F) RAD COLD MATER SCU RAD COLD MATER SCU SOFTENED COLD MATER F HISE PROTECTION MASTE BELOW GROUND WASTE BELOW GROUND ACD MASTE BELOW GROUND ACD MASTER MASTER ACTURAL GAS HEDICAL NITROWS ON ADDRESS OF THE MASTER ACTURAL GAS ACCOMPRESSED AIR VACUUM NO MEDICAL NITROWS ON ADDRESS OF THE MASTER ACTURAL GAS ACCOMPRESSED AIR VACUUM NO MEDICAL NITROWS ON ADDRESS ON ADDRESS OF THE MASTER ACTURAL GAS ACCOMPRESSED AIR VACUUM NO MEDICAL NITROWS ON ADDRESS ON ADDRE	BALL VALVE
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DOMESTIC HOT WATER (140° F) 140 DOMESTIC HOT WATER RETURN (140° F) RCU RAW COLD WATER SCHU SCPTENED COLD WATER F FIRE PROTECTION WASTE ABOVE GROUND WASTE BELOW GROUND VENT GREASE WASTE ALL ACID WASTE ABOVE GROUND ACID WASTE ABOVE GROUND ACID WASTE BELOW GROUND ACID WASTE BELOW GROUND ACID WASTE ABOVE GROUND ACID VENT ROL ROOF DRAIN LEADER OVERFLOW DRAIN LEADER OUT OVERFLOW DRAIN LEADER MEDIUM FRESSURE NATURAL GAS HICH PRESSURE NATURAL GAS HICH PRESSURE NATURAL GAS ACID MEDIUM FRESSURE NATURAL GAS WACULM N MEDICAL NITROUS OXIDE COL CARBON DIOXIDE EXISTING PIPING DEMOLITON LORK SLOPE DOWN IN DIRECTION OF FLOW EQUIPMENT TAG DIAGRAM TAG OO O	GAS SHUT OFF VALVE
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ODL OVERFLOW DRAIN LEADER G NATURAL GAS LIQUIFIED PETROLEUM GAS (PROPANE) MPG MEDIUM PRESSURE NATURAL GAS HIGH PRESSURE NATURAL GAS COMPRESSED AIR VACUUM MEDICAL NITROGEN MEDICAL NITROGEN MEDICAL NITROGEN MEDICAL NITROGEN MEDICAL NITROGEN MEDICAL NITROGEN G SE ** DEMOLITION WORK SLOPE DOWN IN DIRECTION OF FLOW EQUIPMENT TAG DIAGRAM TAG OD OD OD OD OD OD OD OD OD O	STRAINER
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EQUIPMENT TAG DIAGRAM TAG DIAGRAM TAG DIAGRAM TAG DIAGRAM TAG	AUTOMATIC AIR VENT
DIAGRAM TAG DIAGRAM TAG DIAGRAM TAG	CONNECT NEW WORK TO EXISTING
	FLOW INDICATOR
	PIPE CAP
ΦΦ Φ	IN-LINE CIRCULATION PUMP
ΦΦ Φ	TRAP PRIMER
ΦΦ Φ	PIPE BREAK
⊕	SUMP PUMP
-l-	TWO WAY GRADE CLEAN OUT
_	FLOOR CLEAN OUT / CLEAN OUT TO GRADE
	WALL CLEAN OUT
	FLOOR DRAIN
	FLOOR SINK
TE: NOT ALL SYMBOLS MAY BE USED	ROOF / OVERFLOW DRAIN

SHEET INDEX

• INDICATES PREVIOUSLY / CURRENTLY ISSUED SHEETS

PLANCHECK SUBMITTAL

SHEET	TITLE	
		Specifications and Legend
• P101	Plumbing	Schedules
• P102	Plumbing	Plan – Waste and Vent
• P103	Plumbing	Plan - Water and Gas
P104	Plumbing	Details

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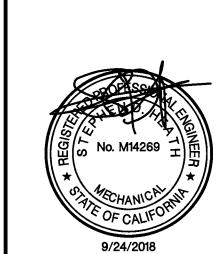
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roject Owner:



Project Status ssue Date: 9/24/2018

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PRINCIPAL IN CHARGE: PROJECT MANAGER

LBX - LONG BEACH EXCHANGE 3850 WORSHAM BOULEVARD

SUITE 410, BUILING R-4

Sheet Title: **PLUMBING SPECIFICATIONS**

AND LEGEND

Project Number:

MAXIMUM FIXTURE FLOW RATES (CGBSC SECTION 5.303.3)

	MAXIMUM FLOW
FIXTURE TYPE	RATE
NONRESIDENTIAL LAVATORY FAUCETS	05 GPM @ 60 PSI
KITCHEN FAUCETS	1.8 GPM @ 60 PSI
METERING FAUCETS	02 GALLONG/CYCLE
WATER CLOSETS	128 GALLONS/FLUSH
URINALS	0.5 GALLONS/FLUSH

NOTE: ADDITIONS OR ALTERATIONS OR NEW PLUMBING FIXTURES AND FITTINGS SHALL NOT EXCEED THE MAXIMUM ALLOWABLE FLOW RATES SPECIFIED IN SECTION 5.303.

PLUMBING FIXTURE SCHEDULE

FIXTURE				TRIM			ACCESSORIES			CONNECTIONS			NOTES				
MARK	DESCRIPTION	MANUFACTURER	MODEL	ТҮРЕ	MATERIAL	COLOR/FINISH	ITEM	MANUFACTURER	MODEL	ITEM	MANUFACTURER	MODEL	COLD	НОТ	WASTE	VENT	NOTES
WC-1	WATER CLOSET	(BY OWNER)	(BY OWNER)	FLOOR-MOUNT	VIT. CHINA	WHITE	FLUSH TANK	AMERICAN STANDARD	4142601	SEAT	AMERICAN STANDARD	5321.110	1"		3"	2"	ELONG BOWL OPEN FRONT SEAT AT ADA HT, PRESSURE ASSIST TOILET, 1.28 GPF MAXIMUM
UR-1	URINAL	тото	UT104	WALL-MOUNT	VIT. CHINA	₩HITE	FLUSH VALVE	toto	TEU2LA12#SS	-	-	-	3/4"	-	2"	1 1/2"	ADA COMPLIANT, FLUSH VALVE, MAX 0.5 GPF
L-1	LAVATORY	KOHLER	K-20000	UNDER-MOUNT	VIT. CHINA	WHITE	FAUCET	KOHLER	(BY OWNER)	-	-	-	1/2"	1/2"	2"	1 1/2"	ADA COMPLIANT, LEAD FREE, MAX 0.35 GPM
TMV-1	THERMOSTATIC MIXING VALVE	SYMMONS	7-210-CK	MAXLINE	BRASS	-	-	-	-	-	-	-	1/2"	1/2"	-	-	SET TEMPERATURE 110°F, INSTALL UNDER EACH LAVATORY/SINK AT ACCESSIBLE LOCATION
TP-1	TRAP PRIMER	ppp	PR-500	PIPE-MOUNT	BRA66	-	-	-	-	-	-	-	1/2"	-	_	-	-
FD-I	FLOOR DRAIN	ZURN	Z415B	FLOOR-MOUNT	CAST IRON	NICKEL - BRONZE	STRAINER	ZURN	-B	-	-	-	-	-	2"	1 1/2"	1/2" MAXIMUM STRAINER OPENINGS
wco	WALL CLEANOUT	ZURN	Z1446	WALL-MOUNT	CAST IRON	NICKEL - BRONZE	-	-	-	-	-	-	-	-	SEE PLAN	-	SPEEDI-SET OUTLET
FCO	FLOOR CLEANOUT	ZURN	Z1474	FLOOR-MOUNT	CAST IRON	NICKEL - BRONZE	-	-	-	-	-	-	-	-	SEE PLAN	-	SPEEDI-SET OUTLET
WHA	WATER HAMMER ARRESTOR	ZURN	Z1700	PIPE-MOUNT	STAINLESS STEEL	STAINLESS STEEL	-	-	-	-	-	-	SEE PLAN	-	_	-	-

GAS LINE SIZING							
SYSTEM PARAMETERS							
Mark	Equipment	Load (CFH)					
K-29	CONVECTION OVEN	100					
K-30	HEAVY DUTY OVEN	40					
K-31	SALAMANDER BROILER	66					
K-32	6 BURNER RANGE	195					
K-34	HEAVY DUTY GRIDDLE	120					
K-35	INFRARED BROILER	84					
K-36	FRYER	225					
K-58 or WH-1	WATER HEATER	150					
	TOTAL GAS LOAD:	980 CFH					

1980

		_
SIZING P	ER TABLE 1216.2(1)	Total Developed Length: 170.0 FT
E SIZE (IN)	CAPACITY (CFH)	25% Fitting Length: 42.5 FT
1/2	30	Total Equivalent Length: 212.5 FT
3/4	63	Inlet Pressure: < 2 PSI
1	119	Pressure Drop: 0.5 IN W.C.
1 1/4	244	Pipe Material: SCH. 40 BLACK STEEL
1 1/2	366	Gas Type: Natural
2	704	
2 1/2	1120	

WATER PIPE SIZING CALCULATIONS SYSTEM PARAMETERS 3850 Worsham Blvd Date: 9/21/2018 Include Water Meter in Calc: Yes Total Fixture Units: 45.5 WSFU Total System GPM: 27 GPM Maximum System GPM: 160 GPM Flush Type: Tank Water Meter Size (in):

	WATER (CLOSETS AND URINA	LS	
FIXTURE	WITH FLUSH TANK	WITH FLUSH VALVE	MAKE	MODEL
WC1	4	0	-	-
WC2	-	-	-	-
WC3	-	-	-	-
WC4	-	-	-	-
UR1	0	2	-	-
UR2	-	-	-	_

SYSTEM COMPONENTS								
	Copper Type K	Copper Type L	Other (Specify)					
Piping Material:	-	Х	-					
	SIZE (IN)	MAKE	MODEL					
Pressure Reducing Valve:	2	-	-					
Backflow Prevention Device	2	WATTS	I F009					

HYDRAULIC CALCULATIONS:								
Maximum Site Pressure:	70.0 psi	Minimum Site Pressure:	65.0 psi					
Set Pressure at Pressure Reducing Valve:	•							
Required Pressure:	25.0 psi							
Pressure Loss Through 2-inch BFP:	13.0 psi							
Pressure Loss Through 2-inch PRV:	-							
Pressure Loss Due to Elevation:	8.6 psi	Static Head:	20.0'					
Miscellaneous Pressure Losses:	-	Total Developed Length:	310.0'					
Pressure Loss Through 2-inch Water Meter:	0.3 psi	25% Fitting Length:	77.5'					
Pressure Available for Friction Loss:	18.1 psi	Total Equivalent Length:	387.5'					
Allowable Friction Loss Per 100 ft:	4.7 psi		•					

ALLOWABLE FRICTION LOSS PER 100 FT: 4.7 psi

PIPE SIZE (IN)	CW FLUSH VALVE (W.S.F.U.) (8 FT/S MAX)	CW FLUSH TANK (W.S.F.U.) (8 FT/S MAX)	HW FLUSH TANK (W.S.F.U.) (5 FT/S MAX)
1/2	-	1	1
3/4	-	7	7
1	-	16	16
1 1/4	-	32	28
1 1/2	18	63	46
2	108	225	119

	Overtitu	WSF	U
Appliances, Appurtenance, or Fixtures	Quantity	Public	Total
Bathtub or Combination Bath/Shower	0	4	-
Bidet	0	-	-
Clothes Washer	0	4	-
Dental Unit, cuspidor	0	1	-
Dishwasher	2	1.5	3
Drinking Fountain or Watercooler	0	1.5	-
Lavatory	8	1	8
Bar Sink	2	2	4
Kitchen Sink	4	1.5	6
Laundry Sink	0	1.5	-
Service Sink or Mop Basin	1	3	3
Clinical Sink	0	3	-
Washup Sink, each set of faucets	0	2	-
Shower, each head	0	4	-
Wash Fountain	0	4	-
Mobile Home, each	0	-	-
Urinal, 1.0 GPF Flushometer Valve	2	4	8
Urinal, greater than 1.0 GPF Flushometer Valve	0	5	-
Urinal, flush tank	0	2	-
Water Closet, 1.6 GPF Gravity Tank	0	2.5	-
Water Closet, 1.6 GPF Flushometer Tank	4	2.5	10
Water Closet, 1.6 GPF Flushometer Valve	0	5	-
Water Closet, greater than 1.6 GPF Gravity Tank	0	5.5	-
Water Closet, greater than 1.6 GPF Flushometer Valve	0	8	-
Clinic Flushometer Valve	0	8	-
Lawn Sprinkler, each head	0	1	-
First Hose Bibb	0	2.5	_
Hose Bibb, each additional	0	1	-
Ware Rinser	2	0.5	1
lce/Beverage Machine	5	0.5	2.5
Custom			-
ТО	TAL FIXTUR	RE UNITS:	45.5
	OTAL SYST		

RECIRCULATING PUMP SCHEDULE

	MANUFACTURER			FLOW	HEAD	MOTOR		
MARK	& MODEL NUMBER	DESCRIPTION	SERVICE	CPM	FT.	HP	V/PH/HZ	NOTES
(CP)	-	IN-LINE	-	-	-	-	-	-

GAS WATER HEATER SCHEDULE

MA	ARK	MANUFACTURER & MODEL NUMBER	STORAGE	RECOVERY (CPH AT 60 F RISE)	TYPE OF GAS	GAS INPUT (MBTUH)	NOTES
\(\begin{align*} \pi \\ \ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	JH 1	A.O. 6MITH BTH150	100 GAL	297	NATURAL	I ← /)	POWER OR DIRECT VENT TO ROOF, PROVIDE EXPANSION TANK ON COLD WATER INLET.

PIPING MATERIAL SCHEDULE

SERVICE	SIZE	PIPE MATERIAL	JOINTS	FITTINGS	NOTES
DOMESTIC COLD AND HOT WATER (BELOW GRADE)	ALL	SOFT DRAWN TYPE K COPPER TUBING OR APPROVED EQUAL	LEAD FREE SOLDER	WROUGHT COPPER	PROTECT PIPING UNDER PENETRATING CONCRETE WITH POLYETHYLENE SLEEVES, NO FITTINGS UNDER CONCRETE.
DOMESTIC COLD AND HOT WATER (ABOVE GRADE)	ALL	HARD DRAWN TYPE L COPPER PIPE OR APPROVED EQUAL	LEAD FREE SOLDER	WROUGHT COPPER	-
SANITARY WASTE AND VENT - WHERE ALLOWED	ALL	SCH. 40 PVC OR ABS OR APPROVED EQUAL	SOLVENT WELD	MATCH PIPE	ASTM D-2661-78 ASTM D-2664-80 ASTM D-2665-82
SANITARY WASTE AND VENT - WHERE REQUIRED	ALL	CAST IRON	NO-HUB	MATCH PIPE	DOMESTIC MANUFACTURED CAST IRON PRODUCTS ONLY.
GAS	ALL	SCH. 40 BLACK STEEL OR APPROVED EQUAL	THREADED OR WELDED	MALLEABLE IRON	ASTM A-120, SCH 40

TABLE 120.3-A

			N THICKNESS NOMINAL PIPE DIAMETER (in inches)						
FLUID TEMPERATURE	CONDUCTIVITY RANGE (in Btu-inch per hour per	INSULATION MEAN RATING	<	1	1 to <	1.5	1.5 to < 4	4 to < 8	8 and large
RANGE, (°F)	square foot per °F)	TEMPERATURE (°F)		INSULATION THICKNESS REQUIRED (in inches)					
	not water systems (steam, st in electric trace tape systen								
Above 350	0.32-0.34	250	4.:	5	5.0)	5.0	5.0	5.0
251-350	0.29-0.32	200	3.0	0	4.6)	4.5	4.5	4.5
201-250	0.27-0.30	150	2.5	5	2.:	5	2.5	3.0	3.0
141-200	0.25-0.29	125	1.:	5	1.:	5	2.0	2.0	2.0
105-140	0.22-0.28	100	1.0	0	1.3	5	1.5	1.5	1.5
	Space of	cooling systems (chilled	water, re	efrigera	nt and br	ine)	k	·····	······································
40-60	0.21-0.27	75	Nonres 0.5	Res 0.75	Nonres 0.5	Res 0.75	1.0	1.0	1.0
Below 40	0.20-0.26	50	1.0	0	1.5	5	1.5	1.5	1.5

- 1. HOT WATER AND DRAIN PIPES EXPOSED UNDER SINKS SHALL BE INSULATED OR OTHERWISE CONFIGURED SO AS TO PROTECT AGAINST CONTACT. THERE SHALL BE NO SHARP OR ABRASIVE SURFACES UNDER
- 2. FAUCET CONTROLS AND OPERATING MECHANISMS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE CONTROLS SHALL NOT BE GREATER THAN 5 LB-FT.
- 3. CONTROLS FOR SERVICE WATER HEATING SYSTEMS SHALL LIMIT THE OUTLET TEMPERATURE AT PUBLIC LAYATORIES TO 110°F (CEC 110.3(c)3). THE WATER HEATER THERMOSTAT MAY NOT BE USED FOR COMPLIANCE WITH THIS CODE SECTION (CPC 4212).

	SIZING PER CPC TABLE 1014.3.6								
	SYSTEM PARAMETERS								
Mark	Plumbing Fixtures	Quantity	DFU	TOTAL DFU					
K-23	MOP SINK	1	3	3					
K-20	3-COMP SINK	1	6	6					
FD	FLOOR DRAIN	2	2	4					
FS	FLOOR SINK	1	1	1					
K-6	HAND SINK	1	1	1					
		······································	TOTAL:	15.0 DFU					
MINIMUM GREASE INTERCEPTOR SIZE:									



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Issue Date: 9/24/2018 REASON

PRINCIPAL IN CHARGE:

PROJECT MANAGER:

THE 908 LBX - LONG BEACH EXCHANGE 3850 WORSHAM BOULEVARD SUITE 410, BUILING R-4

Sheet Title: PLUMBING SCHEDULES

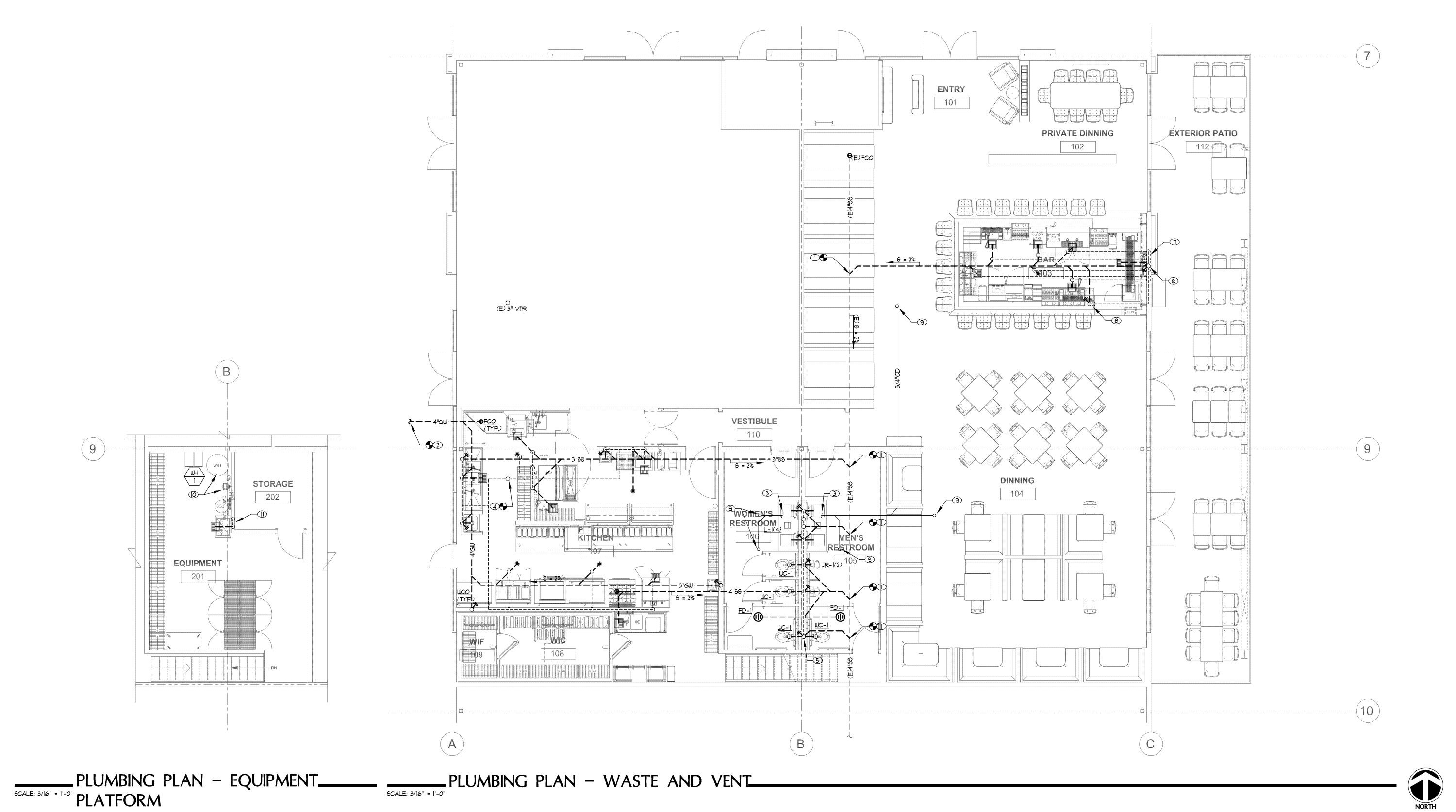
GENERAL NOTES

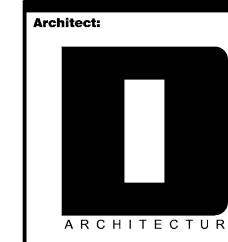
- A. ALL PLUMBING FIXTURES SHALL BE WATER CONSERVATION TYPE AS MANDATED BY LOCAL BLDG. DEPT.
- B. ALL WATER CLOSETS DESIGNATED AS HANDICAP SHALL BE INSTALLED SUCH THAT THE ACTUATOR IS OPERABLE FROM THE WIDE SIDE OF WATER CLOSET.
- C. PRIOR TO INSTALLATION OF SEWER AND WATER PIPING BELOW GRADE COORDINATE EXACT LOCATIONS AND DEPTHS OF BURIAL WITH CIVIL AND FOUNDATION DRAWINGS AND CORRESPONDING ENGINEERS.
- D. PRIOR TO DETAILING & INSTALLING PLUMBING AND FIRE PROTECTION PIPING COORDINATE EXACT ROUTING AND ELEVATIONS WITH MECHANICAL, ELECTRICAL AND FIRE SPRINKLER CONTRACTORS. PROVIDE WRITTEN CONFIRMATION THAT THIS COORDINATION HAS BEEN
- E. ALL PLUMBING FIXTURES SHALL HAVE A TRAP INSTALLED AND SHALL BE PROPERLY VENTED IN ORDER TO MAINTAIN THE TRAP SEAL.

IMPLEMENTED PRIOR TO PROCEEDING WITH INSTALLATION OF PIPING.

PLUMBING PLAN KEYNOTES

- ONNECT NEW SANITARY SEWER LINE TO (E) SANITARY SEWER PROVIDED IN SHELL. CONTRACTOR TO FIELD VERIFY EXACT LOCATION, DIRECTION OF FLOW, SLOPE, AND CAPACITY FOR THE ADDED FIXTURES FROM THIS TI.
- 2 CONNECT NEW GREASE WASTE LINE TO (E) GREASE WASTE LINE PROVIDED IN SHELL. CONTRACTOR TO FIELD VERIFY EXACT LOCATION, DIRECTION OF FLOW, SLOPE, AND CAPACITY FOR THE ADDED FIXTURES FROM THIS TI.
- (3) 3/4" CONDENSATE DRAIN DOWN IN WALL AND CONNECT TO LAYATORY/SINK TAILPIECE.
- 4 CONNECT NEW VENT PIPING TO (E) 3" VENT THRU ROOF.
- (5) NEW 4" VENT THRU ROOF.
- **6** NEW 3" VENT THRU ROOF.
- TO ROUTE FOOT VENTS UNDER SLAB TO EACH FLOOR SINK/DRAIN.
- 8 PROVIDE ISLAND VENT AS SHOWN ON P2.1.
- ③ CONDENSATE DRAIN FROM ROOF EQUIPMENT.
- (10) ROUTE WATER HEATER T&P RELIEF YALVE & DRAIN TO FLOOR SINK W/ I" AIR GAP. ALSO ROUTE FILTRATION EQUIPMENT DRAINS TO FLOOR SINK
- (1) 2" VENT & 3" SANITARY SEWER DOWN TO BELOW.





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Sheet Title: PLUMBING PLAN -WASTE AND

VENT

GENERAL NOTES

A. ALL PLUMBING FIXTURES SHALL BE WATER CONSERVATION TYPE AS MANDATED BY LOCAL BLDG. DEPT.

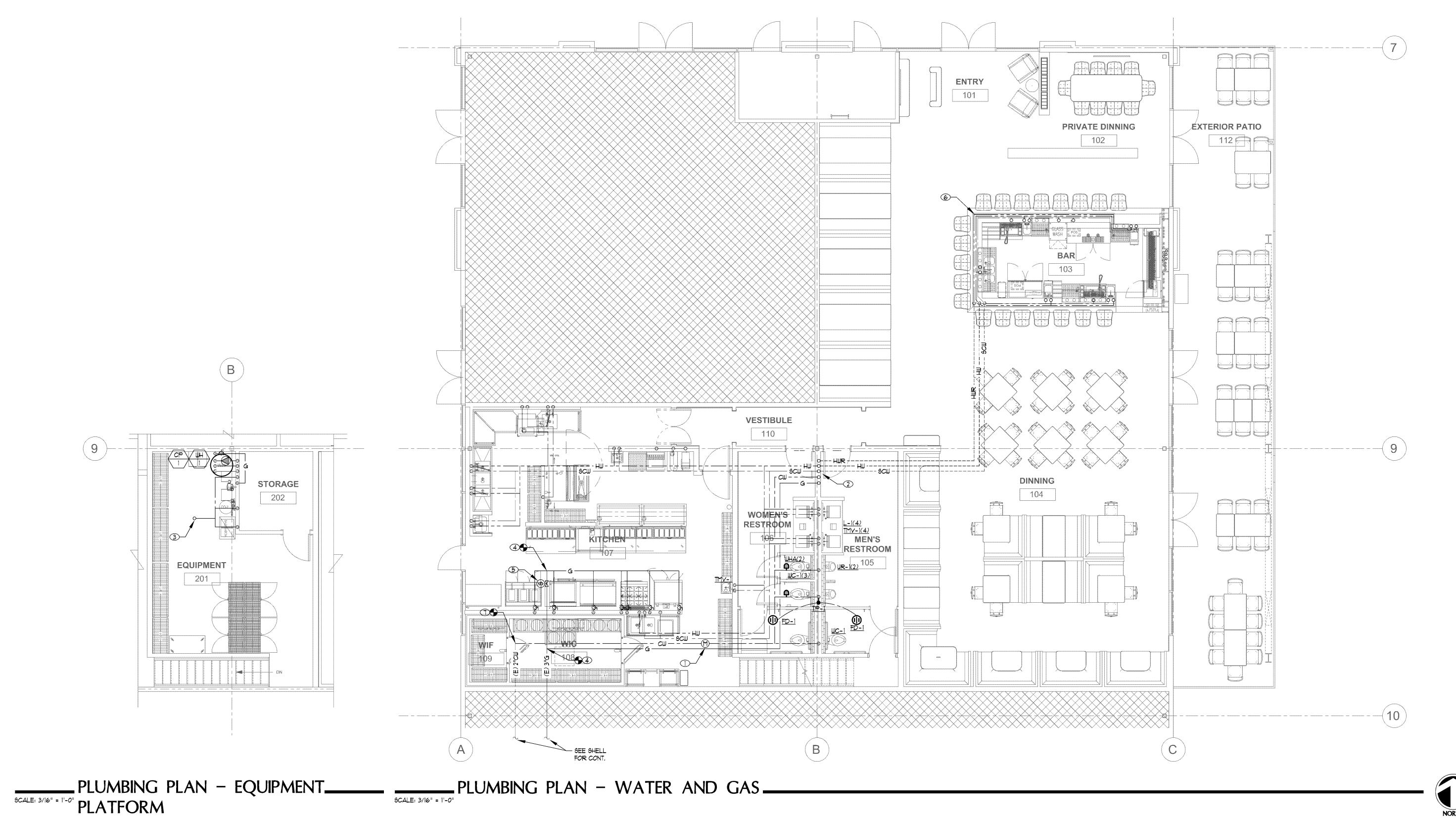
ACTUATOR IS OPERABLE FROM THE WIDE SIDE OF WATER CLOSET.

- B. ALL WATER CLOSETS DESIGNATED AS HANDICAP SHALL BE INSTALLED SUCH THAT THE
- C. PRIOR TO INSTALLATION OF SEWER AND WATER PIPING BELOW GRADE COORDINATE EXACT LOCATIONS AND DEPTHS OF BURIAL WITH CIVIL AND FOUNDATION DRAWINGS AND
- CORRESPONDING ENGINEERS. D. PRIOR TO DETAILING & INSTALLING PLUMBING AND FIRE PROTECTION PIPING COORDINATE EXACT ROUTING AND ELEVATIONS WITH MECHANICAL, ELECTRICAL AND FIRE SPRINKLER CONTRACTORS. PROVIDE WRITTEN CONFIRMATION THAT THIS COORDINATION HAS BEEN
- E. ALL PLUMBING FIXTURES SHALL HAVE A TRAP INSTALLED AND SHALL BE PROPERLY VENTED IN ORDER TO MAINTAIN THE TRAP SEAL.

IMPLEMENTED PRIOR TO PROCEEDING WITH INSTALLATION OF PIPING.

PLUMBING PLAN KEYNOTES

- PROVIDE LINE SIZED TENANT SUB-METER. COORDINATE REQUIREMENTS WITH OWNER.
- 2) CW, HW, HWR, SCW & G. LINES UP TO EQUIPMENT ROOM ABOVE.
- 3) 1/2" CW LINE UP TO MAKE-UP AIR UNIT.
- 4 CONNECT NEW GAS LINE TO (E) GAS LINE PROVIDED IN SHELL.
- (ANSUL). © ROUTE SCW, HW & HWR LINES AS TIGHT TO UNDERCOUNTER WALL AS POSSIBLE.
- ONNECT NEW WATER LINE TO (E) WATER LINE PROVIDED IN SHELL.



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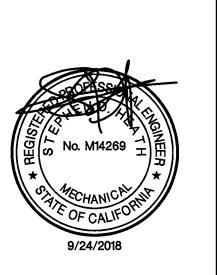
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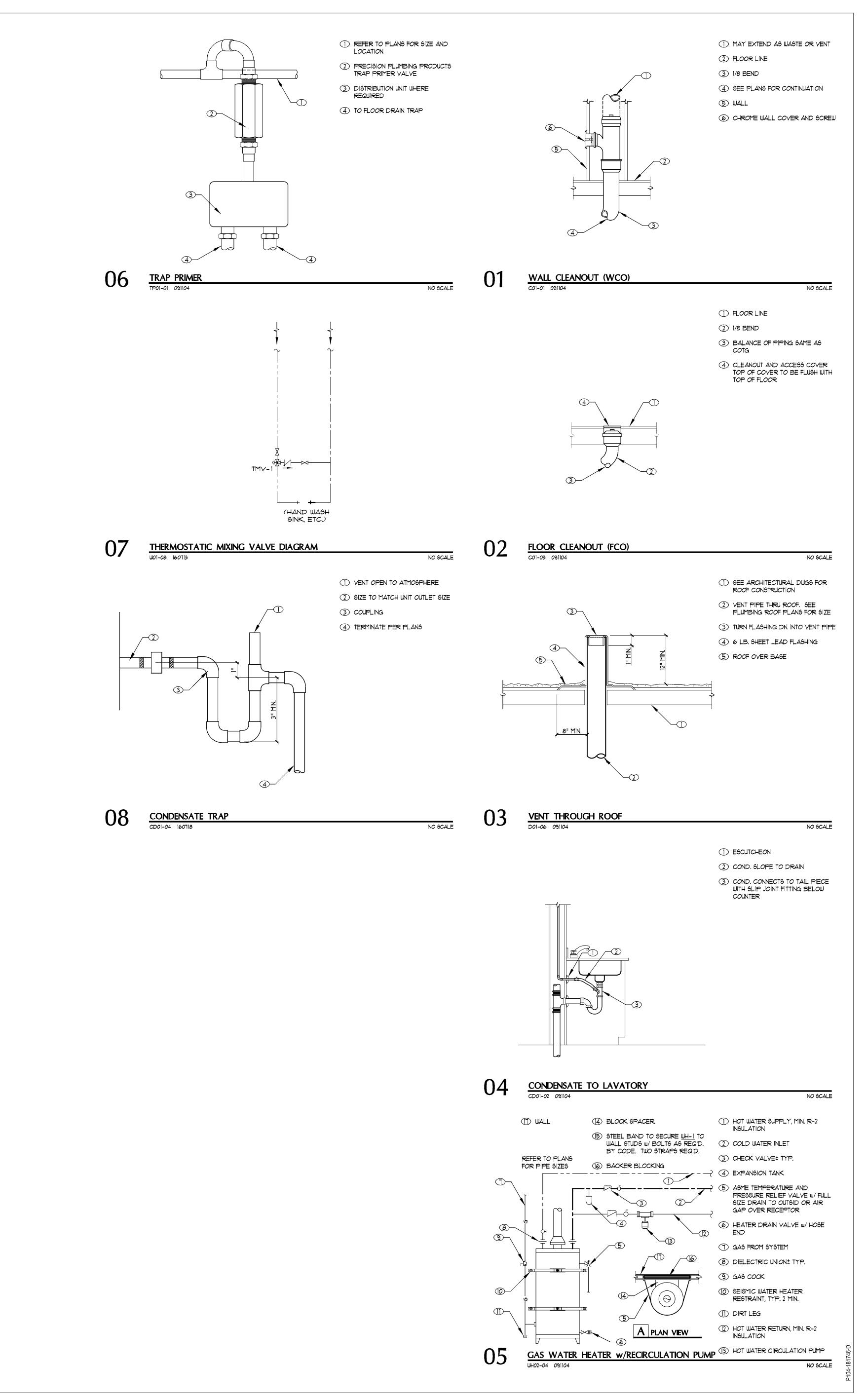
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Sheet Title: PLUMBING PLAN -WATER AND GAS





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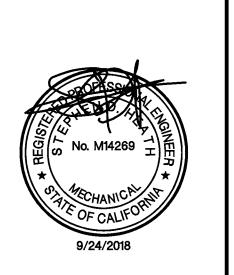
Engineering Consultant:

2 Venture Suite 200 Irvine, CA 92618 949.477.4001 wrighte.com

WRIGHTengineers

ect Owner:

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PRINCIPAL IN CHARGE:
WE
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SE

DRAWN BY:
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