LEGEND

SYMBOL		ABBREV.	DESCRIPTION
DOUBLE	SINGLE		
	C	C	COLD SUPPLY AIR DUCT
	E	E	EXHAUST AIR DUCT
	R	R	RETURN AIR DUCT
			ROUND RADIUS ELBOW
48X24(L)	48X24(L)		DUCT WITH INTERNAL LINING L= 1" THICK 2L= 2" THICK
			TRANSITION - RECTANGULAR TO RECTANGULAR OR ROUND TO ROUND
			TRANSITION - RECTANGULAR TO ROUND
			ELBOW WITH TURNING VANE
R	R		RISE IN DIRECTION OF AIRFLOW
D	D		DROP IN DIRECTION OF AIRFLOW
48X24 *	48X24 *		48" X 24" DUCT FIRST DIMENSION FACES VIEWER (* MEANS STAINLESS STEEL)
			FLEXIBLE DUCT
			CEILING DIFFUSER 4-WAY THROW
			CEILING DIFFUSER 3-WAY THROW
			CEILING DIFFUSER 2-WAY THROW
			CEILING DIFFUSER CORNER THROW
			THERMAFUSER SUPPLY DIFFUSER (AS NOTED ON DWG.)
			SUPPLY OR OUTSIDE AIR DUCT - SECTION
			RETURN OR RELIEF AIR DUCT - SECTION
			EXHAUST AIR DUCT - SECTION
			ROUND DUCT OR RISER - SECTION
SFD	SFD		COMBINATION SMOKE & FIRE DAMPER
FD			FIRE DAMPER
	M OR MD	M OR MD	MOTORIZED DAMPER
		VD	MANUAL VOLUME DAMPER (QUADRANT BALANCING DAMPER)
BDD		BDD	BACKDRAFT DAMPER
			FLEXIBLE DUCT CONNECTOR
			CAPPED DUCTWORK
			CONICAL TAP W/MANUAL VOLUME DAMPER
		360	CEILING DIFFUSER, ADAPTER FOR ROUND DUCT. 360 CFM
EXHAUST	RETURN		CEILING GRILLE OR REGISTER
		6X6 150	6"X6"WALL REGISTER, 150 CFM
		(4)3/4"X5'-0" LSD 300	NO. & SIZE OF SLOTS, LENGTH, LINEAR SLOT DIFFUSER, CFM
		(4)3/4"X5'-0" LBD 300	NO. & SIZE OF SLOTS, LENGTH, LINEAR AIR BAR DIFFUSER, CFM
T S			TIMER SWITCH
P			PRESSURE TRANSMITTER
T			TEMPERATURE TRANSMITTER
DP			DIFFERENTAIL PRESSURE TRANSMITTER
T			ROOM THERMOSTAT
CO2			CARBON DIOXIDE SENSOR
DD			DUCT MOUNTED SMOKE DETECTOR (PROVIDE UNDER ELECTRICAL SECTION AND INSTALL UNDER MECHANICAL SECTION)
WL			WALL LOUVER (UNDER ARCH SECTION)
U/C			UNDERCUT DOOR (UNDER ARCH SECTION)
D/L			DOOR LOUVER (UNDER ARCH SECTION)
L/D			LOUVERED DOOR FULL HEIGHT (UNDER ARCH SECTION)
		AP/AD	ACCESS PANEL/ ACCESS DOOR
CFF			CAPPED FOR FUTURE
D		D	INDIRECT DRAIN

LEGEND

SYMBOL	ABBREV.	DESCRIPTION
HWS	HWS	HOT WATER SUPPLY
HWR	HWR	HOT WATER RETURN
IW	IW	INDUSTRIAL WATER
V	V	VENT
MU	MU	MAKE-UP WATER
		CAPPED PIPE
		PIPE ELBOW UP
		PIPE ELBOW DOWN
		PIPE TEE UP
		PIPE TEE DOWN
		STRAINER
		UNION
		FLANGE
		ECCENTRIC REDUCER
		CONCENTRIC REDUCER
EJ		EXPANSION JOINT
		PRESSURE GAGE WITH COCK
		TEMPERATURE GAGE W/ THERMOWELL
PTTP		PRESSURE & TEMPERATURE TEST PLUG
		FLEXIBLE PIPE CONNECTOR
		ANCHOR
		PIPE GUIDE
		FLOW MEASURING STATION
FS	FS	FLOW SWITCH
PS	PS	PRESSURE SWITCH
		PLUG VALVE
		BUTTERFLY VALVE
		BALL VALVE
	GV	GATE VALVE
	GLV	GLOBE VALVE
	CV	CHECK VALVE
		GATE VALVE WITH HOSE CONNECTOR
	RV	SAFETY OR PRESSURE RELIEF VALVE
	PRV	PRESSURE REDUCING VALVE
		CIRCUIT SETTER
		2-WAY CONTROL VALVE
		3-WAY CONTROL VALVE
	AAV	AUTOMATIC AIR VENT TO BE PIPED TO NEAREST APPROVED RECEPTOR
	MAV	MANUAL AIR VENT TO BE PIPED TO NEAREST APPROVED RECEPTOR
DP		DIFFERENTIAL PRESSURE
FS	FS	FLOOR SINK (SEE PLUMBING)
	POC	POINT OF CONNECTION
1 / M1		DETAIL DESIGNATION / SHEET NUMBER — DETAIL REFERENCE
1		SHEET NOTE
A / M-2		SECTION DESIGNATION / SHEET NO. WHERE SECTION DRAWN
1		REVISION TAG
		RETURN / EXHAUST AIR FLOW DIRECTION
E-1	E-1	NEW EQUIPMENT DESIGNATION
VD		RETURN AIR DUCT W/ BELLMOUTH OPENING W/ WIREMESH SCREEN AT AIR INLET

GENERAL NOTES

1. UNLESS OTHERWISE NOTED, THE WORK DESCRIBED ON THE PLANS AND SPECIFICATIONS SHALL INCLUDE THE FURNISHING AND INSTALLATION OF ALL LABOR AND MATERIALS NECESSARY FOR COMPLETE AND OPERATIONAL HVAC SYSTEMS.
2. ALL WORK SHALL BE IN ACCORDANCE WITH ALL CODES, RULES, AND REGULATIONS OF GOVERNING AGENCIES AND SHALL COMPLY WITH THE REQUIREMENTS OF THE SERVING UTILITY COMPANIES.
3. ALL DUCTWORK, INSULATION, EQUIPMENT AND INSTALLATION SHALL CONFORM TO THE LATEST EDITION OF CALIFORNIA ADMINISTRATIVE CODE TITLE 24 AND C.M.C. DUCT MATERIALS AND CONSTRUCTION SHALL BE PER CHAPTER 6 OF C.M.C. SEAL DUCTS FOR 1% LEAKAGE MAXIMUM.
4. ALL EQUIPMENT, DUCTWORK AND PIPING INSTALLATION SHALL BE SEISMICALLY BRACED IN ACCORDANCE WITH THE LATEST EDITION OF CALIFORNIA BUILDING AND MECHANICAL CODES. HANGING PIPES AND DUCTS ISAT, ROOF SUPPORT PHP DESIGN, AND/OR MASON VIBREX DESIGN.
5. CALIFORNIA MECHANICAL CODE SECTION 608, CONTRACTOR SHALL PROVIDE SHUTOFF FOR SMOKE CONTROL FOR ALL AIR-MOVING SYSTEMS SUPPLYING AIR IN EXCESS OF 2,000 CUBIC FEET PER MINUTE TO ENCLOSED SPACES WITHIN BUILDINGS. AUTOMATIC SHUTOFF SHALL BE ACCOMPLISHED BY INTERRUPTING THE POWER SOURCE OF THE AIR-MOVING EQUIPMENT UPON DETECTION OF SMOKE IN THE MAIN SUPPLY AIR DUCT SERVED BY SUCH EQUIPMENT. SMOKE DETECTORS WHICH WILL DETECT PRODUCTS OF COMBUSTION OTHER THAN HEAT AND WHICH COMPLY WITH THE CALIFORNIA BUILDING CODE, SHALL BE LABELED BY AN APPROVED AGENCY FOR AIR-DUCT INSTALLATION AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS'S INSTALLATION INSTRUCTIONS. SUCH DEVICES SHALL BE COMPATIBLE WITH THE OPERATING VELOCITIES, PRESSURES, TEMPERATURES AND HUMIDITIES OF THE SYSTEM. WHERE AN ELECTRICAL CENTRAL FIRE ALARM DETECTION OR ALARM SYSTEM IS PROVIDED FOR THE BUILDING, THE SMOKE DETECTORS REQUIRED BY THIS SECTION SHALL BE FURNISHED AND SUPERVISED BY SUCH SYSTEM AND SHALL ACTIVATE THE SHUTDOWN. REFER TO OTHER DOCUMENTS FOR SMOKE CONTROL AND SMOKE EVACUATION SPECIFIC REQUIREMENTS AND CONTROLS.
6. INFORMATION GIVEN ON THE DRAWING IS AS EXACT AS POSSIBLE BUT DIAGRAMMATIC. ABSOLUTE ACCURACY IS NOT GUARANTEED, AND THE CONTRACTOR SHALL OBTAIN AND VERIFY EXACT LOCATIONS, MEASUREMENTS, LEVEL, SPACE REQUIREMENTS, POTENTIAL CONFLICTS WITH OTHER TRADES AT THE SITE AND SHALL SATISFACTORILY ADAPT HIS WORK TO ACTUAL CONDITIONS AT THE BUILDING.
7. COORDINATE AND ADJUST ALL WORK BETWEEN TRADES IN ORDER TO ACCOMPLISH A COORDINATED, INTEGRATED AND EFFICIENT INSTALLATION. PROVIDE FOR PHASING AND TEMPORARY SYSTEMS REQUIRED TO COMPLETE THE WORK ON SCHEDULE IN CONFORMANCE WITH THE PROJECT DOCUMENTS.
8. COORDINATE EXACT LOCATION OF ALL CEILING DIFFUSERS, REGISTERS AND GRILLES WITH LIGHTING LAYOUT, CEILING TILE PATTERN WITH ARCHITECTURAL REFLECTED CEILING PLANS. IN CASE OF CONFLICT, ARCHITECTURAL REFLECTED CEILING PLANS WILL TAKE PRECEDENCE. WHERE CEILING IS EXTREMELY TIGHT, CAREFULLY COORDINATE DUCT SIZES AND ROUTING WITH ARCHITECTURAL, STRUCTURAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION SYSTEMS. WHERE INTERFERENCES EXIST TRANSITION TO SUITABLE RECTANGULAR DUCTWORK TO MAINTAIN REQUIRED CEILING HEIGHT.
9. INSTALL THE HVAC SYSTEMS IN CONFORMANCE WITH SOUND AND SECURITY REQUIREMENTS SPECIFIED BY OTHER DISCIPLINES. DUCT LINER IS NOT USED UNLESS SPECIFIED BY ACOUSTICAL. OTHERWISE SEAL AROUND ALL PENETRATIONS OF WALLS AND FLOORS AND PER FIRE STOPPING REQUIREMENTS. PROVIDE SOUND BOOTS OF 3-LB DENSITY FIBER BOARD AT PLENUM WALL PENETRATION FOR RETURN AIR ABOVE CEILING.
10. FIELD COORDINATE THE EXACT LOCATION OF ALL TEMPERATURE SENSORS, THERMOSTATS WITH ANY EQUIPMENT, SHELVING, RACKS, CABINETS OR OTHER FACILITY SUPPLIED FURNITURE AND EQUIPMENT, BASED ON THE ARCHITECTURAL DRAWINGS.
11. UNLESS SPECIFICALLY SHOWN ON THESE PLANS, NO STRUCTURAL MEMBER SHALL BE CUT, DRILLED OR NOTCHED WITHOUT WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND ARCHITECT.
12. PROVIDE MANUAL VOLUME DAMPER UPSTREAM OF EACH AIR INLET/OUTLET TO FACILITATE PROPER BALANCE, WHETHER SHOWN OR NOT. VOLUME DAMPER AT DIFFUSERS AND REGISTER OBD'S' IF INSTALLED SHALL NOT BE USED FOR AIR BALANCING.
13. SEAL ALL OPENINGS AROUND PIPING AND DUCTWORK PENETRATING FIRE RESISTIVE RATED WALLS AND FLOORS TO MAINTAIN RATING INTEGRITY.
14. CONTRACTOR SHALL COORDINATE DEVICES REQUIRING ACCESS. PROVIDE CEILING, WALL OR FLOOR ACCESS PANELS FOR TERMINAL BOXES, VALVES, COMBINATION SMOKE/FIRE DAMPERS AND VOLUME DAMPERS, ACTUATORS, BACK-DRAFT DAMPERS AS REQUIRED. COORDINATE WITH ARCHITECT FOR EXACT LOCATION AND FINAL COUNT OF ACCESS PANELS. MINIMUM SIZE OF ACCESS PANELS SHALL BE 18" X 18". THE MINIMUM CLEARANCE WORKING SPACE AROUND AND CLEAR FOR MAINTENANCE SHALL BE 4 FT. PERMANENT PROVIDE PLATFORMS AND HAND RAILS FOR SERVICE, AND SEPARATE LOCK OUT TAG OUT DISCONNECTS. COMPLY WITH ALL OSHA AND UNION MAINTENANCE SERVICE REQUIREMENTS. COMPLY WITH ALL COLLEGE SECURITY AND ENVIRONMENTAL REQUIREMENTS FOR PERSONAL SAFETY, AND DISPOSAL OF MATERIALS.
15. INSTALL EQUIPMENT IN ACCESSIBLE LOCATIONS AND PROVIDE ADEQUATE SERVICE CLEARANCE 4 FT FOR NORMAL MAINTENANCE WITHOUT REMOVING ARCHITECTURAL, ELECTRICAL OR STRUCTURAL ELEMENTS.
16. FLEXIBLE DUCT LENGTH SHALL NOT EXCEED 7'-0" AT CONNECTION TO ENVIRONMENTAL AIR OUTLETS. MINIMUM RADIUS SHALL BE 1-1/2 DIAMETER OF DUCT. FLEXIBLE DUCT SHALL NOT BE USED IN SYSTEM IF UTILIZED AS PART OF BUILDING SMOKE CONTROL.
17. PROVIDE ISOLATION VALVES AND UNIONS ON PIPING ADJACENT TO ALL CONTROL VALVES AND OTHER APPURTENANCES OR EQUIPMENT. LOCATE VALVES SO THAT EQUIPMENT CAN BE REMOVED WITHOUT DISMANTLING ANY BRANCH LINES.
18. IN CONCEALED IN-ACCESSIBLE CEILING PROVIDE REMOTE MANUAL VOLUME DAMPER REGULATOR OPERATOR AT ACCESSIBLE LOCATION.
19. ALL CURBS, ROOF JACKS AND EQUIPMENT SUPPORT PADS SHALL BE COMPATIBLE WITH ROOFING SYSTEM.
20. REFER TO PLUMBING DRAWINGS OR ALL CONDENSATE DRAIN PIPING. REFER TO MECHANICAL FOR CONDENSATE TRAP DEPTH REQUIREMENTS.
21. A MAINTENANCE LABEL SHALL BE AFFIXED TO MECHANICAL EQUIPMENT. A MAINTENANCE MANUAL SHALL BE PROVIDED FOR THE OWNER'S USE. LABEL EACH ROOF MOUNTED EQUIPMENT TO IDENTIFY THE AREA IT SERVES. SEE SPECIFICATIONS.
22. ALL DUCTWORK AND EQUIPMENT WHICH ARE EXPOSED SHALL HAVE FINISHED APPEARANCE. THEYH SHALL BE APPLIED WITH PRIMER AND ENAMEL PAINT WHERE EXPOSED TO VIEW. COLOR SHALL BE SELECTED BY THE ARCHITECT. ALL DUCTWORK EXPOSED UNDER THE CEILING SHALL BE PAINTED WITH PRIMER AND ENAMEL PAINT TO MATCH THE SURROUNDINGS. SEE ARCHITECTURAL DRAWINGS.
23. PROVIDE SHEET METAL WEATHER HOOD COVER FOR ALL DAMPER ACTUATORS, SMOKE DETECTOR, MOTORS LOCATED OUTDOORS.
24. WHERE ATTIC OR ABOVE CEILING IS TO BE USED AS RETURN PLENUM, IT SHALL CONTAIN NO COMBUSTIBLE MATERIALS, PLASTIC PIPE OR RUBBER INSULATION. ALL CEILING MATERIALS SHALL BE NON-COMBUSTIBLE OR APPROVED FOR PLENUM INSTALLATION.
25. PROVIDE WALL OPENING ABOVE CEILING LEVEL FOR RETURN AIR IN EACH ROOM AS REQUIRED.
26. FIRE DAMPERS INSTALLED IN DUCTWORK SYSTEM WITHOUT ELECTRIC ACTUATOR SHALL BE U.L. LISTED DYNAMIC TYPE (SPRING LOADED).
27. PROVIDE SECURITY BARS ON ALL EXHAUST FAN OPENINGS AND GRAVITY VENT OPENINGS THROUGH HE ROOF GREATER THAN 16"x16".
28. AIR HANDLING DUCT SYSTEM, EXCEPT GREASE EXHAUST DUCT SYSTEM, SHALL BE CONSTRUCTED, INSTALLED AND INSULATED AS PROVIDED IN CHAPTER 6 OF CMC OF METAL GALVANIZED COPPER BEARING SHEET STEEL.
29. ALL WORK SHALL BE IN ACCORDANCE WITH SMACNA IAQ GUIDELINES FOR OCCUPIED BUILDINGS UNDER CONSTRUCTION SECOND EDITION.
30. GENERAL CONTRACTOR SHALL COMPLY/ SUBMIT CONSTRUCTION WASTE MANAGEMENT PER SEC.5-408.1
31. HVAC MOTORS FOR FANS THAT ARE LESS THAN 1 HP AND 1/12 HP OR GREATER SHALL BE ELECTRONICALLY-COMMUNTATED MOTORS OR SHALL HAVE A MINIMUM MOTOR EFFICIENCY OF 70 PERCENT WHEN RATED IN ACCORDANCE WITH NEMA STANDARD MG 1-2006 AT FULL RATING CONDITIONS. MOTORS IN SPACE CONDITIONING EQUIPMENT AND TERMINAL UNITS THAT OPERATE ONLY WHEN PROVIDING HEATING TO THE SPACE SERVED ARE EXCEPTED.

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	EF	EXHAUST FAN	OPNG	OPENING
AHU	AIR HANDLING UNIT	ENT	ENTERING	P	PUMP
AMB.	AMBIENT	ESP	EXTERNAL STATIC PRESSURE	QTY.	QUANTITY
ARCH	ARCHITECT OR ARCHITECTURAL	ETR	EXISTING TO REMAIN	RA	RETURN AIR
B	BOILER	EXH	EXHAUST	RAG	RETURN AIR GRILLE
BHP	BRAKE HORSE POWER	°F OR F	DEGREES FAHRENHEIT	RLA	RUNNING LOAD AMP
BTUH	BRITISH THERMAL UNIT PER HOUR	FCU	FAN COIL UNIT	RPM	REVOLUTIONS PER MINUTE
CAV	CONSTANT AIR VOLUME	FLA	FULL LOAD AMP.	SA	SUPPLY AIR
CFF	CAPPED FOR FUTURE	FPI	FINS PER INCH	SAG	SUPPLY AIR GRILLE
CD	CEILING DIFFUSER	FPM	FEET PER MINUTE	S.P.	STATIC PRESSURE
CFH	CUBIC FEET PER HOUR	HP	HORSEPOWER	SF	SQUARE FEET
CFM	CUBIC FEET PER MINUTE	HZ	HERTZ	SS OR *	STAINLESS STEEL
CLG	CEILING	IN. W.G.	INCH OF WATER GAGE	ST	SOUND TRAP
COP	COEFFICIENT OF PERFORMANCE	KBTUH	THOUSAND BTU PER HOUR	SWE	SIDE WALL EXHAUST
CV	CONSTANT VOLUME	(L)	INTERNALLY LINED DUCT INSULATION	SWR	SIDE WALL RETURN
DB	DRY-BULB	LBS	POUNDS	SWS	SIDE WALL SUPPLY
DIFF	DIFFUSER	MAX.	MAXIMUM	SWT	SIDE WALL TRANSFER
DN	DOWN	MCA	MINIMUM CIRCUIT AMP	TG	TRANSFER GRILLE
DS	DUCT SILENCER	MCC	MOTOR CONTROL CENTER	TYP	TYPICAL
DWG	DRAWING	MIN.	MINIMUM	UNO	UNLESS NOTED OTHERWISE
(E)	EXISTING	NC	NOISE CRITERIA	UTR	UP THROUGH ROOF
EAG	EXHAUST AIR GRILLE	OSA	OUTSIDE AIR	VAV	VARIABLE AIR VOLUME
EER	ENERGY EFFICIENCY RATIO			VTR	VENT THROUGH ROOF

NOTES FOR CCR T24 MANDATORY MEASURES

1. GENERAL: ALL EQUIPMENT AND SYSTEMS INSTALLED IN THIS PROJECT SHALL COMPLY WITH THE ENERGY EFFICIENCY STANDARDS FOR NON RESIDENTIAL BUILDINGS AS PUBLISHED BY THE STATE OF CALIFORNIA.

2. EQUIPMENT AND SYSTEMS EFFICIENCY
   - A HVAC EQUIPMENT SHALL MEET MINIMUM EFFICIENCY REQUIREMENTS AS SCHEDULED ON THE PLANS.
   - B DUCTS AND PIPING SHALL BE INSULATED IN ACCORDANCE WITH ENERGY EFFICIENCY STANDARD 123.
   - C AIR HANDING DUCT SYSTEMS SHALL BE CONSTRUCTED, INSTALLED, SEALED TO 1%%% LEAKAGE, AND INSULATED AS PROVIDED IN CHAPTER 6 OF THE UNIFORM MECHANICAL CODE AND THESE REGULATIONS.

3. VENTILATION
   - A BUILDING SHALL BE VENTILATED AS PROVIDED FOR ON THE PLANS.
   - B GRAVITY OR AUTOMATIC DAMPERS INTERLOCKED AND CLOSED ON FAN SHUTDOWN SHALL BE PROVIDED ON THE OUTSIDE AIR INTAKES AND DISCHARGES OF ALL SPACE CONDITIONING AND EXHAUST SYSTEMS.
   - C ALL GRAVITY VENTILATING SYSTEMS SHALL BE PROVIDED WITH AUTOMATIC OR READILY ACCESSIBLE MANUALLY OPERATED DAMPERS IN ALL OPENINGS TO THE OUTSIDE, EXCEPT FOR COMBUSTION AIR OPENINGS.
   - D AIR BALANCING: ALL SPACE CONDITIONING AND VENTILATION SYSTEMS SHALL BE BALANCED IN THE QUANTITIES SPECIFIED IN THESE PLANS, IN ACCORDANCE WITH THE ASSOCIATED AIR BALANCE (AABC) NATIONAL STANDARDS.
   - E OUTSIDE AIR CERTIFICATION: THE SYSTEMS SHALL PROVIDED THE MINIMUM OUTSIDE AIR AS SHOWN ON THE MECHANICAL DRAWINGS, AND SHALL BE MEASURED AND CERTIFIED BY THE INSTALLING LICENSED C-20 MECHANICAL CONTRACTOR.

4. WHEN COMPLETE THE BUILDING CLOSE-OUT MANUAL SHALL INCLUDE: AS-BUILT DOCUMENTS, MAINTENANCE REQUIREMENTS & SPARE PARTS LISTS, ORIGINAL SYSTEM DESIGN AND OPERATION INFORMATION, AND SHALL BE POSTED WITH APPROPRIATE CERTIFICATES AND DOCUMENTS FOR THE COLLEGE AND INSPECTOR.

2019 CALIFORNIA GREEN BUILDING STANDARDS CODE

5.410.4 TESTING, ADJUSTING AND BALANCING: DURING CONSTUCTION TAPE/BLANK OFF AND SEAL HVAC EQUIPMENT OPENINGS FROM CONSTRUCTION DEBRIS, DUST, AND WATER. CLOSE GRILLES, AIR OPENINGS, AND FIN COILS TO PREVENT CONTAMINATION INSIDE/OUITSIDE TO THE EQUIPMENT, TO THE FILTERS, AND THE DUCTWORK. DO NOT OPERATE THE EQUIPMENT AND DUCTWORK DURING THE CONSTRUCTION PERIOD UNTIL AFTER APPROVED CLEAN-UP IS COMPLETE. COVER EQUIPMENT AND PANELS TO PREVENT WEATHER, SPLASH AND WATER ENTRY. ANY ELECTRICAL PANELS AND COMPONENTS EXPOSED TO WATER OR DUST WILL NEED TO BE REPLACED AT NO COST TO THE OWNER.

5.410.4.4 REPORTING: DELIVER WRITTEN POINT TO POINT COMMISSIONING FUNCTIONALITY REPORT AND TEST AND BALANCE REPORT.

5.410.4.5.1 INSPECTIONS AND REPORTS: INSPECTIONS AND REPORTS DOCUMENTING THE ENTIRE SYSTEM HAS BEEN INSPECTIED AND APPROVED BY THE ENFORCING AGENCY.

5.504.3 COVERING OF DUCT OPENINGS AND PROTECTION OF MECHANICAL EQUIPMENT DURING CONSTRUCTION TIME OF ROUGH INSTALLATION AND DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL FINAL STARTUP OF THE HEATING, COOLING AND VENTILATING EQUIPMENT, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEETMETAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST, WATER AND DEBRIS WHICH MAY ENTER THE SYSTEM.

MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONSTRUCTION DOCUMENTS. WHERE NO DETAIL IS INDICATED, THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2019 CBC, SECTIONS 1616A1.18 THROUGH 1616A1.26 AND ASCE 7-16 CHAPTER 13,26 AND 30.

1. ALL PERMANENT EQUIPMENT AND COMPONENTS.
2. TEMPORARY OR MOVABLE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER.
3. MOVABLE EQUIPMENT WHICH IS STATIONED IN ONE PLACE FOR MORE THAN 8 HOURS AND HEAVIER THAN 400 POUNDS ARE REQUIRED TO BE ANCHORED WITH TEMPORARY ATTACHMENTS.

FOR THOSE ELEMENTS THAT DO NOT REQUIRE DETAILS ON THE APPROVED DRAWINGS, THE INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD AND THE DSA DISTRICT STRUCTURAL ENGINEER. THE PROJECT INSPECTOR WILL VERIFY THAT ALL COMPONENTS AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH ABOVE REQUIREMENTS.

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTION 13.6.5.6, 13.6.7, 13.6.8, AND 2019 CBC, SECTIONS 1616A1.23, 1616A1.24, 1615A1.25, AND 1616A.4.26.

THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM AREA AS NOTED BELOW. WHEN BRACING AND ATTACHMENTS ARE BASED ON A PRE-APPROVED INSTALLATION GUIDE (E.G., SMACNA, OR OSHPD OPM), COPIES OF THE MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO THE START OF HANGING AND BRACING OF THE PIPE, DUCTWORK, AND ELECTRICAL DISTRIBUTION SYSTEMS. STRUCTURAL NEEDED SPECIFIC DETAILS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE LOADS

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEMS (E):

MP☒ MD☐ PP☐ E☐ - OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

MP☐ MD☐ PP☐ E☐ - OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVED (OPM#) #OPM-0043-13 MASON WEST. THE CONTRACTOR SHALL SUBMIT CALCULATIONS AND SHOP DRAWINGS (STAMPED BY A REGISTERED STRUCTURAL ENGINEER) AS A DELEGATED SUBMITTAL OF THE SUPPORTS AND BRACIN SYSTEMS TO BE INSTALLED PER THE OPM PRE-APPROVAL. THE ENGINEER OF RECORD SHALL REVIEW THE DELEGATED SUBMITTAL AS NOTED ABOVE.

APPLICABLE CODES

2019	CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
2019	CALIFORNIA BUILDING CODE (VOL 1 & 2) (2018 INTERNATIONAL BUILDING CODE WITH CALIFORNIA AMENDMENTS)
2019	CALIFORNIA ELECTRICAL CODE, PART 3, TITLE 24 C.C.R., (2017 NATIONAL ELECTRICAL CODE WITH 2019 CALIFORNIA AMENDMENTS)
2019	CALIFORNIA MECHANICAL CODE, PART 4, TITLE 24 C.C.R. (2018 UNIFORM MECHANICAL CODE WITH 2019 CALIFORNIA AMENDMENTS)
2019	CALIFORNIA PLUMBING CODE, PART 5, TITLE 24 C.C.R. (2018 UNIFORM PLUMBING CODE WITH 2019 CALIFORNIA AMENDMENTS)
2019	CALIFORNIA ENERGY CODE, PART 6, TITLE 24 C.C.R.
2019	CALIFORNIA FIRE CODE, PART 9, TITLE 24 C.C.R. (2018 INTERNATIONAL FIRE CODE AND 2019 CALIFORNIA AMENDMENTS)
2019	CALIFORNIA GREEN BUILDING STANDARDS CODE, PART 11, TITLE 24 C.C.R.
2019	CALIFORNIA REFERENCE STANDARDS CODE, PART 12, TITLE 24 C.C.R.

MECHANICAL SHEET INDEX

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REVISIONS

NO.	DESCRIPTION	DATE	APPROVED

B.M.: THE CITY OF GARDENA BENCHMARK NO. 50-15
ELEV. = 43.508'

CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS - ENGINEERING

MECHANICAL LEGENDS, ABBREVIATIONS, & GENERAL NOTES

COMMUNITY AQUATICS & SENIOR CENTER

M0.01

	INITIAL	DATE
DESIGNED BY		
DRAWN BY		
CHECKED BY		

APPROVED BY:

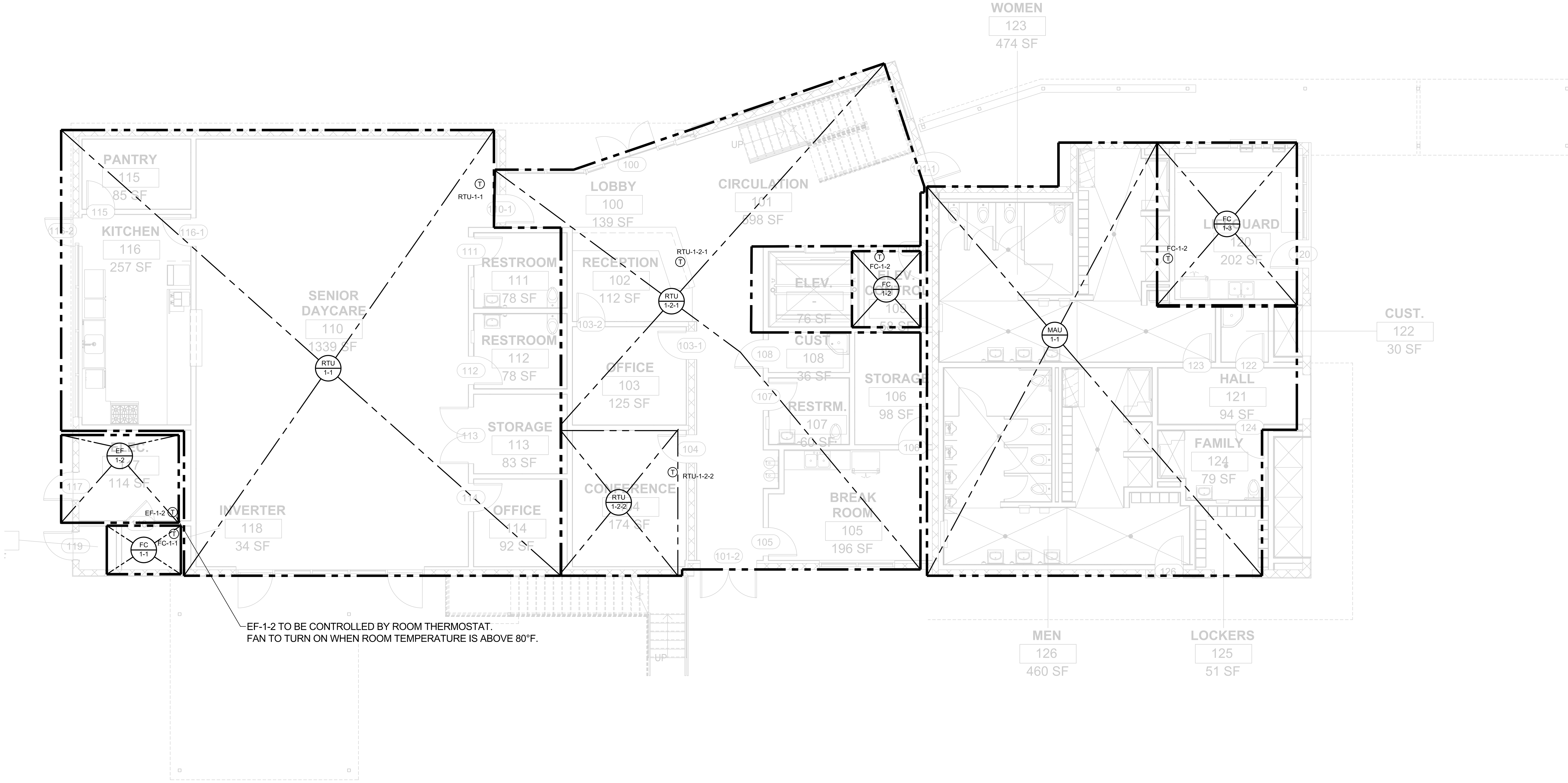
APPROVED BY: DIRECTOR OF PUBLIC WORKS

SHT. 99 OF 157 DWG. NO. 5-2606

PLOT DATE: 5/25/2022 3:04:11 PM

GENERAL NOTES

1. ALL THERMOSTATS INSTALLED ON EXTERIOR WALLS OR COLUMNS SHALL HAVE AN INSULATED BACKING INSTALLED BEHIND THE THERMOSTAT.
2. THERMOSTAT SHALL BE INSTALLED 48" ABOVE FINISHED FLOOR. FINAL THERMOSTAT LOCATION SHALL BE COORDINATED WITH FURNITURE LAYOUT AND APPROVED BY THE ARCHITECT.
3. COORDINATE THERMOSTAT LOCATIONS TO GROUP THEM WITH LIGHT SWITCHES.



1 - FIRST FLOOR MECHANICAL ZONING PLAN

SCALE: 3/16" = 1'-0"

NORTH

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CITY OF GARDENA · FREEWAY CITY · INCORPORATED 1930

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REVISIONS

NO.	DESCRIPTION	DATE	APPROVED

B.M.: THE CITY OF GARDENA BENCHMARK NO. 5D-15
ELEV. = 43.508'

CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS - ENGINEERING

FIRST FLOOR MECHANICAL ZONING PLAN

COMMUNITY AQUATICS & SENIOR CENTER

M2.01

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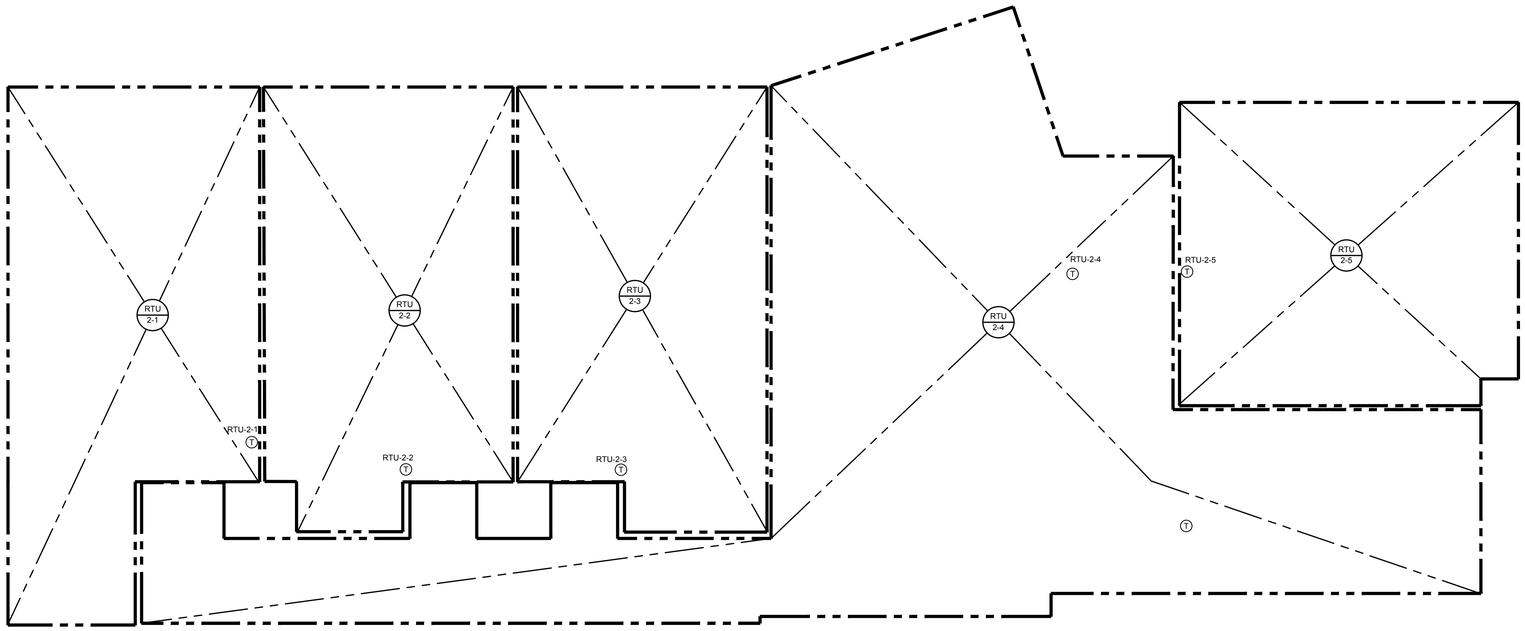
APPROVED BY: DIRECTOR OF PUBLIC WORKS

SHT. 100 OF 157 DWG. NO. 5-2606

FILE PATH:
PLOT TIME: 5/20/2022 5:04:11 PM

GENERAL NOTES

1. ALL THERMOSTATS INSTALLED ON EXTERIOR WALLS OR COLUMNS SHALL HAVE AN INSULATED BACKING INSTALLED BEHIND THE THERMOSTAT.
2. THERMOSTAT SHALL BE INSTALLED 48" ABOVE FINISHED FLOOR. FINAL THERMOSTAT LOCATION SHALL BE COORDINATED WITH FURNITURE LAYOUT AND APPROVED BY THE ARCHITECT.
3. COORDINATE THERMOSTAT LOCATIONS TO GROUP THEM WITH LIGHT SWITCHES.



1 - SECOND FLOOR MECHANICAL ZONING PLAN

SCALE: 3/16" = 1'-0"

NORTH

ALFATECH
421 EAST HUNTINGTON DRIVE
MONROVIA, CA 91016
PHONE: (213) 212-9860
www.atce.com

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B.M.: THE CITY OF GARDENA BENCHMARK NO. SD-15
ELEV. = 43.508'

REVISIONS

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CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS - ENGINEERING

SECOND FLOOR MECHANICAL ZONING PLAN

COMMUNITY AQUATICS & SENIOR CENTER

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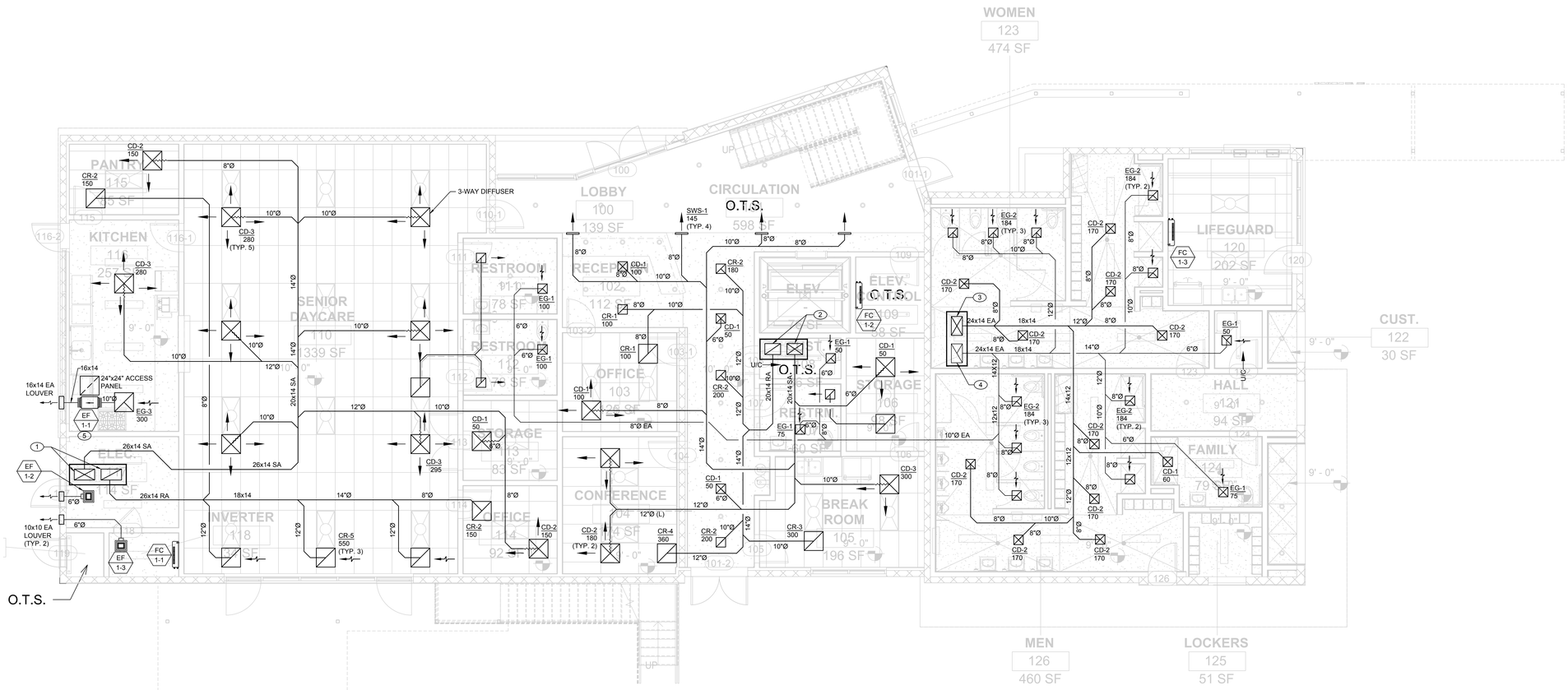
SHT. 101 OF 157 DWG. NO. S-2606

PLOT DATE: 5/20/2022 3:54:17 PM

KEYNOTES

1. 26x14 SA & RA DUCT UP TO SECOD FLOOR.
2. 20x14 SA & RA DUCT UP TO SECOD FLOOR.
3. 24x14 MAKE-UP AIR DUCT UP TO SECOND FLOOR.
4. 24x14 EA DUCT UP TO SECOND FLOOR.
5. PROVIDE FLEX DUCT CONNECTOR AT INLET AND DISCHARGE.



1 - FIRST FLOOR MECHANICAL PLAN

SCALE: 3/16" = 1'-0"

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CITY OF GARDENA
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FIRST FLOOR MECHANICAL PLAN

COMMUNITY AQUATICS & SENIOR CENTER

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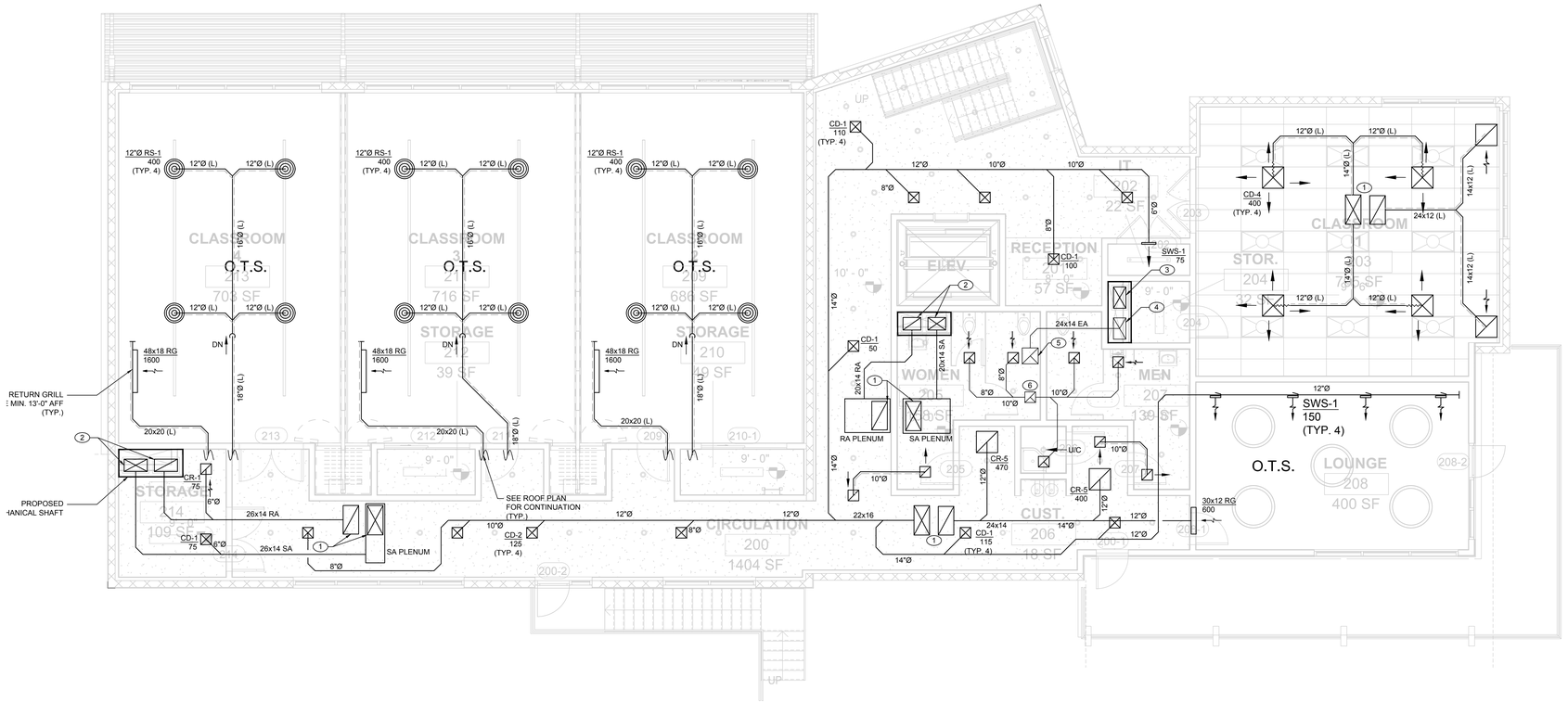
SHT. 102 OF 157 DWG. NO. S-2606

PLOT DATE: 5/20/2022 3:04:17 PM

KEYNOTES

1. 32x18 SA & RA DUCT UP THRU ROOF.
2. 26x14 SA & RA DUCT DN TO FIRST FLOOR.
3. 24x14 MAKE-UP AIR DUCT DN TO FIRST FLOOR & UP THRU ROOF.
4. 24x14 EA DUCT DN TO FIRST FLOOR.
5. 18x18 EA DUCT UP THRU ROOF AND CONNECT TO EF-1-4.
6. 12x12 EA DUCT UP THRU ROOF AND CONNECT TO EF-2-1.



1 - SECOND FLOOR MECHANICAL PLAN

SCALE: 3/16" = 1'-0"

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SECOND FLOOR MECHANICAL PLAN

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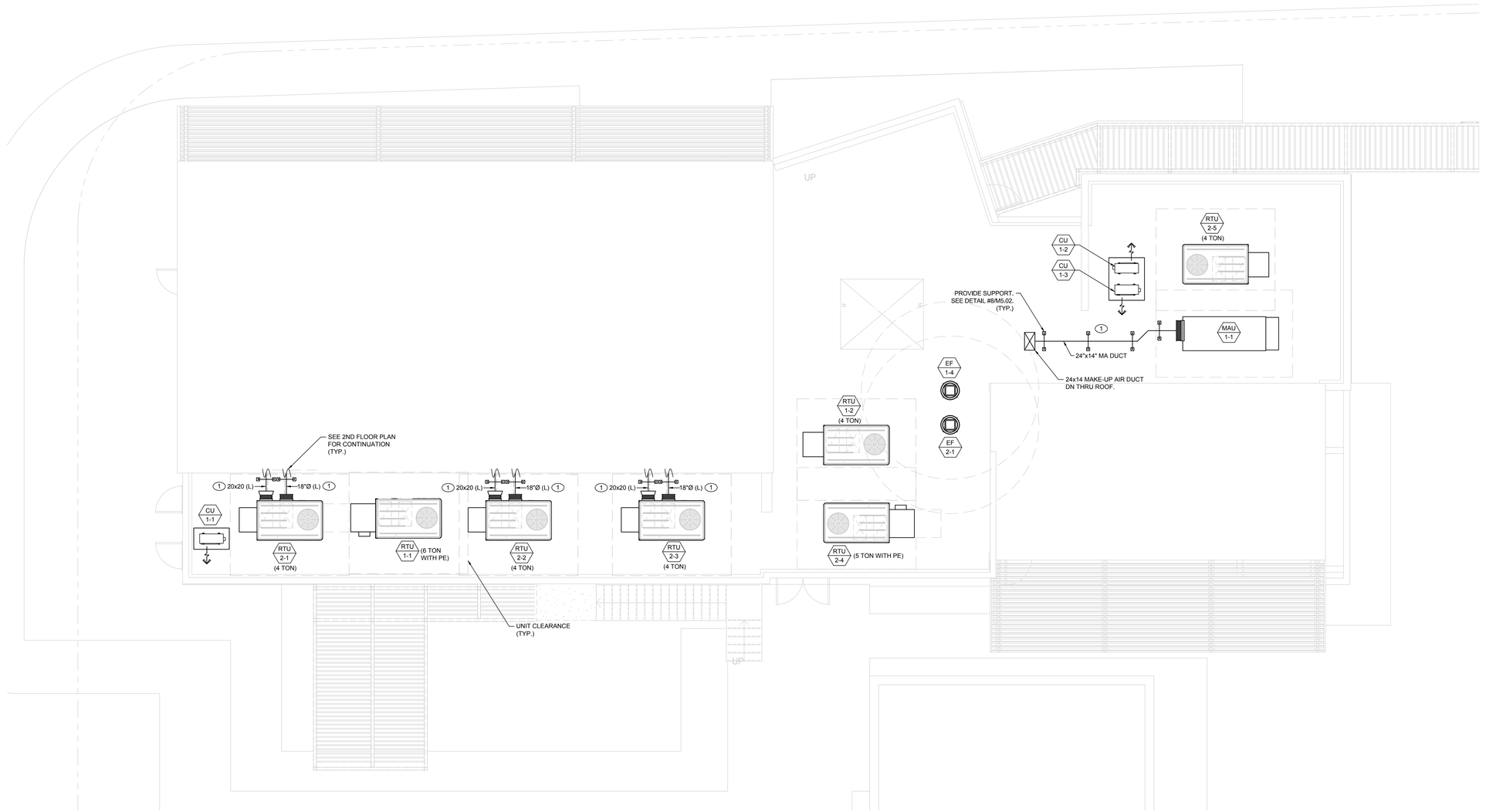
PLOT DATE: 1/26/2023 8:04:11 PM

KEYNOTES

(1) PROVIDE MINIMUM R-8 INSULATED LINING FOR DUCTWORK INSTALLED OUTDOORS. PAINT EXPOSED DUCT.

(2) -



1 - MECHANICAL ROOF PLAN

SCALE: 3/16" = 1'-0"

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CITY OF GARDENA
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MECHANICAL ROOF PLAN

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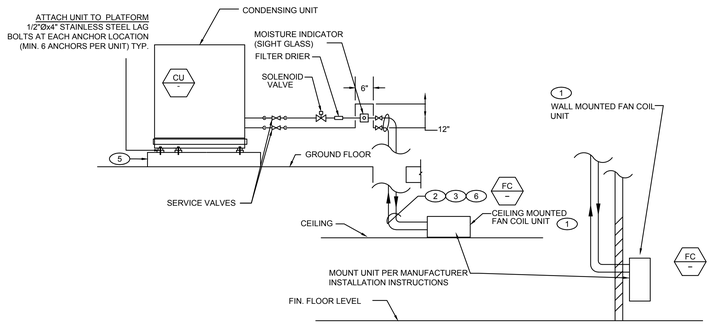
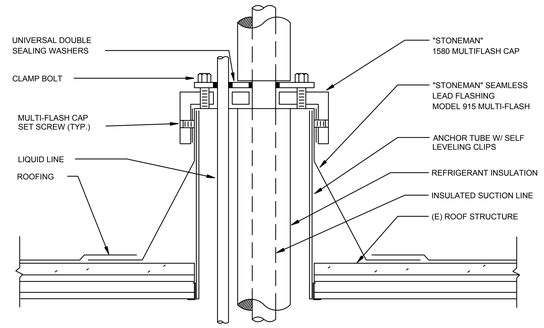


NOTES:

1. FAN COIL UNITS SHALL BE LOCATED SUCH THAT UNIT CAN BE SERVICED AND REMOVED WITHOUT REMOVAL OF PERMANENT CONSTRUCTION. LOCATION SHALL ALSO CONFORM TO MANUFACTURER'S RECOMMENDATION.
2. INSULATE BOTH REFRIGERANT PIPES SUCTION LINES & LIQUID ON HEAT PUMP UNITS NO PIPE INSULATION IS REQUIRED FOR LIQUID LINE ON COOLING ONLY UNITS, IF APPLICABLE.
3. INSTALL PIPES IN STUD WALL WITH TRISOLATOR PIPE SUPPORT.
4. NOT USED
5. EQUIPMENT PAD. REFER TO STRUCTURAL DETAILS FOR EQUIPMENT PAD ON ROOF.
6. INSTALL AND SIZE REFRIGERANT PIPING PER MF'R RECOMMENDATIONS. APPLY LONG LINE APPLICATION DATA IF VERTICAL LINES ARE ABOVE 50 FT.
7. PROVIDE ALUMINUM JACKET ON ALL ROOF REFRIGERANT LINES.

SPLIT SYSTEM MOUNTING AND PIPING DETAILS

SCALE NONE | 9

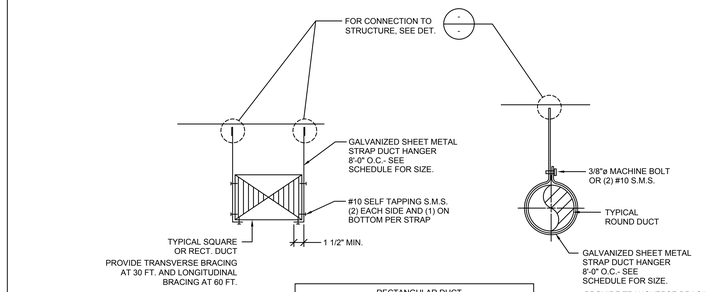


NOTE:

1. INSTALL MULTIFLASH ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.
2. CONTROL & POWER WIRING/CONDUIT MAY RUN THRU FLASHING ASSEMBLY (VERIFY).
3. MUTLI-FLASH ASSY.

REFRIGERANT PIPING THRU ROOF DETAIL

SCALE NONE | 6



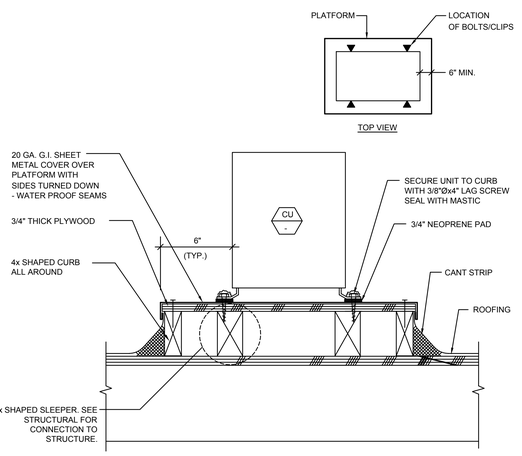
RECTANGULAR DUCT		
MAX. HALF OF DUCT PERIMETER/IN.	STRAP	MAX. LOAD EACH HANGER/LBS.
P/2 =72	1"X 20 GA.	100
P/2 =96	1"X 18 GA.	150
P/2 =192	1"X 16 GA.	300

NOTE:

1. DUCTS OF 6 SF IN CROSS SECTION OR LARGER SHALL BE PROVIDED WITH SUPPORT, DIAGONAL SEISMIC BRACE & LONGITUDINAL BRACE PER MASON WEST OPM-0043-13.
2. SEE MEP COMPONENT ANCHORAGE NOTES ON SHEET M0.01 FOR REQUIREMENT.

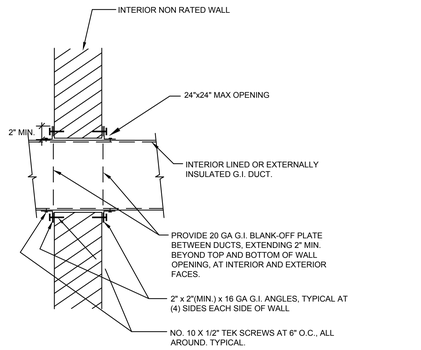
DUCT SUPPORT DETAIL

SCALE NONE | 3



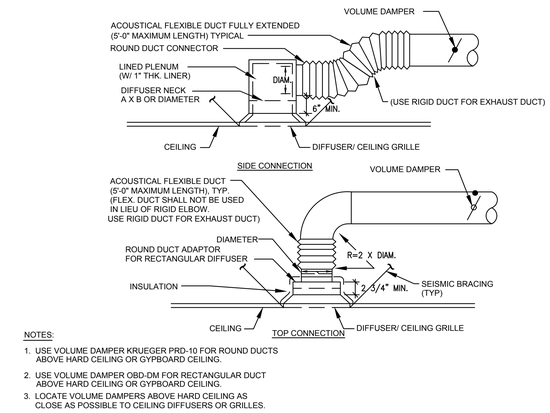
CONDENSING UNIT SUPPORT DETAIL ON ROOF

SCALE NONE | 8



DUCT THRU NON-RATED WALL

SCALE NONE | 5

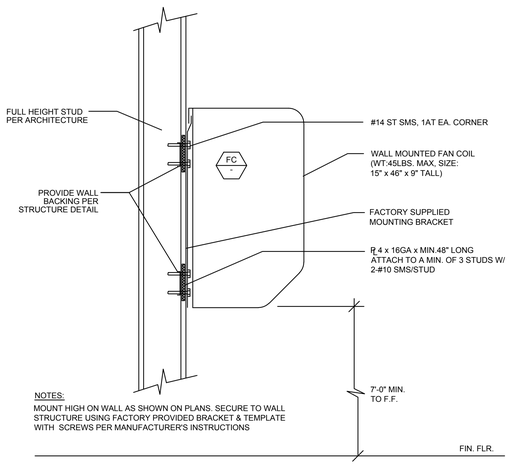


NOTES:

1. USE VOLUME DAMPER KRUEGER PRD-10 FOR ROUND DUCTS ABOVE HARD CEILING OR GYPBOARD CEILING.
2. USE VOLUME DAMPER OBD-DM FOR RECTANGULAR DUCT ABOVE HARD CEILING OR GYPBOARD CEILING.
3. LOCATE VOLUME DAMPERS ABOVE HARD CEILING AS CLOSE AS POSSIBLE TO CEILING DIFFUSERS OR GRILLES.

DIFFUSER CONNECTION DETAIL

SCALE NONE | 2

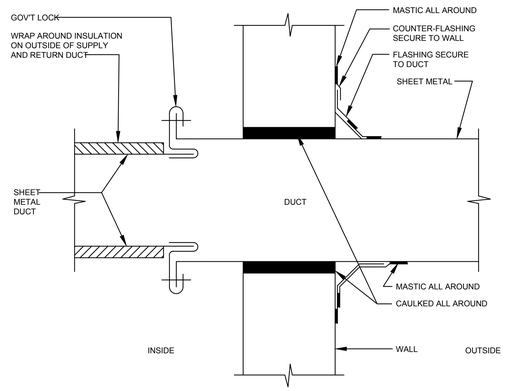


NOTES:

MOUNT HIGH ON WALL AS SHOWN ON PLANS. SECURE TO WALL STRUCTURE USING FACTORY PROVIDED BRACKET & TEMPLATE WITH SCREWS PER MANUFACTURER'S INSTRUCTIONS

SPLIT SYSTEM FAN COIL UNIT MOUNTING DETAIL

SCALE NONE | 7

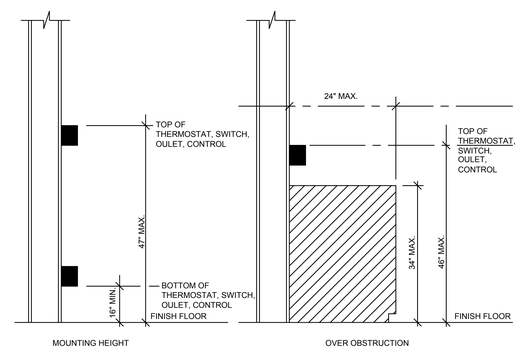


NOTES:

1. FOR DESIGN #, SEE ARCH. DWGS.

DUCT THRU EXTERIOR WALL DETAIL

SCALE NONE | 1



NOTES:

WOOD BASE WITH PIPE CLAMPS AND/OR PLUMBERS TAPE IS NOT ALLOWED.

THERMOSTAT MOUNTING DETAIL

SCALE NONE | 1

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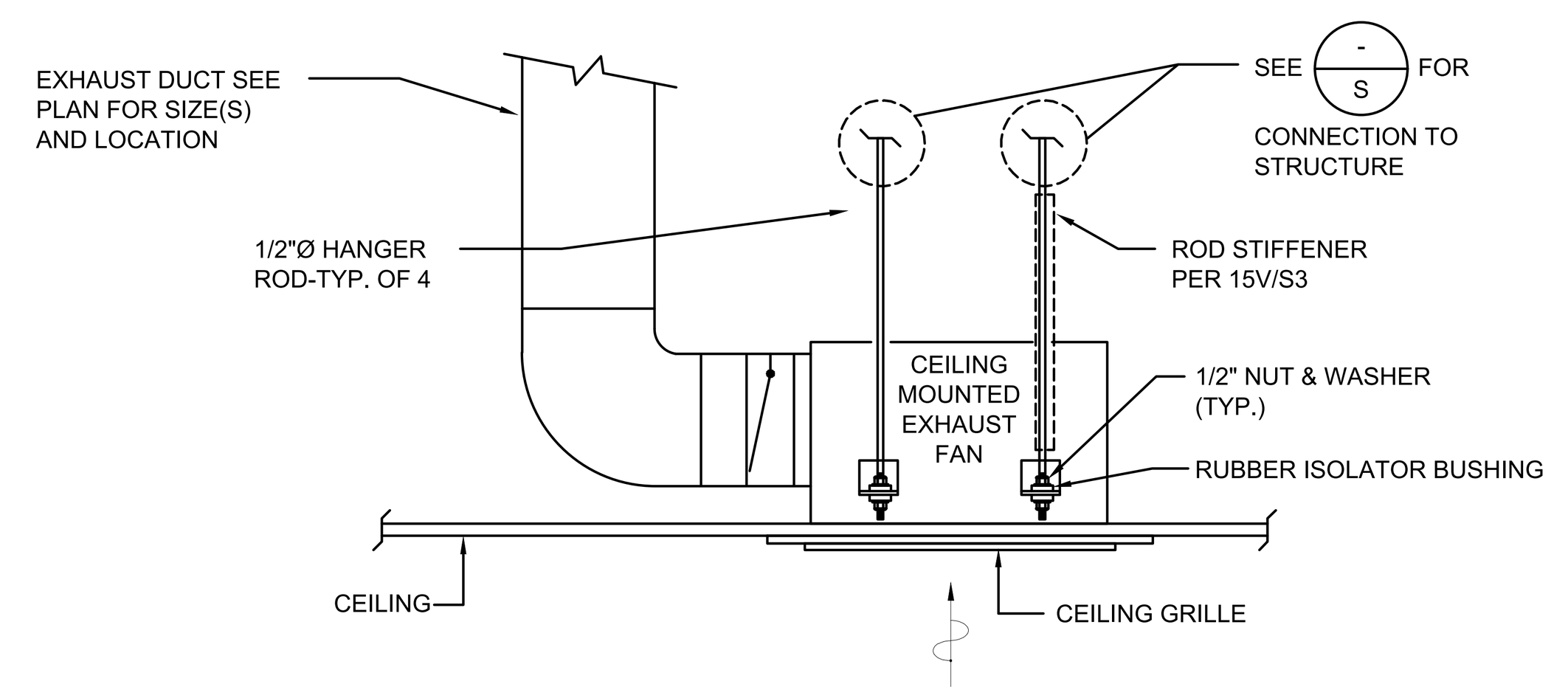
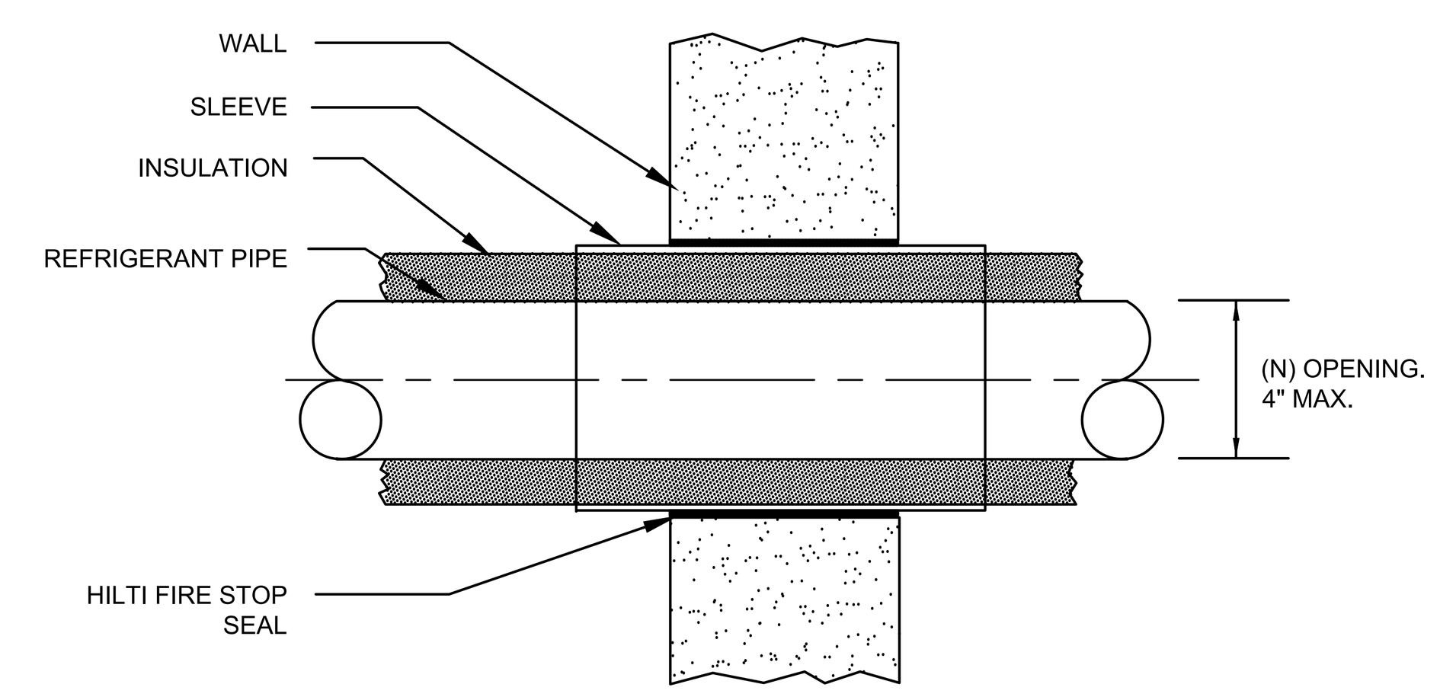


NOTE:

1. CONNECT TO CEILING REGISTER WITH EXHAUST DUCT. SEE PLANS FOR SIZES AND LOCATIONS.

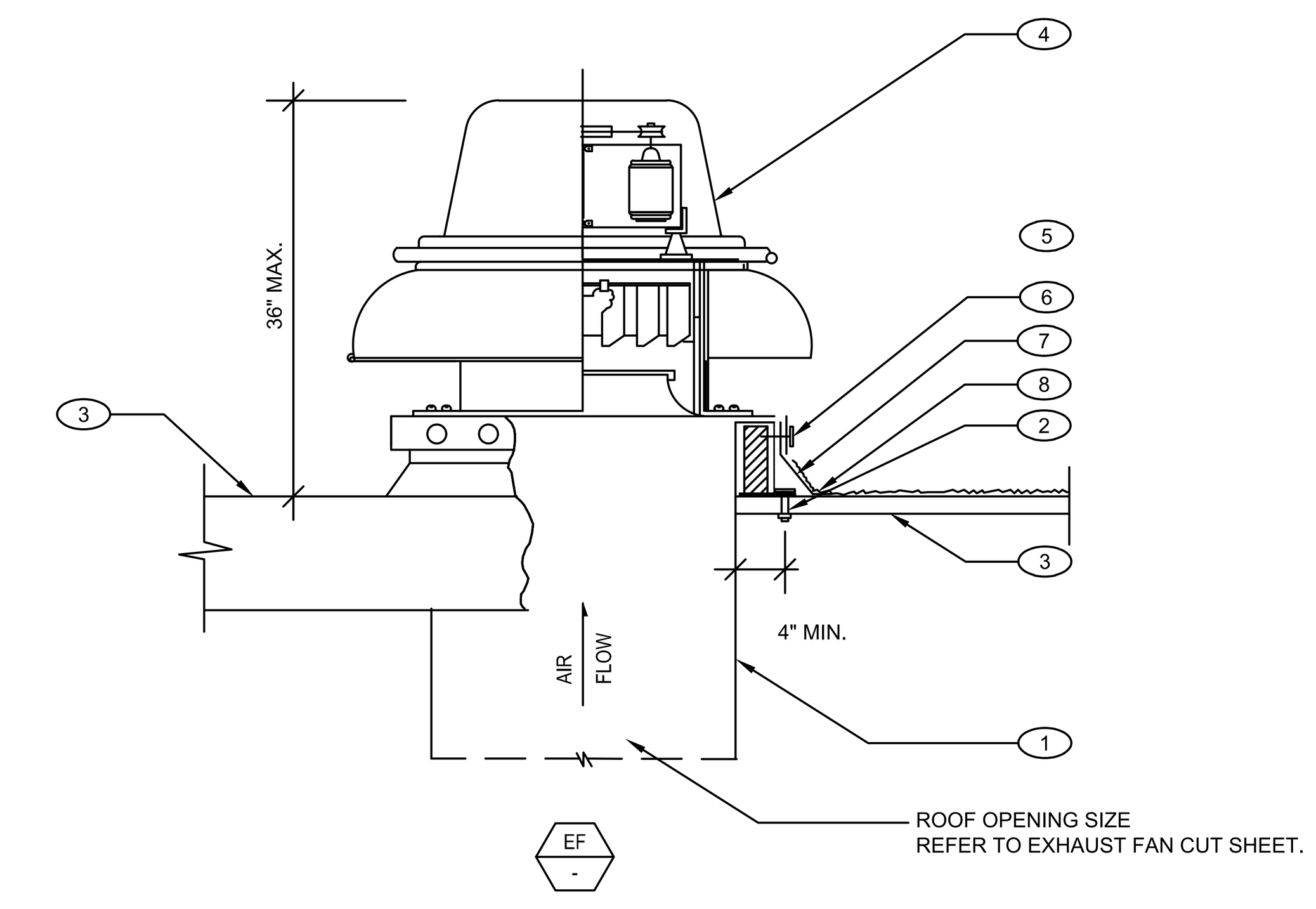
CEILING MOUNTED EXHAUST FAN MOUNTING DETAIL
SCALE NONE | 9



NOTES:

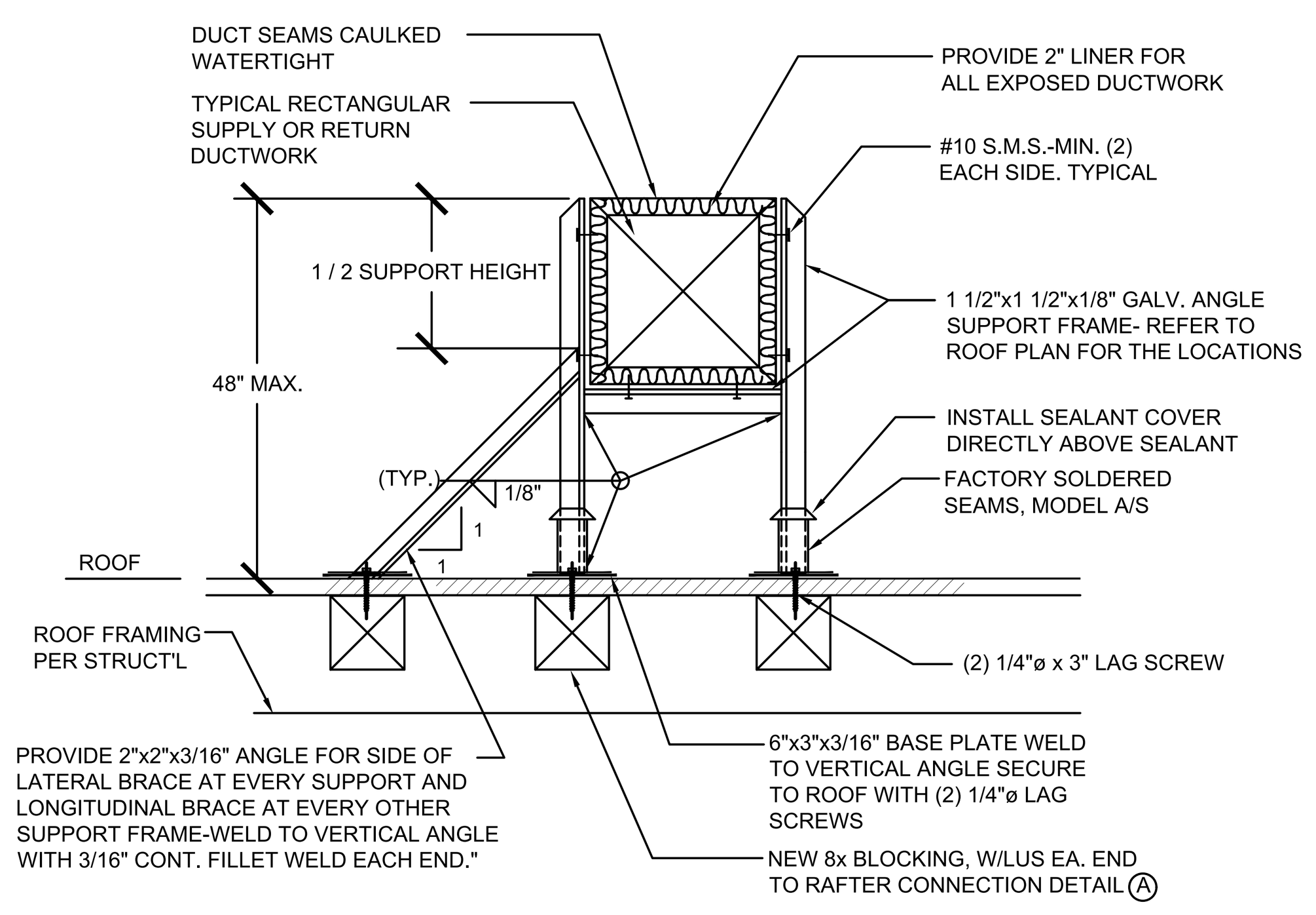
1. PROVIDE 16" MIN. SPACING BETWEEN ADJACENT OPENINGS.
2. DO NOT CUT OR DAMAGE REBAR IN EXISTING CONCRETE WALL.
3. DO NOT CUT OR DAMAGE EXISTING WALL STUDS.

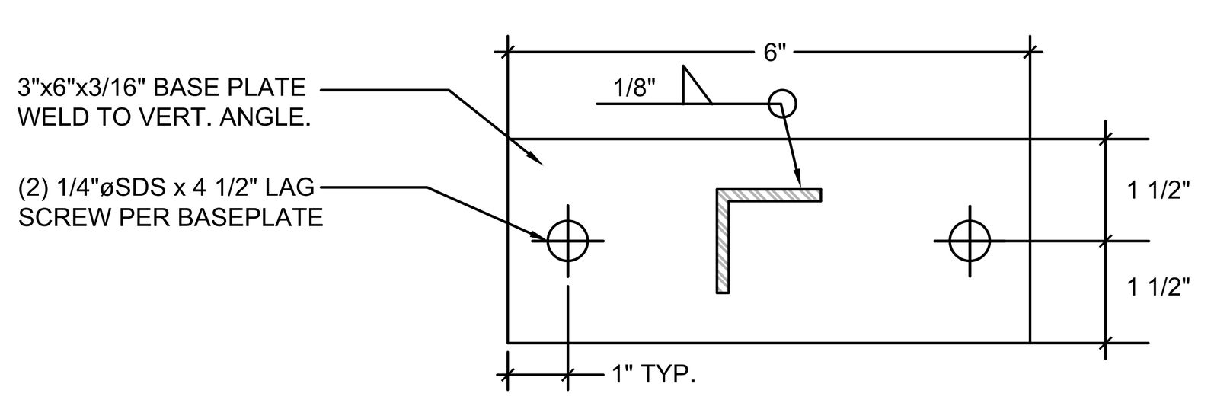
WALL REFRIGERANT PIPE PENETRATION DETAIL
SCALE NONE | 6



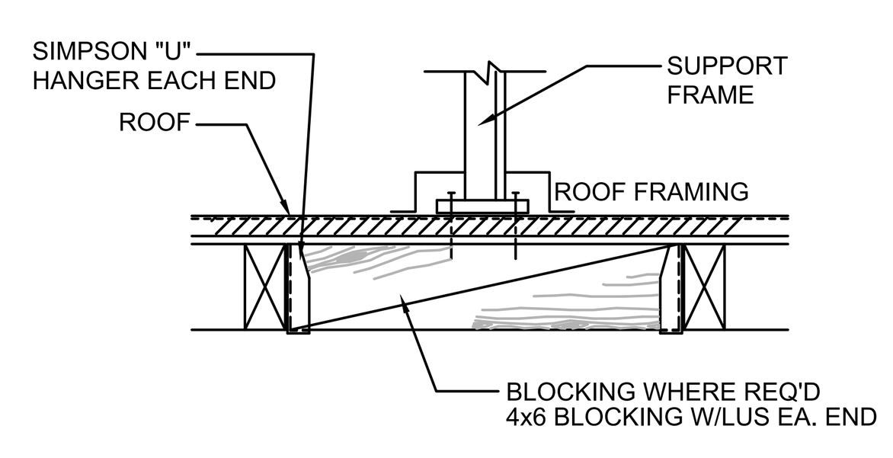
1. EXHAUST DUCT. (SEE PLANS FOR SIZES)
2. (2) 3/8" Ø HILTI KB TZ (2" EMBED) ALL 4 SIDES. SEE STRUCTURAL FOR INSTALLATION REQUIREMENTS
3. ROOF STRUCTURE. (SEE STRUCTURAL DWG'S.)
4. EXHAUST FAN, MAX OPERATING WEIGHT = 63 POUNDS.
5. FACTORY CURB .
6. (2) #14 SHEET METAL SCREWS ALL 4 SIDES.
7. FLASHING.
8. ROOFING.

ROOF EXHAUST FAN DETAIL
SCALE NONE | 3





BASEPLATE DETAIL

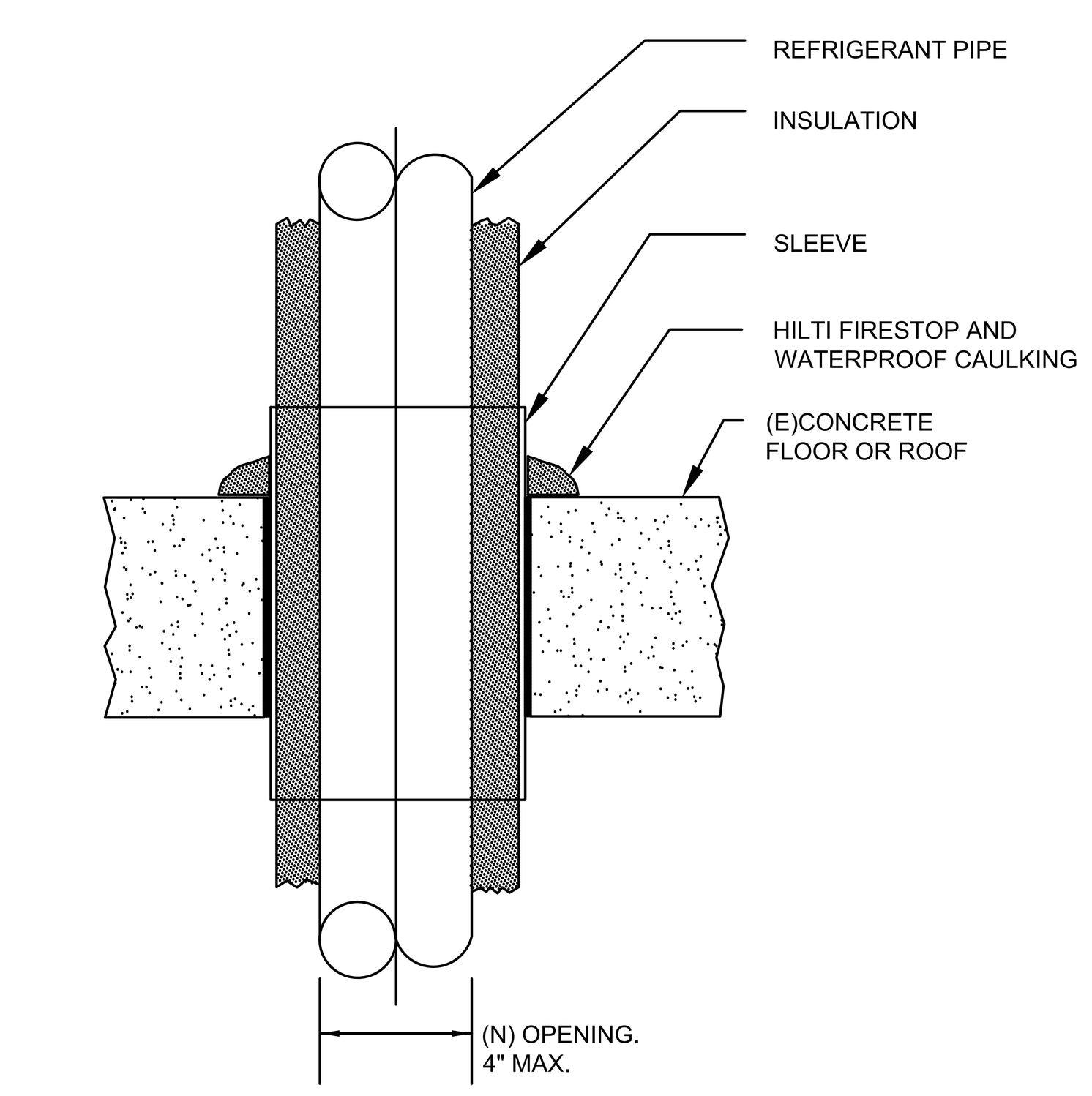


A RAFTER CONNECTION DETAIL

NOTE:

ANGLE FLASHING SHALL BE AS MANUFACTURED BY SBC INDUSTRIES, MODEL A/S, FABRICATED FROM 26 GA. STAINLESS STEEL, TYPE 304, 2B FINISH.

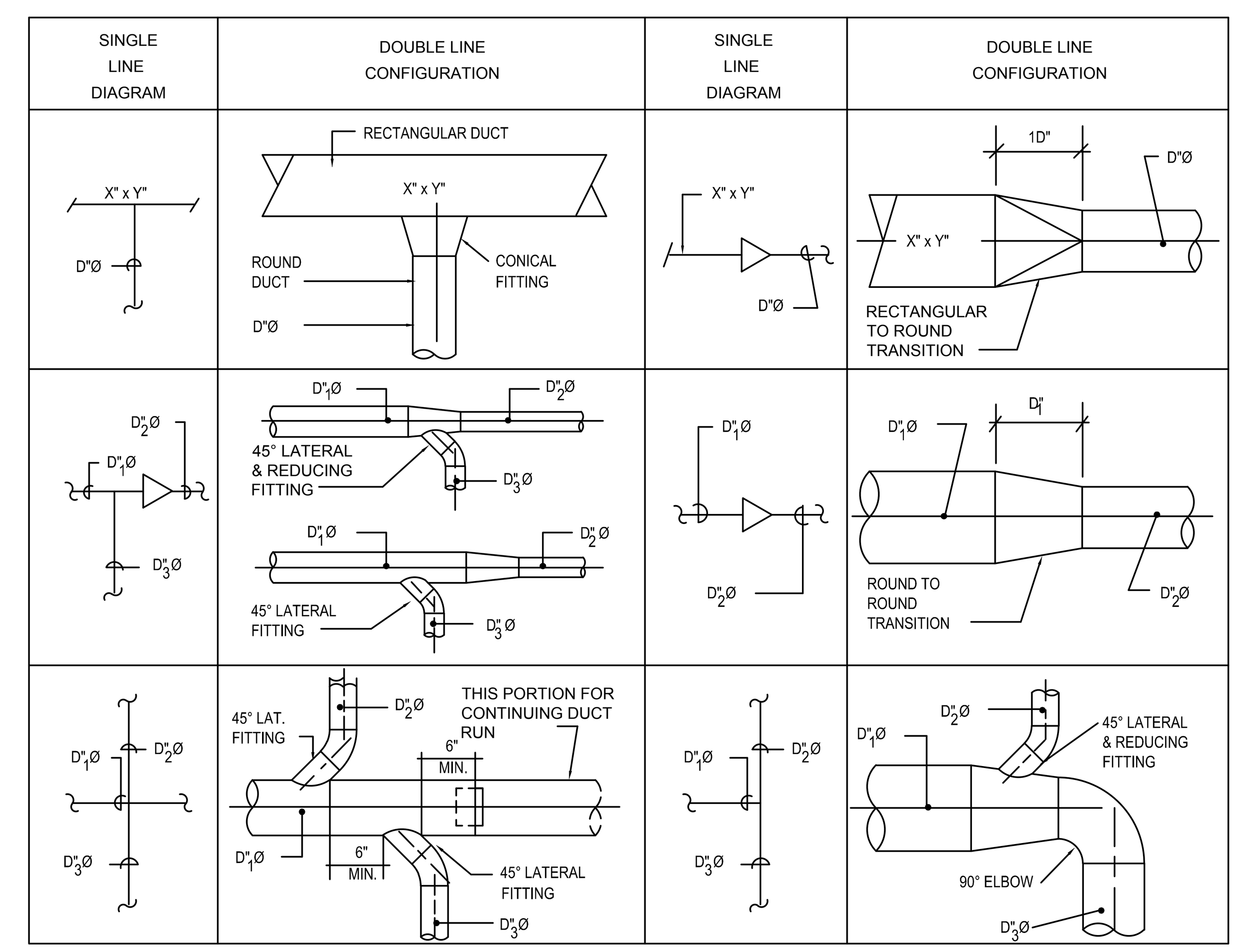
DUCT SUPPORT ON THE ROOF DETAIL
SCALE NONE | 8



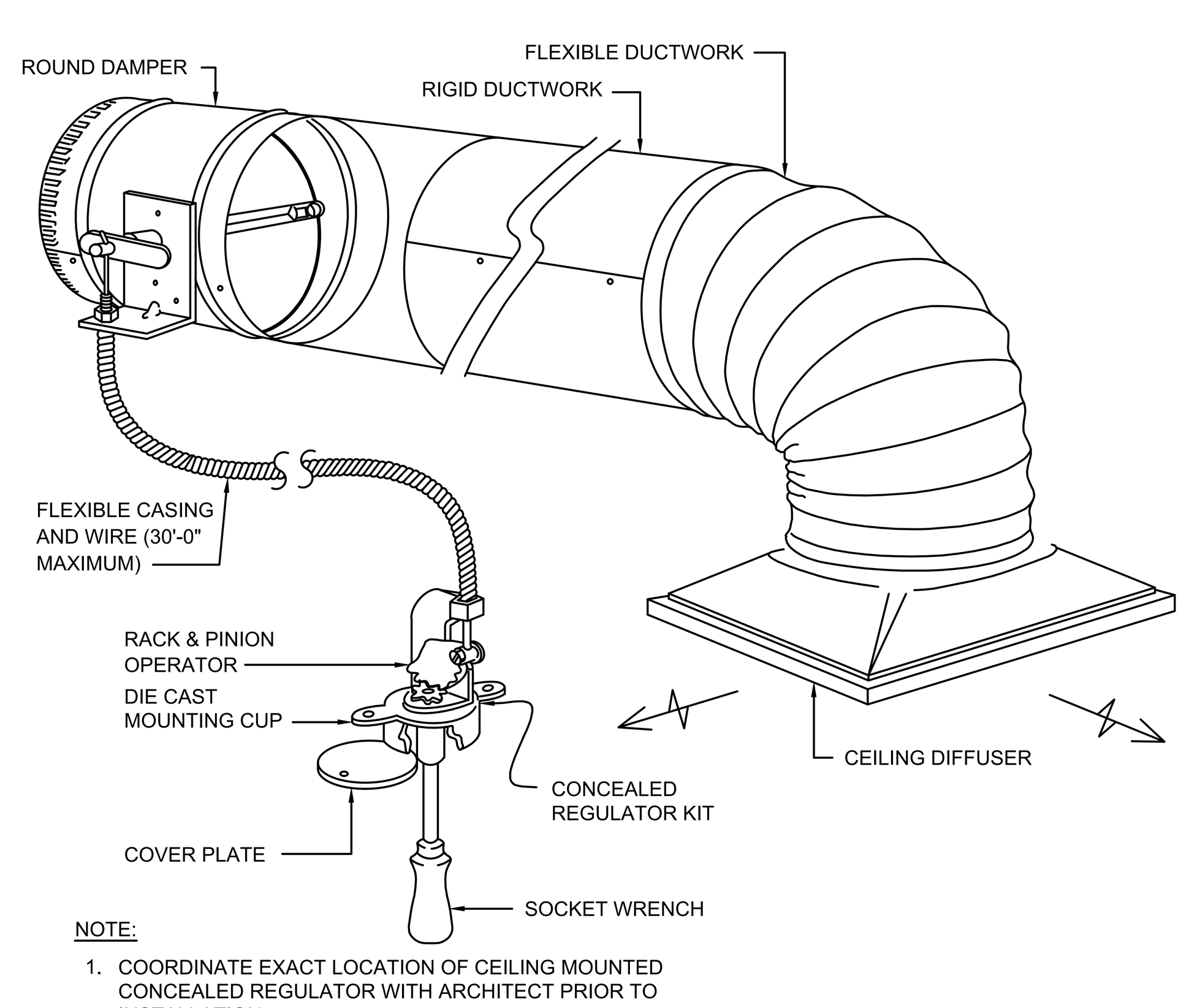
NOTES:

1. PROVIDE 16" MIN. SPACING BETWEEN ADJACENT OPENINGS.
2. DO NOT CUT OR DAMAGE REBAR IN EXISTING SLAB.

REFRIGERANT PIPE FLOOR PENETRATION
SCALE NONE | 5



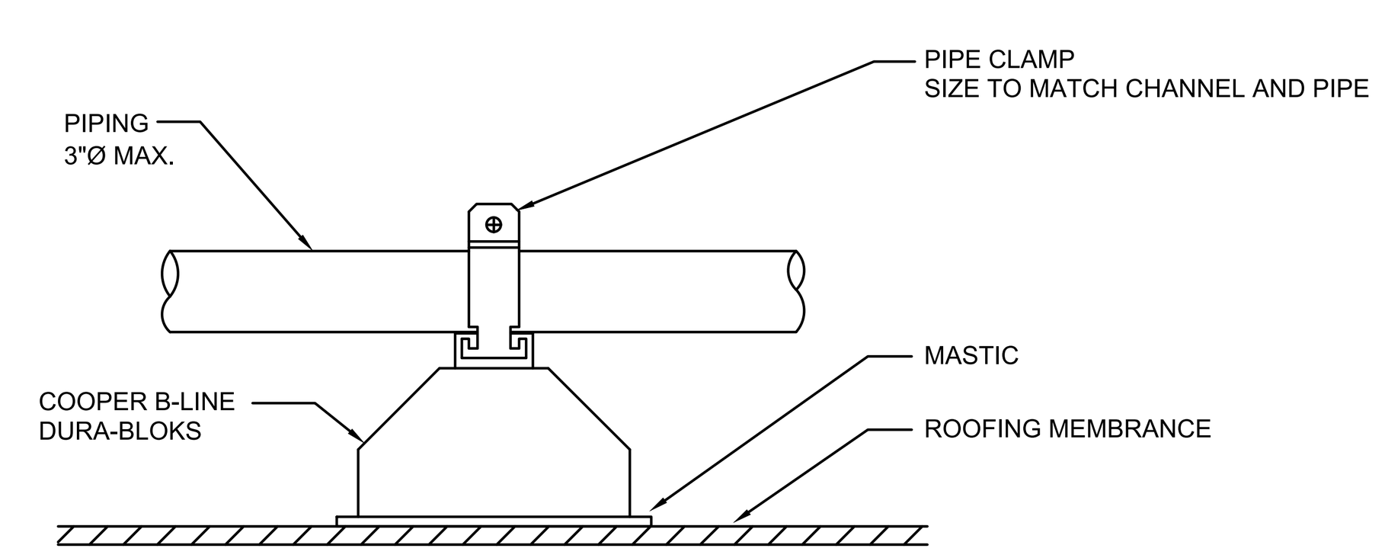
ROUND DUCTWORK DETAIL
SCALE NONE | 2



NOTE:

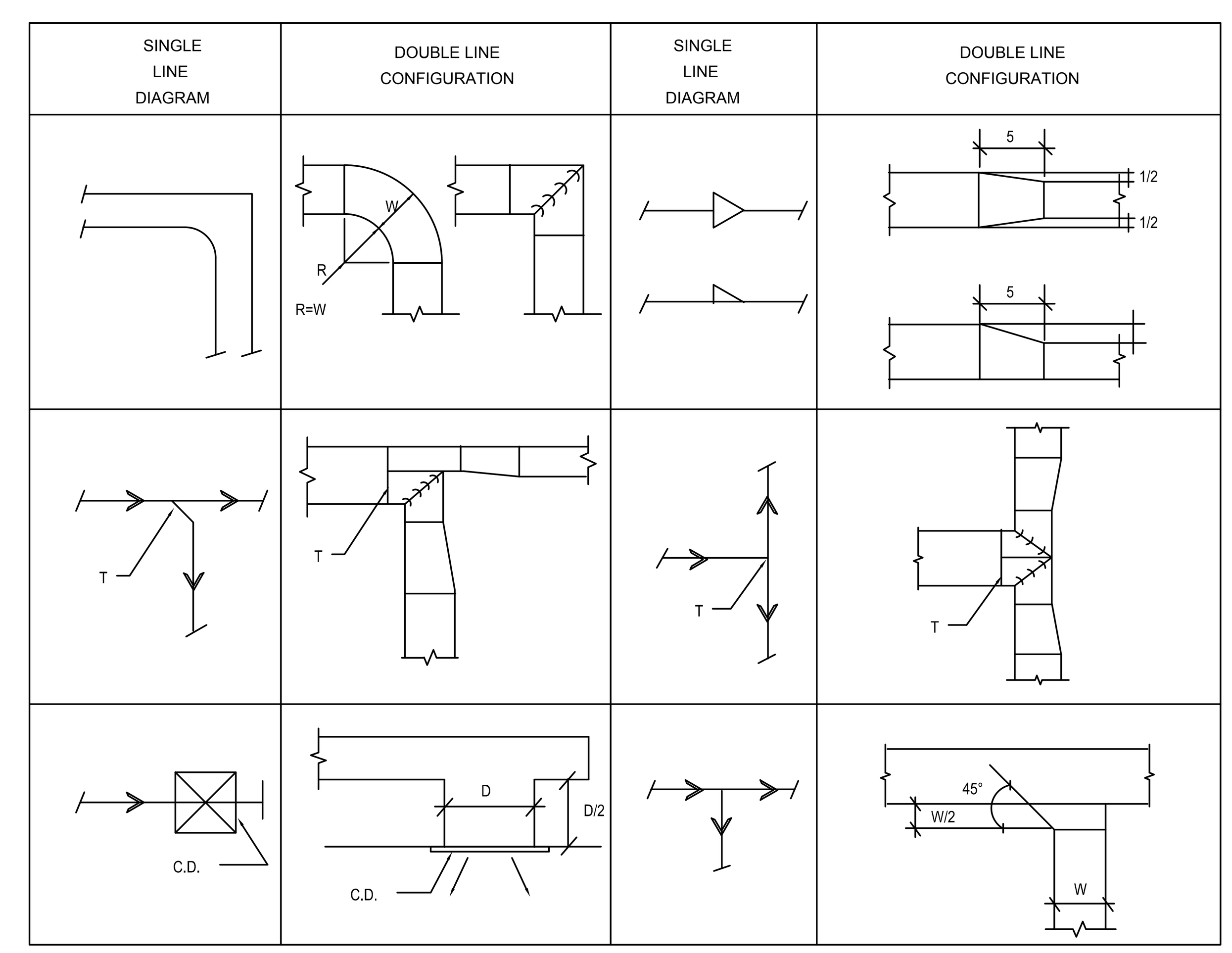
1. COORDINATE EXACT LOCATION OF CEILING MOUNTED CONCEALED REGULATOR WITH ARCHITECT PRIOR TO INSTALLATION.
2. PROVIDE YOUNG REGULATOR WITH BOWDEN CABLE CONTROL SYSTEM

YOUNG REGULATOR REMOTE CABLE SYSTEM DETAIL
SCALE NONE | 7



NOTE: SPACE SUPPORTS AT MAX. 8'-0" ON CENTER

PIPING SUPPORT ON ROOF DETAIL
SCALE NONE | 4



RECTANGULAR DUCTWORK DETAIL
SCALE NONE | 1

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CanFab – Cannon Fabrication Inc (Page 3 of 3)

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FOR: GROUP B ISO

PART NO: SEE BELOW

TABLE 3 ALLOWABLE CURB AND UNIT DIMENSION AND WEIGHT

RELATED CURBS	LCURB [IN]	WCURB [IN]	HCURB [IN]	WTCURB [LBS]	LUNIT [IN]	WUNIT [IN]	HUNIT [IN]	WTUNIT [LBS]	CG LONG [IN]	CG SHORT [IN]	CG HEIGHT [IN]
1008 1008-XIC	SEE PAGE 1	SEE PAGE 1	MIN 8	MIN 405,405	88.125	59.5	47	MAX 2025 FOR 1008 MAX 2166 FOR 1008-XIC	53.875	9.125	23.75
			11	438, 441							
			14	474, 477							
			18	519, 522							
			24	662, 665							
			MAX 36	MAX 828,831							
3012	SEE PAGE 1	SEE PAGE 1	MIN 8	MIN 406	89	59	50.75	MAX 1589	49.75	35.5	HUNIT/2
			11	438							
			14	469							
			18	510							
			24	647							
			MAX 36	MAX 801							
4028S	SEE PAGE 1	SEE PAGE 1	MIN 8	MIN 327	98.25	47	46.875	MAX 1316	47	22	HUNIT/2
			11	359							
			14	391							
			18	433							
			24	574							
			MAX 36	MAX 733							
6042	SEE PAGE 1	SEE PAGE 1	MIN 8	MIN 442	88.625	53.25	46.875	MAX 1565	45	24	HUNIT/2
			11	474							
			14	506							
			18	547							
			24	687							
			MAX 36	MAX 845							
6042S	SEE PAGE 1	SEE PAGE 1	MIN 8	MIN 473	99.688	63.188	50.875	MAX 1916	54	27	HUNIT/2
			11	507							
			14	540							
			18	584							
			24	733							
			MAX 36	MAX 899							

STRUCTURAL REVIEW BY: MARTIN & associates

REGISTERED PROFESSIONAL ENGINEER GREGORY LOUIS OROZCO No. 4957 STRUCTURAL STATE OF CALIFORNIA

12/7/2018

TABLE 4 TABULATED CURB AND ANCHORAGE INFORMATION PER VARYING HEIGHT

		0 < H ≤ 18"	18" < H ≤ 22"	22" < H ≤ 30"	30" < H ≤ 36"
A	CURB THICKNESS	14 GA	14 GA	12 GA	12 GA
B	EXP. ANCHOR	8	8	10	10
C	EXP. ANCHOR	6	6	8	8
D	WELD	18"	18"	18"	18"
E	SCREWS	36	36	38	40
F	SCREWS	24	24	24	24
G	DISTANCE	MAX 0.75"	MAX 0.75"	MAX 0.75"	MAX 0.75"
H	NO. OF CLIPS	10	10	10	10
I	CLIP SMS	(4) #14	(4) #14	(4) #14	(4) #14
J	CLIP SMS	(8) #14	(8) #14	(8) #14	(8) #14
K	ISO RAIL	10 GA 7.5" DEEP X 1" FLANGES			
L	NO. OF ISOLATORS	8 FOR 3012 AND 4028S, 10 FOR 1008, 6042 AND 6042S & 11 FOR 1008 XIC			
M	NO. OF STIFFENERS	8 FOR 3012 AND 4028S, 10 FOR 1008, 6042 AND 6042S & 11 FOR 1008 XIC			

PROJECT: IBC 2018/ CBC 2019 UPDATE DATE: 11.30.18
ENGINEER: LD DISTRIBUTOR:
DRAWING NUMBER: GROUP_B_ISO.DWG PAGE 3 OF 3

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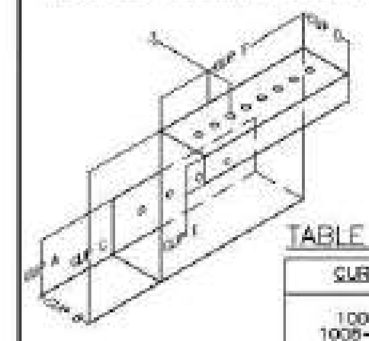
FOR: GROUP B ISO

PART NO: SEE BELOW

HOLD DOWN DETAIL



NOTE:
SEE TABLE 1 FOR DESIGNATED HOLD DOWN CLIP PER CURB

TABLE 1 HOLD DOWN CLIP PER CURB

CURB	[illegible]	GAGE	CLIP A [IN]	CLIP B [IN]	CLIP C [IN]	CLIP D [IN]	CLIP E [IN]	CLIP F [IN]
1008 1008-XIC	1909-SHD8-12	12 GA	1.5	2.625	4.5625	1.875	1.0	9.0
3012	3301-SHD8-12	12 GA	1.0	4.81	3.875	2.125	1.0	9.0
4028S	4901-SHD8-12	12 GA	2.0	3.0625	4.625	1.875	1.0	9.0
6042	6907-SHD8-12	12 GA	2.0	2.0	3.25	1.875	1.0	9.0
6042S	6907-SHD8-12	12 GA	2.0	2.0	3.25	1.875	1.0	9.0

STRUCTURAL REVIEW BY: MARTIN & associates

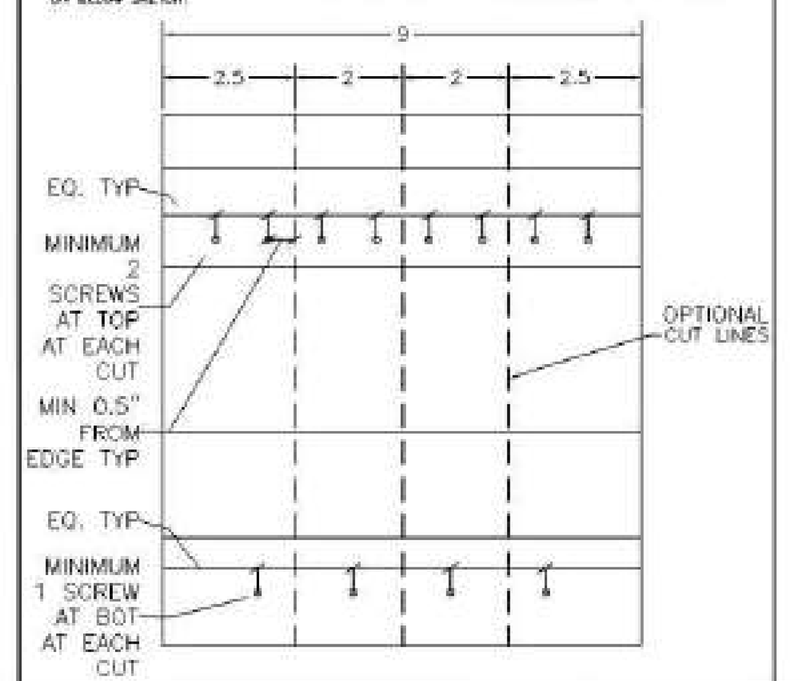
REGISTERED PROFESSIONAL ENGINEER GREGORY LOUIS OROZCO No. 4957 STRUCTURAL STATE OF CALIFORNIA

12/7/2018

ALTERNATIVE HOLD DOWN DETAIL

NOTE:
APPLICABLE ONLY FOR 9" LONG HOLD DOWN WITH (8) SCREWS AT TOP AND (4) SCREWS AT BOT EQUALLY SPACED

1. INFORMATION SHOWN ON THE STAMPED CANFAB CURB DRAWING IS THE MINIMUM REQUIREMENTS FOR THE CURB CONSTRUCTION AND INSTALLATION. NO STRUCTURAL OBJECTION TO THE USE OF LARGER SIZE SCREWS AND THICKER GAUGE SHEET METAL THAN THE INFORMATION SHOWN ON THE STAMPED CANFAB CURB DRAWING.
2. NO STRUCTURAL OBJECTION TO SHIFTING THE ATTACHMENT CLIPS ALONG THE CURB. FIRST AND LAST CLIP IN THE SERIES OF CLIPS SHALL BE LOCATED PER CLIP LOCATION DETAIL PER STAMPED CANFAB CURB DRAWING. DISTANCE SHIFTED SHALL NOT BE LARGER THAN THE LENGTH OF THE CLIP.
3. NO STRUCTURAL OBJECTION TO CUTTING THE ATTACHMENT CLIPS PER REQUIREMENTS AS SHOWN ON BELOW SKETCH.



CLIP LOCATION DETAIL

NOTE:
SEE TABLE 2 FOR CLIP LOCATION

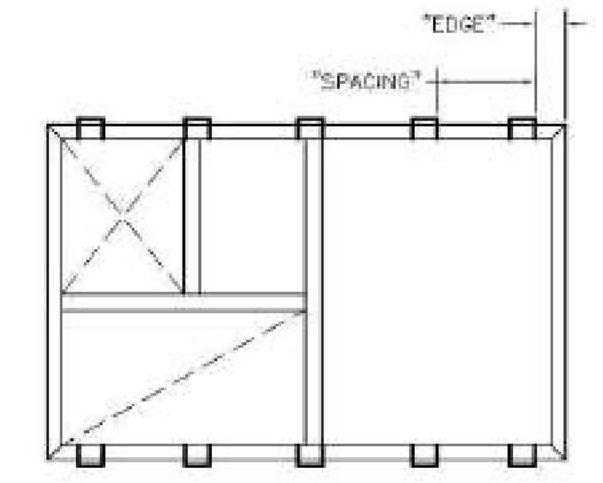


TABLE 2 CLIP LOCATION

CURB	EDGE [IN]	SPACING [IN]
1008, 1008-XIC	7.75	15.56
3012	7.75	13.09
4028S	7.75	25.70
6042	7.75	17.125
6042S	7.75	17.125

PROJECT: IBC 2018/ CBC 2019 UPDATE DATE: 11.30.18
ENGINEER: LD DISTRIBUTOR:
DRAWING NUMBER: GROUP_B_ISO.DWG PAGE 2 OF 3

CanFab – Cannon Fabrication Inc (Page 1 of 3)

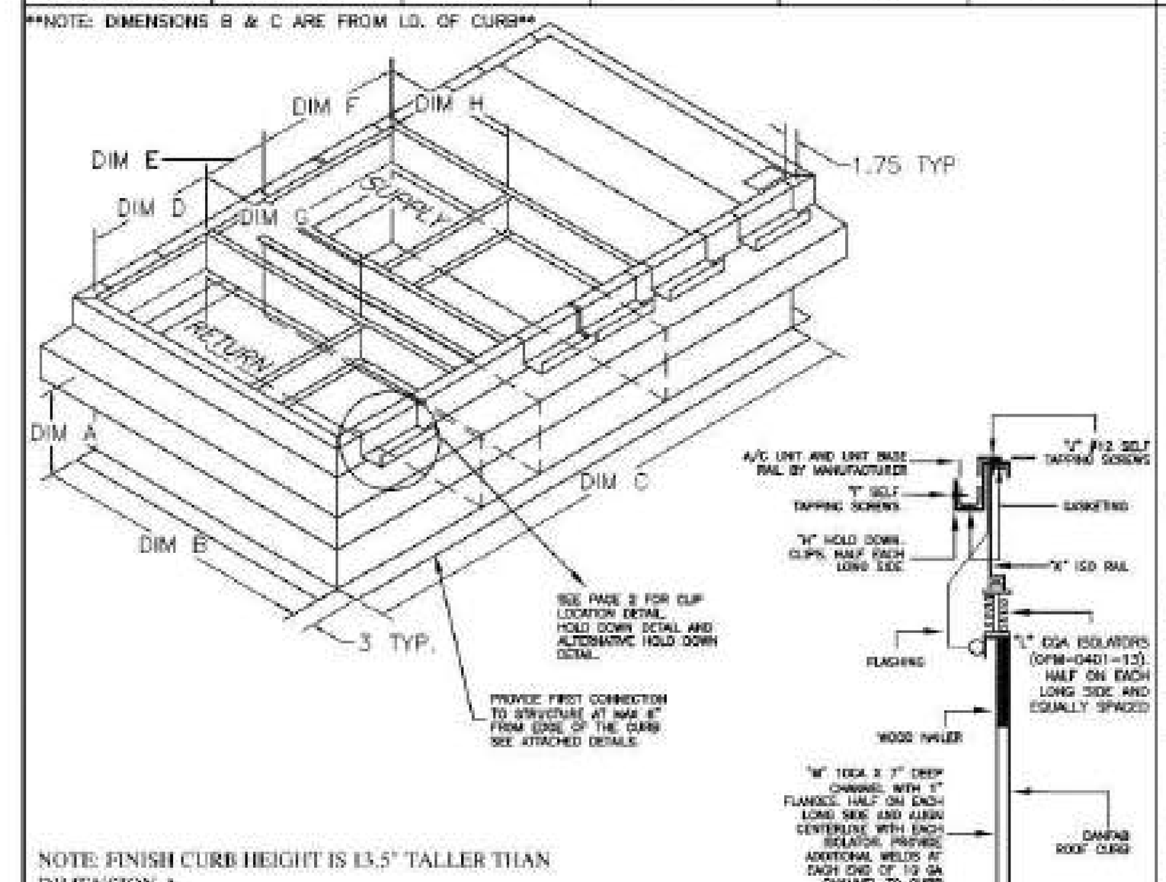
CanFab
CANNON FABRICATION INC
182 GRANITE STREET, SUITE 101, CORONA, CA 92879
PHONE:(951)278-1830 FAX:(951)278-8444 www.canfab.com canfab@canfab.com

FOR: GROUP B ISO
TRANE PRECEDENT 4 - 10 TONS

PART NO: 6042-IC

DIM A	DIM B	DIM C	DIM D	DIM E	DIM F	DIM G	DIM H
VARIES MAX 36" SEE TABLE 3	46.375"	80.5"	18.5"	8.625"	18.5"	34.375"	34.375"

NOTE: DIMENSIONS B & C ARE FROM I.D. OF CURB

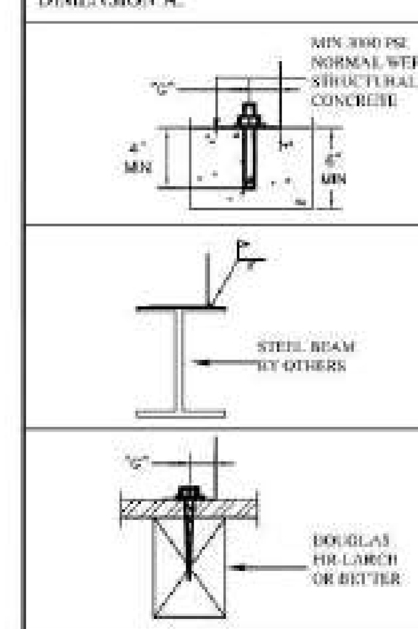


NOTE: FINISH CURB HEIGHT IS 13.5" TALLER THAN DIMENSION A.

ALL WORK SHALL CONFORM TO THE STANDARD OF 2018 INTERNATIONAL BUILDING CODE & 2019 CALIFORNIA BUILDING CODE.

SEISMIC DESIGN CRITERIA
-SDS = 1.5 ap = 2.5
-I = 1.5 Rp = 2.0

WIND DESIGN CRITERIA
-MAX 60 FT TALL BUILDING
-EXPOSURE C
-175 MPH, 3 SECOND GUST WIND



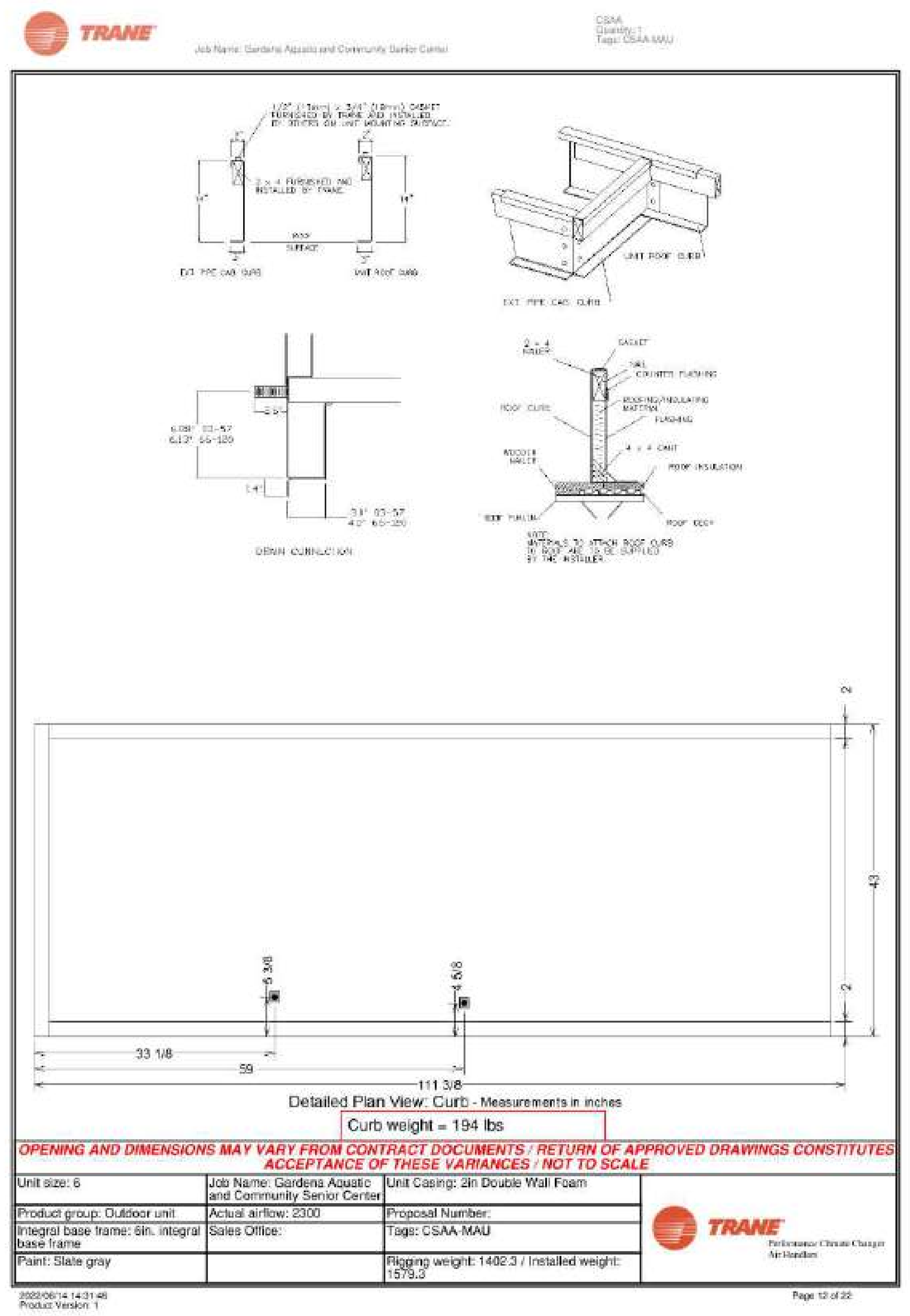
STRUCTURAL REVIEW BY: MARTIN & associates

REGISTERED PROFESSIONAL ENGINEER GREGORY LOUIS OROZCO No. 4957 STRUCTURAL STATE OF CALIFORNIA

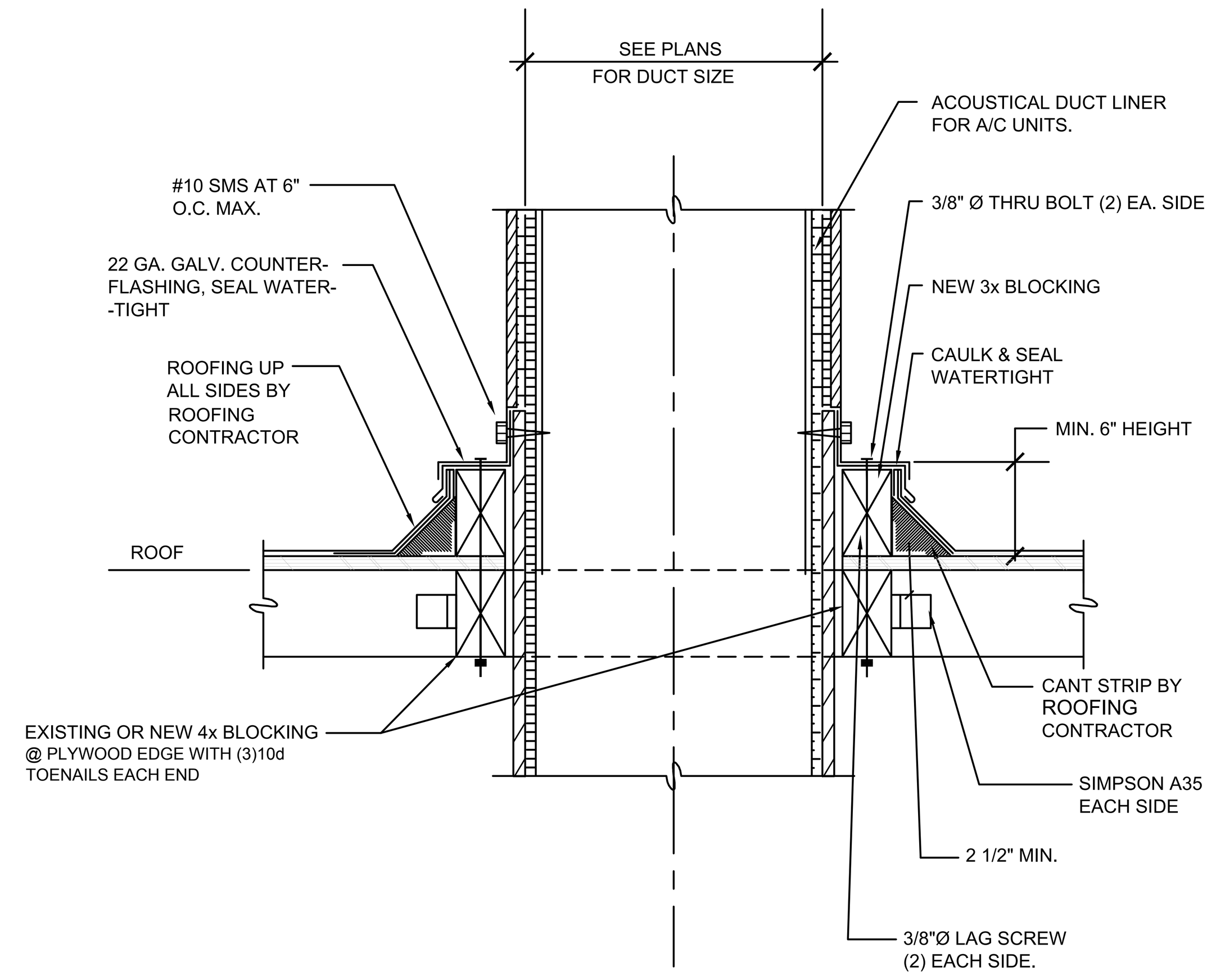
12/7/2018

PROJECT: IBC 2018/ CBC 2019 UPDATE DATE: 11.30.18
ENGINEER: LD DISTRIBUTOR:
DRAWING NUMBER: GROUP_B_ISO.DWG PAGE 1 OF 3

FACTORY VIBRATION ISOLATION CURB FOR TRANE RTU (4 TO 6 TON) SCALE NONE 5

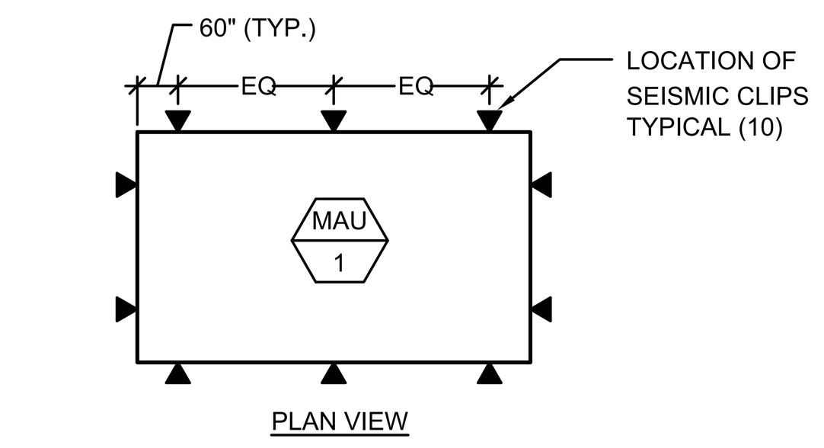


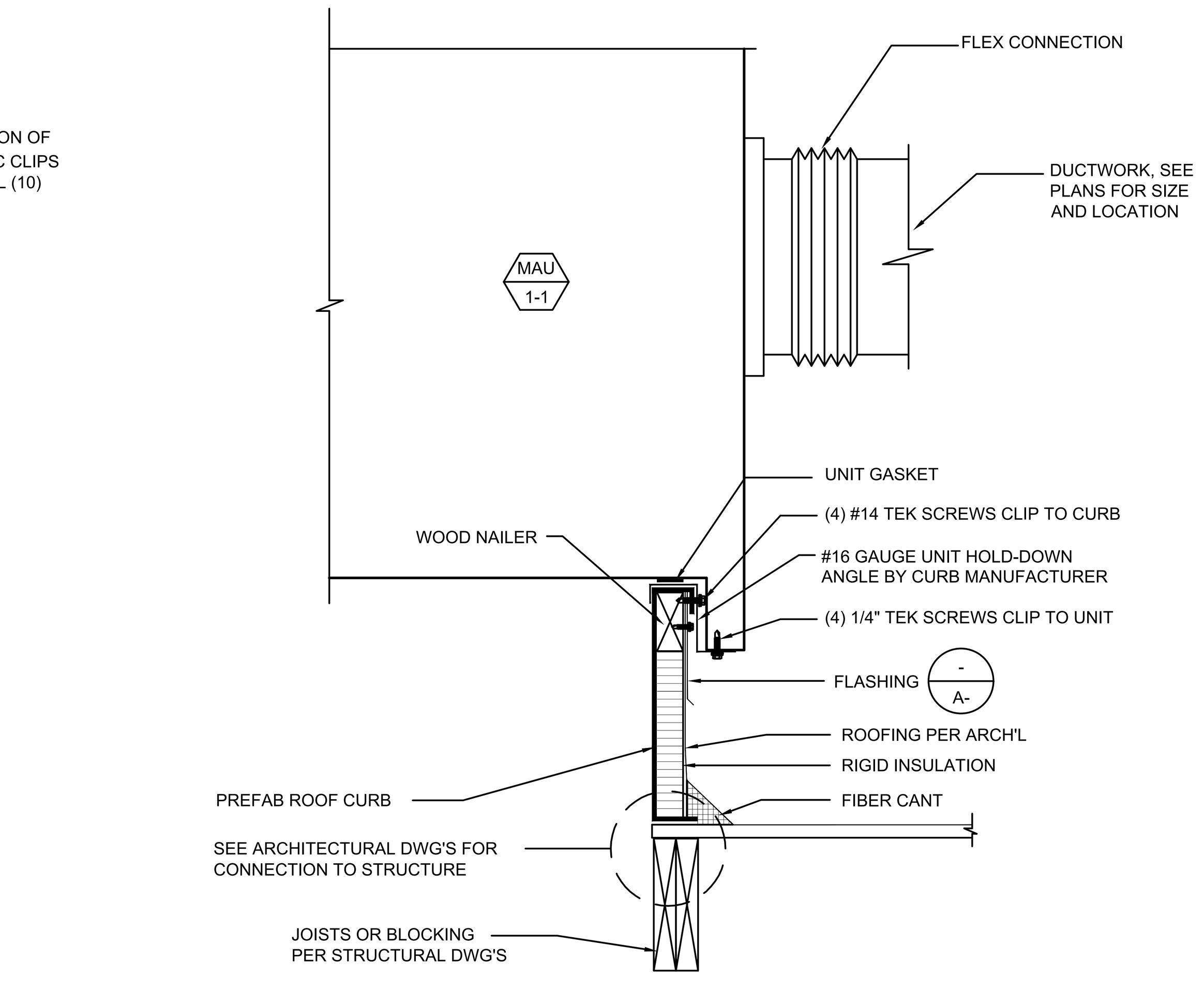
MANUFACTURE ROOF CURB FOR MAKE-UP AIR UNIT MAU-1-1 SCALE NONE 6



NOTES:
1. FOR ALL EXPOSED METAL, PROVIDE STAINLESS STEEL, HOT DIP GALVANIZED OR OTHER CODE APPROVED CORRISON RESISTANT COATING.
2. ALL FASTENERS SHALL BE STAINLESS STEEL, HOT DIP GALVANIZED OR OTHER CODE APPROVED CORRISON RESISTANT COATING.

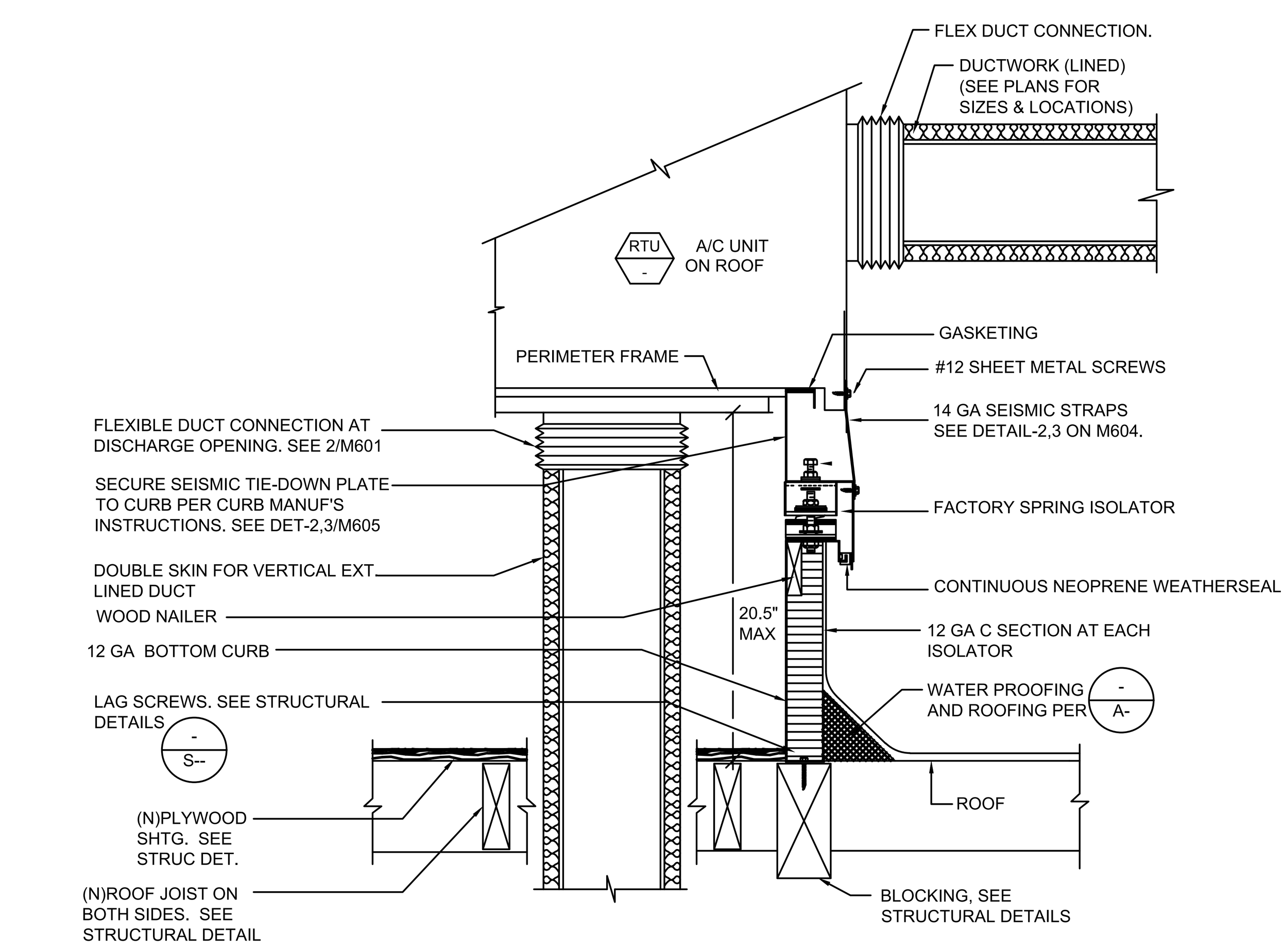
DUCT UP THRU ROOF DETAIL SCALE NONE 4





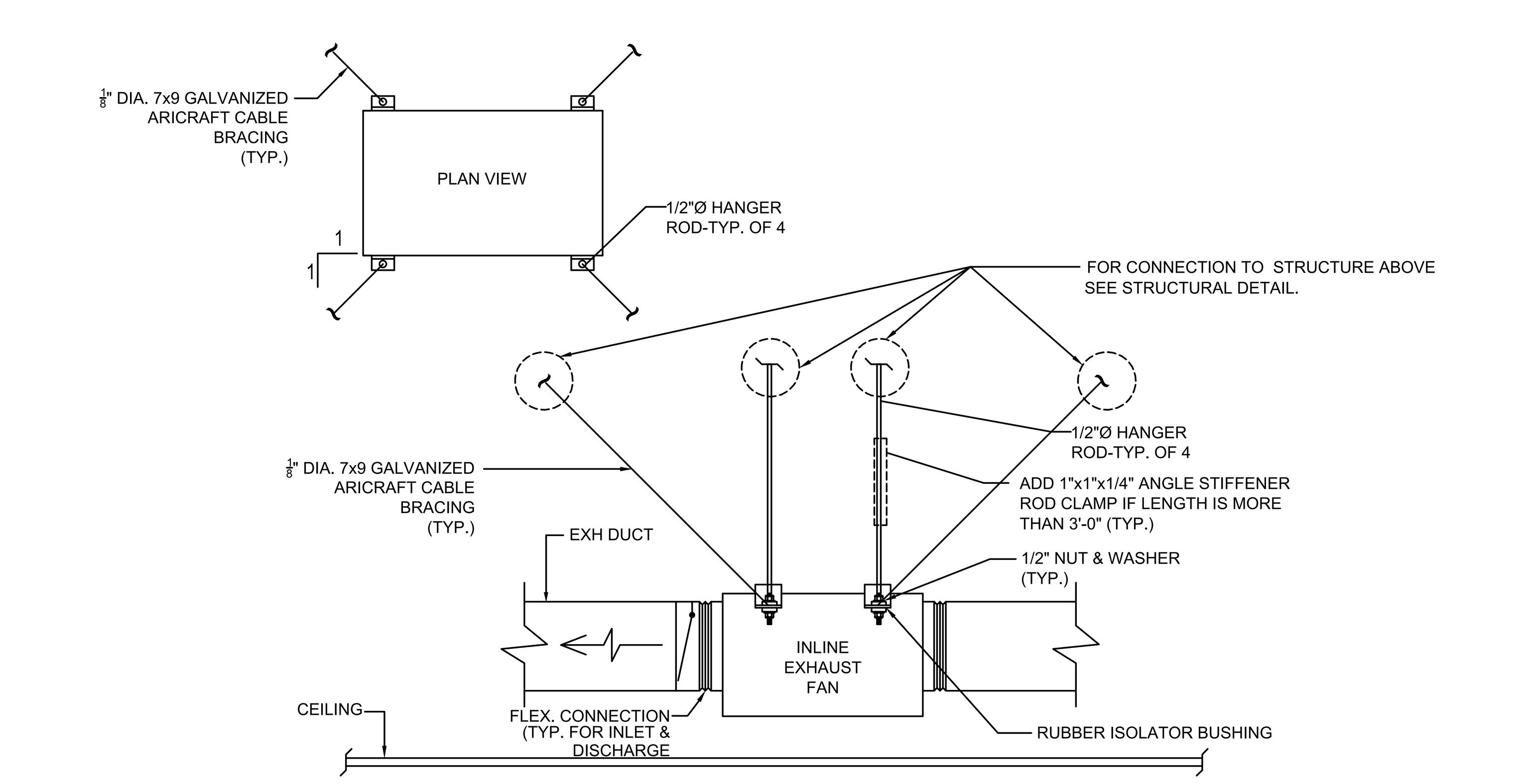
NOTES:
1. FILL ENTIRE VOID SPACE IN ROOF CURB WITH BATT INSULATION.

MAKE-UP AIR UNIT ON ROOF SUPPORT DETAIL SCALE NONE 3



NOTES:
1. COORDINATE WITH STRUCTURAL ROOF FRAMING PLAN.

ROOFTOP PACKAGED UNIT MOUNTING DETAIL SCALE NONE 2



INLINE EXHAUST FAN MOUNTING DETAIL SCALE NONE 1

ALFATECH
421 EAST HUNTINGTON DRIVE
MONROVIA, CA 91016
PHONE: (213) 212-9860
www.atce.com

CITY OF GARDENA INCORPORATED 1930

PREPARED BY:
SVA ARCHITECTS
6 HUTTON CENTRE DR, SUITE 1150
SANTA ANA, CA 92707
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REVISIONS			
NO.	DESCRIPTION	DATE	APPROVED

B.M.: THE CITY OF GARDENA BENCHMARK NO. SD-15 ELEV. = 43.508'

DESIGNED BY / DRAWN BY / CHECKED BY — INITIAL — DATE

CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS - ENGINEERING
MECHANICAL DETAILS
COMMUNITY AQUATICS & SENIOR CENTER
M5.03

APPROVED BY:
APPROVED BY: DIRECTOR OF PUBLIC WORKS

SHT. 107 OF 157 DWG. NO. 5-2606

ROOF TOP HEAT PUMP PACKAGED UNIT SCHEDULE

TAG	MANUFACTURER MAKE	MANUFACTURER MODEL	AREA SERVED	TONS	ELECTRICAL FOR RTU POWER	HP	MCA	MOCP	ELECTRICAL FOR POWER EXHAUST (P.E) MAKE, MODEL & TYPE	ESP IN.WC.	MOTOR HP	MOTOR FLA	MOTOR MCA	MOTOR MOCP	POWER	ECONOMIZER MAKE & MODEL	SUPPLY FAN CFM	SUPPLY FAN EXTRNAL SP IN.WG.	MIN OSA CFM	COOLING CAPACITY TOTAL (MBH)	COOLING CAPACITY SENSIBLE (MBH)	EER/IEER	SEER	EVAPORATOR COIL EDB (°F)	EWB (°F)	LDB (°F)	LWB (°F)	HEATING (HEAT PUMP) INPUT (MBH)	OUTPUT (MBH)	EFF % (COP)	WEIGHT (LBS) RTU	CURB	P.E/ECON	TOTAL	MOUNT'G DETAIL	REMARKS
RTU 1-1	TRANE	WHC074H3R0A	FIRST FLOOR	6	460V-3Ø-60HZ	2.75	19.0	25.0	CANFAB MODEL 6144-PE/MPE	0.50	0.75	1.5	1.875	3.375	460V-3Ø-60	CANFAB MODEL 6144-PE/MPE	2400	1.2	600	75.83	56.37	12.1	15.5	80.0	67.0	55.73	55.64	-	73.65	-	829	687	331	1940 (11)	- M	1 2 3 4 6 7 8
RTU 1-2	TRANE	WHC048H3R0A	FIRST FLOOR	4	460V-3Ø-60HZ	1.5	11.0	15.00	-	-	-	-	-	-	-	FACTORY PROVIDED ECONOMIZER	1600	1.2	400	46.52	36.86	13.0	16.5	80.0	67.0	57.20	57.12	-	43.66	-	679	687	N/A	1435 (11)	- M	1 2 4 8 9
RTU 2-1	TRANE	WHC048H3R0A	SECOND FLOOR	4	460V-3Ø-60HZ	1.5	11.0	15.0	-	-	-	-	-	-	-	CANFAB MODEL SUB-6141-HEC	1600	1.2	400	46.73	37.07	13.0	16.5	80.0	67.0	57.20	57.12	-	43.58	-	679	687	220	1950 (11)	- M	1 2 8 9 10
RTU 2-2	TRANE	WHC048H3R0A	SECOND FLOOR	4	460V-3Ø-60HZ	1.5	11.0	15.0	-	-	-	-	-	-	-	CANFAB MODEL SUB-6141-HEC	1600	1.2	400	46.73	37.07	13.0	16.5	80.0	67.0	57.20	57.12	-	43.58	-	679	687	220	1950 (11)	- M	1 2 8 9 10
RTU 2-3	TRANE	WHC048H3R0A	SECOND FLOOR	4	460V-3Ø-60HZ	1.5	11.0	15.0	-	-	-	-	-	-	-	CANFAB MODEL SUB-6141-HEC	1600	1.2	400	46.73	37.07	13.0	16.5	80.0	67.0	57.20	57.12	-	43.58	-	679	687	220	1950 (11)	- M	1 2 8 9 10
RTU 2-4	TRANE	WHC060H3R0A	SECOND FLOOR	5	460V-3Ø-60HZ	1.5	12.0	15.0	CANFAB MODEL 6142-PE/MPE	0.50	0.75	1.5	1.875	3.375	460V-3Ø-60	CANFAB MODEL 6142-PE/MPE	2000	1.2	400	58.61	46.64	13.0	16.4	80.0	67.0	57.26	57.17	-	56.60	-	678	687	331	1780 (11)	- M	1 2 3 4 6 8
RTU 2-5	TRANE	WHC048H3R0A	SECOND FLOOR	4	460V-3Ø-60HZ	1.5	11.0	15.00	-	-	-	-	-	-	-	FACTORY PROVIDED ECONOMIZER	1600	1.2	400	46.52	36.86	13.0	16.5	80.0	67.0	57.20	57.12	-	43.66	-	679	687	N/A	1435 (11)	- M	1 2 4 8 9

REMARKS
(1) PROVIDE FACTORY VIBRATION ISOLATION CURB.
(2) PROVIDE MERV 13 FILTER WITH FACTORY INSTALLED CONTROLLER TIED TO RTU.
(3) PROVIDE 0-100% FULLY MODULATING ECONOMIZER AND INTEGRAL POWER EXHAUST WITH DRY-BULB INTEGRATED CONTROL. PROVIDE DUAL, SEPARATE POWER TO UNIT AND POWER EXHAUST. PROVIDE CARBON DIOXIDE (CO2) SENSOR FOR DCV CONTROL.
(4) VERTICAL SUPPLY AND RETURN DUCT DISCHARGE
(5) PROVIDE DUCT SMOKE DETECTOR ON SA DUCT PER FIRE ALARM DRAWINGS. PROVIDE CO DETECTOR PER 2019 CBC 915.
(6) PROVIDE SEPARATE POWER FOR POWER EXHAUST.
(7) PROVIDE FAULT DETECTION DIAGNOSTICS PER T-24 120.2(I).
(8) PROGRAMMABLE THERMOSTAT TIED TO RTU. PROVIDE ALL NECESSARY CONTROLS, EQUIPMENT, PROGRAMMING, WIRING AND CONDUITS FOR CONNECTION EXISTING EMS.
(9) PROVIDE 0-100% FULLY MODULATING ECONOMIZER WITH DRY-BULB INTEGRATED CONTROL AND BUILT IN RELIEF DAMPER.
(10) HORIZONTAL SUPPLY & RETURN DUCT DISCHARGE.
(11) ADDED 5% ON THE UNIT WIGHT FOR OTHER MANUFACTURER CAN BID ON THE PROJECT.

SPLIT SYSTEM AIR CONDITIONER SCHEDULE - INDOOR UNIT

SYMBOL	MANUFACTURER AND MODEL NO.	ROOM SERVED	AIRFLOW CFM	REFRIGERATION AMBIENT DB- °F.	REFRIGERATION LVG. AIR DB °F.	ELECTRICAL FLA	ELECTRICAL MCA	ELECTRICAL MCOP	ELECTRICAL V-Ø-HZ	OPERATING WEIGHT (LBS.)	ACOUSTIC DATA (dBA)	ANCHORAGE DETAIL	REMARKS
FC 1-1	MITSUBISHI HIGH WALL DUCTLESS MODEL TPKA0A0121LA00A	BATTERY RM	360	101	51.8	(1)	(1)	(1)	208V-1Ø-60HZ	28.0	48.0	- M-	1 2 8
FC 1-2	MITSUBISHI HIGH WALL DUCTLESS MODEL TPKA0A0181LA00A	ELEV. CONTROL RM	450	101	56.9	(1)	(1)	(1)	208V-1Ø-60HZ	28.0	48.0	- M-	1 2 8
FC 1-3	MITSUBISHI HIGH WALL DUCTLESS MODEL TPKA0A0121LA00A	LIFEGUARD	360	101	51.8	(1)	(1)	(1)	208V-1Ø-60HZ	28.0	48.0	- M-	1 2 8

(1) POWER TO BE SUB FED FROM OUTDOOR CONDENSING UNIT.
(2) COMPLETE WITH MOUNTING BRACKETS, CLEANABLE FILTERS (2)8x12, WALL MOUNTED REMOTE CONTROLLER AND MAXIBLUE CONDENSATE PUMP (120V-1). POWERED FROM FAN COIL UNIT. PROVIDE SAFETY SWITCH.
(3) GROSS COOLING CAPACITY BASED ON 101° F TEMPERATURE OF AIR ENTERING CONDENSER.
(4) SIZE RL & RS LINES PER MANUFACTURER'S RECOMMENDATION BASE ON TOTAL DEVELOPED LENGTH. BOTH REFRIGERANT PIPING SHALL BE INSULATED.

SPLIT SYSTEM AIR CONDITIONER SCHEDULE - OUTDOOR UNIT

SYMBOL	MANUFACTURER AND MODEL NO.	UNIT SERVED	COOLING TOTAL (MBH)	COOLING SENS. (MBH)	HEATING TOTAL (MBH)	HEATING HSPF	IEER	EER	ELECTRICAL MCA	ELECTRICAL MOCP	ELECTRICAL V-Ø-HZ	REFRIGERANT LINES SUCTION	REFRIGERANT LINES LIQUID	OPERATING WEIGHT (LBS.)	ACOUSTIC DATA (dBA)	ANCHORAGE DETAIL	REMARKS
CU 1-1	MITSUBISHI CONDENSING UNIT MODEL TRUZA0121KA70NA	FC 1-1	12,000	10,560	14,000	10.2	21.1	13.3	11.0	28	208/230V-1Ø-60HZ	1/2	1/4	93	46.0	- M-	1 2 3 4
CU 1-2	MITSUBISHI CONDENSING UNIT MODEL TRUZA0181KA70NA	FC 1-2	18,000	13,140	19,000	11.2	19.8	10.7	11.0	28	208/230V-1Ø-60HZ	1/2	1/4	100	46.0	- M-	1 2 3 4
CU 1-3	MITSUBISHI CONDENSING UNIT MODEL TRUZA0121KA70NA	FC 1-3	12,000	10,560	14,000	10.2	21.1	13.3	11.0	28	208/230V-1Ø-60HZ	1/2	1/4	93	46.0	- M-	1 2 3 4

DIFFUSER SCHEDULE

MARK NO.	TYPE	OVERALL DIMENSIONS (IN)	NECK SIZE (IN)	CFM RANGE	MAX. NC	MAX. S.P. (IN WC)	REMARKS SEE BELOW REQUIREMENTS
CD-1	CEILING SUPPLY	24 X 24	6"Ø	0 - 120	25	0.05	TITUS OMNI, SQUARE PLAQUE, 4-WAY PATTERN UNLESS OTHERWISE NOTED. PROVIDE WITH DIRECTIONAL BLOW CLIPS.
CD-2	CEILING SUPPLY	24 X 24	8"Ø	121 - 200	25	0.05	TITUS OMNI, SQUARE PLAQUE, 4-WAY PATTERN UNLESS OTHERWISE NOTED. PROVIDE WITH DIRECTIONAL BLOW CLIPS.
CD-3	CEILING SUPPLY	24 X 24	10"Ø	201 - 300	25	0.05	TITUS OMNI, SQUARE PLAQUE, 4-WAY PATTERN UNLESS OTHERWISE NOTED. PROVIDE WITH DIRECTIONAL BLOW CLIPS.
CD-4	CEILING SUPPLY	24 X 24	12"Ø	301 - 450	25	0.05	TITUS OMNI, SQUARE PLAQUE, 4-WAY PATTERN UNLESS OTHERWISE NOTED. PROVIDE WITH DIRECTIONAL BLOW CLIPS.
CR-1	CEILING RETURN	24 X 24	6"Ø	0 - 120	25	0.05	TITUS OMNI, SQUARE PLAQUE, REMOVE INTERANAL CORE
CR-2	CEILING RETURN	24 X 24	8"Ø	121 - 200	25	0.05	TITUS OMNI, SQUARE PLAQUE, REMOVE INTERANAL CORE
CR-3	CEILING RETURN	24 X 24	10"Ø	201 - 300	25	0.05	TITUS OMNI, SQUARE PLAQUE, REMOVE INTERANAL CORE
CR-4	CEILING RETURN	24 X 24	12 X 12	301 - 450	25	0.05	TITUS PAR (DUCTED SOUND BOOT), PERFORATED FACE.
CR-5	CEILING RETURN	24 X 24	16"Ø	451 - 600	25	0.25	TITUS OMNI, SQUARE PLAQUE, REMOVE INTERANAL CORE
CR-5	CEILING RETURN	24 X 24	16"Ø	451 - 600	25	0.25	TITUS OMNI, SQUARE PLAQUE, REMOVE INTERANAL CORE
CR-6	CEILING RETURN	24 X 24	22x22	601 - 900	25	0.25	TITUS OMNI, SQUARE PLAQUE, REMOVE INTERANAL CORE
WR-1	WALL RETURN	38 X 20	36 X 18	0 - 1690	25	0.05	TITUS 350RL (DUCTED SOUND BOOT), PERFORATED FACE.
SWS-1	SPIRAL DUCT-MOUNTED	16 X 8	14 X 6	0 - 220	25	0.08	TITUS S300, 3/4" BLADE SPACING, DOUBLE DEFLECTION, WITH AIR SCOOP DAMPER/EXTRACTOR, ALUMINUM FINISH
SWS-2	SPIRAL DUCT-MOUNTED	20 X 8	18 X 6	220 - 400	25	0.08	TITUS S300, 3/4" BLADE SPACING, DOUBLE DEFLECTION, WITH AIR SCOOP DAMPER/EXTRACTOR, ALUMINUM FINISH
RS-1	ROUND CEILING DIFFUSER	27"Ø	12"Ø	300 - 400	20	0.08	TITUS TMRA, ADJUSTABLE DISCHARGE PATTERN ROUND DIFFUSER.

REMARKS:
(1) PROVIDE BLACK BACKING FOR DIFFUSERS.
(2) ALL FINISHES AND FRAMES SHALL BE APPROVED BY ARCHITECT.
(3) FRAME TYPE FOR ALL AIR INLETS/OUTLETS SHALL BE SUITABLE/COMPATIBLE WITH CEILING TYPE AND GRID THAT IS TO BE INSTALLED IN.
(4) OPPOSED BLADE DAMPERS ARE NOT ALLOWED ON AIR DISTRIBUTION. SEE NOTE ON PLANS REQUIRING ALL BALANCING THROUGH MANUAL VOLUME DAMPERS IN DUCT, AS FAR AS POSSIBLE FROM DIFFUSERS AND GRILLES.
(5) REMOVE PATTERN CONTROLLER FOR RETURN AIR - PROVIDE WITH CONCEALED TYP FRAME.
(6) DUCT MOUNTED GRILLE FINISH SHALL MATCH EXPOSED SHEET METAL DUCTWORKS.
(7) LINED RETURN AIR SOUND BOOTH TO BE FITTED TO ALL CEILING RETURNS UNLESS THEY ARE DUCTED TO THE FCU RETURN AS INDICATED ON THE PLANS
(8) THE INSIDE OF ALL TRANSFER DUCTWORK CONNECTING TO SIDEWALL PERFORATED FACE GRILLES SHALL BE FINISHED IN FLAT BLACK.

MAKE-UP AIR UNIT SCHEDULE

SYMBOL	MANUFACTURER & MODEL NO.	AREA SERVED	LOCATION	BMS INTERLOCK WITH	SUPPLY AIR BLOWER CFM	SUPPLY AIR BLOWER TSP ("WG)	BHP	RPM	MOTOR HP	MOTOR VOLTAGE	MOTOR MCA	MOTOR MOP	HEATING FURNACE INPUT MBH	HEATING FURNACE OUTPUT MBH	HEATING FURNACE GAS CONN	HEATING FURNACE EFF	FILTER	AREA SMOKE DETECTOR SHUT DOWN	OPER. WEIGHT (LBS.)	ANCHORAGE DETAIL REFERENCE	REMARKS
MAU 1-1	TRANE CSAA006	RESTROOM	ROOF	EF 1-4	2300	2.176	1.27	-	1.5	460-3-60	2.75	15.0	120	95	RIGHT	80%	- -	YES	1622 (4)	- - - -	1 2 3

REMARKS
(1) TWO STAGE GAS VALVE.
(2) ROOF CURB ARE BY MANUFACTURE. VERIFY SLOPE OF ROOF WITH ARCHITECTURAL ROOF PLANS.
(3) THIS BUILDING HAS TOTAL AREA COVERAGE FOR SMOKE DETECTION. SEE FIRE ALARM DRAWINGS FOR CONTROL RELAYS TO SHUT DOWN HVAC UNITS.
(4) INCLUDED MANUFACTURE ROOF CURB'S WEIGHT.

FAN SCHEDULE

SYMBOL	MANUFACTURER AND MODEL NO.	SERVICE	LOCATION	BLOWER CFM	BLOWER SP IN. WC.	BLOWER RPM	MOTOR HP	MOTOR RPM	MOTOR POWER V-PH-HZ	MOTOR DRIVE	SONES	OPERATING WEIGHT LBS	SUPPORT DETAIL	ACCESSORIES	REMARKS
EF-1-1	GREENHECK SQ-97-VG	KITCHEN	CEILING	300	0.25	1641	1/4	1725	115-1-60	DIRECT	15.3	50	-	(2)	
EF-1-2	GREENHECK SP-AP0511W	ELEC. RM	CEILING	110	0.25	861	11 WATTS	-	115-1-60	DIRECT	0.8	10	-	(2)	
EF-1-3	GREENHECK SP-AP0511W	BATTERY RM	CEILING	75	0.25	831	11 WATTS	-	115-1-60	DIRECT	0.8	10	-	(2)	
EF-1-4	GREENHECK G-140-VG	RESTROOMS -	ROOF	2500	1.0	1678	1	1725	115-1-60	BELT	16.0	78	-	(1)	1 2 3 4
EF-2-1	GREENHECK G-098-VG	RESTROOMS -	ROOF	650	0.5	1615	1/4	1725	115-1-60	BELT	16.0	40	-	(1)	1 2 3 4

ACCESSORIES:
(1) VARI GREEN EC MOTOR WITH 0-10 VDC INPUT SIGNAL TO VARY FAN SPEED AND BALANCING DIAL. (2) BACKDRAFT DAMPER.
(3) PRE-FAB ALUMINUM SOUND ATTENUATOR ROOF CURB. (4) BIRD SCREEN.

REMARKS: (1) FAN SELECTED FOR 10% MORE THAN BALANCE CFM.

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REVISIONS

NO.	DESCRIPTION	DATE	APPROVED

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DRAWN BY		
CHECKED BY		

APPROVED BY:
APPROVED BY: DIRECTOR OF PUBLIC WORKS
SHT. 108 OF 157 DWG. NO. S-2606

PLOT DATE: 5/26/2023 5:04:11 PM

BUILDING WATER CALCULATIONS

TABLE 1-BUILDING WATER SUPPLY

Gardena Aquatics Center

PROJECT:			
TYPE OF SYSTEM:	DOMESTIC	BLDG TYPE:	SLAB ON GRADE
PIPE LOSSES ARE BASED ON:	SMOOTH	(CHART A-4) PIPE AND FITTINGS	
MAXIMUM CW DEMAND:	W.S.F.U./GPM 156.5 FU + 10= 185 = 24	GPM	313.00
AVAILABLE PRESSURE (BLDG POC)	HIGH 0.0 PSI	LOW	0.00 PSI
LOSS THROUGH WATER METER	SIZE: (4" meter) N/A	@ 313 GPM	7.2 PSI
LOSS THROUGH REDUCED PRESURE BACK FLOW PREVENTOR (IF APPLICABLE)			10.0 PSI
BUILDING PRESSURE REGULATOR SET POINT (IF APPLICABLE)			0.0 PSI
LOSS THROUGH PRESSURE REGULATOR			0.0 PSI
LOSS THROUGH SUB METER	SUBMETER SIZE OR MODEL		
FLOW: GPM 0.00	FU 0.0		0.0 PSI
PRESSURE REQUIRED @ MOST REMOTE OR/AND HIGHEST FIXTURE WITH WORST SUPPLY CONDITION			30.00 PSI
STATIC LOSS: 10.0 ft	X 0.434		4.34 PSI
TOTAL LOSSES (FROM STREET TO BUILDING):			21.54 PSI
AVAILABLE PRESSURE FOR FRICTION LOSS (FROM LOW OR REGULATOR SET POINT)			51.54 PSI
TOTAL DEVELOPED LENGTH(ADD 15% EXTRA FOR FITTINGS &VALVES): 0.0 ft			
AVAILABLE PRESSURE LOSS PER 100' = -51.5 PSI / 0.0 ft =	0.00		PSI/per 100'

BOOSTING NEEDED	YES BOOSTER OUTLET SET POINT		0.0 PSI
ZONE PRESSURE REGULATOR SET POINT			0.0 PSI
ZONE LOSS THROUGH PRESSURE REGULATOR	REGULATOR SIZE & MODEL		0.0 PSI
ZONE LOSS THROUGH SUB METER	SUBMETER SIZE OR MODEL		
FLOW: GPM 0.00	FU 0.0		0.0 PSI
ZONE PRESSURE REQUIRED @FIXTURE	FLUSH VALVE SYSTEM		0.0 PSI
ZONE STATIC LOSS (GAIN, if negative): 0.0 ft	X 0.434		0.0 PSI
TOTAL LOSS (AFTER BOOSTING):			0.00 PSI
ZONE AVAILABLE PRESSURE FOR FRICTION LOSS(ADD 15% EXTRA FOR FITTINGS &VALVES)			0.00 PSI
ZONE TOTAL DEVELOPED LENGTH(ADD 15% EXTRA FOR FITTINGS &VALVES 0.0 ft			
ZONE AVAILABLE PRESSURE LOSS PER 100' = 0.0 PSI / 0.0 ft =	0.00		PSI/per 100'

TABLE 2-COLD WATER PIPE SIZING CRITERIA

PRESSURE LOSS	0.00	PSI per 100'	COPPER
MAXIMUM VELOCITY	0.00	f/s	H-W Coef. 140

	NPS PIPE SIZE(INCH)	ID(INCH)	GPM	FU(PT SYS.)	FU(TV SYS.)	VEL.
TYPE L COPPER	1/2	0.945	0.0	1	-	0.0 f/s
	3/4	0.785	0.0	6	-	0.0 f/s
	1	1.025	0.0	13	-	0.0 f/s
	1 1/4	1.265	0.0	28	-	0.0 f/s
	1 1/2	1.505	0.0	54	14	0.0 f/s
	2	1.985	0.0	185	98	0.0 f/s
	2 1/2	2.465	0.0	431	295	0.0 f/s
	3	2.945	0.0	719	666	0.0 f/s
	4	3.905	0.0	1,668	1,668	0.0 f/s
	6	5.845	0.0	-	-	0.0 f/s
	8	7.725	0.0	-	-	0.0 f/s

TABLE 3-HOT WATER PIPE SIZING CRITERIA

PRESSURE LOSS	0.00	PSI per 100'	COPPER
MAXIMUM VELOCITY	0.00	f/s	H-W Coef. 140

	PIPE SIZE(INCH)	ID(INCH)	GPM	FU(PT SYS.)	FU(TV SYS.)	VEL.
TYPE L COPPER	1/2	0.945	0.0	1	-	0.0 f/s
	3/4	0.785	0.0	6	-	0.0 f/s
	1	1.025	0.0	15	-	0.0 f/s
	1 1/4	1.265	0.0	28	-	0.0 f/s
	1 1/2	1.505	0.0	46	-	0.0 f/s
	2	1.985	0.0	119	-	0.0 f/s
	2 1/2	2.465	0.0	245	-	0.0 f/s
	3	2.945	0.0	405	-	0.0 f/s
	4	3.905	0.0	940	-	0.0 f/s
	6	5.845	0.0	-	-	0.0 f/s
	8	7.725	0.0	-	-	0.0 f/s

Notes:
- Flow, Head Loss, Velocity and Pressure Loss, calculated per Hazen-Williams Equation.
- Fixture Units and corresponding GPM conversion per LADBS document No. P/PC 2004-xx Public Information Bulletin

PLUMBING SYMBOLS

PLUMBING

- DOMESTIC COLD WATER
- DOMESTIC HOT WATER
- (E)PD — EXISTING PUMP DISCHARGE LINE
- SANITARY WASTE ABOVE FLOOR
- SANITARY WASTE BELOW FLOOR
- VENT
- (E) EXISTING PIPE TO BE DEMO'D

DESCRIPTION

- YY — FIXTURE NUMBER
- XXX / YY — EQUIPMENT DESIGNATION TAG
- DETAIL NUMBER / SHEET NUMBER -(WHERE DETAIL IS SHOWN)
- KEYNOTES

VALVES & FITTINGS

- CO — CLEAN OUT
- WCO — WALL CLEAN OUT
- FCO — FLOOR CLEAN OUT
- GRADE CLEAN OUT (DOUBLE CLEAN OUT)
- GCO
- FLOOR DRAIN / FLOOR SINK
- DOWNSPOUT NOZZLE
- WALL HYDRANT
- HOSE BIB
- ALIGNMENT GUIDE
- PIPE ANCHOR
- PIPE EXPANSION JOINT
- PIPE CAP
- PIPE UP
- PIPE DOWN
- PIPE TEE, UP
- PIPE TEE, DOWN
- UNION
- DIRECTION OF PIPE PITCH
- AQUASTAT
- WATER HAMMER ARRESTER
- BALL VALVE
- BUTTERFLY VALVE
- VALVE (GENERIC)
- CHECK VALVE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- FLEXIBLE CONNECTION
- FLOW DIRECTION
- SHUT OFF VALVE
- GATE
- GLOBE
- PLUG VALVE
- PRESSURE GAUGE
- SOLENOID VALVE
- ANGLE VALVE
- STRAINER
- PRESSURE AND TEMPERATURE TEST PORT
- THERMOMETER
- RELIEF VALVE

NOTE:

NOT ALL SYMBOLS AND ABBREVIATIONS LISTED ON THIS DRAWING MAY APPLY TO THE PROJECT.

ABBR.	DESCRIPTION	ABBR.	DESCRIPTION
ABBREV	ABBREVIATIONS	JS	JANITORS SINK
AD	ACCESS DOOR	LAV	LAVATORY
AFF	ABOVE FINISHED FLOOR	MFGR	MANUFACTURER
AP	ACCESS PANEL	(N)	NEW
BEL	BELOW	OTCS	OPEN TO CEILING SPACE
BFF	BELOW FINISHED FLOOR	PE	POLYETHYLENE
BOP	BOTTOM OF PIPE	PVC	POLYVINYLCHLORIDE
CFF	CAP FOR FUTURE	T&P	TEMPERATURE & PRESSURE
CI	CAST IRON	QTY	QUANTITY
CLG	CEILING	RD	ROOF DRAIN
CW	COLD WATER	REF	REFRIGERATOR
DIA.	DIAMETER	RPBP	REDUCED PRESSURE BACKFLOW PREVENTOR
DF	DRINKING FOUNTAIN	S	SANITARY SEWER
DFU	DRAINAGE FIXTURE UNIT	S.O.V.	SHUT-OFF VALVE
DWG	DRAWING	TYP.	TYPICAL
(E)	EXISTING	UNO	UNLESS NOTED OTHERWISE
EWC	ELECTRIC WATER COOLER	UR	URINAL
FCO	FLOOR CLEAN OUT	V	VENT
FD	FLOOR DRAIN	VBF	VENT BELOW FLOOR
FLR	FLOOR	VTR	VENT THRU ROOF
FW	FILTERED DOMESTIC COLD WATER	W	SANITARY WASTE
HS	HAND SINK	WABG	SANITARY WASTE ABOVE GRADE
HW	HOT WATER	WBEG	SANITARY WASTE BELOW GRADE
IAW	IN ACCORDANCE WITH	WC	WATER CLOSET
IJS	IN JOIST SPACE	WCO	WALL CLEAN OUT
I.E.	INVERT ELEVATION	WHA	WATER HAMMER ARRESTOR
IW	INDIRECT WASTE	WSFU	WATER SUPPLY FIXTURE UNIT

MEDIUM PRESSURE GAS SIZING CHART

A. POOL EQUIPMENT (2 @ 2000; 1 @ 1500; 1 @ 500) — 6000 CFH
B. HVAC BOILER (3 @ 750) — 750 CFH
GRAND TOTAL CONNECTED LOAD — 6750 CFH

PIPE SIZE	CFH
1/2"	728
3/4"	1470
1"	2690
1-1/4"	5520
1-1/2"	8270
2"	15900

NOTE: 1. NATURAL GAS SYSTEM BASED ON 2019 CPC, TABLE 1215.2(6) SCHEDULE 40 METALLIC PIPE.
2. SYSTEM DEVELOPED LENGTH = 175 FT.5 PSI, 3.5 PSI PRESSURE DROP

LOW PRESSURE GAS SIZING CHART

A. POOL EQUIPMENT (2 @ 2000; 1 @ 1500; 1 @ 500) — 6000 CFH
B. HVAC BOILER (3 @ 750) — 750 CFH
GRAND TOTAL CONNECTED LOAD — 6750 CFH

PIPE SIZE	CFH
1/2"	172
3/4"	360
1"	678
1-1/4"	1390
1-1/2"	2090
2"	4020

NOTE: 1. NATURAL GAS SYSTEM BASED ON 2019 CPC, TABLE 1215.2(1) - SCHEDULE 40 METALLIC PIPE
2. SYSTEM MAXIMUM DEVELOPED LENGTH = 10 FT. LESS THAN 2 PSI, 0.5" W.C. PRESSURE DROP

Fixture Unit Calculation Form

Project Name: Gardena Community & Senior Center — Date: 08-19-22
Created By: Marcia McKone — Checked By: Mengyang Wu

Plumbing Fixture Unit Schedules

Descriptiopn	Quantity	Waste F.U	Water F.U	C.W F.U	H.W F.U	H.W. DEMAND (GPH)	Total Waste F.U	Total Water F.U	Total C.W F.U	Total H.W F.U	Possible max. Total H.W DEMAND (GPH)
Fixtures in Non-Residential Areas											
Lavatory	12	1	1	0.75	0.75	6	12	12	9	9	72
Urinals	5	2	4	1	0	0	10	20	5	0	0
Water Closet	15	4	5	5	0	0	60	75	75	0	0
Kitchen Sink	2	2	2	1.5	1.5	20	4	4	3	3	40
Refridgerator	2	0	0.5	0.5	0	0	0	1	1	0	0
Shower	12	2	2	1.5	1.5	30	24	24	18	18	360
Service Sink	3	3	3	2.25	2.25	20	9	9	6.75	6.75	60
Drinking Fountain (Hi-Lo)	2	1	1	1	0	0	2	2	2	0	0
Hose Bibb(1st one)	1	0	2.5	2.5	0	0	0	2.5	2.5	0	0
Hose Bibb	5	0	1	1	0	0	0	5	5	0	0
4" Floor Sink	3	8	0	0	0	0	24	0	0	0	0
Indirect Waste Receptors	3	6	0	0	0	0	18	0	0	0	0
Floor Drain (Emergency only)	11	0	0	0	0	0	0	0	0	0	0
Hub Drain	1	100	0	0	0	0	100	0	0	0	0
Emergency Eyewash/Shower	2	2	0	0	0	0	4	0	0	0	0
Hand Sink	1	2	2	1.5	1.5	0	2	2	1.5	1.5	0
Pool make-up water = 195 GPM											
Mechanical make-up water = 10 GPM											
Grand Totals							**269**	**156.5**	**127.25**	**36.75**	**532**
							Total Waste F.U	**Total Water F.U**	**Total C.W F.U**	**Total H.W F.U**	**Total H.W Possible max. DEMAND**
							Total Bldg Water Demand GPM =	**313 GPM**	**Use 0.4 as demand factor and 1.0 for storage factor: Heater capacity = 212.8 gph, storage tank = 40 Gal.**		

PLUMBING NOTES

A. PRIOR TO BID THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS, ELEVATIONS, POINTS OF CONNECTIONS AND CHARACTERISTICS OF ALL UTILITY PIPING AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT OF ANY DISCREPANCIES.

B. PROVIDE PIPING, EQUIPMENT, AND MATERIALS IN ACCORDANCE WITH APPLICABLE PLUMBING CODE REGULATIONS, STANDARDS, AUTHORITY HAVING JURISDICTION REQUIREMENTS AND AS OTHERWISE RECOMMENDED OR DIRECTED BY MANUFACTURERS.

C. COORDINATE INSTALLATION OF PIPING BELOW GRADE WITH STRUCTURAL COMPONENTS AND OTHER SYSTEM INSTALLATIONS.

D. COORDINATE INSTALLATION OF PIPING, FIXTURES, EQUIPMENT, ETC. WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PRIOR TO INSTALLATION.

E. CLEANOUTS SHALL BE PROVIDED AS REQUIRED BY CODE AND SHALL BE READILY ACCESSIBLE. THE CONTRACTOR SHALL COORDINATE ALL LOCATIONS WITH EQUIPMENT, CABINETS, ETC., WITH ARCHITECT PRIOR TO ANY INSTALLATION. ALL CLEANOUTS SHALL BE SIZED PER CODE.

F. SEE PLUMBING FIXTURE SCHEDULE FOR PIPE CONNECTION SIZES. PROVIDE LOOSE KEY STOPS TO ALL FIXTURES.

G. PROVIDE CEILING ACCESS PANELS FOR ALL VALVES LOCATED ABOVE INACCESSIBLE CEILING SYSTEMS. MAINTAIN FIRE RATINGS WHERE REQUIRED.

H. SEE ARCHITECTURAL DRAWINGS FOR EXACT FIXTURE LOCATIONS.

I. ALL SEWER / DRAINAGE PIPING BELOW GRADE SHALL BE SLOPED AT 2% (1/4" PER FOOT) UNO.

J. DO NOT RUN ANY PIPES OVER ANY ELECTRICAL PANEL OR SWITCHGEAR. NO PLUMBING WORK SHALL BE INSTALLED ABOVE ELECTRICAL SERVICE EQUIPMENT. COORDINATE PIPE LOCATIONS TO AVOID ELECTRICAL PANELS.

K. PROVIDE MANUFACTURER'S RECOMMENDED AND CODE REQUIRED CLEARANCES AROUND ALL PIECES OF EQUIPMENT. PIPING & CONDUIT SHALL NOT INTERFERE WITH REQUIRED ACCESS.

L. EQUIPMENT LAYOUT IS BASED ON EQUIPMENT LISTED IN EQUIPMENT SCHEDULES. ANY OTHER EQUIPMENT USED IS SUBJECT TO MEETING PERFORMANCE REQUIREMENTS OF LISTED EQUIPMENT. CONTRACTOR SHALL MAKE ALL NECESSARY ADJUSTMENTS TO ASSURE OTHER EQUIPMENT WILL FIT IN AVAILABLE SPACE AND WILL NOT EXCEED WEIGHT AND ELECTRICAL REQUIREMENTS.

M. CLEANOUTS SHALL BE FLUSH WITH FINISHED FLOOR AT SEALED CONCRETE / TILE.

N. REFER TO STRUCTURAL DRAWINGS FOR ALLOWABLE METHODS/LOADS FOR HANGING PIPING FROM STRUCTURAL MEMBERS.

O. ANCHORAGE DETAILS FOR EQUIPMENT ARE SUBJECT TO APPROVAL OF THE STRUCTURAL ENGINEER PRIOR TO INSTALLATION AND INSPECTION. UNLESS SPECIFICALLY SHOWN ON THESE PLANS, NO STRUCTURAL MEMBER SHALL BE CUT, DRILLED NOR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER.

P. SEAL ALL PIPE PENETRATIONS OF WALLS WITH AIRTIGHT SEALANT (FIRE RATED SYSTEM AT RATED WALLS). REFER TO ARCHITECTURAL DRAWINGS FOR RATED WALL LOCATIONS.

Q. EACH PLUMBING VENT SHALL TERMINATE NOT LESS THAN TEN (10) FEET FROM TO THREE (3) FEET ABOVE ANY WINDOW, DOOR, AIR INTAKE, OR VENT SHAFT, AND SHALL HAVE A VANDAL RESISTANT VENT CAP.

R. REFER TO ARCHITECTURAL CODE PLAN FOR AREAS WHERE FIRE PENETRATION MATERIALS ARE REQUIRED.

S. MOUNT HOSE BIBBS @ 36" ABOVE GRADE/FF. UNO. PROVIDE WITH NON-REMOVABLE VACUUM BREAKER.

T. PROVIDE INSULATION FOR PIPES PER CALIFORNIA STATE ENERGY CODE (TITLE 24) AND PER SPECIFICATIONS. IN THE EVENT OF CONFLICTS, PROVIDE MATERIAL WHICH MEETS THE MOST STRINGENT REQUIREMENT.

U. PROVIDE ISOLATION VALVE AT EACH BRANCH CONNECTION TO MAIN (CW AND HW).

V. DIELECTRIC ISOLATION FITTINGS AT POINTS OF CONNECTION OF ALL COPPER TUBING AND ANY DISSIMILAR METALS.

W. GRAVITY FLOW WASTE PIPE SIZES SHALL REMAIN AT INDICATED DOWNSTREAM SIZE WHERE SIZES ARE NOT SHOWN.

X. WHERE DOMESTIC COLD AND/OR HOT WATER PIPING DROPS INTO A PIPE CHASE, THE SIZE SHOWN FOR THE PIPE DROPS SHALL BE USED TO THE LAST FIXTURE.

Y. PROVIDE FIRE STOPS ON PIPING TO MAINTAIN RATING OF FIRE RATED WALLS WHERE PENETRATED BY PIPING.

Z. WHERE DOMESTIC HW/CW PIPE SIZES ARE NOT INDICATED, SUPPLY PIPE SIZE SHALL REMAIN LAST INDICATED UPSTREAM SIZE. CIRCULATION PIPE SHALL REMAIN LAST INDICATED DOWNSTREAM SIZE.

AA. WHERE INDICATED PIPE SIZE IS NOT COMMERCIALLY AVAILABLE, PROVIDE NEXT LARGER AVAILABLE SIZE.

AB. PROVIDE WATER HAMMER ARRESTOR (WHA) ON HOT AND COLD WATER BRANCHES THAT SERVE WATER CLOSETS, SINKS, URINALS, WASHING MACHINES, DISHWASHERS, HOSE BIBS, SHOWERS, TUBS, AND OTHER FIXTURES WITH QUICK-CLOSING VALVES. PLACE WHA WITHIN 6 FEET UPSTREAM OF FIXTURE. PROVIDE WITH ACCESS PANEL IF REQUIRED BY LOCAL CODE.

AC. PROVIDE MINIMUM 1/8" SLOPE ON ALL CONDENSATE PIPING. CONDENSATE PIPING SHALL BE INSULATED AND JACKETED.

AD. ALL BURRED ENDS OF WATER PIPING AND TUBING SHALL BE REAMED TO THE FULL BORE OF THE PIPE OR TUBE AND ALL CHIPS SHALL BE REMOVED (SEE CALIFORNIA PLUMBING CODE, 2019 EDITION, SECTION 309.3) ADDITIONALLY, TOOLS USED IN CUTTING OR REAMING SHALL BE KEPT FREE FROM OIL OR GREASE AND WHERE SUCH CONTAMINATION HAS OCCURRED, THE ITEMS AFFECTED SHALL BE REWORKED AND RINSED.

PLUMBING SHEET INDEX

PIPE SCHEDULE

SERVICE	LOCATION	TYPE 'K' COPPER	TYPE 'L' COPPER	SCH 40 PVC	SCH 80 PVC	SCH 40 STEEL	SCH 80 STEEL	FITTINGS (REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)
		PIPING MATERIALS						
WATER	ABOVE GROUND		●					LEAD FREE SOLDERED JOINTS AND FITTINGS
	BELOW GROUND	●						LEAD FREE SOLDERED JOINTS AND FITTINGS
WASTE, STORM DRAIN	ABOVE FLR			●				PROVIDE TYLER 2-BAND NO-HUB COUPLINGS
	BELOW FLR			●				PROVIDE TYLER 4-BAND NO-HUB COUPLINGS
VENT	ABOVE FLR			●				PROVIDE TYLER 2-BAND NO-HUB COUPLINGS
	BELOW FLR			●				PROVIDE TYLER 2-BAND NO-HUB COUPLINGS
CONDENSATE DRAIN	INSIDE		●					95-5 SOLDERED FITTINGS
	OUTSIDE		●					95-5 SOLDERED FITTINGS
NATURAL GAS	INSIDE					●		-
	OUTSIDE						●	-

LEAD-FREE NOTE

ALL PLUMBING PIPING/FITTINGS AND PLUMBING FIXTURES INTENDED TO CONVEY OR DISPENSE WATER FOR DRINKING OR COOKING SHALL BE "LEAD FREE" IN COMPLIANCE WITH AB 1953. CONTRACTOR SHALL PROVIDE CERTIFICATION AS PART OF THE PLUMBING SUBMITTALS THAT ALL PLUMBING PRODUCTS COMPLY WITH AB 1953.

APPLICABLE CODES AND STANDARDS

1. CITY OF BELL GARDENS MUNICIPAL CODE
2. 2019 CALIFORNIA BUILDING CODE
3. 2019 CALIFORNIA ELECTRICAL CODE
4. 2019 CALIFORNIA MECHANICAL CODE
5. 2019 CALIFORNIA PLUMBING CODE
6. 2019 CALIFORNIA ENERGY CODE
7. 2019 CALIFORNIA GREEN BUILDING CODE
8. 2019 CALIFORNIA FIRE CODE
9. ALL CODES TO INCLUDE COUNTY OF LOS ANGELES CODE AMENDMENTS

GREEN BUILDING COMPLIANCE

A. PLUMBING FIXTURES AND FITTINGS SHALL MEET THE STANDARDS REFERENCED IN 2019 CALIFORNIA GREEN BUILDING STANDARD CODE 5.303.

B. PER 2019 CALIFORNIA GREEN BUILDING STANDARD CODE SECTION 4.303, PLUMBING FIXTURES (WATER CLOSETS AND URINALS) AND FITTINGS (FAUCETS AND SHOWERHEADS) SHALL COMPLY WITH THE FOLLOWING:

1. WATER CLOSETS SHALL NOT EXCEED 1.28 GALLONS PER FLUSH.
2. URINALS SHALL NOT EXCEED 0.5 GALLONS PER FLUSH.
3. SHOWERHEADS SHALL HAVE A MAXIMUM FLOW RATE OF 1.8 GALLONS PER MINUTE AT 80 PSI.
4. LAVATORY FAUCETS SHALL NOT EXCEED 1.2 GALLONS PER MINUTE AT 60 PSI.
5. KITCHEN FAUCETS SHALL NOT EXCEED 1.8 GALLONS PER MINUTE AT 60 PSI.

PLUMBING SCOPE OF WORK

TENANT IMPROVEMENT OF THE EXISTING TWO-FLOOR WAREHOUSE OFFICE SPACE.

1. REPLACEMENT OF THE EXISTING PLUMBING FIXTURES IN THE CORE RESTROOM AND JANITOR'S CLOSET ON LEVEL 1 AND THE UNI-SEX RESTROOM AND JANITOR'S CLOSET ON LEVEL 2.
2. REPLACEMENT OF EXISTING STORAGE TYPE WATER HEATERS IN JANITOR CLOSET.
3. PROVISION OF THE PLUMBING SERVICES TO NEW PANTRIES AND WELLNESS ROOM IN TENANT SPACES.

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REVISIONS

NO.	DESCRIPTION	DATE	APPROVED

B.M.: THE CITY OF GARDENA BENCHMARK NO. SD-15 ELEV. = 43.506'

CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS - ENGINEERING

PLUMBING LEGENDS, ABBREVIATIONS, & GENERAL NOTES

COMMUNITY AQUATICS & SENIOR CENTER

P0.01

	INITIAL	DATE
DESIGNED BY		
DRAWN BY		
CHECKED BY		

APPROVED BY:

APPROVED BY: DIRECTOR OF PUBLIC WORKS

SHT. 109 OF 157 DWG. NO. S-2606

PLOT DATE: 5/20/2022 3:04:11 PM

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS AND DIVISION 1, ARE ASSOCIATED WITH THIS SECTION AND THE CONTRACT FOR THIS WORK AND SHALL APPLY TO THIS SECTION AS FULLY AS IF REPEATED HEREIN.

1.02 SCOPE OF WORK

PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, APPLIANCES AND NECESSARY INCIDENTALS FOR THE FULL AND COMPLETE INSTALLATION OF ALL PLUMBING AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.

A. WORK IN THIS SECTION SHALL INCLUDE

1. ALL PLUMBING FIXTURES, WATER HEATERS, VALVES, HOT WATER CIRCULATING PUMP, AND OTHER MISCELLANEOUS ITEMS OR EQUIPMENT REQUIRED FOR A COMPLETE INSTALLATION.
2. CATHODIC PROTECTION FOR UNDERGROUND STEEL OR FERROUS PIPING.
3. CONNECTIONS TO SANITARY SEWER, WATER AND GAS MAINS.
4. DOMESTIC HOT AND COLD WATER SYSTEMS.
5. DOMESTIC WATER HEATERS.
6. EXCAVATION AND BACKFILL.
7. FLOOR SINKS AND FLOOR DRAINS.
8. FURNISH AND SET ALL SLEEVES FOR PIPES PASSING THROUGH WALLS AND FLOORS.
9. GAS SYSTEM.
10. PIPE COVERING, INSULATION AND WRAPPING.
11. ROUGH-IN AND FINAL CONNECTIONS TO AIR CONDITIONING EQUIPMENT OF GAS AND WATER, AND CONDENSATE DRAINS.
12. ROUGH-IN AND FINAL CONNECTIONS TO FIXTURES AND EQUIPMENT FURNISHED UNDER OTHER SECTIONS OF THE SPECIFICATIONS OR BY THE OWNER.
13. ROOF DRAINAGE SYSTEM.
14. SANITARY SOIL, WASTE AND VENT SYSTEM. ALL PLUMBING FIXTURES, WATER HEATERS, VALVES, HOT WATER CIRCULATING PUMP, AND OTHER MISCELLANEOUS ITEMS OR EQUIPMENT REQUIRED FOR A COMPLETE INSTALLATION.
15. SAFING OF ALL PENETRATIONS THROUGH FIRE WALLS AND FLOORS.
16. WATER FOR CONSTRUCTION AND TEMPORARY CONNECTIONS.

B. RELATED WORK IN OTHER SECTIONS

1. TEMPORARY FACILITIES AS SPECIFIED IN SECTION 01500.
2. CUTTING AND PATCHING AS SPECIFIED IN SECTION 01045.
3. CONCRETE WORK AS SPECIFIED IN DIVISION 3, HOWEVER, PROVIDE TEMPLATES FOR SPACING AND SIZE OF CONCRETE PADS AND ANCHOR BOLTS FOR ALL PLUMBING EQUIPMENT.
4. ELECTRICAL WORK AS FOLLOWS WILL BE PROVIDED UNDER DIVISION 16:
   A. CONDUIT AND WIRING AS SHOWN ON THE DRAWINGS AND AS REQUIRED FOR PLUMBING EQUIPMENT.

1.03 QUALITY ASSURANCE

A. CODES AND STANDARDS

1. ALL ITEMS SHOWN ON SITE, ARCHITECTURAL OR MECHANICAL DRAWINGS ARE TO BE PROVIDED COMPLETE FROM POINT OF CONNECTION TO FINISHED FIXTURE IN COMPLIANCE WITH ALL GOVERNING AUTHORITY REQUIREMENTS. THESE DRAWINGS OR SPECIFICATIONS SHALL NOT BE CONSTRUED TO PERMIT WORK IN VIOLATION OF GOVERNING CODES.

2. IN ADDITION TO THE REQUIREMENTS OF ALL LOCAL AND GOVERNING CODES, ORDINANCES AND AGENCIES, CONFORM TO THE REQUIREMENTS OF THE FOLLOWING CODES AND STANDARDS:
   A. CALIFORNIA BUILDING CODE, 2019 EDITION.
   B. CALIFORNIA PLUMBING CODE, 2019 EDITION.
   C. CITY OF GARDENA REQUIREMENTS.
   D. STATE FIRE MARSHAL.
   E. STATE HEALTH DEPARTMENT REQUIREMENTS.
   F. ALL REQUIREMENTS OF FEDERAL/OSHA.
   G. ALL OTHER REGULATORY AGENCIES HAVING JURISDICTION OVER THIS WORK.

B. GUARANTEES: PROVIDE A WRITTEN GUARANTEE FORM REQUIRED UNDER DIVISION 1, AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR ONE YEAR. GUARANTEE SHALL BE INCLUSIVE OF REPAIR OF DAMAGE TO, OR REPLACEMENT (IF SO REQUIRED) OF ANY PORTION OF PREMISES CAUSED BY WATER, OIL, OR GAS LEAKS OR BREAKS IN PIPE, FIXTURES OR EQUIPMENT PROVIDED UNDER THIS SECTION.

1.04 SUBMITTALS

A. SHOP DRAWINGS:

1. SHOW ALL DETAILS OF ALL PIPING, PIPING SUPPORTS, MECHANICAL EQUIPMENT PADS AND SUPPORTS.

B. PRODUCT DATA:

1. WITHIN 35 DAYS AFTER AWARD OF CONTRACT AND PRIOR TO DELIVERY TO THE JOB SITE OF ANY MATERIALS OF THIS SECTION, CONTRACTOR SHALL SUBMIT SEVEN COMPLETE BROCHURES OF ALL MATERIALS AND EQUIPMENT, IN CONJUNCTION WITH ALL SHOP DRAWING SUBMITTALS PER DIVISION 1 OF THESE SPECIFICATIONS.

2. PRODUCT DATA SHALL INCLUDE ALL PLUMBING EQUIPMENT, FIXTURES, PIPE SUPPORTS AND OTHER ASSOCIATED STANDARD ITEMS AS REQUIRED TO COMPLEMENT SHOP DRAWINGS.

3. MANUFACTURERS AND SUPPLIERS OF EQUIPMENT SHALL PROVIDE ALL NECESSARY DATA TO COMPLY WITH THE STATE OF CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS. COMPLIANCE CERTIFICATION FOR ALL EQUIPMENT SHALL BE INCLUDED IN EQUIPMENT SUBMITTALS.

C. OTHER SUBMITTALS

1. STERILIZATION TEST REPORT.
2. TEST DATA.

D. OPERATION AND MAINTENANCE INSTRUCTIONS: DELIVER TO ARCHITECT THREE COMPLETE SETS IN BOUND BOOKLET FORM OF WRITTEN OPERATING AND MAINTENANCE INSTRUCTIONS AND BROCHURES FOR EQUIPMENT SPECIFIED IN THIS SECTION. FULLY INSTRUCT OWNER'S OPERATING PERSONNEL AND DEMONSTRATE ALL ASPECTS OF PERFORMANCE, OPERATION AND MAINTENANCE. AMOUNT OF TIME ALLOCATED FOR SAID INSTRUCTION AND DEMONSTRATIONS OF EQUIPMENT AND SYSTEMS SHALL BE INCORPORATED IN THESE OBLIGATIONS. SUBMIT A LETTER TO ARCHITECT SIGNED BY OWNER'S REPRESENTATIVE WHO WILL OPERATE SYSTEMS STATING THAT HE HAS BEEN FULLY INSTRUCTED BY CONTRACTOR CONCERNING OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEM. ONE ADDITIONAL SET OF APPROVED INSTRUCTIONS SHALL BE SUITABLY FRAMED BEHIND GLASS AND MOUNTED AS INSTRUCTED.

E. RECORD DRAWINGS: COMPLY WITH REQUIREMENTS OF DIVISION 1. PROVIDE AN ACCURATE DIMENSIONED RECORD OF AS-BUILT LOCATIONS AND ELEVATIONS, AS REFERRED TO APPROVED BASE DATUM, OF BURIED CONCEALED LINES, MANHOLES, CLEANOUTS, VALVES, PLUGGED TEES, CAPPED ENDS AND OF WORK WHICH HAS NOT BEEN INSTALLED AS PER DESIGN DWGS.

1.05 PRODUCT HANDLING

A. PROTECTION: ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PROTECT THE MATERIALS OF THIS SECTION BEFORE, DURING, AND AFTER INSTALLATION.

B. REPLACEMENTS: ANY OCCURRENCE OF DAMAGE, SHALL TRIGGER IMMEDIATE REPAIR OF ALL DAMAGED AND DEFECTIVE WORK TO THE APPROVAL OF THE ARCHITECT AT NO ADDITIONAL COST TO OWNER.

1.06 JOB CONDITIONS:

A. EXAMINATION OF THE SITE: EXAMINE THE SITE PRIOR TO BID AND INCLUDE ALL CONDITIONS IN BID PROPOSAL UNDER WHICH WORK IS TO BE PERFORMED.

1.07 MISCELLANEOUS

A. EXAMINATION OF THE SITE: EXERCISE CARE IN EXAMINING THE SITE AND COORDINATE ALL WORK INDICATED ON THE DRAWINGS WITH EXISTING CONDITIONS. REPORT TO ARCHITECT IN WRITING CONDITIONS THAT WILL PREVENT PROPER PROVISIONS OF THIS WORK. VERIFY DEPTH AND LOCATION OF SERVICE LINES WITH SERVICING COMPANIES HAVING JURISDICTION BEFORE EXCAVATING. BY SUBMISSION OF THE BID, THE CONTRACTOR WARRANTS THAT HE HAS FAMILIARIZED HIMSELF WITH THE EXISTING CONDITIONS AND WILL PERFORM ALL WORK AS REQUIRED FOR HOOKUP AND AS REQUIRED BY THE CONTRACT DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.

B. PERMITS AND FEES: CONTRACTOR SHALL ARRANGE, APPLY AND PAY FOR ALL NECESSARY PERMITS, INSPECTIONS, EXAMINATIONS, FEES AND CHARGES REQUIRED BY PUBLIC AUTHORITIES HAVING JURISDICTION.

C. SERVICE CONNECTIONS: MAKE ALL NECESSARY ARRANGEMENTS WITH APPLICABLE UTILITY COMPANY FOR CONNECTION TO EXISTING SERVICE LINES. PAY ALL FEES ASSOCIATED WITH WORK INCLUDING METERS AND HOOKUP CHARGES. UTILITY ASSESSMENT FEES, IF ANY, WILL BE PAID BY THE OWNER AND ARE NOT PART OF THIS CONTRACT.

D. DRAWINGS: DRAWINGS SHOW DESIRED LOCATION AND ARRANGEMENT OF PIPING, EQUIPMENT AND OTHER ITEMS, AND SHOULD BE ADHERED TO AS CLOSE AS POSSIBLE. CONTRACTOR SHALL ASSUME THE RESPONSIBILITY FOR COORDINATING THE WORK WITH ALL OTHER TRADES. WORK SPECIFIED WHICH IS NOT CLEARLY DEFINED BY THE DRAWINGS SHALL BE INSTALLED AND ARRANGED TO THE SATISFACTION OF THE ARCHITECT. IF CHANGES IN INDICATED LOCATIONS AND ARRANGEMENTS ARE DEEMED NECESSARY BY ARCHITECT, THEY SHALL BE COMPLETED BY CONTRACTOR WITHOUT ADDITIONAL CHARGES PROVIDED THE CHANGE IS ORDERED BEFORE WORK IS INSTALLED AND NO ADDITIONAL MATERIALS ARE REQUIRED.

PART 2 - PRODUCTS

2.01 GENERAL

A. PIPE SLEEVES AND WRAPPING: FURNISH POLISHED CHROMIUM PLATE AND BRASS SET SCREW FLANGES WHERE PLUMBING PIPES PENETRATE WALLS, FLOORS, CEILINGS, AND PARTITIONS IN FINISHED PORTIONS OF BUILDING, INCLUDING FLANGES ON PIPES AT FIXTURES. ALL SLEEVES IN CONCEALED AND EXTERIOR WALLS SHALL BE 20 GAUGE GALVANIZED IRON 1" O.D. LARGER THAN THE PIPE OD, CAULKED IF BELOW GRADE IN A MOISTURE-PROOF MANNER. ALL PIPES PENETRATING THROUGH FIRE WALLS AND FLOORS SHALL BE PROPERLY FIRE SAFED WITH DOW CORNING 3-6548 SILICONE RTV FOAM AND INSTALLED PER MANUFACTURER'S DIRECTIONS.

B. PIPE IDENTIFICATION

1. PIPING IDENTIFICATION TO COMPLY WITH ANSI AND OSHA STANDARDS: EACH INDIVIDUAL PIPELINE SHALL BE IDENTIFIED FOR QUICK AND EASY IDENTIFICATION AS TO CONTENT AND CHARACTER OF MATERIAL CARRIED IN THE PIPES BY SETON SNA OR STR MARKERS.

2. MARKERS SHALL BE INSTALLED AND LOCATED AT NOT MORE THAN 8' INTERVALS AND SO LOCATED THAT MARKERS SHALL BE VISIBLE WHERE PIPING SYSTEM IS EXPOSED.

   A. ONE MARKER SHALL BE INSTALLED AT EITHER SIDE OF VALVES, SPECIAL FITTINGS AND AT BRANCH TAKE-OFF. IN FURRED AREAS INSTALL ONE BAND TWENTY FOUR (24) INCHES ABOVE FLOOR AND NINETEEN (19) INCHES BELOW CEILING LINE.

   B. PROVIDE TWO IDENTIFICATION CHARTS COMPLETE WITH GLASS AND FRAME SHOWING LIST OF MATERIALS CONVEYED IN THE PIPING SYSTEM, CLASSIFIED BY NATURE OF ITS CONTENTS AND RESPECTIVE IDENTIFYING COLORS.

3. COLOR SCHEME SHALL BE APPROVED. BASE COLOR FOR MARKERS SHALL BE AS FOLLOWS:

DOMESTIC HOT WATER --- YELLOW
DOMESTIC COLD WATER --- GREEN
FUEL GAS --- YELLOW
SANITARY SEWER --- GREEN
SANITARY VENT --- GREEN
INDUSTRIAL COLD WATER --- GREEN
STORM DRAINS --- GREEN

C. MATERIALS: ALL MATERIALS WHEN NOT OTHERWISE SPECIFIED SHALL CONFORM TO THE APPLICABLE ASTM, ASME, AGA, AND ASA STANDARDS.

D. EQUAL MATERIALS AND SUBSTITUTIONS: IN ADDITION TO MANUFACTURERS SPECIFICATIONS, THE FOLLOWING SHALL ALSO BE CONSIDERED EQUAL, PROVIDED CORRESPONDING MODELS MEET ALL SPECIFIED REQUIREMENTS. EQUIVALENT SUBSTITUTED MANUFACTURER'S EQUIPMENT NAMED HEREIN SHALL BE SUBMITTED TO ARCHITECT FOR APPROVAL. SUBMIT ALTERNATE SELECTIONS AT TIME OF BID, LISTING MAJOR EQUIPMENT.

ITEM	MANUFACTURER
ACCESS PANELS:	MILCOR
BACKFLOW PREVENTERS:	NEPTUNE, HERSEY
CLEANOUTS:	ZURN
DRAINS & FLOOR SINKS:	ZURN
ELECTRIC WATER COOLERS:	SUNROC, HAWS, ACORN
FLUSH VALVE:	ZURN
GAS VENTS:	METALBESTOS, AMERIVENT
INSULATION:	MANVILLE, OWENS-CORNING, FIBERGLAS
PIPE HANGERS & SUPPORTS:	GRINNELL, FEE & MASON, B-LINE
PLUMBING FIXTURES:	CRANE
PRESSURE GAUGES:	MARSH, MARSHALLTOWN, TRERICE
SOIL PIPE:	TYLER, UNIVERSAL
SOLDERS:	HANDY-HARMAN, LUCAS, MILHAUPT
STRAINERS:	WALWORTH, BAILEY, MUELLER
TOILET SEATS:	CHURCH, BENEKE
VALVES:	WALWORTH, MILWAUKEE
WATER PRESSURE REDUCING VALVES:	BAILEY
WATER HEATERS:	AMERICAN, STATE, LOCHINVAR

2.02 PIPE AND FITTING SCHEDULE

A. SOILS AND STORM DRAIN LINES SHALL BE 5' FROM BUILDING: VITRIFIED CLAY PIPE AND FITTINGS OR SERVICE WEIGHT NO-HUB CAST-IRON PIPE AND FITTINGS CISPI-301 AND SHALL BEAR THE NSF TRADEMARK. INSTALL IN ACCORDANCE WITH AUTHORITIES HAVING JURISDICTION.

B. SOIL, WASTE, VENT AND STORM DRAIN PIPING SHALL BE 5' OUTSIDE BUILDING: SERVICE WEIGHT NO-HUB CAST-IRON PIPE AND FITTINGS CISPI-301 AND SHALL BEAR THE NSF TRADEMARK..

C. DOMESTIC HOT & COLD WATER PIPING LOCATED ABOVE GROUND: TYPE L HARD- DRAWN COPPER TUBE, ASTM B88, & WROUGHT COPPER FITTINGS, ANSI B16.22.

D. DOMESTIC COLD WATER PIPING LOCATED BELOW GROUND AND OUTSIDE THE BUILDING

1. 3" DIA. AND UNDER: TYPE K HARD-DRAWN COPPER TUBE, ASTM B88, AND WROUGHT COPPER FITTINGS ANSI B16.22, SOLDER JOINT TYPE (REFER TO PARAGRAPH "PIPE WRAPPING" HEREIN).
2. 4" DIA. AND LARGER: BELL AND SPIGOT CLASS 50 DUCTILE IRON PIPE CENTRIFUGALLY CAST, CEMENT- LINED INSIDE.

E. INDIRECT AND CONDENSATE DRAINS: TYPE M COPPER TUBE, ASTM B88 AND WROUGHT COPPER FITTINGS, ANSI B16.22, SOLDER JOINT TYPE.

F. GAS PIPING

1. 2" AND UNDER LOCATED ABOVE GROUND: SCHEDULE 40 BLACK STEEL PIPE, ASTM A-135, A-795, WITH CLASS 150 WOG BLACK BANDED MALLEABLE IRON SCREWED FITTINGS.
2. 2-1/2" AND LARGER ABOVE GROUND: SCHEDULE 40 BLACK STEEL PIPE, ASTM A-135, A-795, WITH SCHEDULE 40 BUTT WELDED FITTINGS.
3. BELOW GROUND: PLEXCO PE2406 POLYETHYLENE PIPING SYSTEMS WITH ELECTRIC FUSION SOCKET FUSION JOINTS. PROVIDE #12 ELECTRIC TRACER COPPER WIRE, SPIRAL WRAPPED AROUND PIPE. BACKFILL WITH CLEAN SAND 4" AROUND PIPE. INSTALLATION SHALL COMPLY WITH MANUFACTURER'S DIRECTION AND AUTHORITIES HAVING JURISDICTION.

G. COMPRESSED AIR PIPING: TYPE L HARD-DRAWN COPPER TUBE, ASTM B88, WITH WROUGHT COPPER FITTINGS, ANSI B16.22.

H. REAGENT WATER PIPING: SCHEDULE 80 (PVC) POLYVINYL CHLORIDE ASTM D-2241 AND ASTM D-1785 AND SCHEDULE 80 FITTINGS, PROVIDE SOLVENT WELDED JOINTS.

I. VACUUM PIPING: TYPE L HARD-DRAWN COPPER TUBE, ASTM B88, WITH WROUGHT COPPER FITTINGS, ANSI B16.22.

J. CARBON DIOXIDE (COMPRESSED AIR) PIPING: TYPE L HARD-DRAWN COPPER TUBE, ASTM B88, WITH WROUGHT COPPER FITTINGS, ANSI B16.22.

K. NITROGEN PIPING: TYPE L HARD-DRAWN COPPER TUBE, ASTM B88, WITH WROUGHT COPPER FITTINGS, ANSI B16.22.

2.03 MATERIALS FOR JOINTS, FITTINGS AND VALVES

A. SOIL, WASTE, VENT AND STORM DRAIN CAST-IRON PIPE

1. PROVIDE "NO-HUB" COUPLINGS AS APPROVED BY THE CAST-IRON SOIL PIPE FOUNDATION, CISPI-310-85 SHALL BEAR THE NSF TRADEMARK

B. SOLDER AND FLUX

1. WATER PIPING: EQUIVALENT TO HARRIS "BRIDGIT" LEAD-FREE BRAZING ALLOY. 95-5 SOLDERS ARE NOT APPROVED.
2. COPPER INDIRECT AND CONDENSATE DRAINAGE PIPING: LEAD-FREE SOLDER WITH NON-CORROSIVE PASTE FLUX.

C. WELDED JOINTS: WELDING SHALL BE CONDUCTED PERFORMED ONLY BY QUALIFIED WELDERS, AND SHALL COMPLY WITH ASME BOILER CONSTRUCTION CODE, ANSI CODE FOR PRESSURE PIPING, AND STATE REQUIREMENTS.

D. UNIONS AND GASKETS

1. 2" DIA. AND SMALLER FOR STEEL PIPE: SCREWED MALLEABLE-IRON GROUND JOINT, CLASS 150 WOG, WITH BRASS-TO-IRON SEAT, GALVANIZED OR BLACK TO MATCH SERVICE.
2. 2-1/2" DIA. AND LARGER FOR STEEL PIPE: CAST-IRON FLANGED GASKET TYPE, CONFORMING TO ANSI B16.1, GALVANIZED OR BLACK TO MATCH SERVICE, OR 150 LB. FORGED STEEL SLIP-ON FLANGES.
3. UNIONS FOR COPPER TUBING: CAST BRONZE, GROUND JOINT PATTERN, SOLDERED JOINT CONNECTION, ASTM B62 AND ANSI B16.18.
4. DIELECTRIC UNIONS: EPCO, FURNISHED COMPLETE WITH ISOLATORS AND GASKETS OF SAME SIZE AS PIPE, GALVANIZED OR BLACK TO SUIT SERVICE.
5. DIELECTRIC FLANGES: F.H. MALONEY CO., TYPE E FLANGES FOR CATHODIC INSULATION.
6. GASKETS: 1/16" GARLOCK #17022.

E. STRAINERS: Y-TYPE WITH SEMI-STEEL BODY AND STAINLESS STEEL SCREEN WITH PERFORATIONS SUITABLE FOR SERVICE REQUIREMENTS, OR SAME SIZE AS INSTALLED PIPELINE. PROVIDE GATE VALVE WITH HOSE CONNECTION AT EACH STRAINER BLOW-OFF.

1. 2-1/2" DIA. AND UNDER: BAILEY 100-A SERIES, 125 LB. OR 250 LB., SCREWED ENDS WITH SCREWED GASKETED CAP.
2. 3" DIA. AND LARGER: BAILEY 100-A SERIES, 125 LB. OR 250 LB., FLANGED ENDS AND BOLTED GASKET CAP.

F. VALVES: PROVIDE VALVES OF THE SAME MANUFACTURER, OR FOLLOWING NUMBERS OR EQUIVALENT BY COMPARATOR CHART OF APPROVED MANUFACTURER. PROVIDE ADAPTORS FOR VALVES IN COPPER TUBING WHERE NECESSARY. ALL DOMESTIC WATER VALVES, 2" DIA. AND UNDER, SHALL BE BALL VALVES.

1. ECCENTRIC VALVES, 2" DIA. AND UNDER, GAS: DEZURIK #425 VALVE WITH RS49, PLUG SEALS, IRON BODY, SCREWED OR FLANGED, U.L. LISTED.
2. GATE VALVES, 2-1/2" DIA. AND LARGER, DOMESTIC WATER: 200 PSI WOG, SOLID WEDGE DISC, UNION BONNET, RISING STEM, FLANGED.

GRINNELL	6020A
NIBCO	F-617-0
CRANE	465 1/2
STOCKHAM	G-623

3. PARTITION STOP VALVES: T&S B415, LOOSE-KEY TYPE WITH WALL FLANGE.
4. BALL VALVES, DOMESTIC WATER: BRONZE, FULLPORT, CLASS 150, THREADED.

GRINNELL	3750 OR 171N
NIBCO	T-585
JAMESBURY	300

NOTE: PROVIDE FLANGED IRON BODY VALVES OR EQUIPMENT USED IN COPPER PIPING SYSTEMS WITH MALONEY FLANGE AND BOLTS INSULATING KITS.

G. CHECK VALVES

1. HORIZONTAL SWING:
   A. 2" DIA. AND UNDER (200 PSI WOG), BRONZE SCREWED CAP, SWING.

	THREADED	SOLDER
GRINNELL	3300	3300SJ
NIBCO	T-413(BWY)	S-413(BWY)
CRANE	37	1342
STOCKHAM	320	B-309

   B. 2-1/2" DIA. AND LARGER (200 PSI WOG), IRON BODY, BRONZE TRIM, SCREWED CAP, SWING, Y-PATTERN, REGRINDING, FLANGED.

GRINNELL	6300A
NIBCO	F-918-B
CRANE	373
STOCKHAM	G-931

H. PRESSURE REDUCING VALVES

1. 1" DIA. AND UNDER: CLA-VAL #990.
2. 1-1/4" DIA. AND LARGER: CLA-VAL #90-01.

2.06 PIPE HANGERS

A. HANGERS SHALL BE PROVIDED WITH FACTORY INSTALLED ISOLATION AND DI-CHROMATE FINISH.

1. 2" DIA. AND UNDER: GRINNELL F69.
2. 2-1/2" DIA. AND LARGER: GRINNELL F65.
3. CONCRETE INSERTS: GRINNELL 281 AND 282.
4. RISER CLAMPS FOR COPPER PIPING: GRINNELL 261P, PLASTIC COATED.
5. RISER CLAMPS FOR OTHER PIPING: GRINNELL 261.

B. HANGER RODS SHALL CONFORM TO THE FOLLOWING TABLE:

PIPE SIZE 2" DIA. AND UNDER: 3/8" RODS
PIPE SIZE 2-1/2" DIA. AND 3": 1/2" RODS
PIPE SIZE 3" DIA. AND LARGER: 5/8" RODS

2.07 ROOF FLASHING

A. SANITARY VENT FLASHINGS: SEMCO 1100-3 OR 1100-5, COMPLETE WITH ONE-PIECE LEAD FLASHING AND COUNTERFLASHING SLEEVE.

B. OTHER PIPE THROUGH ROOF FLASHING: SEMCO 1100-2 OR 1100-4, COMPLETE WITH ONE-PIECE 4 LB. LEAD FLASHING AND COUNTERFLASHING SLEEVE.

2.08 PIPE SLEEVES

PROVIDE ADJUST-TO-CRETE, PARAMOUNT, HOLE-OUT OR SPERZEL CRETE SLEEVE AT CONCRETE WALLS OR FLOORS. PROVIDE FLOOR SLEEVES EXTENDED TO TOP OF CONCRETE CURBS FOR PIPING RISING THROUGH FLOORS. WALL SLEEVES TO BE FLUSH WITH FINISHED SURFACE. SLEEVES SHALL BE SIZED TO PERMIT HALF (1/2) INCH CLEARANCE AROUND PIPE INSULATION. INSULATION AND COVERING SHALL BE CONTINUOUS THROUGH WALL AND FLOOR SLEEVES.

2.09 ACCESS PANELS

A. PROVIDE ACCESS PANELS IN PLASTER WALLS AND CEILINGS: KARP #DSC214PL, ELMDOR PW, 24"X24" WITH METAL ACCESS DOOR AND FRAME, PRIME COATED STEEL AND PAINTED TO MATCH ADJACENT SURFACES. FOR FIRE RATED AREAS PROVIDE USE KARP #KRP-150 FR 1-1/2 HOUR "B" LABEL ACCESS PANELS, U.L. LISTED.

B. PROVIDE ACCESS PANELS IN ACOUSTIC TILE CEILINGS: KARP #DSC-210, ELMDOR AT, 24'X24" WITH METAL ACCESS DOOR AND FRAME, 24"X24" MINIMUM SIZE, PRIME COATED STEEL, RECESSED TO ACCEPT STANDARD TILE IN FULL OPENING DOOR.

c. PROVIDE ACCESS PANELS IN CERAMIC TILE WALLS: ELMDOR DW-SS, SMITH 4730, CHROME-PLATED COVER AND FRAME OF SUITABLE SIZE FOR PURPOSE INTENDED, BUT NOT LESS THAN 8"X8" SIZE. FOR FIRE RATED AREAS PROVIDE ELMDOR FR 1-1-1/2 HOUR "B" LABEL ACCESS PANELS, U.L. LISTED.

2.10 CLEANOUTS

FOR CAST-IRON SOIL PIPE, PROVIDE IRON BODY WITH EXTRA HEAVY BRONZE PLUGS SCREWED INTO CAULKING FERRULES, FOR STEEL PIPE, PROVIDE EXTRA HEAVY BRONZE PLUGS; AND FOR VITRIFIED CLAY PIPE, PROVIDE VITRIFIED CLAY PLUGS. PROVIDE ACCESS PANELS, PLATES, AND FRAMES FOR FLUSH MOUNTING WHERE CLEANOUTS OCCUR IN FINISHED INTERIOR WALLS. EXPOSED PARTS OF FLOOR CLEANOUTS SHALL HAVE ADJUSTABLE TOP. PROVIDE ACCESSIBILITY TO ALL CLEANOUTS AND CLEANOUT PLUGS. CLEANOUT SHALL BE THE FOLLOWING:

A. IN FINISHED FLOORS: PROVIDE CAST-IRON WITH POLISHED NICKEL BRONZE ROUND TOP, NON-SKID DIAMOND TREAD SET FLUSH WITH THE FLOOR. PROVIDE FLASHING FLANGE WHEN USED WITH WATERPROOFING MEMBRANE.

SMITH - 4023
WADE - W-6000
ZURN - ZN-1420-2
JOSAM - 56010 (ADD -41 WHEN NEEDED)

B. IN MECHANICAL EQUIPMENT AREAS: PROVIDE CAST-IRON WITH HEAVY CAST-IRON ROUND TOP, NON-SKID DIAMOND TREAD SET FLUSH WITH THE FLOOR. PROVIDE FLASHING FLANGE WHEN USED WITH WATERPROOFING MEMBRANE.

SMITH - 4223
WADE - W-6000
ZURN - Z-1420-25
JOSAM - 56070 (ADD -41 WHEN NEEDED)

C. IN WALLS: PROVIDE CLEANOUT TEE COMPLETE WITH SQUARED POLISHED NICKEL BRONZE ACCESS PLATE WITH VANDALPROOF SCREWS AND FRAMES. OPENING 8"x8" MINIMUM.

SMITH - 4558-U
WADE - W-8460-S
ZURN - ZN-1445-3
JOSAM - 58770-15

D. IN EXTERIOR GRADES: PROVIDE CAST-IRON BODY, VANDALPROOF COVER, NON-SKID DIAMOND TREAD, SET FLUSH WITH GRADE OR FINISHED SURFACE. IN NON-SURFACED AREA, THEY SHALL BE CAST IN A CONCRETE BLOCK 14'x14'x6" DEEP.

SMITH - 4020-U
WADE - W-8300MF
ZURN - ZN-1460-15-W/Z-1450-8
JOSAM - 58680-15

2.11 SHOCK ABSORBERS

PROVIDE SHOCK ABSORBERS MANUFACTURED BY PRECISION PLUMBING PRODUCTS (PPP) INSTALLED AS INDICATED OR AS RECOMMENDED BY PDI PAMPHLET WWH-201. FURNISH ACCESS PANEL FOR A SINGLE MULTIPLE FIXTURE INSTALLATION (NOT OF FLUSH VALVE TYPE). IN NO SITUATION SHALL A FIXTURE BE INSTALLED WITHOUT SHOCK PROTECTION.

2.12 PRESSURE TEMPERATURE RELIEF VALVE

FURNISH DOMESTIC WATER HEATER WITH ASME RATED PRESSURE/TEMPERATURE RELIEF VALVE SET TO RELIEVE AT 125 PSI PRESSURE AND AT 188 DEGREE TO 208 DEGREE F TEMPERATURE RANGE.

2.13 PRESSURE GAUGES

POTTER-ROEMER 6240-U.L. - F.M. 0-300 PSI RANGE, COMPLETE WITH 3-1/2" DIAMETER DIAL AND GAUGE COCK. INSTALL PRESSURE GAUGES WHERE SHOWN AND AS REQUIRED.

2.14 INSULATION

A. ALL PIPE INSULATION SHALL FULLY COMPLY WITH THE STATE OF CALIFORNIA ENERGY EFFICIENCY STANDARDS. INSULATION THICKNESSES SPECIFIED ARE BASED ON INSULATION DISPLAYING THERMAL RESISTANCES IN THE RANGE OF R-4.0 TO R-4.6 PER INCH OF THICKNESS ON A FLAT SURFACE AT A MEAN TEMPERATURE OF 75 DEGREE F. THICKNESSES SPECIFIED ARE MINIMUM AND SHALL BE PROPORTIONALLY INCREASED FOR MATERIALS HAVING R VALUES LESS THAN 4.0 PER INCH OF THICKNESS OR MAY BE REDUCED FOR MATERIALS HAVING R VALUES GREATER THAN 4.6 PER INCH THICKNESS. PIPE INSULATION SHALL BE INSTALLED AFTER PIPING IS INSTALLED, TESTED AND APPROVED AND IS IN CLEAN, DRY CONDITION. FIRMLY BUTT INSULATION JOINTS.

B. ALL HOT WATER AND INTERIOR CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH GLASS FIBER PIPE INSULATION WITH FACTORY APPLIED WHITE JACKET, J-M MICRO-LOK 650 AP, 1" THICK FOR PIPE SIZES OF 1/2" TO 1", AND 1-1/2" THICK FOR PIPE SIZES TO 1-1/4" AND ABOVE. ALL FITTINGS AND VALVES SHALL BE INSULATED WITH PREFORMED INSULATION WITH PVC PREMOLDED ONE PIECE FITTING COVER, J.M. ZESTON COVER. ADHERE LONGITUDINAL LAPS AND BUTTS OF STRIPS OF JACKET WITH FACTORY APPLIED PRESSURE SENSITIVE TAPE SYSTEM, J-M AP-T. FLANGES AND UNIONS SHALL NOT BE COVERED.

C. ALL PIPING UNDER LAVATORIES ACCESSIBLE TO THE PHYSICALLY HANDICAPPED SHALL BE INSULATED WITH PLUMBEREX SPECIALTY PRODUCTS HOT WATER SUPPLY AND 'P' TRAP PREFABRICATED INSULATION.

2.15 PLUMBING FIXTURES

A. GENERAL: ALL PLUMBING FIXTURE TRIMS & EXPOSED SUPPLIES AND WASTES TO BE MADE OF BRASS WITH POLISHED CHROME-PLATED FINISH. FURNISH INDIVIDUAL LOOSE KEY STOPS OR, IF SPECIFIED, SCREW DRIVER STOPS FOR SUPPLIES AND, UNLESS INTEGRAL WITH VALVES OR FAUCETS, MOUNT UNDER FIXTURE. SEPARATELY TRAP ALL WASTES. MFURNISH EXPOSED SUPPLIES AND WASTES TO WALL WITH POLISHED CHROME-PLATED CAST BRASS WALL ESCUTCHEONS. PROVIDE ALL LAVATORIES WITH 1-1/2" 17 GAUGE CHROME-PLATED CAST BRASS P-TRAPS. ALL PLUMBING FIXTURES SHALL BE WHITE, UNLESS OTHERWISE NOTED OR SPECIFIED BY ARCHITECT.

B. WALL-HUNG FIXTURES: CONTRACTOR TO ENSURE SPECIFIED FIXTURES WITH HANGERS OR SUPPORTING ARMS SHALL BE SECURELY FASTENED ON A 1/4" THICK BY 6" WIDE STEEL WALL PLATE WHICH EXTENDS AT LEAST ONE STUD OVER FIRST AND LAST FIXTURE MOUNTING POINTS, OR A TOTAL OF THREE STUDS MINIMUM. FASTEN WALL PLATE TO EACH STRUCTURAL STUD IT CROSSES BY TACK WELDING EACH SIDE OF STUD FLANGE AT TOP AND BOTTOM OF PLATE. FIXTURE OR SUPPORTING ARMS SHALL BE SECURELY AND FIRMLY ATTACHED TO STEEL WALL PLATE IN COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS. IN THE SITUATION THAT STRUCTURAL STUDS ARE NOT BEING INSTALLED BEHIND WALL-HUNG FIXTURES, PLUMBING CONTRACTOR SHALL NOTIFY ARCHITECT AND MECHANICAL ENGINEER IMMEDIATELY.

C. WALL-MOUNTED WATER CLOSETS: INSTALL WITH A COMBINATION FIXTURE SUPPORT AND WASTE FITTING INSTALLED PER MANUFACTURES RECOMMENDATIONS AND HEIGHT INDICATED ON ARCHITECTURAL DRAWINGS.

D. URINALS: INSTALL USING BRASS NIPPLES. INSTALL AT HEIGHTS SPECIFIED ON ARCHITECTURAL DRAWINGS.

E. DRAINS: WHERE INSTALLED IN CONSTRUCTION WITH WATERPROOF MEMBRANE, INSTALL DRAINS WITH FLASHING CLAMP DEVICE WITH CORROSION-RESISTANT CLAMPING BOLTS.

F. FIXTURE SEALER: PROVIDE WALL-HUNG FIXTURES WITH WHITE SILICONE SEALER BETWEEN FIXTURE AND WALL, APPLIED SMOOTH AND EVEN.

FIXTURES, TRIM AND ACCESSORIES SHALL BE AS SHOWN IN THE DRAWINGS.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. INSPECTION: ALL PLUMBING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH TRADES DUE TO LACK OF COORDINATION SHALL BE RESOLVED BY ARCHITECT WHOSE DECISION IS FINAL. RELOCATE OR OFFSET ANY WORK AS NECESSARY TO ACCOMMODATE WORK OF OTHER TRADES AT NO EXTRA COST TO THE OWNER WHEN SO DIRECTED BY THE ARCHITECT.

B. DISCREPANCIES

1. ANY DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT.
2. DO NOT PROCEED WITH INSTALLATION IN AREAS WHERE A DISCREPANCY HAS BEEN SITED UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED.
3. INTERFERENCES BETWEEN WORK WHICH HAS BEEN INSTALLED BY VARIOUS

3.02 LOCATIONS AND SPACE REQUIREMENTS

A. CONTRACTOR SHALL FULLY INFORM HIMSELF WITH REGARDS TO ANY ANOMALIES AND LIMITATIONS OF SPACES AVAILABLE FOR INSTALLATION OF WORK UNDER THIS DIVISION. DRAWINGS SHOW DESIRED LOCATION AND ARRANGEMENT OF PIPING, EQUIPMENT AND OTHER ITEMS, AND ARE TO BE FOLLOWED AS CLOSELY AS POSSIBLE. WORK SPECIFIED, NOT EXPLICITLY DEFINED BY DRAWINGS SHALL BE INSTALLED AND ARRANGED TO THE MANNER SATISFACTORY OF THE ARCHITECT. IF CHANGES IN INDICATED LOCATIONS AND ARRANGEMENTS ARE DEEMED NECESSARY BY ARCHITECT, THEY SHALL BE COMPLETED BY CONTRACTOR WITHOUT ADDITIONAL CHARGE PROVIDED THE CHANGE IS ORDERED BEFORE WORK IS INSTALLED AND NO ADDITIONAL MATERIALS ARE REQUIRED.

B. CONFIRM ALL SPACES, DIMENSIONS FOR ALL FIXTURES, EQUIPMENT, TENANT OR OWNER-FURNISHED EQUIPMENT AND EQUIPMENT FURNISHED UNDER OTHER SECTIONS.

C. OBTAIN ALL NECESSARY ROUGH IN DATA AND DIMENSIONS FOR ALL FIXTURES, EQUIPMENT, TENANT OR OWNER-FURNISHED EQUIPMENT AND EQUIPMENT FURNISHED UNDER OTHER SECTIONS.

D. MAINTAIN ALL NECESSARY HEADROOM CLEARANCES AND ACCESSIBILITY IN ACCORDANCE WITH LOCAL AND GOVERNING AGENCIES AND MAINTAIN CEILING HEIGHTS.

E. CONSTANTLY COORDINATE WORK OF OTHER TRADES TO PREVENT INTERFERENCE WITH THIS INSTALLATION.

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REVISIONS

NO.	DESCRIPTION	DATE	APPROVED

B.M.: THE CITY OF GARDENA BENCHMARK NO. 5D-15
ELEV. = 43.508'

CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS - ENGINEERING
PLUMBING SPECIFICATIONS
COMMUNITY AQUATICS & SENIOR CENTER
P0.02

	INITIAL	DATE
DESIGNED BY		
DRAWN BY		
CHECKED BY		

APPROVED BY:
APPROVED BY: DIRECTOR OF PUBLIC WORKS

SHT. 110 OF 157 DWG. NO. 5-2606

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3.03 PIPE INSTALLATION

A. INSTALL PIPE RUNS STRAIGHT AND TRUE. SPRINGING OR FORCING PIPING INTO DESIRED LOCATION IS NOT PERMITTED. INSTALL IN MANNER TO PREVENT ANY UNDUE STRAIN ON EQUIPMENT. PROVIDE SMOOTH JOINTS AND UNOBSTRUCTED INSIDE AND OUT, AND REAM PIPE ENDS THOROUGHLY TO REMOVE BURRS. CONCEAL PIPING IN FINISHED PORTIONS OF THE BUILDING UNLESS OTHERWISE DIRECTED OR INDICATED. CAP OR PLUG ENDS & OPENINGS IN PIPE & FITTINGS IMMEDIATELY AFTER INSTALLATION TO EXCLUDE DIRT UNTIL EQUIPMENT IS INSTALLED OR FINAL CONNECTIONS ARE MADE. PIPE SIZE REDUCTIONS SHALL BE ANCHORED WITH REDUCING FITTINGS. USE NO BUSHINGS UNLESS SPECIFICALLY AUTHORIZED. USE NO CLOSE NIPPLES. PROCEED TO ROUGH IN AS RAPIDLY AS GENERAL CONSTRUCTION OF BUILDING WILL PERMIT AND COMPLETE AND TEST BEFORE ANY LATHING, PLASTERING, OR DRYWALL, OR OTHER FINISH WORK HAS COMMENCED. FIT WORK INTO AVAILABLE SPACE AND ACCURATELY ROUGH IN. GRADE AND VALVE WATER PIPING SO AS TO ENSURE FOR COMPLETE DRAINAGE AND CONTROL OF THE SYSTEM. FURNISH CLAMPS AND/OR CONCRETE THRUST BLOCKS AT DEAD ENDS, ANGLES, OR OTHER POINTS WHERE SEPARATION OF JOINTS MAY OCCUR. GRADE VENT PIPING TO FACILITATE PIPING TO FREE ITSELF OF CONDENSATION OR WATER.

B. INSTALL PIPING TO AVOID BEAM PENETRATIONS UNLESS SLEEVING IS SHOWN ON DRAWINGS. CONSTANTLY COORDINATE WORK OF OTHER TRADES TO PREVENT INTERFERENCE WITH THIS INSTALLATION. SEEK AND OBTAIN APPROVAL FROM ARCHITECT IF CORING OR CUTTING OF CONCRETE WORK IS REQUIRED DUE TO FAILURE TO INSTALL REQUIRED SLEEVES PRIOR TO THE TIME OF CONCRETE POUR. COST OF CORING AND CUTTING WORK SHALL BE PAID BY THE SUBCONTRACTOR.

C. EXPOSED PLATED OR ENAMELED PIPE: PROVIDE CONNECTIONS TO EQUIPMENT WITH SPECIAL CARE. SHOW NO TOOL MARKS OR THREADS.

D. DIELECTRIC UNIONS: PROVIDE CONNECTIONS BETWEEN TWO DISSIMILAR METAL PIPES WITH DIELECTRIC UNIONS.

E. UNIONS: INSTALL A UNION ON ONE SIDE OF EACH SHUTOFF VALVE, AT BOTH SIDES OF AUTOMATIC VALVES, AT EQUIPMENT CONNECTIONS AND ELSEWHERE INDICATED OR REQUIRED, UNLESS FLANGES ARE INDICATED.

F. FLOOR, WALL AND CEILING PLATES: FURNISH WHERE PIPES PIERCE FINISHED SURFACES.

G. NOISE: INSTALL SOIL, WASTE, AND WATER PIPING SO AS TO PREVENT ANY UNUSUAL TRANSMISSION OF NOISE FROM FLOW OF WATER UNDER NORMAL CONDITIONS.

H. SHUTOFF VALVES: FURNISH WHERE INDICATED AND REQUIRED FOR ADEQUATE CONTROL OF SYSTEMS AND FOR ISOLATION OF FIXTURE GROUPS AND EQUIPMENT.

I. BURIED PIPING: INSTALL WITH MINIMUM 36" COVERAGE UNLESS OTHERWISE SHOWN ON DRAWINGS. LAY PIPING ACCURATELY TO GRADE WHERE INVERT ELEVATIONS ARE INDICATED ON DRAWINGS. PROVIDE THRUST BLOCKS AS REQUIRED PER MANUFACTURER'S RECOMMENDATIONS.

J. EQUIPMENT AND MATERIALS: INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

K. ACCESSIBILITY: ENSURE INSTALLED WORK IS READILY ACCESSIBLE FOR NORMAL OPERATION, READING OF INSTRUMENTS, ADJUSTMENT, SERVICE, INSPECTION AND REPAIR. FURNISH ACCESS PANELS WHERE INDICATED AND REQUIRED.

L. PIPE JOINTS: INSTALL SCREWED JOINTS WITH A MINIMUM AMOUNT OF COMPOUND APPLIED TO THE MALE THREAD ONLY. ALL JOINTS SHALL BE MADE PER CODE REQUIREMENTS.

M. PROVIDE PIPE ISOLATION AT ALL HANGERS FOR NON-INSULATED PIPE.

N. PIPING ROUGH-IN FOR FIXTURES: SUPPORT OR SECURE TO BUILDING STRUCTURE OR FIRMLY ANCHORED WASTE PIPING SO THAT PIPES CANNOT BE DISPLACED. DO NOT SECURE TO WALLS. USE OF MAKESHIFT TEMPORARY DEVICES, SUCH AS ROPE, WIRE, TAPE, ETC. IS PROHIBITED.

3.04 HANGERS AND SUPPORTS

A. LOCATE HORIZONTAL PIPE RUNS FIRMLY IN PLACE USING APPROVED STEEL AND IRON HANGERS, SUPPORTS, AND/OR PIPE RESTS UNLESS OTHERWISE INDICATED. FASTEN HANGER RODS FROM CONCRETE INSERTS OR FROM APPROVED BRACKETS, CLAMPS OR CLIPS. HANG PIPES INDIVIDUALLY OR IN GROUPS ONLY IF SUPPORTING STRUCTURE IS ADEQUATE TO SUPPORT WEIGHT OF PIPING AND FLUID. EXCEPT FOR BURIED PIPING, HANG OR SUPPORT PIPE RUNS TO PROVIDE FREE EXPANSION OR CONTRACTION WITHOUT STRAIN TO PIPE OR EQUIPMENT.

1. HORIZONTAL STEEL PIPING: PROVIDE HANGERS OR SUPPORTS EVERY 10' OR EVERY 8' FOR PIPING 1-1/4" DIA. AND UNDER.
2. HORIZONTAL COPPER TUBING: FOR 2" DIAMETER AND OVER, PROVIDE HANGERS EVERY 10' OR EVERY 6' FOR PIPING 1-1/2" DIAMETER AND UNDER.
3. HORIZONTAL CAST-IRON HUB AND SPIGOT PIPING: PROVIDE HANGERS OR SUPPORTS LOCATED AT EACH HUB.
4. HORIZONTAL CAST-IRON NO-HUB PIPING: PROVIDE HANGERS OR SUPPORTS AT EACH SIDE OF A NO-HUB FITTING. PROVIDE ANTI-SEPARATION BRACING AT EACH 90 DEGREE CHANGE OF DIRECTION.
5. VERTICAL PIPING: SUPPORT AT EACH FLOOR PENETRATION WITH IRON PIPE CLAMPS.
6. SWAY BRACE IN ACCORDANCE WITH NFPA 13.

B. BRANCHES: PROVIDE SEPARATE HANGERS OR SUPPORTS FOR BRANCH LINES 6' OR MORE IN LENGTH.

C. SOUND AND ELECTROLYSIS ISOLATORS: INSTALL AT ALL HANGERS AND SUPPORTS FOR HOT AND COLD DOMESTIC WATER LINES. SECURELY ATTACH PIPE TO WALLS, STUDS, ETC. ALL SUCH PIPING SHALL BE ISOLATED FROM STRUCTURE BY "TRISOLATORS".

3.05 EXPANSION AND CONTRACTION

PIPING SUBJECT TO EXPANSION AND CONTRACTION SHALL BE INSTALLED WITH EXPANSION LOOPS MADE UP OF BENDS, FITTINGS, OR VICTAULIC COUPLINGS, EXPANSION JOINTS, SWING JOINTS, OR OTHER APPROVED METHODS OR DEVICES. BRANCH LINES FROM MAINS SUBJECT TO EXPANSION AND CONTRACTION SHALL HAVE A SWING JOINT INSTALLED AT A POINT OF CONNECTION WITH THE MAIN. RISERS WHICH PASS THROUGH ONE OR MORE FLOORS SHALL HAVE SWING JOINTS INSTALLED AT THEIR BASE. ANCHOR LINES SUBJECT TO EXPANSION AND CONTRACTION BY APPROVED METHODS TO RESTRICT MOVEMENT.

3.06 CORROSION PREVENTION

JOINT BETWEEN CUPROUS AND FERROUS MATERIALS SHALL BE MADE WITH APPROVED NYLON INSULATING COUPLINGS. SEPARATE ALL CONTACT SURFACES OF DISSIMILAR METALS WITH NON-CONDUCTING COATING OR SHEET.

3.07 CLEANOUTS

A. FURNISH CLEANOUTS WHERE INDICATED AND REQUIRED. UNLESS OTHERWISE NOTED OR INDICATED, CLEANOUTS SHALL BE ACCESSIBLE WITH EXTENSIONS TO GRADE, TO OUTSIDE OF BUILDINGS, OR TO FLOORS ABOVE AS SHOWN OR REQUIRED. DO NOT LOCATE CLEANOUTS IN PUBLIC LOBBIES AND PUBLIC CORRIDORS UNLESS SPECIFICALLY APPROVED BY ARCHITECT.

B. MEMBRANES: WATERPROOFING MEMBRANE LOCATED UNDER FLOOR, SHALL HAVE MEMBRANE BROUGHT TO CLEANOUT WITHOUT PUNCTURING, AND PERMANENTLY ANCHOR TO INTEGRAL ANCHORING FLANGE WITH A HEAVY CAST-IRON CLAMPING COLLAR AND RUSTPROOFED BOLTS.

C. COVERS: LOCATE CLEANOUT COVERS WITH ALL FINISHED WALL, FLOOR OR GRADE AND IN ALL CASES SHALL BE SECURELY ANCHOR BY MEANS OF INTEGRAL LUGS AND BOLTS. WHERE SURFACING MATERIAL SUCH AS RESILIENT COVERING IS SPECIFIED, ASCERTAIN THICKNESS BEING USED AND SET CLEANOUT TOP TO FINISH AT FLOOR LEVEL FOR SMOOTH FLOOR FINISH.

D. USE ACORN 3500 THREAD COMPOUND.

3.08 ACCESS BOXES AND PANELS

A. FURNISH VALVE BOXES FOR VALVES LOCATED BELOW GRADE. FURNISH METAL ACCESS PANELS OF SIZE AND TYPE HEREINBEFORE SPECIFIED FOR VALVES OR SHOCK ABSORBERS LOCATED IN CONCEALED AREAS.

B. ACCESS BOXES AND PANELS: SHALL BE SET FLUSH WITH FINISHED WALL, FLOOR OR CEILING. DOOR OR PLATE LOCATED IN FINISHED WALLS SHALL BE REMOVED DURING CONSTRUCTION OR BE OTHERWISE SUITABLY COVERED TO PROTECT FINISH.

C. OUTSIDE GENERAL SERVICE ACCESS BOXES: FURNISH WITH METAL, ASBESTOS CEMENT, OR CLAY PIPE SLEEVE EXTENSIONS WHERE ADDED DEPTH IS NECESSARY. DO NOT LOCATE BOXES IN PUBLIC WALKS, DRIVEWAYS OR COVERED PASSAGES UNLESS INDICATED.

3.15 TESTS

A. TESTS SHALL BE PERFORMED TO ARCHITECT'S SATISFACTION. CONDUCT TESTS IN PRESENCE OF ARCHITECT AND AT A TIME SUITABLE TO HIM IF REQUESTED. PROVIDE NECESSARY LABOR AND EQUIPMENT AND BEAR COSTS FOR TESTING. COST OF REPLACING AND/OR REPAIRING DAMAGE RESULTING THEREFROM SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR. SHOULD THE CONTRACTOR REFUSE OR NEGLECT TO MAKE TESTS NECESSARY TO SATISFY THE ARCHITECT THAT REQUIREMENT OF SPECIFICATIONS AND DRAWINGS ARE MET, SUCH TESTS MAY BE MADE BY AN INDEPENDENT TESTING COMPANY AND THE CONTRACTOR SHALL PAY FOR ALL EXPENSES.

B. HYDROSTATIC TESTS: CONDUCT BY FILLING PIPING SYSTEM COMPLETELY WITH WATER AND ELIMINATING ACCUMULATIONS OF AIR SO THAT LEAKAGE, NO MATTER HOW SMALL, WILL BE IDENTIFIED ON TESTING GAUGE IMMEDIATELY. MAINTAIN PRESSURE UNTIL PIPE UNDER TEST HAS BEEN EXAMINED, FOR NO LESS THAN 24 HOURS. TEST SYSTEMS AT FOLLOWING PRESSURE:

SYSTEM	TEST PRESSURE
DOMESTIC COLD WATER	150 PSIG
DOMESTIC HOT WATER	150 PSIG

C. SANITARY SOIL, WASTE, VENT SYSTEM TESTS: PRIOR TO INSTALLATION OF FIXTURES, ALL ENDS OF THE SYSTEM SHALL BE CAPPED AND LINES FILLED WITH WATER TO 10' ABOVE THE SECTION BEING TESTED (INCLUDING VENTS) AND ALLOW TO STAND UNTIL A THOROUGH INSPECTION HAS BEEN CONDUCTED. MAKE TESTS IN SECTIONS IF SEEN AS NECESSARY. ENSURE INTERCONNECTIONS BETWEEN EXISTING SECTIONS PREVIOUSLY TESTED ARE INCLUDED IN NEW SECTIONS IN THE NEW TEST.

D. ROOF DRAINAGE SYSTEM: TEST AS SPECIFIED FOR SANITARY SYSTEM.

E. GAS SYSTEMS: TEST & FILL GAS SYSTEM WITH COMPRESSED AIR AT 10 PSI FOR SIX HOURS OR LONGER AS DIRECTED TO PROVE TIGHT WITHOUT LEAKS. USE PRESSURE RECORDER TO RECORD PRESSURE OF ALL LINES FOR DURATION OF TEST.

3.16 ADJUSTING

AT COMPLETION OF WORK AND AFTER CLEANING OF SYSTEM, FIXTURES AND EQUIPMENT AND AUTOMATIC PARTS OF PLUMBING SYSTEM SHALL BE CAREFULLY & INCREMENTLY ADJUSTED FOR NORMAL OPERATION. ALL FLUSH VALVES AND FIXTURE STOPS SHALL BE CHECKED FOR PROPER OPERATION AND FINAL ADJUSTMENTS MADE WHERE NECESSARY. SYSTEM SHALL OPERATE QUIETLY WITHOUT VIBRATION OR NOISE.

FIRE PROTECTION SPECIFICATIONS

1.00 GENERAL

1.01 GENERAL REQUIREMENTS

A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO THIS SECTION.

1.02 PRINCIPAL WORK

A. GENERAL REQUIREMENTS:

1. PROVIDE ALL REQUIRED LABOR, MATERIALS, EQUIPMENT AND CONTRACTOR'S SERVICES NECESSARY OR REQUIRED FOR COMPLETE, SAFE INSTALLATION OF FIRE PROTECTION WORK IN FULL CONFORMANCE WITH REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION; ALL AS INDICATED ON THE DRAWINGS AND/OR HEREIN SPECIFIED INCLUDING THE FOLLOWING:

a. FIRE PROTECTION SYSTEMS INCLUDING CONNECTIONS TO EXISTING PIPING AND EQUIPMENT.
b. CORE DRILLING, ROUGH CUTTING AND PATCHING.
c. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS.
d. TESTING, FILING AND FEES
e. CADD AS-BUILT DRAWINGS.

2. PROVIDE ALL NECESSARY SUPPORTS, PIPE, FITTINGS AND VALVES THAT ARE REQUIRED FOR THE INSTALLATION OF THIS WORK COORDINATED WITH ALL OTHER TRADES AND THE EXISTING STRUCTURE. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF PIPING.

3. THIS CONTRACTOR SHALL CONFIRM SIZES AND LOCATIONS OF ALL EXISTING PIPING TO BE CONNECTED TO PRIOR TO START OF WORK.

4. CONNECTIONS TO EXISTING WORK: SHALL BE AT ODD HOURS TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL PIPING RUN IN OTHER TENANTS' AREAS SHALL BE COORDINATED WITH THAT TENANT, INSTALLED ON OVERTIME AND AT TIMES CONVENIENT TO TENANT AFFECTED. ALL WORK SPACE SHALL BE CLEANED AND RESTORED TO ITS ORIGINAL CONDITION. OBTAIN APPROVAL OF BUILDING MANAGEMENT PRIOR TO INSPECTION SHUTDOWN OR COMMENCING WORK.

5. VERIFY ALL GOVERNING DIMENSIONS IN THE AREA OF WORK.

6. CAREFULLY EXAMINE EXISTING CONDITIONS BEFORE SUBMITTING PROPOSAL. COORDINATE ALL WORK TO MINIMIZE INTERFERENCE WITH EXISTING AND NEW FACILITIES.

7. SUBMISSION OF PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT REQUIRED EXAMINATION OF FIELD CONDITIONS AND CONTRACT DRAWINGS HAS BEEN MADE. LATER CLAIMS FOR EXTRA LABOR, EQUIPMENT AND MATERIALS REQUIRED DUE TO DIFFICULTIES, WHICH COULD HAVE BEEN FORESEEN, WILL NOT BE RECOGNIZED.

1.03 SUBMITTALS

A. PROVIDE SIX (6) COPIES OF SUBMITTAL MATERIAL.

B. IF THIS CONTRACTOR SUBMITS MANUFACTURER'S EQUIPMENT CUT SHEETS OF SPECIFIED ITEMS AS LISTED IN THESE SPECIFICATIONS, THEN THEY SHALL BE SUBMITTED FOR RECORD ONLY.

C. IF THIS CONTRACTOR ELECTS TO USE MANUFACTURERS OTHER THAN LISTED IN THE SPECIFICATIONS, THEN THIS CONTRACTOR SHALL DO THE FOLLOWING.

1. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL SUBMIT A LIST OF MANUFACTURE SUBSTITUTIONS, FOR REVIEW AND ACCEPTANCE. SUBSTITUTION WILL NOT BE ACCEPTED AT ANY OTHER TIME.

2. AFTER VERIFYING ALL FIELD CONDITIONS THIS CONTRACTOR SHALL SUBMIT EQUIPMENT CUT SHEETS FOR REVIEW AND APPROVAL.

3. AT THE TIME OF EACH SUBMISSION, THIS CONTRACTOR IS TO IDENTIFY ANY DEVIATION BY CLOUDING ON SHOP DRAWINGS.

4. SUBMIT MANUFACTURER'S CUT SHEETS FOR THE FOLLOWING:

a. PIPE AND FITTINGS.
b. VALVES.
c. SUPPORTS.
d. SPRINKLER HEADS.
e. SLEEVES.

D. SUBMIT FULLY COORDINATE SHOP DRAWINGS OF FLOOR PLANS INDICATING TYPE OF SPRINKLER HEADS, PIPE SIZES, ELEVATIONS AND DIMENSIONS WITH DETAILS AND HYDRAULIC CALCULATIONS, PERFORMED IN COMPLIANCE WITH THE DESIGN CRITERIA INDICATED ON THE CONTRACT DRAWINGS.

E. AS-BUILT DRAWINGS.

1.04 QUALITY ASSURANCE

A. PROVIDE WORKMANSHIP OF HIGHEST QUALITY. INSTALL ALL PIPING AND SPRINKLER HEADS IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS, REQUIREMENTS OF NFPA-13 LOCAL FIRE DEPARTMENT, OWNER'S INSURANCE UNDERWRITERS AND LOCAL BUILDING CODE.

B. ALL MATERIAL, FIRE PROTECTION ITEMS, ETC., SHALL BE NEW AND BEST OF ITS KIND, UNLESS OTHERWISE NOTED.

C. TYPE AND SIZE OF MATERIALS APPROVED BY LOCAL FIRE DEPARTMENT, NFPA AND OWNER'S INSURANCE UNDERWRITERS.

D. SYSTEM AS INSTALLED SHALL MEET REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION AND OWNER'S INSURANCE UNDERWRITERS AND RECEIVE APPROVAL OF SAME BEFORE FINAL PAYMENT.

E. ALL SUBMITTALS SHALL INDICATE M.E.A. APPROVAL WITH A CALENDAR NUMBER, FACTORY MUTUAL AND UNDERWRITERS LABORATORY, INC.

1.05 GUARANTEE

A. PROVIDE ONE YEAR GUARANTEE AGAINST DEFECTIVE WORKMANSHIP AND MATERIALS.

1.06 DEMOLITION

A. IN DEMOLITION WORK, UNUSED PIPING SHALL NOT BE ABANDONED 'IN PLACE' EXCEPT AS NOTED HEREIN. PIPING SHALL BE REMOVED BACK TO SOURCE OR POINT OF DISCHARGE, AND THE RESULTING OPENINGS PLUGGED AS INDICATED ON THE DRAWINGS.

B. DISCONNECT, REMOVE AND CAP OR PLUG EXISTING UNUSED PIPING AS NOTED OR REQUIRED TO PERMIT NEW INSTALLATION.

C. THE CONTRACTOR SHALL DISCONNECT AND REMOVE ALL EXISTING UNUSED PIPING WITHOUT INTERRUPTING EXISTING REQUIRED FUNCTIONING SYSTEMS.

1.07 WORK NOT INCLUDED:

A. FINISHED PATCHING AND PAINTING UNLESS OTHERWISE NOTED.

B. WIRING OF ALARM INITIATING DEVICES

1.08 PHASING

A. CONTRACTOR SHALL SUBMIT A FIRE PROTECTION PHASING SCHEDULE UPON AWARD OF CONTRACT TO BE APPROVED BY THE ENGINEER AND OWNER.

B. AT NO TIME SHALL THE BUILDING BE WITHOUT FIRE PROTECTION EXCEPT IN AREAS OF NEW WORK. IF WATER IS TO BE TURNED OFF, THEN TEMPORARY PIPING IS TO BE INSTALLED AS REQUIRED AND PROVIDE FIRE WATCH.

C. REMOVAL OF EXISTING PIPING SHALL BE DONE IN A SATISFACTORY MANNER TO THE ENGINEER AND COORDINATED WITH THE GC SECTION.

2.00 PRODUCTS

2.01 BASE BID MANUFACTURERS

A. PIPING: ALLIIED TUBE, BERGER, WHEATLAND TUBE CO., NORTHWEST PIPE & CASING CO., LACLEDE STEEL.
B. FITTINGS: WARD FITTINGS, VICTAULIC AND STAR PIPE PRODUCTS, INC.
C. VALVES: NIBCO, STOCKHAM, TYCO, MILWAUKEE AND VICTAULIC CO.
D. SPRINKLER HEADS: VIKING, TYCO, GLOBE, RELIABLE AND VICTAULIC.
E. HANGERS AND SUPPORTS: ANVIL INTERNATIONAL, CARPENTER AND PATERSON, INC., MICHIGAN HANGER (ERICO), B-LINE, PSI CORP.

2.02 GENERAL ITEMS

A. ESCUTCHEONS:

1. PROVIDE EXPOSED PIPES WITH APPROVED TYPE, SINGLE PIECE, CAST BRASS OR CAST IRON ESCUTCHEONS, FIRMLY HELD IN PLACE. IN FINISHED SPACE PROVIDE CHROME PLATED.

2. PROVIDE PENDENT SPRINKLER HEADS WITH CHROME PLATED ESCUTCHEONS TO MATCH SPRINKLER HEAD UNLESS OTHERWISE NOTED.

B. SLEEVES: PROVIDE NO. 22 USSG GALVANIZED STEEL SLEEVES EXTENDED THROUGH CONSTRUCTION IN CEILINGS, WALLS AND PARTITIONS. FIREPROOF BY SEALING ALL SLEEVES IN ACCORDANCE WITH BUILDING CODE AND FIRE DEPARTMENT REQUIREMENTS. SLEEVES SIMILAR TO MICHIGAN HANGERS MFG. CORP.

C. HANGERS AND PIPING SUPPORTS:

1. SUPPORT MATERIALS: GALVANIZED STEEL.

2. ALL PIPING SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURE. PIPE SUPPORTED FROM PIPE, CHAIN, STRAP, PERFORATED BAR, OR WIRE HANGERS ARE NOT PERMITTED.

3. SUPPORT HORIZONTAL PIPING AT LEAST EVERY 12 FT. NO BRANCHES 2 FT. OR LONGER WITHOUT SUPPORT.

4. PIPING 2 IN. OR LESS PROVIDE ELECTROPLATED SOLID BAND HANGERS, ANVIL INTERNATIONAL AUTO-GRIP ADJUSTABLE SWIVEL RING FIG. 69.

5. FOR HORIZONTAL PIPING 2-1/2 IN. AND LARGER, PROVIDE GALVANIZED 'CLEVIS' HANGER, ANVIL INTERNATIONAL NO. 260.

6. SUSPEND HANGERS FROM EXPANSION ANCHORS IN SOLID CONCRETE SLABS, SIMILAR TO HILTI HDI OR FROM EXISTING STRUCTURAL STEEL WITH BEAM CLAMPS SIMILAR TO ANVIL INTERNATIONAL NO. 95 WITH RETAINING CLAMP NO. 89. PROVIDE RODS SIZED FOR PIPE SUPPORTED AND LOCK HANGER IN PLACE WITH DOUBLE NUTS.

7. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING HANGER RODS IN REQUIRED LOCATIONS, PROVIDE ADDITIONAL STEEL FRAMING AS REQUIRED AND REVIEWED.

D. LABELING:

1. PROVIDE ON MAIN PIPING IN OR AT CEILING, 10 FT. ON CENTERS, INDICATING SYSTEM, SIZE AND DIRECTION OF FLOW, SETMARK SNA TYPE. ADHESIVE TYPE MARKERS WILL NOT BE PERMITTED.

2.03 PIPE AND FITTINGS

A. PIPE:

1. STANDARD WEIGHT SCHEDULE 40 STEEL PIPE, SEAMLESS OR WELDED MILD STEEL, ASTM A-106 OR A-53 FOR STANDPIPE AND SPRINKLER SUPPLY PIPING.

2. SCHEDULE 10 STEEL PIPE MAY BE USED FOR SPRINKLER SYSTEM DIAMETERS 2 IN. AND LARGER WITH WALL THICKNESS IN ACCORDANCE WITH NFPA-13. THREADED OR CUT GROOVED CONNECTIONS NOT PERMITTED FOR THIS PIPE.

B. FITTINGS:

1. CAST IRON THREADED: STANDARD WEIGHT, EXCEPT AS NOTED, ANSI B-16.4.

2. MALLEABLE IRON: THREADED AND BANDED, STANDARD WEIGHT, EXCEPT AS NOTED, ANSI B-16.3.

3. GROOVED END MALLEABLE IRON FITTINGS AND COUPLINGS WITH APPROPRIATE PRESSURE RATING, SIMILAR TO VICTAULIC: SUBJECT TO SPECIAL APPROVAL BY THE ENGINEER.

4. REDUCERS AND INCREASERS: OF THE TAPERED TYPE. NO BUSHINGS SHALL BE PERMITTED EXCEPT WHERE SPECIFICALLY APPROVED BY THE ENGINEER.

5. CONNECTIONS TO EXISTING PIPING MAY BE MALLEABLE IRON OR DUCTILE IRON MECHANICAL T-OUTLETS, SIMILAR TO VICTAULIC STYLE 920.

2.04 VALVES

A. VALVES:

1. VALVES CONTROLLING WATER FLOW IN FIRE STANDPIPE AND SPRINKLER SYSTEM SHALL BE OF THE OS&Y TYPE UNLESS OTHERWISE NOTED:

a. VALVES 2 IN. AND SMALLER: THREADED BRONZE, 175 PSI WWP, SIMILAR TO NIBCO NO. T-104-O.

2.05 SPRINKLER HEADS

A. CAST BRASS, CLOSED, FUSIBLE LINK, SPRAY TYPE, 1/2 IN. ORIFICE, ORDINARY DEGREE TEMPERATURE RATING, EXCEPT AS NOTED.

1. IN FINISHED AREAS WITH HUNG CEILINGS, CONCEALED TYPE WITH CEILING PLATES FACTORY PAINTED WHITE, SIMILAR TO RELIABLE MODEL G4FR.

2. IN UNFINISHED AREAS: UPRIGHT WHERE POSSIBLE, PENDENT HEADS WHERE NECESSARY, BRONZE FINISH, SIMILAR TO RELIABLE MODEL G.

B. HIGHER TEMPERATURE RATING WHERE SUBJECT TO ABNORMAL HEATING CONDITIONS AND/OR WHERE INDICATED.

C. PROVIDE WITH WIRE GUARDS WHERE SUBJECT TO MECHANICAL DAMAGE.

D. SPRINKLER CABINET:

1. PROVIDE ENAMELED STEEL CABINET WITH (6) (12) OR (24) EXTRA SPRINKLER HEADS INCLUDING EACH TEMPERATURE RATING AND TYPE USED IN CONFORMANCE WITH NFPA 13. PROVIDE SPRINKLER HEAD WRENCHES FOR EACH TYPE OF SPRINKLER HEAD USED.

2.06 TEST AND DRAIN CONNECTIONS

A. PROVIDE DRAIN VALVES AND/OR PLUGS AS REQUIRED BY NFPA-13.

B. PROVIDE TEST AND DRAIN ASSEMBLY DOWNSTREAM OF EACH WATERFLOW ALARM SWITCH, CONSISTING OF TEST AND DRAIN VALVES, SIGHT GLASS AND CALIBRATED ORIFICE, AND CONNECT IT TO DRAIN AS NOTED.

1. APPROVED COMPACT COMBINATION TEST-DRAIN FITTINGS WITH THREADED ENDS, SIMILAR TO VICTAULIC STYLE 720, MAY BE USED. FOR 4 IN. AND LARGER, SPRINKLER CONNECTIONS DIAMETER OF DRAIN PIPE FROM FITTING SHALL BE 2 IN.

2. FOR DRAINS SERVING PRESSURE REDUCING VALVES, THE DRAIN, DRAIN CONNECTION, AND ALL OTHER DOWNSTREAM DRAIN PIPING SHALL BE SIZED TO PERMIT A FLOW OF AT LEAST THE GREATER SYSTEM DEMAND SUPPLIED BY THE PRESSURE-REDUCING VALVE. DRAIN CONNECTION 2 INCH MINIMUM, DRAIN RISER 3 INCH MINIMUM.

2.07 FIRE EXTINGUISHERS

A. PROVIDE:

1. 2½ GAL. WATER TYPE: WHERE NOTED AS FE-1, POTTER-ROEMER MODEL NO. 3202.

2. 10 LBS. ABC-RATED DRY CHEMICAL TYPE: WHERE NOTED AS FE-2, POTTER-ROEMER MODEL NO. 3010.

3. 5 LBS. CARBON DIOXIDE TYPE, FE-3, POTTER-ROEMER MODEL NO. 3405.

2.08 FIRE EXTINGUISHER CABINETS

A. PROVIDE CABINETS SIZED TO HOUSE NOTED FIRE EXTINGUISHERS. FULL RECESSED NO. 20 USSG SHEET STEEL BOX.

B. NO. 20 USSG DOOR FRAME AND DOOR OF NO. 20 USSG HOLLOW METAL CONSTRUCTION, WIRE GLASS PANEL MARKED FIRE EXTINGUISHER, CONTINUOUS PIANO HINGE AND SATIN FINISH CP LEVER CATCH.

C. PROVIDE DUO-PANEL DOOR.

D. CABINETS SHALL BE SIMILAR TO POTTER ROEMER 1700 SERIES (FOR ONE EXTINGUISHER).

2.09 SPRINKLER HEADS

A. CAST BRASS, CLOSED, FUSIBLE LINK, SPRAY TYPE, 1/2 IN. ORIFICE, ORDINARY DEGREE TEMPERATURE RATING, EXCEPT AS NOTED.

1. IN FINISHED AREAS WITH HUNG CEILINGS, CONCEALED TYPE WITH CEILING PLATES FACTORY PAINTED WHITE, SIMILAR TO RELIABLE MODEL G4FR.

2. IN UNFINISHED AREAS: UPRIGHT WHERE POSSIBLE, PENDENT HEADS WHERE NECESSARY, BRONZE FINISH, SIMILAR TO RELIABLE MODEL G.

B. HIGHER TEMPERATURE RATING WHERE SUBJECT TO ABNORMAL HEATING CONDITIONS AND/OR WHERE INDICATED.

C. PROVIDE WITH WIRE GUARDS WHERE SUBJECT TO MECHANICAL DAMAGE.

D. SPRINKLER CABINET:

1. PROVIDE ENAMELED STEEL CABINET WITH (6) (12) OR (24) EXTRA SPRINKLER HEADS INCLUDING EACH TEMPERATURE RATING AND TYPE USED IN CONFORMANCE WITH NFPA 13. PROVIDE SPRINKLER HEAD WRENCHES FOR EACH TYPE OF SPRINKLER HEAD USED.

3.00 EXECUTION

3.01 TESTS

A. TEST ENTIRE SYSTEM PIPING HYDROSTATICALLY FOR TWO HOURS AT 200 PSI OR AT 50 PSI ABOVE MAXIMUM WORKING PRESSURE (WHICHEVER IS GREATER) AND IN ACCORDANCE WITH ALL REQUIREMENTS OF LOCAL BUILDING CODE.

3.02 INSTALLATION

A. ACCURATELY ALIGN SPRINKLER HEADS IN HUNG CEILING AREAS SYMMETRICALLY WITH DIFFUSERS, GRILLES, LIGHTING FIXTURES AND CEILING TILES.

B. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ACTUAL QUANTITIES AND LOCATIONS OF SPRINKLER HEADS AND OTHER REQUIRED DEVICES FOR CODE COMPLIANCE WITH AUTHORITY HAVING JURISDICTION.

C. ALL SPRINKLER HEAD LOCATIONS, TYPES, FINISHES ETC. SHALL BE REVIEWED BY THE PROJECT MANAGER PRIOR TO INSTALLATION.

D. CONTRACTOR SHALL CHECK ALL CONDITIONS AT THE SITE AND EXAMINE ALL PERTINENT DRAWINGS BEFORE PREPARING WORKING DRAWINGS.

E. CONTRACTOR SHALL TAKE MEASUREMENTS FOR HIS OWN WORK, VERIFY HIS DRAWINGS WITH DRAWINGS OF OTHER TRADES, AND EXISTING CONDITIONS AND BE RESPONSIBLE FOR PROPER INSTALLATION IN AVAILABLE SPACE FOR APPURTENANCES HEREIN SPECIFIED AND/OR INDICATED, AND SHALL, BEFORE MAKING ANY CHANGES, SECURE APPROVAL OF PROJECT MANAGER FOR SUCH VARIATIONS.

ALL REFERENCES TO FIRE SPRINKLER SYSTEMS, FIRE SERVICE MAINS, STAND PIPE SYSTEM OR SPECIAL FIRE SUPPRESSION SYSTEMS ON THESE PLANS SHALL BE USED FOR BIDDING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION.

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ELEV. = 43.508'

CITY OF GARDENA
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FIRE PROTECTION SPECIFICATIONS
COMMUNITY AQUATICS & SENIOR CENTER
P0.03

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SHT. 111 OF 157
DWG. NO. 5-2606

FILE PATH:
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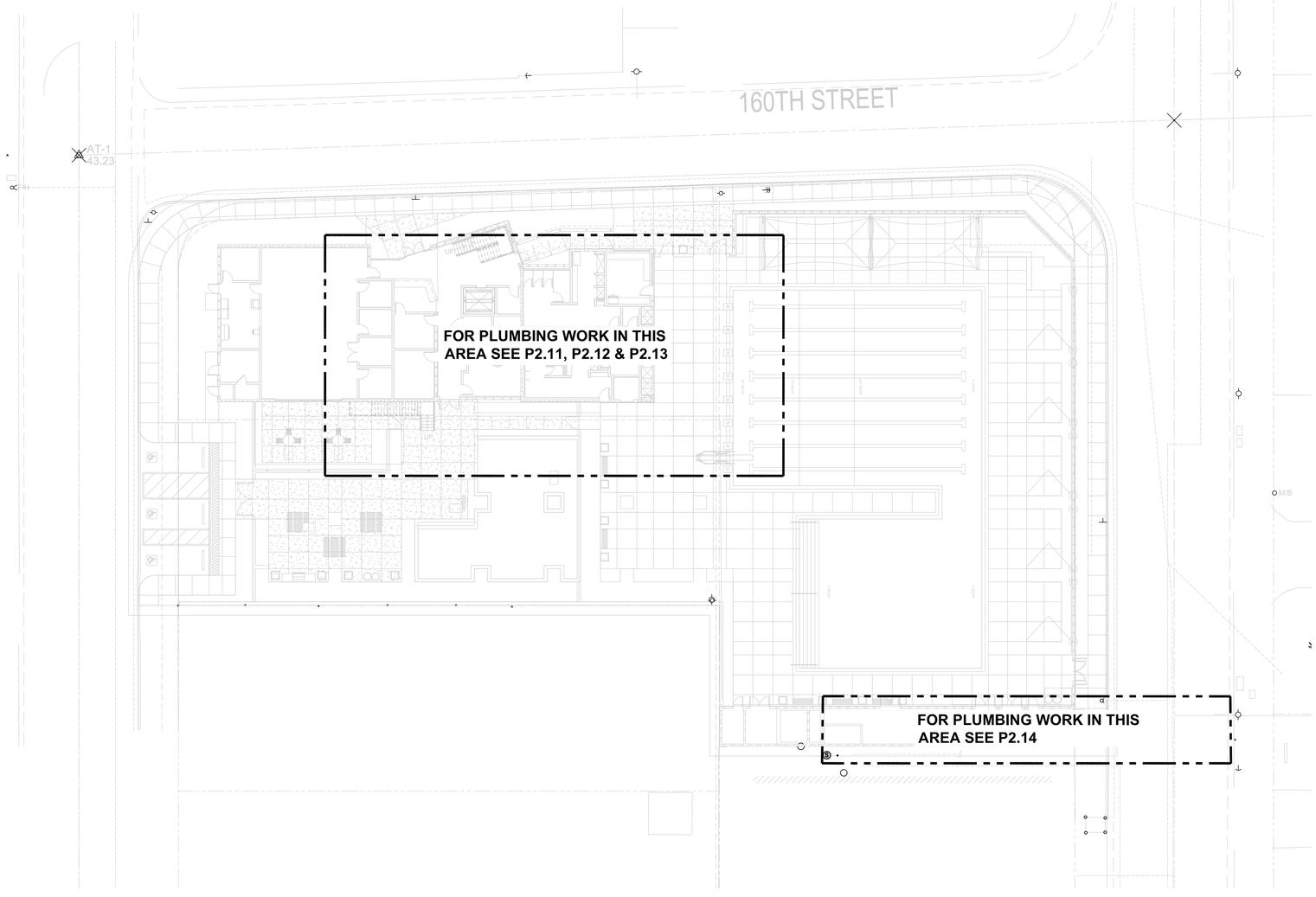

1 - PLUMBING SITE PLAN

SCALE: 1/16" = 1'-0"

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DEPARTMENT OF PUBLIC WORKS - ENGINEERING

FIRST FLOOR PLUMBING PLAN

COMMUNITY AQUATICS & SENIOR CENTER

P1.11

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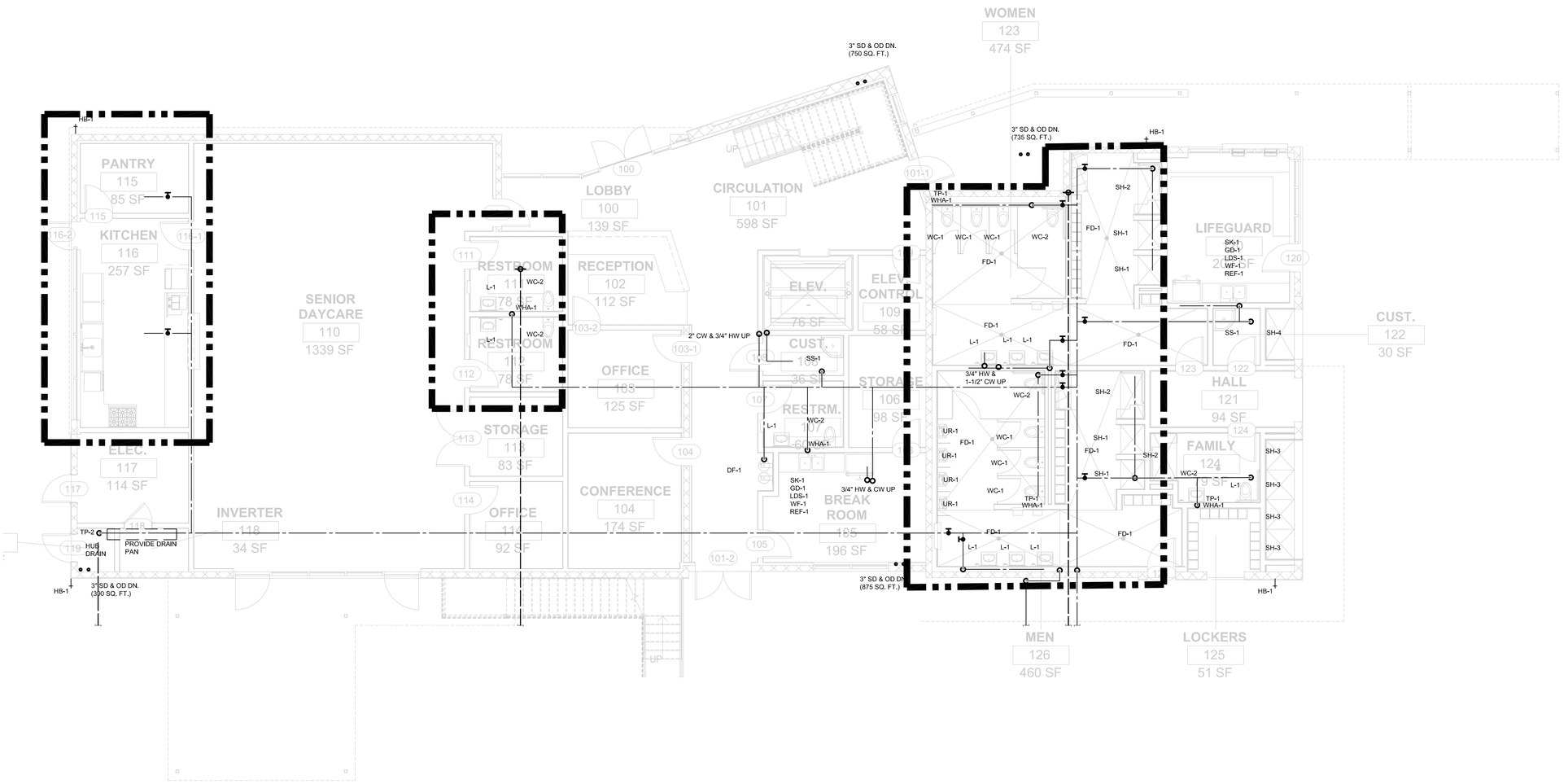

1 - FIRST FLOOR PLUMBING PLAN

SCALE: 3/16" = 1'-0"

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FIRST FLOOR PLUMBING PLAN

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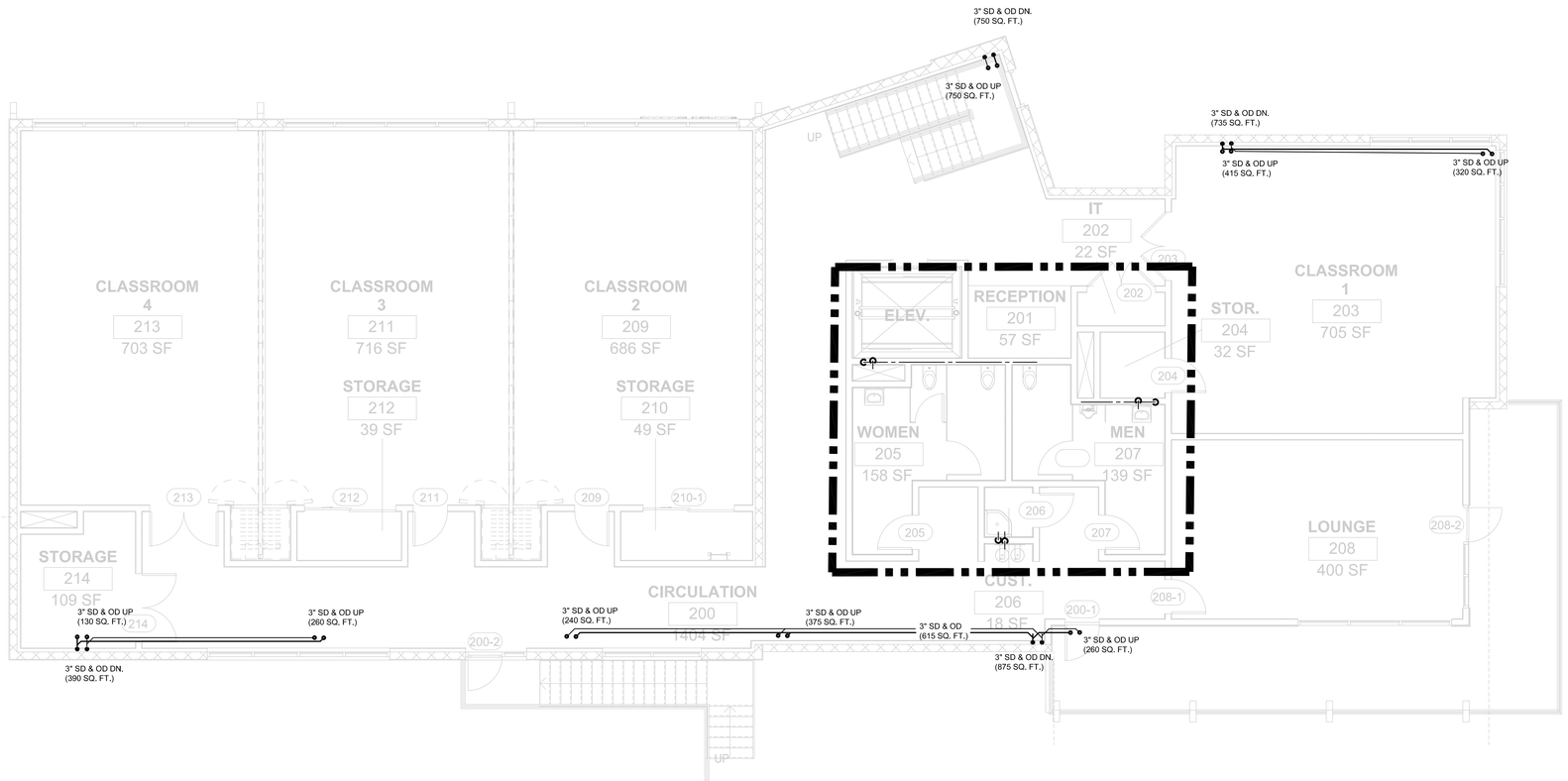

1 - SECOND FLOOR PLUMBING PLAN

SCALE: 3/16" = 1'-0"

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CITY OF GARDENA
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SECOND FLOOR PLUMBING PLAN

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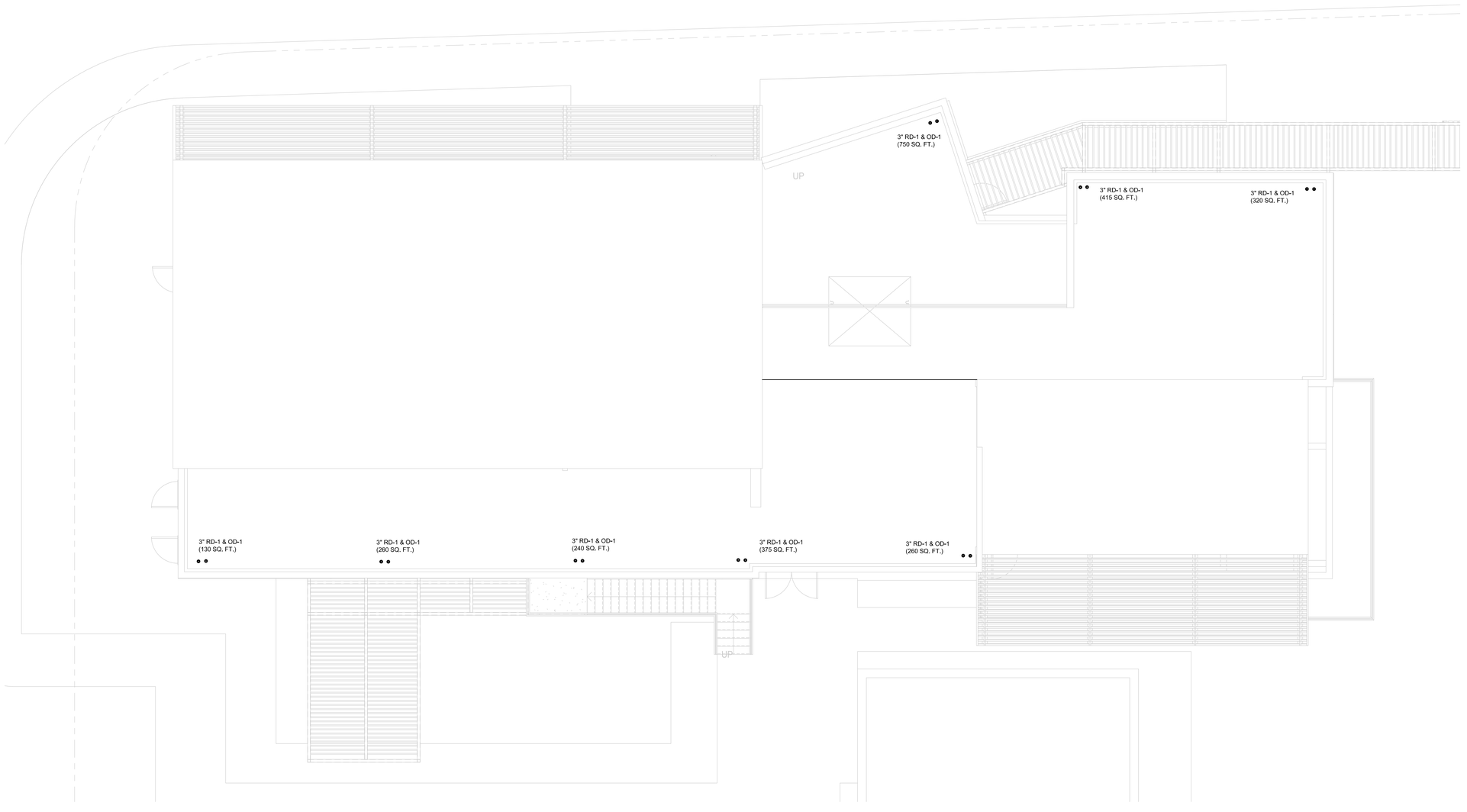

1 - PLUMBING ROOF PLAN

SCALE: 3/16" = 1'-0"

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PLUMBING ROOF PLAN

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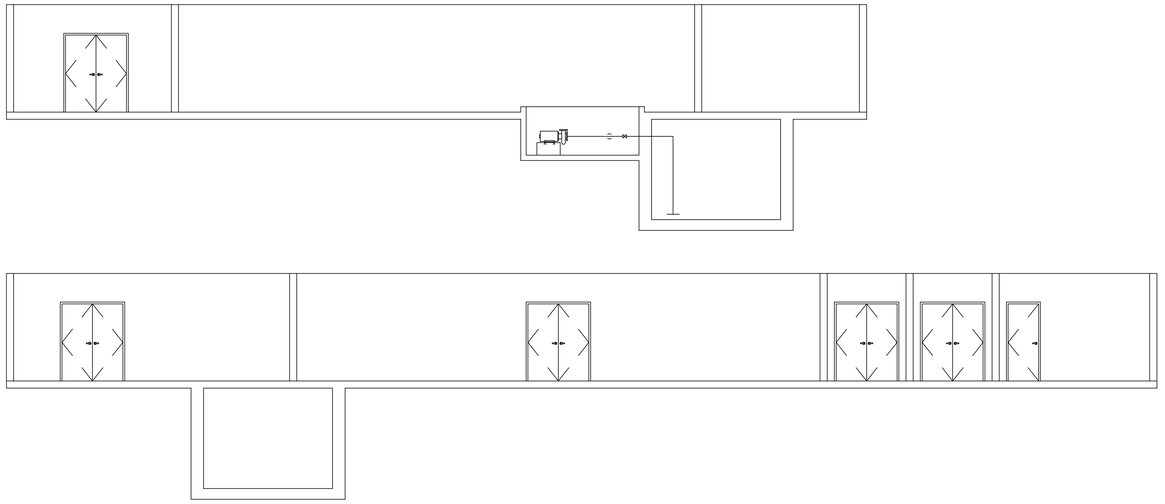

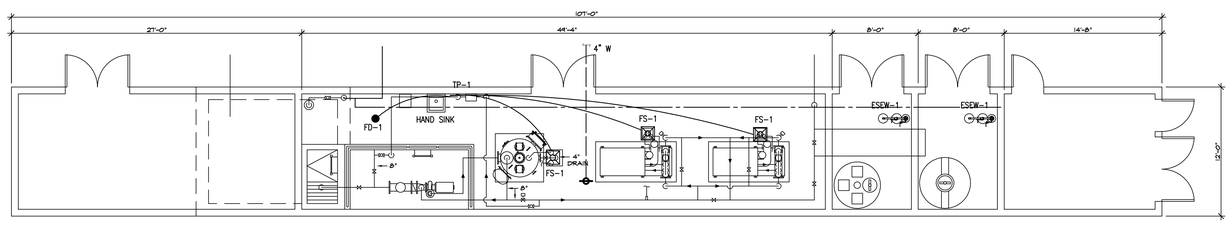

EQUIPMENT ROOM PLAN

SCALE: 1/4" = 1'-0"

NORTH

1 - FIRST FLOOR PLUMBING PLAN

SCALE: 1/4" = 1'-0"

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FIRST FLOOR PLUMBING PLAN

COMMUNITY AQUATICS & SENIOR CENTER

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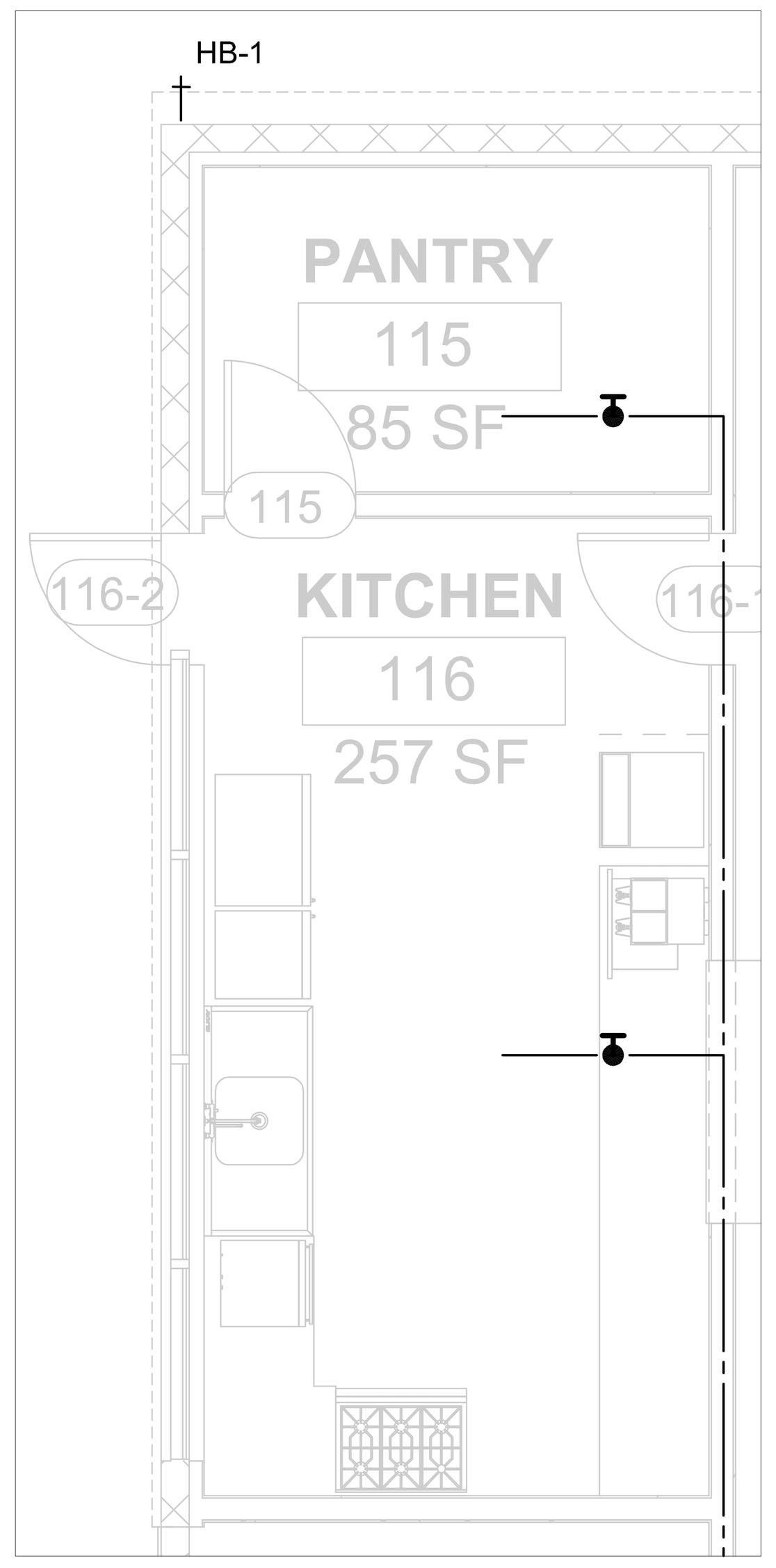

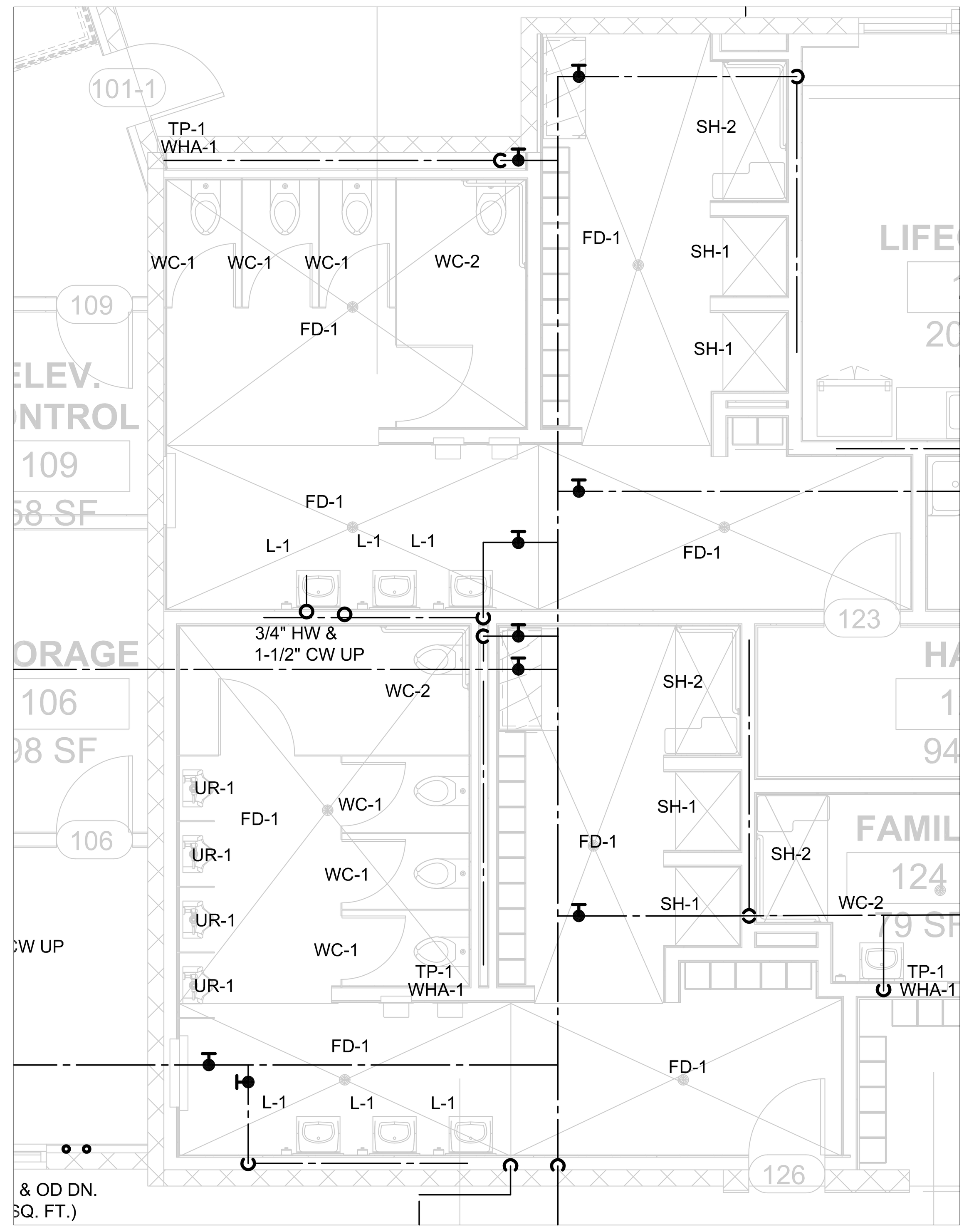

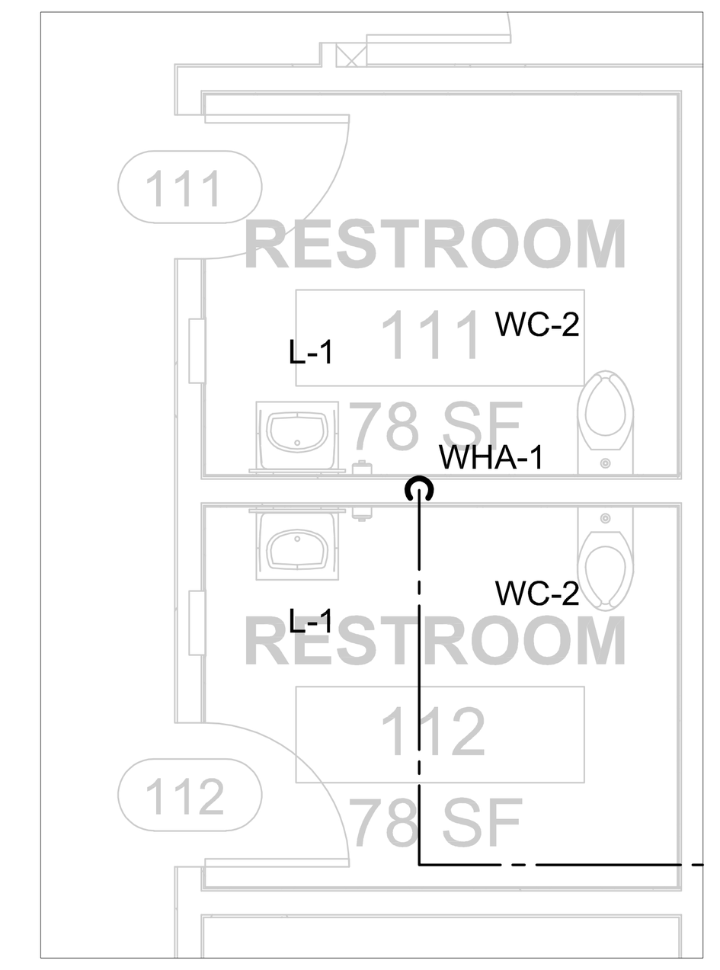

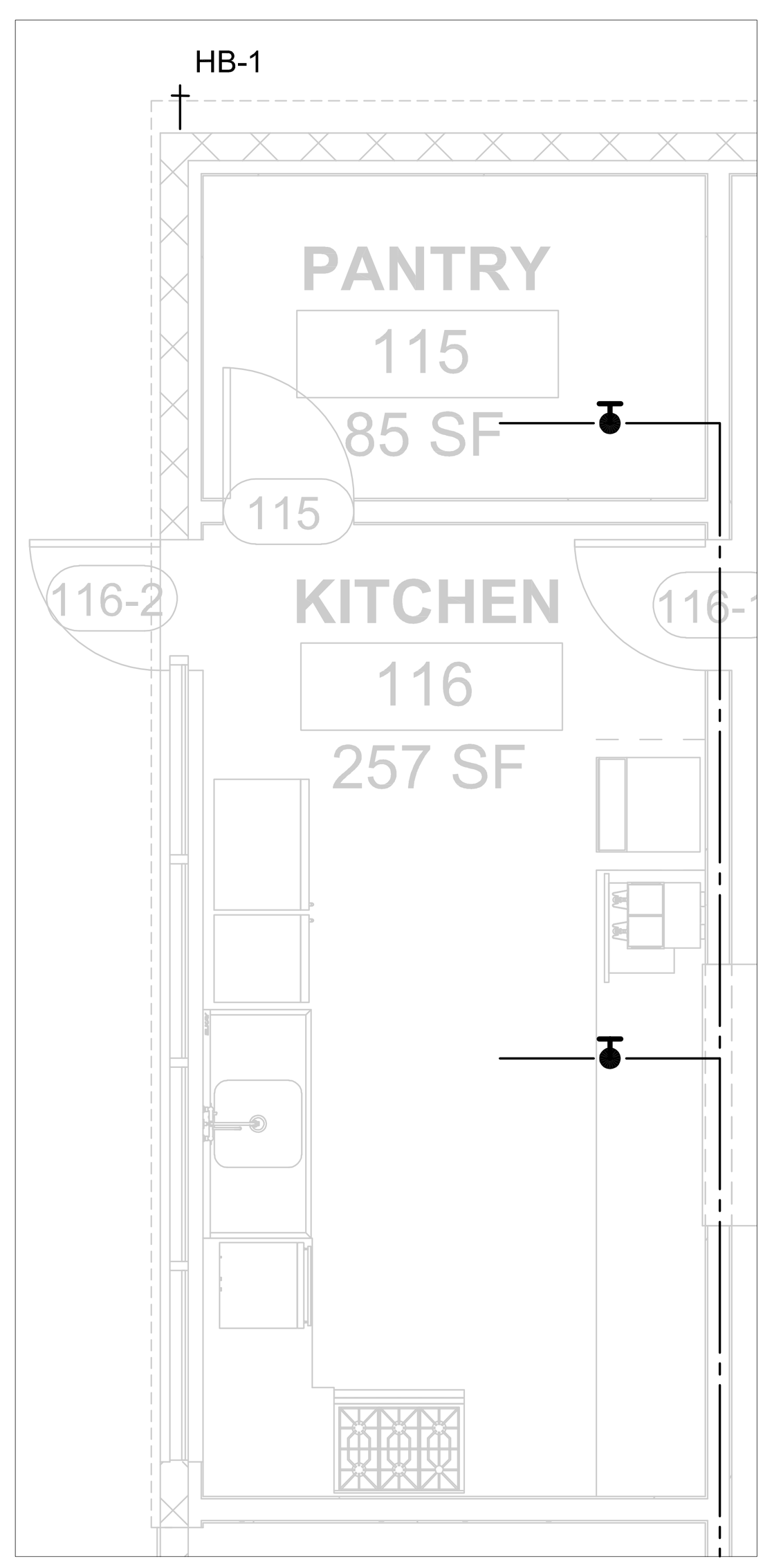

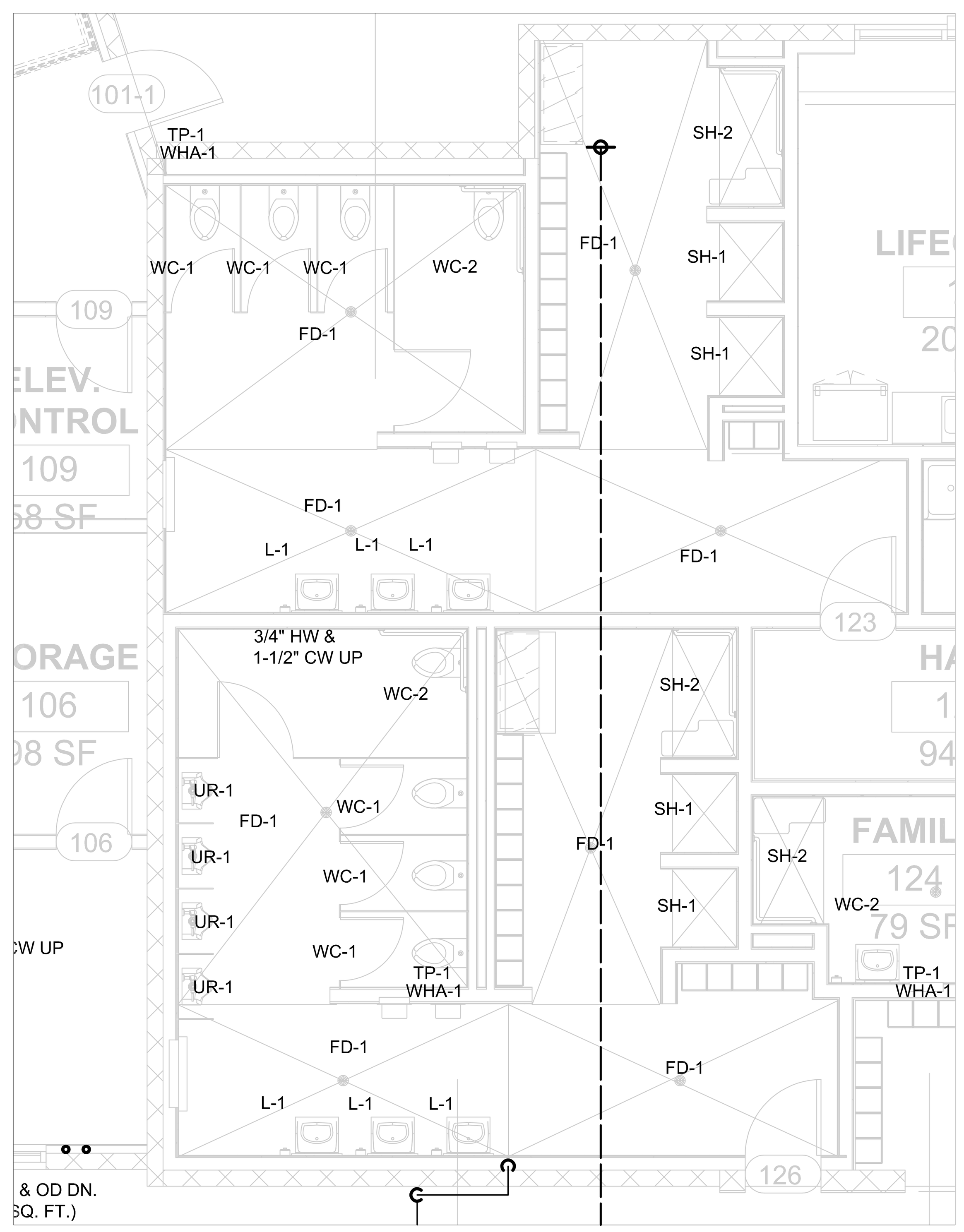

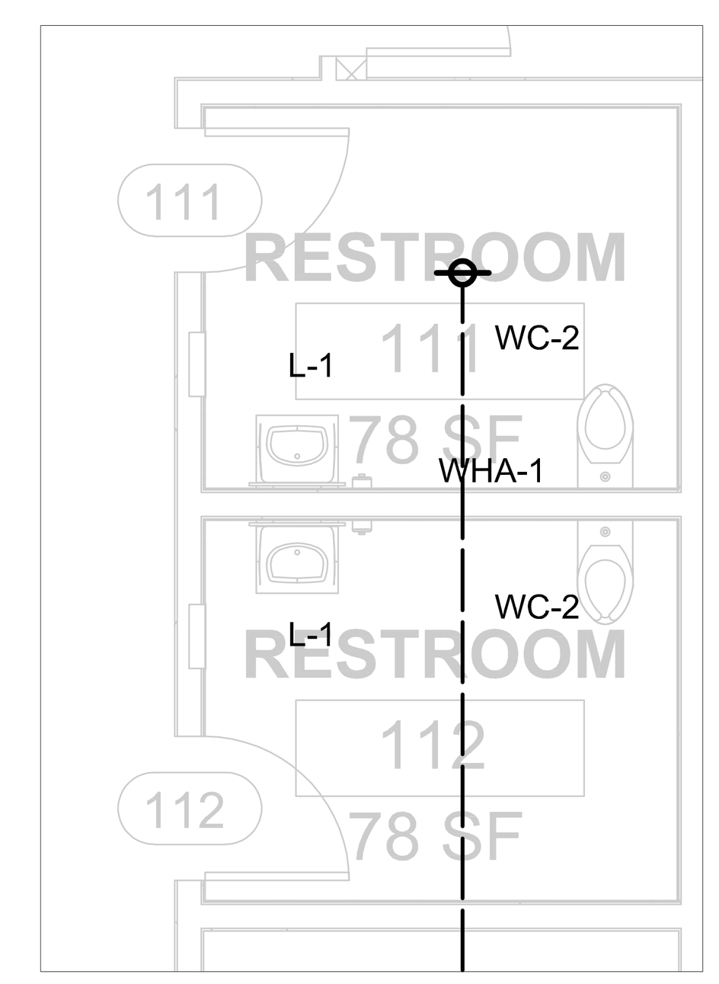

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CITY OF GARDENA
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ENLARGED PLUMBING PLANS

COMMUNITY AQUATICS & SENIOR CENTER
P4.01

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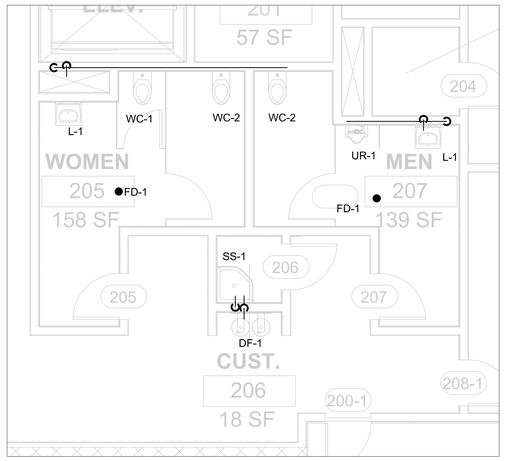

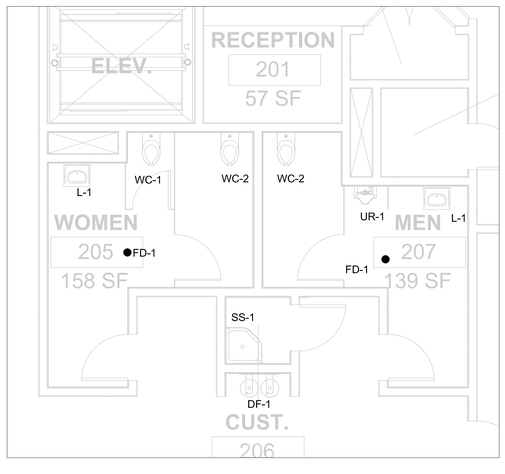

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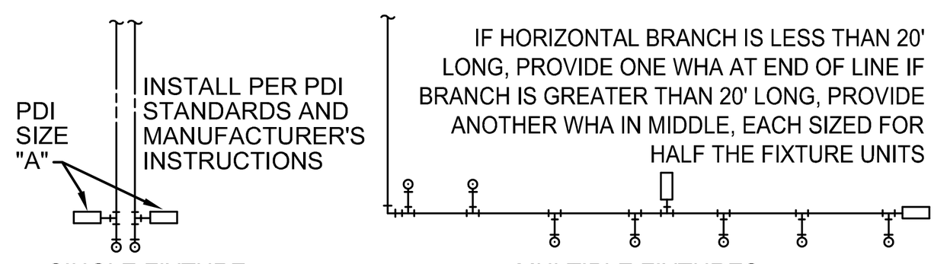
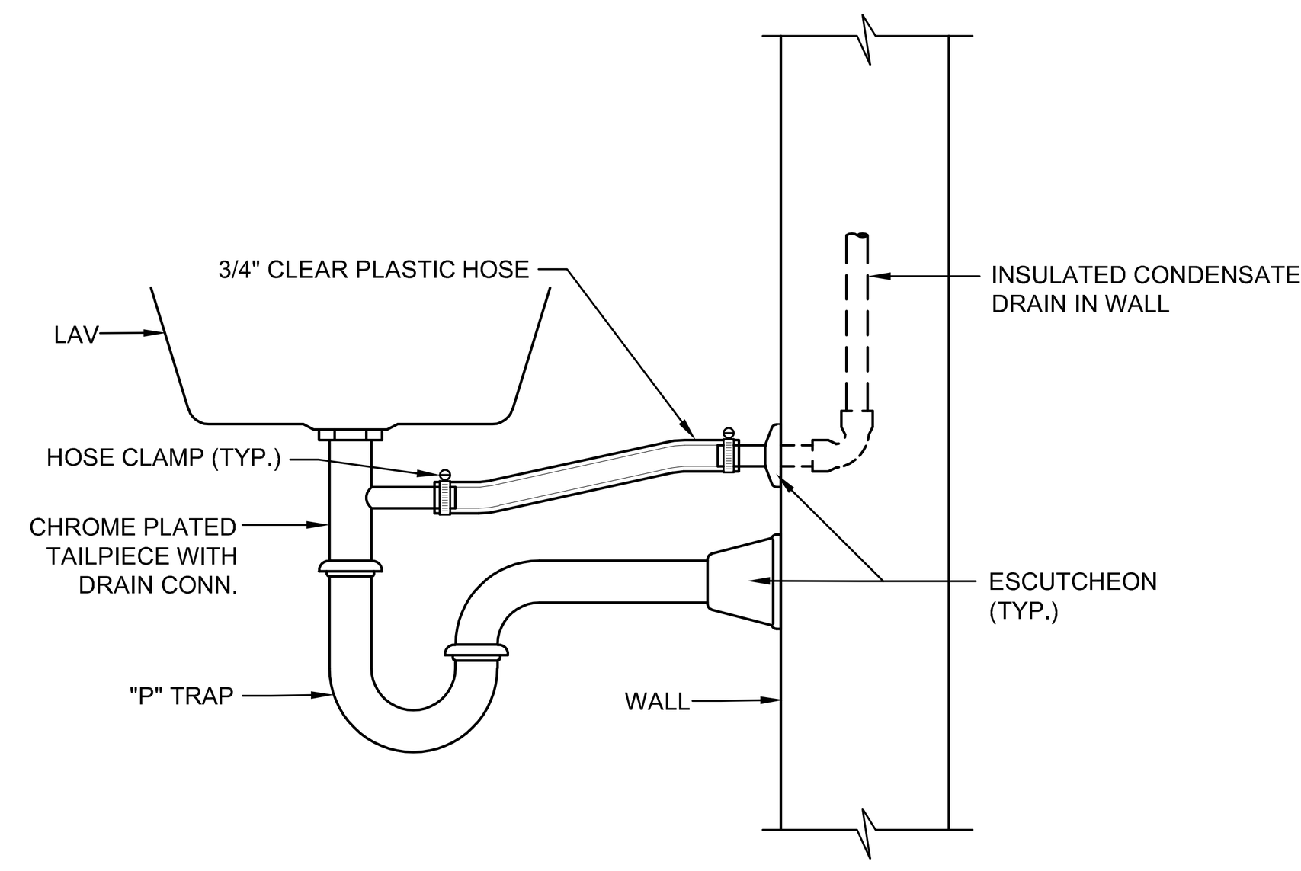


PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

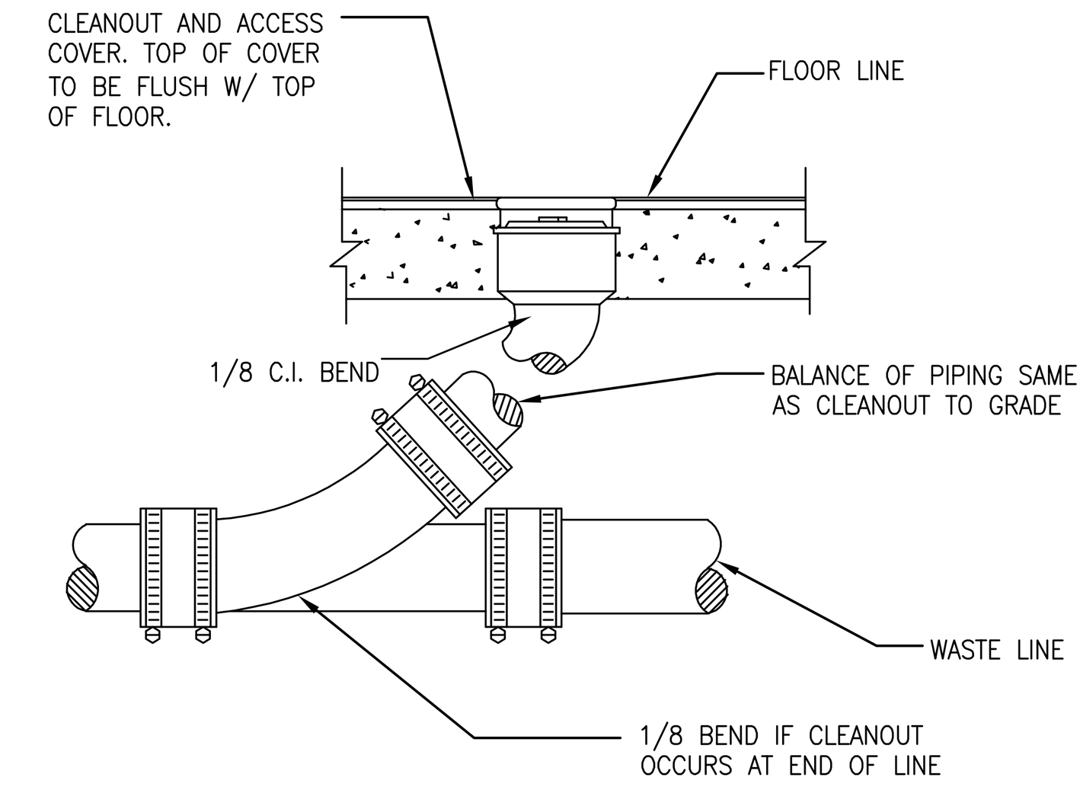
FIXTURE UNIT TABULATION		
FIXTURE	COLD	HOT
VALVE WATER CLOSET	5	--
TANK WATER CLOSET	2.5	--
URINAL	4	--
LAVATORY/SINK	1	1
JANITOR'S SINK	3	3
LAUNDRY	3	3

PROVIDE WATER HAMMER ARRESTERS. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL IN LINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE THE UNITS AS SHOWN ON THE DRAWINGS AND/OR PER THE TABLES SHOWN ABOVE. PROVIDE ACCESS PANEL PER CODE.

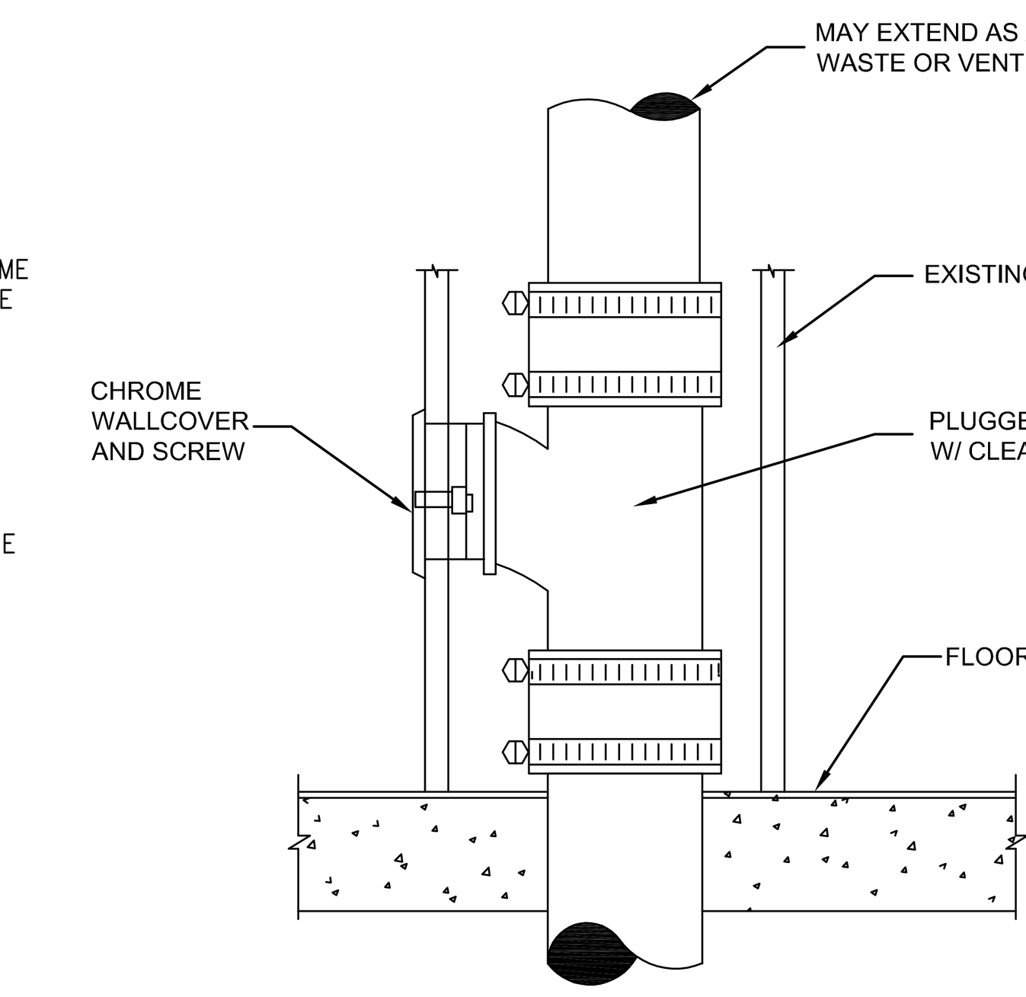
WATER HAMMER ARRESTOR | SCALE NONE | 9



CONDENSATE DRAIN TO TRAP | SCALE NONE | 6

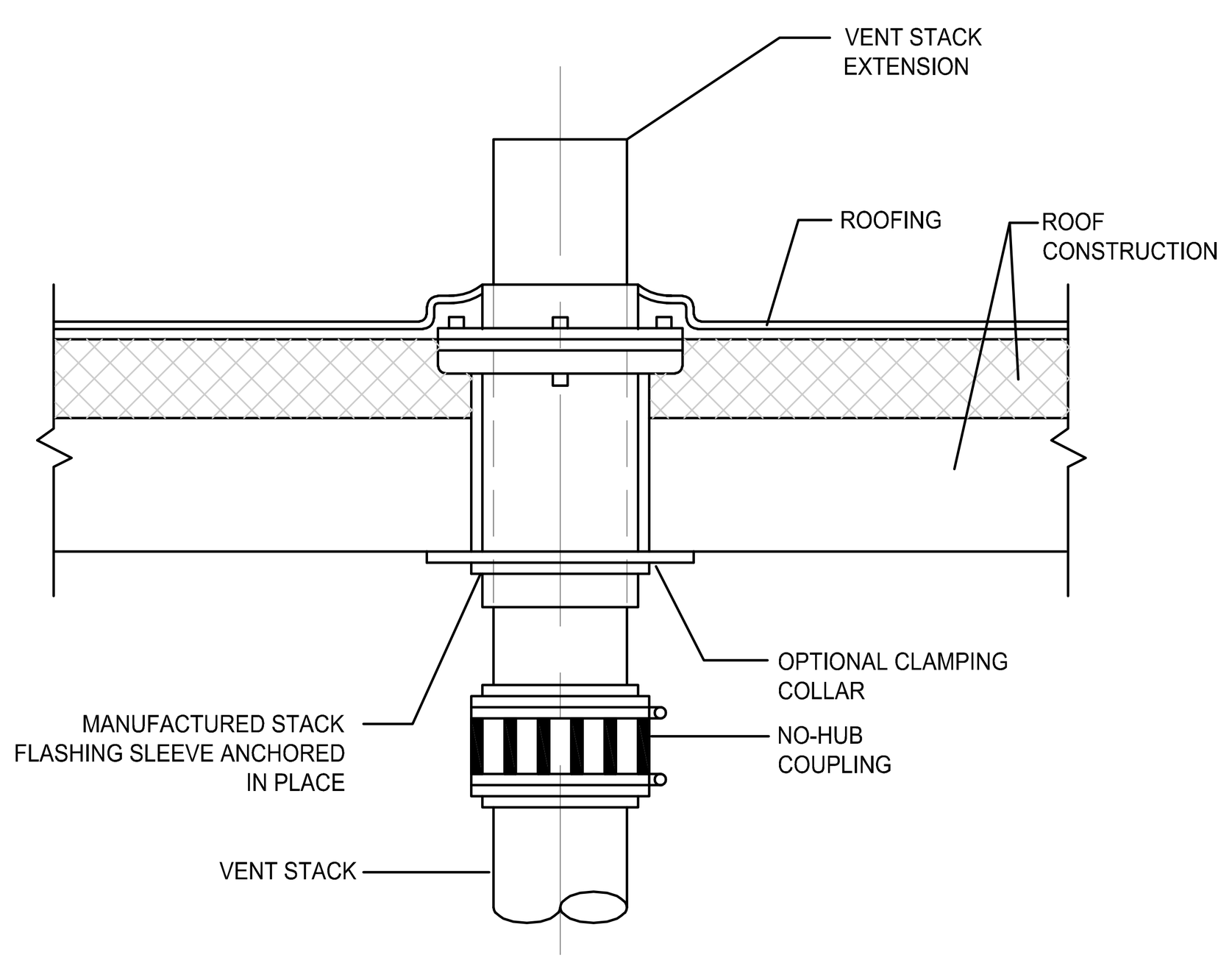


FLOOR CLEAN-OUT DETAIL

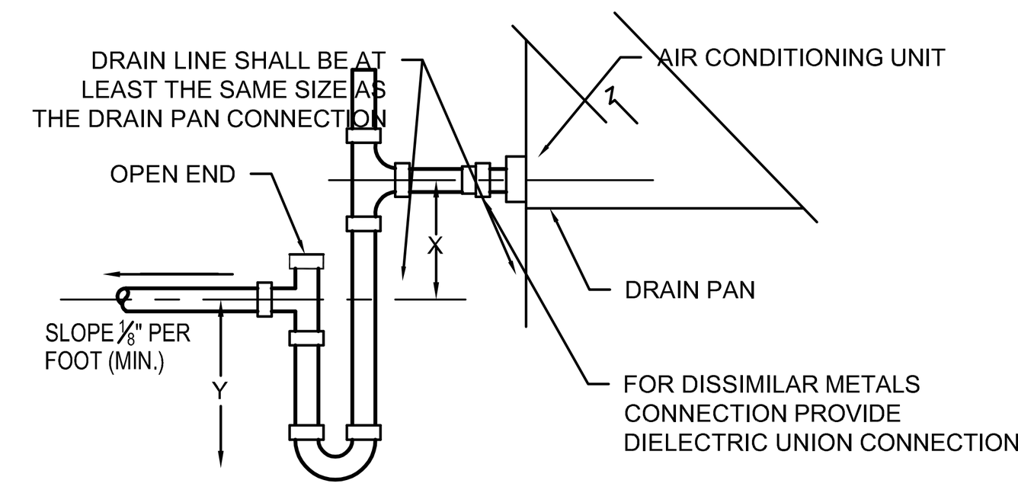


WALL CLEAN-OUT DETAIL

TYPICAL CLEANOUTS | SCALE NONE | 3



VENT THRU ROOF | SCALE NONE | 8



NOMINAL TONS	DRAIN LINE SIZE (IN.)
UP TO 20	3/4
21-40	1
41-90	1-1/4
91-125	1-1/2
126-250	2

BLOW THROUGH COIL
1. X=1"
2. Y=TSP+1"

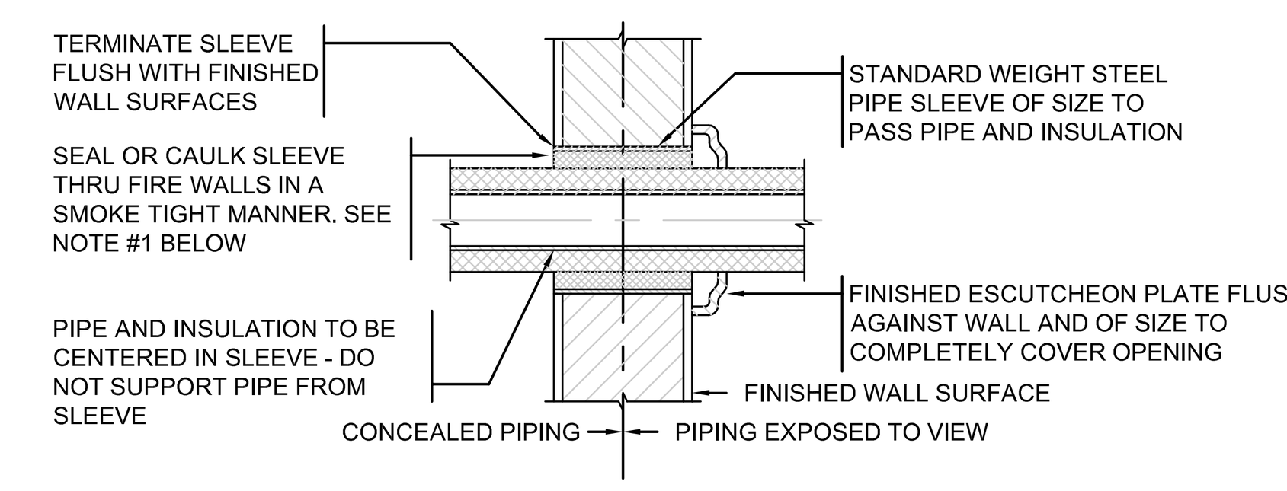
DRAW THROUGH COIL
1. X=TSP+1"
2. Y= 1/2 (TSP+1")

TSP=TOTAL STATIC PRESSURE INSIDE DRAIN PLENUM (INCHES OF WATER COLUMN)

NOTES:

1. WHERE VERTICAL SPACE DOES NOT PERMIT TRAP INSTALLATION AS REQUIRED ABOVE FLOOR SLAB, EXTEND P-TRAP TO BELOW SLAB.
2. FOR INDOOR AND OUTDOOR INSTALLATION PROVIDE INSULATED RAIN LINE TO THE POINT OF DISCHARGE AT APPROVED RECEPTOR.

CONDENSATE DRAIN TRAP | SCALE NONE | 5

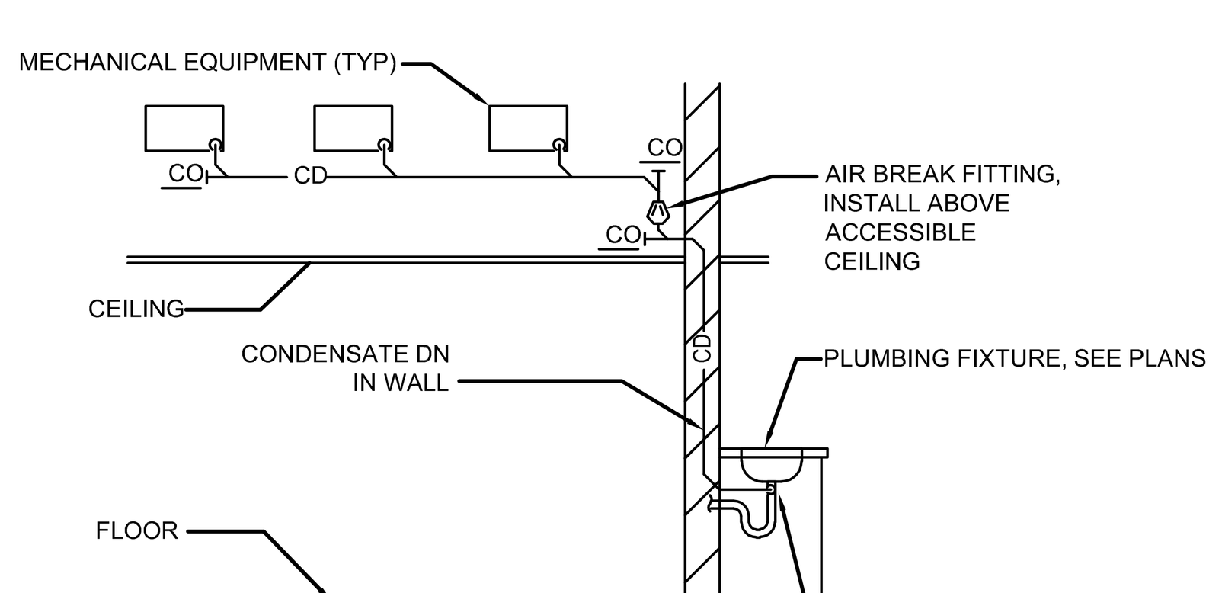


INTERIOR WALLS / FLOOR

NOTES:

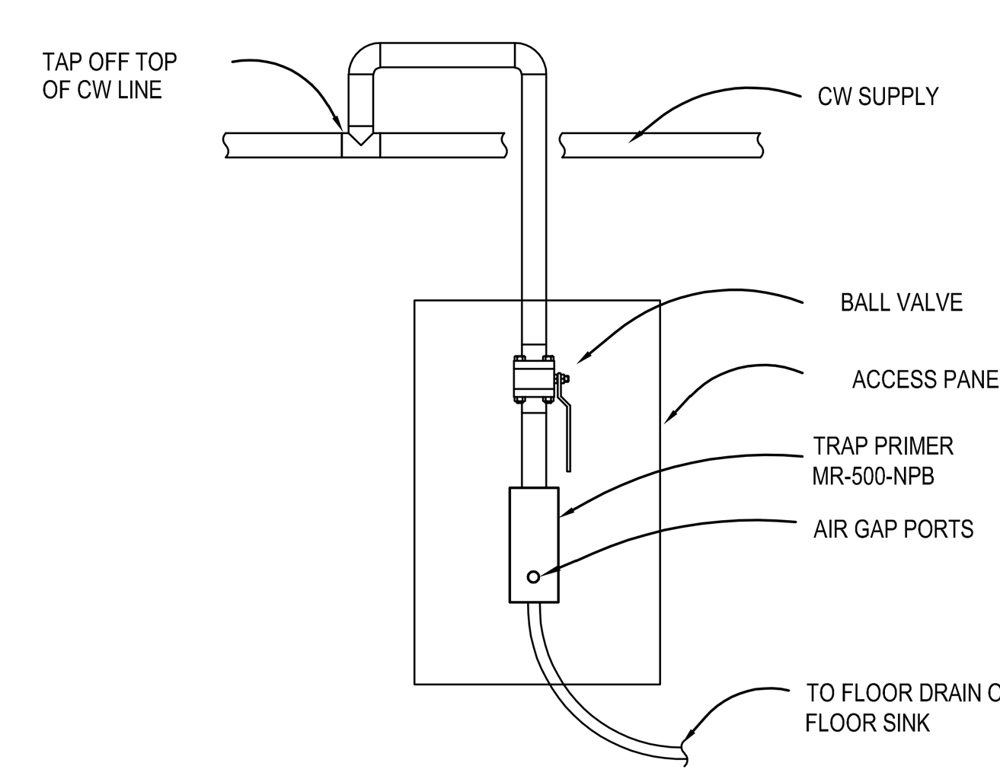
1. PLUMBING PIPING PENETRATING FIRE RATED WALLS SHALL BE SEALED IN A SMOKE TIGHT MANNER WITH SEALANT MATERIAL OF THE SAME RATING OF THE WALL. FIRE BARRIER 3M MODEL PSS7904 CAL. STATE FIRE MARSHALL LISTING NO. 4485-0941:100.
2. ALL WATER PROOFING SHALL BE AS INDICATED ON ARCHITECTURAL DRAWINGS.

PIPE SLEEVE THRU WALL/FLOOR | SCALE NONE | 2

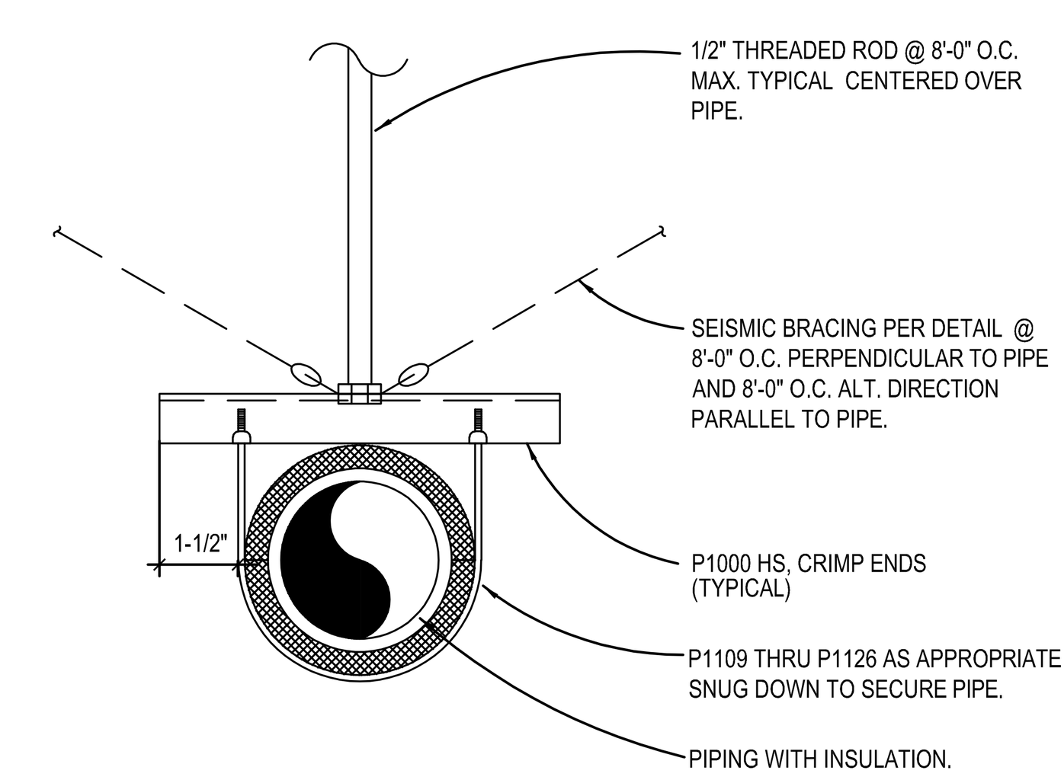


CONNECT CONDENSATE DRAIN LINE TO P-TRAP OF PLUMBING FIXTURE. PROVIDE JAY R. SMITH CONDENSATE TRAP NO. 9200 OR APPROVED ALTERNATE IN LIEU OF STANDARD P-TRAP.

AIR BREAK FITTING | SCALE NONE | 7



TRAP PRIMER DETAIL | SCALE NONE | 4



NOTE:
WHERE PIPE DOES NOT EXCEED 1" DIA. SEISMIC BRACING IS NOT REQUIRED ADDITIONALLY PIPES MAY BE SUPPORTED W/UNISTRUT J1205-J1210 AS APPROPRIATE.

PIPE SUPPORT | SCALE NONE | 1

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CITY OF GARDENA
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PLUMBING DETAILS
COMMUNITY AQUATICS & SENIOR CENTER
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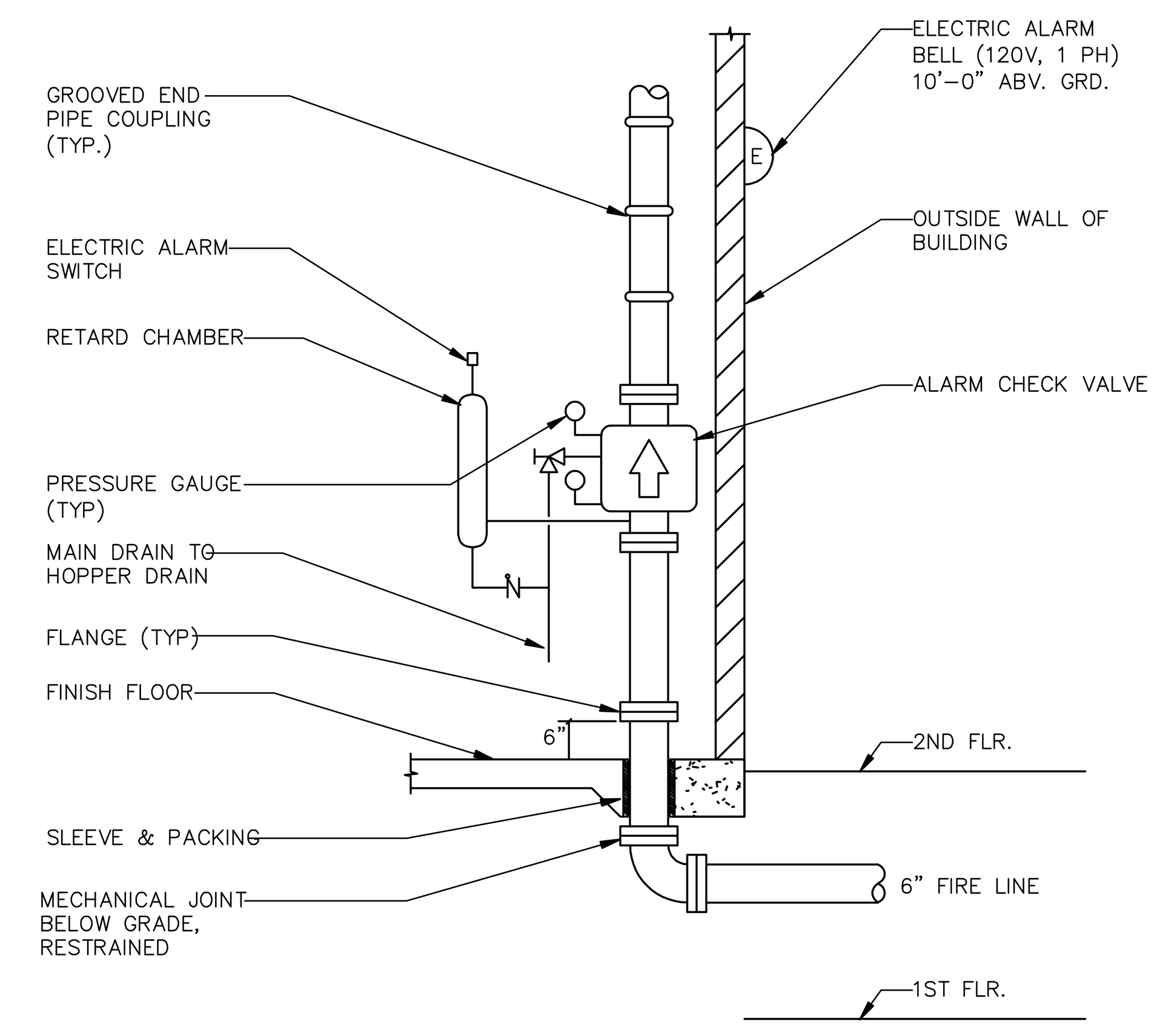
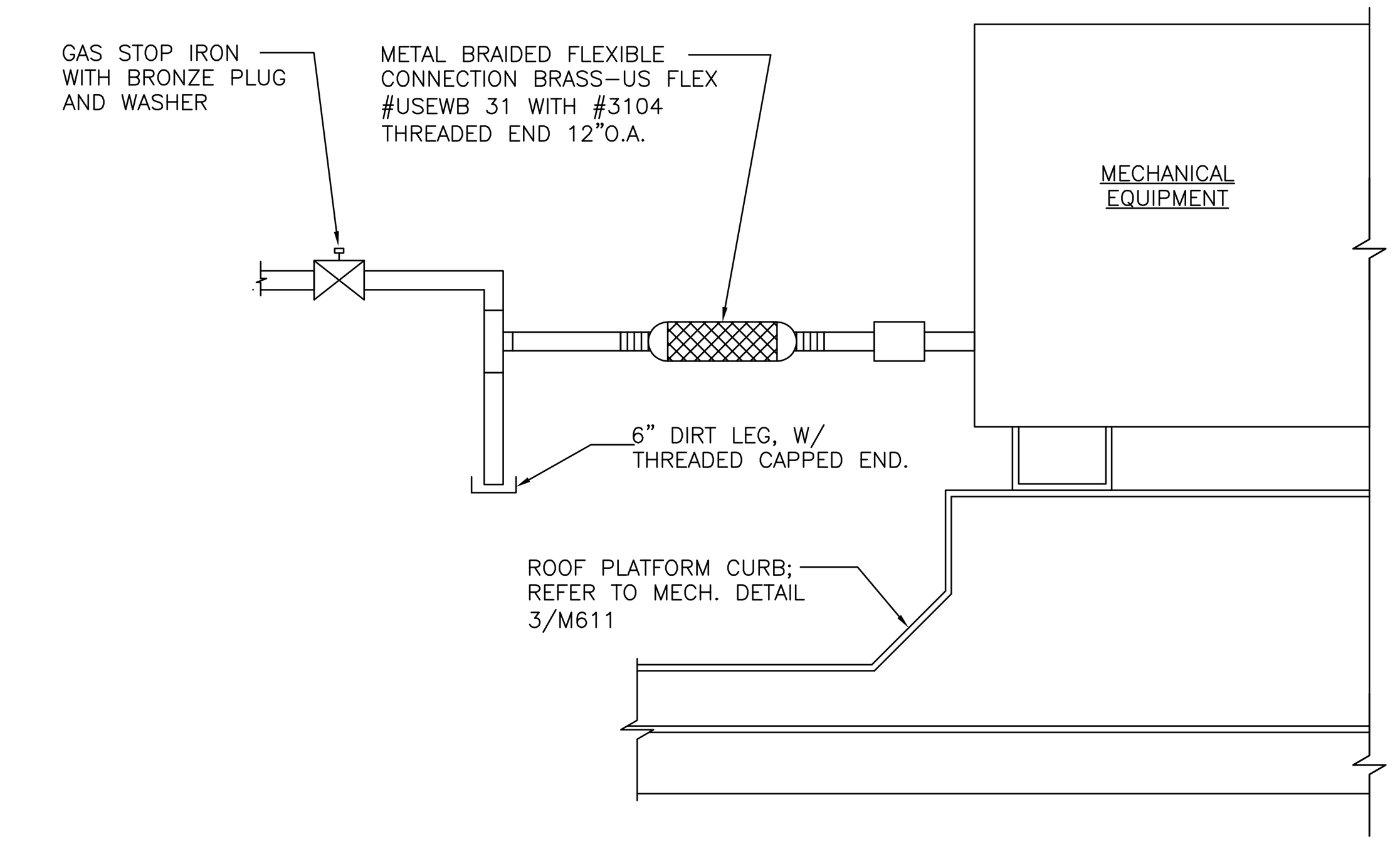


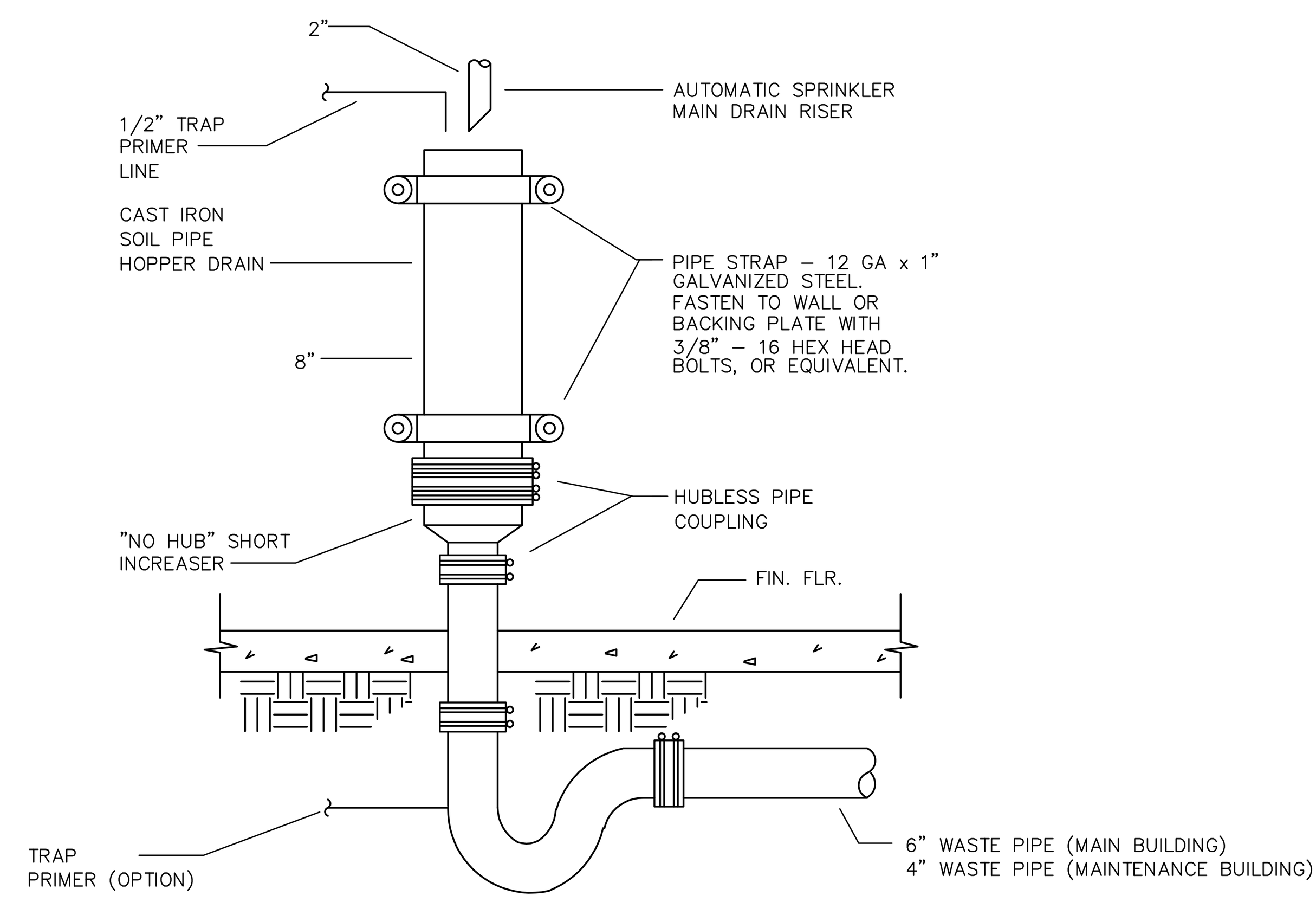
NOTES:
1. ALL REQUIRED ALARM VALVE TRIM NOT SHOWN.
2. THIS DETAIL IS FOR REFERENCE ONLY.

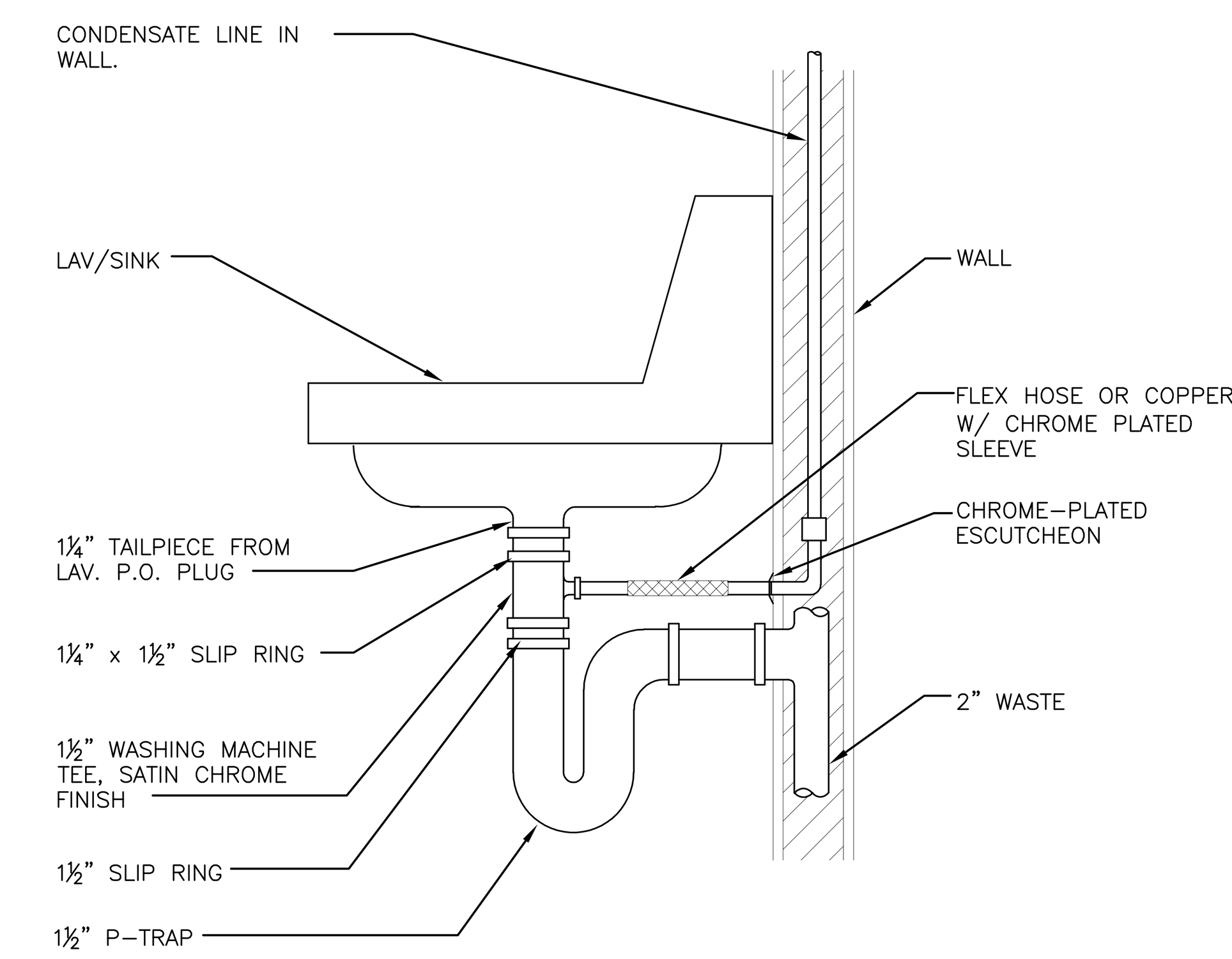


WATER HAMMER ARRESTOR	SCALE NONE	9

AUTOMATIC SPRINKLER RISER	SCALE NONE	6

TYPICAL GAS CONNECTION AT MECHANICAL UNIT DETAIL	SCALE NONE	3



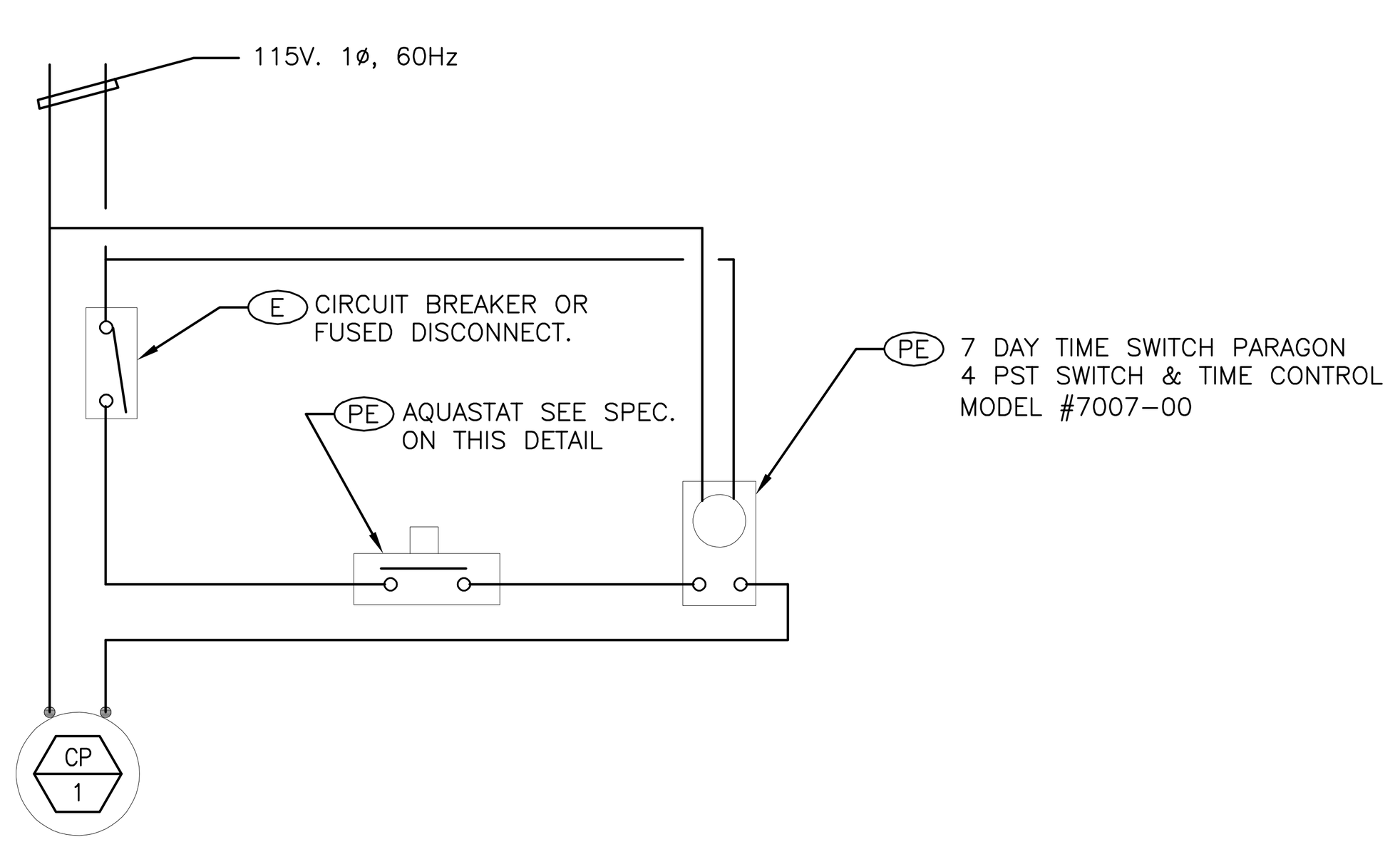


NOTE:
REFER TO PLUMBING FLOOR PLAN FOR OPTION TO SPILL CONDENSATE DRAINS OVER FLOOR SINK OR SERVICE SINK.

VENT THRU ROOF	SCALE NONE	8

HUB DRAIN DETAIL	SCALE NONE	5

MULTIPLE PIPE SUPPORT/ SWAY BRACING DETAIL	SCALE NONE	2



SPECIFICATION
AQUASTAT: HONEYWELL NO. L4006A
40 TO 180 DEGREE F RANGE, 5–30 DEGREE F ADJUSTABLE DIFFERENTIAL

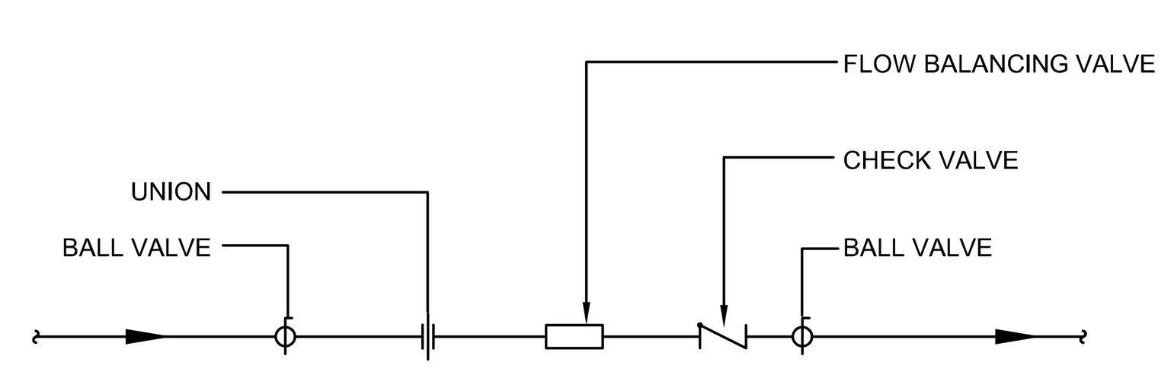
(PE) FURNISHED BY PLUMBER INSTALLED BY ELECTRICAL CONTR.

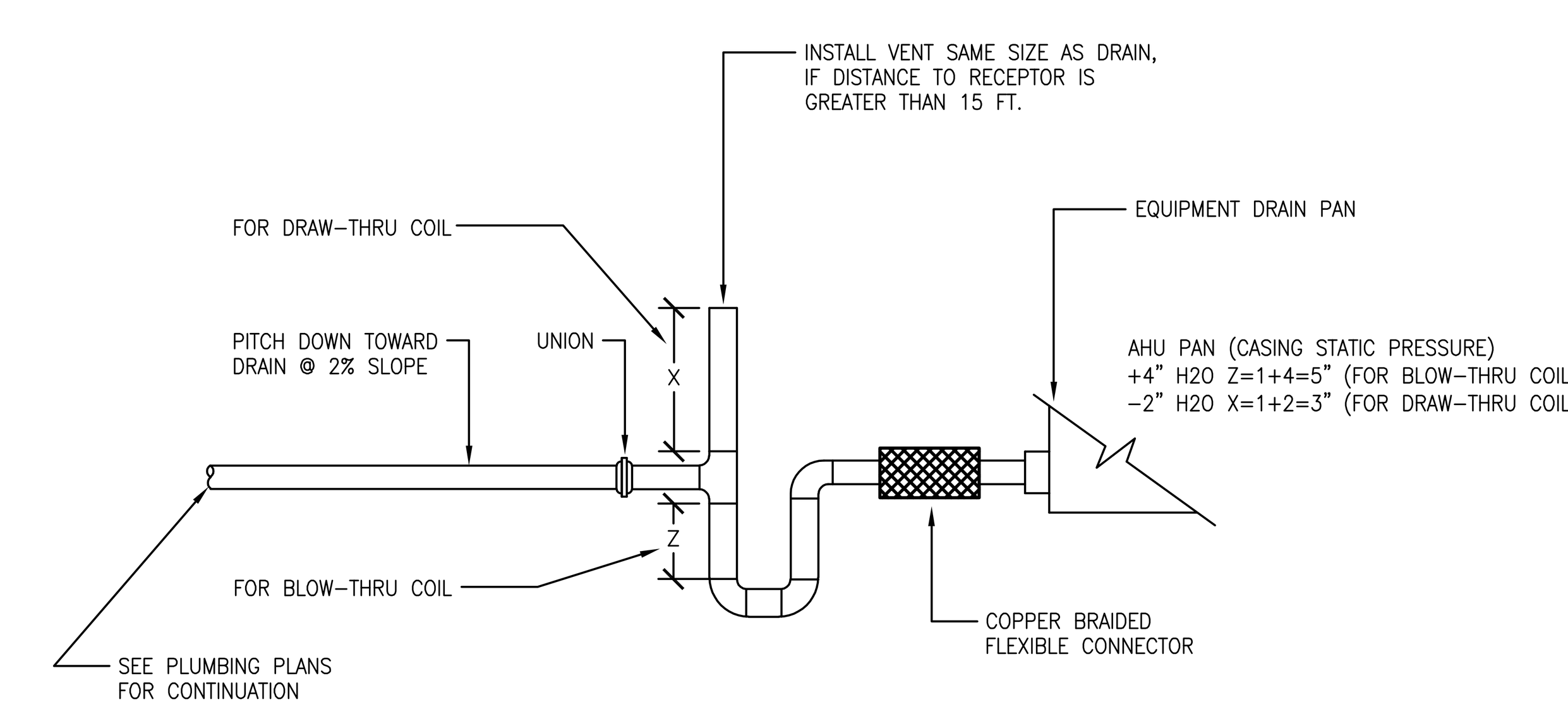
(E) FURNISHED AND INSTALLED BY ELECTRICAL CONTR.

ALL WIRING BY ELECTRICAL CONTR.

PUMP START/STOP AQUASTAT SETTINGS (DEGREES F) :

PUMP #	START	STOP
CP-1	110	120





HOT WATER CIRCULATING PUMP AND WIRING DIAGRAM	SCALE NONE	7

HOT WATER RETURN BALANCING VALVE	SCALE NONE	4

TYPICAL CONDENSATE DRAIN CONNECTION DETAIL	SCALE NONE	1

ALFATECH
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B.M.: THE CITY OF GARDENA BENCHMARK NO. SD-15 ELEV. = 43.508'

REVISIONS

NO.	DESCRIPTION	DATE	APPROVED

CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS - ENGINEERING

PLUMBING DETAILS

COMMUNITY AQUATICS & SENIOR CENTER

P5.02

	INITIAL	DATE
DESIGNED BY		
DRAWN BY		
CHECKED BY		

APPROVED BY:

APPROVED BY: DIRECTOR OF PUBLIC WORKS

SHT. 120 OF 157 DWG. NO. S-2606

PANTRY EQUIPMENT & FIXTURE SCHEDULE

UNIT TAG	ARCH TAG	DESCRIPTION	ROUGH-IN SIZE				REMARKS
			WASTE	VENT	CW	HW	
SK-1	-	DROP IN SINK DOUBLE BOWL	2"	2"	3/4"	3/4"	JUST DLR-ADA-1933-A-GR: 19"x33"x5-1/2" DEEP DOUBLE BOWL 18 GAUGE TYPE 304 STAINLESS STEEL FIXTURE,CHICAGO FAUCET #201-AGN8AE36-317AB: DECK MOUNTED FAUCET WITH 8" CENTERS AND 4" WRISTBLADE HANDALS, 1.5 GPM, PROVIDE GD-1,
SK-2	-	UNDERCOUNTER SINK WELLNESS ROOM	2"	2"	3/4"	3/4"	JUST DLR-ADA-1933-A-GR: 19"X33"X5-1/2" DEEP DOUBLE BOWL 18 GAUGE TYPE 304 STAINLESS STEEL FIXTURE,CHICAGO FAUCET #201-AGN8AE36-317AB: DECK MOUNTED FAUCET WITH 8" CENTERS AND 4" WRISTBLADE HANDALS, 1.5 GPM, PROVIDE GD-1,
GD-1	-	GARBAGE DISPOSAL	-	-	-	-	INSINKERATOR EVOLUTION ESSENTIAL XTR WITH SINKTOP SWITCH ACTIVATION AND DISHWASHER DRAIN CONNECTION, 3/4" HP, 120 VOLTS, 60 HZ, 1725 RPM, 8.1 AMP.
REF-1	-	REFRIGERATOR	-	-	1/2"	-	PROVIDE IPS CORP. #FRMB12ABSHA: ICE MACHINE BOX WITH LEAD FREE QUARTER VALVE WITH WATER HAMMER ARRESTOR
REF-2	-	REFRIGERATOR	-	-	1/2"	-	PROVIDE IPS CORP. #FRMB12ABSHA: ICE MACHINE BOX WITH LEAD FREE QUARTER VALVE WITH WATER HAMMER ARRESTOR
CM-1	-	COFFEE MAKER	-	-	1/2" FCW	-	REFER TO ARCHITECTURAL DRAWINGS FOR FULL SPECIFICATIONS. PROVIDE APPROVED DOUBLE CHECK VALVE.

NOTES:
1. REFERENCE ONLY. REFER TO ARCHITECTURAL FOR FULL SCHEDULE AND EXACT EQUIPMENT LOCATIONS.
2. REFER TO ARCHITECTURAL DWG AND MANUFACTURES' INSTALLATION MANUAL FOR INSTALLATION DETAILS.

MISCELLANEOUS EQUIPMENT SCHEDULES

UNIT TAG	DESCRIPTION	MINIMUM CONN.				REMARKS
		WASTE	VENT	DCW ICW	DHW IHW	
BV-1	BALANCING VALVE	-	-	-	3/4" DHWR	REFER TO KITCHEN DWG FOR FULL DETAILS. DISCHARGE TO FS-1
GPR-1	GAS PRESSURE REGULATOR	1/2" IW	-	-	-	STAINLESS STEEL LAB SINK. REFER TO ARCHITECTURAL/LAB DWG FOR FULL DETAILS. PROVIDE WITH LOCAL TEMPERATURE MIXING VALVE AND VACUUM BREAKER.
GPR-2	GAS PRESSURE REGULATOR	1/2" IW	-	-	-	STAINLESS STEEL LAB SINK. REFER TO ARCHITECTURAL/LAB DWG FOR FULL DETAILS. PROVIDE WITH LOCAL TEMPERATURE MIXING VALVE AND VACUUM BREAKER.
GPR-3	GAS PRESSURE REGULATOR	2"	1-1/2"	3/4" DCW	3/4" DHW	-
GPR-4	GAS PRESSURE REGULATOR	(2) 3/4" IW	-	1/2" FW	-	-
GPR-5	GAS PRESSURE REGULATOR	(2) 3/4" IW	-	1/2" FW	-	-
SV-1	SEISMIC VALVE	3/4" IW	-	1/2" FW	-	-
BFP-1	BACKFLOW PREVENTER	-	-	3" DCW	-	WATTS LF009:

NOTE:
1. LAB FIXTURES SCHEDULE IS SHOWN FOR REFERENCE ONLY. REFER TO ARCHITECTURAL/LAB CONSULTANT DRAWINGS FOR FULL SCHEDULE AND EXACT EQUIPMENT LOCATIONS.
2. REFER TO FLOOR PLAN FOR DOMESTIC OR INDUSTRIAL WATER SYSTEM REQUIREMENT AT LAB SINKS.
3. INDIRECT WASTE (IW) SHALL DISCHARGE TO SANITARY WASTE SYSTEM THROUGH FLOOR SINK WITH AIR GAP PER CPC REQUIREMENT UNLESS NOTED OTHERWISE.

TANK SCHEDULE

SYMBOL	DESCRIPTION/ SERVICE	MANUFACTURER & MODEL NO.	STORAGE (GALLON)	ASME	WORKING PRESSURE RATING	CONFIGURATION	TANK LINING	REMARKS
ST 1	DOMESTIC HOT WATER SYSTEM STORAGE TANKS	AMTROL	-	YES	ASME 150 PSI	-	-	-

NOTES:
1. PROVIDE SEISMIC ATTACHMENT CLIP.
2. 5 YEAR LIMITED WARRANTY.
3. PROVIDE BRASS P&T RELIEF VALVE RATED TO 150 PSI.
4. PROVIDE TEMPERATURE SENSOR WITHIN 3/4" BULBWELL..
5. PROVIDE WITH MAGNESIUM ANODE RODS AND MANWAY.
6. PROVIDE OUTDOOR RATED FOAM INSULATION.
7. INSTALL TANK SENSOR, FACTORY SUPPLIED & SHIPPED LOOSE, IN THE TAPPING PROVIDED IN THE LOWER 25% OF THE STORAGE TANK TO ACHIEVE PROPER OPERATION.
   - WIRE TANK 1 SENSOR TO THE LEAD WATER HEATER CONTROLLER.
   - ALLOW FOR MULTI-MASTER OPERATION

CIRCULATOR PUMP SCHEDULE

SYMBOL	DESCRIPTION	LOCATION	MANUFACTURER & MODEL NO.	DESIGN POINT			MOTOR				REMARKS
				GPM	HEAD (FEET)	PUMP EFF. (%)	HP	VOL.	PH.	FREQ. (HERTZ)	
CP 1	DOMESTIC RE-CIRCULATION PUMP (140°F)	-	BELL & GOSSETT ECOCIRC	-	-	0	-	-	-	-	-

NOTES:

PLUMBING FIXTURE SCHEDULE

UNIT TAG	UNIT TAG	DESCRIPTION	MINIMUM CONN.				REMARKS
			WASTE	VENT	CW	HW	
WC-1	-	WATER CLOSET - ADA	4"	2"	1-1/2"	-	AMERICAN STANDARD AFWALL "MILLENNIUM FLOWISE #2257.101: WALL MOUNTED, VITREOUS CHINA, ELONGATED FLUSHOMETER TOILET, TOP SPUD, WHITE FINISH. SLOAN "ROYAL" #111 ESS-1,28-TMO-HW; 1.28 GPF SENSOR FLUSHVALVE; J.R. SMITH 200 OR 400 SERIES FLOOR ANCHORED CARRIER. INSTALL AT ADA APPROVED HEIGHT.
WC-2	-	WATER CLOSET (PUBLIC)	4"	2"	1-1/2"	-	WILLOUGHBY #ETW-1490-ES-BS-1.28GPF-TWE: WALL MOUNTED STAINLESS STEEL, 1.28 GPF
WC-3	-	WATER CLOSET - ADA (PUBLIC)	4"	2"	1-1/2"	-	SAME AS WC-2 EXCEPT AT ADA APPROVED HEIGHT.
UR-1	-	URINAL - ADA	0"-2"	1-1/2"	1-1/4"	-	AMERICAN STANDARD WASHBROOK #6590.001: WALL MOUNTED, VITREOUS CHINA, TOP SPUD, WHITE FINISH, SLOAN "ROYAL" #186 ESS-0,125-DBP-TMO-HW; 0,125 GPF SENSOR FLUSHVALVE, J.R. SMITH FLOOR ANCHORED CARRIER. INSTALL AT ADA APPROVED HEIGHT.
UR-2	-	URINAL - ADA (PUBLIC)	2"	1-1/2"	1-1/4"	-	WILLOUGHBY #UW-1317-HEU-0,125GPF: WALL MOUNTED STAINLESS STEEL, 0,125 GPF. INSTALL AT ADA APPROVED HEIGHT.
L-1	-	LAVATORY - ADA	2"	1-1/2"	3/4"	3/4"	AMERICAN STANDARD LUCERNE #0.356.421: WALL MOUNTED, VITREOUS CHINA, SINGLE HOLE PUNCH. SLOAN "OPTIMA" EAF-200 PLG-ITM-CP-0.35GPM-MLM-IR-IQ-FCT; 0,35 GPM SENSOR FAUCET, PROVIDE WITH TMV-2. J.R. SMITH FLOOR ANCHORED CARRIER, INSTALL AT ADA APPROVED HEIGHT.
L-2	-	LAVATORY-ADA (PUBLIC)	2"	1-1/2"	3/4"	3/4"	WILLOUGHBY #HS-1013-46-HC-EL-1L1-PZPB-WMSB-PT: WALL MOUNTED, STAINLESS STEEL FIXTURE WITH 0.35 GPM SENSOR FAUCET. PROVIDE WITH TMV-2INSTALL AT ADA APPROVED HEIGHT.
L-3	-	LAVATORY - ADA (3 STATION) (PUBLIC)	2"	1-1/2"	3/4"	3/4"	SLOAN #ELC-73000: 3 STATION, COUNTER MOUNTED, SLOANSTONE FIXTURE. SLOAN "OPTIMA" #EAF-200-PLG-ITM-CP-0.35GPM-MLM-IR-IQ-FCT; 0,35 GPM SENSOR FAUCET (PROVIDE 3), PROVIDE WITH TMV-2. INSTALL AT ADA APPROVED HEIGHT.
L-4	-	LAVATORY - ADA (2 STATION) (PUBLIC)	2"	1-1/2"	3/4"	3/4"	SLOAN #AD-82000: 2 STATION, WALL MOUNTED CORIAN FIXTURE, SLOAN "OPTIMA" #EAF-200-PLG-ITM-CP-0.35GPM-MLM-IR-IQ-FCT; 0,35 GPM SENSOR FAUCET (PROVIDE 3), PROVIDE WITH TMV-2, INSTALL AT ADA APPROVED HEIGHT.
L-5	-	LAVATORY - ADA (3 STATION) (PUBLIC)	2"	1-1/2"	3/4"	3/4"	SAME AS L-4 EXCEPT USE #AD-83000: 3 STATION FIXTURE.
SH-1	-	SHOWER - ADA	2"	1-1/2"	3/4"	3/4"	SYMMONS #C-96-500-B30-V-X-1.5: 1.5 GPM
SH-2	-	SHOWER (PUBLIC)	2"	1-1/2"	3/4"	3/4"	ACORN #17411FA-04-M-8-EVSP2: WALL MOUNTED PNEUTRONIC 1.5 GPM 14 GAUGE TYPE 304 STAINLESS STEEL SHOWER.
SH-3	-	SHOWER - ADA (PUBLIC)	2"	1-1/2"	3/4"	3/4"	SAME AS SH-3 EXCEPT USE #450BADAWH INSTALL AT ADA APPROVED HEIGHT.
SH-4	-	SHOWER - ADA (PUBLIC)	2	1-1/2"	3/4"	3/4"	ACORN #110ADA-1-1-8-W-EVS1: 1.5 GPM
HS-1	-	HAND SINK - ADA	2"	1-1/2"	3/4"	3/4"	WILLOUGHBY #CES-912: WALL MOUNTED 16 GAUGE TYPE 304 STAINLESS STEEL FIXTURE, CHICAGO FAUCET #EVR-A12D-43ABCP: 0.35 GPM SENSOR FAUCET, PROVIDE WITH TMV-2. INSTALL AT ADA APPROVIDE HEIGHT.
SS-1	-	SERVICE SINK	3"	2"	3/4"	3/4"	AMERICAN STANDARD FLORWELL #7741.000: FLOOR MOUNTED CORNER TYPE, CHICAGO FAUCET #897-RCF: WALL MOUNTED FAUCET WITH WALL BRACE AND VACUUM BREAKER.
DF-1	-	DRINKING FOUNTAIN (HI-LI)	2"	2"	3/4"	-	ELKAY EZWS-ERPBM28K: PROVIDE WITH BOTTLE FILLER AND 8 GPH CHILLER. 115/1/60
HB-1	-	HOSE BIBB (WALL)	-	-	3/4"	-	ACORN #8151-SSLF: PROVIDE WITH NON-REMOVABLE VACUUM BREAKER.
HB-2	-	HOSE BIBB (ROOF)	-	-	3/4"	-	ACORN #8126CR-LF: PROVIDE WITH NON-REMOVABLE VACUUM BREAKER.
ESEW-1	-	EMERGENCY EYEWASH/SHOWER	2"	2"	1-1/4"	1-1/4"	GUARDIAN #GBF1994: BARRIER FREE
LDS-1	-	LEAK DETECTION SYSTEM	-	-	-	-	FLOODSTOP FS3/4NPT EMERGENCY WATER LEAK DETECTION AND SHUT OFF SYSTEM WITH ONE STRAIGHT VALVE. PROVIDE EXTRA WATER SENSOR AND SENSOR MANIFOLD AS NECESSARY.
LDS-2	-	LEAK DETECTION SYSTEM	-	-	-	-	FLOODSTOP FS3/4H EMERGENCY WATER LEAK DETECTION AND SHUT OFF SYSTEM WITH TWO STRAIGHT VALVES. PROVIDE EXTRA WATER SENSOR AND SENSOR MANIFOLD AS NECESSARY.
FD-1	-	FLOOR DRAIN	2"	2"	1/2"TP	-	J.R SMITH 2005-Y-B SERIES WITH ADJUSTABLE SQUARE NICKEL BRONZE STRAINER & TRAP PRIMER CONNECTION, OR EQUAL.
FD-2	-	SHOWER DRAIN	2"	2"	-	-	SAME AS FD-1 EXCEPT LESS TRAP PRIMER CONNECTION.
FS-1	-	FLOOR SINK	3"	2"	1/2"TP	-	J.R. SMITH #3100Y-C-U-CI: DUCO CAST IRON BODY, FLASHING CLAMP, VANDAL PROOF SCREWS, 1/2 OR 3/4 GRATE. PROVIDE WITH TRAP PRIMER CONNECTION.
FS-2	-	FLOOR SINK	6"	4"	1/2"TP	-	J.R. SMITH #6060Y-C-U-: STAINLESS STEEL BODY, FLASHING CLAMP, VANDAL PROOF SCREWS, FULL GRATE, PROVIDE WITH TRAP PRIMER CONNECTION.
TD-1	–	TRENCH DRAIN	4"	2"	1/2"TP	-	J.R. SMITH 9660-316SS: STAINLESS STEEL BODY WITH 4" OUTLET, PROVIDE WITH FLASHING FLANGE AND COLLAR AND 1/2" TRAP PRIMER CONNECTION.
RD-1	-	ROOF DRAIN	SEE PLANS FOR SIZES				J.R. SMITH 1010Y; DUCO CAST IRON BODY
OD-1	–	OVERFLOW DRAIN	SEE PLANS FOR SIZES				J.R. SMITH 1080Y; DUCO CAST IRON BODY WITH 2" WATER DAM
TP-1	-	TRAP PRIMER	-	-	1/2"	-	MIFAB MR-500-NPB ALL BRASS CONSTRUCTION, PRESSURE DRIP ACTIVATION, WITH AIR GAP, DISTRIBUTION UNIT AND ACCESS PANEL.
TP-2	-	TRAP PRIMER (ELECTRONIC)	-	-	1/2"	–	MIFAB MI-300-120-VAC, ELECTRONIC TRAP SEAL PRIMER WITH AIR GAP, DISTRIBUTION UNIT AND CONTROL PANEL.
WHA-1	-	WATER HAMMER ARRESTOR	-	-	1/2"	-	MIFAB #WHB, BELLOWS TYPE, OR APPROVED EQUAL.
TMV-1	-	TEMPERATURE MIXTURE VALVE WATER HEATER	-	-	3/4"	-	POWERS INTELLISTATION MODEL LFIS200F00LP MASTER TEMPERATURE MIXING VALVE. TEMPERATURE SET AT 120°F, ASSE 1017 LISTED.
TMV-2	-	TEMPERATURE MIXTURE VALVE LAVATORIES/HAND SINK	-	-	1/2"	-	WATTS MODEL LFUSG-B-M2 POINT OF USE TEMPERATURE MIXING VALVE. TEMPERATURE SET AT 110°F, ASSE 1070 LISTED.
TMV-3	-	TEMPERATURE MIXING VALVE EMERGENCY EYEWASH/SHOWER	-	-	-	-	WATTS POWERS HYDROGUARD XP SERIES EMERGENCY TEMPERATING MIXING VALVE WITH COLD WATER BYPASS, MODEL ES150, ASSE 1071 LISTED.

NOTES:
1. REFER TO ARCHITECTURAL FOR FULL SCHEDULE AND EXACT EQUIPMENT LOCATIONS.
2. REFER TO ARCHITECTURAL DWG AND MANUFACTURES' INSTALLATION MANUAL FOR INSTALLATION DETAILS.

STORAGE TYPE GAS WATER HEATER SCHEDULE

MARK	MANUFACTURE & MODEL NUMBER	AREA SERVED	LOCATION	INCOMING WATER TEMP.	STORAGE TEMP.	TEMP. RISE	STORAGE CAPACITY	RECOVERY	FUEL TYPE	GAS INPUT DATA		THERMAL EFFICIENCY	OPER. WEIGHT	REMARKS
										BTU/HR	KW	%	LBS.	
GWH 1	A.O.SMITH BTHL-199A	DOMESTIC WATER SYSTEM	-	60° F	140° F	80° F	250 GALLONS	288	NATURAL GAS	199,000	58	95	3207.5	-

NOTES:
1. PROVIDE T&P RELIEF VALVE RATED AT 150 PSI.
2. PROVIDE SMART TOUCH OPERATING CONTROL SYSTEM.
3. PROVIDE BMS GATEWAY TO BACNET IP.
4. PROVIDE CONCRETE PAD.
5. PROVIDE POLYPROPYLENE VENT PIPE WITH ADAPTOR AND RAIN CAP.

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SHT. 121 OF 157 DWG. NO. 5-2606

PLOT DATE: 3/23/2022 3:04:11 PM

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