



ABBREVIATIONS

AAV	AIR ADMITTANCE VALVE
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISH FLOOR
BFP	BACKFLOW PREVENTER
CA	COMPRESSED AIR
CFM	CUBIC FEET PER MINUTE
CFU	COLD WATER TEMPERATURE UNITS
CO	COLD WATER
CONC	CONCRETE
COTD	CLEANOUT TO GRADE
CW	COLD WATER
DF	DRINKING FOUNTAIN
DFU	DRAINAGE FIXTURE UNITS
DTR	DOWN
ELS	ELEVATION
EWG	ELECTRICAL WATER COOLER
EWV	ELECTRIC WATER HEATER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FS	FLOOR SWITCH
FT	FOOT OR FEET
FV	FLUSH VALVE
GALV	GALVANIZED
GI	GREASE INTERCEPTOR
GPF	GALLONS PER FLUSH
GPM	GALLONS PER MINUTE
GW	GAS WATER HEATER
HB	HOSE BIBB
HD	HUB DRAIN
HFU	HOT WATER FIXTURE UNITS
HW	HOT WATER
HWR	HOT WATER RETURN
INV	INVERT
MECH	MECHANICAL
NC	NORMALLY CLOSED
NG	NATURAL GAS
NO	NORMALLY OPEN
PSI	POUNDS PER SQUARE INCH
S	SANITARY
SH	SHOWER
SK	SINK
SS	STAINLESS STEEL
TLT	TOILET
TYP	TYPICAL
U	URNAL
V	VENT
VTR	VENT THROUGH ROOF
W	WASTE
W/	WITH
WC	WATER CLOSET (TOILET)
WCO	WALL CLEANOUT
WH	WALL HYDRANT
WHA	WATER HAMMER ARRESTOR

LEGEND

(Symbol)	SANITARY PIPING	(Symbol)	ELBOW TURN UP
(Symbol)	VENT PIPING	(Symbol)	ELBOW TURN DOWN
(Symbol)	COLD WATER SUPPLY PIPING	(Symbol)	CONNECTION, BOTTOM
(Symbol)	HOT WATER SUPPLY PIPING	(Symbol)	CONNECTION, TOP
(Symbol)	HOT WATER RETURN PIPING	(Symbol)	PIPE SIZE TRANSITION
(Symbol)	COMPRESSED AIR PIPING	(Symbol)	GATE VALVE
(Symbol)	VACUUM PIPING	(Symbol)	BALL VALVE
(Symbol)	GAS PIPING	(Symbol)	BUTTERFLY VALVE
(Symbol)	RAIN LEADER	(Symbol)	SWING CHECK VALVE
(Symbol)	ROOF DRAIN	(Symbol)	SPRING CHECK VALVE
(Symbol)	HOSE BIBB (HB) OR WALL HYDRANT (WH)	(Symbol)	PRV
(Symbol)	CLEANOUT TO FLOOR	(Symbol)	PRESSURE REDUCING VALVE
(Symbol)	FLOOR DRAIN	(Symbol)	PRESSURE RELIEF VALVE, PIPE FULL SIZE DISCHARGE TO FLOOR DRAIN
(Symbol)	CLEANOUT TO GRADE	(Symbol)	UNION
(Symbol)	UNION	(Symbol)	GLOBE VALVE
(Symbol)	VENT THRU ROOF	(Symbol)	THERMAL EXPANSION VALVE
(Symbol)	WATER HAMMER ARRESTOR	(Symbol)	ANGLE VALVE
(Symbol)	SHEET NOTE	(Symbol)	SOLENOID VALVE
(Symbol)	EQUIPMENT TAG	(Symbol)	FLEXIBLE PIPE CONNECTOR
(Symbol)	DRAWING DESCRIPTION	(Symbol)	STRAINER WITH BLOW DOWN GATE VALVE FULL SIZE OF STRAINER AND 3/4" HOSE END CONNECTION WITH CAP
(Symbol)		(Symbol)	COMPRESSED AIR DROP
(Symbol)		(Symbol)	VACUUM DROP

ABOVE GROUND GAS NOTES

FABRICATE AND INSTALL GAS SYSTEMS IN ACCORDANCE WITH NFPA 54 "NATIONAL FUEL GAS CODE" AND WITH LOCAL GAS UTILITY COMPANY REQUIREMENTS AND STANDARDS.

SUBMIT MANUFACTURERS TECHNICAL PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR GAS SYSTEMS PRODUCTS.

SUBMIT MAINTENANCE DATA AND PARTS LISTS FOR GAS SYSTEMS MATERIALS AND PRODUCTS. INCLUDE THIS DATA, PRODUCT DATA, SHOP DRAWINGS, AND RECORD DRAWINGS IN MAINTENANCE MANUAL.

PROVIDE PIPING MATERIALS AND FACTORY-FABRICATED PIPING PRODUCTS OF SIZES, TYPES, PRESSURE RATINGS, AND CAPACITIES AS INDICATED. WHERE NOT INDICATED, PROVIDE PROPER SELECTION AS DETERMINED BY INSTALLER TO COMPLY WITH INSTALLATION REQUIREMENTS. PROVIDE MATERIALS AND PRODUCTS COMPLYING WITH NFPA 54 WHERE APPLICABLE. BASE PRESSURE RATING ON GAS PIPING SYSTEM MAXIMUM DESIGN PRESSURES. PROVIDE SIZES AND TYPES MATCHING PIPING AND EQUIPMENT CONNECTIONS. PROVIDE FITTINGS OF MATERIALS WHICH MATCH PIPE MATERIALS USED IN NATURAL GAS SYSTEMS. WHERE MORE THAN ONE TYPE OF MATERIALS OR PRODUCTS ARE INDICATED, SELECTION IS INSTALLER'S OPTION. PROVIDE IDENTIFICATION AND PAINT GAS PIPING YELLOW. PROVIDE PIPE SUPPORT AND SECURE TO STRUCTURE.

ALL INTERIOR GAS PIPING UNDER THIS CONTRACT SHALL BE BLACK STEEL PIPE, SCHEDULE 40; MALLEABLE IRON THREADED FITTINGS. ALL EXTERIOR GAS PIPING SHALL BE GALVANIZED.

PROVIDE AND INSTALL PIPING SPECIALTIES IN ACCORDANCE WITH THE PIPE ESCUTCHEONS, DIELECTRIC UNIONS, PIPE SLEEVES, AND SLEEVE SEALS. PROVIDE AND INSTALL SUPPORTS AND ANCHORS.

PROVIDE AGA APPROVED SPECIAL VALVES REQUIRED FOR GAS SYSTEMS INCLUDING THE FOLLOWING TYPES:

- GAS COCKS 2" AND SMALLER, 150 PSI NON-SHOCK WOG, BRONZE STRAIGHTWAY COCK, FLAT OR SQUARE HEAD, THREADED ENDS.
- WRENCHES, PROVIDE OPERATING WRENCHES FOR ALL GAS COCKS SERVING BOILERS AND FOR USE AS MASTER SHUTOFF AT LABS.
- BALL VALVES, AGA APPROVED, UL-LISTED BALL VALVES MAY BE USED FOR LAB MASTER SHUTOFF VALVES AT CONTRACTOR'S OPTION.
- ACCEPTABLE PRODUCERS FOR GAS COCKS: DEZURK, JENKINS BROS., LUNKEN-HEIMER, NIBCO, POWELL, STOCKHAM, WAL WORTH, ROCKWELL.
- MASTER GAS CONTROL VALVE: BRONZE OR ALUMINUM BODY, PACKLESS, SINGLE SEAT, SUITABLE FOR FUEL GAS, SOLENOID OPERATED, NORMALLY OPEN, UL-APPROVED, MANUAL RESET, 24 VOL DC. THE VALVE TO CLOSE WHEN DE-ENERGIZED BY THE FACP, ACCEPTABLE PRODUCER: AUTOMATIC SWITCH CO., BULLETIN 8044, OR APPROVED EQUAL.

GAS REGULATORS

- FIRST STAGE REGULATOR: PROVIDE UL LISTED FIRST STAGE (LOW PRESSURE) REGULATOR SET FOR 1/2 PSI, OR APPROVED EQUAL.
- SECOND STAGE REGULATORS: PROVIDE UL LISTED SECOND STAGE, ADJUSTABLE REGULATORS WITH INTEGRAL RELIEF VALVES.
- ACCEPTABLE PRODUCERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE REGULATORS BY REGO, OR APPROVED EQUAL.
- GAS METER AND REGULATOR: NEW EQUIPMENT AS REQUIRED. THIS SHALL BE PROVIDED BY LOCAL UTILITY COMPANY. CONTRACTOR SHALL COORDINATE THIS WITH LOCAL UTILITY COMPANY.
- EXAMINE AREAS AND CONDITIONS UNDER WHICH GAS SYSTEMS, MATERIALS, AND PRODUCTS ARE TO BE INSTALLED. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN MANNER ACCEPTABLE TO INSTALLER. COORDINATE WITH GAS SUPPLIER PRIOR TO STARTING WORK.

INSTALL GAS PIPING IN ACCORDANCE WITH DIVISION 23 BASIC MECHANICAL MATERIALS AND METHODS.

- USE SEALANTS ON METAL GAS PIPING THREADS WHICH ARE CHEMICALLY RESISTANT TO GAS. USE SEALANTS SPARINGLY, AND APPLY TO ONLY MALE THREADS OF METAL JOINTS.
- REMOVE CUTTING AND THREADING BURRS BEFORE ASSEMBLING PIPING.
- DO NOT INSTALL DEFECTIVE PIPING OR FITTINGS. DO NOT USE PIPE WITH THREADS WHICH ARE CHIPPED, STRIPPED OR DAMAGED. DO NOT USE BUSHINGS IN THE GAS SYSTEM.
- PLUG EACH GAS OUTLET, INCLUDING VALVES, WITH THREADED PLUG OR CAP IMMEDIATELY AFTER INSTALLATION AND RETAIN UNTIL CONTINUING PIPING, OR EQUIPMENT CONNECTIONS ARE COMPLETED.
- GROUND GAS PIPING ELECTRICALLY AND CONTINUOUSLY WITHIN PROJECT, AND BOND TIGHTLY TO GROUNDING CONNECTION.
- INSTALL DRIPLEGS IN GAS PIPING WHERE INDICATED, AND WHERE REQUIRED BY CODE OR REGULATION.
- INSTALL "TEE" FITTING WITH BOTTOM OUTLET PLUGGED OR CAPPED, AT BOTTOM OF PIPE RISERS.
- USE DIELECTRIC UNIONS WHERE DISSIMILAR METALS ARE JOINED TOGETHER.
- INSTALL PIPING WITH 1/64" PER FOOT (1/8%) DOWNWARD SLOPE IN DIRECTION OF FLOW.
- INSTALL PIPING PARALLEL TO OTHER PIPING, BUT MAINTAIN MINIMUM OF 12" CLEARANCE BETWEEN GAS PIPING AND HYDRONIC PIPING ABOVE 200°F.
- FOR PIPING UNDERGROUND BENEATH BUILDINGS, INSTALL IN WELDED CONDUIT. EXTEND CONDUIT INSIDE AND TERMINATE IN ACCESSIBLE PORTION OF BUILDING AND SEAL. EXTEND CONDUIT OUTSIDE A MINIMUM OF 3' FROM BUILDING, AND VENT ABOVE GRADE.

VALVES INSTALLATION:

- GAS COCKS: PROVIDE AT CONNECTION TO GAS TRAIL FOR EACH GAS-FIRED EQUIPMENT ITEM. GAS RISERS AND BRANCHES WHERE INDICATED.
- LOCATE GAS COCKS WHERE EASILY ACCESSIBLE, AND WHERE THEY WILL BE PROTECTED FROM POSSIBLE INJURY.
- CONTROL VALVES: INSTALL AS INDICATED FOR ELECTRICAL FOR WIRING; NOT TO BE USED IF THIS SECTION.
- CONNECT GAS PIPING TO EACH GAS-FIRED EQUIPMENT ITEM, WITH DRIP LEG AND SHUTOFF GAS COCK. COMPLY WITH EQUIPMENT MANUFACTURER'S INSTRUCTIONS.

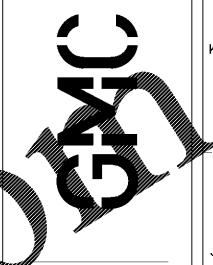
GAS VENT INSTALLATION:

- INSTALL GAS VENTS FOR ALL DRAFT GAS-FIRED APPLIANCES IN ACCORDANCE WITH NFPA 54 AND THE MANUFACTURER'S INSTRUCTIONS.
- GAS VENTS SHALL TERMINATE AT LEAST 10 FEET ABOVE THE ROOF AND 2 FEET HIGHER THAN ANY PORTION OF A BUILDING WITHIN A HORIZONTAL DISTANCE OF 10 FEET.
- MINIMUM VERTICAL GAS VENT LENGTH IS 10 FEET.
- SLOPE HORIZONTAL GAS VENT CONNECTIONS UPWARD AT LEAST 1/4 INCH PER FOOT.
- INSPECT, TEST, AND PURGE GAS SYSTEMS IN ACCORDANCE WITH NFPA 54, LOCAL UTILITY REQUIREMENTS, AND AS PER SPECIFICATION SECTION "TESTING, CLEANING AND STERILIZATION OF PIPING SYSTEMS".

GENERAL NOTES

- PLUMBING CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND CONNECTION LOCATIONS BEFORE ANY PIPE CUTTING IS COMMENCED.
- THE PIPING SHOWN ON THESE DRAWINGS ARE DIAGRAMMATIC. CONTRACTOR SHALL ARRANGE WORK IN A NEAT AND ORDERLY MANNER. THE PLUMBING CONTRACTOR SHALL MAKE ANY OFFSETS, TRANSITIONS, AND OTHER MINOR ADJUSTMENTS AS REQUIRED FOR A COMPLETE AND WORKING SYSTEM INSTALLATION. COORDINATE ALL PIPING WITH DUCTWORK SHOP DRAWINGS. ROUTE PIPING AS REQUIRED TO AVOID CONFLICTS.
- PRIOR TO START OF ANY WORK, COORDINATE SANITARY SEWER AND POTABLE WATER PIPING WITH CIVIL DRAWINGS. FIELD VERIFY PIPE INVERTS PRIOR TO LAYING OUT SANITARY SEWER PIPING.
- CONTRACTOR SHALL PROVIDE ALL TEMPORARY OR PERMANENT CAPS FOR PIPING. CONTRACTOR SHALL NOT LEAVE PIPING OPEN ENDED.
- DRAWINGS SHOW GENERAL SIZE AND APPROXIMATE LOCATIONS. THE DRAWINGS ARE INTENDED TO SHOW THE GENERAL ARRANGEMENT OF THE UTILITY SYSTEM. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CONNECTIONS SIZE, LOCATION, DEPTH. THE CONTRACTOR SHALL INSTALL ALL SYSTEMS ACCORDING TO THE ACTUAL FIELD CONDITIONS FOUND. ANY PLUMBING SYSTEM COMPONENT INSTALLED INCORRECTLY DUE TO FIELD CONDITIONS SHALL BE REMOVED AND INSTALLED CORRECTLY AT THE EXPENSE OF THE CONTRACTOR.
- REFER TO RISERS FOR SIZES NOT INDICATED ON PLAN VIEWS. RISERS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO INDICATE ALL OFFSETS, BENDS, FITTINGS, ETC.
- CONTRACTOR SHALL PROVIDE ALL CONNECTIONS, FITTINGS, APPURTENANCES, ETC. AS NECESSARY FOR INSTALLATION AND OPERATION OF OWNER FURNISHED EQUIPMENT.
- INSTALL ALL EQUIPMENT AND PIPING PER MANUFACTURERS REQUIREMENTS AND TO MANUFACTURERS RECOMMENDED CLEARANCES.
- ALL TRAP PRIMERS AND DOMESTIC WATER ISOLATION VALVES SHALL BE ACCESSIBLE. ISOLATION VALVES SHALL BE OF THE QUARTER TURN BALL TYPE.
- PROVIDE ACCESS DOORS/PANELS IN NON ACCESSIBLE WALLS AND CEILING FOR ALL VALVES, SHOCK ABSORBERS, AND ALL OTHER ITEMS THAT REQUIRE ACCESS FOR PROPER MAINTENANCE. COORDINATE COLOR AND INSTALLATION OF ACCESS DOORS WITH ARCHITECTURAL.
- BALL VALVES SHALL BE PROVIDED ON ALL WATER BRANCH LINES TO ALL EQUIPMENT, HOSE BIBBS, AND RISER TAKE-OFFS.
- THE CONTRACTOR SHALL NOT CUT ANY STRUCTURAL MEMBERS OF BUILDING WITHOUT PRIOR CONSENT OF ARCHITECT AND STRUCTURAL ENGINEER.
- DO NOT MOUNT DISCONNECT SWITCHES ON PLUMBING EQUIPMENT EXCEPT AS RECOMMENDED BY MANUFACTURER.
- PLUMBING CONTRACTOR TO COORDINATE WITH OTHER TRADES AS REQUIRED FOR INSTALLATION OF EQUIPMENT AND ANY OTHER PLUMBING ITEMS.
- ALL PENETRATIONS OF FIREWALLS, CEILING, FLOORS, ETC. FOR PIPING SHALL BE UL LISTED FIRESTOPPING AND SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATION. CONTRACTOR SHALL OBTAIN MANUFACTURER SHOP DRAWINGS AT JOBSITE FOR ALL PENETRATIONS.
- ALL (VTR'S) VENT THRU ROOF PENETRATIONS INDICATED ON PLANS ARE PRELIMINARY. FINAL CONDITIONS SHALL BE COORDINATED WITH ALL TRADES. ALL VTR'S SHALL BE A MINIMUM OF 12" FROM ALL FRESH AIR INTAKE OPENINGS.
- CONTRACTOR SHALL PROVIDE GENERAL WARRANTY FOR WORKMANSHIP FOR PERIOD OF ONE YEAR FROM DATE OF FINAL COMPLETION.
- PROVIDE ALL EQUIPMENT AND VALVES WITH 2 1/2" ENGRAVED, LAMINATED PLASTIC EQUIPMENT MARKER FOR IDENTIFICATION PURPOSES.
- PROVIDE ESCUTCHEON PLATES FOR ALL WALL PENETRATIONS.
- CONTRACTOR SHALL PROVIDE ALL CONNECTIONS, APPURTENANCES, ETC. AS NECESSARY FOR INSTALLATION AND OPERATION OF OWNER FURNISHED EQUIPMENT IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.
- COMPLY WITH SPECIFICATION FOR PIPE SLEEVES, HANGERS, SELECTIONS, AND APPLICATIONS.
- ENGAGE A FACTORY AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM START-UP SERVICES AND TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE AND MAINTAIN EQUIPMENT.
- ALL ITEMS PENETRATING THROUGH ROOF SHALL BE FLASHED. DOWNER FLASHED A MINIMUM OF 12" AND SHALL BE PAINT TO MATCH ROOF COLOR. PROVIDE APPROVED SEALS AT ALL ROOF PENETRATIONS.
- PROVIDE PREFABRICATED WATER HAMMER ARRESTORS AT EACH NEW BATHROOM GROUP ON HOT AND COLD WATER PIPING.
- PROVIDE AIR CUMULUM BREAKERS ON FIXTURES WITH HOSE THREAD CONNECTIONS.
- PROVIDE DIELECTRIC UNIONS AT ALL DISSIMILAR METAL PIPE CONNECTIONS.
- UNDER SLAB WATER LINE AND VENT PIPING PASSING TO UNDERSIDE OR THROUGH FOUNDATION FOOTING, WALL OR GRADE BEARING SHALL BE PROVIDED WITH A RELIEVING ARCH OR PIPE SLEEVE 2 (TWO) PIPE SIZES GREATER THAN PIPE SIZE INDICATED ON PLANS. COORDINATE FINAL PIPE ROUTING AND LAYOUT WITH STRUCTURAL DRAWINGS.
- SEE TOILET ROOM ELEVATIONS ON ARCHITECTURAL DRAWINGS FOR PLUMBING FIXTURE MOUNTING HEIGHT.
- COORDINATE EXACT LOCATION OF ALL EXTERIOR WALL HYDRANTS WITH ARCHITECT DRAWINGS.
- PRIOR TO SUBSTANTIAL COMPLETION OF NEW WORK AREAS, CONTRACTOR SHALL HAVE SANITARY PLUMBING SYSTEM CLEARED OF DEBRIS OR ANY MATTER THAT WOULD INTERFERE OR PREVENT ADEQUATE CONVEYANCE OF MATERIALS FROM MOVING THROUGH AND TERMINATING INTO BUILDING OR PUBLIC DISPOSAL FACILITIES.
- COORDINATE FLOOR DRAIN LOCATIONS IN GANG TOILET ROOMS WITH ARCHITECTURAL PLANS.
- PROVIDE BASE CLEANOUT AT LOWEST FLOOR LEVEL ON ALL SANITARY STACKS, STORM STACKS & WASTE STACKS. EXACT LOCATION OF ALL CLEANOUTS MUST BE COORDINATED AND APPROVED PRIOR TO INSTALLATION.
- ALL COMPONENTS OF PLUMBING SYSTEMS ARE TO BE INSTALLED PER MANUFACTURERS INSTRUCTIONS.
- WATER LINES FOR ICE MAKERS AND REFRIGERATORS SHALL BE BRAIDED STAINLESS STEEL.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OR RELOCATION OF ANY EXISTING MATERIALS OR SYSTEMS ABOVE EXISTING CEILING WHICH MAY INTERFERE WITH THE INSTALLATION OF NEW SYSTEMS OR UTILITIES.
- CONTRACTOR SHALL DEVELOP AND SUBMIT COORDINATION DRAWINGS WHICH IDENTIFY AND RESOLVE POTENTIAL CONFLICTS BETWEEN PLUMBING WORK, STRUCTURAL, FIRE SPRINKLER, HVAC DUCTWORK, AND ELECTRICAL SYSTEMS.
- ALL WORK SHALL COMPLY WITH THE FOLLOWING AGENCIES:
2009 INTERNATIONAL BUILDING CODE
2009 INTERNATIONAL FUEL GAS CODE
2009 INTERNATIONAL PLUMBING CODE
NATIONAL FIRE PROTECTION AGENCY (NFPA)
AMERICAN SOCIETY OF HEATING AND REFRIGERATION ENGINEERS (ASHRAE)
ALL APPLICABLE LOCAL CODES, ORDINANCES, AND THE AUTHORITY HAVING JURISDICTION.

1 DETAIL NOT TO SCALE



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PLUMBING LEGEND
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