

three inches = one foot
one and one-half inch = one foot
one inch = one foot
three-quarters inch = one foot
one-half inch = one foot
three-eighths inch = one foot
one-quarter inch = one foot
one-eighth inch = one foot

ABBREVIATIONS (NOT ALL SYMBOLS WILL APPLY TO THIS WORK)
A/E ARCHITECT/ENGINEER
AD AREA DRAIN
AFF ABOVE FINISH FLOOR
AFG ABOVE FINISH GRADE
AG AIR GAP
AP ACCESS PANEL
AS AUTOMATIC SPRINKLER
ASD ADJUSTABLE SPEED DRIVES
ASD AUTOMATIC SPRINKLER DRAIN
ASHRAE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, REFRIGERATION, AIR CONDITIONING ENGINEERS
ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASPE AMERICAN SOCIETY OF PLUMBING ENGINEERS
ASR AUTOMATIC SPRINKLER RISER
AW ACID WASTE
BFP REDUCED PRESSURE BACKFLOW PREVENTER
BHP BREAK HORSEPOWER
BSP BLACK STEEL PIPE
BT BATHTUB
BTU BRITISH THERMAL UNIT
BTU/HR BRITISH THERMAL UNIT PER HOUR
C CELSIUS
C/C CUT AND CAPPED PIPE
CD CONDENSATE DRAIN
CGA COMPRESSED GAS ASSOCIATION
CI CAST IRON
C/O CUT AND LEFT OPEN PIPE
CO CLEANOUT
CS CLINICAL SINK
CV CONTROL VALVE
CW COLD WATER
(D) EXISTING ITEM TO BE DEMOLISHED
DCW DOMESTIC COLD WATER
DHW DOMESTIC HOT WATER
DHWL DOMESTIC HOT WATER RETURN
DHWL DOMESTIC WATER RETURN
DHS DOMESTIC HOT WATER SUPPLY
DI DEIONIZED WATER
DN DOWN
DOE DEPARTMENT OF ENERGY
DS DOWNSPOUT
DISHWASHER
DW DRAWING
DWH DOMESTIC WATER HEATER
DWR DRINKING WATER RETURN
DWS DRINKING WATER SUPPLY
DWV DRAIN WASTE VENT
(E) EXISTING ITEM TO REMAIN
EL ELEVATION
EMCS ENERGY MONITORING AND CONTROL SYSTEM
EPA ENVIRONMENTAL PROTECTION AGENCY
EPACT ENERGY POLICY ACT
ESC ESCUTCHEON
ESH EMERGENCY SHOWER
ET EXPANSION TANK
EWC ELECTRIC WATER COOLER
EWC ELECTRIC WATER COOLER
EWH ELECTRIC WATER HEATER
EWS EYE WASH STATION
EX EXISTING
F FAHRENHEIT
FCO FLOOR CLEANOUT
FCW FILTERED COLD WATER
FD FLOOR DRAIN
FDC FIRE DEPARTMENT CONNECTION
FM FLOW METER
FOP FUEL OIL PUMP
FOR FUEL OIL RETURN
FOS FUEL OIL SUPPLY
FOV FUEL OIL VENT
FS FLOOR SINK
FS FLOW SWITCH
FU FIXTURE UNITS
GAL GALLON
GCD GRADE CLEANOUTS
GPD GALLONS PER DAY
GPM GALLONS PER MINUTE
GPR GAS PRESSURE REGULATOR
GRS GAS REGULATOR STATION
GT GREASE TRAP
GVR GAS VENT THROUGH ROOF
GWH GAS FIRED WATER HEATER
H&CW HOT AND COLD WATER
HUB HUB DRAIN
HEX HEAT EXCHANGER
HP HORSEPOWER
HS HAND SINK
HST HOT WATER STORAGE TANK (DOMESTIC)
HWP HOT WATER PUMP
HWP HOT WATER PUMP
HWR HOT WATER RETURN
HWS HOT WATER SUPPLY
HYD HYDRANT
ICW INDUSTRIAL COLD WATER
INV INVERT
IPC INTERNATIONAL PLUMBING CODE
IRW IRRIGATION WATER
IW INDIRECT WASTE
IWH INSTANTANEOUS WATER HEATER
IWR INDUSTRIAL WATER RETURN
IWS INDUSTRIAL WATER SUPPLY
KW KILOWATT
KWHR KILOWATT-HOUR
L/S LITER PER SECOND
LA LABORATORY AIR
LAV LAVATORY
LBS/HR POUNDS PER HOUR
LW LABORATORY COLD WATER
LWH LABORATORY HOT WATER
LNG LIQUID NATURAL GAS
LOX LIQUID OXYGEN
LV LABORATORY VACUUM
LW LOW WATER
M METER
MA MEDICAL AIR
MAV MANUAL AIR VENT
MBH 1000 BTUH
MED MEDICAL
MER MECHANICAL EQUIPMENT ROOM
MH MANHOLE
MOU MEMORANDUM OF UNDERSTANDING
MSB MEDICAL SERVICE BASIN
MSB MEDICAL VACUUM
MV MEDICAL VACUUM
N2 NITROGEN
N2O NITROUS OXIDE
NC NORMALLY CLOSED
NG NATURAL GAS
NIC NOT IN CONTRACT
NO NORMALLY OPEN
NOM.A. NOMINAL
NFW NON POTABLE WATER
NTC NOT TO SCALE

VALVE SYMBOLS (NOT ALL SYMBOLS WILL APPLY TO THIS WORK)
GATE VALVE - THREADED/FLANGED
BALL VALVE - THREADED/FLANGED
GATE VALVE WITH 3/4" HOSE ADAPTER
CHECK VALVE
WYE STRAINER (WITH BALL VALVE & HOSE CONNECTION)
WYE STRAINER WITH VALVED DRAIN AND QUICK-COUPLE HOSE CONNECTOR
FLEXIBLE CONNECTION
ANGLE GLOBE VALVE
BUTTERFLY VALVE
BALL VALVE (ISOMETRIC OR DETAIL)
MODULATING CONTROL VALVE
MODULATING CONTROL BUTTERFLY VALVE
TWO POSITION CONTROL VALVE
THREE-WAY MODULATING CONTROL VALVE
THREE-WAY TWO POSITION CONTROL VALVE
PRESSURE REGULATING VALVE
PRESSURE SAFETY VALVE
AUTOMATIC BALANCING CONTROL VALVE
CIRCUIT SETTER VALVE
GATE VALVE WITH GLOBE-VALVED BYPASS
PLUG VALVE
CONTROL VALVE (CV) - FLOAT-OPERATED
PRESSURE REDUCING VALVE (PRV)
WATER LEVEL CONTROLLER
FLOW METER

GENERAL PIPING SYMBOLS (NOT ALL SYMBOLS WILL APPLY TO THIS WORK)
DIRECTION OF PIPE PITCH (DOWN)
DIRECTION OF FLOW
ANCHOR
REDUCER OR INCREASER
ECCENTRIC REDUCER
TOP CONNECTION, 45' OR 90'
BOTTOM CONNECTION, 45' OR 90'
SIDE CONNECTION
CAPPED OUTLET
RISE OR DROP IN PIPE
UNION
PIPE UP
PIPE DOWN
INVERTED BUCKET TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
THERMOMETER
PRESSURE GAGE
FLOW ELEMENT
REFRIGERANT SIGHT GLASS
TEST PLUG (PRESSURE/TEMPERATURE)
AUTOMATIC AIR VENT
MANUAL AIR VENT
QUICK-COUPLE HOSE CONNECTOR
END OF DEMOLITION
CONNECTION BETWEEN NEW AND EXISTING
EXISTING ITEMS TO BE DEMOLISHED
RISER NUMBER (EXAMPLE=1)
PHOTO INDICATOR
PENETRATION

PIPING SYMBOLS (NOT ALL SYMBOLS WILL APPLY TO THIS WORK)
HPS HIGH PRESSURE STEAM (60 PSIG AND ABOVE)
HPSR HIGH PRESSURE STEAM CONDENSATE RETURN
MPS MEDIUM PRESSURE STEAM (16 PSIG THRU 59 PSIG)
MPSR MEDIUM PRESSURE STEAM CONDENSATE RETURN
LPS LOW PRESSURE STEAM (15 PSIG AND BELOW)
LPSR LOW PRESSURE STEAM CONDENSATE RETURN
PC CONDENSATE PUMP DISCHARGE
HWS HOT WATER HEATING SUPPLY
HWSR HOT WATER HEATING RETURN
GWS GLYCOL-WATER HEATING SUPPLY
GWSR GLYCOL-WATER HEATING RETURN
SWS SOLAR WATER SUPPLY
SWSR SOLAR WATER RETURN
RL REFRIGERANT LIQUID
RS REFRIGERANT SUCTON
RSG REFRIGERANT HOT GAS
CWS CHILLED WATER SUPPLY (FROM TOWER)
CWSR CHILLED WATER RETURN (TO TOWER)
GCS CHILLED GLYCOL-WATER SUPPLY
GCSR CHILLED GLYCOL-WATER RETURN
MW MAKE-UP WATER
D DRAIN LINE
V VENT LINE
GWS GLYCOL-WATER RUN AROUND SUPPLY
GWSR GLYCOL-WATER RUN AROUND RETURN
X EXISTING PIPE TO BE REMOVED
FWD FEEDWATER PUMP DISCHARGE
FWS FEEDWATER PUMP SUCTION
CPS CONDENSATE TRANSFER PUMP DISCHARGE
CPSR CONDENSATE TRANSFER PUMP SUCTION
VRS VACUUM CONDENSATE RETURN
TC TUBE CLEANER WATER SUPPLY
BO BOILER BLOWOFF
CBO CONTINUOUS BLOWDOWN
BWS BOILER WATER SAMPLE
FWS FEEDWATER SAMPLE (FROM DEAERATOR)
CF CHEMICAL FEED
OF OVERFLOW
A COMPRESSED AIR
G NATURAL GAS MAIN FUEL
GI NATURAL GAS IGNITER FUEL
LPG LIQUEFIED PETROLEUM GAS IGNITER FUEL
FOS FUEL OIL SUPPLY
FOR FUEL OIL RETURN
RHS ROLLER-TYPE HANGER
SH VARIABLE SPRING-TYPE HANGER (TYPE 51)*
SCH SPRING CUSHION-TYPE HANGER (TYPE 48 OR 49)*
CLEVIS-TYPE HANGER
TH TRAPEZE HANGER (PROVIDE U-BOLT PIPE ATTACHMENT TO TRAPEZE EXCEPT WHERE RH ARE INDICATED)
PS FLOOR-SUPPORTED PIPE STAND
RC RISER CLAMP (TYPE 42)*
WB WALL BRACKET (TYPE 31, 32, 33)*
CSH CONSTANT SUPPORT HANGER (TYPE 54, 55, 56)*
SS SLIDING SUPPORTS (TYPE 35)*
* TYPE NUMBERS REFER TO MANUFACTURER'S STANDARDIZATION SOCIETY STANDARD PRACTICE SP-58
EXISTING SANITARY PIPE
EXISTING VENT PIPE
NEW SANITARY WASTE PIPE
NEW SANITARY VENT PIPE
NEW MEDICAL AIR LINE
NEW VACUUM LINE
NEW OXYGEN LINE
NEW STORM PIPE

GENERAL NOTES
1. DRAWINGS
a. PLUMBING DRAWINGS ARE TO BE CONSIDERED DIAGRAMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK AND SYSTEMS. IT IS NOT POSSIBLE TO INDICATE EVERY FITTING, VALVE, OFFSET, TRAP, ACCESS PANEL, ETC. THAT IS REQUIRED FOR A PROPER WORKING SYSTEM AND MAINTENANCE THEREOF. NO ADDITIONAL COST WILL BE ALLOWED FOR SUCH ITEMS.
b. FOR EXISTING SYSTEMS, ALL LINES AND CONDITIONS SHOWN ON THE DRAWING HAVE BEEN SHOWN IN GOOD FAITH. HOWEVER, THERE IS NO IMPLIED GUARANTEE AS TO THEIR SIZE, LOCATION, ELEVATION, COMPLIANCE WITH CURRENT CODES OR CONDITIONS. THE CONTRACTOR SHALL INVESTIGATE ALL EXISTING CONDITIONS AND SHALL MODIFY THE PROPOSED WORK AS REQUIRED OR DIRECTED.
c. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT EQUIPMENT LOCATIONS, ETC. AND OTHER SPACE CONDITIONS. CHECK DRAWINGS OF OTHER TRADES TO COORDINATE PLUMBING WORK.
2. FEES/INSPECTIONS
a. PAY ALL FEES AND ARRANGE FOR ALL INSPECTIONS. SUCH INSPECTIONS ARE TO BE CONDUCTED BY AUTHORITIES HAVING JURISDICTION. ADVISE THE COR/G.C. OF ANY MODIFICATION TO OR DEVIATION FROM THE CONTRACT DOCUMENTS IN ORDER TO COMPLY WITH CODES. ENTERING INTO A CONTRACT WILL BE DEEMED AS EVIDENCE OF COMPLIANCE WITH THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION OVER THE WORK.
3. QUALITY ASSURANCE
a. ALL PLUMBING WORK SHALL COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AS WELL AS ALL UTILITY COMPANY REGULATIONS. THESE CODES SHALL SUPERCEDE ANY INFORMATION CONTAINED WITHIN THE DRAWING SET CONTRADICTING THESE CODES.
b. EACH PIECE OF EQUIPMENT SHALL HAVE MANUFACTURER'S NAME, ADDRESS, SERIAL, AND MODEL NUMBERS ON A PLATE SECURELY ATTACHED TO IT.
c. ALL PIPING ABOVE GRADE SHALL HAVE AN EXPOSED TAG TO IDENTIFY THE PIPE.
d. EACH PIECE OF EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR AS INDICATED ON PLANS.
e. ALL PLUMBING WORK SHALL BE PERFORMED BY INDIVIDUALS SKILLED IN THIS TRADE AND COMPLETED IN A PROFESSIONAL MANNER.
f. EACH PIECE OF EQUIPMENT SHALL BE INSTALLED AS FREE FROM NOISE AND VIBRATION AS POSSIBLE.
4. EQUIPMENT DELIVERY AND STORAGE
a. DELIVER EQUIPMENT TO THE SITE IN MANUFACTURER'S ORIGINAL PACKAGING. CLEARLY MARK EACH ITEM WITH THE PROPER IDENTIFICATION NUMBER. STORE IN SAFE DRY AREA.
5. EQUIPMENT MANUALS/SUBMITTALS
a. SUBMIT EQUIPMENT CATALOGS TO OWNER/G.C. FOR APPROVAL PRIOR TO PURCHASE AND INSTALLATION. ONCE APPROVED, PROVIDE OWNER/G.C. WITH COPIES OF THESE ITEMS.
PRODUCTS/MATERIALS
1. PIPING
a. DOMESTIC WATER PIPING ABOVE GRADE - SHALL BE TYPE "L" HARD COPPER TUBING AND CAST BRONZE OR WROUGHT COPPER SOLDER JOINT FITTINGS. SOLDER SHALL BE LEAD FREE, HAVING A COMPOSITION SIMILAR TO 95.5% TIN, 4% COPPER AND 0.5% SILVER AS MANUFACTURED BY ENGLEHARD CORP. OR EQUAL. VALVES IN DOMESTIC WATER PIPING 2" AND SMALLER SHALL BE BRONZE BODY WITH FULL PORT STAINLESS STEEL BALL VALVE WITH LEVER HANDLE. INSULATION SHALL BE 3/4" THICK, PREFORMED FIBERGLASS WITH VAPOR BARRIER JACKET. AS AN OPTION, FOR PIPE SIZES 2" AND SMALLER, THE CONTRACTOR MAY USE A 3/8" THICK PRE-MOLDED FOAM PLASTIC SIMILAR TO "ARMAFLEX", IN EITHER CASE THE INSULATION MATERIAL SHALL HAVE A FLAME SPREAD RATING OF 25 AND A SMOKE GENERATED RATING OF 50.
b. CONDENSATE DRAIN PIPING - SHALL BE P.V.C. DWV SCH. 40 OR TYPE "L" HARD COPPER TUBING. INSULATE CONDENSATE DRAIN WITH A PREFORMED NITRIL RUBBER BASED ELASTOMETRIC PIPE INSULATION, SECURED WITH ADHESIVE. INSULATION THICKNESS SHALL BE 3/4" THICK.
c. SANITARY WASTE & VENT PIPING ABOVE GROUND - SHALL BE NO-HUB CAST IRON PIPE AND FITTINGS WITH NEOPRENE SLEEVE AND STAINLESS STEEL DRAW BAND JOINTS, OR WHERE ALLOWED, THE CONTRACTOR MAY USE P.V.C. SCHEDULE 40 DWV PIPING AND FITTINGS. FLOOR SINK THAT SERVE BEVERAGE UNITS TO BE "DURIRON" OR EQUAL.
EXECUTION
1. LAYOUT: PLUMBING
a. PRIOR TO INSTALLATION, LAYOUT ALL PLUMBING WORK IN A MANNER THAT WILL ALLOW INSTALLATION OF ALL OTHER WORK INCLUDING.
b. COORDINATE AND COMMUNICATE INSTALLATION OF PLUMBING WORK WITH THAT OF OTHER TRADES, SO THAT ALL WORK MAY BE INSTALLED IN SPACE AVAILABLE.
c. PROVIDE ALL ADA INSULATION PROTECTION AS REQUIRED.
2. EQUIPMENT:
a. INSTALL ALL MATERIAL AND EQUIPMENT IN A NEAT AND WORKMANLIKE MANNER IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND PROVIDE FOR THE FOLLOWING:
i. CONNECTION OF PIPING AND ACCESSORIES TO EQUIPMENT SHALL PERMIT EASY REMOVAL WITH MINIMUM OF DISTURBANCE TO OTHER EQUIPMENT AND MATERIALS.
ii. ITEMS REQUIRING INSPECTION, ADJUSTMENT, MAINTENANCE, SERVICING OR REPLACEMENT SHALL BE EASILY ACCESSIBLE.
b. SLEEVE TO BE INSTALLED (2" MINIMUM AFF) FOR ALL PENETRATIONS.
3. EXISTING PLUMBING SYSTEMS:
a. ALL EXISTING PIPING, MATERIALS OR EQUIPMENT NOT REQUIRED FOR THE NEW SYSTEM, WHETHER OR NOT SUCH ITEMS ARE INDICATED ON PLANS, SHALL BE REMOVED. THE STATUS OF ALL SUCH ITEMS SHALL BE VERIFIED BY THIS CONTRACTOR BEFORE DISCONNECTING, CAPPING OR REMOVING.
b. ALL EXISTING PIPING, MATERIALS OR EQUIPMENT WHICH WILL REMAIN AS PART OF THE ACTIVE SYSTEM SHALL BE VISUALLY INSPECTED. ANY SUCH ITEMS FOUND TO BE DEFECTIVE SHALL BE REMOVED AND REPLACED WITH NEW MATERIALS OF LIKE SUBSTANCE, SIZE AND TYPE. ALL PLUMBING SYSTEMS THAT HAVE BEEN REPAIRED, MODIFIED OR RELOCATED SHALL BE TESTED IN ACCORDANCE WITH THIS SPECIFICATION FOR NEW SYSTEMS.
TESTS AND INSPECTIONS
1. DOMESTIC WATER SYSTEM - STERILIZE THE ENTIRE WATER DISTRIBUTION SYSTEM THOROUGHLY WITH A SOLUTION CONTAINING NOT LESS THAN 50 PARTS PER MILLION OF AVAILABLE CHLORINE. USE EITHER LIQUID CHLORINE OR CALCIUM HYPOCHLORITE CONFORMING TO FEDERAL SPECIFICATIONS. ALLOW THE STERILIZING SOLUTION TO REMAIN IN THE SYSTEM FOR EIGHT HOURS. DURING WHICH TIME ALL VALVES AND FAUCETS SHALL BE OPENED AND CLOSED SEVERAL TIMES. AFTER STERILIZATION, THE SOLUTION SHALL BE FLUSHED FROM THE SYSTEM WITH CLEAN WATER UNTIL THE RESIDUAL CHLORINE CONTENT IS NOT GREATER THAN 0.2 PARTS PER MILLION UNLESS DIRECTED OTHERWISE. TEST SYSTEM HYDROSTATICALLY AT 100 PSIG MINIMUM FOR A PERIOD OF 24 HOURS WITH A PRESSURE LOSS NOT TO EXCEED 1 PSIG.
2. SANITARY DRAINAGE SYSTEM - SHALL BE WATER TESTED BEFORE FINAL CONNECTION TO THE SANITARY SEWER. ALL OPENINGS SHALL BE PLUGGED EXCEPT THE HIGHEST OPENING WHICH SHALL PRODUCE A MINIMUM OF A 10 FOOT HEAD. THE SYSTEM SHALL RETAIN THE WATER LEVEL FOR AT LEAST 15 MINUTES AT WHICH TIME ALL JOINTS SHALL BE INSPECTED AND ALL OBSERVED LEAKS CORRECTED.
3. FINAL INSPECTION - BEFORE FINAL INSPECTION, CERTIFY IN WRITING THAT ALL SYSTEMS ARE INSTALLED, ADJUSTED, TESTED AND READY FOR USE.

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MANAGER, INFECTION CONTROL, SAFETY OFFICER, DATE, ENGINEERING MANAGER, MANAGER, CHIEF OF STAFF

Drawing Title: PLUMBING ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES

Project Title: BUFFALO GU AHU
Building Number: 1
Location: V.A.M.C. BUFFALO, NEW YORK

Date: 09-07-2017
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