PLUMBING SYMBOLS

- TAG-# — EQUIPMENT TAG
- ELBOW TURN DOWN
- ELBOW TURN UP
- ELBOW DOWN - SIDE CONNECTION
- SIDE OUTLET ELBOW - UP
- ELBOW DOWN - W/ TEE
- 4-WAY TEE - UP
- TEE - OUTLET DOWN
- TEE - OUTLET DOWN W/ ELBOW
- TEE - OUTLET UP
- 45° ELBOW DOWN
- TEE - HORIZONTAL
- ELBOW - 90°
- ELBOW - 45°
- ELBOW - 22.5°
- WYE - 45°
- VALVE - GATE
- VALVE - ANGLE (EL VIEW)
- VALVE - GATE (MOTORIZED)
- VALVE - GATE (AIR OPERATED)
- VALVE - ANGLE (PLAN VIEW)
- VALVE - GATE (HOSE CONNECTION)
- VALVE - SWING GATE CHECK
- VALVE - GLOBE
- VALVE - GLOBE ANGLE (EL VIEW)
- VALVE - GLOBE ANGLE (PLAN VIEW)
- VALVE - GLOBE (SOLENOID)
- VALVE - GLOBE (AIR OPERATED)
- VALVE - GLOBE (MOTORIZED)
- VALVE - BALL
- VALVE - BUTTERFLY
- VALVE - NEEDLE
- VALVE - PLUG
- VALVE - AUTO EXPANSION
- VALVE - SPRING CHECK
- VALVE - 3-WAY SOLENOID
- VALVE - 4-WAY SOLENOID
- VALVE - 3-WAY AIR MOTOR
- VALVE - 3-WAY ELEC. MOTOR
- VALVE - PRESSURE REDUCING
- VALVE - SAFETY PRESSURE RELIEF
- VALVE - SAFETY TEMP/PRESS RELIEF
- VALVE - 3-WAY MANUAL
- VALVE - DIAPHRAGM
- FLEX HOSE TUBE
- BLIND FLANGE
- PIPE JOINT BALL
- EXPANSION JOINT - FLANGED
- EXPANSION JOINT - SCREWED
- REDUCER
- EXPANSION LOOP
- DRAIN OPENING FUNNEL
- PITCH DROP
- PITCH RISE
- QUICK DISCONNECT
- PIPE PLUG
- PIPE PLUG - SCREWED
- ECCENTRIC REDUCER
- SEAL WATER CONNECTION
- SLEEVE
- UNION
- ACTUATOR - ELEC. MOTOR
- ACTUATOR - SOLENOID
- ACTUATOR - DIAPHRAGM
- ACTUATOR - PNUEMATIC
- PIPE COCK SCREWED
- MOTOR OPERATED THROTTLE
- PNEUMATIC OPERATED THROTTLE
- WATER REGULATOR VALVE
- ACTUATOR - MANUAL NON-RISE
- ACTUATOR - MANUAL STEM/YOKE
- ACTUATOR - MANUAL LEVER
- PI — PRESSURE INDICATOR
- TI — TEMPERATURE INDICATOR
- FE — FLOW ELEMENT
- CENTRIFUGAL PUMP
- AIR RECEIVER TANK
- COMPRESSED AIR FILTER
- DUPLEX AIR COMPRESSOR
- EMERGENCY SHOWER
- GAS CYLINDER
- SIMPLEX AIR COMPRESSOR
- BOILER RETURN TRAP
- WS — WATER SOFTENER
- FLOOR CLEANOUT
- FLOOR DRAIN
- YARD HYDRANT
- YARD CLEANOUT
- TOTALIZING METER
- AIR ELIMINATOR
- AIR SEPERATOR
- XXX — GENERAL EQUIPMENT
- GT — GREASE TRAP
- HORIZONTAL CLEANOUT
- ROOF DRAIN
- ROTAMETER
- SAMPLE FUNNEL
- SIGHT GLASS
- STEAM TRAP
- BASKET STRAINER
- PUMP (SCHEMATIC)
- STRAINER
- STRAINER (BLOW-OFF)
- AIR SET
- DUPLEX STRAINER
- FILTER STRAINER
- STRAINER (PLAN)
- THERMOSTATIC TRAP
- AV — AUTOMATIC AIR VENT
- MAX — MANUAL AIR VENT
- 00.0 GPM — HYDRONIC W/ BY-PASS
- 00.0 GPM — HYDRONIC CONNECTION
- 00.0 GPM — HYDRONIC W/ TEMP
- 00.0 GPM — HYDRONIC W/ VALVE

PLUMBING LINETYPES:

- NEW
- EXISTING
- HIDDEN OR UNDERGROUND
- CW — CITY WATER
- PW — POTABLE WATER
- HWS — HOT WATER SUPPLY
- HWS — HOT WATER RETURN
- NPW — NON-POTABLE WATER
- IW — INDUSTRIAL WASTE
- SAN — SANITARY SEWER
- ST — STORM SEWER
- WW — WELL WATER
- V — VENT OR RELIEF LINE

PLUMBING ABBREVIATIONS:

#	NUMBER, POUND
%	PERCENT
&	AND
@	AT
°F	DEGREES FAHRENHEIT
°C	DEGREES CENTIGRADE
AFF	ABOVE FINISHED FLOOR
APD	AIR PRESSURE DROP
APPROX	APPROXIMATE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS, INC.
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
AV	AIR VALVE
BDD	BOILER BLOW DOWN
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BO	BLOW OFF, BY OTHERS
BOD	BOTTOM OF DUCT
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STEEL, BOTTOM OF SLOPE
BOT	BOTTOM
BOW	BOTTOM OF WALL
BV	BALL VALVE
C TO C	CENTER TO CENTER
CA	COMPRESSED AIR
CAP	CAPACITY
CHD	CHEMICAL DRAIN
CHEM	CHEMICAL
CHS	CHEMICAL SUPPLY
CI	CAST IRON
CL	CENTER LINE
CO	CLEAN OUT
CV	CONTROL VALVE
CW	COLD/CITY WATER
CWR	COLD WATER RETURN
CWS	COLD WATER SUPPLY
D	DRAIN
DEG, °	DEGREES
DEMO	DEMOLITION
DI	DUCTILE IRON, DROP INLET
DIA	DIAMETER
DN	DOWN
DPW	DOMESTIC POTABLE WATER
DS	DOWNSPOUT
DWV	DRAIN, WASTE AND VENT
EA	EACH
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXST	EXISTING
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLANGE
FLEX	FLEXIBLE
FOG	FUEL OIL GAUGE
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
FPM	FEET PER MINUTE
FT, '	FOOT/FEET
FTR	FIN TUBE RADIATION
G	GAS
GA	GAUGE, GAGE
GAL	GALLON
GALV	GALVANIZED
GM	GAS METER
GPM	GALLONS PER MINUTE
GR	GLYCOL RETURN
GS	GLYCOL SUPPLY
GV	GATE VALVE
HB	HOSE BIBB
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HW	HOT WATER
HWC	HOT WATER CIRCULATION
HWH	HOT WATER HEATER
HWP	HOT WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HWT	HOT WATER TANK
HYD	HYDRANT
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN, "	INCH
INV	INVERT
IW	INDUSTRIAL WASTE
IWH	INSTANTANEOUS WATER HEATER
JAN	JANITOR
L	LENGTH
LBS	POUNDS
LP	LOW PRESSURE
LPC	LOW PRESSURE CONDENSATE
LPG	LOW PRESSURE GAS
LPS	LOW PRESSURE STEAM
LS	LEVEL SWITCH
LT	LEVEL TRANSMITTER
LVL	LEVEL
M	METER
MAN	MANUAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MIN	MINIMUM
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
N/A	NOT APPLICABLE
NPT	NATIONAL PIPE THREAD
NPW	NON-POTABLE WATER
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
PD	PRESSURE DROP
POC	POINT OF CONNECTION
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PW	POTABLE WATER
R	RADIUS
RD	ROOF DRAIN
RDO	ROOF DRAIN OVERFLOW
RED	REDUCER
REST	RESTROOM
RET	RETURN
RFGT	REFRIGERANT
RPBP	REDUCED PRESSURE BACKFLOW PREVENTOR
RPM	REVOLUTIONS PER MINUTE
RS	RAW SEWAGE
S	SINK
SHR	SHOWER
SP	STATIC PRESSURE
SS	SANITARY SEWER
SST	STAINLESS STEEL
STM	STEAM
SW	SERVICE WATER
T	THERMOMETER
TBD	TO BE DETERMINIDED
TD	TANK DRAIN
TDU	TRIPLE DUTY VALVE
TEMP	TEMPERATURE
TMPD	TEMPERED
TMV	THERMOSTATIC MIXING VALVE
TOC	TOP OF CONCRETE
TOD	TOP OF DUCT
TOF	TOP OF FOOTING
TOG	TOP OF GRATE
TOM	TOP OF MASONRY
TOP	TOP OF PIPE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
V	VENT
VIF	VERIFY IN FIELD
VTR	VENT TO ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WH	WATER HEATER
WL	WATER LINE
WM	WATER METER
WP	WATER PROOF
WPD	WATER PRESSURE DROP
YCO	YARD CLEANOUT
YD	YARD DRAIN

PLUMBING NOTES:

1. ALL PLUMBING SYSTEMS SHALL BE TESTED AND INSPECTED ACCORDING TO THE PROVISIONS OF THE INTERNATIONAL PLUMBING CODE (IPC) AND LOCAL PLUMBING CODE.
2. THESE GENERAL NOTES PRESENT AND/OR SUMMARIZE KEY PROJECT INFORMATION FOR THE DRAWING READER'S CONVENIENCE. SEE ALSO INDIVIDUAL DRAWING NOTES AND PROJECT SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
3. ALL REFERENCES TO REFERENCE STANDARDS HEREIN ARE TO MOST RECENT ISSUE IN EFFECT AS OF THE DATE OF THESE DOCUMENTS, UNLESS NOTED OTHERWISE IN PROJECT SPECIFICATIONS OR ON THE DRAWINGS.
4. SUBMIT SHOP DRAWINGS, PROJECT DATA AND SAMPLES AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
5. ALL EXISTING DIMENSIONS SHOWN WITH THE ± SYMBOL ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE FABRICATION AND CONSTRUCTION.
6. DIMENSIONS MARKED WITH AN "X" SHALL BE DETERMINED BY EQUIPMENT MANUFACTURER.
7. PROVIDE CLEANOUTS IN ACCORDANCE WITH THE PLUMBING CODE.
   - A. PROVIDE CLEANOUTS AT THE BASE OF EACH WASTE OR SOIL STACK.
   - B. PROVIDE A CLEANOUT NEAR THE JUNCTION OF THE BUILDING DRAIN AND THE BUILDING SEWER EITHER INSIDE OR OUTSIDE OF THE BUILDING WALL.
   - C. PROVIDE THE PROPER SPACING BETWEEN CLEANOUTS.
   - D. PROVIDE PROPER SIZE CLEANOUTS-SAME SIZE AS THE PIPE THEY SERVE (UP TO 4 INCH PIPE).
8. ALL PIPING SHALL BE IDENTIFIED EITHER BY COLOR MARKING OR METAL TAGS IN ACCORDANCE WITH THE PLUMBING CODE.
9. PROVIDE AIR CHAMBERS OR AN APPROVED MECHANICAL DEVICE TO ARREST WATER HAMMER AND ABSORB HIGH-PRESSURES IN ACCORDANCE WITH THE PLUMBING CODE.
10. PROVIDE TEMPERED WATER THROUGH A WATER TEMPERATURE LIMITER DEVICE THAT CONFORMS TO ASSE 1070 AT ACCESSIBLE HAND WASHING PLUMBING FIXTURES.
11. BACKFILL ALL TRENCHING AND EXCAVATIONS IN ACCORDANCE WITH THE PLUMBING CODE.
12. HANGERS, ANCHORS, AND SUPPORTS SHALL BE SECURELY ATTACHED TO THE BUILDING CONSTRUCTION AT INTERVALS AS REQUIRED BY PLUMBING CODE.
13. PROTECT ALL PIPING PASSING THROUGH CONCRETE FLOORS AND WALLS AGAINST EXTERNAL CORROSION BY PROVIDING A PROTECTIVE SHEATHING/WRAP, WHICH WILL ALLOW FOR EXPANSION AND CONTRACTION OF PIPING IN ACCORDANCE WITH THE PLUMBING CODE.
14. ALL PIPING ENTERING AND LEAVING STRUCTURES BELOW GRADE, THROUGH FOUNDATION, BELOW FOOTINGS OR FIRE WALLS SHALL BE SLEEVED AND PACKED AS REQUIRED BY LOCAL AUTHORITIES AND PER A UL RATED ASSEMBLY. ALL SLEEVES ARE NOT INDICATED ON DRAWINGS.
15. PROVIDE PROTECTION AGAINST PHYSICAL DAMAGE FOR PIPING IN ACCORDANCE WITH THE PLUMBING CODE.
16. THE SLOPE FOR HORIZONTAL DRAINAGE PIPING SHALL BE IN ACCORDANCE WITH THE PLUMBING CODE.
17. ALL INTERIOR FLOOR DRAINS AND OPEN RECEPTACLES WITH TRAPS SHALL BE PROTECTED BY A TRAP PRIMER OR TRAP SEALER (SEE SPECIFICATIONS AND PLANS FOR LOCATION AND TYPE). PROVIDE 1/2" SLOPED LINE TO FLOOR DRAIN.
18. SLOPES AND INVERT ELEVATIONS SHALL BE ESTABLISHED BEFORE ANY PIPE IS INSTALLED IN ORDER TO MAINTAIN PROPER SLOPES. ALL PIPING SHALL BE LOCATED AND DETERMINED WHEN TO BE INSTALLED TO AVOID CONFLICT WITH OTHER TRADES.
19. CONTRACTOR SHALL COORDINATE LOCATION OF ALL MECHANICAL AND ELECTRICAL EQUIPMENT.
20. CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS AND DIMENSIONS BEFORE CONSTRUCTION BEINGS, INCLUDING SEWER INVERT ELEVATION. CONTACT OWNER SHOULD DISCREPANCIES OCCUR.
21. CONTRACTOR SHALL PROVIDE REQUIRED COMPRESSED AIR, WASTE & VENT PIPING, AND MAKE FINAL CONNECTIONS TO EQUIPMENT.
22. MAINTAIN SERVICE ACCESS TO EQUIPMENT TO ALLOW FOR MAINTENANCE AND FUTURE REPLACEMENT
23. SANITARY SEWER PIPING SHALL BE INSTALLED WITH A MINIMUM SLOPE OF 1%. WASTE PIPING 3" AND SMALLER SHALL BE INSTALLED WITH A MINIMUM SLOPE OF 2%.
24. THESE PLANS ARE SCHEMATIC AND DIAGRAMMATIC ONLY. THEY DO NOT SHOW ALL REQUIRED BENDS, OFFSETS, VALVES, AND MISCELLANEOUS FITTINGS FOR A COMPLETE INSTALLATION. THE CONTRACTOR SHALL INSTALL ALL REQUIRED PIPES, VALVES, AND FITTINGS AS PER CODE, AND TO INSTALL A COMPLETE SYSTEM.
25. OPEN SANITARY VENTS SHALL NOT TERMINATE WITHIN 10 FEET HORIZONTALLY OF ANY AIR INTAKE UNLESS IT IS LOCATED AT LEAST TWO (2) FEET ABOVE THE TOP OF SUCH OPENING.
26. PROVIDE SHUTOFF VALVES FOR ALL BRANCHES OFF MAIN SUPPLY LINES.
27. THE PIPE SIZES AND LENGTHS SHOWN ON THESE DRAWINGS ARE APPROXIMATE AND ARE NOT TO BE USED FOR FABRICATION. THE MECHANICAL CONTRACTOR SHALL PREPARE AND SUBMIT COMPLETE SHOP DRAWINGS FOR APPROVAL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
28. COORDINATE THE EXACT LOCATION AND SIZE OF ALL ROOF, WALL AND SLAB PENETRATIONS WITH THE ARCHITECTURAL DRAWINGS.
29. ANY ADDITIONAL OFFSETS OR FITTINGS REQUIRED FOR PROPER INSTALLATION, COORDINATION WITH OTHER TRADES, AND/OR TO MAINTAIN PROPER CLEARANCES SHALL BE PROVIDED FOR A COMPLETE AND WORKING SYSTEM.
30. ALL PIPING SYSTEM SUPPORT AND HANGER MATERIAL, SPACING AND METHOD OF ATTACHMENT SHALL BE PER PROJECT SPECIFICATIONS.
31. ALL VALVES SHALL BE LOCKABLE TYPE. PROVIDE CHAIN OPERATORS FOR ALL VALVES ABOVE OPERATING LEVEL. SEE SPECIFICATION FOR ADDITIONAL INFORMATION.
32. ALL WORK IN THIS PACKAGE SHALL BE COORDINATED WITH OWNER TO AVOID SHUTDOWN OF UTILITIES.
33. WATER LINES SHALL NOT BE ROUTED ABOVE ANY ELECTRICAL ROOM, ELECTRICAL PANELS OR TELEPHONE ROOMS.
34. MAINTAIN PIPING A MINIMUM OF 7'-0" A.F.F. IN ALL MECHANICAL ROOMS. ALL PIPING SHALL BE LOCATED AS HIGH AS POSSIBLE.
35. INSTALL BOTTOM OF ALL EXTERIOR WALL HYDRANTS AT 24" ABOVE FINISH GRADE ELEVATION.
36. CONTRACTOR MAY RE-ROUTE PIPING IF A BETTER ROUTE THAN THE EXISTING IS DETERMINED. OBTAIN APPROVAL FROM ENGINEER AND OWNER PRIOR TO INSTALLATION.
37. PIPING ABANDONED IN PLACE SHALL BE DRAINED AND CAPPED AT BOTH ENDS.
38. REPAIR ALL PENETRATIONS AND DAMAGE GENERATED FROM DEMOLITION AND INSTALLATION OF NEW PIPING. MATERIALS AND FINISHES SHALL MATCH ADJACENT SURFACE/MATERIAL.
39. ALL EXPOSED GAS PIPING SHALL BE PRIMED AND PAINTED.
40. ALL GAS PIPING SHALL BE LABELED AT BEGINNING, END AND AT 6' INTERVALS DESIGNATING GAS AND PRESSURE. LABELS SHALL BE PER SPECIFICATIONS.
41. ALL PRODUCTS LISTED ARE SHOWN FOR BASIS OF DESIGN ONLY. PRODUCTS MAY BE SUPPLIED ON AN "OR EQUAL" BASIS.
42. CONTRACTOR SHALL REPAIR OR REPLACE ANY DAMAGE DONE TO FACILITIES AND EQUIPMENT DURING THE COURSE OF CONSTRUCTION.

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OAKLAND COUNTY
WATER RESOURCES COMMISSIONER
PERRY STREET DIVERSION
PUMPING STATION CONTRACT 1 OF 2

PLUMBING NOTES AND LEGEND

Project No.: 200-12678-12002
Designed By: S. ULREY
Drawn By: S. ULREY
Checked By: W. KRAMER

P-001

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Bar Measures 1 inch

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