PUMP, COMPRESSOR AND MIXER SYMBOLS

- CENTRIFUGAL PUMP
- CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
- CHEMICAL FEED PUMP
- PERISTALTIC / HOSE PUMP
- GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
- PISTON PUMP
- METERPUMP
- VERTICAL TURBINE PUMP
- PROGRESSIVE CAVITY PUMP
- SUBMERSIBLE SUMP PUMP
- RECIPROCATING PUMP
- GRINDER
- HEAT EXCHANGER
- COMPRESSOR (PISTON)
- BLOWER
- MIXER
- HAND PUMP
- SCREW PUMP

GATE AND VALVE SYMBOLS

- GATE VALVE OR UNDEFINED VALVE
- CHECK– SWING
- CHECK– BALL
- CHECK– FLAPPER
- PLUG VALVE
- BALL VALVE
- BUTTERFLY
- GLOBE
- DIAPHRAGM
- NEEDLE
- PINCH VALVE
- AIR RELEASE OR AIR/VACUUM VALVE
- PRESSURE RELIEF OR SAFETY
- PRESSURE REGULATOR(EXTERNAL)
- PRESSURE REGULATOR(INTERNAL)
- 3–WAY
- ANGLE VALVE
- SLIDE GATE
- SLUICE GATE
- STOP GATE

MISCELLANEOUS SYMBOLS

- BLIND FLANGE
- AIR GAP
- DRAIN
- IN–LINE MIXER
- PULSATION DAMPENER
- ROTATING BEACON
- HORN
- UNION
- FLEXIBLE CONNECTION
- FILTER/SEPARATOR
- STRAINER
- BACKFLOW PREVENTOR
- GEARBOX
- PURGE/FLUSH CONNECTION
- EXPANSION JOINT
- FLAME ARRESTER
- RUPTURE DISK
- DIAPHRAGM SEAL
- ANNULAR (IN–LINE) SEAL
- RADIO ANTENNA
- SHOWER/EYEWASH
- FUEL SEPARATOR
- AIR FILTER
- WATER LEVEL
- CONCENTRIC REDUCER
- QUICK DISCONNECT
- THREADED CAP
- HOSE CONNECTION
- EDUCTOR
- DIFFUSER
- FLOW STRAIGHTENING DEVICE
- SILENCER
- OVERFLOW RINGS

VALVE ACTUATORS

- SOLENOID
- ELECTRICAL/HYDRAULIC
- DIAPHRAGM
- HYDRAULIC OR OR PNEUMATIC CYLINDER

MOTOR DRIVES

- VFD — VARIABLE FREQUENCY CONTROLLER (ELEC AC)
- SCR — VARIABLE SPEED DRIVE (ELEC DC)
- VSD — VARIABLE SPEED DRIVE (MECH)
- ELECTRIC MOTOR

VALVE LABELS

NO	NORMALLY OPEN
NC	NORMALLY CLOSED
FC	FAILS CLOSED
FO	FAILS OPEN
FIP	FAILS IN LAST POSITION
LO	LOCK OPEN
LC	LOCK CLOSE

LOGIC SYMBOLS

- AND = AND
- OR = OR
- INTERLOCK = INTERLOCK
- N = NOT
- Δ = DELTA
- ∴ = THEREFORE
- MIN = MINIMUM SELECTED
- MAX = MAXIMUM SELECTED

PRIMARY ELEMENT SYMBOLS

- SONIC FLOWMETER (DOPPLER OR TRANSIT TIME)
- MAGNETIC FLOWMETER
- CORIOLIS FLOWMETER
- THERMAL FLOWMETER
- THERMAL FLOWMETER WITH FLOW CONDITIONER
- V–CONE FLOWMETER
- PITOT TUBE
- VORTEX FLOWMETER
- ORIFICE FLOWMETER
- PROPELLER/ TURBINE FLOWMETER
- VENTURI FLOWMETER
- PARSHALL FLUME
- WEIR (V–NOTCH)
- VARIABLE AREA FLOW INDICATOR (ROTAMETER)
- FLOW NOZZLE
- RADAR LEVEL SENSOR (PTOF)
- RADAR LEVEL SENSOR (TDR)
- SONIC LEVEL SENSOR
- BUBBLER LEVEL SENSOR
- SUSPENDED SENSOR LEVEL TRANSMITTER
- INVERTED COLUMN LEVEL SWITCH
- CAPACITANCE LEVEL SWITCH
- CAPACITANCE LEVEL SENSOR
- FLOAT LEVEL SWITCH
- TEMPERATURE ELEMENT WITH THERMO WELL

LINE SYMBOLS

- PRIMARY–MAJOR–1
- SECONDARY–MAJOR–2
- PRIMARY–MINOR–1
- SECONDARY–MINOR–2
- INSTRUMENT
- FUTURE
- PNUEMATIC
- ELECTRICAL
- HYDRAULIC
- CAPILLARY
- UNDEFINED
- HEAT TRACE
- SONIC
- LOGIC
- BINARY

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 — 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

REV NO.	REVISION DESCRIPTION	DATE	DRAWN	CHECKED
7941				

Last Saved By: TKS 3-01-05 09:38am

PROFESSIONAL ENGINEER STATE OF NEVADA — JOHN M JACOBS — Exp: 1/31/05 — ELECTRICAL — No 12210 — 8/19/05

City of Las Vegas
DEPARTMENT OF PUBLIC WORKS

CITY OF LAS VEGAS NEVADA

Environmental Division

LONE MOUNTAIN SEWER LIFT STATION MODIFICATIONS
DURANGO HILLS WATER RESOURCE CENTER MISC IMPROVEMENTS

SUPERSEDES DWG NO.

DESIGNED BY: K. JUMBO
DRAWN BY: D. HUTCHENS
CHECKED BY: L. WONG

INSTRUMENTATION SYMBOLS

SCALE:	DRAWING NO.	SHEET NO.
NONE	N–2	43 of 46

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