

LINE NUMBERING SYSTEM

16" - PL - 1090 - C15B - HC

LINE SIZE
FLUID DESIGNATION
LINE NUMBER
LINE CLASS
INSULATION CODE

EQUIPMENT NUMBERING SYSTEM

530 - G - 0 - 01 - A

PLANT NUMBER
EQUIPMENT IDENTIFICATION PREFIX
TRAIN 1,2,3 ETC. (COMMON=0)
SEQUENTIAL NUMBER
PARALLEL/STANDBY/SPARE UNITS (A,B,C ETC)

CONTRACTOR P&ID NUMBERING SYSTEM

50489-530-020-PID-XXXX.YYY

DRG No. FOR P&ID
SEQUENTIAL No.
SHEET No. (NONE IF ONE SHEET ONLY)

KOC P&ID NUMBERING SYSTEM

000 00 000

LOCATION CODE
DISCIPLINE CODE
SERIAL NO./SEQUENTIAL NO.

LINE CONTINUATIONS

UNIDIRECTIONAL
BI-DIRECTIONAL

FLUID DESIGNATION
FLUID DESIGNATION

XXXX.YYY
P & ID SEQUENTIAL & SHEET No. FOR CONTINUATION

FLUID DESIGNATION

AA AERATION AIR
AI INSTRUMENT AIR
AP PLANT AIR
BD BLOWDOWN AND RELIEF
CA COMBUSTION AIR
DC CHEMICAL DRAIN
DD DEDICATED DRAIN
DH OILY DRAIN (OPEN)
DO OPEN DRAIN (WATER)
DP PRESSURIZED DRAIN
DR STORM SEWER
DS SANITARY SEWER
EG EXPORT GAS
ES ELECTRIC POWER SUPPLY
FG FUEL GAS, PILOT GAS
FF FIRE FOAM
GH RICH GLYCOL
GI INERT GAS
GN NATURAL GAS
GP PURGE GAS
IN INHIBITOR/INJECTION CHEMICALS
KP PROCESS CHEMICALS
NI NITROGEN
OF FUEL OIL (DIESEL)
OH HYDRAULIC OIL
OL LUBE OIL AND SEAL OIL
PC PROCESS CONDENSATE
PE PROCESS EFFLUENT
PG PROCESS GAS/VAPOUR
PL PROCESS LIQUID

PS PROCESS SOLUTION
VA VENT TO ATMOSPHERE
VT VESSEL TRIM
WC COOLING WATER SUPPLY
WD DOMESTIC WATER (POTABLE)
WF FIRE WATER
WO OILY WATER
WP PRODUCED WATER/
FORMATION WATER
WR COOLING WATER RETURN
WT TREATED WATER
WU UTILITY WATER
WW WELL WATER (BRACKISH)
XA METHANOL
XB SCALE INHIBITOR
XC CORROSION INHIBITOR
XD ANTI-FOAM
XE DEMULSIFIER
XF COAGULANT
XG FOAM
XH OXYGEN SCAVENGER
XI ACID
XJ CAUSTIC
XK SOLVENT
XL BIOCIDES
XM HYDROCHLORITE
XN POLYELECTROLITE
XR REVERSE DEMULSIFIER

INSULATION ABBREVIATION (NOTE 4)

A ACCOUSTIC
C COLD
CA COLD ACCOUSTIC
CSA COLD & SPECIAL ACCOUSTIC
ET ELECTRICAL HEAT TRACING
ETA HEAT & ACCOUSTIC WITH ELECTRICAL TRACING
FA FIREPROOF & ACCOUSTIC
FP FIREPROOF
HA HOT ACCOUSTIC
HC HEAT CONSERVATION
HSA HOT & SPECIAL ACCOUSTIC
PP PERSONNEL PROTECTION
SA SPECIAL ACCOUSTIC
SR SOLAR RADIATION
ST STEAM HEAT TRACING
STA HEAT & ACCOUSTIC WITH STEAM TRACING

PIPING SYMBOLS

PROCESS LINE
EXISTING LINE
FUTURE PROCESS LINE
AUX. LINE
EXISTING UG LINE
BATTERY LIMIT (B/L)
BUND WALL
MECHANICAL LINK
FENCE
INSULATION AND STEAM TRACING
INSULATION AND ELECTRICAL TRACING
INSULATION (NOTE 4)
INSULATION AND HEAT CONSERVATION
FLANGED JOINT (SHOWN ONLY WHEN REQUIRED)
BUND FLANGE (BOLTED)
END CAP WELDED
PLUGGED COUPLING
REMOVABLE SPOOL
BY OTHERS
LIMIT OF VENDOR SCOPE OF SUPPLY

CONCENTRIC REDUCER (OR GENERAL REDUCER)
ECCENTRIC REDUCER
INSULATION SPEC BREAK OR LINE NUMBER CHANGE
LINE JOINED WITH "STRAUB COUPLINGS"
FEMALE HOSE CONNECTION
MALE HOSE CONNECTION WITH COVER
INDICATION OF REQUIRED SLOPE
FREE DRAINING
SPECTACLE BLIND (CLOSED)
SPECTACLE BLIND (OPEN)
HAMMER/PADDLE BLIND OR SPADE
RING SPACER
ATMOSPHERIC VENT
ATMOSPHERIC VENT WITH MESH SCREEN/ BIRD SCREEN/ INSECT SCREEN
SAND COVER DRAIN
TUNDISH
Y-TYPE STRAINER (PLUGGED)
Y-TYPE STRAINER WITH VALVE 1/2" UNLESS SHOWN OTHERWISE
T-TYPE STRAINER
TEMPORARY T-TYPE STRAINER (TEMP.)
CONE TYPE STRAINER
IN LINE FILTER
BUCKET/ BASKET STRAINER
DUPLEX STRAINER
TRAP
BARRED TEE
VORTEX BREAKER
DEMISTER PAD (OR STATIC MIXER AS NOTED)
SAMPLE CONNECTION
CHEMICAL AND WASH WATER INJECTION NOZZLE
FLAME ARRESTOR
SILENCER
DISTRIBUTOR/SPRAY NOZZLE
EXHAUST HEAD
EXPANSION BELLOWS
TIE-IN NUMBER
PLANT NUMBER (530)
UTILITY STATION
W - WATER, A - AIR, S - STEAM
DD : DEDICATED DRAIN
DH : OPEN DRAIN
DP : PRESSURIZED DRAIN OR SAND WASHING DRAIN
DRAIN CONNECTION
50489-530-020-PID-XXXX
SP ITEM VALVE BODY + TRIM MATERIAL
25Cr - 25Cr, SUPER DUPLEX S/S
625 - INCONEL 625
6Mo - MOLYBDENUM S/S
FLEXIBLE HOSE
STATIC MIXER
VENDOR TIE-IN POINT
ABOVEGROUND/UNDERGROUND LINE

VALVES

NOTE 9, 19, 20

GATE VALVE
NORMALLY CLOSED GATE VALVE
CAPPED GATE VALVE
PLUGGED GATE VALVE
GLOBE VALVE
CHECK VALVE
NEEDLE VALVE
BUTTERFLY VALVE
BALL VALVE (NOTE 26)
NORMALLY CLOSED BALL VALVE (NOTE 26)
EQUALIZING VALVE ON MAIN BODY
PLUG VALVE
DRAIN VALVE ON MAIN VALVE BODY
ANGLE VALVE
3-WAY VALVE
FLOAT OPERATED VALVE
DAMPER
AUTOMATIC RECIRCULATION VALVE

INSTRUMENTATION

TWO WAY VALVE, FAIL OPEN
TWO WAY VALVE, FAIL CLOSE
V-BALL MIXING VALVE, FAIL OPEN
V-BALL MIXING VALVE, FAIL CLOSE
OPEN CLOSE OPERATION
THREE WAY VALVE FAIL OPEN TO PATH A-C
FOUR WAY VALVE FAIL OPEN TO PATHS A-C AND D-B
ANY VALVE, FAIL LOCKED (POSITION DOES NOT CHANGE)
ANY VALVE FAIL, INDETERMINATE
PRESSURE - REDUCING REGULATOR SELF-CONTAINED, WITH HANDWHEEL ADJUSTABLE SET POINT.
PRESSURE - REDUCING REGULATOR WITH EXTERNAL PRESSURE TAP.
BACKPRESSURE REGULATOR, SELF CONTAINED.
DOWN STREAM PRESSURE REGULATOR SELF CONTAINED
CONTROL VALVE WITH HANDWHEEL

COMPRESSOR SEAL GAS
SUPPLY DIFFERENTIAL PRESSURE CONTROL
V-NOTCH VALVE/LCV/PCV
HAND CONTROL VALVE
BLOWER INLET FILTER SILENCER
BLOWER INLET SILENCER
CORROSION COUPON (XXXX ; ITEM NUMBER)
CORROSION PROBE (XXXX ; ITEM NUMBER)
CHEMICAL INJECTION (XXXX ; ITEM NUMBER)
BIO PROBE (XXXX ; ITEM NUMBER)
HYDROGEN PROBE (XXXX ; ITEM NUMBER)
ANALYSER
COSASCO FITTING
INSULATION ON EQUIPMENT
CLEAN OUT PIT

COMPRESSORS

RECIPROCATING COMPRESSOR MOTOR DRIVEN
RECIPROCATING COMPRESSOR ENGINE DRIVEN
SCREW COMPRESSOR MOTOR DRIVEN
SCREW COMPRESSOR ENGINE DRIVEN

VESSELS

VERTICAL VESSEL (WITHOUT DEMISTER)
VERTICAL VESSEL (WITH DEMISTER)
HORIZONTAL VESSEL/ SEPARATOR WITHOUT BOOT
VERTICAL FILTER
FILTER (CARTRIDGE)
HORIZONTAL GAS/WATER/OIL SEPARATOR WITH BOOT
FILTER
LUBE OIL FILTER
HORIZONTAL SEPARATOR/ WITH WEIR & VANE PACK
PIG LAUNCHER/RECEIVER

INDIRECT FIRED HEATERS

SHELL AND TUBE HEAT EXCHANGER
ELECTRIC HEATER

GENERAL NOTES:

- ALL EQUIPMENT ARE PREFIXED BY 530-., & INSTRUMENTS PREFIXED BY 030- WHICH IS NOT SHOWN ON THE P&ID'S OR P&ID'S.
- INSTRUMENT SYMBOLIC IS IN ACCORDANCE WITH ANSI/ISA SECTION 5-1 AND 5-2, AND IS SHOWN ON DWG. 50489-530-DCO-PID-1105.001.
- LOW POINT DRAIN & HIGH POINT VENT ARE INDICATED IN P&ID.
- INSULATION OF EQUIPMENT AND PIPING.
- A NOTE IS ADDED TO DESCRIBE DRIVER IF A GAS ENGINE OR DIESEL ENGINE IS REQUIRED ON P&ID.
- A NOTE IS ADDED TO INDICATE GEARBOX EQUIPMENT ON P&ID.
- ALL CONTROL VALVES HAVE A BODY RATING OF 300# CLASS MINIMUM IRRESPECTIVE OF PIPING CLASS FOR SIZES UP TO AND INCLUDING 8" NOMINAL BORE. LARGE VALVES ARE LINE RATED.
- THE NUMBER OF RELIEF VALVES, INLET/OUTLET LINE SIZES AND VESSEL NOZZLE SIZES ARE PROVIDED BASED ON VENDOR INPUT. THE RELIEVING SCENARIOS AS PER RELEVANT API STANDARDS ARE CONSIDERED IN ORDER TO ASSESS THE NUMBER OF VALVES REQUIRED AND THE ASSOCIATED INLET/OUTLET AND NOZZLE SIZES.
- WHERE A VALVE IS NORMALLY CLOSED, THE SYMBOL IS SHOWN WITH SOLID FILL HATCH.
- OVER PRESSURE PROTECTION IS PROVIDED FOR ALL THE PIPING SYSTEMS AS REQUIRED WHENEVER A LOW PRESSURE SYSTEM IS COMBINED WITH HIGH PRESSURE SYSTEMS.
- THERMAL RELIEF VALVES WITH CONNECTION TO THE NEAREST DRAIN HEADER ARE PROVIDED AS NECESSARY FOR THE ABOVE GROUND LONG PIPES AS PER THE REQUIREMENTS OF RELEVANT API STANDARDS AND GOOD ENGINEERING PRACTICE.
- OPEN AND CLOSED DRAINS ARE SEGREGATED AND ROUTED INTO SEPARATE HEADERS FOR GRAVITY DRAINING TO THE NEAREST DRAIN VESSEL ADEQUATE BACK FLOW PROTECTION (CHECK VALVES) IS PROVIDED FOR ALL THE INDIVIDUAL DRAIN LINES CONNECTING TO THE HEADERS.
- VALVE ACCESS REQUIREMENT ARE AS PER PIPING DESIGN BASIS.
- MANUAL VALVES WILL BE GEAR OPERATED IF REQUIRED AS PER KOC STANDARDS FOR GATE, BALL, PLUG AND GLOBE VALVES.
- GATE VALVES TO BE INSTALLED WITH STEM AT A MINIMUM OF 30° TO VERTICAL ON LINE WORKS THAT CARRY FLUID CONTAINING SAND.
- EQUIPMENT CALL OUT AS PER EG-DO-C-001 REV. 02.
- EQUIPMENT CALL OUT AS PER EG-DO-C-001 REV. 02.
- TANK CAPACITIES ARE MAXIMUM HOLDING CAPACITIES OF THE TANKS (BTL TO HLLL).
- P&IDs SHOW MOVs FOR PROCESS REQUIREMENTS. HOWEVER, THE FOLLOWING MANUAL VALVES ARE MOTOR DRIVEN.
 - VALVES IN CLASS 150# AND 300# AT 16" OR LARGER
 - VALVES IN CLASS 600# AT 8" OR LARGER
 - BLOCK VALVE OF CONTROL VALVE & LOCKED VALVE (IN OPEN OR CLOSED POSITION) ARE NOT MOTORIZED.
- DELETED.
- UNDERGROUND (BURIED) SECTION OF METALLIC PIPE/PIELINE ARE PROVIDED WITH CATHODIC PROTECTION AS PER KOC STANDARD KOC-L-015.
- ALL UNDERGROUND CS PIPING ARE EXTERNALLY COATED WITH HIGH BUILD EPOXY AS PER KOC STANDARD KOC-P-004 PT-8.
- UNDERGROUND (BURIED) SECTION OF METALLIC PIPE/PIPELINE ARE ELECTRICALLY ISOLATED FROM ABOVE GROUND STRUCTURES, EQUIPMENT THAT REQUIRED ELECTRICAL GROUNDING AS PER KOC STANDARD KOC-L-015.
- INSULATION KIT ARE PROVIDED FOR DISSIMILAR METAL FLANGE JOINTS AND AT METALLIC PIPING UG-AG INTERFACE.
- FOR INSTRUMENT TAGGING, REFER DOC NO. 50489-530-080-PHL-1001.
- ALL BALL VALVES ARE FULL BORE TYPE.
- TAG NUMBER FOR HS/UA/UL FOR MOTORS HAS BEEN PROVIDED ON PID-1104.003.

AS-BUILT
KOC APPROVAL

NAME / KOC No:
DESIGNATION:
GROUP / TEAM:
SIGNATURE:
DATE:

AS-BUILT
LARSEN & TOUBRO LIMITED

NAME:
DESIGNATION:
SIGNATURE:
DATE:
DEPT/ DIVISION:

20 ISSUED FOR AS-BUILT
02 ISSUED FOR CONSTRUCTION
01 ISSUED FOR CONSTRUCTION
0 ISSUED FOR CONSTRUCTION
D ISSUED INCORPORATED CLIENT COMMENTS
C ISSUED INCORPORATED CLIENT COMMENTS
0C ISSUED INCORPORATED CLIENT COMMENTS
B ISSUED INCORPORATED CLIENT COMMENTS
A ISSUED FOR APPROVAL

DESCRIPTION
DRAWN
CHECKED
HOD
PEM
APPRD.

DATE

CONTRACTOR REVISION

CONTRACTOR DETAILS:-
LARSEN & TOUBRO LIMITED
FARIDABAD

PROJECT TITLE:-
NEW GATHERING CENTRE GC-30
IN NORTH KUWAIT

DOCUMENT TITLE:-
PIPING & INSTRUMENTATION DIAGRAM
STANDARD SYMBOL & NOMENCLATURE

PROJECT NO.
CONTRACTOR DRG. NO.
SHEET NO. 1 OF 3
COMPANY DRG. NO.
EF1902

DRAWING NO.
REV. KOC DRG. NO.
SHEET NO.
REV. A8