



TYPICAL SKID OF DELUGE VALVE FOR DRY CRUDE STORAGE TANKS

AS-BUILT
KOC APPROVAL
NAME / KOC No.:
DESIGNATION :
GROUP / TEAM :
SIGNATURE :
DATE :

AS-BUILT
LARSEN & TOUBRO LIMITED
NAME : VAIBHAV VERMA
DESIGNATION : AGM
SIGNATURE :
DATE : 12-Aug-2019
DEPT/ DIVISON : ENGINEERING

GENERAL NOTES:

- FOR STANDARD SYMBOLS AND NOMENCLATURE SEE DRAWINGS 50489-530-020-PID-1104.001 & 1105.001.
  - ALL EQUIPMENT NUMBERS SHOWN ON THIS P&ID ARE PRECEDED BY 530-
  - FOR ESDV, SBDV AND MOV DETAILS SEE DRAWINGS 50489-530-020-PID-1106.001 & 1107.001.
  - FOR MISCELLANEOUS PIPING DETAILS SEE DRAWINGS 50489-530-020-PID-1108.001.
  - FOR TYPICAL VALVING, DRAINAGE AND GENERAL ARRANGEMENT OF LEVEL INSTRUMENTATION, PUMPS AND CONTROL VALVES SEE DRAWING 50489-530-020-PID-1109.001.
- NOTES:
- UV/IR FLAME DETECTORS AUTOMATICALLY DETECT FIRE AND WHEN ACTIVATED A SIGNAL IS SENT TO THE F&G PANEL IN THE CCR.
  - AIR SET IS FITTED WITH AIR FILTER, REGULATOR AND PI.
  - RO SUPPLIED TO GIVE PRESSURE/LOSS CHARACTERISTICS OF THE DELUGE VALVE.
  - 4 WAY SUCTION COLLECTION HEAD IS INSTALLED TO ALLOW SECONDARY SUPPLY OF WATER TO DELUGE SYSTEM.
  - DELUGE VALVE IS DIAPHRAGM TYPE DESIGNED FOR DELUGE OPERATION AND BE UL LISTED AND FM APPROVED
  - TRIGGER HEAD CONFIGURATION  
1/2" FUSABLE PLUGS OVER PROTECTED EQUIPMENT ON A GENERAL 3 x 3 METRE MATRIX.
  - 2 VALVES REQUIRED IN BYPASS LINE TO PREVENT UNNECESSARY LOSS OF WATER DUE TO GATE VALVE PASSING.
  - ADEQUATE DRAINAGE IS PROVIDED AROUND DELUGE SYSTEM TO AVOID ACCUMULATION OF WATER AROUND THE EQUIPMENT.
  - PROVISION IS MADE FOR PRESSURE TESTING AS PER NFPA 15 CLAUSE NO. 6.4.4 & 6.4.4.5 NEAR THE HYDRAULIC REMOTE TEST NOZZLE.
  - DELUGE VALVES ARE HELD CLOSED BY AIR PRESSURE SUPPLIED FROM THE INSTRUMENT AIR SYSTEM.
  - DELUGE VALVES SHALL FULLY OPEN WITHIN 10 SECONDS ON REMOVE OF INSTRUMENT AIR BY:  
A. REMOTE OPERATION OF A PUSH BUTTON AT THE MAIN FIRE AND GAS PENEL, LOCATED IN THE CONTROL ROOM, TO ENERGIZE A SOLENOID VALVES IN INSTRUMENT AIR SUPPLY TO DELUGE VALVE.  
B. LOCAL OPERATION OF A MECHANICAL AIR RELEASE UNIT OF DELUGE VALVE STATION.
  - SPRAY NOZZLE IS CONSTRUCTED FROM MAINE BRASS.
  - DELUGE VALVE STATIONS ARE PROTECTED FROM RADIATED HEAT BY THE PROVISION OF METAL RADIATION SHIELDS.
  - PIPE MOC (AS PER KOC-L-009):  
3" SIZE AND BELOW : 90-10 COPPER NIKEL TO ASTM B 466 UNIS.  
4" SIZE AND ABOVE : CARBON STEEL API 5L GRB WITH PHENOLIC EPOXY COATING.
  - FLANGE INSULATION KITS ARE PROVIDED AT DISSIMILAR METAL JUNCTIONS HAVING ELECTROMOTIVE POTENTIAL DIFFERENCE GREATER THAN 0.05V AS PER CLAUSE 7.3.1.17 OF KOC-L-009.
  - INTERNALLY COATED UG PIPING ARE FLANGED SPOOLS AS PER KOC-L-009.
  - FLUSHING DRAIN PIT IS ACCESSIBLE FROM GROUND LEVEL.
  - THE UNDERGROUND SECTION ARE EXTERNALLY COATED WITH 3 LAYERS EXTRODED HDPE AS PERKOC-P004 PART 6, REV-2 WITH THE INTERNAL PHENOLIC EPOXY ON THE PIPING SHALL BE AS PER KOC-P-005 REV-1.
  - THE ABOVE GROUND PIPING SECTION ARE COATED WITH SYSTEM A1-1 OF KOC-P-001 REV 3
  - TOP CHAMBER OF DELUGE VALVE IS CONNECTED TO WATER LINE & TO WATER INLET OF ACTUATOR WHEN THE AIR PRESSURE DROPS DUE TO DETECTION OF FIRE THE DIAPHRAGM OF ACTUATOR IS LIFTED AND ALLOWS THE WATER PRESSURIZING DIAPHRAM OF DELUGE VALVE TOP CHAMBER TO DRAIN. THIS RELEASES THE PRESSURE IN THE TOP CHAMBER OF DELUGE VALVE ALLOWING THE DELUGE VALVE TO OPEN.

LEGENDS:

SYMBOL	DESCRIPTION
	FIRE WATER PIPING
	SPRAY NOZZLE
	REDUCER
	GATE VALVE
	END CAP

REFERENCE DRAWINGS:

50489-530-000-CAL-1010	HYDRAULIC CALCULATION FOR WATER SPRAY SYSTEM FOR DRY CRUDE STORAGE TANK
KOC-L-009	KOC STANDARD FOR FIRE PROTECTION SYSTEMS
50489-530-000-LAD-1065	FIRE WATER NETWORK LAYOUT
50489-530-000-LAD-1073	FIRE WATER DETAIL ARRANGEMENT DRAWING FOR WATER SPRAY SYSTEM FOR DRY CRUDE STORAGE TANK

ZO	ISSUED FOR AS-BUILT	PAK/DEU	NIJ	SRA	RAK	12.08.18
O1	RE-ISSUED FOR CONSTRUCTION	PAK/DEU	NIJ	SRA	RAK	27.07.16
O	ISSUED FOR CONSTRUCTION	PAK/DEU	NIJ	SRA	RAK	13.05.16
C	ISSUED "INCORPORATED CLIENT COMMENTS"	PAK/DEU	NIJ	SRA	RAK	15.10.15
B	RE ISSUED FOR APPROVAL	PAK/DEU	NIJ	SRA	RAK	10.04.15
A	ISSUED FOR APPROVAL	PAK/DEU	NIJ	SRA	RAK	06.01.15
REV.	DESCRIPTION	DRAWN	CHECKED	HOD APPRD.	PEM	DATE

CONTRACTOR REVISION



CONTRACTOR DETAILS:-	LARSEN & TOUBRO LIMITED FARIDABAD
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PROJECT TITLE:-	NEW GATHERING CENTRE GC-30 IN NORTH KUWAIT
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DOCUMENT TITLE:-	PIPING & INSTRUMENTATION DIAGRAM DELUGE WATER SPRAY SYSTEM FOR DRY CRUDE STORAGE TANK (D-003)
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PROJECT NO.	DRAWING NO.
CONTRACTOR DRG. NO.	REV. KOC DRG. NO.
50489-530-000-PID-1103.001	ZO
SHEET NO. 1 OF 2	SHEET NO.
COMPANY DRG. NO.	REV.
SHEET NO.	