



| GENERAL NOTES:  |  |   |  |  |  |  |  |  |  |
|---|--|---|--|--|--|--|--|--|--|
| A. FOR STANDARD SYMBOLS AND NOMENCLATURE SEE DRAWINGS 50489-530-020-PID-1104.001.<br>B. ALL EQUIPMENT NUMBERS SHOWN ON THIS PAD ARE PRECEDED BY 530.<br>C. FOR ESDV, SEDV AND MOV DETAILS SEE DRAWINGS 50489-530-020-PID-1106.001.<br>D. FOR MISCELLANEOUS PIPING DETAILS SEE DRAWING 50489-530-020-PID-1108.001.<br>E. DELETED.  |  |   |  |  |  |  |  |  |  |
| <b>NOTES:</b>   |  |   |  |  |  |  |  |  |  |
| 1. UV/R FLAME DETECTORS AUTOMATICALLY DETECT FIRE AND WHEN ACTIVATED<br>A SIGNAL IS SENT TO THE F&G PANEL IN THE CCR.<br>2. AIR SET IS FITTED WITH WATER FILTER, REGULATOR AND PI.<br>3. RO SUPPLIED TO GIVE PRESSURE/LOSS CHARACTERISTICS OF THE DELUGE VALVE.<br>4. A WAY SUSTAIN COLLECTION HEAD IS INSTALLED TO ALLOW SECONDARY SUPPLY OF WATER TO DELUGE SYSTEM.<br>5. DELUGE VALVE IS DIAPHRAGM TYPE DESIGNED FOR DELUGE OPERATION<br>AND BE LISTED AND FM APPROVED.<br>6. TROGHER HEAD CONFIGURATION<br>7. 1/2" FLEXIBLE PLUGS OVER PROTECTED EQUIPMENT ON A GENERAL<br>7.1 3" METRIC MATRIX.<br>7.2 VALVES REQUIRED IN BYPASS LINE TO PREVENT UNNECESSARY LOSS<br>OF WATER DUE TO DATE LINE CLOSURE.<br>8. ADEQUATE DRAINAGE PROVIDED AROUND DELUGE SYSTEM TO ALLOW<br>ACCUMULATION OF WATER AROUND THE EQUIPMENT.<br>9. PROVISION IS MADE FOR PRESSURE TESTING AS PER NPA 15, CLAUSE NO.<br>6.4.4 & 6.4.4.5 NEAR THE HYDRAULICALLY REMOTE TEST NOZZLE.<br>10. DELUGE VALVES ARE HELD CLOSED BY AIR PRESSURE SUPPLIED FROM THE INSTRUMENT<br>AIR SYSTEM.<br>11. DELUGE VALVES SHALL FULLY OPEN WITHIN 10 SECONDS ON REMOVE OF INSTRUMENT AIR BY:<br>A. REMOTE OPERATION OF A PUSH BUTTON AT THE MAIN FIRE AND GAS PANEL LOCATED IN THE<br>CONTROL ROOM, TO ENERGIZE A SOLENOID VALVES IN INSTRUMENT AIR SUPPLY TO DELUGE<br>VALVE.<br>B. LOCAL OPERATION OF A MECHANICAL AIR RELEASE UNIT OF DELUGE VALVE STATION.<br>12. SPRAY NOZZLE IS CONSTRUCTED FROM MANG. BRASS.<br>13. DELUGE VALVE STATIONS ARE PROTECTED FROM RADIATED HEAT BY THE PROVISION OF<br>METAL RADIATION SHIELDS.<br>14. PIPE MD (AS PER KOC-L-009):<br>2" SIZE AND BELOW : 90-10 COPPER NIKEL TO ASTM B 466 UNS.<br>4" SIZE AND ABOVE : CARBON STEEL API 5L GRB WITH PHENOLIC EPOXY COATING.<br>15. FLANGE INSULATION KITS ARE PROVIDED AT DISSIMILAR METAL JOINTS HAVING<br>ELECTROSTATIC POTENTIAL DIFFERENCE GREATER THAN 0.05V<br>AS PER CLAUSE 7.3.1.17 OF KOC-L-009.<br>16. INTERNALLY COATED UG PIPING ARE FLANGED SPOOLS AS PER KOC-L-009.<br>17. UNDERGROUND PIT IS ACCESSIBLE FROM GROUND LEVEL.<br>18. FLOODING DRAIN SECTION IS EXTERNALLY COATED WITH 3 LAYERS EXTENDED HOPE<br>AS PERKOC-P004 PART 6, REV-2 WITH THE INTERNAL PHENOLIC EPOXY ON THE PIPING SHALL BE<br>AS PER KOC-P-005 REV-1.<br>19. THE ABOVE GROUND SPRAY SECTION IS COATED WITH SYSTEM AI-1 OF KOC-P-001 REV 3<br>20. TOP CHAMBER OF DELUGE VALVE IS CONNECTED TO WATER LINE & TO WATER INLET OF<br>ACTUATOR WHEN THE AIR PRESSURE DROPS DUE TO DETECTION OF FIRE THE DIAPHRAGM OF<br>ACTUATOR IS LIFTED AND ALLOWS THE WATER PRESSURE DIAPHRAGM OF DELUGE VALVE TOP<br>CHAMBER TO RISE. THIS RELIEVES THE PRESSURE IN THE TOP CHAMBER OF DELUGE VALVE<br>ALLOWING THE DELUGE VALVE TO OPEN. |  |   |  |  |  |  |  |  |  |
| <b>LEGENDS:</b>   |  |   |  |  |  |  |  |  |  |
| <b>SYMBOL</b>   |  | <b>DESCRIPTION</b>  |  |  |  |  |  |  |  |
| FW  |  | FIRE WATER PIPING   |  |  |  |  |  |  |  |
| ↓   |  | SPRAY NOZZLE  |  |  |  |  |  |  |  |
| ⊗   |  | REDUCER   |  |  |  |  |  |  |  |
| ⊗   |  | GATE VALVE  |  |  |  |  |  |  |  |
| D   |  | END CAP   |  |  |  |  |  |  |  |
| <b>REFERENCE DRAWINGS:</b>  |  |   |  |  |  |  |  |  |  |
| 50489-530-000-0AL-1009/1017   |  | HYDRAULIC CALCULATION FOR WATER SPRAY SYSTEM FOR<br>DUAL & WET 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-1072  |  | FIRE WATER DETAIL ARRANGEMENT DRAWING FOR WATER SPRAY<br>SYSTEM FOR DUAL & WET CRUDE STORAGE TANK |  |  |  |  |  |  |  |
| Z1 RE-ISSUED FOR AS-BUILT<br>Z1 ISSUED FOR AS-BUILT<br>01 RE-ISSUED FOR CONSTRUCTION<br>0 ISSUED FOR CONSTRUCTION<br>C ISSUED "INCORPORATED CLIENT COMMENTS"<br>B RE-ISSUED FOR APPROVAL<br>A ISSUED FOR APPROVAL   |  | PAK/DEU<br>PAK/DEU<br>PAK/DEU<br>PAK/DEU<br>PAK/DEU<br>PAK/DEU                                    |  | NIJ<br>NIJ<br>NIJ<br>NIJ<br>NIJ<br>NIJ |  | SRA<br>SRA<br>SRA<br>SRA<br>SRA<br>SRA |  | RAK 30.09.18<br>RAK 09.08.18<br>RAK 27.07.16<br>RAK 13.05.16<br>RAK 15.10.15<br>RAK 10.04.15<br>RAK 06.01.15 |  |
| REV.  |  | DESCRIPTION   |  | DRAWN                                  |  | CHECKED                                |  | HOD / PEM<br>APPRO. DATE   |  |
| CONTRACTOR REVISION   |  |   |  |  |  |  |  |  |  |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <div> <b>KUWAIT OIL CO.</b><br/> <b>K. S. C.</b> </div> <div style="text-align: center;"> <br/> <small>شركة نفط الكويت<br/>K. S. C.</small> </div> <div> <b>شركة نفط الكويت</b><br/> <b>ش.م.ك.</b> </div> </div>  |  |   |  |  |  |  |  |  |  |
| <b>CONTRACTOR DETAILS:-</b>   |  |   |  |  |  |  |  |  |  |
| <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> <b>LARSEN &amp; TOUBRO LIMITED</b><br/> <b>FARIDABAD</b> </div> </div>   |  |   |  |  |  |  |  |  |  |
| PROJECT TITLE:-- NEW GATHERING CENTRE GC-30 IN NORTH KUWAIT   |  |   |  |  |  |  |  |  |  |
| DOCUMENT TITLE:-- PIPING & INSTRUMENTATION DIAGRAM<br>DELUGE WATER SPRAY SYSTEM FOR DUAL/WET CRUDE<br>STORAGE TANKS (D-001/D-002)   |  |   |  |  |  |  |  |  |  |
| PROJECT NO.   |  | DRAWING NO.   |  |  |  |  |  |  |  |
| CONTRACTOR DGR. NO.   |  | REV.  |  | KOC DGR. NO.                           |  | REV.                                   |  | REV.   |  |
| 50489-530-000-PID-1102.01   |  | Z1  |  |  |  |  |  |  |  |
| SHEET NO. 1 OF 2  |  | REV.  |  | SHEET NO.                              |  |  |  |  |  |
| COMPANY DGR.  |  |   |  |  |  |  |  |  |  |
| SHEET NO.   |  |   |  |  |  |  |  |  |  |