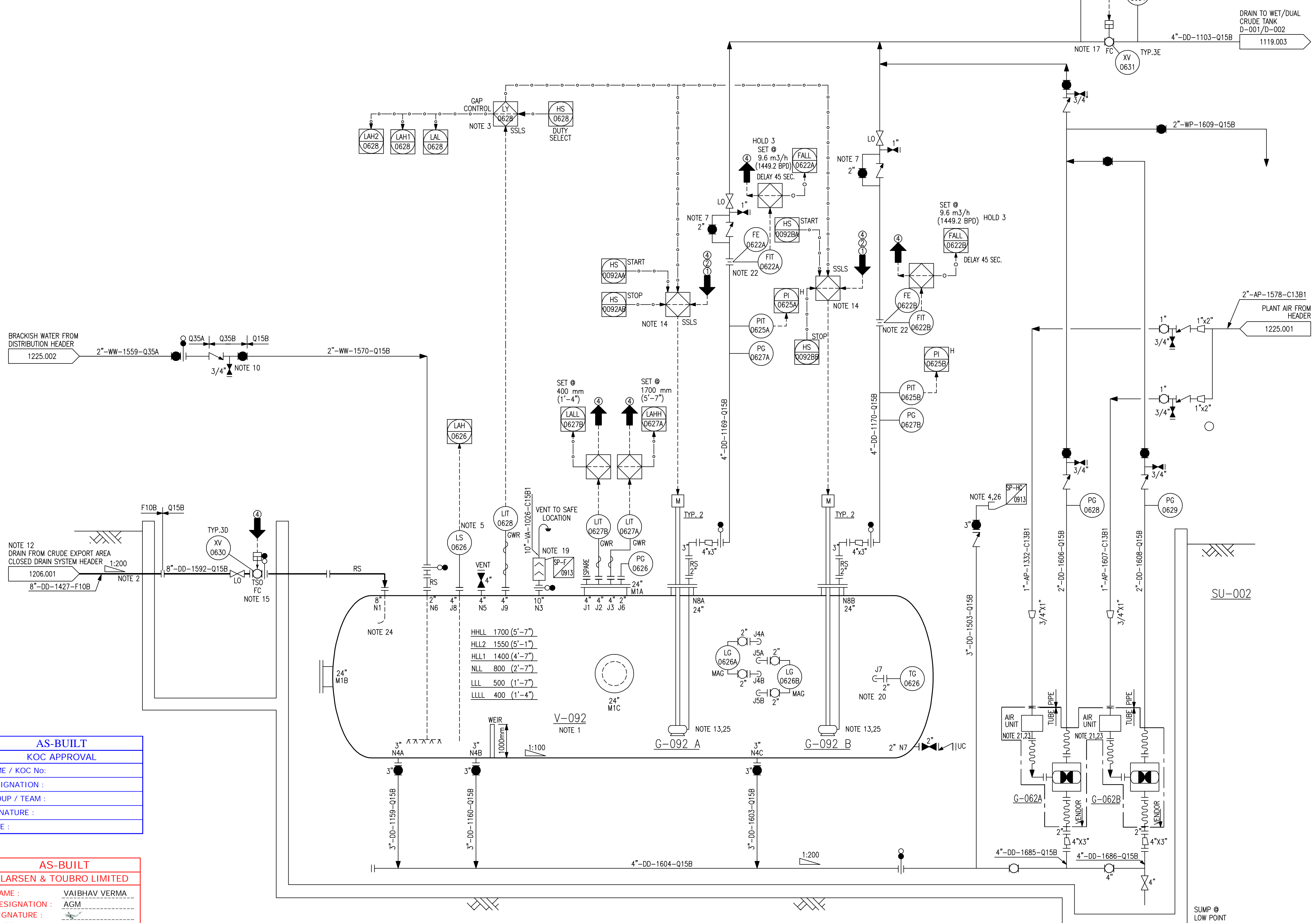


SU-002  
CRUDE EXPORT AREA DRAIN VESSEL PIT  
CAPACITY m3 (BBLs) : 590.4 (3713.5)  
LENGTH mm (ft-in) : 12000 (39'-4.4")  
WIDTH mm (ft-in) : 6000 (19'-8.2")  
DEPTH mm (ft-in) : 8200 (26'-10.8")

V-092  
CRUDE EXPORT AREA DRAIN VESSEL  
CAPACITY m3 (BBLs) : 21 (132)  
ID mm (ft-in) : 2000 (6'-6")  
LENGTH (T/T) mm (ft-in) : 6000 (19'-8")  
OP PRESS /DES PRESS barg (PSIG) : 0.01/3.5 (0.145/50.75)  
OP TEMP /DESIGN TEMP °C (°F) : -3~71/93/-3 (27~159.8/200/27)  
UTC NO. :  
TRIM NO. : VT-V092-Q15B/Q35B/ C15B1



| AS-BUILT       |  |
|----------------|--|
| KOC APPROVAL   |  |
| NAME / KOC NO: |  |
| DESIGNATION :  |  |
| GROUP / TEAM : |  |
| SIGNATURE :    |  |
| DATE :         |  |

| AS-BUILT                |               |
|-------------------------|---------------|
| LARSEN & TOUBRO LIMITED |               |
| NAME :                  | VAIBHAV VERMA |
| DESIGNATION :           | AGM           |
| SIGNATURE :             |               |
| DATE :                  | 28-Nov-2018   |
| DEPT/ DIVISION :        | ENGINEERING   |

G-062 A/B NOTE 16  
CRUDE EXPORT AREA DRAIN VESSEL PIT PUMP  
FLOWRATE m3/hr (BPD) : 6 (905.7)  
DRIVER POWER KW (HP) : N/A  
DIFF PRESS ΔP barg (PSIG) : 5 (72.5)  
S.G. @ OP OT : 0.998~1.17  
FLUID VISCOSITY @ PT CP : 51.66  
OP PRESS/DES PRESS barg (PSIG) : 5/11.55 (72.5/167.52)  
OP TEMP/DESIGN TEMP °C (°F) : 15~55/93/-3 (59~131/200/27)  
UTC NO. :  
TRIM NO. : G062A/B-Q15B

G-092 A/B NOTE 16  
CRUDE EXPORT AREA DRAIN VESSEL PUMP  
FLOWRATE m3/hr (BPD) : 28 (4227)  
DRIVER POWER KW (HP) : 18.5 (24.8)  
DIFF PRESS ΔP barg (PSIG) : 3.66 (53.1)  
S.G. @ OP OT : 0.847~1.17  
FLUID VISCOSITY @ PT CP : 51.66  
OP PRESS/DES PRESS barg (PSIG) : 3.67/14.4 (53.2/208.8)  
OP TEMP/DESIGN TEMP °C (°F) : -3~71/93/-3 (27~159.8/200/27)  
UTC NO. :  
TRIM NO. : G062A/B-Q15B

GENERAL NOTES:

A. FOR STANDARD SYMBOLS AND NOMENCLATURE SEE DRAWINGS 50489-530-020-PID-1104.001 & .002.

B. ALL EQUIPMENT NUMBERS SHOWN ON THIS P&ID ARE PRECEDED BY 530--.

C. ALL INSTRUMENT NUMBERS SHOWN ON THIS P&ID ARE PRECEDED BY 030--.

D. FOR TYPICAL INSTRUMENT CONNECTION SBDV, XV, MOV & ESDV DETAILS SEE DRAWINGS 50489-530-020-PID-1106.002, .003, .004, .005, .006 & .007.

E. FOR MISCELLANEOUS PIPING TYPICAL VALVING, DRAINAGE & GENERAL ARRANGEMENT OF LEVEL INSTRUMENTS, PUMPS, STRAINERS & CONTROL VALVES SEE DRAWINGS 50489-530-020-PID-1108.001 TO 1108.010.

F. DRAWING NUMBERS SHOWN IN P&ID CONTINUATION BOXES ARE ABBREVIATED SHOWING SEQUENTIAL NUMBERS ONLY. THE FULL FORM OF THE DRAWING NUMBER IS 50489-530-020-PID-XXXX.SHT.NO.

G. FOR MATERIAL SELECTION DIAGRAM SEE DRAWINGS 50489-530-020-MSD-1001.001 TO 1023.

H. DETAIL NUMBERING FOR CI, SC, CC & CP SEE DRAWING 50489-530-020-PID-1108.003.

I. PAINTING & COATING ARE IN ACCORDANCE WITH KOC-P-001.

J. LOW POINT DRAIN & HIGH POINT VENT ARE INDICATED IN P&ID.

K. FOR CAUSE & EFFECT REFER DOC. NO. 50489-530-020-PHL-1009.

L. FOR ALARM VALUES REFER DOC. NO. 50489-530-020-SUM-1006.

NOTES:

1. VESSEL IS LOCATED BELOW GRADE IN A PIT TO ACCOMMODATE GRAVITY DRAINS.

2. DRAIN LINES AND HEADERS FROM ABOVE GROUND EQUIPMENT RUN UNDERGROUND WITH A SLOPE TO THE DRAIN SUMP FOR SELF DRAINING.

3. G-092 A/B PUMPS ARE GAP CONTROLLED AS FOLLOWS:

A. LAH2 SET @ 1550 mm (5'-1") : START STANDBY PUMP BY SSLS

LAH1 SET @ 1400 mm (4'-7") : START DUTY PUMP BY SSLS

LAL SET @ 500 mm (1'-7") : STOP DUTY STANDBY PUMPS BY SSLS

B. FAILURE OF DUTY PUMP : START STANDBY PUMP, DUTY PUMP IN LOCAL, START STANDBY PUMP ON DEMAND

C. HULL IN WET OR DRY/WET TANKS : INHIBIT START OF PUMPS  
STOP DUTY AND STANDBY PUMPS

4. CONNECTION FOR REMOVAL OF SLUDGE/BACK FLUSHING.

5. TUNING FORK TYPE INSTRUMENT TO DETECT SAND BUILD UP. (SET AT 700mm)

6. ALL LOCAL INSTRUMENTS ARE ABOVE GROUND LEVEL AND ACCESSIBLE AT A SAFE LOCATION.

7. FOR BACK FLUSHING OF PUMP WHEN PUMP IS TRIPPED BY STRAINER PLUGGING.

8. (a) FLUSHING CONNECTIONS ARE PROVIDED AT END OF COLLECTION HEADERS AND AT ANY CHANGES IN DIRECTION OF UNDERGROUND PIPE OVER 90°.

(b) ADDITIONAL CLEANING FACILITIES ARE PROVIDED AT ANY CHANGE IN DIRECTION 45° AND AT A MAXIMUM OF 60 METRE INTERVALS ON STRAIGHT RUN.

(c) EQUIPMENT ISOLATION VALVES ARE SHOWN ON UPSTREAM P&ID'S.

9. DELETED

10. SPRING LOADED BALL VALVE.

11. DELETED

12. PRESSURISED & GRAVITY DRAINS ARE SEGREGATED INTO SEPARATE HEADERS. REFER TO RELEVANT DRAWINGS FOR DRAIN COLLECTION AND ROUTING.

13. MINIMUM SUBMERGENCE IS 380mm FROM THE BOTTOM OF THE VESSEL.

14. DURING SHUTDOWN LEVEL-1 AND 2, EMERGENCY GENERATOR SUPPLIES POWER TO THESE PUMPS, SO PUMPS CAN RUN AFTER THE RELATIVE ESD LOGICS ARE RESET.

15. WHEN LEVEL MEASURED BY LIT-0628 IS COMING AT LOW, VALVE IS RESET AUTOMATICALLY.

16. ONE PUMP OPERATING AND ONE PUMP ON STAND-BY.

17. A. TO PREVENT BACK FLOW VALVE TO OPEN WHEN UPSTREAM PRESSURE EXCEEDS DOWNSTREAM PRESSURE.

B. WHEN PUMP(S) ARE RUNNING PDAL ACROSS XV SHALL NOT STOP THE PUMPS.

C. NO PUMP RUNNING AUTOMATICALLY CLOSE THE XV.

D. PUMP(S) RUNNING & IN FIXED TIME IF XV OPEN FEED BACK IS NOT RECEIVED, STOP THE PUMP.

18. DELETED.

19. VENT TO SAFE LOCATION ARE AS PER KOC-G-002.

20. TG-0626 IS LOCATED BELOW LLL.

21. AIR UNIT IS KEPT AT PLATFORM OUTSIDE THE PIT.

22. STRAIGHT LENGTH REQUIREMENT FOR ORIFICE FLOW METER ARE 20D UPSTREAM & 5D DOWNSTREAM.

23. ADEQUATE PIPING SUPPORT ARE PROVIDED TO AVOID OR MINIMIZE VIBRATION.

24. INLET PIPE ELBOW DISTRIBUTOR WITH IMPINGEMENT PLATE.

25. FOR AUTO GREASING UNIT REFER, 50489-530-020-PID-1108.004.

26. PIT WATER SHALL BE REMOVED BY VACUUM TRUCK USING SLUDGE/BACK FLUSHING LINE (3"-DD-1503-Q15B).

|      |                                     |         |         |        |     |          |
|------|-------------------------------------|---------|---------|--------|-----|----------|
| Z2   | ISSUED FOR AS-BUILT                 | BAK/SSI | AKG     | SRA    | RAK | 28.11.18 |
| Z1   | ISSUED FOR AS-BUILT                 | BAK/SSI | AKG     | SRA    | RAK | 08.10.18 |
| Z0   | ISSUED FOR AS-BUILT                 | BAK/SSI | AKG     | SRA    | RAK | 26.08.18 |
| 01   | ISSUED FOR CONSTRUCTION             | BAK/SSI | AKG     | SRA    | RAK | 08.12.16 |
| 0    | ISSUED FOR CONSTRUCTION             | HSB/VSA | AKG     | SRA    | RAK | 29.03.16 |
| D    | ISSUED INCORPORATED CLIENT COMMENTS | JSI/CHS | AKG     | SRA    | RAK | 23.12.15 |
| C    | ISSUED INCORPORATED CLIENT COMMENTS | BAK/ABY | AKG     | SRA    | RAK | 16.10.15 |
| OC   | ISSUED INCORPORATED CLIENT COMMENTS | JSI/VSA | AKG     | SRA    | RAK | 01.06.15 |
| B    | ISSUED INCORPORATED CLIENT COMMENTS | BAK/VSA | AKG     | SRA    | RAK | 20.02.15 |
| A    | ISSUED FOR APPROVAL                 | JSI/ABY | AKG     | SRA    | RAK | 11.12.14 |
| REV. | DESCRIPTION                         | DRAWN   | CHECKED | HOD    | PEM | DATE     |
|      |                                     |         |         | APPRD. |     |          |

CONTRACTOR REVISION

KUWAIT OIL CO.  
K. S. C.

شركة نفط الكويت  
ش.م.ك.

الهيئة العامة للغذاء والدواء  
A Subsidiary of Kuwait Petroleum Corporation

CONTRACTOR DETAILS:-  
LARSEN & TOUBRO LIMITED  
FARIDABAD

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

DOCUMENT TITLE:-  
PIPING & INSTRUMENTATION DIAGRAM  
CRUDE EXPORT AREA DRAIN VESSEL (V-092)  
& PUMPS (G-092A/B)

| PROJECT NO. |                            | DRAWING NO. |              |
|-------------|----------------------------|-------------|--------------|
| EF1902      | CONTRACTOR DRG. NO.        | REV.        | KOC DRG. NO. |
|             | 50489-530-020-PID-1205.006 | Z2          |              |
|             | SHEET NO. 6 OF 12          |             | SHEET NO.    |
|             | COMPANY DRG. NO.           | REV.        |              |
|             | EF1902-530-DCO-PID-0205.00 | A           |              |
|             | SHEET NO.                  |             |              |

A1