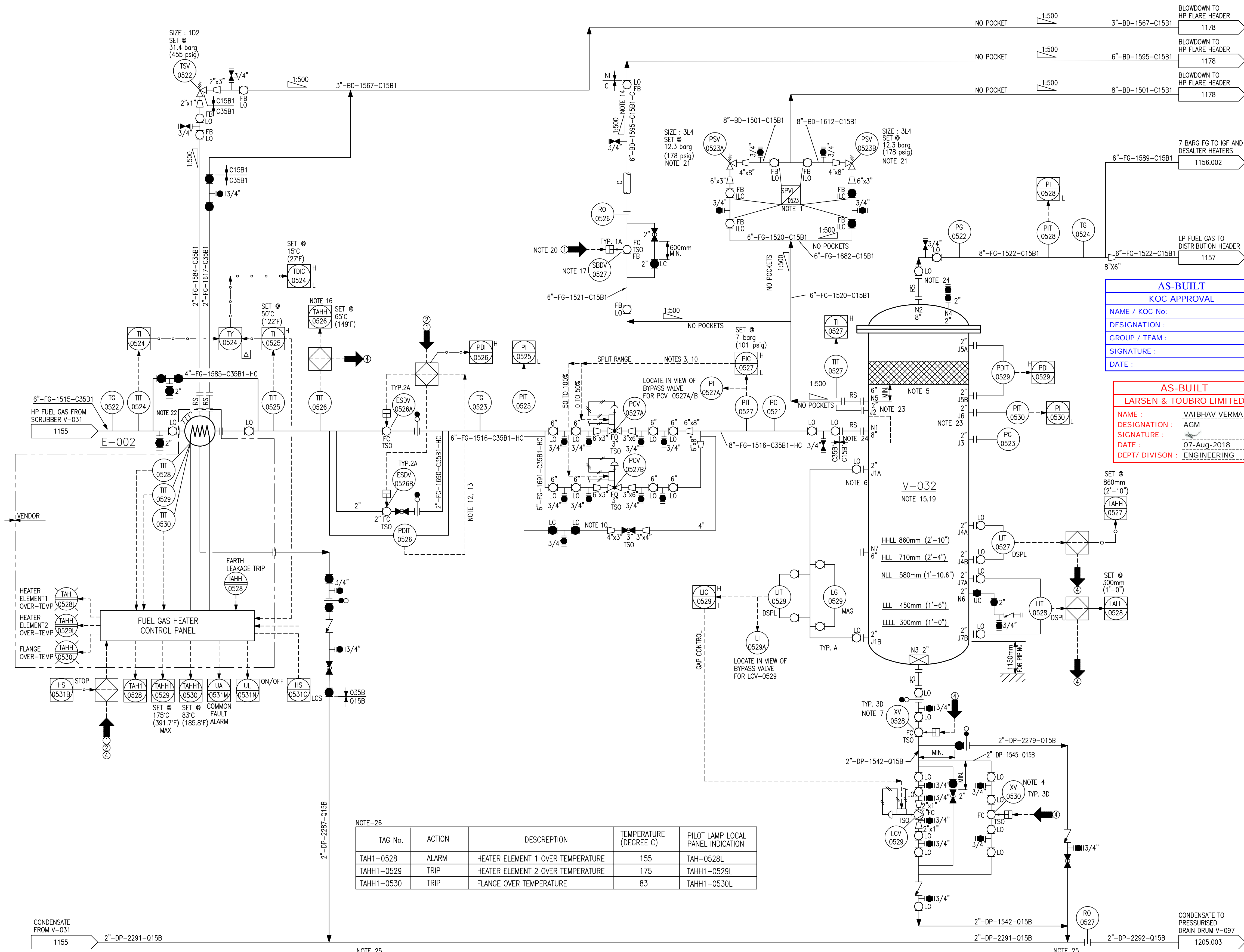


E-002  
FUEL GAS HEATER  
DUTY KW (BTU/hr) : 145.3 (495784)  
OP PRESS /DES PRESS barg. (PSIG) : 27.9/31.4 (405/455)  
OP INLET TEMP/DES TEMP °C (°F) : 13-46/93/-35.5 (55.4-115/200/-31.9)  
OPERATING OUTLET TEMP °C (°F) : 28 TO 50 (82.4 TO 122)  
UTC NO. :  
TRIM NO. : ET-E-002-C35B

V-032  
FUEL GAS K.O. DRUM  
CAPACITY Nm<sup>3</sup>/hr (MMSCFD) : 15056 (13.5)  
ID mm (ft.-in) : 900 (2'-11")  
LENGTH T/T mm (ft.-in) : 3100 (10'-3")  
OP PRESS /DES PRESS barg (PSIG) : 7/12.3 (101/178)  
OP TEMP/DESIGN TEMP °C (°F) : 12.9 TO 41.5/93/-21 (55.2-106.7/200/-5.8)  
UTC NO. :  
TRIM NO. : VT-V-032-C15B/C35B



TAG No.	ACTION	DESCRIPTION	TEMPERATURE (DEGREE C)	PILOT LAMP LOCAL PANEL INDICATION
TAH1-0528	ALARM	HEATER ELEMENT 1 OVER TEMPERATURE	155	TAH-0528L
TAHH1-0529	TRIP	HEATER ELEMENT 2 OVER TEMPERATURE	175	TAHH1-0529L
TAHH1-0530	TRIP	FLANGE OVER TEMPERATURE	83	TAHH1-0530L

- GENERAL NOTES:
- FOR STANDARD SYMBOLS AND NOMENCLATURE SEE DRAWINGS 50489-530-020-PID-1104.001 & .002.
  - ALL EQUIPMENT NUMBERS SHOWN ON THIS P&ID ARE PRECEDED BY 530--.
  - ALL INSTRUMENT NUMBERS SHOWN ON THIS P&ID ARE PRECEDED BY 030--.
  - FOR TYPICAL INSTRUMENT CONNECTION, SBDV, XV, MOV & ESDV DETAILS SEE DRAWINGS 50489-530-020-PID-1106.001, .002, .003, .004, .005, .006 & .007.
  - 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.
  - DRAWING NUMBERS SHOWN IN P&ID CONTINUATION BOXES ARE ABBREVIATED SHOWING DRAWING SEQUENTIAL NUMBERS ONLY. THE FULL FORM OF THE DRAWING NUMBER IS 50489-530-020-PID-XXXX.SHT.NO.
  - FOR MATERIAL SELECTION DIAGRAM SEE DRAWINGS 50489-530-020-MSD-1001.001 TO 1023.
  - DETAIL NUMBERING FOR CI, SC, CC & CP SEE DRAWING 50489-530-020-PID-1108.003.
  - PAINTING & COATING ARE IN ACCORDANCE WITH KOC-P-001.
  - LOW POINT DRAIN & HIGH POINT VENT ARE INDICATED IN P&ID.
  - FOR CAUSE & EFFECT REFER DOC. NO. 50489-530-020-PHL-1009.
  - FOR ALARM VALUES REFER DOC. NO. 50489-530-020-SUM-1006.
- NOTES:
- RELIEF VALVE INLET AND AND OUTLET ISOLATION VALVES ARE KEY INTERLOCKED IN THE FOLLOWING POSITIONS:
    - ON-LINE RELIEF VALVES: INLET AND OUTLET VALVES ARE OPEN
    - SPARE RELIEF VALVE: INLET VALVES ARE CLOSED, OUTLET VALVES ARE OPEN
  - DELETED.
  - PRESSURE REDUCING STATION FROM ~27.9barg TO 7barg.
  - XV-0530 OPENS ON HHLL AND CLOSSES ON NLL REFER CAUSE AND EFFECT DIAGRAM 50489-530-020-PHL-1009.
  - DEMISTER PAD TO REMOVE DROPLETS GREATER THAN OR EQUAL TO 10 MICRONS.
  - ALL VENTS AND DRAINS OF LEVEL BRIDLE & CONTROL VALVES ARE TO BE HARD PIPED TO NEAREST FLARE AND DRAIN LINES.
  - XV-0528 CLOSSES ON LLLL AND OPENS ON HLL REFER CAUSE AND EFFECT DIAGRAM 50489-530-020-PHL-1009.
  - DELETED.
  - FUEL GAS PRESSURE INSTRUMENT TAPPINGS ARE AS PER LEGEND P&ID 1106.001.
  - PCV-0527A/B ARE TWO PARALLEL VALVES EACH SIZED FOR 50% OF TOTAL CAPACITY. BYPASS CONTROL VALVE HAVE A CAPACITY EQUAL TO CALCULATED OF REQUIRED VALVE FLOW COEFFICIENT (CV) OF THE CONTROL VALVE. (PCV-0527A OR PCV-0527B)
  - DELETED.
  - ESDV-0526B IS A PRESSURE EQUALISING VALVE. AFTER SYSTEM DEPRESSURISATION, ESDV-0526B IS INHIBITED UNTIL PRESSURE IS EQUALISED ACROSS IT. ESDV-0526B IS ALLOWED TO OPEN IN ORDER TO EQUALISE THE PRESSURE ACROSS ESDV-0526A. PDI-0526 WILL GIVE PERMISSIVE TO ESDV-0526A TO OPEN.
  - VALVES ARE LOCATED ACCESSIBLE AND AWAY FROM VESSELS.
  - INSULATION REQUIRED BETWEEN BLOWDOWN VALVE AND BLOCK VALVE TO PROTECT PERSONNEL FROM COLD SURFACE (-21°C) DURING BLOWDOWN.
  - V-031, V-032 AND E-002 ARE LOCATED AWAY FROM THE FIRE ZONE OF ANY OTHER EQUIPMENT.
  - HEATER TRIP (ESD LEVEL 4) OCCURS IF EXIT TEMPERATURE RISES TO 65°C.
  - ALL BLOWDOWN VALVES ARE SUPPLIED WITH A DEDICATED INSTRUMENT AIR ACCUMULATOR.
  - H2S DETECTION ARE ENABLED BEFORE COMMISSIONING STARTS.
  - VESSEL ARE PROTECTED AGAINST FIRE.
  - VESSEL PRESSURE ARE BLOWN DOWN AUTOMATICALLY ON ESD LEVEL 1.
  - EACH PSV-0523A/B IS SIZED TO BE CAPABLE OF RELIEVING THE TOAL FULLY OPEN FLOW (WITH MAXIMUM UPSTREAM PRESSURE) THROUGH BOTH THE CONTROL VALVES IN THE CONTROL SET (PCV-0527A/B).
  - PROVIDE INSULATION FOR FUEL GAS HEATER AS PER KOC STANDARD 015-NH-1003.
  - NOZZLE J2, J3, J6, ARE LOCATED ABOVE NOZZLE N1.
  - BLIND FLANGE ARE PROVIDED AFTER DISMANTLING OF REMOVAL SPOOL PIECE DURING MAINTENANCE.
  - ADEQUATE PIPING SUPPORT ARE PROVIDED FOR TWO PHASE FLOW.

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

AS-BUILT  
LARSEN & TOUBRO LIMITED  
NAME : VAIBHAV VERMA  
DESIGNATION : AGM  
SIGNATURE :  
DATE : 07-Aug-2018  
DEPT/ DIVISION : ENGINEERING

REV.	DESCRIPTION	DRAWN	CHECKED	HOD	PEM	DATE
20	ISSUED FOR AS-BUILT	SK/CHS	CHS	SRA	RAK	07.08.18
05	ISSUED FOR CONSTRUCTION	SK/CHS	CHS	SRA	RAK	14.11.17
04	ISSUED FOR CONSTRUCTION	PAK/CHS	CHS	SRA	RAK	02.10.17
03	ISSUED FOR CONSTRUCTION	PAK/CHS	AKG	SRA	RAK	13.05.17
02	ISSUED FOR CONSTRUCTION	CHS	AKG	SRA	RAK	22.04.17
01	ISSUED FOR CONSTRUCTION	BAK/SSI	AKG	SRA	RAK	08.12.16
0	ISSUED FOR CONSTRUCTION	PAK/ABY	AKG	SRA	RAK	31.03.16
D	ISSUED INCORPORATED CLIENT COMMENTS	JSI/ABY	AKG	SRA	RAK	31.12.15
C	ISSUED INCORPORATED CLIENT COMMENTS	BAK/VSA	AKG	SRA	RAK	19.10.15
OC	ISSUED INCORPORATED CLIENT COMMENTS	JSI/VSA	AKG	SRA	RAK	30.05.15
B	ISSUED INCORPORATED CLIENT COMMENTS	JSI/VSA	AKG	SRA	RAK	18.02.15
A	ISSUED FOR APPROVAL	JSI/ABY	AKG	SRA	RAK	12.12.14

CONTRACTOR REVISION

**KUWAIT OIL CO. K. S. C.** **شركة نفط الكويت ش.م.ك.**

CONTRACTOR DETAILS:- **LARSEN & TOUBRO LIMITED FARIDABAD**

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

DOCUMENT TITLE:- **PIPING & INSTRUMENTATION DIAGRAM FUEL GAS K.O DRUM (V-032)**

PROJECT NO.	DRAWING NO.	REV.	KOC DRG. NO.	REV.
50489-530-020-PID-1156.001	20			
SHEET NO. 1 OF 4				
COMPANY DRG. NO.				
EF1902-530-DCO-PID-0156.001	A4			
SHEET NO.				