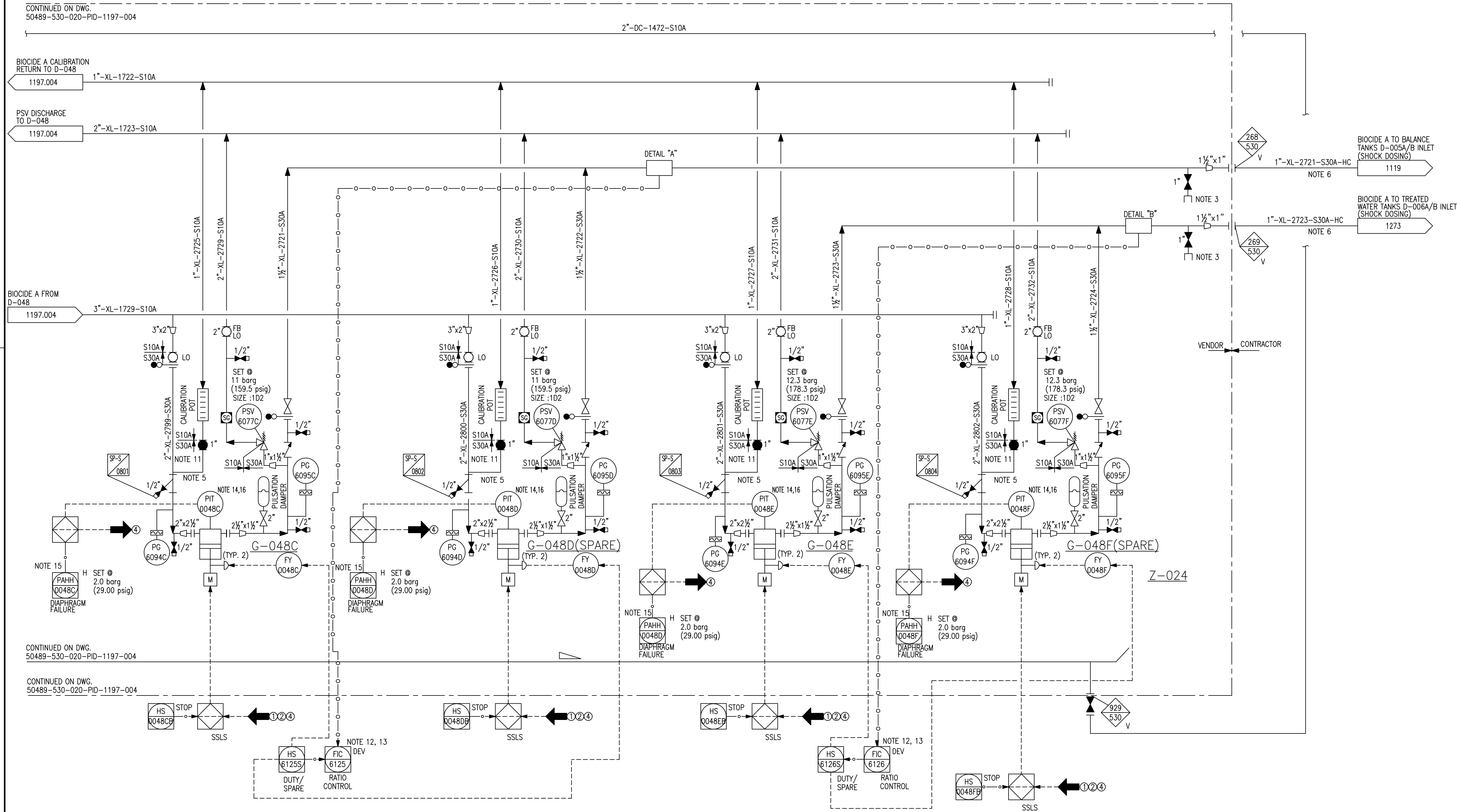


Z-024  
CHEMICAL INJECTION SKID



G-048C/D(SPARE)      NOTE 1, 2,10

EFFLUENT WATER BALANCE TANK      BIOCIDES A SHOCK DOSING PUMP

FLOWRATE 1/hr (USGPH)	: 115.31 (304.62)
DRIVER POWER KW (HP)	: 2.2 (2.95)
DIFF PRESS $\Delta$ P bar (PSI)	: 5.01 (72.67)
S.G. @ OP OT	: 1.023~1.1
FLUID VISCOSITY @ PT CP	: 15
OP PRESS/DES PRESS barg (PSIG)	: 51.17 (72.67/159.54)
OP TEMP/DESIGN TEMP °C (°F)	: 15~55/-3~93 (59~131/27~200)
UTIC NO.	
TRIM NO.	: GT-G048C/D-S30A

G-048E/F(SPARE) NOTE 1, 2, 10

WATER TREATMENT BIOCIDE A SHOCK DOSING PUMP

FLOWRATE 1/hr (USGPH)	: 1152.6 (304.5)
DRIVER POWER KW (HP)	: 2.2 (2.95)
DIFF PRESS $\Delta$ P bar (PSI)	: 6.95 (100.8)
S.G. @ OP OT	: 1.023~1.1
FLUID VISCOSITY @ PT CP	: 15
OP PRESS/DES PRESS barg (PSIG)	: 6.95/12.3 (100.8/178.4)
OP TEMP/DESIGN TEMP $^{\circ}$ C ( $^{\circ}$ F)	: 15~55/-3~93 (59~131/27~200)
UTC NO.	
TRIM NO.	: GT-G048E/F-S30A


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 SBOV, XV, MOV & ESDV DETAILS SEE DRAWINGS 50489-530-020-PID-1106.001, 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 DRAWING SEQUENTIAL NUMBERS ONLY. THE FULL FORM OF THE DRAWING NUMBER IS 50489-530-020-PID-XXXXX.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. AUTOMATIC VARIABLE PUMP STROKE ADJUSTMENT IS THROUGH DCS.
2. LOW LOW LIQUID LEVEL IN D-048 STOPS BIOCIDIC A INJECTION PUMPS.
3. FLUSHING CONNECTIONS.
4. EYEWASH AND SAFETY SHOWERS ARE PROVIDED IN THE CHEMICAL INJECTION SKID AREA.
5. PROVIDE CORIOLIS FLOW MEASUREMENT AND FACILITY FOR LOCAL CALIBRATION.
6. BIOCIDIC A SHALL BE STORED BELOW 60°C. ALL PIPEWORK TO BE INSULATED TO PROTECT THE FLOW FROM HEAT BUILD UP DUE TO SOLAR RADIATION.
7. DELETED
8. BATCH CONTROL – THE QUANTITY OF DOSING FLUID IS DETERMINED BY OPERATOR AND INPUT INTO TOTALISER. PUMP STOPS WHEN BATCH VOLUME IS ACHIEVED.
9. (A) LOW POINT DRAIN IS PROVIDED AS APPROPRIATE.
- (B) DELETED
10. BIOCIDIC A & BIOCIDIC B TO BE ADDED ALTERNATIVELY BY WEEKLY SHOCK DOSING FOR 4 HRS.
  - (A) 3075 LITERS AND BASED ON MAXIMUM DOSING RATE 400 PPM: 4612 LITERS
  - (B) SHOCK DOSING TO TREATED WATER TANK BASED ON NORMAL DOSING RATE 400 PPM: 3073 LITERS & BASED ON MAXIMUM DOSING RATE: 600 PPM: 4610 LITERS.
11. PUMP SUCTION BALL VALVE & CALIBRATION POT BALL VALVE ARE LOCATED ADJACENT TO ONE ANOTHER FOR MEASURING THE FLOW.
12. DEVIATION ALARMS ARE CONFIGURED IN THE DCS TO ALARM IF ACTUAL FLOW DIFFERS FROM SET BY 10%.
13. CHEMICAL INJECTION RATIO CONTROLLER IS SET IN PPM.
14. PUMPS ARE PROVIDED WITH DIAPHRAGM RUPTURE ALARM (PAHH).
15. PAHH STOPS BIOCIDIC A SHOCK DOSING PUMP.
16. DIRECT MOUNTING TO THE PUMP HEAD FOR DETECTING RUPTURE OF DIAPHRAGM.
17. MINIMUM STROKE OF 10% IS PROVIDED FOR ALL CHEMICAL INJECTION PUMP.

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

AS-BUILT	
LARSEN & TOUBRO LIMITED	
NAME :	VAIBHAV VERMA
DESIGNATION :	AGM
SIGNATURE :	
DATE :	18-Aug-2018
DEPT/ DIVISION :	ENGINEERING

Z0	ISSUED FOR AS-BUILT	HSB/CHS	AKG	SRA	RAK	18.08.18
01	ISSUED FOR CONSTRUCTION	HSB/CHS	AKG	SRA	RAK	22.12.16
D	ISSUED FOR CONSTRUCTION	HSB/CHS	AKG	SRA	RAK	06.06.16
0	ISSUED INCORPORATED CLIENT COMMENTS	PAK/CHS	AKG	SRA	RAK	08.04.16
C	ISSUED INCORPORATED CLIENT COMMENTS	JSI/ABY	AKG	SRA	RAK	30.10.15
0C	ISSUED INCORPORATED CLIENT COMMENTS	BAK/ABY	AKG	SRA	RAK	04.06.15
B	ISSUED INCORPORATED CLIENT COMMENTS	BAK/VSA	AKG	SRA	RAK	24.02.15
A	ISSUED FOR APPROVAL	PK/ABY	AKG	SRA	RAK	12.12.14
REV.	DESCRIPTION	DRAWN	CHECKED	HOD APPR.	PEM	DATE

## CONTRACTOR REVISION


**KUWAIT OIL CO.**  
**K. S. C.**
**شركة نفط الكويت**  
**ش.م.ك.**  
 Incorporated in the State of Kuwait  
 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  
CHEMICAL INJECTION SKID #4 - BIOCIDES (SHOCK DOSING)  
(G-048C/D/E/F)

PROJECT NO.	DRAWING NO.			
EF1902	CONTRACTOR DRG. NO.	REV.	KOC DRG. NO.	REV.
	50489-530-020-PID-1197.006	Z0		
	SHEET NO. 6 OF 7		SHEET NO.	
	COMPANY DRG. NO.	REV.		
	EF1902-530-DCO-PID-0197.006	A2		
	SHEET NO.			