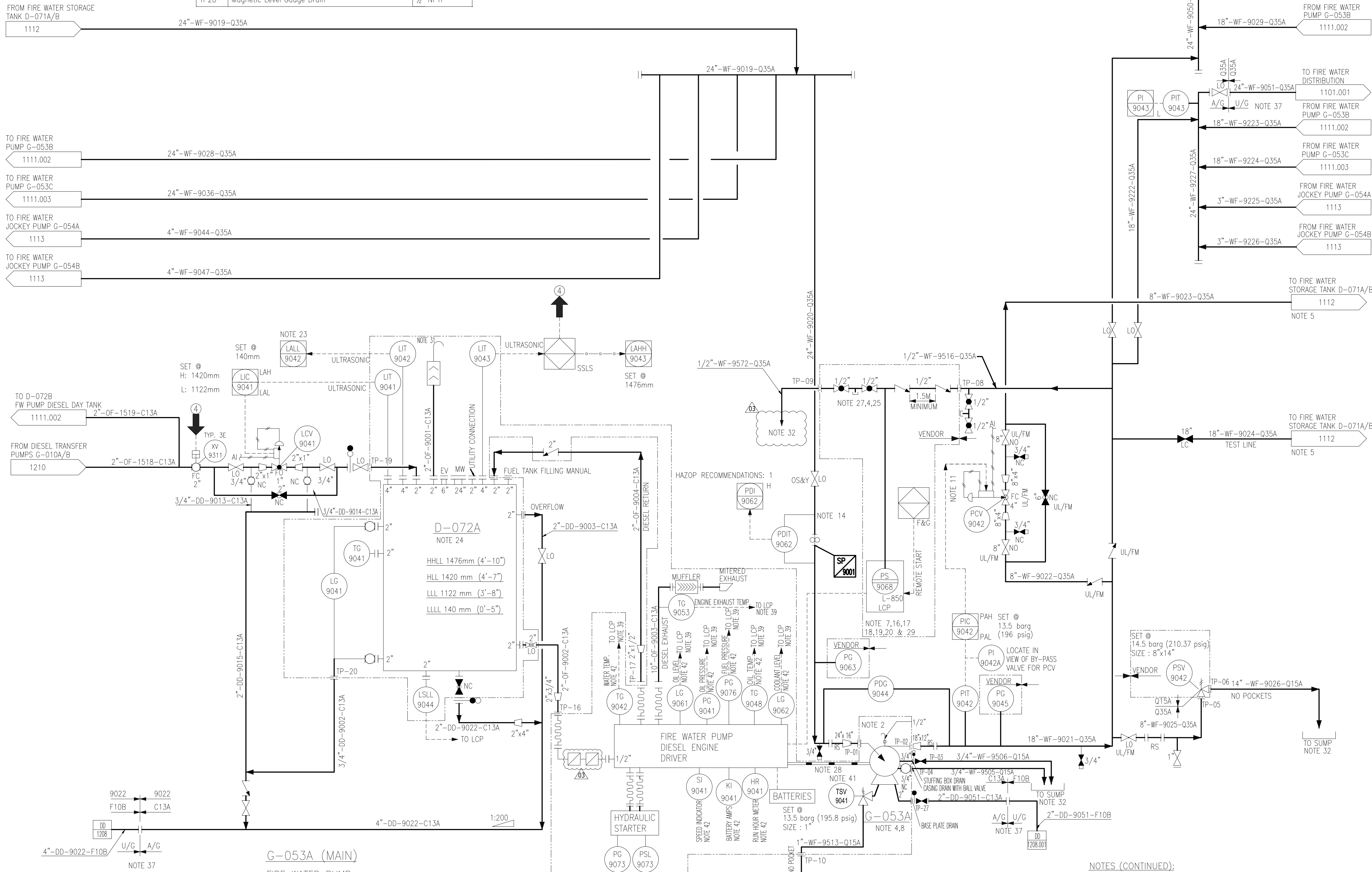


TP#	DESCRIPTION	SIZE
TP01	Diesel Fire Pump Suction	16" 300# RF
TP02	Diesel Fire Pump Discharge	12" 300# RF
TP03	Casing Drain With Ball Valve	3/4" 150# RF
TP04	Prv Inlet	8" 300# RF
TP05	Waste Cone Outlet	14" 150# RF
TP08	Pressure Sensing Line On Controller Side	1/2" 300# RF
TP09	Pressure Sensing Line Drain	1/2" 300# RF
TP10	Casing Relief Valve Connection For Fire Water Pump	2" 150# RF
TP27	Base Plate Drain For Fire Water Pump	3/4" 150# RF
TP16	Fuel Supply Engine Side	1/2" 150# RF
TP17	Fuel Return Engine Side	1/2" 150# RF
TP19	Automatic Fuel Filling	2" 150# RF
TP20	Magnetic Level Gauge Drain	1/2" NPTF

D-072A FIRE WATER PUMP DIESEL DAY TANK

CAPACITY M3 (BBLs) : 4.9 (30.82)
 DIMENSION mm (ft.-in) : 1750x1750 (5' 9"x5' 9")
 HEIGHT mm (ft.-in) : 1805.8 (5' 11")
 OPERATING PRESS./DESIGN PRESS.barg (psig) : ATM/ATM+STATIC HEAD
 OPERATING TEMP./DESIGN TEMP.°C (°F) : AMB/93/-3 (AMB/200/27)
 UTC NO. :
 TRIM NO. : DT-D072A-C13A



FLOWRATE m3/hr (USGPH) : 1135 (299835.3)
 DRIVER SITE POWER KW (HP) : 751 (1007.1)
 DIFFERENTIAL PRESS.(ΔP) bar (PSI) : 12.94 (179.84)
 SPECIFIC GRAVITY @ OP AND OT : 1.02
 FLUID VISCOSITY AT PT CP : 0.7
 OPERATING DISCHARGE PRESS./DESIGN PRESS. barg (psig) : 12.8/17.5 (185.6/253.8)
 OPERATING TEMP./DESIGN TEMP.°C (°F) : 34/93/-3 (93.2/199.4/27)
 UTC NO. :
 TRIM NO. : GT-G053A-Q35A

PUMP OPERATION LOGIC (TABLE NO.1) NOTE 38		
185.6 PSIG	12.8 barg	JOCKEY PUMP (DUTY) STOP
175 PSIG	12.07 barg	JOCKEY PUMP (DUTY) START
160 PSIG	11.03 barg	MAIN PUMP (1st DUTY) START
150 PSIG	10.3 barg or ≤11.03barg+10secdelay	MAIN PUMP (2nd DUTY) START
140 PSIG	9.65 barg or ≤11.03barg+20secdelay	MAIN PUMP (STANDBY) START

NOTES (CONTINUED):

- ONE FREE-STANDING REMOTE CONTROL PANEL FOR THE FIRE WATER PUMP SET (S) SHALL BE LOCATED WITHIN THE AUXILIARY CONTROL ROOM.
- DELETED.
- ALL SUCTION & DISCHARGE PIPING OF FIRE WATER PUMPS SHALL COMPLY WITH NFPA 20 REQUIREMENTS FOR PERFORMANCE TESTING OF FIRE WATER PUMPS.
- FIRE WATER PIPING ABOVE 3" THAT REQUIRE INTERNAL COATING SHALL BE WITH FLANGED CONNECTION.
- INSULATING GASKET KIT SHALL BE INSTALLED AT CONNECTING PIPES MADE OF DISSIMILAR METALS & AT PIPING UG/AG INTERFACE.
- PUMP OPERATION PHILOSOPHY SHALL BE AS PER 50489-530-000-08117-PHL-V001.
- THESE ARE SWITCH GAUGES WHICH WILL INDICATE LOCALLY & SEND SIGNAL TO LCP.
- PRESSURE SENSING LINE IS PRESSURISED BY CONNECTING TO DISCHARGE LINE OF FIRE WATER PUMPS AND THE SYSTEM IS PRESSURISED AT 12.8 BARG BY JOCKEY PUMPS.
- TSV-9041 IS THERMAL CASING RELIEF VALVE.
- INSTRUMENTS MOUNTED ON DIESEL ENGINE DRIVER.

HAZOP RECOMMENDATIONS:

- PROVIDED DCS INDICATION WITH HIGH ALARM FOR PDIT-9062/9063/9064.

GENERAL NOTES:

- FOR STANDARD SYMBOLS AND NOMENCLATURE SEE DRAWINGS 50489-530-020-PID-1104.001 & 1104.002.
 - ALL EQUIPMENT NUMBERS SHOWN ON THIS P&ID ARE PRECEDED BY 530--.
 - FOR TYPICAL INSTRUMENT CONNECTION SBDV, XV, MOV, & ESDV DETAILS SEE DRAWING NOS. 50489-530-020-PID-1106.001 TO 004, 006 & 007.
 - FOR MISCELLANEOUS PIPING DETAILS SEE DRAWING 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-1108.001 TO 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.
 - ALL INSTRUMENT TAG NO. SHOWN ON THIS P&ID ARE PRECEDED BY 030.
 - PAINTING/COATING SHALL BE IN ACCORDANCE WITH KOC-P-001.
- NOTES:**
- CATHODIC PROTECTION PROVIDED FOR UNDERGROUND SECTION OF PIPELINE AS PER KOC-L-015.
 - ALL FIRE WATER PUMPS ARE PROVIDED WITH AN AUTOMATIC AIR RELEASE VALVE.
 - WHEN THE FIRE WATER PRESSURE IN THE MAIN HEADER DROPS BELOW 11.03 BARG THE PUMP HAVING FIRST PRIORITY WILL START. THE SECOND PUMP WILL CUT IN AFTER A PERIOD OF 10 SECONDS IF THE LOW HEADER PRESSURE PERSISTS OR IF THE PRIORITY PUMP FAILS TO START. ALL PUMPS G-053A/B/C HAVE EQUAL CAPABILITY FOR NOMINATION AS THE PRIORITY PUMP. INTERLOCKS ARE PROVIDED TO PREVENT FIRE WATER TO PREVENT FIRE WATER PUMPS STARTING SIMULTANEOUSLY.
 - ALL FIRE WATER PUMPS ARE EQUIPPED WITH INDIVIDUAL AUTOMATIC CONTROLLERS. EACH CONTROLLER HAS ITS OWN PRESSURE SENSING LINE.
 - FLOW INDICATOR FOR FIRE WATER PUMPS RUNNING TEST. PROVIDED ON COMMON RETURN FOR ALL PUMPS.
 - DESIGN TO COMPLY WITH NFPA 20 REQUIREMENTS RELEVANT TO LOCAL PANEL AND INSTRUMENT.
 - THE CONTROLLER FOR EACH UNIT OF MULTIPLE PUMP UNITS INCORPORATES A SEQUENTIAL TIMING DEVICE TO PREVENT ANY ONE DRIVER FROM STARTING SIMULTANEOUSLY WITH ANY OTHER DRIVER.
 - IT IS ARRANGED TO SHUT DOWN THE ENGINE AT A SPEED APPROXIMATELY 20 PERCENT ABOVE RATED ENGINE SPEED AND TO BE MANUALLY RESET.
 - LEAD PUMP SELECT SIGNAL.
 - ALL DRIVERS ARE TO HAVE THE FOLLOWING :
 (a) RUNNING INDICATION ON THE DCS.
 (b) MOTOR FAULT ALARM IN THE DCS.
 (c) LOCAL STOP / START.
 (d) FIRE PUMP STOP FROM THE LOCAL CONTROL PANEL ONLY.
 - DELETED.
 - DELETED.
 - CONTROL VALVE AND LINE ARE SIZED BY PUMP MANUFACTURER'S SPECIFIED MINIMUM FLOW.
 - DELETED.
 - DELETED.
 - DUPLEX TYPE STRAINERS WITH PROPER DRAIN VALVE.
 - WHEN AT REST, THOSE PARAMETERS AFFECTING ITS READINESS TO OPERATE ARE CONTINUOUSLY MONITORED AND IF A FAULT SITUATION OCCURS, THE FACT IS ANNUNCIATED AT THE LOCAL AND REMOTE CONTROL PANELS.
 - A LOCAL FIREWATER PUMP CONTROL PANEL IS SITUATED ON EACH FIRE PUMPSET SKID.
 - THE FIREWATER PUMPS ARE ABLE TO BE STARTED AUTOMATICALLY OR MANUALLY FROM LOCAL OR REMOTE CONTROL PANELS.
 - THE DRIVER IS EQUIPPED WITH MANUALLY OPERABLE DIRECT-START SWITCHES ALLOWING POWER FROM THE BATTERIES TO THE STARTER MOTOR.
 - FIRE WATER PUMP AND CONTROLLER ARE UL LISTED/FM APPROVED.
 - THE WEEKLY START FACILITY IS PROVIDED BY PUMP VENDOR AND IS MANUALLY INITIATED ONLY.
 - THE FIRE WATER PUMP IS DESIGNED IN ACCORDANCE WITH KOC-ME-009, CRITERIA TO KOC-ME-009, EF1902-KOC-ME-009-CRT-DE1, 015-YH-1003 & NFPA 20.
 - DELETED.
 - ALL 9042 IS FOR ALARM ONLY, IF THE LIQUID LEVEL OF DIESEL DAY TANK BECOMES LOW LIQUID LEVEL, THE ALARM WILL SOUND.
 - THE SUPPLY TIME OF DIESEL FUEL FOR THE FIRE WATER PUMP OPERATION IS OF 24 (TWENTY FOUR) HOURS.
 - THE PRESSURE SENSING LINE INSTALLED AT EACH FIRE WATER PUMP CONTROLLER TO DETECT THE PRESSURE DROP IN FIRE WATER LINE IS IN ACCORDANCE WITH NFPA 20 AND SHALL BE PROVIDED BY PUMP VENDOR.
 - DELETED.
 - PUMP START / STOP SEQUENCE SHALL BE PROVIDED AS PER NFPA 20 & KOC-ME-009 INCLUDING THE UL LISTED/FM APPROVED CONTROLLER.
 - DUPLEX OR ASSEMBLY SHALL BE LOCATED AT A MINIMUM OF 10 PIPE DIAMETERS FROM THE PUMP SUCTION FLANGE.
 - FOLLOWING FUNCTION ARE PROVIDED IN THE LOCAL & REMOTE CONTROL PANEL AS PER KOC-ME-009:
 a. START/STOP (ONLY ON LOCAL CONTROL PANEL)
 b. BATTERY SELECTOR
 c. PANEL HEATER ON/OFF
 d. ANNUNCIATOR TEST BUTTON
 e. ALARM ACKNOWLEDGEMENT BUTTON & RESET BUTTON
 f. WEEKLY TEST START/STOP
 g. MAIN ISOLATION
 h. ON/OFF MANUAL SELECTOR
 i. MANUAL EMERGENCY START BUTTON ETC
 - SHIFTED TO NOTE NO. H OF GENERAL NOTES
 - VENT CONNECTION OF DAY TANKS SHALL BE PROVIDED WITH FLAME/SPARK ARRESTER.
 - ROUTED TO STORM WATER SEWER.

HOLD:

- DELETED.
- DELETED.
- DELETED.

REV.	DESCRIPTION	DRAWN	CHECKED	HOD	PEM	DATE
03	RE - ISSUED FOR CONSTRUCTION	HSH/HSA	NIJ	SRA	RAK	23.09.16
02	RE - ISSUED FOR CONSTRUCTION	HSH/HSA	NIJ	SRA	RAK	08.08.16
01	RE - ISSUED FOR CONSTRUCTION	HSH/HSA	NIJ	SRA	RAK	16.07.16
0	ISSUED FOR CONSTRUCTION	HSH/HSA	NIJ	SRA	RAK	15.03.16
F	ISSUED "INCORPORATED CLIENTS COMMENTS"	HSH/HSA	NIJ	SRA	RAK	16.01.16
E	ISSUED FOR VENDOR HAZOP	PAK/HSA	NIJ	SRA	RAK	13.10.15
D	ISSUED "INCORPORATED CLIENTS COMMENTS"	PAK/HSA	NIJ	SRA	RAK	25.08.15
C	ISSUED "INCORPORATED CLIENTS COMMENTS"	PAK/HSA	NIJ	SRA	RAK	05.05.15
B	ISSUED "INCORPORATED CLIENTS COMMENTS"	PAK/HSA	NIJ	SRA	RAK	21.02.15
A	ISSUED FOR APPROVAL	PAK/ASA	NIJ	SRA	RAK	01.01.15

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
FIRE WATER PUMP (G-053A)

PROJECT NO.	DRAWING NO.	REV.	KOC DRG. NO.	REV.
EF1902	50489-530-000-PID-1111.001	03		
	SHEET NO. 1 OF 3			
	COMPANY DRG. NO. EF1902-530-DB0-PID-0111.001	REV.		
	SHEET NO.	A4		