DRAWING NO. 6X15WXH86XE52 REV. 0

REVISIONS							
REV.	DESCRIPTION	ECO No	DATE	REF. ZONE	REV'D	CHKD	APPVL

GENERAL NOTES

ALLOW ± 6MM (0.25 IN) FOR VARIATION OF NOZZLE FLANGE FACES, DRAINS, CENTERLINE HEIGHT, FOUNDATION BOLTS HOLES AND ALL OTHER NOMINAL DIMENSIONS UNLESS OTHERWISE SPECIFICALLY TOLERANCED. FOUNDATION BOLTS SHOULD NOT BE SET RIGIDLY UNTIL RECEIPT OF EQUIPMENT.

PROVISION MUST BE MADE TO SUPPORT PIPING EXTERNAL TO THE PUMP TO PREVENT EXCESSIVE NOZZLE LOADS AND MAINTAIN PUMP DRIVER ALIGNMENT.

ALL HOLES IN FLANGES STRADDLE CENTERLINE.

THIS DRAWING IS NOT TO SCALE-WORK FOR DIMENSIONS.

DIMENSIONS SHOWN IN MM.
CHECK ALIGNMENT OF UNIT AND READ INSTRUCTION BOOK BEFORE STARTING (OR ROTATING) EQUIPMENT.

PUMP MUST BE FULL OF LIQUID WHEN IN OPERATION.

WHEN OPERATING FOR SOME TIME AT REDUCED CAPACITY, MUCH OF THE PUMP HORSEPOWER WILL GO INTO THE LIQUID IN THE FORM OF HEAT. A BY-PASS MUST BE PROVIDED UNDER THESE CONDITIONS TO PREVENT THE LIQUID IN THE PUMP FROM BECOMING HOT ENOUGH TO VAPORIZE.

SERIOUS DAMAGE MAY OCCUR TO THE PUMP IF OPERATING AT A CAPACITY LOWER THAN 604 GPM (MINIMUM FLOW AT 3580 RPM) AT ANY OPERATING CONDITION.

FLOWSERVE RECOMMENDS STRICT COMPLIANCE WITH API 686 RECOMMENDED PRACTICE FOR INSTALLATION.

FLOWSERVE TO PROVIDE INSULATION FOR PUMP CASING. FAILURE TO INSTALL INSULATION WILL RESULT IN A TEMPERATURE GRADIENT ACROSS THE PUMP RESULTING IN ALIGNMENT PROBLEMS.

PIPING NOTES

DO NOT CONNECT TO PIPE TAPS OTHER THAN THOSE SPECIFIED ON DRAWING. CUSTOMER SHOULD ROUTE PIPING IN SUCH A MANNER THAT DISASSEMBLY OF THE PUMP IS NOT RESTRICTED.

SLOPE DRAIN PIPING TOWARDS COLLECTING VESSEL AND TERMINATE ABOVE LEVEL OF LIQUID IN VESSEL. FRICTION LOSS IN DRAIN LINE PIPING SHALL BE LIMITED TO 0.15M (0.5 FEET) OF WATER BASED ON DRAIN FLOW.

PUMP DRAINS:

CUSTOMER TO PROVIDE DRAIN CONNECTIONS TO PUMP AS SHOWN ON GENERAL ARRANGEMENT DRAWING. DRAIN VALVES MUST BE CLOSED BEFORE OPERATION TO PREVENT DAMAGE TO EQUIPMENT OR PERSONAL INJURY.

LUBRICATION OIL SYSTEM:

PUMP IS SUPPLIED WITH LUBE OIL SYSTEM. BEFORE STARTING PUMP, REFER TO INSTRUCTION MANUAL FOR LUBRICATION OIL REQUIREMENTS AND PROPER FILL LEVELS AND SETTINGS.

COOLING WATER SYSTEM:

CUSTOMER TO CONNECT TO COOLING WATER CONNECTION AS SHOWN ON GENERAL ARRANGEMENT DRAWING. COOLING WATER FLOW MUST BE SUPPLIED TO PUMP BEFORE STARTING AND WHILE ON HOT STAND BY.

BALANCING LINE PIPING:

INTERNAL BALANCING LINE IS PROVIDED BY FLOWSERVE WHICH IS INSTALLED BETWEEN THE SUCTION HEAD AND DISCHARGE HEAD OF THE PUMP.

SHAFT SEAL SYSTEM:

PUMP IS EQUIPPED WITH MECHANICAL SEALS WITH API PLAN 23 PIPING ARRANGEMENT. BEFORE STARTING PUMP, REFER TO CONSTRUCTION MANUAL FOR PROPER SEAL SETTING AND VENTING.

G. A. NOTES

(FOR CONNECTIONS REFER TO GENERAL ARRANGEMENT DRW.: 6X15WXH86XE52 SHEET 1/2)

LIFTING REQUIREMENTS:

(BASEPLATE)
DO NOT LIFT BEDPLATE WITH MOTOR MOUNTED. SLING BEDPLATE FROM ALL TEN (10) LIFTING EYES PROVIDED. FAILURE TO DO THIS MAY RESULT IN PERMANENT DEFORMATION OF THE BEDPLATE.

NOTE#1. SUCTION PIPING:

UNIFORM FLOW INTO PUMP SUCTION IS REQUIRED. A STRAIGHT LENGTH OF PIPE AT LEAST 6 DIAMETERS IN LENGTH SHOULD BE CONNECTED TO THE SUCTION NOZZLE BEFORE PLACING ELBOWS, BENDS, STRAINER, OR VALVE. PIPING DESIGNER IS TO BE RESPONSIBLE FOR SATISFACTORY PIPING ARRANGEMENT.

STRAINER NOTE: FLOWSERVE TO SUPPLY A SUCTION STRAINER UPSTREAM OF SUCTION NOZZLE, A MINIMUM OF SIX (6) DIAMETERS FROM NOZZLE.
STRAINER TO BE SIZED FOR 300% OPEN AREA OF SUCTION NOZZLE WITH 100 MESH START UP AND 20 MESH OPERATING SCREEN. CUSTOMER TO SUPPLY DIFFERENTIAL PRESSURE SWITCH ACROSS STRAINER. NORMAL PRESSURE DIFFERENTIAL IS 2 - 4 PSI, AND ALARM LEVEL IS 5 - 7 PSI.

NOTE#2. PUMP BOLTING TO PEDESTALE:

FOUR (4) STUDS AND LOCKNUTS MUST BE PROVIDED BY FLOWSERVE FOR PUMP FEET TO ALLOW THERMAL GROWTH OF PUMP AND TO AVOID BINDING TIGHTEN THE PUMP FOOT HOLD DOWN BOLTS TO TORQUE RECOMMEND IN INSTRUCTION MANUAL. DO NOT EXCEED THIS TORQUE VALUE

NOTE#3. MINIMUM FLOW BY-PASS NOTE:

CUSTOMER TO PROVIDE A MINIMUM FLOW VALVE WHICH SHOULD BE INSTALLED BY CUSTOMER BETWEEN PUMP DISCHARGE AND FIRST VALVE, AND CONNECTED TO SOURCE OF PUMP SUCTION. VALVE IS DESIGNED TO HANDLE BREAKDOWN OF DISCHARGE PRESSURE. THE SYSTEM MUST BE OPEN WHEN STARTING AND STOPPING AND WHEN DISCHARGE FLOW IS LESS THAN THE MINIMUM FLOW LEVEL OF 604 GPM AT 3580 RPM.

NOTE#4. STARTING:

PUMPS SHOULD BE STARTED WITH CLOSED DISCHARGE VALVE AND OPEN MINIMUM FLOW BY-PASS LINE. STARTING PUMP ON STANDBY SERVICE WITH DISCHARGE VALVE OPEN IS ACCEPTABLE PROVIDED THAT THE DISCHARGE CHECK VALVE IS SHUT UNTIL PUMP PRESSURE REACHES SYSTEM PRESSURE.

NOTE#5. WARMING PROCEDURES:

WHILE THE PUMP CAN START WITHOUT WARMING, PRE-WARMING IS RECOMMENDED PRIOR TO PLACING FEED PUMPS IN OPERATION.
INADEQUATE PRE-WARMING CAN CAUSE THERMAL INDUCED STRESSES IN THE PRESURE CANTAINMENT COMPONENTS AND TIE RODS AND TEMPERATURE STRATIFICATION INSIDE THE PUMP WICH CAN REDUCE INTERNAL RUNNING CLEARANCES.

ALTHOUGH THE SYMMETRIC DESIGN OF THE PUMP MINIMIZES THE NEGATIVE EFFECTS OF THERMAL TRANSIENTS, FLOWSERVE RECOMMENDS PRE-WARMING. 36 GPM (6X15WXH) OF WARMING FLOW IS REQUIRED TO ADEQUATELY WARM THE PUMP. THE PUMP SHOULD BE WARMED AT A RATE OF 100ºF PER HOUR AND THE PUMPS SHOULD NOT BE STARTED UNTIL THE EXTERNAL TEMPERATURE OF THE PUMP IS WITHIN 100ºF OF THE FEED WATER, AND DIFFERENTIAL TEMPERATURE OF BETWEEN THE SUCTION HEAD AND DISCHARGE HEAD IS LESS THAN 50ºF.

THE WARM WATER SHOULD BE PIPED INTO THE DRAIN OF THE DISCHARGE HEAD AND OUT OF THE SUCTION NOZZLE. THIS WILL MAXIMIZE THE MIXING AND MINIMIZE THE POSSIBILITY OF TEMPERATURE STRATIFICATION.

NOTE#6. BEDPLATE INSTALLATION:

BEDPLATE FOR THE START-UP BOILER FEED PUMP TRAIN IS FURNISHED BY FLOWSERVE. CUSTOMER TO FURNISH (18) 25MM (1.00 IN) DIAMETER ANCHOR BOLT ASSEMBLIES FOR HOLD DOWN TO FOUNDATION. 28MM (1.10 IN) DIAMETER DRILL THRU HOLES IN THE LOWER FLANGE OF THE BEDPLATE ARE PROVIDED FOR THE ANCHOR BOLTS.

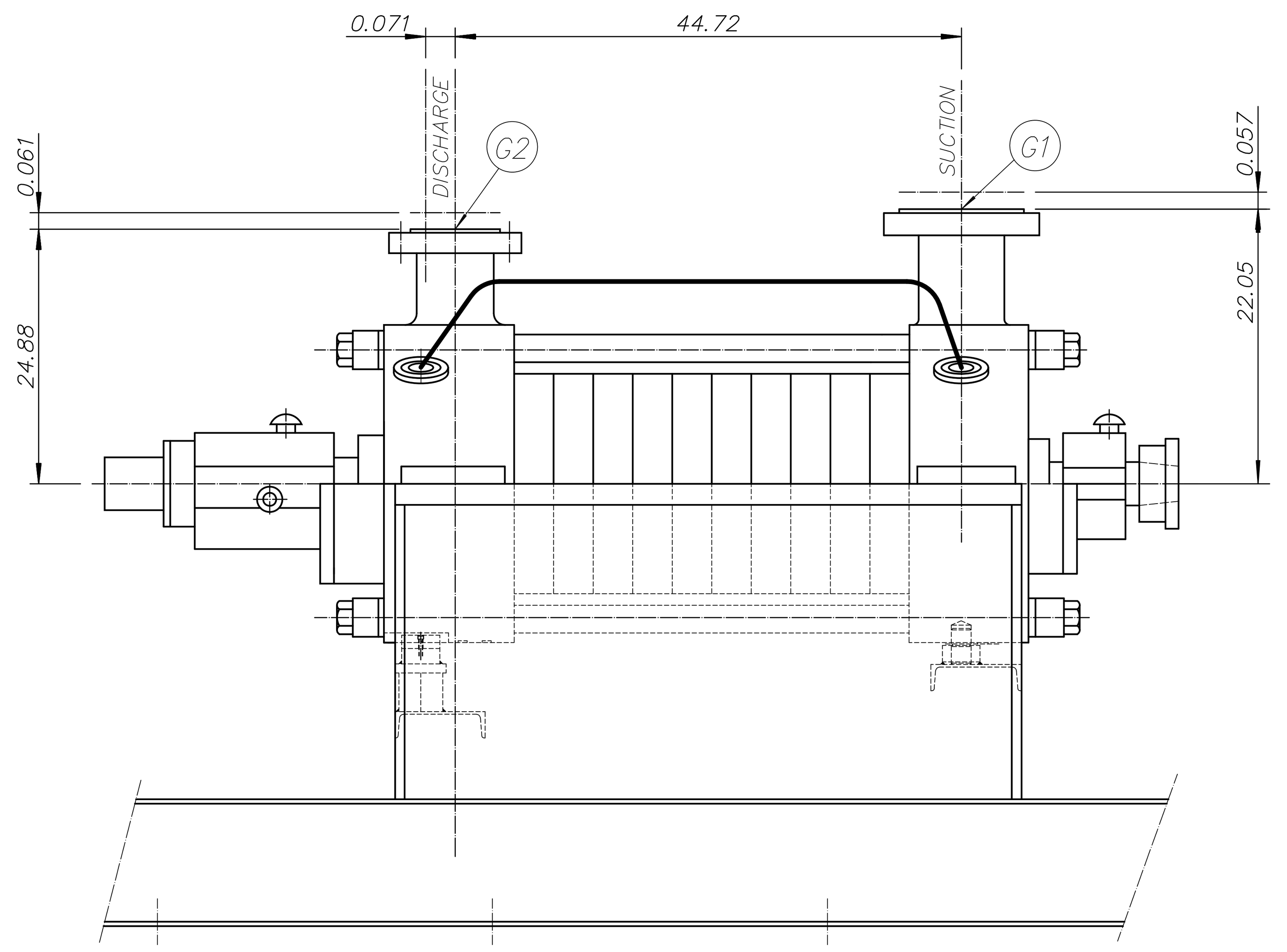
REFER TO FLOWSERVE INSTRUCTION MANUAL FOR BEDPLATE INSTALLATION, GROUTING, AND MOUNTING INFORMATION. STRUCTURAL , BEDPLATE DESIGN IS PROVIDED WITH TOPPLATE. FLOWSERVE RECOMMENDS THAT THE CUSTOMER GROUTS INTERIOR OF BEDPLATE WITH A COMMERCIAL EPOXY GROUT, TO THE TOP OF THE MAIN STRUCTURAL MEMBERS. TOP SURFACE OF GROUTING SHOULD BE SEAL COATED WITH AN EPOXY BASED COATING TO SEAL JOINT AREAS.

PUMP PINS AND KEYBLOCKS ARE NOT SHOP WELDED. FLOWSERVE TO TACKWELD KEY BLOCK AND PIN BLOCK INTO POSITION ON PEDESTAL. AFTER INSTALLATION AND FINAL ALIGMENT IN FIELD. CUSTOMER TO WELD KEY BLOCK AND PIN BLOCK IN PLACE WITH .75 [19 MM] FILLET WELL ALL AROUND. SEE 6X15WXH86XE52 SHHET 1/2

NOTE#7. VIBRATION:

IF FLOWSERVE SUPPLIES VIBRATION EQUIPMENT, REFER TO FLOWSERVE DIAGRAM FOR VIBRATION LEVELS. DURING NORMAL OPERATION, VIBRATION LEVELS SHOULD BE LESS THAN 4.5 MILS (0,114 MM). IF LEVEL EXCEED THIS VALUE, PUMP SHOULD BE SHUT-DOWN. FOR OTHER VALUES SEE LOGIC STARTUP DIAGRAM.

NOTE#8: NOZZLE DISPLACEMENT DUE TO THERMAL EXPANSION AT DESIGN TEMPERATURE



CUSTOMER INFORMATION	
P.O. NUMBER:	104009
END USER:	Gainesville Renewable Energy
JOB:	FAGEN GAINESVILLE
PLANT:	FAGEN GAINESVILLE
UNIT:	6X15WXH-7
SERVICE:	BFP
ITEM:	
SERIAL No.:	

OPERATING CONDITIONS	
FLOW:	2175 gpm
HEAD:	5580 ft
BHP:	3451,1 BHP
EFFICIENCY:	82,5%
RPM:	3580 rpm
FLUID:	Feedwater
TEMPERATURE:	278 ºF
S.G.:	0,929 kg/ m3

1st Angle Projection

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APPROVAL NOTE TO CUSTOMER

1.-PURCHASER'S COMMENTS AND/OR CORRECTIONS, WITHIN THE SCOPE OF CONTRACT WILL BE MADE ON THE FIRST COMPLETED CERTIFIED DRAWING SUBMITTED BY FLOWSERVE CORPORATION AND RETURNED
2.-CORRECTIONS, ALTERATIONS, ADDITIONS AND MODIFICATIONS OUTSIDE SCOPE OF CONTRACT OR MADE AFTER FIRST SUBMITTAL MAY REQUIRE AN ADDITIONAL ENGINEERING SERVICE CHARGE.
3.-ITEMS CONDITIONALLY APPROVED OR WITH DEFERRED APPROVAL BY PURCHASER, MUST BE SPECIFICALLY STATED OTHERWISE DELIVERY MAY BE EFFECTED.

STATUS OF APPROVAL	
ORDER No. COS 11-10P40239	
DRAWN BY I.CASTRO	DATE 21/09/11
CHECKED BY LOB	DATE 02/11/11
APPROVED BY PH	DATE 02/11/11
CAD FILENAME: COS-11-10P40239-1100_2	

FLOWSERVE Coslada Operations

DWG TITLE GENERAL ARRANGEMENT
PUMP TYPE 6X15WXH-7

SIZE	DRAWING NO.	REV.
A1	6X15WXH86XE52	0
SCALE NTS	UNITS mm	SHEET NO. 2/2 n/p

M014200-BFWM00005 S02 R0

NO EXCEPTIONS NOTED | Release for manufacture