NOTES FOR DESIGNER: (DO NOT INCLUDE ON CONSTRUCTION DRAWINGS)

1. REFER TO THE LANL MASTER SPECIFICATION 23 2113, HYDRONIC PIPING.
2. WHEN EDITING DETAIL TO SUIT PROJECT, ADD JOB SPECIFIC REQUIREMENTS AND DELETE ONLY THOSE PORTIONS THAT DO NOT APPLY. TO SEEK A VARIANCE FROM APPLICIABLE REQUIREMENTS, CONTACT THE ESM MECHANICAL POC.
3. LINE SIZE VALVES, STRAINERS AND FLEXIBLE CONNECTORS.
4. FOR END SUCTION AND IN-LINE PUMPS USE ECCENTRIC REDUCER (FLAT ON TOP) AT SUCTION NOZZLE WHEN REQUIRED. USE CONCENTRIC REDUCERS UNDER ALL OTHER CONDITIONS WHEN REQUIRED.
5. STRAINERS ARE NOT GENERALLY REQUIRED ON SECONDARY PUMPS ON CLOSED SYSTEM PIPING. STRAINERS OR OTHER FILTERING DEVICES SHOULD BE PROVIDED FOR OPEN SYSTEM PIPING, FOR EXAMPLE; CONDENSER WATER PUMP.
6. USE A NON-SLAM TYPE CHECK VALVE ON THE DISCHARGE SIDE OF THE PUMP ON CONDENSER WATER PUMPS AND PUMPS INSTALLED IN PARALLEL. A SINGLE PUMP ON A CLOSED PIPING SYSTEM DOES NOT REQUIRE A CHECK VALVE.
7. INSTALL FLEXIBLE CONNECTORS IN SUCTION AND DISCHARGE PIPING AS SHOWN ON STANDARD DRAWINGS. SELECT CONNECTORS FOR SUITABLE TEMPERATURE AND PRESSURE RATINGS WITH A MINIMUM RATED MISALIGNMENT OF 1/4" FOR SIZES 10" AND SMALLER AND 3/8" FOR SIZES 12" AND LARGER.
8. FLEXIBLE CONNECTORS ARE NOT REQUIRED ON MECHANICAL TYPE GROOVED COUPLING SYSTEMS PROVIDING FLEXIBLE GROOVED COUPLINGS ARE INSTALLED AS RECOMMENDED BY THE MANUFACTURER.
9. DO NOT INSTALL VALVES, STRAINERS, ETC., DIRECTLY AT SUCTION NOZZLE OF END SUCTION PUMPS. THE SUCTION PIPING SHOULD BE STRAIGHT FOR THE NUMBER OF PIPE DIAMETERS NOTED. WHERE THIS IS NOT POSSIBLE, USE A SUCTION DIFFUSER (COMBINATION FLOW STRAIGHTENER AND DIFFUSER).
10. PRESSURE GAUGES ARE REQUIRED ON SUCTION AND DISCHARGE SIDE OF PUMP (DO NOT MANIFOLD) AND MAY BE LOCATED IN THE PIPING OR PUMP BODY. PROVIDE COMPOUND GAUGES ON SUCTION SIDE OF PUMP IN OPEN PIPING SYSTEMS.
11. DESIGN THE PIPING SYSTEM TO ENSURE THAT THE MAXIMUM WEIGHT ON THE PUMP CASING DOES NOT EXCEED THE MANUFACTURERS RECOMMENDED COMBINED FORCES AND MOMENTS. DISCHARGE AND SUCTION PIPING SHOULD BE SUPPORTED CLOSE TO THE PUMP FLANGE TO PREVENT VIBRATION AND STRAIN ON PUMP CASING.
12. WHERE CRITICAL CONDITIONS ARE PRESENT, (UPPER FLOORS, MECHANICAL PENTHOUSE, LASER EQUIPMENT, ELECTRON MICROSCOPE, ETC.) INSTALL PUMP ON SPRING SUPPORTED CONCRETE INERTIA BASE WEIGHING 1 1/2 TO 3 TIMES WEIGHT OF PUMPING EQUIPMENT.
13. PROVIDE UNIONS ON DISCHARGE AND INLET FOR NON-FLANGED APPLICATIONS.
14. AS A GENERAL GUIDELINE, PUMPS SHALL BE SPECIFIED AND SELECTED USING THE FOLLOWING PARAMETERS:
    - A. 250 GPM AND GREATER: CENTRIFUGAL SINGLE STAGE, DOUBLE SUCTION TYPE WITH FLEXIBLE COUPLING.
    - B. 249 GPM AND LESS: CENTRIFUGAL END SUCTION TYPE WITH FLEXIBLE COUPLING AND BACK PULL-OUT DESIGN.
        1. CLOSE COUPLED PUMPS MAY BE UTILIZED WHEN SPACE IS LIMITED. CARE SHOULD BE EXERCISED IN HOT WATER APPLICATIONS.
    - C. OPTION: AN IN-LINE CLOSE COUPLED PUMP MAY BE USED FOR CONSTANT COIL CIRCULATION APPLICATION.
    - D. SELECT PUMP TO OPERATE WITHIN THE CAPACITY RANGE RECOMMENDED BY THE MANUFACTURER.
    - E. SELECT PUMP TO OPERATE ON NEGATIVE SLOPE OF PUMP CURVE.
    - F. SELECT A MAXIMUM NOMINAL 1800 RPM OPERATING SPEED, (CONDENSATE RETURN PUMPS MAY BE 3600 RPM).
    - G. THE BHP AT DUTY POINT SHALL NOT EXCEED 90% OF INDICATED MOTOR NAMEPLATE HORSEPOWER RATING. THE MOTOR SHALL BE NON-OVERLOADING THROUGHOUT THE PUMP CURVE.
15. PUMP CONCRETE PAD (2004 ASHRAE SYSTEMS & EQUIPMENT HANDBOOK, PAGE 39.13)
    - A. MINIMUM WEIGHT OF CONCRETE SHOULD BE 2.5 TIMES THE WEIGHT OF THE PUMP ASSEMBLY.
    - B. CONCTETE PAD SHOULD BE AT LEAST 4 INCHES THICK AND 6 INCHES WIDER THAN THE PUMP BASE PLATE ON EACH SIDE.

DRAWING DEVELOPED FOR ML-3/ ML-4 PROJECTS. FOR ML-1/ ML-2, ADDITIONAL REQUIREMENTS AND QA REVIEWS ARE REQUIRED. (REMOVE THIS NOTE WHEN INSERTED INTO A DRAWING PACKAGE).

00% REVIEW
NOT FOR CONSTRUCTION

NO	DATE	CLASS REV	DC	DESCRIPTION	DWN	DSGN	CHKD	SUB	APP
3	06-29-2017	UNCLASS	TO	ADMIN. CHANGES TO CAD STD. REV#5 FORMAT & SHEET NUMBER WAS 7 OF 8.	JB	AJ	ML	ML	TO
2	08-14-2003	U	LB	EDITORIAL CHANGES & DWG. NO. WAS ST6120	RP	RF	RR	GG	TO
1	09-06-2002	U	LB	GENERAL REVISION	RP	BB	GG	GG	TO

ENGINEERING STANDARDS

MECHANICAL

PUMP PIPING DETAIL
DESIGN NOTES

TA- XX BLDG- XX

DRAWN	R.PEARSON
DESIGN	B.BURTSCHELL
CHECKED	G.GREWAL
DATE	06-28-99

SUBMITTED
DISCIPLINE POC: GURINDER GREWAL

APPROVED FOR RELEASE
STANDARDS MANAGER: TOBIN ORUCH

Los Alamos NATIONAL LABORATORY
PO Box 1663
Los Alamos, New Mexico 87545

SHEET 7
7 OF 7

D.C.: U | REVIEWER: LARRY BAYS | DATE: 06-28-99

PROJECT ID: **CHAPTER 6**
DRAWING NO: **ST-D30GEN-4**
REV: **3**