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

1. REFER TO THE COMPREHENSIVE SPECIFICATION 22 2113, HYDRAULIC PIPING.
2. WHEN EDITING DETAIL TO SUIT PROJECT, ADD JOB SPECIFIC REQUIREMENTS AND DELETE ONLY THOSE PORTIONS THAT DO NOT APPLY. TO AVOID A VARIANCE FROM APPLICABLE REQUIREMENTS, CONTACT THE ESM MECHANICAL POC.
3. LINE SIZE VALVES, STRAINERS AND FLEXIBLE CONNECTORS.
4. FOR END SUCTION AND IN-LINE PUMPS USE ECONOMIC 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-SCALE TYPE CHECK VALVE ON THE DISCHARGE SIDE OF THE PUMP OR IN THE INLET TO THE PUMP. WHEN PUMPS ARE INSTALLED IN PARALLEL, FLEXIBLE CONNECTORS ARE NOT REQUIRED ON MECHANICAL PIPING AS SHOWN ON STANDARD DRAWINGS. SELECT CONNECTORS FOR SUITABLE TEMPERATURE AND PRESSURE RATING WITHIN THE MANUFACTURER.
7. INSTALL FLEXIBLE CONNECTORS IN SUCTION AND DISCHARGE PIPING TO REDUCE VIBRATION AND STRAIN ON SUCTION AND DISCHARGE PIPING. USE CONCENTRIC REDUCERS UNDER ALL OTHER CONDITIONS WHEN REQUIRED.
8. FLEXIBLE CONNECTORS ARE NOT REQUIRED ON MECHANICAL TYPE PIPE IN HOT WATER APPLICATIONS. SPACE IS LIMITED. CARE SHOULD BE EXERCISED WHERE CRITICAL CONDITIONS ARE PRESENT, (UPPER FLOORS, MECHANICAL PENTHOUSE, LASER EQUIPMENT, ELECTRON MICROSCOPE, ETC.) INSTALL PUMP ON SPRING SUPPORTED CONCRETE INERTIA BASE WEIGHING 1½ TO 3 TIMES WEIGHT OF PUMP ASSEMBLY.
9. INSTALL FLEXIBLE CONNECTORS IN SUCTION AND DISCHARGE PIPING TO REDUCE VIBRATION AND STRAIN ON SUCTION AND DISCHARGE PIPING. USE CONCENTRIC REDUCERS UNDER ALL OTHER CONDITIONS WHEN REQUIRED.
10. PRESSURE GAUGES ARE REQUIRED ON SUCTION AND DISCHARGE SIDE OF PUMP DO NOT MANIPULATE 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 TO MINIMIZE VIBRATION AND STRAIN ON PUMP CASING.
12. WHERE CRITICAL CONDITIONS ARE PRESENT, (UPSTAIRS FLOORS, MECHANICAL PENTHOUSE, LASER EQUIPMENT, ELECTRON MICROSCOPE, ETC.) INSTALL PUMP ON SPRING SUPPORTED CONCRETE INERTIA BASE WEIGHING 1½ TO 3 TIMES WEIGHT OF PUMP ASSEMBLY.
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. 240 GPM AND LESS: CENTRIFUGAL END SUCTION TYPE WITH FLEXIBLE COUPLING.
   C. 240 GPM AND LESS: END SUCTION TYPE WITH FLEXIBLE COUPLING AND A SINGLE CENTERLINE BACK PULL-OUT DESIGN.
   D. 240 GPM AND LESS: CENTRIFUGAL DOUBLE SUCTION TYPE WITH FLEXIBLE COUPLING AND A SINGLE CENTERLINE BACK PULL-OUT DESIGN.
   E. 240 GPM AND LESS: CENTRIFUGAL SINGLE STAGE, DOUBLE SUCTION TYPE WITH FLEXIBLE COUPLING AND A SINGLE CENTERLINE BACK PULL-OUT DESIGN.
   F. 240 GPM AND LESS: CENTRIFUGAL DOUBLE SUCTION TYPE WITH FLEXIBLE COUPLING AND A SINGLE CENTERLINE BACK PULL-OUT DESIGN.
   G. 240 GPM AND LESS: CENTRIFUGAL SINGLE STAGE, DOUBLE SUCTION TYPE WITH FLEXIBLE COUPLING AND A SINGLE CENTERLINE BACK PULL-OUT DESIGN.
   H. 240 GPM AND LESS: CENTRIFUGAL DOUBLE SUCTION TYPE WITH FLEXIBLE COUPLING AND A SINGLE CENTERLINE BACK PULL-OUT DESIGN.
15. PUMP CONCRETE PAD (ASHRAE SYSTEMS & EQUIPMENT HANDBOOK, PAGE 28-13)
   A. MINIMUM WEIGHT OF CONCRETE SHOULD BE 2 ½ TIMES THE WEIGHT OF THE PUMP ASSEMBLY.
   B. CONCRETE PADS SHOULD BE AT LEAST 4 INCHES THICK AND 8 INCHES WIDER THAN THE PUMP BASE PLATE ON EACH SIDE.

DESIGNER'S SIGNATURE:

REV: 3

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CHAPTER 6