

Part 1 General**1.1 RELATED SECTIONS**

- .1 Section 21 05 00 Common Work Results for Mechanical
- .2 Section 26 05 00 Common Work Result for Electrical

1.2 SUMMARY

- .1 General
 - .1 Procedures and cleaning solutions for cleaning mechanical piping systems.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM E202-00, Standard Test Methods for Analysis of Ethylene Glycols and Propylene Glycols.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures. Include product characteristics, performance criteria, and limitations.

1.5 QUALITY ASSURANCE

- .1 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products**2.1 CLEANING SOLUTIONS**

- .1 Warm water

Part 3 Execution**3.1 INSTRUCTIONS**

- .1 Flush all piping using a high pressure water hose fed through the piping system where indicated on the drawing.

3.2 CLEANING PIPING SYSTEMS

- .1 Timing: systems operational, hydrostatically tested and with safety devices functional, before cleaning is carried out.

Flush the existing pipes from the river water pumps to the filtration system, and from the filtration system to process equipment

The specific areas to be flushed as indicated include:

The piping from (A) pump 1 and (B) pump 2 to the filtration system including the (C) untreated river water header and piping to the individual filter tank isolation valves. flush from the tank existing isolation valve to the (D) treated river water header and then to the (E) treated river water process supply header including the headers and (F)

By-pass line. from the process supply header, flush the lines to the following process equipment heat exchangers, as well as through the internal heat exchanger piping, shown on 1/M2:

Chiller 1 turbine oil cooler: fed from valve 113

Chiller 1 compressor oil cooler: fed from valve 113

Chiller 2 turbine oil cooler: fed from valve 113

Chiller 2 compressor oil cooler: fed from valve 113

Compressor 1 air cooler: fed from valve 27

Compressor 1 oil cooler: fed from valve 27

Compressor 2 air cooler: fed from valve 27

Compressor 2 oil cooler: fed from valve 27 please refer to 1/M3 and 2/M3 for piping to be flushed in

The basement and 2nd floor, respectively. please refer to 5/M3 for a schematic of the overall process.

Prior to flushing the piping from the (E) treated river water process supply header to the compressor heat exchangers (K, L, M, N), ensure that the isolation valve for the city water feed to the compressor heat exchangers is closed. please refer to detailed piping schematic in 3/M3. here, the valve is labeled with the id number "204".

Flush the existing pipes from the (E) treated river water process supply header identified in 1/M2 to the following process equipment heat exchangers, as well as through the internal heat exchanger piping, shown on 2/M3: (0) fluid drive oil cooler: fed from valve 29. please note that 1/M3 shows some of the piping lines supplying chiller heat exchangers (G, H, I, J) on the ground floor. 1/M3 also shows the drain lines from these same heat exchangers for reference.

- .2 Cleaning Agency:
 - .1 Retain qualified water treatment specialist to perform system cleaning.
- .3 Cleaning procedures:
 - .1 Provide detailed report outlining proposed cleaning procedures at least 2 weeks prior to proposed starting date. Report to include:
 - .1 Cleaning procedures, flow rates, elapsed time.
 - .2 Chemicals and concentrations used.
 - .3 Inhibitors and concentrations.
 - .4 Specific requirements for completion of work.
 - .5 Special precautions for protecting piping system materials and components.
 - .6 Complete analysis of water used to ensure water will not damage systems or equipment.
- .4 Conditions at time of cleaning of systems:
 - .1 Systems: free from construction debris, dirt and other foreign material.
 - .2 Control valves: operational, fully open to ensure that terminal units can be cleaned properly.
 - .3 Strainers: clean prior to initial fill.
 - .4 Install temporary filters on pumps not equipped with permanent filters.
 - .5 Install pressure gauges on strainers to detect plugging.
- .5 Report on Completion of Cleaning:
 - .1 When cleaning is completed, submit report, complete with certificate of compliance with specifications of cleaning component supplier.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION