c. Surge protection systems including equipment design showing the maximum / minimum pressure along the pipeline during pump start, pump stop, and emergency or power failure pump stop situation.

d. Design of all auxiliary facilities and equipment

e. A/C, Ventilation System Calculation

f. Any other documentation as required by the Contract

D. Drain, vent, and clean-out points shall be provided in sufficient numbers to the satisfaction of the Engineer.

E. Any water hammering, even by plant shut down due to power failure, etc. must be avoided by means of anti-water hammering measures.

F. All instruments, connected to equipment and pipe work must be equipped with a self cleaning three-way isolation/test valve, the valve drain point shall be connected to the next drain with a visible outlet.

G. All instruments connected to equipment with rotating / oscillating parts or to other equipment and pipes which are subject of vibration must be isolated against vibration transfer by means of flexible connections or other suitable measures, subject of approval by the Engineer.

H. Service platforms, ladders, etc. (permanently fixed and / or mobile) must be provided wherever necessary and as required by the Engineer for easy inspection, maintenance and repair of equipment, instruments and plants.

I. Any pipe, cable, equipment and installation of the plant shall not be used to support other pipes, cables, etc. of the plant.

## 1.2.4 Pumps

### *1.2.4.1 Design*

A. The following centrifugal pumps shall be used for all storm water pumping applications:

**Table 1-2: Centrifugal Pumps Details**

| Pump Type | Wet Well | Dry Well |
|---|---|---|
| Submersible direct-coupled pumps | ✓ | ✓ |
| Submersible axial (propeller) | ✓ | × |