Alpha
Consulting Engineers Pte Ltd

FEEDBACK REPORT FORM

Ref No: 162-031114 (CS)

To: CCG From: YYF

Job No./Project: Master Specification - PSI - Section 2 - Pumps, Tanks & Other Equipment - Clause 2.6 Electric Water Heater *(where applicable)*

Source of feedback: -

Scope of Feedback: * ☐ Quality ☐ Environmental ☐ Administrative ☐ Contractual ☐ Technical ☒ Specification ☐ Others

Section A : Problem & Cause

Specification regarding the heating element for the electric water heater is not clear.

Section B : Mitigating Action Taken, if any

Nil

Section C : Suggested Corrective Action

Please see attached

Section D : Approved Corrective Action

Document Affected * : ☒ Yes ☐ No Affected Document : PSI Master Specification

Approved By : CCG Date : 11/9/14.

Section E : Action

Action By : NA

Targeted Completion : NOV. 2014

Actual Completion : 5/11/2014 Verified By :

** Mark [X] where appropriate*

Distribution:

All tanks shall be fitted with tight-fitting covers for access openings. All overflow pipes and vent pipes shall be screened to prevent mosquito breeding.

The bolt, nuts, external reinforcement angle bars, internal tie rod, ladders, hinges and other accessories for the GRP tank shall be of stainless steel 304.

All fibreglass reinforced polyester water storage tank for potable water storage shall be approved by Water Department, Public Utilities Board.

2.5 Pressed Steel Tanks

Pressed steel water storage tanks shall be supplied and fitted generally as shown in the accompanying Specification Drawings. Tanks shall be of the 2 compartments type complete with internal and external access ladders, ball valves, inlet, outlet and overflow flanges, level indicators, float switches and all other necessary fittings.

All pressed steel water storage tanks shall be constructed of mild steel plates of 1.2m x 1.2m nominal size to SS 22, complete with covers, manholes, hasp and staples, pad locks including painting internally with 3 coats of non-toxic and non-corrosive bitumastic or PVC based paint and externally with one coat of rust proof etch primer to a dry film thickness of 30 microns and finished with 2 coats of chlorinated rubber resistant finish giving an additional total dry film thickness of 60 microns. All tanks shall be fitted with tight fitting covers and access openings, and all overflow pipes shall be screened to prevent mosquito breeding.

2.6 Electric Water Heater Δ (see attached)

Storage type of electric water heater complete with storage tank, heating element, insulation, automatic temperature control, over temperature protector etc. shall be provided as shown in the drawings.

The storage tank shall be fabricated from high quality steel suitable for its usage and conditions. The tank surface shall be coated internally with a layer of porcelain to give a tough, smooth, glasslike lining. The tank shall be designed to withstand a minimum working pressure of 10 bars.

Sufficient thickness of fibreglass or rock wool shall be provided to maintain temperature of stored water to conserve energy.

Automatic temperature control shall consist of an adjustable type temperature setting which automatically keeps the water temperature at preset level.

The over temperature protector shall automatically cut off the power supply in the event that desire preset temperature is exceeded.

2.7 Pressure Booster System

The water pressure booster system shall be supplied and installed generally as shown in the Specification drawings. The system shall have a minimum total capacity as shown on the Schedule of Requirements.

The water pressure booster system shall be approved by Water Department, Public Utilities Board.

The system shall be a proprietary made one piece assembly and shall be complete with pumps, pressure control valve on each pump, automatic controls and pneumatic tanks.

FWY

From: CCG
Sent: Tuesday, 12 August, 2014 4:07 PM
To: FWY
Cc: YYF; LFY
Subject: Master Spec for Clause 2.6 Electric Storage Water Heater

Please replace clause 2.6 of the PSI master specification with the following:-

2.6 Electric Storage Water Heater

The electric storage water heater shall be supplied and installed as a complete unit from a single supplier, comprising of storage tank, insulation, heating element, automatic temperature control, safety device for over-temperature and over-pressure, etc. as shown in the drawings.

The storage tank shall be of stainless steel. Otherwise, it shall be fabricated from high quality steel, and enamelled internally, with a layer of tough, smooth, glasslike lining, and provided with suitable anti-corrosion anode rod.

The tank shall be designed to withstand a minimum working pressure of 10 bars.

The tank shall be insulated with sufficient thickness of CFC-free high density polyurethane to maintain the temperature of stored hot water to conserve energy.

The heating element shall be copper/stainless steel sheathed to ensure the most efficient heat transfer to the water and positioned to ensure that the heat can be distributed evenly throughout the tank. Where available as option, "heat elevator" shall be provided. The heating element shall be rated at minimum 3kW (230V single phase) and protected by thermal fuse to prevent "dry burn".

The entire electrical connection unit shall be housed within a water proof enclosure with appropriate cable glands for the cable penetrations. The unit shall be supplied with minimum 5 m length of ~~2.5mm2 PVC/PVC~~ 3C x 2.5mm² PVC electrical cable for connection to the nearest electrical terminal unit connection.

The hot water temperature shall be regulated automatically via an adjustable thermostat with pre-set temperature of 65 degree C with safety thermal cut-off at maximum 70 degree C. Industrial grade safety temperature and pressure relief shall also be provided to prevent over-pressure in the tank and releases the water to the floor trap via a drain pipe.

The heater enclosure shall be of electro-galvanised steel complete with epoxy powder coating for anti-corrosion and to withstand damages from rough handling. Universal mounting brackets and accessories shall also be provided as part of the unit for space saving and safe mounting on site.

locks. Panel shall be hot press moulded and able to withstand local outdoor weather condition.

All tanks shall be fitted with tight-fitting covers for access openings. All overflow pipes and vent pipes shall be screened to prevent mosquito breeding.

The bolt, nuts, external reinforcement angle bars, internal tie rod, ladders, hinges and other accessories for the GRP tank shall be of stainless steel 304.

All fibreglass reinforced polyester water storage tank for potable water storage shall be approved by Water Department, Public Utilities Board.

2.5 Pressed Steel Tanks

Pressed steel water storage tanks shall be supplied and fitted generally as shown in the accompanying Specification Drawings. Tanks shall be of the 2 compartment type complete with internal and external access ladders, ball valves, inlet, outlet and overflow flanges, level indicators, float switches and all other necessary fittings.

All pressed steel water storage tanks shall be constructed of mild steel plates of 1.2m x 1.2m nominal size to SS 22, complete with covers, manholes, hasp and staples, pad locks including painting internally with 3 coats of non-toxic and non-corrosive bitumastic or PVC based paint and externally with one coat of rust proof etch primer to a dry film thickness of 30 microns and finished with 2 coats of chlorinated rubber resistant finish giving an additional total dry film thickness of 60 microns. All tanks shall be fitted with tight fitting covers and access openings, and all overflow pipes shall be screened to prevent mosquito breeding.

2.6 Electric Storage Water Heater

The electric storage water heater shall be supplied and installed as a complete unit from a single supplier, comprising of storage tank, insulation, heating element, automatic temperature control, safety device for over-temperature and over-pressure, etc. as shown in the drawings.

The storage tank shall be of stainless steel. Otherwise, it shall be fabricated from high quality steel and enamelled internally with a layer of tough, smooth, glasslike lining, and provided with suitable anti-corrosion anode rod.

The tank shall be designed to withstand a minimum working pressure of 10 bars.

The tank shall be insulated with sufficient thickness of CFC-free high density polyurethane to maintain the temperature of stored hot water to conserve energy.

The heating element shall be copper/stainless steel sheathed to ensure the most efficient heat transfer to the water and positioned to ensure that the heat can be distributed evenly throughout the tank. Where available as option, “heat elevator” shall be provided. The heating element shall be rated at minimum 3kW (230V single phase) and protected by thermal fuse to prevent “dry burn”.

The entire electrical connection unit shall be housed within a water proof enclosure with appropriate cable glands for the cable penetrations. The unit shall be supplied with minimum 2m length of 3C x 2.5mm2 PVC electrical cable for connection to the nearest electrical terminal unit connection.

The hot water temperature shall be regulated automatically via an adjustable thermostat with pre-set temperature of 65 degree C with safety thermal cut-off at maximum 70 degree C.

MASTER COPY

Industrial grade safety temperature and pressure relief shall also be provided to prevent over-pressure in the tank and releases the water to the floor trap via a drain pipe.

The heater enclosure shall be of electro-galvanised steel complete with epoxy powder coating for anti-corrosion and to withstand damages from rough handling. Universal mounting brackets and accessories shall also be provided as part of the unit for space saving and safe mounting on site.

2.7 Pressure Booster System

The water pressure booster system shall be supplied and installed generally as shown in the Specification drawings. The system shall have a minimum total capacity as shown on the Schedule of Requirements.

The water pressure booster system shall be approved by Water Department, Public Utilities Board.

The system shall be a proprietary made one piece assembly and shall be complete with pumps, pressure control valve on each pump, automatic controls and pneumatic tanks. Alternatively, suitable pumps and pneumatic tanks can be integrated to form a compatible constant pressure water booster system.

The system shall comprise of two pumps, each sized at 50 percent of the system capacity.

Acoustic measures shall be provided if necessary to ensure compliance to the required sound level in all occupied areas.

The pneumatic tanks shall be of the approved type and appropriately sized for the proper operation of the respective lead pump. A pressure switch located in the main water stream shall activate the lagging pump when the main system pressure drop below the pre-set system pressure.

The pneumatic tanks shall be factory tested to withstand at least 1.5 times the operating pressure.

All parts of the system in contact with water shall be of corrosion resistant materials.

2.8 Water Tank Level Controls

The level control units shall be operated by suspended electrodes and shall be of 'No Float' type. The level control electrode shall be made of stainless steel pipes grade 316, the electrode ends shall be sealed. When required, intermediate insulated support brackets shall be installed to prevent the electrodes swaying. A complete set of electrodes shall be installed in each tank compartment and be arranged to interlock with the pumps. Each set of electrodes shall be enclosed by a suitable casing, extending from the highest water level to bottom of the tank, to minimize effect of wave of water.

MASTER COPY