NA

From: EL
Sent: Friday, July 18, 2003 12:00 PM
To: All
Subject: OM-SC/074 - Revision to Master Specification for Plumbing & Sanitary Installation

Importance: High

Our Ref: OM-SC/074

18 July 2003

MEMORANDUM

To: Members of the Staff

From: EL

REVISION TO MASTER SPECIFICATION FOR PLUMBING & SANITARY INSTALLATION

Please refer to the attachments and take note of the changes made to the PSI Specifications.



0BFD0001.pdf



0BFC0001.pdf

/el

FEEDBACK REPORT FORM

Alpha Engineering Consultant

Ref No: 59-250603

To: **LCT** From: **NHS** (25 JUN 2003)

→ CLM / NHS

Job No./Project: **GENERAL – GAS SUPPLY SYSTEM** *(where applicable)*

Source of feedback: **CLM/CITY GAS PTE LTD**

Scope of Feedback: *~~Quality System/Administrative/Contractual~~/Technical/Specification/Others

NOT correct! PG is still in operation for Distribution of ~~town~~ gas in S'pore.

Section A : Problem & Cause

1. "POWERGAS" has been changed to "CITY GAS PTE LTD" as per the letter dated 15 Jan 2002. (see sht 1 of 2) ← New set up, see item 2.
2. Under note # 4, statement is not relevant to all types of pipe materials. Specifically, this is for GI. API has to be welded. (see sht 2 of 2) ← I believe we still use GI for the gas riser which is normally 50mm ϕ ?

Section B : Suggested Corrective Action

1. Under note # 1 – "POWERGAS" to change to "CITY GAS PTE LTD"
2. To remove note # 4 in order to avoid any confusion. See

Please check "PUB approved solenoid valve ~ ~ ~"

I think need to be updated.

Section C: Approved Corrective Action

Approved By : [signature] Date: 16/7

Section D : Action

Action By: **NHS / EL**

Targeted Completion: **27 Jun 2003**

Actual Completion: 15/7/03 Verified By: [signature] R. Vijay.

* *Delete as appropriate*

Distribution:

Form Rev 0
FORM A9.A/ISO/0597

30/11/95

3.41 Grease Interceptors & Grease Trap

Grease interceptor for carpark shall be of cast iron type with appropriate aluminium alloy strainer. Grease trap installation shall comply with the details and Specification shown on the latest ENV Standard Drawings.

30/11/95

3.42 Inspection Chambers/Screen Chambers

All inspection chambers/Screen Chambers shall comply with the details and specification shown on the latest ENV Standard Drawings & the Code of Practice on Sanitary Plumbing and Drainage System. The Sub-Contractor shall employ a Civil/Structural Professional Engineer to take charge of the civil/structural aspects of the work and upon completion to furnish completion and Inspection Certificates to the Architect.

When deemed necessary by the Architect, piling for bedding of the Inspection Chambers/Screen Chambers shall be provided by the Sub-Contractor and the cost for piling shall be in accordance with the Schedule of Unit Rates.

30/11/95

3.43 Inspection Chamber Cover

All inspection chamber covers shall comply with the latest edition of the relevant Singapore Standard and shall be approved by the ENV.

All inspection chambers on the driveway, car parks and other area where vehicular load are expected shall be or provided with heavy duty inspection chamber covers.

30/11/95

3.44 Fixing of Sanitary Wares, Fittings, Electric Water Heater and Accessories

Generally all sanitary wares, fittings, electric water heater and accessories shall be fixed mechanically by bolts and nuts onto wall and floor using corrosion resistance type metal bolts and nut or screws. For heavy sanitary wares, metal expansion type of bolts and corrosive resistance metal brackets shall be used. The Sub-Contractor shall submit fixing proposal to the Architect for review before commencement of work.

The Sub-Contractor shall include the prices of taking delivery from the Contractor's site store and thereafter be responsible for protection, breakage, temporary storage, labour, tools and materials necessary for fixing the sanitary wares, fittings and accessories in the final location. The Sub-Contractor shall not include the cost of cutting tiles and fitting up to or around sanitary wares, fittings and accessories.

15/07/03

3.45 Gas Solenoid Valve

All gas solenoid valves shall comply to BS EN 60079-14, the Code of Practice for Selection, Installation and Maintenance of Electrical Apparatus for Use in Potentially Explosive Atmosphere.

The solenoid valve shall be complete with manual reset and a visual indicator to show whether the valve is in the open or closed mode.

30/11/95

3.46 Fire Hydrants

Hydrants shall be of the pillar type having two 63.5mm (2 1/2 inches) nominal bore outlets with external threads matching to the local fire brigade's standard hose threaded coupling connection. The bore of the standpipe should be at least twice the area of the two outlets.

The outlets shall be provided with protective standard caps of cast iron or other suitable material and attached to the standpipe by chains. All working parts shall be of gunmetal.

Valve pits of adequate size shall be constructed to house sluice valve complete with surface box, lid, lid key and hydrant key.

15/07/03

3.47 Gas Leak Detection System

The Sub-Contractor shall supply and install Gas Leak Detection System approved City Gas Pte Ltd to detect and monitor the presence of gas in the premises as shown in the Specification Drawings.

Gas Leak Detectors shall comply with BS 6020 Part 1 and Part 4. The Leak Detection System shall include the following features:

(a) Vertical scale indicator or digital display - for direct reading of up to 100% Lower Explosive Limit.

(b) Warning Alarm - with adjustable level of Lower Explosive Limit from 0 to 100%.

(c) Flashing status lights - for indicating of Warning, Danger and Fail Modes.

The Lower Explosive Limit of manufactured gas (hydrogen) is about 4% of gas by volume in air. The leak detection system shall be interlinked to a solenoid valve controlling gas supply to the area. All detectors installed shall be explosion proof and shall be certified for use in a hazardous area zone 2 environment as described under SS 254: Part 1 or any equivalent standard having similar classification. The system shall be capable of cutting off the gas supply at no more than 20% of the Lower Explosive Limit of manufactured gas (hydrogen).

When using the above standards or equivalent, the following classification applies for PUB Manufactured Gas:

Apparatus Group	:	II B or equivalent
Temperature Classification	:	T1 (450°C)

FEEDBACK REPORT FORM

Alpha Engineering Consultant

Ref No: 60 - 030703

To: **LCT** From: **NHS**

Job No./Project: **PLUMBING, SANITARY & GAS INSTALLATIONS** *(where applicable)*

Source of feedback: **BRITISH STANDARDS ONLINE**

Scope of Feedback: ~~*Quality System/Administrative/Contractual~~/Technical/Specification/~~Others~~

Section A : Problem & Cause

BS Standard Numbers in the Plumbing, Sanitary & Gas Installation standard notes do not reflect the latest revised Standard Numbers

Section B : Suggested Corrective Action

To refer to the "British Standards Online" and check the respective "BS" numbers that need to be updated.

Section C: Approved Corrective Action

Approved By : _____ Date: 8/7/03

Section D : Action

Action By: **NHS / VT / EL** 03/07/03 15/07/03

Targeted Completion: **CAD - completed on 03/07/03 / Specs – completed on** 15/07/03

Actual Completion: 15/7/03 Verified By: _____

* *Delete as appropriate*

Distribution:

Selected fill material, free from lumps and stones shall be placed over the pipes and compacted in layers not exceeding 150mm in depth to a height of 300mm above the top of the pipes. The remainder of the trench shall then be backfilled to the surrounding level with ordinary fill material.

The Sub-Contractor shall employ a Civil/Structural Professional Engineer to take charge of the civil/structural engineering aspects of the work and upon completion to furnish Completion and Inspection Certificates to the Architect.

When deemed necessary by the Architect, piling for bedding shall be provided by the Sub-Contractor and the cost of piling shall be in accordance with the Schedule of Unit Rates.

15/07/03

3.12 Type of Pipework

The types and qualities of all pipework used shall comply with the following schedule unless otherwise shown on the Drawings or specified elsewhere in the Specification:

	Service		Type
(a)	Domestic Water Supply (cold water pipes)	(i)	For 66.7mm diameter & below: Copper pipes in accordance to BS EN 1057 and copper capillary fittings to BS 864 Part 2, light duty for aboveground and heavy duty for underground.
		(ii)	For 75mm diameter and above: Cement lined ductile iron pipes & fittings to BS EN 545 c/w flanged joint.
		(iii)	For water tank drain pipes and overflow pipes - UPVC pipes in accordance with SS 141.
(b)	Domestic Water Supply (hot water pipe)	(i)	Copper pipes to BS EN 1057 – light duty and copper fittings to BS 864.
(c)	Soil/Waste and Vent	(i)	Cast iron pipes (hubless) to CISPI: 301-82, BS 6087 and ASTM C564 for above ground installation. (75mm diameter & above)
		(ii)	Ductile iron pipe to BS EN 598 for underground, buried or cast in structure installation.
		(iii)	Unplasticised PVC pipes in accordance with SS 213 complete with accessories/adaptors for connection to hubless cast iron pipes (50mm diameter & below).
		(iv)	Vitrified clay piped to BS 65 and BS 540 for inspection chamber connections for manholes/minor sewer.
(d)	Gas Pipes	(i)	Buried pipes and fittings installed from the property boundary line to the building shall be ductile iron pipes to BS EN 969.
		(ii)	Risers pipes and distribution pipes installed within building shall be galvanised iron pipes and fittings to BS 1387 Class 'C'.

		(iii)	Pipes within unventilated risers and concealed spaces (e.g. false ceiling) shall be of API Schedule 40 Grade B steel pipe with welded joints.
(e)	Drain and Air Vents	(i)	Copper pipes in accordance with BS EN 1057 light duty.

30/11/95

3.13 Jointing For Buried Pipes

All buried pipes for Water and Sanitary Services shall be jointed by flexible mechanical and 'Tyton' joints or approved equal to the approval of the relevant local authorities.

30/11/95

3.14 Steel Piping Jointing

For all pipe connections to valves, strainers and equipment, flanged or screwed joints shall be used. All screwed joints shall be made with Teflon or equal acceptable PTFE thread sealing tape. Hemp or similar organic substances shall not be used.

On black steel pipework all joints up to and including 65mm diameter shall be made by means of screwed connections. Pipe of 80mm diameter and above shall be joined by means of welding unless otherwise indicated in the Specification Drawings.

In all cases where pipes are joined to flanged equipment, the appropriate mating flanged shall be used.

Full circumferential radiography tests shall be carried out on all API schedule 40 gas pipe welded joints. The result of the radiography tests shall be endorsed and certified by the Sub-Contractor's Professional Engineer.

30/11/95

3.15 Flanges for Steel Pipes

Flanges shall be of mild steel in accordance with BS 4504 Part 1. All flanged joints shall be flushed and aligned, and shall be made with corrugated jointing rings, coated on both sides with recommended jointing compound. All bolts shall be hexagonal- headed steel in accordance with BS 916 complete with washers and nuts. Flanges and bolts shall be suitable for the working pressure.

30/11/95

3.16 Steel Pipe Fittings

Proprietary made fittings, which are designed and manufactured to relevant Singapore Standard or British Standard for intended use, shall be supplied and installed. Any fitting which is fabricated from cutting pipes and welding will not be accepted.

In all cases, fittings and pipeworks shall be of the same material unless written confirmation for the contrary is obtained from the Architect.

In general all fitting shall be of the malleable iron type, but in all cases, entirely suited to the working and test pressures of the circuit concerned.

On all changes of directions, long radius elbows and sweep or 'pitcher' tees shall be used. Short elbow may be used only where physical constraint warrants it and permitted by the Architect. Bends, offsets and other pipe fittings formed by welding together segmented pieces will be rejected. Short fill-in sections of piping less than 150mm long shall not be welded onto any pipe run.

Reduction in the diameter for through-flow pipes shall be made by means of reducing sockets for vertical pipes only; for horizontal piping and connections to pump suction, eccentric reducing sockets shall be used.

All joints shall be re-tightened when installation is completed.

15/07/03

3.19 Valves, Cock, etc. General

All valves, cocks, etc. shall be suitable for the working and test pressure of the system concerned. Valve flanges shall be in accordance with BS 4504 as specified for their respective service pipework. The nominal bore of any valve shall not be less than the bore of the pipe to which it is fitted.

Valves shall be fitted in accessible positions for operation and repair. The connection between each valve and the adjacent equipment shall be made either with a union or flange for ease of dismantling.

Valve spindles shall be adequately lubricated with graphite, and all glands shall be freshly packed before installation. All valves in plant rooms shall be of the external spindle type. All valves must be 'right handed', i.e. to shut valve the spindle must turn clockwise. All valves must be fitted with handwheels.

Where possible, all valves supplied and fitted shall be of the same manufacture unless agreed otherwise by the Architect. Control valves shall be supplied only by manufacturer of control equipment.

All valves, cocks, etc. for water or other services shall comply with the requirements of the Public Utilities Board. All brass fittings, except exposed terminal fittings such as taps, shall be dezincification -resistant complying with CZ 132 of BS EN 12420 or CZ 132 of BS EN 12163 or equivalent. Where valves are located above 2m from the floor level or in an inaccessible location, they shall be operated by chain mechanism.

30/11/95

3.20 Isolating Valves

Gate valves up to and including 80mm diameter where fitted to steel pipe shall be of gunmetal with female screwed connections. Valves for copper pipe shall be of brass and shall have compression type connections for sizes up to and including 40mm. The valves shall be of the fullway, split wedge disc pattern with non-rising spindles of high tensile steel, fitted with detachable cast iron handwheels.

Valves 100mm diameter and above where fitted to steel pipes shall be of the flanged cast iron type or flanged cast steel to suit the valve design working pressure with inside screws solid wedge and high tensile steel spindles fitted with detachable cast iron handwheels.

Valves of 80mm diameter and above where fitted to copper pipe shall be flanged and similar to those detailed for steel pipework.

30/11/95

3.21 Globe Valves

Globe valves shall be supplied and fitted for proper balancing and water flow control. They shall be of the globe pattern, screwed gunmetal for sizes up to and including 80mm diameter. Globe valves of 100mm diameter and above shall be of the flanged cast iron type.

For copper pipework, the relevant details specified earlier for isolating valves shall be applicable.

30/11/95

3.22 Drain Cocks

Gunmetal drain cocks shall be provided as and when necessary to ensure that all sections of the pipework and plant can be effectively drained. The sizes of drain cocks shall be as follows:

(a) Tanks, Plant and Pipes above 150mm dia. .... not less than 25mm dia.

(b) Pipes up to 150 dia. 15mm