

**GENERAL SPECIFICATION**  
**FOR**  
**CATERING EQUIPMENT INSTALLATION**  
**IN**  
**GOVERNMENT BUILDINGS**  
**OF**  
**THE HONG KONG SPECIAL ADMINISTRATIVE REGION**  
**2001 EDITION**

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**BUILDING SERVICES BRANCH**  
**ARCHITECTURAL SERVICES DEPARTMENT**

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2. This General Specification is solely compiled for use on catering equipment installation in Government buildings of the Hong Kong Special Administrative Region.
3. It is hereby declared that the specification contained therein may not be pertinent or fully cover the extent of installation carried out by others. Prior consent by the Director of Architectural Services must be obtained for adoption of this General Specification on installations of other nature or locations.

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# **PART A - SCOPE AND GENERAL REQUIREMENTS**

## **SECTION A1**

### **SCOPE OF SPECIFICATION**

#### **A1.1 INSTALLATION TO COMPLY WITH THIS SPECIFICATION**

This General Specification details the intrinsic properties (including materials and workmanship) required of a catering equipment installation including commercial kitchen equipment carried out for or on behalf of Architectural Services Department, the Hong Kong Special Administrative Region.

#### **A1.2 INSTALLATION TO COMPLY WITH THE PARTICULAR SPECIFICATION & DRAWINGS**

The catering equipment installation shall comply in every respect with this General Specification, the Particular Specification and the Drawings relating to a particular job or modified by written instruction of the Architect.

#### **A1.3 SCOPE OF THE WORK**

The scope of the Works in this General Specification, the Particular Specification and the Drawings relating to a particular project consists of the whole of the labour and all materials necessary to form a complete installation and such commissioning, adjustments, tests and maintenance as prescribed. It shall include not only the major items of plant and equipment shown or specified but all the incidental sundry components necessary for the completion of the Works and for the proper operation and maintenance of the installation, including the necessary labour, whether or not these sundry components are mentioned in detail in the Contract.

#### **A1.4 DEFINITIONS, INTERPRETATION & ABBREVIATIONS**

In this General Specification, the following words or expressions shall have meaning hereby assigned to them except when the context otherwise requires: -

##### **A1.4.1 Terminology and Glossary of Terms**

“Air Conditioning Contractor” means the person, firm or company contracting, or sub-contracting to the Building Contractor, for the air conditioning and/or ventilation installation, including the Air Conditioning Contractor’s personal representatives, successors and permitted assigns.

“Architect” means the person, company or firm appointed from time to time by the Employer and notified in writing to the Contractor (or the Contractor of the Main Contract in the sub-contracting arrangement) to act as the Architect for the purpose of the Contract. The person

appointed may be described by name or as the holder for the time being of a public office.

“Building Contractor” means the person, firm or company who’s tender has been accepted by the Employer for building construction, including the Building Contractor’s personal representatives, successors and permitted assigns. (The word “Building Contractor” may also mean the Contractor of the Main Contract, as the context requires in sub-contracting arrangement.)

“Contract” means the Articles of Agreement, the Tender and the acceptance thereof by the Employer (including such further agreed documents as may be expressly referred to in or by the same), Drawings, General Conditions of Contract, Special Conditions of Contract (if any), Specification and priced Bills of Quantities or Schedule of Rates. (The word “Contract” may also mean domestic or nominated sub-contract as the context requires.)

“Contractor” means the person, firm or company whose tender for the fire service installation has been accepted by the Employer and includes the Contractor’s personal representative, successors and permitted assigns. (The word “Contractor” may also mean domestic or nominated sub-contractor as the context requires.)

“Drawings” means the drawings referred to in the Specification or Bills of Quantities and any modification of such drawings approved in writing by the Architect and such other drawings as may be from time to time be furnished or approved in writing by the Architect.

“Electrical Contractor” means the person, firm or company contracting, or sub-contracting to the Building Contractor, for the electrical installation, including the Electrical Contractor’s personal representatives, successors and permitted assigns.

“Employer” means the Government of the Hong Kong Special Administrative Region.

“Maintenance Period” means the maintenance period named in the Appendix to the Form of Tender commencing on the day following the date of Completion of the Works or any Section or part thereof certified by the Architect in accordance with the Contract.

“Particular Specification” means the specifications referred to in the Contract for a particular project.

“Specification” means the specifications referred to in the Contract and any modification thereof or addition thereto as may from time to time be furnished in writing or approved in writing by the Architect.

“Temporary Works” means all temporary work of every kind required for the construction, completion and maintenance of the Works.

“Town/L.P. Gas Contractor” means the person, firm or company contracting, or sub-contracting to the Building Contractor, for the



town/L.P. gas installation, including the Town/L.P. Gas Contractor's personal representatives, successors and permitted assigns.

"Works" means the work or services including work or services to be carried out by Nominated Sub-Contractors to be constructed, completed, maintained and/or supplied in accordance with the Contract and includes Temporary Works.

#### A1.4.2 Abbreviations

"ANSI" means American National Standards Institute

"ASTM" means American Society for Testing and Materials

"BEAB" means the British Electrical Approval Board, U.K.

"BS" means the British Standards, including British Standard Specifications and British Standard Codes of Practice, published by the British Standards Institution.

"BS EN" means European Standard adopted as British Standard.

"FSD" means the Fire Services Department of the Hong Kong Special Administrative Region.

"EMSD" means the Electrical and Mechanical Services Department of the Hong Kong Special Administrative Region.

"HKSAR" means Hong Kong Special Administrative Region.

"IEE" means the Institution of Electrical Engineers of United Kingdom

"IEC" means the International Electrotechnical Commission Publications.

"ISO" means the International Organization for Standardization Publications.

"LPG" means the Liquefied Petroleum Gas as defined under the Gas Safety Ordinance (Cap 51).

"LPGA" means the Liquefied Petroleum Gas Association of United Kingdom (previously known as Liquefied Petroleum Gas Industry Technical Association)

"WSD" means the Water Supplies Department of the Hong Kong Special Administrative Region.

#### **A1.5 SINGULAR AND PLURAL**

Words importing the singular only also include the plural and vice versa where the context requires.

**SECTION A2**  
**STATUTORY OBLIGATIONS AND OTHER REGULATIONS**

**A2.1     INSTALLATION TO COMPLY WITH OBLIGATIONS AND REGULATIONS**

The installation shall comply with this General Specification, and with the following statutory obligations, regulations and specifications currently in force in the HKSAR:

- (a) The Gas Safety Ordinance, Chapter 51, Laws of the Hong Kong Special Administrative Region and all the Gas Safety Regulations.
- (b) Codes of Practice published by the Gas Authority.
- (c) Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installation and Equipment published by the Fire Services Department, the HKSAR.
- (d) Requirements and Circular Letters of Fire Services Department of the Hong Kong Special Administrative Region.
- (e) Buildings Ordinance, Chapter 123, Laws of the Hong Kong Special Administrative Region and all subsidiary Regulations and associated Codes of Practice published by the Building Department, the HKSAR.
- (f) Dangerous Goods Ordinance, Chapter 295, Laws of the Hong Kong Special Administrative Region.
- (g) Electricity Ordinance, Chapter 406, Laws of the Hong Kong Special Administrative Region and all subsidiary Regulations and associated Codes of Practice published by the Electrical and Mechanical Services Department, the HKSAR.
- (h) The Waterworks Ordinance, Chapter 102, Laws of the Hong Kong Special Administrative Region.
- (i) Water Pollution Control Ordinance, Chapter 358, Air Pollution Control Ordinance, Chapter 311, Noise Control Ordinance, Chapter 400, Laws of the Hong Kong Special Administrative Region and all the regulations related to the environmental protection.
- (j) Occupational Safety and Health Ordinance, Chapter 509, Laws of the Hong Kong Special Administrative Region.
- (k) Public Health and Municipal Service Ordinance, Chapter 132, Provision of Municipal Service (Reorganisation) Ordinance, Chapter 552, Laws of the Hong Kong Special Administrative Region.
- (l) British Standard Specifications and British Standard Codes of Practice published by the British Standards Institution, or internationally recognised

equivalent standards acceptable to the Gas Authority and demonstrated to be equivalent in overall technical substitute on the type of construction, functions, performance, general appearance and standard of quality of manufacture and approved by the Architect.

- (m) The General Specification for Electrical Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.
- (n) The General Specification for Fire Service Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.
- (o) The General Specification for Liquefied Petroleum Gas Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.
- (p) The General Specification for Air-conditioning, Refrigeration, Ventilation and Central Monitoring and Control System Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.
- (q) The General Specification for Building issued by the Architectural Services Department of the Hong Kong Special Administrative Region.
- (r) Rules and regulations for town gas supply of The Hong Kong and China Gas Co. Ltd.
- (s) Requirements from relevant authorities for licensed premises.

All gas works shall be carried out in person by registered gas installers in compliance with Gas Safety Ordinance. All electrical works shall be carried out or supervised by appropriate grade of registered electrical workers in compliance with Electricity Ordinance. Relevant work completion certificates shall be submitted.

All domestic gas appliances supplied and installed in the Works shall have the approval by the Gas Authority in accordance with the Code of Practice GU05 "Approval of Domestic Gas Appliances" published by the Gas Authority, the HKSAR.

Unless otherwise specified, all equipment, components and materials shall comply with the relevant international recognised standards approved by the Architect. Particular reference should be made to the following for general guidance: -

BS EN 10088    Stainless steels

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| BS EN 10258 | Cold rolled stainless steel narrow strip and cut lengths. Tolerances on dimensions and shape.        |
| BS EN 10259 | Cold rolled stainless and heat resisting steel wide strip and plate/sheet. Tolerances on dimensions. |
| BS EN 1706  | Aluminium and aluminium alloys. Castings. Chemical composition and mechanical properties.            |
| ISO 3522    | Cast aluminium alloys – Chemical compositions and mechanical properties                              |
| BS EN 60335 | Specification for safety of household and similar electrical appliances.                             |
| BS 5258     | Safety of domestic gas appliances.                                                                   |
| BS 5784     | Safety of electrical commercial catering equipment.                                                  |
| BS 3831     | Specification for vitreous enamel finishes for domestic and catering appliances.                     |
| BS EN 26    | Specification for gas burning appliances                                                             |
| BS EN 126   | Multifunctional controls for gas burning appliances                                                  |
| BS EN 203   | Specification for gas heated catering equipment                                                      |
| BS EN 631   | Catering containers                                                                                  |
| ISO 5160    | Commercial refrigerated cabinets                                                                     |
| ISO 8187    | Household refrigerating appliances, Refrigerator-freezers, Characteristics and test methods          |

The British Standards, ISO Standards, IEC Standards and other standards referred to within this General Specification indicate the basic requirements. The Contractor may offer products, materials and equipment complying with alternative internationally recognised equivalent standards acceptable to the Gas Authority and demonstrated to be equivalent or better in overall technical substitute on the type of construction, functions, performance, general appearance and standard of quality to the relevant standards or other standards specified in this General Specification to the Architect for approval.

## **A2.2 COMPLIANCE WITH SPECIFICATIONS**

The Tender submitted shall be deemed to be fully in compliance with the Specifications and all statutory regulations currently in force. Any deviations due to the substitution of other standards shall be detailed in a covering letter

accompanying the Tender. Any queries regarding interpretation should be addressed to the Architect before submission of the Tender.

### **A2.3 IN CASE OF CONFLICT**

In the case of conflict between the technical requirements of this General Specification and any other requirements, the following order of preference shall apply:

- (a) Gas Safety Ordinance, Gas Safety Regulations and other statutory requirements.
- (b) The Particular Specification and/or the Drawings of specified work involved.
- (c) This General Specification.
- (d) Rules and Regulations of the local public utility companies.
- (e) British Standards and Codes of Practice issued by the British Standards Institution or acceptable equivalent.

### **A2.4 GUARANTEE**

The Contractor in supplying a specific item of equipment or appliance, whether specified herein by name or whether of a make selected by the Contractor, shall be deemed to warrant its satisfactory performance under all local working conditions.

Unless otherwise stated, the Contractor's guarantee for the equipment or appliances supplied shall extend for a period of one year from the date of completion of its installation or the contractual works whichever is later.

In the event of anything described in the Specification or shown in the tender drawings being, in the Contractor's opinion, unsuitable for or inconsistent with the Contractor's guarantee or responsibilities, the Contractor shall draw the Architect's attention thereto at the time of tendering.

Neither the time limit imposed on the Contractor's guarantee, nor the Maintenance Certificate issued by the Architect, nor the acceptance of installation by the Employer, nor the approval by the Architect of any material or method shall in any way absolve the Contractor from the Contractor's responsibility for any latent defects in the future and which are, in the opinion of the Architect, due to the Contractor's failure to use the materials and methods which comply with this General Specification and the Particular Specification and Drawings.

### **A2.5 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS**

Comply with all regulations on safety and occupational health aspects issued by the Works Bureau, the Labour Department and other authorities of the Hong Kong

Special Administrative Region, from time to time. Particular attention is drawn to the following:

- (a) Construction Sites (Safety) Regulations
- (b) Factories and Industrial Undertakings (Electricity) Regulations
- (c) Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations
- (d) Factories and Industrial Undertakings (Confined Spaces) Regulations
- (e) Construction Site Safety Manual issued by the Works Bureau, the HKSAR.
- (f) Occupational Safety and Health Ordinance, Chapter 509, Laws of the Hong Kong Special Administrative Region

## **A2.6 ADDITIONAL INFORMATION**

Any requests for additional information, e.g. Architectural Drawings, should be addressed to the Architect before submission of the Tender.

## **A2.7 INTELLECTUAL PROPERTY RIGHTS**

If the Contractor intends to use the intellectual property rights of another party in performing the Contractor's obligations under the Contract, appropriate licences shall be obtained from the relevant rights owners.

Where any software is provided in the Works, the Contractor shall submit documents showing that appropriate permission or licence has been obtained from relevant beneficial owners of intellectual property rights for the use of the software free of all fees for the whole operating life of the Works.

Where O&M manuals and as-built drawings are submitted, the Contractor shall obtain appropriate permission or licence from relevant beneficial owners of intellectual property rights to allow the Architect, the Employer and the subsequent owners or occupiers of the Works, and all parties responsible for the operation and maintenance of the Works free from all fees to make additional copies of the manuals and drawings in connection with the execution of the Works and/or the subsequent alteration, extension, operation and maintenance thereof.

## **A2.8 DESIGN RESPONSIBILITY**

The Contractor shall design the catering equipment installation to comply with the statutory requirements and the performance requirements in the Specification. The Drawings show the basic requirements. The Contractor shall develop the design

information shown in the Drawings and complete the detailed design and installation details of the catering equipment installation to comply with the requirements of the Specification and the statutory regulations. All design drawings, calculation and installation drawings shall be submitted to the Architect for approval.

## **A2.9 DATE COMPLIANCE**

No value for current or future date/time will cause any interruption to operation which will affect the performance or functionality of all or part of the systems and/or equipment (including any supplied or supported embedded systems, hardware, software, firmware, micro-code and programmes).

## **SECTION A3**

### **Execution of Works**

#### **A3.1 THE INTERNATIONAL SYSTEM OF UNITS (SI)**

The International System of Units (System International d'Unites) of weights and measures shall be used for all materials and equipment.

#### **A3.2 PROGRAMME OF WORK**

The Contractor shall submit a detailed programme of Work showing the Contractor's intended method, stages and order of proceeding with the Work in co-ordination with the building construction programme, together with the period of time he estimated for each and every stage of Work. The programme shall include the following:

- (a) Dates of order of equipment and materials.
- (b) Dates of expected completion of builder's work requirements, i.e. when work site is required to be ready.
- (c) Dates of delivery of equipment and materials to site.
- (d) Dates of commencement and completion of every stage of Work in line with the building construction programme, i.e. each floor level and/or zone area.
- (e) Dates of requirement of temporary facilities necessary for testing & commissioning, e.g. electricity supply, steam, water, town gas etc.
- (f) Dates of completion, testing and commissioning.

Short term programmes showing the detailed work schedules of coming weeks and months shall also be provided to the Architect. Programmes shall be regularly updated to reflect the actual progress and to meet the obligations under the Contract.

In addition, detailed schedules showing the installation drawing submission, equipment offer submission, and commissioning and testing shall be submitted to the Architect for approval. The formats and information of the schedules shall be as required by the Architect.

#### **A3.3 BUILDER'S WORK**

Where there is no Building Contractor carrying out the building work for a particular project, all builder's work for the catering equipment installation shall be carried out by the Contractor.



Where there is a Building Contractor carrying out the building work for a particular project, unless otherwise specified, all builder's work including pipework openings, holes through the building structure, partition walls and all concrete bases, supports, ducts etc. required for the installation as shown in the Drawings will be carried out in the building work by the Building Contractor and free of charge to the Contractor provided that the Contractor shall submit in good time to the Architect for approval, full details of such requirements, so that due consideration may be given before the Building Contractor commences works in the areas concerned. Following approval by the Architect, the Contractor shall be responsible for marking out the exact positions and sizes of all such work and for providing detailed information to the Building Contractor to facilitate him to carry out such work as it proceeds. The Contractor shall check that the work so executed will meet the Contractor's requirements. The Contractor shall be liable for all expenses incurred which are brought about by the Contractor's failure to comply with the above requirements.

Unless otherwise specified, all the electrical and mechanical services terminals including electrical, cold and hot water, steam, gas, drain, exhaust duct etc. required for the final connections of the equipment as shown on Drawings will be carried out by the other services contractors at no cost to the Contractor. The Contractor, however, shall supply and install the final connections to these terminals provided by others.

Any additional builder's work items beyond those already included will also be carried out by the Building Contractor and other services contractors provided that the Contractor shall submit in good time to the Architect for approval, full details of such requirements, so that due consideration may be given before the Building Contractor or other services contractors have commenced work in the areas concerned.

#### **A3.4 COORDINATION OF CONTRACT WORKS**

The Contractor shall coordinate the Contractor's proposed programme of work and the actual work on site with that of the Building Contractor and any other contractors and sub-contractors and shall make any modification reasonably required to suit the coordination or as necessary to the satisfaction of the Architect in order to adhere to the approved overall construction programme.

#### **A3.5 COOPERATION WITH OTHER CONTRACTORS**

The Contractor shall cooperate at all times with the Building Contractor and all other contractors and sub-contractors in order to achieve efficient working on site.

#### **A3.6 SAMPLE BOARD**

Prior to the commencement of installation work, the Contractor shall submit to the Architect for approval in good time a sample board of electrical and mechanical

accessories proposed to be used for the Contract. Each sample shall be firmly fixed onto a rigid wooden or metal board and clearly numbered and labelled. A list shall be affixed to show the item description, make and brand, country of origin and locations of installation (if not generally used). Only samples deemed to comply with the specification shall be displayed and items shall be adequate for the whole installation unless otherwise clearly indicated as outstanding ones to be submitted later. Samples rejected by the Architect shall be replaced as soon as possible. Upon approval of all items in a sample board, the Architect will endorse the list of the sample board and the Contractor shall deliver the sample board to the site office for reference.

### **A3.7      **ADVICE OF ORDER PLACED****

The Contractor shall submit copies of all orders placed for major items of equipment.

**SECTION A4**  
**Information Required from Tenderer**

**A4.1 INFORMATION FURNISHED WITH TENDER**

The Tenderer shall complete the Equipment Schedule attached to the Tender Document and also furnish the following information, where applicable, without which the Tender will be considered incomplete:

- (a) Name of manufacturer, country of manufacture, type and catalogue number, and full technical performance details, of all major items of equipment offered.
- (b) Voltage & frequency of operation, current consumption and heating power in wattage of electric appliances.
- (c) Heating power in wattage and gas consumption of gas appliances.
- (d) Steam pressure of operation, steam temperature, steam consumption and heating power in wattage of steam appliances.
- (e) Water pressure of operation and water consumption of appliances using water.
- (f) Copies of test certificate showing compliance with the specified standards of the offered equipment and materials issued by the British Standards Institution or any other recognized international testing authorities.
- (g) Illustrated technical brochures in English showing all major items of equipment and their installation requirements.
- (h) Details of special builder's works and any special works required to be carried out by others.

**SECTION A5**  
**Drawings and Manuals**

**A5.1 CONTRACT DRAWINGS**

Should the arrangement and dimensions shown in the Drawings be considered inadequate for the Contractor to properly proceed with the work as specified, the Contractor shall draw the Architect's attention to the fact within twenty-eight (28) calendar days after the commencement of the Works together with details of amendments required.

**A5.2 INSTALLATION DRAWINGS**

Installation drawings including manufacturer's shop drawings shall be prepared and submitted to the Architect for perusal by the Contractor in sequence with the Building Contractor's construction programme. They shall contain layout plans, sectional drawings (elevations and plans), isometric views, schematic diagrams, standard details, special details, etc. and shall show the following particulars:

- (a) Construction details of fabricated equipment.
- (b) Electrical and mechanical control circuit diagrams.
- (c) Schematic diagrams.
- (d) Service routings, levels and requirements of the final connections relative to the structure and other services.
- (e) Plant and equipment locations with dimensions and weights.
- (f) Service joints, supports and fixing details together with their locations.
- (g) Location and size of service connections for gas, electricity, water etc; with dimensions.
- (h) Location of drain cocks, overflows, flues etc; with dimensions.
- (i) Maintenance access, facilities and all necessary details relating to the proper operation and maintenance of the systems.

The drawings shall include all design accessories and shall be drawn to match the materials and equipment supplied by the Contractor. Drawings showing details in spatial zones shall be prepared subsequent to proper coordination with the Building Contractor and other trades on site.

All drawings shall be dimensioned in S.I. units and suitably scaled to show all necessary details.

The manufacturer's shop drawings are drawings for equipment or plant to be manufactured by a specialist manufacturing supplier. The drawings shall show detailed construction, principal dimensions and weights, clearances for maintenance, etc.

The Contractor shall submit a detailed installation drawing submission schedule and programme to the Architect. The Contractor shall allow adequate time in the programme for vetting of the installation drawings by the Architect and for drawing re-submissions as necessary.

Four (4) sets of the preliminary installation drawings shall be submitted to the Architect who will then check, endorse and return two (2) sets to the Contractor for onward submission to the Gas Authority for perusal. Works can only be commenced upon receipt of a set of drawings approved by the Architect. Six (6) sets of all such approved drawings shall then be submitted to the Architect.

### **A5.3 BUILDER'S WORK DRAWINGS**

Unless otherwise agreed by the Architect, the Contractor shall submit to the Architect, within six (6) weeks of the award of the Contract, six (6) copies of drawings showing details of all builder's work required for the catering equipment installation, and showing all loads on beams or structures. Such drawings shall clearly indicate the details and positions of all holes, trenches and cutting required for pipework, drains, foundation plinths, ventilation requirements, etc. and construction details for equipment bases.

### **A5.4 AS-FITTED DRAWINGS**

Supply three (3) sets of the first draft prints of as-built drawings at least fifty-six (56) calendar days prior to the commencement of commissioning of the installation/services/equipment. Any details not available at that time (e.g. commissioning and testing results) shall be provided with the penultimate drafts.

The Architect will check the drafts and return a set of marked up copies to the Contractor within forty-two (42) calendar days from the date of submission by the Contractor, together with comments necessary for final and approved documents.

The finalised approved as-built drawings shall be in three (3) sets of microfilm, two (2) sets of computer disk, one (1) set of reproducible copy and four (4) sets of prints, and shall be submitted as soon as possible but not later than one month after the completion of the Contract whichever date is earlier.

The detailed requirements and the media of as-built drawings shall also be as specified in the Preliminaries of the Contract.

### **A5.5 SIZES OF DRAWINGS**

Each drawing submitted shall conform approximately to one or other of the following standard sizes:

- (a) 841 x 1189 mm (A0)
- (b) 594 x 841 mm (A1)
- (c) 420 x 594 mm (A2)
- (d) 297 x 420 mm (A3)
- (e) 210 x 297 mm (A4)

## **A5.6 OPERATION AND MAINTENANCE MANUALS**

Supply three (3) sets of the first draft of operation and maintenance manuals and the lists of recommended spare parts, recommended spare parts for one year's operation and special tools complete with prices to the Architect for comment at least fifty-six (56) calendar days prior to the commissioning and testing of the plant and equipment. Any details not available at that time (e.g. commissioning and testing results) shall be provided with the penultimate drafts.

The Architect will check the draft and return it to the Contractor within forty-two (42) days from the date of submission by the Contractor with comments necessary for final and approved documents.

The three (3) sets of finalised manuals shall be submitted as soon as possible but not later than one month after the installation/services/equipment has been commissioned. One set of the manuals shall be the original.

The detailed requirements, structure and contents of the operation and maintenance manual shall be as specified in the Preliminaries of the Contract. All commissioning and testing results, certificates and record photographs as necessary shall be included in the final manuals. The lists of recommended spare parts and special tools complete with prices shall be included in the final manuals.

The final manuals shall have pages of A4 size with A3 size folded where necessary. The pages shall be of good quality paper that is sufficiently opaque to avoid "see through". Unless otherwise specified in the Preliminaries of the Contract, the manuals shall be bound in durable loose-leaf ring binders of four ring type with hard covers. Where specified, instead of ring binder, the manuals shall be permanently bound and encased in durable hard covers. The manual shall have labels or lettering on the front and spine of the covers. The number of separate manual volumes required depends on the size and complexity of the installation concerned. The Architect's agreement is to be obtained on this at the draft manual stage.

The Contractor shall include a set of original or certified true copies of all the licences required in Section A2.8 for the intellectual property rights in the manuals.

The operation and maintenance manuals shall give details of the following, where applicable:

- (a) the minimum clearance around the appliances necessary to comply with the floor, wall, and, where appropriate, ceiling temperatures specified in the relevant international or BS specification. If the appliance is intended to be installed on a protective base, this shall be stated;
- (b) requirements for fixings to floor or wall;
- (c) requirements for water supply and drainage;
- (d) recommendations for water treatment and method of descaling;
- (e) grade of lubricants;
- (f) data covering adjustments, tolerances, rating of fuses and testing procedure;
- (g) recommended servicing periods based on operating hours or fixed period;
- (h) list of recommended spare parts.

Operation manuals shall be provided with each appliance. The following information shall be given in the manuals:

- (a) procedure and method for operating the appliance;
- (b) recommended day to day servicing by the operator;
- (c) method of stripping and assembly for cleaning;
- (d) recommended cleaning agents;
- (e) warning notice of potential hazards;
- (f) equipment heating up time;
- (g) maximum or minimum loading, including liquid levels.

## SECTION A6 Miscellaneous

### **A6.1 LABELS, DATA PLATES AND WARNING NOTICES**

Labels shall be provided to all pipeworks, valves, electric circuits, metal-clad switches, indicators, cables, internal wiring terminals and all other equipment to facilitate operation and proper maintenance of the installation.

Labels and notices required by statutory requirements shall be inscribed accordingly whereas other labels shall indicate name and purpose of the equipment together with ratings and commissioned set values where applicable.

Labels for equipment identifications shall be made of sandwich plastic material with a red outer layer and a white inner layer. Lettering shall be engraved by cutting away the outer layer to the outline of the required letters or characters, exposing the white layer underneath. All labels shall be in both Chinese and English.

Notices for safety warning and instructions shall be constructed of heavy gauge aluminium sheets painted with symbols or wording as appropriate.

Labels and notices shall be fixed by screws. Where drilling and tapping is impracticable, approved adhesive may be used subject to prior approval by the Architect.

Each cable core shall be cramped at both ends with cable ferrules for identification.

A data plate shall display the information applicable to the appliance. The data plate shall be fixed in such a position that it can be easily read with the appliances in position.

Appliances incorporating an electrical system shall display a circuit diagram of the system, preferably on the inside of the main terminal box cover.

Warning notice sufficiently durable and legible throughout the life of the equipment shall be fixed to the appliance in a prominent position drawing the attention of the operator to any potential hazard.

### **A6.2 PAINTING**

All equipment, appliances, pipeworks, hangers, brackets, supports, etc. which form part of the works shall be painted after erection. Painting shall be done in accordance with the latest edition of "General Specification for Buildings issued by the Architectural Services Department of the Hong Kong Special Administrative Region". Painting materials used on heated surface shall be heat resistant.

Items that do not require to be painted unless otherwise specified shall include:

- (a) Insulated ductwork with aluminium or hammer-clad finish,



- (b) Copper pipework and fitting, (except where specifically stated),
- (c) Stainless steel surface,
- (d) Galvanized pipework, ductwork, conduit or cable tray where concealed within duct shaft or false ceiling,
- (e) UPVC pipework or ductwork,
- (f) Materials with a factory applied anodised, baked enamel or painted finish, provided that the colours are approved prior to application, and
- (g) Insulated pipework or ductwork concealed within duct shaft or false ceiling.

The requirement for painting of all pipework and ductwork is in addition to the colour coding or banding as specified in the latest edition of “General Specification for Air-conditioning, Refrigeration, Ventilation and Central Monitoring and Control System Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region”.

All finishing to factory assembled appliances shall be factory applied in accordance with the manufacturer’s normal practice and to a standard suitable for the duty and location of the appliances.

Where factory applied finishes are approved, the Contractor must obtain from the manufacturer touch-up paint kits and detailed instructions for making good after completion any damage to finishes which may occur during transportation, storage, installation or commissioning.

All surfaces requiring to be painted on site shall generally be painted with one coat of an approved primer, two coats of an approved high gloss-finishing coat. Ferrous surfaces shall be painted with one coat of an approved primer, one coat of an approved undercoat and two coats of an approved high gloss.

### **A6.3 TRAINING OF EMPLOYER’S STAFF**

The Contractor shall provide adequate training to the Employer’s staff at completion of the Works after commissioning of the installation until they are fully familiar with the operation, routine testing and maintenance of the installation.

### **A6.4 EQUIPMENT DATA SHEETS AND CIRCUIT DIAGRAMS**

Unless otherwise specified, within six weeks of signing the contract, the Contractor shall submit three (3) sets of the data sheet and circuit diagram for each of the equipment for approval. The data sheet and circuit diagram shall be included in the operation and maintenance manuals upon approval by the Architect.

The equipment data sheet shall include the important data, such as made, model number, serial number, capacity, rating, power consumption, operating pressure, testing pressure, operating voltage, size, etc.

The circuit diagrams for the electrical, electronic and refrigeration system of equipment shall show all parts used and how they are connected.

#### **A6.5 ELECTRICAL AND MECHANICAL SERVICES CONNECTIONS TO THE CATERING EQUIPMENT**

All mains operated electrical equipment shall be suitable for a supply of 380 V, 3 phases, 50 Hz and 220 V, 1 phase, 50 Hz.

The condition of the steam supply pressure and temperature, cold water supply pressure, town/L.P. gas etc. will be specified in the Particular Specification.

The Contractor should seek the Architect's confirmation of the conditions of services supply prior to the ordering of equipment.

#### **A6.6 SPARES AND TOOLS**

The Contractor shall also supply all the spare parts and special tools required for the whole Maintenance Period for operation and maintenance of the plant and installation. All consumable parts except fuel and water supply shall be included.

Unless otherwise specified, the Contractor shall submit before the certified completion date of the Works a price list for itemized spares and consumables pertaining to all the equipment offered as recommended by the manufacturers for a period of one year's operation and maintenance following the completion of the contract Maintenance Period. The prices listed shall be fixed and open for acceptance up to the end of the maintenance period.

In addition, the Contractor shall submit before the certified completion date of the Works a complete list of all the replaceable parts with model number, part number and price which shall be for purchase and use after the expiration of the Maintenance Period. The list shall be complete with suggested prices.

#### **A6.7 NOISE AND VIBRATION**

The Contractor shall select and offer equipment that do not have any objectionable noise and vibration and shall take all necessary steps to reduce and prevent the transmission of such noise and vibration from the equipment.

#### **A6.8 SAFETY FACILITIES**

Facilities for operational and maintenance safety shall be supplied and installed to comply with the Occupational Safety and Health Ordinance and with the requirements of Labour Department. All moving parts shall be appropriately covered and emergency stops shall be supplied and installed where necessary. Adequate spaces and facilities shall be allowed for maintenance and access.

# **PART B – GENERAL TECHNICAL REQUIREMENTS**

## **SECTION B1** **DESIGN AND CONSTRUCTION**

### **B1.1 COMPONENT CO-ORDINATION**

Equipment shall be made to meet the technical, functional, safety, dimensional and finishing requirements stipulated in the Particular Specification, this General Specification and/or indicated on the Drawings, and be designed on metric system. Equipment for European cooking shall be a dimensionally co-ordinated unit. Unless otherwise specified, it shall be designed to accommodate a range of containers with sizes selected from BS EN 631-1.

### **B1.2 OPERATING CONDITIONS**

Equipment including all components shall be suitable for operation in tropical climatic conditions. These conditions will be  $-5^{\circ}\text{C}$  to  $45^{\circ}\text{C}$  with a corresponding relative humidity of 98%.

### **B1.3 SOUND, RELIABLE AND SAFE CONSTRUCTION**

Equipment, including its components, shall be soundly constructed so that in normal use it is reliable and will operate without danger to the user or damage to the surroundings.

Equipment shall have adequate mechanical strength and be so constructed that it will not deform and will withstand such rough treatment as may be expected in normal use.

Equipment shall be free of sharp edges and pointed protrusions that would be liable to cause injury to personnel or damage to clothing.

Equipment with hot parts shall be properly insulated or designed to avoid direct contact and injury to personnel.

### **B1.4 SAFETY INTERLOCKING DEVICES FOR DOOR, COVER, GUARD, ETC.**

Parts that are intended to be removable by the user, e.g. for cleaning, shall be readily accessible, shall not require the use of tools for their removal, shall be easy to assemble correctly and impossible to assemble incorrectly.

Handles, knobs, hinges, catches, and fittings shall be so constructed and fixed that they do not work loose, deform or break in normal use, or harbour grease or food debris.

Any door, cover or guard accessible to the user which, if opened or displaced could expose the user to danger or injury, shall require a tool to release it or shall be interlocked so that it cannot be opened or displaced until safe conditions have been established.

#### **B1.5 ADJUSTABLE LEGS FOR FLOOR STANDING EQUIPMENT**

Floor standing equipment shall be mounted on pedestal or on legs with adjusters for levelling, with base of the equipment not less than 150 mm clear of the floor.

#### **B1.6 STABILITY REQUIREMENTS**

Equipment, unless designed to be fixed in position, shall comply with the stability requirements given in the relevant International Standards. Any appliance for which there is no specific method of test for stability shall comply with the international standards for a similar type of equipment.

#### **B1.7 ACCESSIBILITY**

Equipment shall be constructed to allow easy access to components requiring periodic cleaning, adjusting and servicing. Access panels shall be provided as specified and indicated on the working drawings and recorded on the as fitted drawings to show the location especially where panels are built-in or concealed.

#### **B1.8 DESIGN AND CONSTRUCTION TO MAINTAIN HYGIENIC CONDITIONS**

Equipment shall be so designed and constructed to permit it to be maintained in a hygienic condition without difficulty. Working surfaces and food compartments shall have smooth surfaces and be free of crevices. Wherever practicable corners shall be rounded. Where applicable, means shall be provided to collect spillage and condensate, e.g. a removable tray under open top boiling rings.

Spaces that are not easily accessible to the user, e.g. spaces between adjacent appliances in 'en-suite' arrangements, shall be sealed to prevent ingress of spillage, dirt and vermin or the space between each appliance shall be sufficient to allow cleaning of adjacent surfaces. Tubular legs and box section material shall be completely sealed.

Equipment e.g. deep fat fryer, that needs to be emptied for cleaning shall be provided with a means for completely draining the contents. Where a draw off tap is provided for this purpose it shall be protected against inadvertent operation.

Unless otherwise specified, steam heating equipment shall be supplied and installed with steam jacket or product having equivalent performance and function to separate steam from direct contact with items being cooked.

## **B1.9 LOCATION OF CONTROLLING DEVICES AND SENSORS**

Suitable types of controlling devices, sensors, starters, etc. shall be supplied and installed in accordance with appropriate international standards so as to facilitate proper operation of the equipment and for maintenance purposes.

All controls mounted on external vertical surfaces of the appliances shall be set into recessed die-stamped stainless steel cups, or otherwise protected and/or guarded to prevent damage, to avoid accidental operation and to shelter from spillage in normal use.

All sensors fixed inside the appliances shall be protected by suitable compartment.

## **B1.10 INSULATION FOR HEATED OR REFRIGERATED APPLIANCES**

Heated or refrigerated appliances shall be thermally insulated to minimise heat losses or heat gains and to prevent direct contact with hot/cold parts. Thermal insulation shall be securely located and protected against mechanical damage, spillage, and sealed against infestation by insects and ingress of fluid.

All hand wheels, knobs and handles for the heated or refrigerated appliances shall be efficiently insulated.

## **B1.11 DESCALING OF WATERWAYS**

It shall be possible to descale all waterways where the formation of scale may occur. The recommended method of descaling shall be given in the manufacturer's servicing instruction.

## **B1.12 NOISE AND VIBRATION LEVEL**

The level of noise and vibration from any source associated with the appliances shall be as low as practicable under all operation conditions.

In particular, no rattles, vibrations, or discreet tones shall be discernible in occupied area outside the room housing the appliance or appliance enclosures. Silencers with insertion losses, sound-sealing panels, isolation and damping devices, etc. shall be supplied and installed if required, to attenuate the noise of the appliances and to damp the vibration of machinery to a reasonable level having regard to the use of the building and works.

## **B1.13 WITHDRAWAL AND RE-INSTALLATION OF INDIVIDUAL APPLIANCE**

The method of construction of 'en-suite' appliances shall permit individual appliance to be withdrawn or re-installed without difficulty.

Modular ‘en-suit’ back-to-back appliances shall incorporate a compartment to accommodate the services to individual appliance.

Appliance connections for external services shall be so positioned that:

- (a) an appliance can be connected and disconnected with the appliance in position. Alternatively for ‘en-suite’ appliances approved flexible connections are acceptable to enable an appliance to be connected and disconnected in the withdrawn position;
- (b) the services can be grouped together and installed clear of the space under the appliances to facilitate cleaning.

#### **B1.14 INSTALLATION OF ELECTRIC ELEMENTS**

Appliances operating with water, such as bain marie and steamer, shall be supplied and installed with immersion type heating elements of sufficient wattage to bear and maintain the water contained in the appliances at a temperature of 98<sup>0</sup>C. The heating elements shall be fitted with water-tight bushings extending through the bottom or side of the appliances. Terminals shall be protected by removable caps. Each element shall be fitted with a thermostat control with a pilot light indicator.

Appliances requiring dry heat, such as plate warmers, shall be fitted with strip or ring heaters of sufficient wattage to provide the desired heat. Unless otherwise specified, these heaters shall be installed directly below the bottom shelf. They are to be mounted in suitable channels and are to be inter-connected with insulated nickel wire. Each appliance shall be provided with one or more thermostatic controls with a pilot light indicator.

All wiring shall be properly protected in enclosures.

#### **B1.15 EARTH AND EQUIPOTENTIAL BONDING OF APPLIANCES**

All electric appliances shall be provided with an earth terminal. This terminal shall provide an effective electrical connection with all exposed metal parts of the unit and shall be effectively connected with the consumer’s earth terminal via the earth-continuity conductor of the final circuit for the appliances.

All fixed appliances shall be provided with a terminal or means for the connection of an external equipotential conductor. This terminal shall maintain an effective electrical connection with all fixed exposed metal parts of the appliances and shall allow the connection of a conductor having nominal cross sectional area up to 6 mm<sup>2</sup>. It shall be located in a position convenient for the connection of the earth conductor after installation of the appliances.

Snap-on type connectors shall not be used to connect conductors that are associated with bonding and earthing of an appliance.

## **B1.16 JOINTS AND FITTINGS IN DIRECT CONTACT WITH HEATED ELEMENTS**

All joints and fittings in direct contact with materials subject to direct burner flame or heater elements shall be brazed or welded.

Copper that is subjected to direct heat shall be of a thickness not less than 1.2 mm. This requirement does not apply to heat exchanger fins that shall be of a thickness not less than 0.8 mm.

Where copper is used for water heating appliances the internal surfaces in contact with water shall be heavily tinned or nickel-plated.

## **B1.17 GENERAL SAFETY, HYGIENIC, OPERATIONAL REQUIREMENTS FOR ELECTRICAL APPLIANCES**

The appliances including its components parts, shall be soundly constructed so that in normal use it will operate without causing danger to the user or damage to the surroundings. Any guard accessible to the user which, if opened or displaced, would expose the user to danger or injury shall require a special tool to release it and be interlocked so that the machine cannot be operated unless the guard is in proper position. A warning notice shall be securely fixed to the appliance in a prominent position for the attention of the operator.

Appliances shall be designed and constructed allowing it to be maintained in a hygienic condition without difficulty. Working surfaces and food compartments shall be smooth and be free of crevices.

Handles, knobs, hinges, catches and fittings shall be so constructed and fixed that they will not become loose, deform or break in normal use or harbour grease or food debris.

The method of construction of 'en-suite' appliances shall permit individual component to be withdrawn and re-installed without difficulty.

The equipment shall be provided with a terminal for the connection of an external equipotential conductor.

The electric motors of the equipment shall have the appropriate motor protection in accordance with the IEE Wiring Regulations.

All mechanical moving parts and cutting surfaces shall be adequately protected with guards.

## **B1.18 DESIGN OF EQUIPMENT, FIXTURES AND APPLIANCES**

The Contractor shall be responsible for the design of the catering equipment, fixtures and appliances to meet with the performance and functional requirements. In particular, the design shall meet with the hygiene requirements in Public Health



and Municipal Service Ordinance and Provision of Municipal Service (Reorganisation) Ordinance, the safety and occupational health requirements in Occupational Safety and Health Ordinance and all the statutory regulations in environmental protection. The Contractor shall allow all facilities and features in the equipment design to meet with the environmental statutory requirements on its own unless otherwise stated. Where a number of catering equipment, fixtures and appliances are provided by the Contractor, the Contractor shall design and coordinate the most appropriate layout and arrangement and submit to the Architect for approval. The design shall take full consideration on the operational flow, steps and requirements in the use of the equipment, fixtures and appliances for catering purpose. Particular attention is required on the difference between preparation of Chinese foods and foods of western style. All design shall meet with the statutory licensing requirements.

## SECTION B2 CONTROLS

### **B2.1 MANUALLY OPERATED CONTROL FOR FUEL ISOLATION**

Fuel consuming appliance shall be provided with one or more manually operated control to enable all fuel consuming components to be isolated from the fuel supply.

### **B2.2 AUTOMATIC CONTROL FOR FUEL CONSERVATION**

Wherever practicable fuel consuming appliances shall incorporate automatic control devices to conserve fuel by reducing latent heat losses and eliminating unnecessary heating when the cooking process is interrupted or completed.

### **B2.3 TIME CONTROL**

Whenever the electrical heating elements or gas burners of the grills, ovens, solid top hot plates, boiling tops, etc. are specified to be under timer control, a variable timer shall be provided and be capable of being reset manually either forward or backwards at any time after the initial setting. The timer shall clearly indicate the time expire period of operation or time remaining. Time setting range shall be in accordance with the maximum cooking process time of individual appliance and as indicated in the appropriate parts or Schedule in the Appendix to the Particular Specification.

### **B2.4 AUTOMATIC PROTECTIVE DEVICES FOR SAFETY REASONS**

Appliances shall incorporate adequate automatic protective devices to ensure that safe conditions are maintained if the normal automatic temperature or pressure controls fail or the power supplied to the appliances be interrupted.

### **B2.5 MINIMUM REQUIREMENT OF PROTECTIVE DEVICES**

#### **B2.5.1 WATER HEATING APPLIANCES**

##### **(a) NON PRESSURE TYPE**

Non-pressure type water heating appliance shall be provided with at least:

- (i) A vent to atmosphere of adequate dimension so that no part of the boiler can exceed atmospheric pressure when operated continuously at maximum heat input.

- (ii) A low water level protective device if no automatic water level control is incorporated in the appliances.

**(b) PRESSURE TYPE**

Water heating appliances of pressure type, including water boilers, steam generators, pressure jacketed boiling pans, and etc. shall be fitted with at least:

- (i) A pressure safety valve
- (ii) A vacuum release valve
- (iii) A pressure gauge
- (iv) A low water level cut-out (except live steam heated boiling pans)
- (v) A water gauge marked with maximum and minimum water level (except boiling pans).

**B2.5.2 Fryers, Deep and Shallow Type**

Gas or electric fryers shall incorporate at least the followings:

- (a) A high temperature limit thermostatic cut out of the manual reset type. A tool shall be required to gain access to the reset mechanism.
- (b) A device to isolate the gas or electricity supply to the burners or heating elements when the tilting pan is displaced from the normal operating position.
- (c) A permanent mark to indicate the maximum oil level and adequate capacity above this level for surge boiling conditions.

**B2.5.3 ELECTRICAL POWER OPERATED APPLIANCES**

Appliances such as mixer, mincer, peeler, chipper, slicer, meat saw, dishwasher, etc., and any appliances that has power driven moving parts or high pressure steam/hot water jets which could be exposed when operating or cleaning the appliances, shall incorporate devices to prevent automatic restarting after a stoppage due to drop in electrical voltage, steam pressure or failure of fuel supply. Overheat safety cut-out shall be provided for electric water heater.

**B2.5.4 GAS APPLIANCES - FLAME FAILURE PROTECTION**

- (a) Main burners in an enclosed or semi-enclosed space shall be provided with an ignition device and flame failure protection devices. It shall not be possible for gas to pass to the main burner until a pilot flame has been established, and the gas to the main burner and pilot burner if fitted, shall automatically cut-off if the pilot flame or other means of igniting the main burner fail.
- (b) Main burners not in an enclosed or semi-enclosed space shall incorporate automatic controls to cut off the gas to the main burner should the pilot flame or other means of igniting the main burner fail.

## **B2.6 SPECIAL CONTROLS FOR GAS APPLIANCES**

Controls, such as timers and thermostats, provided to regulate the cooking process shall not control the gas supply to pilot burners. The manual ON/OFF control and automatic safety cut-out device (if fitted) of a main burner shall also control its associated pilot burner.

Automatic ignition, when specified, shall be of continuous spark fail-safe type by piezo-electrostatic.

## **B2.7 Controls for Steam Operated Appliances**

All steam-heated appliances shall be suitable for the stated working pressures. The Contractor shall supply and install pressure reducing valve sets for those appliances requiring to be operated at lower pressures, each incorporating a direct acting reducing valve with screwed bronze body and bronze excess pressure relief valve. The reducing valve shall be preceded by a Y-type strainer and high and low pressure gauges with isolating valves shall be fitted at the up-and-down-steam of the pressure reducing set. Each pressure reducing set shall be capable of maintaining the required pressure under no-flow conditions.

A bronze stop valve with integral seat, screwed BSP shall be supplied and installed in the steam connection to each item of equipment, and a steam trap set shall be supplied and installed in the condensate discharge connection.

Adjustable thermostatic controls shall be included.

Steam traps serving boiling pans and steam heating coils shall be of the ball-float pattern and shall discharge into the common condensate system. Each compartment of the wet steaming ovens and each of the high-speed ovens shall be drained by a trap of the balanced pressure thermostatic type discharging over the floor gully provided. Ball-float trap shall be preceded by a strainer and followed by a combined sight/check valve, pipe union and stop valve. Strainers shall not be fitted to balanced pressure traps.

**SECTION B3**  
**MATERIALS AND FINISHES**

**B3.1 GENERAL**

Materials used in appliances shall comply with the relevant approved international standards and shall be appropriate to the duty and conditions arising in the part of the appliances in which they are used. All metal components shall be corrosion resistance or be treated to resist corrosion.

**B3.2 MATERIALS IN CONTACT WITH FOOD OR WATER**

Materials that make contact, or are liable to make contact with food shall not cause contamination. All food containers shall be made of high-grade stainless steel and shall have smooth surface and be free of crevices.

**B3.3 EXTERNAL SURFACES**

The external surfaces of appliances shall be of vitreous enamel finishes or manufactured with high-grade stainless steel. The appliances shall have pleasant appearance and all surfaces shall be smooth with no sharp edges and pointed protrusions that would be liable to cause injury to the user or damage to clothing.

**B3.4 TRAYS, SHELVES AND BASKETS**

Trays, shelves and baskets shall be of stainless steel. The compartments shall have smooth surfaces, well rounded corners for ease of cleaning and shall be free from scrap traps.

**B3.5 STAINLESS STEEL**

Unless otherwise specified, stainless steel shall be austenitic 18-8 type No. 304 or 316 having a content of 17-20% chromium, 8-10.5% nickel and a maximum of 0.15% carbon.

The stainless steel shall be free from scale and all surfaces shall be polished to type 4 commercial (satin) finish.

The thickness of stainless steel sheet shall be adequate to support the designed load with a good safety margin. Unless otherwise specified, the thickness of the stainless steel sheet shall be 1.5 mm for top surface, shelving, trays, baskets, sinks, etc; 1.2 mm for exposed front, rear and end sections and 0.85 mm for all internal panel sections. Doors shall be double sided, 1.2 mm thick outside and 0.85 mm thick inside and shall slide easily and silently and be readily removable without the use of tools.

### **B3.6 GALVANIZED IRON**

Galvanized iron shall conform to BS EN 10143 - Continuously hot-dip metal coated steel sheet and strip – tolerances on dimensions and shape. It shall be galvanized on an 8% copper bearing alloy sheet with approved hot pure zinc galvanizing. Where galvanized iron has been welded, all seams shall be leaned and scale removed and finished with a prime coat of aluminium paint.

### **B3.7 WHITE METAL AND ALUMINIUM ALLOY CASTINGS**

Where white metal is specified, a white metal (commercially known as nickel silver) casting is intended. Such metal shall be of corrosion resistant quality having not less than 30% nickel content.

Aluminium alloy casting shall have chemical compositions equal to ISO 3522 Al-Si8Cu3Fe or better.

All castings shall be rough ground, polished and buffed to a bright lustre, free from pits, cold runs, checks, burrs or other surface imperfections.

### **B3.8 VITREOUS ENAMEL FINISHES**

Vitreous enamel finishes shall comply with BS3831 - Vitreous enamel finish.

### **B3.9 ELECTRIC MOTORS FOR APPLIANCES**

All motors shall be of totally enclosed type class F fan cooled, if necessary, having two-hour duty cycle and ball bearings (except small timing motors which may have sleeve bearings). All motors shall have windings impregnated to resist moisture. Motors shall have ample power to operate machines for which they are designated under full load operating conditions without exceeding their rated capacities.

Starting switches shall be provided to match the particular appliances.

All single-phase electrical plug-in appliances shall be equipped with three wire cords. A three-wire core shall be supplied together with the appliances.

All motors of 0.75 kW and over shall be equipped with overload protection.

All motors 0.25 kW and under shall be furnished with a manual starting switch with thermal overload, unless these motors shall be used for devices requiring automatic operations, in which case switches shall be of magnetic type with manual reset.

All motor 0.33 kW and above shall be furnished with magnetic push button station, complete with manual reset.

### **B3.10 THERMAL INSULATION MATERIALS**

Thermal insulating materials shall be inert, non-hygroscopic, non-flammable and shall not give off noxious or toxic fumes. It shall be of any type as specified in the General Specification for Air-conditioning, Refrigeration, Ventilation and Central Monitoring and Control System Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.

**B3.11 COMPONENTS, PIPES AND FITTINGS IN WATER SIDE SYSTEM**

Components, pipes and fittings in water side system shall comply with the General Specification for Building issued by Architectural Services Department of the Hong Kong Special Administrative Region. The installation shall comply with Waterworks Ordinance.

**B3.12 COMPONENTS, PIPES AND FITTINGS IN REFRIGERATION SYSTEM**

Components, pipes and fittings in refrigeration system shall comply with the relevant sections of the General Specification for Air-conditioning, Refrigeration, Ventilation and Central Monitoring and Control System Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.

**B3.13 COMPONENTS, PIPES AND FITTINGS IN FUEL GAS SYSTEM**

Components, pipes and fittings in Town Gas System shall comply with the Codes of Practice published by the Gas Authority, the requirements of the Fire Services Department, Hong Kong and the Operating Procedures published by The Hong Kong and China Gas Co. Ltd.

Components, pipes and fittings in L.P. Gas system shall comply with the General Specification for Liquefied Petroleum Gas Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.

**B3.14 COMPONENTS, PIPES AND FITTINGS IN STEAM SYSTEM**

Components, pipes and fittings in steam system shall comply with the British Standards published by the British Standards Institution or approved equivalent together with any amendments made thereto.

**B3.15 COMPONENTS, CABLES AND FITTINGS IN ELECTRICAL SYSTEM**

Components, cable and fittings in electrical system shall comply with the General Specification for Electrical Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.

### **B3.16 EXHAUST HOODS, FANS AND DUCTWORKS**

Exhaust hoods, fans and ductworks shall comply with the relevant sections of the General Specification for Air-conditioning, Refrigeration, Ventilation and Central Monitoring and Control System Installation in Government Buildings, Hong Kong issued by the Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.



**SECTION B4**  
**SERVICES AND SERVICES CONNECTIONS**

**B4.1 FUEL GAS SUPPLY**

The gas pipe including stop cocks, gas cocks, flexible hoses and all necessary accessories for a complete installation shall be supplied and installed for the connection of appliances to the adjacent gas supply point.

**B4.2 ELECTRICITY SUPPLY**

The electrical supply will be 380/220 volt, 50 Hz unless otherwise specified in the Particular Specification. Equipment not designed for the above voltage shall be provided with a transformer of adequate capacity in compliance with the current IEC 60076 for the appliances.

The electrical load of single-phase appliances shall not exceed 10 kW and three phase appliances shall be balanced as far as practicable. A sufficient length of PVC insulated single core cable enclosed in PVC covered flexible conduit shall be supplied and installed for connection of fixed appliances to the adjacent power supply point.

**B4.3 WATER SUPPLY**

Appliances that require main water supply shall conform to the requirements of the Water Supplies Department.

**B4.4 STEAM SUPPLY**

All steam pipes including insulation, fitting and pressure reducing device shall be supplied and installed for the connection of steam supply point to the appliances requiring steam.

Steam trap equipment complete with accessories shall be supplied and installed for condensing steam drain to the condensate system.

## SECTION B5 SINKS AND FIXTURES

### **B5.1 TAPS, VALVES, FITTINGS, ETC.**

Brass/bronze taps shall be provided for sinks. The taps shall be chromium-plated and provided with ball check to prevent cross flow of hot and cold water. Exposed piping and fittings forming part of the tap assembly shall also be chromium-plated.

Draw-off taps for hot liquids shall be of all metal bodies with insulated handles. Valves, taps and cocks shall be of smooth bore type and capable of being cleaned easily.

### **B5.2 STAINLESS STEEL PIPES AND TUBING**

Whenever stainless steel pipe or tubing is specified, it shall be seamless or welded of gauge specified and of true roundness. Seamless tubing shall be thoroughly and properly annealed, pickled, ground smooth and finished to match adjacent work. Welded tubing shall be thoroughly heated and then drawn true to size and roundness and ground as required. All tubing, where exposed to view, shall be given a final grind of polishing after installation.

### **B5.3 STRUCTURAL STEEL SECTIONS**

All angles, bends, channels or other structural sections used for framing shall be uniform and ductile in quality, free of hard spots, runs, checks, cracks or other surface defects. Where such sections are specified as galvanized or tinned, they shall be done by hot dipped process with all fluxes removed. In the case of galvanized, the finished surface shall be smooth and free from cold runs, blisters and uncoated or scaly patches.

### **B5.4 HANDLES, BRACKETS, LOCKING DEVICES AND HARDWARE**

Wherever appliance is provided with handles, knobs, hinges, brackets or other miscellaneous hardware, they shall be of either heavy satin finish chromium-plated brass or stainless steel, or other alloys as specified.

All drawers, enclosed cabinets and storage bins shall be provided with heavy-duty chromium-plated cylinder type locking devices.

### **B5.5 FASTENERS**

All welds, bolts, screws, springs, washers and nuts shall be of steel, except otherwise specified, in which case they shall either be of brass or stainless steel. Where dissimilar metals are fastened, screws, bolts and nuts shall be such as to ensure suitable fastening and prevent bulging of metals being fastened.

## **B5.6 BOLTS AND SCREWS CONSTRUCTION**

All exposed surfaces on appliances shall wherever possible be free of bolts, screws and rivet heads. Where bolts are used to fasten trim to panelling and body of warmers, cabinets, counters, etc. and in particular to fasten tops of counters, dish tables, etc., to top of framing, such bolts and screws shall be of concealed type. If the threads of bolts and screws wherever inside the fixtures are either visible or possible to come in contact with the hands or wiping cloth, such bolts and screw thread square to be capped with suitable lock washer and chromium-plated brass or bronze acorn nuts. Where screw threads are not visible or readily accessible, they may be capped with standard lock washer and steel nuts to prevent rusting or corroding. When bolts or screws are welded to the underside of trim or top, the reverse side of weld shall be neatly finished and uniform with adjoining trim or top surfaces. Depression at these points will not be acceptable.

## **B5.7 LEGS**

All legs shall be constructed of not less than 38 mm outside diameter 2.0 mm thick stainless steel tubing, cold drawn annealed and pickled, and shall be spaced not more than 1800 mm from centre to centre. All legs shall be of uniform finish.

## **B5.8 LEG CROSS BRACING**

All leg cross bracing, where required, shall be constructed of not less than 25 mm outside diameter stainless steel tubing, cold drawn, annealed and pickled. All cross bracing shall run horizontal and level between all legs, approx. 200 mm above floor unless otherwise specified. All joints shall be completely welded around entire circumference of the tubing to form a complete seal. All welds shall be ground and polished smooth to match adjacent work.

## **B5.9 LEG MOUNTINGS**

Where units are mounted on legs, under-bracing shall be supplied and installed. Legs in all cases shall be provided with sanitary type stainless steel channel braces along full length of respective tops. Channel shall measure approx. 100 mm in width including flanges and 25 mm high. Ends of channel shall be rounded and fully enclosed by welded stamping, matching cross section of channel. Channel shall be projection welded to underside of stainless steel units at intervals of not more than 250 mm and at ends not more than 250 mm from centre to centre. Crevices between channel and underside of unit shall be fully closed and sealed off with filler. Channel braces to receive supporting legs shall be concentric with legs.

## **B5.10 GUSSETS**

Legs shall be held firmly in position by reinforced leg sockets or gussets welded to the underside of channel braces. Gussets shall have stainless steel socket and stainless steel base plate. The stainless steel base plate shall be welded to top.

### **B5.11 UNDER-BRACING**

All stainless steel counters, tables, drain boards and dish table tops shall be braced below with inverted “U” type channels of approx. 100 mm wide and 25 mm high spaced not more than 750 mm on centres and run the whole length of the fixtures.

### **B5.12 CONSTRUCTION OF FEET**

Bottom of legs shall be sealed for sanitation purpose and height of the legs shall be adjustable for levelling. The legs shall be fitted at bottom with sanitary type stainless steel bullet-shaped feet, fully enclosed and with a slightly rounded bottom to protect the floor. Top of each foot shall be fitted with a male threaded stem to fit into the end of the pipe legs and provided with a total adjustment of 40 mm. Bottom of each pipe leg shall be finished off smoothly and overlap the stem to provide sanitary fitting and prevent the accumulation of grease or other debris at this point.

All feet are to have one-piece die-stamped closed bottoms to ensure sanitation.

### **B5.13 UNDER-SHELVING**

Where flat under-shelving is specified, under-shelves shall be constructed of 1.2 mm polished stainless steel. All shelving sides shall be turned down to form a channel shape of size approximately 12 x 38 x 12 mm and with corners cut out to fit contour of leg. Shelving shall be bolted to leg with stainless steel round head bolts. Under-shelving shall be reinforced with 25 x 100 x 25 mm, 2.0 mm thick stainless steel welded channels.

Removable type shelving shall be of the same material, rolled down on all sides, with corners notched to contour of leg, with resulting notches ground and polished smooth. Under-shelving shall be constructed in sections of not more than 1000 mm and where butted against adjoining shelf section, shelving sides shall be turned down to form channel shape approximately 38 mm x 12 mm. Supporting channel shall be furnished on underside of each shelf section and shall be of size approximately 25 x 100 x 25 mm and of stainless steel.

Where slotted under-shelving is specified, it shall consist of a series of stainless steel panels or sections, slotted and with sides of slots turned down to form cross channels. Slots shall be approximately 32 mm wide and channels approximately 75 mm wide. Panels shall have all edges rounded and polished, ground smooth to assure easy cleaning. Panel shall be removable. Panels shall be not more than 750 mm wide in any direction. Slots shall run from front to rear in all cases. Adequate reinforcement shall be provided beneath panels.

### **B5.14 DRAWERS**

Drawer fronts shall be of not less than 1.2 mm thick stainless steel, double pan type, with resulting corners welded, ground and polished smooth. Drawers shall set

into an enclosed 1.2 mm stainless steel vermin-proof housing closed on all sides and bottom, stainless steel channel shaped slides, four (4) ball bearing rollers, two (2) rear, auto stops and release catches. Drawer face shall be provided with recessed stainless steel pull handle welded to face.

Drawers shall be provided with suspension and stop to prevent drawers from pulled out a minimum of two third of their length and support heavy load without deflection. Drawers shall, however, be easily removed without the use of tools.

Refrigerated drawers shall be provided with a full-perimeter soft gasket.

#### **B5.15 WATER INLETS LOCATION**

Water inlets shall be located in all cases above positive water level to prevent siphoning of liquids into the water system.

#### **B5.16 CONSTRUCTION OF PIPE CHASES**

Where it is necessary for plumbing and supply piping to be passed through the base, this piping shall be enclosed in a suitable pipe chase with easily removable access panels. These access panels shall not be held in place with screws or latches, but shall be formed in a pan shape, removable without tools or hinges.

The foregoing only applies to fixtures where an access is required from the front of the fixture, as in the case of sinks. Pipe chases at the end of fixtures containing bottom and intermediate shelves need not be enclosed unless otherwise specified. Unless otherwise specified, shelves in these fixtures shall be turned up a minimum of 75 mm at the edge of the pipe chase.

In detailing fixtures, the Contractor should consult with the building Contractor to ensure that due allowance is made for traps or other controls, particularly under lower shelves that site on masonry bases.

Where plumbing and supply piping pass through shelves on open base tables, shelves shall be neatly punched or die-stamped for the piping. The Contractor shall note the location of such pipe chases or stamped pipe openings, on the plan and/or detailed drawings. These shall be of sufficient size to accommodate all necessary risers so that additional holes need not be cut on site.

#### **B5.17 SLIDING DOORS AND HINGED DOORS**

Sliding doors for cabinets, counters etc. shall be made of not less than 1.2 mm polished stainless steel exterior and not less than 0.85 mm stainless steel interior, unless otherwise specified. Doors shall be equipped with die-stamped recessed stainless steel pull handles. Doors shall be of double pan construction, filled with suitable sound attenuating material of 12 mm thick, with all corners welded, ground and polished smooth to uniform finish. Doors shall be designed to permit removal for cleaning or adjustment without use of tools. Bolts and screws shall be kept to a

minimum and be of corrosion resistant metal. Upper suspension stainless steel rollers shall be heavy duty and ground to minimize wear and noise. Precaution shall be taken in all cases to avoid friction or rubbing between doors, door suspension and upper sliding framework, including hardware. Double doors shall be provided with double overhead tracks and carriers for maximum clear door opening. Units shall be provided with trackless bottom with concealed guide for overhead roller doors. Guides shall be equipped with limit stops to prevent telescoping of doors.

Hinged doors for cabinets, counters, etc. shall be made of polished stainless steel exterior and stainless steel pan-shaped interior, filled with suitable sound attenuating material not less than 12 mm thick, with all corners welded, ground and polished smooth. Doors shall be flush mounted and fitted with stainless steel concealed hospital type offset butt hinges with concealed fasteners. Door handles shall be of stainless steel and flush mounted. Locks and full magnetic door seal shall be provided if particularly specified.

## **B5.18 WELDING**

All welding shall be done by electric fusion, metal-arc method. Stainless steels shall be welded by inert gas, e.g. argon. Carbon-arc or gas welding will not be permitted. All welding shall be done in a thorough manner, with welding rod of same composition as sheets or parts welded. Welds shall be complete welds, strong and ductile, with excess metal ground off and joints finished smooth to match adjoining surface. Welds shall be free of mechanical imperfections such as gas holes, pits, runs, cracks, etc. and shall have same colour as the adjoining surfaces. All joints on tops of fixtures, tables drain boards, exposed shelving, sinks, etc. shall be welded. All tops which are constructed of more than one piece of sheet metal, shall be continuously butt-welded together with welds ground smooth and polished. Butt welds made by spot welding and filling in the voids with solder and finishing by grinding will not be acceptable.

All welded joints shall be homogeneous with the sheet metal itself. Where sheet sizes necessitate a joint, such joint shall be welded. Tops of fixtures shall be fabricated in the factory with welded joints to reduce field joints to a minimum. Where fixtures join, tops of such fixtures shall be continuous with welded joints. All joints made in the field shall be closely butted, pulled together in field, field welded, ground and polished smooth in accordance with Section B5.20 of this General Specification. Tops of fixtures, with welded factory joints, shall be of maximum length to permit bringing of fixtures to their final positions, and to reduce field joints to an absolute minimum. Wherever welds occur on surfaces not finished by grinding and polishing as specified, such welds and the accompanying discoloration shall be suitably coated in factory by means of metallic base paint to prevent the possibility of progressive corrosion to such joints.

## **B5.19 SOLDERING AND BRAZING**

Soldering where required shall be done with solder consisting of 75% pure tin and 25% lead. Stainless steel requiring soldering shall be first thoroughly cleaned of

surface oxides and shall then be applied with a suitable stainless steel soldering flux. After the soldering has been completed, excess or remaining flux shall be passivated clean and the entire soldered joint cleaned with liquid alkaline or neutralizing agent to prevent any attachment on stainless steel by soldering flux.

Particular and special care shall be given to neutralizing all excess soldering flux. In no case shall soldering be relied upon for stability of seams of joints. The soldering shall serve only as a filler to prevent leakage. Soldering shall not at any time be considered as replacing welding or brazing. Solder shall not be used in or on containers or food handling equipment coming in contact with foods.

Brazing shall only be applied to the jointing of brass and bronze connecting fittings, particularly in the case of steam coils. All steam coils requiring dip tinning shall be first brazed with surplus flux removed, so that metal is exposed and then dipped. Low temperature melting silver base hard solder will be considered as the equivalent of brazing.

Brazing or hard silver solder shall not in any event replace a welding operation. Stainless steel to stainless steel joints shall be made by brazing or hard silver soldering using hard solder.

## **B5.20 GRINDING, POLISHING AND FINISHING**

All welded exposed joints shall be suitably ground flush with adjoining material neatly finished to harmonize therewith. Wherever material has been sunken or depressed by welded operation, such depressions shall be suitably hammered and preened flush to adjoining surface, and if necessary, again ground to eliminate low spots. All ground surfaces shall then be polished or buffed to match adjoining surfaces, consistent with good workmanship. Care shall be exercised in all grinding operations to avoid excessive heating of metal and metal discoloration. In all cases grain of rough grinding shall be removed by successive polishing operation. Texture of final polishing operation shall be uniform and smooth, consistent with reasonable care and good workmanship. General finish of all equipment shall be of high grade.

Butt joint and contact joint shall be close fitting and shall not require solder as filler. In no case shall any soldering operation be done where dependence is placed solely on soldering for strength and stability of joint or fixture itself.

Wherever bends occur, they shall be free of undue extrusion and shall not be flaky, scaly or cracked in appearance and where marks are found on uniform surface or material, all such marks shall be removed by suitable grinding, polishing and finishing. Wherever sheared edges occur, they shall be free of burrs, fins, or irregular projections and shall be finished over such sheared edges. Where mitres or bull nose corners occur, they shall be neatly finished with under edge material neatly ground to uniform condition and in no case will overlapping materials be acceptable.

Where a welding operation occurs on stainless steel, the possibility of corrosion shall be entirely eliminated. Ways shall be used to eliminate the possibility of

carbide precipitation. Each joint of welding shall be suitably finished in a bright finish to eliminate possibility of progressive corrosion. Underside of each weld shall be suitably ground or coated to prevent possibility of oxidization and progressive corrosion. Welding done by any process that eliminates or reduces carbide precipitation in connection with bolts and screws need not be so treated.

Wherever welded framing is specified of galvanized or tinned angle or channel construction, welding shall be done before hot galvanized. If galvanized structural sections are used for such a welded framework, welded joints shall be suitably treated by means of metallic coating to cover up all surfaces marred by welding and grinding operations. All iron or galvanized pipe or other parts shall be cleaned and Duco finished in the factory with not less than two (2) coats of Duco Grey or other approved products having equivalent general appearance, performance and functions.

Equipment shall be neatly finished without any scarf, or other manufacturing foreign matter. All external metal surfaces shall be smooth with no sharp angles, and shall be stoved enamel coated, properly painted, or finished. Where stainless steel is specified, exposed surfaces shall be given a finish equal to No. 4 (satin) or product having equivalent general appearance, performance and functions. When manufacturing process and welding disturb the original finish, it shall be carefully reground and polished and restored to match the rest of the surface.

Where specified, all cabinets, doors shelves, whether inside or outside of cabinet and wherever exposed, are to be No. 4 finish. This applies to inside finish of any cabinet having doors or otherwise. An exposed surface shall be interpreted as meaning an inside surface exposed to view when sliding or swinging door is opened. Underside of shelf need not be No. 4 finish but such finish shall be at least equal to No. 80 ground finish. Indication of die markings not blending with final finish will not be acceptable.

## **B5.21 CONSTRUCTION OF SINKS**

All sinks shall be fabricated of not less 1.5 mm polished stainless steel and of the size and design as specified under the particular item. The backs, bottom and front shall be formed of one continuous shell with the ends welded into place. Partitions for compartment sinks shall be of the same materials, electrically welded in place. The partitions shall be of double thickness with a half round top edge.

All corners both vertical and horizontal shall be covered on a minimum 15 mm radius electrically welded, ground smooth and polished. Solder in filleted corners will not be acceptable.

Across the back of all sinks, unless otherwise specified, there shall be a 150 mm minimum high splashback extended backward 25 mm across the top. Ends shall be enclosed. Unless otherwise specified, two tap holes for hot and cold water taps on approximately 200 mm centres shall be provided over the centre line of partitions between compartments, 50 mm approximately from the top of the splash. Drain boards shall be pitched toward sink compartments.



The bottom of each compartment shall have four (4) radial die-stamped grooves pitched to the drain and shall be provided with a heavy-duty standpipe drain plug with removable stainless steel strainer. Connected overflow for drain valve shall be supplied and installed. The drain point shall be suitably located so that the standpipe will not hinder any washing work.

Body shall be mounted on not less than Ø38 mm tubular stainless steel legs fitted with stainless steel adjustable feet. Legs shall be fitted with die-formed, enclosed, sanitary closed gussets. Open type or two sided gussets will not be accepted. These gussets shall be welded to the underside of the sink.

Sink insets shall be of one-piece deep drawn construction of at least 1.6 mm stainless steel with all corners rounded on not less than 15 mm radius. Sinks shall be welded integral with counter tops with no gap between.

All sinks shall be provided with drains and connected overflows. Connected overflow shall be furnished with stainless steel perforated plates constructed so that constant water level is at least 25 mm below dividing partitions. All sinks shall be 360 mm approximately deep unless otherwise specified.

## **B5.22 CONSTRUCTION OF HAND BASINS**

All hand basins shall be constructed with at least 1.6 mm stainless steel, sanitary, ground and smooth, with backsplash. Basin shall be furnished with swivel spout mixing tap and cast brass grid drain plug with tailpiece and completed with anti-siphon trap. Detergent dispensers and paper dispensers for all hand basin units shall be supplied and installed. Dispensers shall be mounted on wall at a convenient level suitable for use.

## **B5.23 CONSTRUCTION OF METAL TABLE TOPS**

Metal tabletops shall be constructed of single pieces of stainless steel sheet not less than 1.6 mm thick, ground smooth, and polished. All working tops on closed base fixtures shall be reinforced on the underside with a framework of at least 40 mm iron channel sections of galvanised steel of same thickness as top. All open base tables shall be reinforced with 40 mm x 40 mm x 3 mm approximately stainless steel angles or alternatively inverted 'U' channels 100 mm wide with 25 mm turn downs of the same thickness as top. Reinforcing sections shall be spaced not more than 750 mm apart.

Cross-angle members or inverted 'U' channels shall be placed at each pair of legs. One angle runner or 'U' channel, running lengthwise, shall be provided on tops up to 750 mm; two provided on all tops over 750 mm. All tops shall be reinforced so that there shall not be any noticeable deflection and all reinforcements shall be stud welded to the underside of the top. No rivets or bolts shall be used through the top.

Field joints shall be provided in the top where necessary and they shall be located for practical construction and consistent with sizes convenient for shipping and accessibility into the building.

All metal tops shall be turned down approximately 50 mm in a box section except where adjacent to walls or other places of equipment. The wall side shall be turned up 150 mm and back 25 mm approximately unless otherwise specified. Ends of this splash shall be closed.

Where tables meet with dish-washing machine or pot washing machine, their sides shall be turned down and a flange shall be provided, arranged so as to permit the bolting of 5 mm neoprene gasket between the flanges and turn down of table forming water tight joint across top edges of tables.

Underside of tables shall be provided with suitable sound attenuating materials, where specified. Sound attenuating materials shall be waterproof. Dish table and sink table shall be provided with sound attenuating materials.

#### **B5.24 CONSTRUCTION OF ENCLOSED BASES**

All enclosed bases or cabinet bodies shall be of a least 1.6 mm stainless steel unless otherwise stated in the Particular Specifications. They shall be enclosed on the ends and sides. The bases shall be reinforced at the top with a framework of 40 mm x 40 mm x 3 mm approximately stainless steel angle or inverted 'U' channel sections with all corners of said framework mitred and welded. Bottom shall be reinforced with channels and gussets where necessary. Additional angles and channel cross members shall be provided to reinforce shelves and support tops. All free corners of enclosed bases or cabinet bodies shall be rounded on 15 mm radius and all corners against walls and other fixtures shall be square.

In the case of fixtures fitted against or between walls, the boxes shall be set in at least 25 mm from the wall line, but the tops will extend back to the wall line. This shall permit adjustment to wall irregularities. A vertical trim strip of the same material as the body shall be provided at each end of the fixture to close the gap between the back edge of the body and the wall, or the end of the body shall extend 25 mm to the wall line.

These fixtures shall be constructed with 150 mm long legs as specified in Section B5.7.

#### **B5.25 CONSTRUCTION OF SHELVES**

All interior shelves in cabinet bodies and enclosed bases shall be constructed of not less than 1.6 mm stainless steel. The front shall be flanged down 50 mm and under 12 mm approximately. The rear and ends shall be turned up approximately 50 mm against the interior of the body. Shelves shall be solid in un-heated bases and shall be perforated in heated bases. Perforations shall be 20 mm in diameter and spaced 100 mm on centres. All shelves shall be rigidly reinforced with angle and/or channel framework to prevent sagging.

The elevated shelves above work tops shall be constructed of not less than 1.2 mm stainless steel. All edges shall be turned adjacent to walls or other fixtures where

they shall be turned up 50 mm approximately. All corners shall be welded and ground smooth. Shelves on wall line shall be mounted on not less than 2.0 mm thick stainless steel brackets. Brackets shall be spaced not more than 900 mm. Shelves over the top of free standing fixture shall be mounted on not less than 25 mm diameter stainless steel uprights or not less than Ø38mm stainless steel tubular stands at the back edge of the fixture with cantilever stainless steel brackets on the top.

#### **B5.26 CONSTRUCTION OF WOOD TOP TABLES**

Where wood top tables are called for, tops shall be not less than 75 mm thick sectional, hard rock, kiln dried maple construction. This shall be constructed of a series of maple strips 32 mm wide and approximately 75 mm thick, bolted by a least 12 mm steel rods spaces approximately 500 mm apart, threaded and fitted with nuts and washers at each end. Bolts to be counter sunk at ends holes filled with maple plugs. Both top and bottom of tabletop shall be sanded down smooth and finished with two (2) coats of hot paraffin. The top shall be tight, homogeneous and warp free. Wood tops shall be mounted on 1.6 mm thick stainless steel channels running front to back.

Where wood baffles are called for, they shall be provided at the ends or backs of tops. Baffles shall be constructed as to terminate in fully cover intersections where baffle meets tabletop.

#### **B5.27 SPLASHBACK**

Stainless steel tables and counters adjacent to building walls, unless otherwise specified, shall be furnished with not less than 150 mm high splashback returned 25 mm approximately to wall with welded closed ends.

## PART C – COMMISSIONING, TESTING & MAINTENANCE

### SECTION C1 ACCEPTANCE TESTING AND COMMISSIONING

#### **C1.1 ADJUSTMENTS, COMMISSIONING, FUNCTIONAL AND PERFORMANCE TESTS**

- (a) The Contractor shall commission the installation and carry out complete functional and performance tests for all equipment and systems installed by the Contractor, make all necessary adjustments, including setting all controls and checking the operation of all protective and safety devices in accordance with the manufacturers' instructions, the requirements of the statutory rules and regulations and to the satisfaction of the Architect before the installations will be accepted. Prior to any tests, the Contractor shall submit detailed procedures and a programme for commissioning and testing to the Architect for approval at least 4 weeks before commencement of commissioning and testing or within six months after commencement of the Contract whichever is earlier.
- (b) The detailed procedures submitted shall follow "Testing and Commissioning Procedure No. 9 for Catering Equipment Installation in Government Buildings, Hong Kong" issued by Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region with additional details and tests proposed by the Contractor to the approval of the Architect and in accordance with the manufacturer's recommendation, relevant standards and statutory regulations.

Commissioning and testing shall include, but not limited to: -

- (i) Factory tests to be witnessed where required
- (ii) Visual inspection and checking
- (iii) Safety and quality tests
- (iv) Commissioning, tuning and adjustment
- (v) Functional tests
- (vi) Performance tests

Visual inspection and checking shall include verification of the installed equipment being the approved models. The Contractor shall submit relevant documents including delivery orders and payment vouchers to substantiate the equipment installed on site being the approved models if the identification of the manufacturer and model name cannot be seen easily on site.

The Contractor shall make a detailed plan on the programme of the commissioning and testing works at the commencement of the Contract, in order to ensure that all of such works can be completed within the Contract period. The commissioning and testing programme submitted shall detail the types of commissioning and testing works required, the breaking down of the programme into area basis, the tests that are required during construction and at the time before the completion of the Works, the period of tests with float time allowed, and the programme for the completion of various builder's works.

- (c) Complete functional tests and performance tests shall be carried out for all appliances provided under the Contract, either by the manufacturers during production or by the Contractor on site. The Contractor shall be responsible to provide the results of the functional tests and performance tests for all non-standard production appliances.
- (d) Functional tests and performance tests shall be carried out by competent and experienced engineers and technicians and shall be in accordance with "Testing and Commissioning Procedure No. 9 for Catering Equipment Installation in Government Buildings, Hong Kong" issued by Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region, BS Specification or other approved international recognised standards, statutory rules and regulations and supply companies' requirements for the particular appliances.
- (e) Performance tests shall include: -
  - (i) Heating up/cooling down time test;
  - (ii) Thermal efficiency test;
  - (iii) Temperature maintenance test;
  - (iv) Test on the proper operation of all functional control devices;
  - (v) Tests on the proper operation of all protective and safety devices;
  - (vi) Tests on the accuracy and proper operation of meters, gauges and other indication devices;
  - (vii) Pressure tests on pressure type components incorporated in an appliance, which operate above atmospheric pressure;
  - (viii) Leakage test on water circuits, steam circuits, refrigeration circuits, fuel gas circuits, fuel oil circuits, etc;
  - (ix) Insulation and earth continuity tests for electrical circuits.
- (d) Functional tests shall include demonstration and tests to prove the functioning of the equipment and installation fulfilling the design intent

and operational requirements. This includes the tests on all switches and control.

(e) Certificate of Test for Pressure Type Appliances:

A certificate of test issued by a competent person shall be provided for each pressure type boiler, steam generator and vessels incorporated in an appliance which operate above atmospheric pressure, in accordance with the Boilers and Pressure Vessels Ordinance, Chapter 56, Laws of Hong Kong.

(f) Certificate of Test of L.P. Gas Appliances:

When it is so required by the Gas Authority, the Contractor shall provide certificate for L.P. gas appliances.

## **C1.2 COMMISSIONING TO ACHIEVE OPTIMUM PERFORMANCE**

After testing and commissioning at completion of installation, the Contractor shall despatch competent and experienced engineers and technicians to carry out further commissioning of all equipment at completion of Works and in Maintenance Period when the equipment are put into operation in accordance with the manufacturer's instructions and "Testing and Commissioning Procedure No. 9 for Catering Equipment Installation in Government Buildings, Hong Kong" issued by Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region. The Contractor shall carry out necessary fine-tuning, adjustment and commissioning to suit the catering operation to achieve optimum performance.

## **C1.3 LABOUR AND MATERIALS REQUIRED FOR FUNCTIONAL/PERFORMANCE TESTS AND COMMISSIONING**

All labour, materials and fuel necessary for carrying out the functional/performance tests and the commissioning shall be provided by the Contractor, except that the Building Contractor will supply electricity and water.

The Contractor shall allow labour, materials and fuel for carrying out overall acceptance test with the users and to provide training to the users on the use and operation of the equipment.

## **C1.4 RESULTS OF TESTS AND CERTIFICATE OF TESTS**

All commissioning and testing results shall be properly recorded during commissioning and testing at the witness of the Architect. Immediately after the commissioning and testing, the Contractor shall endorse the data recorded on site, irrespective whether the tests are successful or not, and submit a copy of the data record sheet to the Architect. A full commissioning and testing report shall be forwarded to the Architect within fourteen (14) calendar days after completion of

commissioning and testing of the installation. The report shall be in accordance with the “Testing and Commissioning Procedure No. 9 for Catering Equipment Installation in Government Buildings, Hong Kong” issued by Building Services Branch of the Architectural Services Department of the Hong Kong Special Administrative Region.

Three (3) copies of the results of tests for all appliances and certificate of tests for pressure type appliances and certificates for L.P. gas appliances signed by authorised or competent person shall be submitted before the hand-over inspection and shall be included in the operation and maintenance manuals.

#### **C1.5 STATUTORY INSPECTION, TEST AND CERTIFICATION**

The Contractor shall allow the costs for arranging all statutory inspections, tests and certification on the acceptance of the equipment and installation. The statutory inspection and test shall be arranged before completion of the Works.

**SECTION C2**  
**MAINTENANCE DURING MAINTENANCE PERIOD**

**C2.1 GENERAL MAINTENANCE REQUIREMENTS**

- (a) The Contractor shall furnish maintenance, free of further charge, for the complete catering equipment installation for the whole Maintenance Period unless otherwise specified. This free maintenance shall include the following services: -
  - (i) Emergency Services
  - (ii) Breakdown Services
  - (iii) Routine Services
  - (iv) Final inspections, tests and maintenance services
  - (v) All the services and requirements in Section C2
- (b) The maintenance of the catering equipment installation shall be carried out by competent personnel provided by the Contractor in accordance with this General Specification and manufacturer's instructions and manuals.
- (c) All inspections, tests, maintenance services and repairs shall be carried out generally in accordance with the manufacturers' recommendations/instructions and to the satisfaction of the Architect. The maintenance service is to maintain the catering equipment installation in a good and functional working condition. The maintenance service shall include preventive maintenance and all spare parts required in the Maintenance Period. The Contractor shall despatch competent and experienced engineers and technicians equipped with the appropriate testing instruments, tools, equipment, etc. to inspect, service, test, adjust and maintain the catering equipment installation in a satisfactory operating condition. The Contractor shall allow for carrying out such inspection, service, testing, adjustment and maintenance at a time outside normal office hours including general holidays.
- (d) All labour and materials necessary including cleaning materials, lubricants, tools, instruments, replacement of parts, etc., and transportation required for carrying out routine and emergency inspections, tests, repairs, replacements and maintenance services shall be included in the Contract. Any renewals or repairs necessitated by reason of negligence or misuse of the equipment or by reason of any other cause beyond the Contractor's control (with the exception of ordinary wear and tear) shall be carried out at an additional cost with prior notice to the Architect.
- (e) The Contractor shall be responsible for all repairs necessary to maintain the catering equipment installation in a safe, reliable and operative condition. The Contractor must ensure that the Contractor's servicing staff shall carry



out the necessary repairs by utilising manufacturer's original replacement parts. The Contractor shall ensure minimum interruption to the operation of the catering equipment installation during each inspection, testing, repair or maintenance service.

- (f) The Contractor shall allow for carrying out emergency, breakdown and routine services at time outside normal office hours including public holidays whenever necessary. The Contractor shall submit a list with at least two names, telephone and pager numbers and addresses of the Contractor's English-speaking and Cantonese-speaking representative to who services calls should be directed.
- (g) The Contractor shall allow all necessary expendable materials such as cleaning fluid, oil, grease, jointing materials, abrasive anti-corrosive, touch up paints, etc., required for the maintenance work.
- (h) The Contractor shall, at the Contractor's own expenses, make all suitable arrangements to avoid damage to property or installations provided by others during the course of the Works. The Contractor shall be responsible for all losses and claims for injury or damage to any person or property arises out of or in consequence of the execution of the maintenance work. The Contractor shall, as and when instructed by the Architect, repair or replace at the Contractor's own cost any part of the installation proved to be defective by reason of Contractor's negligence, faulty design, inadequate routine maintenance and supervision, workmanship or materials. No claim whatsoever shall be made by the Contractor for such repair or replacement if it is within the scope of the Contractor's responsibility.
- (i) During the Maintenance Period, the Contractor shall supply and install without charge to Government replacements for all equipment and parts which in the opinion of the Architect become unserviceable where such un-serviceability is due to faulty materials, workmanship, design, installation or inadequate performance, rating and size of the work provided by the Contractor.
- (j) After each emergency, breakdown and routine inspection, testing and maintenance service, the Contractor shall furnish to the Architect a report complete with the following details: -
  - (i) Date and time of inspection, testing and maintenance service.
  - (ii) Persons carrying out the task.
  - (iii) Details of inspection and maintenance service.
  - (iv) Results of all tests performed.
  - (v) Any external factors significantly affecting the service and test results.
  - (vi) Any follow-up actions as required.

- (k) The Contractor shall carry the final inspection, testing and maintenance of the catering equipment installation at the end of the Maintenance Period to maintain and certify the equipment and installation in a good and functional working condition. In the final inspection, testing and maintenance, all routine services shall be carried out.

## **C2.2 EMERGENCY SERVICES**

- (a) Emergency services shall be rendered if the report involves gas leakage, electricity leakage, explosion, fire hazard or human safety. Notification to the Contractor of the required emergency services will normally be by telephone from the Architect's representative, or the user.
- (b) The Contractor shall make suitable arrangements whereby competent personnel can be despatched for emergency works at any time during the day or night including public holidays, whether true or false, and attending to such calls in the shortest possible time and using the quickest means of transport. In general a response time of less than one hour will be expected unless special arrangement is made and approved for very remote locations.
- (c) Following response to an emergency call the Contractor shall on the next working day submit a written "Emergency Service Report" to the Architect.

## **C2.1 BREAKDOWN SERVICES**

- (a) The Contractor shall make suitable arrangement whereby competent personnel can be despatched for repair works as soon as possible within 24 hours.
- (b) Following response to a breakdown call the Contractor shall submit a "Breakdown Services Report" to the Architect within 7 days after attending to such call.

## **C2.1 ROUTINE SERVICES - GENERAL**

- (a) The Contractor shall carry out the routine services at the 6th month and the 12th month of the Maintenance Period, or at an interval shorter than 6 months as recommended by the manufacturer. The routine services shall include preventive maintenance.
- (b) Before routine maintenance is carried out on site the Contractor shall obtain the Architects' agreement on the programme of routine maintenance, such as date and time taken.
- (c) After the routine maintenance, the Contractor shall furnish to the Architect the "Routine Service Report" within 14 days.

- (d) The routing services shall be carried out in accordance with the manufacturer's instructions where applicable and in compliance with all relevant safety regulations and shall include all works specified in Section C2.5.

## **C2.5 ROUTINE SERVICES - WORKS INCLUDED**

### **(a) Gas/Oil Heated Appliances**

- (i) To check and where necessary correct for adequate provision of combustion and ventilation air for each item of appliance.
- (ii) To clean all combustion spaces up to the appliance outlet and all internal boiler flue passages.
- (iii) To clean and adjust all burner equipment including checking and adjusting burner gas pressure.
- (iv) To check and where necessary correct for satisfactory operation of the gas pilot and ignition device.
- (v) To check and where necessary correct the condition of all exposed flue systems and terminals including the functioning of draught diverters to ensure safe and proper combustion. Where flue pipes have minor defects, these shall be repaired by welding and finished with heat resisting aluminium paint.
- (vi) To check and where necessary correct all gas valves, cocks and taps to ensure that they are gas tight and easy to operate, in proper condition.
- (vii) To check and where necessary correct all pressure and temperature operated valves, flame failure and all other control devices to ensure that they are in proper working condition and are adjusted to give correct control of operation.
- (viii) To check and where necessary correct any water cock that forms an integral part of a gas appliance.
- (ix) To check and where necessary correct the general performance of the appliance.
- (x) To ensure that the appliance, on completion of its inspection and maintenance is not leaking water or gas and is in proper working condition and to the satisfaction of the user.

### **(b) Refrigerated Appliance**

- (i) To check condition of compressor and condenser fan and replace defective and worn-out parts.

- (ii) To clean condenser and remove dirt and dust between fins.
- (iii) To check and refill refrigerant where necessary.
- (iv) To check controls for proper operation.
- (v) To check and correct the general performance of the appliances where necessary.
- (vi) To ensure the appliance is in proper working condition on completion of its routine servicing.

(c) Electric Appliances

- (i) To carry out insulation and earth test to ensure the safe operation.
- (ii) To check all functional controls are in proper operation.
- (iii) To ensure all protective and safety devices are working and set properly.
- (iv) To check components with moving parts and replace defective and worn out parts.
- (v) To check and correct the general performance of the appliances where necessary.
- (vi) To ensure the appliance is in proper working condition on completion of its routine servicing.