

Section 6- Bill of Quantities (“BQ”)

Macau International Airport New Hangar

Construction Cost Summary

	Desciplines	Sum
A0	Site & General Requirements	
A	Architectural	
B	Structural	
C	Plumbing	
D	Drainage	
E	Electrical	
F	Mechanical	
G	Fire Service	
	Total	

Macau International Airport New Hangar

Bills of Quantities

No.	Description	Quantity	Unit	Unit Price	Sum
A0	<p>Site & General Requirements</p> <p>All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.</p> <p>Contrator shall conduct site visits and shall verify the quantities and sizes of all items as required to complete the work in field. All the unit prices proposed by the contractor in this list shall be regarded as fully based on the actual site condition and have taken into consideration all factors that may affect the construction</p> <p>The contractor should submit all necessary documents, certificates, form, etc. as required by CAM for the completion of works.</p> <p>The contractor's work shall comply with all applicable codes and regulations. Where there are conflicts in the regulations, the contractor shall seek clarifications from Authorities having Jurisdictions at no additional cost to the owner.</p> <p>The contractor should apply for the relevant work permit prior to any on site work.</p> <p>The contractor's shall ensure the should apply for the relevant work permit prior to any on site work.</p>				

Macau International Airport New Hangar

Bills of Quantities

No.	Description	Quantity	Unit	Unit Price	Sum
	<p>All materials, equipment, entire installations, etc. should fully satisfy the requirements of Government Authorities, Utility Companies, drawings, material list and specification. Materials as specified or equivalent quality.</p> <p>The contractor has a responsibility to protect the existing above ground and underground facilities and equipment, and maintain a good operation during the construction of the whole project.</p> <p>The contractor should supply & install temporary hoarding (with nice finishing and notice board/signage along the frontage of the work area) and access panels as required by CAM.</p> <p>The contractor shall provide temporary utilities and be responsible for all the cost associated.</p> <p>The contractor should clean the site and remove all surplus materials, rubbish, debris, etc. to legal dumping site on demand and/or upon completion.</p> <p>The contractor should provide and implement all necessary safety and protective precaution measures during execution of works.</p> <p>The contractor shall be responsible for conduct all the required material test as indicated in the drawings, specifications and as required by Owner/Architect.</p>				

Macau International Airport New Hangar

Bills of Quantities

No.	Description	Quantity	Unit	Unit Price	Sum
	<p>The contractor shall provide cross-checking drawings with coordinated mechanical, electrical, plumbing and drainage systems and develop the setting plans of structural slab edge, openings and penetrations for Owner/Architect's approval.</p> <p>All items quoted for the works must be guaranteed for serviceability for at least 10 years from the date of practical completion. No obsolete components should be quoted for these works.</p>				
A0.1	The contractor should supply access, platform/scaffolding, site office, storage, utility, communication instruments, toilets, O&M manual, as-built documents, T&C report, labeling of all installations and equipment, signage and graphic as indicated in drawings, etc.	1	Item		
A0.2	The contractor should supply & install temporary hoarding (no less than 2.5M high), covered walkway structure (no less than 2.5M high), construction barricade and gate, with nice finishing and notice board/signage along the frontage of the work area) and access panels as required by CAM.	900	SQM		
A0.3	Site measurement work, as required to carry out the work. Including allocation of setting outpoints, construction site planning based on contractor's scope of work and all other measurement work required.	1	Item		
A0.4	Demolish and relocate the existing construction, facilities and utilitie lines as indicated in the drawings. Clean the site and remove all debris, rubbish, surplus materials, etc. to legal dumping site per Authorities Having Jurisdiction's guidelines.	1	Item		

Macau International Airport New Hangar

Bills of Quantities

No.	Description	Quantity	Unit	Unit Price	Sum
A0.5	Termite treatment.	1	Item		
A0.6	Contractor to furnish and install airport security fence, as indicated in the drawings. Dimensions and specificaions of the fencing to follow airport standard specifications. Including security gate, control devices, hardwares. Verify gate location with Owner's Representative in field.	110	SQM		
			Sub-total:	MOP	

Macau International Airport New Hangar

Architectural Construction Cost Summary

No.	Catogories	Sum (MOP)
A	Architecture	
A1	Architectural Metal	
A2	Carpentry	
A3	Cladding, Waterproofing & Insulation	
A4	Window and Door	
A5	Interior Finishes and Plaster	
A6	Sanitary Fixtures and Accessories	
A7	Misc	
	Sub-total	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A1	<p>Architectural Metal</p> <p>All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.</p> <p>All systems and model numbers called out are referecens to establish the standard of quality and appearance ONLY. All material or product with equipvalent quality shall be regarded as acceptable.</p> <p>Fit and shop assemble components in largest practical sizes for delivery to site.</p>				
A1.1	<p>Fabricate galvanized steel handrails and guardrails with sizes as shown, closed ends with return bends to wall, smooth bends, with welded construction, except otherwise noted on Drawings. Unit price shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.</p> <p>Standard Structural Steel Shapes, Bars, and Plates: ASTM A36.</p> <p>Steel Pipe Rails: ASTM A53, Grade B.</p> <p>Steel Tubings: ASTM A500 and/or ASTM A501, Grade B.</p> <p>Fasteners and Hardware: ASTM A36.</p>				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
	Exposed Fasteners: Stainless Steel.				
	Painting: As specified in SECTION 09 9000, PAINTING AND COATING.				
A1.1.1	Installed at stair no.1	22.50	M		
A1.1.2	Installed at stair no.2	22.50	M		
A1.1.3	Installed at stair no.3	12.50	M		
A1.1.4	Installed at stair no.4	12.50	M		
A1.1.5	Installed at stair no.5	12.50	M		
A1.2	At Janitor room, supply and install 1.6mm thickness 316 stainless steel plate at side wall of mop sink, 800mm height x 2000mm width, no.4 finish.				
A1.2.1	Ground floor Janitor Room	3.20	SQM		
A1.2.2	First floor Janitor Room	3.20	SQM		
A1.2.3	Second floor Janitor Room	3.20	SQM		
A1.3	Provide fixed access ladder for access to roof. Heavy duty pipe rail consists of 12mm thickness steel flat bar side rails, 10mm steel bent plate and 20mm diameter steel rungs. Mill finish. Size and Slope: As required and as shown on the Drawings. Anchors: As recommended by manufacturer for structure to which ladder is to be attached.	1.00	SET		
		Sub-total:		MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A2	<p>Carpentry</p> <p>All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.</p> <p>All systems and model numbers called out are referecens to establish the standard of quality and appearance ONLY. All material or product with equipvalent quality shall be regarded as acceptable.</p> <p>Fire Retardant Treatment: All lumber and plywood used on the Work, unless otherwise specified, shall comply with AWPA standards for pressure impregnation with fire-retardant chemicals to achieve flame-spread rating of not more than 25 in accordance with ASTM E84 and D2898, or UL Test 723.</p> <p>Complete fabrication of treated items prior to treatment, wherever possible</p> <p>Fabricate all casework with plywood, unless otherwise noted.</p> <p>Refer to Specification Section 064100 for casework and casework hardware specifications.</p> <p>Refer to Specification Section 066116 for solid acrylic polymer surfacing specifications.</p> <p>Conduct termite treatments for all lumbers anf plywoods transferred to the work site.</p>				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A2.1	Supply and fabricate 600mm width, 850 mm high basement cabinet with countertop. Countertop to be 20mm thickness CORIAN or WILSONART or FORMICA solid acrylic polymer surface, including integrate lavatories, as indicated in the drawings. Other exposed surfaces to be finished with NEVAMAR or WILSONART or FORMICA plastic laminte, 1.3mm thickness, color to be choosen by Architect. Including all the hardwares including but no limited to hinges, door and drawer pulls, drawer slides, lock, standard and shelf brackers. Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work. The casework shall be fabricated in accordance with the drawings. Adjust casework dimensions per site condition.				
A2.1.1	Ground Floor Pantry	3.50	M		
A2.1.2	First Floor Pantry	3.00	M		
A2.1.3	Second Floor Pantry	3.00	M		
A2.2	Supply and fabricate 750mm width, 1050 mm high basement cabinet with countertop. Countertop to be 20mm thickness CORIAN or WILSONART or FORMICA solid acrylic polymer surface, including integrate lavatories, as indicated in the drawings. Other exposed surfaces to be finished with NEVAMAR or WILSONART or FORMICA plastic laminte, 1.3mm thickness, color to be choosen by Architect. Including all the hardwares including but no limited to hinges, door and drawer pulls, drawer slides, lock, standard and shelf brackers. Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work. The casework shall be fabricated in accordance with the drawings. Adjust casework dimensions per site condition.				
A2.2.1	Ground Floor Lobby	5.00	M		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A2.3	Supply and fabricate 350mm width, wall basement cabinet to the bottom of ceiling. The bottom of wall cabinet to be 1425mm above the finished floor. All exposed surfaces to be finished with NEVAMAR or WILSONART or FORMICA plastic laminate, 1.3mm thickness, color to be chosen by Architect. Including all the hardware including but not limited to hinges, door and drawer pulls, drawer slides, lock, standard and shelf brackets. Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work. The casework shall be fabricated in accordance with the drawings. Adjust casework dimensions per site condition.				
A2.3.1	Ground Floor Pantry	3.50	M		
A2.3.2	First Floor Pantry	3.00	M		
A2.3.3	Second Floor Pantry	3.00	M		
A2.4	Supply and fabricate 600mm width solid acrylic polymer countertop. 20mm thickness CORIAN or WILSONART or FORMICA solid acrylic polymer surface, including backslash and lavatories holes, as indicated in the drawings. Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work. Adjust countertop dimensions per site condition.				
A2.4.1	Ground Floor Toilet Rooms	3.80	M		
A2.4.2	First Floor Toilet Rooms	3.30	M		
A2.4.3	Second Floor Toilet Rooms	3.30	M		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A2.5	Furnish and install 400mm deep adjustable shelves as indicated in the drawings. 25mm plywood core with plastic laminate finishes. Extra heavy-duty standards and brackets, steel, 20mm wide X 17mm high, 50mm adjustment. Model No. 87-187 standard with #187LL bracket and #211 shelf rest by Knappe & Vogt, or accepted equal. Length of Bracket shall be suitable for the width of specified shelves. Overall size: 1200mm x 900mm.	3.00	Ea		
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A3	Cladding, Waterproofing & Insulation All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work. All systems and model numbers called out are referecens to establish the standard of quality and appearance ONLY. All material or product with equipvalent quality shall be regarded as acceptable. Conduct flood test for all waterproofing membrane. Observe for leakage, drain, correct defects, and re-test until specified results as request by Owner and Architect are obtained.				
A3.1	Waterproofing membrane				
A3.1.1	Supply and install Type1 Rubberized asphalt sheet waterproofing for vertical surfaces. GRACE CONSTRUCTION Bituthene 3000 system or equipvalent, including prefabricated vertical drainage composite, GRACE CONSTRUCTION Hydroduct 220 or equipvalent, including all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	2200.00	SQM		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A3.1.2	Supply and install Type 2 Rubberized asphalt sheet waterproofing. Pre-applied integrally bonded sheet membrane waterproofing applied on prepared subbase and shoring prior to placement of concrete slabs, walls and as shown. GRACE CONSTRUCTION Preprufe 300R or equivalent, Unit price shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	9000.00	SQM		
A3.1.3	Supply and install Type 3 Rubberized asphalt sheet waterproofing. Hot fluid applied rubberized asphalt installed with spunbonded polyester reinforcement. Monolithic Membrane MM6125EV-FR by American Hydrotech, Inc. or equivalent. Including prefabricated vertical drainage composite, GRACE CONSTRUCTION Hydroduct 650 or equivalent. Unit price shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	900.00	SQM		
A3.1.4	Supply and install Type4 Rubberized asphalt sheet waterproofing. Cold applied, self-adhering rubberized asphalt sheet waterproofingn. GRACE CONSTRUCTION Ice and Water Shield or equivalent. Unit price shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work. Used at top of parapet.	30.00	sqm		
A3.1.5	Supply and install Type 5 waterproofing. Vapor barrier per sheet metal wall panel manufacturer. Refer to A3.3.	13050.00	SQM		
A3.1.6	Supply and install Type 6 waterproofing membrane in toilet rooms and showers. LATICRETE#9235 or equivalent, return the membrane at corner of wall 300mm above finished floor. Unit price shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	120.00	SQM		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A3.1.7	Furnish and install water repellent coating at all exposed concrete surfaces. Clear, non-yellowing, penetrating, water-based sealer, Hydrozo ENVIROSEAL 20 as manufactured by BASF/ Hydrozo, Inc., or Sure Klean Weather Seal SL100 as manufactured by ProSoCo, Inc., or accepted equal. Hydrozo ENVIROSEAL 20 or Sure Klean Weather Seal SL100 are specified as a standard of quality. Conduct water test 20 days after the application. The test shall be conducted with a garden type spray nozzle located a measured ten feet (3m) from the coated surface and aimed upward so that water strikes that coated surface at a 45 degree downward angle. The water shall run continuously for two hours. Test water must be collected and contained for proper disposal. Test water may not be discharged into the storm drainage system. Use: at exposed above grade exterior concrete surfaces.	30.00	SQM		
A3.2	Insulation				
A3.2.1	Supply and install Insulation Type 1. Material: 6-1/2 inch (156mm) thick, R=19, unfaced fiberglass, "Thermal Batt Insulation" as manufactured by Owens Corning, or accepted equal. Use: Thermal insulation at annex block exterior walls.	1800.00	SQM		
A3.2.2	Supply and install Insulation Type 2. Material: 3 1/2-inch (90mm) thick, unfaced fiberglass, "Sound Attenuation Batt Insulation" as manufactured by Owens Corning, or accepted equal. Use: Typical Acoustical insulation.	900.00	SQM		
A3.2.3	Supply and install Insulation Type 3. Material: Unfaced semi-rigid mineral fiber felt, thickness as shown and as required. "Thermafiber Safing Insulation", 4-pounds per cubic feet minimum and as required for the specified fire-rating assemblies, as manufactured by Thermafiber LLC, or accepted equal. Comply with ASTM C612, Class 1. Use: Fire Retardant insulation.	2000.00	SQM		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A3.2.4	Supply and install Insulation Type 4. Material: Styrofoam Brand insulation "ROOFMATE", as manufactured by The Dow Chemical Company, extruded polystyrene, rigid board insulation. Thickness: 100mm. Use: Roof insulation under all ballast gravel at annex block.	900.00	SQM		
A3.2.5	Supply and install Insulation Type 5 under sheet metal roof. Product to be per sheet metal roof manufacturer's standard. Refer to A3.3.	8050.00	SQM		
A3.3	Sheet Metal Roof and Wall system				
A3.3.1	Furnish and fabricate aluminum standing seam roof panel system. Outer liner to be Kalzip 65/400 or equivalent. Including all the galvanized steel structural deck, vapor barrier, insulation, clip, anchor bolt, flashing, edge trim, enclosure panel, gutter and all necessary parts.	8050.00	SQM		
A3.3.1	Furnish and fabricate aluminum standing seam wall panel system. Kalzip 65/400 or equivalent. Including all the vapor barrier, clip, anchor bolt, flashing, edge trim, enclosure panel, gutter and all necessary parts.	5000.00	SQM		
A3.4	Joint Sealant				
A3.4.1	Supply and install Type 1 joint sealant. ASTM C920, FS TT-S-00227E Type I, Class A, two-component, gun-grade, self-leveling, with primer, two-part polyurethane, sealant, capable of plus and minus of 25-percent movement. TREMCO THC-900 or equivalent. Including closed cell backing rod.	400.00	M		
	Color to match adjacent area.				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A3.4.2	<p>Use: Exterior, for horizontal joints at paving and paving meeting the building.</p> <p>Supply and install Type 2 joint sealant. ASTM C920, FS TT-S-001543A, single component, gun-grade, non-sagging, silicone sealant, with movement capability plus or minus 50-percent; Dow Corning 795 Silicone Building Sealant, Tremco Spectrem 4-TS or accepted equal.</p> <p>Color to be selected by by Architect.</p> <p>Use: General exterior building sealing, unless otherwise shown or specified.</p>	1000.00	M		
A3.4.3	<p>Supply and install Type 3 joint sealant. ASTM C834, Single component, gun-grade, paintable, acrylic-latex, water-based sealant, Tremco 'Tremflex' 834, Sonneborn of ChemRex Inc., or accepted equal.</p> <p>Color to match adjacent area unless otherwised noted.</p> <p>Use: All interior building sealing, including sound insulated partitions, except as otherwise specified.</p>	1000.00	M		
A3.4.4	<p>Supply and install Type 4 joint sealant, ASTM C920, FS TT-S-001543 A, single component, gun-grade, silicone rubber sealant, mildew-resistant, with movement capability plus or minus 25-percent, Dow-Corning 786, General Electric Sanitary L007, Tremco 'Tremsil' 200, or accepted equal.</p> <p>Color: white.</p> <p>Use: Interior wet areas and sanitary sealant, including but not limited to toilet rooms, showers, lavatories, janitors.</p>	200.00	M		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A3.4.5	Supply and install Type 5 joint sealant , FS TT-S-001543, single component, gun-grade, silicone sealant, with movement capability plus or minus 25-percent, General Electric Construction SCS1200, or accepted equal. Color: To match adjacent surfaces. Use: Countertops.	30.00	M		
A3.4.6	Supply and install Type 6 joint sealant, EMSEAL DSM or equivalent, to be used at below grade slab joints and the joint between building and paving.	400.00	M		
A3.5	FIREPROOFING All fireproofing material shall be free of asbestos and mineral wool fiber Fire-resistance rating of assemblies in accordance with ASTM E119. Frame-spread and smoke development rating for materials in accordance with ASTM E84. Fire hour rating shall be based on the design criteria prescribed by currently Macau Fire Code, NFPA 409, NFPA 220 and NFPA 101 standards.				
A3.5.1	Sprayed on Fireproofing, Beams/Decks. "Monokote MK-6HY as manufactured by the Construction Products Division of W.R. Grace & Co.; or "Pyrolite ", as manufactured by the Carbolite Corporation.	2700.00	SQM		
A3.5.2	Intumescent Fireproofing, Carbolite Nullfire S605 or equivalent;	9000.00	SQM		
A3.5.3	Provide firestopping as required per respective fire assemblies as indicated in the drawings and specifications.	1.00	ITEM		
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A4	<p>Window and Door</p> <p>All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.</p> <p>All systems and model numbers called out are referecens to establish the standard of quality and appearance ONLY. All material or product with equipvalent quality shall be regarded as acceptable.</p> <p>For grade and core construction, comply with the Architectural Woodwork Standard published by Architectural Woodwork Institute (AWI), 2009 edition, for quality standard.</p> <p>Refer to Hardware specifications 087100 for door hardware.</p> <p>Construct and install assemblies to comply with NFPA Standard No. 80, and as specified herein. All fire-rated doors assemblies shall be tested for compliance with National Fire Protection Association (NFPA) Standard 252(1995), "Standard Methods of Fire Tests of Door Assemblies"; UL 10B, FIRE TESTS OF DOOR ASSEMBLIES, or BS476: part 22, and bear the labels.</p>				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
	Aluminum window finishes shall be in accordance with Architectural Specifications 084400 Glazed Assemblies. Painting shall be in accordance with Architectural Specifications 099000 Painting Glass shall be in accordance with Architectural Specifications 088000.				
	Conduct termite treatments for all lumbers and plywoods transferred to the work site.				
A4.1	Non-rated Single leaf wood door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness, with integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Wood door leaf: timber strand structural composite lumber core. Quarter sawn teakwood hardwood face veneer, paint grade. 1-3/4 inch (45mm) thickness. Including all hardware as shown in the Door Hardware Specifications.				
A4.1.1	900x2100mm (7A)	11.00	Leaf		
A4.1.2	900x2100mm; with wood louver; with horizontal 2mm thickness hairline finish stainless steel facing panel as shown (6A)	3.00	Leaf		
A4.1.3	900x2100mm, with vertical 2mm thickness hairline finish stainless steel facing panel as shown; with type 1 glass vision panel (1A)	8.00	Leaf		
A4.1.3	900x2100mm, with horizontal 2mm thickness hairline finish stainless steel facing panel as shown; with type 3 glass half glass panel, with panic hardware (15A)	1.00	Leaf		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A4.2	Non-rated paired wood door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness, with integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Wood door leaf: timber strand structural composite lumber core. Quarter sawn teakwood hardwood face veneer, paint grade. 1-3/4 inch (45mm) thickness. Including all hardware as shown in the Door Hardware Specifications.				
A4.2.1	1800x2100mm, with vertical 2mm thickness hairline finish stainless steel facing panel as shown; with two (2) type 1 glass vision panel (2B)	12.00	Pair		
A4.2.2	1800x2100mm, with two (2) type 1 glass half glazed panel; with panic hardware (12B)	7.00	Pair		
A4.3	30 minutes rated single wood door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness cold-roll sheet steel, with integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Wood door leaf: solid mineral core, hardwood face veneer, paint grade. 1 3/4 inch (45mm) thickness. Including all hardware as shown in the Door Hardware Specifications.				
A4.3.1	900x2100mm, with horizontal 2mm thickness hairline finish stainless steel facing panel as shown; with type 3 glass half glass vision panel, with panic hardware (8A)	12.00	Leaf		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A4.4	1-hour rated single wood door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness cold-roll sheet steel , with integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Wood door leaf: solid mineral core, hardwood face veneer, paint grade. 1 3/4 inch (45mm) thickness. Including all hardware as shown in the Door Hardware Specifications.				
A4.4.1	900x2100mm, with type 3 glass half glass panel, with panic hardware (5A)	2.00	Pair		
A4.4.2	900x2100mm, with DG warning sign, with Non-smoking sign (14A)	1.00	Leaf		
A4.5	1-hour rated paired wood door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness, with integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Wood door leaf: solid mineral core, hardwood face veneer, paint grade. 1 3/4 inch (45mm) thickness. Including all hardware as shown in the Door Hardware Specifications.				
A4.5.1	1800x2100mm, with 2mm thickness hairline finish stainless steel facing panel as shown (3B)	6.00	Pair		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A4.6	Exterior non-rated single steel door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness metallic coated steel sheet, comply with ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF180) zinc-iron-alloy (galvannealed) coating designation. With integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Doors shall have the faces sheets formed from one sheet of steel, the thickness of which shall be 16-gauges (1.6mm) minimum. Galvanize all exterior doors. Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level. 1 3/4 inch (45mm) thickness. Core: Interlocking stiffeners of 0.0299-inch (0.75mm) thick steel plates, channels or Z-shapes extending vertically, full height of door; spaced not more than 6-inch (150mm) centers, and spot welded to the face sheets.				
A4.6.1	900x2100mm, with panic hardware (9D)	11.00	Leaf		
A4.6.2	900x2100mm, with DG warning sign, with Non-Smoking sign (13D)	1.00	Leaf		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A4.7	Exterior non-rated paired steel door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness metallic coated steel sheet, comply with ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF180) zinc-iron-alloy (galvannealed) coating designation. With integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Doors shall have the faces sheets formed from one sheet of steel, the thickness of which shall be 16-gauges (1.6mm) minimum. Galvanize all exterior doors. Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level. 1 3/4 inch (45mm) thickness. Core: Interlocking stiffeners of 0.0299-inch (0.75mm) thick steel channels or Z-shapes extending vertically, full height of door; spaced not more than 6-inch (150mm) centers, and spot welded to the face sheets.				
A4.7.1	1800x2400mm (10C)	6.00	Pair		
A4.7.2	1800x2400mm, with panic hardware (4C)	1.00	Pair		
A4.8	Aluminum entrance door, Vistawall Model 212 Narrow Stile with door sub-frame. Double-leaf single acting, single swing door. With type 2 laminate glass panel; with exterior: E.P.D.M. weather strip meeting ASTM C864.				
A4.8.1	1800x2400, with panic hardware (11C)	1.00	Pair		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A4.9	Exterior 3-hour rated single steel door on hollow metal frame: Hollow metal door frame: one-piece, all joints continuously welded and ground smooth, 16-gauge (1.6mm) minimum thickness metallic coated steel sheet, comply with ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF180) zinc-iron-alloy (galvannealed) coating designation. With integral stops, jambs and trim, and profile as shown. Paint per Painting Specifications. Doors shall have the faces sheets formed from one sheet of steel, the thickness of which shall be 16-gauges (1.6mm) minimum. Galvanize all exterior doors. Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level. 1 3/4 inch (45mm) thickness. Core: Honeycomb-core interlocking stiffeners of 0.0299-inch (0.75mm) thick steel plates, channels or Z-shapes extending vertically, full height of door; spaced not more than 6-inch (150mm) centers, and spot welded to the	2.00	Leaf		
A4.10	WINDOW AND GLAZING				
A4.10.1	Supply and install deep recessed aluminum windows, Vistawall FG-3000 Thermal Multiplane Series-Front Set or equivalent, at all exterior windows. Million size 50mm x 112mm. Glazing system to be type 4 glazing, 1-inch (25mm) thick overall, hermetically dual sealed unit composed of 1/4-inch thick ultra clear heat strengthened outer lite with Low-E solar coating on No. 2 Surface, 1/2-inch air space and 1/4-inch thick heat strengthened ultra clear glass inner lite. Opeable panel to be 30P Series Zero-sightline Vent or accepted equal. Refer to window schedule for shapes and configurations of the windows.	410.00	SQM		
A4.11	LOUVER				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A4.11.1	Supply and install Type 1 extruded aluminum louvers. Model No. DC-7024/A4080, Storm Resistant Fixed Horizontal Louver by Construction Specialties, Inc or accepted equal. Frames and blades to be fabricated from 6063-T5 alloy. Frame components to have a nominal 2mm thickness. Blades to have a 2mm material thickness. PVDF coated to match exterior wall panel finishes. All fasteners to be stainless steel. Including inset screen.	1,800.00	SQM		
A4.11.12	Supply and install Type 2 extruded aluminum louvers. Model No. A-4907, High Performance Drainable Fixed Mullion Louver by Construction Specialties, Inc or equivalent. Frames and blades to be fabricated from 6063-T5 alloy. Frame components to have a nominal 2mm thickness. Blades to have a 2mm material thickness. PVDF coated to match exterior wall panel finishes. All fasteners to be stainless steel. Including inset screen.	120.00	SQM		
A4.11.3	Supply and install Type 3 extruded aluminum louvers penthouse. Model No. 4118 Horizontal Line Louvered Penthouses by Construction Specialties, Inc. or accepted equal. Overall dimensions: 1350x1150x800mm. Frames and blades to be fabricated from 6063-T5 alloy. Frame components to have a nominal 2mm thickness. Blades to have a 2mm material thickness. PVDF coated to match exterior wall panel finishes. All fasteners to be stainless steel. Including inset screen.	1.00	EA		
A4.12	ACCESS DOOR				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A.4.12.1	Floor access door. 3000x2700mm custom made double leaf steel vault access door. The Bilco Company, Type JD, or accepted equal. The vault access door shall be pre-assembled from the manufacturer. Covers shall be 1/4" (6.3mm) steel diamond pattern, reinforced to support a minimum live load of 300 psf with a maximum deflection of 1/150 of the span. Entire door including all hardware components shall be highly corrosion resistant. A continuous EPDM gasket shall be mechanically attached to the frame around the entire perimeter of the cover. Hinges: Through bolted to the covers with tamperproof Type 316 stainless steel lock bolts and to the frame with Type 316 stainless steel bolts and locknuts. Both leafs opens to 175-degrees. Finishes: Mill finished red oxide primed steel to receive painting per 099000 Painting specifications. Including, cylinder lock, gasket, lifting mechanism and all accessories.	1.00	Pair		
A.4.12.2	Supply and install roof hatch door, Bilco Company Model TYPE F or equivalent single leaf manual opening roof hatch. 1220 MM X 1220 MM inside dimension. Cover: 14-gauge(2MM) type 304 stainless steel cover and frame, insulated with 25mm fire retardant and moisture resistant structural insulation. Curb: 12-inch (305mm) high, 14 gauge (2mm) welded stainless steel curb, 1-inch rigid insulation. Brushed stainless steel finish. Hardware: Heavy duty hinge, 90-degree full opening and locking hold-open arms, gas springs, interior and exterior handles, continuous weather seal gasket, welded stainless steel cap flashing. Unit price shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	2.00	Pail		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A.4.12.3	Furnish and install steel access door. Custom made double leaf steel wall flush access door. The access door shall be pre-assembled from the manufacturer. Covers shall be 1/4" (6.3mm) steel diamond pattern. Entire door including all hardware components shall be highly corrosion resistant. Sizes: 2000mm wide x 600 mm height. Frame: Channel frame shall be 1/4" (6mm) steel with full anchor tables around the perimeter. A continuous EPDM gasket shall be mechanically attached to the frame around the entire perimeter of the cover. Hinges: Through bolted to the covers with tamperproof Type 316 stainless steel lock bolts and to the frame with Type 316 stainless steel bolts and locknuts. Both leafs opens to 175-degrees. Finishes: Mill finished red oxide primed steel to receive painting per 099000 Painting specifications. Including, cylinder lock, gasket and all accessories.	2.00	Leaf		
A4.13	Design, material supply and install of the Hangar door panels, motorised heavy duty sliding door (9090x14500mm), including all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	10	nos.		
A4.14	Furnish and install 1 hour rated galvanized steel vertial rolling fire shutters, UL10B or BS 476 part 22 or equivalent standard. CORNELL Fire Door ERD10, or SUZUKI Vertical Rolling Fire Shutter or accepted equal. PVDF finishes. Color to match adjacent area.				
A4.14.1	2100x2400 opening;	6	Ea.		
A4.14.2	1200x2400mm opening;	3	Ea.		
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A5	Interior Finishes and Plaster All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work. All systems and model numbers called out are referecens to establish the standard of quality and appearance ONLY. All material or product with equipvalent quality shall be regarded as acceptable. Refer to Specification Section 066116 for solid acrylic polymer surfacing specifications.				
A5.1	Mortar/ cement screeding/ topping				
A5.1.1	Provide cement sand screed to floors, minimum thickness at any point, >25mm. Cement sand proportions: 1:3				
A5.1.1.1	basement	2500.00	SQM		
A5.1.1.2	ground floor @ annex building	100.00	SQM		
A5.1.1.2	1st floor	765.00	SQM		
A5.1.1.3	2nd floor	765.00	SQM		
A5.1.1.4	1% slope at rooftop of the Annex Building. Pitch as shown in the drawings.	860.00	SQM		
A5.1.2	Supply and install heavy duty industrial floor, 15mm in two layers hard aggregate screed, KORODUR 0/4 or accepted equal.	8535.30	SQM		
			Subtotal:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A5.2	Raised Floor Supply and install heavy duty cementitious infill raised floor system. TATE, TOPTECH, FLEXIBLE SPACE SYSTEMS, or MATRIX raised floor, TATE Concore 3000 or equivalent, 600x600mm stringerbolt system. Finished with electrostatic dissipative epoxy coating system. Installed in equipment rooms.	50	SQM		
			Subtotal:	MOP	
A5.3	Floor finishes				
A5.3.1	Supply and install non-slip thru body floor tile, MIRAGE CERAMICHE, REFIN OR CAESER porcelain tiles. Model number to establish the standard, MIRAGE CERAMICHE SO 06 PIETRACHIARA, non-porous, single fired, porcelain stone tile. R>=12 (DIN 51130). 450x450mm. Thin set bond coat, consisting of latex-cementitious mortar conforming to ANSI A118.4. RONCRETE Ronabond SuperTile Adhesive or equivalent. 3mm epoxy grout in conformance with ANSI A108.6 and A118.3, certified by tile manufacturer as suitable for the type of tiles and use. RONACRETE Ronagrout EPG or equivalent. Use for all floor tiles and floor base.				
A5.3.1.1	ground floor restroom and janitor	50.00	SQM		
A5.3.1.2	1st floor restroom and janitor room	40.00	SQM		
A5.3.1.3	2nd floor restroom and janitor room	40.00	SQM		
A5.3.2	Furnish and install colourless, water-emulsifying two-components epoxy evaporation protection agent, Koropox or equivalent, on heavy duty industrial cementitious floor.	8535.30	SQM		
A5.3.2	Resilient floor type 1. RF-1. Furnish and install NORA, BURKE or JOHNSONITE rubber sheet floor. NORA model NORAPLAN SIGNA 1462 or equivalent, 2mm thick. Including 100 mm high self cove base and aluminum trim. Including all materials and all other work involved.				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A5.3.1.1	ground floor	32.60	SQM		
A5.3.1.2	1st floor	150.00	SQM		
A5.3.1.3	2nd floor	150.00	SQM		
A5.3.12	Supple and install floor mat at entrance, CONSTRUCTION SPECIALTIES INC. (ASIA) Series Peditred SA, or BALCO or CORONET accepted equal, 1000lbs rolling load. Size and dimension as shown.	3.00	SQM		
A5.3.13	Furnish and supply clear finish concrete hardener. Concentrated solution of magnesium silicofluoride and/or zinc silicofluoride. Use: at interior exposed horizontal concrete surfaces.	2400.00	SQM		
A5.3.14	Supply and install crystalline concrete sealer at water tank, 2-layer coating, each coating at 0.75 kg/m2. Brush or spray applied. VANDEX Super or accepted equal. Including waterproofing mortar fillet at all edges. Permeability Testing, CRD-C 48-92. At the completion of the test, the treated specimens (15.2 cm x 15.2 cm) shall not exhibit any water leakage tested for 14 days under 200 psi (462 feet of head pressure [13.8 bar]). Compressive Strength, 3,500 psi 28 days per ASTM C 109. Chemical Resistance, ASTM C 267	1300.00	SQM		
			Subtotal:	MOP	
A5.4	Plaster work				
	Work shall include bond agent, undercoat and final coat.				
	Under coat: cement: portland cement; Lime: sand mix: ready-mixed to BS 4721, using sand to BS 1199, type A. Mix proportions: 1:1:6. Thickness: 10mm at walls and 5mm at soffits.				
	Final coat: Gypsum plaster to BS 1191: Part 1, Class B. Thickness: 5mm				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
	Finish: Smooth				
A5.4.1	Plaster work applied at cast-in-place concrete wall.	2080.00	SQM		
A5.4.1	Plaster work applied at cast-in-place concrete ceiling bottom.	1200.00	SQM		
			Subtotal:	MOP	
A5.5	Wall Finishes				
A5.5.1	Supply and install procelain wall tile, MIRAGE CERAMICHE, REFIN OR CAESER procelain tiles. Model number to establish the standard, MIRAGE CERAMICHE SO 06 PIETRACHIARA, non-porous, single fired, porcelain stone tile. . 450x450mm. Thin set bond coat, consisting of latex-cementitious mortar conforming to ANSI A118.4. RONACRETE Ronabond Tile Adhesive or equivalent. 3mm latex-portland cement Grout: In conformance with ANSI A118.6, certified by the tile manufacturer as suitable for the type of tiles and use. Use for wall tiles installation. Ronafix Colour Grout Powder or equivalent. Use for all wall tiles.				
A5.5.1.1	ground floor restroom and janitor	200.00	SQM		
A5.5.1.2	1st floor restroom and janitor room	200.00	SQM		
A5.5.1.3	2nd floor restroom and janitor room	200.00	SQM		
A5.5.2	Supply and install crystalline cementitious inner lining at water tank, 2-layer coating, 2-layer coating, each coating at 0.75 kg/m2. Brush or spray applied. VANDEX Super or accepted equal. Including waterproofing mortar fillet at all edges. Permeability Testing, CRD-C 48-92. At the completion of the test, the treated specimens (15.2 cm x 15.2 cm) shall not exhibit any water leakage tested for 14 days under 200 psi (462 feet of head pressure [13.8 bar])). Compressive Strength, 3,500 psi 28 days per ASTM C 109. Chemical Resistance, ASTM C 267.	1400.00	SQM		
			Subtotal:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A5.6	Drywall Level of finish: Level 5 by GA214 Apply manufacturer's standard joint filler and skim coat prior to accept painting. Fire resistive rating and number of drywall layer per drawings and applicable code requirements Provide metal stud framing, bracing, bridging as required;				
A5.6.1	Interior partition gypsum board. Fire-Rated Board: Sheetrock Mold Tuff Interior Gypsum Panels by USG or accepted equal, ASTM C36, 1/2-inch, and 5/8-inch thick by 4-foot wide, Type X typical, fire-resistive core, typical at all partitions, unless otherwise noted. Tapered and rounded edges.				
A5.6.1.1	Basement	375.70	SQM		
A5.6.1.2	Ground floor	9825.00	SQM		
A5.6.1.3	1st floor	1989.00	SQM		
A5.6.1.4	2nd floor	1969.60	SQM		
A5.6.2	High-Impact Water Resistant Board: Sheetrock Fiberock Aqua-tough panels by USG or accepted equal, ASTM C1178, Type X, fire-resistive core, 5/8-inch by 4-foot (1200mm) wide outer lining at hangar bay area up to 2400 mm height above finished floor.				
A5.6.2.1	Ground floor	2085.00	SQM		
A.5.6.3	Cement fiber board outer lining, 12.5mm thickness, USG Durock or Kanul USG Aqualpanel or accepted equal. At wet location.				
A5.6.3.1	Ground floor	385.00	SQM		
A5.6.3.2	1st floor	225.00	SQM		
A5.6.3.3	2nd floor	225.00	SQM		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A5.6.4	Exterior Gypsum sheating board: Dens-Glass Gold by G-P Gypsum Corporation, or Securock by USG or accepted equal, ASTM C1177, 1/2-inch thick by 4-foot wide, water-resistant treated core, glass mat facing on both sides and long edges. Square edges.	5000.00	SQM		
A5.6.5	Design, furnish and install metal support/ stud work for interior drywall partitions. Including all bracing, bridging, backing plates and all accessories.	7040.00	SQM		
A5.6.6	Design, furnish and install metal support/ stud work for exterior wall system. Including all bracing, bridging, backing plates and all accessories.	5000.00	SQM		
			Subtotal:	MOP	
A5.7	Wall Paint				
A5.7.1	Non VOC latex pain, ICI Dulux Lifemaster9300 or accepted equal, Eggshell finish, two course face coat, primer LM9116. Color to be selected by Architect.	12000.00	SQM		
			Subtotal:	MOP	
A5.8	Ceiling Finishes				
A5.8.1	Supply and install acoustical ceiling panels, USG or ARMSTRONG or EcoPhone systems. All components shall be products of the same manufacturer. The following model numbers are used to establish a standard of quality and appearance. Grid system to be USG DONN Finline 1/8 Reveal Tee System, DXWT FINELINE PROFILE or accepted equal. Ceiling panel to be Halcyon No. 98225 lay-in panel with NRC 0.95, Class A, or equipbalent. Factory applied washable white acrylic latex paint finish. Unit cost shall including all support frames, trims, accessories.				
A5.8.1.1	Ground floor	80.00	SQM		
A5.8.1.2	1st floor	40.00	SQM		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A5.8.1.3	2nd floor	40.00	SQM		
A5.8.2	Supply and install PVDF finished aluminum linear ceiling. "Box 8" as manufactured by Luxalon to establish the standard of quality and appearance. Roll formed, 0.025 inch thick aluminum with square edges; 7 5/32 inch wide, 5/8 inch deep with 27/32 inch reveal to form a 8 inch module.				
A5.8.2.1	Ground floor	40.00	SQM		
A5.8.2.2	1st floor	40.00	SQM		
A5.8.2.3	2nd floor	40.00	SQM		
A5.8.3	supply and install gypsum board ceiling, Sheetrock Mold Tuff Interior Gypsum Panels by USG or accepted equal, ASTM C36, 1/2-inch (12mm) thick and as shown by 4-foot (1200mm) wide typical at ceiling and soffit only, unless otherwise shown. Tapered and rounded edges. Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	16.00	SQM		
			Subtotal:	MOP	
A5.9	Ceiling Paint				
A5.9.1	Non VOC latex pain, ICI Dulux Lifemaster9300 or accepted equal, flat finish, two course face coat, primer LM9116. Color to be selected by Architect. Use: at annex building gypsum board ceiling and sprav-on fireproofing.	3500.00	SQM		
			Subtotal:	MOP	
A5.10	Acrylic Polymer Shower Unit				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A5.10.1	Solid acrylic polymer shower unit: Fabricate shower receptors in shop to greatest extent practical to sizes and shapes indicated. No seams shall be permitted on all shower receptors and each interior panel. Thickness: Shower Receptors: Profile as shown, 1/2-inch (12.5mm) thick minimum at drain. Shower Interior Panels: 1/4-inch (6mm) thick. Interior dimension: 1475 x 1175mm.	2.00	Set		
			Subtotal:	MOP	
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A6	<p>Sanitary Fixtures and Accessories</p> <p>All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.</p> <p>All systems and model numbers called out are referecens to establish the standard of quality and appearance ONLY. All material or product with equivalent quality shall be regarded as acceptable.</p> <p>Provide tubing supplies, traps, pipe flanges and wastes to wall of not less than #17 gauge (1.35mm) polished chromium-plated brass.</p> <p>All fixtures for handicapped personnel shall be mounted in accordance with 9/83/M SUPRESSÃO DE BARREIRAS ARQUITECTÓNICAS.</p> <p>All plumbing fixtures shall be complete with P-traps, or integral traps. Point up joints between fixtures and wall or floor with white mastic. Mastic shall have sufficient resiliency to prevent cracking or pulling away from wall due to fixture movement.</p>				

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A6.1	Furnish and install wall mounted stainless steel service sink, Elkay wall mounted model ESSB 2118 or accepted equal, 14 gauge (2.0mm), type 304 18-8 stainless steel, 12 inch (305mm) deep single compartment, faucet ledge with two 8" (200mm) center faucet holes, sound dampen underneath, and self-rimming. LK907BR03L2H bucket hook faucet, rough chrome finish. LK173 cast iron drain. Standard P-trap. .	9	SET		
A6.2	Furnish and install wall hang water closet, KOHLER-4330, A/S 2257.103 "Afwall", or equivalent vitreous china, wall hung, 1.6 gallon per flush siphon jet elongated bowl. Sloan Royal 111, or Zurn Z6000-WS1, 1.6 GPF ADA flush valve. Manufacturer's heavy duty white plastic open front seat. Provide floor mount support chair carrier.	18	SET		
A6.3	Furnish and install lavatories, KOHLER-2196-1, A/S 0476s "Aqualyn", or equivalent vitreous china, self rimming with one hole and front overflow.	12	SET		
A6.4	Furnish and install white urinal, KOHLER-4690-ET, American-Standard 6501.010 "Washbrook", or equivalent vitreous china, wall hung with top spud connection, 1.0 gallon per flush. Sloan 186-1, or Zurn Z6003-WS1, or accepted equal. 1.0 GPF flush valve. Provide floor mount support carrier.	6	SET		
A6.5	Faucet and shower heads				
A6.5.1	Furnish and install single level handle faucet, Moen Commercial 8419, or equivalent, with temperature limit stop, and 0.5 GPM vandalproof outlet. Chrome finish.	15	SET		
A6.5.2	Furnish and install shower head, MOEN COMMERCIAL 8348 或 SYMMONS Temptrol® II BP-56-300-B30-V or accepted equal. Equipped with 5 feet metal hose, wall outlet inline vacuum breaker and spray head, wall bracket, showerhead, diverter valve, lever handles, and chrome finish.	2	SET		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A6.5.3	Furnish and install emergency shower and eyewash combination Unit (ESE-1): Haws 8200WC, Guardian GBF-1909, Encon 01050272, or accepted equal. Barrier-free unit with ABS shower head and stay-open ball valve with pull rod no higher than 1200mm above finished floor, ABS receptor with twin eye-face wash heads and push flag operated stay-open ball valve.	1	SET		
A6.6	Toilet Accessories				
A6.6.1	Unless otherwise specified, Model numbers called out below are used to establish a standard of quality, utility and appearance.				
A6.6.2	Furnish and install paper towel dispenser, type 1, BOBRICK B-262 or accepted equal. (PTD1)	6	SET		
A6.6.3	Furnish and install paper towel dispenser, type 2, GA ENMOTION recessed automated touchless tower dispenser or accepted equal.	6	SET		
A6.6.4	Furnish and install grab bar, type, BOBRICK B-6806-24 or accepted equal. (GB1)	2	SET		
A6.6.5	Furnish and install grab bar, type, BOBRICK B-6806-30 or accepted equal. (GB2)	2	SET		
A6.6.6	Furnish and install grab bar, type, BOBRICK B-68137 or accepted equal. (GB3)	2	SET		
A6.6.7	Furnish and install grab bar, type, BOBRICK B-6806-48 or accepted equal. (GB4)	6	SET		
A6.6.8	Furnish and install grab bar, type, BOBRICK B-4998 or accepted equal. (GB5)	6	SET		
A6.6.9	Furnish and install shower curtain rod, BOBRICK B-207-60 or accepted equal. (SCR1)	2	SET		
A6.6.10	Furnish and install towel bar, Bobrick B-530-18 or accepted equal. (TB)	2	SET		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A6.6.11	Furnish and install shower seat. Bobrick B-517/518 or accepted equal. (SS)	2	SET		
A6.6.12	Furnish and install mop holder, Bobrick B-223-24 or accepted equal. (MH)	3	SET		
A6.6.13	Furnish and install toilet paper dispenser, type 1, BOBRICK B-347 or accepted equal. (TPD1)	-	UNIT		
A6.6.14	Furnish and install toilet paper dispenser, type 2, BOBRICK B-3474 or accepted equal. (TPD2)	1	SET		
A6.6.15	Furnish and install toilet paper dispenser, type 3, BOBRICK B-357 or accepted equal. (TPD3)	3	SET		
A6.6.16	Furnish and install toilet paper dispenser, type 4, BOBRICK B-3574 or accepted equal. (TPD4)	6	SET		
A6.6.17	Furnish and install toilet paper dispenser, type 5, BOBRICK B-4288 or accepted equal. (TPD5)	2	SET		
A6.6.18	Furnish and install toilet seat cover dispenser, BOBRICK B-211 or accepted equal. (SCD)	2	SET		
A6.6.19	Furnish and install soap dispenser , type1, deck mounted, BOBRICK B-822 or accepted equal.,. (SD1)	12	Ea		
A6.6.20	Furnish and install soap dispenser , type2, wall mounted, BOBRICK B-4112 or accepted equal.,. (SD2)	6	Ea		
A6.6.21	Furnish and install robe hook, BobrickB-76717 or accepted equal. (RH)	22	Ea		
A6.6.22	Furnish and install mirror, BobrickB-292 1700X1650MM, or accepted equal. (M1)	5	Ea		
A6.6.23	Furnish and install mirror, BobrickB-292 1700X2100MM or accepted equal. (M2)	1	Ea		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A6.6.24	Furnish and sintall automated hand dryer, BOBRICK B-7128 115V TrimLine(tm) Surface-Mounted ADA Dryer or accepted equal. (HD)	6	Ea		
A6.7	Toilet Compartment				
A6.7.1	Toilet cubicle compartment. Solid Color Reinforced Composition Panel: Sierra Series Solid Color Reinforced Composite panels as manufactured by Bobrick Washroom Equipment, Inc., and are used to establish a standard of quality, utility and appearance. Thickness: panels: 12.5mm. Doors and pilasters: 18.75mm. All hardware, fittings, fasteners and accessories to be 18-8, type-304 stainless steel. Manufacturer's Institutional type theft-resistant, heavy-duty operating hardware.				
A6.7.1.1	1500mm(L)x900mm(W)x2400mm(H), including (1) 600mm width door	12	Ea		
A6.7.1.2	2500mm(L)x2400mm(H), including (1) 900m width door	6	Ea		
A6.7.2	Urinal screen. Solid Color Reinforced Composition Panel. 600mm x 1400mm. Sierra Series Solid Color Reinforced Composite panels as manufactured by Bobrick Washroom Equipment, Inc., and are used to establish a standard of quality, utility and appearance. Thickness: panels: 12.5mm. All hardware, fittings, fasteners and accessories to be 18-8, type-304 stainless steel. Manufacturer's Institutional type theft-resistant, heavy-duty operating hardware.	3	Ea		
		Sub-total:		MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A7	<p>Misc</p> <p>All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.</p> <p>All systems and model numbers called out are referecens to establish the standard of quality and appearance ONLY. All material or product with equipvalent quality shall be regarded as acceptable.</p>				
A7.1	Elevator cart interior. Stainless steel wall panel as shown in the drawings. Provide standard ceiling and lighting design options for Architect's review and selection. Floor to match the entrance lobby flooring.	1	ITEM		
A.7.2	<p>Signage</p> <p>Unless otherwise noted. Plaque Size and Symbol: To be determined by Owner. Letter style and size to be determined by Owner. Braille: Stainless steel pin insert, Grade 2. Colors: As required by Code and as selected by Owner.</p>				
A.7.2.1	Toilet /Shower Facility Identifications:				
A.7.2.1.1	Toilet /Shower Facility Door Identifications: Acrylic plaques designating use by Men and Women as noted.	6	Ea		
A.7.2.1.2	Toilet /Shower Facility Accessible Identifications: Acrylic plaques designating use by Men and Women as noted, with grade 2 braille text.	8	Ea		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A.7.2.2	Stair Number Identifications: Acrylic plaques designation stair number and roof access.	11	Ea		
A.7.2.3	Room Name and Room Number Identifications: Acrylic plaques indicating room's name and number. Interior location: Acrylic; Exterior location: Stainless Type 304 18-8.				
A.7.2.3.1	Ground floor	17	Ea		
A.7.2.3.1	First floor	14	Ea		
A.7.2.3.1	Second floor	14	Ea		
A.7.2.4	Exiting Identifications: Acrylic plaques indicating location of exits and direction of travel to exits. Installed on wall adjacent to the elevator on each floor.	3	Ea		
A.7.2.5	Elevator warning signage: Acrylic plaques with notes as required by Code.	3	Ea		
A.7.2.5	Non-smoking warning signage: Acrylic plaques with notes as required by Code.	1	ITEM		
A.7.2.6	Exit door warning signage: Acrylic plaques with notes as required by Code.	19	Ea		
A.7.2.7	Exterior type 316 facility identification. Macau International Airport logo, 15000mm width, 10000mm height, 100mm depth, 2mm thickness. Profile to follow Airport standard specifications.	1	ITEM		
A.7.2.8	DG room identifications: Exterior type 316 plaque with notes as required by code.	1	Ea		

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
A.7.3	Provide and insall fire protective curtian. Curtain shall be of EFP4/1000 type reinforced fabric curtain, consisting of a satin fiberglass fabric with integral stainless steel wire weave and two (2) hour fire retardant polyurethane coating. Curtains shall be in accordance with the requirements as outlined under NFPA 105. Curtain fabric material must has been tested under the UL 1784 standard and BS EN 1634-1, BS 476 Parts 6,7 & 22 and bear UL 10B, 10D, UL S label. Curtain shall be at minimum no less than .054 cm thick.	2,430	SQM		
A7.4	Corner Guard				
A.7.4.1	1. Type 1: PETG corner guard, Model No. "Acrovyn SFS-20N", by Construction Specialties, Inc. or equipvalent, flush mounted. Size: 50mm x 50 mm, unless otherwise shown. Matte finish pebblette grain surface. Provide aluminum closure caps for all Corner Guards. Color: As selected from manufacturer's standard by Architect. Height: 2400mm, typ.	14.00	Ea		
A.7.4.2	Type 2: Same as Type 1, except provide one hour fire barrier. Model No. "Acrovyn SFS-20N 1R" or equipvalent. Height: 2400mm, typ.	0.00	Ea		
A.7.4.3	Type 3: Same as Type 1, except provide two hour fire barrier. Model No. "Acrovyn SFS-20N 2R" or equipvalent. Height: 2400mm, typ.	6.00	Ea		
A.7.4.4	Type 4: stainless steel corner guard, Model No. "LG", by Construction Specialties, Inc. or equipvalent, flush mounted. Size: 75mm x 75 mm, unless otherwise shown. No.4 finish, type 304, 18-8. Used at basement. Height: 2400mm, typ.	16.00	Ea		
A.7.5	25mm~50mm radius gravel, white, @ annex buidling roof.	16.00	Ea		
		SUBTOTAL:	MOP		

Item No.	Description	Quantity	Unit	Unit Price	Sum
B	Structural All steel work and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.				
B1	- Steel Work Structure				
B1.1	Supply and install the following Grade S345 steel work members in accordance with design drawings and technical specification, including welding, installation, hoisting facilities, necessary material and construction procedure.				
	C1 (1000x1000x50x50mm)	400.00	T		
	C2 (UC356x406x340kg/m)	115.00	T		
	PE1 (H150x150x31.5kg/m)	96.00	T		
	Ve1 (H150x150x31.5kg/m)	1.50	T		
	VM1 (UB838x292x226kg/m)	73.00	T		
	VM2 (UB533x210x122kg/m)	151.00	T		
	VM3 (PFC200x75x23.4kg/m)	1.70	T		
	BR1 (UB533x210x122kg/m)	94.00	T		
	BR2 (PFC200x75x23.4kg/m)	30.00	T		
	Staircase (PFC300x90x48.6kg/m)	16.00	T		
B1.2	Supply and install the following Grade S345 steel plate in accordance with design drawings and technical specification, including grade 8.8 anchor bolt, installation, non-shrinkage cement grouting with minimum strength 35Mpa, necessary material and construction procedure.				

Item No.	Description	Quantity	Unit	Unit Price	Sum
B1.3	C1 Column (1450x1450x100mm)	31.00	pcs		
	C2 Column (850x850x50mm)	11.00	pcs		
	C1x VM1 (150x760x16mm)	66.00	pcs		
	VM1xVM2 (150x440x12mm)	194.00	pcs		
	C2 G.PLATE (320.6x188.2x20mm)	66.00	pcs		
	CAP PLATE (403X406.4X16mm)	11.00	pcs		
	VM2xVM2 (150X460X12mm)	6.00	pcs		
	PE1 (170x170x20mm)	12.00	pcs		
	PE1x VM1/VM2 (150x150x16mm)	60.00	pcs		
	VM1/VM2 STIFFENER (501x99.5x10mm)	36.00	pcs		
	C1 X BR1 & BR2 G.PL-20 (712X279X12mm)	20.00	pcs		
	C1X BR1 & BR2 G.PL-20 (1105X279X12mm)	40.00	pcs		
B1.3	Submit steel work material test reports to comply with drawings and specificaiton.	1.00	sum		
B2	Concrete structure				
B2.1	For the safety of excavation work, contractor must provide a temporary lateral support system planning with registered engineer endorsement, including geotechnical calculation, method statement, monitoring, temporary lateral support design and calculation.	1.00	sum		
B2.2	To excavate any soil layer for underground structure, including any underground boulders, facilities, foundation, etc., and cart away excavated debris from site.	1,856.00	m ³		
B2.3	Backfilling with selected sand or approval material, including compaction, necessary material and construction procedure.	3,488.00	m ³		
B2.4	According to shop drawings, supply labor and material to install formwork for each concrete structure member, including temporary supporting, fixing, fittings, necessary material and construction procedure.	13,680.00	m ²		

Item No.	Description	Quantity	Unit	Unit Price	Sum
B2.5	According to shop drawings, supply labor and grade B35 concrete for each structural member, including concrete curing, necessary material and construction procedure.	7,934.00	m ³		
B2.6	Grade B15 blinding concrete.	165.00	m ³		
B2.7	Supply labor and grade A460 NR reinforcing steel bar for each member of concrete structure, including spacer, fixing, necessary material and construction procedure.	1,160.00	T		
B2.8	Backfilling with selected sand or approval material for slab, including compaction, necessary material and construction procedure.	290.00	m ³		
B2.9	Supply and install structural expansion joint.	1,143.00	m		
B2.10	Selected gravel for backfilling.	3,661.00	m ³		
B3	Roof Steel Spaceframe Section 05 12 01 All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional necessary for performance of the work.				
B3.1	Design, material supply and install of the roof steel spaceframe work shown in the spaceframe drawings, including all materials, equipment, labor and all preparation work and additional necessary for performance of the work.	630.00	tons		

Item No.	Description	Quantity	Unit	Unit Price	Sum
B4	Gantry Furnish and install of 3.5Ton overhead gantry system.	1.00	Ea		
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
C	Plumbing All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
C1	Water Supply System Supply and install 'STEK' SK-I or equalivent stainless steel tube/pipe comply with BS standard for water supply, including fittings, supportings, necessary material and construction procedure. DN80 DN40 DN32 DN25 DN15	3 84 14 422 270	m m m m m		
C2	Gate valve DN80 DN40 DN25 DN15	2 2 4 52	Nos Nos Nos Nos		
C3	Non-return valve DN80 DN40	1 1	Nos Nos		
C4	To connect existing public water supply network, including excavation, fittings, necessary material and contruction procedure.	1	lot		
C5	Supply and install water meter.	1	sum		
C6	Supply and install water meter door.	1	lot		
C7	System testing and commissiong.	1	sum		

C8	Provide training and user manual for end user on all aspects of the maintenance and operation of all installations.	1	sum		
C9	Provision for all painting and labelling to all drainage pipes and equipments as all as necessary as required by CAM.	1	sum		
C10	As fitted drawings.	1	sum		
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
D	Drainage				
	All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities, quantities and dimensions defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
D1	Rain water drainage system				
D1.1	Supply and install 'Crown' or equivalent uPVC pipe, comply with BS standard, including necessary material and construction procedure.				
	DN100	22	m		
	DN200	108	m		
	DN225	22	m		
D1.2	According to specification and design drawings, supply and install manholes with cast iron cover, including necessary fittings, material and construction procedure.				
	Size : 1000x1000x1000mm (Depth)	3	Nos		
	Size : 1000x1000x1180mm (Depth)	2	Nos		
	Size : 1000x1000x1190mm (Depth)	2	Nos		
	Size : 1000x1000x1370mm (Depth)	4	Nos		
	Size : 1000x1000x1550mm (Depth)	2	Nos		
	Size : 1000x1000x1730mm (Depth)	2	Nos		
	Size : 1000x1000x1910mm (Depth)	2	Nos		
D1.3	To connect rain water drainage pipe to underground public network, including DN225 concrete pipe, comply with Third Party test requirement, necessary material and construction procedure.	2	lot		
D1.4	Supply and install dia. 200mm floor drain, including necessary fittings, material and construction procedure.	5	Nos		

D1.5	Supply and install 300mm width 'IP Seng' or equalivent cast iron channel cover grating, including necessary material and construction procedure.	304	m			
D2	Sewage drainage system					
D2.1	Supply and install 'Crown' or equalivent uPVC pipe, comply with BS standard, including necessary material and construction procedure.					
	DN50	120	m			
	DN100	277	m			
	DN200	96	m			
	DN225	6	m			
D2.2	According to specification and design drawings, supply and install manholes with cast iron cover, including necessary fittings, material and construction procedure.					
	Size : 500x500x550mm (Depth)	1	Nos			
	Size : 500x500x1000mm (Depth)	1	Nos			
	Size : 1000x1000x1000mm (Depth)	2	Nos			
	Size : 500x500x1170mm (Depth)	1	Nos			
	Size : 1000x1000x1250mm (Depth)	2	Nos			
	Size : 1000x1000x1310mm (Depth)	1	Nos			
	Size : 1000x1000x1350mm (Depth)	1	Nos			
	Size : 1000x1000x1530mm (Depth)	1	Nos			
	Size : 1000x1000x1820mm (Depth)	1	Nos			
	Size : 1000x1000x2070mm (Depth)	1	Nos			
D2.3	To connect sewage drainage pipe to underground public sewage network, including DN225 concrete pipe, coating treatment, comply with Third Party test requirement, necessary material and construction procedure.	2	lot			
D2.4	Supply and install dia. 50mm floor drain, including necessary fittings, material and construction procedure.	44	Nos			
D2.5	Supply and install 300mm width 'IP Seng' or equalivent cast iron channel cover grating, including necessary material and construction procedure.	565	m			
D2.6	Supply and install 'KOSHIN' or equalivent submersible pump, H=10m, Q=280L/min, including control system, cabling, fittings, necessary material and construction procedure.	1	set			
D3	System testing and commissioning.	1	sum			

D4	Provide training and user manual for end user on all aspects of the maintenance and operation of all installations.	1	sum		
D5	Provision for all painting and labelling to all drainage pipes and equipments as all as necessary as required by CAM.	1	sum		
D6	As fitted drawings.	1	sum		
			Sub-total:	MOP	

Macau International Airport New Hangar

Electrical Construction Cost Summary

No.	Catogories	Sum (MOP)
E	Electrical	
E1	Power Distribution	
E2	Access Control System	
E3	Data Network	
E4	Telecommunication	
E5	Public Address System	
E6	CCTV	
E7	Elevator	
	Sub-total	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
E1	Power Distribution				
	All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
E1.1	Distribution Switch Board				
E1.1.1	Q.G.B.T (N/E)	1.00	NO.		
E1.1.2	Q.FS	1.00	NO.		
E1.1.3	Q.FOAM	1.00	NO.		
E1.1.4	Q.SPQ	1.00	NO.		
E1.1.5	Q.1F.A, Q.1F.H, Q2F.A, Q2F.H	4.00	NO.		
E1.1.6	Q.1F.B ~ Q.1F.G	6.00	NO.		
E1.1.7	Q.2F.B ~ Q.2F.G	6.00	NO.		
E1.1.8	"ACIX" Meter box	1.00	NO.		
E1.2	Single Core or Multi-Core Power Cable				
E1.2.1	XV2(3x185+95+T95)	150.00	m		
E1.2.2	XV3x150+95+T95	100.00	m		
E1.2.3	XV3x120+70+T70	200.00	m		
E1.2.4	XV3x95+50+T50	60.00	m		
E1.2.5	XV3x70+35+T35	40.00	m		
E1.2.6	XV3x50+25+T25	200.00	m		

E1.2.7	XV3x2.5+2.5+T2.5	200.00	m		
E1.2.8	XV2x16+T10	1200.00	m		
E1.2.9	FRV3x6+6+T6	300.00	m		
E1.2.10	FRV3x70+35+T35	180.00	m		
E1.2.11	FRV3x95+50+T50	120.00	m		
E1.2.12	FRV3(3x1x400+1x240+T1x240)	180.00	m		
E1.3	Hot-Dip Galvanize Cable Tray				
E1.3.1	CP 1000 x 13mm	400.00	m		
E1.3.2	CP 300 x 13mm	1600.00	m		
E1.4	Socket Outlet and Power Point for Equipment				
E1.4.1	13A Single Socket Outlet	90.00	No.		
E1.4.2	13A Connection Unit for Indoor Unit	100.00	No.		
E1.4.3	32A IP55 3P Socket Outlet	5.00	No.		
E1.4.4	20A IP55 Isolating Switch for Lift	2.00	No.		
E1.4.5	100A IP55 Isolating Switch for Compasd Pump	2.00	No.		
E1.4.6	200A IP55 Isolating Switch for Roller Door	1.00	No.		
E1.4.7	600A IP55 Isolating Switch For HVAC	1.00	No.		
E1.4.8	Floor Box Uint (including 2x13A 3P Socket Outlet and 2x32A IP55 3P Socket Outlet)	8.00	No.		
E1.5	Cable				
E1.5.1	VD20+V2x2.5+T2.5	4800.00	m		
E1.5.2	XV3x25+16+T16	650.00	m		
E1.6	Normal Lighting				
E1.6.1	10A One gang one way switch	55.00	No.		
E1.6.2	10A One gang two way switch	20.00	No.		
E1.7	Lighting Fixture				
E1.7.1	F1	162.00	No.		
E1.7.2	F2	208.00	No.		
E1.7.3	F3	170.00	No.		
E1.7.4	F4	70.00	No.		
E1.7.5	F5	31.00	No.		
E1.7.6	F6	16.00	No.		
E1.7.7	F7	47.00	No.		
E1.7.8	S1	40.00	No.		
E1.7.9	2 Hr. Emergency Battery	100.00	No.		
E1.8	Cable				

E1.8.1	VD20+V2x1.5+T1.5	18500.00	m		
E1.8.2	VD20+V2x2.5+T2.5	7500.00	m		
E1.9	Generator including all the bus chamber, control panel, ducting working etc				
E1.9.1	1250KVA	1.00	No.		
E1.10	400V, 400Hz Transformer	2.00	No.		
E1.11	Other Item not state above:				
		Sub-total:		MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
E2	Access Control System All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
E2.1	Distribution Equipment				
E2.1.1	Central Computer Set	2	NO.		
E2.1.2	Intelligent Controller	14	NO.		
E2.1.3	Card Reader	16	NO.		
E2.1.4	Electric Door Lock	13	NO.		
E2.1.5	Break Glass	12	NO.		
E2.1.6	Door Release Button	11	NO.		
E2.1.7	Switch	2	NO.		
E2.1.8	Software	1	NO.		

E2.1.9	Equipment rack	1	NO.
E2.1.10	UPS(for 30 mins. Operation)	1	NO.
E2.1.11	Other item not stated above		
E2.2	Wiring		
E2.2.1	Multi-core Cables	3000	m
E2.2.2	Outdoor 24 core Fiber cable	1500	m
E2.2.3	Any other items		
		Sub-total:	MOP

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
E3	Data Network All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
E3.1	Distribution Equipment				
E3.1.1	Core Switch	1	NO.		
E3.1.2	Access Switch	3	NO.		
E3.1.3	Data 24 port Patch Panel	9	NO.		
E3.1.4	Data Duplex Outlet	84	NO.		
E3.1.5	Data Single Outlet	20	NO.		
E3.1.6	Fiber 24 port Patch Panel	2	NO.		
E3.1.7	Equipment rack	3	NO.		
E3.1.8	UPS(for 30 mins. Operation)	1	NO.		
E3.2	Wiring				

E3.2.1	CAT 6 cable	10,000	m		
E3.2.2	Outdoor 24 core Fiber cable	1,500	m		
E3.2.3	Other item not stated above				
			Sub-total	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
E4	Telecommunication All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
E4.1	Distribution Equipment				
E4.1.1	CAT5 E cable	11,000	m		
E4.1.2	200 CAT5 E Cable	1,500	m		
E4.1.3	Tel/data Duplex Outlet (TE or approved equipment)	126	NO.		
E4.1.4	300P Connection-BOX	1	NO.		

E4.1.5	100P Connection-BOX	2	NO.		
E4.1.6	Other item not stated above				
			Sub-total	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
E5	Public Address System All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
E5.1	Distribution Equipment				
E5.1.1	Wall-mounted Paging Station with hand-held microphone, 4 Page Codes, DSP and on-board memory	1	NO.		
E5.1.2	Speaker	60	NO.		
E5.1.3	End of Line surface-mountable networked safety device that tests speaker line integrity	3	NO.		
E5.1.4	Message Server supporting message storage and playback, event scheduling, VoIP interface, logging	1	NO.		
E5.1.5	Power Amplifier	1	NO.		
E5.1.6	Audio Input/Output unit	4	NO.		
E5.1.7	CD Player	1	NO.		

E5.1.8	Switch	1	NO.		
E5.1.9	PA System Software	1	NO.		
E5.1.10	Equipment rack	1	NO.		
E5.1.11	UPS(for 30 mins. Operation)	1	NO.		
E5.2	Wiring				
E5.2.1	Speaker cable	6,000	m		
E5.2.2	CAT.5 cable	300	m		
E5.2.3	Audio signal cable	500	m		
E5.2.4	Other item not stated above				
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
E6	CCTV All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
E6.1	Distribution Equipment				
E6.1.1	Pan Tilt Zoom Camera Set	14	NO.		
E6.1.2	Dome Camera Set	24	NO.		
E6.1.3	Housing & bracket	14	NO.		
E6.1.4	Colour 40" LCD monitor	3	NO.		
E6.1.5	Switch	4	NO.		
E6.1.6	Network Recorder	3	NO.		
E6.1.7	Equipment rack	1	NO.		

E6.1.8	UPS(for 30 mins. Operation)	1	NO.		
E6.2	Wiring				
E6.2.1	Signal cable		m		
E6.2.2	CAT.6 cable	3,500	m		
E6.2.3	Other item not stated above				
			Sub-total:	MOP	0.00

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
E7	Elevator All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
E7.1	Supply and installation hangar NO: 1 elevator, including the power supply box, control valve box and testing. The lift system must comply with the EN81, GB7588 and the latest international standards. Computer frequency transformer single control; permanent magnet synchronous gearless traction drive; ≥ 1000 kg load; dock landing: stop layer 3 stations; Car wall: Hairline stainless steel, rear siding with mirror stainless steel; ceiling: hairline stainless steel, configuration, energy-efficient lighting with ventilation / N10S; car manipulation box: round anti-disruptive type micro stainless steel button, LED digital position indicator and directional arrows lattice / CBV-N211; including all passenger elevator standard functions and related equipment in accordance with the technical specifications and functions.	1	Set		
		Sub-total:	MOP		

Macau International Airport New Hangar

Mechanical Construction Cost Summary

No.	Catogories	Sum (MOP)
F	Mechanical	
F1	HVAC system	
F2	Compressed Air system	
	Sub-total	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
F1	HVAC system All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
F1.1	VRV SYSTEM AND SPLIT SYSTEM				
F1.1.1	Supply and installation of "R410A" VRV system (Heat Pump) outdoor unit c/w anti-vibration treatment, additionally refrigerant charge computation base on the length of the refrigerant pipe and all necessary accessories and installation work need to complete the proper operation of the equipment. Brand : DAIKIN or equivalent				
F1.1.1.1	Cooling Capacity : 10.0HP	6	no		
F1.1.1.2	Cooling Capacity : 42.0HP	3	no		
F1.1.1.3	Cooling Capacity : 46.0HP	2	no		

F1.1.2	Supply and installation of VRV indoor unit c/w factory standard decoration panel, filter, remote controller and all necessary accessories and installation work need to complete the proper operation of the equipment. Type : Ceiling Mounted Built-in-type					
F1.1.2.1	Cooling Capacity : 8.0HP	1	nos			
1.2.2	Cooling Capacity : 10.0HP Type : Ceiling Mounted Cassette (Round Flow) type	4	nos			
F1.1.2.3	Cooling Capacity : 2.0HP	3	nos			
F1.1.2.4	Cooling Capacity : 2.5HP	4	nos			
F1.1.2.5	Cooling Capacity : 3.0HP Type : Ceiling Mounted Cassette (Double Flow) type	52	nos			
F1.1.2.6	Cooling Capacity : 2.0HP Type : Outdoor air processing unit	3	nos			
F1.1.2.7	Cooling Capacity : 10.0HP	5	nos			
F1.1.3	Supply and installation of refrigerant pipe for VRV system c/w Flexible Electrometric insulation tube, hot dip galvanized steel support, hanger rod and all necessary accessories and installation work need to complete the proper operation of the system.	1	lot			
F1.1.4	Supply and installation of VRV factory standard refrigerant distributor c/w Flexible Electrometric insulation tube, hot dip galvanized steel support hanger rod and all necessary accessories and installation work need to complete the system.	1	lot			
F1.1.5	Supply and installation of Split unit c/w associated insulated refrigerant pipe, control wiring, factory standard remote controller and all necessary accessories and installation work need to complete the proper operation of the equipment.					

	Type : Wall mounted type				
F1.1.5.1	Cooling Capacity : 1.0HP	2	no		
F1.1.6	Supply and installation of condensate drain pipework, including uPVC Pipe c/w insulation, main raiser's and final connections to the rain/storm water drainage system.	1	lot		
F1.2	MECHANICAL VENTILATING SYSTEM				
F1.2.1	Supply and installation of Ventilator c/w hot dip galvanized support, hanger rod, anti-vibration mounting and all necessary accessories and installation work need to complete the proper operation of the equipment.				
	Type : Propeller Fan				
F1.2.1.1	EF-G-1	1	no		
F1.2.1.2	EF-G-2	1	no		
F1.2.1.3	EF-G-8	1	no		
F1.2.1.4	EF-G-9	1	no		
	Type : In line Duct Fan				
F1.2.1.5	EF-B-1	1	no		
F1.2.1.6	EF-B-2	1	no		
F1.2.1.7	EF-B-3	1	no		
F1.2.1.8	FF-B-1	1	no		
F1.2.1.9	FF-B-2	1	no		
F1.2.1.10	EF-G-3	1	no		
F1.2.1.11	EF-G-4	1	no		
F1.2.1.12	EF-G-5	1	no		
F1.2.1.13	EF-G-6	1	no		
F1.2.1.14	EF-G-7	1	no		
F1.2.1.15	EF-G-10	1	no		
F1.2.1.16	FF-G-1	1	no		
F1.2.1.17	EF-1-1,2-1	1	no		
F1.2.1.18	EF-1-2,2-2	1	no		
F1.2.1.19	EF-1-3,2-3	1	no		
F1.3	AIR DISTRIBUTION SYSTEM				
F1.3.1	Supply & installation of rectangular G.I. duct work including HDG support, hanger rod, fiber glass external insulation and all necessary accessories for the following G.I. Sheet thickness :	1	lot		

F1.3.2	Supply & installation of rectangular G.I. duct work including HDG support, hanger rod and all necessary accessories for the following G.I. Sheet thickness :	1	lot		
F1.3.4	Supply & installation of the following aluminum enamel baked diffuser and louver :	1	lot		
F1.3.5	Supply and installation of G.I. damper c/w 68C fusible link and all necessary accessories, for all ducts passing through slabs or fire rated walls.	1	lot		
F1.4	POWER AND CONTROL SYSTEM				
F1.4.1	Supply & installation of individual wired remote controller /w all related fixing accessories.	72	set		
F1.4.2	Supply and Installation of inter transmission wiring for VRV system /w all related fixing accessories.	1	set		
F1.4.3	supply & install VRV system intelligent central controller c/w all related wiring installation work.	1	no		
F1.4.4	Supply and Installation of exhaust air fan control panels w/ all related power cable and control wiring.	1	set		
F1.5	MISCELLANEOUS				
F1.5.1	Supply and Installation or Japan made "INABA" RD series metal trunking c/w HDG steel support and all related accessories for refrigerant pipework of VRV system on roof top.	1	set		
F1.5.2	Supply and Installation or Japan made "INABA" SD Slimduct c/w all related fittings for exposed pipework of split system on roof top.	1	set		
F1.5.3	Labeling and painting for the above installation work	1	set		
F1.5.4	Perparation of working drawing and as-built drawings	1	set		

F1.5.5	Preparation of operation and instruction manuals	1	set		
F1.5.6	Testing and commissioning	1	set		
F1.6	Other items not enumerated above but work associated (state details)				
			Sub-total:	MOP	

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
F2	Compressed Air system All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work.				
F2.1	Equipment				
F2.1.1	Supply and installation of Rotary screw compressor and all necessary accessories and installation work need to complete the proper operation of the equipment. Brand : CompAir or equivalent Free Air Delivered: 2.6m3/min Working Pressure: 10 Bar	2	set		
F2.1.2	Supply and installation of Refrigerant Air Dryer and all necessary accessories and installation work need to complete the proper operation of the equipment. Brand : CompAir or equivalent Free Air Delivered: 3.6m3/min Working Pressure: 10 Bar Refrigerant: R134a	2	set		

F2.1.3	Supply and installation of Air Receiver and all necessary accessories and installation work need to complete the proper operation of the equipment. Capacity: 600L Working Pressure: 10 Bar	2	set		
F2.2	Pipework and Accessories				
F2.2.1	Compressed Air Pre-Filter Free Air Delivered: 4.9m3/min Max. Working Pressure: 16 Bar	2	Pcs		
F2.2.2	Compressed Air After Filter Free Air Delivered: 4.9m3/min Max. Working Pressure: 16 Bar	2	Pcs		
F2.2.3	Supply and installation of G.I. pipe to B.S. 1387 medium grade and fittings.	1	lot		
F2.2.4	Supply and installation of Stop valve and all work need to complete the system.	1	lot		
F2.2.5	Supply and installation of air outlet connecting coupler.	1	lot		
F2.3	POWER AND CONTROL SYSTEM				
F2.3.1	Supply and Installation of air compressor control panels w/ all related power cable and control wiring.	2	set		
F2.4	MISCELLANEOUS				
F2.4.1	Labeling and painting for the above installation work	1	set		
F2.4.2	Preparation of working drawing and as-built drawings	1	set		
F2.4.3	Preparation of operation and instruction manuals	1	set		
F2.4.4	Testing and commissioning	1	set		
F2.5	Other items not enumerated above but work associated (state details)				

			Sub-total:	MOP

Macau International Airport New Hangar

Bill of Quantities

Item No.	Description	Quantity	Unit	Unit Price	Sum
G	Fire Service All systems and components indicated in the design documents, either listed or not listed below, shall be fully executed by the Contractor in accordance with the qualities and quantities defined in the drawings and specifications. The work to be performed and materials to be employed shall follow the codes and regulations currently enforced in Macau. All materials must be submitted for approval by Macau International Airport Co., Ltd (CAM). Unit prices shall include all materials, equipment, labor and all preparation work and additional cost necessary for performance of the work				
G1	Sprinkler System				
G1.1	Fire pump sets including motors and all necessary accessories: - SP-1 and SP-2 - SJ-1	2 1	no. no.		
G1.2	Fire pump control panels including busbar chambers, fuse-switches, switch fuses and associated trunking, conduits, and cables to the pump motors and main isolator switches: - SPCP	3	no.		
G1.3	Galvanized steel pipes(medium grade) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories: - 25mm dia. - 32mm dia. - 40mm dia. - 50mm dia. - 65mm dia. - 80mm dia. - 100mm dia - 150mm dia. - 50mm dia. (heavy grade)	 2,200 250 100 100 350 600	 m m m m m m m m m		

G1.4	Carbon steel pipes (ERW 430) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories : - 200mm dia.	30	m		
G1.5	Ductile iron pipes (K12) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories: - 100mm dia - 150mm dia. - 200mm dia.		m m m		
G1.6	Gate Valves (including test / flushing valves): - 25mm dia. - 50mm dia. - 80mm dia. - 100mm dia. - 150mm dia. - 200mm dia. - 25mm dia. (PN25) - 150mm dia. (PN25) - 200mm dia. (PN25)	5	no. no. no. no. no. no. no. no. no.		
G1.7	Silent check valves: - 50mm dia. - 100mm dia. - 150mm dia. - 200mm dia. - 50mm dia. (PN25) - 150mm dia. (PN25) - 200mm dia. (PN25)	4	no. no. no. no. no. no. no.		
G1.8	Swing check valves: - 25mm dia. - 150mm dia. - 200mm dia. - 25mm dia. (PN25)	2	no. no. no. no.		
G1.9	Globe valves: - 80mm dia. - 100mm dia. - 150mm dia. - 100mm dia. (PN25) - 150mm dia. (PN25)		no. no. no. no. no.		

G1.10	Pipeline strainers: - 150mm dia. - 200mm dia.	2	no.		
			no.		
G1.11	Pump flexible connectors: - 50mm dia. - 100mm dia. - 200mm dia. - 50mm dia. (PN25) - 150mm dia. (PN25) - 200mm dia. (PN25)	2	no.		
			no.		
		4	no.		
			no.		
			no.		
			no.		
G1.12	Expansion joints : - 50mm dia. - 100mm dia. - 150mm dia. - 200mm dia. - 100mm dia. (PN25) - 150mm dia. (PN25) - 200mm dia. (PN25)		no.		
			no.		
			no.		
			no.		
			no.		
			no.		
			no.		
G1.13	Electrically monitored subsidiary stop valves including micro switches, cables, conduits and all necessary accessories: - 100mm dia - 150mm dia. - 200mm dia. - 150mm dia. (PN25) - 200mm dia. (PN25)	8	no.		
			no.		
		10	no.		
			no.		
			no.		
G1.14	Electrically monitored zone subsidiary stop valves(butterfly valves) including built-in supervisory switches,cables, conduits and all necessary accessories: - 25mm dia. - 50mm dia. - 80mm dia. - 100mm dia - 150mm dia. - 200mm dia. - 25mm dia. (PN25) - 150mm dia. (PN25) - 200mm dia. (PN25)	2	no.		
			no.		
			no.		
			no.		
			no.		
			no.		
			no.		
			no.		
			no.		
G1.15	Alarm valve sets including water motor alarm gongs, valve trim and all necessary accessories:				

	- 80mm dia.		no.		
	- 100mm dia.		no.		
	- 150mm dia.	1	no.		
	- 200mm dia.		no.		
	- 150mm dia. (PN16)		no.		
	- 150mm dia. (PN25)		no.		
G1.16	Sprinkler zone test and drain assemblies including valves, pipework, painting and all necessary accessories :				
	-100 mm dia	5	no.		
G1.17	Sprinkler heads including pipework of 40mm dia.and below :				
	- spray / conventional pattern upright / pendent type (standard response)	1,000	no.		
	- spray / conventional pattern upright / pendent type (quick response)	50	no.		
	- concealed type (quick response)		no.		
	-flush/recessed type (quick response)		no.		
	- flat spray type (standard / quick response)		no.		
	- sidewall type (standard response)		no.		
	- sidewall type (quick response)		no.		
	- extended coverage sidewall type (quick response)		no.		
G1.18	Sprinkler inlets c/w drain valves (100mm dia.)	1	no.		
G1.19	Vortex inhibitors :				
	- 150mm dia.		no.		
	- 200mm dia.	2	no.		
G1.20	Proving pipe assemblies :				
	- OH3	1	no.		
G1.21	Direct reading flow meters :				
	- 80mm dia.	1	no.		
	- 100mm dia.		no.		
	- 150mm dia.		no.		
G1.22	Pressure switches including cables, conduits and all necessary accessories				
	- for sprinkler pumps (SP)	2	no.		
	- for jockey pumps (SJ)	1	no.		
	- for sprinkler installations	1	no.		

G1.23	Start / stop push buttons c/w indicators and buzzers including cables, conduits and all necessary accessories (for SBP)	3	no.		
G1.24	Others:				
	- Sprinkler guards	100	no.		
	- Sprinkler water shields (75mm diameter)	100	no.		
	- Sprinkler rosettes (ceiling plates)	300	no.		
	- Stainless steel baffles		no.		
	- Pressure gauges c/w stop valves	20	no.		
	- Damped pressure gauges c/w stop valves	20	no.		
	- Air vents c/w stop valves	5	no.		
G1.25	Additional items required by the Tenderer to complete the installation (please specify)		no.		
				sub - total (a)	
G2	FH / HR SYSTEM				
G2.1	Fire pump sets including motors and all necessary accessories:				
	- FP-1 and FP-2	2	no.		
	- FJ -1	1	no.		
G2.2	Fire pump control panels including busbar chambers, fuse-switches, switch fuses and associated trunking, conduits, and cables to the pump motors and main isolator switches:				
	- FPCP	1	no.		
G2.3	Galvanized steel pipes (medium grade) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories:				
	- 25mm dia.	60	m		
	- 50mm dia.	250	m		
	- 65mm dia.		m		
	- 100mm dia.		m		
	- 150mm dia.	300	m		
	- 50mm dia. (heavy grade)		m		

G2.11	Pressure relief valves: - 50mm dia.	1	no.		
G2.12	Pipeline strainers: - 65mm dia. - 100mm dia. - 150mm dia. - 200mm dia.	1	no.		
G2.13	Pump flexible connectors: - 50mm dia. - 100mm dia. - 150mm dia. - 200mm dia. - 50mm dia. (PN25) - 1000mm dia. (PN25) - 150mm dia. (PN25) - 200mm dia. (PN25)	2 2	no. no. no.		
G2.14	Expansion joints: - 50mm dia. - 100mm dia. - 150mm dia. - 200mm dia. - 50mm dia. (PN25) - 1000mm dia. (PN25) - 150mm dia. (PN25) - 200mm dia. (PN25)		no. no. no. no. no. no. no. no.		
G2.15	Pressure reducing valves: - 50mm dia. - 100mm dia. - 150mm dia. - 1000mm dia. (PN25) - 150mm dia. (PN25)		no. no. no. no. no.		
G2.16	Fire hose reel sets c/w fire hoses, nozzles, nozzle cabinets and all necessary accessories (swing / fixed type)	12	no.		
G2.17	Single outlet fire hydrant valves		no.		
G2.18	Self-contained pressure reducing single outlet fire hydrant valves	22	no.		
G2.19	F.S. inlets c/w drain valves: - 100mm dia.	4	no.		

G2.20	Vortex inhibitors: <ul style="list-style-type: none"> - 65mm dia. - 100mm dia - 150mm dia. - 200mm dia. 	1	no.		
G2.21	Pressure switches including cables, conduits and all necessary accessories <ul style="list-style-type: none"> - for fire pumps (FP/BP/FJ) - for fire pumps (RP/RJ) - for PRV high pressure 	2	no.		
G2.22	Start / stop push buttons c/w indicators and buzzers including cables, conduits and all necessary accessories (for BP)	1	no.		
G2.23	Others: <ul style="list-style-type: none"> - Pressure gauges c/w stop valves - Damped pressure gauges c/w stop valves - Air vents c/w stop valves 	10	no.		
G2.24	Additional items required by the Tenderer to complete the installation (please specify)		no.		
				sub - total (b)	
G3	F.S. TOWN MAIN SUPPLY SYSTEM				
G3.1	Galvanized steel pipes (medium grade) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories: <ul style="list-style-type: none"> - 25mm dia. - 50mm dia. - 65mm dia. - 80mm dia. - 100mm dia - 150mm dia. - 50mm dia. (heavy grade) 	100	m		
G3.2	Ductile iron pipes (K12) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories: <ul style="list-style-type: none"> - 80mm dia. - 100mm dia. - 150mm dia. - 200mm dia. - 250mm dia. 	100	m		

G4.1	F.S. panels including all necessary software, hardware and accessories: - MFAP-01 - FARP - 01 - FARP - 02 -FDCP - 01	1 1 1 1	no. no. no. no.		
G4.2	Intelligent operator's terminal (IOPT-3A-01) including personal computer, monitor, software, hardware and all necessary accessories	1	no.		
G4.3	Alarm printers including all necessary accessories (AP-3A-01)	2	no.		
G4.4	Battery chargers and batteries including all necessary accessories - MFAP-01 - FARP - 01 - FARP - 02 -FDCP - 01	1 10 1	no. no. no. no.		
G4.5	Uninterruptible power supply units including all necessary accessories: - for IOPT - for alarm printer	1 2	no. no.		
G4.6	Analogue smoke detectors including cables, conduits and all necessary accessories	60	no.		
G4.7	Analogue heat detectors including cables, conduits and all necessary accessories	60	no.		
G4.8	Rate-compensation type heat detectors including cables, conduits and all necessary accessories.	10	no.		
G4.9	Flame detectors including cables, conduits and all necessary accessories (High & low)	240	no.		
G4.10	Intrinsically safe / flameproof heat detectors including cables, conduits and all necessary accessories	60	no.		
G4.11	Remote indicators including cables, conduits and all necessary accessories	20	no.		

G4.12	Weatherproof remote indicators including cables, conduits and all necessary accessories		no.		
G4.13	Modules including cables, conduits and all necessary accessories :				
	- Control modules	30	no.		
	- Monitor modules	110	no.		
	- Fault isolator modules	40	no.		
G4.14	Breakglass units including cables, conduits and all necessary accessories	20	no.		
G4.15	Weatherproof breakglass units including cables, conduits and all necessary accessories				
G4.16	Fire alarm bells including cables, conduits and all necessary accessories				
	- 50mm dia		no.		
	- 80mm dia		no.		
	- 100mm dia.		no.		
	- 150mm dia		no.		
	- 200mm dia		no.		
G4.17	Flow switches including cables, conduits and all necessary accessories :				
	- 50mm dia		no.		
	- 80mm dia		no.		
	- 100mm dia.		no.		
	- 150mm dia	5	no.		
	- 200mm dia		no.		
G4.18	Wall-mounted / ceiling-mounted strobes (flashing red lights) including cables, conduits and all necessary accessories :				
	- 135cd & below		no.		
	- 150cd & above		no.		
	- 135cd & below (weatherproof)		no.		
	- 150cd & above (weatherproof)		no.		
G4.19	Audible / visual warning units (notification appliances) including cables, conduits and all necessary accessories	70	no.		
G4.20	Weatherproof visual alarm warning units including cables, conduits and all necessary accessories (for sprinkler water motor alarm gongs)		no.		

G4.21	Alarm buzzer units (audible notification appliances including cables, conduits and all necessary accessories)		no.		
G4.22	Weatherproof alarm buzzer units (audible notification appliances) including cables, conduits and all necessary accessories		no.		
G4.23	Micro switches including cables, conduits and all necessary accessories	20	no.		
G4.24	Dry contacts including cables, conduits and all necessary accessories	20	no.		
G4.25	Flameproof / intrinsically safe fire alarm devices including cables, conduits and all necessary accessories		no.		
	- Breakglass units	11	no.		
	- Fire alarm bells	11	no.		
	- Strobes (135cd & below)		no.		
	- Strobes (150cd & above)	120	no.		
	- Audible / visual warning units	20	no.		
	- Alarm buzzer units	20	no.		
G4.26	Safety barriers including cables, conduits and all necessary accessories	50	no.		
G4.27	Single core PVC copper cables:				
	- 1.5mm ²		m		
	- 2.5mm ²		m		
	- mm ²		m		
G4.28	Standard fire resistance cables				
	- 2-cores, 1.5mm ²	2000	m		
	- 4-cores, 1.5mm ²		m		
	cores, mm ²		m		
G4.29	Enhanced fire resistant cables :				
	- 2-cores, 1.5mm ²	500	m		
	- 4-cores, 1.5mm ²		m		
	cores, mm ²		m		
G4.30	MICS cables:				
	- 2-cores, 1.5mm ²	3,000	m		
	cores, mm ²		m		
G4.31	Armoured cables :				

	- 2-cores, 1.5mm ²		m		
	- 2-cores, 2.5mm ²	100	m		
	cores, mm ²		m		
G4.32	Fire resistant armoured cables :				
	- 2-cores, 1.5mm ²		m		
	- 2-cores, 2.5mm ²		m		
	cores, mm ²		m		
G4.33	Metal trunking including all necessary accessories:				
	- 75mm x 75mm		m		
	- 100mm x 100mm	100	m		
G4.34	Galvanized steel conduits including junction boxes and all necessary accessories:				
	- 20mm dia.		m		
	- 25mm dia.	500	m		
	- 32mm dia.		m		
G4.35	Rigid PVC conduits including junction boxes and all necessary accessories:				
	- 20mm dia.		m		
	- 25mm dia.	1000	m		
	- 32mm dia.		m		
G4.36	Flexible conduits including all necessary accessories:				
	- 20mm dia.		no.		
	- 25mm dia.	500	no.		
G4.37	Sheet metal solid baffles (1200mm dia.)		no.		
G4.38	Connection of F.S. direct telephone line including all deposit and the rental charges up to the expiry of DLP	1	lot		
G4.39	Additional items required by the Tenderer to complete the installation (please specify)		no.		
G4.40	Foam emergency remote manual actuation station completed with delay unit	10	no.		
				sub total (d):	
G5	CLEAN AGENT gas flooding fire extinguishing System				

G5.1	Gas cylinders including gaseous agent, (FM-200/NAF-S-125/Novec 1230), cylinder valve assemblies, manifolds, brackets and all necessary accessories: <ul style="list-style-type: none"> - System no. G-F01 - System no. G-F02 - System no. G-F03 - System no. G-F04 	1	no.			
G5.2	Galvanized steel pipes (heavy grade, butt welded) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories: <ul style="list-style-type: none"> - 25mm dia. - 32mm dia. - 40mm dia. - 50mm dia. 		m			
G5.3	Seamless carbon steel pipe (Schedule 40/Grade A) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories <ul style="list-style-type: none"> - 80mm dia. - 100mm dia. 	35	m			
G5.4	Seamless carbon steel pipe (Schedule 80/Grade B) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories <ul style="list-style-type: none"> - 25mm dia. - 32mm dia. - 40mm dia. - 50mm dia. - 80mm dia. - 100mm dia. 		m			
G5.5	Solenoid actuators / agent release modules including pneumatic actuator lines, cables, conduits and all necessary accessories	1	no.			
G5.6	Flexible discharge hose c/w manifold check valves	1	no.			
G5.7	Gas discharge nozzles	3	no.			
G5.8	Emergency manual release units including cables, conduits and all necessary accessories	2	no.			

G5.9	Lock-off units including cables, conduits and all necessary accessories		m		
G5.10	Gas flooding release control panels including all necessary hardware and accessories:	1	no.		
G5.11	Battery chargers and batteries including all necessary accessories:	1	no.		
G5.12	Smoke detectors including cables, conduits and all necessary accessories		no.		
G5.13	Intrinsically safe / flameproof heat detectors including cables, conduits, and all necessary accessories	6	no.		
G5.14	Remote indicators including cables, conduits and all necessary accessories		no.		
G5.15	Weatherproof remote indicators including cables, conduits and all necessary accessories		no.		
G5.16	Sirens including cables, conduits and all necessary accessories	2	no.		
G5.17	Fire alarm bells including cables, conduits and all necessary accessories - 150mm dia - 150mm dia (weatherproof)		no. no.		
G5.18	Flashing warning sign boxes including cables, conduits and all necessary accessories	2	no.		
G5.19	Weatherproof flashing warning sign boxes including cables, conduits and all necessary accessories	2	no.		
G5.20	Flameproof / intrinsically safe fire alarm devices including cables, conduits and all necessary accessories : - Fire alarm bells - Sirens - Flashing warning sign boxes		no. no. no.		
G5.21	Safety barriers including cables, conduits and all necessary accessories (for intrinsically safe fire detectors / fire alarm devices)		no.		

G5.22	Supervisory pressure switches including cables, conduits and all necessary accessories	1	no.		
G5.23	Gas discharge pressure switches including cables, conduits and all necessary accessories	1	no.		
G5.24	Dry contacts including cables, conduits and all necessary accessories	2	no.		
G5.25	Single core PVC copper cables: - 1.5mm ² - mm ²	60	m m		
G5.26	Standard fire resistance cables - 2 -cores, 1.5mm ² - -cores, mm ²	30	m m		
G5.27	Enhanced fire resistant cables: - 2 -cores, 1.5mm ² - -cores, mm ²		m m		
G5.28	Metal trunking including all necessary accessories: - 75mm x 75mm - 100mm x 100mm	10	m m		
G5.29	Galvanized steel conduits including junction boxes and all necessary accessories: - 20mm dia. - 25mm dia. - 32mm dia.	100	m m m		
G5.30	Rigid PVC conduits including junction boxes and all necessary accessories: - 20mm dia. - 25mm dia. - 32mm dia.	50	m m m		
G5.31	Flexible conduits including all necessary accessories: - 20mm dia.	30	m		
G5.30	Additional items required by the Tenderer to complete the installation (please specify)				
				sub total (e)	

G6	DELUGE FOAM-WATER SYSTEMS				
G6.1	Fire pump sets including motors and all necessary accessories : - FWP-1 to FWP-5 - FWJ-1 - FWHP-1 and FWHP-2	5 1 2	no. no. no.		
G6.2	Fire pump control panels including, busbar chambers, fuse-switches, switch fuses, programmable logic controllers, UPS and associated trunking, conduits, and cables to the pump motors and main isolator switches: - FWCP - FWJ-1 - FWHP-1 and FWHP-2	5 1 2	no. no. no.		
G6.3	Foam concentrate pump sets including motors, pump controllers and all necessary operating components / controls: - FCP-1 and FCP-2 - FCJ-1	2 1	no no		
G6.4	Galvanized steel pipes (heavy grade) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories: - 25mm dia. - 32mm dia. - 40mm dia. - 50mm dia. - 65mm dia. - 80mm dia. - 100mm dia - 150mm dia.		m m m m m m m m		
G6.5	Ductile iron pipes (K12) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories: - 65mm dia. - 80mm dia. - 100mm dia - 200mm dia.	200	m m m m		

G6.6	Carbon steel pipes (ERW 430) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories:				
		-25mm dia.		m	
		- 32mm dia.		m	
		- 40mm dia.		m	
		- 50mm dia.		m	
		- 65mm dia.	8700	m	
		- 80mm dia.	300	m	
		- 100mm dia.	1,500	m	
		- 150mm dia.		m	
		- 200mm dia.	2,200	m	
		- 250mm dia.	500	m	
		- 300mm dia.		m	
		- 400mm dia.	200	m	
G6.7	Stainless steel pipes (Grade 316) including pipe fittings, pipe joints, pipe supports, pipe sleeves, painting and all necessary accessories:			m	
		- 32mm dia.		m	
		- 40mm dia.		m	
		- 50mm dia.		m	
		- 65mm dia.		m	
		- 80mm dia.	30	m	
		- 100mm dia	80	m	
		- 150mm dia	200	m	
		- 200mm dia	30	m	
G6.8	Gate Valves (UL/FM) Approval:				
		- 25mm dia.		no.	
		- 32mm dia.		no.	
		- 40mm dia		no.	
		- 50mm dia.	2	no.	
		- 65mm dia.	2	no.	
		- 80mm dia.		no.	
		- 100mm dia.	11	no.	
		- 150mm dia.		no.	
		- 200mm dia.	25	no.	
		- 250mm dia.	25	no.	
		- 300mm dia.		no.	
		- 400mm dia.	11	no.	
		- 25mm dia. (PN25)		no.	
		- 32mm dia. (PN25)		no.	
		- 40mm dia. (PN25)		no.	
		- 65mm dia. (PN25)		no.	
		- 80mm dia. (PN25)		no.	

	- 100mm dia. (PN25)		no.	
	- 150mm dia. (PN25)		no.	
	- 200mm dia. (PN25)		no.	
	- 32mm dia.(stainless steel)		no.	
	- 40mm dia.(stainless steel)	4	no.	
	- 50mm dia.(stainless steel)	4	no.	
	- 65mm dia.(stainless steel)		no.	
	- 80mm dia.(stainless steel)		no.	
	- 100mm dia.(stainless steel)	9	no.	
	- 150mm dia.(stainless steel)	9	no.	
	- 200mm dia.(stainless steel)		no.	
G6.9	Silent check (UL/FM) approval valves		no.	
	- 32mm dia.		no.	
	- 40mm dia		no.	
	- 50mm dia.	1	no.	
	- 65mm dia.		no.	
	- 80mm dia.	6	no.	
	- 100mm dia.	20	no.	
	- 150mm dia.		no.	
	- 200mm dia.		no.	
	- 250mm dia.	5	no.	
	- 300mm dia.		no.	
	- 350mm dia.		no.	
	- 400mm dia.		no.	
	- 32mm dia. (PN25)		no.	
	- 40mm dia. (PN25)		no.	
	- 50mm dia. (PN25)		no.	
	- 65mm dia. (PN25)		no.	
	- 80mm dia. (PN25)		no.	
	- 100mm dia. (PN25)		no.	
	- 150mm dia. (PN25)		no.	
	- 200mm dia. (PN25)		no.	
	- 250mm dia. (PN25)	5	no.	
	- 300mm dia. (PN25)		no.	
	- 350mm dia. (PN25)		no.	
	- 400mm dia. (PN25)		no.	
G6.10	Swing check valves (UL/FM) approval:			
	- 25mm dia.		no.	
	- 32mm dia.		no.	
	- 40mm dia		no.	
	- 50mm dia.		no.	
	- 65mm dia.		no.	

		- 80mm dia.		no.	
		- 100mm dia.		no.	
		- 150mm dia.	2	no.	
		- 200mm dia.	2	no.	
		- 250mm dia.		no.	
		- 300mm dia.		no.	
		- 400mm dia.		no.	
		- 25mm dia. (PN25)		no.	
		- 32mm dia. (PN25)		no.	
		- 40mm dia. (PN25)		no.	
		- 50mm dia. (PN25)		no.	
		- 65mm dia. (PN25)		no.	
		- 80mm dia. (PN25)		no.	
		- 100mm dia. (PN25)		no.	
		- 150mm dia. (PN25)		no.	
		- 200mm dia. (PN25)		no.	
		- 250mm dia. (PN25)		no.	
		- 300mm dia. (PN25)		no.	
		- 32mm dia.(stainless steel)		no.	
		- 40mm dia.(stainless steel)		no.	
		- 50mm dia.(stainless steel)		no.	
		- 65mm dia.(stainless steel)		no.	
		- 80mm dia.(stainless steel)		no.	
		- 100mm dia.(stainless steel)		no.	
		- 150mm dia.(stainless steel)		no.	
		- 200mm dia.(stainless steel)		no.	
G6.11	Globe valves (UL/FM) Approval:				
		- 50mm dia.		no.	
		- 100mm dia.		no.	
		- 150mm dia.		no.	
		- 200mm dia.	10	no.	
		- 250mm dia.		no.	
		- 300mm dia.		no.	
		- 50mm dia. (PN25)		no.	
		- 100mm dia. (PN25)		no.	
		- 150mm dia. (PN25)		no.	
		- 200mm dia. (PN25)		no.	
		- 300mm dia. (PN25)		no.	
		- 50mm dia.(stainless steel)		no.	
		- 65mm dia.(stainless steel)		no.	
		- 80mm dia.(stainless steel)		no.	
		- 100mm dia.(stainless steel)		no.	
		- 150mm dia.(stainless steel)		no.	
G6.12	Pipeline strainers (UL/FM) Approvals				

		- 50mm dia.		no.		
		- 65mm dia.		no.		
		- 80mm dia.		no.		
		- 100mm dia.	1	no.		
		- 150mm dia.		no.		
		- 200mm dia.		no.		
		- 250mm dia.		no.		
		- 400mm dia. (bucket type)	5	no.		
		- 80mm dia.(stainless steel)		no.		
		- 100mm dia.(stainless steel)		no.		
		- 150mm dia.(stainless steel)		no.		
		- 200mm dia.(stainless steel)	2	no.		
G6.13	Pressure relief valves (UL/FM) Approvals					
		- 65mm dia.		no.		
		- 80mm dia.	5	no.		
		- 100mm dia		no.		
		- 150mm dia.		no.		
		- 200mm dia.		no.		
		- 250mm dia.	5	no.		
G6.14	Expansion joints:					
		- 100mm dia	1	no.		
		- 150mm dia.		no.		
		- 200mm dia.		no.		
		- 250mm dia.	20	no.		
		- 300mm dia.		no.		
G6.15	Electrically monitored subsidiary stop valves including micro switches, cables, conduits and all necessary accessories:					
		- 32mm dia.		no.		
		- 40mm dia		no.		
		- 50mm dia.		no.		
		- 65mm dia.		no.		
		- 80mm dia.		no.		
		- 100mm dia.		no.		
		- 150mm dia.		no.		
		- 200mm dia.		no.		
		- 250mm dia.		no.		
		- 300mm dia.		no.		
		- 400mm dia.		no.		
		- 450mm dia.		no.		

G6.16	Electrically monitored subsidiary stop valves (butterfly valves) including chains, pad locks, protective warning labels, security tags, built-in supervisory switches, cables, conduits and all necessary accessories <ul style="list-style-type: none"> - 32mm dia. - 40mm dia - 50mm dia. - 65mm dia. - 80mm dia. - 100mm dia. - 150mm dia. - 200mm dia. - 250mm dia. - 300mm dia. - 400mm dia. 		no.		
G6.17	Electrically monitored subsidiary globe valves including chains, pad locks, protective warning labels, security tags, built-in supervisory switches, cables, conduits and all necessary accessories <ul style="list-style-type: none"> - 100mm dia. - 150mm dia. - 200mm dia. 		no.		
G6.18	Non-air-aspirating foam discharge sprinklers	870	no.		
G6.19	Foam hand hose stations including all necessary components	11	no.		
G6.20	Remote control foam monitors including foam discharge nozzles and all necessary components		no.		
G6.21	Foam proportioners including all necessary components <ul style="list-style-type: none"> - 50mm dia. - 65mm dia. - 80mm dia. - 100mm dia. - 150mm dia. - 200mm dia. 	1 10	no. no. no. no. no. no.		
G6.22	Foam concentrate storage tanks including all necessary components: <ul style="list-style-type: none"> - 8505 litres 	4	no.		

	- 300mm dia.				
G6.30	Pressure reducing valves : - 200mm dia. - 300mm dia. - 400mm dia.	1	no. no. no. no.		
G6.31	Foam water inlets c/w drain valves (100 mm dia)	16	no.		
G6.32	Air release valves : - 25mm dia. - 80mm dia. - 100mm dia		no. no. no.		
G6.33	Pressure switch assemblies including valves, orifices, pipework, painting, cables, conduits and all necessary accessories - for foam water pumps (FWP-FWJ) - for foam water hand hose pumps - for foam concentrate pumps (FWP-FWJ) - for PRV high pressure	5 2 2	no. no. no.		
G6.34	Solenoid releasing valves including cables, conduits and all necessary accessories	11	no.		
G6.35	Emergency manual actuation stations including cables, conduits and all necessary accessories	10	no.		
		1	lot		
G6.36	Discharge tests completed with Foam concentrate for testing as specified in relevant clauses of this specification - full discharge test - other please specify				
G6.37	Others: - Pressure gauges c/w stop valves - Damped pressure gauges c/w stop valves - Air vents c/w stop valves		no. no. no.		
G6.38	Additional items required by the Tenderer to complete the installation (please specify)		no.	sub total (f)	
G7	Portable Fire Fighting Appliances	30	no.		
G7.1	4.5 kg / 5 k CO₂ fire extinguishers				

G7.2	9 litres water/CO ₂ fire extinguishers		no.		
G7.3	50 kg wheeled type dry powder fire extinguishers	10	no.		
G7.4	Sand Buckets		no.		
G7.5	Fire blankets		no.		
G7.6	FM-200/NOVEC 1230 automatic fixed sprayer units :	1	no.		
	-27.7kg (61 lb)		no.		
	- 25.9kg (57 lb)		no.		
	- 24kg (53 lb)		no.		
	- 22.2kg (49 lb)		no.		
	- 20.4kg (45 lb)				
G7.7	Additional items required by the Tenderer to complete the installation (please specify)		sub total (g)		
			sub total (f)		