DIVISION 7

THERMAL AND MOISTURE PROTECTION

BUILDING WORK

DIVISION 7

THERMAL AND MOISTURE PROTECTION

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SECTION 07120

THERMAL AND MOISTURE PROTECTION

PART 1 GENERAL

1.1 DESCRIPTION

This work shall consist of the supply of all materials and waterproofing of concrete roofs and surfaces; the filling of the expansion joints with mastic filler and covering the same with aluminum strip covers; and the supply and installation of all thermal insulation boards for walls and roofs, all in accordance with the Specifications, the Drawings and the Bill of Quantities.

1.2 SCREEDING

Flat roof slabs shall receive screeding concrete composed of cement and sand and fine aggregates cast to falls as indicated on the Drawings. Cured for twenty-eight days, it shall yield a minimum compressive strength of 210 kg./cm^2. The surfaces of the screeding shall be even, free from depressions and other defects, and all debris and substances determintal to the work shall be removed.

1.3 ROOF FINISH

The waterproofing membrane shall be laid as specified herein on a cement/ sand screed laid to falls as shown on the Drawings.

Screeding shall be cement/sand mix of 1:6 (one part of ordinary Portland cement to six parts of fine aggregate as specified in Section 2.00).

The screed shall be finished smooth and true with a wood float and shall not be less than 5 cm. thick at its thinnest point. The screed shall be used to form angle fillets as shown in the Drawings at walls and parapets. The waterproofing membrane shall be taken up the walls and parapets as shown, and tucked into prepared chases.

Plastic pressure-release vents, consisting of a ribbed base in black polypropylene and a snap-on cap in PVC, shall be fixed in the positions specified by the approved manufacturer (i.e. approximately one per each 100 square meters).

PART 2 MATERIALS FOR FLEXIBLE WATERPROOFING OF ROOFS

A. Roof slabs shall be waterproofed by the use of a performed high performance membrane (modified asphalt) in combination with primer and elastomeric fluid applied mastic. The impervious laminate sheet shall not be less than 0.2 mm. thick so as to accommodate substantial cracking of the substrata. The overall thickness of membrane shall be not less than 4 mm. The flexible waterproofing membrane

shall be supplied to Site in rolls 1.52 m. x 15.25 m., protected by heavy duty cardboard cartons. The primer shall be supplied in cans containing approximately 18.93 litres of bitumen modified moisture curing polyurethane fluid or the manufacturer's recommended primer. The thickness of the applied membrane and primer shall be constant throughout the roof when applied. This shall be as manufactured by the following, or approved equivalent:

- Ruberoid "High-Performance 150 E", applied on a "Rubber-glass 120 G-P" middle layer over "Rubervent" first layer;
- Imper "Paralon NT4" applied with "Impertine" primer;
- Fosroc "Tremco Jiffy Seal 400" applied in double ply (two courses) with "Tremco" primer, "Awazel".

B. Both the membrane and the elastomeric fluid applied mastic shall be guaranteed by the manufacturer against failure of the waterproofing qualities of the roof, excepting failure of the substrata, fire or Acts of God, for a minimum period of five years.

C. The protection shield to the membrane and mastic shall be lightweight thermal insulation slab as manufactured by Dow Chemical Export Co. (Dubai) or an approved equivalent. The slab shall consist of composite bonded laminate of 100 mm. thickness of extruded polystyrene foam supplied with a tongue and groove detail on the longer edges.

D. Flashing sheets, cant strips, sealants and accessories to form the waterproof membrane to falls shall be as recommended by the manufacturer, provided at locations indicated and at other locations recommended by the manufacturer.

E. Where metal flashings are required to dress the membrane against vertical surfaces, aluminum flashings shall be provided in compliance with manufacturer's instructions.

PART 3 EXECUTION APPLICATION OF FLEXIBLE WATERPROOFING FOR ROOFS

A. Surface Preparation:

1. The substrate shall be primed to receive the membrane system in compliance with manufacturer's instructions.

2. The substrate shall be cleaned of dust, debris and any other substances detrimental to the work.

3. Cant strips, flashing sheets and accessory items shall be installed where shown or as recommended by the manufacturer, at wall deck junctures, change planes and protrusions, etc.

4. Voids shall be filled, including non-moving joints and rough areas of the substrate, with a coating of elastomeric mastic in the manner recommended by the manufacturer. Covers shall be formed at corners and penetrations in the substrate.

5. Expansion joint details in the substrate shall be as recommended by the manufacturer.

6. Special treatment shall be applied to moving cracks as recommended by the manufacturer, which shall include a 3 mm. preparatory coat over the crack extending 70 mm. on each side.

7. Metal surfaces shall be prepared, primed and sealed as recommended by the manufacturer.

8. Adjoining surfaces not to receive the membrane shall be masked off, and roof drains shall be closed off to prevent spillage and migration of liquid materials outside the membrane area or into the drainage system.

B. Application:

1. Installation of the membrane, including integral flashings and priming, shall be carried out in compliance with the manufacturer's instructions.

2. Installation of the membrane shall commence only in the presence of the manufacturer's technical representative. All workmen applying roofing materials shall wear rubber-soled shoes.

3. Integral liquid applied flashings shall be formed extended vertically as indicated or required, placed with extra coatings applied to produce additional thicknesses as recommended by the manufacturer.

4. Elastomeric sheeting flashing shall be formed extended vertically and horizontally on substrata base as indicated or required, and bonded with fluid applied roofing material as required by the manufacturer.

5. Flanges of sleeves for air terminals of lightning conductors shall be lapped with roof membrane, and similar treatment shall be provided for other sleeves, pipes, etc. piercing the roof membrane, and cants shall be provided in these conditions.

6. Before application of insulation protective shield, the installer shall water-test the applied area for a minimum of 24 hours to determine integrity of application. If a leak is detected, the repair shall be made before insulation is applied.

7. The waterproof membrane shall be clear of all debris before and during the laying of the insulation protective shield.

8. The insulation slabs shall be carefully set out before installation commences. Slabs shall be laid half-lapped in a brick bond pattern starting from the perimeter of the roofs, against the line of the parapet, always ensuring that the end of the slabs butt tightly together. Slabs less than full length may be used towards the centre of the roof.

9. Where the slabs are laid over a change in slope of the roof, the modified mortar shall be cut with a masonry saw along the line of the change in plane. The last row of slabs should be cut to fit against the parapet.

10. Slabs shall be neatly cut around penetrations, leaving a gap of approximately 5 mm.

11. Flashings to parapets and roof kerbs shall protect the edge of the insulation slabs at least 50 mm. from the effects of solar radiation and winds.

3.1 SURFACE AGGREGATE (RIVER BED GRAVEL)

A. The course aggregate must be clean from line aggregate, clay, dusty and to be high strength.

B. No allowable to use the aggregate that is desolve in water.

C. Wadi gravel to be laid over roofing system to gradation shall be 100% passing the 19 mm sieve and zero % passing the 4.75 mm sieve according to ASTM - C136.

D. Weight unit for aggregate not less than 960 kg/m^3 according to ASTM – C29.

E. Stiffeners for aggregate passing from sieve 3.36 mm not to exceed of 20% according to ASTM – D1865.

F. The total thickness for this layer is 10 cm.

3.2 WATERPROOFING OF CONCRETE CONSTRUCTION BELOW GROUND

A. The horizontal and vertical surfaces of concrete construction below ground level shall be waterproofed by use of materials as per Item No. 12.04.

The waterproofing membrane shall be highly resistant to deformation and puncture, even if cracking occurs in the substructure.
This flexible membrane shall be supplied in rolls 1.52 m x 15.25 m protected by heavy duty cartons. The thickness of the membrane and primer shall be constant throughout the works when applied, and not less than 4 mm.

B. Both the membrane and the fluid applied mastic shall be guaranteed by the manufacturer against failure of the waterproof qualities of the concrete structure,

excepting for general failure of the concrete structure or Acts of God, for a minimum period of five years.

C. The protection of the substructural membrane to vertical and horizontal surfaces shall be achieved by use of 10 cm. thick block walls and 5 cm. concrete blinding on horizontal surfaces. Where vertical surfaces are formed on non-significant structures, the ground beams, etc., shall not be formed in concrete blinding but shall be offered up to the cast face of the ground beam itself.

D. Flashing sheets, angles and corners and accessories to form the waterproof membrane shall be provided at the locations indicated and at any other locations recommended by the manufacturer.

E. If water accumulates during the construction period, all necessary precautions under Item ("Water in Excavations") shall be taken by the Contractor to ensure that the viability of the membrane is maintained.

F. Where special flashings are required to dress the membrane against vertical surfaces, aluminum flashing at significant points shall be provided in compliance with the manufacturer's instructions.

G. To create the correct conditions for application of the membrane underground, the following preparations shall be made:

1. Priming of the substrate to receive the membrane system shall be carried out in compliance with the manufacturer's instructions.

2. The substrata shall be cleaned of dust, debris and any other substances detrimental to the work.

3. Cant strips, flashing sheets and accessory items shall be installed where shown or as recommended by the manufacturer, at wall deck junctures, change plans and protrusions, etc.

4. Voids shall be filled, including non-moving joints and rough areas of the substrate, with a coating of elastomeric mastic in the manner recommended by the manufacturer. Covers shall be formed at corners and penetrations in the substrate with the membrane material.

5. Expansion joint details in the substrate shall be as recommended by the manufacturer.
6. Special treatment shall be applied to moving cracks as recommended by the manufacturer, which shall include a preparatory coat of 3 mm. over the crack extending 70 mm. on each side.

7. Metal surfaces shall be prepared, primed and sealed as recommended by the manufacturer.

8. Adjoining surfaces not to receive the membrane shall be masked off.

H. Elastomeric sheet flashing shall be formed extended vertically and horizontally on substrata formed as indicated and required, and bonded with fluid applied material as recommended by the manufacturer.

I. The membrane shall be protected from damage, until the backfilling is complete and the oversite concrete is poured, by providing protection boards or sheets in compliance with the manufacturer's instructions.

3.3 DAMP-PROOF COURSE

A. Damp-proof course (stepped) shall be of black sheet of pitch, P.V.C. and synthetic fibres.

B. The top of the wall shall be truly and properly level and perfectly dry before the application of the damp-proof course.

C. Surfaces to be treated shall be swept free of dust particles, loose sand or aggregate.

D. The material shall comply with B.S. 743/A, as manufactured by Ruberoid "Hydroload 150E"; Permalit "Permaflex"; or Permanite "Perma-Seal"; or an approved equivalent.

3.4 WATER PROOF COATING FOR EXTERNAL WALLS

A. Material:

The coating shall be cold applied rubberized bituminous emulsion providing a dry film thickness of not less than 1mm after application. The rubber content shall be not less than 10 percent in dry film.

B. Workmanship:

This coating shall generally be executed in accordance with the manufacturer's recommendations.

The water proof coating material shall be integrally supplied as manufactured by SIKA (Seal 105) Terrace, Vandex.

3.5 EXPANSION JOINTS

Expansion joints at various locations and between the different parts of the skeleton of the structures shall be made in accordance with the Drawings and shall be dealt with as delineated thereon and specified hereunder.

A. Expansion joints in concrete walls and columns and floors shall have aluminium beads fixed in the plaster at both sides of the joints and raked out to a sufficient depth to allow the fixing of a P.V.C. cover strip, for different case and types, and as manufactured by Alifab, Correnaly, construction specialties or an approved equivalent.

B. Expansion joints at ceiling soffits shall be filled with only two parts polysulphide mastic to B.S. 5215.

C. Expansion joint covers at the roofs shall be made of aluminum 2 mm thick, and the external edge of the joints shall have 5 cm wide x 2 cm. thick sealing compound filling of 2 parts poly-sulfide mastic and backing rod as shown on Detailed Drawings.

D. Expansion joints in block work partitions shall meet the requirements of the BS CP 121, Part 1 : 1973. Provision shall be made for vertical and horizontal movement joints to reduce the incidence of cracking.

3.6 REFLECTIVE SOLAR SHIELD PAINT

Reflective solar shield paint of tung oil phenolic resin vehicle and a leafing aluminum pigment on waterproofing membrane at vertical beams, parapets and where required.

The paint shield shall be applied in two coats. The first coat shall be applied at least seven days after application of the waterproof membrane. The second coat shall be applied three days after the application of the first coat.

This item shall be as manufactured by Fosroc "Tremco"; or Deitermann's "Eurolan-PU Silver"; or an approved equivalent.

3.7 THE CONTRACTOR'S RESPONSIBILITY

Notwithstanding any approval from the Engineer regarding the use of any waterproofing materials or mastic filler in the expansion joints or in the method of execution of the work, the Contractor shall be solely responsible for the proper waterproofing to tanks, basements and roofs and watertightness of the expansions joints. The Contractor shall hand over the building in a perfect waterproof condition at the end of the Maintenance Period and any damage resulting from lack of watertightness of the building shall be repaired by the Contractor at his own expense.

3.8 THERMAL INSULATION ON ROOFS

Roofs shall receive thermal insulation board of 100 mm. thickness of extruded polystyrene rigid foam with skin, having shiplap edge treatment, colored blue throughout, meeting the provisions of DIN 18164, Part 1 (June 1979).

Thermal insulation board shall have the following properties:

A. Five-year aged average thermal conductivity of 0.032 W/mK (0.22 Btu· in/ft.^{2}·h·°F) when tested at 24°C (75°F) in accordance with DIN 52612 or ASTM C-518.

B. Compressive strength of 280 kPA (40 psi) average, when tested according to DIN 53421 or ASTM D-1621.

C. Water absorption of <1% in volume average when tested in accordance with ASTM D-2842.

D. Water vapor permeability of 0.4-0.6 perm inch average when tested in accordance with ASTM C-355.

E. Board dimensions width 600 mm covering dimension
Length 1250 mm covering dimension.

3.9 THERMAL INSULATION FOR WALLS

Wall mate extruded polystyrene rigid foam with skin, having tongue and groove edge treatment, colored blue throughout, meeting the provision of DIN 18164, Part 1 June (1979), board dimensions 50 mm thickness, 600 mm width, 2500 mm length and shall have the following properties:

A. Five year aged average thermal conductivity of 0.032 W/mK (0.22) Btu.in/ft^2-h-°F) when tested at 24°C (75°F) in accordance with DIN 52612 or ASTM C-518.

B. Compressive strength of 210 kPa (30 psi) average, when tested according to DIN 53421 or ASTM D-1621.

C. Water absorption of <1% in volume average when tested in accordance with ASTM D-2842.

D. Water vapor permeability of 1 perm inch average when tested in accordance with ASTM C-355.

Extruded polystyrene rigid foam for roofs and walls shall be as manufactured by "DOW" Chemical Export Co. (Dubai) or an approved equivalent.

3.10 SEPARATION LAYER

A. Material:
The separation layer shall consist of one layer 250 micron thickness polyethylene sheets or polyester supplied in rolls not less than 500 cm wide.b) Workmanship:

The separation layer shall be executed over the concrete blinding layer under slabs on grade and for roofing system as shown on Drawings.

1. Adjacent sheets shall overlap by not less than 150 mm and an approved sealing tape shall be fixed along the joints.

2. Sheeting shall be turned up vertically by at least 300 mm along the perimeter of basement walls, columns and roof parapets.

3.11 GUARANTEE

The Contractor shall provide the Employer with a "five-year guarantee certificate" endorsed by the specialist firm executing the work against leaks resulting from defects of materials and workmanship in the executed works. The five-year period shall start from the date of substantial completion. The Contractor shall undertake in the said certificate to execute at his expense any repairs necessary for making good of any defects upon notification of such defects by the Employer.

END OF SECTION

DIVISION 8

DOORS AND WINDOWS

BUILDING WORK

DIVISION 8

DOORS AND WINDOWS

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SECTION 08110

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes steel doors, panels and frames; non-rated, interior borrowed light frames and door louvers. This work shall consist of the supply, fixing and hanging of all metal doors, complete and in accordance with Drawings, Specifications and the Bill of Quantities.

PART 2 MATERIAL

2.1 GENERAL:

All details of steel doors and all other steel works shall conform in general with the Detail Drawings. The Contractor shall take the overall dimensions for all the metal works from the actual work on Site and shall be held responsible for the accuracy of all fitting and fixing. Workmanship shall be to the best standards in quality and finish. All corners of frames and casements shall be clearly and accurately mitred and electrically welded. All rough edges, burrs and sharp arises shall be removed. Stiffeners and connecting members shall be close-fitted, bolt holes shall be drilled and not punched, and the welding shall be in an approved manner.

2.2 HOLLOW METAL FRAMES FOR DOORS

A. Scope:

The scope of the work covered in this Item includes, but is not necessarily limited to, the following:

1. Provision and installation of pressed metal frames for external and internal steel doors.
2. Provision and installation of all necessary accessories to pressed metal frames.
3. Provision of fine class of concrete and filling hollow spaces behind jambs with concrete, and well-tamping and consolidating fine concrete within the hollow frame.
4. Provision of all necessary shop drawings and obtaining the Engineer's approval.

B. Workmanship, Generally:

1. All work shall be executed in a shop whose products are limited to the highest quality work.

2. All joints shall be tightly fitted; exposed welds shall be executed neatly and ground and finished smooth without pits or blemishes.

3. Items detailed on Plans to be anchored with bolts shall be provided with holes.

4. All items shall be of the shape and size indicated on Drawings.

5. All work shall be fitted together at the fabricating shop insofar as is possible, and delivered complete and ready for erection.

6. Handling and delivery: Proper care shall be exercised in handling all work in order to protect the finished surfaces. All work shall be in first class condition upon completion of the Project.

7. The Contractor is responsible for ensuring that the manufacturer obtains templates of hardware. The shop drawings shall indicate all hardware applications and no fabrication shall commence until approval of the shop drawings is received from the Engineer. The Contractor shall furnish one set of approved shop drawings to the hardware supplier.

2.3 Materials:

A. Frames shall be manufactured to comply with B.S. Nos. 1245 : 1975 and 459 : 1951, Part 3 for one hour fire-rated doors, and to the profiles shown on the Drawings, from 1.6 mm. hot-dip zinc-coated mild steel.

B. Frames shall be cold-formed with head and jamb members mitred to smooth hairline joints continuously welded and ground smooth. Frames shall be rigid, neat in appearance, free from defects, warp or buckle.

C. Forming shall be to profiles as detailed. All angles, moulds and returns shall be straight, true to line and neatly formed. Corner joints shall be mitered.

D. Frames shall be neatly morticed and reinforced with 5 mm. steel plate welded to the inner surfaces of frames at all hardware. Morticing, drilling and tapping for morticed hardware shall be done by the frame manufacturer. Drilling and tapping

for surface hardware shall be done by the installer. Foreign matter shall be kept from tapped holes. Frames not properly prepared to receive hardware shall be rejected.

E. Frames shall be thoroughly cleaned of grease, oil and other impurities, filled flush to conceal all seams, welds, etc., and given two coats of zinc chromate primer.

F. Frames shall be delivered to the Job Site properly braced and crated in a manner to prevent damage. Frames with warps, bends or faulty workmanship shall be rejected.

2.4 Anchors for Metal Frames:

A. Unless otherwise shown on Drawings, a minimum of three anchors of an approved type shall be provided, plus a floor anchor at each side of the frame. Anchors shall be of the adjustable type, and as shown on the Drawings.

B. For 2 hour fire-rated doors, four anchors for each jamb shall be supplied.

C. Strap type anchors for frames at cast in situ concrete shall be provided of No. 12 gauge 2-shape, 30 cm. long x 4 cm. wide, with 5 cm. long legs.

D. 3-shaped type anchors shall be provided at each jamb in partitions of No. 12 gauge, 4 cm. width, with one end welded to a plate sliding within the internal face of the frame. Length shall be equal to the length of one concrete block, and the other end of the anchor shall be built into the mortar joints between blocks or chased into the concrete.

E. Floor anchors for all frames shall be No. 12 gauge minimum securely welded to the frame and drilled for anchor bolts.

2.5 Shop Finish for Metal Frames:

A. All exposed surfaces shall be ground or sanded smooth.

B. All surfaces shall be phosphate-treated and cleaned to ensure maximum paint adherence.

C. All surfaces shall be painted with two coats of rust-inhibitive metallic oxide, zinc chromate or synthetic resin primer, which shall be baked-on and sanded smooth between coats. Finished surfaces shall be smooth, uniform and free from sags, drips and brush marks.

2.6 Storage and Protection:

A. Frames shall be installed in accordance with the manufacturer's instructions and shall be properly protected during installation to avoid distortion.

B. Storage of frames on Site prior to installation shall be effected in a protected area inaccessible to workmen. Frames damaged before, during or after installation shall be replaced or repaired as directed by the Engineer at the Contractor's expense.

C. Wood doors shall not be installed in pressed hollow metal frames until door closers and stops or holders can be installed simultaneously to prevent the occurrence of damage to doors.

2.7 IRONMONGERY FOR STEEL DOORS

General:

The Contractor shall prove and fix the ironmongery complete, including all necessary screws, bolts, plugs and other fixings. The use of nails for fixing shall not be allowed.

All ironmongery shall be of first quality and shall not be inferior to the appropriate British Standards quoted below:

No. 455:1957	Locks and latches for doors - Schedule for sizes and dimensions
No. 1227:1945	Hinges
No. 1228:1945	Door bolts – iron, steel and non-ferrous

The Contractor shall be required to submit for approval samples of all items of ironmongery he proposes to use.

2.8 GLAZING

Steel doors and window casements shall be prepared for inside glazing. All glass shall be of an approved make and quality, 6 mm. thick, of clear sheet, obscure, frost, tinted, or Georgian wired glass as specified in the Bill of Quantities or shown on Drawings, and in accordance with Section 8800 of these Specifications.

END OF SECTION

SECTION 08210

WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes wood doors, frames, sub-frames and door leaves. This work shall consist of the supply, fixing and hanging of all wood doors, complete and in accordance with Drawings, Specifications and the Bill of Quantities.

1.2 SUBMITTALS

A. Shop Drawings: indicate materials, component profiles, fastening methods, jointing details, finishes and accessories.

B. Samples:
1. One small size door sample illustrating wood grain and specified finish.
2. Samples of each type of ironmongery.

1.3 QUALITY ASSURANCE

A. Perform work in accordance with the General Specifications issued by the Ministry of Public works and Housing.

PART 2 PRODUCTS

2.1 Sub-Frames:

Sub-frames shall be provided for all wooden doors in white wood in accordance with the drawings and clause 1105 of the General Specifications.

2.2 Door Frames and Architraves

Door frames & architraves shall be fabricated from first grade pinewood in accordance with the drawings and clauses 1104 and 1106 of the General Specifications.

2.3 Door Leaves:

Door leaves shall be fabricated from the wood types specified hereunder and in accordance with the drawing and clauses 1104 and 1107.1 of the General Specifications.

A. Veneered Door Leaves:
- Core strips in White wood.
- Bottom and top rails and stiles in Beech wood.
- Facings in 5 mm Teak veneered plywood.

B. Non-Veneered Door Leaves:
- Core strips in White wood.
- Bottom and top rails and stiles in Beech wood.
- Facings in 5 mm Plywood.

2.4 Painting:

Doors shall be painted by the spray method to achieve full coverage of not less than 100 microns of the dry film. All exposed surfaces of the door components shall be painted inclusive of frame, architrave and door leaf comprising edge bands. The type of paint shall be as follows:-

A. Veneered Doors: Polyurethane laquer pigmented as would be directed by the Engineer.

B. Non-Veneered Doors: Oil enamel (Semi-gloss) of a color as would be directed by the Engineer.

2.5 Ironmongery (Hardware):

Ironmongery shall be provided as shown on the drawing and specified hereunder. Ironmongery shall comprise hinges, handles, locks, latches, closers, floor-stops, flush-bolts and push-plates where applicable. All doors shall have floor-stops of the type where the rubber cushion is moulded over the center piece. Door closers where applicable shall be of the floor type. Bathroom doors shall be provided with Deadlocks (without cylinder) with privacy indicator.

Ironmongery finish shall be as follows: -

A. Veneered Doors: All Brass or Brass alloys.

B. Non-Veneered Doors: Aluminum or Stainless Steel having matt finish.

Samples of each type of ironmongery shall be submitted to the Engineer for approval.

END OF SECTION

SECTION 08520

ALUMINIUM WORKS

PART 1 GENERAL

1.1 SUMMARY

This work shall consist of the supply, fixing and hanging of all Aluminum windows, Doors..etc., complete and in accordance with Drawings, Specifications and the Bill of Quantities.

1.2 SUBMITTALS

A. Shop Drawings of Aluminum Works

The Contractor shall submit to the Engineer, for his approval and in accordance with the Specifications and Drawings, fully-dimensioned and detailed shop drawings for the various types of aluminum doors and windows, locks, handles and opening mechanisms, etc., to be included within the Works.

B. Samples: Submit one small size aluminum window.

PART 2 PRODUCTS

2.1 General

All extruded aluminum shall be in accordance with B.S. or German Standards powder coated electrostatic with thermal break. Screws and internal components shall be either stainless steel, cadmium-plated steel, or corrosion resistant materials of sufficient strength to perform the specific function for which they are used. Dry glazing materials shall be of resilient architectural quality neoprene and butyl tape.

2.2 ALUMINIUM WINDOWS

Windows shall be pre-assembled units. Corners of windows and frames are to be mitred, reinforced with a solid internal aluminum corner bracket and then cold-forged to form a tight hairline joint. All critical joints shall be pre-sealed with a suitable non-hardening material.

The locking assembly shall comprise a forged anodised aluminum handle with keep. Hingings shall be balance type friction arms of heavy duty aluminum which shall allow the window to be set in any open position. Weather seals shall be architectural grade neoprene, double sealed around the window between frame and operating section except on the exterior of the sill.

Glazing beads shall be of the lock-in type requiring no screws.

Glazing materials shall be butyl tape and a continuous neoprene wedge.

2.3 ALUMINIUM DOORS

Sections for aluminum doors shall be extruded, with tubular door profiles being 3.2 mm. thickness and glazing beads 1.25 mm. thickness.
Doors shall have a minimum tubular 50 mm. vertical stiles, 65 mm. top rail, and 99.25 mm. bottom rail. Each corner shall be constructed with one reinforcing channel securely mounted to a cadmium-plated steel back-up plate, and then 'Sigma' deep-penetration welded at four points concealed within the section.

Glazing beads shall be locked in and tamper-proof, without exposed screws, complete with integral resilient neoprene for glazing. Doors shall have adjustable double wool pile weather stripping at the meeting stiles.
Each door leaf shall have an adjustable mechanism located in the top rail near the lock stile providing for minor clearance adjustment after installation.

A. Finish:

All exposed aluminum shall be one of the RAL colours to match bushammered stone colour.
The aluminum powder coated shall have a minimum thickness of 80 microns.

B. Schedule for Aluminum door types description and ironmongery.

C. Hardware:

The doors shall include the following hardware:

1. Aluminum midrail, fluted finish, 10 cm. wide, both sides integrated with push-pull handles.

2. Double-action floor spring, heavy duty, independly adjustable, two closing speeds and hold-open system, with centre pivots (concealed type).

3. Maximum security, two-way locking deadlock of deadbolt and a hidden half-inch diameter steel bolt into the floor.

4. Letter slot, as required in Door Schedules.

PART 3 EXECUTION

3.1 FIXING AND ADJUSTMENT

A. Windows and doors shall be set straight, plumb, level and rigid in the prepared openings, and the Contractor shall supply all lugs and hold-fasts necessary for their proper and rigid fixing.

B. After installation and completion of glazing and operating hardware, the hardware shall be adjusted to provide free operation and a watertight

condition when closed and locked. Hardware and operating parts shall be lubricated or waxed as required.

3.2 ALUMINIUM FRAMING

Framing members shall provide for flush glazing, and shall be 11.4 x 4.5 cm. profiles. Raised glazing beads and exposed screws shall not be permitted. Joinery at intersecting sections shall form a pre-weathered sealed hairline joint.
Expansion mullion shall be pre-weathered to prevent air, dust and moisture infiltration. Resilient glazing settings shall be of architectural quality neoprene.
Core assemblies shall be interlocking internally by a coppler providing a positive retention capable of withstanding a direct pull of 200 pounds per each.
Provision for reglazing shall be provided. Glazing materials shall be resilient architectural quality neoprene.

A. Finish:

All exposed aluminum shall be one of the RAL colors to match bushammered stone color, obtained by giving all aluminum a caustic etch followed by an anodic treatment to produce a high density aluminum oxide coating. This coating shall be Architectural Class 1 anodic coating with integral color (B.S. 1651 : 1961).

The aluminum oxide shall be 25 microns minimum thickness.

B. Hardware:

All ground to lintel glazed framing shall have the following hardware:

1. Aluminum mid-rail concealed externally, protruding internally, 10 cm. wide with fluted finish, at 100-cm. height from finished floor level for safety protection.

C. Glazing:

All external doors, frames and windows shall be single-glazed, composed of 6 mm. glass and as specified in section 08800.

3.3 CORNER GUARDS

A. Corner guards shall be of extruded black or grey PVC of high impact resistance, 90 cm. x 6.3 cm. x 6.3 cm. wide on all protruding corners of blockwork and columns. Fixing shall be by means of double-coated adhesive foam tape of 4 lb. density, irradiated white polythene foam-coated on both sides with a moderate tack, high dead load adhesive.

END OF SECTION

SECTION 08800

GLAZING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes glass glazing for metal frames, doors, windows, and glazed walls.
   1. Glass glazing materials and installation requirements are included in this section for other sections referencing this section.

1.2 SYSTEM DESCRIPTION

A. System performance to achieve continuity of building enclosure air barrier and vapor retarder with glass and glazing materials of this section.

B. Design Tolerances: Size glass to withstand dead loads and positive and negative wind loads acting normal to plane of glass.

1.3 SUBMITTALS

A. Product Data on Glass Types Specified: Submit physical and environmental characteristics, size limitations, and special installation requirements.

B. Product Data on Glazing Compounds: Submit chemical characteristics, limitations, and special application requirements. Identify available colors.

C. Samples: Submit two samples 200x200 mm in size, illustrating glass coloration and design.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with B.S.952 requirements.

PART 2 PRODUCTS

2.1 The work under this Section shall including the supply and installation of the following:

A. External glass for doors, windows and curtain walls shall be 6 mm. thick, float type.

B. Clear glass 6 mm. thick, for use in internal windows and vision panels in walls.

C. Security glass 6 mm. thick, in vision panels.

D. Frosted glass 6 mm. thick, in vision panels of doors and toilets' windows.

E. Obscurable Georgian wired glass 6 mm. thick, for use in aluminum entrance doors.

F. Clear Georgian wired glass 6 mm. thick.

G. Mirrors shall be 6 mm. thick unless otherwise specified.

2.2 MATERIALS FOR GLASS

The glass shall be to B.S. 952, of any approved manufacture.

PART 3 EXECUTION

3.1 Each light shall bear a label stating the manufacturer's name, type, quality and thickness. Labels shall not be removed until removal is authorised by the Project Supervisor.

3.2 Cutting and glazing shall be as recommended by the manufacturer of the glass and in accordance with these Specifications.

3.3 Glazing shall be done on Site by skilled glaziers and in accordance with the best standards of the trade.

3.4 Edges shall be clean-cut, with no nipped or seamed edges.

3.5 All glass shall be cut accurately to fit its particular position. Sizes of glass required for this shall be obtained from the aluminum manufacturer.

3.6 All glazing shall be done with the sash in a closed position.

3.7 All surfaces to receive glazing compound shall be cleaned free from dust, water and any foreign matter, which would adversely affect the installation.

3.8 Regular clearance from sides, bottoms and tops of all glass panes shall be maintained.

3.9 Mirrors shall be fixed with galvanized sheets 2mm thick for supports and hooks, lug screws and self adhesive.

3.10 Glazing beads shall be continuous and in single lengths.

3.11 TESTING

All exterior casement and fixed windows shall be flooded with water and tested for leaks in the presence of the Engineer or his representative. Any leaks shall be corrected.

A. Exterior glazing shall be flooded for a minimum of five minutes, with a minimum hose water pressure of 20 psi, and as described in Section 8.00 hereto, under items for aluminum windows. Glass shall not be deflected while testing.

B. Correction of all leaks shall be done with materials of equal quality to those specified for the original installation. Leaking joints that were not originally intended to be caulked, and leaks due to faulty joining, shall be replaced with new material and fitted properly, unless patching is authorized by the Engineer.

C. All areas where correction of leaks was required shall be retested.

3.12 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

END OF SECTION