DIVISION 5

METALS

BUILDING WORK

DIVISION 5

METALS

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SECTION 05500

MISCELLANEOUS METAL

PART 1: GENERAL

1.01 SCOPE OF WORK

A Furnish all labor materials, equipment and incidentals required to provide all miscellaneous metal as indicated and as specified herein.

B Miscellaneous metal work include items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not specified in other sections of these specification.

C This Section cover the following miscellaneous metal items:

1. Steel Screen.

2. Floor channels and gratings.

1.02 RELATED WORK NOT INCLUDED

A Installation of embedded miscellaneous metal items is included in Division 3 and 4.

B Masonry reinforcement, masonry ties and anchor slots are included in Division 4.

1.03 SUBMITTALS

A Submit detail drawings, as provided for in special conditions, showing sizes of members, method of assembly, anchorage, and connection to other members.

B Field measurements shall be taken at the site to verify or supplement indicated dimensions and to insure proper fitting of all items.

C Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.

1.04 COORDINATION

A The work of this Section shall be completely coordinated with the work of other Sections. Verify at the site both the dimensions and work of other trades adjoining items of work in this Section before fabrication and installation of items herein specified.

B Furnish to the pertinent trades all items included under this Section that are to be built into the work of other Sections.

1.05 REFERENCE SPECIFICATIONS

A. Unless otherwise specified, materials shall conform to the following:

Structural Steel	ASTM A36
Structural Tubing	ASTM A500, Grads B
Welded and Seamless Steel pipe	ASTM A53
Gray Iron Castings	ASTM A48, Class 30
Galvanizing, general	ASTM A123
Galvanizing, hardware	ASTM A153
Galvanizing. assemblies	ASTM A386
Aluminum (Extruded Shape)	6061 T6
Aluminum (Extruded Pipe)	6063 T6
Aluminum sheet, Plate and Rolled Shapes	6061 T6
Anchor Bolts and Nuts	ASTM A320,Grade B8
Stainless Steel Bolts, Bars, & Shapes	AISI, Type 304
Stainless Steel Plate and Sheet	AISI, Type 302
Welding Rods for Steel	AWS Spec. for Arc Welding (Type E70XX)
High Strength Steel Bolts, Nuts & Washers	ASTM A325 mechanically galvanized per ASTM B454
Screws	Stainless Steel, IFI-04, Grade 303 or 305

PART 2: PRODUCTS

2.01 MATERIALS

A Ferrous Metals

1. Metal Surfaces, General: for fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes and including pitting, seam marks, roller marks, rolled trade names and roughness.

2. Steel Plates, shapes and bars: ASTM A 36 or BS 1449 .

3. Steel bar grating: ASTM A 569 or ASTM A 36 .

4. Steel tubing: cold formed, ASTM A500; or hot-rolled, ASTM A 501, BS 4848, or BS 2994 .

5. Structural steel sheet: hot-rolled, ASTM A 570; or cold-rolled ASTM A611, class 1; of grade required for design loading.

6. Galvanized structural steel sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.

7. Steel pipe: ASTM A 53 or BS 4848. Type and grade as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.

8. Grey iron castings: ASTM A 48, Class 30, or BS 1452.

9. Malleable Iron castings: ASTM A 47, grade as selected by fabricator.

10. Brackets, flanges and anchors: cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

11. Concrete inserts: threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.

B Grout

1. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

C Fasteners

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls select fasteners for the type, grade and class required.

2. Bolts and Nuts: Regular-hexagon head type, ASTM A 307, Grad A, or BS 1768.

   Lag Bolts: square head type, FS FF-B-561.

   Machine Screws: cadmium plated steel, FS FF-S-92, or BS 4183.

   Wood screws: flat head carbon steel, FS FF-S-111, or BS 1210.

   Plain washers : round, carbon steel, FS FF-W-92, or BS 3410.

   Masonry anchorage devices: expansion shields, FS FF-S-325, or BS 5050.

   Toggle bolts: tube-wing type, FS FF-S-589, type, class and style as required.

   Lock washers: helical spring type carbon steel, FS FF-W-84.

D Paint

1. Shop primer for ferrous metal: Manufacturer's or fabricator's standard, fast-curing, lead-free primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.

2. Shop primer for ferrous metal: fast-curing, lead-free, abrasion-resistant, rust-inhibitive primer selected for compatibility with substrates and with types of alkyd-type finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements only of FS TT-P-86, Types I, II, and III.

3. Galvanizing repair paint: high zinc dust content paint for regalvanizing welds in galvanized steel.

4. Polyester Powder Coat Finish:

   a. Is to be polyester resin powder electrostaticlly applied and baked to give minimum thickness of 70 microns, to meet the requirements of BS 6496. Colour to be select by the Engineer. Manufacturer is to provide a 10 year warranty, agreeing to repair or replace defective coating, defined as abnormal deterioration, aging or weathering or loss of adhesion.

2.02 STEEL ITEMS

A General:

1 Steel Items shall be fabricated of steel bars, shapes, plates and pipe required, ground smooth as approved. Galvanize after fabrication. Securing of components shall be stainless steel.

2 Miscellaneous sleeves not specified in other Sections shall be steel or cast iron pipe in walls and floors with end joints as shown on the Drawing. All pipe sleeves shall have center anchor around circumference.

3 Miscellaneous steel shall be fabricated and installed as shown and shall include anchor bolts, lifting hooks, porous checkered plate, miscellaneous steel called for on the Drawings and not otherwise specified.

B Floor Channels and gratings: cast iron floor channels and straight bar gratings with zinc coated finish, of medium duty, as shown on the Drawings.

C Flat and projected Mashrabeya type screens: are to be constructed of galvanized steel hollow tubes and solid steel bars sections of sizes and dimensions shown on the drawings. Units are to be complete with opening portions and bolt fixings; all finished with coloured electostaticlly baked applied polyester finish.

PART 3: EXECUTION

3.01 FABRICATION

A All miscellaneous metal work shall be formed true to detail with clean, straight, sharply defined profiles and smooth surface of uniform color and texture and free from defects impairing strength or durability.

B Connections and accessories shall be of sufficient strength to safely withstand stresses and strains to which they will be subjected. Steel accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fitting.

C Welded joints shall be rigid and continuously welded or spot welded as specified or shown. The face of welds shall be dressed flush and smooth. Exposed joints shall be close fitting and jointed where least conspicuous.

D Welding of parts shall be in accordance with the standard AWS practices for arc and gas welding. All welding shall be done only by welders certified as to their ability to perform welding in accordance with the requirements of the AWS Code. Component parts of built-up members to be welded shall be adequately supported and clamped or held by other adequate means to hold the parts in proper relation for welding.

E All non-galvanized steel miscellaneous metal work shall be prepared and primed in shop after fabrication as specified in Section 09901. Abrasions and welding damage of primer in the field shall be touched up with the primer used immediately after erection.

F All steel items not specified to be painted shall be galvanized.

3.02 INSTALLATION

A Install all items furnished except items to be embedded in concrete or other masonry which shall be installed under Division 3 and Division 4 respectively. Items to be attached to concrete or masonry after such work is completed shall be installed in accordance with the details shown or suitable alternate method. Fastening to wool plugs in masonry will not be permitted. All dimensions shall be verified at the site before fabrication is started.

B All steel surfaces to come in contact with exposed concrete or masonry shall receive a protective coating of an approved heavy bitumastic troweling mastic applied in accordance with the manufacturer's instructions prior to installation.

C Where aluminum contacts a dissimilar metal, apply a heavy brush coat of zinc.chromate primer followed by two coats of aluminum metal and masonry point to the dissimilar metal.

E Where items are cast into concrete, backpaint with the above paint the contact areas before setting.

F Anchor bolts and expansion bolts shall be set accurately. Where indicated on Drawings, specified, or required, anchor bolts shall be provided with head or nut embedded in concrete or suitable pipe sleeves, or both. Where indicated on the Drawings, specified, or required, anchor bolts shall be provided with square plates or shall have square heads and washers to be set in the concrete forms with suitable pipe sleeves, or both. If anchor or expansion bolts are set after the concrete had been placed, all necessary drilling and grouting or caulking shall be done and care shall be taken not to damage the structure or finish by cracking, chipping, spalling, or otherwise during the drilling and caulking. Minimum distance between the center of any expansion anchor and an edge or exterior corner of concrete shall be not less the 4-1/2 times the diameter of the hole in which it is installed.

G Where galvanizing is damaged by field welding or other erection process, an approved 95 % zinc dust primer shall be applied to the properly prepared damaged areas.

H Welding

1. Ferrous Metal Welding. Permissible weld stress for all structural fillet welding provided under these specifications shall be as tabulated in AWS D1.1 except as specified herein. The allowable shear stress on the effective throat of a fillet weld shall not exceed 124 MPa for ASTM A36, ASTM A441, and ASTM A588 steels. "Effective throat" shall be the shortest distance form the root to the face of the diagrammatic weld regardless of weld size.

    a. Except as otherwise specified, welding shall be performed using only those joint details which have a prequalified status when performed in accordance with the AWS code and the AISC specification.

    b. Welds that are not dimensioned on the construction drawings shall be sized to develop the full strength of the least strength component involved in the connection.

End of Section

DIVISION 6

WOODS AND PLASTICS

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WOODS AND PLASTICS

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SECTION 06100

ROUGH CARPENTRY

PART 1: GENERAL

1.01 SCOPE OF WORK

A Furnish all labor, materials, equipment, and incidentals necessary to install all items of carpentry work not specified as part of other sections and which is generally not exposed, except as other wise indicated complete as shown and as specified herein.

B Set in place, all pressed metal frames which are to be built into masonry. Install all other pressed metal and aluminum door frames as specified in Division 8. Install doors, louvers and finish hardware furnished under other Sections.

1.02 RELATED WORK

A Other Sections directly related to work covered in this section include the following:

1. Section 03300 - Concrete
2. Section 05500 - Miscellaneous Metals
3. Section 08120 - Aluminum Doors and Frames.

PART 2: PRODUCTS

2.01 MATERIALS

A All lumber shall be sound stock, delivered dry, and shall be fully protected at all times from injury and dampness. Split, broken, or otherwise damaged pieces will not be allowed in the work.

B Wood for blocking, shims, framing and nailers shall be Construction Grade. Wood members that will contact masonry or concrete shall be pressure treated with chromated copper arsenate or fluorochrome arsenate phenol. Minimum net retention of solid preservative shall be 4.6 kg per m^3 (0.40 lb per cu ft).

C All treatment shall be performed in accordance with the requirements of the Standard Specifications of the American Wood Preservers Association for treating wood. Apply a heavy coat of the same preservative used in treating to all surfaces cut after treatment.

D Nails, spikes, bolts, nuts and washers where sizes are not indicated or specified, shall be of suitable size and number to securely fasten and hold members in place and to develop the structural strength of the members.

Hot dip galvanize after fabrication, except bolts and nuts shall be mechanically galvanized to provide for ease of installation.

PART 3: EXECUTION

3.01 INSTALLATION

A All carpentry shall be accurately cut, fitted, and installed as detailed on the Drawings.

B Anchors shall be installed, where indicated or required, to anchor carpentry or other items securely to masonry or concrete.

C Forms for structural concrete work shall be as specified under Division 3. Provide all other miscellaneous wood form work as may be required for the completion of the work.

D Temporary wood doors and cloth or transparent plastic covered frames shall be provided for exterior wall openings when and as required for sun, sand and dust control.

E Installation of Doors, Windows, Louvers, and Finish Hardware

End of Section

SECTION 06200

FINISH CARPENTRY

PART 1: GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required and install finish carpentry work which is exposed to view, is non-structural, and which is not specified as part of other sections.

1.02 RELATED WORK

A. Section 06100-Rough Carpentry.

B. Section 08211-Wood Doors and Frames.

C. Section 08610-Wood Windows and Screens.

D. Section 09902-Painting.

1.03 REFERENCES

A. ANSI A135.4-Basic Hardboard.

B. ANSI A208.1-Mat Formed Wood Particleboard.

C. ASTM E84-Test Method for Surface Burning Characteristics of Building Materials.

D. AWI-Quality Standards.

E. AWPA (American Wood Preservers Association) C2-Lumber, Timbers, Bridge Ties and Mine Ties-Preservative Treatment by Pressure Processes.

F. AWPA (American Wood Preservers Association) C20-Structural Lumber Fire Retardant Treatment by Pressure Process.

G. BHMA A156.9-Cabinet Hardware.

H. FS MMM-A-130-Adhesive, Contact.

I. HPMA (Hardwood Plywood Manufacturer's Association) HP-American Standard for Hardwood and Decorative Plywood.

J. NEMA (National Electric Manufacturers Association) LD3-High Pressure Decorative Laminates.

K. NHLA (National Hardwood Lumber Association).

L. NWWDA (National Wood Window and Door Association) I.S.4–Water Repellant Preservative Treatment for Millwork.

M. PS 1-Construction and Industrial Plywood.

N. PS 20-American Softwood Lumber Standard.

1.04 SUBMITTALS

A. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, and fixing, to a minimum scale of (1:10).

B. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storage, installation, and finish of treated material.

C. Provide instructions for attachment hardware and finish hardware.

D. Samples: Submit two samples of finish plywood, (200 x150 mm) in size illustrating wood grain and specified finish.

E. Submit two samples of wood trim (300 mm) long.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver finish carpentry materials until painting, wet work; grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

C. Protect work from moisture damage.

1.06 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings and instructed by the manufacturer.

1.07 COORDINATION

A. Coordinate the work with plumbing and electrical rough-in, installation of associated and adjacent components.

PART 2: PRODUCTS

2.01 LUMBER MATERIALS

A. Softwood Lumber: Comply with PS 20; and with applicable grading rules of the respective grading and inspecting agency for the species and product indicated, maximum moisture content of (8) percent.

B. Hardwood Lumber: Graded in accordance with AWI Premium; maximum moisture content of (8) percent; with vertical grain, of quality suitable for transparent finish.

2.03 SHEET MATERIALS

A. Softwood Plywood: Comply with PS 1 Grade C-D; Graded in accordance with AWI Custom; lumber core.

B. Hardwood Plywood: Graded in accordance with AWI Premium; lumber core, type of glue recommended for application.

C. Wood Particleboard: Comply with AWI standard, composed of wood chips, medium density, made with high waterproof resin binders; of grade to suit application; sanded faces.

D. Hardboard: Pressed wood fiber with resin binder, standard grade, smooth two sides.

2.04 PLASTIC LAMINATE MATERIALS

A. Plastic Laminate: Comply with AWI, colour and surface texture as selected.

B. Laminate Backing Sheet: Comply with NEMA LD-3 BK20 backing grade, undecorated plastic laminate.

2.05 ADHESIVE

A. Adhesive: Type recommended by AWI to suit application.

2.06 FASTENERS

A. Fasteners and anchorages: Provide nails, screws and other anchoring devices of the type, size, material and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable specifications.

1. Where finish carpentry is exposed on exterior or in areas of high relative humidity, provide fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153).

B. Concealed Joint Fasteners: Threaded steel.

2.07 ACCESSORIES

A. Lumber for Shimming, and Blocking: Softwood lumber.

B. Plastic Edge Trim: Extruded flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness; coluor as selected.

C. Float Glass: Clear, top quality; (6 mm) thick minimum.

D. Primer: Alkyd primer sealer type.

E. Wood Filler: Solvent or Oil base as suitable, tinted to match surface finish colour.

2.08 WOOD TREATMENT PROCESSES

A. Preservative treatment: following basic fabrication, provide 3 minute dip treatment of finish carpentry items indicated to receive preservative treatment in 5 percent solution of pentach lorophenol, with vehicle which will not interfere with finish application and will produce minimum effect upon appearance. Apply brush coat on surfaces cut after treatment.

2.09 FABRICATION

A. Fabricate to AWI Premium.

B. Shop assemble work for delivery to site, permitting passage through building openings.

C. Fit exposed sheet material edges with (9.5 mm) matching hardwood edging. Use one piece for full length only.

D. Cap exposed plastic laminate finish edges with plastic trim.

E. Shop prepare and identify components for book match grain matching during site erection.

F. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

G. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.

H. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.

2.10 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.

D. Finish work in accordance with AWI-Section 1500 applicable System.

E. Seal and varnish semi-exposed to view surfaces. Brush apply only.

F. Seal surfaces in contact with cementitious materials.

PART 3: EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Install work in accordance with AWI Premium Quality Standard.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of (1 mm). Do not use additional overlay trim to conceal larger gaps.

D. Install hardware in accordance with manufacturer's instructions.

3.03 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply two coats of preservative treatment on wood in contact with cementitious materials.

C. Allow preservative to dry prior to erecting members.

3.04 SCHEDULE

A Refer to the Drawings and B. O.Q.

End of Section

DIVISION 7

THERMAL AND MOISTURE PROTECTION

BUILDING WORK

DIVISION 7

THERMAL AND MOISTURE PROTECTION

INDEX

SECTION 07005

WATERPROOFING AND DAMPPROOFING

PART 1: GENERAL

1.01 SCOPE OF WORK

A Furnish all materials, labor, and equipment required to perform all waterproofing of cast-in-place concrete, dampproofing, protection board and related work necessary for the proper completion of the project as required by the drawings and as specified herein.

1.02 GUARANTY

A As a condition of this Section furnish the Employer with a written guaranty that the dampproofing membrane and the liquid waterproofing work upon completion will be waterproof for a period of five years and that during this time all defects in the waterproofing or bonding, or leaks which may develop through the surface, shall be promptly repaired at no expense to the Employer, provided such leaks and defects are not due to causes beyond control of this section.

1.03 APPLICATION SCHEDULE

A Dampproof the all surfaces of all cast-in-place concrete walls, foundations, columns and ground beams in contact with soil from the bottom of the footings up to floors dampproofing layer.

B Floors dampproofing membrane shall be applied below ground slabs and Raft foundation, wet areas and planters, as shown on drawings.

1.04 SUBMITTALS

A Submit to the Engineer, as provided in Submittals Section for shop drawings, detailed information on materials proposed & installation methods.

B Submit two sets of representative samples of any or all proposed materials required for the work of this Section as requested by the Engineer.

C Submit to the Engineer for review, the manufacturer's specifications and instructions for materials and installation. These specifications and instructions shall be as required to provide the detailed drawings.

1.05 DELIVERY, STORAGE AND HANDLING

A All perishable materials for the work of this Section shall be delivered, stored and handled so as to preclude damage of any nature. Manufactured materials shall be delivered and stored in their original containers, plainly marked with identification of material and maker. Materials in broken containers, or in packages showing water marks or other evidence of damage, shall not be used and shall be removed from the site.

1.06 JOB CONDITIONS

A Hot Weather Requirements

1. Protect fresh membrane from hot sun as approved.

2. Provide artificial shade, wind breaks and use cooled materials, as required.

PART2: PRODUCTS

2.01 MATERIALS

A Material for walls of basement, floors, wet areas and planter waterproofing shall be 3mm thick torch applied polyester membrane, complying with the following particular specification:

Description	Test Method
Thickness : 3mm	ASTM D751
Reinforcement (base): 180g/m2 woven non-woven polyester	-----
Coating material: Mixture of bitumen modified with APP and additives	-----
Softening point: 150° C	ASTM D36
Water absorption: less than 0.15 %	ASTM D570
Upper surface: flammable polyethylene film	------
Tensile strength: 950 N/5 cm long, 700 N/5 cm trans.	ASTM D146

Man: DERMABIT
DW1, Dermabit water proofing industries CO.
P.O. Box 5945-Riyadh 11432
Saudi Arabia
Tel: (01) 4645988
Fax: (01) 4634100

Man: BITUMAT
Bituminous Materials Factory
P.O. Box 7487-Dammam 31462
Saudi Arabia
Tel : 8424842

Or other equal and approved.

B Material for concrete surfaces in contact with soil, shall be two coats of cold applied black bitumens coating solution to BS 3416, Class A as manufactured by:

Man: CRODA PAINTS Ltd.
Bankside
Hull
North Humberside HU5 1SQ
England
Tel: (0482) 41441
Tlx: 52536

Ref.: Bituminous Blach High Build.

Man: FOSROC INTERNATIONSL Ltd.
(Middle East Division)
United Arab Emirates

Ref. : Nitoproof 120.

Or other equal and approved.

C Primers, bonding compounds, adhesives and the like are to be types recommended for purpose by sheet manufacturer.

D Protection sheet for Sur facces of contact with soil: shall be 20 mm thic expanded pltyrne.

PART 3: EXECUTION

3.01 GENERAL

A All installation shall conform to the acceptable shop drawings and the system and materials manufacturer's specifications and instructions as submitted and reviewed.

3.02 SUBSTRATE SURFACE

A Concrete surfaces shall be free of roughness or projections, with a clean surface, finished as specified under concrete finishes section which will allow an even application of the membrane and insulation.

B Surfaces shall not contain any grease, oil or any other contaminants which could affect the complete bonding of the membrane to the concrete surface.

C Surfaces shall be visibly dry and thoroughly cleaned, (remove all dust, dirt, and loose materials) immediately prior to application of membrane. Compressed air, vacuum cleaner or other suitable means shall be used.

3.03 INSTALLATION

1. Single layer bituminous sheet: lay with 75 mm side laps and 100mm end laps, torch lower surface of sheet and seal to base by firm pressure and seal laps by torching in accordance with manufacturer's instructions.

2. Pipes Etc.: where pipes etc. pass through sheeting make junctions completely watertight by forming collars fully bonded or sealed to both pipes and sheeting.

3. Inspection : inform the Engineer a reasonable length of time before covering any part of membrane with overlying construction to allow inspection.

4. Protect finished sheeting and prevent puncturing during following work. Cover sheeting with permanent overlying construction as soon as possible. Immediately prior to covering check for damage and repair as necessary.

B Installation of Coatings

1. Dry surfaces: dampen before applying water based bitumen emulsion.

2. Apply coatings generally in accordance with manufacturer's recommendations to clean, dry surfaces, in dry atmospheric conditions, after primer has dried and after previous coats have hardened.

3. Ventilation: spaces in which coatings are to be applied are to be well ventilated.

4. Cold and Hot applied bitumen: apply number of coats to thickness and at rate of application recommended by coating manufacturer or as stated in bill of quantities.

5. Chemical waterproof coating: mix dry powder with water on site and apply mixture to pre-wetted surfaces in number of coats and at rate of application recommended by coating manufacturer.

6. Brushing: work coating into recesses, edges, joints, intersections and over surfaces generally to obtain uniform and continuous film.

7. Intersections: ensure continuity of coatings including at junctions with other membranes.

8. Covering: final covering is to be laid/applied as soon as possible after coating has hardened.

End of Section

SECTION 07500

ROOFING SYSTEM

PART 1: GENERAL

1.01 SCOPE OF WORK

A Furnish all labor, materials, equipment and incidentals required to install membrane roofing system and all roofing system accessories and finishing materials as shown on the drawing and specified herein.

1.02 SUBMITTALS

A Submit to the Engineer as provided in special conditions of contract shop drawings showing details of construction and erection of roofing system and components and detailed technical data on membrane and other materials proposed. Include independent laboratory testing results certifying that submitted components and materials meet this Specification.

B Provide, with shop drawings, certification that the roofer who will execute the work is an experienced applicator of the roofing system proposed.

C Submit to the Engineer for review, two representative samples of all roofing components and materials. Board and sheet stock samples shall be 300 mm square or long, minimum.

D Submit to the Engineer for review, the manufacturer's specifications and instructions for materials and installation of the insulated roofing system. These specifications and instructions shall be as required to provide the detailed roofing system.

1.03 DELIVERY, STORAGE AND HANDLING

A All perishable materials for the work of this Section shall be delivered, stored and handled so as to preclude damage of any nature. Manufactured materials, such as base sheets, felts, cement and lime, shall be delivered and stored in their original containers, plainly marked with identification of material and maker. Materials in broken containers, or in packages showing water marks or other evidence of damage, shall not be used and shall be removed from the site.

1.04 PRE-ROOFING CONFERENCE

A Well in advance of commencement of roofing operations but after roofing substrate has been constructed and prepared for roofing, a pre-roofing conference shall be held to inspect the substrate. All parties having an interest in the roofing or work on the roofs shall be informed of the conference.

B The conference shall include an inspection by all parties of the substrate and its conformance with the drawings, the approved shop drawings and the roofing system manufacturer's approved specifications, and instructions. All objections to approval of the substrate shall be submitted in writing to the Engineer. Coordinate efforts to remedy objections and prepare substrate properly to receive roofing.

1.05 JOB CONDITIONS

A Hot Weather Requirements

1. Protect fresh membrane from hot sun as approved.

2. Provide artificial shade, wind breaks and use cooled materials, as required.

1.06 GUARANTY

A As a condition of this Section furnish the Employer with a written guaranty that the roofing system work upon completion will be waterproof for a period of ten (10) years and that during this time all defects in the waterproofing or bonding, or leaks which may develop through the surface, shall be promptly repaired at no expense to the Employer, provided such leaks and defects are not due to causes beyond control of this section.

PART 2 : PRODUCTS

2.01 WATERPROOFING MATERIALS

A Waterproofing shall be single layer high performance torch applied polyester membrane complying with the following particular specification:

1. Description:

Thickness	:	4 mm
Reinforcement (base)	:	260 grms/m2 woven non woven polyester with continuous thread.
Coating material	:	APP modified bitumen, modified with plastomers and elastomers
Upper surface	:	Film finish/ or slated.
Method of application	:	Torchy apply on concrete surface.

2. Characteristics of the membrane:

Characteristic	Minimum requirement	Test Method
Flexibility at low temperature (-4°C to 10°C)	No cracking	ASTM D146
Softening point	Minimum 150°C	ASTM D36
water absorption	less than 0.15%	ASTM D570
Tensile strength N/50 mm longitudinal direction.	1200	ASTM D146
transverse direction	950	ASTM D146
Elongation		
longitudinal direction	55%	ASTM D146
transverse directions	60%	ASTM D146

B Skirtings and upstrands material shall be two layer bituminous sheet similar to paragraph A above but capsheet layer shall be 4mm thick slate finished.

C Primers and adhesives, types recommended for purpose by roof covering manufacturer.

D Cant strip shall be asphalt impregnated fiberboard by Manville, Celotex or equal.

E Portland cement shall conform to ASTM C150 Type I.

F Water for mortar and grout shall be fresh, clean, potable and free from organic matter, acids and alkalis.

G No lime will be allowed to be added to cementitious mixes used under this Section.

2.02 ACCESSORIES AND FASTENINGS MATERIALS

A Aluminium for Flashings and the like: to BS 1470, designation S1B, 0.8 mm thick, temper grade H2.

B Channel (Reglet): aluminium alloy to BS 1470, designation S1B-H2, 0.8 mm thick, dovetailed channel section for casting into concrete or surface fixing, as shown on the Drawings, to receive top edges of flashings, upstands and sealants.

C EDGE TRIM: extruded aluminium section to BS 1474, designation 6063, condition TF.

D Black Bitumen Coating Solution for painting backs of flashings is to be to BS 3416, Type 1.

E Pointing Sealant shall be polysulphide rubber based compound:

Man: Expandite Ltd
Chase Road
London NW10 6PS
England
Tel: (01) 965 8877

Ref. : Thiofle 600

Or other equal and approved.

PART 3: EXECUTION

3.01 GENERAL

A All installation shall conform to the acceptable shop drawings and the system and materials manufacturer's specifications and instructions as submitted and reviewed.

3.02 SUBSTRATE SURFACE

A Concrete surfaces to receive roofing shall be free of roughness or projections, with a smooth clean surface, finished as specified under concrete finishes section which will allow an even application of the membrane and insulation. Concrete shall have damp cured for 28 days minimum before application of roofing.

B Surfaces shall not contain any grease, oil or any other contaminants which could affect the complete bonding of the membrane to the concrete surface.

C Concrete shall be free from surface laitance, loose aggregate, form release agents, curing compounds or other surface treatments.

D Surfaces shall be visibly dry and thoroughly cleaned, (remove all dust, dirt, and loose materials) immediately prior to application of membrane. Compressed air, vacuum cleaner or other suitable means shall be used.

E Notify the Engineer at least 48 hours before application of roofing commences. A representative of the roofing manufacturer shall be present while roofing is being applied to assure conformance to drawings, specifications, and good workmanship requirements.

F Notify the Engineer in writing if, when instructed to proceed with work, the surfaces to be covered are not satisfactory.

G Commencement of the installation of any material shall be considered as acceptance of the conditions of all the surfaces to be covered, and no subsequent claim on account of previous condition of surface will be entertained.

3.03 SCREEDING

A Flat roof slabs shall receive Class 18 screeding concrete cast to falls as indicated on the Drawings. The surfaces of the screeding concrete shall be even and free from any depressions and other defects with reasonably smooth surface finish and ready to receive water proofing works.

3.04 ROOFING MEMBRANE INSTALLATION

A The time of roofing operations with respect to adverse weather conditions, shall be subject to the approval of the Engineer.

B The Manufacturer shall certify that the membrane meets or exceeds the individual requirements set forth herein.

C The following tests shall be carried out by an independent laboratory on specimens from supplied material on site, cost of tests to be included in the Contractor rates:

- Low temperature flexibility.
- Softening point.
- Breaking strength and elongation at break for both directions.

D Antidust priming asphalt shall comply with ASTM-D41.

E Application shall be according to manufacturer's printed and approved instructions.

F Sheets to be arranged to give a minimum of 75 mm overlap with adjacent end sheet.

3.05 EXTERNAL AND INTERNAL CORNERS

A Internal corners shall be two layers of roofing sheet applied as following:

1. cant strip shall be applied as manufacturer instructions.
2. 300 mm wide underlayer sheet applied first.
3. Capsheet applied to primed vertical or horizontal face with 50mm overlaps.

B External corners shall be three layers of roofing sheet as following:

1. 25 mm chamfer formed in concrete assist in dressing roofing sheet around angle

2. 300 mm wide underlayer sheet applied first.

3. Roofing sheet applied to horizontal primed surfaces with 50 mm overlaps.
4. Roofing sheet applied to vertical surface with 50 mm overlaps on to primed surfaces.

End of Section

SECTION 07900

CAULKING

PART 1: GENERAL

1.01 SCOPE OF WORK

A Furnish all materials, labor & equipment required to install caulking materials as required by the drawings and as specified herein.

B The terms "caulking" and "sealing" as used on the drawings and in these specifications are synonymous, and either or both terms shall indicate the materials specified herein.

1.02 RELATED WORK

A Other sections directly related to work covered in this section include the following:

1. Section 03300-Concrete.
2. Section 04200-Masonry.
3. Section 04400-Natural stone slab cladding

1.03 SUBMITTALS

A Submit to the Engineer, as provided in the Submittals Sections, detailed information on materials proposed and installation methods.

B Submit two sets of representative samples of any or all proposed materials required for the work of this section as requested by the Engineer.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A Sealants shall be stored in unopened containers, under cover, in a cool dry place.

PART 2: PRODUCTS

2.01 MATERIALS

A Concelaed Joint Sealant for movement joints is to be oil based mastic compound unless otherwise specified.

Man: Dunlop Ltd.
Chester Road
Erdington
Birmingham B35 7AL
England
Tel: (021) 373 8101
Ref: Caulking compound DP 247-43

Man: Expandite Ltd.
Chase Road
London NW10 6PS
England
Tel: (01) 965 8877
Tlx: 25420

Ref: Secomastic

Or other equal and approved.

B Exposed Joint Sealant for movement joints is to be approved two-part polysulphide rubber based compound unless otherwise specified.

Man: `Dunlop Ltd.

Ref: High butyl mastic 421.8

Man: Fosroc International Limited (Middle East Division)
U.A.E - Dubai
Tel : 310567
Fax : 310379

Ref: Thioflex 600

Or other equal and approved.

C Joint Sealant for movement joints in car park decks and sewage treatment works is to be two-part, compound of chemically resistant elastomeric polymers, cold applied, resistant to fuel and oil spillage.

Man: Servicised Ltd.
Ajax Avenue
Slough
Berkshire SL1 4BH
England
Tel: 0753 692929
Tlx: 846966 Servcd G.

Ref: Vertigard

Man: Forsroc International Limited
U.A.E - Dubai

Ref. : Expofelx 800

Or other equal and approved.

D Joint Sealant for movement joints in retaining walls and basements is to be bitumen based compound.

Man: Expandite Ltd.
Chase Road
London NW10 6PS
England
Tel: (01) 965 8877
Tlx: 25420

Ref: Plastiseal

Man: Servicised Ltd.
Ajax Avenue
Slough
Berkshire SL1 4BH
England
Tel: 0753 692929
Tlx: 846966 Servcd G.

Ref: Servijoint

Or other equal and approved.

E Joint Sealant for movement joints in drinking water reservoirs and for damp conditions is to be sulphate resistant olymeric ompound or use with cement.

Man: Servicised Ltd.
Ajax Avenue
Slough
Berkshire SL1 4BH
England
Tel: 0753 692929
Tlx: 846966 Servcd G.

Ref: Servi-gard

Or other equal and approved.

F Primer shall be as recommended by the sealant manufacturer.

G Backup Material shall be Polyethylene or polyurethance foam as recommended by the sealant manufacturer.

H Bondbreaker Tape Adhesive-backed polyethylene tape as recommended by the sealant manufacturer.

2.02 PERFORMANCE AND DESIGN REQUIREMENTS

A Colors. Colors of sealants shall be as selected by the Engineer from the manufacturer's standard line of colors. Different colors may be required for different locations.

B Backup Material. Backup material shall be provided as necessary to control the depth of sealant and shall be of suitable size so that, when compressed 25 to 50 percent, the space will be filled.

PART 3: EXECUTION

3.01 JOINT PREPARATION

A All surface to receive sealant shall be clean, dry, and free from dust, grease, oil, or wax. Concrete surfaces which have been contaminated by form oil, paint, or other foreign matter which would impair the bond of the sealant to the substrate shall be cleaned by sandblasting. All surfaces shall be wiped with a clean cloth saturated with xylol or other suitable solvent and primed before the sealant is applied.

B Unless otherwise recommended by the sealant manufacturer and permitted by the Engineer, the depth of sealant in a joint shall be equal to the width of the joint, but not more than 20 mm.

C Backup material shall be rolled or pressed into place in accordance with the manufacturer's installation instructions, avoiding puncturing and lengthwise stretching. If depth of the joint does not permit use of backup material, bondbreaker tape shall be placed at the bottom of the joint to prevent three-sided adhesion.

3.02 SEALING

A Sealing work shall be done before any field painting work is started. The air temperature and the temperature of the sealed surfaces shall be above 10 C when sealing work is performed.

B Upon completion of the sealing work, each sealed joint shall have a smooth, even, tooled finish, flush with the edges of the sealing recess, and all adjacent surfaces shall be clean. Sealant shall not lap onto adjacent surfaces. Any sealant so applied as to prevent the painting of adjacent surfaces to a clean line, or with an excess of material outside the joint and feathered onto surfaces, shall be removed and the joint resealed.

End of Section