

## **PART 1 - GENERAL**

### **1.1 GENERAL REQUIREMENTS**

- .1 Conform to requirements of General Conditions and Division 1.

### **1.2 SCOPE OF WORK**

- .1 Provide all labour, materials and necessary equipment to supply and install the shop fabricated **Durex® Integrated Building System (IBS)** where shown on the Architectural drawings and as specified.

### **1.3 RELATED WORK SPECIFIED ELSEWHERE**

- |    |   |               |
|----|---|---------------|
| .1 | Concrete walls:   | Section 03300 |
| .2 | Masonry walls:  | Section 04200 |
| .3 | Air barrier:  | Section 07196 |
| .4 | Roofing:  | Section 07500 |
| .5 | Firestopping system, other than firestopping:               | Section 07840 |
| .6 | Caulking (other than caulking (specified in this Section)): | Section 07900 |
| .8 | Interior gypsum board finish:                               | Section 09250 |

### **1.4 DESIGN CRITERIA**

- .1 All materials used shall conform to the requirements of applicable CSA and CGSB standards and the governing building codes and local by-laws.
- .2 The shop fabricated **Durex® Integrated Building System (IBS)** shall be designed by registered a professional engineer.
- .3 Design system to comply with the requirements of the Local Building Code and to meet the following standards:
- .1 ASTM E283-84, Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.
  - .2 ASTM E330-84, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
  - .3 CAN/ULC-S101-M89, Standard Methods of Fire Endurance Tests of Building Construction and Materials.
  - .4 CAN4-S114-M80 (R1985), Standard Method of Test for Determination of Non-Combustibility in Building Materials.
- .4 All system components shall conform to ULC design No. (EW-17).
- .5 Design, locate and caulk all required control joints and expansion joints. Locate such joints of the structure and the **Durex® Integrated Building System (IBS)**.
- .6 Design panel system to interface with all other components of the exterior wall systems to form a continuous and complete air/vapour barrier.

- .7 Design panel system to withstand all applicable loads, including live, dead, wind, seismic, etc. Allow for appropriate factors of safety.
- .8 Ensure that maximum deflection design criterion does not exceed 1/240 of the clear span under positive or negative loads.
- .9 Ensure that steel stud section properties are in accordance with the A.I.S.I. Cold Formed Design Manual.
- .10 Design all connections for the steel stud framed units to be electric fusion welded.
- .11 Design panels to include means of hoisting for transportation and site erection.

## 1.5 **SAMPLES**

- .1 Prior to installation of mock-up, submit duplicate 600 mm x 600 mm (24" x 24") representative samples of the **Durex® Integrated Building System (IBS)**, including steel stud, sheathing board, air barrier, insulation, reinforcing mesh and colour and texture of the coating finish in accordance with requirements in Division 1.

## 1.6 **SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with requirements specified in Division 1.
- .2 Clearly indicate dimensions, tolerances, materials and large scale details for terminations, elevations of prefabricated units, identification of each prefabricated unit, openings, locations of expansion and/or control joints, reveals, description of related and abutting components.
- .3 Each shop drawing submitted shall bear the signature and stamp of a qualified registered professional engineer .

## 1.7 **TEST CERTIFICATES**

- .1 Submit copies of certificates showing conformance to the following requirements and local authorities having jurisdiction for the approval of the installation of the specified prefabricated **Durex® Integrated Building System (IBS)**:
  - .1 Fire Endurance Test conforming to CAN/ULC-S101-1989. The composite panel subjected to test will not develop an average temperature rise of more than 140°C (252°F) or a maximum temperature rise at any point of more than 180°C (324°F) on its unexposed face within 10 minutes and the non-combustible cladding material will remain in place for not less than 15 minutes.
  - .2 Non-Combustibility Test conforming to CAN4-S114 (R1985) "Standard Method Test for Determination of Non-Combustibility in Building Materials". The base coat and/or finish coat of the EIFS subjected to tests for non-combustibility cladding.
  - .3 Ontario Building Code requirements 3.2.3.7.(1) & 3.2.3.7. (3) that construction of the exposing building face where unprotected openings of no less than 10% but not more than 25% of the exposing building face, the exposed building face shall have a fire-resistance of not less than 1 hour and be clad with non-combustible cladding.
  - .4 Submit Third Party Certificate on the insulation materials.

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## **1.8 MAINTENANCE DATA**

- .1 Provide maintenance data for **Durex® Integrated Building System (IBS)** work for incorporation into Maintenance Manual specified in Division 1.

## **1.9 QUALIFICATIONS OF APPLICATOR**

- .1 Work of this Trade shall be executed by a qualified fabricator/installer approved by **Durabond Products Limited**. Applicator shall have been trained, by **Durabond Products Limited** in the most recent installation procedures of this type of work, and will have proper equipment and skilled personnel to expediently complete work of this Trade in an efficient and very best workmanlike manner.

## **1.10 MANUFACTURER'S SUPERVISION AND INSTALLER**

- .1 Arrange for **Durabond Products Limited** to have a qualified technical representative visit site prior to commencement of work to discuss with General Contractor, Installer and Architect, the installation procedures to be used, in order that alternative recommendations may be made to Architect should adverse conditions exist.
- .2 Also, arrange for the qualified technical representative to visit site at regular intervals during installation and upon completion of work to ensure adherence to specifications and to check quality of completed work.
- .3 The above supervision shall be at no extra cost to Owner.

## **1.11 QUALITY REFERENCE STANDARD HOUSE**

- .1 The contractor shall erect one house on each site constructed with the **Durex® Integrated Building System (IBS)** as per drawings and specifications which shall become the reference standard for the erection of the remaining houses to be constructed.
- .2 Contractor shall construct quality reference standard house in presence of Architect and **Durabond's** representative. Such construction shall follow the use of approved materials and details required.
- .3 Approved quality reference standard house shall serve as a standard for the remainder of work throughout project.

## **1.12 DELIVERY, STORAGE AND HANDLING**

- .1 Transport, handle and store prefabricated units by approved methods to prevent damage, such as chipping and cracking.
- .2 Store prefabricated units on pallets raised above the ground. Where possible, store units in a dry, waterproof location.
- .3 Provide protective coverings to protect the prefabricated units from damage due to inclement weather and other construction work.

## **1.13 ENVIRONMENTAL CONDITIONS**

- .1 Do not proceed with installation of prefabricated units immediately prior to, during nor immediately after inclement conditions, nor wet weather is anticipated within 24 hours after installation.
- .2 Proceed with work only when surfaces and conditions are satisfactory for production of a first class installation.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- .1 All components of **Durex® Integrated Building System (IBS)** shall be manufactured/supplied by **Durabond Products Limited**, 55 Underwriters Road, Toronto, Ontario, Canada M1R 3B4, Tel: (416) 759-4474. No substitutions or addition of other materials shall be permitted. Installed by its locally approved fabricator/installer.
- .2 **Metal studs, tracks and bracings:** Cold formed from sheet steel meeting requirements of ASTM A446 and hot dip galvanized in conformance to CAN/CSA G164-M92.
- .3 **Sheathing board: Duraboard Cement Board**, minimum 12 mm (1/2") thick.
- .4 **Membrane air/vapour barrier:** Self-sealing rubberized asphalt composite sheet membrane, minimum 1.02 mm (40 mils) thick, **Durex® Flex-Seal** manufactured by **Durabond Products Limited**. Include the appropriate primer for the appropriate substrate.
- .5 **Insulation:** Shall be (Type I expanded polystyrene to CAN/CGSB-51.20-M87, minimum RSI-value of 0.65 per 25 mm (R value of 3.75 per inch thickness). Total thickness as indicated on drawings.
- .6 **Insulation for prefabricated shapes:** Expanded polystyrene to CAN/CGSB-51.20-M87, minimum RSI-value of 0.65 per 25 mm (R value of 3.75 per inch) thickness.
- .7 **Insulation adhesive:** For bonding insulation to the air/vapour barrier, **Durex® Flex-Seal Insulation Adhesive**.
- .8 **Mechanical fasteners and fastener plates:** Fasteners for securing shall be self-tapping screws for steel. All fasteners shall be corrosion resistant coated in conformance with ASTM C1002-83, ASTM C954-81, or ASTM A548-82. Fastener plates shall be **Durex® WDP plastic plates** distributed by **Durabond Products Limited**.
- .9 **Standard reinforcing fabric:** Standard duty, open weave glass fibre mesh weighing 152 gms/sq. m (4.5 oz/sq. yd.). **Durex® 040 mesh** in 1 m by 50 m (38" x 150') rolls.
- .10 **Detail reinforcing fabric:** Standard duty, open weave glass fibre mesh weighing 152 gms/sq. m (4.5 oz/sq. yd.). **Durex® 040 detail mesh** in 25 cm by 50 m (10" x 150') rolls, or **Durex® Adhesive Back detail mesh** in 30 cm by 50 m (12" x 150") rolls.
- .11 **Scratch coat and base coat: Durex® Uniplast Grey Medium** mixed with **Durex® Acrybond 'S'** in strict accordance with **Durabond's** printed instructions.
- .12 **Finish primer coat: Durex® Brush Coat**, colour number \_\_\_\_\_.
- .13 **Finish Coat:** Finish coat shall be **Durex® Architectural Coating** \_\_\_\_\_, colour number \_\_\_\_\_.
- .14 **Sealant:** Low modulus sealant as recommended and approved by **Durabond Products Limited**. Standard colour as selected by Architect.
- .15 **Compressible seal:** Pre-formed open cell polyurethane foam impregnated with polymer modified asphalt.

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- .16 **Foamed-in-place insulation:** Class 1, single or two component polyurethane foam with flame spread rating of 25, fuel contributed 0 and smoke developed 20. Must be ozone friendly and containing no fluoro-carbons. Density of 27.2 kg/cu.m. (1.75 lbs./cu.ft.) and minimum RSI-value of 0.91 per 25 mm (R value of 5 per 1") thickness. Enerfoam manufactured by Abisko Manufacturing Inc., or Froth-Pak manufactured by Insta-Foam Products, Inc.
- .17 **Surface sealer (optional):** 100% acrylic based clear sealer **Durex® Wall Seal 15** manufactured by **Durabond Products Limited**.
- .18 **Anchors and supports:** To CAN/CSA-G40.21, Type 300W, (44W), galvanized after fabrication, to suit design.

## 2.2 MIXES

- .1 Prepare and mix primer, scratch and base and finish coats in strict accordance with **Durabond's** written instructions to obtain a homogeneous consistency of mixture. Other than those specified by **Durabond**, do not add any other additives, rapid binders, antifreeze, accelerators, fillers or pigments to the mixtures without written approval from **Durabond Products Limited**.
- .2 Mix air barrier and insulation adhesive in accordance with the following formula by weight:

<b>Durex® Flexcrete</b>	1 pail
<b>Durex® Flexcrete 'B'</b>	1 bag
- .3 Mix both scratch coat and base coat in accordance with the following formula by weight:

<b>Durex® Uniplast Grey Medium</b>	1 bag
<b>Durex® Acrybond 'S'</b>	5 litres

Pour the **Durex® Acrybond 'S'** into an empty clean mixing container. While under slow mixing action add the **Durex® Uniplast Medium** in the required mixing proportions. Mix well until the mixture is free of lumps. Do not over-mix or use excessive mixing speed.
- .4 Let mixed materials stand for a few minutes until they begin initial stiffening. Mix only enough materials, which can be used within 45 minutes. Re-temper and use. Discard all materials which have begun to stiffen for a second time.

## 2.3 CUTTING OF STEEL STUD SECTIONS/TOLERANCES:

- .1 Inspect and verify that all steel sections are in conformance with the reviewed shop drawing requirements for dimensions, thickness and galvanizing prior to commencing construction of panels.
- .2 Refer only to reviewed shop drawings for guidance in dimensions and tolerances for the construction of the prefabricated panels.
- .3 Keep one original set of reviewed shop drawings at the fabricator's construction facility at all times during the panel fabrication. That way, these drawings shall be readily available to fabricating personnel.
- .4 Prefabricated panels shall conform to the following dimensional tolerances: length and width 3 mm+ (1/8")+), 6 mm + (1/4")+), thickness 3 mm+ (1/8")+).

- .5 All cutting of steel members shall be straight and square, executed with appropriate trade sharp cutting tools.

## **2.4 FABRICATION-GENERAL**

- .1 Fabricate **Durex® Integrated Building System (IBS)** to suit field conditions and dimensions and in full conformance with the reviewed shop drawings.
- .2 Fabricate **Durex® Integrated Building System (IBS)** in sufficient time and in proper sequence to ensure adequate curing before installation.
- .3 On back or on unexposed edge, mark each prefabricated unit to correspond to identification mark on shop drawings for location.
- .4 Mark each prefabricated unit with date fabricated.
- .5 Provide all openings and reveals where indicated.

## **2.5 FABRICATION OF STUD STEEL FRAMEWORK**

- .1 Fabricate stud framework in jigs with framing members laid out as per shop drawings. Weld all joints.
- .2 Completely touch up all welded areas with corrosion-preventive zinc-rich primer.
- .3 Fabricate steel stud framework to conform with specified tolerances, true and straight.
- .4 Discard all bent or damaged framing sections.
- .5 Handle and store steel stud framework with care to prevent damage to any framing member or any welded joint.

## **2.6 SHEATHING BOARD**

- .1 Fasten the sheathing board along the length of each stud at 300 mm (12") o.c.
- .2 Secure fasteners along tracks around edge of panels and around all sides of openings at not more than 50 mm (2") from edge and spaced not more than 200 mm (8") o.c.
- .3 Ensure all vertical joints of sheathing boards are placed over a framing member. Provide one fastener one each side of cement board edge spaced at not more than 300 mm (12") o.c. taking care not to damage the edge board. Stagger vertical joints of the sheathing boards; avoid joint alignment.
- .4 Install sheathing boards with its strong axis perpendicular to the framing members.
- .5 Solidly fasten 100% of fasteners directly to the framing members. Remove and replace all loose or improperly installed fasteners.

## **2.7 INSULATION ADHESIVE/AIR BARRIER**

- .1 Apply a 1.5 mm (1/16") thick coat of **Durex® Flexcrete** over the entire substrate surface, applying sufficient pressure in the trowelling process to ensure full contact with the substrate.
- .2 Allow a minimum of 24 hours for drying and curing.

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- .3 At all locations where the substrate material changes install a 300 mm (12") wide strip of **Durex® Flex-Seal Air/Vapour Barrier Membrane** in strict accordance with **Durabond Products Limited's** printed instructions.

## 2.8 **INSULATION**

- .1 Apply **Durex® Flexcrete Insulation Adhesive** to back of insulation boards using a notched trowel and apply in continuous strokes to cover the entire surface of each board to be adhered to the substrate.
- .2 Install insulation boards to substrate with joints offset with respect to joints in substrate, in running bond pattern. Pre-cut boards to fit snugly around openings designed in the panels. Butt boards to moderate tight fit. Ensure that vertical edges of the insulation boards are placed over a framing member wherever possible.
- .3 Before the insulation adhesive begins initial set firmly press insulation board into place, beginning installation at one end, from the designed bottom base line of the panel to form an uninterrupted surface. Ensure full thermal barrier throughout.
- .4 Interlock board joints at all corners.
- .5 Where they may occur fill gaps with foamed-in-place insulation.
- .6 Provide all reveals in insulation boards as indicated. Ensure reveals are true to size and straight and level throughout. Ensure all reveals are in accurate alignment over entire wall surfaces.

## 2.9 **DETAIL REINFORCING FABRIC**

- .1 Provide detail reinforcing fabric and wrap around and reinforce edge of insulation board at all terminations of the system and along both edges of all expansion/control joints.
- .2 Install the detail reinforcing fabric to the substrate prior to installation of the insulation board.
- .3 Apply a ribbon of adhesive, 50 mm wide by 18 mm thick (2" x 3/4"), along all edges which are to receive the detail reinforcing fabric.
- .4 Install the detail reinforcing fabric so that a strip approximately 100 mm (4") wide will be embedded under the insulation board and the remainder be returned onto the edge of the board and onto the face.
- .5 Place the pre-measured and cut strip of detail reinforcing fabric over the ribbon of adhesive. Press fabric into place and smooth out ensuring that the fabric is well embedded into the adhesive.

## 2.10 **FASTENERS FOR INSULATION**

- .1 Install fasteners at not more than 300 mm (12") o.c. vertically and 400 mm (16") o.c. horizontally, or at spacing equivalent to spacing of framing members.
- .2 Install fasteners along termination points within 150 mm (6") of the edge and spaced not more than 200 mm (8") o.c.
- .3 Solidly fasten 100% of fasteners directly to the framing members. Ensure that locations of framing members have been clearly and accurately marked.
- .4 Install 25% of the fasteners through the insulation. Install the remaining 75% of the fasteners after the installation of the scratch coat and standard reinforcing fabric.

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- .5 Install fasteners to a depth to leave the **Durex® WDP anchor plate** flush or slightly depressed from the surface.
- .6 Remove all loose or improperly installed fasteners and replace them.
- .7 Do not remove any fasteners once they have been permanently installed.

## **2.11 SCRATCH COAT**

- .1 At all areas where detail reinforcing fabric has been installed, apply a 6 mm (1/4") thick layer of scratch coat. Pull detail reinforcing fabric into the scratch coat so that it is fully embedded. Using an edging tool smooth the corner to render a true and square corner.
- .2 Apply a 4 mm (5/32") thick coat of scratch coat mix over the entire insulation surface, applying sufficient pressure in the trowelling process to ensure full contact with the insulation.
- .3 Allow minimum 3 days for curing and drying.

## **2.12 REINFORCING FABRIC**

- .1 Embed the reinforcing fabric into the scratch coat. Ensure that the trowelling process fills all voids in the fabric.
- .2 Install the reinforcing fabric in a horizontal pattern to the final installed position of the prefabricated panel with all fabric joints overlapped minimum 50 mm (2").
- .3 Reinforce all corners of openings where no control joints are detailed with an additional strip, 225 mm by 300 mm (9" x 12") of reinforcing fabric installed diagonally across the top of corners.
- .4 Overlap the standard (and high impact) reinforcing fabric with the detail reinforcing fabric 100 mm (4") at all locations where detail reinforcing fabric has been installed.
- .5 Install standard (and high impact) reinforcing fabric tight, straight and free of wrinkles, ripples and waves.

## **2.13 BASE COAT**

- .1 During hot weather, if the scratch coat surface is exceptionally dry, lightly dampen the surface with a fog mist of clean potable water. Do not over-saturate as it will impair the bonding of the base coat.
- .2 Trowel apply the base coat, applying sufficient pressure to ensure full bond with the scratch coat.
- .3 Use a straight edge tool to darby the surface and bring it to a straight, even and true surface.
- .4 Total thickness of both the scratch and base coats shall be not less than 6.4 mm (1/4").
- .5 When the base coat has taken initial set, use a wood or sponge float and work the surface with light circular motions to remove all high points and to fill low points.
- .6 Final surface shall be smooth, straight and true to a tolerance of not more than 3.2 mm in 3 m (1/8" in 10'-0"). Surface shall be free of towel marks, irregularities and visible mesh pattern.
- .7 Allow minimum 3 days for curing and drying.

## **2.14 FINISH PRIMER COAT**

- .1 Apply primer with high pile roller at the rate of 2.8 litre/sq. m. (600 sq. ft/pail). Evenly apply primer throughout. Substrate shall not be visible through the applied primer.
- .2 Avoid excessive build-up in any one area.
- .3 Allow minimum 4 hours prior to application of the finish coat.

## **2.15 FINISH COAT**

- .1 Apply finish texture coat within 3 days after application of primer coat. Longer periods may be scheduled between operations provided that the primed surface is kept clean and in good condition.
- .2 Apply final texture coat in strict accordance with **Durabond's** printed instructions for the selected finish.
- .3 Final texture finish and colour shall match the approved site mock-up.
- .4 Do not apply primer and finish texture coat onto surfaces which will be caulked.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- .1 Examine the structure to receive the **Durex® Integrated Building System (IBS)** for defects which will adversely affect execution and quality of work.
- .2 Report in writing to Architect all adverse conditions which will be detrimental to work of this trade. Such conditions shall include discrepancies in panel sizes, structure irregularities and variances from reviewed shop drawings.
- .3 Do not start work until unsatisfactory conditions have been corrected.
- .4 Commencement of work shall indicate acceptance of all conditions.

### **3.2 INSTALLATION**

- .1 Install the **Durex® Integrated Building System (IBS)** in accordance with approved mock-up, **Durabond's** printed instructions and reviewed shop drawings.
- .2 Supply anchor bolts, structural steel inserts, plates and the like to be cast into cast-in-place concrete required for the connection or the support of pre-finished panel units to Concrete Sub-trade for installation. Supply layout drawings locating accurately the position of all cast-in-place items to be installed by Concrete Sub-trade. Check installation prior to pour.
- .3 Provide proper equipment and erect work using trades skilled in this trade.
- .4 Install panels plumb, level, and in true alignment with the face of adjacent panels.
- .5 Erect units with joints parallel and other and in accordance with design requirements and reviewed shop drawings. Joint width shall be minimum 12 mm (1/2"); maximum 25 mm (1/2").
- .6 Anchor prefabricated panel units to building structure in a manner which will allow structure to deform due to load deflections, creep and thermal movements without imparting additional loads to structure or units.

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- .7 Securely fasten units in place by welding where possible. Protect work form damage by weld splatter.
- .8 Where bolted connections are used for installation, tighten bolted connections with equal torque. Secure bolts with lock-washers or lock-weld nut to bolt.
- .9 Provide temporary erection anchorage for welded anchorage system.
- .10 Clean field welds with wire brush and touch up with zinc-rich primer.
- .11 Remove shims and spacers from joints after fastening but before sealant is applied.

### **3.3 CAULKING**

- .1 At all faces, caulk joints between the prefabricated panel units and all joints between the **Durex® Integrated Building System (IBS)** and abutting building components.
- .2 Apply sealant in strict accordance with the sealant manufacturers' printed instructions.

### **3.4 AIR SEAL**

- .1 Prior to fastening the **Durex® Integrated Building System (IBS)** to concrete slab apply a 300 mm (12") wide strip of **Durex® Flex-Seal Air/Vapour Barrier Membrane**. Apply a coat of **Durex® Flex-Seal Primer** to concrete surfaces prior to application of membrane.

### **3.5 SURFACE SEALER (OPTIONAL)**

- .1 After complete installation of the **Durex® Integrated Building System (IBS)** apply one coat of surface sealer to exterior face of panels. Apply sealer in strict accordance with **Durabond's** printed instructions.

### **3.6 SPECIAL CLEANING**

- .1 Clean off all spotting and blemishes from work not intended to receive the **Durex® "Flexlite Select MF" System** and leave work in clean condition.
- .2 Entirely reinstate at this Trade's own expense, any surface not to be coated, but soiled and attributable to this Trade due to spillage, mixing of material or any other cause.