

PART 1 GENERAL

1.1 Related Work

- .1 Gypsum Board Assemblies Section 09 21 16

1.2 References

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 1320-(2005), Standard Practice for Installation of Mineral Fibre Batt and Blanket Thermal Insulation for Light Frame Construction.
- .2 Canadian Standards Association (CSA International).
 - .1 CSA B111-(1974(R2003)), Wire Nails, Spikes and Staples.
- .3 Environmental Choice Program (EPC)
 - .1 CCD-016-(97), Thermal Insulation.
- .4 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC-S702-(1997), Standard for Mineral Fibre Insulation.

PART 2 PRODUCTS

2.1 Insulation

- .1 Batt and blanket mineral fibre: CAN/ULC S702, Type 1, thickness 64 mm, density 10.4 Kg/m³ for acoustic insulation, density 4.8 1 Kg/m³ for thermal insulation.

2.2 Accessories

- .1 Insulation clips:
 - .1 Impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, adhesive back, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.
- .2 Nails: galvanized steel, length to suit insulation plus 25 mm, to CSA B 111.
- .3 Staples: 12 mm minimum leg, to CSA B 111-1974.
- .4 Joint sealing tape: as recommended by manufacturer.

PART 3 EXECUTION

3.1 Insulation Installation

- .1 Install insulation to maintain continuity to building elements and spaces.
- .2 fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices.
- .5 Do not enclose insulation until it has been inspected and approved by Engineer.

3.2 Cleaning

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 GENERAL

1.1 Section Includes

- .1 Requirements for the installation of preformed metal cladding/siding.

1.2 Related Sections

- .1 Section 01 01 00 General Instructions
- .2 Section 07 62 00 Metal Flashing & Trim
- .3 Section 07 92 00 Joint Sealers

1.3 References

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D 2369-03, Test Method for Volatile Content of Coatings.
 - .2 ASTM D 2832-92(R1999), Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-93.2-M91, Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use.
 - .2 CAN/CGSB-93.3-M91, Prefinished Galvanized and Aluminum-Zinc Alloy Steel Sheet for Residential Use.
 - .3 CAN/CGSB-93.4-92, Galvanized and Aluminum-Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
 - .4 CGSB 93.5-92, Installation of Metal Residential Siding, Soffits and Fascia.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .4 Environmental Choice Program (ECP)
 - .1 CCD-045-95, Sealants and Caulking Compounds.
- .5 Underwriters' Laboratories of Canada ((ULC)
 - .1 CAN/ULC-S706-02, Wood Fibre Thermal Insulation for Buildings.

1.4 Submittals

- .1 Product data: submit manufacturer's printed product literature, specifications and data

sheet in accordance with Section 01 01 00 General Instructions.

.1 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 01 00 General Instructions. Indicate VOC's for caulking materials during application and curing

.2 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 01 00 General Instructions.

.2 Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, metal furring, and related work.

.3 Samples

.1 Submit samples in accordance with Section 01 01 00 General Instructions.

.2 Submit duplicate 300 x 1200 mm samples of siding material, of colour and profile specified.

.4 Manufacturer's Instructions

.1 Submit manufacturer's installation instructions.

1.5 Quality Assurance

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with 01 01 00 General Instructions.

.2 Divert used metal cut-offs from landfill by disposal removed for disposal at the nearest metal recycling facility.

.3 Divert reusable materials for reuse at nearest used building materials facility.

.4 Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.

PART 2 PRODUCTS

2.1 Material Cladding Components

- .1 Silhouette HCF series by Fabral Metal Wall and Roof Systems or approved equal.
 - .1 Horizontal concealed-fastener wall panel design.
 - .2 Profile configurations - four ribs
 - .3 0.032" - 0.050" aluminum and 24ga - 18ga steel is available.
 - .4 Smooth.
 - .5 Mitered corners.
 - .6 Width 16" with a 7/8" depth.
- .2 Panel materials
 - .1 22 gauge, Grade 50 (50 ksi yield strength) structural steel with AZ50 (0.50 oz/ft.²) aluminum-zinc alloy coating, both conforming to ASTM A 792.
 - .2 0.032", 3105-H14 or equivalent (18 ksi yield strength) aluminum alloy conforming to ASTM B 209.
- .3 Texture
 - .1 Panels shall be (smooth), (stucco embossed).
- .4 Finish
 - .1 Refer to manufacturer's standard colour card to determine appropriate finish and colour. All panels shall receive a factory-applied Kynar® 5000 conforming to the following:
 - .1 Metal preparation: all metal shall have the surfaces carefully prepared for painting on a continuous process coil coating line by alkali cleaning, not water rinsing, application of chemical conversion coating, cold water rinsing, sealing with an acid rinse, and thorough drying.
 - .2 Prime coating: a base coat of epoxy paint specifically formulated to interact with the top-coat, shall be applied to the prepared surfaces by roll coating to a dry film thickness of 0.20 ± 0.05 mils. This prime coat shall be oven cured prior to application of finish coat.
 - .3 Exterior coating: a finish coating shall be applied over the primer by roll coating to a dry film thickness of 0.80 ± 0.05 mils for a total dry film

thickness of 1.00 ± 0.10 mils. This finish coating shall be oven-cured.

- .4 Interior coating: a washcoat shall be applied on the reverse side over the primer by roll coating to a dry film thickness of 0.30 ± 0.05 mils for a total dry film thickness of 0.50 ± 0.10 mils. The washcoat shall be oven-cured.
- .5 Colour: the colour of the exterior finish shall be as chosen from the manufacturer's standard colour chart.
- .6 Physical properties: the coating shall conform to the manufacturer's standard performance criteria as listed by certified test reports for fade, chalk, abrasion, humidity, adhesion, pollution resistance, and others as required and standard within the industry.

2.2 Accessories

- .1 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and window/door trim of same material, colour and gloss as cladding, with fastener holes pre-punched.

2.3 Fasteners

- .1 Nails: CSA B111. Screws: ANSI B18.6.4 Purpose made stainless steel.

2.4 Caulking

- .1 Sealants: polyurethane:
 - .1 Test for acceptable VOC emissions in accordance with ASTM D 2369 and ASTM D 2832.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 Installation

- .1 Conform to the standard set forth in the SMACNA architectural sheet metal manuals and the approved shop drawings detailed, CG SB 93.5 and manufacturer's written instructions..
- .2 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.

- .3 Install panels plumb, level, and straight with the ribs parallel, conforming to the design as indicated.
- .4 Install panel system so it is watertight, without waves, warps, buckles or distortions.
- .5 Install outside corners, fillers and closure strips with carefully formed and profiled work.
- .6 Install soffit and fascia cladding as indicated.
- .7 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
- .8 Attach components in manner not restricting thermal movement.
- .9 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00 - Joint Sealing.

3.3 Cleaning

- .1 Dispose of excess materials and debris, all tools and barricades from jobsite.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

- .1 General Instructions Section 01 01 00

1.2 References

- .1 Aluminum Association Inc. (AAI)
 - .1 Aluminum Sheet Metal Work in Building Construction-2002.
 - .2 AA DAF 45 - 03 Designation System for Aluminum Finishes-1980.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM A 167-099 (2004), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A 606-04, Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
 - .3 ASTM A 653/A 653 M-07, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM A 792/A 792M-06a, Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .5 ASTM B 32-04, Specification for Solder Metal.
 - .6 ASTM B 370-03, Specification for Copper Sheet and Strip for Building Construction.
 - .7 ASTM D 523-89(1999), Test Method for Specular Gloss.
 - .8 ASTM D 822-01(2006), Practice for Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon Arc Light and Water Exposure Apparatus.
- .3 Canadian Roofing Contractors Association (CRCA).
 - .1 Roofing Specifications Manual 1997.
- .4 Canadian Standards Association (CSA)
 - .1 CSA A123.3-M05, Asphalt or Tar Saturated Roofing Felt.
 - .2 AAMA/WDMA/CSA 101/I.S.2/A440-2008, Standard/Specification for Windows, Doors, and Unit Skylights.

- .3 CSA B111-1974 (R 2003), Wire Nails, Spikes and Staples.
- .5 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
 - .2 CAN/CGSB-93.1-M85, Sheet, Aluminum Alloy, Prefinished, Residential.
- .6 Green Seal Environmental Standards
 - .1 Standard GS-03-93, Anti-Corrosive Paints.
 - .2 Standard GS-11-97, Architectural Paints.
 - .3 Standard GS-36-00, Commercial Adhesives.
- .7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .8 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule # 113-04, Architectural Coatings.
 - .2 SCAQMD Rule # 1168-05, Adhesives and Sealants.

1.3 Samples

- .1 Submit shop drawings in accordance with Section 01 01 00 General Instructions.
- .2 Submit duplicate samples of each type of sheet metal material, colour and finish.

1.4 Waste Management

- .1 Separate and recycle waste materials in accordance with Section 01 01 00 General Instructions.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material for recycling in accordance with Waster Management Plan.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Ensure empties containers are sealed and stored safely for disposal away from children.
- .6 Divert unused metal materials from landfill to metal recycling facility as approved by Engineer.
- .7 Unused paint and sealant material must be disposed of at an official hazardous material

collections site as approved by Engineer.

- .8 Unused paint and sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .9 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 PRODUCTS

2.1 Sheet Metal Materials

- .1 Galvanized steel sheet: commercial quality to ASTM A 653/ A 653M with 1.25 oz. per sq. ft. zinc coating to Z275 designation zinc coating.
- .2 Finish: pre-finished steel with factory applied, silicone modified polyester coating, Stelco/Dofasco '5000 series' paint colour to be selected.
 - .1 Class F1S
 - .2 Colour to be selected from manufacturer's standard range.
 - .3 Specular gloss: 30 units \pm 5 in accordance with ASTM D523.
 - .4 Coating thickness: not less than 25 micrometres.
 - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20 % to ASTM D 822 as follows:
 - .1 Outdoor exposure period 1000 hours.
 - .2 Humidity resistance exposure period 1000 hours.

2.2 Accessories

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB 37.5
- .3 Underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.
- .4 Sealants: one part low or medium modulus to CGSB 19-GP-9M, Dow Corning, '795' or G.E. 'Silpruf', colour to match flashing.
- .5 Cleats: of same material, and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.

- .6 Fasteners: of same material as sheet metal, to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing application.
- .7 Washers: of same material as sheet metal, with rubber packings.
- .8 Touch-up paint: as recommended by pre-finished material manufacturer.

2.3 Fabrication

- .1 Fabricate metal flashings and other sheet metal work to applicable CRCA 'FL' series specifications and as indicated.
- .2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm". Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.4 Metal Flashings

- .1 Form flashings, copings, scuppers and fascia to profiles indicated of 0.018" (26 gage) thick galvanized steel.

PART 3 EXECUTION

3.1 Manufacturer's Instructions

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions and data sheets.

3.2 Installation

- .1 Install sheet metal work to CRCA specifications and as detailed.
- .2 Use concealed fastenings except where approved before installation.
- .3 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.
- .4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock, forming tight fit over hook strips, except where otherwise shown.
- .5 Lock end joints and caulk with sealant.
- .6 Insert metal flashings into reglets or under cap flashing to form weathertight junction.
- .7 Turn top edge of flashing into recessed mortar joint, minimum 25 mm. Screw fasten

flashing, with washer, securely into joint.

.8 Caulk flashing at mortar joint with sealant.

.9 Weld flashings around structural items projecting through roof membrane as detailed.

3.3 Cleaning

.1 Proceed in accordance with Section 01 01 00 General Instructions.

.2 On completion and verification of performance of installation, remove surplus material, excess materials, rubbish, tools and equipment.

.3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

- .1 General Instructions Section 01 01 00

1.2 References

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-1984, Sealing Compound, one Component, Acrylic Gase, Solvent Curing (Issue of 1076 reaffirmed, incorporating Amendment Nol 1).
 - .2 CAN/CGSB-19.13-M87, Sealing Compound, one-component Elastomeric, Chemical Curing.
 - .3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
 - .4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
 - .5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .2 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C919-(02), Standard Practice for Use of Sealants in Acoustical Applications.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS)

1.3 Samples

- .1 Submit duplicate samples of each type of material and colour to be used in accordance with Section 01 01 00 - General Instructions.
- .2 Cured samples of exposed sealants for each colour where required to match adjacent material.

1.4 Environmental Conditions

- .1 Do not proceed with installation of joint sealants under following conditions:
 - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
 - .2 When joint substrates are wet.

JOINT SEALING

- .2 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Materials Safety Data Sheets (MSDS) acceptable to Labour Canada.
- .3 Conform to manufacturer's recommended temperatures, relative humidity and substrate moisture content for application and curing of sealants including special conditions governing use.

1.5 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 01 00 - General Instructions.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Dispose of surplus chemical and finishing materials in accordance with federal, provincial and municipal regulations.
- .5 Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- .6 Fold up metal banding, flatten, and place in designated area for recycling.
- .7 Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- .8 Use the least toxic sealants necessary to comply with the requirements of this section.
- .9 Close and seal tightly all partly used sealant containers and store protected in well ventilated fire-safe area at moderate temperature.
- .10 Place used hazardous sealant tubes and other containers in areas designated for hazardous materials.

1.6 Warranty

- .1 Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run, lose adhesion, stain adjacent surfaces or dry hard for five (5) years.

PART 2 PRODUCTS

2.1 Materials

- .1 General:

JOINT SEALING

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- .1 Sealants and caulking compounds must:
 - .1 meet or exceed all applicable governmental and industrial safety and performance standards; and
 - .2 be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the fisheries Act and the Canadian Environmental Protection Act (CEPA).
 - .2 Sealant and caulking compounds must not be formulated or manufactured with: aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, barium or their compounds, except barium sulfate.
 - .3 Sealant and caulking compounds must not contain a total of volatile organic compounds (VOCs) in excess of 5% by weight as calculated from records of the amounts of constituents used to make the product.
 - .4 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.
 - .5 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
 - .6 When low toxicity caulks are not possible, confine usage to areas which off gas to the exterior are contained behind air barriers, or are applied several months before occupancy to maximize off gas time..
 - .7 Where sealants are qualified with primers use only these primers.
 - .2 Primers: type recommended by sealant manufacturer for type of surface being primed.
 - .3 Joint fillers:
 - .1 General: compatible with primers and sealants, oversized 30 to 50%.
 - .2 Expanded polyethylene rod for tubular shape or tape to suit joint size and to be under minimum 10% compression at minus 25 degrees F., "Ethafoam" by Dow Chemical Canada Inc. or approved equal. Outsize rod not less than 25% wider than joint.
 - .3 Bond breaker: pressure sensitive Polyethylene tape, which will not bond to sealants.
 - .4 Sealant:

JOINT SEALING

- .1 Type 1: multi-component, chemical curing conforming to CGSB 19.24, or two component "Dymeric" sealant by Tremco or equivalent.
- .2 Acoustical Sealant to ASTM C 919.
- .3 Colour of sealants: Obtain selection from Consultant unless specified otherwise.
- .5 Joint Cleaner: non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

PART 3 EXECUTION

3.1 Protection

- .1 Protect installed Work of other trades from staining or contamination.

3.2 Surface Preparation

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil, grease and other matter which may impair work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coating unless test have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces to sealant manufacturer's instructions.

3.3 Priming

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime side of joints to sealant manufacturer's instructions immediately prior to caulking.

3.4 Backup Material

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 Mixing

- .1 Mix material in strict accordance with sealant manufacturer's instructions.

3.6 Application

.1 Sealant

- .1 Apply sealant in accordance with manufacturer's written instructions.
- .2 Mask edges of joint where irregular surface or sensitive joint border exist to provide neat joint.
- .3 Apply sealant in continuous bead.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Neatly tool surfaces before skimming begins to a slight concave joint.
- .8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing

- .1 Cure sealants in accordance with sealant manufacturer's instructions.
- .2 Do not cover up sealants until curing has taken place.

.3 Cleanup

- .1 Clean adjacent surfaces immediately and leave work neat and clean.
- .2 Remove excess and droppings, using recommended cleaners as work progresses.
- .3 Remove masking tape after initial set of sealant.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

- .1 Finish hardware: Section 08 71 10
- .2 Exterior Painting Section 09 91 13

1.2 References

- .1 American Society for Testing and Materials (ASTM).
 - .1 ASTM A 653/A653M-13, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - .2 ASTM C578-14a, Standard Specification for Rigid Cellular Polystyrene Thermal Insulation.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP- 19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA).
 - .1 CSA A101-M1983, Thermal Insulation, Mineral Fibre, for Buildings.
 - .2 CAN/CSA-G40.20/G40.21-13, Structural Quality Steels.
 - .3 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA).
 - .1 CSDFMA, Specifications for Commercial Steel Doors and Frames, 2006.
 - .2 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.
- .5 National Fire Protection Association (NFPA).
 - .1 NFPA 80-13, Fire Doors and Windows.
 - .2 NFPA 252-12, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN4-S104- 10, Fire Tests of Door Assemblies.
 - .2 CAN4-S105-10, Fire Door Frames Meeting the Performance Required by CAN4-S104

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01 01 00 General Instructions.
- .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of fasteners, glazed openings, finishes, and arrangement of hardware.
- .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, and finishes.

- .4 Identify each unit relating to numbering on drawings and as specified.

1.4 Requirements of Regulatory Agencies

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M, NFPA 252, for ratings specified or indicated.
- .2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.5 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with the Waste Reduction Workplan.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Set aside and protect the following surplus and uncontaminated waste finish materials: Deliver to, or arrange collection by employees, individuals, or organizations for verifiable re-use or re-manufacturing.
- .5 Place materials defined as hazardous or toxic waste in designated containers, and place used sealant and adhesive tubes and containers in areas designated for hazardous waste.
- .6 Return solvent and oil soaked rags, used during installation, for contaminant recovery, proper disposal, or appropriate cleaning with no contaminant release to water systems.
- .7 Close and seal tightly all partly used sealant and adhesive containers and store protect in well ventilated fire-safe area at moderate temperature.
- .8 Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- .9 Fold up metal banding, flatten, and place in designated area for recycling.
- .10 Collect wood packing shims and pallets and place in designated area for recycling and reuse.
- .11 Do not dispose of paints or solvents by pouring on the ground. Place in designated containers and ensure proper disposal in accordance with federal, provincial and municipal regulations.
- .12 Solvent based paints, which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner in accordance with hazardous waste regulations. Empty paint cans are to be dry prior to disposal or recycling (where available).
- .13 Where paint recycling is available, collect all waste paint by type and provide for delivery to

recycling or collection facility.

- .14 Paints and finishes are regarded as hazardous products and are subject to regulations for their disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional levels of Government.

1.4 Items Supplied by Others

- .1 Procure templates and hardware items from Finish Hardware supplier.

PART 2 PRODUCTS

2.1 Door Materials

- .1 Sheet steel: lock forming grade, hot dip galvanized steel, to ASTM A 653/A653M, commercial grade (CS) Type B, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts.
 - .1 Exterior Doors: Coating designation Z275 (G90) or paintable galvanized steel.
- .2 Reinforcement channel: to CAN/CSA-G40.20/G40.21. Type 44W, coating designation to ASTM A 653/A653M.
- .3 Door core:
 - .1 Hollow steel exterior: vertically stiffened with steel ribs and all voids filled with injected rigid urethane or urethane board infill, thickness to fill core space. ASTM C578, type 1, rigid extruded fire retardant, closed cell board, density 16 to 32 kg/m³ (1 to 2 pcf), thermal value RSI - 1.0 (R-6.0) minimum.
 - .2 Hollow steel fire rated: similar to hollow steel core except with semi-rigid fibrous insulation fill, ULC approved.
- .4 Glazing stops: minimum 20 gauge (1 mm) base thickness commercial grade sheet steel, tamperproof. Fire rated stops of thickness and design approved by ULC.
- .5 Thermal insulation material must:
 - .1 not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act;
 - .2 be manufactured using a process that uses chemical compounds with the minimum ozone depletion potential (ODP) available.

2.2 Adhesives

- .1 Select Adhesives which:

- .1 do not contain volatile organic compounds in excess of 5 % by weight as measured by as demonstrated through calculation from records of the amounts of constituents used to make the product;
- .2 are accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance;
- .3 are accompanied by information describing proper disposal methods for containers.
- .2 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
- .3 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .4 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.3 Frame Materials

- .1 Fabricate frames in accordance with CSDFMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Sheet steel: lock-forming grade, hot dip galvanized steel, to ASTM A 653M, wiped zinc finish.
 - .1 Frame base metal thickness: 16 gauge (1.6 mm).
 - .2 Floor anchors, channel spreaders and wall anchors: minimum 16 gauge (1.6 mm) base thickness steel.
 - .3 Guard boxes: minimum 22 gauge (0.8 mm) base thickness steel.
 - .4 Glazing stops: minimum 20 gauge (1 mm) base thickness steel. Fire rated stops of thickness and design approved by ULC.
- .4 Blank, reinforce, drill and tap frames for mortised, templated hardware, using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .5 Prepare frame for door silencers, - 3 for single door.
- .6 Manufacturer's nameplates on frames and screens are only permitted on hinge side of frame concealed from view.
- .7 Conceal fastenings except where exposed fastenings are indicated.
- .8 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .9 Fire rated frame components: materials and construction approved by ULC.

- .10 Hinge, strike, reinforcing: minimum 10 gauge (3.5 mm) thick base thickness steel.
- .11 Door bumpers: black neoprene studs.

2.4 Frame Fastenings

- .1 Expansion bolts and shields, toggle nuts, shims, galvanized. Exposed screws are not permitted.

2.5 Primer

- .1 Primer and touch-up for doors and frames: to CAN/CGSB-1.181.

2.6 Paint

- .1 Steel doors and frames shall be field painted in accordance with Sections 09 91 23. Finish shall be free of scratches or other blemishes.

2.7 Accessories

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .3 Metallic paste filler: to manufacturer's standard.
- .4 Fire labels: metal rivetted.
- .5 Sealant: refer section 07 92 10 - Sealants.
- .6 Glazing: wired glass - refer section 08 80 50 - Glazing.
- .7 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
- .8 Weatherstripping

2.6 General Fabrication

- .1 Fabricate doors and frames in accordance with details, approved shop drawings, ULC and NFPA requirements and "Canadian Manufacturing Specifications for Steel Doors and Frames", by CSDFMA except as otherwise specified.
- .2 Mortise, reinforce, drill and tap doors and frames and reinforcements to receive hardware. Reinforce all doors and frames for overhead surface mounted door closers and hardware.
- .3 Do welding in accordance with Canadian Welding Bureau Standard No. 59.

- .4 Exposed surfaces shall be free from wave, warp or buckle, corners square, joints tightly fitted. Weld and grind without leaving blemishes on exposed surfaces. Re grind at welded areas.
- .5 Attach ULC labels to fire rated doors and frames.
- .6 Touch up galvanized surfaces damaged during fabrication with primer. Leave galvanized doors and frames ready for site painting.

2.7 Door Fabrication

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Interior doors: hollow steel construction.
- .3 Fabricate doors with longitudinal edges locked seam, welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .4 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E 330.
- .5 Exterior door laminated core construction: both face sheets 1.2mm (18 gauge) steel, with polystyrene core, laminated under pressure to face sheets.
- .6 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .7 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .8 Reinforce doors where required, for surface mounted hardware. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .9 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .10 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .11 Manufacturer's nameplates on doors can be placed on hinge side of door concealed from view, otherwise they are not permitted.
- .12 Exterior door: Flush PVC top caps.
- .13 Make provision glazing as indicated and provide glazing stops.
- .14 Construct matching transom panels in same manner as doors. Rebate meeting edges of

doors at junction with transom panels.

2.8 Frame Fabrication

- .1 Frames shall be one piece fully welded in factory, to CSA W59.
- .2 Cut mitres and joints accurately and weld continuously on inside of frame profile.
- .3 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- .4 Protect strike and hinge reinforcements using guard boxes welded to frames.
- .5 Weld in two channel spreaders per frame, to ensure proper frame alignment.
- .6 Construct thermally broken frames using steel core, separate exterior portion from interior portion with continuous interlocking PVC thermal break, to exterior door openings.
- .7 Provide jamb anchors for fixing at floor.
- .8 Provide 3 jamb anchors per jamb for frames up to 1520 mm high and 1 additional anchor for each additional 760 mm.
- .9 Coat inside of frame with bituminous coating.

PART 3 EXECUTION

3.1 General Installation

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDFMA Installation Guide.

3.2 Frame Installation

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Remove temporary spreaders after frames are built-in.
- .4 Make allowance for deflection to ensure structural loads are not transmitted to frames.
- .5 Fill behind frames to exterior walls and sound rated walls with mineral fibre loose insulation.
- .6 Caulk perimeter of frames between frame and adjacent material.
- .7 Install door bumpers after frames have been finished painted.

3.3 Door Installation

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .2 Provide even margins between doors and jambs and doors and finished floor as follows:
 - .1 Hinge side: 1.0 mm
 - .2 Latch side and head: 1.5 mm
 - .3 Finished floor: 13 mm
- .3 Adjust operable parts for correct function.

3.4 Finish Repairs

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.5 Glazing

- .1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

END OF SECTION

HANGAR DOORS

PART 1 GENERAL

1.1 Related Work

- .1 Section: Instructions to Bidders
- .2 Section: 01 01 00 General Instructions

1.2 References

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.105-M91, Quick-Drying Primer
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G40.20/G40.21=98, General Requirements for Rolled or Welded Structural Quality Steel.
- .3 Environmental Choice Program (ECP)
 - .1 CCD-048-95, Recycled Water-born Surface Coatings
 - .2 CCD-047a98, Surface Coatings.

1.3 Submittals

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specification and data sheets in accordance with Section 0101 00 General Instructions.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 01 00 General Instructions.
 - Indicate VOC's:
 - .1 For caulking material during application.
 - .2 For door materials and adhesives.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 01 00 General Instructions.
 - .2 Indicate each type of door, arrangement of hardware, required clearances and electrical requirements and connections.
- .3 Manufacturer's Instructions:
 - .1 Submit manufacturer's Installation instructions.

1.4 Quality Assurance

- .1 Test Reports: certified test reports showing compliance with specified performance

HANGAR DOORS

characteristics and physical properties.

- .2 Certificates: product certificates signed by manufacturer certifying material comply with specified performance characteristics and criteria and physical requirements.
- .3 Qualifications of Manufacturer
 - .1 The manufacturer supplying the door shall have at least ten years experience in the design or manufacture of Aircraft Hangar Doors. All design drawings shall be stamped by a Professional Engineer registered in the Province of Ontario who is familiar with the design of hangar doors, and the company or engineer shall have a Certificate of Authorization to practice Professional Engineering in the Province of Ontario.

1.5 Waste Management and Disposal

- .1 Remove from site and dispose of packaging material at appropriate recycling facilities.
- .2 Dispose of corrugated cardboard, polystyrene, plastic packaging material in appropriate on site bin for recycling in accordance with site waste management program.
- .3 Divert unused metal and wiring material from landfill to metal recycling facility approved by Project manager.
- .4 Divert unused paint material from landfill to official hazardous material collections site approved by Project Manager.
- .5 Don not dispose of unused paint material into sewer systems, into lakes, streams onto ground or in locations where it will pose health or environmental hazard.

PART 2 PRODUCTS

2.1 Material

- .1 Horizontal Sliding doors: galvanized steel with Z275 zinc coating, internally reinforced with interlocking sections.
 - .1 Wind pressure as per NBC.
 - .2 Deflection to 1/180 of span
 - .3 Building defection
 - .1 down 1/480
 - .2 up 1/720
- .2 Structural steel frame: to CAN/CSA-G40.21
 - .1 Door;
 - .1 CSA S-16 or S-16-09
 - .2 CSA S-136 or S-136-07
 - .2 Welding: to CSA W59-03
- .3 Head rail guide: size, material and profile to manufactures recommendations.
- .4 Shop primer: to CAN/CGSB-1.105 (MPI 79)

HANGAR DOORS

2.2 Door Design

- .1 Design doors to:
 - .1 Operate electrically - emergency opening (towing).
 - .2 Open horizontally, sliding to both sides (bi-parting).
 - .3 33.5 m X 15.5 m x 6 bi-parting leaves.
 - .4 3 section on separate rails, echelon formation.

- .2 Provide steel tracks and top guides for horizontally closing.
 - .1 Rails:
 - .1 ASCE rail shape, minimum 30 lbs/yard
 - .2 Field bolted, +/- 2mm tolerance.
 - .3 Sleeper spacing not to exceed 1.524 m o.c. and 150 mm both sides of rail.
 - .4 Levelling devices to allow for +/- 25mm

- .3 Bogies:
 - .1 deflection
 - .1 maximum vertical 1/360 span
 - .2 maximum horizontal 1/240 span
 - .2 Drilled to accept structural members.
 - .3 Continuous mounting angle on exterior face.
 - .4 Reinforced wheel boxes to allow wheels to be inserted or removed without removing door from track.

- .4 Wheels:
 - .1 Minimum 305 mm diameter.
 - .2 Steel C 1045 machined.
 - .3 Spherical roller bearings to accommodate wind loads (live/dead) (SLS -0.75)
 - .4 25 year life with 100% dead load.
 - .5 Wheel treads heated to hardness - Brindell 350.
 - .6 Axles to be removable and fitted with grease fittings.

- .5 Top Guides:
 - .1 Sealed ball bearings designed for minimum 25 year life (SLS-0.75), removable.
 - .2 Adjustable to allow for levelling at max 6090 mm horizontally and 3045 mm vertically.
 - .3 Vertical deflection allowance:
 - .1 down 1/450
 - .2 up 1/720

- .6 Safety Bumpers:
 - .1 Shock absorbing
 - .1 Maximum mass of door at speed of 300 mm/sec impacting adjacent leaves.
 - .2 End stop bumpers to be provided.

HANGAR DOORS

- .3 welded and bracing to allow for maximum bumper force plus 25% of design.
- .7 Weatherstripping:
 - .1 Each leaf - polypropylene brush with aluminum extrusions, continuous, adjustable.
- .8 Warning Horn:
 - .1 Each leaf of door shall have a warning horn which operates when door is in operation.
- .9 Safety Edge:
 - .1 Each leading edge of door (when opening/closing) to be fitted with Miller safety edge.
- .10 Man Door:
 - .1 Provide in leading leaf of opening complete with electrical interlock to prevent motion of door open.
- 2.3 Electrical Operator
 - .1 Electrical motors, controller units, remote pushbutton station, starters, relays, timers, thermal overloads, transformers and other electrical components: to CSA approvals with CSA enclosure types.
 - .2 Power supply: 600 V, 3 phase TEFC, 60 Hz.
 - .3 Controller unit: with integral motor reversing starter 120V, 1 phase, 60 Hz., heater elements for overload protection and control relays as applicable.
 - .4 Operation:
 - .1 Controls mounted on leading leaf of each drive door in NEMA 12 (dust tight) enclosure.
 - .2 High quality double/triple reduction helical bevel gears in oil bath complete with disc break.
 - .3 Motor design to be back driven by releasing break disconnect lever.
 - .4 Conductors: festooning power supply system allowing for expansion/contraction of top guides.
 - .5 Lock switch panels located on exterior of door leaf (exterior operation).
 - .5 Door speed: maximum 18 m per minute.
 - .6 Mounting brackets: galvanized steel, size and thickness to suit condition.
 - .7 All electrical equipment located below 460 mm of the floor to be explosion proof.

HANGAR DOORS

PART 3 EXECUTION

3.1 Manufacturer's Instructions

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instruction, product installation instructions, and data sheets.

3.1 Installation

- .1 Install doors in accordance with manufacturer's instructions.
- .2 Install electrical motors, controller units, pushbutton station, relays and other electrical equipment required for door operation.
- .3 Installation includes electrical wiring from power supply located near door opening.
- .4 Adjust door operating components to ensure smooth opening and closing of doors.
- .5 Ground rails shall be installed ± 3 mm in 6 M and ± 6 mm overall in both alignment and top of track elevation as shown on the manufacturer's drawings. The ground rail system shall be securely fastened to reinforcing bar or other means of attachment so the possibility of movement during concrete backfilling is impossible.
- .6 Top Guides shall be installed ± 6 mm in 6 M and ± 10 mm overall for both alignment and elevation as shown on the manufacturers drawing.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

- .1 Steel Doors and Frames Section 08 11 14

1.2 Reference Standards

- .1 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
- .2 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-1981, Butts and Hinges.
- .3 CAN/CGSB-69.19-93/ANSI/BHMA A156.3-1984, Exit Devices.
- .4 CAN/CGSB-69.20M90/ANSI/BHMA A156.4-1986, Door Controls (Closers).
- .5 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.
- .6 Can/CGSB-69.22-M90/ANSI/BHMA A156.6-1986, Architectural Door Trim.
- .7 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxilary Hardware.
- .8 CAN?CGSB-69.34-90/ANSI/BHMA A156.18-1987, Materials and Finishes.
- .9 CAN/CGSB-69.36-M90/ANSI/BHMA A156.20-1984, Strap and Tee Hinges and Hasps.
- .10 UL 10B Fire Tests of Door Assemblies
- .11 CAN/ULC S 104-10- Standard Method for Fire Tests of Door Assemblies.
- .12 CAN/ULC S 132-07 - Standard for Emergency Exit and Emergency Fire Exit Hardware.

1.3 Requirements Regulatory Agencies

- .1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.4 Hardware List

- .1 Submit contract hardware list in accordance with 01 10 00 - General Instructions - Shop Drawings, product Data, Samples and Mock-ups.
- .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

1.5 Maintenance Data

- .1 Provide operation and maintenance data for door closers, locksets, door holders and fire exit

hardware for incorporation into manual specified in Section 01 01 00 - Operation and Maintenance Manual.

- .2 Brief maintenance staff regarding proper care, cleaning, and general maintenance.

1.6 Maintenance Materials

- .1 Provide maintenance materials in accordance with Section 01 01 00 General Instructions

1.7 Delivery and Storage

- .1 Store finishing hardware in locked, clean and dry area.
- .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

PART 2 - PRODUCTS

2.1 Hardware Items

- .1 All hardware to BHMA A 156 series.
- .2 Only door locksets and latchsets listed in CGSB Qualified Products List are acceptable for use on this project.
- .3 Use one manufacturer's products only for all similar items.
- .4 All items to be heavy duty.

2.2 Door Hardware

- .1 Locks and latches:
 - .1 Bored and preassembled locks and latches: to CAN/CGSB-69.17, designed for function and keyed as stated in Hardware Schedule.
 - .2 Interconnected locks and latches: to CAN/CGSB-69.28, series 5000 interconnected lock, designed for function and keyed as stated in Hardware Schedule.
 - .3 Mortise locks and latches: to Can/CGSB-69.29, series 1000 mortise lock, designed for function and keyed as stated in Hardware Schedule.
 - .4 Lever handles.
 - .5 Escutcheons: round.
 - .6 Normal strikes: box type, lip projection not beyond jamb.
 - .7 Cylinders: key into keying system as directed.
 - .8 Finished to 630.
- .2 Butts and hinges:
 - .1 Butts and hinges: to CAN/CGSB-69.18, designed by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule. 3 knuckle concealed bearing hinges to be used.
 - .2 Continuous hinges in accordance with CAN/CGSB-69.36, full length of door edge mount - beveled hinge/guard. Two inch knuckles. Split nylon bearings at each point. 35 stainless steel pin. Stainless steel material. Adjust-screw fasteners. Table I, finished to C28

- .3 Exit devices: to CAN/CGSB-69.19, type functions and grades as listed in hardware schedule, modern, finished to C32D. SARGENT, NO SUBSTITUTIONS.

.4 Door Closers and Accessories:

- .1 Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numerical identifiers listed in Hardware Schedule, non-size in accordance with Can/CGSB-69.20, table A1, finished to A1.
- .2 Closers to have aluminum alloy bodies, full molded covers, fully reversible, multi-sized.
- .3 Mounted on hangar side of door.
- .5 Auxiliary locks and associated products: to Can/CGSB-69.21, designated by letter E and numeral identifiers listed in Hardware Schedule, finished to 626.
- .1 Cylinders: supplied by Engineer and installed by Contractor.
- .6 Architectural door trim: to Can/CGSB.69.22, designated by letter J and numeral identifiers listed in Hardware Schedule, finished to C32D.
- .1 Door protection plates: kick plate, 1.27 mm thick stainless steel finished to C32D.
- .2 Push plates: 1.27 mm thick stainless steel finished to C32D.
- .3 Push/Pull units: type stainless steel, finished to C32C.
- .7 Auxiliary hardware: to Can/CGSB-69.32, designated by letter L and numeral identifiers listed in Hardware Schedule, finished to C32D.
- .1 Holder, door mounted: finished to C32D.
- .2 Lever extension flush bolt, finish to C32D.
- .8 Astragal: overlapping, steel, finished to 600 primer for paint, full length of door or as listed in hardware list.

2.3 Miscellaneous Hardware

- .1 Indexed key control system: to CAN/CGSB-69.21, designated by letter E and numeral identifiers, wall mounted system, colour enamel paint finish.

2.4 Fastenings

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .2 Exposed fastening devices to match finish of hardware.
- .3 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .4 Use fasteners compatible with material through which they pass.

2.5 Keying

- .1 Provide construction cores.

PART 3 - EXECUTION

3.1 Installation Instructions

- .1 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .2 Furnish manufacturers' instructions for proper installation of each hardware component.
- .3 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
- .4 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .5 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type of fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .6 Mounting heights for hardware from finished floor to centre line of hardware as shown on Drawing or at the following heights from finished floor to center line of item.
 - .1 Lockset: 900 mm (36 inches) to cross bar.
 - .2 Installation to meet current National Building Code.
- .7 Remove construction when directed by Engineer; install permanent cores and check operation of all locks.
- .8 Receive Engineer supplied hardware items and coordinate all hardware installation with other sections.
- .9 Adjust hardware for smooth operation.

3.2 Hardware Schedule

- .1 Refer to door schedule on drawings.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

- .1 All glass and glazing required for the project and including: sliding hangar door glazing.

1.2 References

- .1 ASTM C542-82 (1984) Specification for Lock-Strip Gaskets.
- .2 ASTM E90-87 Method for Laboratory Measurement of Airborne-Sound Transmission Losses of Building Partitions.
- .3 CAN/CGSB-12 1-M90 Glass, Safety, Tempered or Laminated.
- .4 CAN/CGSB-12.2-M76 Glass, Sheet, Flat, Clear.
- .5 CAN/CGSB-12.3M76 Glass, Polished or Flat, Flat, Clear.
- .6 CAN/CGSB-12.5-M86 Mirrors, Silvered.
- .7 CAN/CGSB-12.8-M97 Insulating Glass Units.
- .8 CAN/CGSB-12.11-M76 Glass, Wired, Safety.

PART 2 - PRODUCTS

2.1 Glass Materials

- .1 Flat glass: to CAN/CGSB-12.3, glazing quality, 6mm thick.
- .2 Laminated safety glass for all doors and partitions to CAN/CGSB-12.1, Type 2, Class B of thickness indicated. Tint transparent, 6 mm thick.
- .3 Acoustic insulating glass units: to CAN/CGSB-12.8, with one sheet of 6 mm thick tempered glass and one sheet of 6 mm thick tempered glass, with hermetically sealed space, minimum STC of 39 to ASTM E90.
- .4 Wired glass: to CAN/CGSB-12.11, type 1, wire mesh style 3, 6 mm thick.
- .5 Security glass with one sheet of 6 mm thick tempered glass and one sheet of laminated safety glass.

2.2 Accessories

- .1 Glazing tape: preformed butyl tape, 10 - 15 durometer hardness, paper release, black colour, size to suit installation.
- .2 Setting blocks: neoprene, Shore "A" durometer hardness to ASTM D2240, 1997, to suit glazing method, glass light weight and area.
- .3 Spacer shims: neoprene, Shore "A" durometer hardness to ASTM D2240, 1997, 75 mm long x one half height of glazing shop x thickness to suit application, self adhesive on one face.
- .4 Glazing splines: polyvinyl - chloride manufacturer's standard dry glazing splines to suit aluminum extrusions, colour as selected.
- .5 Glazing clips: manufacturer's standard.
- .6 Lock-strip gaskets: black neoprene to ASTM C542.
- .7 Glazing stops, minimum 20 gauge (1mm) base thickness commercial grade sheet steel, tamper proof. Fire rated stops of thickness and design approved by ULC.

PART 3 - EXECUTION

3.1 Examination

- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.2 Preparation

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

3.3 Installation Interior - Dry method Tape and Tape

- .1 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .2 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .3 Rest glazing on setting blocks and push against tape for full contact at perimeter of light of unit.

- .4 Place glazing tape on free perimeter of glazing in same manner described in 3 above.
- .5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .6 Knife trim protruding tape.
- .7 Glazing to be secured with fasteners from the secured side of the wall only.

END OF SECTION

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PART 1 GENERAL

1.1 Related Sections

- | | | |
|----|--------------------------------|------------------|
| .1 | General Instructions | Section 01 01 00 |
| .2 | Structural Steel for Buildings | Section 05 12 23 |
| .3 | Hangar Doors | Section 08 13 73 |

1.2 References

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environment Design): Green Building Rating System Reference Package for New Construction and Major Renovations.
 - .2 Environmental Protection Agency (EPA)
 - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
 - .3 Health Canada/Workplace Hazardous Materials Information System (WHIMS)
 - .1 Material Safety Data Sheets (MSDS).
 - .4 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - February 2004.
 - .2 Standard GPS-1-05, MPI Green Performance Standard for Painting and Coatings.
 - .5 National Fire Code of Canada
 - .6 Society for Protective Coatings (SSPC)
 - .1 Systems and Specifications, SSPC Painting Manual 2005.

1.3 Quality Assurance

- .1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Qualified journeymen who have a "Tradesman Qualification Certificate of Proficiency" shall be engaged in painting work. Apprentices may be employed provided they work

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-
- under the direct supervision of a qualified journeyman in accordance with trade regulations.
- .3 Conform to latest MPI requirements for exterior painting work including preparation and priming.
 - .4 Materials (primers, paints, coating, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) Shall be in accordance with MPI Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.
 - .5 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.
 - .6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Engineer.
 - .7 Standard of Acceptance:
 - .1 Walls: No defects visible from a distance of 1000 mm at 90° to surface.
 - .2 Soffits: No defects visible from floor at 45° to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.4 Environmental Performance Requirements

- .1 Provide paint products meeting MPI "Environmentally Friendly" ratings based on VOC (EPA Method 24) content levels.

1.5 Submittals

- .1 Submit product data and manufacturer's installation/application instructions for paints and coating products to be used in accordance with Section 01 01 00 General Instructions.
- .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 01 00 General Instructions.
- .3 Upon completion, submit records of products used. List products in relation finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour number(s).
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Material Safety Data Sheets (MSDS).

1.6 Samples

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-
- .1 Submit samples in accordance with Section 01 01 00 General Instructions.
 - .2 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 13 mm plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
 - .5 10 mm plywood for finishes over wood surfaces.
 - .3 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.
 - .4 Submit full range of available colours where colour availability is restricted.

1.7 Quality Control

- .1 Provide mock-up in accordance with Section 01 01 00 General Instructions.
- .2 When requested by the Consultant or Paint Inspection Agency, prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and or/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

1.8 Extra Materials

- .1 Submit maintenance materials in accordance with Section 01 01 00 General Instructions.
- .2 Submit one - one litre can of each type of colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- .3 Deliver to Contractor and store where directed.

1.9 Delivery, Handling and Storage

- .1 Deliver, store and handle materials in accordance with Section 01 01 00 General Instructions.
- .2 Deliver and store materials in original containers, sealed, with labels intact.
- .3 Labels shall clearly indicate:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.

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- .4 Colour number in accordance with established colour schedule.
 - .4 Remove damaged, opened and rejected materials form site.
 - .5 Provide and maintain dry, temperature controlled, secure storage.
 - .6 Observe manufacturer's recommendations for storage and handling.
 - .7 Store materials and supplies away from heat generating devices.
 - .8 Store materials and equipment in a well ventilated area with temperature rant 7 C to 30 C.
 - .9 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
 - .10 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.
 - .11 Remove paint materials from storage only in quantities required for same day use.
 - .12 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - .13 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.10 Site Requirements

- .1 Surface and Environmental Condition:
 - .1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint only when previous coat of paint is dry or adequately cured.
 - .4 Apply paint finishes only when conditions forecast for entire period of application fall within manufacturer's recommendations.
 - .5 Do not apply paint when:

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- .1 Temperature is expected to drop below 10° C before paint has thoroughly cured.
- .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
- .3 Surface to be painted is wet, damp or frosted.

- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of the Engineer such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.11 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Section 01 01 00 General Instructions.
- .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) Are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
 - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
 - .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
 - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).

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- .6 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .7 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection for verifiable re-use or re-manufacturing.
- .8 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

PART 2 PRODUCTS

2.1 Materials

- .1 Paint materials listed in the latest edition of the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems shall be products of a single manufacturer.
- .3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:
 - .1 Be water-based, water soluble, water clean-up.
 - .2 be non-flammable, biodegradable.
 - .3 Be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .4 Be manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .5 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .7 Water-borne surface coatings and recycled water-borne surface coatings must have a flash point of 61.0°C or greater.
- .8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

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- .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

- .9 Water-borne paints and stains, recycled water-borne surface coatings and water-borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

- .10 Recycled water-borne surface coatings must contain 50% post-consumer material by volume.
- .11 Recycled water-borne surface coatings must not contain:
 - .1 Lead in excess of 600 ppm weight/weight total solids.
 - .2 Mercury in excess of 50.0 ppm weight/weight total product.
 - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
 - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
 - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

- .12 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.
 - .1 Lead, cadmium and chromium are to be determined using ICP-AES (inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
 - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
 - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 Colours

- .1 Engineer will provide Colour Schedule after Contract award.
- .2 Colour schedule will be based upon selection of two base colours and one accent colours. No more than three colours will be selected for the entire project and no more than three colours will be selected in each area.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in a restricted range of colours, selection will be based on the limited range.
- .5 Second coat in a three coat system to be tinted slightly lighter colour than top; coat to

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show visible difference between coats.

2.3 Mixing and Tinting

- .1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Engineer's written permission.
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Engineer.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 Gloss/Sheen Ratings

- .1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level Category	Units @ 60° /	Units @ 60° /
G1- matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish		
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces shall be as specified herein and as noted on Finish Schedule.

2.5 Exterior Painting Systems

- .1 Asphalt Surfaces: zone/traffic marking for drive and parking areas, etc.
 - .1 EXT 2.1A Latex zone/traffic marking finish.

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- .2 EXT 21B Alkyd zone/traffic marking finish.
 - .3 Painting of traffic/zone line layouts on exterior asphalt surfaces to be in accordance with approved drawings, and MPI Architectural Painting Specification Manual requirements.

 - .2 Structural Steel and Metal Fabrications:
 - .1 EXT 5.1E - Waterborne epoxy finish.
 - .2 EXT 5.1M - Waterborne light industrial G-5 coating (over waterborne primer).

 - .3 Galvanized Metal: not chromate passivated:
 - .1 EXT 5.3C - Epoxy finish (for use in high contact/high traffic areas).
 - .2 EXT 5.3J - Waterborne light industrial G-5 coating (over waterborne primer).

PART 3 EXECUTION

3.1 General

- .1 Perform preparation and operations for exterior painting in accordance with MPI Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.2 Existing Conditions

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Engineer damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Engineer. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Stucco: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.3 Protection

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and

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restore such surfaces as directed by Engineer.

- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .5 Removal of light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings shall be done prior to undertaking painting operations by General Contractor. Items shall be securely stored and re-installed after painting is completed by General Contractor.
- .6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
- .7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of Engineer.

3.4 Cleaning and Preparation

- .1 Clean and prepare exterior surfaces in accordance with MPI Painting Specification Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and other surface debris by brushing, wiping with dry, clean cloths or compressed air.
 - .2 Wash surfaces with a biodegradable detergent (and bleach where applicable) and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow to dry thoroughly.
 - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
 - .6 Use trigger operated spray nozzles for water hoses.
 - .7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.
- .2 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .3 Where possible, prime surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
 - .2 Apply wood filler to nail holes and cracks.

EXTERIOR PAINTING

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- .3 Tint filler to match stains for stained woodwork.
 - .4 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
 - .5 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes or blowing with clean dry compressed air.
 - .6 Touch-up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rested areas, shall be by supplier of fabricated materials.
 - .7 Do not apply paint until prepared surfaces have been accepted by the Engineer.

3.5 Application

- .1 Method of application to be as approved by Engineer. Apply paint by brush, roller, air sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Engineer.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray Application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
 - .4 Brush out immediately runs and sags.
 - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Engineer.
- .5 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare

EXTERIOR PAINTING

areas before next coat of paint is applied.

- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.
- .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

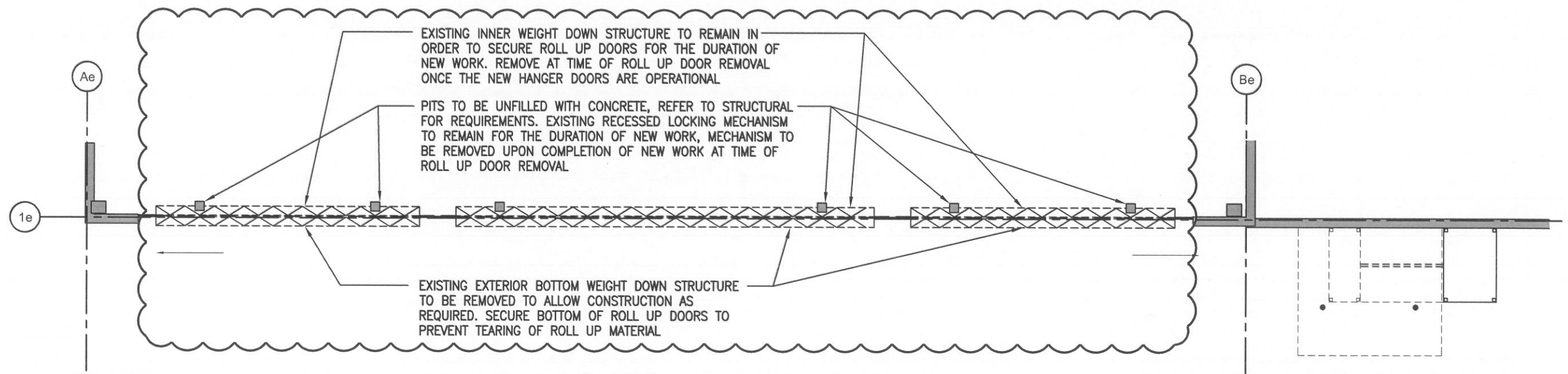
3.6 Field Quality Control

- .1 Field inspection of exterior painting operations to be carried out by independent inspection firm as designated by Engineer.
- .2 Advise Engineer when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Co-operate with inspection firm and provide access to areas of work.

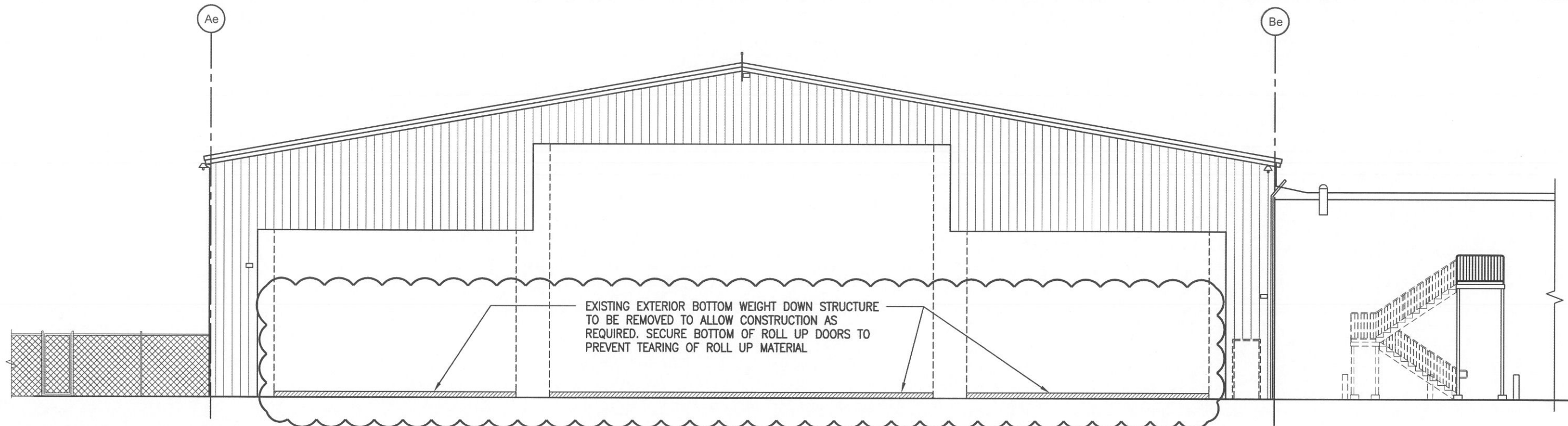
3.7 Restorations

- .1 Clean and re-install all hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashes on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Engineer. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Engineer.

END OF SECTION



1 FLOOR PLAN-EXISTING
ASK01 1:150



2 EXISTING ELEVATION - OUTSIDE HANGER
ASK01 1:150

ISSUED AS PART OF

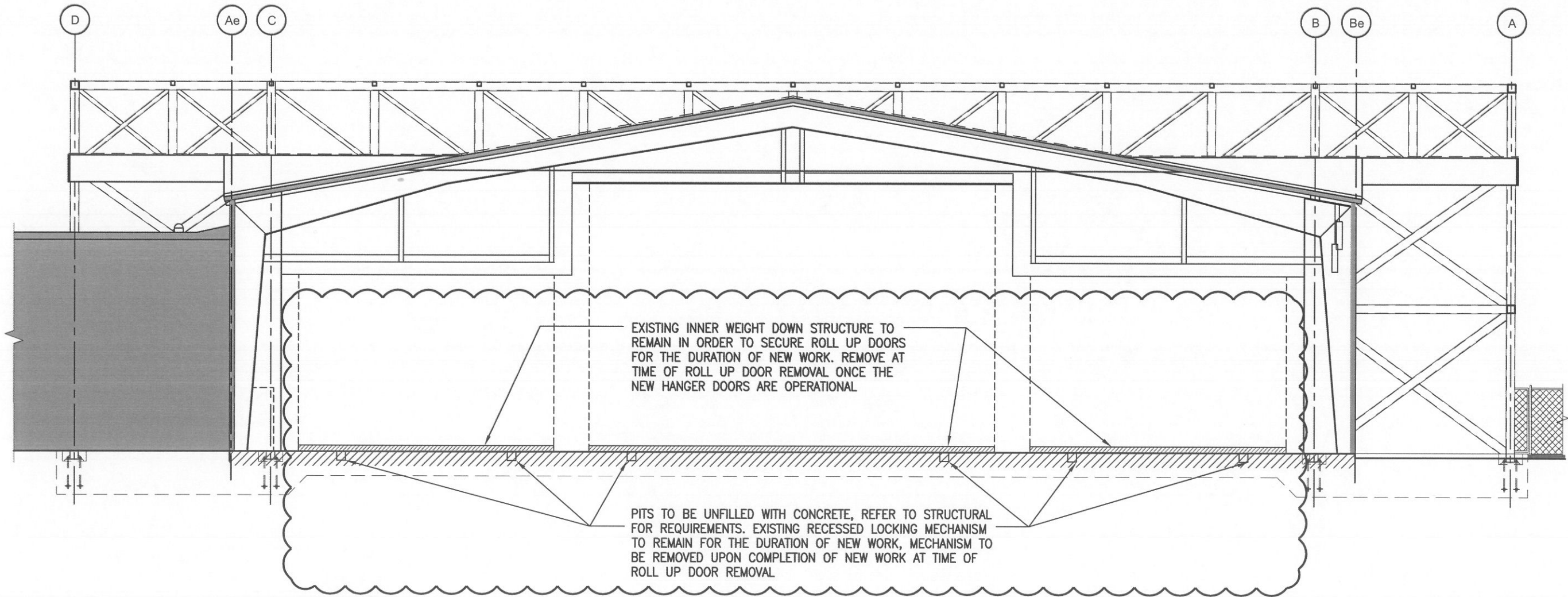


4 BEECHWOOD, SUITE 201, OTTAWA, ONTARIO, CANADA K1L 8L9
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PROJECT NAME
HANGER DOORS CARP ROAD

DRAWING TITLE
EXISTING FLOOR PLAN & ELEVATION

DATE 20.11.2015	PROJECT NO. 0132
SCALE AS NOTED	
DRAWN BY S.S.	DRAWING NO. ASK-01
REVIEWED BY R.W.	



1 EXISTING ELEVATION - INSIDE HANGER
ASK02 1:150

ISSUED AS PART OF SIXXX

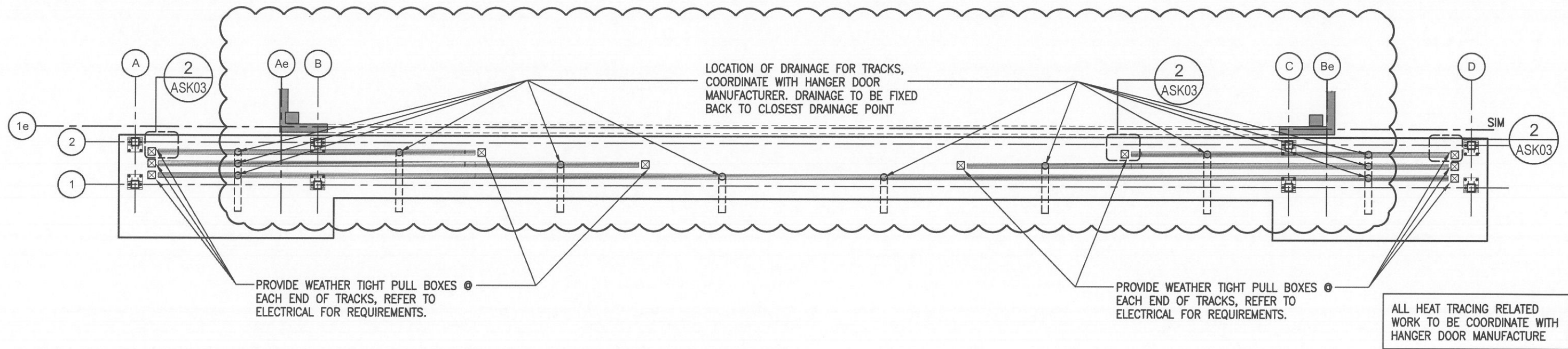
WOODMAN ARCHITECT
&
ASSOCIATES LTD.

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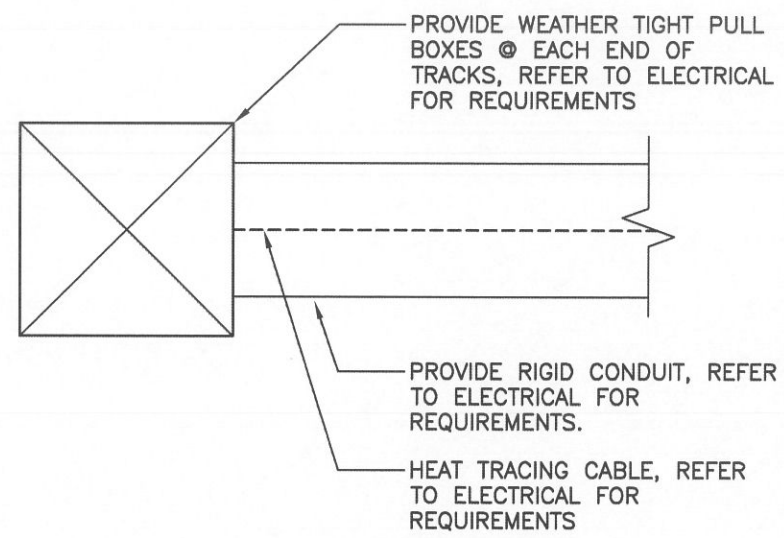
PROJECT NAME
HANGER DOORS CARP ROAD

DRAWING TITLE
EXISTING ELEVATION

DATE 20.11.2015	PROJECT NO. 0132
SCALE AS NOTED	
DRAWN BY S.S.	DRAWING NO. ASK-02
REVIEWED BY R.W.	



1 FOUNDATION PLAN - LOCATION OF DRAINAGE & PULL BOXES FOR TRACKS
ASK03 1:150



2 PLAN DETAIL- PULL BOX
ASK03 1:10

ISSUED AS PART OF SI



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PROJECT NAME
HANGER DOORS CARP ROAD

DRAWING TITLE
FOUNDATION PLAN
LOCATION OF DRAINAGE & PULL BOXES FOR TRACKS

DATE
26.11.2015

SCALE
AS NOTED

DRAWN BY
S.S.

REVIEWED BY
R.W.

PROJECT NO.
0132

DRAWING NO.
ASK-03