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1.1 SUMMARY OF WORK

- .1 The work of this contract comprises of all exterior door and window replacements and FRR (Fire Resistance Rating) upgrades to interior ceiling and walls, roof rehabilitation, Engineering structural upgrades and interior repairs and fire separations. These projects are numbered A, B and C. All of these will be tendered all at the same time and with one contractor.
- .2 The interior work of this contract comprises removal of existing gypsum board ceiling and upper portion of tall wall, install new blocking, new ceiling/wal insulation with new vapour barrier, new ceiling and new upper portion of wall. Painting/repainting and including all teh related work in the 8-Plex, Apartment in Prince Albert National Park, Waskesiu Lake, Saskatchewan.
- .3 The roof rehabilitation comprises re-roofing, new attic insulation and new ceilings in the 8-Plex Apartment.
- .4 Tenants will occupy the lower floors of the building during entire construction period. Co-operate with Departmental Representative to minimize conflict and to facilitate tenant use.

1.2 WORK BY OTHERS

- .1 Co-operate with other Contractors/personnel in carrying out their respective works.
- .2 Co-ordinate work with that of other contractors/personnel. If any part of work under this Contract depends for it's proper execution or result upon work of another Contractor/personnel, report it promptly to Departmental Representative in writing, any defects which may interfere with proper execution of work.

1.3 WORK RESTRICTIONS

- .1 Commence work upon notification of acceptance.
 - .2 Execute work with least possible interference or disturbance to the normal use of building. Make arrangements with Departmental Representative to facilitate work as stated.
-

1.3 WORK
RESTRICTIONS
(Cont'd)

- .3 Maintain existing services to building and provide tenant, visitor and vehicle access.
- .4 Where security is reduced by work, provide temporary means to maintain security. Review measures with Departmental Representative before proceeding.
- .5 Smoking is not permitted on site.
- .6 Do not block exit door and routes.
- .7 Working hours are Monday to Friday, excluding holidays, from 8am to 6pm.
- .8 Only one entry and one stair will be used for construction purposes. Stairway clearly marked for purpose.

1.4 PROJECT
MEETINGS

- .1 Departmental Representative will schedule a project start-up meeting following notice of tender award.
- .2 Agenda to include line of communication, contract information, safety, scheduling and co-ordination.
- .3 Subsequent meetings will be called as required.
- .4 Contractor to record minutes and distribute to all participants.

1.5 SCHEDULE

- .1 On award of contract submit bar chart construction schedule for work. Indicate anticipated progress stages. Take necessary measures to complete work within schedule time. Do not change schedule without approval from Departmental Representative.
- .2 Schedule work in consultation with Departmental Representative to minimize impact on tenants' use of the building.

1.6 SUBMITTALS

- .1 Product data: Manufacturer's catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
 - .1 Submit five (5) copies of product data, or electronic documentation.
-

1.6 SUBMITTALS
(Cont'd)

- .1 (Cont'd)
 - .2 Delete information not applicable to project.
 - .3 Cross-reference product data information to applicable portions of Contract Documents.
- .2 Samples: examples of materials, equipment, quality, finishes and workmanship.
 - .1 Where colour, pattern or texture is criterion, submit full range of samples.
 - .2 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.
- .3 Project photos: Document progress to work by digital photographs grouped in folders by date and copied to a CD labelled with the project title, number and date.
 - .1 Viewpoints and frequency to be determined in conjunction with Departmental Representative.
 - .2 Submit photographs monthly with progress statement.

1.7 SAFETY AND
HEALTH AND
HAZARDOUS MATERIALS

- .1 Comply with Canada Labour Code, Part 2, Occupational Safety and Health regulations.
 - .2 Comply with the requirements of the Workplace Hazardous Materials Information Systems (WHMIS) regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS).
 - .3 Comply with Saskatchewan Workers Compensation Act.
 - .4 Perform duties in accordance with the Saskatchewan Occupational Health and Safety Act and Regulation.
 - .5 Submit copies of WCB Clearance Letter and WCB Contractor Rating. Submit copy of Final WCB Clearance Letter at completion of project.
 - .6 Submit letter stating that Contractor assumes the role of Prime Contractor for the purposes of site safety responsibility.
 - .7 Submit completed and signed copy of Attestation and Proof of Compliance with Occupational Health and Safety form.
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1.7 SAFETY AND
HEALTH AND
HAZARDOUS MATERIALS
(Cont'd)

- .8 Submit two (2) copies of the Contractor's generic Health and Safety Plan and 2 copies of the site-specific Health and Safety Plan within 5 days after date of Notice to Proceed and prior to commencement of Work. Site-specific Safety Plan must include the results of the site-specific safety hazard assessment, and the results of the safety, health and hazard analysis for the site tasks, and proposed mitigations for the identified hazards.
- .9 Submit copies of work-site health and safety meeting minutes, inspection reports, reports or directions issued by Federal, Provincial or Municipal health and safety inspectors, incident and accident reports, and follow-up reports.
- .10 Work at site may involve contact with asbestos-containing pipe insulation or mould. Contractor to take appropriate precautions.
- .11 Be responsible for the health and safety of persons on site, safety of property on site and the environment to extent that they may be affected by conduct of the Work.
- .12 For work inside occupied buildings give Departmental Representative 48 hours notice for work involving hazardous substances (Canada Labour Code Part II Section 10), and before painting, caulking, or using adhesives.

1.8 RELICS AND
ANTIQUITIES

- .1 Protect relics, antiquities and items of historical and scientific interest found during course of the Work. Bring such items to immediate attention of Departmental Representative and await instructions before proceeding with the work in the location where the items are found.

1.9 FIRE SAFETY
REQUIREMENTS

- .1 Comply with the National Building Code of Canada 2010 (NBC) for fire safety in construction and the National Fire Code of Canada 2010 (NFC) for fire prevention, fire fighting and life safety in buildings in use.

1.9 FIRE SAFETY
REQUIREMENTS
(Cont'd)

- .2 Comply with Human Resources and Social Development Canada (HRSDC), Fire Commissioner of Canada (FCC) standards:
 - .1 No 301; Standard for Construction Operations.
 - .2 No 374; Fire Protection Standard for general storage (Indoor and Outdoor).
 - .3 Available from HRSDC, Fire Protection Services, Policies and Standards, Fire Commissioner of Canada Standards, or the following internet site;
http://www.hrsdc.ca.ca/eng/labour/fire_protection/policies_standards/commissioner/index.shtml.
 - .4 Retain all fire safety documents and standards on site.
- .3 Protect and maintain emergency access to fire department connections and access routes.

1.10 FIELD QUALITY
CONTROL

- .1 Carry out work using qualified licensed workers in accordance with Provincial Act respecting manpower vocational training and qualifications.
- .2 Permit employees registered in Provincial Apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers.
- .3 Determine permitted activities and task by apprentices, based on level of training attended and demonstration of ability to perform specific duties.
- .4 Specification section identifies specific work experience requirements.
- .5 Work to conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, National Building Codes of Canada 2010 (NBCC 2010) and applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement applies.

1.11 TEMPORARY
UTILITIES

- .1 Existing services required for the work, excluding communications equipment, may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads, to a maximum of 110 Volts. Connect and disconnect at own expense and responsibility.
- .2 Provide and maintain temporary fire protection during performance of the Work.
- .3 Notify Departmental Representative and utility companies of intended interruption of services, obtain requisite permission.
- .4 Give Departmental Representative 48 hours notice related to each necessary interruption of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions during periods determined by Departmental Representative.

1.12 CONSTRUCTION
FACILITIES

- .1 The Contractor's construction yard will be located in the parking lot and determined in consultation with the Departmental Representative.
 - .2 Contractor may park vehicles in designated locations as instructed by Departmental Representative.
 - .3 Scaffold to be designed in accordance with CSA-S269.2 and to minimum standards outlined in Occupational Safety & Health Standards.
 - .4 Provide and maintain scaffolding, ladders, swing staging, platforms, hoists, etc. as needed to execute the Work.
 - .5 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders, independent of finished surfaces.
 - .6 Provide and maintain lockable weatherproof sheds for storage of tools, equipment and materials.
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1.12 CONSTRUCTION
FACILITIES
(Cont'd)

- .7 Existing washroom facilities on the main floor of the building may be used by Contractor's personnel during the building's normal operating hours, but are to be used at the responsibility of the Contractor. Keep facilities clean. Contractor responsible for providing facilities at other times.
- .8 Do not unreasonably encumber site with materials or equipment.
- .9 Move stored products or equipment, which interfere with operations or building.
- .10 Provide common-use signs related to information, instruction, use of equipment, public safety, etc. in both official languages or by the use of commonly understood graphic symbols.
- .11 Advertising is not permitted on this project.
- .12 The Contractor is responsible for the construction yard and work area security at all times.
- .13 Ensure the construction zone is secure against entry when the work site is closed.

1.13 PROTECTION

- .1 Do not perform work when weather is not acceptable to do work. Advise and confirm with Departmental Representative and record as lost hours.
- .2 Provide temporary weather protection at the end of each work day and secure work in progress properly against all weather conditions, including but not limited to wind, hail.
- .3 Protect finished work against damage until take-over.

1.14 EXAMINATION &
PREPARATION

- .1 Examine site and conditions likely to affect Work and be familiar and conversant with existing conditions.
 - .2 Before commencing work, provide photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent claims.
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1.14 EXAMINATION &
PREPARATION
(Cont'd)

- .3 Protect all soft and hard landscaping elements, including plants and trees.

1.15 EXECUTION

- .1 Remove items as shown or specified.
- .2 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.
- .3 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

1.16 CLEAN UP

- .1 Maintain work in tidy condition, free from accumulation of waste products and debris.
- .2 Clean up work area as Work progresses. At the end of each work period, and more often if ordered by Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
- .3 Do not burn waste materials.
- .4 Provide on-site containers for collection of waste materials.
- .5 Dispose of waste materials and debris off site.
- .6 Upon completion, remove temporary protection and surplus materials. Make good defects noted.

1.17 WASTE
MANAGEMENT

- .1 Comply with the Canadian Environmental Protection Act for waste management program on construction and demolition projects.
 - .2 Prepare a Waste Reduction Workplan, which identifies opportunities for reduction, reuse or recycling of materials. Submit to Departmental Representative and post on site prior to project start-up.
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1.17 WASTE
MANAGEMENT
(Cont'd)

- .3 Unless otherwise specified, materials for removal become the Contractor's property.

1.18 CLOSEOUT
SUBMITTALS

- .1 Submit two (2) project manuals at the time of substantial performance and in the format of 'letter'-sized 'D'-ring binders. Manuals to contain all project information including:
- .1 Product data;
 - .2 Paint specifications and recipe;
 - .3 Progress photographs;
 - .4 Maintenance schedules and procedures.
 - .5 Product literature, brochures, or other documentation of products that were used in lieu of specified products but have identical specificatons.
- .2 Submit specified maintenance manuals and materials.
- .3 Submit manufacturers warranties.
- END OF SECTION.

PART 1 - GENERAL

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|-----------------------|----|---|
| <u>1.1 REFERENCES</u> | .1 | Department of Justice Canada.
.1 Canadian Environmental Assessment Act (CEAA).
.2 Canadian Environmental Protection Act (CEPA). |
| | .2 | Health Canada/Workplace Hazardous Materials Information System (WHMIS).
.1 Material Safety Data Sheets (MSDS). |
| | .3 | Transport Canada.
.1 Transportation of Dangerous Goods Act (TDGA).
.2 Transportation of Dangerous Goods Regulations (TDG Regulations) |
| | .4 | Saskatchewan - Transport Canada.
.1 The Dangerous Goods Transportation Regulations (TDG). |

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|-----------------------|----|---|
| <u>1.2 SUBMITTALS</u> | .1 | Make submittals in accordance with Section 01 00 10 General Instructions. |
| | .2 | Prior to beginning of Work on site submit Waste Reduction Workplan in accordance with Sections 01 00 10 General Instructions and indicate:
.1 Descriptions of and anticipated quantities of materials to be salvaged, reused, recycled and landfilled.
.2 Schedule of selective demolition.
.3 Number and location of dumpsters.
.4 Anticipated frequency of tippage. |

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| <u>1.3 QUALITY ASSURANCE</u> | .1 | Regulatory Requirements: ensure Work is performed in compliance with CEAA, CEPA, TDGA, and applicable Provincial/Territorial regulations, acts, codes. |
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| <u>1.4 WASTE MANAGEMENT AND DISPOSAL</u> | .1 | Separate waste materials for recycling in accordance with Waste Management Plan. |
| | .2 | Place materials defined as Hazardous materials in designated containers. |
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1.4 WASTE
MANAGEMENT AND
DISPOSAL
(Cont'd)

- .3 Handle and dispose of hazardous materials in accordance with CEAA, CEPA, TDGA, TGA regulations.
- .4 Ensure emptied containers are sealed and stored safely.
- .5 Remove materials that cannot be salvaged for recycling and dispose of in accordance with applicable codes at licensed facilities.

1.5 SITE CONDITIONS

- .1 Testing has confirmed the presence of asbestos in the boiler piping insulation.
- .2 Should material resembling spray or trowel-applied asbestos or other designated substance be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.
 - .1 Do not proceed until written instructions have been received from Departmental Representative.
- .3 Notify Departmental Representative before disrupting building access or services.
- .4 Submit Health and Safety Plan to Departmental Representative for review and acceptance, including handling and disposing of hazardous materials (eg asbestos, mould etc).

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Inspect building with Departmental Representative and verify extent and location of items designated for removal, disposal, recycling, salvage and items to remain and reinstall.
 - .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
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3.2 PROTECTION

- .1 Prevent movement, settlement, or damage to adjacent landscaping features and to parts of building to remain in place. Provide bracing and shoring required.
- .2 Keep noise, dust, and inconvenience to occupants and public to minimum.
- .3 Protect building systems, services, equipment, furnishings and landscaping.
- .4 Provide temporary dust screens, covers, railings, supports, fall protection and other protections as required.
- .5 Do Work in accordance with Section 01 00 10 General Instructions.

3.3 SALVAGE

- .1 Refer to drawings and specifications for items to be salvaged for reinstallation and reuse.

3.4 SELECTIVE DEMOLITION

- .1 Remove materials indicated and as follows to permit new construction.
 - .1 Doors;
 - .1 Cut exterior cladding to facilitate door removal.
 - .2 Removed exterior cladding, flashings. Do not remove building paper.
 - .3 Cut interior gypsum.
 - .4 Remove interior gypsum and trim. Do not remove vapour barrier.
 - .5 Clean and clear all debris to the framing to facilitate new door installation.
 - .2 Windows;
 - .1 Cut exterior cladding to facilitate window removal.
 - .2 Remove exterior cladding and flashing. Do not remove building paper.
 - .3 Cut interior gypsum.
 - .4 Remove interior gypsum and trim. Do not remove vapour barrier.
 - .5 Clean and clear all debris to the framing to facilitate new window installation.
 - .3 Roofing;
 - .1 Remove asphalt shingles and underlayments down to existing roof deck.
 - .2 Remove flashings.

3.4 SELECTIVE
DEMOLITION
(Cont'd)

- .1 (Cont'd)
- .3 (Cont'd)
 - .3 Remove eaves trough and retain for re-use.
 - .4 Remove attic roof vents and abandoned and non-operational mechanical vents.
 - .5 Cut out and remove rotting fascias, roof sheathing and soffits.
 - .6 Remove all gypsum board, vapour retarder and insulation at ceilings and bulkheads throughout top floor.
- .4 Interior;
 - .1 Remove materials indicated and as follows to permit new construction.
 - .2 Confirm timing and schedule with Departmental Representative.
 - .3 Remove all gypsum board, vapour retarder and insulation at ceilings and bulkheads and upper portion of tall wall from 2440 mm above floor to high ceiling throughout top floor.
- .2 Sort materials into appropriate piles for recycling or disposal.
- .3 Do not disturb items designated to remain in place.

3.5 DISPOSAL

- .1 Dispose of removed materials in accordance with Waste Management Plan.

3.6 CLEANING

- .1 Remove debris and leave work site clean each day and upon completion of Work.

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section 09 91 13 Interior and Exterior Paint
Back-priming of wood.

1.2 REFERENCES

- .1 American Society for Testing and Materials
International (ASTM)
 - .1 ASTM A 123/A 123M, Standard
Specification for Zinc (Hot-Dip Galvanized)
Coatings on Iron and Steel Products.
 - .2 ASTM A 653/A 653M, Standard
Specification for Steel Sheet, Zinc-Coated
(Galvanized) or Zinc-Iron Alloy-Coated
(Galvannealed) by the Hot-Dip Process.
- .2 Canadian Standards Association (CSA
International)
 - .1 CSA B111, Wire Nails, Spikes and
Staples, and Staples.
 - .2 CSA O121, Douglas Fir Plywood.
 - .3 CSA O141, Softwood Lumber.
 - .4 CSA O151, Canadian Softwood Plywood.
 - .5 CSA O80 Series-08, Wood Preservation.
- .3 Health Canada/Workplace Hazardous Materials
Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian
Lumber.
- .5 American Wood Protection Association (AWPA)
 - .1 AWPA M2-11, Standard for Inspection of
Treated Wood Products.
 - .2 AWPA M4-11, Standard for the Care of
Preservative-Treated Wood Products.

1.3 QUALITY
ASSURANCE

- .1 Lumber identification: by grade stamp of an
agency certified by Canadian Lumber
Standards Accreditation Board.
- .2 Plywood identification: by grade mark in
accordance with applicable CSA standards.
- .3 Pressure preservative treated wood
identification: each piece of lumber and
plywood to be identified with appropriate
CSA mark.

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| <u>1.4 DELIVERY,
STORAGE, AND
HANDLING</u> | .1 | Waste Management and Disposal:
.1 Separate waste materials for recycling
in accordance with Waste Management Plan. |
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PART 2 - PRODUCTS

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| <u>2.1 LUMBER MATERIAL</u> | .1 | Lumber: unless specified otherwise,
softwood, S4S, moisture content 19% or less
in accordance with following standards:
.1 CAN/CSA-0141.
.2 NLGA Standard Grading Rules for
Canadian Lumber. |
| | .2 | Furring, blocking, nailing strips, grounds,
rough bucks, cants, curbs, fascia backing
and sleepers:
.1 Board sizes: "Standard" or better
grade.
.2 Dimension sizes: "Standard" light
framing or better grade.
.3 Post and timbers sizes: "Standard" or
better grade. |

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|----------------------------|----|---|
| <u>2.2 PANEL MATERIALS</u> | .1 | Douglas fir plywood: to CSA 0121, standard
construction, exterior grade, thickness to
match existing.
.1 Urea-formaldehyde free. |
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|------------------------|----|---|
| <u>2.3 ACCESSORIES</u> | .1 | Nails, spikes and staples: to CSA B111, or
ASTM F 1667, Driven Fasteners: Nails,
Spikes, and Staples. |
| | .2 | Bolts: size to suit application, unless
indicated otherwise, complete with nuts and
washers. |
| | .3 | Proprietary fasteners: toggle bolts,
expansion shields and lag bolts, screws and
lead or inorganic fibre plugs, recommended
for purpose by manufacturer. |
| | .4 | ULC approved fire blocking (fire stopping)
materials at service penetrations in wood
framing. |
| | .5 | Hardware and accessories for attic access. |
-

2.4 FINISHES

- .1 Galvanizing: to ASTM A 653/A 653M.

2.5 WOOD
PRESERVATIVE

- .1 Preservative: to CSA-080 Series, odourless water-borne, for paint finish.
- .2 Comply with AWWA M4 and revisions specified in CSA 080 Series, Supplementary Requirements to AWWA M2.
- .3 Treat lumber used in exterior and roof locations to CSA 080 Series using Alkaline Copper Quat (ACQ-C , ACQ-D, ACQ-D Carbonate) preservative to obtain minimum net retention of 2.6 kg/m³ of wood.
- .4 Following water-borne preservative treatment, dry material to maximum moisture content of 15%.
- .5 Remove chemical deposits on treated wood to receive applied finish.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Treat surfaces of pressure preservative treated wood exposed by cutting, trimming or boring with liberal brush application of preservative before installation.
- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
- .3 Back-prime material that will receive a paint finish with alkyd exterior primer, before installation.

3.2 EXAMINATION

- .1 Examine wood trim and framing for defects and signs of deterioration. Report findings to Departmental Representative.
- .2 Replace damaged or rotted wood with new material matching existing size, profile, thickness, type, species and grade.

3.3 INSTALLATION

- .1 Comply with requirements of NBC, supplemented by the following paragraphs.
- .2 Replace damaged or rotted wood roof and soffit framing.
- .3 Replace damaged or rotted wood roof sheathing, fascias, soffits and trim.
- .4 Install furring and blocking as required to space-out and support ceiling finishes, fascia, soffit, siding and other work as required (including blocking separation of interior concealed space from exterior/attic concealed space as required by code).
- .5 Apply ULC approved fire rated fire block (fire stopping) materials at service penetrations in wood framing where it is accessible to maintain continuous fire/smoke resistance rating and continuous vapour barrier.
- .7 Use pressure preservative treated material as follows:
 - .1 Wood cants, fascia backing and fascias, curbs, nailers, saddle.
- .8 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .9 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .10 Install wood cants, fascia backing, nailers, curbs and other wood supports as required.
- .11 Use hot dip galvanized fasteners for exterior work and pressure-preservative treated lumber.

3.4 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM).
 - .1 ASTM E 96/E 96M, Standard Test Methods for Water Vapour Transmission of Materials.
- .2 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
 - .2 CAN/ULC-S704, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 00 10 - General Instructions.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 00 10 General Instructions. Indicate VOC's insulation products and adhesives.

1.3 QUALITY ASSURANCE

- .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 00 10 General Instructions.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Waste Management Plan.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
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PART 2 - PRODUCTS

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|------------------------|----|---|
| <u>2.1 INSULATION</u> | .1 | Extruded polystyrene (XPS) : to CAN/ULC - S701.
.1 Type: 3
.2 Compressive strength: 20 psi.
.3 Thickness: as indicated
.4 Edges: square
.5 Standard of Acceptance: Owens Corning Foamular C-200 or approved equal. |
| <u>2.2 ACCESSORIES</u> | .1 | Insulation baffle: pre-formed from coated carboard with integral tabs and end caps to maintain minimum 25 mm ventilation space. |

PART 3 - EXECUTION

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| <u>3.1 MANUFACTURER'S INSTRUCTIONS</u> | .1 | Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets. |
| <u>3.2 WORKMANSHIP</u> | .1 | Install insulation after building substrate materials are dry. |
| | .2 | Install insulation baffles along all roof edges for attic ventilation requirement. Staple to rafters to provide minimum 25 mm clearance from roof sheathing. |
| | .3 | Install insulation to maintain continuity of thermal protection to building elements and spaces. |
| | .4 | Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions. |
| | .5 | Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 gas burning equipment. |
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3.2 WORKMANSHIP
(Cont'd)

- .6 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .8 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

3.3 EXAMINATION

- .1 Examine substrates and immediately inform Departmental Representative in writing of defects.
- .2 Prior to commencement of work ensure:
 - .1 Substrates are firm, straight, smooth, dry, free of grease, oil and free of snow, moisture, ice or frost and clean of dust and debris.

3.8 CLEANING

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

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702, Standard for Thermal Insulation, Mineral (Glass) Fibre, for buildings.

1.2 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 00 10 General Instructions.
- .2 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

- .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 00 10 General Instructions.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Waste Management Plan.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

ART 2 - PRODUCTS

1.5 INSULATION

- .1 Batt and blanket mineral fibre: to CAN/ULC S702.
 - .1 Type: 1.
 - .2 Thickness: as indicated.
 - .3 Standard of Acceptance: Owen Corning EcoTouch Pink Fibreglas.
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| <u>1.6 ACCESSORIES</u> | .1 | Staples: 19 mm minimum leg. |
| | .2 | Tape: as recommended by manufacturer. |
| | .3 | Insulation baffle: pre-formed from coated cardboard with integral tabs and end caps to maintain minimum 25 mm ventilation space. |

PART 3 - EXECUTION

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| <u>2.1 MANUFACTURER'S INSTRUCTIONS</u> | .1 | Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets. |
| | .2 | Install insulation baffles where indicated. Staple to rafters to provide minimum 25 mm clearance from roof sheathing. |

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| <u>2.2 INSULATION INSTALLATION</u> | .1 | Install insulation to maintain continuity of thermal protection 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 | For small spaces around door and window framing, cut insulation as close to space dimensions as possible, gently push insulation in place. Do not crush or compress insulation. |
| | .5 | Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN/ULC-S604 Type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents. |
| | .6 | Do not enclose insulation until it has been inspected and approved by Departmental Representative. |
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- 2.3 CLEANING .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

PART 1 - GENERAL

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| <u>1.1 REFERENCES</u> | .1 | Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.32-M, Sheathing Membrane, Breather Type" |
| | .2 | Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS). |
| <u>1.2 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 00 10 General Instructions. |
| | .2 | Product Data:
.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit WHMIS MSDS - Material Safety Data Sheets. |
| | .3 | Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties. |
| <u>1.3 QUALITY ASSURANCE</u> | .1 | Qualifications:
.1 Applicator: company specializing in performing work of this section with minimum 3 years experience with installation of housewrap systems. |
| | .2 | Installation shall be in accordance with manufacturer's installation guidelines and recommendations. |
| | .3 | Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer. |
| <u>1.4 DELIVERY, STORAGE AND HANDLING</u> | .1 | Deliver, store and handle materials in accordance with manufacturer's written instructions. |
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1.5 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling were possible.
- .2 Maintain temperature and humidity recommended by material manufacturers before, during and after installation.

1.6 SEQUENCING

- .1 Sequence work to permit installation of materials in conjunction with related materials and seals.
- .2 Reference drawing and material manufacturer's recommendations for sequencing work.

PART 2 - PRODUCTS

2.1 SHEET SURROUND
HOUSEWRAP

- .1 Spunbonded polyolefin, non-woven, non-perforated, weather barrier. (HDPE) High Density Polyethylene.

2.2 ACCESSORIES

- .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by house wrap barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
- .2 Staples: minimum 12 mm leg.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install surround housewrap over wood siding prior to installing siding. Stucco remains uncovered for this project except for Trim elements around windows.
 - .2 Use sheets of largest practical size to minimize joints.
 - .3 Inspect for continuity and proper overlap sequences. Repair punctures and tears with sealing tap before work is concealed.
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<u>3.1 INSTALLATION (Cont'd)</u>	.4	Ensure proper installation around openings, windows, doors, flashings and that overlapping is adhered to for proper installations. Reference both drawings and manufacturer's recommendations.
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<u>3.2 EXAMINATION</u>	.1	Verify that surfaces and conditions are ready to accept work of this section.
	.2	Ensure surfaces are clean, dry, sound. Ensure that stucco is sound and repair any holes, sharp edges or damages.

<u>3.3 EXTERIOR SURFACE OPENINGS</u>	.1	Cut sheet surround housewrap to form openings and ensure material is lapped and sealed to frame.
	.2	Protect openings from damage once window/doors are removed.

<u>3.4 CLEANING</u>	.1	On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
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<u>3.5 PROTECTION OF WORK</u>	.1	Do not permit adjacent work to damage work of this section.
	.2	Ensure finished work is protected from climatic conditions.

<u>3.6 EXPIRATION OF UV PROTECTION</u>	.1	Surround house wrap is sensitive to UV exposure. Refer to the manufacturer's recommendations for exposure. Generally 60 days exposure maximum.
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PART 1 - GENERAL

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|---|----|---|
| <u>1.1 REFERENCES</u> | .1 | Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction. |
| | .2 | Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS). |
| <u>1.2 SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 00 10 General Instructions. |
| | .2 | Product Data:
.1 Submit manufacturer's printed product literature, specifications and datasheet and include:
.1 Product characteristics.
.2 Performance criteria.
.3 Limitations. |
| | .3 | Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS). |
| <u>1.3 QUALITY ASSURANCE</u> | .1 | Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 00 10 General Instructions. |
| <u>1.4 DELIVERY, STORAGE AND HANDLING</u> | .1 | Waste Management and Disposal:
.1 Separate waste materials for recycling in accordance with Waste Management Plan. |

PART 2 - PRODUCTS

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| <u>2.1 SHEET VAPOUR BARRIER</u> | .1 | Polyethylene film: to CAN/CGSB-51.34, 0.15 mm thick. |
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2.2 ACCESSORIES

- .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
 - .1 Standard of Acceptance: 3M Vapour Barrier tape or approved equal.
- .2 Sealant: compatible with vapour retarder materials, recommended by vapour retarder manufacturer.
 - .1 Single component, non-skinning, non-hardening, synthetic rubber sealant.
 - .2 Standard of Acceptance: Tremco Acoustical Sealant or approved equal.
- .3 Staples: minimum 12 mm leg.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Ensure services are installed and inspected prior to installation of retarder.
- .2 Install sheet vapour retarder on warm side of exterior wall and ceiling assemblies prior to installation of gypsum board to form continuous retarder.
- .3 Use sheets of largest practical size to minimize joints.
- .4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.2 EXTERIOR SURFACE OPENINGS

- .1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

3.3 PERIMETER SEALS

- .1 Seal perimeter of sheet vapour barrier as follows:
 - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
 - .2 Lap sheet over sealant and press into sealant bead.
 - .3 Install staples through lapped sheets at sealant bead into wood substrate.
 - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.
-

- 3.4 LAP JOINT SEALS .1 Seal lap joints of sheet vapour barrier as follows:
- .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over two adjacent framing members at joint.
 - .3 Lap adjoining sheets minimum one stud or joist space and press into sealant beads.
 - .4 Install staples through lapped sheets at sealant beads into wood substrate.
 - .5 Ensure that no gaps exist in sealant beads. Smooth out folds and ripples occurring in sheet over sealant.

- 3.5 ELECTRICAL BOXES .1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
- .1 Wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.
 - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

- 3.6 CLEANING .1 Proceed in accordance with Section 01 00 10 General Instructions.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian Roofing Contractors' Association
 - .1 CRCA Roofing Specification Manual - 1997.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA A123.1/A123.5-05, Asphalt Shingles Made From Organic Felt and Surfaced With Mineral Granules/Asphalt Shingles Made From Glass Felt and Surfaced With Mineral Granules.
 - .2 CAN3-A123.52, Asphalt Shingle Application on Roof Slopes 1:6 to Less Than 1:3.
 - .3 CSA B111, Wire Nails, Spikes and Staples.
- .3 Health Canada/Workplace Hazardous Materials.
 - .1 Material Safety Data Sheets (MSDS).
- .4 National Research Council Canada (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC)
 - .1 CCMC, Registry of Product Evaluations.

1.2 SUBMITTALS

- .1 For products not in compliance with NBC 2010 or CSA standards, submit proof of manufacturer's CCMC Listing and listing number to Departmental Representative.
 - .2 Submit manufacturer's instructions indicating special handling criteria, installation sequence and cleaning procedures.
 - .3 Submit product data sheet for asphalt shingles. Include:
 - .1 Product characteristics.
 - .2 Performance criteria.
 - .3 Installation instructions.
 - .4 Limitations.
 - .5 Colour and finish.
 - .4 Submit WHMIS, MSDS - Material Safety Data Sheets.
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1.3 SAMPLES

- .1 Submit samples in accordance with Section 01 00 10 General Instructions.
- .2 Submit (1) one full bundle of specified shingle c/w wrapper intact & bearing lot and batch number. Leave bundle in storage on-site, as directed by Departmental Representative.
- .3 Submit duplicate samples of underlayment, roofing accessories and vents.

1.4 QUALITY ASSURANCE

- .1 Contractor Qualifications:
 - .1 Roofing to be applied by installer trained and approved by manufacturer for application of it's products.
 - .2 Installers to have minimum five (5) years of proven experience.
 - .3 Manufacturer's representative to provide technical assistance to applicator and assist where required in correct installation of shingles.
- .2 Pre-Installation Meeting:
 - .1 Convene pre-installation meeting once week prior to beginning work of this section with contractor's representative and Departmental Representative to:
 - .2 Verify project requirements.
 - .3 Review installation and substrate conditions.
 - .4 Review co-ordination with other building subtrades.
 - .5 Review manufacturer's installation instructions and warranty requirements.
- .3 Schedule work so as not to unnecessarily interfere with the operations of the building's occupants.
- .4 Commencement of roofing application indicates Contractor's acceptance of the substrate surfaces for the work.

1.5 COMPATIBILITY

- .1 Compatibility between components of roofing system is essential. Bituminous adhesives, underlayment, shingles and sealants incorporated into roofing system to be compatible with each other.
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1.6 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 00 10 General Instructions.
- .2 Provide and maintain dry, off-ground weatherproof storage. Store rools on end.
- .3 Indicate on containers or wrappings of materials, the manufacturer's name and brand, compliance with applicable standard and mass, where applicable.
- .4 Deliver materials in original containers, sealed, with labels intact. Deliever fasteners in boxes or kegs and keep in protective storage until used. Do not oil or grease fasteners.
- .5 Do not place materials on roof in concentrations that exceed design live loads.
- .6 Remove only in quantities required for same day use.

1.7 ENVIRONMENTAL

- .1 Apply materials to dry surfaces and only under weather & humidity conditions which will not introduce moisture into the roofing system.

1.8 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Waste Management Plan.
- .2 Remove from ssite and dispose of all packaging materials at appropriate recycling facilities.
- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Turn over unused asphalt shingles to Departmental Representative.
- .5 Dispose of unused asphaltic cement ttype materials at hazardous material collections site.

1.9 EXTRA MATERIALS

- .1 Provide maintenance materials in accordance with Section 01 00 10 General Instructions.
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- 1.9 EXTRA MATERIALS (Cont'd)
- .2 All unused shingles remain property of owner.
 - .3 Submit one full bundle (2.3 m²) of shingles for maintenance purposes.

- 1.10 WARRANTY
- .1 Submit standard warranty on workmanship stating that the contractor hereby warrants that the asphalt shingle roofing shall stay in place and remain leak proof for two (2) years and the related sheet metal work shall stay in place and remain watertight and free from distortion for one (1) full year.
 - .2 Submit asphalt shingle manufacturer's written warranty bearing lot & batch numbers of supplied materials.
 - .3 Complete one (1) annual inspection of roof throughout the warranty period. Provide all necessary repairs and replacement of defective work appearing in the application as ordered by the Departmental Representative during the period of warranty.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Asphalt shingles: to CSA A123.1/A123.5.
 - .1 Type: 3 tab laminated fibrellass shingles, manufactured in single bartch and dye lot.
 - .2 Mass: minimum 11.47 kg/3m² (375 lbs per square).
 - .3 Class A fire resistance.
 - .4 Fibreglass mat coated on both sides with SBS modified rubber asphalt.
 - .5 Colours: as selected from manufacturer's standard range by Departmental Representative.
 - .6 Warranty: 50 year on shingles, 177 km/h for wind.
 - .7 Standard of acceptance: Malarky Alaskan.
 - .2 Starter strip: mineral surfaced full width starter shingle with perforated strip.
 - .3 Underlayment: SBS modified fibreglass with mineral fines surface.
 - .1 Standard of Acceptance: Malarky Right Start UDL.
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2.1 MATERIALS (Cont'd)

- .4 Eave protection: Self-adhered SBS modified bitumen, mineral fines surface.
 - .1 Standard of Acceptance: Malarkey ArcticSeal 401.
- .5 Ridge Capping: Asphalt shingles from same batch and dye lot to match selected shingles.
 - .1 Standard of Acceptance: Malarky Hip and Ridge Strips, width to suit application.
- .6 Asphaltic Cement: As recommended by shingle manufacturer.
- .7 Nails: to CSA B111, of galvanized steel, 12 guage with min. 10 mm head, sufficient length to penetrate 19 mm into deck.

2.2 ACCESSORIES

- .1 Ridge vent: rigid plastic construction with hinged design to accommodate varying roof pitches, 18 sq. in. net free ventilation area per linear foot, width to suit cap shingle dimensions.
 - .1 Standard of Acceptance: GAF Cobra Snow Country Advance.
- .2 Vent Pipe Accessories:
 - .1 Flashing: Domed, spun aluminum, c/w rubber grommet, to match slope of roof.
 - .2 Standard of Acceptance: Thaler.
 - .3 Extension: PVC drain, waste & vent pipeto extend existing plumbing vent stacks, dimension to suit existing pipe diameter.
 - .4 Accessories: PVC primer & cement, PVC connectors and sealants, to suit vent pipe materials and dimensions.

PART 3 - EXECUTION

3.1 PROTECTION

- .1 Protect grounds at locations of hoisting, heavy equipment, vehicles, scaffolding and foot traffic with appropriate coverings.
 - .2 Cover walls and adjacent work where materials hoisted or used. Clean off all marred surfaces.
 - .3 Maintain roof drainage. Protect building faces until drains, scuppers, eaves trough and down piples are completely installed.
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3.1 PROTECTION
(Cont'd)

- .4 Prevent traffic over completed roofing except where required for relative work. Comply with precautions deemed necessary by Departmental Representative.
- .5 At the end of each day's work or when stoppage occurs due to inclement weather, provide all necessary seals to protect the building and the completed work. Protect all materials out of storage.

3.2 REMOVAL OF
EXISTING ROOFING

- .1 Remove existing roofing, flashings and underlay, and expose roof deck.
- .2 Remove only that part that can be re-covered or protected in the same day.
- .3 Withdraw existing shingle and flashing nails, set those which break off. Leave surfaces free from dirt and loose material.
- .4 Remove portion of decking damaged, wet and/or rotted, or affected by fungal or insect attack.
- .5 Replace cut out portions of decking with sheathing of equal sectional dimensions, and specified grade. Seat each end on rafter, with 25 mm bearing, and secure to rafter.

3.3 EXAMINATION AND
PREPARATION

- .1 Prior to installation, examine roof decking and all other exposed structural surfaces to determine all defects and/or damage and report all findings to the Departmental Representative.
- .2 Replace all damaged or rotted existing wood blocking, fascia, rafters and/or other wood structures, as encountered during the work.
- .3 All decking shall be sound, free of defects, cleaned and dry prior to application.

3.4 APPLICATION

- .1 Do asphalt shingle work in accordance with manufacturer's instructions.
 - .2 Shingle application:
 - .1 Coverage shall be not less than two thicknesses of shingle, disregarding cut-outs, over the entire roof.
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3.4 APPLICATION
(Cont'd)

- .2 (Cont'd)
 - .2 Shingle tabs shall be secured by a 25 mm diameter spot of the specified asphalt roofing cement applied under each tab corner.
- .3 Edge flashing:
 - .1 Install drip edge along eaves and rake edges, overhanging 25 mm, with minimum 75 mm flange extending onto roof decking. Nail to deck at 200 - 250 mm on centre. Avoid face nailing.
 - .2 Fabricate edge flashing of min. 0.45 mm (26 GA) Prefinished sheet steel.
 - .3 Close him bottom edges of all flashing, return to from a continuous drip edge.
 - .4 End laps shall be over laped min. 100 mm and set into asphalt roofing cement.
 - .5 Do not nail through overlaps. Cut, notch and lock drip edges at overlaps.
- .4 Flashing at Intersections:
 - .1 Protect intersection of shingle roofs with wall, curbs and masonry chimneys with not less than 0.45 mm (26 GA.) prefinished galvanized sheet steel flashing.
 - .2 Install bottom step flashing (soaker base flashing) interleaved between shingles at vertical junctions. Step flashing along slopes of roof to provide min. 100 mm wide head laps.
 - .3 Set shingles onto flanges of sheet metal flashing, chimney saddles, attic space vents, plumbing vent flashing, mastic pans and all flanged roof-top flashing flanges with a full bedding of asphalt roofing cement extending a minimum of 75 mm wide.
 - .4 Cover the upper portion and sides of fanged roof-top flashing on contact with the roof with shingles for a minimum of two thirds (2/3) of the length. The remaining one third (1/3) portion of flashing shall cover the head of preceding shingles.
- .5 Eave protection:
 - .1 Install eave protection extending from the eave edge of the roof decking to a line not less than 300 mm inside the inner face of the exterior walls.
 - .2 Install parallel to the eaves, smoothly, and evenly. Fully seal side and end laps together; not less than 75 mm wide.
 - .3 Fasten eave protection sufficiently to hold in place with roofing nails positioned not less than 450 mm above the eaves.
- .6 Underlayment:

3.4 APPLICATION
(Cont'd)

- .6 (Cont'd)
 - .1 Install underlayment on wood roof decking and apply parallel to the eaves, smoothly, evenly and overlapping minimum one-half sheet at side laps and 150 mm at end laps to provide a full 2-ply installation.
 - .2 Fasten to hold in place with roofing nails. Provide min. 150 mm overlap onto the eave protection.
- .7 Ridges:
 - .1 Extend shing capping on ridges min. 100 mm on either side of the hip or ridge and lap not less than 150 mm.
 - .2 Apply capping without exposed nail heads and cut at an angle so that no part of the head-lap is visible beyond the edges of the shingle butts.
 - .3 Apply all ridge capping in the direction opposite to prevailing winds.
- .8 Vents:
 - .1 Install continuous rdige vent in locations indicated following manufacturer's instructions.
 - .2 Install new plumbing vent flashing to all vent locations.
 - .3 Clean and prime metal flanges of chimneys and vents prior to application of shingles.

3.5 CLEAN UP

- .1 Remove all nails and scraps from grounds. Use bar magnet and rake in grassed areas, plant beds, and uneven turf.

PART 1 - GENERAL

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| <u>1.1 REFERENCES</u> | .1 | Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS) |
| | .2 | ASTM C 1186 - Standard Specification for Flat Fiber-Cement sheets. |
| | .3 | Fiber-cement siding - complies with ASTM C 1186 Type A Grade II |
| <u>1.2 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Submit in accordance with Section 01 00 10 - General Information. |
| | .2 | Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for cementitious materials and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit 2 copies of WHMIS MSDS. Indicate VOC's for cementitious materials. |
| <u>1.3 QUALITY ASSURANCE</u> | .1 | Installer qualifications: Minimum of 2 years experience with installation of similar products. |
| | .2 | Apprentices must be accompanied by qualified personnel. |
| <u>1.4 DELIVERY, STORAGE AND HANDLING</u> | .1 | Deliver, store and handle materials in accordance with manufacturer's written instructions. |
| | .2 | Deliver materials to site in original factory packaging, labelled with manufacturer's name and address. |
| | .3 | Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.1 Store and protect cementitious panels from nicks, scratches, and blemishes.
.2 Replace defective or damaged materials with new. |
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<u>1.4 DELIVERY, STORAGE AND HANDLING (Cont'd)</u>	.4	Ensure workers wear gloves, dust masks, long sleeved clothing, eye protection and protective clothing when working with cutting cementitious boards.
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<u>1.5 ENVIRONMENTAL REQUIREMENTS</u>	.1	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 material safety data sheets (MSDS) acceptable to Labour Canada.
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<u>PART 2 - PRODUCTS</u>	.1	Factory finished Fiber cement lap siding,
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<u>2.1 DESIGN REQUIREMENTS</u>	.1	Design composite building panel wall to provide for thermal movement of component materials caused by ambient temperature without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
	.2	Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.
	.3	Maintain following installation tolerances: .1 Maximum variation from plane or location shown on approved shop drawings: 10 mm/m of length and up to 20 mm/100 m maximum. .2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.75 mm.

<u>2.2 MATERIALS</u>	.1	Factory finished Fiber cement lap siding: from 5mm to 7 mm thick.
	.2	Sealants: Use approved sealants where indicated by supplier/manufacturer of the Cementitious siding boards.
	.3	Fasteners: Use either stainless steel or galvanized nails.

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| <u>2.3 COMPONENTS</u> | .1 | Panels: Factory coloured cementitious panels. 1220 mm X 2438. |
| | .2 | Trim boards 38 mm thick Aritsan style. Width as indicated. |
| | .3 | Lapped siding. 210 mm width, length as needed. 177 mm reveal once installed. |
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| <u>2.4 FABRICATION</u> | .1 | Cut panels under nominal size by 2 mm to provide 4 mm wide joint after installation. |
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| <u>2.5 FINISH OF PANELS</u> | .1 | Colour coating: Siding comes pre-coated by manufacturer with a selection of colour selected by Departmental Representative from manufacturers full range. |
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PART 3 - EXECUTION

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| <u>3.1 EXAMINATION</u> | .1 | Verify that condition of substrate is acceptable in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied. |
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| <u>3.2 INSTALLATION</u> | .1 | Protect surface of metals in contact with concrete, mortar, plaster or other cementitious surface with isolation coating. |
| | .2 | Install head and sill flashings, edge trim, cap pieces and fillers. |
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| <u>3.3 CLEANING</u> | .1 | Progress Cleaning: clean in accordance with Section 01 00 10 - General Instructions. |
| | .2 | Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 - General Instructions. |
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3.3 CLEANING
(Cont'd)

- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 00 10 - General Instructions.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
.2 Repair damage to adjacent materials caused by mineral fibre reinforced panel installation.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653/A 653 M, Standard Specification for Steel Sheet, Zinc coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B 32, Standard Specification for Solder Metal.
 - .3 ASTM D 523, Standard Test Method for Specular Gloss.
- .2 Canadian Roofing Contractors Association (CRCA).
 - .1 Roofing Specifications Manual.
- .3 Canadian Sheet Steel Building Institute (CSSBI)
 - .1 Roofing Specification Manual.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA A123.3, Asphalt Saturated Organic Roofing Felt.
 - .2 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
- .5 Canadian General Standards Board (CGSB)
 - .1 AAMA/WDMA/CSA 101/I.S.2/A440-2008, Standard/Specification for Windows, Doors, and Unit Skylights.
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 00 10 - General Instructions.
 - .2 Product Data:
 - .1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 00 10 - General Instructions.
 - .3 Samples:
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<u>1.2 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)</u>	.3	(Cont'd) .1 Submit duplicate 200 x 200 mm samples of each type of sheet metal material, finishes and colours.
<u>1.3 QUALITY ASSURANCE</u>	.1	Pre-Installation Meetings: Convene pre-installation meeting one week prior to beginning of work of this section and on-site installation, with contractor's representative. .1 Verify project requirements. .2 Review installation and substrate conditions. .3 Co-ordination with other building subtrades. .4 Review manufacturer's installation instructions and warranty requirements.
<u>1.4 DELIVERY, STORAGE AND HANDLING</u>	.1	Deliver, store and handle materials in accordance with Section 01 00 10 - General Instructions.
<u>1.5 WASTE MANAGEMENT</u>	.1	Separate waste materials for recycling in accordance with Waste Management Plan.
<u>PART 2 - PRODUCTS</u>	.1	Pre-finished metal flashing. Thickness and
<u>2.1 SHEET METAL MATERIALS</u>	.1	Zinc coated steel sheet: to ASTM A 653/A 653M, Commercial quality (CS) Type A, grade 33, with Z275 designated zinc coating, base metal thickness as indicated. .1 Recycled content: 30%.
<u>2.2 PREFINISHED STEEL SHEET</u>	.1	Prefinished steel with factory applied two coat silicone modified polyester. .1 Colour selected by Departmental Representative from manufacturer's standard range. For pricing assume QC 18229 Dark Brown. .2 Specular gloss: 30 units +/- 5 in accordance with ASTM D 523. .3 Coating thickness: not less than 25 micrometres.

- 2.2 PREFINISHED STEEL SHEET
(Cont'd)
- .1 (Cont'd)
 - .4 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 100 hours.
 - .2 Humidity resistance exposure period 1000 hours.
 - .5 Standard of Acceptance: Perspectra.

- 2.3 ACCESSORIES
- .1 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32 with Home wrap for windows, siding and doors.
 - .2 Isolation coating: Alkali resistant bituminous paint for roofing.
 - .3 Plastic cement: to CAN/CGSB 37.5.
 - .4 Fasteners: of same material as sheet metal, to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing application for windows and doors.
 - .5 Underlay for metal flashing: dry sheathing to CAN/CGSB-51.32 or No. 15 perforated asphalt felt to CSA A123.3 for roofing.
 - .6 Cleats: of same material and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured for roofing.
 - .7 Sealants:
 - .1 For metal to metal joints: One part neutral cure silicone.
 - .2 For metal to masonry: One part neutral cure silicone.
 - .3 Colours selected by Departmental Representative from manufacturer's standard range.
 - .4 Acceptable product: Dow Corning 795.
 - .8 Fasteners: of same material as sheet metal, to CSA B111 for nails and CSA B35.3 for screws of length and thickness suitable for application.
 - .1 Hex-head, self tapping screws: 300 series stainless steel, hexagon head. Min. 9 mm head. Washers min. 1 mm thck, same type of metal c/w rubber packings. Colour to match sheet metal.
 - .1 Standard of Acceptance: Teks c/w Climseal washers.
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| <u>2.3 ACCESSORIES</u>
(Cont'd) | .8 | (Cont'd) |
| | .1 | (Cont'd) |
| | .2 | Sheet metal screws: Self-tapping screws, 300 series stainless steel, rounded head, Robertson. Min. size No. 8. |
| | .3 | Rivets: 300 Series stainless steel pop rivets. Min. Size No.8. |
| | .9 | Touch-up paint: as recommended by prefinished material manufacturer. |

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| <u>2.4 FABRICATION</u> | .1 | Fabricate metal flashings and other sheet metal work as indicated. |
| | .2 | Form pieces in 2400 mm maximum lengths. |
| | .1 | Make allowance for expansion at joints. |
| | .3 | Hem exposed edges on underside 12 mm. |
| | .1 | 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. |

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| <u>2.5 METAL FLASHINGS</u> | .1 | Form flashings, drip edges, etc. to profiles indicated of 0.45 mm (26 GA.) thick prefinished sheet metal. |
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| <u>2.6 REGLETS</u> | .1 | Form recessed reglets of 0.45 mm (26 GA.) thick prefinished steel sheet metal to be built-in to masonry work for base flashings as detailed. |
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PART 3 - EXECUTION

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| <u>3.1 MANUFACTURER'S INSTRUCTIONS</u> | .1 | Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets. |
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| <u>3.2 INSTALLATION</u> | .1 | Use concealed fastenings except where approved before installation. |
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3.2 INSTALLATION
(Cont'd)

- .2 Provide underlay under sheet metal.
 - .1 Secure in place and lap joints 100 mm.
- .3 Counterflash flashings at intersections of roof with vertical surfaces and curbs.
 - .1 Flash joints using S-lock forming tightfit over hook strips, as detailed for roofing.
- .4 Lock end joints and caulk with sealant.
- .5 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint for roofing.
- .6 Caulk flashing at reglet with sealant.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 00 10 - General Instructions.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Leave work areas clean, free from grease, finger marks and stains.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing Materials International (ASTM) .2 ASTM A 167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .3 Canadian Standards Association (CSA).
 - .1 CSA Z259.15-12 Anchorage Connectors.
 - .2 CSA Z259.16-04 Design of Active Fall-Protection Systems.
- .4 Province of Saskatchewan:
 - .1 Occupational Health and Safety Act.
 - .2 Occupational Health and Safety Regulations.

1.2 SYSTEM DESCRIPTION

- .1 Proprietary Personal Restraint Roof Anchors: Anchors to resist lateral forces of 22.2 kN per workers attached at any point and in all directions, without damage or permanent set.

1.3 SUBMITTALS

- .1 Submit manufacturer's test results in accordance with Section 01 00 10 - General Instructions.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 00 10 - General Instructions.
 - .2 Indicate component profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories. Include location drawings, elevations and details where applicable.
 - .3 Submit engineered layout drawings sealed by a professional engineer registered in the Province of Saskatchewan. Drawings to indicate placement and size of anchors required to provide compliant coverage.
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1.5 QUALITY ASSURANCE

- .1 Submit design data in accordance with Section 01 00 10 - General Instructions.
- .2 Submit Test Reports and substantiating engineering data and test results of previous tests by independant laboratory and other supportive data.
- .3 Site inspect the installation under direct supervision of a Professional Structural Engineer experienced in desing of this Work and lincenced in the Province of Saskatchewan.
- .4 Pre-Installation Meeting: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.
- .5 Co-ordinate the work with reinforcement of roof framing, installation of roofing materials and sheet metal work.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Waste Management Plan.
- .2 Place materials defined as hazardous or toxic wate in designated containers.

1.7 SITE CONDITIONS

- .1 Prior to start of work verify existing site conditions in accordance with Section 01 00 10 - General Instructions.
- .2 Veryify dimensions, tolerances and method of attachement with other work.

1.8 MAINTENANCE

- .1 Submit design, product and maintenance data for incorporation into manual specified in Section 01 00 10 - General Instructions.
 - .2 Submit manufacturer's printed product literature, specifications and data sheets.
 - .3 Submit inspection and maintenance information.
 - .4 Submit sealed and reviewed shop drawings.
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PART 2 - PRODUCTS

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| <u>2.1 MATERIALS</u> | .1 | Stainless steel sheet: No. 302 alloy, 20 GA thickness. |
| | .2 | Steel D-Rings: forged steel, di-chromate plated, ring thickness determined by imposed loads. |
| | .3 | Screws: stainless steel, No. 12 hex head, 73 mm long. |
| | .4 | Nails: Spiral stainless steel, 83 mm long. |
| | .5 | Gaskets Under Anchors: Neoprene pads, compatible with roof membrane, cut to size. |
| | .6 | Acceptable Product: Super Anchor Safety RS-10 Roof Anchors. |

PART 3 - EXECUTION

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|------------------------|----|---|
| <u>3.1 EXAMINATION</u> | .1 | Verify dimensions, tolerances and method of attachment with other work. |
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| <u>3.2 INSTALLATION</u> | .1 | Install anchors in accordance with engineered shop drawings and follow manufacturer's instructions. |
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| <u>3.4 PROTECTION</u> | .1 | Protect installed products and components from damage during construction. |
| | .2 | Repair damage to adjacent materials caused by roof anchors and safety restraint installation. |

PART 1 - GENERAL

1.1 REFERENCES

- .1 ASTM International
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 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.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 - General Instructions.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Manufacturer's product to describe:
 - .1 Caulking compound.
 - .2 Primers.
 - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
 - .3 Submit 2 copies of WHMIS MSDS
 - .3 Samples:
 - .1 Submit 2 samples of each type of material and colour.
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1.2 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .3 (Cont'd)
 - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.
- .4 Manufacturer's Instructions:
 - .1 Submit installation instructions for each product used.

1.3 CLOSEOUT
SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 General Instructions.
- .2 Data: submit operation and maintenance data for incorporation into manual.

1.4 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect joint sealants from punctures, leaks and seal used sealants with lid tightly for reuse.
 - .3 Replace defective or damaged materials with new.

1.5 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
 - .2 Joint-Width Conditions:
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- 1.5 SITE CONDITIONS (Cont'd)
- .2 (Cont'd)
- .1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
- .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.
- 1.6 ENVIRONMENTAL REQUIREMENTS
- .1 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 Material Safety Data Sheets (MSDS) acceptable to Health Canada.
- .2 Departmental Representative will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of caulking and sealants. Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.

PART 2 - PRODUCTS

- 2.1 SEALANT MATERIAL DESIGNATIONS
- .1 Silicones one part: to CAN/CGSB-19.13.
- .2 Polyethylene, urethane, neoprene or vinyl foam:
- .1 Extruded open cell foam backer rod.
- .2 Size: oversize 30%.
- .1 Neoprene or butyl rubber:
- .1 Round solid rod, Shore A hardness 70.
- .2 High density foam:
- .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
- .3 Bond breaker tape:
- .1 Polyethylene bond breaker tape which will not bond to sealant.

<u>2.2 SEALANT SELECTION</u>	.1	Perimeters of exterior openings where stucco meets trim boards and for recommended applications to Cementitious hard board siding; sealant type: Elastomeric Joint Compound conforming to ASTM C920 Grade NS.
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<u>2.3 JOINT CLEANER</u>	.1	Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
	.2	Primer: in accordance with sealant manufacturer's written recommendations.

<u>2.4 EXAMINATION</u>	.1	Verify that conditions of substrate are acceptable for joint sealant installation in accordance with manufacturer's written instructions. .1 Proceed with installation only after unacceptable conditions have been remedied.
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<u>2.5 SURFACE PREPARATION</u>	.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 coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
	.4	Ensure joint surfaces are dry and frost free.
	.5	Prepare surfaces in accordance with manufacturer's directions.

<u>2.6 PRIMING</u>	.1	Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
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- 2.6 PRIMING
(Cont'd)
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.
- 2.7 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. sealant manufacturer's instructions.
- 2.8 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 exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .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 proper curing has taken place.
- 2.9 CLEANING
- .1 Progress Cleaning: clean in accordance with Section 01 00 10 - General Instructions.
- .1 Leave Work area clean at end of each day.
- .2 Clean adjacent surfaces immediately.
- .3 Remove excess and droppings, using recommended cleaners as work progresses.
- .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 - General Instructions.
-

- 2.10 PROTECTION
- .1 Protect installed products and components from damage during construction.
 - .2 Repair damage to adjacent materials caused by joint sealants installation.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653/A 653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .3 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 1990.
- .4 National Fire Protection Association (NFPA)
 - .1 NFPA 80-99, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.
- .5 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-01, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .3 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
 - .5 CAN4-S105-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.2 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior frame assembly to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.

1.3 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Provide submittals in accordance with Section 01 00 10 - General Instructions.
- .2 Product data:
 - .1 Submit test and engineering data, and installation instructions.
- .3 Submit samples in accordance with Section 01 00 10 - General Instructions.

1.4 DELIVERY,
STORAGE AND
HANDLING

- .1 The contractor responsible for installation shall remove wraps or covers from door and frame product upon delivery to building site.
- .2 All materials shall be thoroughly inspected upon receipt and all discrepancies and/or damages shall be immediately reported to the Departmental Representative. All damages shall be noted on the carrier's Bill of Lading.
- .3 The contractor responsible for installation shall ensure all materials are properly stored on planks or dunnage in a dry location. Products should be stored in a vertical position, spaced with blocking to permit air circulation between them. Materials shall be covered to protect them from damage from any cause.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Exterior entrance doors, steel to ASTM A924-97 (M-97), galvanized to ASTM A653M commercial steel, known commercially as paintable Galvanneal. 1.6 mm thick metal.
- .2 Interior doors shall be fabricated from leveled steel to ASTM A924, galvanized to ASTM A653 commercial steel known commercially as paintable Galvanneal. 1.2 mm thick metal.

2.2 DOOR CORE
MATERIALS STANDARD

- .1 Polyisocyanurate: Rigid foam, closed cell, faced board, thermal value: R12.3 (RSI 2.17) (minimum), conforming to ASTM C1289.
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- 2.3 DOOR CORE MATERIALS FRR DOOR .1 Endothermic insulation or thermal shield conforming to ASTM-E2074 and CAN4-S104
- 2.4 PRIMER .1 Touch-up prime CAN/CGSB-1.181.
- 2.5 ACCESSORIES
- .1 Door silencers: GJ-64 or equal, single stud rubber/neoprene type
- .2 Exterior top and bottom caps: steel.
- .3 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.
- .4 Glazing: In accordance with Section 08 81 00.
- .5 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.
- .2 Design exterior glazing stops to be tamperproof.
- 2.6 FRAMES FABRICATION GENERAL
- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .3 Exterior frames: 1.6 mm thermally broken type construction.
- .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, 2 at head for double door.
- .6 Manufacturer's nameplates on frames and screens are not permitted.
- .7 Conceal fastenings except where exposed fastenings are indicated.
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2.6 FRAMES
FABRICATION GENERAL
(Cont'd)

- .8 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .9 Thermal Breaks: Rigid polyvinylchloride (PVC) extrusion.

2.7 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

2.8 FRAMES:

- .1 Provide frames with mechanical joints which inter-lock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDMA Recommended Installation Guide for Steel Doors and Frames.
- .2 Securely attach floor anchors to inside of each jamb profile.

2.9 DOOR
FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass openings as indicated on drawings.
 - .2 Fabricate doors with longitudinal edges locked seam. Seams: visible.
 - .3 Blank, reinforce, drill doors and tap for mortised, templated hardware.
 - .4 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
 - .5 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
-

2.9 DOOR
FABRICATION GENERAL
(Cont'd)

- .6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .7 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104 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.
- .8 Manufacturer's nameplates on doors are not permitted.

2.10 HOLLOW STEEL
CONSTRUCTION

- .1 Form face sheets for exterior doors from 1.6 mm sheet steel.
- .2 Form face sheets for interior doors from 1.2 mm sheet steel.

2.11 THERMALLY
BROKEN DOORS AND
FRAMES

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

PART 3 - EXECUTION

3.1 MANUFACTURER'S
INSTRUCTIONS

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

3.2 INSTALLATION
GENERAL

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
 - .2 Install doors and frames to CSDMA Installation Guide.
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3.3 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. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .5 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor: 13 mm.
- .3 Adjust operable parts for correct function.

3.5 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.

3.6 GLAZING

- .1 Install glazing for doors and frames in accordance with Section 08 81 00 - Glazing.

PART 1 - GENERAL

1.1 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03 (R2009), Designation system for Aluminum Finishes.
- .2 American Architectural Manufacturers Association (AAMA)
 - .1 AAMA 609.1-02. Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-79.1-M91, Insect Screens.
 - .2 CAN/CGSB-82-1-M89, Sliding Doors.
- .4 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.
- .5 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #79 Primer, Alkyd, Anti-Corrosive for Metal.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 - General Instructions.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for sliding doors and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS Environmental Procedures. Indicate VOC's for materials as follows:
 - .1 Caulking materials during application and curing.
 - .2 Door materials and adhesives.
 - .3 Certificates:
 - .1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - .4 Test Reports:
 - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
 - .1 Anodized finish, weathering characteristics.
-

1.2 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .4 (Cont'd)
 - .1 (Cont'd)
 - .2 Insect screens.
 - .3 Air tightness.
 - .4 Water tightness.
 - .5 Wind load resistance.
 - .6 Condensation resistance.
 - .7 Ease of operation.
 - .8 Forced entry resistance.
- .5 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .6 Manufacturers' Field Reports: submit copies of manufacturers field reports.

1.3 CLOSEOUT
SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 General Instructions
- .2 Operation and Maintenance Data: submit operation and maintenance data for sliding doors for incorporation into manual.

1.4 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect sliding doors from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Materials: to CAN/CGSB-82.1 supplemented as follows.
 - .2 Panel sash: clad wood.
-

2.1 MATERIALS
(Cont'd)

- .3 Main frame: clad wood.
- .4 Glass:
 - .1 Materials: Clear glass, 2 pane inert
- .5 Sealants: to SCAQMD Rule 1168.
- .6 Screens: to CAN/CGSB-79.1.
 - .1 Type: Fibreglass.
 - .2 Style: Aluminum frame.
 - .3 Insect screening mesh: count 18 x 16, plastic-coated fibrous glass.
 - .4 Fasteners: tamper proof.
 - .5 Screen frames: colour to match window frames.

2.2 SLIDING DOOR
CLASSIFICATION

- .1 Doors must be certified under AAMA/WDMA/DMA/CSA 101/I.S.2/A440 North American Fenestration Standard/specifications for doors and be selected as per A440S1-Canadian Supplement.
 - .1 Zone C
 - .2 U-Factor minimum = 1.7 wsq.m.k
 - .3 Metric/SI
 - .4 Minimum Class is "R".

2.3 FABRICATION

- .1 Fabricate to CAN/CGSB-82.1 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Finish steel clips and reinforcement with shop coat primer to MPI #79 380 g/m² zinc coating to ASTM A 123/A 123M.

2.4 ENAMEL COATING

- .1 Finish exposed surfaces of aluminum components in accordance with CAN/CGSB-82.1, including Appendix C, to match aluminum doors and frames colour to match Departmental Representative's sample.
-

2.5 GLAZING .1 Glaze windows in accordance with
CAN/CGSB-82.1.

2.6 HARDWARE .1 Hardware: stainless steel or white bronze
sash locks and aluminum handles to provide
security and permit easy operation of units.
.2 Locks: provide operating sash with locking
device, to provide locking in closed
position.

2.7 AIR BARRIER AND
VAPOUR RETARDER .1 Equip frames with site installed air barrier
and vapour retarder material for sealing to
building air barrier and vapour retarder as
follows:
.1 Material: identical to, or compatible
with, building air barrier and vapour
retarder materials to provide required air
tightness and vapour diffusion control
throughout exterior envelope assembly.
.2 Material width: adequate to provide
required air tightness and vapour diffusion
control to building air barrier and vapour
retarder from interior.
.3 Ensure integrity of building envelope
is maintained.

PART 3 - EXECUTION

3.1 EXAMINATION .1 Verification of Conditions: verify that
conditions of substrate previously installed
under other Sections or Contracts are
acceptable for sliding door installation in
accordance with manufacturer's written
instructions.
.1 Visually inspect substrate.
.2 Inform Departmental Representative of
unacceptable conditions immediately upon
discovery.
.3 Proceed with installation only after
unacceptable conditions have been remedied.

3.2 MANUFACTURER'S
RECOMMENDATIONS .1 Comply with manufacturer's written data,
including product technical bulletins,
product catalogue installation
recommendations, product carton installation
recommendations and data sheets.

3.3 INSTALLATION

- .1 Install sliding doors and frames in accordance with CAN/CGSB-82.1 and manufacturer's written recommendations.
- .2 Adjust operable parts for correct function.

3.4 CAULKING

- .1 Caulk junction of frame and adjacent building components both inside and outside.
- .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within sliding door units.
- .3 Sealant to: SCAQMD Rule 1168.

3.5 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Perform cleaning of aluminum components in accordance with the following standards:
 - .1 AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
 - .3 Perform cleaning after installation to remove construction and accumulated environmental dirt.
 - .4 Clean aluminum with damp rag and approved non-abrasive cleaner.
 - .5 Clean vinyl surfaces in accordance with manufacturer's instructions.
 - .6 Clean enamel coatings in accordance with manufacturer's instructions.
 - .7 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
 - .8 Clean glass and glazing materials with approved non-abrasive cleaner.
 - .9 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
 - .10 Recycle material where facilities are available.
-

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by sliding door installation.

PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-79.1-M91, Insect Screens.
- .2 CSA International
 - .1 CSA-A440-00/A440.1-00 (R2005), A440-00, Windows/Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows. CAN/CSA-A440.2-09, Fenestration Energy Performance.
 - .2 CAN/CSA-Z91-02 (R2008), Health and Safety Code for Suspended Equipment Operations.
 - .3 CAN/CSA-Z809-08, Sustainable Forest Management.
- .3 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 General Instructions.
 - .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for windows and include product characteristics, performance criteria, physical size, finish and limitations.
 - .3 Shop Drawings:
 - .1 Submit drawings.
 - .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim junction between combination units elevations of unit, description of related components and exposed finishes fasteners, and caulking. .
 - .4 Test and Evaluation Reports:
 - .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
 - .1 Windows classifications.
 - .2 enamelled finish, weathering characteristics.
 - .3 Insect screens.
 - .4 Air tightness.
 - .5 Water tightness.
-

1.2 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .4 (Cont'd)
 - .1 (Cont'd)
 - .6 Wind load resistance.
 - .7 Condensation resistance.
 - .8 Sash strength and stiffness - operable casement.
 - .9 Ease of operation - windows with operable lights.
 - .10 Forced entry resistance.
 - .11 Mullian deflection - combination and composite windows.

1.3 CLOSEOUT
SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 General Instructions.
- .2 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.

1.4 QUALITY
ASSURANCE

- .1 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in a dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect windows from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Materials: to CSA-A440/A440.1 supplemented as follows:
-

2.1 MATERIALS
(Cont'd)

- .2 All windows by same manufacturer.
- .3 Sash: clad wood.
- .4 Main frame: clad wood.
- .5 Wood species: Pine.
- .6 Glass: Clear, in accordance with Section 08 80 50 - Glazing.
- .7 Screens: to CAN/CGSB-79.1.
 - .1 Type: fiberglass
 - .2 Style: removable.
 - .3 Insect screening mesh: count 18 x 16.
 - .4 Fasteners: tamper proof.
 - .5 Screen frames: aluminum colour to match window frames.
 - .6 Mount screen frames for interior replacement.
- .8 Interior wood sills extended to drywall.

2.2 WINDOW TYPE A
CLASSIFICATION

- .1 Types;
 - .1 Casement: with double glazing insulating glass.
 - .2 Fixed: with double glazing insulating glass.
 - .3 Awning: with double glazing insulated glass.
 - .4 Screens: on ventilating portion of windows.
- .2 Classification rating: to CSA-A440/A440.1.
 - .1 Air tightness: A3.
 - .2 Water tightness: B3.
 - .3 Wind load resistance: C3.
 - .4 Condensation resistance: 55 and over.
 - .5 Forced Entry: F2 for main level and walk out level. F1 for upper windows on 2nd level.
 - .6 Insect Screens: S1 all around.
 - .7 Glazing: G2 all around.

2.3 FABRICATION

- .1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:
 - .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
-

2.3 FABRICATION
(Cont'd)

- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40 380 g/m² zinc coating to ASTM A 123/A 123M.

2.4 ALUMINUM
FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Electrolytically deposited colour anodic finish: Colour choice determined by field unit representative (Asset Managers discretion)

2.5 ENAMEL COATING

- .1 Enamel coating: in accordance with CSA-A440/A440.1, including appendices, supplemented as follows:
 - .1 Colour steel doors and frames.

2.6 ISOLATION
COATING

- .1 Primers Paints Coatings: in accordance with manufacturer's recommendations for surface conditions.
- .2 Isolate aluminum from following components, by means of isolation coating:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.7 GLAZING

- .1 Glaze windows in accordance with CSA-A440/A440.1.
 - .1 All windows by same manufacturer.
 - .2 Glass: in accordance with Section 08 80 50 - Glazing.

2.8 SCREENS

- .1 Screens: to CAN/CGSB-79.1 .1
 - .1 Insect screen mesh 18 X 16 .2Screen
 - .2 Screen frames: aluminum, colour to match window frames. .3 unt screen frames
 - .3 Provide full insect screens to vent location on widow.

- 2.9 AIR BARRIER & VAPOUR BARRIER
- .1 Equip window frames with site installed surround house wrap material for sealing to vapour retarder as follows:
 - .1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
 - .2 Material width: adequate to provide required air tightness and vapour diffusion control to building surround house wrap and vapour retarder from interior.

PART 3 - EXECUTION

- 3.1 EXAMINATION
- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

- 3.2 INSTALLATION
- .1 Window installation:
 - .1 Install in accordance with CSA-A440/A440.1.
 - .2 Arrange components to prevent abrupt variation in colour.
 - .2 Sill installation:
 - .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces.
 - .2 Cut sills to fit.
 - .3 Secure sills in place with anchoring devices located at ends joints of continuous sills and evenly spaced 600 mm on centre in between.
 - .4 Fasten expansion joint cover plates and drip deflectors with self tapping stainless steel screws.
 - .5 Maintain 6 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.
 - .3 Caulking:
-

3.2 INSTALLATION
(Cont'd)

- .3 (Cont'd)
- .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
- .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 - General Instructions.
- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 - General Instructions.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by window installation.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.1-2000, American National Standard for Butts and Hinges.
 - .2 ANSI/BHMA A156.2-2003, Bored and Preassembled Locks and Latches.
 - .3 ANSI/BHMA A156.3-2001, Exit Devices.
 - .4 ANSI/BHMA A156.4-2000, Door Controls - Closers.
 - .5 ANSI/BHMA A156.6-2005, Architectural Door Trim.
- .2 Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
 - .1 CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 - General Instructions.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Hardware List:
 - .1 Submit contract hardware list.
 - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Manufacturer's Instructions: submit manufacturer's installation instructions.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 General Instructions.
 - .2 Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.
-

- | | | |
|---|----|--|
| <u>1.4 MAINTENANCE
MATERIALS
SUBMITTALS</u> | .1 | Supply maintenance materials in accordance with Section 01 00 10 - General Instructions. |
| | .2 | Tools:
.1 Supply 2 sets of wrenches for door closers locksets and fire exit hardware. |
| <u>1.5 QUALITY
ASSURANCE</u> | .1 | Regulatory Requirements
.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada. |
| | .2 | Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements. |
| <u>1.6 DELIVERY,
STORAGE AND
HANDLING</u> | .1 | Deliver, store and handle materials in accordance with with manufacturer's written instructions. |
| | .2 | Delivery and Acceptance Requirements:
deliver materials to site in original factory packaging, labelled with manufacturer's name and address. |
| | .3 | Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location. |
| | .4 | Storage and Handling Requirements:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect door hardware from nicks, scratches, and blemishes.
.3 Protect prefinished surfaces with wrapping.
.4 Replace defective or damaged materials with new. |

PART 2 - PRODUCTS

- | | | |
|--------------------------|----|--------------------|
| <u>2.1 DOOR HARDWARE</u> | .1 | Locks and latches: |
|--------------------------|----|--------------------|
-

2.1 DOOR HARDWARE
(Cont'd)

- .1 (Cont'd)
 - .1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, series 2000 preassembled lock, grade 1 series 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
 - .2 Lever handles: pewter colour design.
 - .3 Normal strikes: box type, lip projection not beyond jamb.
 - .4 Cylinders: key into keying system as as directed.
 - .2 Butts and hinges:
 - .1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
 - .3 Door Closers and Accessories:
 - .1 Door controls (closers): to ANSI/BHMA A156.4, size in accordance with ANSI/BHMA A156.4, table A1, finished to Cadmium plated.
 - .4 Door bottom seal: heavy duty, door seal of extruded aluminum frame and hollow closed cell neoprene weather seal, surface mounted with drip cap recessed in door face, closed ends, adjustable automatic retract mechanism when door is open, clear anodized finish.
 - .5 Thresholds: 127 mm wide x full width of door opening, extruded aluminum plain surface, with thermal break of rigid PVC.
 - .6 Weatherstripping:
 - .1 Head and jamb seal:
 - .1 Extruded aluminum frame and hollow closed cell neoprene nylon brush, clear anodized finish.
 - .2 Adhesive backed neoprene material.
 - .2 Door bottom seal:
 - .1 Extruded aluminum frame and closed cell neoprene nylon brush sweep, clear anodized finish.
 - .7 Barrier Free Pneumatic Door Operator:
 - .1 Heavy duty pneumatically assisted door closer, capable of multi-door operation, complete with actuators, control boxes, pneumatic tubing and compressed air source.
 - .2 Self contained control box/compressor combination for independent operation of two door leaves.
 - .3 Control boxes: complete with electric strike relay.
-

2.1 DOOR HARDWARE
(Cont'd)

- .7 (Cont'd)
- .4 Mount operators on either push or pull sides of doors as required to place them inside rooms.
- .5 Actuation of operators by manual means.
- .6 Supply switched line voltage to control box. Locate switch adjacent to box.
- .7 Supply low voltage wiring to each actuator and 6 mm diameter air tubing to each operator.
- .8 Mount control box in location as directed by Departmental Representative.

2.2 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 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.
- .5 Use fasteners compatible with material through which they pass.

2.3 KEYING

- .1 Supply keys in duplicate for every lock in this Contract.
- .2 Keying to match existing keying.
- .3 Supply 3 master keys for each master key or grand master key group.
- .4 Stamp keying code numbers on keys and cylinders.
- .5 Hand over keys to Departmental Representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Supply manufacturers' instructions for proper installation of each hardware component.
- .4 Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
- .5 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .6 Use only manufacturer's supplied fasteners.
 - .1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

3.2 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 - General Instructions.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
-

3.3 CLEANING
(Cont'd)

- .1 (Cont'd)
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 00 10 - General Instructions.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by door hardware installation.

PART 1 - GENERAL

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM C 542-05, Standard Specification for Lock-Strip Gaskets.
 - .2 ASTM D 2240-05, Standard Test Method for Rubber Property - Durometer Hardness.
 - .3 ASTM E 84-10, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .4 ASTM E 330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass. Glass.
 - .2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .3 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .4 CAN/CGSB-12.8-97 (Amendment), Insulating Glass Units.
- .3 Glass Association of North American (GANA)
 - .1 GANA Glazing Manual - 2008.
 - .2 GANA Laminated Glazing Reference Manual - 2009.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.
- .2 Hold project meetings every week month.
- .3 Ensure site supervisor, project manager subcontractor representatives, attend.
- .4 Departmental Representative will submit written or verbal notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 00 10 General Instructions.
 - .2 Product Data:
-

1.3 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .2 (Cont'd)
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 QUALITY
ASSURANCE

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

1.5 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance manufacturers recommendations.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect glazing and frames from nicks, scratches, and blemishes.
 - .3 Protect prefinished aluminum surfaces with wrapping strippable coating.
 - .4 Replace defective or damaged materials with new.

1.6 MATERIALS

- .1 Design Criteria:
 - .1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
 - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
 - .2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to design pressure of to ASTM E330.
-

1.6 MATERIALS
(Cont'd)

- .1 (Cont'd)
 - .3 Limit glass deflection to 1/200 of glass with full recovery of glazing materials.
 - .4 Safety glass: to CAN/CGSB-12.1, transparent for sliding doors.
 - .5 Low emissivity (LOW E) glass
- .2 Insulating Glass Units:
 - .1 Insulating glass units: to CAN/CGSB-12.8, double unit, mm overall thickness.
 - .1 Glass: to CAN/CGSB-12.3
CAN/CGSB-12.1 CAN/CGSB-12.2
CAN/CGSB-12.4 CAN/CGSB-12.10.
 - .2 Inter-cavity space thickness: 3 mm to 10 mm with low conductivity spacers.
 - .3 Glass coating: low "E" colour.
 - .4 Inert gas fill: argon.
- .3 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

PART 3 - EXECUTION

2.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.
 - .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 Visually inspect substrate.
 - .4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .5 Proceed with installation only after unacceptable conditions have been remedied.

2.2 CLEANING

- .1 Progress Cleaning:
 - .1 Remove traces of primer, caulking.
 - .2 Remove glazing materials from finish surfaces.
 - .3 Remove labels.
 - .4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
-

2.2 CLEANING
(Cont'd)

- .1 (Cont'd)
 - .1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

2.3 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 After installation, mark each light with an "X" by using removable plastic tape or paste.
- .3 Repair damage to adjacent materials caused by glazing installation.

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C 1396/C 1396M-11, Standard Specification for Gypsum Wallboard.
 - .2 ASTM C 475/C 475M-12, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .3 ASTM C 840, Standard Specification for Application and Finishing of Gypsum Board.
 - .4 ASTM C 1002, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .5 ASTM C 1047, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .2 Association of the Wall and Ceilings Industries International (AWCI)
- .3 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.2 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in original packages, containers or bundles bearing manufacturer's brand name and identification.
- .2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.
- .3 Handle gypsum to prevent damage to edges, end or surfaces. Protect metal accessories and trim from being bent or damaged.

1.3 SITE ENVIRONMENTAL REQUIREMENTS

- .1 Maintain temperature 10 degrees C minimum, 21 degrees C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
 - .2 Apply board and joint treatment to dry, frost free surfaces.
-

1.3 SITE
ENVIRONMENTAL
REQUIREMENTS
(Cont'd)

- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.4 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Waste Management Plan.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Do not dispose of unused caulking materials into sewers systems, into lakes, streams, onto ground or in other locations where it will pose a threat or environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Standard board: to ASTM C 1396/C 1396M Type X, 15.9 mm thick and Regular 12.7 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges squared.

PART 3 - EXECUTION

3.1 ERECTION

- .1 Do application and finishing of gypsum board in accordance with ASTM C 840 except where specified.
- .2 Install work level to tolerance of 1:1200.

3.2 APPLICATION

- .1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical works are approved.
- .2 Apply single layer or double layer gypsum board to either existing walls or open wall studs. Maximum spacing of screws 300 mm on center and minimum 38 mm from edges.
 - .1 Single layer application:
 - .1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C 840.

3.2 APPLICATION
(Cont'd)

- .2 (Cont'd)
 - .1 (Cont'd)
 - .2 Apply ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
 - .3 Apply gypsum board vertically providing sheet lengths that will minimize end joints.
- .3 Apply water-resistant gypsum board in bathrooms. Apply water resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads.
- .4 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions about fixed building components. Seal full perimeter of cut-outs around electrical boxes, duts, in partitions where perimeter sealed with acoustic sealant.
- .5 Install gypsum board with face side out.
- .6 Do not isntall damage or damp boards.
- .7 Located edge or end joints over supports. Stagger vertical joints over different studson opposite side of walls.

3.3 INSTALLATION

- .1 Erect accessories straight, plumb or level, ridid and at proper plane. Use full length pieces where pratical. Make joints tight, accurately align and rigidly secured. Mitreand fit corners accurately, free from rough edges. Secure at 150 mm on centre.
 - .2 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rididly secure frames to furring or framing systems.
 - .3 Finish face panel joints and internal angles with joint system consisting of joint compound, joint take and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
-

3.3 INSTALLATION (Cont'd)

- .4 Gypsum Board Finish: finish gypsum board walls and ceilings to following level in accordance with association of the wall and ceiling industries (AWCI) International Recommended Specifications on Levels of Gypsum Board Finish:
 - .1 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
- .5 Finish corner beads, control joints and trimas required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .6 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .7 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .8 Complete installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .9 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

3.4 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
 - .2 Repair damage to adjacent materials caused by gypsum board assemblies installation.
-

3.6 SCHEDULES

- .1 Ceiling and bulkhead assemblies to be fire rated.
 - .1 30 minute fire-rated ceiling/bulkhead membrane assembly, 'M1' in Appendix A-9.10.3.1 of NBCC.
 - .1 Single layer 16 mm Type X gypsum board with fastener and support spacing as indicated in NBC Appendix notes.
- .2 Use 13 mm or 16 mm boards to match existing thickness where patching-in is required.
- .3 Use moisture resistant board in bathrooms.

PART 1 - GENERAL

1.1 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheet (MSDS).
- .2 The Master Painters Institute (MPI)
 - .1 Maintenance Repainting Manual and Architectural Painting Specification Manual including Identifiers, Evaluation, Systems, Preparation and Approved Product Lists.
- .3 National Fire Code of Canada.
- .4 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings) of the Environmental Protection Agency (EPA).

1.2 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
 - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work
 - .3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
 - .2 Conform to latest MPI requirements for exterior painting work including preparation and priming.
 - .3 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners and solvents) to be in accordance with the latest edition of the MPI Approved Product List and to be from a single manufacturer for each system used.
 - .4 Paint materials such as linseed oil, shellac, and turpentine, to be the highest quality product of an approved manufacturer listed in MPI Maintenance Repainting Manual and shall be compatible with other coating materials as required.
-

1.2 QUALITY
ASSURANCE
(Cont'd)

- .5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

1.3 PERFORMANCE
REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI "Environmentally Friendly" E1, E2 and E3 ratings based on VOC (EPA Method 24) content levels.

1.4 SCHEDULING

- .1 Submit work schedule for various stages of painting to Departmental Representative for approval. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Paint occupied facilities in accordance with approved schedule. Schedule operations to approval of Departmental Representative such that painting surfaces will have dried cured sufficiently before occupants are affected.
- .3 Obtain written authorization from Departmental Representative for changes in work schedule.
- .4 Schedule repainting operations to prevent disruption of by other trades if applicable and by occupants in and about building.

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 00 10 - General Instructions.
 - .2 Provide samples in accordance with Section 01 00 10 General Instructions.
 - .1 Submit duplicate 300 X 300 mm samples on 3 mm hardboard for review and acceptance.
 - .2 Samples to indicate colour and gloss for each coating type specified.
 - .3 Submit two copies product data and manufacturer's installation/application instructions for paints and coating products to be used.
 - .4 Submit two copies WHMIS Material Safety Data Sheets (MSDS) in accordance with Section 01 00 10 - General Instructions for paints and coating materials to be used.
 - .5 Quality Assurance Submittals:
-

- 1.5 SUBMITTALS
(Cont'd)
- .5 (Cont'd)
 - .1 Submit manufacturer's application instruction.
 - .6 Closeout Submittals:
 - .1 Provide maintenance data for incorporation into manual specified in Section 01 00 10 - General Instructions.
 - .2 Submit records of products used. List products in relation to finish system and including the following:
 - .3 Product name, type and use. (ie materials and location)
 - .4 Manufacturer's product number.
 - .5 Colour numbers.
 - .6 Manufacturer's Material Safety Data Sheets (MSDS).
- 1.6 MAINTENANCE
- .1 Extra Materials:
 - .1 Submit maintenance materials in accordance with Section 01 00 10 - General Instructions.
 - .2 Provide extra materials from same production run as products installed.
 - .3 Provide one 3.79 litre can of each type and colour of finish coating. Identify type and colour in relation to established colour schedule and finish system.
- 1.7 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with manufacturers instructions, supplemented as follows:
 - .1 Deliver and store materials in original containers, sealed, with labels intact.
 - .2 Labels: to indicate:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
 - .3 Remove damaged, opened and rejected materials from site.
 - .4 Store and handle in accordance with manufacturer's recommendations.
-

1.7 DELIVERY,
STORAGE AND
HANDLING
(Cont'd)

- .1 (Cont'd)
 - .5 Store materials and equipment in secure, dry, well-ventilated area with temperature range between 7 degrees C to 30 degrees C. Store materials and supplies away from heat generating devices and sensitive products above minimum temperatures as recommended by manufacturer. 6
 - Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. Upon completion of operations, return areas to clean condition to approval of Departmental Representative.
 - .6 Remove paint materials from storage in quantities require for same day use.
 - .7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage and disposal of hazardous materials.
 - .8 Fire Safety Requirements:
 - .1 Provide on 9 kg Type ABC dry chemical 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 daily.
 - .3 Handle, store, use and dispose of flammable and combustible materials
 - .9 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC dry chemical 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.
 - .4 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Waste Management Plan.

1.7 DELIVERY,
STORAGE AND
HANDLING
(Cont'd)

- .2 (Cont'd)
- .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).
- .6 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

1.8 AMBIENT
CONDITIONS

- .1 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Do not preform repainting work when:
- .1 Ambient air and substrate temperature are below 10 degrees C.
- .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperature.
- .3 Substrate and ambient air temperatures are expected to fall outside MPI paint manufacturer's prescribed limits.
-

1.8 AMBIENT
CONDITIONS
(Cont'd)

- .1 (Cont'd)
 - .1 (Cont'd)
 - .4 Relative humidity is above 85% or when dew point is less than 3 degrees C variance between air/surface temperatures.
 - .5 Rain or snow is forecast to occur before paint has thoroughly cured.
 - .6 It is foggy, misty, raining or snowing at site.
 - .2 Conduct moisture tests using properly calibrated electronic Moisture Meter.
 - .3 Do not perform repainting work when maximum moisture content of substrate exceeds:
 - .1 15% for wood.
 - .2 12% for gypsum board.
- .2 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces in accordance with Section 01 00 10 - General Instructions.
 - .2 Provide continuous ventilation for seven days after completion of application of paint.
 - .3 Coordinate use of existing heating and ventilation system with Departmental Representative and ensure it's operation during and after application of apint as required.
 - .4 Provide temporary ventilations and heating equipment where permanent facilites are not available or supplemental ventilating and heating equipment if ventilation and heating from existing systemis inadequate to meet minimum requirements.
 - .5 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .3 Application Requirements:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind conditions are such that airborne particles will affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limis noted.
 - .3 Apply paint whern previous coat of paint is dry or aequately cured, unless otherwise pre-approved by specific coating manufacturer.
 - .4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.
 - .5 Do not apply paint when:

1.8 AMBIENT
CONDITIONS
(Cont'd)

- .3 (Cont'd)
- .5 (Cont'd)
 - .1 Temperature is expected to drop below 10 Degrees 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 repainting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
 - .8 Remove paint from area which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .4 Additional interior application requirements:
 - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.
 - .2 Paint materials for paint systems: to be products of single manufacturer.
 - .3 Paints and coatings to be as follows:
 - .1 Be water-based water soluble water clean-up.
 - .2 Be non-flammable biodegradable.
-

2.1 MATERIALS
(Cont'd)

- .3 (Cont'd)
 - .3 Be manufactured without compounds which contribute to ozone depletion in 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.

2.2 COLOURS

- .1 Departmental Representative will provide Colour Schedule.
- .2 First coat in two coat (Premium) exterior repaint system to be tinted slightly lighter colour than top coat to show visible difference between coats.
- .3 Second coat in three coat (Premium) interior paint system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer.
- .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 is defined as sheen rating of applied paint, in accordance with following values.
 - .1 Gloss level G1 - Matte finish, Units at 60 degrees 0 to 5, Units at 85 degrees, maximum 10.
-

2.4 GLOSS/SHEEN
RATINGS

(Cont'd)

- .1 (Cont'd)
 - .2 Gloss level G2 - Velvet finish, Units at 60 degrees 0 to 10, Units at 85 degrees 10 to 35.
 - .3 Gloss level G3 - Eggshell finish, Units at 60 degrees 10 to 25, Units at 85 degrees 10 to 35.
 - .4 Gloss level G4 - Satin finish, Units at 60 degrees 20 to 35, Units at 85 degrees minimum 35.
 - .5 Gloss level G5 - Semi-gloss finish, Units at 60 degrees, 35 to 70.
 - .6 Gloss level G6 - Gloss finish, Units at 60 degrees, 70 to 85.
 - .7 Gloss level G7 - High gloss finish, Units at 60 degrees, over 85.
- .2 Gloss level ratings of painted surfaces as specified.

2.5 EXTERIOR
PAINTING SYSTEMS

- .1 Cementitious Composition Board Surfaces: (vertical surfaces, horizontal soffits)
 - .1 EXT 3.3A - Latex Egg shell or flat finish.
- .2 Wood Panelling: Unless otherwise directed by Departmental Representative, all wood panelling is unfinished.
- .3 Stucco: All existing stucco remains unfinished.
- .4 REX 6.2 - Dimensional Lumber (columns, beams, exposed joists, underside of decking, siding, and fencing).
 - .1 REX 6.2H - High Performance Acrylic gloss level 5.
- .5 REX 6.3 - Dressed Lumber: (door, door and window frames, casings, battens and smooth fascias).
 - .1 REX 6.3A - High Performance Acrylic gloss level 5.
- .6 REX 6.4 - Wood Panelling: (Plywood siding and soffits).
 - .1 REX 6.4G - Latex gloss level 2.

2.6 INTERIOR
PAINTING SYSTEMS

- .1 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finish:
 - .1 INT 9.2M - Institutional low odour/low VOC gloss level.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

- .1 Perform preparation and operations for painted in accordance with MPI Maintenance Repainting Manual and Architectural Painting Specifications Manual except where specified otherwise.

3.3 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 No repainting work to commence until such adverse conditions and defects have been corrected and surfaces and conditions are acceptable to Painting Subcontractor and Inspection agency.
- .3 Degree of surface deterioration (DSD) to be assessed using MPI Identifiers and Assessment criteria indicated in the MPI Maintenance Repainting Manual. MPI DSD rating and descriptions are as follows:

<u>Condition</u>	<u>Description</u>
DSD-0	Sound Surface
Includes visual aesthetic defects that do not affect film's protective properties.	
DSD-1	Slightly Deteriorated Surface
Indicating fading, gloss reduction, slight surface contamination, minor pin holes and scratching.	
DSD-2	Moderately Deteriorated Surface.
Small areas of peeling, flaking, slight cracking and staining.	
DSD-3	Severely Deteriorating Surface.
Heavy peeling, flaking, cracking, checking scratches, scuffs, abrasion, small holes and gouges.	

3.3 EXAMINATION (Cont'd)

DSD-4 Substrated Damage.
Repair or replacement of surface required.

- .4 Where an assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .5 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter. Do not proceed with until conditions fall within acceptable range as recommended by manufacturer.
- .6 Maximum moisture content as follows:
 - .1 Stucco, plaster and gypsum board: 12%
 - .2 Wood: 15%

3.4 INTERIOR EXTERIOR PREPARATION

- .1 Surface Preparation:
 - .1 Remove electrical cover plates, light fixtures and other surface mounted elements, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
 - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
 - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
 - .2 Clean and prepare new and existing surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt and other surface debris by vacuuming, wiping with dry, clean cloths.
 - .2 Wash surfaces with a biodegradable detergent where applicable and clean warm water using as 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 Use trigger operated spray nozzles with water hose.
-

3.4 INTERIOR
EXTERIOR
PREPARATION
(Cont'd)

- .2 (Cont'd)
- .5 Allow surfaces to drain completely and to dry thoroughly.
- .6 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
- .7 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water-based paints.
- .8 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean. If such products are used, consult the manufacturer's directions for both paint being used and cleaners being used for compatibility issues.
- .3 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before applying primer coat. Apply primer, paint or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .4 Sand and dust between coats as recommended by paint manufacturer 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 combined with vacuum cleaning.
- .6 Do not paint until prepared surfaces have been accepted by Departmental Representative.

3.5 EXISTING
CONDITIONS

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative any damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

3.6 PROTECTION

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking.
- .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 building.
- .5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.
- .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.

3.7 APPLICATION

- .1 Apply paint materials in accordance with paint manufacturer's written application instructions.
 - .2 Apply paint by method that is best suited for substrate being painted or repainted. Conform to manufacturer's application instructions unless specified otherwise.
 - .3 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 Departmental Representative.
-

3.7 APPLICATION
(Cont'd)

- .3 (Cont'd)
 - .5 Remove runs, sags and brush marks from finished work and repaint.
 - .4 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.
 - .5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare 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.
 - .10 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Departmental Representative.
 - .11 Standard Of Acceptance:
 - .1 When viewed using natural prevailing sunlight at peak period of the day (mid-day) on surface viewed, surfaces to indicate following:
 - .1 Fascias and soffits: no defects visible from grade at 45 degrees to surface.
-

3.7 APPLICATION
(Cont'd)

- .11 (Cont'd)
 - .1 (Cont'd)
 - .2 When viewed using final lighting source:
 - .1 Ceilings: no defects visible from floor at 45 degrees to surface.
 - .3 Final coat to exhibit uniformity of colour and sheen across full surface area.

3.8 MECHANICAL/ m
ELECTRICAL
EQUIPMENT

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Do not paint over nameplates, instruction plates or operational tags.

3.9 FIELD QUALITY
CONTROL

- .1 Painting contractor shall notify Departmental Representative a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finished Schedule with selected and approved colours.
- .2 Inspection:
 - .1 Field inspection of exterior painting operations to be carried out by Departmental Representative.
 - .2 Advise Departmental Representative when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirement when requested by Departmental Representative.

3.10 CLEANING

- .1 Proceed in accordance with Section 01 00 10 - General Instructions.
-

3.10 CLEANING
(Cont'd)

- .2 Remove paint where spilled, splashed, splattered or over sprayed as work progresses using means and materials that are not detrimental to affected surfaces or occupants of building.
- .3 Keep work areas free from unnecessary accumulation of tools, equipment, surplus materials and debris.
- .4 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.
- .5 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil based materials as well as cleaning and protective materials (e.g. rags, drop cloths and masking papers), paints thinners, paint removers/strippers in accordance with the safety requirements of authorities having jurisdiction and as specified.
- .6 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Sediment remaining from cleaning operation to be disposed of in a manner acceptable to authorities having jurisdiction.
- .7 Recycle paint and coatings in excess of repainting requirements as specified.

3.11 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings 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. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition.

PART 1 - GENERAL

- | | | |
|--------------------|----|---|
| <u>1.1 SUMMARY</u> | .1 | Fire/smoke dampers to be installed in all HVAC duct work that passes through both Storage and Locker rooms on the walk out entry level. |
|--------------------|----|---|
-
- | | | |
|-----------------------|----|--|
| <u>1.2 REFERENCES</u> | .1 | American National Standards Institute/National Fire Protection Association (ANSI/NFPA)
.1 ANSI/NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems. |
| | .2 | Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS). |
| | .3 | Underwriters Laboratories of Canada (ULC)
.1 CAN4-S112-M1990, Fire Test of Fire Damper Assemblies.
.2 CAN4-S112.2-M84, Standard Method of Fire Test of Ceiling Firestop Flap Assemblies.
.3 ULC-S505-1974, Fusible Links for Fire Protection Service. |
-
- | | | |
|--|----|---|
| <u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Product Data:
.1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 00 10 - General Instructions Include product characteristics, performance criteria, and limitations.
.1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 00 10 - Submittal Procedures.
.2 Indicate the following:
.1 Fire dampers.
.2 Smoke dampers.
.3 Fire stop flaps.
.4 Operators.
.5 Fusible links.
.6 Design details of break-away joints. |
| | .2 | Quality assurance submittals: submit following in accordance with Section 01 00 10 - Submittal Procedures. |
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1.3 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .2 (Cont'd)
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.
 - .1 Departmental Representative will make available 1 copy of systems supplier's installation instructions.
- .3 Closeout Submittals:
 - .1 Provide maintenance data for incorporation into manual specified in Section 01 00 10 - General.

1.4 QUALITY
ASSURANCE

- .1 Certificates;
 - .1 Catalogue or publish rating those obtained from tests carried out by manufacturers or those ordered by manufacturer from independant testings agency signifying adhearence to codes and standards.

1.5 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 00 10 - General Instructions.

1.6 DELIVERY,
STORAGE, AND
HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Packing, shipping, handling and unloading.
 - .2 Deliver, store and handle in accordance with manufacturers written instructions.

PART 2 - PRODUCTS

2.1 FIRE DAMPERS

- .1 Fire dampers: arrangement Type A, listed and bear label of ULC UL Warnock Hersey, meet requirements of provincial fire authority Fire Commissioner of Canada (FCC) CFFM and ANSI/NFPA 90A authorities having jurisdiction. Fire damper assemblies fire tested in accordance with CAN4-S112.
 - .2 Mild steel, factory fabricated for fire rating requirement to maintain integrity of fire wall and/or fire separation.
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2.1 FIRE DAMPERS
(Cont'd)

- .2 (Cont'd)
 - .1 Fire dampers: 1-1/2 hour fire rated unless otherwise indicated.
 - .2 Fire dampers: automatic operating type and have dynamic rating suitable for maximum air velocity and pressure differential to which it will be subjected.
- .3 Top hinged: offset single damper, square; Type specified by department representative.
- .4 Fusible link actuated, weighted to close and lock in closed position when released or having negator-spring-closing operator for multi-leaf type or roll door type in horizontal position with vertical air flow.
- .5 40 x 40 x 3 mm retaining angle iron frame, on full perimeter of fire damper, on both sides of fire separation being pierced.
- .6 Equip fire dampers with steel sleeve or impair damper operation.
- .7 Equip sleeves or frames with perimeter mounting angles attached on both sides of wall or floor opening. Construct ductwork in fire-rated floor-ceiling or roof-ceiling assembly systems with air ducts that pierce ceiling to conform with ULC.
- .8 Design and construct dampers to not reduce duct or air transfer opening cross-sectional area.
- .9 Dampers shall be installed so that the centerline of the damper depth or thickness is located in the centerline of the wall, partition of floor slab depth or thickness.
- .10 Unless otherwise indicated, the installation details given in SMACNA Install Fire Damp HVAC and in manufacturer's instructions for fire dampers shall be followed.

PART 3 - EXECUTION

3.1 MANUFACTURER'S
INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.
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3.2 INSTALLATION

- .1 Install in accordance with ANSI/NFPA 90A and in accordance with conditions of ULC listing.
- .2 Maintain integrity of fire separation.
- .3 After completion and prior to concealment obtain approvals of complete installation from authority having jurisdiction.
- .4 Install access door adjacent to each damper.
- .5 Co-ordinate with installer of firestopping.
- .6 Ensure access doors/panels, fusible links, damper operators are easily observed and accessible.
- .7 Install break-away joints of approved design on each side of fire separation.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 00 10 - General Instructions.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.