APPENDIX G - MINIMUM MATERIAL REQUIREMENTS

The intent behind the Minimum Material Requirements is to set out the minimum standards of materials to be used in a School that the Province will accept. The Contractor may choose to use materials that exceed these minimum requirements.

List of Minimum Material Requirements

Material		Material	
03 31 00 Structural Concrete		09 64 40 Cushioned Wood Flooring System	
03 35 00 Concrete Finishing		09 65 00 Resilient Flooring	
04 20 00 Masonry Units		09 67 13 Fluid Applied Athletic Flooring	
05 00 00 Metals - Structure		09 68 00 Carpeting	
05 50 00 Metal Fabrication - Stairs/Railing		09 81 29 Sprayed Acoustic Insulation	
06 40 00 Architectural Woodwork		09 90 00 Painting and Coating	
07 13 00 Sheet Membrane Waterproofing		10 00 00 Specialties	
07 46 15 Steel Siding		10 21 13 Toilet Compartments	
07 46 46 Mineral-Fiber Cement Siding		10 22 26 Operable Partitions	
07 50 00 Membrane Roofing		10 22 27 Vertically Folding Operable Walls	
08 11 13 Hollow Metal Doors and Frames		10 51 00 Lockers	
08 14 16 Flush Wood Doors		10 75 00 Flagpoles	
08 35 00 Folding Doors and Grilles		11 66 23 Gymnasium Equipment	
08 41 13 Monumental Aluminum Framed Folding/Paired Panel System		11 66 53 Gymnasium Dividers	
		12 25 00 Motorized Blinds	
08 44 13 Glazed Aluminum Curtain Walls		12 48 13 Entrance Floor Mats and Frames	
08 51 13 Aluminum Windows		14 21 00 Elevators	
08 70 00 Hardware		20 00 00 Common Mechanical Requirements	
08 80 00 Glazing		26 00 00 Electrical	
09 20 00 Gypsum Board		32 10 00 Bases, Ballasts, and Paving	
09 24 23 Portland Cement Stucco		32 90 00 Planting	
09 30 13 Ceramic Tile		33 00 00 Utilities	
09 51 11 Acoustic Ceiling Tiles			
09 57 90 Acoustic Baffles			
09 61 00 Polished Concrete Flooring			

03 31 00 STRUCTURAL CONCRETE

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM C330/C330M-09, Standard Specification for Lightweight Aggregates for Structural Concrete.

.2 ASTM A82/A82M-07 Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.3 ASTM A185/A185M-07 Standard Specification for Steel Welded Wire Reinforcement, Plain for Concrete.

.4 ASTM A1022/A1022M-07 – Standard Specification for Deformed and Plain Stainless Steel Wire and Welded Wire for Concrete Reinforcement.

.5 CSA-A23.1-09, Concrete Materials and Methods of Concrete Construction.

.6 CSA-G30.18-09 - Carbon Steel Bars for Concrete Reinforcement

.7 CSA G40.20-04/G40.21-04 (R2009) – General Requirements for Rolled or Welded Structural Quality Steel/Structural Steel.

.8 CAN/CSA A3000-08 – Cementitious Materials Compendium.

2. STANDARDS

.1 Finish surfaces to within 6mm in 3m as measured with a 3m straightedge.

.2 Surface finish
Exterior sidewalks – Surface uniform broom finish to produce regular corrugations not exceeding 2mm deep.
Exposed concrete – Knock off ridges, fill tie holes, sack rub grout finish throughout/
Floor slabs – Finish interior concrete to a hand smooth trowelled surface.

3. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

3.1 MATERIALS

.1 Portland Cement, Supplementary Cementing Materials: to minimum standards in CAN/CSA-A3000-03.

.2 Aggregates: to minimum standards in CSA A23.1.

.3 Cast-in-place concrete: to conform to minimum standards in CSA-A23.1.

END OF SECTION

03 35 00 CONCRETE FINISHING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CSA-A23.1-09, Concrete Materials and Methods of Concrete Construction.

.2 CAN/CGSB-25.20-95, Surface Sealer for Floors.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Portland Cement, Supplementary Cementing Materials: to CAN/CSA-A3000-08.

.2 Surface Sealer: to CAN/CGSB-25.20-95, Type 2 – Water Based.

.3 Colouring agent: non-metallic type concrete colouring pigments.

END OF SECTION

04 20 00 UNIT MASONRY

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CSA A165 Series-04 (R2009) CSA Standards on Concrete Masonry units.

.2 CAN/CSA A371-04 (R2009), Masonry Construction for Buildings.

.3 CAN/CSA A179-04 (R2009), Mortar and Grout for Unit Masonry

.4 CAN/CSA A370-04 (R2009), Connectors for Masonry

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Concrete Block Masonry Units: to minimum CSA A165. Series 04 and Classification: H/15/D/M.

.2 Sound Absorbing block: minimum 250 deep block, minimum NRC 0.70, horizontally and vertically reinforceable with rear thru cavity, dual chamber design, c/w acoustic inserts.

.3 Bullnose corner blocks to be used on exposed corners.

.4 Cavity Weeps/Vents: Preformed plastic or galvanized steel, 100 mm long.

.5 Mortar: to minimum CSA A179-04.

.6 Mortar Colour Admixtures: Metallic oxide pigments. Colour will be selected from manufacturer's standard range. Pigments shall not exceed 10-15% by weight of cement content.

.7 Masonry cement is not permitted.

.8 Grout: to minimum CSA A179-04.

.9 Connectors: to minimum CSA A370-04.

.10 Flashings: Modified Bitumen Base Flashing: SBS modified sheet membrane, minimum 1.0 mm thick self-adhering type or minimum 3.0 mm thick torch-applied type.

END OF SECTION

05 00 00 METALS – STRUCTURE

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM A108-07, Standard Specification for Steel Bar, Carbon and Alloy, , Cold-Finished.

.2 ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

.3 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength (Metric)

.4 ASTM A490M-10e1, Standard Specification for High Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints (Metric)

.5 CAN/CGSB-1.105, Quick-Drying Primer

.6 CAN/CSA-G40.20/ G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel

.7 CSA 816-09 Design of Steel Structures.

.8 CAN/CSA S136-07, North American Specification for the Design of Cold-Formed Steel Structural Members.

.9 CSA W59-03 Welded Steel Construction (Metal Arc Welding).

.10 CSA W47.1-09 Certification of Companies for Fusion Welding of Steel .

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS.1 Steel: Structural quality, to minimum CAN/CSA-G40.20.

.2 Rolled and Hollow Structural Steel Sections: to minimum CAN/CSA-G40.21.

.3 Cold Rolled Sections: Conforming to minimum CAN/CSA S136 with yield strength of 380 Mpa.

3.0 FABRICATION AND ERECTOR REQUIREMENTS

.1 Comply with applicable requirements of CSA-S16 and CSA S136.

.2 Do welding in accordance with CSA W59.

.3 Welding shall be undertaken only by a company approved by the Canadian Welding Bureau to the requirements of CSA W47.1, Certification of Companies for Fusion Welding of Steel – Division 1 or 2.

END OF SECTION

05 50 00 METAL FABRICATION – STAIRS/RAILING

1. General

The Contractor shall consider the following reference documents in the design of the Schools.

1.1 REFERENCE DOCUMENTS

.1 CAN/CGSB-1.105-M91, Quick-Drying Primer

.2 CAN/CSA-G40.20/ G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel

.3 CSA-S16-09, Design of Steel Structures

.4 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools.

2.1 MATERIALS

.1 Steel: Structural quality, to minimum CAN/CSA-G40.20.

.2 Structural Steel Sections and plates: to minimum CAN/CSA-G40.21.

.3 Welding materials: to CSA W59.

.4 Shop Coat Primer: to CAN/CGSB-1.105.

.5 Form treads and risers from minimum 3 mm steel plate.

.6 Stringers shall be minimum C310 x 31 kg/m channels.

.7 Landings shall be steel plate minimum 3 mm thick.

.8 Balusters and Handrails shall be 38 mm diameter steel pipe.

END OF SECTION

06 40 00 ARCHITECTURAL WOODWORK

1. General

1.1 REFERENCE DOCUMENTS

The Contractor shall consider the following reference documents in the design of the Schools:

.1 "Architectural Quality Standards Woodwork" of the Architectural Woodwork Institute (AWMAC) Latest edition, hereinafter referred to as "AWMAC Manual" – Custom Grade".

.2 ANSI/BMHA A156.9-2001, American National Standard for Cabinet Hardware.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Silicone Sealant: to minimum CAN/CGSB-19.13-M87, Shore A hardness 15-25, clear colour.

2.2 COUNTERTOPS

.1 High pressure plastic laminate: general purpose grade, standard duty, minimum 1.06 mm thick complete with PVC edging, with: high pressure plastic laminate: general purpose grade, standard duty, minimum 1.06 mm thick complete with laminate edging.

.2 Core: poplar or mahogany plywood, minimum 19 mm thick. Liner grade backer sheet to underside of all countertops.

.3 Solid surface countertops: Solid surface material (SSM) shall consist of reacted monomers and resins, mineral fillers and pigments manufactured in sheets of 13 mm nominal thickness. SSM shall be solid, non-porous, homogeneous, hygienic, renewable, and, when applicable, may feature inconspicuous hygienic seams. SSM shall be free from conspicuous internal strengthening fibers. SSM must meet or exceed performance standards set forth in ISSFA -2-01.

2.2 CASEWORK

.1 Plastic Laminate Casework Exposed Parts:
- .1 Core for Doors: plywood.
- .2 Core for All Other Panel Products: hardwood plywood.
- .3 Laminate Grade: general purpose grade, standard duty, minimum 1.06 mm thick.
- .4 Plastic laminate to both sides of doors and drawer fronts.
- .5 Edge Banding for doors and drawer fronts: minimum 3 mm PVC edge to match faces.

.2 Plastic Laminate Casework Semi-Exposed Parts:
- .1 Core for Doors: approved particleboard, medium- density fibreboard, or otherwise engineered core.
- .2 Core for all other Panel Products: hardwood plywood.
- .3 Liner Grade: minimum thickness of 0.76 mm, used on the following:
  - .1 Semi-exposed shelves.
  - .2 Interior portions of case bodies.
  - .3 All surfaces of drawer boxes.
- .4 Semi-exposed Surface of Casework Doors and Fronts: same as exposed face.
- .5 Edge Banding: minimum 1 mm PVC edge, colour to match door face.

.3 Prefinished Casework:
- .1 To AWMAC custom grade for clear finish, 'Nova' by States Industries or 'Multi-core' by Longlac Wood Industries.
- .2 Core: manufacturer's option to AWMAC Manual.
- .3 AWMAC Veneer Grade: minimum B grade all sapwood (white). Species: Birch.
- .4 Semi-exposed Parts: as governed by AWMAC grade for this casework type.
- .5 Edging: minimum 3mm PVC: colour to match panel.

.4 Hardware (Institutional grade):
- .1 Hinges: minimum 125 degree opening; concealed hinge; swing free; self closing; nickel plated steel hinge arm and hinge cup.
- .2 Pulls: Stainless steel "D" pull, 101 mm c.c., brushed nickel finish.
- .3 Drawer Slides: minimum 45 kg. load capacity; steel track; full extension, steel ball bearings.

.4 Door Locks/Catches: Provide locks to all units, disk tumbler cam type. Each room to be keyed alike. Vandal resistant elbow catch for each pair of lockable doors.

.5 Shelf Pilaster and Brackets: Steel standards, zinc coated; 13 mm adjustable standards; recess mounted. Aluminum standards are not acceptable.

.6 File Folder Rails: complete with Hanging rails, sleeves and brackets.

.7 Grommets: minimum size to be 60mm diameter, 22mm depth. Provide at reception desks, countertop areas where electrical, telephone and data outlets are located below.

END OF SECTION

07 13 00 SHEET MEMBRANE WATERPROOFING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM D36-95: Softening Point of Bitumen (Ring-and-Ball Apparatus)

.2 ASTM D146-90: Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing.

.3 ASTM D2523-78 (R1995): Testing Load-Strain Properties of Roofing Membranes.

.4 ASTM E96-95: Water Vapour Transmission of Materials.

.5 CGSB 37-GP-9Ma: Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the schools.

2.1 MATERIALS

.1 Primer: to CGSB 37-GP-9Ma.

.2 Waterproofing Membrane: Pressure sensitive sheet consisting of rubberized asphalt 1.5 mm thick bonded to 250 micrometre thick polyethylene; conforming to the following properties:

Colour:	Black
Thickness (total):	1.8 mm
Water Vapour Transmission:	ASTM E96-95 Method B 0.003 metric perms

Tensile Strength:	ASTM D2523-78 13,800 kPa
Softening Point:	ASTM D36-95 38oC
Pliability:	ASTM D146-90 – 0-25oC

.3 Slip Sheet: Waterproofing membrane specified above but with the polyethylene bond breaker sheet left intact and not stripped from membrane.

.4 Mastic: for sealing joints and edges of membrane use rubberized asphalt [similar material specified for membrane] in gun grade.

END OF SECTION.

07 46 15 STEEL SIDING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM A653M-96, Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.

.2 CGSB 19-GP-5M, Sealing Compound, One Component, Acrylic Base, Solvent Curing.

.3 ASTM B209-07, Standard Specification for Aluminum and Aluminum-Alloy, Sheet and Plate.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Sheet steel: Exposed to exterior, minimum grade A, Z275 coating designation, factory precoated with fluorocarbon paint finish, 2 coat system dry paint film thickness of 0.025 mm conforming to film test procedures described in CSSBI Bulletin No. 5. Factory preformed prepainted metal, to profile chosen by designer.

.2 Exterior sheet: factory preformed prepainted metal. Material thickness as required to withstand oil canning minimum 0.76 mm thick..

.3 Exterior corners: of same profile, material and finish as adjacent siding material.

.4 Rigid insulation: Mineral fibreboard insulation to CAN/CGSB 51.10-92, type 2, Class 5 rigid and as follows:

.1 Thermal Resistance: minimum 0.73m2˚ c/w per 25.4 mm thickness.
.2 Minimum Density: 45 kg/m3.
.3 Thickness: minimum 75 mm.

.5 Accessories: cap flashings, drip flashings, internal corner flashings, copings and closures for head, jamb, sill and corners, of same material and finish as exterior siding, brake formed to shape.

END OF SECTION

07 46 46 MINERAL-FIBER CEMENT SIDING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM C1186-07 Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Siding

.1 Non-asbestos fibre cement siding to ASTM C1186 Grade II:

.1 Lap Siding: minimum 7.5mm thick x minimum 145mm high, manufacturers standard finish and colour range.

.2 Vertical Siding: minimum 7.5mm thick, 1220mm x 4880 scored sheets with stucco type finish. Colour as selected by the Province from manufacturer's standard colour range.

.3 Trim: minimum 7.5mm thick, colour to be as selected by the Province from manufacturer's standard colour range.

.2 Accessories

.1 Exposed trim, closures, and cap pieces of same material, colour and finish as siding.

.2 Fasteners and retaining clips to be of a corrosion resistant finish in accordance with siding manufacturers recommendations. Fasteners to be prefinished and color coated to match siding color.

END OF SECTION

07 50 00 MEMBRANE ROOFING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CGSB-37.29 latest edition, Rubber-Asphalt Sealing Compound.

.2 CAN/CGSB-51.20 latest edition, Thermal Insulation, Polystyrene Boards and Pipe Covering.

.3 The system must meet or exceed the Alberta Roofing Contractors Association Ltd. (ARCA) requirements.

.4 CSA S136-01 (R2007), North American Specification for the Design of Cold-Formed Steel Structural Members.

.5 Canadian Sheet Steel Building Institute Standards 10M and 20M.

.6 ASTM D4434 (latest version), “Standard for Polyvinyl Chloride Sheet Roofing”. Classification: Type II, Grade 1.

.7 Alberta Building Code (2006).

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Provide minimum 2.5 mm thick, SBS modified bitumen premanufactured sheet, with manufacturer's standard internal reinforcement, compatible with substrates and adjoining membranes.
Roofing cap sheet: light colour cap sheets.

.2 For Thermo plastic Polyvinyl Chloride roofing, provide minimum 80 mil (2.0 mm), thermoplastic membrane with fiberglass reinforcement.

.3 Insulation:

.1 Insulation to be Molded Expanded Polystyrene (MEPS) Board: certified for conformance with CAN/CGSB-51.20-M87, Thermal Insulation, Polystyrene, Boards and Pipe Covering, Type 2 or approved alternate.

.2 A rigid isocyanurate foam insulation conforming to CAN/ULC-S770.

.3 Flexible Flashing and Air Seal Membrane: For SBS modified roofing system, provide minimum 2.5 mm thick, SBS modified bitumen pre-manufactured sheet, with manufacturer's standard internal reinforcement, compatible with substrates and adjoining membranes.

.4 Vapour Barrier: One ply self-adhesive polyester reinforced 3.5mm thickness, or 2 ply #15 organic felts fully mopped.

.5 Metal flashings:

.1 Galvanized Steel Sheet: commercial quality sheet to ASTM A653-M96, with Z275 designation zinc coating.

.2 Prepainted Galvanized Steel: commercial quality to ASTM A653-M96 with Z275 zinc coating prepainted with baked on enamel with colours of proven durability for exterior exposure, to CSSBI Technical Bulletin No. 7, 5000 series.

.6 Thermal Barrier: Exterior grade gypsum sheathing to CSA A82.27, M, minimum thickness shall be 12 mm (1/2").

.7 Profile Materials: Z275 galvanized sheet steel conforming to ASTM A653M Grade 230, having a minimum nominal core thickness .76 mm.

.8 Roof Panel Support System: Hidden fastener, purpose-made, thermally responsive full height clip system, full insulation depth, full thermal expansion and contraction of the exterior roof sheet.

.9 Subgirts: If required, subgirts shall be fabricated from a minimum 1.22 mm (.050") thick Z275 Galvanized steel.

.10 Clips: To be fabricated from a minimum of 1.22 mm (.050") steel, with minimum Z275 galvanized coating.

END OF SECTION

08 11 13 HOLLOW METAL DOORS AND FRAMES

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 Requirements of Canadian Manufacturing Standards for Steel Doors and Frames published by the Canadian Steel Door and Frame Manufacturers' Association.

.2 ASTM A653M-06 Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.

.3 Fire door and frame components and assemblies shall be labeled and listed by an organization accredited by Standards Council of Canada.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Sheet Steel: to ASTM A653M-06 commercial quality steel, cold rolled, zinc coated to ZF075 coating designation.

.2 Reinforcement for Hardware: carbon steel, welded in place, prime painted, to the following minimum thicknesses:

.1	Hinge, pivot and panic bar reinforcements:	3.5 mm
.2	Lock face, flush bolts, concealed bolts:	2.5 mm
.3	Concealed or surface closer reinforcements:	2.5 mm
.4	Other surface hardware reinforcements:	2.5 mm

2.2 DOORS

.1 Doors constructed of sheet steel, seamless construction with no visible seams or joints on faces at vertical edges.

.2 Exterior doors: Minimum 1.6 mm face sheet steel, internally steel stiffened with continuous vertical steel stiffeners at 150 mm O.C. spot welded to both face sheets; fill voids with glass fibre insulation.

.3 Interior Doors: Minimum 1.2 mm face sheet steel, honeycomb core material consisting of rigid pre-expanded resin impregnated Kraft paper having maximum 25 mm hexagonal shaped cells.

2.3 FRAMES

.1 Exterior door and window frames to be a minimum 2.0 mm thick steel thermally broken.

.2 Interior door and window frames to be a minimum 1.6 mm thick steel, 2.0 mm steel for openings larger than 1200 wide.

.3 Provide drywall returns on frames.

END OF SECTION

08 14 16 FLUSH WOOD DOORS

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 Canadian Standards Association (CSA).

.1 CSA O115-M1982 (R2000), Hardwood and Decorative Plywood.

.2 National Fire Protection Association (NFPA).

.1 NFPA (fire) 80 2007 edition, Fire Doors and Windows.
.2 NFPA (fire) 252-2008 edition, Fire Tests of Door Assemblies.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC).

.1 Architectural Woodwork Quality Standards Illustrated, Latest edition

.4 Underwriters' Laboratories of Canada (ULC).

.1 ULC CAN4 S104M-M80 (R1985), Standard Method for Fire Tests of Door Assemblies.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Wood fire rated doors shall be labeled.

.2 Door materials: to meet AWMAC requirements and other specified requirements.

.3 Door Thickness: minimum 45 mm.

2.2 MINERAL CORE DOORS

.1 Fire rated wood doors: tested in accordance with CAN4 S104 or NFPA 252 to achieve rating.

.2 Reinforcement: SLM, as required for hardware installation, as indicated in AWMAC Quality Standards for Architectural Woodwork, 1998 edition.

.3 Provide mineral core doors for fire ratings over 20 minutes.

2.3 SOLID CORE DOORS

.1 Wood doors shall be constructed of a solid wood core, 7 ply construction. Particleboard cores are not acceptable.

.2 Fire Rating: Minimum of 20 minute fire rating.

.3 Face of the doors to bebirch veneer premium Grade A, stain grade.

END OF SECTION

08 35 00 FOLDING DOORS AND GRILLES

1. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

1.1 MATERIALS

.1 Rolling Grille – Serveries

.1 Rolling grille: Interlocking flat profile slats, type FE-138, aluminum with endlocks on alternate, clear anodized, finish.

.2 Guides: continuous extruded aluminum shapes (minimum 60 x 54 mm) with continuous silicon treated strips. Guide finish to be clear anodized.

.3 Bottom bar: extruded aluminum minimum size of 45mm deep x 57mm high. Provide cylinder locking receiver.

.4 Barrel: 100 mm minimum diameter steel pipe barrel, maximum deflection of 7mm per 305mm of width. Helical torsion springs for counter balancing the curtain.

.5 Hood: square aluminum hood with clear anodized finish.

.6 Operation: manual push up operation of a maximum force of 13.7kg of effort utilizing finger lifts.

.7 Locking Mechanism: Keyed cylinder lock.

.2 Rolling Grille – Office Area

.1 Horizontal rods: Continuous double channel extruded aluminum section with "V" groove line appearance on center.

.2 Vertical spacing: Aluminum panel connectors, 51mm by 64mm minimum.

.3 Connectors are spaced around minimum 3mm thick polycarbonate panel inserts. Ends of polycarbonate edges shall be encapsulated in rigid vinyl spline.

.4 Bottom Bar: Heavy extruded tubular aluminum

.5 Guides: Heavy extruded aluminum shape minimum 64mm by 37mm with upset shoulders for curtain retention. Each guide will be fitted with vinyl stripping for quiet operation and to cushion both sides of curtain.

.6 Counterbalance: Helical torsion spring assembly set in steel pipe of recommended size by manufacturer to support curtain with a maximum deflection of 7mm per 305mm of curtain width.

.7 Bracket Plates: Minimum 5mm steel plate to support counterbalance assembly, curtain (and hood, optional)

.8 Centered keyed cylinder both sides of bottom bar.

.9 Manual push-up operation.

.3 Side Folding Grille – Office Area

.1 Panel: minimum 180mm wide with minimum 90mm high bottom and top plates of truss like aluminum and glazed with minimum 3mm Polycarbonate with a 100 percent viewable area of a minimum 115mm wide. Provide two-piece vertical aluminum tubular hinges between panels.

.2 Finish-Exposed Aluminum Parts: Clear Anodized

.3 Overhead Track: Extruded Aluminum, minimum 35 mm wide by maximum 45mm high, complete with alignment bars, track pins. Provide nylon Trolleys and carry weight of complete curtain.

.3 Manual pull - push operation. Provide attached pull straps on Closures over 2700 mm in height and all countertop applications.

END OF SECTION

08 41 13 Monumental Aluminum Framed Folding/Paired Panel System

1. General

1.0 SUMMARY

.1 Section Includes: Sliding/folding aluminum and glass door system, including aluminum frame, threshold, panels, sliding/folding and locking hardware, glass and glazing; designed to provide an opening glass wall, with sizes and configurations as shown on drawings.

1.1 REFERENCE DOCUMENTS

.1 ASTM E557 Standard Practice for the Installation of Operable Partitions – 2000.

.2 Can/CGSB – 12.1 – M90, Tempered or Laminated Safety Glass.

2. Products

2.1.1 Aluminum Framed Folding/Paired Panel System

.1 Frame and Panels: From manufacturer's standard profiles, provide head track, side jambs, and panels with dimensions shown on drawings.

.1 Provide panels with standard one lite.

.2 Provide standard bottom rail – manufacturer's standard kickplate with height specified.

.3 Aluminum Extrusion: Extrusions with nominal thickness of 2.0 mm. Alloy specified as AlMgSi0.5 with strength rated as 6063-T5. Anodized conforming to AAMA 611, powder coated conforming to AAMA 2063.

.4 Aluminum Finish: Clear anodized

.2 Glass:

.1 All glass to comply with safety glazing requirements as per 08 80 00, minimum 6mm thick glass. Provide with dry glazing.

.3 Locking Hardware and Handles:

.1 Main Entry Panel: Provide manufacturer's standard lever handles on the inside and outside, lock set with lockable latch, multi-point locking with a dead bolt and rods at the top and bottom on primary panel only. Rods to be concealed and not edge mounted. If there is a secondary swing panel, provide two point locking with flat handles on inside only for the

secondary swing panel. Stainless steel handles. Provide manufacturer's standard handle on the inside and lock set with profile cylinder.

.2 On all other secondary swing panels and pairs of folding panels, provide manufacturer's standard handles and concealed two point locking hardware operated by 180 degree turn of handle between each pair.

.3 Flat handle finish stainless steel in a brushed satin finish.

.4 Aluminum locking rods with standard (or reinforced to meet higher structural loading) fiber glass reinforced polyamide end caps at top and bottom.

.4 Sliding/Folding Hardware: Provide manufacturer's standard combination sliding and folding hardware with top and bottom tracks.

.1 For each pair of folding panels, provide upper running carriage and lower guide carriage.

.2 Provide manufacturer's standard zinc die cast powder coated hinges that are closest to match to finish of frame and panels (or stainless steel hinges). Provide stainless steel security hinge pins with set screws.

.3 Adjustment: Provide system capable of specified amount of adjustments without removing panels from tracks without needing to remove panels from tracks, 1.5 mm in width per hinge.

.5 Other components:

.1 Threshold: Provide standard sill in the same finish as panel finish.

.2 Provide stainless steel screws for connecting frame components.

2.2 Accessories

.1 Provide other side lites, transoms, corner posts, or single or double doors as required.

END OF SECTION

08 44 13 GLAZED ALUMINUM CURTAIN WALLS

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CSA-G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Exterior Frame: Thermally broken extruded aluminum curtain wall section, 50 mm x 146 mm size, 3.0 mm minimum thickness flush stops.

.2 Aluminum extrusions: Aluminum Association alloy AA6063-T5.

.3 Sheet aluminum: Aluminum Association alloy AA1100 anodizing quality.

.4 Steel reinforcements: to CAN/CSA-G40.21-04.

.5 Weather-stripping: waterproof, rot-proof pile fibre 4 mm high x 6 mm wide in neoprene backing of flexible vinyl.

.6 Finish on exposed aluminum surfaces shall be clear anodized coating to AAM12C22A41 not less than 18 micrometer thick, Architectural Class I designation.

END OF SECTION

08 51 13 ALUMINUM WINDOWS

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CSA-A440-M90, Windows.

.2 CAN/CSA-G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel.

.3 CAN/CSA-G164-M92, Hot Dip Galvanizing Of Irregularly Shaped Articles.

.4 ASTM A653M-06, Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.

.5 ASTM E283-91, Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Materials, attachments, accessories, shall meet or exceed requirements of CAN/CSA-A440-M90.

.2 Aluminum: Aluminum Association (AA) alloy 6063-T5 or 6063-T6 for extrusions and AA 1100, anodized quality, for sheet.

.3 Steel: to CAN/CSA-G40.21-04, hot dip galvanized to CAN/CSA-G164-M92.

.4 Sheet Steel: to ASTM A653M-06, hot dip galvanized to Z275 coating designation.

.5 Small box curtain wall, approved by Alberta Infrastructure.

.6 Anodized Finishes: Provide surface preparation and anodized finish on exposed aluminum surfaces to Aluminum Association Architectural designation, with even distribution of approved colour variation, as follows:

.1 Clear Anodized Coating: to AA M12C22A41 not less than 18 micrometers thick, Architectural Class I designation.

.7 Mechanically keyed gaskets in the box section complete with pressure plate.

.8 Exterior sills: brake formed aluminum sheet, minimum 1.3 mm thick.

.9 Closures: brake formed aluminum sheet, minimum 1.3 mm thick.

END OF SECTION

08 70 00 HARDWARE

1. General

1.1 REFERENCE DOCUMENTS

The Contractor shall consider the following reference documents in the design of the Schools:

.1 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturer's Association.

.2 ANSI/BHMA A156.1-2000, Butts and Hinges.

.3 ANSI/BHMA A156.2-1996, Bored and Preassembled Locks and Latches.

.4 ANSI/BHMA A156.3-2001, Exit Devices.

.5 ANSI/BHMA A156.4-2000, Door Controls - Closers.

.6 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.

.7 ANSI/BHMA A156.6-2001, Architectural Door Trim.

.8 ANSI/BHMA A156.8-2000, Door Controls – Overhead Stops and Holders.

.9 ANSI/BHMA A156.13-2002, Mortise Locks and Latches, Series 1000.

.10 ANSI/BHMA A156.15-2001, Release Devices – Closer Holder, Electromagnetic and Electromechanical

.11 ANSI/BHMA A156.16-2002, Auxiliary Hardware.

.12 ANSI/BHMA A156.18-2000, Recommended Practices for Materials and Finishes.

.13 ANSI/BHMA A156.19-2002, American National Standard for Power Assist and Low Energy Power Operated Doors

.14 ANSI/BHMA A156.21-2001, Thresholds.

.15 ANSI/BHMA A156.22-2003, Door Gasketing and Edge Seal Systems.

.16 ANSI/BHMA A156.25-2001, Electrified Locking Devices.

.17 ANSI/BHMA A156.31-2001, Electric Strikes and Frame Mounted Actuators.

1.2 SOURCE OF SUPPLY

.1 Use one manufacturer's products only for all similar items.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools.

2.1 HARDWARE FOR FIRE RESISTANCE RATED DOORS

.1 Provide UL listed hardware on doors required to have a fire resistance rating. Hardware to match hardware specified in the following articles.

2.2 LOCKS AND LATCHES

.1 Mortise and bored type locks shall be listed in BHMA's Directory of Certified Locks and Latches.

.2 Bored Latches: to ANSI/BHMA A156.2, series 4000 bored lock, grade 1, designed for passage function.

.3 Mortise Locks and Latches: to ANSI/BHMA A156.13, series 1000 mortise locks, grade 1, designed for function as specified in the Technical Requirements, and keyed as stated in hardware schedule. Mortise body to have adjustable bevel front to conform to shape of door edge.

.4 Lever handles: plain design with end return towards door, solid lever.

.5 Roses and escutcheons: round roses for bored latches, rectangular escutcheons for mortised locksets.

.6 Normal strikes: manufacturer's standard wrought box type, lip projection curved to protect jamb.

.7 Cylinders: key into keying system as noted.

.8 Finish: Satin Chrome.

.9 Product Manufacturers: one of the following, at the Contractor's option.

.1 Corbin
.2 Sargent
.3 Schlage
.4 Yale

Substitutions will not be accepted.

2.3 DOOR HANGING DEVICES:

.1 Butts and Hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers listed in standard, satin chrome finish.

.1 Interior: full mortised, steel, 5 knuckle, bearing type, 114 mm x 114 mm, A8112.

.2 Exterior: full mortised, stainless steel, 5 knuckle, bearing type, 114 mm x 114 mm A5111.

.3 Pins: Non-rising on in-swing doors, non-removable on out-swing doors, button type.

2.4 EXIT DEVICES

.1 Products shall be to ANSI/BHMA A156.3, grade 1, modern with push pad or modern narrow stile with push pad as required, functions as specified in design, satin stainless steel finish.

.1 Application and Types:
- .1 Exterior doors - type 4, narrow style rim.
- .2 Interior single doors and active leaf of interior double doors – type 10, narrow style mortised.
- .3 Inactive leaf of interior double doors – type 5, narrow style surface vertical rod.

.2 Auxiliary items(s):
- .1 Type 21 - Door coordinator with carry bar, bar type with filler piece.
- .2 Type 22 – Removable mullion.

.3 Exit devices on exterior doors shall be electrically equipped to automatically lock, using one of the following features, when the exterior doors are locked down from a central point in the administration area. Refer to ANSI/BHMA A156.25.

.1 Fail-secure exterior trim, or

.2 Automatic latch retraction.

.4 Product Manufacturers: one of the following, at the Contractor's option.

.1 Corbin
.2 Sargent
.3 Schlage
.4 Yale
.5 Von Duprin

Substitutions will not be accepted.

2.5 DOOR CLOSERS AND ACCESSORIES:

.1 Door Controls (Closers): to ANSI/BHMA A156.4, surface mount, modern type with cover, designated by letter C and numeral identifiers listed in standard, size in accordance with ANSI/BHMA A156.4, table A1, painted aluminum finish.

.1 In-swing doors: parallel arm mount, C02021
.2 Out-swing doors: hinge side mount, C02011

.2 Door Controls – Overhead Stops: to ANSI/BHMA A156.8, designated by letter C and numeral identifiers listed in standard, concealed slide stop – C51541 or surface mount stop – C52541, satin stainless steel finish.

.3 Closer/Holder Release Devices: to ANSI/BHMA A156.15, designated by letter C and numeral identifiers listed in standard complete with options, finish to match satin chrome. Devices tied into fire alarm to release holder upon activation of the fire alarm. 24 volt with a maximum of two devices tied into one transformer.

.4 Door coordinator with carry bar, bar type with filler piece for double doors.

.5 Provide drop plate as required to coordinate with Overhead Holders/Stops.

2.6 LOW ENERGY SWING DOOR OPERATORS

.1 Low Energy Power Operated Doors: doors with a power mechanism that opens and closes the door upon receipt of an actuating signal and does not generate more kinetic energy than specified in ANSI/BHMA A156.19. Closing of doors is linked to and integral with power operator mechanism.

.2 Operator:

.1 Type: electro-mechanical, surface-mounted to door frame header, connected to door with pivoting linkage arm.

.2 Motor: electric, permanent magnet, minimum 1/12 HP (60W) DC motor, equipped with circuit protection, connections for power and control wiring, and suited to building's electrical service at point of installation.

.3 Provide semi-concealed, readily accessible, "on-off" switch.

.4 Gears shall be in an air-tight, gasketed gear box concealed within operator enclosures.

.5 Operators shall be equipped with a clutch mechanism as required to meet performance and regulatory requirements.

.6 Provide manufacturer's standard, surface mounted enclosure, designed to prevent entry of dust.

.7 Enclosure shall allow ready access for adjustments, servicing and maintenance of operator and controls.

.8 Enclosures Finish:

.1 Plastic: colour of finish shall be compatible with adjacent door frame.

.2 Aluminum: clear anodized

.3 Electronic Controls:

.1 Electronic controls shall be solid state, low voltage.

.2 Swing doors controls shall include provision for time delay from 1-30 seconds before closing, and individually adjustable closing and opening speeds.

.3 Provide readily accessible, semi-concealed "on-off" switch.

.4 Electronic controls shall be electronically shut down from a central point in the administration area when the building is in lock down mode. Coordinate this function with the single point shut down identified in paragraph 2.4.2

.4 Accessories:

.1 Provide recessed international symbol of accessibility (ISA) and the following clearly legible wording under ISA's: "PUSH TO OPEN", on push plates or on identification plates adjacent to activating device.

.2 Push plates and identification plates shall be stainless sheet steel, satin finish. Letters on plates shall be recessed, in colour matching symbol of accessibility, in upper case, and Helvetica medium font.

.3 Identification plates shall be minimum 100 mm x 100 mm.

.4 Push buttons shall be red, in stainless steel cover plate.

.5 Fasteners:

.1 Materials for Fastening Metals to Metals: aluminum, nonmagnetic stainless steel, finished to match adjacent material.

.2 Materials for Fastening Metals to Concrete and Masonry: stainless steel or carbon steel, hot dip galvanized to CAN/CSA-G164-M92.

.3 Provide tamper-resistant exposed fasteners for mounting devices and to replace batteries in exterior locations and interior public spaces.

.6 Finishes:

.1 Factory finish components.

.2 Hardware: Satin chrome.

.3 Stainless Steel: no. 4, satin finish.

.4 Aluminum: clear anodized.

.5 Exposed Steel: apply finishes as follows:

.1 Primer: Vinyl Wash Primer to CAN/CGSB 1.121-93.

.2 Finish Coats: two coats of Quick Drying Gloss Enamel to CAN/CGSB-1.88-92.

2.7 AUXILIARY LOCKS AND ASSOCIATED PRODUCTS

.1 Products shall be to ANSI/BHMA A156.5, grade 1, designated by letter E and numeral identifiers listed in standard and specified below, satin chrome finish.

.2 Latch bolt, type E0121, keyed outside with thumbturn inside. Key into keying system.

.3 Bored dead bolt, type E0141, keyed both sides. Key into keying system.

.4 Mortised dead bolt, type E06081, operated by key from inside only. Key into keying system.

.5 Cylinders: types as required to accommodate lockset, exit device or bolt. Key into keying system.

2.8 ELECTRIC STRIKE AND STAND-ALONE CARD READER SYSTEM

.1 Products shall be to ANSI/BHMA A156.31, designated by letter E and numeral identifiers listed in standard and specified in design, finish as specified in design.

.2 Electric Strike: semi-rim mounted, continuous duty, fail secure, 12 or 24 volts as specified in design, type E09311. Provide manufacturer’s wiring and devices required for complete installation.

.3 Card Reader System:

.1 System is to include all required hardware and software to fully monitor and control the designated door. System is to utilize 26 bit, Corporate 1000 cards. System shall be capable of expansion.

.2 Exterior grade proximity card reader for 26 bit, Corporate 1000 cards.

.3 Provide one terminal for programming cards.

2.9 ARCHITECTURAL DOOR TRIM

.1 Products shall be to ANSI/BHMA A156.6, designated by letter J and numeral identifiers listed in standard and specified below, finish as specified below.

.2 Door Protection Plates: kick plate type J103, 1.27 mm thick stainless steel, 305 mm in height x door width less 20 mm, satin finish.

.3 Push Plates: type J301, 1.27 mm thick stainless steel, 100 mm x 400 mm, satin finish.

.4 Pull Units with Plate: type J405, stainless steel, 200 mm centre to centre pull bar of 19 mm diameter rod, 100 mm x 400 mm plate size, satin finish.

2.10 AUXILIARY HARDWARE

.1 Products shall be to ANSI/BHMA A156.16, designated by letter L and numeral identifiers listed in standard, to match satin chrome finish.

.2 Stop, Wall Mounted: convex bumper pad, type L02101.

.3 Stop, Floor Mounted: domed with bumper pad.
.1 Type L02141 for regular doors.
.2 Type L02161, for doors with thresholds and undercut doors.

.4 Lever Extension Flush Bolt: 305 mm long latch bar, type L04081, and type L04091 for doors with radiussed swing edge.

.5 Door Silencer: for metal door frames, type L0311.

.6 Dustproof Strike: non-locking, type L04021, to suit bolt specified.

2.11 WEATHERSTRIPPING AND DOOR SEALS

.1 Products shall be to ANSI/BHMA A156.22, designated by letter R and numeral identifiers listed in standard and specified below.

.2 Head and Jamb Seal:
- .1 Extruded aluminum frame and retainer, solid closed cell neoprene insert, clear anodized finish, type R3B166.

.3 Adjustable Head and Jamb Seal: (for sound attenuation)
- .1 Extruded aluminum frame and solid closed cell neoprene insert, screw attachment and adjustment, clear anodized finish, type R3B266.

.4 Door Bottom Seal with Rain Drip:
- .1 Extruded aluminum frame and contact type vinyl insert, clear anodized finish, Type R3D536.

.5 Automatic Door Bottom Seal: (for sound attenuation)
- .1 Heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene seal, closed ends, adjustable, automatic retract mechanism when door is open, clear anodized finish.
  - .1 Recessed in door bottom – Type R3B326
  - .2 Surface mounted – Type R3B336
  - .3 Recessed in door face – R3B346

.6 Door Sweep:
- .1 Extruded aluminum frame and closed cell neoprene sweep, clear anodized finish, type R3B416.

.7 Astragal: overlapping, extruded aluminum for regular double doors, steel for fire resistance rated double, both edges radiussed and smooth, 3 mm x 45 mm x height of doors less depth of rebate.

2.12 THRESHOLDS

.1 Thresholds: to ANSI/BHMA A156.21, barrier-free, width as required by design x full width of door opening, extruded aluminum, mill finish, serrated surface, with thermal break of rigid PVC, scribed to frame profile. Type J32193.

2.13 FASTENINGS

.1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.2 Match exposed fastening devices to finish of hardware.

.3 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.4 Use fasteners compatible with material through which they pass.

.5 Use sex nuts and bolts for doors without special reinforcing for closers.

2.14 KEYING

.1 Locks shall be master keyed and construction master keyed.

.2 Determine detailed requirements for master keying system upon consultation with the Province, prior to finalizing keying schedule.

.3 Form keys from nickel silver.

.4 Provide two change keys for each lock. Provide all other keys as required to meet keying system requirements.

2.15 KEY CONTROL SYSTEM

.1 Provide a steel cabinet complete with index control system, key tags, and key envelopes.

.2 Provide adequate capacity to contain all keys, plus minimum 25% additional capacity with tags.

END OF SECTION

08 80 00 GLAZING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.

.3 CAN/CGSB-12.4-M91, Heat Absorbing Glass.

.4 CAN/CGSB-12.8-97, Insulating Glass Units.

.5 CAN/CGSB-12.11-M90, Wired Safety Glass.

.6 CAN/CGSB-12.9-M91, Spandrel Glass.

.7 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.8 CGSB 19-GP-14M, Sealing Compound, One Component, Butyl-Polisobutylene Polymer Base, Solvent Curing.

.9 CAN/CGSB-19.24-M90, Multicomponent, Chemical-Curing Sealing Compound.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Glass:

.1 Minimum 6mm thickness.

.2 Sealed insulating glass units for exterior windows and curtainwall assemblies must comply with CAN/CGSB-12.8-M90.

.1 Interior pane 6mm clear float glass, exterior pane 6mm tempered glass tinted grey. 50% visible light transmittance.

.2 Low E coating on No. 2 surface of sealed units.

.3 Spacer/separator: between interior of sealed unit and secondary seal to provide continuous vapour barrier.

.4 Sealants for Insulating Glass Units:

.1 Butyl-polyisobutylene Sealants: one component, polymer base, solvent curing, to CGSB 19-GP-14M, colour to match frame colour.

.2 Polysulphide Base and Polyurethane Base Sealants: to CAN/CGSB-19.24-M90, multi-component, chemical curing, and as follows:

.1 Type: 2 - non-sag.
.2 Class: A - glazing.
.3 Movement Capability: plus and minus 25%.
.4 Colour: Black.

.3 Silicone Base Sealants: to CAN/CGSB-19.13-M87, one component, elastomeric, chemical curing, and as follows:

.1 Rheological Properties: Class 2 - non-sag.
.2 Substrate Class: G - Glass.
.3 Glazing Suitability: Class A - resists ultraviolet through glass.
.4 Temperature Class: L - low temperature
.5 Movement Class: 40.
.6 Colour: Black.

.4 Do not use polyurethane sealants for insulating glass units having laminated glass with a polyvinyl butyrate interlayer.

.5 Setting Blocks:

.1 Neoprene, 80 durometer hardness, 100mm x 6mm x width required.

.6 Space Shims:

.1 Neoprene, 80 durometer hardness, 75mm x 6mm.

.7 Glazing Splines and Gaskets:

.1 Manufacturer’s standard dry neoprene.

.8 Glazing Tape:

.1 Preformed butyl tape, 10-10 durometer hardness with integral neoprene skin, 80 durometer hardness, paper release.

END OF SECTION

09 20 00 GYPSUM BOARD

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM C840-07 - Standard Specification for Application and Finishing of Gypsum Board.

.2 CAN/CGSB-7.1-M86 - Cold Formed Steel Framing Components.

.3 ASTM C1396/C1396M-06a, Standard Specification for Gypsum Board.

.4 ASTM C 36/C36M-03e1, Abuse Resistant Board

.5 ASTM C630/C630M-03e, Water Resistant Gypsum Backing Board

.6 ASTM C645-07a, Standard Specification for Nonstructural Steel Framing Members**.**

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 GYPSUM BOARD

.1 Gypsum Board: to ASTM C 36/C36M-03e1.

.2 Type "X" Gypsum Board: board with Type X core, to ASTM C 36/C36M-03e1.

.3 Abuse Resistant Board: to ASTM C 36/C36M-03e1.

.4 Moisture Resistant Board: to C630/C630M-03e.

.5 Exterior Sheathing: Standard board to ASTM C 1396, fire rated board to ASTM C 1396 type x.

.6 Exterior Sheathing: roof underlay to ASTM C 472.

2.2 FRAMING MEMBERS

.1 Studs and Tracks: Interior non-load bearing walls to CAN/CGSB-7.1 M86, minimum 0.50 mm galvanized sheet steel to ASTM A653M-96, Z180 zinc coating.

.2 Furring: minimum 0.60 mm thick galvanized sheet steel to ASTM A653M-96, Z180 zinc coating.

.3 Resilient Furring: minimum 0.60 mm thick galvanized steel, pre-punched for fasteners, 35 mm face width, 16 mm high.

2.3 SUSPENDED CEILING AND SOFFIT SYSTEM COMPONENTS

.1 Carrying Channels: Cold rolled steel to CSA A82.30-M1980.

.2 Tie Wire and Hangers: to CSA A82.31 - M91, galvanized.

2.4 ACOUSTIC TREATMENT MATERIALS

.1 Acoustic Sealant: non-hardening, non-skinning permanently flexible, to CAN/CGSB-19.21-M87.

.2 Acoustic Insulation: fibrous glass or mineral fibre, unfaced batts, friction fit.

2.5 ACCESSORIES

.1 Screws: to ASTM C1002-07a, and modified as required for fastening to 1.22 mm and thicker steel studs.

.2 Corner Beads: to ASTM C1047-05, galvanized sheet steel, beaded angle, knurled and perforated, 32 mm wide flanges, for joint compound filling, metal and paper flange combination, beaded angle.

.3 Edge Beads: to ASTM C1047-05, galvanized sheet steel to ASTM A653M-96, Z180 zinc coating, beaded edge, knurled and perforated flange 32 mm wide.

.4 Control Joints: to ASTM C1047-05, pre-formed galvanized metal or plastic "V" type, perforated flanges.

.5 Joint treatment material, joint tape and topping compound: to ASTM C475-94.**END OF SECTION**

09 24 23 PORTLAND CEMENT STUCCO

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM C932--06, Surface-Applied Bonding agents for Exterior Plastering

.2 CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type

.3 ASTM C150-07, Standard Specification for Portland Cement

.4 Association of Wall and Ceiling Contractors “Specification Standards Manual” (For Lathing, Plastering, Stucco, Veneer Plaster, Gypsum Wallboard, Steel Studs, Exterior Insulation and Finish System and Associated Systems) 1993 Edition.

.5 Comply with "Portland Cement Plaster Stucco Resource Guide", 2003 Edition, of the Alberta Wall and Ceiling Association.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Sheathing Paper: to CAN/CGSB-51.32-M77, breather type.

.2 Reinforcement (stucco): stucco mesh in accordance with Alberta Wall and Ceiling Contractors “Specification Standards Manual.”

.3 Reinforcement (parging): metal lath mesh in accordance with Alberta Wall and Ceiling Contractors “Specification Standards Manual”.

.4 Portland Cement Stucco to ASTM C150-07.

.1 2 coat system 9mm scratch coat, 9mm brown coat (sand float finish).

.5 Acrylic Finish Coat to CAN/CGSB-1.162-M90, ASTM D 968, CAN/ULC-S134.

.1 Medium texture smooth finish.

END OF SECTION

09 30 13 CERAMIC TILE

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

.2 CAN/CGSB-75.1-M88, Tile, Ceramic.

.3 CAN 2-75, Glazed Ceramic Wall Tile.

.4 ANSI A118.1-1992 Specifications for Dry-Set Portland Cement Mortar.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Porcelain Floor Tile: to CAN/CGSB-75.1-M88, Type 4, Class MR1, unglazed, rectified edge, minimum size 900 cm^2. Colour as selected by the Province from manufacturer's standard colour range.

.2 Unglazed Mosaic Porcelain Floor Tile: to CAN/CGSB-75.1-M88, Mohs rating 6, Class TYPE 2, MR1. Colour as selected by the Province from manufacturer's standard colour range.

.3 Glazed Ceramic Wall Tile: to CAN 2-75: Type 5, Class MR4, faces glazed, cushioned edges on all 4 sides, minimum size 115 cm^2. Colour as selected by the Province from manufacturer's standard colour range.

.4 Thin-set Mortar: to ANSI A118.4 when combined with acrylic mortar admix, Shear Bond Strength: 440 psi (7 day), Compressive Strength: 3000 psi (7 day).

.5 Water Resistant Backing Panel: Durock Cement Board or Dens Shield Tile Guard by Georgia Pacific Company.

.6 Wall Tile Adhesive: Organic Tile: to meet or exceed ANSI A136.1, type 1, low VOC, solvent free, non-flammable and non-toxic.

.7 Cement: to CAN/CSA-A5-93.

2.2 ACCESSORIES

.1 Floor Control Joints: for porcelain or ceramic tile floor installations using tile 300mm x 300mm or greater in dimension.

.1 Prefabricated movement and expansion joint; 10mm wide surface movement profile purpose made.

.2 Floor Transition Strips Type One: for porcelain or ceramic floor tile to other floor surfaces:

.1 Prefabricated edge protection profile for porcelain or ceramic floor tile adjacent to floor finishes with +/- 1.5mm difference in elevation, stainless steel.

.3 Floor Transition Strips Type Two: for porcelain or ceramic floor tile to other floor surfaces:

.1 Prefabricated edge protection profile for porcelain or ceramic floor tile adjacent to floor finishes with a 2 ~ 6mm difference in elevation, stainless steel.

.4 Outside Vertical Corners: for all ceramic wall tile vertical outsides corners.

.1 Bullnose edge profile tile.

.5 Reinforcing Mesh: 50 x 50 x 1.6 x 1.6mm galvanized steel wire mesh.

.6 Metal lath: to ASTM C 847 galvanized finish.

END OF SECTION

09 51 11 ACOUSTIC CEILING TILES

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 American Society for Testing and Materials (ASTM)
- .1 ASTM E 1264-98, Classification for Acoustical Ceiling Products.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
- .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA)
- .1 CSA B111-74(R1998), Wire Nails, Spikes and Staples.

.4 Underwriters Laboratories of Canada (ULC)
- .1 CAN/ULC-S102-88(R2000), Surface Burning Characteristics of Building Materials.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 CEILING PANELS

.1 Ceiling units to CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units and conforming to ASTM E 1264-98 (2005).

.2 Rating of tiles to CAN/ULC-S102-88 (R2000), Surface Burning Characteristics of Building Materials.

.3 Suspended acoustic panel ceiling tile that is compatible size to suit lay in light fixtures and mechanical diffusers. Typical sizing is imperial measurement grid of 610mm x 610mm (24” x 24”) or 610 mm x 1220 mm (24” x 48”).

.4 Acoustic Ceiling Panels shall be mineral fibre, non-directional fissured, flat lay in tiles, white in colour for maximum reflectance.

.5 Minimum CAC – Ceiling Attenuation Class of 35.

.6 Minimum LRC – Light Reflectance Coefficient of 0.80.

2.2 CEILING GRID

.1 Support system to CSA B111-74(R1998), Wire Nails, Spikes and Staples. Suspension system made of commercial quality cold rolled steel zinc coated, shop painted satin sheen, white and die cut interlocking components main and cross tee of double web.

.2 Fire-rated Suspension System: Fire rated to ULC design, exposed T bar grid including wall mounting, blue steel retainer clips.

.3 Hangers: 2.6 mm steel wire galvanized.

END OF SECTION

09 57 90 ACOUSTIC BAFFLES

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 AATCC8-2005, Colorfastness to Crocking: AATCC Crockmeter Method.

.2 AATCC 16-2004, Colorfastness to Light

.3 ASTM C423-90a, Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

.4 ASTM D1117-01, Standard Guide for Evaluating Nonwoven Fabrics

.5 CAN/CGSB-51.10-92, Mineral Fibre Board Thermal Insulation

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Baffle Core: Minimum 2” rigid fibrous glass board insulation, to CAN/CGSB-51.10-92, and as follows:
Density: 45-112 kg/m3.

.2 Noise Reduction Coefficient (NRC): minimum 0.85 tested to ASTM C423-90a, Type A or No. 4.

.3 Wood: straight, smoothly, essentially clear with slight defects permitted, average moisture content of 6-9%.

.4 Hangers: metal cables, minimum 1.6 mm diameter.

.5 Fabric: 100% polyester yarn, weight 270 g/m2 minimum, plain weave flame spread and smoke spread ratings to meet the *Alberta Building Code 2006*. Colour as selected by the Province from manufacturer's standard colour range.

END OF SECTION

09 61 00 POLISHED CONCRETE FLOORING

1. General

The Contractor shall consider the following reference documents in the design of the schools.

1.1 REFERENCE DOCUMENTS

.1 Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method

.2 ASTM D523 – Standard Test Method for Specular Gloss.

.3 ASTM E 1155 – Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.

.4 **System Description**
Performance Requirements: Performance of polished concrete floor system is measured by the following criteria:

.1 Static Coefficient of Friction, ASTM C 1028:
Dry Surface: 0.6
Wet Surface: 0.6

.2 Specular Gloss/Reflectance, ASTM D523:
60 Degrees: 60 degrees.

.3 Floor Surface Profile, ASTM E 1155:
Floor Flatness Number (FF): 50
Floor Levelness Number (FL): 35

2. Products

The Contractor shall consider the following minimum material requirements in the design of the schools.

2.1 STANDARDS

.1 System grind depth to be a minimum of 1.6 mm (1/16").

.2 Grind the concrete floor to within 50 mm of any vertical obstruction with appropriate grit to cut specified depth into floor, removing construction debris, floor slab imperfections and until there is a uniform scratch pattern. Vacuum or wash the floor thoroughly after each grind.

.3 Fill cracks and surface imperfections with fast set filler adhesive with filler aggregate, as per manufacturers instructions.

.4 Spray apply concrete densifier undiluted at approximately 4.5 square metres per litre. Cover the entire work area liberally and allow to sit for 30 minutes. Squeegee excess material off of the floor and wash clean. Allow 12 to 24 hours for initial cure.

.5 Hand grind and polish perimeter edges and inside corners to within 3.2 mm to vertical obstructions.

2.2 MATERIALS

.1 Concrete Densifier: Pentra-Sil 244+ or approved alternate
- .1 Permanent sealing, densifying, and hardening compound for concrete.
- .2 Odourless.
- .3 VOC: 0.

.2 Concrete Sealer:
- .1 Pentra-Guard (HP) plus Pentra-Guard (RS) or approved alternate.

.3 Fast Set Filler: Roadware Hybrid Urethane (98% solids) Adhesive or approved alternate with coloured aggregate filler for cracks and concrete surface imperfections

.

.4 Concrete Densifier: Pentra-Sil Concrete Densifier or approved alternate.

.5 Grinding Machine: Counter rotating head floor grinding machine, HTC 800HD, HTC 800, HTC 650, HTC 500, HTC 130, Diamatic 780 Ultra 780 or similar Equipment.

.6 Grinding Heads:
- .1 Metal bonded Diamond Cakes in 30, 70, 120, 220 and 400 grits, depending on application.
- .2 Resin bonded, phenolic diamonds 200, 400, 800 and 1500 grits.
- .3 Add a “spiff coat” of pentracil for stain resistance.

.7 Control Joint Filler fast cure elastomer, applied prior to grinding process.

2.3 FINISH CRITERIA

.1 Aggregate Exposure:
1.6 mm (1/16”) depth cut: Minimal to no course aggregate exposure.

.2 Polished Concrete Floor System: IPCI Sheen Level 4 – Gloss Finish.

.3 Preparation Step:

- .1 Remove existing floor coatings and level floor by grinding with 80-grit metal bonded diamonds.
- .2 Apply concrete densifier to deeply saturate floor.
- .3 Remove residue of concrete densifier dried on floor surface by grinding with 150-grit metal-bonded diamonds.
- .4 Floor Closure Polishing:
  Remove 150-grit metal-boned diamond scratches by grinding with 100-grit resin-bonded diamonds. Continue with 200-grit, 400-grit, 800 grit-and stopping at 1500-grit resin-bonded diamonds.

END OF SECTION

09 64 40 CUSHIONED WOOD FLOORING SYSTEM

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CGSB-1.36-M97, General Purpose Interior Alkyd Varnish.

.2 CAN/CGSB-1.175-M97, Polyurethane Interior Coating, Oil Modified, Clear, Gloss and Satin.

.3 CAN/CGSB-25.2-92, Paste Floor Wax.

.4 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.5 CAN/CSA-O80 Series-97 (R2002), Wood Preservation.

.6 CSA O151-04, Canadian Softwood Plywood.

.7 DIN 18032-2 for shock absorption, ball return, deflection and surface friction.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS – CUSHIONED WOOD FLOORING

.1 Flooring: Northern Hard Maple to M.F.M.A.-F.J.-Standards, second grade and better, minimum 57mm face width x 20mm thick.

.2 Resilient Pads: 11 mm thick EPDM Bio-cushion resilient pads.

.3 Plywood Underlayment: two (2) layers of 12.7 mm thick, Canadian Softwood plywood, select grade.

.4 Fastners: Flooring – 50 mm 15 gauge cleats or staplers. Subfloor – 25 mm length, 11 mm crown, coated staples, construction adhesive – PL 400.

.5 Membrane: minimum 0.10 thick, type 2 polyethelene.

.6 Protective Coating: clear single component moisture cured polyurethane to Master Painter's Institute Approved Product List Item #31.

.7 Game Lines: Coloured urethane paint, compatible with the urethane floor finish.

.8 Perimeter Base: 76mm wide x 150mm high x 6mm thick, moulded rubber, vented, specifically for wood gymnasium floor systems complete with anchors and fasteners.

.9 Thresholds: To CGSB 69.37, type 6-340, extruded aluminum, vented type minimum 5mm (3/16") thickness, plain type specifically for wood gymnasium floor, complete with anchor fasteners.

2.2 MATERIALS – WOOD PARQUET FLOORING

.1 Wood Parquet Flooring: consisting of 8.7 mm thick square edge strips 24 mm wide, 120 mm long; arranged in square 120 mm x 120 mm; squares to form a panel 483 mm x 483 mm.

.2 Primer: Low VOC type as recommended by the manufacturer in accordance with LEED requirements.

.3 Adhesive: Low VOC type as recommended by the manufacturer in accordance with LEED requirements.

.4 Finish Materials: Water-based, low VOC Filler and sealer as recommended by Flooring Manufacturer.

.5 Transition Strips: between parquet flooring and concrete floors and between flooring and resilient flooring; wood types to match parquet as recommended by the manufacturer.

END OF SECTION

09 65 00 RESILIENT FLOORING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM F2034-03e1 Standard Specification for Sheet Linoleum Floor Covering

.2 ASTM F1066-04 Standard Specification for Vinyl Composition Floor Tile

.3 ASTM F1861-02 Standard Specification for Resilient Wall Base

.4 ASTM F2169-02 Standard Specification for Resilient Stair Treads

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

1. Flooring Types

.1 Sheet Linoleum composed of natural ingredients which are mixed and calendared onto a jute backing to CSA A1256.1. ASTM F2034-03 e1.

.1 Welded seams – matching colour rods for common coulour joints.

.2 Vinyl Composition Floor Tile: to ASTM F-1066-04, and as follows:

.1 Type: A, Composition 1, Class 2 through pattern.

.2 Thickness: 3.2 mm.

.3 Size: 305 x 305 mm.

.3 One piece rubber tread and nosing with contracting color strip.

.4 Rubber Multipurpose Flooring (for weight rooms only):

1 Prefabricated athletic rubber flooring, calandered and vulcanized with a base of natural and synthetic rubber, stabilizing agents and pigmentation.

.2 Thickness: 6mm (for Multi-Purpose Room), 10 mm (for Weight Rooms only). Manufactured in two layers, which are vulcanised together. The shore hardness of the top layer will be greater than that of the bottom layer. Materials to be available in tile or roll configuration.

.3 Non-slip safety flow (NSF): (wet areas only) to ASTM E648, STM 3662, ULC 5102.

.4 Colour as selected by the Province from manufacturer's standard colour range.

2.2 RESILIENT BASE

.1 Resilient Base: to ASTM F-1861, and as follows:

.1 Type 1, rubber, B cove, Minimum thickness 3.17 mm, Minimum height 100mm comes with premoulded end stops and external corners.

2.3 ACCESSORY COMPONENTS

.1 Vinyl adapter strips, vinyl transition strips and plastic coving strips.

2.4 ACCESSORY MATERIALS

.1 Sub-Floor filler: white premix latex containing no gypsum requiring water only to produce cementitious paste.

.2 Primers: as recommended by primer and adhesive manufacturer.

.3 Adhesives: solvent-free, as recommended by flooring manufacturer and adhesive manufacturer for each flooring material and type and location of substrate.

.4 Welding Rod: designed to weld seams of sheet flooring, as recommended by flooring manufacturer, colour to be selected from standard range by the Province.

END OF SECTION

09 67 13 FLUID APPLIED ATHLETIC FLOORING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 DIN 18032, Shock Absorption.
.2 ASTM D-2632, Impact Resilience.
.3 ASTM D-1894, Friction Dry.
.4 DIN 18032, Ball Rebound.
.5 ASTM D-2240, Surface Hardness.
.6 ASTM C-502, Wear Resistance.
.7 ASTM D-395-B, Compression Set.
.8 DIN 53515, Top Layer Properties.
.9 DIN 51960, Infammability of Top Layer

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Adhesive: Pulastic Tacly Adhesive – a two component polyurethane.
.2 Shock Pad 6015: Granulated rubber polyurethane mat 9mm thickness.
.3 Pad Sealer: A two component polyurethane sealer.
.4 Polyurethane Resin: A pigmented two component polyurethane.
.5 Coating: A pigmented two component polyurethane surface paint.

.6 Game Line Paint: A pigmented two component polyurethane paint.

END OF SECTION.

09 68 00 CARPETING

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 Carpet components, construction and performance shall meet or exceed requirements of CAN/CGSB-4.129-93, Carpet for Commercial Use.

.2 Carpet system: must meet or exceed the Carpet and Rug Institutes Green Label Plus Certification.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Carpet tile must have the Environmentally Preferable Product (EPP) designation from an independent third party.

.2 Carpet tile: minimum 18 ounce face weight, 100% nylon, level loop, 100% solution dyed, modular size of 610 mm x 610 mm (24” x 24”).

.3 Texture retention, stain resistance, flame spread and smoke spread ratings to conform to Alberta Building Code.

.4 Backing to contain anti-microbial characteristics, to ensure mould and water resistance.

.5 Manufacturer must have a collection and recovery system for the carpet.

.6 Carpet adhesive: mill applied water based or releasable pressure sensitive type adhesive. Adhesive to meet or exceed the VOC and emission standards for South Coast Air Quality Management District Rule #1168. VOC Emissions: product shall have certification number indicating it meets or exceeds requirements of

Indoor Air Quality Testing Program of the Canadian Carpet Institute or the Carpet and Rug Institute (U.S.).

.7 Cementitious Underlayment: self-levelling and trowel grade, pre-mixed, polymer-modified, containing no gypsum, not softened by water after final set. Minimum compressive strength 10 MPa at 8 hours and 20 Mpa at 7 days.

.8 Underlayment Bond Coat: compatible with releasable pressure sensitive tile to substrate.

.9 Carpet Edge Guard: non-metallic, extruded or molded heavy-duty rubber "T" shaped cap insert and minimum 50 mm wide, aluminum anchorage flange, profiled to accept cap.

.10 Rubber base to CAN/CSA A126.5, continuous top set, complete with premoulded end stops and external corners, type 1 rubber, coved, 3.17mm thick, 100mm high.

END OF SECTION

09 81 29 SPRAYED ACOUSTIC INSULATION

1. General

The Contractor will consider the following reference documents in its design of the Schools.

1.1 REFERENCE DOCUMENTS

.1 Acoustical coating to CAN/CGSB-92.2-M90.

.2 NRC requirements to ASTM C423, Type A mounting.

.3 ASTM E84-07b Surface Burning Characteristics of Building Materials.

2. Products

The Contractor will consider the following minimum material requirements in its design of the Schools.

2.1 MATERIALS

.1 Acoustical spray coating material: minimum 25mm thick, non-combustible cellulose fibre, impact resistant, with integral dry adhesive formulated for combination with liquid additive.

.2 Liquid additive: acrylic based emulsion having a solids content of not less than 46% and a ph of 9.0 to 9.5 at 25°C.

.3 The coating shall have a maximum flame spread rating of 15, maximum smoke develop rating of 5.

.4 Noise reduction coefficient to be a minimum of 0.75.

.5 Light reflectance to be a minimum of 80.

END OF SECTION

09 90 00 PAINTING AND COATING

1. General

The Contractor will consider the following reference documents in its design of the Schools.

1.1 REFERENCE DOCUMENTS

.1 "Architectural Painting Specification Manual", latest edition, including the latest edition of the "Approved Products Lists", published by the Master Painters Institute (MPI).

2. Products

The Contractor will consider the following minimum material requirements in its design of the Schools.

2.1 MATERIALS

.1 Only MPI approved products from MPI Approved Product Lists corresponding to the specified finishing systems.

.2 Where the MPI Approved Products List identifies products for a given product type that are environmentally friendly, designated by E1, E2 or E3, select products as follows:

- .1 Use a product with either an E2 or E3 designation, where available.
- .2 Where a product with an E2 or E3 designation is not available, use a product with a E1 designation.

.3 All paint products to be low or no VOC except areas and materials required to have high strength coatings which will not conform.

.4 Select MPI approved products that participate in the Environmental Choice Program (ECP)

- .1 ECP-12-89, Solvent-borne Paints.
- .2 ECP-07-89, Water-borne Surface Coatings.

END OF SECTION

10 00 00 SPECIALTIES

1. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

1.1 FUME HOODS

.1 CSA, ANSI/UL approved: Double sided, dual access bench top to UL1805 and ASHRAE 110

.2 Static pressure: minimize static pressure loss with sufficient baffle openings and a round bell mounted stub duct. Average static pressure loss readings when measured with sash in full open position at 100 FPM face velocity shall not exceed 75FPM @0.25 inches, 100FPM @0.35 inches and 125 FPM @ 0.60 inches.

Air usage/ratio pressure with sash full open: At 100fpm exhausts 830 cfm @ 0.26" H20 static pressure.

Air usage/static pressure with sash open 18": At 100fpm, exhausts 530cfm @ 0.10" H20 static pressure.

.3 Noise level not to exceed 60 dBa.

.4 Illumination: vapour proof incandescent light, 2- 20 watt fluorescent fixture minimum 80 footcandles in the average work area.

.5 Safety glass: clear float tempered, minimum 6mm thick.

.6 Exterior shell: double sided fume hood, 18 gauge sheet steel with powder coated finish.

.7 Interior liner: Polyresin, minimum 6mm thick, solid fiberglass reinforced pressed thermoset resin board, white in colour.

.8 Sash Cables: Stainless steel, aircraft grade, uncoated, 3/32" diameter.

.9 Sash pull: stainless steel, 18 gauge, type 304.

.10 Sash tracks: Polyvinyl chloride, corrosion resistant.

.11 Cable pulleys: Plastic, ball bearing type, 1 ½" diameter.

.12 Capacity: minimum 485 CFM.

.13 Blower: Blower to be external.

.14 Water: cold water gooseneck plumbing, prepiped from valve to outlet.

1.2 KILN VENTING SYSTEM

.1 Downdraft venting system.

.2 Minimum 3" diameter 8'-0" length flexible aluminum duct.

.3 Power: 115 volt, 1.4 amp with in line power switch.

.4 Minimum air volume 140 CFM.

.5 Vent motor: Wall mounted

.6 Kiln Capacity: Maximum kiln capacity to be used with this system is 12 cubic feet (24 cubic feet with additional plenum cup kit).

1.3 DUST COLLECTOR SYSTEM

.1 The dust collection system shall be an exterior mounted recirculation type consisting of a dust separator, fabric filter media, ductwork, filter reconditioning mechanism and exhaust fan with an **explosion-proof** motor.

Construct the dust separator with built-in inlet baffles adequately separating coarse particles from fine ones and directing heavier particles down into a hopper.

Dust collector with integral storage and tight fitting slide gate for emptying.

Dust collector shall be complete with an automatic filter shaker. The shaking mechanism shall be operated automatically on a programmed timing cycle whenever fan is shut down. A time delay interlock shall be provided to allow the fan to stop and the shaking cycle to operate for a definite time period before the fan can be re-started. This shaking time period shall be adjustable between one and three minutes.

The dust collector fan/motor package shall be of the materials-handling type and shall be installed between the dust collection and return outlet.

.2 Filtration: Collector and filtering media capable of effectively collecting and filtering dust and chips produced by various woodworking equipment, without plugging the collector or hanging up on the filtering media. Filtering media shall have a minimum dimension of 160mm between wall or tubes or sides of envelopes on the dirty side, to prevent bridging and short circuiting of filter area.

.3 Noise level The dust control system shall include a silencer to maintain a noise level of NC 75 or less.

END OF SECTION

10 21 13 TOILET COMPARTMENTS

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM A653M-96, Sheet Steel, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process.

.2 Spray apply finish enamel to CAN/CGSB-1.88-92, Type 2 gloss.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Sheet steel: minimum commercial grade, stretcher leveled, sheet steel to ASTM A653M-96, with Z275 zinc coating.

.2 Minimum steel thickness:

.1	Panels, doors, urinal screens:	0.80 mm.
.2	Pilasters:	1.00 mm.
.3	Reinforcement:	3.00 mm.
.4	Headrails:	1.00 mm.

.3 Hardware:

.1 Hardware components to be stainless steel.

.2 Hinges: adjustable to automatically return inswinging doors from any position to nominal 30 degrees from closed position, and shall return outswinging doors to closed position.

.3 Barrier-free hardware required for barrier free washrooms.

.4 Floor Anchorage: concealed stainless steel fasteners.

.5 Door, panel and pilaster thickness to be minimum 32mm.

.6 Latch set, door bumpers, brackets as required.

END OF SECTION

10 22 26 OPERABLE PARTITIONS

1. General

The Contractor shall consider the following reference documents in the design of the Schools.

1.1 REFERENCE DOCUMENTS

.1 ASTM E 413 - Classification for Rating Sound Insulation; 1987 (Reapproved 1999).

.2 ASTM E 557 - Standard Practice for the Installation of Operable Partitions; 2000.

.3 ASTM E 90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools.

2.1 MATERIALS

.1 Folding mechanical manually operated, top supported, centre stacked, paired panels.

.2 Panel minimum 80 mm (3.15”) thick, and of uniform and equal widths not exceeding the width of the specified panel finish. Panels shall be full height, one piece construction. Panels shall have reinforced 21 gauge (minimum) steel face panels, complete with a reinforced steel frame to produce a rigid, one piece panel which does not twist or rack.

.3 Materials shall be approved by the Underwriters' Laboratories of Canada, for Fire Hazard Classifications per NBC 1977. Make test data available to substantiate these requirements.

.4 Carrier Components: Ball bearing trolleys, two wheels at every second hinge and wheel at end posts.

.5 Acoustical performance of the operable partition shall have been tested in an acoustical laboratory in accordance with ASTM E 90.

.1 The lead nose and expandable closure shall seal to the wall by means of an extruded, soft vinyl, compressible bulb seal. Vertical wall jambs shall not be permitted.

.2 The vertical seals between panels shall interlock a minimum of 50 mm (2") by means of unbreakable scratch and dent proof, solid colour, self aligning, PVC tongue and groove extrusions. Metal or plastic trim with less than 50 mm (2") of interlock shall not be permitted.

.3 The horizontal top seal shall be, two, continuous contact, multi finger, 25mm vinyl sweep seals or a retractable seal that operates simultaneously with the bottom seals .

4 The operable floor seal shall be a mechanical, retractable bottom seal providing 30 mm (1.2") operating clearance. Downward seal pressure shall provide maximum acoustical seal and stabilize the bottom of the partition. Bottom seal allowing for less than 30 mm (1.2") of operating clearance shall not be permitted.

.6 Suspension Systems:

.1 Track shall be #1, heat treated, tempered, anodized aluminum track, connected to the support structure with pairs of .375" adjustable hanger rods, and brackets spaced in accordance with the supplier's recommendations.

.2 Trolleys for single side stacked panels, all steel precision bearing, glass reinforced nylon tired, 4 wheeled trolleys. Mill finished aluminum track shall not be permitted. Non precision bearings or steel tires shall not be permitted.

.3 Trolleys for paired straight run panels, Teflon disc-type omni directional, glass reinforced nylon tired, 4 wheeled trolleys. Mill finished aluminum track is not permitted.

.4 Panel weight shall be 10 – 13 lbs. / sq. ft. based on panel size and option selected.

.7 Hardware: latching steel door handles, satin chrome finish, lock cylinder master-keyed to building keying system.

.8 Accessories: aluminum jamb moulding, stacking straps and snaps, white enameled ceiling guard full width of top seal at drawn position and all fitments required.

END OF SECTION

10 22 27 VERTICALLY FOLDING OPERABLE WALLS

1. General

The Contractor shall consider the following reference documents in the design of the Airdrie, RVS 9-12:

1.1 SECTION INCLUDES

.1 Supply and installation of Automatic Vertically Folding Acoustical Walls as shown on the architectural drawings. All necessary hardware, seals, lifting machinery, electrical controls are included

1.2 REFERENCES

.1 ASTM E90-04: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.2 ASTM E336-05: Standard Test Method for Measurement of Airborne Sound insulation in Buildings.

.3 ASTM E413-04: Classification For Rating Sound Insulation.

.4 ASTM E557-0092006): Standard Guide for The Installation of Operable Partitions.

.5 CAN/ULC-S102-03: Surface Burning Characteristics of Building Materials and Assemblies 1.3.

2. Products

2.1 STRUCTURAL SUPPORT FRAMING AND MISC. ANCHORAGE

.1 Main structural support framing: Provided as part of the structural steel Section of the Work.

.2 Anchorage and support angles and brackets: Designed and supplied as part of the work of Section 05 50 00 Metal Fabrications.

2.2 VERTICALLY FOLDING OPERABLE WALL

.1 System type and operation: Top hung, hinged pair panels, mechanically operated, complete with acoustic seals at perimeter of each panel. Provide operable wall systems designed to have a design life of 10,000 complete, closed-to-opened-to-closed position, operating cycles, with a smooth, quiet operation. Design entire door system to fail in a safe, completely non-moving condition during any situation e.g. power failure at any stage of operation and/or position.

.2 Drive System type: Standard Drive System with adjustable operating speed between 5 and 10 vertical feet per minute. Provide thermal and overload protection in order to ensure safety and reliability of the operating system.

.3 Panel construction: Provide equal height panels dividing the vertical separation between finished ceiling and floor in equally sized panels. Design panels with non-progressive removability to allow convenient servicing and replacement. Provide an STC rating of 54 minimum per ASTM E90 for the individual panels. Provide steel faced panels free of bowing, oil canning, warping and waviness.

.4 Panel finish: Bottom panels to be plastic laminate, two middle panels are to be white boards, and the top panels are to be vinyl.

.5 Acoustic performance and Sound Seals: Provide an STC rating of 51 minimum per ASTM E90 for the complete, installed, wall system. Provide automatically activated head, jamb and bottom acoustic seals.

.6 Automatic operation services and controls:

.1 Site conduit and wiring of power supply to local junction box with local disconnect switch: by Electrical Sections of the Work.

.2 Site conduit and wiring from local junction box to door operator (including disconnect switches at each motor if required by the manufacturer): Provided as part of the work of this section.

.3 Site conduit and wiring for door operator control system (including key operation switches): Provided as part of the work of this Section. Provide two, spring return 3 position, key switches located on either side of the axis of the wall.

.7 Safety leading (door bottom) edge: Provide continuous safety sensors along the bottom edge of the door to stop lowering operation if the leading edge comes into contact with any object between it and the finished floor level. Program the operating system to resume regular operation only after the key switch is released, the direction of the wall has been reversed and the obstruction removed.

END OF SECTION

10 51 00 LOCKERS

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 CAN/CGSB-44.40-92, Steel Clothing Locker

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Lockers: to CAN/CGSB-44.40-92, 381 mm wide x 457 mm deep x 1830 mm high double tier. (6 tier in change rooms)

.2 Body: 0.70 mm thick cold rolled steel, continuously lock formed back and sides.

.3 Frame: 1.6 mm thick formed steel channel, welded one piece construction, notched frame for rigid shelf support, 1.8 mm thick 5 knuckle hinges.

.4 Doors: 1.6 m thick cold rolled steel outer panel, 1.0 mm thick cold rolled steel inner panel for welded sandwich panel construction with sound abating honeycomb core, black polypropylene handle box flush with door face, prepared for number plates, rubber bumper silencers, ventilation louvres top and bottom.

.5 Finish: Baked enamel. Colour as selected by the Province from manufacturer’s standard colour range.

.6 Accessories: wall coat hooks, double ceiling hooks, metal vented top trim, closures and filling panels, finished end panels, sloped tops, number plates and padlock hasps:

.7 Bases: 100mm high plywood clad, wood framed base for student lockers. 100 mm masonry base in change rooms and wet areas.

END OF SECTION

10 75 00 FLAGPOLES

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 ASTM B 241/B 241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 MATERIALS

.1 Flagpoles

.1 Shaft: Provide one seamless cone tapered aluminum ground set internal halyard poles c/w tilting base. Finish: to be brushed aluminum.

.2 Flagpole height: minimum 9m.

.3 Provide all required balls, trucks, halyards, cleats, collars and foundation tubes for complete assembly of each flagpole. Base covers to match pole finish.

.4 Flagpoles resistant to wind velocities up to 177km/hr without permanent deformation.

.5 Truck: Cast aluminum housing and spindle, with one 60.3mm diameter cast nylon sheaves; revolving mounting with stainless steel ball bearings, non-fouling.

.6 Halyard: Internal system;

.1 Materials: 8 mm diameter (Number 10) white waterproof polypropylene.

.2 Hardware: Two chrome swivel-type flag snaps; neoprenecoated counterweight, beaded nylon retainer

ring.

.7 Cleat: Internal-mounted at factory, cam-action with internal sheave; cast aluminum access door and frame with keylock.

.8 Ground set foundation assembly for manual tilt.

.2 Accessories

.1 Ground Sleeve: Galvanized steel components as follows:

.1 Foundation tube: Corrugated, 16 gauge, centered on face of base plate.

.2 Base plate: Square, side dimensions 100 mm greater than inside dimension of foundation tube.

.3 Ground spike: 19 mm diameter, centered on face of base plate opposite foundation tube attachment.

.4 Setting plate: 152 mm square.

.5 Hinge pin: Hinge pin system c/w tilting base.

.2 Provide standard spun aluminum flash collar.

.3 Provide spun aluminum finial, 14 gauge minimum wall thickness, 150 mm minimum diameter, flush seam, clear anodized finish.

.4 Provide aluminum housing cleat covers finish matching shaft, with key operated cylinder lock.

END OF SECTION

11 66 23 GYMNASIUM EQUIPMENT

1. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

1.1 BASKETBALL BACKSTOPS – CEILING SUSPENDED, MAIN COURT

.1 Provide 2 – main court ceiling mounted, rear swing mechanism, complete with electric winch minimum 3/4" HP.

.2 Frame of 50 mm square painted steel tubing.

.3 Steel parts primed and finished with spray coat of industrial enamel.

1.2 BASKETBALL BACKSTOPS – WALL MOUNTED SIDEFOLD, CROSS COURTS

.1 Provide 4 – backstops with sidefolding mechanism and operating pole.

.2 Steel tubing frame, 50 mm square, including adjustable stabilizing bars. No cable braces permitted, height adjustment of minimum 610 mm required.

.3 Steel parts primed and finished with spray coat of industrial enamel paint.

1.3 BACKBOARDS AND GOALS

.1 Main courts: fibreglass backboard complete, spring loaded, removable nylon net, safety edge cushion. Backboard to have baked enamel border and target area.

.2 Cross courts: aluminum backboard complete with factory painted border and target area. Standard bolted mount, steel goal with removable nylon net.

1.4 VOLLEYBALL/BADMINTON END AND INTERMEDIATE POSTS

.1 Volleyball/Badminton end and intermediate posts: 76 mm dia. O.D. x 3.5 mm thick round tubing, with 350 mm reinforcing insert.

External bracing of 25 mm x 2.7 mm gauge round tubing. Complete with nets fabricated from high quality nylon chord square mesh. Bottom brace with rubber padding for floor protection.

.2 End post accessories:

.1 Adjustable nickel plated fittings for net height adjustment.

.2 Manual crank winch and polypropylene leaders to receive nets.

.3 Finish: primed and finished in industrial enamel.

.4 Transporter: provide minimum (2) transporters, each supplied with two castors for the movement of the poles to and from storage.

1.5 FLOOR SOCKETS

.1 Floor post sockets: steel tube with base plate.

.2 Flush socket floor covers. bronze post socket covers to sit over post sockets flush with floor. Provide fingergrip opening for removal.

.3 Storage Room Sockets: steel tube with base plate.

END OF SECTION

11 66 53 GYMNASIUM DIVIDERS

1. General

The Contractor shall consider the following reference documents in the design of the Schools:

1.1 REFERENCE DOCUMENTS

.1 NFPA 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

2. Products

The Contractor shall consider the following minimum material requirements in the design of the Schools:

2.1 CURTAIN

.1 A combination of vinyl fabric and mesh, with the following characteristics:

- .1 Weight: minimum18 oz. per sq. yd.
- .2 Hydrostatic resistance: minimum 40 psi.
- .3 Tear resistance: minimum 45 kg.
- .4 Colour as selected by the Province from manufacturer's standard colour range.
- .5 Flame retardance: passes NFPA 701.

.2 Fabric shall be in complete unspliced widths. Seams of curtain shall have heat sealed finish. Hems shall be turned and stitched.

.3 Brass hoisting grommets spaced to manufacturers standards for loading.

2.2 SUSPENSION SYSTEM

.1 3mm Aircraft Cable and all associated clews, fasteners and pulleys required for suspension and movement to manufacturers standards for loading.

.2 Bottom of Curtain hemmed with 38mm outside dia. padded pipe in hem, connected to each hoisting cable.

2.3 HOIST

.1 Electric winch motor - Size and voltage appropriate to suit.

END OF SECTION

12 25 00 MOTORIZED BLINDS

3. General

The Contractor shall consider the following reference documents in the design of the Schools:

3.1 REFERENCE DOCUMENTS

.1 NFPA 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

4. Products

The Contractor shall consider the following minimum material requirements in the design of the schools.

4.1 MATERIALS

.1 Shade Construction:

.1 Shadecloth to be visually transparent, single material Colour as selected by the Province from manufacturer's standard colour range. Flame retardance: passes NFPA 701.

.2 Bottom bar shall be rectangular 6mm x 37mm with internal grooves to accommodate a fabric guide carrier at each end and hardware to attach to cable guide system where applicable.

.3 Cable guide, full length for all shades.

.4 Shade roller to be an extruded aluminum tube minimum 1.0 mm thick with two fabric mounting channels.

.2 Motor Drive:

.1 Provide maintenance free, totally enclosed, electric single phase motor, minimum voltage size 95-125v 60hz, (Class-A (max. 140 deg. C) thermal protection.

.2 Provide limit switches, circuit brakes, solenoid disc brakes.

.3 Electrical controls:

.1 Rocker type switches with momentary stopping, raising and lowering capabilities.

END OF SECTION.

12 48 13 ENTRANCE FLOOR MATS AND FRAMES

1. Products

The Contractor shall consider the following minimum materials requirements in the design of the Schools.

1.1 ENTRY MAT SYSTEM

.1 Tufted, Cut Pile, 100% Nylon, 27 oz/sq. yd. finished face weight.

.2 Tile: 457 x 457 (18” x 18”) tile squares, nominal total thickness 11 mm (0.435”), finished pile height 6.0 mm (0.237”).

.3 Step 1: P/4022 E-Z Scrub matting, recessed.

.4 Step 2: P/4043 Clean Sweep.

.5 Products to be part of the CRI Indoor Air Quality Program and have CRI Seal of Approval.

END OF SECTION

14 21 00 ELEVATORS

1. General

The Contractor shall consider the following reference documents in the design of the Schools.

1.1 REFERENCE DOCUMENTS

.1 Comply with requirements of CAN/CSA-B44-07

2. Products

2.1 MATERIALS

The Contractor shall consider the following minimum materials in the design of the Schools.

.1 Frame: structural steel.

.2 Platform: Sound isolating steel frame platform, plywood or steel subfloor.

.3 Cab walls to be of 14-gauge sheet steel, with powder paint finish.

.4 Doors and Frames; 1.52 mm thick steel, baked enamel finish.

.5 Hoistway Fascias: 1.9 mm sheet steel.

END OF SECTION

20 00 00 COMMON MECHANICAL REQUIREMENTS

1. General

1 Materials and equipment installed shall be new, full weight and of quality specified in accordance with performance requirements.

.2 Statically and dynamically balance rotating equipment.

.3 Each major component of equipment shall bear manufacturer's name, address, catalog and serial number in a conspicuous place.

2. Products

The Contractor shall consider the following minimum materials requirements in its design of the Schools.

2.1 HANGERS AND SUPPORTS

.1 Pipe supports shall meet the requirements of ANSI/ASME B31.1-2007 (R2010), Power piping.

.2 Duct hangers shall follow the recommendations of the SMACNA Duct Manuals.

2.2 DUCTWORK AND BREECHING INSULATION

.1 Duct insulation, recovery materials, vapour barrier facings, tapes and adhesives shall have maximum flame spread ratings less than or equal to 25 and maximum smoke developed less than or equal to 50, when tested in accordance with CAN/ULC S102-10, NFPA 255 or ASTM E84-11b.

.2 Insulating materials and accessories shall withstand service temperatures without smoldering, glowing, smoking or flaming when tested in accordance with ASTM C411-11.

.3 Comply with the following applicable Standards and Guidelines:

.1	ASTM C4 11- 11	Standard Test Method For Hot Surface Performance Of High Temperature Thermal Insulation.

.2	ASTM E84-11b	Standard Test Method for Surface Burning Characteristics of Building Materials
.3	CGSB 51-GP-52MA	Vapour Barrier, Jacket and Facing Materials for Pipe, Duct and Equipment Thermal Insulation
.4	NFPA 255	Standard Method of Test of Surface Burning Characteristics of Building Materials, 2006 Edition
.5	CAN/ULC-S102-10	Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

2.3 PIPING AND EQUIPMENT INSULATION

.1 Comply with the following applicable Standards and Guidelines:

.1	ASTM C411-11	Standard Test Method for Hot-Surface Performance of High Temperature Thermal Insulation.
.2	ASTM E84-11b	Standard Test Method for Surface Burning Characteristics of Building Materials

.3	CAN/CGSB-51.40-95	Flexible, Elastomeric, Unicellular Thermal Insulation, Sheet and Pipe Covering
.4	CGSB 51-GP-52MA	Vapour Barrier, Jacket and Facing Materials for Pipe, Duct and Equipment Thermal Insulation
.5	CAN/CGSB-51.53-95	Poly (Vinyl Chloride) Jacketing Sheet for Insulated Pipes, Vessels and Round Ducts
.6	NFPA 255	Standard Method of Test of Surface Burning Characteristics of Building Materials, 2006 Edition
.7	CAN/ULC-S102-10	Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

.2 Pipe insulations, recovery materials, tapes, vapour barrier facings and adhesives shall have maximum flame spread rating of 25 and maximum smoke developed rating of 100 except in plenum spaces and air handling systems where maximum smoke development rating shall be 50, when tested in accordance with CAN/ULC-S102-10, NFPA (FIRE) 255, or ASTM E84-11b.

.3 Insulating materials and accessories shall withstand service temperatures without smoldering, glowing, smoking or flaming when tested in accordance with ASTM C441-10.

2.4 PIPE AND PIPE FITTINGS

.1 Comply with the following Standards and Guidelines and applicable laws:

Applicable Standards and Guidelines:

.1 ANSI/ASME B16.18-2001(R2005) Cast Copper Alloy Solder Joint Pressure Fittings

.2	ANSI/ASME B16.22-2001 (R2005)	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
.3	ANSI/ASME B16.3-2011	Malleable Iron Threaded Fittings: Classes 150 and 300
.4	ANSI/ASME B16.5-2003	Pipe Flanges and Flanged Fittings
.5	ANSI/ASME B16.25- 2007	Buttwelding Ends
.6	ANSI/ASME B16.39-2009	Malleable Iron Threaded Pipe Unions – Classes 150, 250 and 300
.7	ANSI/ASME B31.1-2007 (R2010)	Power Piping
.8	ANSI/ASME B31.3-2008	Process Piping
.9	ANSI/ASME B31.5-2008	Refrigeration Piping and Heat Transfer Components
.10	ANSI/ASME B16.9-2007	Factory-Made Wrought Buttwelding Fittings
.11	ASME Section IX 2007 ASME	Welding and Brazing Qualifications Boiler and Pressure Valve Code- Section IX
.12	ASTM A53/A53M-10	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
.13	ASTM A106/A106M-10	Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
.14	ASTM A214/214M-96 (2005)	Standard Specification for Electric-Resistance-Welded Carbon

		Steel Heat-Exchanger and Condenser Tubes
.15	ASTM B32-08	Standard Specification for Solder Metal
.16	ASTM B88-09	Standard Specification for Seamless Copper Water Tube
.17	ASTM B280-08	Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service
.18	ASTM B306-09	Standard Specification for Copper Drainage Tube (DWV)
.19	ASTM B664-90 (2006)	Standard Specification for 80% Silver - 20% Graphite Sliding Contact Materials
.20	ASTM C564-11	Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
.21	ASTM D1002-10	Standard Specification for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)
.22	ASTM D2235-04(2011)	Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
.23	ASTM D2464-06	Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
.24	ASTM D2564-04(2009)c1	Standard Specification for Solvent Cements for Poly

		(Vinyl Chloride) (PVC) Plastic Piping Systems
.25	ASTM D3138-04(2011)	Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components
.26	ASTM G17-07	Standard Test Method for Penetration Resistance of Pipeline Coatings (Blunt Rod)
.27	CAN/ICSA B149.1-10	Natural Gas and Propane Installation Code
.28	CSA B52-05 (R2009)	Mechanical Refrigeration Code
.29	CAN/CSA-B70-06	Cast Iron Soil Pipe, Fittings and Means of Joining
.30	CAN/CSA-B1800-11	Thermoplastic nonpressure piping compendium
.33	ASTM F441/F441M-09	Standard Specifications for Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe, Schedules 40 and 80

Applicable laws:

.1 National Plumbing Code of Canada 2005.

.2 Alberta Regulation 119/2007 – Plumbing Code Regulation.

.3 Provincial Board of Labour Regulations for Welded Steel precision tubing as approved by the authority having jurisdiction.

END OF SECTION

26 00 00 ELECTRICAL

1. Products

The Contractor shall consider the following minimum materials requirements in its designs of the Schools.

1.1 CONDUIT

.1 Provide conduit of proper type and size to suit intended use, fulfill wiring requirements, and comply with CEC.

.2 EMT: to CSA C22.2 No.83-M1985. Provide rain-tight fittings in weatherproof and damp areas.

.3 Rigid Metal: to CSA C22.2 No.45-M1981.

.4 Rigid PVC (Unplasticized): to CSA C22.2 No.211.2-M1984.

.5 Flexible Metal Conduit: to CSA C22.2 No. 56-1977.

.6 Following materials for mechanical protection of direct buried conductors, as permitted under CEC Rule 12-012(3) (e).

.1 Polyethylene Pipe: to CSA B137.1-95, minimum series 75.
.2 Flexible Plastic Underground Power Cable Ducting: to CSA C22.2 No. 211.1 1984.

2.2 WIRE AND CABLE

.1 Building Wiring: to CSA C22.2 No. 75-M1983, copper conductor, 600 V or 1000V RW90 X-link insulation. Use in all locations, except for underground wire which shall be RW90 X-Link -40°C or TWU75 -40°C. Aluminum Alloy conductor may be used for feeders 100 Amps and over.

.2 Wire Sizing: according to CEC. Minimum wire size shall be #12 AWG.

.3 Do not use metallic or non-metallic sheathed cables or wire with aluminum conductors, except where otherwise indicated.

.4 Armoured Cable: to CSA C22.2 No. 51-95. Use only for final connections to luminaires in lengths not exceeding 1.5 m and for runs concealed in metal or wood frame partitions containing only one circuit.

2.3 BOXES AND FITTINGS

.1 Provide boxes and fittings suitable for intended use and area installed and as follows:

.1 Outlet Boxes: to CSA C22.2 No. 18-92.
.2 Pull and Junction Boxes: to CSA C22.2 No. 40-M1989.
.3 Bushings, Knockout Closures, and Locknuts: to CSA C22.2 No. 18-92.

2.4 WIRING DEVICES

.1 Specification grade and as follows:

.1 Switches: to CSA C22.2 No. 111-M1986, toggle type, 15 A, 125 V, full load rated.
.2 Receptacles: to CSA C22.2 No. 42-M1984, duplex, 15 A, 125 V, U-ground.
.3 Cover Plates: Provide as per requirements.

2.5 DISCONNECTS

.1 Disconnects: to CAN/CSA C22.2 No.4-M89 and required by CEC to suit application.

2.6 CABINETS AND ENCLOSURES

.1 Cabinets and Enclosures: to CSA C22.2 No. 40-M1989, and as follows:

.1 Interior Cabinets: EEMAC-1
.2 Exterior Enclosures: EEMAC-3R

2.7 GROUNDING EQUIPMENT

.1 Grounding Equipment: to CSA C22.2 No. 41-M1987.

2.8 SUPPORTING DEVICES

.1 Provide ventilated cable tray for low tension systems, Class C1, ladder type or basket type. Tray to consist of open cable tray with minimum dimensions of 450 mm x 100 mm deep, galvanized steel. Support cable tray passes through fire rated walls, provide total enclosed tray for a distance of 200 mm on each side of the wall.

END OF SECTION

32 10 00 BASES, BALLASTS, AND PAVING

1. General

The Contractor shall consider the following reference documents in its design of the Schools.

1.1 REFERENCE DOCUMENTS

.1 ASTM D3515-01, Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.

.2 ASTM D242-04, Mineral filler for Bituminous Paving Mixtures.

.3 ASTM D692-00 (2004), Course Aggregate for Bituminous Paving Mixtures.

.4 ASTM D1073-06, Fine Aggregate for Bituminous Paving Mixtures.

.5 The following documents, referenced in this Section, are published by the Master Painters Institute (MPI)

- .1 Architectural Painting Specification Manual, latest edition. (APS Manual)
- .2 Maintenance Repainting Manual, latest edition. (MR Manual)
- .3 Approved Product List, latest edition.

.6 Concrete Materials and Methods of Concrete Construction: CSA A23.1/A23.2-94.1.2

2. Products

2.1 MATERIALS

The Contractor shall consider the following minimum requirements in the design of the Schools:

.1 Hot mix pavement mixtures utilizing asphalt cement and aggregate in accordance with ASTM D3515-96.

.2 Traffic marking to MPI EXT 2.1A, Latex.

.3 Concrete ingredients, admixtures and reinforcing steel: CSA A23.1-04/A23.2-04

END OF SECTION

32 90 00 PLANTING

1. General

1.3 REFERENCE DOCUMENTS

The Contractor shall consider the following reference documents in the design of the Schools:

.1 Nomenclature: to "International Code of Nomenclature for Cultivated Plants".

.2 Canadian Standards For Nursery Stock: latest edition by Canadian Nursery Trades Association / Landscape Canada.

.3 *Alberta Yards & Gardens, What to Grow* published by Alberta Agriculture, Food and Rural Development, Agdex 200/32-1.

.4 *Pruning in Alberta* published by Alberta Agriculture**,** Food and Rural Development Agdex 270/24-1.

2. Products

2.1 MATERIALS

The Contractor shall consider the following minimum material requirements in the design of the Schools:

.1 Topsoil: natural, fertile, friable, agricultural soil meeting following requirements:

- .1 Not less than 6% organic material.
- .2 pH value ranging from 5.9 to 7.0.
- .3 Non-toxic to plant growth.
- .4 E.C.-Salinity reading not exceeding 1.5.
- .5 Soil texture: loam soil as defined by Canadian System of Soil Classification.
- .6 Reasonably free from subsoil, slag, clay, stone, lumps, live plants, roots, sticks, quack-grass, noxious weeds and foreign matter.

.2 Grass seed: certified Canada No. 1 seed, free of disease, weed seeds or other foreign materials in accordance with the Canada “Seeds Act” and “Seeds Regulations” for lawn grass mixtures, having minimum purity of 97% and germination of 75%.

.1 Seed mixture 'C'
25% Fairway crested wheatgrass,
15% Sodar streambank wheatgrass,
10% Reubens Canada bluegrass,
10% Kentucky bluegrass blend,
10% Hard fescue,
25% Boreal creeping red fescue,
5% Fiesta III perennial ryegrass.

.3 Nursery Sod: freshly cut and healthy with strong, fibrous root system. Containing maximum of 2% of other grass species, and maximum of two broad leaf weeds and ten other weeds per 40 m2. Sod soil portion shall be a maximum of 40 mm and minimum 25 mm.

.4 Fine Fescue Drought Tolerant Grass Sod: sod grown from a minimum five varieties of proven drought tolerant fine fescue grasses.

END OF SECTION

33 00 00 UTILITIES

1. General

1.1 REFERENCE DOCUMENTS

The Contractor shall consider the following reference documents in the design of the Schools:

.1 ANSI/AWWA M11-91, Steel Pipe - A Guide for Design and Installation

.2 ANSI/AWWA C207-94, Steel Pipe Flanges for Waterworks Service
Sizes 4 in through 144 in (100 mm through 3600 mm).

.3 ANSI/AWWA C502-94, Dry-Barrel Fire Hydrants

.4 ANSI/AWWA C500-93, Metal-Seated Gate Valves for Water Supply Service

.5 CSA B137.1-9, 5 Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services

.6 Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications

.7 CAN/CGA-B149.1-M91, Natural Gas Installation Code

.8 CSA B51-95, Boiler, Pressure Vessel, and Pressure Piping Code

.9 CSA Z662-96, Oil and Gas Pipeline Systems

.10 ASTM C76-95a, Reinforced Concrete Culvert, Storm Drain and Sewer Pipe

.11 CSA B182.1-96, Plastic Drain and Sewer Pipe and Pipe Fittings

.12 CSA B182.2-95, PVC Sewer Pipe and Fittings

.13 CSA A23.1-94, Concrete Materials and Methods of Concrete Construction

2. Products

2.1 MATERIALS

The Contractor shall consider the following minimum material requirements in the design of the Schools:

.1 Concrete: 20 MPa, 80 mm slump, sulphate resistant Portland cement.

.2 Provide factory-fabricated pipe and pipe fittings of sizes, types, pressure ratings, and fasteners.

.3 Steel Pipe and Pipe Fittings: Pipe to ANSI/AWWA C200-91; Fittings: to ANSI/AWWA C208-83.

.4 Polyvinyl Chloride (PVC) Pipe and Fittings: Pipe to CSA B137.3-93, CI DR 18, Fittings to CSA B137.3-93.

.5 Gate Valves: to ANSI/AWWA C500-93, non-rising stem, square body, to open counter-clockwise.

.6 Hydrants: to ANSI/AWWA C502-94, compression type, complying with requirements of local authority having jurisdiction.

.7 Sanitary and Storm Pipe: Rigid PVC pipe – SDR 35 meeting ASTM specification D3034.

.8 Non-Corrugated Perforated Plastic Drain Pipe: to CSA B182.1-96, minimum150 mm diameter.

.9 Filter Gravel: coarse aggregates to CSA A23.1-94, Table 3, Group 1, 20 mm to 5 mm nominal minimum size of aggregate.

.10 Fittings and Solvent Cement: as specified.

END OF SECTION