

PART 1        GENERAL

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| <u>1.1    REFERENCES</u> | .1 | Aluminum Association (AA) |
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- .1    AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
  - .2    ASTM International
    - .1    ASTM C475-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
    - .2    ASTM C514-04(2009e1), Standard Specification for Nails for the Application of Gypsum Board.
    - .3    ASTM C557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
    - .4    ASTM C840-08, Standard Specification for Application and Finishing of Gypsum Board.
    - .5    ASTM C954-07, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
    - .6    ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
    - .7    ASTM C1047-09, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
    - .8    ASTM C1178/C1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
    - .9    ASTM C1396/C1396M-09a, Standard Specification for Gypsum Wallboard.
  - .3    Association of the Wall and Ceilings Industries International (AWCI)
    - .1    AWCI Levels of Gypsum Board Finish-97.
  - .4    Canadian General Standards Board (CGSB)
    - .1    CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
    - .2    CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and

Metal Studs.

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|   | .5 | Green Seal Environmental Standards (GS)  |
|   | .1 | GS-11-2008, 2nd Edition, Paints and Coatings.  |
|   | .6 | South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards   |
|   | .1 | SCAQMD Rule 1113-A2007, Architectural Coatings.  |
|   | .2 | SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.   |
|   | .7 | Underwriters' Laboratories of Canada (ULC)   |
|   | .1 | CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.  |
| 1.2 ACTION AND INFORMATIONAL SUBMITTALS | .1 | Submit in accordance with Section 01 33 00 - Submittal Procedures.   |
|   | .2 | Product Data:  |
|   | .1 | Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations. |
|   | .3 | Samples:   |
|   | .1 | Submit for review and acceptance of each unit.   |
|   | .2 | Samples will be returned for inclusion into work.  |
|   | .3 | Submit duplicate 300 mm long samples of corner and casing beads shadow mould cornice cap textured finishes insulating strip.   |
| 1.3 DELIVERY, STORAGE AND HANDLING      | .1 | Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.  |
|   | .2 | Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.  |
|   | .3 | Storage and Handling Requirements:   |

- .1 Store gypsum board assemblies materials level off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
- .3 Protect from weather, elements and damage from construction operations.
- .4 Handle gypsum boards to prevent damage to edges, ends or surfaces.
- .5 Protect prefinished aluminum surfaces with wrapping strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
- .6 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

#### 1.4 AMBIENT CONDITIONS

- .1 Maintain temperature 10 degrees C minimum, 21 degrees C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 Standard board: to ASTM C1396/C1396M Type X, 16 mm thick, 1200 mm wide x maximum practical

- length, ends square cut, edges rounded squared bevelled.
- .2 Water-resistant board: to ASTM C1396/C1396M Type X, 16 mm thick, 1200mm wide x maximum practical length.
- .3 Metal furring runners, hangers, tie wires, inserts, anchors.
- .4 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .5 Resilient clips drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .6 Nails: to ASTM C514.
- .7 Steel drill screws: to ASTM C1002.
- .8 Stud adhesive: to CAN/CGSB-71.25 ASTM C557.
- .9 Laminating compound: as recommended by manufacturer, asbestos-free.
- .10 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .11 Cornice cap: 12.7 mm deep x partition width, of 1.6 mm base thickness galvanized sheet steel, prime painted. Include splice plates for joints.
- .12 Shadow mould: 35 mm high, snap-on trim, of 0.6 mm base steel thickness galvanized sheet pre-finished in satin enamel white colour.
- .13 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
  - .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.
  - .2 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .14 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .15 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as

required.

.16 Joint compound: to ASTM C475, asbestos-free.

## 2.2 FINISHES

.1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.

.1 Primer: VOC limit 50 g/L maximum to GS-11 SCAQMD Rule 1113.

## PART 3 EXECUTION

### 3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### 3.2 ERECTION

.1 Do application and finishing of gypsum board to ASTM C840 except where specified otherwise.

.2 Do application of gypsum sheathing to ASTM C1280.

.3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C840 except where specified otherwise.

.4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.5 Install work level to tolerance of 1:1200.

.6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.

- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across studs joists between the layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 38 mm common nail 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

### 3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply single layer gypsum board to wood and metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.
  - .1 Single-Layer Application:
    - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C840.
    - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
  - .3 Apply water-resistant Type X gypsum board in

washroom. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads.

- .4 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.
- .5 Apply board using stud adhesive on furring or framing laminating adhesive on base layer of gypsum board.
- .6 Install gypsum board on walls vertically to avoid end-butt joints. Install gypsum board with face side out.
- .7 Do not install damaged or damp boards.
- .8 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

#### 3.4 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install shadow mould at gypsum board/ceiling juncture. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.

- .7 Provide continuous polyethylene dust barrier behind and across control joints.
- .8 Locate control joints at changes in substrate construction at approximate 10 m spacing on long corridor runs.
- .9 Install control joints straight and true.
- .10 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .11 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .12 Splice corners and intersections together and secure to each member with 3 screws.
- .13 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .14 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .15 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
  - .1 Levels of finish:
    - .1 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
- .16 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .17 Fill screw head depressions with joint and taping compounds to bring flush with adjacent

surface of gypsum board so as to be invisible after surface finish is completed.

- .18 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .19 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .20 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .21 Mix joint compound slightly thinner than for joint taping.
- .22 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .23 Allow skim coat to dry completely.
- .24 Remove ridges by light sanding or wiping with damp cloth.

### 3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
  - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 3.6 PROTECTION

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

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| <u>1.1    RELATED<br/>SECTIONS</u>                  | .1 | Section 01 74 21 - Construction/Demolition Waste Management And Disposal.  |
|   | .2 | Section 09 21 16 - Gypsum Board Assemblies.  |
| <u>1.2    REFERENCES</u>                            | .1 | American Society for Testing and Materials International, (ASTM).  |
|   | .1 | ASTM C645-00, Specification for Nonstructural Steel Framing Members.   |
|   | .2 | ASTM C754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.   |
|   | .2 | Canadian General Standards Board (CGSB).   |
|   | .1 | CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.  |
|   | .3 | Environmental Choice Program (ECP).  |
|   | .1 | CCD-047a -98, Paints - Surface Coatings.   |
|   | .2 | CCD-048-98, Surface Coatings - Recycled Water-borne.   |
| <u>1.3    QUALITY<br/>ASSURANCE</u>                 | .1 | Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.  |
|   | .2 | Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.           |
| <u>1.4    WASTE<br/>MANAGEMENT AND<br/>DISPOSAL</u> | .1 | Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.  |
|   | .2 | Remove from site and dispose of packaging materials at appropriate recycling facilities.   |
|   | .3 | Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan. |
|   | .4 | Divert unused metal materials from landfill  |

to metal recycling facility approved by  
Departmental Representative.

- .5 Divert unused gypsum materials from landfill  
to recycling facility approved by  
Departmental Representative.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to  
ASTM C645, stud sizes indicated, roll formed  
from 0.91 mm thickness hot dipped galvanized  
steel sheet, for screw attachment of gypsum  
board lath. Knock-out service holes at 460 mm  
centres.
- .2 Floor and ceiling tracks: to ASTM C645, in  
widths to suit stud sizes, 32 mm flange  
height.
- .3 Metal channel stiffener:, 1.4 mm thick cold  
rolled steel, coated with rust inhibitive  
coating.
- .4 Acoustical sealant: to 07 92 00.
- .5 Insulating strip: rubberized, moisture  
resistant 3 mm thick foam strip, 12 mm wide,  
with self sticking adhesive on one face,  
lengths as required.

## PART 3 EXECUTION

### 3.1 ERECTION

- .1 Align partition tracks at floor and ceiling  
and secure at 600 mm on centre maximum.
- .2 Install damp proof course under stud shoe  
tracks of partitions on slabs on grade.
- .3 Place studs vertically at 400 mm on centre  
and not more than 50 mm from abutting walls,  
and at each side of openings and corners.  
Position studs in tracks at floor and  
ceiling. Cross brace steel studs as required  
to provide rigid installation to  
manufacturer's instructions.
- .4 Erect metal studding to tolerance of 1:1000.
- .5 Attach studs to bottom and ceiling track  
using screws.

- .6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .8 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .9 Install heavy gauge single jamb studs at openings and elsewhere as indicated.
- .10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- .13 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .14 Extend partitions to ceiling height except where noted otherwise on drawings.
- .15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50 mm leg ceiling tracks. Use double track slip joint as indicated.
- .16 Install continuous insulating strips to isolate studs from uninsulated surfaces.

- .17 Install two continuous beads of acoustical sealant insulating strip under studs and tracks around perimeter of sound control partitions.

### 3.2 CLEANING

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

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1.1    REFERENCES

- .1    American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
  - .1    ANSI/CTI A108.1-1999, Specification for the Installation of Ceramic Tile.
- .2    American Society for Testing and Materials International (ASTM)
  - .1    ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .2    ASTM C207-06, Standard Specification for Hydrated Lime for Masonry Purposes.
- .3    Canadian General Standards Board (CGSB)
  - .1    CAN/CGSB-8.1-M88, Sieves, Testing, Woven Wire, Metric.
  - .2    CAN/CGSB-25.20-95, Surface Sealer for Floors.
  - .3    CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
  - .4    CGSB 71-GP-29M-79, Adhesive, Elastomeric, for Installation of Quarry Tiles.
- .4    South Coast Air Quality Management District (SCAQMD), California State
  - .1    SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .5    Terrazzo, Tile and Marble Association of Canada (TTMAC)
  - .1    Tile Installation Manual 2006/2007.

1.2    SUBMITTALS

- .1    Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
- .3    Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .1    Submit duplicate 600 x 600 mm sample panels of each colour, texture, size and pattern of quarry tile.
  - .2    Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

1.3 DELIVERY,  
STORAGE AND  
HANDLING

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- .1 Packing, shipping, handling and unloading:
  - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Deliver, store and handle products in manner to avoid damage.
  - .3 Have materials delivered to job site just prior to installation.
  - .4 Deliver products to job site in manufacturer's unopened cartons with labels intact and legible.
  - .5 Keep cartons dry and protected from vandalism and away from heavy traffic areas.
  - .6 Store cartons in upright position.
  - .7 Handle furan resin mortar and grout with care and abide by safety labels found on each unit and product MSDS's.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of materials.

1.4 AMBIENT  
CONDITIONS

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- .1 Ventilation:
  - .1 Provided continuously during and after installation. Run system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of installation.
  - .2 Ventilate enclosed spaces.
- .2 Temperature:
  - .1 Maintain ambient temperature of not less than 12 degrees C from 72 hours before installation until fully cured.
  - .2 Maintain ambient temperature of not less than 5 degrees C from 72 hours before installation until fully cured.
  - .3 Maintain ambient temperature of not less than 20 degrees C or above 35 degrees C from 72 hours before installation until fully cured.

- 1.5 MAINTENANCE      .1    Extra Materials:
- .1    Provide minimum 2% of each type and colour of quarry tile required for project maintenance use. Store where directed.
  - .2    Maintenance material same production run as installed material.

PART 2      PRODUCTS

- 2.1 TILES AND PAVERS      .1    Quarry tile: porcelain unglazed quarry tile to CAN/CGSB-75.1, Type 4, Class MR 5, 300 x 300 x 8-9 mm thickness size, colour through the full thickness plain textured face, to match existing cushioned edges, colour to match existing as selected by Departmental Representative. Matching coved base, 300 x 100 mm high.

- 2.2 MORTAR AND ADHESIVE MATERIALS      .1    Cement: to CAN/CSA-A3000.
- .2    Sand:
- .1    Crushed or pit run consisting of hard durable particles free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
  - .2    Gradations to be within limits specified when tested to ASTM C136. Sieve sizes to CAN/CGSB-8.1.
  - .3    Table:

Sieve Designation	% Passing
4.75 mm	100
2.36 mm	95-100
1.18 mm	60-100
0.600 mm	35-80
0.300 mm	15-50
0.150 mm	2-15
0.075 mm	0-5
  - .4    Hydrated lime: to ASTM C207.
  - .5    Latex additive: formulated for use in cement mortar.
  - .6    Water: potable and free of minerals which are detrimental to mortar and grout mixes.
  - .7    Dry set mortar:
    - .1    To ANSI A108.1
    - .2    Water retentive cement mortar.

- .8 Elastomeric adhesive: to CGSB 71-GP-29M.
- .9 Modified Mortar adhesive: to CGSB 71-GP-30M, Type 2.
- .10 Adhesives: in accordance with Section 07 92 00 - Joint Sealants.
  - .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.
- .11 Colour pigment: non fading mineral oxides, unaffected by lime or cement and which will not stain tile.

#### 2.3 GROUT

- .1 Cement grout: to ANSI/CTI A108.1.
- .2 Grout preparation: to manufacturer's instructions.

#### 2.4 ACCESSORIES

- .1 Reinforcing mesh: 50 x 50 x 1.6 mm galvanized steel wire mesh.
- .2 Divider strips: brass with fill depth.
- .3 Cleavage plane: polyethylene film to CAN/CGSB-51.34, type 2, 0.10 mm thick.
- .4 Floor sealer: to CAN/CGSB 25.20, Type 1:
- .5 Protective coating: to tile and grout manufacturer's recommendations.

#### 2.5 MIXES

- .1 Scratch coat: 1 part cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand.
- .2 Slurry bond coat: cement and water mixed to creamy paste. Latex additive may be included.
- .3 Mortar bed for floors: 1 part cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.
- .4 Levelling coat: 1 part cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water, including latex additive.
- .5 Bond or setting coat: 1 part cement, 1/3 part hydrated lime, 1 part water.
- .6 Mortar ingredients: measured by volume.
- .7 Dry set mortar: mix ed to manufacturer's

instructions.

- .8 Adhesives: in accordance with Section 07 92 00 - Joint Sealants.
  - .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.
- .9 Organic Adhesive:
  - .1 Pre-mixed.
  - .2 Type I Type II.
  - .3 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.
- .10 Modified mortar adhesive: mixed to manufacturer's instructions.
  - .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.

### PART 3 EXECUTION

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|---------------------------------|----|---|
| 3.1 MANUFACTURER'S INSTRUCTIONS | .1 | Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets. |
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| 3.2 WORKMANSHIP | .1 | Do tile work in accordance with TTMAC Tile Installation Manual 2006/2007.  |
|                 | .2 | Apply mortar bed or bond coat to clean and sound surfaces.   |
|                 | .3 | Fit tile units around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Make cut edges smooth and even. |
|                 | .4 | Maximum surface tolerance: 1:800.  |
|                 | .5 | Make joints between tiles uniform and approximately 6 mm wide, plumb, straight, true, even and with adjacent units flush. Align patterns.                |
|                 | .6 | Lay out units so perimeter tiles are minimum 1/2 size.   |
|                 | .7 | Sound tiles after setting and replace hollow sounding units to obtain full bond.   |
|                 | .8 | Make internal angles square, external angles   |

bullnosed.

- .9 Construct base 100 mm high with bullnosed top edge.
- .10 Use bullnose edged tiles at termination of wall tiles, except where tiles but projecting surface or differing plane.
- .11 Install divider strips at junction of tile flooring and dissimilar material.
- .12 Clean installed tile surfaces after installation cured.
- .13 Keep building expansion joints free of mortar or grout.

### 3.3 SETTING SYSTEM

- .1 Install tile and bases on substrate in accordance with TTMAC detail 200-15.

### 3.4 CONTROL JOINTS

- .1 Provide control joints 6 mm wide at 5000 mm intervals each way in all heated areas where indicated.
- .2 Provide control joints around perimeter of large areas, around columns, in locations where area changes direction and where tile abuts other hard material. Place control joints directly over subfloor expansion/control joints.
- .3 Provide control joints for exterior areas at 3600 mm intervals each way where indicated. Minimum width of control joints 10 mm.
- .4 Fill joints with sealant.

### 3.5 FLOOR SEALER AND PROTECTIVE COATING

- .1 Apply 2 coats in accordance with manufacturer's printed instructions.

### 3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.

### 3.7 PROTECTION

- .1 Protect new floors until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation

PART 1        GENERAL

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| <u>1.1    SUMMARY</u>        | .1    Section Includes:   |
|                              | .1    Materials and application of acoustical units for direct application or for application and installation within a suspended ceiling.            |
|                              | .2    Related Sections:   |
|                              | .1    Section 01 33 00 - Submittal Procedures.  |
|                              | .2    Section 01 35 30 - Health and Safety Requirements.  |
|                              | .3    Section 01 35 43 - Environmental Procedures.  |
|                              | .4    Section 01 45 00 - Testing and Quality Control.   |
|                              | .5    Section 01 74 21 - Construction/Demolition Waste Management and Disposal.   |
|                              | .6    Section 01 78 00 - Closeout Submittals.   |
|                              | .7    Section 09 53 00 - Acoustical Suspension: Suspension system.  |
| <br><u>1.2    REFERENCES</u> | <br>.1    American Society for Testing and Materials International (ASTM)   |
|                              | .1    ASTM C423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method                     |
|                              | .2    ASTM E1264-98, Standard Classification for Acoustical Ceiling Products.   |
|                              | .3    ASTM E1477-98a(2003), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers. |
|                              | .2    Canadian General Standards Board (CGSB)   |
|                              | .1    CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction and Amendment No. 1 1988.                              |
|                              | .2    CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.   |
|                              | .3    Canadian Standards Association (CSA International)  |
|                              | .1    CSA B111-1974(R2003), Wire Nails, Spikes and Staples.   |
|                              | .4    Department of Justice Canada (Jus)  |

- .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
    - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
  - .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).
  - .6 Underwriter's Laboratories of Canada (ULC)
    - .1 CAN/ULC-S102-2003, Surface Burning Characteristics of Building Materials and Assemblies.
- 1.3 SUBMITTALS
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Submit duplicate half size samples of each type acoustical units.
- 1.4 QUALITY ASSURANCE
  - .1 Health and Safety:
    - .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.
- 1.5 DELIVERY, STORAGE AND HANDLING
  - .1 Protect on site stored or installed absorptive material from moisture damage.
  - .2 Store extra materials required for maintenance, where directed by Departmental Representative.
  - .3 Waste Management and Disposal:
    - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction /Demolition Waste Management and Disposal .
    - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
    - .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
    - .4 Separate for recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste

Management Plan.

- .5 Place materials defined as hazardous or toxic in designated containers in accordance with Section 01 35 43 - Environmental Procedures.
- .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
- .7 Ensure emptied containers are sealed and stored safely in accordance with Section 01 35 43 - Environmental Procedures.
- .8 Fold up metal and plastic banding, flatten and place in designated area for recycling.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

- .1 Permit wet work to dry before beginning to install.
- .2 Maintain uniform minimum temperature of 15 degrees C and humidity of 20 -40 % before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

#### 1.7 EXTRA MATERIALS

- .1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide acoustical units amounting to 2 % of gross ceiling area for each pattern and type required for project.
- .3 Ensure extra materials are from same production run as installed materials.
- .4 Clearly identify each type of acoustic unit, including colour and texture.
- .5 Deliver to Departmental Representative, upon completion of the work of this section.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 Acoustic units for suspended ceiling system:

to CAN/CGSB-92.1 ASTM E1264.

- .1 Type 1.
- .2 Class A.
- .3 Ecolabel certified Cellulose fibre with minimum 75 % recycled content.
- .4 Pattern fissured, Class A .
- .5 Textures: medium.
- .6 Flame spread rating of 25 or less in accordance with CAN/ULC-S102.
- .7 Smoke developed 50 or less in accordance with CAN/ULC-S102.
- .8 Noise Reduction Coefficient (NRC) designation of 70. Sound Absorption Average (SAA) of 0.9 to ASTM C423.
- .9 Edge type square edge.
- .10 Colour white.
- .11 Size 19 x 600 x 1200 mm thick.
- .12 Shape flat.
- .2 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.
- .3 Polyethylene: to CAN/CGSB-51.34, 0.15 mm thick.

### PART 3 EXECUTION

- |                                      |    |  |
|--------------------------------------|----|--|
| <u>3.1 EXAMINATION</u>               | .1 | Do not install acoustical panels and tiles until work above ceiling has been inspected by Departmental Representative. |
| <u>3.2 INSTALLATION</u>              | .1 | Install acoustical panels and tiles in ceiling suspension system.  |
|                                      | .2 | Install fibrous acoustical media above suspended tiles where indicated.  |
| <u>3.3 APPLICATION</u>               | .1 | Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.                          |
| <u>3.4 INTERFACE WITH OTHER WORK</u> | .1 | Co-ordinate with Section 09 53 00- Acoustical Suspension.  |
|                                      | .2 | Co-ordinate ceiling work to accommodate components of other sections, such as light                                    |

fixtures, diffusers, speakers, sprinkler  
heads, to be built into acoustical ceiling  
components.

PART 1        GENERAL

1.1    RELATED        .1    Section 09 51 13 - Acoustical Panel Ceilings.  
REQUIREMENTS

1.2    REFERENCES     .1    ASTM International

                         .1    ASTM C635/C635M-07, Standard  
   Specifications for the Manufacture,  
   Performance and Testing of Metal  
   Suspension Systems for Acoustical Tile  
   and Lay-In Panel Ceilings.

                         .2    ASTM C636/C636M-08, Standard Practice  
   for Installation of Metal Ceiling  
   Suspension Systems for Acoustical Tile  
   and Lay-In Panels.

                         .2    Health Canada/Workplace Hazardous Materials  
   Information System (WHMIS)

                                 .1    Material Safety Data Sheets (MSDS).

1.3    ACTION AND     .1    Submit in accordance with Section 01 33 00 -  
INFORMATIONAL     Submittal Procedures.

SUBMITTALS        .2    Product Data:

                         .1    Submit manufacturer's instructions,  
   printed product literature and data  
   sheets for acoustical suspension and  
   include product characteristics,  
   performance criteria, physical size,  
   finish and limitations.

                         .3    Shop Drawings:

                                 .1    Submit reflected ceiling plans for  
   special grid patterns as indicated.

                                 .2    Indicate lay-out, insert and hanger  
   spacing and fastening details, splicing  
   method for main and cross runners,  
   location of access splines change in  
   level details, access door dimensions,  
   and locations and acoustical unit  
   support at ceiling fixture lateral  
   bracing and accessories.

                         .4    Samples:

                                 .1    Submit for review and acceptance of each  
   unit.

                                 .2    Samples will be returned for inclusion  
   into work.

                                 .3    Submit one representative model of each

type ceiling suspension system.

- .4 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

#### 1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for acoustical suspension for incorporation into manual.

#### 1.5 QUALITY ASSURANCE

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

#### 1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect acoustical ceiling tiles and tracks from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and

Disposal.

## PART 2 PRODUCTS

- |                     |    |   |
|---------------------|----|---|
| 2.1 DESIGN CRITERIA | .1 | Design Requirements: maximum deflection: 1/360th of span to ASTM C635/ASTM C635M deflection test. |
|---------------------|----|---|
- 
- |               |    |  |
|---------------|----|--|
| 2.2 MATERIALS | .1 | Intermediate duty system to ASTM C635/ASTM C635M.  |
|               | .2 | Basic materials for suspension system: commercial quality cold rolled steel zinc coated aluminum sheet mill finished.  |
|               | .3 | Suspension system: non fire rated, made up as follows: <ul style="list-style-type: none"><li>.1 2 directional exposed tee bar grid.</li><li>.2 Concealed H runner, tee spline and flat steel spline.</li></ul>   |
|               | .4 | Exposed tee bar grid components: shop painted satin sheen white. Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection. |
|               | .5 | Hanger wire: galvanized soft annealed steel wire: <ul style="list-style-type: none"><li>.1 3.6 mm diameter for access tile ceilings.</li><li>.2 2.6 mm diameter for other ceilings.</li></ul>  |
|               | .6 | Hanger inserts: purpose made.  |
|               | .7 | Carrying channels: 38 mm channel, of galvanized steel.   |
|               | .8 | Accessories: splices, clips, wire ties, retainers and wall moulding flush reveal, to complement suspension system components, as recommended by system manufacturer.   |

## PART 3 EXECUTION

- |                 |    |  |
|-----------------|----|--|
| 3.1 EXAMINATION | .1 | Verification of Conditions: verify conditions of substrates previously installed under |
|-----------------|----|--|

other Sections or Contracts are acceptable for acoustical ceiling tile and track installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### 3.2 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Installation: to ASTM C636/C636M except where specified otherwise.
- .3 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.
- .4 Do not erect ceiling suspension system until work above ceiling has been inspected and approved by Departmental Representative.
- .5 Secure hangers to overhead structure using attachment methods as indicated acceptable to Departmental Representative.
- .6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .7 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width system according to reflected ceiling plan.
- .8 Ensure suspension system is co-ordinated with location of related components.
- .9 Install wall moulding to provide correct ceiling height.
- .10 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.

- .11 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .12 Interlock cross member to main runner to provide rigid assembly.
- .13 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .14 Install access splines to provide 10% ceiling access.
- .15 Finished ceiling system to be square with adjoining walls and level within 1:1000.

### 3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Touch up scratches, abrasions, voids and other defects in painted surfaces.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 3.4 PROTECTION

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

PART 1        GENERAL

1.1    SUMMARY

- .1    Section Includes:
  - .1    Material and installation of site applied paint finishes to new interior surfaces, including site painting of shop primed surfaces.
  - .2    Sustainable requirements for construction and verification:
- .2    Related Sections:
  - .1    Section 01 33 00 - Submittal Procedures.
  - .2    Section 01 35 30 - Health and Safety Requirements.
  - .3    Section 01 45 00 - Testing and Quality Control.
  - .4    Section 01 61 00 - Common Product Requirements.
  - .5    Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .6    Section 01 78 00 - Closeout Submittals.

1.2    REFERENCES

- .1    Department of Justice Canada (Jus)
  - .1    Canadian Environmental Protection Act (CEPA), 1999, c. 33
- .2    Environmental Protection Agency (EPA)
  - .1    EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3    Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1    Material Safety Data Sheets (MSDS).
- .4    Master Painters Institute (MPI)
  - .1    MPI Architectural Painting Specifications Manual, 2004.
- .5    National Fire Code of Canada - 1995
- .6    Society for Protective Coatings (SSPC)
  - .1    SSPC Painting Manual, Volume Two,

8th Edition, Systems and  
Specifications Manual.

- .7 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

### 1.3 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
  - .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

### 1.4 SCHEDULING

- .1 Submit work schedule for various stages of painting to Departmental Representative for review. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Departmental Representative for changes in work schedule.
- .3 Schedule painting operations to prevent disruption of occupants.

### 1.5 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit product data and instructions for each paint and coating product to be used.
  - .2 Submit product data for the use and application of paint thinner.

- .3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application and curing.
- .3 Samples:
  - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
  - .2 Submit duplicate 200 x 300 mm sample panels of each paint stain clear coating special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm birch plywood for finishes over wood surfaces.
    - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
  - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
  - .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
    - .1 Lead, cadmium and chromium: presence of and amounts.
    - .2 Mercury: presence of and amounts.
    - .3 Organochlorines and PCBs: presence of and amounts.
  - .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with

- 
- specified performance characteristics and physical properties.
  - .6 Manufacturer's Instructions:
    - .1 Submit manufacturer's installation and application instructions.
  - .7 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
    - .1 Product name, type and use.
    - .2 Manufacturer's product number.
    - .3 Colour numbers.
    - .4 MPI Environmentally Friendly classification system rating.
- 
- |                        |   |
|------------------------|---|
| <u>1.6 MAINTENANCE</u> | .1 Extra Materials: <ul style="list-style-type: none"><li>.1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.</li><li>.2 Quantity: provide - one four litre can of each type and colour of primer stain finish coating. Identify colour and paint type in relation to established colour schedule and finish system.</li><li>.3 Delivery, storage and protection: comply with Departmental Representative requirements for delivery and storage of extra materials.</li></ul> |
|------------------------|---|
- 
- |   |   |
|---|---|
| <u>1.7 DELIVERY, STORAGE AND HANDLING</u> | .1 Packing, Shipping, Handling and Unloading: <ul style="list-style-type: none"><li>.1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.</li></ul> |
|   | .2 Acceptance at Site: <ul style="list-style-type: none"><li>.1 Identify products and materials with labels indicating:</li></ul>   |

- .1 Manufacturer's name and address.
  - .2 Type of paint or coating.
  - .3 Compliance with applicable standard.
  - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
  - .1 Provide and maintain dry, temperature controlled, secure storage.
  - .2 Store materials and supplies away from heat generating devices.
  - .3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.
- .8 Fire Safety Requirements:
  - .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
  - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
  - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .9 Waste Management and Disposal:
  - .1 Separate waste materials for reuse

- and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal .
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
  - .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
  - .4 Separate for recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan (WMP).
  - .5 Place materials defined as hazardous or toxic in designated containers.
  - .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
  - .7 Ensure emptied containers are sealed and stored safely.
  - .8 Unused paint coating materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.
  - .9 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
  - .10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
  - .11 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
  - .12 To reduce the amount of contaminants entering waterways,

sanitary/storm drain systems or into ground follow these procedures:

- .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
- .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
- .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
- .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .14 Set aside and protect surplus and uncontaminated finish materials: Deliver to or arrange collection by organizations for verifiable re-use or re-manufacturing.

#### 1.8 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
  - .1 Ventilate enclosed spaces.
  - .2 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
  - .3 Provide continuous ventilation for seven days after completion of application of paint.
  - .4 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.

- .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless pre-approved written approval by specifying body and product manufacturer, perform no painting when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
    - .4 The relative humidity is under 85 % or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
    - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
    - .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand

- 'normal' adverse environmental factors.
- .2 Perform painting work when maximum moisture content of the substrate is below:
  - .1 Allow new concrete and masonry to cure minimum of 28 days.
  - .2 15 % for wood.
  - .3 12 % for plaster and gypsum board.
- .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
  - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
  - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
  - .3 Apply paint when previous coat of paint is dry or adequately cured.
- .4 Additional interior application requirements:
  - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
  - .2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 Paint materials listed in the MPI

Approved Products List (APL) are acceptable for use on this project.

- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .6 Provide paint products meeting MPI "Environmentally Friendly", E2 ratings based on VOC (EPA Method 24) content levels.
- .7 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
- .8 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
  - .1 Water-based Water soluble Water clean-up.
  - .2 Non-flammable biodegradable.
  - .3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
  - .4 Manufactured without compounds which contribute to smog in the lower atmosphere.
  - .5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .9 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

- .10 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .11 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
  - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .12 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .13 Recycled water-borne surface coatings to contain 50 % post-consumer material by volume.
- .14 Recycled water-borne surface coatings must not contain:
  - .1 Lead in excess of 600.0 ppm weight/weight total solids.
  - .2 Mercury in excess of 50.0 ppm weight/weight total product.
  - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
  - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
  - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

## 2.2 COLOURS

- .1 Departmental Representative will provide Colour Schedule after Contract award.
- .2 Colour schedule will be based upon selection of three base colours and three accent colours. No more than six

colours will be selected for entire project and no more than three colours will be selected in each area.

- .3 Selection of colours from manufacturer's full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

### 2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Departmental Representative for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

### 2.4 GLOSS/SHEEN RATINGS

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

	Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level 1 - Matte Finish (flat)	Max. 5	Max. 10
Gloss Level 2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

- .2 Gloss level ratings of painted surfaces as indicated and as noted on Finish

Schedule.

2.5 INTERIOR  
PAINTING SYSTEMS

- .1 Concrete vertical surfaces: including horizontal soffits:
  - .1 INT 3.1A - Latex insert gloss level 6-5 finish (over sealer).
- .2 Concrete horizontal surfaces: floors:
  - .1 INT 3.2B - Alkyd floor enamel gloss low gloss finish.
- .3 Concrete masonry units:
  - .1 INT 4.2A - Latex insert gloss level 6-5 finish.
- .4 Structural steel and metal fabrications: columns, beams, joists:
  - .1 INT 5.1A - Quick dry enamel semi-gloss finish.
- .5 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
  - .1 INT 5.3A - Latex insert gloss level 65 finish.
- .6 Dimension lumber: columns, beams, exposed joists, underside of decking:
  - .1 INT 6.2A - Latex insert gloss level 65 finish (over alkyd primer).
- .7 Dressed lumber: including doors, door and window frames, casings, mouldings:
  - .1 INT 6.3A - High performance architectural latex insert gloss level 65 finish.
- .8 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
  - .1 INT 9.2A - Latex insert gloss level 64 finish (over latex sealer).

2.6 SOURCE  
QUALITY CONTROL

- .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
  - .1 Lead, cadmium and chromium are to

be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

### PART 3 EXECUTION

#### 3.1 MANUFACTURER'S INSTRUCTIONS

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

#### 3.2 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

#### 3.3 EXAMINATION

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

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:

.1 Stucco, plaster and gypsum board:

12%.

.2 Concrete: 12%.

.3 Clay and Concrete Block/Brick:  
12%.

.4 Wood: 15%.

### 3.4 PREPARATION

#### .1 Protection:

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

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect passing pedestrians, building occupants and general public in and about the building.

#### .2 Surface Preparation:

.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.

.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.

#### .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and other surface debris by vacuuming,

- wiping with dry, clean cloths or compressed air.
- .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
- .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
- .4 Allow surfaces to drain completely and allow to dry thoroughly.
- .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
- .6 Use trigger operated spray nozzles for water hoses.
- .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Clean following surfaces with high pressure water washing.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
  - .2 Apply wood filler to nail holes and cracks.
  - .3 Tint filler to match stains for stained woodwork.
- .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from

a distance up to 1000 mm.

- .8 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.
- .9 Touch up of shop primers with primer as specified.
- .10 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.
- .11 Prime existing oil painted surfaces prior to application of latex finishes.

### 3.5 APPLICATION

- .1 Method of application to be as approved by Departmental Representative. Apply paint by brush roller airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
  - .2 Work paint into cracks, crevices and corners.
  - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
  - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
  - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators

- and gauges.
- .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
- .4 Brush out immediately all runs and sags.
- .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.
- .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/  
ELECTRICAL  
EQUIPMENT

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- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with

colour and finish to match adjacent surfaces, except as indicated.

- .2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint fire protection piping red.
- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .11 Do not paint interior transformers and substation equipment.

### 3.7 SITE TOLERANCES

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across

full surface area.

3.8 FIELD  
QUALITY CONTROL

- .1 Interior painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and local Painting Contractor's Association. Painting contractor shall notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
- .2 Interior surfaces requiring painting shall be inspected by Paint Inspection Agency who shall notify Departmental Representative in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
- .3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer shall provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.
- .4 Standard of Acceptance:
  - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
  - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
  - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .5 Field inspection of painting operations to be carried out by independent inspection firm as designated by Departmental Representative.

- .6 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .7 Cooperate with inspection firm and provide access to areas of work.
- .8 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

### 3.9 RESTORATION

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