



# 2016-2018 TERRAZZO SPECIFICATION GUIDE 096600

Includes:

- 09 66 13 Portland Cement Terrazzo
- 09 66 23. 13 Polyacrylate Modified Cement Terrazzo

- 09 66 23. Epoxy Resin Thin-Set Terrazzo
- Restoration of Terrazzo

TERRAZZO, TILE AND MARBLE ASSOCIATION OF CANADA  
L'ASSOCIATION CANADIENNE DE TERRAZZO, TUILE ET MARBRE

2016-2018

Terrazzo Specification Guide 09 66 00



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#### SPECIFICATIONS AND GUIDES

Produced by the Terrazzo, Tile and Marble Association of Canada

Specification Guide 09300 Tile Installation Manual\*  
Terrazzo Specification Guide 09 66 00\*  
Terrazzo Color Plates\*  
Maintenance Guide\*  
Dimensional Stone Guide

As the members of TTMAC are continually striving to maintain and improve the standards of the industry, specifications are subject to revision at any time.

## PROFILE OF TTMAC

The Terrazzo, Tile and Marble Association of Canada was founded in 1944. Its mandate was to develop a method of standardizing terrazzo, tile and stone installation techniques, as well as being a technical resource and liaison for architects, designers, engineers and trade installers.

### ASSOCIATION ACTIVITIES & BENEFITS

- Produces and distributes trade specification guidelines.
- Sets standards for installation methods used in the industry.
- Promotes technical research on new materials and techniques.
- Maintains an up-to-date library resource centre.
- Encourages development of new technology and products.
- Is a door to the industry in Canada with a global outlook.
- Publishes newsletters, maintains and circulates an annual Membership Directory and Buyers' Guide.
- Liaisons with other associations, government departments, trade magazines, trade commissions, and those interested in sharing information for the good of the industry.
- Offers independent arbitration of complaints and site inspections.
- Promotes an annual convention, seminars and workshops.
- Provides general information to architects, specifiers, engineers, contractors, designers and the building industry in general.
- Encourages and promotes the installation of terrazzo, tile, natural stone and other dimensional stone products and related materials.
- Promotes quality workmanship and materials from TTMAC members.
- Assists in setting standards and distributes information to further develop education in the Hardsurface industry.
- Provides systems analysis using the Universal Floor Tester (ASTM C-627)
- Provides ongoing product seminars
- Highlights the hard surface industry through publication of the Hardsurface Magazine
- Offers specification and jobsite assistance through the Verispec program

### SPECIFICATION STUDY ON TERRAZZO

The Terrazzo, Tile and Marble Association of Canada provides this Terrazzo Specification Guide 09 66 00 to assist in clarifying and standardizing installation specifications for terrazzo and related products.

It is the responsibility of the architect/specifier or qualified consultant to clearly specify in detail the requirements for the complete installation of terrazzo products, systems, related sections, warranty and guarantees.

This guide refers to the usual circumstances relating to terrazzo installations. In the case of circumstances out of the ordinary, we suggest that you consult the TTMAC. The scope of work and methods of installation may vary by site conditions and from region to region.

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## ACKNOWLEDGEMENTS

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This guide supercedes 09 66 00 (2007)

## TABLE OF CONTENTS

	Page
Introduction - Understanding Terrazzo	5
Terrazzo Types	7
Divider Strips	7
Aggregate Chips	8
Colour Selection	9
Environmental Conditions	9
Flatness Tolerance	9
Pinholes	9
Finish Thickness & Weight Allowance	10
Waterproof Membranes	10
Crack Isolation Membranes	10
Coefficient of Friction/Slip Resistance (COF)	10
Metric Conversion Guide	11
Movement Joints for Terrazzo Installations	12
Section 09410/096613 Portland Cement Terrazzo	13 - 22
410F-2016 Portland Cement Terrazzo Bonded to Concrete Slab	23
411F-2016 Portland Cement Terrazzo Floating System	24
412F-2016 Portland Cement Terrazzo Epoxy Bonded to Concrete Slab	25
413F-2016 Portland Cement Venetian Terrazzo Bonded to Concrete Slab	26
414F-2016 Rustic Portland Cement Terrazzo – Interior/Exterior	27
415W-2016 Portland Cement Terrazzo on Vertical Surfaces	29
416B-2016 Portland Cement Terrazzo Base Poured in Place Cove Base	30
417S-2016 Poured in Place Terrazzo Stairs	31
418F-2016 Palladiana Terrazzo on Cement Mortar Bed on Concrete Slab	33
420P-2016 Precast Terrazzo Stairs, Base and Window Sills	36
Section 09420/096623 Thin-Set Epoxy Terrazzo	38 - 45
440F-2016 Epoxy Resin Thin-Set Terrazzo Bonded to Concrete Slab	46
441B-2016 Poured in Place Epoxy Resin Thin-Set Terrazzo Base – Interior	48
442S-2016 Poured in Place Epoxy Resin Thin-Set Terrazzo Stairs - Interior	49
443B-2016 Precast Epoxy Resin Thin-Set Base	51
Section 09440/096623.13 Polyacrylate Modified Cement Terrazzo	52 - 51
444F-2016 Polyacrylate Modified Cement Installed Over Underbed – Direct Bond to Concrete Slab	58
445B-2016 Poured in Place Polyacrylate Modified Cement Terrazzo Base	60
446S-2016 Poured in Place Polyacrylate Modified Cement Terrazzo Stairs	61
Surface Restoration of Terrazzo	63
Repairing Cracks in Terrazzo page to be included	
Glossary of Terms	66 - 68

For maintenance guidelines, refer to the latest edition of the TTMAC Hardsurface Maintenance Guide

## Understanding Terrazzo

Several hundred years ago in Venice, Italy a flooring system was created that has withstood the test of time and is still in use today. Terrazzo, from the Italian word terrace, was discovered by Venetian workers who found another use for discarded marble remnants created from odd size pieces of custom marble fabrications. It was recognized as a craft in 1579 by the Supreme Institution of the Venetian Republic. Prior to that time it was considered art and people practicing this were part of a minor branch of the art of the "murieri". In that year the "Mariegola dei Terrazeri" was drawn up that contained a list of apprentices or persons qualified for the construction of terrazzo floors. As a form of art, terrazzo was used in stately buildings from numerous palaces across Europe for Kings and Princesses to the Vatican and during the late 1700's the craft was brought to North America by skilled European immigrants.

Technological advancements in both installation techniques and range of available aggregates have impacted terrazzo, but the beauty, elegance and durability still exists today. From these roots of antiquity, today terrazzo is considered a contemporary flooring choice for use in buildings of our time. Over the past few years the appearance of terrazzo has been updated with new colours, natural aggregate, glass aggregate and the addition of metal particles or components. Combined with the improvements in the installation process and new equipment for grinding and polishing, terrazzo has experienced a revival as a choice floor system for heavy commercial areas or to create special effects in almost any application.

### Terrazzo Types

Although terrazzo offers the same general appearance, the system may in fact be different beyond what you can see. There are several types of terrazzo systems that are first categorized by the binder type that holds aggregates together like cement, acrylic (polyacrylate) or epoxy. Within the cement category, there are varying systems that have different overall thicknesses ranging from 12 mm to 75 mm and are defined by the under bed layer. Each system offers benefits and functions that may be required for different construction methods. These systems and types include: Floating, Bonded, Epoxy bonded, Semi-Venetian, Venetian and Rustic.

During the 1960's the introduction of epoxy and acrylic binder compounds led to the development of thin-set terrazzo with thicknesses ranging from 6 mm to 10 mm. These systems are lightweight, easier and faster to install and because of their thin profile they are ideally suited for renovation or rehabilitation work. For new construction, other finishes such as tile or carpet can easily be placed adjacent without the need to depress the concrete base slab. Advancements in polymer resin technology resulted in these systems being solvent free with virtually no odor, therefore, much more user friendly than the original. Since 1998 these systems have seen a significant increase in usage in Canada and throughout the United States.

### Colours and Aggregates

The binder that holds all aggregate particles together can be pigmented to almost any colour and with the ever increasing use of epoxy as the binder, the spectrum of colour and accuracy is unlimited. Nature's pallet of colour is available from marble aggregates that are sourced within North America or Europe. Other aggregates like granite or washed, screened and graded stones can also be incorporated into terrazzo. Coloured or recycled glass can be added to epoxy terrazzo in varying proportions or can be used exclusively. The use of glass allows the designer to incorporate unique or bold colours that are not available with marble aggregate colours for accents or special effects. Crushed sheet mirror or manufactured mirror particles that are available in different colours may be used to create sparkle or depth to terrazzo. Metal shapes, letters, or filings can also be incorporated into terrazzo for additional effects. The combination of new and recycled materials allows for virtually any design, pattern or image that is limited only by the imagination.

### Advancements

Terrazzo has undergone many changes since its discovery, from installation techniques, to types of strips used. Divider strips originally consisted of wood that was used for shrinkage control that were later removed and filled with a mortar and finer marble chips. This method was later replaced with the placement of 19 mm x 19 mm marble mosaic strips that remained in the terrazzo surface. During the 1920's metal divider strips became available and continue to be used today in many different types of thicknesses and metal choices like zinc, aluminum or brass. Plastic strips were introduced through the mid seventies and offer a choice of colour to complement the overall design.

By far one of the greatest improvements has occurred in the grinding procedure. From a manual process using a wooden pole with an abrasive stone attached to one end, referred to as a "Galera" this process was mechanized during the 1920's to include rotary abrasive stones and plenty of water. Since 2000 this process has been significantly improved with the use of diamond abrasive stones in a dry process. This advancement has had considerable impact because it has greatly reduced the time required for grinding. Furthermore, the "pacerina" or residual slop has been eliminated and dust particles generated from grinding are captured with high powered vacuum units with efficient filters. Although wet grinding may still be necessary for polishing, the time saving and residual slop has been dramatically reduced.

The floating terrazzo system that ranges up to 75 mm is designed to prevent or suppress the transmission of cracks that may form in the concrete base slab. This crack suppression concept has been adopted by thin-set epoxy type systems and has recently led to the development of crack suppressant membranes. These liquid applied membranes suppress the transmission of cracks that may occur in concrete and are directly bonded to the concrete base slab prior to the installation of an epoxy terrazzo system.

#### Maintenance and Life Cycle

Terrazzo has always been valued for its durability and subtle beauty. From its ancient beginnings, terrazzo has been used for floors in commercial buildings, hospitals, offices, churches, and airports and was considered the flooring material of choice in the commercial buildings industry of the 1950's and early 1960's. Independent studies have shown that when initial cost, replacement and maintenance costs are considered over a period of ten years the cost of terrazzo is less than most other floor finishes. When the same criteria is looked at over a 40 year period, the cost of terrazzo is significantly less than most other floor finishes.

Terrazzo, the floor that was invented centuries ago and walked upon by everyone has been updated in appearance and new technologies have been applied to it, so that it is faster and easier to install and appeals to current design trends. It is being used on many projects from small areas to create special effects to large mega projects like the new Terminal Building at Pearson International Airport. With the recent developments, colour options and aggregate choices, there are more applications available for terrazzo than ever before.

## Terrazzo Types

Over the years, terrazzo has evolved to utilize different types of compounds to bind aggregates together. The type of binder, method of installation or size of the aggregate define the terrazzo type. Some of the common terrazzo types are as follows:

### 1. Portland Cement Terrazzo

- Bonded Terrazzo
- Floating Terrazzo
- Epoxy Bonded
- Venetian Terrazzo
- Palladiana Terrazzo
- Rustic Terrazzo
- Terrazzo on Vertical Surfaces

### 2. Precast Terrazzo

- Portland Cement
- Epoxy Resin
- Stairs
- Bases
- Window Sills

### 3. Epoxy Resin Thin Set Terrazzo

### 4. Polyacrylate Modified Cement Terrazzo

## Divider Strips

Divider strips are available in different metals such as aluminum, white alloy of zinc and brass, or in colored plastic which is limited due to extend lead time as a result of availability. They are also available in thin or heavy gauge type and are available in 2 mm, 3 mm or 6 mm widths and 6 mm to 32 mm in depth. The standard length of floor divider strips is 1800 mm however, aluminum type strips are available in 2720 mm lengths. Divider strips are available in L or T profiles. The function of a divider strip varies with each system from minimizing or control of structural and shrinkage cracks to permitting the creation of a design separating colours or to provide a neat transition between terrazzo and other finishes.

Drawings should clearly indicate the location of the divider strips that will form the desired panel size and/or design. Divider strips may also be used where needed to separate patterns and colours. Pre-assembled units used for patterns and decorative work may be manufactured off-site. Special consideration in the placement of divider strips must be taken in order to address anticipated cracking directly above structural beams, construction joints, concrete control joints, mechanical expansion joints & slab openings. Divider strips must be placed at all intersections and at corridors structural columns.

Divider strips should be aligned across intersecting strips in order to maintain straight lines for the full length and width of the installation. Connection gaps shall not exceed 3 mm at intersections. Deviation of strip alignment shall not exceed 6 mm over the span of a 6 m length, 10 mm over a 15 m length or 12 mm over a 30 m length. Full width of the divider strips must be exposed in the finished product. It is appropriate for the location and pattern of the divider strip to be considered in the design stage of the concrete slabs and joints. Divider strip gauge and type is dependant on the type of terrazzo specified.

## Portland Cement Systems

The purpose of divider strips in Portland cement terrazzo is to control and localize setting and shrinkage as well as flexural cracks and to permit the laying of different colour mixtures in various patterns with accuracy. The gauge and thickness of a divider strip does not affect its purpose. Fractures in terrazzo are caused by structural movement, expansion, contraction and/or vibration. Cracking or cracks from shrinkage should not occur in properly installed terrazzo. Shrinkage of terrazzo is largely governed by installation techniques and curing methods used.

The correct location of divider strips and other precautionary measures may assist in reducing fracturing. In order to address this, carry a line of division through to the wall, unless special provisions are made. Do not let the line of division stop in the field. Failure to do this may result in cracking that is entirely unnecessary. When a cove base divider is used it must line up with the floor divider strip. Panel size formed by divider strips is dependent on several factors such as; room size and shape, proposed use of the area, floor cost, importance of appearance and decorative consideration. Panels of 600 mm to 750 mm are common in small areas. Commercial work in hospitals and institutions are usually laid out in panels ranging in size from 900 mm up to 1200 mm.

Wall base, borders and wainscots must be divided. Wainscots should be divided both horizontally and vertically into panels not exceeding 750 mm in either direction, smaller panels are preferable.

Special T or L divider strips can be used in epoxy bonded applications or on fully cured underbeds.

## Epoxy Resin Terrazzo

Epoxy terrazzo allows for greater spacing between divider strips due to the negligible shrinkage. Since epoxy terrazzo is bonded directly to the concrete substrate its behavior is dependent upon the slab movement, so it is essential to position divider strips over all construction joints, cold joints, control and expansion joints.

Divider strips may be placed at 6000 mm x 6000 mm on center, or to divide a room up equally or to terminate daily production neatly.

Cove base top strips are required for wall base. A dividing strip is usually used for the bottom of the cove base. Wall bases must be continuous except where intersecting with a control or expansion joint.

## Aggregate Chips

The aggregate chips used in terrazzo are graded according to size. In co-operation with the aggregate chip producers and dealers, the TTMAC recommends the following standardization of sizes. The terrazzo industry uses screens of their own devising, for their own special purposes, which are not covered by any known standard. The screen sizes shown are dimensions of the square openings in the screen.

Chip size for granite, plastic and glass may differ between various manufacturers and suppliers. Metal chips of non-corrosive and non-rusting material may also be used. European chips are also available and may differ in size from the list below.

Chip Size	Passing Screen	Retained on Bottom Screen
No. 0	3.0 mm	2.0 mm to 3.0 mm
No. 1	6.0 mm	3.0 mm to 6.0 mm
No. 2	10.0 mm	6.0 mm to 10.0 mm
No. 3	12.0 mm	10.0 mm to 12.0 mm
No. 4	16.0 mm	12.0 mm to 16.0 mm
No. 5	19.0 mm	16.0 mm to 19.0 mm
No. 6	22.0 mm	19.0 mm to 22.0 mm
No. 7	25.0 mm	22.0 mm to 25.0 mm
No. 8	29.0 mm	25.0 mm to 29.0 mm

Standard terrazzo aggregate is defined as domestic marble chips 0, 1, and 2.

The specification writer should make a schedule of the various sizes, proportions and types and colours of aggregate and gauges, thickness and types of divider strips to be used in various locations and conditions throughout the project. Select the size required from the foregoing table and insert them into the schedule. The aggregate size and ratio generally used for Portland cement terrazzo floors is 30% No. 1 and 70% No. 2. A mixture of only No. 0 and/or No. 1 chips are not recommended for Portland cement terrazzo floor installations, however, they are recommended for 6mm epoxy resin terrazzo installations. Chip sizes #0, #1 and #2 may be used for 10mm epoxy terrazzo

Aggregate chip coverage must show a minimum density of 70% on all finished terrazzo types, but may exceed this minimum.

Terrazzo applied to vertical surfaces typically shows a minimum of 70% exposure, but due to the manual hand application, a minor colour variation may be visible between floor and vertical base.

## Colour Selection

TTMAC Terrazzo colour plates may be used as a guide to select a finished floor colour. Colour plates may be modified by altering aggregate size, colour of chips available, percentage of different chips and colour of binder.

In the case of epoxy terrazzo, colours to match the TTMAC colour plates are available or custom colours may be created to match almost any colour.

Electronic colour images may be used, but it is best practice to construct actual finished samples for approval by the consultant.

## Environmental Conditions

The underbed and terrazzo topping should not be installed at temperatures below 5°C. For applications using epoxy matrix and/or epoxy bonding agents, the temperature must be a minimum of 12°C or below 35°C. The ambient and surface temperature must be maintained at a minimum of 15°C or below 35°C. Consult manufacturer's recommendations and environmental requirements prior to any installation.

## Flatness Tolerance

Finished flatness (not level) tolerance shall not exceed 6 mm over a span of 3000 mm in length. Flatness tolerance is determined by centering a 3000 mm long aluminum straightedge over the mid point of the irregularity. This method is applicable to concave and convex substrate conditions.

Thin-set terrazzo will follow the contour of the concrete substrate. Any concrete variations that may prevent compliance to the above flatness tolerance must be corrected prior to installation. Corrections to non-conforming subfloors are not the responsibility of the terrazzo contractor. Materials and procedures used must be approved by the terrazzo contractor.

Lighting will affect the general appearance of the terrazzo surface finish. For example, a perfectly acceptable surface in large areas or in corridors, exposed to natural or artificial light, reflecting at a shallow angle will give an optical magnification showing every minute variation. The surface may appear to have variations greater than the permissible tolerance. If the floor has a high sheen this is further magnified.

## Pinholes

The existence of pinholes are a typical characteristic of a terrazzo surface. The presence of pinholes shall not be interpreted as being a deficiency that may compromise the integrity of the installation, however, concentrations or a mass of pinholes visible from a standing distance of 1.5 meters are not acceptable and must be corrected by the terrazzo contractors. Materials used, must, at a minimum, meet the requirements of relevant standards listed under "Glossary", see page 64. Manufacturer's recommendations must be followed.

**FINISH THICKNESS & WEIGHT ALLOWANCE**  
(Based on material density of 2400Kg/cu meter)

Allowance for Finish

Types of Installation Systems	(minimum thickness)	Weight
Portland Cement Floating	75 mm	180 Kg/m <sup>2</sup>
Portland Cement Bonded	50 mm	118 Kg/m <sup>2</sup>
Portland Cement Venetian	75 mm	180 Kg/m <sup>2</sup>
Thin-set Epoxy Bonded	13 mm	31 Kg/m <sup>2</sup>
Polyacrylate Modified Cement	10 mm	24 Kg/m <sup>2</sup>
Epoxy Epoxy Resin Thin Set	6 mm	15 Kg m <sup>2</sup>
Resin Thin Set	10 mm	24 Kg/m <sup>2</sup>
Palladiana	13 mm	Variable

NOTE: The above minimum thickness allowances for finish may be increased, with a corresponding increase in dead load computations. The above standard allowances for finish are the minimum applicable for the type of finish indicated and govern all details herein.

### Waterproof Membranes

These membranes where required may be liquid applied, built up membranes or sheet applied materials. Some materials are suitable only for use below underbed installations, while others may be used in both underbed or thin-set methods. In all cases, refer to manufacturer's recommendations regarding limitations and suitable applications.

### Crack Isolation Membranes

Cement terrazzo floors installed on reinforced underbeds over a slip sheet or epoxy resin thin set terrazzo installed over an anti fracture membrane will substantially reduce crack transmission from the substrate. Crack isolation membranes are proprietary systems designed for use in thin-set applications of terrazzo over a cracked substrate. Materials used are elastomeric sheets or trowel applied materials. Either material must be suitable for subsequent bonding of terrazzo topping. Membranes and resin materials should come from a single source to insure compatibility. When applied over the whole surface, crack isolation membranes in some cases will also act as waterproof membranes. On existing cured concrete, some membranes may be applied over existing cracks in a band wider than 300 mm centered on the crack. The use of a crack isolation membrane does not eliminate the need for properly designed movement joints. Must conform to ANSI 118.12.

The TTMAC does not endorse any specific material used as a crack isolation membrane. Consult the manufacturer to determine whether their product will withstand the anticipated movement and loads imposed. A crack isolation membrane will not prevent cracking of terrazzo if there is vertical movement of adjacent surfaces.

The standard finish on terrazzo is typically 120 grit or finer. When using polishing stones or diamond equivalents in the final stage of finishing the terrazzo, it is normal to expect some surface swirl marks. These markings will disappear with normal maintenance procedures and foot traffic. It should be noted that higher levels of finish may be achieved above the standard 80 or 120 grit process, however, the coefficient of friction may be reduced.

Maintenance and area of use of surface will affect the coefficient of friction. Refer to latest edition of TTMAC Maintenance Guide. The coefficient of friction of the terrazzo finish is dependent on the use of properly rated sealers.

Guidelines cannot address every installation. The type of terrazzo, use or service requirements, environmental conditions and individual manufacturer's recommendations are all factors that should be considered and specified. (Contact the TTMAC for consultation or assistance)

## METRIC CONVERSION GUIDE

To convert inches to millimeters, multiply the number of inches by 25.4 to obtain millimeters. To convert feet to millimeters, multiply the number of feet by 304.88 to obtain millimeters.

For a reference only, some common industry metric conversions to the imperial equivalents follow:

Fraction/Decimal/Millimeter (Conversion Table for One Inch)

Fraction	Decimal	Millimeters (Approximately)
1/64	.0156	0.396
1/32	.03125	0.794
1/16	.0625	1.588
3/32	.09375	2.381
1/8	.125	3.175
5/32	.15625	3.969
3/16	.1875	4.763
7/32	.21875	5.556
¼	.250	6.350
9/32	.28125	7.144
5/16	.3125	7.938
11/32	.34375	8.731
3/8	.375	9.525
13/32	.40625	10.319
7/16	.4375	11.113
15/32	.46875	11.906
½	.500	12.700
17/32	.53125	13.494
9/16	.5625	14.288
19/32	.59375	15.081
5/8	.625	15.875
21/32	.65625	16.669
11/16	.6875	17.465
23/32	.71875	18.256
¾	.750	19.050
25/32	.78125	19.844
13/16	.8125	20.638
27/32	.84375	21.431
7/8	.875	22.225
29/32	.90625	23.019
15/16	.9375	23.813
31/32	.96875	24.606
1	1.000	25.400

**EXPANSION JOINTS**

Planned breaks in the construction of structure and surface finishes designed to accommodate continuing movement in the structure throughout the life of the building caused by movement and/or contraction due to thermal or other effects. Control joints are required in both floors and walls. Control joints must extend through both the terrazzo and the substrate on which the terrazzo is applied.

**CONTROL JOINTS**

A planned break in the construction of backing materials and surface finishes designed to control the location of cracks and to accommodate movement caused by initial volume changes in the structure, such as shrinkage and deflection. Control joints in terrazzo must be located above the control joint in the substrate or above any construction cold joints for bonded systems.

**COLD JOINTS**

Cold joints are formed primarily between slab pours. A control joint should be installed over all cold joints in the slab. Therefore, it is important to stop at a planned control joint location. Where conditions do not allow one to install a control joint, the use of a crack isolation membrane may be considered, along with a control joint placed as close as possible to the cold joint in the substrate.

**CONSTRUCTION JOINTS**

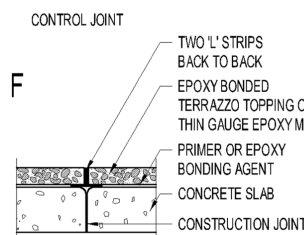
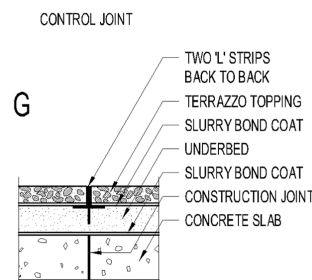
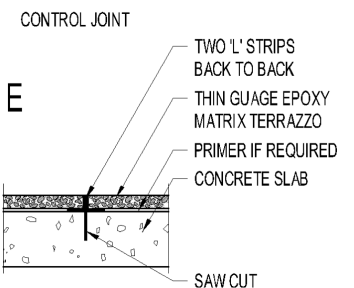
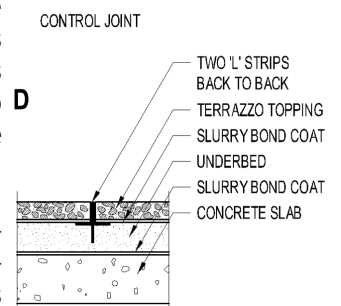
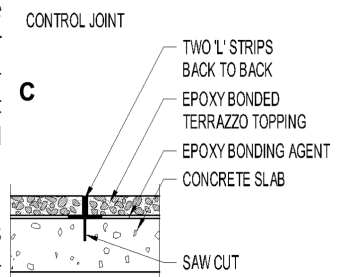
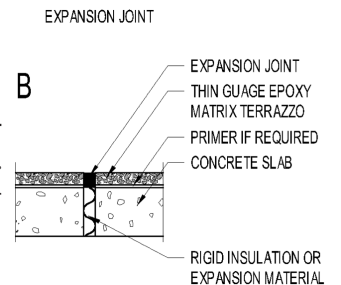
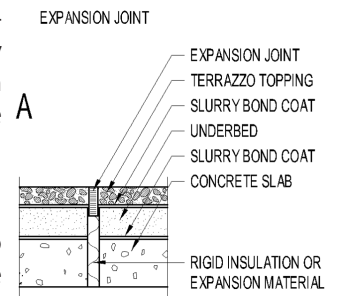
A planned engineered joint built into the main structure to accommodate structural volume changes associated with factors such as; concrete drying, shrinkage and creep, dissimilar material abutment growth, settlement and vibration, or the plane where two successive placements of concrete meet but do not bond. Reinforcing dowels may be installed at the midpoint of the concrete slab. A control joint should be placed over this joint in the terrazzo for bonded systems.

Control joints should be provided around columns, in line with columns, where terrazzo abuts other hard materials, over cold joints and construction joints, at transitions which include corridors and changes in direction, for example, T's, L's and diagonals and over beams and areas where extreme cracking hazards may occur. Back to back metal dividing strips should have a gap with a flexible approved material. In floating terrazzo, the use of single divider strips provides sufficient control of anticipated shrinkage that will take place as each divider picks up a small amount of the contraction. Cold joints and construction joints in the structural slab have no influence on the placement of divider strips since the underbed is separated from the substrate by an isolation membrane.

The location of movement and control joints is the responsibility of the consultant. Consultants should also specify in detail the type of movement joint and indicate the area of installation on the project drawings. For interior control joints, double metal or plastic terrazzo strips placed back to back may be used. Prefabricated movement joints may be recommended by the manufacturer for interior/exterior use.

Recommended spacing for control joints are as follows:

- Interior terrazzo – control joints 4878 mm to 6098 mm in each direction
- Exterior rustic terrazzo – control joints 2439 mm to 3659 mm in each direction



## SECTION 09410/096613 - Portland Cement Terrazzo

### Portland Cement Terrazzo, Epoxy Bonded Terrazzo, Rustic Terrazzo, Stairs, Bases, Floating Terrazzo

#### Surface Preparation

Substrate preparation shall preferably be conducted utilizing a shot blasting method to achieve a #3-5 Concrete Surface Profile (CSP). An acceptable alternate is mechanical grinding or scarifying to achieve a similar substrate profile to promote sufficient bond of the terrazzo flooring system.

Substrate surface must be clean, cured and free of contaminants such as oil, sealers and curing compounds. Unless special precautions are taken, concrete must be cured for a minimum of 28 days (preferably longer) to minimize shrinkage and should have a steel trowel finish for installations of epoxy resin thin-set terrazzo matrix, polyacrylate modified cement terrazzo matrix, and epoxy bonded terrazzo. Terrazzo with a bonded underbed should have a substrate with a screed finish. If a cleavage membrane is used on a concrete slab with a steel trowel or fine broom finish, omit 6 mm sand base. If a cleavage membrane is to be applied over a rough surface, a 6 mm sand-bed must be applied under the cleavage membrane.

A slight levelling coat may be required prior to installation of strips and topping for epoxy bonded terrazzo, and is normally applied in a thickness of 0 to 8 mm and allowed to set before application of strips, bonding agents and topping. For a slight levelling coat a latex additive must be mixed with the sand and cement.

For a levelling coat in excess of 8 mm thick, a latex additive is required. For thicker installations use the underbed method. See 2.2.1, Page XX (pending where new page is located).

#### Environmental Conditions

The underbed and terrazzo topping should not be installed at ambient and surface temperatures below 5°C. For applications using epoxy bonding agents, the ambient and surface temperature must be maintained at a minimum of 15°C or below 35°C. Consult manufacturer's recommendations and environmental requirements prior to any installation.

#### Materials

Materials used, must, at a minimum, meet the requirements of relevant standards listed under References, see page 64. Manufacturer's recommendations must be followed.

### PRODUCTS

#### Cement

Refer to CSA CAN3-A5-M1989. Grey Portland cement is most widely used except where a white matrix is specified. White Portland cement is used when a white or light coloured matrix is desired. A combination of white and grey Portland cement can also be mixed in any percentage ratio (eg. 50/50, 75/25, 90/10,80/20). Grey Portland cement is always used in the underbed mix.

Type 30 – High Early Strength Portland cement is used only for underbeds when a faster cure is required.

#### Colour Pigments

Pigments can be used to colour cement terrazzo matrix and are available in powder or liquid form. Ratios must be respected in order not to jeopardize the structural integrity of the terrazzo topping. Interior: Powder pigments not to exceed 900 grams per bag of 40 kg cement. Exterior: Powder pigments shall not exceed 225 grams per 40 kg bag of cement.

Terrazzo colour plates are to be used as a guide only. Plates may be modified providing the specifier states aggregate size, origin, colour and percentages and colour matrix. Actual samples should be submitted for final approval by the consultant before installation of terrazzo.

### Aggregate

The aggregate size and ratio generally used for cement terrazzo floors are 30% No. 1 and 70% No. 2. A mixture of only No. 0 and/or No. 1 chips are not recommended for Portland cement terrazzo floor installations. The use of No. 2 or larger aggregates on floors will help obtain an acceptable compressive strength in the range of 30 mpa to 48mpa. If the topping is not properly compacted to extract excessive water and cement, shrinkage will take place more rapidly and map cracking will occur. Bases, borders, stairs and wainscots typically use a mixture of No. 0 and/or No. 1 aggregate. The ratio of water to Portland cement must not exceed 18 L per 40 kg bag of Portland cement.

### Rustic Terrazzo

Rustic Terrazzo is installed in a similar manner to standard terrazzo except that the topping is washed with water on the same day as installed to expose the aggregate; alternatively a retarder is applied and covered with polyethylene sheeting, then washed the following day.

### Epoxy Bonded Terrazzo

Epoxy bonded terrazzo is standard Portland cement terrazzo topping without the use of the conventional cement and sand underbed. Instead, the topping is bonded directly to the concrete substrate using an epoxy bonding agent. This in turn reduces the setting depth required and the finished weight. It is imperative that the system be free of hydrostatic pressure. Care must be taken to use acceptable forms of vapour barriers prior to pouring of concrete slabs on or below grade. Once poured, the concrete slab must receive a steel trowel finish. Shotblast or mechanical surface preparation is required to remove laitance. No curing agents or sealers can be used during this process. The concrete substrate must be cured for a minimum 28 days and must be free of any contaminants prior to the installation of the terrazzo. When terrazzo floors are to be installed in direct contact with the ground, the slab must be made moisture resistant to prevent moisture vapor transmission issues. Concentrated areas containing moisture in contact with cement may produce efflorescence in the form of a white powdery accumulation, particularly where divider strips occur.

### Bonded Terrazzo

Bonded terrazzo is a standard Portland cement terrazzo topping applied to a conventional cement and sand underbed. The underbed is bonded directly to the substrate using a slurry bond coat of Portland Cement of which latex may be added. The concrete substrate must have a screed finish to accommodate this application. Bonded terrazzo will crack where the structural concrete slab cracks, regardless of the placement of divider strips. This is much less likely to happen in the case of floating terrazzo. It is recommended that non-bonded terrazzo be used wherever depth and budget permit. When terrazzo floors are to be installed in direct contact with the ground, the slab must be made moisture resistant to prevent capillary action and/or hydrostatic pressure. Concentrated areas containing moisture in contact with cement may produce efflorescence in the form of a white powdery accumulation, particularly where divider strips occur.

### Floating Terrazzo

Floating terrazzo is composed of a terrazzo topping applied to a reinforced underbed and a bond breaking material such as polyethylene sheeting and sand or an uncoupling system. This system is recommended for areas that are susceptible to structural movements. Take note that floating terrazzo is not recommended in areas where floors will be subject to heavy loads such as lift trucks and/or pallet movers.

### Venetian Terrazzo

Venetian terrazzo can be installed using a floating terrazzo, bonded terrazzo or epoxy bonded terrazzo method. Portland cement terrazzo utilizing the majority chip size of No. 5 or larger is classified as Venetian terrazzo.

### Palladiana Terrazzo

Palladiana is a form of terrazzo in which 12 mm to 18 mm thick random fractured slabs of marble or suitable products are set in an underbed and the joints between these slabs are filled with terrazzo, or a low shrinkage jointing material.

## Placing Terrazzo

Floating or non-bonded terrazzo is considered superior to minimize cracking rather than using a bonded terrazzo. The purpose of installing reinforcing mesh in floating terrazzo is to resist deflection of slabs during curing and to resist breaking or cracking of slabs from surface impact.

## Grinding

All terrazzo surfaces require grinding that is done with wet or dry mechanical equipment. After the floor has sufficiently cured, grind with No. 24 grit abrasive stones or diamond equivalents. Follow initial grind with No. 80 grit. Remove excess slurry, rinse with clean water and apply appropriate grout of which latex may be added to cement terrazzo by hand trowel or machine to fill all voids. Allow grout to cure for 48 hours and re-grind with No. 80 grit stones or finer, to a maximum of 120 grit until all grout is removed from surface, rinse with clean water, let surface dry thoroughly and apply specified sealer when terrazzo is dry as per manufacturer's recommendations.

It is advisable to delay sealing of terrazzo floors, when laid in contact with the ground over polyethylene sheeting, until all moisture has had an opportunity to evaporate. Portland cement terrazzo is not recommended in locations where it will be exposed to excessive concentrations of de-icing salts or calcium chloride.

## Curing (Mortar Underbed Curling)

Screeded mortar underbeds not bonded to the substrate have a tendency to curl up at screed joints and control joint locations. This condition is predominant in floating systems where a polyethylene film is placed over the concrete slab not allowing the bottom surface to cure at the same rate as the surface. Therefore, the top surface dries and shrinks at a faster rate causing the edges to curl up. The weight of these unsupported edges plus any additional load on the floor creates stresses and cracks likely will occur. To minimize curling, the surface of the underbed must be kept wet and once it has hardened, covered with polyethylene film for a minimum of 72 hours to provide proper curing.

## Maintenance

All aspects of maintenance of terrazzo are discussed in the latest TTMAC Maintenance Guide.

## MASTER SPECIFICATION INTRODUCTION

This Master Specification refers to the usual circumstances relating to the use of terrazzo. For unusual circumstances, consult the TTMAC Membership Directory and Buyers' Guide for qualified contractors suppliers. The methods and/or scope of work are governed by local building regulations and practices.

1. General
  - 1.1 WORK INCLUDED
    - 1.1.1 Inspection of surfaces and prevailing conditions
    - 1.1.2 Divider strips
    - 1.1.3 Portland cement terrazzo mixes
    - 1.1.4 Application of Portland cement mixes
    - 1.1.5 Floors, wainscots & partition bases, stair treads and risers
    - 1.1.6 Curing
    - 1.1.7 Surfacing and grinding
    - 1.1.8 Slurry handling and removal
    - 1.1.9 Cleaning and sealing

Spec Note: Refer to other sections or describe work of others that affects the terrazzo.

Spec Note: Specify testing requirements if required. State minimum 5 years experience required for applicator and must be a member in good standing of TTMAC.

## 1.2 QUALITY ASSURANCE

1.2.1 Installer: employ skilled mechanics, trained and experienced in terrazzo work. The work of the sub-contractor to be executed by a company that is a member in good standing with TTMAC. This work to be done under proper supervision by persons skilled in the method. The installer must have at least five (5) years proven experience and submit a list of completed projects of similar magnitude and scope to the project consultant.

Spec Note: A list of current members is available from the TTMAC office or at [www.ttmac.com](http://www.ttmac.com).

1.2.2 Supplier: a member in good standing with the Terrazzo, Tile and Marble Association of Canada, providing materials meeting the minimum standards of TTMAC.

## 1.3 REFERENCES

1.3.1 Do terrazzo work in accordance with latest Terrazzo Specification Guide 09400 / 09 66 00 produced by TTMAC.

## 1.4 SUBMITTALS

1.4.1 Submit three (3) samples 150 mm x 150 mm of each colour and type of terrazzo for approval by the consultant. Submit samples (300 mm in length) of all specified divider strips and control joints.

1.4.2 For precast terrazzo submit shop drawings showing all dimensions, anchors, supports and relation to structure and other work.

1.4.3 Submit four (4) copies of latest edition of TTMAC Maintenance Guide for inclusion in the data book.

1.4.4 Show location of all expansion, control, cold, or seismic joints on drawings. Note and detail conditions where terrazzo flooring meets adjacent floors. Clearly note the depth and area of depressed concrete that may receive underbed. All terrazzo colours and strip sizes must be clearly noted on drawings and specifications. a n

## 1.5 DELIVERY, STORAGE AND HANDLING

1.5.1 Deliver, store and handle products in a manner to avoid damage. Store materials in a clean, dry, heated location furnished by others. Material must be conditioned to ambient temperatures for a period of 24 hours prior to installation.

## 1.6 PROJECT/SITE CONDITIONS

1.6.1 Examine areas where the work of this section is to be located.

1.6.2 Do not place terrazzo until unacceptable conditions have been corrected and approved by the terrazzo contractor.

1.6.3 Protect work during installation and protect finished corners exposed to construction operations and traffic.

## 1.7 SEQUENCING/SCHEDULING Site specific

## 1.8 ALTERNATIVES

Note: Describe requirements for alternatives that may be required for consideration by the specifier. Procedures for administration are usually described in Division 1, General Requirements.

## 1.9 ALLOWANCES

Note: Describe if required.

## 1.10 UNIT PRICES

Note: Identify requirements, if any

1.11 WARRANTY  
One year from date of substantial completion of terrazzo installation. (This may vary according to the specifications.)

## 2. PRODUCTS

Spec Note: Where terrazzo is specified without other descriptions, it would mean the following: 100% domestic marble chips, size No. 1 for bases, borders and wainscots and No. 1 & 2 for floors, grey cement, divider strips standard 14 gauge zinc: 50 mm bonded system; divider strip pattern 900 mm or 1200 mm squares.

### 2.1 MATERIALS

2.1.1 Cement: Portland cement to CAN CSA-A5-93

2.1.2 Sand: Sharp, screened sand: ASTM C-144

2.1.3 Water: Clean water, free from oil, acids, alkali or organic matter.

2.1.4 Marble, granite, glass chips

2.1.5 Colour pigments: Non fading mineral pigments.

2.1.6 Slip resistant material: No. 36 grit aluminum oxide.

2.1.7 Slip resistant channel strips: Brass or zinc 10 mm x 10 mm, 20 gauge dove-tailed shaped channels with anchor tapes.

2.1.8 Reinforcing mesh: [50 mm x 50 mm] mesh size, fabricated from 1.6 mm thick galvanized wire/fabric welded mesh. ASTM A821/ASTM A185.

2.1.9 Divider strips: 25 mm to 32 mm deep with anchorage devices, except where specified otherwise.

2.1.10 Cove Dividers: Metal or plastic with a 38 mm radius used to control shrinkage at wall base or as colour separation.

2.1.11 Cleavage Plane: [0.10 mm [4 mil] thick polyethylene film, to CAN/CGSB-51.34-M86]

2.1.12 Crack Suppression Membrane: As specified, install as per manufacturer's recommendations.

2.1.13 Epoxy bonding agent (for epoxy bonded systems): [specify type here]

Spec Note: Sealers and Maintenance Products: As per manufacturer's recommendations and must be U/L listed as slip resistant.

2.1.14 Cleaners: Conforming to CAN/CGSB-2.107-92

2.1.15 Sealers: Conforming to CAN/CGSB-25.20-95

2.1.16 Floor finish: Conforming to CAN/CGSB-25.21-95

### 2.2 MIXES/PROPORTIONS

2.2.1 Underbed: One part Portland cement to four parts sand by volume. Wet and mix thoroughly to a low slump to provide workability. Adjust water volume depending on moisture content of sand to obtain consistency and workability.

2.2.2 Scratch Coat (by volume): One part Portland cement, 4 parts sand and latex additive if required. Adjust water

- 2.2.3 Slurry Bond Coat: Mix Portland cement and water to a creamy paste consistency. Latex additive may be included to increase bond.
- 2.2.4 Underbed for Walls (by volume): 1 part Portland cement to 3 parts sand. Latex additive may be included to increase bond strength. Adjust water volume depending on moisture content of sand to obtain consistency and workability.
- 2.2.5 Standard terrazzo topping typically consists of 2 parts cement to three parts aggregate. Chip size ratio 70% No. 2 and 30% No. 1.
- 2.2.6 Venetian terrazzo topping: Same mix as for standard terrazzo. Chip sizes No. 1 and No. 2 are used in the mix and then larger chip sizes, up to No. 8, are sprinkled and distributed as closely and evenly as possible.
- 2.2.7 Palladiana Terrazzo: A form of terrazzo in which 12 mm to 18 mm thick random fractured slabs of marble or suitable products are set in an underbed and the joints between these slabs are filled with terrazzo, or a low shrinkage jointing material.
- 2.2.8 Rustic terrazzo topping typically consists of 2 parts Portland cement to three parts aggregate. Chip size 70% No. 2 and 30% No. 1. For special size aggregate, ratio may be changed provided allowances for thickness of topping is made to compensate for stone size.
- 2.2.9 Epoxy bonded terrazzo topping: same mix as standard terrazzo topping with a specified epoxy bonding agent.

When mixed with water the underbed shall be of such a consistency and workability that will allow maximum compaction during tamping of the underbed, and achieve a minimum compressive strength of 15 Mpa (2000 psi) after 28 days. A stronger mix can be achieved by adding a latex additive to the water.

### 3. EXECUTION

Spec Note: Specify special inspection required in addition to site inspection.

#### 3.1 INSPECTION

- 3.1.1 Verify existing conditions are ready to receive work.
- 3.1.2 Verify substrate surfaces are clean, dimensionally stable, cured and free of contaminants such as oil, sealers and curing compounds.
- 3.1.3 Verify that concrete has been allowed to cure for a minimum of 28 days.
- 3.1.4 Verify that concrete slabs scheduled to receive epoxy bonded terrazzo or floating terrazzo have a steel trowel finish. Concrete scheduled to receive bonded terrazzo must have a screed finish. Ensure concrete slabs have been finished to a tolerance not exceeding 6 mm in 3000 mm from the required plane.
- 3.1.5 Notify Consultant in writing of unacceptable substrate conditions. Beginning of installation implies acceptance of existing conditions.

#### 3.2 PREPARATION

Spec Note: If the substrate is to be depressed to accommodate the terrazzo system, depressions from the finished floor level to be no less than 50 mm for bonded terrazzo and no less than 75 mm for a floating terrazzo floor.

- 3.2.1 Bonded terrazzo: Substrate to be laitance free. Clean and thoroughly saturate slab, remove excess water prior to installation. Apply a slurry bond coat of cement and water to the substrate and proceed immediately to install underbed. The addition of a latex additive will improve the bond.

3.3.2 Divider strips: Install divider strips in underbed while still in plastic state. Set strips true and level to required pattern. Terrazzo panels created by the installation of divider strips should be no greater than 1200 mm x 1200 mm. Structural or movement joints must be addressed by mechanical devices. Divider strips are not intended to replace or to be used as structural expansion joints. Avoid using patterns where divider strips do not carry through in both directions.

### 3.4 INSTALLATION OF TERRAZZO TOPPINGS

SPEC NOTE: Aggregate chip coverage must show a minimum density of 70% on all finished terrazzo types, but may exceed this minimum.

3.4.1 Standard terrazzo topping: Allow underbed to cure for 48 hours, sweep or vacuum underbed, saturate with water and remove excess. Apply a cement slurry bond coat and immediately follow with application of terrazzo topping mix. Wet terrazzo topping mixture, mix thoroughly and spread with trowel level to top of strips. Sprinkle topping with dry aggregate chips. Roll with heavy rollers to compact topping until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strips to close all voids and pin holes. Control the cure a minimum of 48 hours. After floor has sufficiently cured, grind with No. 24 grit abrasive stones or with diamond equivalents. Follow initial grind with No. 80 grit or finer stones, to a maximum of 120 grit, remove excess, rinse with clean water and apply grout by hand trowel or machine to fill all voids. Let grout cure for a minimum of 48 hours and re-grind with No. 80 grit of finer stones, to a maximum of 120 grit, until all grout is removed from surface. Let surface dry thoroughly and apply sealer as per manufacturer's recommendations.

Spec Note: See Detail 412F-2007.

3.2.2 Floating terrazzo: Broom clean base slab and fill all voids with loose sand over rough screed surface. Apply polyethylene film over sand. Overlap joints 100 mm. Install underbed with reinforcing wire mesh with joints overlapping 100 mm. Wire mesh must be kept 19 mm above substrate.

3.2.3 Epoxy bonded terrazzo: Concrete to be sound with steel trowel finish and free of laitance. Shotblasting, grinding or scarifying are recommended methods of surface preparation. Substrate must be primed with an epoxy bonding agent. Terrazzo topping to be installed while bonding agent is tacky.

### 3.3 INSTALLATION

3.3.1 Underbed: Install underbed over properly prepared substrate and screed to required levels. The levels should allow for the thickness of the terrazzo topping in order to provide a flat and continuous transition between terrazzo and adjacent flooring. Permit underbed to cure for a minimum 48 hours prior to installation of terrazzo topping.

3.4.2 Epoxy bonded terrazzo: Clean base slab, remove laitance by shotblasting grinding or scarifying. Clean thoroughly. Moisture content in slab not to exceed manufacturer's recommendations. Install divider strips and base bead top strips where required. Mix and install epoxy bonding agent following specifications of the supplier of the epoxy and where possible, under the direction of a manufacturer's representative. Install terrazzo topping as in 3.4.1, omitting water saturation of concrete slab and slurry bond coat

3.4.3 Venetian terrazzo topping: Place the terrazzo mix approximately 13 mm below top of strips, immediately sprinkle with larger size chips distributing as closely and evenly as possible. Tamp down and roll into a compact mass. Trowel evenly to a finish over tops of dividing strips and cure. Allow topping to set 48 hours, then grind, grout and finish as for standard terrazzo topping.

3.4.4 Slip resistant terrazzo topping: On heavy traffic floors, ramps, shower change rooms and exterior areas exposed to weather conditions, the use of non-slip material may be required to increase the slip resistance properties of the floor. This is achieved by introducing No. 36 grit white aluminum oxide into the mix at a ratio of 1kg/m<sup>2</sup> with an additional 1kg/m<sup>2</sup> to be broadcasted prior to seeding and rolling of the floor. To increase slip resistance properties, final polishing of terrazzo is not to exceed a No. 80 grit stone finish. Grinding with a finer stone higher than No. 80 may affect the slip resistance, however such factors as surface cleanliness, improper maintenance, application of topical coating, degree of wear of shoes, design, composition of shoe soles and temperature can all affect slip resistance under field conditions. For stair treads, the use of non-slip abrasive inserts is recommended at a minimum of two per step, set at a distance of no more than 25 mm to each other and 19 mm from the nosing.

3.4.5 Rustic Terrazzo Topping: Allow underbed to cure for 48 hours, sweep, saturate with water and remove excess. Apply a cement slurry bond coat and immediately follow with application of terrazzo topping mix, add colour pigments with dry aggregate chips. Roll topping with rollers to compact topping until excess cement and water has been extracted, or to suit conditions. Expose the aggregate by hosing, absorbent rolling or by applying a retarder to the surface of the matrix topping. Cover topping with polyethylene sheeting over night. Remove all excess retarded laitance by power washing and stiff broom. Rinse floor with clean water to remove remaining laitance, leaving aggregates exposed and clean.

3.4.6 Palladiana Terrazzo: Allow underbed to cure for 24-48 hours depending on job conditions, sweep or vacuum underbed clean. Wipe any residue from back side of fractured slabs. With a notched trowel spread latex Portland cement mortar bond coat to underbed. Backbutter underside of marble (granite) and place firmly to a level plane before bond coat skins over. Use sufficient bond coat to ensure a minimum of 80% contact. Contact shall be evenly distributed to give full support of the pieces. Allow bond coat to cure for a minimum of 48 hours prior to application of filler. On fresh mortar bed, beat fractured marble pieces into position and let cure for a minimum of 48 hours prior to application of filler. After underbed has sufficiently cured, remove any laitance from joints. Sweep or vacuum, saturate with water and remove excess. Apply a slurry bond coat if specified and immediately follow with application of terrazzo filler. Wet filler mixture, mix thoroughly and trowel terrazzo mixture to fill all joints level to top of fractured pieces. Sprinkle filler mixture with dry aggregate. Roll with light roller to compact topping until excess cement and water has been extracted. Hand trowel filler surface flush with top fractured pieces to close all pinholes. Control cure for a minimum of 48 hours.

Spec Note: State height of base [ \_\_\_\_\_ ]

Spec Note: See Detail 416B-2016.

3.4.7 Terrazzo bases: Where required, install base bead top strips at specified height, straight and level. Apply underbed to backing and trowel to within 8 mm of finished surface. Install divider strips and cove base dividers in line with floor divider strips.

3.4.8 Terrazzo, treads and risers: Cast-in place: Apply in accordance with "Standard Terrazzo Topping".

Spec Note: For poured in place treads and risers, see Detail 417S-2016.

3.4.9 Set slip resistant strip channels during underbed application or epoxy bond to cured underbed

and on concrete slab. Install terrazzo around channels. After terrazzo is cured, ground and sealed, clean non-slip channels. Apply masking tape to protect adjacent surfaces. Pack and fill channel with abrasive-epoxy mixture to maintain a consistent thickness of 2 mm above terrazzo tread. Remove masking tape and allow to cure overnight.

3.4.10 Over concrete, terrazzo and underbed to be not less than 45 mm thick for treads and not less than 25 mm for risers, stringers and curbs. The terrazzo topping to be 10 mm thick for risers, treads, stringers and curbs.

Spec Note: Diamond mesh must be fastened to steel surface (by others) prior to underbed application.

3.4.11 Over steel, terrazzo and underbed, to be not less than 50 mm thick for treads and landings and 38 mm for risers.

3.4.12 Terrazzo in steel pans: Terrazzo and underbed to be not less than 50 mm thick.

Spec Note: See Precast treads on steel stairs and concrete. Details No. 420P-2016.

3.4.13 Precast: Manufacture precast terrazzo treads and risers by a compression or vibratory process in accurately designed molds. Reinforce treads with reinforcing mesh and steel rods. Wire and/or weld the mesh to steel rods. Install slip resistant strips in precast treads as specified. Precast treads to be installed using a mechanical anchoring system where necessary as designed and approved by the consultant.

3.4.14 Terrazzo on vertical surfaces greater than 300 mm in height: A masonry substrate is required for this application. Apply scratch coat and allow to cure 24 hours. Apply underbed with sufficient water to a workable mix. Install divider strips in semi plastic underbed and trowel firmly along edges. Epoxy bond L or T strips on cured underbed. Install terrazzo topping, omit sprinkling of surface chips and rolling specified for standard terrazzo topping.

### 3.5 FIELD QUALITY CONTROL

Specify standard references and testing procedures required. Refer to References, Page 64.

### 3.6 PATCHING

Remove and replace all defective or damaged work promptly and when directed by the architect.

### 3.7 CLEANING/SEALING

Refer to current TTMAC Associate Member Manufacturer's/suppliers of terrazzo products for appropriate product suggestions.

### 3.8 PROTECTION

General contractor to provide appropriate protection to completed terrazzo work. Protect work of other trades. Prohibit traffic during installation and for 48 hours after completion. Protect floor from impact and vibration for a minimum of 48 hours after installation. Protect base from impact, vibration, heavy hammering on adjacent and opposite walls. On completion of terrazzo floor it is the responsibility of the owner/agent or general contractor to protect the floor from damage by using approved materials

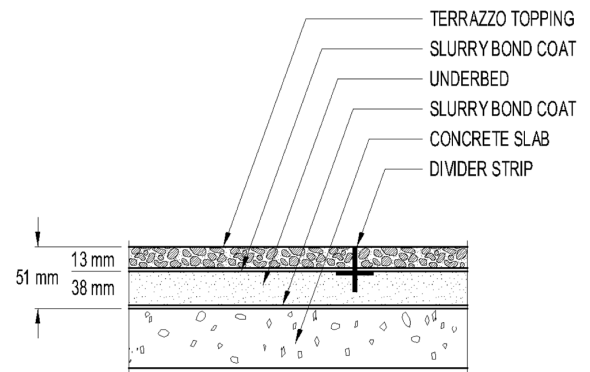
END OF SECTION

#### SUITABLE SUBSTRATE

- Interior concrete slab, screed finished, where deflection under both dead and live loads conforms to local building codes.

#### UNDERBED MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM C-144-99
- Divider strips: zinc, brass, gauged 2 mm, 3 mm or 6 mm heavy top
- Underbed: One part Portland cement to four parts clean, washed sand by volume; add sufficient clean water and mix thoroughly to a low slump to provide workability.



#### TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate chips: marble, granite, a limited amount of plastic or glass chips may be added to the mix according to local practice and manufacturer's recommendations
- Abrasive aggregate: Aluminum oxide if specified
- Topping: 40 kg cement, white, grey or a blend of both, to 90 kg of aggregate chips, 70% No. 2 and 30% No.1 for floors; add colour pigment if specified. Use no more than 18 liters of water per 40 kg of cement or adjust to suit conditions to provide workability

#### UNDERBED INSTALLATION

Broom clean base slab, saturate with water and remove excess. Apply a slurry bond coat consisting of a thick paste of cement and water, latex-additive may be added. Place and screed underbed mix to 13 mm below finished floor elevation or slope. Install divider strips and control joints in underbed while in a workable plastic state. Trowel firmly on both sides of divider strips to a true and level plane and required pattern.

#### TERRAZZO TOPPING INSTALLATION

Allow underbed to cure, sweep or vacuum, saturate with water and remove excess. Apply a slurry bond coat and immediately follow with application of terrazzo topping mix. Wet topping mixture, mix thoroughly and spread terrazzo mixture with trowel, level to top of strips. Sprinkle topping with dry aggregate chips. Roll topping with heavy rollers to compact topping until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strips to close all voids and pin holes. Control cure for a minimum of 48 hours.

#### GRINDING

After floor has sufficiently cured, grind with No. 24 grit abrasive stones or with diamond equivalents. Follow initial grind with No. 80 grit stones. Remove excess slurry, rinse with clean water and apply grout by hand trowel or machine to fill all voids. Allow grout to cure for 48 hours and re-grind with No. 80 grit stones or finer, to a maximum of 120 grit until all grout is removed from surface, rinse with clean water, let surface dry thoroughly and apply sealer as per manufacturer's recommendations.

#### LIMITATIONS

- Exterior terrazzo installations subject to freeze /thaw conditions are not recommended.
- Use Detail 411F-2007 for precast floor systems, post tension concrete floor systems and other floors subject to movement or deflection
- For colour pigments, see Page XX

#### OTHER CONSIDERATIONS

- See 401MJ-2007 for placement of control joints
- For use of crack isolation membranes, see Page 11
- Topping thickness may vary depending on aggregate size
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.

#### SUITABLE SUBSTRATE

- Precast concrete floor systems, post tensioned concrete floor systems and any other floors subject to movement, deflection or excess cracking where deflection under both dead and live loads conforms to local building codes.

#### UNDERBED MATERIALS

- Cleavage membrane: 0.10 mm (4 mils) polyethylene film CAN/CGSB-51.34-M86
- Reinforcing mesh: 51 mm x 51 mm x 1.6 mm galvanized, welded mesh ASTM A821/ASTM A185
- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM-C-144-99
- Divider strips: zinc, brass, stainless steel or plastic, gauge 2 mm, 3 mm or 6 mm heavy tops.
- Underbed: One part Portland cement to four parts clean, washed sand by volume; add sufficient clean water and mix thoroughly to a low slump to provide workability.

#### TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate chips: marble, granite, a limited amount of plastic or glass chips may be added to the mix according to local practice and manufacturer's recommendations
- Abrasive aggregate: aluminum oxide if specified
- Topping: 40 kg cement, white, grey or a blend of both, to 90 kg of aggregate chips, 70% No.2 and 30% No.1 for floors; add colour pigment if specified. Use no more than 18 liters of water per 40 kg of cement or adjust to suit conditions to provide workability

#### UNDERBED INSTALLATION

Broom clean base slab. Screed 6 mm of loose sand. Apply polyethylene film over sand, overlapping edges a minimum of 102 mm. Install reinforcing mesh, overlay 102 mm at edges and ends, and tie. Wet surface, place and screed underbed mix to 13 mm below finished floor elevation or slope. Install divider strips and control joints in underbed, while in a workable plastic state. Trowel firmly on both sides of divider strips to a true and level plane and required pattern.

#### TERRAZZO TOPPING INSTALLATION

Allow underbed to cure, sweep or vacuum, saturate with water, and remove excess. Apply a slurry bond coat and immediately follow with application of terrazzo topping mix. Wet topping mixture, mix thoroughly and spread with trowel, level to top of strips. Sprinkle topping with dry aggregate chips. Roll with heavy rollers to compact topping until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strips to close all voids and pin holes. Control cure for a minimum of 48 hours.

#### GRINDING

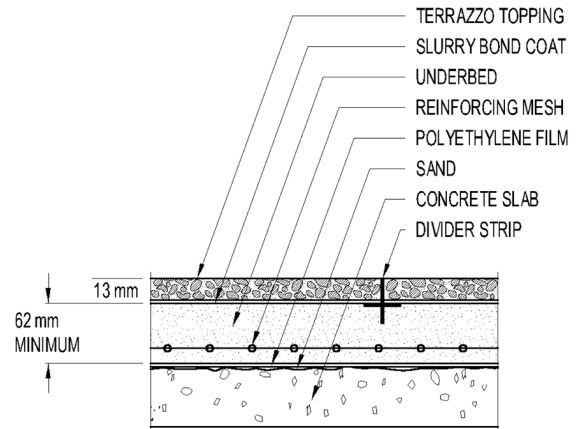
After floor has sufficiently cured, grind with No. 24 grit abrasive stones or with diamond plugs. Follow initial grind with No.80 grit stones. Remove excess slurry, rinse with clean water and apply grout by hand trowel or machine to fill all voids. Allow grout to cure and re-grind with No. 80 grit stones or finer, to a maximum of 120 grit until all grout is removed from surface. Rinse with clean water, let surface dry thoroughly and apply sealer as per manufacturer's recommendations.

#### LIMITATIONS

- The thickness of the underbed should be 62 mm minimum
- Keep reinforcing mesh approximately 13 mm above polyethylene film
- For colour pigments, see Page XX

#### OTHER CONSIDERATIONS

- See 401MJ-2007 for placement of control joints
- Topping thickness may vary, depending on aggregate size
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.
- Screeded mortar underbeds not bonded to the substrate have a tendency to curl up at screed joints and control joint locations. This condition is predominant in floating systems where a polyethylene film is placed over the concrete slab not allowing the bottom surface to cure at the same rate as the surface. Therefore, the top surface dries and shrinks at a faster pace causing the edges to curl up. The weight of these unsupported edges plus any additional load on the floor creates stresses and cracks likely will occur. To minimize curling, the surface of the underbed must be kept wet and once it has hardened, covered with polyethylene film for a minimum of 72 hours to cure evenly.

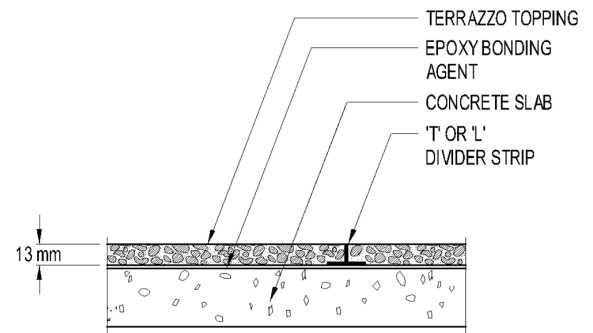


#### SUITABLE SUBSTRATE

- Interior concrete slab, steel trowel or fine broom finish, where deflection under both dead and live loads conforms to local building codes.

#### MATERIALS

- Portland cement: CAN/CSA-A5-93
- Epoxy bonding agent installed as per manufacturer's recommendations.
- Divider strips: zinc, brass, gauged 2 mm, 3 mm or 6 mm heavy top, L or T shaped



#### TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate chips: marble, granite, a limited amount of plastic or glass chips may be added to the mix according to local practice and manufacturer's recommendations
- Abrasive aggregate: aluminum oxide if specified
- Terrazzo topping: 40 kg of cement, white, grey or a blend of both, to 90 kg of aggregate chips, 70% No.2 and 30% No. 1 for floors; add colour pigment if specified. Use no more than 18 liters of water per 40 kg cement or adjust to suit conditions to provide workability.

#### SURFACE PREPARATION

Concrete shall be sound with steel trowel finish, free of laitance and curing compounds. Surface may be prepared using grinding or scarifying. If required, depress slab 13 mm if standard terrazzo or 25 mm if venetian terrazzo, below finished floor levels, conforming to general contour required. All base slabs shall be protected from oil, grease or other contaminants.

#### INSTALLATION OF TERRAZZO STRIPS

Sweep and clean base slab and layout pattern. Bond strips and control joints to floor with appropriate epoxy product. Ensure that strips are fully bonded to the substrate, paying special attention to points of intersection. Allow strips to set prior to application of terrazzo topping.

#### TERRAZZO TOPPING INSTALLATION

After strips are installed, sweep or vacuum floor. Prime surface evenly with bonding agent using a medium pile paint roller or brush. Allow bonding agent to dry, until tacky. Wet topping mixture, mix thoroughly and spread terrazzo mixture with trowel, level to top of strips. Sprinkle topping with dry aggregate chips. Roll with heavy rollers to compact topping until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strips to close all voids and pin holes. Control cure for a minimum of 48 hours.

#### GRINDING

After floor has sufficiently cured, grind with No. 24 grit abrasive stones or with diamond plugs. Follow initial grind with No. 80 grit stones. Remove excess slurry and rinse with clean water. Apply latex grout by hand trowel or machine to fill all voids. Allow grout to cure and re-grind with No. 80 grit stones or finer, to maximum of 120 grit until all grout is removed from surface. Rinse with clean water. Let surface dry thoroughly and apply sealer as per manufacturer's recommendations.

#### LIMITATIONS

- For epoxy bonded terrazzo installations, do not wet substrate or apply a slurry bond coat. Only apply epoxy bonding agents following manufacturer's recommendations
- For colour pigments, see Page 14 (pending where new page is located)

#### OTHER CONSIDERATIONS

- See 401MJ-2007 for placement of control joints
- For use of crack isolation membranes, see Page 11 (pending where new page is located)
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.

SUITABLE SUBSTRATE

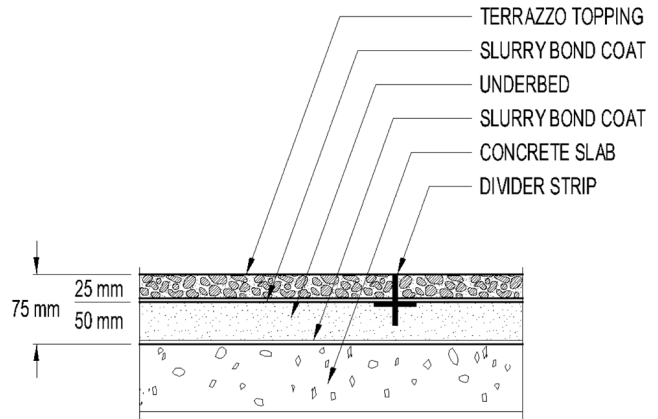
- Interior concrete slab where deflection under both dead and live loads conforms to local building codes.

UNDERBED MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM C-144-99
- Divider strips: Zinc, brass or stainless steel, 2 mm, 3 mm or 6 mm heavy top by 32 mm or 38 mm in depth
- Underbed: one part Portland cement to four parts clean washed sand. Add sufficient clean water and mix thoroughly to a low slump to provide workability

TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate chips: marble (granite optional)
- Abrasive aggregate: Aluminum Oxide if specified
- Terrazzo topping: 40 kg of cement, white/grey or a blend of both, to 90 kg of aggregate chips, 50% No.2 and 50% No.1; add colour pigment if specified. Use no more than 18 liters of water per 40 kg of cement or adjust to suit conditions to provide workability.



UNDERBED INSTALLATION

Broom clean base slab, saturate with water and remove excess. Apply a slurry consisting of a thick paste of cement and water, latex-additive may be added. Place and screed underbed mix to a minimum 19 mm below finished floor elevation or slope. For larger size aggregate, increase depth to 25 mm. Install divider strips and control joints in underbed while in a workable plastic state. Trowel firmly on both sides of divider strips to a true and level plane and required pattern.

TERRAZZO TOPPING INSTALLATION

Allow underbed to cure, sweep or vacuum, saturate with water and remove excess. Apply a slurry bond coat and immediately follow with application of terrazzo topping mix. Wet topping mixture, mix thoroughly and spread terrazzo mixture of 50% No. 2 and 50% No. 1 to below top of strips. Sprinkle a mix of dry chips combining No. 1, 2, 3, 4 and 5 and/or No. 6, 7 and 8 broadcasting as closely and evenly as possible. Tamp down and roll into a compact mass, until excess cement and water has been extracted. Trowel to an even finish over top of divider strips. Control cure for a minimum of 48 hours.

GRINDING

After floor has sufficiently cured, grind with No.24 grit abrasive stones or with diamond plugs. Follow initial grind with No. 80 grit stones, remove excess slurry, rinse with clean water and apply grout by hand trowel or machine to fill all voids. Allow grout to cure and re-grind with No. 80 grit stones or finer, to a maximum of 120 grit until all grout is removed from surface. Rinse with clean water. Let surface dry thoroughly and apply sealer as per manufacturer's recommendations.

LIMITATIONS

- Thickness of the underbed must be 51 mm minimum for installations bonded to a concrete slab. Thickness of underbed to be increased depending on chip size to accommodate the increased depth of divider strips. For a floating system, increase thickness of the underbed to 62 mm minimum. Refer to Detail 411F-2016.
- For colour pigments, see Page 14. (pending location of new page)

OTHER CONSIDERATIONS

- See 401MJ-2007 for placement of control joints
- For use of crack isolation membranes, see Page 11 (pending location of new page)
- Venetian terrazzo is also suited for an epoxy bonded system
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.

SUITABLE SUBSTRATE

- Concrete slab steel trowel or fine broom finish for epoxy bonded where deflection under both dead and live loads conforms to local building codes.

MATERIALS

- Portland cement CAN/CSA-A5-93
- Epoxy bonding agent installed as per manufacturer's recommendations.
- Interior – Divider strips: zinc, brass, 2 mm, 3 mm or 6 mm heavy top, L or T shaped
- Exterior – Divider strips: Removable wood screed, plastic or saw-cut
- For exterior applications substitute slurry bond coat for epoxy bonding agent
- Caulking – exterior only

TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both.
- Colour pigments: non-fading in powder or liquid form if specified.
- Aggregate chips: marble, granite or pea gravel. riverstone.
- Terrazzo topping: 40 kg of cement white, grey or a blend of both, to 90 kg of aggregate, 70% No.2 and 30% No.1 for floors; add colour pigment if specified. Use no more than 18 liters of water per 40 kg cement or adjust to suit conditions to provide workability.
- Exterior – Air entraining agent of 6% plus or minus 1%

SURFACE PREPARATION

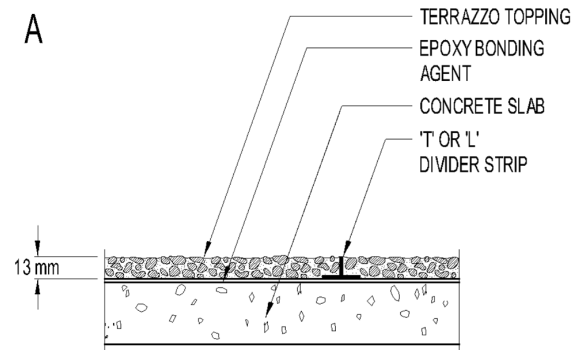
Concrete to be sound with steel trowel finish, free of laitance and curing compounds. Surface may be prepared using grinding. If required, depress slab a minimum of 13 mm. All base slabs shall be protected from oil, grease or other contaminants.

INSTALLATION OF TERRAZZO STRIP OPTIONS

- Broom clean base slab and layout pattern. Bond strips and control joints to floor with appropriate epoxy product. Ensure that strips are fully bonded to the substrate, paying special attention to points of intersection. Allow strips to set before application of terrazzo topping.
- Exterior – wood screeds shall be removed following cure of terrazzo. Fill open joint with suitable caulking to a maximum of 13 mm in width.
- Saw cuts may be used as control joints and filled with suitable caulking.

TERRAZZO TOPPING INSTALLATION

After strips are installed, sweep or vacuum floor and prime surface evenly with epoxy bonding agent, using a medium pile paint roller or brush. Allow bonding agent to dry, until tacky. Wet topping mixture, mix thoroughly and spread with trowel level to top of strips. Sprinkle topping with dry aggregate. Roll with heavy rollers to compact topping until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strips. Expose aggregate by hosing, absorbent rolling or by applying a retarder to surface of matrix topping. Cover topping with polyethylene film over night. Remove all excess retarded laitance with stiff broom and hosing. Rinse floor with clean water to remove remaining laitance leaving aggregates exposed and clean.



Cont'd..

## DETAIL 414F-2016 DETAIL B – TERRAZZO BONDED TO UNDERBED

### SUITABLE SUBSTRATES

- Concrete slab screed finish where deflection under both dead and live loads conforms to local building codes.

### UNDERBED MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM C-144-99
  - Interior – Divider Strips: zinc or brass, 2 mm, 3 mm or 6 mm heavy top
  - Exterior – Removable wood screed or saw-cut
- Caulking: exterior only

### TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour Pigments: non-fading in powder or liquid form if specified
- Aggregate Chips: marble, granite or pea gravel or riverstone
- Terrazzo Topping: 40 kg cement white, grey or a blend of both to 90 kg of aggregate chips, 70% No. 2 and 30% No. 1 for floors; add colour pigments if specified. Use no more than 18 liters of water per 40 kg cement or to suit conditions to provide workability
- Exterior – Air entraining agent of 6% plus or minus 1%

### UNDERBED INSTALLATION

Broom clean base slab, saturate with water and remove excess. Apply a slurry consisting of a thick paste of cement and water, latex additive may be added. Place and screed underbed mix to 13 mm below finished floor elevation or slope. Install divider strips and control joints in underbed mix, while in a workable plastic state. Trowel the strip firmly on both sides to a true and level plane and required pattern. For exterior only – Air entraining agent of 6% plus or minus 1%.

### TERRAZZO TOPPING INSTALLATION

Allow underbed to cure, sweep or vacuum, saturate with water and remove excess. Apply slurry bond coat of cement and immediately follow with application of terrazzo topping mix. Wet topping mixture, mix thoroughly and spread with trowel level to top of strips. Sprinkle topping with dry aggregate. Roll with heavy rollers to compact topping until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strips. Expose aggregate by hosing, absorbent rolling or by applying a retarder to surface of matrix topping. Cover topping with polyethylene film over night. Remove all excess retarded laitance with stiff broom and hosing. Rinse floor with clean water to remove remaining laitance, leaving aggregate exposed and clean.

### DETAIL A & B SEALING

Rinse exposed aggregate with clean water and allow to dry. When thoroughly dry, apply sealer in accordance with manufacturer's directions.

### LIMITATIONS

- De-icing salts are harmful to Portland cement surfaces and should not be used on exterior exposed rustic terrazzo.
- Other non-sodium based de-icing products are suitable for use.
- For colour pigments, see Page 14.
- For exterior application of Detail A an epoxy bonding agent should not be used.

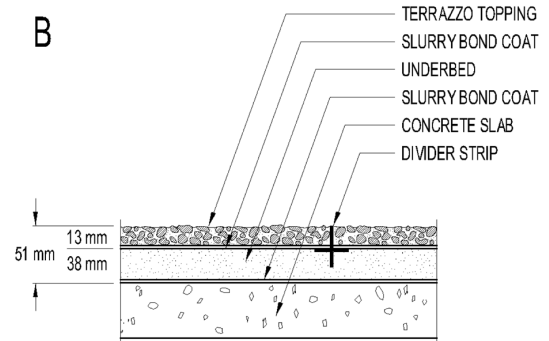
### OTHER CONSIDERATIONS

In certain circumstances, the rolling to compact topping can be omitted. Trowel topping flush with top of strips, sprinkle aggregate, hand trowel topping surface until aggregate is fully embedded in the matrix. Expose aggregate with an absorbent roller right after the embedding of the aggregate or by applying a retarder over surface of topping. Cover with polyethylene film and let cure. If a retarder is being used, follow manufacturer's recommendations. Power wash to expose aggregate. Exterior – Scoring may be used in lieu of divider strips and/or control joints to form a pattern if desired. Make cuts to a depth of 1/3 of the overall depth of the terrazzo assembly. Fill joints with a suitable caulking compound. Minimum width 6 mm. Exterior – Waterproofing can not be accommodated in the terrazzo application and must be installed below the substrate

- See 401MJ-2007 for placement of expansion and control joints
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.

### Rustic Portland Cement Terrazzo installed over a floating system – Interior Only

- For underbed installation, see Detail 411F-2016
- For terrazzo topping installation, see Detail 414F-2016, B.

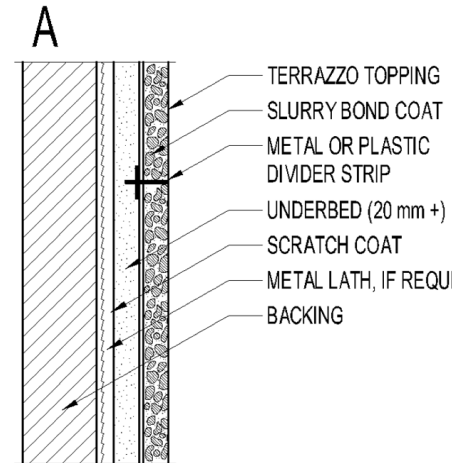


SUITABLE SUBSTRATE

- Concrete or masonry substrate for interior/exterior use
- 13 mm cementitious backer unit (CBU) meeting ANSI A118.9-1992 on reinforced wood or metal studs, interior only

UNDERBED MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: Clean washed to ASTM C-144-99
- Scratch coat: 7 mm minimum
- Underbed: 19 mm minimum
- Galvanized metal lath: 1.4kg/m2 ASTM-C-847-95
- Base bead top strips: zinc or brass
- Divider strips: zinc, brass, stainless steel or plastic, gauged 2 mm, 3 mm or 6 mm heavy top. For epoxy bonded installation, use shallow type L or T-shaped strips
- Epoxy bonding agent
- Underbed: One part Portland cement to three parts clean washed sand for scratch coat and underbed. Add sufficient clean water and mix thoroughly to a workable consistency. Latex additive may be used in modification of underbed.



TOPPING MATERIALS B

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate Chips: marble, granite, a limited amount of plastic or glass chips may be added to the mix according to local practice and manufacturer's recommendations.
- Topping: 40 kg of cement white, grey or a blend of both, to 45kg of 100% No. 1 aggregate; colour pigments, if specified. Add water and mix to a uniform stiff workable consistency.

BASE BEAD TOP STRIPS AND UNDERBED INSTALLATION

Install base bead top strips at specified height, straight and level. Mechanically fasten metal lath over surfaces that present bonding problems. Apply scratch coat and allow to cure. Apply underbed to required thickness, plumb and straight to within 10 mm of finish line. Install divider strips as specified and shown on drawings in semi-plastic underbed and trowel firmly along edges. Epoxy bond L or T strips on cured underbed for thin-set installations.

TERRAZZO TOPPING INSTALLATION

Allow underbed to cure, clean and wet as required. Apply a slurry bond coat and immediately follow with application of terrazzo topping mix. Apply a stiff workable terrazzo mix to slurry bond coat and trowel mixture to top of strips. Trowel and compact until surface is tight and excess cement and water has been extracted. For epoxy bonded installations do not wet or apply slurry bond coat to the substrate. Apply bonding agent following manufacturers' recommendations. Allow to cure and grind.

GRINDING

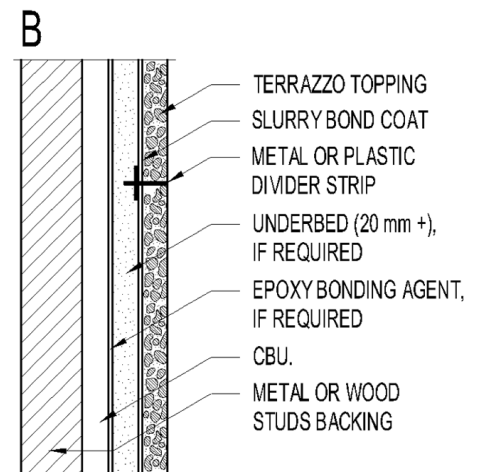
After terrazzo has sufficiently cured, grind with course abrasive stone or diamond. Follow initial grind with No. 80 grit stone and wash surface with clean water. Apply grout by hand, using same matrix and pigment as the topping to fill all voids and pin holes. Remove excess grout with burlap cloth or by other means. Allow grout to cure. Final grind with No. 80 or finer grit stones or discs, to a maximum of 120 grit until all grout is removed from the surface. Rinse and clean, let surface dry thoroughly. Apply sealer following manufacturer's recommendations.

LIMITATIONS

- When installing terrazzo directly to poured concrete, the substrate must be fully cured for a minimum of 28 days and free of contaminants. Substrate that is not cured will react unsatisfactorily with epoxy bonding agent.
- For colour pigments, see Page 14.
- Aggregate size shall be limited to No. 0 and No. 1
- Recommended panel size not to exceed 750 mm

OTHER CONSIDERATIONS

- See 401MJ-2007 for placement of control joints
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.



SUITABLE SUBSTRATE

- Concrete or masonry, 13 mm minimum cementitious backer unit (CBU) meeting ANSI A118.9-1992, 13 mm drywall or 16 mm minimum exterior grade plywood.

UNDERBED MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM C-144-99
- Galvanized metal lath: 1.4kg/m<sup>2</sup> ASTM-C-847-95
- Base bead top strip: zinc, brass or stainless steel
- Cove base divider strip: zinc, brass or plastic, gauged 2 mm, 3 mm or 6 mm heavy top
- Underbed: one part Portland cement to three parts clean washed sand. Add sufficient water to form a stiff mix
- Epoxy bonding agent

TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate chips: marble, granite, a limited amount of plastic and or glass chips may be added to the mix according to local practice and manufacturer's recommendations.
- Topping: 40 kg of cement white, grey or a blend of both, to 45 kg of 100% No. 1 aggregate, and colour pigment, if specified. Add water and mix to a uniform stiff workable consistency.

BASE BEAD TOP STRIP AND UNDERBED INSTALLATION

Install base bead top strip at specified height, straight and level. Mechanically fasten metal lath over plywood or drywall substrate. Apply underbed to backing, trowel underbed to within 8 mm of finish surface. Install divider strips and cove base dividers as shown or specified, in semi-plastic setting bed, plumb and aligned with floor strips. Allow to cure before installation of terrazzo topping.

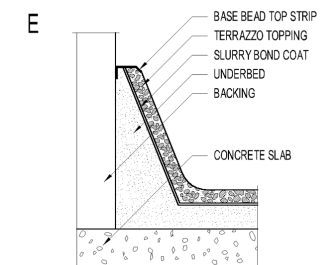
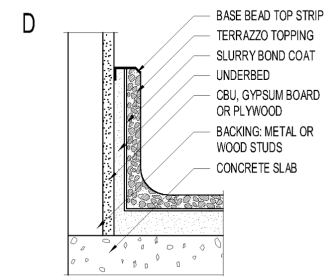
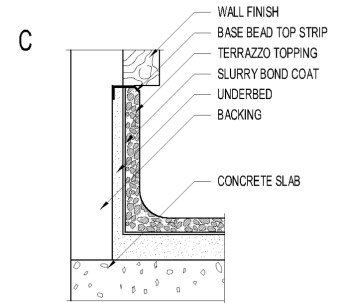
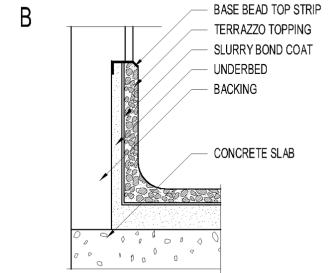
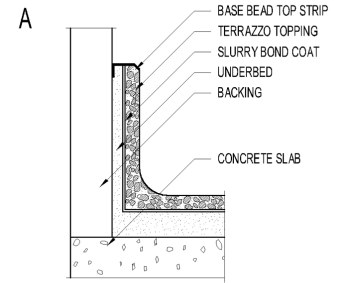
TERRAZZO TOPPING INSTALLATION

After underbed has sufficiently cured, clean and wet underbed as required. Apply a slurry bond coat and immediately follow with application of terrazzo topping mix. Apply a stiff workable terrazzo mix to slurry bond coat. Trowel terrazzo mixture to shape of cove base as specified. Allow to cure and grind.

When using an epoxy bonding agent, ensure the fully cured substrate is free of all laitance and contaminants. Prime surface evenly with bonding agent using a brush. Allow bonding agent to dry until tacky. Wet topping mixture to a stiff workable consistency and apply level to top of strips. Trowel terrazzo mixture to shape of cove base. Allow to cure and grind.

GRINDING

After base has sufficiently cured, grind with coarse abrasive stone or diamond. Remove excess, wash base with clean water. Apply grout by hand using same colour matrix and pigment as topping to fill all voids and pin holes. Remove excess grout with burlap cloth or other means. Allow grout to cure. Final grind with No. 80 or finer grit disc, to a maximum of 120 grit until all grout is removed from the surface. Rinse surface clean, let dry thoroughly and apply sealer following manufacturer's recommendations.

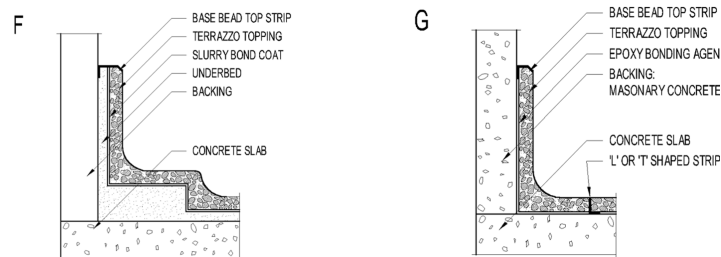


### LIMITATIONS

- When terrazzo base is to be finished flush with adjacent wall finishes, the base must protrude a minimum of 3 mm beyond other finishes
- When terrazzo base is to be installed in a recessed cavity, the base must be a minimum height of 152 mm
- For colour pigments, see Page 14
- The radius of cove base shall be no less than 38 mm

### OTHER CONSIDERATIONS

- Backing for terrazzo base should be cementitious backer units (CBU), concrete or masonry.
- Where terrazzo topping is to be directly applied to substrate a shallow type base bead top strip and L or T shaped cove base divider strip is to be used.
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.



**SUITABLE SUBSTRATE:**

Interior/exterior concrete slab screed finish for underbed installations. Fine broom or steel trowel finish for epoxy bonded installations. Surface to be free of cracks, wax or oily films and curing compounds. Steel pan stairs for interior and exterior, wood stairs for interior only. Maximum deflection in substrate must conform to local building codes.

**UNDERBED MATERIALS**

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM-C-144-99
- Scratch coat: 7 mm minimum
- Epoxy bonding agent
- Base bead top strips: zinc or brass
- Steel rods: 10 mm minimum thickness
- Galvanized metal lath: 1.4kg/m<sup>2</sup> ASTM-C-847-95 for wood and steel stairs
- Reinforcing mesh: 51 mm x 51 mm x 1.6 mm galvanized, ASTM A821/ASTM A185
- Cove divider strips: zinc, brass or plastic, gauged 2 mm, 3 mm or 6 mm heavy top. For epoxy bonded installation, use L or T-shaped strips
- Underbed: One part Portland cement to three parts clean washed sand. Add sufficient clean water and mix thoroughly to as low a slump as possible to provide workability.
- Abrasive strip channel: 10 mm wide by 10 mm deep zinc or brass
- Cleavage membrane: 0.10 mm (4 mils) polyethylene film CAN/CGSB-51.34-M86

**TOPPING MATERIALS**

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate chips: marble, granite, or a limited amount of plastic or glass chips may be added to the mix according to local practice and manufacturer's recommendations.
- Topping: 40 kg of cement, white, grey or a blend of both, to 45kg of 100% No. 1 aggregate, add colour pigments, if specified. Add water and mix to a uniform stiff working consistency to suit conditions and to provide workability.

**BASE BEAD TOP STRIP UNDERBED INSTALLATION**

Install base bead top strip at wall stringer or where specified, at required height, straight and level. Mechanically fasten galvanized metal lath over surfaces that may present a bonding problem. Apply underbed to backing to within 8 mm of the finish of base surface. Place and screed underbed mix to minimum of 10 mm and a maximum of 13 mm below finished stair elevation for risers and treads. Install divider strips, cove divider strips and slip resistant channels while underbed is in semi-plastic state. Allow to cure before installation of terrazzo topping.

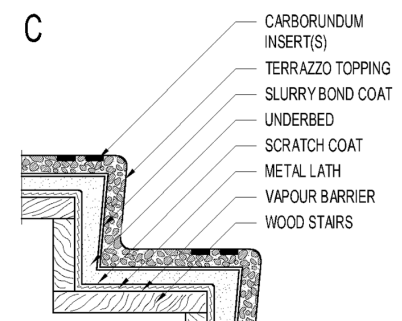
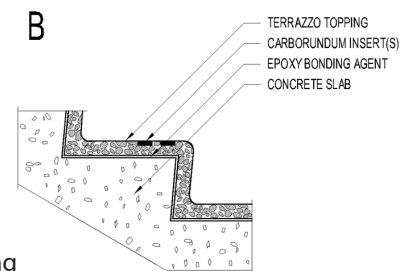
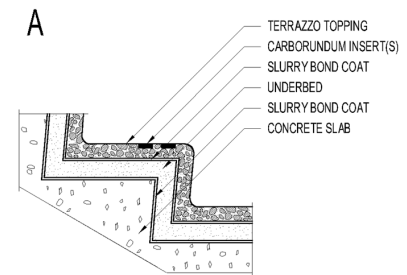
When bonding divider strips directly to cured underbed, install L or T strips using epoxy bonding agent. Allow to cure before installing terrazzo topping.

**DETAIL A – TERRAZZO TOPPING INSTALLATION**

After underbed has sufficiently cured, clean and wet as required. Apply cement slurry bond coat and immediately follow with application of terrazzo topping mix. Brush cement slurry to cured underbed surface. Apply a stiff workable terrazzo mix to slurry bond coat. Trowel mixture on risers, treads, curbs and stringers as detailed. Compact terrazzo surface until excess cement and water has been extracted, to a dense uniform flat surface, level to top of strips. Allow to cure and grind.

**DETAIL B – SUBSTRATE PREPARATION**

Clean substrate. Apply a slight leveling coat if required to adjust substrate irregularities, let cure. Install base bead top strips as specified. Mechanically fasten metal lath to substrates that may present a bonding problem. Apply scratch coat to backing and trowel underbed to within 8 mm of finish surface. Epoxy bond L or T shaped divider strips, cove base strips and slip resistant channels as shown or specified. Allow to cure prior to installation of terrazzo topping.



Continued on next page.

**DETAIL B – TERRAZZO TOPPING INSTALLATION**

After strips have sufficiently cured, clean stairs and apply bonding agent to substrate with brush. Allow epoxy bonding agent to set to a tacky consistency. Do not wet surface prior to application of bonding agent and topping. Apply a stiff workable terrazzo mix to tacky bonding agent. Trowel mixture on risers, treads, curbs and stringers as detailed. Compact terrazzo surface until excess cement and water has been extracted to a dense uniform flat surface level to top of strips. Allow to cure and grind.

**DETAIL C – WOOD STAIRS (INTERIOR ONLY)**

Mechanically fasten galvanized metal lath to wood substrate over cleavage membrane (vapour barrier). Install underbed, divider strips, cove divider strips, slip resistant channels and terrazzo topping according to Detail A, but increase thickness of underbed on horizontal surface to a minimum of 38 mm and a minimum of 25 mm on vertical surface.

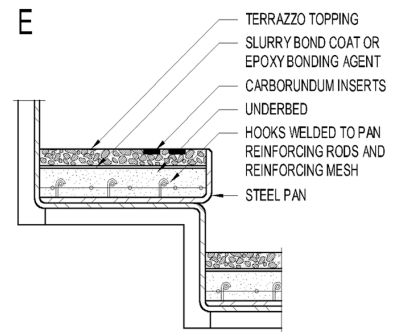
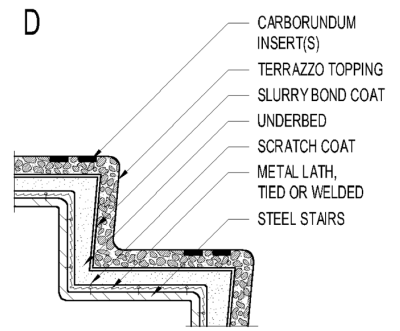
**DETAIL D – STEEL STAIRS**

Spot weld galvanized diamond mesh to steel stairs by others. Installation of underbed and terrazzo topping according to Detail A, increasing thickness of underbed on horizontal surface to a minimum of 38 mm and a minimum of 25 mm on vertical surface.

**DETAIL E – STEEL PAN STAIRS**

Install underbed with reinforcing mesh/steel rods. Ensure that reinforcing members are suspended approximately 16 mm above the bottom steel pan. Screed underbed to a minimum of 10 mm and a maximum of 13 mm below finished surface. Install divider strips and slip resistant channels while underbed is in semi-plastic state. Allow underbed to cure 24 hours before installation of terrazzo topping, as per Detail A.

Underbed with reinforcing members may be poured and allowed to cure prior to the installation of strips. In this case, L or T shaped strips can be installed on a cured underbed with an epoxy bonding agent and allowed to set. Prime underbed using an epoxy bonding agent or a cement slurry bond coat and install terrazzo topping.



**GRINDING**

After terrazzo has sufficiently cured, grind with course abrasive stone or diamond. Remove excess and wash base with clean water. Apply grout by hand using same colour matrix and pigment as topping to fill all voids and pin holes. Remove excess grout with burlap cloth or other means. Allow grout to cure. Final grind with No. 80 grit disc until all grout is removed from the surface. Rinse and clean surface, let dry thoroughly. Apply sealer following manufacturer's recommendation.

**INSTALLATION OF ABRASIVE INSERTS**

After sealer has dried, mask terrazzo with 19 mm or 25 mm wide adhesive tape on both sides of abrasive channels to protect finished surface. Remove protective foam and all foreign matter. With pointing trowel spread abrasive mix into channel maintaining a consistent thickness of 2 mm above terrazzo tread. Remove masking tape and allow to cure overnight.

**LIMITATIONS**

- Wood stairs not recommended for exterior applications.
- Radius of cove risers shall be no less than 38 mm
- For colour pigments, see Page 14

**OTHER CONSIDERATIONS**

- On exterior stairs and wet areas, a slight slope of 4% on treads away from riser is recommended.
- For Detail C and D, underbed may be installed over fresh scratch coat.
- Strict attention must be paid to local building codes in regard to abrasive nosings and visually impaired warning line, if specified.
- Reinforcing metal lath to be welded by the fabricator and installer of steel stairs
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.
- Provide tactile surface prior to stairs where required for visually handicapped.

# PALLADIANA TERRAZZO INSTALLED ON CEMENT MORTAL BED ON CONCRETE SLAB 418F-2016

## DETAIL A

### SUITABLE SUBSTRATE

- Interior concrete slab, screed finished, where deflection under both dead and live loads conforms to local building codes.

### UNDERBED MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM C-144-99
- Divider strips: zinc or brass gauged 2 mm, 3 mm, or 6 mm heavy top by 12 mm, 19 mm or 25 mm
- Underbed: one part Portland cement to four parts clean washed sand. Add sufficient clean water and mix thoroughly to a slow slump to provide workability.
- Bond Coat: Latex Portland cement mortar

### TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Fragmented marble (granite or other suitable products optional) ranging in size from minimum 100 mm x 100 mm to maximum 300 mm x 300 mm
- Aggregate chips: marble, a limited amount of glass chips may be added to the mix according to local practice and manufacturer's recommendations.
- Terrazzo filler: 40kg of cement; white, grey or a blend of both to a 45 kg of 100% No. 1 aggregate, add colour pigment, if specified. Use no more than 18 litres of water per 40kg of cement or adjust to suit conditions to provide workability

### UNDERBED INSTALLATION

Broom clean base slab, saturate with water and remove excess. Apply a slurry consisting of a thick paste of cement and water, latex-additive may be added. Place and screed underbed mix to suit thickness of fractured marble slab and setting material. Install divider strips (optional) and control joints in underbed while in a workable plastic state. Trowel firmly on both sides of divider strips to a true and level plane and required pattern.

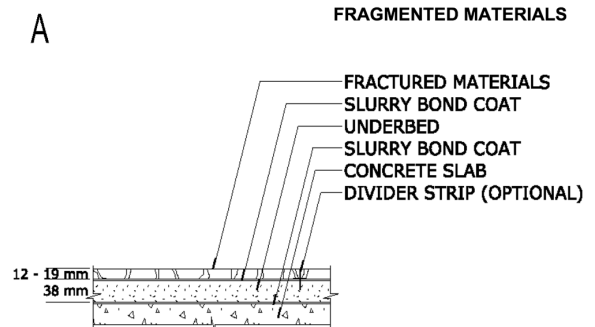
### INSTALLATION OF FRACTURED MATERIALS

Allow underbed to cure for 24 – 48 hours depending on job conditions, sweep or vacuum underbed clean. Wipe any residue from back side of fractured slabs. With a notched trowel spread latex Portland cement mortar bond coat to underbed. Backbutter underside of marble (granite or other suitable products optional) and place firmly to a level plane before bond coat skins over. Use sufficient bond coat to ensure a minimum of 80% contact. Contact shall be evenly distributed to give full support of the pieces. Allow bond coat to cure for a minimum of 48 hours prior to application of filler. On fresh mortar bed, beat fractured pieces into position and let cure for a minimum of 48 hours prior to application of filler.

### APPLICATION OF FILLER

After underbed has sufficiently cured, remove any laitance from joints. Sweep or vacuum, saturate with water and remove excess. Apply a slurry bond coat if specified and immediately follow with application of terrazzo filler. Wet filler mixture, mix thoroughly and trowel terrazzo mixture to fill all joints level to top of fractured pieces. Sprinkle filler mixture with dry aggregate. Roll with light roller to compact topping until excess cement and water has been extracted. Hand trowel filler surface flush with top fractured pieces to close all pinholes. Control cure for a minimum of 48 hours.

Continued Next Page



## GRINDING

After floor has sufficiently cured, grind with No. 24 grit abrasive stones or with diamond plugs. Follow initial grind with No. 80 grit stones, remove excess slurry and grind with 120 grit to remove grinding swirl marks. Rinse with clean water and apply grout by hand trowel or machine to fill all voids. Allow grout to cure for 48 hours and regrind with No. 120 or finer grit stones until all grout is removed from surface. Rinse with clean water. Let surface dry thoroughly and apply sealer as per manufacturers' recommendations.

## LIMITATIONS

- Exterior installations subject to freeze/thaw conditions are not recommended
- The thickness of the underbed for a floating system should be 65 mm minimum
- Keep reinforcing mesh approximately 19 mm above polyethylene film
- Substrate variation not to exceed 6mm in 3000 mm
- For colour pigments see Page 14 (pending where the new page is located)

## OTHER CONSIDERATIONS

- For precast concrete floor systems, post tensioned concrete floor systems and any other floors subject to movement, deflection or excess cracking, the floating system should be used. Application directions as per detail (414F). Increase depth of strips to allow for thickness of fragmented slabs.
- See 401MF-2007 for placement of control joints
- Topping height will vary, depending on fragmented slab thickness
- For use of crack isolation membranes see Page 11 (pending new page location)
- Palladiana can also be installed without an underbed in a thin-set system
- To maintain uniformity and aesthetics a combination of fragmented pieces must be installed randomly. Sizes may range from a minimum of 100 mm x 100 mm to a maximum of 300 mm x 300 mm.
- White or grey Portland cements may not be uniform in shade and may produce a variation in the appearance in the matrix.
- If a higher degree of finish is desired, further grind with progressively finer grits
- Joint width is usually between 12 mm and 32 mm, wider joints should be specified
- In certain circumstances, the rolling to compact topping filler can be omitted. Trowel topping flush with top of fractured pieces, sprinkle aggregate, hand trowel filler surface until aggregate is fully embedded in the matrix

## DETAIL B – THIN-SET METHOD

### SUITABLE SUBSTRATE

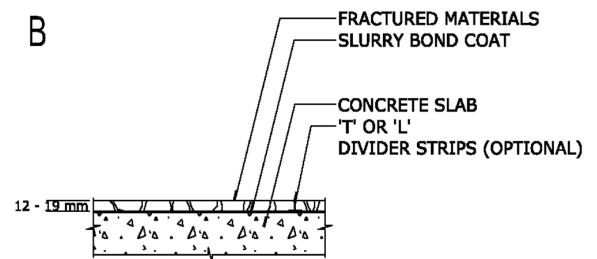
- Interior concrete slab, steel trowel or fine broom finish where deflection under both dead and live loads conforms to local building codes.

### MATERIALS

- Portland cement: CAN/CSA-A5-93
- Divider strips: zinc, brass, stainless steel or plastic, gauged 2 mm, 3 mm or 6 mm heavy top by 12 mm, 19 mm or 25 mm, L or T shaped
- Bond coat: Latex Portland cement mortar

### TOPPING MATERIALS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Fragmented marble (granite or other suitable products optional) ranging in size from minimum 100 mm x 100 mm to maximum 300 mm x 300 mm
- Aggregate chips: marble (granite optional) a limited amount of glass chips may be added to the mix according to local practice and manufacturers' recommendations
- Abrasive aggregate: aluminum oxide if specified
- Terrazzo filler: 40kg of cement white, grey or a blend of both to 45kg of 100% No. 1 aggregate, add colour pigment, if specified. Use no more than 18 litres of water per 40kg of cement or adjust to suit conditions to provide workability



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## SURFACE PREPARATION

Concrete shall be sound with steel trowel finish, free of laitance and curing compounds. Surface may be prepared using shotblasting, sandblasting, grinding or scarifying. If required, depress slab to accommodate thickness of fractured slabs and setting material.

## INSTALLATION OF STRIPS

Sweep and clean base slab and layout pattern. Bond strips and control joints to floor with appropriate epoxy product. Ensure that strips are fully bonded to the substrate, paying special attention to points of intersection. Allow strips to set prior to application of fractured slabs.

## INSTALLATION OF FRAGMENTED MATERIALS

After strips are installed, sweep or vacuum floor, wipe any residue from back side of fractured slabs. With a notched trowel spread latex Portland cement mortar bond coat to concrete slab. Backbutter underside of marble (granite or other suitable products optional) and place firmly to a level plane before bond coat skins over. Use sufficient bond coat to ensure minimum of 80% contact. Contact shall be evenly distributed to give full support of the pieces. Allow bond coat to cure for a minimum of 48 hours prior to application of filler.

## APPLICATION OF FILLER

After mortar bond coat is sufficiently cured, remove any laitance from joints. Sweep or vacuum, saturate with water and remove excess. Apply a slurry bond coat if specified and immediately follow with application of terrazzo filler. Wet filler mixture, mix thoroughly and trowel terrazzo mixture to fill all joints level to top of fractured pieces. Sprinkle filler mixture with dry aggregate. Roll with light roller to compact terrazzo filler until excess cement and water has been extracted. Hand trowel filler surface flush with top of fractured pieces to close all pinholes. Control cure for a minimum of 48 hours.

## GRINDING

After floor has sufficiently cured, grind with No. 24 grit abrasive stones or with diamond equivalents. Follow initial grind with No. 80 grit stones, remove excess slurry and grind with No. 120 grit to remove grinding swirl marks. Rinse with clean water and apply grout by hand trowel or machine to fill all voids. Allow grout to cure for 48 hours and regrind with No. 120 or finer grit stones until all grout is removed from surface. Rinse with clean water. Let surface dry thoroughly and apply sealer as per manufacturers' recommendations.

## LIMITATIONS

- Exterior installations subject to freeze/thaw conditions are not recommended
- Concrete slab surface maximum variation not to exceed more than 6 mm from true plane in 3000 mm
- Thin-set installations are not intended to level substrate, it will only follow contour of the concrete slab
- If the substrate is not suitable for bonding, any work required to eliminate nonconformity of substrate is the responsibility of others.
- For colour pigments see Page 14 (pending new page location)

## OTHER CONSIDERATIONS

- See 401MJ-2007 for placement of control joints
- For use of crack isolation membranes see Page 11 (pending new page location)
- Topping height will vary depending on fractured slab thickness
- To maintain uniformity and aesthetics a combination of fragmented pieces must be installed randomly. Sizes may range from a minimum of 100 mm x 100 mm to a maximum of 300 mm x 300 mm.
- In certain circumstances, the rolling to compact topping filler can be omitted. Trowel topping flush with top of fractured pieces, sprinkle aggregate, hand trowel filler surface until aggregate is fully embedded in the matrix
- Joint width is usually between 12 mm and 32 mm, wider joints should be specified
- If a higher degree of finish is desired, further grind with progressively finer grit stones
- White and grey Portland cements may not be uniform in shade and may produce a variation of shade in the matrix

SUITABLE SUBSTRATES

- Interior/exterior concrete screed finish for underbed installation free of cracks, contaminants and curing compounds.
- Interior/exterior concrete substrate fine broom or steel trowel finish free of cracks, contaminants and curing compounds for thin-set installations.
- Steel stairs reinforced to meet maximum deflection conforming to local building codes.

SETTING MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM C-144-99
- Latex-Portland cement mortars, modified epoxy emulsion mortars or 100% solid epoxy mortar.
- Underbed: One part Portland cement to three parts washed concrete sand by volume; add sufficient clean water and mix thoroughly to a low slump to provide workability.

PRECAST UNITS

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Aggregate chips: marble, granite, a limited amount of plastic or glass chips may be added to the mix according to local practice and manufacturer's recommendations.

DETAIL A – INSTALLATION OVER FRESH UNDERBED

Clean and saturate with water and remove excess. Apply a slurry bond coat consisting of water, cement latex additive. Place a screed mix to the required level on treads and risers. Backbutter precast treads and risers with a latex Portland cement mortar. Place treads and risers into position and set and align units straight and true to conform with all detail dimensions. Allow assembly to cure. Force grout into full depth of joint. Remove excess grout and clean.

DETAIL B – INSTALLATION THIN-SET METHOD

Concrete shall be sound with a steel trowel or fine broom finish, free of cracks, contaminants, curing compounds or laitance. Surface variation of concrete slab not to exceed 6 mm in 3049 mm or 2 mm in 305 mm. A slight levelling coat may be required on substrates to adjust any irregularity, if specified. Allow to cure prior to the application of bond coat and pre-cast. Apply bond coat directly over substrate or over levelling coat. Backbutter bonding material to back of pre-cast. Use sufficient bond coat to ensure a minimum of 95% coverage. Set and align pre-cast straight and true to conform with all detailed dimensions. Contact shall be evenly distributed to give full support to the pre-cast. Allow assembly to cure. Force grout into full depth of joint, remove excess and clean.

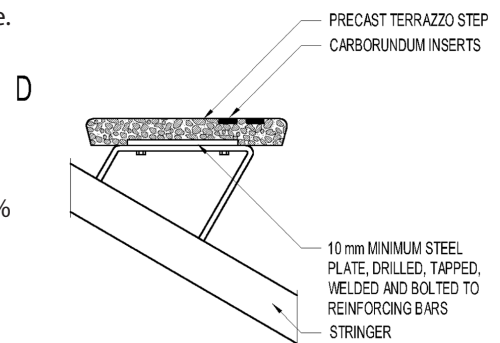
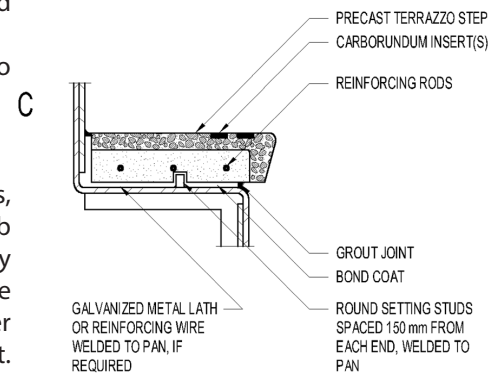
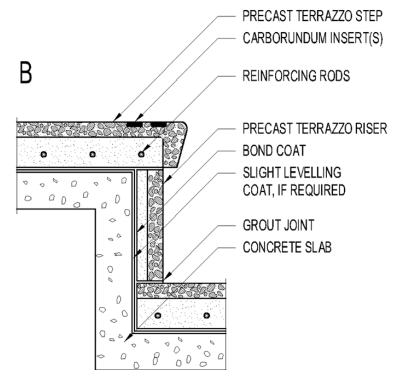
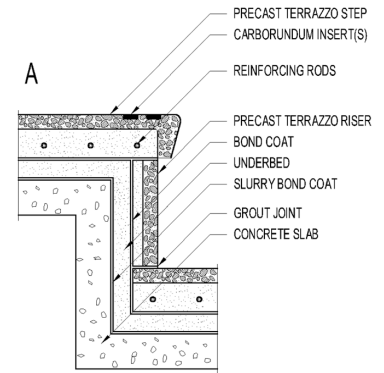
DETAIL C – STEEL STAIRS

SETTING MATERIAL

- Latex Portland cement mortars, modified epoxy emulsion mortars or 100% solid epoxy mortars.

INSTALLATION

- Spot weld metal lath to steel stair on steel treads, by others. Install pre-cast as per Detail B, omitting slight leveling coat.



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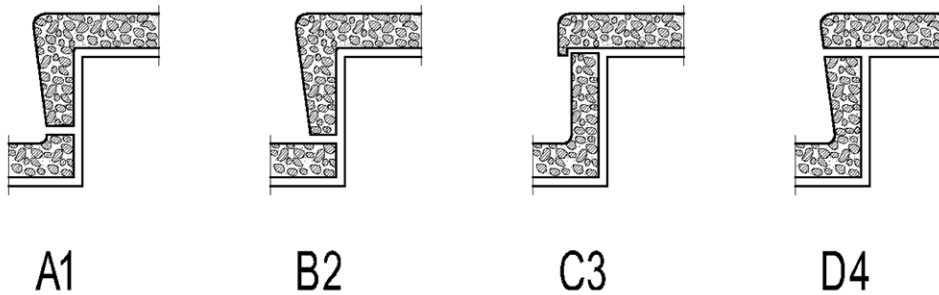
## LIMITATIONS

- Pre-cast should not have variances greater than 3 mm in length, height or width.

## OTHER CONSIDERATIONS

- Pre-cast terrazzo may be directly bonded to steel without the use of metal lath.
- Pre-cast terrazzo may be set by the mortar system, thin-set or weld and bolt method.
- Pre-cast terrazzo may be installed over a cured underbed. If modified epoxy or 100% solid epoxies are used as a bonding material, underbed must be cured for a minimum of 7 days.
- Where Precast terrazzo is to be installed over a cracked substrate using a thin-set method, a crack isolation membrane must be applied over the crack. Membrane must be compatible with setting material for proper bonding of the Precast. Install as per manufacturer's recommendations.
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.
- Provide tactile surface prior to stairs where required for visually handicapped.

## OPTIONAL TREADS AND RISERS (TO BE SPECIFIED BY ARCHITECT)



PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions and division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. Section Includes:

1. Thin-set epoxy terrazzo flooring including preparation of substrates.
2. Thin-set precast epoxy terrazzo tread or tread & riser units.
3. Thin-set precast epoxy terrazzo wall base units.
4. Related accessories.

B. Related Sections:

01. Section 03300, Cast In Place Concrete.
02. Section 04200, Unit Masonry.
03. Section 05510, Metal Stairs.
04. Section 07260, Under-slab Vapor Retarder/Barrier.
05. Section 07900, Joint Sealants.
06. Section 09900, Painting.
07. Section [ ] Furnishing and Setting Floor Drains.
08. Section [ ] Setting of Metal Base Beads and Wood Grounds.
09. Section [ ] Temporary Heat, Water and Electricity.
10. Section [ ] Other Adjacent Floor Finish Trades (for Transition Details).
11. Section [ ] For Confirmation of LEED Requirements.

1.3 SUBMITTALS

A. Single Source supply of epoxy terrazzo components is suggested for added quality assurance. Manufacturer's product data for each type of terrazzo and accessory. System will be evaluated on the basis of standards. For tests not listed in published data, manufacturer shall supply missing data according to standard referenced.

1. Physical properties.
2. Performance properties.
3. Specified tests.
4. Material Safety Data Sheet.
5. Manufacturer's standard warranty.

B. LEED Submittals

Product Data for Credit EQ 4.1: For adhesives, including printed statement of VOC content and chemical components. Compliance with CA 01350 requirements for testing of volatile organic Emissions from Various sources using small scale environmental chamber.

C. Shop Drawings. Include terrazzo installation requirements. Include plans, elevations, sections, component details and attachments to other work. Show layout of the following:

1. Divider strips.
2. Control and expansion joint strips.
3. Base and border strips.
4. Abrasive strips.
5. Stair treads, risers and landings.
6. Pre-cast terrazzo jointing and edge configurations including anchorage details.
7. Terrazzo patterns.
8. <Insert requirements>

#### D. Approved samples

For added quality assurance, samples listed in the project "Finish Schedule" shall have precedence as to the suggested manufacturer to supply the epoxy resin products for a successful terrazzo installation. Such factors as variation in color and design intent can be expected if the manufacturer supplying the epoxy products for the project is different than the manufacturer of the epoxy products used in the control sample.

E. Samples for Verification: Match architect/designer's samples for each type, material, color and pattern of terrazzo and accessory required showing the full range of color, texture and pattern variations expected. Label each terrazzo sample to identify the Manufacturer and approved product formula or formula reference number. Prepare samples of same thickness and from same material to be used for the work in size indicated below:

- a. Epoxy terrazzo: minimum 6" x 6" (152.4 mm x 152.4 mm) sample of each color and type of terrazzo.
- b. Precast epoxy terrazzo: minimum 6" x 6" (152.4 mm x 152.4 mm) sample of each color and type of terrazzo.
- c. Accessories: 6" length (152.4 mm) of each kind of divider strip, stop strip and control joint strip required.
- d. Stair Treads: 12" length (304.8 mm) wide sample combination tread/riser with cast-in nosing.

#### F. Manufacturer Experience:

1. Submit proof of associate membership in TTMAC.
2. Furnish a list of at least five (5) epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years of the same scope, complexity and at least 50 percent of the square footage.
3. Engage an epoxy manufacturer with at least ten (10) years experience in supplying epoxy products specific to the terrazzo industry.

#### G. Qualification Data: For qualified installer.

1. Submit proof of contractor membership in the TTMAC.
2. Furnish a list of at least five (5) epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years of the same scope, complexity and at least 50 percent of the square footage.

#### H. Material Test Reports: For moisture and/or relative humidity of substrate.

I. Maintenance Data: Submit [ ] copies of TTMAC maintenance recommendations and [ ] copies of manufacturer's instructions

### 1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is acceptable to architect and epoxy terrazzo manufacturer to install manufacturer's products.

1. Engage a terrazzo contractor with at least five (5) years of satisfactory experience in installation of epoxy terrazzo. Terrazzo contractor shall demonstrate experience during last five (5) years of at least five (5) projects of comparable scope and complexity of at least 50 percent of the total square footage of this project
2. Engage an installer who is a contractor member of TTMAC.

#### B. Source Limitations:

1. Obtain primary Epoxy Terrazzo Flooring System materials including moisture treatment, membranes, primers, resins and hardening agents from a single manufacturer with proof of TTMAC associate membership.
2. Obtain aggregates, divider strips, sealers and cleaners from source recommended by primary materials manufacturer.
3. Engage an epoxy manufacturer with at least ten (10) years experience as a TTMAC associate member.

C. Pre-installation Conference: Conduct conference at project site to comply with requirements in Section 01200 – Project Meetings. Review methods and procedures related to terrazzo including, but not limited to, the following:

1. Inspect and discuss installation procedures, joint details, job site conditions, substrate specification, vapor barrier details and coordination with other trades.
2. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
3. Review special terrazzo designs and patterns.
4. Review plans for concrete curing and site drying to enable timely achievement of suitable slab moisture conditions.

D. TTMAC Standards: Comply with TTMAC's written recommendations for terrazzo type indicated unless more stringent requirements are specified.

E. Mock-ups: Build mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mock-ups for terrazzo including accessories.
  - a. Size: Minimum 100ft<sup>2</sup> (9.3m<sup>2</sup>) of typical poured-in-place flooring [and base] condition for each color and pattern [in locations directed by architect] <Insert location requirements>.
2. Approved mockups may become part of the completed work if undisturbed at time of substantial completion.

#### 1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in supplier's original wrappings and containers labeled with source's or manufacturer's name, material or product brand name and lot number if any.

B. Store materials in their original, undamaged packages and containers inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity.

1. Storage temperatures should be between 50°F to 90°F (10.0°C to 32.2°C).

#### 1.6 PROJECT CONDITIONS (These responsibilities are not limited to the terrazzo installer)

A. Prior to surface preparation, terrazzo contractor shall:

1. Evaluate slab condition, including slab moisture content and extent of repairs required, if any.
2. Maintain the ambient room and floor temperature at 60-90°F (15.5-32.2°C) or above for a period extending 72 hours before, during and after floor installation. Concrete to receive epoxy terrazzo shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted according to ASTM F2170 (determining relative humidity in concrete slabs using in situ probes). Proceed with installation only after substrates have a maximum relative humidity measurement reading less than 80%. If relative humidity measurement reading is greater than or equal to 80%, a Moisture Vapor Treatment is required. Apply to terrazzo substrates according to manufacturer Product Data Sheet.

B. Prior to and during each day of installation, the terrazzo contractor shall verify that the dew point is at least 5°F (-15°C) less than the slab and air temperature.

C. Acceptable Substrates:

1. Level tolerance: Concrete sub-floor shall be level with a maximum variation from level of 1/4" in 10 feet (6.4 mm in 3.1m). Any irregularity of the surface requiring patching and/or leveling shall be done using epoxy Fill and selected aggregates as recommended by the manufacturer.
2. Concrete floor shall be prepared mechanically by shot blasting in accordance with ICRI Guideline No. 03732. Specifically, surface preparation results should achieve a CSP3-CSP5 profile.
3. Concrete floor shall receive a steel trowel finish.
4. Concrete shall be cured a minimum of 28 days. No curing agents are to be used in areas to receive terrazzo.
5. Concrete slab on grade shall have an efficient moisture vapor barrier (suggested minimum: 15 mils (.4 mm thickness) directly under the concrete slab. Reference ASTM Methods E1745 Class A and installed in accordance with E1643. Moisture barrier shall NOT be punctured.
6. Saw cutting of control joints must be done between 12 and 24 hours after placement of the structural concrete and at a frequency compatible to ACI recommendations.

D. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

E. Provide protection from other trades prior to final acceptance by owner.

PART 2 – PRODUCTS 2.01 EPOXY TERRAZZO

A. Products/Systems Overview: The Basis of Design" shall be limited to an epoxy manufacturer that has supplied products specific to the terrazzo industry for a minimum of 10 years. The manufacturer shall also be a member in good standing of the TTMAC. The terrazzo contractor shall be an approved installer of the primary epoxy resin manufacturer specified as the "Basis of Design" or (as required by the manufacturer's respective company).

B. Materials:

1. Primer: Standard Primer or Moisture Vapor Treatment (for slabs on-grade, light weight concrete and green concrete).
  - a. Physical properties of moisture mitigating primer shall have a maximum of 0.3 perms with 100% RH.
2. Flexible Reinforcing Membrane: Epoxy Crack Isolation Membrane for substrate crack preparation and reflective crack reduction.
  - a. Reinforcement: Fiberglass scrim (optional).
3. Epoxy Matrix: Epoxy Matrix and in color required for mix indicated (see "Finish Schedule").
  - a. Physical properties without aggregates. All specimens cured for 7 days at 73-77°F (22.8-25°C) and 50 percent plus or minus 2 percent RH. This product shall meet the following requirements:

Property	Test Method	NTMA Requirements	Terroxy Thin-set Epoxy Terrazzo Typical Results
Hardness	ASTM D-2240 using Shore-D Durometer	60-85	75-85
Tensile Strength	ASTM D-638	3,000 psi min. (20.7 MPa)	4,800 psi min. (33.1 MPa)
Compressive Strength	ASTM D-695 Specimen B cylinde	10,000 psi min. (68.9 MPa)	12,000 psi min. (82.7 MPa)
Flexural Strength	ASTM D-790	Not specified	4,500 psi min. (31.7 MPa)
Chemical Resistance	ASTM D-1308 seven days at room temperature by immersion method	No deleterious effects: Distilled Water Mineral Oil Isopropanol Ethanol 0.025 Detergent Solution 1% Soap Solution 10% Sodium Hydroxide 10% Hydrochloric Acid 30% Sulfuric Acid 5% Acetic Acid	No deleterious effects: Distilled Water Mineral Oil Isopropanol Ethanol 0.025 Detergent Solution 1% Soap Solution 10% Sodium Hydroxide 10% Hydrochloric Acid 30% Sulfuric Acid 5% Acetic Acid

b. Physical properties with aggregates. For Epoxy Matrix blended with three volumes of Valdres marble blended 60% #1 chip and 40% #0 chip, ground and grouted with epoxy resin according to Installation Specifications, finishing to a nominal 3/8" (9.5 mm) thickness. All specimens cured for 7 days at 73-77°F (22.8-25°C) and 50 percent RH plus or minus 2 percent RH. This finished Epoxy Matrix shall meet the following requirements:

Property	Test Method	TTMAC Requirements	Thin-set Epoxy Terrazzo Typical Results
Flammability	ASTM D-635	Self extinguishing, extent of burning 0.25" (6.4 mm) max.	Self extinguishing, extent of burning 0.25" (6.4 mm) max
Thermal Coefficient of Linear Expansion	ASTM D-696	25x10 <sup>-6</sup> inches per inch per degrees to 140°F  (11.4x10 <sup>-7</sup> cm per cm per °C to 60°C Max)	25x10 <sup>-6</sup> inches per inch per degrees to 140°F  (11.4x10 <sup>-7</sup> cm per cm per °C to 60°C Max)
Bond Strength	ACI COMM 403, Bulletin 59-43 (pages 1139-1141)	300 psi (2.1 MPa) -100% concrete failure	300 psi (2.1 MPa) -100% concrete failure
Flammability	ASTM D-635		Self extinguishing, extent of burning 0.25" (6.4 mm) max
Fire Rating - Test for Surface Burning Characteristics of Flooring	CAN/ULC S102.2-10 Tunnel Test		Smoke Developed Classification (SDC) - 175  Flame Spread Rating (FSR) - 5

4. Aggregates [OPTION: Marble, Glass, Mother of Pearl, Porcelain, Concrete] complying with TTMAC gradation standards for mix indicated and containing no deleterious or foreign matter.

- a. Abrasion and Impact Resistance: Less than 40 percent loss per ASTM C 131.
- b. 24-Hour Absorption Rate: Less than 0.74 percent.
- c. Dust Content: Less than 1.0 percent by weight.
- d. Pre-Consumer or Post-Consumer Recycled Content: <Insert Value> percent.
- e. Finishing Grout: Epoxy Matrix or Epoxy Clear Resin with a broadcast of filler as recommended by the TTMAC.

C. Mix: Comply with TTMAC Epoxy Terrazzo Specification and manufacturer's written instructions for matrix and aggregate proportions and mixing.

1. Color and pattern schedule: Where the following designations are indicated, provide specified terrazzo matrices matching architect's samples:

- a. TZ1: <Insert sample number & manufacturer>
- b. TZ <Insert sample number & manufacturer>
- c. TZ <Insert sample number & manufacturer>
- d. TZ <Insert sample number & manufacturer>

## 2.2 STRIP MATERIALS

A. Thin-set Divider Strips: L-type.

1. Material [White-zinc alloy] or [Brass] selected from a Canadian manufacturer.
2. Guide for commonly used L-type divider strips for Thin-set Epoxy Terrazzo Systems:

System Height	Strip Height	Strip Width
3/8" System	3/8"	16 gauge 1/8" 1/4"

System Height	Strip HeightE	Strip Width
9.5 mm System	9.5 mm	16 gauge 3.2 mm 6.4 mm

## 2.3 MISCELLANEOUS ACCESSORIES

A. Strip Adhesive: 100% solids epoxy resin adhesive recommended by Epoxy Resin Manufacturer.

1. Use adhesive that has a VOC content of 50g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Construction joints, contraction joints (Saw Cuts), isolation joints and cracks shall be detailed in accordance with the National Terrazzo & Mosaic Association (NTMA) Technical bulletin T24 as suggested by the TTMAC.

C. Patching and Fill Material: Epoxy Fill and selected aggregates as recommended by Epoxy Resin System Manufacturer.

D. Joint Compound: Epoxy Joint Filler Hardener to be used with Epoxy Resin Matrix Part A. Color to be selected by architect to match/compliment terrazzo flooring.

E. Cleaner: A neutral cleaner with pH factor between 7 & 10 specifically designed for terrazzo.

F. Surface Finish System: Level of polish to be specified by architect in accordance with desired appearance and level of reflectivity.

G. Sealer: Slip and stain-resistant sealer that is chemically neutral with a pH factor between 7 and 10, that meets a standard coefficient of friction of 0.5 or higher, as measured by the James Machine (ASTM D-2047 Test Method), and does not affect physical properties of terrazzo.

1. [Option 1: WB Acrylic Sealer, medium gloss, water-based sealer.]

2. [Option 2: Acrylic Sealer, high performance, high gloss acrylic sealer.]

3. [Option 3: WB Urethane or T-Rx, high performance, high gloss, chemical-resistant urethane sealer.]

## 2.4 PRECAST TERRAZZO

A. Precast Terrazzo Units: Precast epoxy terrazzo [base] [stair tread] [threshold] [bench] [and] [planter] <Insert requirements> units.

1. All precast components to utilize Epoxy Resin products as manufactured by the epoxy terrazzo flooring manufacturer for fabrication to ensure color consistency with the poured in place flooring.

2. Manufacturers: Subject to compliance with requirements, provided products acceptable to architect.

a. <Insert manufacturer's name>.

B. Precast Terrazzo Base Units: 1/4" (6.4 mm) thick, cast in maximum lengths possible, but not less than 36" (900 mm).

1. Type: [As indicated].

2. Height: [As indicated].

3. Outside Corner Units: With finished returned edges at outside corner.

4. Color and Pattern: [Match architect's sample] [Match adjacent poured-in-place terrazzo flooring].

C. Terrazzo Cove Base:

1. [Option 1: Epoxy Matrix poured-in-place cover base with 3/4" (19mm) radius, [ ]" high. (4" (101.2 mm), 6" (152.4 mm) or 8" (203.2 mm))]

2. [Option 2: Precast Epoxy Terrazzo Cove Base: Type , " high.]

D. Precast Terrazzo Stair Treads: Thickness indicated with cast-in nosing.

1. Tread/Riser: 1/2" (12.7 mm) thick epoxy, Type with abrasive pattern .

2. Color and Pattern: [Match architect's approved Sample]

## PART 3 – EXECUTION 3.01 EXAMINATION

A. Examine substrates and areas, with Terrazzo Contractor present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions, including level tolerances, have been corrected.

### 3.2 PREPARATION

A. Clean substrates of substances, including oil, grease and curing compounds, that might impair terrazzo bond. Provide clean, dry and neutral substrate for terrazzo application.

B. Concrete Slabs:

1. Provide sound concrete surface free of laitance, glaze, efflorescence, curing compounds, form- release agents, dust, dirt, grease, oil and other contaminants incompatible with terrazzo.

a. Prepare concrete mechanically by shot blasting. Surface preparation results should achieve a CSP3- CSP5 profile according to International Concrete Repair Institute Guideline No. 03732.

b. Repair or level damaged and deteriorated concrete according to Epoxy Resin Supplier Technical Bulletins for Thin-set epoxy terrazzo.

c. Repair cracks and non-expansion joints greater than 1/16" (1.6mm) wide according to available Tech Bulletins regarding Crack Detailing and Joint Treatments for Thin-set epoxy terrazzo.

2. Verify that concrete substrates are visibly dry and free of moisture.

3. Moisture Testing:

a. Test for moisture according to ASTM F2170 (determining relative humidity in concrete slabs using in situ probes).

b. Proceed with installation only after substrates have a maximum relative humidity measurement reading less than 80%. If relative humidity measurement reading is greater than or equal to 80%, a Moisture Vapor Treatment is required. Apply to terrazzo substrates according to manufacturer data sheet.

C. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.

1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

### 3.3 EPOXY TERRAZZO INSTALLATION

A. General:

1. Comply with TTMAC's written recommendations for terrazzo and accessory installation.

2. Place, rough grind, grout, cure grout, fine grind and finish terrazzo according to manufacturer's Epoxy Matrix Product Data Sheet.

3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.

4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

B. Thickness: [3/8" (9.5 mm)]

C. Flexible Reinforcing Membrane

1. [Option 1: Membrane application for isolated cracking. Route out all cracks and fill with 100% Epoxy Primer. Apply Epoxy Crack Isolation Membrane (spread at 40 mils = 1.0 mm thickness) across the crack allowing 6" (152.4mm) on either side. Imbed fiberglass scrim at a minimum of 9" (22.8cm) into wet membrane and saturate with additional membrane.]

2. [Option 2: Membrane application for extensive cracking or crack prevention. Route out all cracks and fill with 100% Epoxy Primer. Apply Epoxy Crack Isolation Membrane (spread at 40 mils = 1.0 mm thickness) over prepared substrate to produce full substrate coverage in areas to receive terrazzo. (fiberglass scrim optional)]

D. Primer: Apply to terrazzo substrates according to Epoxy Resin Manufacturer's Primer Product Data Sheet.

E. Strip Materials:

1. Divider and Accessory Strips:

- a. Install strips in adhesive setting bed without voids below strips.
- b. Construction joints, contraction joints (Saw Cuts), isolation joints and cracks shall be detailed in accordance with TTMAC or epoxy resin manufacturer's suggestions.

F. Placing Terrazzo:

1. Mix epoxy matrix with chips and fillers in ratios directed by Epoxy Resin Manufacturer.
2. Trowel apply terrazzo mixture over epoxy primer to provide a dense flat surface to top of divider strips. Allow to cure per manufacturer recommendations before rough grinding.

G. Rough Grinding: Grind with 24 grit silicon carbide or 24 grit turbo diamonds until all terrazzo strips and marble chips are uniformly exposed.

H. Grouting:

1. Cleanse floor with clean water and rinse.
2. Remove excess rinse water by wet vacuum, dry and fill voids with Epoxy Matrix or Clear Resin with a broadcast of filler.
3. Allow grout to cure. Grout may be left on terrazzo until other trades work is completed.

I. Polishing: Polish with 120 grit diamond pads or equivalent stones until all grout is removed from surface. Produce surface with a minimum of 70 percent aggregate exposure. (Optional high finish polishes available. Please consult a terrazzo contractor for more information.)

### 3.4 PRECAST TERRAZZO INSTALLATION

A. Install precast units using method recommended by TTMAC and manufacturer unless otherwise indicated.

B. Seal joints between units with joint sealants.

### 3.5 CLEANING AND PROTECTION

A. Cleaning: Remove grinding dust from installation and wash all surfaces with a neutral cleaner with a pH factor between 7-10.

B. Sealing: Apply sealer that is chemically neutral with a pH factor between 7 and 10, that meets a standard coefficient of friction of 0.5 or higher, as measured by the James Machine (ASTM D-2047 Test Method), does not affect physical properties of terrazzo and complies with TTMAC standards.

C. Protection: The protection of the floor is not the sole responsibility of the terrazzo installer and should be discussed amongst those associated with responsibility for general construction of the project. Upon completion, the work shall be ready for final inspection and acceptance by the owner or his agent. Provide final protection and maintain conditions, in a manner acceptable to terrazzo contractor, that ensure terrazzo is without damage or deterioration.

END OF SECTION 096623

#### SUITABLE SUBSTRATES

- Interior concrete slabs, steel trowel finish, free from hydrostatic pressure and moisture transmission. Exterior grade Douglas Fir plywood meeting CSA 0121, over wood or steel joists at maximum of 406 mm o.c. where deflection under both dead and live loads conforms to local building codes. Existing well bonded ceramic tile, cementitious or epoxy terrazzo with proper surface preparation.

#### MATERIALS

- Primer: As recommended by epoxy resin manufacturer
- Divider strips: L or T shallow type, zinc, brass, stainless steel, aluminum or plastic, gauged 2 mm, 3 mm or 6 mm heavy top.
- Strip setting material: Epoxy or contact cement

#### TOPPING MATERIALS

- Epoxy matrix: Two-components consisting of resin and hardener.
- Aggregate chips: Marble, granite, glass or plastic chips. 30% No. 0 and 70% No. 1 aggregate with filler and epoxy resin normally used for 6 mm thick installations. For 10 mm thick installations, No. 2 size aggregate may be added, follow epoxy manufacturer's recommendations.

#### SUITABLE SUBSTRATES – DETAIL A

Concrete must be sound with steel trowel finish, free of contaminants such as oil, sealers, hardening or curing chemicals applied to surface or incorporated in the mix along with any other bond-inhibiting contaminants. Remove contaminants by sandblasting, shotblasting, scarifying, grinding. Over cracked concrete substrates, apply a crack isolation membrane over the area in a band 305 mm centred on the crack or over the entire area.

#### INSTALLATION OF TERRAZZO STRIPS

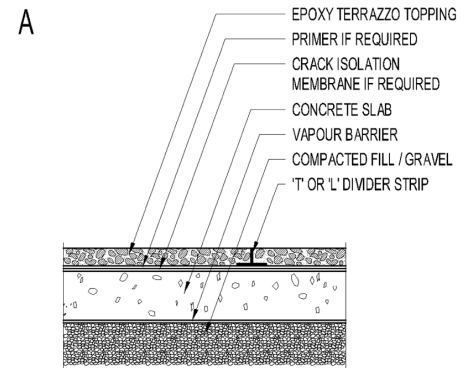
Sweep or vacuum base slab clean and lay out pattern with chalk line as shown on drawings. Install control joints directly above control joints in subfloor. Bond strips to floor with epoxy or contact cement in line with the location of strips by pouring in a continuous line, or by placing additional spots as necessary for stability, and at all points that intersect. Allow strips to set prior to application of epoxy terrazzo topping.

#### TERRAZZO TOPPING INSTALLATION

After setting material has sufficiently cured, sweep or vacuum floor clean. If specified or required, apply primer to substrate evenly using a short nap paint roller, follow manufacturer's recommendations. Mix epoxy components as per manufacturer's directions. Add aggregate, filler and mix thoroughly with a low speed drum mixer. Spread terrazzo mixture, maintaining a consistent specified 6 mm or 10 mm thickness. Hand trowel topping surface flush with top of divider strips to close all voids and pin holes. For large areas, sprinkle topping with dry aggregate using same ratio as in the mix and power trowel. Let cure and grind.

#### DETAIL B – WOOD SUBSTRATE (INTERIOR ONLY)

Sub-floor: minimum 16 mm exterior grade plywood on joist spaced 406 mm o.c. Underlayment 16 mm or thicker Douglas Fir exterior-grade plywood, select tight faced, meeting CSA-0121. Apply both layers of panel with top grain at right angles to joist, and with top layer staggered to give 50% overlap of sheets of sub-floor. Gap top layer of plywood 6 mm between sheets. Glue top layer to substrate and screw 150 mm o.c. around perimeter and 203 mm o.c. throughout the body of the panel. Use 75 mm galvanized screws when attaching to joist or cross bridging, use 38 mm screws in body of the panel. Fill joints with epoxy compound and cover joints with 50 mm fiber-mesh tape and flexible epoxy resin, let cure. Installation of divider strips as per Detail A, omitting control joints. Prime plywood surface. A second coat may be required depending on porosity of plywood. For suitability of epoxy over plywood, consult with manufacturer.



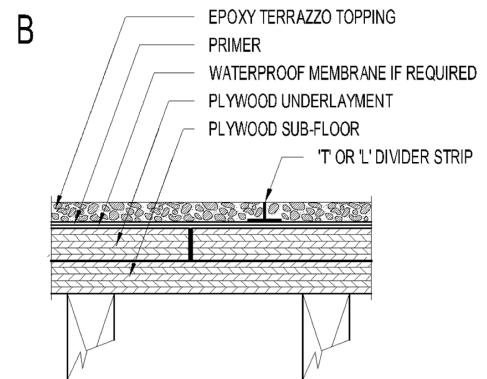
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## GRINDING

After floor has sufficiently cured, grind with 24 grit abrasive stones or with diamond equivalents. Follow initial grind with No. 80 grit stones, with wet or dry method, remove excess slurry and rinse with clean water. Allow area to dry thoroughly. Apply grout by hand trowel using a blend of epoxy resin/hardener and grout filler. Repeat grouting process until all voids and pinholes are completely filled. Allow grout to cure and regrind with No. 80 grit stones or finer, to a maximum of 120 grit until all grout is removed from surface. Rinse surface with clean water. Let surface dry thoroughly and apply sealer as per manufacturer's recommendations.

## LIMITATIONS

- Detail B for use on interior floors in dry areas. For residential or light commercial use only.
- Waferboard, particleboard, interior grade plywood should not be used for substrates or underlayment.
- Plywood underlayments containing moisture repellents should not be used, as staining may occur.
- Plywood must be completely free of contaminants such as oil, sealers, waxes, varnishes, paint or other foreign materials.
- For installations over concrete slabs on and below grade, an efficient moisture barrier must be installed under the slab to prevent moisture vapour transmission.
- Moisture content in the slab must not exceed 80% .
- Concrete slab surface maximum variation not to exceed more than 6 mm from true plane in 3049 mm or 2 mm in 305 mm. Epoxy terrazzo is not intended to level substrate, it will only follow contour of the concrete slab.
- Epoxy terrazzo should not be installed in areas where hydrostatic pressure is present.
- If the substrate is not suitable for bonding, any work required to eliminate nonconformity of substrate is the responsibility of others. Any materials required to correct nonconformity must be compatible with the epoxy system selected and approved by the terrazzo contractor and manufacturer.



## OTHER CONSIDERATIONS

- Epoxy terrazzo may be installed over stable steel substrates with proper surface preparation. Follow manufacturer's recommendations. Deflection under both dead and live loads must conform to local building codes.
- Concrete must cure for a minimum of 28 days, preferably 90 days or longer for epoxy terrazzo applications.
- The use of strips in epoxy terrazzo is mainly for esthetical purposes, to honor expansion joints and to separate patterns or different colours and at walls if a cove base is required or at termination of daily pours. Strips serve no other purpose, as no shrinking occurs during curing.
- Epoxy terrazzo may also be applied over cementitious board underlayment, preparation of substrate as per Detail B. Installation of terrazzo as per Detail A.
- On post-tensioned concrete floor systems and other floors subject to movement, deflection and cracking, a compatible crack isolation membrane should be applied to minimize the transmission of cracks to the surface. Follow manufacturer's recommendations.
- Refer to 401MJ-2007 for expansion and control joints.
- A combination of aggregates may be introduced into the mix.

**SUITABLE SUBSTRATES**

Concrete or masonry, 13 mm minimum cementitious backer unit, (CBU) meeting ANSI A118.9-1992, gypsum board, 16 mm minimum exterior grade Douglas Fir plywood meeting CSA 0121 on wood or metal studs, maximum 406 mm o.c. with backing reinforcements.

**MATERIALS**

- Primer: As recommended by epoxy resin manufacturer
- Base bead top strip: Shallow type zinc or brass
- Divider strips: L or T shallow type zinc, brass, stainless steel or plastic, gauged 2 mm, 3 mm or 6 mm heavy top
- Cove base divider strips: Shallow type
- Epoxy setting material

**TOPPING MATERIAL**

- Epoxy matrix: Two-components consisting of resin and hardener
- Aggregate chips: Marble, granite, a limited amount of glass or plastic chips may be added to the mix according to local practice and manufacturer's recommendations.
- 30% No. 0 and 70% No. 1 aggregate with filler and epoxy resin, follow manufacturer's recommendations.

**INSTALLATION OF BASE BEAD TOP STRIP AND BORDER**

Install base bead top strip at specified height or as detailed on drawings, straight and level. Install L or T floor strips parallel to walls and curbs to form a border. Install cove divider strips as shown or specified. Allow strips to set prior to application of epoxy terrazzo.

**TERRAZZO TOPPING INSTALLATION**

After base bead top strips and floor strips have set, sweep or vacuum clean. Apply primer to base and border evenly using a brush. Do not wet surface prior to application of epoxy primer and topping. Mix epoxy components as per manufacturer's recommendations. Add aggregate and filler, mix thoroughly with a low speed drum mixer. Apply a stiff workable mix to tacky primer. Trowel terrazzo mixture to base, shape as specified or detailed. Allow to cure and grind.

**GRINDING**

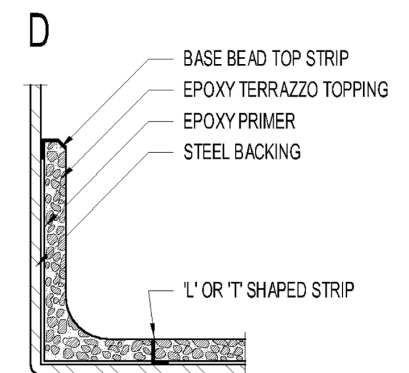
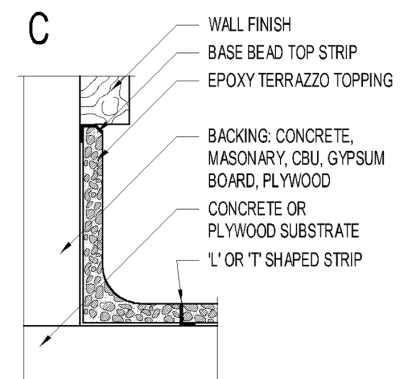
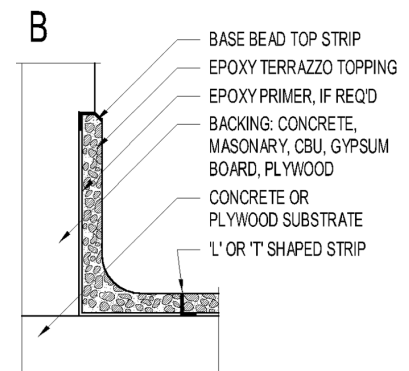
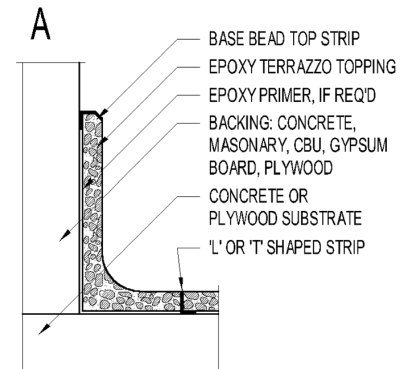
After topping has sufficiently cured, wet or dry grind with coarse abrasive stone or diamond. Remove excess, wash base with clean water. Allow to dry thoroughly. Apply grout by hand trowel using a blend of epoxy grout resin/hardener and grout filler of same colour as used in topping. Repeat grouting process until all voids and pinholes are completely filled. Allow grout to cure and regrind with 80 or finer grit disc, up to a maximum of 120 grit until all grout is removed from surface. Rinse surface with clean water and allow to dry thoroughly. Apply sealer as per manufacturer's recommendations.

**LIMITATIONS**

- Waferboard, particleboard and interior grade plywood should not be used as a backing material or underlayment.
- Plywood underlayments containing moisture repellents must not be used, as staining will occur.
- Plywood must be completely free of contaminants, such as oil, sealers, waxes, varnishes, paint or other foreign materials.
- For recess base installations, a minimum of 152 mm in height is required for grinding purposes.

**OTHER CONSIDERATIONS**

- Over concrete surfaces, the application of primer may not be required.
- Base height is normally 102 mm to 152 mm. However, base heights may exceed 152 mm. Heights exceeding 152 mm must be specified.
- Epoxy terrazzo base may be installed over stable steel substrates with proper surface preparation. Follow manufacturer's recommendations.
- A combination of various types and colours of aggregate chips may be introduced into the terrazzo mix.
- Backing for terrazzo base should be cementitious backer units (CBU), concrete or masonry.
- Prefabricated epoxy terrazzo base could be used as an alternate to a poured in place base.



## SUITABLE SUBSTRATES

- Interior concrete stairs, steel trowel finish, shotblasting, sandblasting or grinding/scarifying if required
- Exterior grade Douglas Fir plywood meeting CSA 0121, 16 mm or thicker, screwed or nailed to wood stairs where deflection under both dead and live loads conforms to local building codes.
- Stable steel stairs with proper surface preparation, maximum deflection confirms to local building codes.
- Existing well-bonded tile, terrazzo with proper surface preparation

## MATERIALS

- Primer: As recommended by epoxy resin manufacturer
- Base bead top strips: Zinc or brass
- Divider strips: L or T shallow type, zinc, brass, gauged 2 mm, 3 mm or 6 mm heavy top.
- Cove base divider strips: Shallow type
- Abrasive strips channel: 10 mm wide shallow type, zinc or brass
- Epoxy setting material

## TOPPING MATERIAL

- Epoxy Matrix: two components consisting of resin and hardener
- Aggregate Chips: marble, granite, glass or plastic chips
- 30% No. 0 and 70% No. 1 aggregate with filler and epoxy resin, follow manufacturer's recommendations.

## INSTALLATION OF BASE BEAD TOP STRIPS AND DIVIDER STRIPS

## DETAIL A

Install base bead top strips at wall stringer where specified, straight and level at required height. Sweep or vacuum substrate clean, lay out pattern with chalk line as shown on drawings. Bond L or T strips, coved divider strips and slip resistant channels with epoxy in line with the location of the strips by pouring into continuous line or by placing spots as necessary for stability. Allow strips to set prior to application of epoxy terrazzo topping.

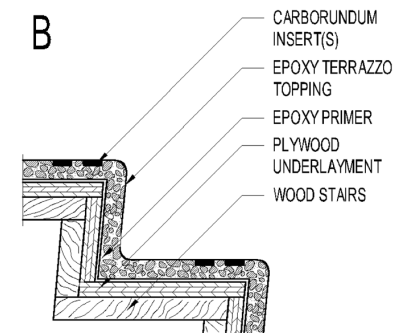
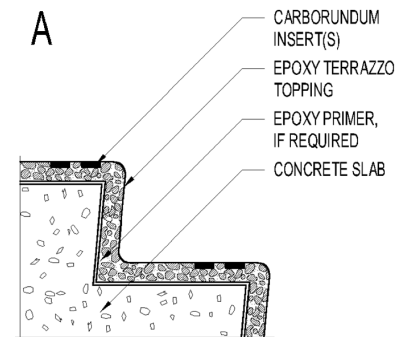
## TERRAZZO TOPPING INSTALLATION

After setting material has sufficiently cured, sweep or vacuum substrate clean. If required, apply primer to substrate evenly using a brush, follow manufacturer's recommendations. Mix epoxy components as per manufacturer's recommendations. Mix aggregate, filler and epoxy resin thoroughly with a low speed drum mixer. Apply mixture over tacky primer on risers, treads and curb stringers to cove shape as specified (or detailed).

Trowel topping surface flush with top of strips to close all voids. Allow to cure and grind.

## DETAIL B – WOOD STAIRS

Underlayment minimum 16 mm or thicker Douglas Fir exterior grade plywood, glued, nailed or screwed to steps, risers and landing. Gap plywood 3 mm, fill joints with epoxy or flexible compound and cover joints with 51 mm fibre-mesh tape and epoxy resin. Let cure and sand lightly. Installation of base bead top strips and divider strips as per detail A. Prime plywood surface. For suitability of epoxy over plywood, consult with manufacturer. Application of epoxy terrazzo topping as per Detail A.



## DETAIL C – STEEL STAIRS

Metal substrate must be structurally sound and free of contaminants such as oil or grease. Remove any scaling and rust mechanically by sanding, sandblasting or by other means. Sweep or vacuum surface to remove dust. Application of base bead top strips, divider strips and application of terrazzo topping as per Detail A.

## GRINDING

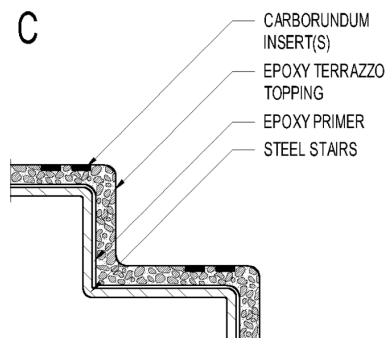
After topping has sufficiently cured, wet grind with coarse grit abrasive stone. Remove excess, wash stairs with clean water. Allow to dry thoroughly. Apply grout by hand trowel using a blend of epoxy grout resin/hardener and grout filler. Epoxy grout must be the same colour as used in topping. Repeat grouting process until all voids and pinholes are completely filled. Let grout cure and regrind with No. 80 grit disc until all grout is removed from the surface. Rinse surface with clean water and allow to thoroughly dry. Apply sealer following manufacturer's recommendations.

## LIMITATIONS

- Detail B for use on interior floors in dry areas. For residential or light commercial use.
- Waferboard, particleboard, interior grade plywood must not be used for substrate or underlayment.
- Plywood underlayment containing moisture repellents should not be used, as staining will occur.
- Plywood must be completely free of contaminants such as oil, sealers, waxes, varnishes, paint or other foreign materials.
- Maximum variation of concrete step surface not to exceed more than 6 mm from true plane in 3049 mm or 2 mm in 305 mm. Epoxy terrazzo is not intended to level substrate, it will only follow contour of the concrete.
- Concrete substrate must cure for a minimum of 28 days prior to installation of epoxy terrazzo.

## OTHER CONSIDERATIONS

- Epoxy terrazzo may also be applied over cementitious board underlayment. Preparation of substrate as per Detail B. Installation of terrazzo as per Detail A.
- The use of cove dividers and divider strips in epoxy terrazzo stairs is mainly for aesthetic purposes and to separate borders of different colours at the stringers and stairs and at termination of daily pours. They serve no other purpose, as no shrinking occurs during curing.
- Strict attention must be paid to local building codes in regard to abrasive nosing and visually impaired warning lines if specified.
- Provide tactile surface prior to stairs where required for visually handicapped.



SUITABLE SUBSTRATES

Concrete or masonry 13 mm minimum cementitious backer unit (CBU) meeting ANSI A118.9-1992, gypsum board, 16 mm minimum exterior grade Douglas Fir plywood meeting CSA 0121 on wood or metal studs maximum 400 mm o.c. with backing reinforcements

SETTING MATERIALS

- Latex modified Portland cement mortars, modified epoxy emulsion mortars, 100% solids epoxy mortar
- Organic adhesive type 1 or type 2 (ANSI A136.1-1999)
- Grout: Portland cement, latex-Portland cement or epoxy

INSPECTION

Examine area to receive precast terrazzo for any inconsistencies of substrate that would effect proper execution of terrazzo work. Substrate must be clean, free of cracks, paint and any other deleterious materials that will have an impediment in the bonding of the precast to the substrate. Surface variation of substrate not to exceed 6 mm in 3049 mm.

INSTALLATION

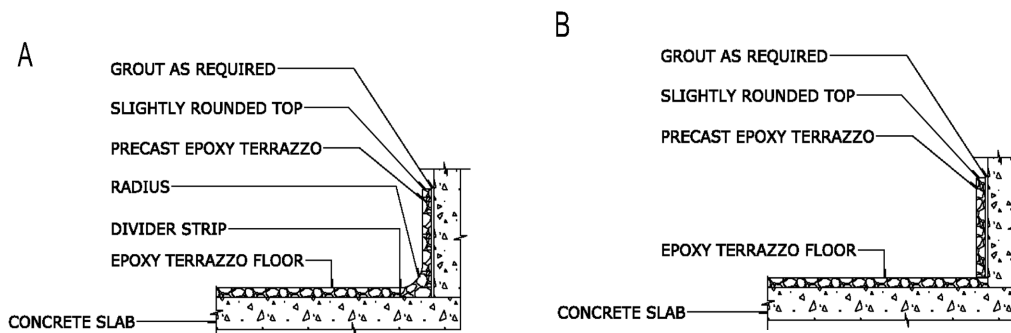
Sweep area clean, snap a chalk line to maintain a straight level line. Backbutter bonding material to back of precast. Use sufficient bond coat to ensure a minimum of 95% coverage. Set and align precast straight, true and even with each other maintaining uniform joints. Contact shall be evenly distributed to give full support to the precast base. Allow to cure. Force grout into full depth of joint, remove excess and clean.

LIMITATIONS

- Organic adhesives are not recommended for use in areas exposed to temperatures above 60°C
- Organic adhesives – Manufacturers’ recommendations must be followed for use and suitability with non-absorbent material
- Precast should not have variances greater than 3 mm in length and height
- Waferboard, particleboard should not be used as a backing material
- Plywood must be completely free of contaminants, such as oil, sealers, waxes, varnishes, paint or other delaterious materials

OTHER CONSIDERATIONS

- Precast epoxy terrazzo base may be installed over stable steel with proper surface preparation
- Where precast terrazzo base is to be installed over a cracked substrate, a crack isolation membrane should be applied over the crack. Membrane must be compatible with setting material for proper bonding of the precast. Alternatively the precast could be cut directly above the crack and the joint caulked to form a movement joint.
- Do not install precast base of expansion and control joints. Precast base must be cut in line and directly above floor and wall movement joints.



## SECTION 09440/096623.13

### Polyacrylate Modified Cement Terrazzo

Polyacrylate modified cement terrazzo consists of marble, granite, plastic or glass chips in a white, grey or a combination of both Portland cement and polyacrylate resin matrix.

Thin gauge is the term used for polyacrylate modified cement terrazzo as it can be applied in a relatively thin layer compared to Portland cement terrazzo.

Polyacrylate modified cement terrazzo has the following advantages:

- Polyacrylate modified cement terrazzo is installed over a smooth concrete slab at a minimum thickness of 10 mm. It can also be installed on cured underbed with a slight increase in thickness as per regular Portland cement terrazzo topping of 13 mm.
- Divider strips are necessary at control joints, cold joints, termination of flooring, termination of daily pours, or to separate colours or to provide a pattern in the floor and may be used at floor/base junctions. Refer to 401MJ-2016.
- Divider strips are necessary at regular intervals and are also used to separate colours or to provide a pattern in the floor. It is necessary to provide a suitable break in the continuity of the topping at control and expansion joints, in the concrete base slab and at the junction of the base and floor.
- This terrazzo matrix is resistant to many chemicals. The type of aggregate selected has a direct correlation to the degree of chemical resistance. However, the specifier must not be misled by this statement. It might be necessary to check with the manufacturer of the polyacrylate matrix in this regard and also the chemical resistance of the aggregate should be tested.
- This terrazzo topping can be applied over new or existing concrete where it is not possible to provide the depth required for Portland cement terrazzo. Proper surface preparation is important.
- Weight: Due to the weight of polyacrylate modified cement terrazzo, the structure can be designed for a lighter load. Refer to Finish Thickness and Weight Allowance.
- For 10 mm thick topping, aggregate size is limited to No. 1 and No. 2 chips. Larger size aggregate may be used for toppings of 12 mm +.

Concrete surfaces to receive the polyacrylate modified cement terrazzo topping must be smooth, have a steel trowel finish free of curing compounds, chemicals and oils. Normally, the base slab level is uniform throughout a floor area regardless of adjacent finishes to avoid depressing the terrazzo floor area. It is desirable to locate a divider strip at these points.

### Products

Polyacrylate modified cement terrazzo is a mix compounded from liquid polyacrylate copolymer and dry reactant composite.

Refer to the manufacturer's data for detailed information.

### Aggregate Chips

Aggregate chips used in terrazzo are graded by numbers according to size. In co-operation with the aggregate chip producers and dealers, the TTMAC recommends the following standardization of chip sizes for polyacrylate modified cement terrazzo.

The screen sizes shown are dimensions of the square openings in the screen. The terrazzo industry uses screens of their own devising, for their special purposes that are not covered by any known standard.

Chip Size	Passing Screen	Retained on Bottom Screen
No. 1	6.0 mm	3.0 mm to 6.0 mm
No. 2	10.0 mm	6.0 mm to 10.0 mm

#### Execution

The success of the finished terrazzo floor topping depends not only on a proper selection of the product, but also on the skill and experience of the applicator/contractor and the condition and preparation of the base to receive the topping.

The specifier, in consultation with the supplier of the topping materials, should verify that the concrete floor specification for new concrete slabs will provide the required base surface. More critical is the review of conditions applying to existing surfaces and proper surface preparation. A qualified applicator/contractor and the product manufacturer are resources for the specifier to use for information.

It is good policy to specify that the manufacturer's representative inspect the site and conditions and, where possible, provide inspections during installation. Consult the manufacturer in regard to normal practice for site review.

#### Master Specification

##### 1. GENERAL

##### 1.1 WORK INCLUDED

1.1.1 Inspection of surfaces and prevailing conditions

1.1.2 Divider strips and base bead top strip

1.1.3 Primer, as per manufacturer's recommendations

1.1.4 Polyacrylate terrazzo mixes and mixing

1.1.5 Installation – Floors, bases and stairs

1.1.6 Surfacing and Grouting

1.1.7 Cleaning and sealing

##### 1.2 RELATED WORK included in other sections.

1. Supply of mat frames or foot grilles

2. Waterproofing

3. Anchors, slots, ties, sleeves, collars, pipes, bolts, inserts, sub-specialty items and underfloor electrical raceway systems built into polyacrylate terrazzo.

4. Convenient, adequate temporary electric service 110-220 single phase

5. Temporary heat (maintained by others above 12°C and not more than 30°C for a period of seven days before, during and following installations) If propane heat is used, heating units must be of a vented type or areas must be properly vented

6. Locked heated space for storage materials

7. Hoisting facilities when required.

8. Convenient water supply.

Spec. Note: Specify testing requirements if required.

### 1.3 RELATED SECTIONS

1.3.1 Section [03 30 00 – Cast in Place Concrete:] [03350 – Concrete Finishing; concrete floor finishing].

1.3.2 Section 05 51 00 – Metal Stairs: tread reinforcing.

1.3.3 Section 06 10 00 – Rough Carpentry: underlayment

1.3.4 Section 07 10 00 – Waterproofing Membrane

1.3.5 Section 07 92 00 – Joint Sealers

1.3.6 Section 09 29 00 – Gypsum Board: [gypsum board] [cementitious backer unit]

### 1.4 Quality Assurance

1.4.1 Installer: employ skilled mechanics/applicators, trained and experienced in terrazzo work. Company must be registered as members in good standing with the Terrazzo, Tile and Marble Association of Canada, (TTMAC) with a minimum of five years [proven] experience. If requested by Consultant, submit a listing of at least three previously completed projects of similar size and scope.

Spec Note: A list of current members is available from the TTMAC office or at [www.ttmac.com](http://www.ttmac.com).

1.4.2 Supplier to be a member in good standing with the Terrazzo, Tile and Marble Association of Canada, providing materials meeting the minimum standards of the TTMAC.

1.5.1 TTMAC: Terrazzo, Tile and Marble Association of Canada.

1.5.2 Thin gauge polyacrylate plastic matrix terrazzo-CAN/CGSB-51.34-M86

Spec. Note: Describe quantity and size of samples and other special requirements.

### 1.6 SUBMITTALS

1.6.1 Submit three (3) samples 150 mm x 150 mm of each colour and type of terrazzo for approval by the consultant. Submit samples (300 mm in length) of all specified divider strips and control joints. An allowance of \$100.00 for each colour and type of terrazzo to be carried to cover the cost of samples supplied by others.

Spec Note: Terrazzo plates are to be used as a guide only.

1.6.2 Submit four (4) copies of the latest edition of the TTMAC Maintenance Guide for inclusion in the data book. Give specific warning of any maintenance practice or materials that may damage or disfigure the finished work, or alter the coefficient of friction (slip resistance) of the finished surface.

### 1.7 DELIVERY, STORAGE AND HANDLING

1.7.1 Deliver, store and handle products in a manner to avoid damage to containers and/or bags. Maintain a minimum temperature of 12°C for storage.

## 1.8 SITE CONDITIONS

- 1.8.1 Examine the areas in which the work of this section is to be installed.
- 1.8.2 Do not proceed with installation of terrazzo topping until improper conditions have been corrected.
- 1.8.3 Protect work during installation and protect finished surfaces while other work is being executed in the area. Protection is not the sole responsibility of the terrazzo installer and should be discussed with those associated with general construction of the project.
- 1.8.4 Check for appropriate heating facilities and required working conditions.

Spec Note: Subfloor not to vary more than 6 mm from true plane in 3000 mm.

Spec. Note: Specifier to verify that concrete specifications provide for a smooth, steel troweled finish for slabs to receive polyacrylate matrix topping.

- 1.8.5 Ensure that concrete slab is smooth, sound and clean free of any compounds or curing agents and at proper levels to receive terrazzo topping. Polyacrylate terrazzo, as specified, is not intended to level the substrate and will only follow the contour of the concrete slab. If, for any reason, the subcontractor questions suitability of substrate for bonding, any work required to eliminate non-conformity of subsurface specifications is the responsibility of others. Any materials used to correct non-conformity must be compatible with polyacrylate system selected and be approved by the terrazzo contractor and manufacturer

Spec Note: The polyacrylate material manufacturer representative to inspect the site conditions and provide spot inspections during installation.

- 1.8.6 Do not install topping until concrete slab is properly cured. Spec. Note: Allow at least 28 days for curing.
- 1.8.7 Verify the base slab temperature is not less than 15C before applying topping. Spec. Note: Describe requirements.

## 1.9 ALLOWANCE

Spec. Note: Identify special requirements, if any.

- 1.9.1 Unit Prices
- 1.9.2 Warranty: One year from date of completion of terrazzo installation.

## 2. PRODUCTS

Spec Note: Where terrazzo is specified without other descriptions, it would mean the following: 100% domestic marble chips, size No. 1 for bases, borders and wainscots and No. 1 & 2 for floors, grey cement, divider strips standard 14 gauge zinc: 50 mm bonded system; pattern 900 mm or 1200 mm squares.

### 2.1 MATERIALS

- 2.1.1 Polyacrylate plastic matrix
- 2.1.2 Liquid polyacrylate copolymer, dry coreactant composite and pigment
- 2.2 Aggregate chips: Specify size and type, marble, granite, glass or plastic chips.
  - 2.2.1 Aggregate: A Blend of sizes up to but not exceeding standard No. 2 chip size.

Spec. Note: Where terrazzo is specified without other descriptions, it would mean the following: 100% domestic marble chips, 30% No. 0 and 70% No. 1 for 6 mm matrix thickness. For 10 mm thickness it is recommended that chip size be 25% No. 0, 45% No. 1 and 30% No. 2 and 14 gauge L zinc divider strips.

## 2.3 DIVIDER STRIPS

2.3.1 Special shallow type, white alloy zinc or brass,

2.4 BASE BEAD TOP STRIPS: metal or plastic strips used as a leveling stop on top of terrazzo base.

2.5 COVE DIVIDERS: Metal or plastic with a 38 mm radius used to control shrinkage at wall base or as colour separation.

2.6 PRIMER: See manufacturer's specifications, if required.

2.6.1 Sealer and maintenance products: As per manufacturer's recommendations and must be U/L listed as slip resistant. Refer to latest edition of TTMAC Maintenance Guide.

2.6.1.1 Cleaners: Conforming to CAN/CGSB-2.107.92 Sealers: Conforming to CAN/CGSB-25.20-95 Floor Finish: Conforming to CAB/CGSB-25.21-95

## 3. EXECUTION

### 3.1 PREPARATION

3.1.1 Clean concrete slab. Remove laitance by grinding or scarifying. Clean and vacuum surface. Rinse concrete surface if required with water and allow to dry thoroughly.

3.1.2 Protect adjacent surfaces

3.1.3 Refer to 1.7: Site conditions .

SPEC NOTE: Aggregate chip coverage should show a minimum density of 70% on all finished terrazzo types, but may exceed this minimum.

### 3.2 INSTALLATION

3.2.1 Install divider strips, base bead top strips and cove dividers where required.

3.2.2 Terrazzo Bases: Install base bead top strip at specified height, straight and level. Apply underbed to backing, trowel underbed to within 8 mm of finish surface. Install divider strips, cove base dividers in line with floor divider strips. For direct bond to substrate, omit underbed. Prime substrate following manufacturer's recommendations.

Terrazzo Floor: For thin-set installations, prime concrete surface as recommended by manufacturer. Over cured underbed, apply a slurry bond coat of cement latex. Mix aggregate, cement and liquid polyacrylate copolymer as per manufacturer's recommendations. Spread mixture level to top of strips. Sprinkle mixture uniformly with dry aggregate using same formula as in topping. Roll with heavy rollers to compact topping until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strip to close all voids and pin holes. Allow to cure for 48 hours. Grind surface by machine with No. 24 grit abrasive stones or diamonds. Follow initial grind with No. 80 grit stones, remove excess slurry, rinse with clean water or use a dry grinding method. Apply grout to fill all voids and pin holes. Allow grout surface to cure for a minimum of 24 hours. Grind using No. 80 grit stones or finer, to a maximum of 120 grit abrasive stones or diamonds. Rinse and allow surface to dry thoroughly. Apply sealer following manufacturer's recommendations.

3.2.3 Complete work as per the polyacrylate matrix manufacturer's written instructions.

CLEANING AND SEALING: Refer to latest edition of TTMAC Maintenance Guide. Sealers should be ULC listed as slip resistant.

- 3.3 PROTECTION: General Contractor/Owner to provide adequate protection to completed terrazzo work. Protect work of other trades. Prohibit traffic during installation and for 48 hours after completion. Protect floor from impact and vibration for a minimum of 48 hours after installation. Protect base from impact, vibration, heavy hammering on adjacent and opposite walls for at least 48 hours. On completion of terrazzo floor, it is the responsibility of the owner/agent or general contractor to protect the floor from damage.

SUITABLE SUBSTRATES

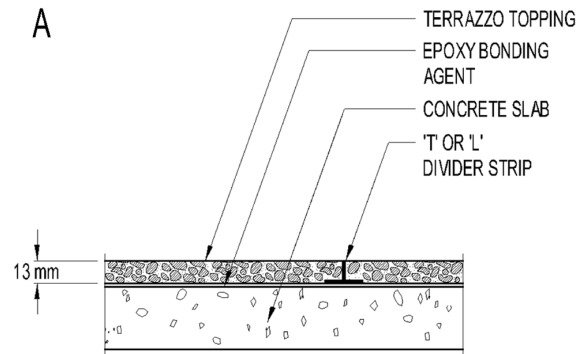
- Interior concrete slab, steel trowel, fine broom, or screed finish, where deflection under both dead and live loads conforms to local building codes.

MATERIALS

- Bonding agent: Epoxy or acrylic. For application, follow manufacturer's recommendations
- Divider strips: Zinc, brass, stainless steel or plastic, shallow type gauged 2 mm, 3 mm or 6 mm heavy top, L or T shaped.

TOPPING MATERIAL

- Portland cement: White, grey or a blended mixture of both with polyacrylate resin
- Colour pigments: non-fading in powder or liquid form
- Aggregate chips: marble, granite, a limited amount glass or plastic chips may be added to the mix according to local practice and manufacturer's recommendations
- Non-slip abrasive aggregate: 36 grit white aluminum oxide if specified
- Terrazzo Topping: 40 kg of cement white, grey or a blend of both, to 90 kg of aggregate chips, 70% No. 2 and 30% No. 1 for floors; add colour pigments if specified. Mix aggregate, cement and polyacrylate resin in accordance with manufacturer's recommendations.



SURFACE PREPARATION DETAIL A

Concrete must be sound with steel trowel or fine broom finish, free of contaminants such as oil, sealers, hardening or curing chemicals applied to surface or incorporated in the mix, along with any other bond-inhibiting contaminants. Remove contaminants by grinding or scarifying. Over cracked concrete substrate, apply a crack isolation membrane over the area in a band of 305 mm centered on the crack or over the entire area.

INSTALLATION OF TERRAZZO STRIPS DETAIL A

Sweep or vacuum base slab clean, lay out pattern with chalk line as shown on drawings. Install control joints directly above control joints in subfloor. Bond strips to floor with epoxy in line with the location of strips by pouring in a continuous line, or by placing spots as necessary for stability and at all points that intersect. Allow strips to set prior to application of polyacrylate terrazzo topping.

TERRAZZO TOPPING INSTALLATION DETAIL A

After setting material has sufficiently cured, sweep or vacuum floor clean. Apply epoxy bonding agent following manufacturer's recommendations, using a short nap paint roller. Allow bonding agent to dry until tacky. Mix aggregate, cement and polyacrylate resin as per manufacturer's recommendations. Using a trowel, spread terrazzo mixture level to top of strips. Sprinkle topping uniformly with dry aggregate chips. Roll topping with heavy rollers to compact topping until excess cement and water has been extracted. Sweep away excess cement with a corn broom. Hand trowel topping surface flush with top of divider strips to close all voids and pin holes. Control cure for a minimum of 48 hours and grind.

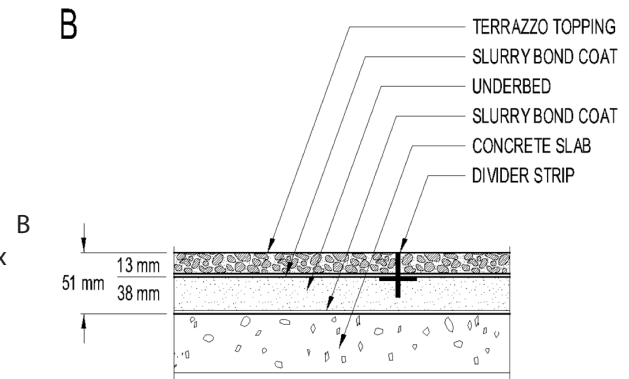
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## UNDERBED MATERIALS

- Portland Cement: CAN.CSA-A5-93
- Sand: Clean washed to ASTM C-144-99
- Divider Strips: Zinc, brass, stainless steel or plastic gauged 2 mm, 3 mm or 6 mm heavy top.
- Underbed: One part Portland cement to four parts clean, washed sand by volume. Add sufficient clean water and mix thoroughly to a low slump to provide workability.

## UNDERBED INSTALLATION DETAIL B

- Broom clean base slab and saturate with water. Remove excess water. Apply a slurry consisting of a thick paste of cement and latex additive. Place and screed underbed mix to 13 mm below finished floor elevation or slope. Install divider strips and control joints in underbed while underbed is still in a workable plastic state. Trowel the strips firmly on both sides to a true and level required pattern.



## TERRAZZO TOPPING INSTALLATION DETAIL B

48 hours after underbed installation, sweep or vacuum cured underbed, saturate with water, remove excess. Apply a slurry bond coat of cement and latex additive, immediately follow with application of terrazzo topping mix. Mix aggregate, cement and polyacrylate resin as per manufacturer's recommendations. Using a trowel, spread terrazzo mixture level to top of strips. Sprinkle topping with dry aggregate chips and roll with heavy rollers to compact until excess cement and water has been extracted. Hand trowel topping surface flush with top of divider strips to close all voids and pin holes. Control cure for a minimum of 48 hours.

## GRINDING

After floor has sufficiently cured, wet or dry grind with No. 24 grit abrasive stone. Follow initial grind with No. 80 grit stones. Remove excess, slurry, wash floor thoroughly and apply grout by hand trowel or by machine to fill all voids. Allow grout to cure and grind with No. 80 grit stones or finer, to a maximum of 120 grit stones until all grout is removed from surface. Rinse with clean water. Allow surface to dry and apply sealer following manufacturer's recommendations.

## LIMITATIONS

For concrete slab, (Detail A), surface variation not to exceed 6 mm in 3049 mm from the required plane and not more than 2 mm in 300 mm when measured from high or low point in the surface.

## OTHER CONSIDERATIONS

- Polyacrylate modified cement terrazzo can also be installed over a floating system, refer to Detail 411F-2007.
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.

SUITABLE SUBSTRATES

Concrete or masonry, 13 mm minimum cementitious backer unit (CBU), meeting ANSI A118.9-1992, gypsum board or 16 mm minimum exterior grade Douglas Fir plywood on wood or metal studs meeting CSA-0121, maximum 406 mm o.c. with backing reinforcements

MATERIALS

- Portland cement: CAN/CSA-A5-93
- Sand: clean washed to ASTM-C-144-99
- Metal lath: 1.4kg/m<sup>2</sup> ASTM-C-847-1995
- Base bead top strips: zinc or brass
- Cove base divider strips: zinc, brass or plastic, gauged 2 mm, 3 mm or 6 mm heavy top
- Floor divider strips: zinc, brass, plastic, gauged 2 mm, 3 mm or 6 mm heavy top

TOPPING MATERIAL

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Polyacrylate resin
- Aggregate chips: marble, granite, a limited amount of plastic or glass chips may be added to the mix according to local practice and manufacturer's recommendations
- Topping: 40 kg of cement to 45 kg of aggregate chips, 100% No. 1 for base and colour pigments if specified. Polyacrylate resin percentage in accordance with manufacturer's recommendations. Mix to a uniform stiff working consistency to suit conditions and to provide workability.

INSTALLATION OF BASE BEAD TOP STRIPS AND DIVIDER STRIPS

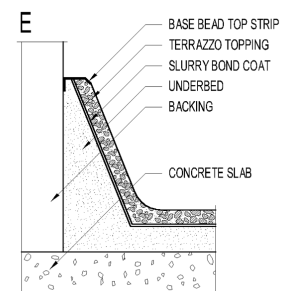
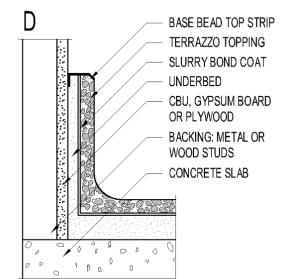
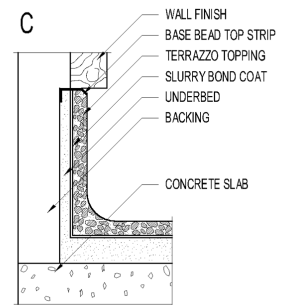
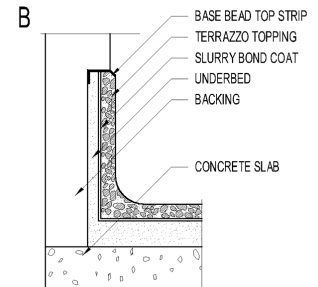
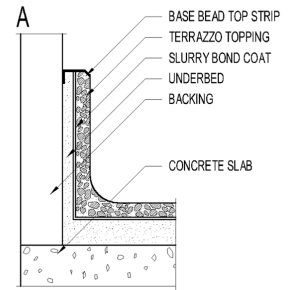
Install base bead top strips to specified height, straight and level. Attach metal lath with screws or nails over gypsum board and plywood substrate. Apply underbed to backing, trowel underbed to 8 mm of finished surface. Install divider strips and cove base dividers as shown or specified, in semi-plastic setting bed, plumb and aligned with floor strips. Allow to cure before installation of terrazzo topping.

TERRAZZO TOPPING INSTALLATION

After underbed has sufficiently cured, sweep clean and wet as required. Apply cement latex slurry the same colour as specified for topping. Brush cement slurry on cured underbed surface. Apply a stiff workable terrazzo mix to slurry bond coat before bond coat dries and skins over. Do not wet or apply slurry bond coat to substrate where terrazzo topping is to be directly applied to substrate. Apply bonding agent following manufacturer's recommendations. Trowel terrazzo mixture to base shape as specified (or detailed). Allow to cure and grind.

GRINDING

After base has sufficiently cured, grind with coarse abrasive stone or diamond. Remove excess slurry, wash base with clean water. Apply grout using same colour matrix and pigment as topping to fill all voids and pin holes. Remove excess grout with burlap cloth or other means. Allow grout to cure, final grind with No. 80 grit or finer disc, to a maximum of 120 grit until all grout is removed from surface. Rinse surface clean and allow to dry thoroughly. Apply sealer following manufacturer's recommendations.

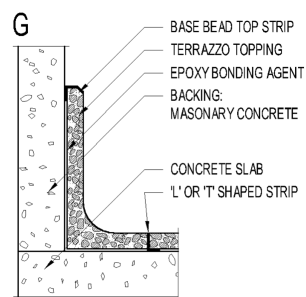
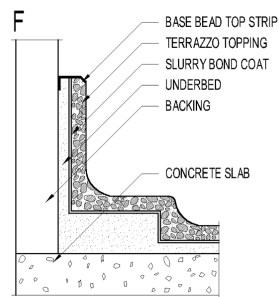


## LIMITATIONS

For recess base installations, a minimum of 152 mm in height is required for grinding purposes.

## OTHER CONSIDERATIONS

- Base height is normally 102 mm to 152 mm, however, base heights may exceed 152 mm. Heights exceeding 152 mm must be specified.
- Backing for terrazzo base should be a cementitious backer unit (CBU), concrete or masonry.
- For terrazzo topping bonded directly to substrate, use shallow type base bead top strips and shallow type L or T cove divider strips.
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.
- For colour pigments see page 14
- Prefabricated epoxy terrazzo base could be used as an alternate to a poured in place base.



**SUITABLE SUBSTRATES**

Interior concrete slab with a screed finish for underbed installations, fine broom or steel trowel finish for epoxy bonded installations. Surface to be free of cracks, oily films or wax and curing compounds. Maximum deflection in substrate to conform with local building codes.

**UNDERBED MATERIALS**

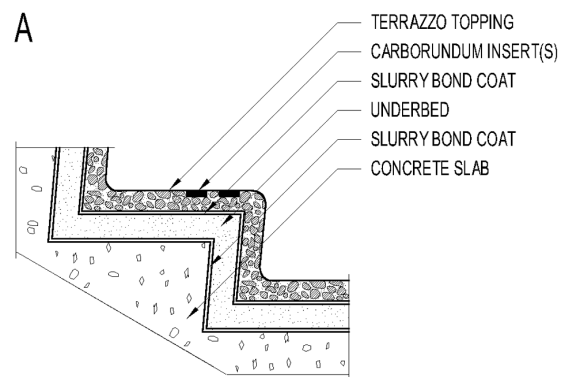
- Portland cement: CAN CSA-A5-93
- Sand: clean washed to ASTM-C-144-99
- Metal lath: 1.4 kg/m<sup>2</sup> ASTM-C-847-95
- Scratch coat: 7 mm minimum
- Base bead top strips: zinc or brass
- Epoxy bonding agent
- Cove divider strips: zinc, brass or plastic, gauged 2 mm, 3 mm or 6 mm heavy top. For epoxy bonded installation, use L or T-shaped strips
- Abrasive strip channel: 10 mm wide x 10 mm deep, zinc or brass
- Underbed: one part Portland cement to three parts clean washed sand. Add sufficient clean water and mix thoroughly to as low a slump as possible to provide workability.

**TOPPING MATERIAL**

- Portland cement: white, grey or a blended mixture of both
- Colour pigments: non-fading in powder or liquid form if specified
- Polyacrylate resin
- Aggregate chips: marble, granite, a limited amount of glass or plastic chips may be added to the mix according to local practice and manufacturer's recommendations
- Topping: 40 kg cement white, grey or a blended mixture of both, to 45 kg of aggregate chips, using 100% No. 1 for stairs. Add colour pigments if specified. Mix aggregate, cement and polyacrylate resin following manufacturer's recommendations. Mix to a uniform stiff working consistency to suit conditions and to provide workability.

**DETAIL A - BASE BEAD TOP STRIPS AND UNDERBED****INSTALLATION**

Install base bead top strip on wall stringer or where specified at required height, straight and level. Attach metal lath over surfaces that present a bonding problem. Apply underbed to backing, to within 8 mm of finished surface. Sweep clean and saturate screeded concrete stairs and remove excess. Apply a slurry consisting of a thick paste of cement and water, a latex additive may be added. Place and screed underbed mix to a minimum of 10 mm, to a maximum of 13 mm below finished stair elevation. Install divider strips, coved divider strip and slip resistant channels while mortar is in a semi-plastic state. Epoxy bond L or T shaped strips over a cured underbed. Allow to cure prior to installation of terrazzo topping.

**DETAIL A - TERRAZZO TOPPING INSTALLATION**

After underbed has sufficiently cured, sweep clean and wet underbed as required. Apply a cement and latex slurry using the same colour as specified for the topping. Brush cement slurry on cured underbed surface. Apply a stiff workable terrazzo mix to slurry bond coat before bond coat skins over. Trowel mixture on risers, treads, curbs and stringers as detailed. Compact terrazzo surface until excess cement has been extracted to a dense uniform flat surface level to top of strips. Allow to cure and grind.

#### DETAIL B – INSTALLATION OF BASE BEAD TOP STRIPS AND DIVIDER STRIPS

Install base bead top strips on wall stringers, where specified, straight and level at required height. Attach metal lath over surfaces that present a bonding problem. Apply underbed to backing and trowel to within 8 mm of finished surface. Sweep or vacuum substrate and lay out pattern with chalk line as shown on drawings. Bond L or T strips, cove base divider strips and slip resistant channels with epoxy, in line with the location of the strips by pouring in a continuous line or by placing spots as necessary for stability. Allow strips to set prior to application of polyacrylate terrazzo topping.

#### DETAIL B – TERRAZZO TOPPING INSTALLATION

After strips have sufficiently cured, sweep or vacuum stairs clean. Apply bonding agent to substrate with a brush. Allow bonding agent to set to a tacky consistency. Do not wet surface prior to application of bonding agent and topping. Apply a stiff workable terrazzo mix to tacky bonding agent. Trowel mixture on risers, treads, curbs and stringers as detailed. Compact terrazzo surface until excess cement has been extracted to a dense uniform flat surface, level to top of strips. Allow to cure for a minimum of 48 hours and grind.

#### GRINDING

After topping has sufficiently cured, grind with coarse abrasive stone or diamonds. Remove excess with clean water. Apply grout using same colour matrix and pigments as topping to fill all voids and pin holes. Remove excess grout with a burlap cloth or other means. Allow grout to cure for a minimum of 24 hours. Final grind with No. 80 grit stone or disc until all grout is removed from the surface. Rinse surface clean and allow to dry thoroughly. Apply sealer following manufacturer's recommendations.

#### INSTALLATION OF ABRASIVE INSERTS

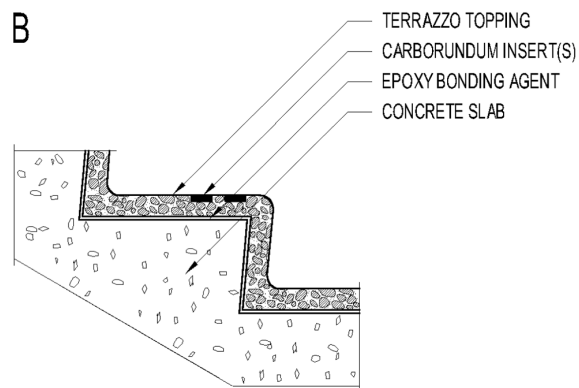
After sealer has dried, mask terrazzo with 19 mm or 25 mm wide adhesive tape on both sides of abrasive channels to protect finished surface. Remove protective foam from inserts and clean all foreign matter. With pointing trowel, spread abrasive mix into channel and maintain a consistent thickness of 2 mm above terrazzo tread. Remove masking tape and allow to cure.

#### LIMITATIONS

- Radius of cove shall be no less than 38 mm

#### OTHER CONSIDERATIONS

- A combination of various types and colours of aggregate chips may be introduced into the terrazzo mix
- Strict attention must be paid to local building codes in regard to abrasive nosing and visually impaired warning lines, if specified.
- White and grey Portland cements may not be uniform in shade and may produce a variation in appearance in the matrix.
- Provide tactile surface prior to stairs where required for visually handicapped.



## SURFACE RESTORATION OF TERRAZZO

Restoration requires remedial action that should only be performed by professionals who are specialized in the use of specific equipment and materials according to trade practice.

### STRIPPING

Remove existing floor finishes with a heavy duty commercial floor stripper designed for the use of terrazzo as per manufacturer's recommendations. Apply solution to with a clean mop. Machine scrub with a brush or pad. Remove dirty solution with a wet vacuum or mop. Rinse with clean water and allow terrazzo to dry thoroughly. Apply appropriate terrazzo sealer as per manufacturer's recommendations. This same basic procedure applies to the terrazzo base using scrubbing equipment for vertical applications.

### LIGHT RE-GRINDING

This procedure is suggested to refinish terrazzo floors and base where a light grinding is required. Using a terrazzo floor machine grinding with number 80 grit stones or diamonds. Keep the area wet with clean water at all times. Fine silica sand may be used if surface finishes and dirt are difficult to remove. Remove grinding slurry thoroughly and rinse with clean water. If required, regrind the entire surface again with number 120 grit abrasive stones or diamonds keeping the floor wet. Wash and rinse well with clean water. The same procedure applies to refinishing the terrazzo base, using base grinding machines and appropriate grinding stones or sanding discs. Allow areas to dry thoroughly and apply a terrazzo sealer as per manufacturer's recommendations.

### HEAVY RE-GRINDING

This procedure is required to remove multi layers of surface finishes (sealers, waxes), dirt and to grind a thin layer of terrazzo which may remove superficial stains, scratches and badly pitted surfaces. With terrazzo floor grinding machine, remove a thin layer of terrazzo using coarse stones or diamonds such as 24 grit. When completed, remove all slurry and rinse with clean water. Further grind the terrazzo with number 80/120 grit stones or diamonds keeping the floor wet until terrazzo is free from scratches. Remove all grinding slurry and thoroughly wash and rinse surface. If terrazzo is a cementitious base, grout using a cement/acrylic mix with or without colour pigment added to match the terrazzo matrix, filling pinholes and voids. If terrazzo is an epoxy resin type, allow surface to dry thoroughly, then grout using a coloured epoxy resin to match the terrazzo matrix, filling pinholes and voids. Allow grout to remain on the surface until completely cured. Wet grind with 80 or finer grit stones or diamonds until all grout has been removed from the terrazzo surface. Wash and rinse terrazzo using a neutral cleaner and allow terrazzo to dry thoroughly. Apply appropriate terrazzo sealer following manufacturer's directions.

The same basic procedure applies to resurfacing terrazzo base, using base machine grinders and appropriate grinding stones or sanding discs.

### PATCHING TERRAZZO

Remove any loose and unsound materials and clean thoroughly. Use an appropriate bonding agent, epoxy or cementitious binding materials and an aggregate mixture to match existing terrazzo. After curing, grind patches using 80 grit or finer stones or diamond equivalents until area has a similar finish to the surrounding floor. Allow area to dry then apply the terrazzo appropriate sealer as per manufacturers recommendations.

Terrazzo repairs or patches may not match the original installation. Factors such as binding materials, variations in aggregate, discolouration over time, exposure to elements and normal wear and tear may play a roll in matching the existing terrazzo.

### CRACKS

Cracks in terrazzo are usually results of cracks in the structural concrete slab. If the crack is a structural crack, the terrazzo will crack again after the repair, unless the structure is properly repaired.

Most cracks can be satisfactorily repaired depending on the width of the crack. For cracks where the opening of the crack is greater than 6mm, it is recommended that crack be chipped on each side to provide a larger and irregular opening, Then a mixture of the same aggregate and binder combination is inserted by applying pressure and forcing the mixture into the crack. It is most important that this mixture in slightly proud of the existing terrazzo floor to allow for proper grinding procedures to take place. Once properly cured, grind then apply a terrazzo sealer to this repaired area.

For cracks where the opening is less the 6mm, it is recommended that the crack be filled with the same binding matrix as originally used. No aggregate is needed.

#### PROTECTION OF COMPLETED TERRAZZO FLOORS

The protection of any terrazzo system is NOT the responsibility of the terrazzo installation company. It is strongly suggested to consult with the terrazzo installation company as to proper protection of completed terrazzo system installations as job-site conditions will vary depending upon the specific project conditions and suggested requirements.

#### STANDARDS AND CODES

Careful examination of the building codes, national and provincial, applicable to the area of the project, should be made in coordination with the specifications.

## GLOSSARY

**Abrasive Aggregate:** Aluminum oxide to No. 36 graded size, used as an additive to terrazzo or cement toppings to increase the coefficient of friction/slip resistance (COF) on non-slip finished surfaces.

**Aggregate Chips:** For the purpose of terrazzo, reference is to various chip sizes consisting of marble, granite, pea gravel, river stone, quartz, glass, or plastic. Non corrosive metal or other mineral chips may also be used.

**Air Entraining:** The capability of a material or process to develop a system of minute bubbles of air in cement, mortar or concrete during mixing

**Ambient Temperature:** The environment temperature surrounding the object under construction.

**Backing:** Any material used as a base over which terrazzo is to be installed.

**Base Bead Top Strips:** Metal strips of various thickness and length made of zinc alloy or brass used as a finish topping over base in horizontal or vertical installations.

**Bluing:** the chemical reaction of epoxy curing agents, water and oxygen

**Bond Breaker:** A material used to prevent adhesion of newly placed concrete and the substrate.

**Bonding Agent:** A latex, epoxy or other type of adhesive material used to bond thin-set terrazzo matrix to concrete or other suitable underlayment.

**Broadcasted:** See sprinkling.

**Broom Surface:** The surface texture obtained by stroking a broom over freshly placed concrete. Also brushed surface.

**Cementitious Backer Unit (CBU):** A backer board designed as a substrate. It can be used in place of metal lath, Portland cement scratch coat and mortar bed over frame construction.

**Chairs:** Metal supports used to hold rebar at a predetermined height within the mortar bed.

**Cleaner :** A neutral liquid detergent or soap, with suitable sequestering agents for use in general maintenance and cleaning of terrazzo.

**Cleavage Membrane:** A membrane that provides a separation and slip sheet between the mortar setting bed and the backing or base surface.

**Coefficient of Friction:** The measurement of static slip resistance between ceramic tile and stone under both wet and dry conditions while utilizing Neolite heel assemblies.

**Cold Joint:** Any point in concrete construction where a pour was terminated and the edge has lost its plasticity before work was continued.

**Colour Pigments:** A powder or liquid additive used to attain the desired colour of the terrazzo matrix.

**Colour Plates:** Coloured pictures of actual terrazzo samples.

**Construction Joint:** The surface where two successive placements of concrete meet but do not bond cementitiously.

**Control Joint:** A joint cut, formed or tooled into the concrete surface to control the location of cracks due to shrinkage and other dimensional changes in the concrete structure.

**Cove Base Dividers:** Metal or plastic strips approximately 180 mm long with a 38 mm radius shaped form used at intersections of walls and floors normally installed in line with floor strips, control joints and expansion joints to minimize cracking due to curing and structural movement. Also used for the purpose of separating colour sections.

**Crack Isolation Membrane:** A system to separate the terrazzo from cracking/movement of substrate.

**Curing:** Maintenance of humidity and temperature of the freshly placed mortar or topping during same definite period following the placing or finishing, to assure

**Delamination:** The separation of a coating or topping from the previous coat or from the substrate. When a delamination effects a large area, it can often be detected by sound tapping the surface.

**Deflection:** A variation in the position or shape of a structure due to effects from live or dead loads. Normally measured by the linear deviation from an established plane.

**Divider strips:** White alloy of zinc, brass or plastic strips, used to control expansion or contraction of the underbed and topping, to divide different colour panels and for other aesthetic purposes.

**Efflorescence:** A whitish powder, sometimes found on surfaces caused by the deposition and crystallization of soluble salts carried through into the surface by moisture.

**Elastomer:** A polymer with elastic properties, such as rubber.

**Elastomeric:** Rubber like; relating to or having the properties of elastomers.

**Epoxy:** A two component liquid resin consisting of bisphenol A and epichlorohydrin generally referred to as Part A and B and is used to bind aggregate chips as used in the terrazzo mix.

**Expansion Joint:** A joint that extends through the terrazzo topping, mortar bed and substrate. They are designed to allow for continuous movement in the building structure caused by expansion and/or contraction due to thermal change or other influences.

**Flexural Strength:** A measurement of force or resistance required to bend a material from a straight plane or line.

**Granite:** A very hard, crystalline, igneous rock, composed of feldspar, quartz and lesser amounts of dark ferromagnesium materials. Gneiss and black "granites" are similar to "true" granites in structure and texture, but are composed of different materials and type of rock.

**Grout:** Portland cement with or without additives or epoxy matrix applied to the terrazzo surface to fill pin holes and voids after rough grinding.

**Grinding:** A method using mechanical power equipment and abrasive material to roughen a surface that is too smooth or to improve the appearance of a surface that is too rough.

**Hydrostatic Pressure:** A force exerted by a column or head of water.

**Isolation Joint:** A built-in separation between adjoining similar or dissimilar elements of a concrete structure, usually a vertical plane. Also, see expansion joint.

**Latex:** A water emulsion of a synthetic rubber or plastic obtained by polymerization used as an additive in cementitious bonding material.

**Marble:** A metamorphic recrystallized limestone, composed predominantly of crystalline grains of calcite or dolomite, or both, having interlocking or mosaic texture. Marble has been redefined to include all calcareous rocks capable of taking a polish such as travertine, and attractive serpentine rocks.

**Matrix:** There are three different types of matrix:

Portland cement and water mix used to bind aggregate chips in the terrazzo topping.

Polyacrylate is a mix compounded from liquid polyacrylate copolymer and dry co-reactant composite.

**Mortar:** A mixture of one part cement to four parts sand mixed to a semi dry slump, placed over the slab as a base, to provide a level plane for the terrazzo topping and a bed for the divider strips.

**Pencil Rod:** Reinforcing rod with a diameter no greater than 6 mm.

**PH:** The negative logarithm of the hydrogen ion concentration in mol/liter. Measure of the acidity or alkalinity of an aqueous solution. pH=7 represents neutrality, i.e. the solution is neither acid nor alkaline. pH values from 0 to 7 are acidic, the lower the pH value, the higher the degree of acidity; pH values from 7 to 14 represent alkalinity. The higher the pH value about 7, the greater the degree of alkalinity (CED)

**Paccarina:** Slurry from terrazzo grinding.

**Panels:** The section formed by the layout of divider strips.

**Pinhole:** is a normal characteristic of a finished terrazzo product. It should not be misconstrued that the appearance of minor pinholes indicate a lack of integrity or the loss of performance expected of this product. A concentration of a mass of such pinholes is not acceptable and must be corrected by the terrazzo contractor.

**Plate Numbers:** Numbers appearing adjacent to various terrazzo illustrations in the Terrazzo, Tile and Marble Association of Canada colour plates. Often used in lieu of formula in jobs specifications.

**Polyethylene Sheeting:** An organic synthetic inert sheeting, manufactured in various thicknesses.

**Polymeric:** Having similar elements combined in the same proportions by weight, but different in molecular weights and chemical properties.

**Portland Cement:** Materials containing appropriate amounts of calcium compounds, silica, alumina and iron oxide that are crushed and screened and placed in a rotating cement kiln. Ingredients used in this process are typically materials such as limestone, marl, shale, iron ore, clay and fly ash.

**Prefabricate Movement Joint (PMJ):** A prefabricated profile that typically is made of extruded Poly-Vinyl Chloride (PVC). Chlorinated Polyethylene (CPE), sometimes in combination with metal edging. All allow for movement within the terrazzo surface due to thermal changes, shrinkage and other influences.

Precast: Terrazzo fabricated in molds, in a shop or factory, by a compression and vibratory method.	Slurry Bond Coat: A mixture of Portland cement and water (a latex bonding agent may be added). Used for bonding underbed to concrete substrate.
Primer: An epoxy or acrylic material applied to substrate to bond terrazzo toppings.	Sprinkle (Seeding): The practice of sowing or densifying the compaction of aggregate chips on the surface of the terrazzo. Accomplished by using the same aggregate chips as in the matrix, sprinkled prior to the rolling operation.
Reinforcing Mesh: 50 mm x 50 mm galvanized, minimum 16 gauge welded steel mesh used as reinforcement.	Substrate: The underlying supports for the terrazzo installation.
Release Agent: A compound applied to a form to help remove the form after curing.	Sub Floor: An underlying surface to receive or support terrazzo.
Riser: Vertical height or piece connecting two treads or steps of a staircase.	Surface Temperature: The degree of heat of a surface measured by a thermometer.
Sand: Minute fragments resulting from wearing down of siliceous rock.	Surfacing: The grinding, grouting, and finishing operations on terrazzo topping.
Sand Blasting: Blast cleaning a surface with silica sand, flint, or other crystalline silica abrasives to remove dirt and to roughen a surface in preparation for coating.	Terrazzo: A form of mosaic flooring made by embedding various types pieces of aggregate chips in matrix.
Scarifying: A method of mechanically preparing concrete or other surfaces for coating, using a self-contained unit resembling a plant sweeper with sharp rotating blades.	Terrazzo Plates : Photographic plates of terrazzo samples. Plates will differ from actual samples.
Scratch Coat: A mixture of Portland cement, sand and water applied as the first coat of mortar. It's surface usually is scratched or roughened so that subsequent coats of mortar will bond properly.	Thin-Set: Terrazzo system which can be applied over a smooth concrete slabs or other suitable substrates at a minimum thickness of 6 mm to a maximum of 13 mm.
Screed: To level off mortar to the specified plane or shape with a wood or metal straight edge.	Topping: The wearing surface of the terrazzo floor.
Screed Joints: Where two separate screeded underbed applications meet.	Uncoupling System: Typically a membrane that separates the finished surface from the substrate so as to allow independent movement and attempts to prevent the transfer of stresses to the tiled surface.
Sealer: A clear protective coating or treatment which precludes foreign liquid or matter from being absorbed, by closing the pores in the surface.	Underbed: A mixture of Portland cement, sand and water installed to a thickness as required to provide an even substrate to support divider strips and terrazzo topping.
Seismic Joints: allowing for earthquake or other forces.	Undulation: Up or down variation from a straight plane resembling a gentle rise and fall similar to a wave.
Slip Resistance: The ability of a surface to prevent sliding or loss of footing.	Vapour Barrier: Waterproof membranes or polyethylene sheeting placed directly under concrete slabs on grade or below grade to prevent moisture transmission.
Shot Blasting: A surface preparation method that uses cast steel shot propelled by centrifugal force to clean and/or profile a surface in preparation for coating.	Venetian: A type of terrazzo topping consisting of aggregate chips No. 1 to No. 8.
Slip Sheet: A layer, such as polyethylene plastic that remains un-bonded to one surface and allows horizontal movement between two different surfaces.	













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