Cement Backer Units Over Lightweight Steel Framing
TDS 133

GENERAL CONDITIONS

All substrates to receive ceramic tile, stone, masonry veneer, thin brick, or similar hard architectural finishes installed by the thin-bed method, including where Cementitious Backer Units (CBU) are installed, must be structurally sound, clean and not deflect more than L/360 for ceramic tile and L/480 for stone (where L = span) under all distributed or concentrated live and dead loads.

All CBU must comply with American National Standards Institute, Inc. (ANSI) A118.9 "Standards for Test Methods and Specifications for Cementitious Backer Units."

All CBU for walls and facades must be certified by the manufacturer to be suitable for exterior applications, especially in climates subject to freeze-thaw cycling.

Interior wall installations of CBU over Lightweight Steel Framing (LSF) must comply with ANSI A108.11 "Interior Installation of Cementitious Backer Units."

Provide movement/expansion joints for ceramic tile, stone and thin brick installations as per Tile Council of America, Inc. (TCA) "Handbook for Ceramic, Glass and Stone Tile Installation {Movement Joint Design Essentials EJ-171}".

WALLS & FACADES

- Compliance with design criteria, as well as state and local building codes must be approved and certified by a qualified structural engineer. Use more stringent design criteria when necessary to comply with state and local building code stiffness requirements for thin veneers.
- For thin-bed ceramic tile installations when a cementitious bonding material will be used, including medium bed mortar: maximum allowable variation in the tile substrate – for tiles with edges shorter than 15" (375mm), maximum allowable variation is ¼" in 10' (6mm in 3m) from the required plane, with no more than 1/16" variation in 12" (1.5mm variation in 300mm) when measured from the high points in the surface. For tiles with at least one edge 15" (375mm) in length, maximum allowable variation is 1/8" in 10' (3mm in 3m) from the required plane, with no more than 1/16" variation in 24" (1.5mm variation in 600mm) when measured from the high points in the surface. For modular substrate units, such as exterior glue plywood panels or adjacent concrete masonry units, adjacent edges cannot exceed 1/32" (0.8mm) difference in height. Should the architect/designer require a more stringent finish tolerance (e.g. 1/8" in 10' [3mm in 3m]), the subsurface specification must reflect that tolerance, or the tile specification must include a specific and separate requirement to bring the subsurface tolerance into compliance with the desired tolerance.
- All designs, specifications and construction practices shall be in accordance with industry standards. Refer to:
  American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members" - current edition [www.steel.org];
  Canadian Sheet Steel Building Institute (CSSBI) "Lightweight Steel Framing Binder {Publication 52M}" **-** current edition [www.cssbi.ca];
  Steel Stud Manufacturers Association (SSMA) "Product Technical Information" and "ICBO Evaluation Service, Inc. Report ER-4943P" – current edition [www.ssma.com];
  Metal Lath/Steel Framing Association "Steel Framing Systems Manual" – current edition
- Prior to commencing work, installer must submit to Architect/Structural Engineer for approval, shop drawings showing wall/façade construction and attachment details. All attachments must be designed to prevent transfer of building or structural movement to the wall/façade.
- Construct all framing with galvanized or other rust resistant steel studs and channels; minimum requirements:
  Stud Gauge: 16 gauge;

Stud Material: steel conforming to ASTM A1011 "Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength current edition with the minimum yield point required per code;
Stud Spacing: not to exceed 16" (400mm) o.c.;
Stud Width: 6" (150mm);
Horizontal Bridging: Not to exceed 4' (1.2m) o.c.; 16 gauge CR channel typical ***or as specified by structural engineer.***

- Studs shall be seated squarely in the channel tracks with the stud web and flange abutting the track web, plumbed or aligned, and securely attached to the flanges or web of both the upper and lower tracks by welding. Similarly connect horizontal bridging/purlins and anti-racking diagonal bracing ***as determined by structural engineer.*** Grind welds smooth and paint with rust inhibiting paint. Finished frame and components must be properly aligned, square and true.
- Provide adequate support of framing elements during erection to prevent racking, twisting or bowing.
- Lay out the CBU installation so all board edges are supported by metal framing (studs vertically and purlins horizontally). Cut/fit CBU and add additional framing elements as required to support board edges. Stagger boards in courses to prevent continuous vertical joints and allow 1/8-3/16" (3-5mm) between sheets.
- Fasten the CBU with 7/8" (22mm) minimum length, non-rusting, self-imbedding screws for metal studs (BUILDEX® Catalog item 10-24 17/16 Wafer T3Z or equivalent). Fasten the boards every 6" (150mm) at the edges and every 8"(200mm) in the field. Stagger placement of screws at seams. Place screws no less than 3/8" (9mm), and no more than 1" (25 mm), from board edges.
- Tape all the board joints with the alkali resistant 2" (50mm) wide reinforcing mesh provided by the CBU manufacturer embedded in a LATICRETE® latex portland cement mortar used to install the ceramic tile, stone or thin brick (see below).
- To prevent water leakage through the wall or facade, apply a LATICRETE Waterproofing Membrane over the CBU before installing ceramic tile, stone or thin brick (refer to Data Sheets 236.0, 649.0, 105.0 for additional information).
- Install ceramic tile, stone or thin brick in ***exterior*** areas with:
  LATICRETE 4237 Latex Additive plus LATICRETE 211 Powder;
  LATICRETE 4237 Latex Additive plus LATICRETE 272 Mortar;
  LATICRETE 4237 Latex Additive plus LATICRETE 317;
  LATICRETE 3701 Mortar Admix plus LATICRETE 272 Mortar;
  LATICRETE 3701 Mortar Admix plus LATICRETE 317;
  LATICRETE 333 Super Flexible Additive plus LATICRETE 272 Mortar*;
  LATICRETE 333 Super Flexible Additive plus LATICRETE 317*;
  LATICRETE 333 Super Flexible Additive plus LATICRETE 220 Marble & Granite Mortar*;
  LATICRETE 101 Rapid Latex Admix plus LATICRETE 272 Mortar;
  LATICRETE 101 Rapid Latex Admix plus LATICRETE 317;
  LATICRETE 101 Rapid Latex Admix plus LATICRETE 220 Marble & Granite Mortar;
  LATICRETE 255 MultiMax™*†;
  LATICRETE 254 Platinum;
  LATICRETE 254R Platinum Rapid;
  LATICRETE 4-XLT*;
  LATICRETE Masonry Veneer Mortar*;
  LATICRETE 253 Gold*;
  LATICRETE 253R Gold Rapid*;

  * Residential and light commercial applications that are not continuously submerged;

- For ***interior*** applications, the following may also be used:
  LATAPOXY® 300 Adhesive;
  LATICRETE 252 Silver
- Apply the mortars recommended above in the following manner:
  Wipe CBU with a damp sponge to remove dust and to increase working/adjustability time over hot, dry surfaces. Apply the mortar or epoxy adhesive using the flat side of the trowel to work the material into good contact with the CBU. Then comb on additional mortar or epoxy adhesive with the notched side of the trowel. Spread only as much mortar or epoxy adhesive as can be covered in 15–20 minutes. Use the correct size notched trowel and "back butter" the tiles if necessary to achieve the correct coverage and bedding. "Back butter" all tile larger than 8"x 8" (200mm x 200mm) in facial area and all tiles in exterior areas. Beat the tiles into the mortar with a rubber mallet or beating block.

Check your bond periodically by removing a tile and verifying the extent of coverage – insure that tiles are fully bedded with a minimum 3/32" (2.5mm) thick continuous layer of mortar or epoxy adhesive.

Once the tiles set firm, in ***exterior*** areas grout with:
LATICRETE® PermaColor™ Grout;
LATICRETE 1500 Sanded Grout and LATICRETE 1776 Grout Enhancer;
LATICRETE 1600 Unsanded Grout and LATICRETE 1776 Grout Enhancer;
LATICRETE 1500 Sanded Grout;
LATICRETE 1600 Unsanded Grout;
LATICRETE Masonry Pointing Mortar

- For ***interior*** applications, the following may also be used:
  LATICRETE SpectraLOCK® PRO Premium Grout [Δ];
  LATICRETE SpectraLOCK PRO Grout;
  LATICRETE SpectraLOCK 2000 IG (for areas exposed to high heat, harsh chemicals and cleaners and food acids)
  LATAPOXY® SP-100

- For full installation information, refer to individual product package instructions and Data Sheets.
- **Caution: to install water sensitive marble and agglomerates in interior areas, use LATAPOXY 300 Adhesive.**

Caution: to install white or light colored stone, use *white* LATICRETE 211 Powder, LATICRETE 272 Mortar, LATICRETE 317 or LATICRETE 220 Medium Bed Mortar (mixed with the LATICRETE Latex Additives indicated above) or *white* LATICRETE 254 Platinum, LATICRETE 254R Platinum Rapid; LATICRETE 255 MultiMax™, LATICRETE 4-XLT, LATICRETE 253 Gold, LATICRETE 253R Gold Rapid or LATICRETE 252 Silver.

- Provide protection from weather and other site conditions that could contaminate or damage CBU surfaces.

[Δ] United States Patent No.: 6881768 (and other Patents)
[†] United States Patent No.: 6,784,229 B2

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