SPECIFICATION FOR BRICKLAYERS DIRECT BOND FLOOR INSTALLATION

1. SCOPE

1.1 This specification is meant to provide general guidelines for good practice when using the bricklayers direct bond setting method. Chemical resistant brick flooring is broadly used in the chemical process and food/beverage processing industries where high loads, high impact and thermal shock conditions may be present. It offers a durable and aesthetically pleasing floor to provide protection to concrete from organic acids, salts, detergents, alkali cleaning agents, oils, solvents, and organic foodstuffs. The brick functions as a mechanical and thermal barrier. The mortar functions as a chemical resistant virtually impermeable jointing barrier, and the setting bed functions as an adhesive as well as a protective membrane barrier over the concrete.

1.2 Consult applicable bedding and mortar side jointing technical data sheets for more information as noted below. The selection of the adhesive setting bed and side jointing mortar materials should be based on a review of the anticipated chemical thermal and mechanical conditions as well as in consultation with Armor and the installation contractor.

1.3 Other applicable documents to review may include a number of detail drawings including: CED-745 plate embed into brick floor, CED-1006 pipe penetrations through floors, CED-1011 trench detail, CED-1015 floor and curb detail, CED-1020 compression joint detail, CED-1023 core holes in brick floor detail, CED-1028 brick trench tie-in to monolithic detail, CED-1031 acid brick curb detail, CED-1038 floor drain detail.

2. CONCRETE SUBSTRATE

2.1 Prior to commencement of any work, the flooring contractor shall thoroughly examine all floor surfaces, and report any conditions which will adversely affect proper floor installation. These conditions may include the presence of birdbaths, irregular slopes and flatness, cracks or chips, and degraded expansion or control joints amongst others. Commencement of work shall be deemed as acceptance of floor finish slope and condition. If there are any disputes, these should be resolved before commencement of work as a brick floor will follow the elevations of the underlying concrete.

2.2 Acid proof floors should be designed to drain completely. To do this, a fall of up to 1/4" (6 mm) to the foot may be considered in the design. However, this amount of slope is very evident when walking across the slope. A 1/8" (3 mm) to the foot slope will still drain if all brick and joints are smoothly laid. A lesser slope should be reviewed with the contractor.

2.3 Prepare the concrete surface in accordance with industry practice as outlined in NACE No. 6/SSPC-SP 13. Criteria for acceptance shall be as noted in section 6, Acceptance Criteria. If moisture testing is not performed in accordance with NACE No. 6/SSPC-SP 13 section 5, then standard industry practice is to allow a 28-day cure on concrete surfaces receiving membranes, epoxy setting beds or monolithic toppings. Consult Armor or review with the installation contractor and the general contractor to resolve. If circumstances are such that the above acceptance criteria cannot be met, work should be halted until resolved. Exact surface preparation method shall be determined by installation contractor based on his experience, personal preferences, equipment, access, job-specific needs and circumstances.

3. *MATERIALS*

3.1 Brick pavers are available in a variety of sizes and surface textures, depending on the manufacturer. Standard sizes are typically 8" x 3 7/8" x 1 3/16" (203.2 x 98.4 x 30.2 mm) or 1 3/8" (34.9 mm), and 8" x 4" x 1 3/8" (203.2 x 101.6 x 34.9 mm). For heavier load areas a brick single with nominal dimensions of 8" x 3 3/4" x 2 1/4" (203.2 x 95.3 x 57.2 mm) may also be used. Brick shall conform to ASTM C279, Type II or Type III latest revision. Brick surface texture shall be as specified by owner or owner's representative.

The brick surface may need to be pre-waxed with a wax suitable for aesthetic purposes to prevent adhesion of mortar to brick surface and to facilitate cleanup of mortar from the brick face upon completion of the brickwork. Wax should not carry onto the edge, side or bottom of the brick.

All brick cuts shall be made with a masonry saw and brick cuts allowed to dry before use. Brick slivers of a size typically on the order of 1" or less, whether along the brick/paver length or width shall not be used for both aesthetic and functional reasons. Such slivers are not only unsightly but also can be problematic, especially in critical areas such as along an expansion joint or a transition to an adjoining surface or room where there is an expectation of heavy traffic. If for example, there is an 8.5" (216 mm) gap to fill to complete the floor, it would not be desirable to place an 8" (203 mm) full brick plus a 1/2" (13 mm) sliver part brick. The contractor may choose to use a 5" (1 mm) and 3.5" (87 mm) piece instead, alternating their positions to break bond in the adjoining row to achieve the best aesthetic while maintaining the layout. Consult with the contractor for his plan to address this detail. An experienced contractor can often foresee the need to make minor joint width adjustments as work proceeds to avoid this issue, and this section is noted only as a cautionary point.

3.2 The setting bed material shall be Thinset™ Adhesive, a 100% reactive epoxy adhesive composed of an epoxy resin, chemically curing hardener, and inert silica filler. The adhesion of the epoxy setting bed is greater than the tensile strength of the concrete slab and the brick. For upgraded performance requirements in strong chemical service environments, or high thermal shock areas, Thinset Novolac Adhesive may be specified.

3.3 Side jointing is selected based on the anticipated chemical and thermal conditions. Consult with installation contractor or Armor if unsure which mortar to use. The choice of mortars is as follows, consult data sheets for more detail:

Carbon filled furan - Furalac™ Green Panel Mortar data sheet CE-128
Quartz filled vinyl ester – Pennchem™ Mortar data sheet CE-250
High bond epoxy – Pennchem Novolac Mortar data sheet CE-276
Carbon filled vinyl ester – Armor Vinyl Ester Mortar Carbon - data sheet CE-231
Carbon filled phenolic – Asplit™ CN Mortar - data sheet CE-254

3.4 Expansion joints are required to accommodate mechanical or thermal stresses in the flooring. Expansion joints are placed in the brickwork over existing joints in the underlying concrete. Flexjoint U500 Joint Sealant (CE-134), a two component polyurea joint filler shall be used in traffic bearing areas. Consult joint detail drawings CED 1020 or CED 1030 for a typical detail.

There are several guidelines that could be followed to determine where the joints are placed. However, not all rules should be followed as there would be redundancy, and it is known that joints are a maintenance item. It is suggested the specified locations be determined on a case-by-case basis after review by the qualified contractor.

4. CONDITIONING OF MATERIALS AND JOBSITE

4.1 All brickwork with chemically curing mortars should be performed under cover from the elements, and at a minimum temperature of 50˚F (10˚C) and a maximum of 90˚F (32˚C) unless specific arrangements for

exceptions are made. The temperature limitations apply not only to the air, but to the substrate the masonry will be in contact with as well as the materials themselves. In addition, the air temperature must be maintained from start of job until cure is initiated at 5˚F (3˚C) or more above the moisture dew point.

All materials including the brick must be kept dry and within this temperature range for not less than 48 hours prior to use to allow sufficient time to acclimate. All work shall be kept dry until the mortar has reached the point of cure designated by the manufacturer. The bedding and jointing materials and chemically setting compounds that are temperature dependent and work best within a temperature range of 70˚F-75˚F (21˚C-24˚C). Higher temperatures will reduce work life and set time, and lower temperatures will increase it.

4.2 The user should be conscious of temperature changes and erratic cures that can result from high winds (chilling or heating, and rapid drying), by direct sunlight during summer months, particularly in hot climates, and changes in temperature for daytime to nighttime. Provide appropriate job protection.

5. APPLICATION OF MATERIALS

5.1 Mix epoxy setting bed material in accordance with manufacturers recommendations. Read product labels and installation specifications for Thinset™ Adhesive or Thinset Novolac Adhesive for specific mixing instructions. Setting bed material which has begun to cure cannot be recovered by adding more resin. Do not add water, Portland cement, or any additives or adulterants to any components or the mixed setting bed.

5.2 Apply the setting bed material in a continuous layer to a thickness of 1/8" (3 mm) directly on the concrete slab by trowel ensuring that there are no voids. Use of a notched trowel to gauge the thickness of the setting bed shall be permitted, provided the bed is continuous and void free, with no areas of underlying concrete remaining exposed. 100% substrate coverage is required.

5.3 If surface-damp concrete is a concern, it may first be conditioned by applying Penntrowel™ Epoxy Primer (CE-139) or Novocoat™ SC100 Primer. Thinset Adhesive should be placed after primer has dried to touch, but no longer than 48 hours after primer has been installed.

5.4 Mix side jointing mortar in accordance with manufacturers recommendations. Use separate trowels and mixing container to mix and apply epoxy setting bed material and side jointing mortar. Do not mix epoxy setting bed material and mortar together.

5.5 With a clean bricklayer’s trowel, butter the vertical side joints of the brick with 1/8" (3 mm) of the mortar. Set the brick directly into the wet THINSET epoxy setting material. Press and tap the brick or paver into position tight against adjacent brick so that the mortar is extruded from all vertical side joints. All joints must be completely filled. Nominal 1/8" (3 mm) joints shall be maintained or tighter if allowed by the brick tolerances. The installed brick floor must be uniform and smooth. Allow the mortar joints to set for a short time before striking to remove extruded mortar.

5.6 Brick can be laid in several different patterns such as running bond, broken bond and herringbone. Review with the client before commencement of work to verify aesthetic preferences, including how details such as around piers and columns, perimeter of room, high points, expansion joints and drains are to be handled.

5.7 In severe chemical environments or continuously wet processing areas it is important to consider the installation technique known as back buttering or double buttering of the bed joint of brick with the epoxy setting bed material. For these areas, the setting bed can serve the function of an impervious membrane under the brick when this technique is used. A uniform continuous bed of nominal 1/16” (1.5 mm) is first applied onto the concrete substrate and each brick is back buttered with a 1/16” layer as well, taking care to fill any extrusion grooves on the brick backside if present. When the brick is installed into the wet bed, a

slight rotating action is used by the bricklayer to fully bed the brick into the wet adhesive on the concrete and achieve full and uniform coverage under the brick.

5.8 Steam cleaning to remove wax shall be performed after mortar has set hard. Remove all wax and excess material. Under no circumstances shall any acid be used in the cleanup work without prior approval. Attention to potential for clogging drains during cleanup must also be considered.

5.9 Install expansion jointing as required. Provide temporary tape protection along the joint edge to facilitate cleanup of jointing that runs onto the adjacent brickwork.

6. CLEANUP

6.1 Consult specific product data sheets for suggested tool cleaning recommendations.

7. SAFETY PRECAUTIONS DISCLAIMER CONTACT INFORMATION

7.1 Consult current Safety Data Sheets (SDS's) before commencement of work.

7.2 Mixes and applications of this product present a number of hazards. Read and follow the hazard information, precautions and first aid directions on the individual product labels and safety data sheets before using. While all statements, technical information, and recommendations contained herein are based on information our company believes to be reliable, nothing contained herein shall constitute any warranty, express or implied, with respect to the products and/or services described herein and any such warranties are expressly disclaimed. We recommend that the prospective purchaser or user independently determine the suitability of our product(s) for their intended use. No statement, information or recommendation with respect to our products, whether contained herein or otherwise communicated, shall be legally binding upon us unless expressly set forth in a written agreement between us and the purchaser/user. For all Terms and Conditions of Sale see armor-inc.com.

7.3 Please contact Armor for further information at +1-877-98ARMOR (982-7667) or customerservice@armor-inc.com.