IMPORTANT NOTES

Concrete Masonry Units

DESCRIPTION OF THE SUBSTRATE

- Concrete masonry units (CMU's) are sometimes referred to as concrete block, cement block, cinder block or light-weight block.
- The block face can be smooth, split-face or scored.
- The blocks are cured from 14 – 30 days before they are shipped to a construction site.
- The blocks come in various shapes & sizes as well as various weights and densities.
- Regardless of the type or shape, new concrete blocks have a very porous surface that usually requires a block-filler as a primer.

ASSESSMENT & DSD LEVELS

Likely causes of coating failures on concrete masonry units:

- Moisture issues
- Moisture vapor – caused by humidity or temperature differences
- Construction issues – defective gutters, flashing, roofing, etc.
- Design and environment issues
- Too much paint – non-breathable systems
- Issues with clear coatings

Surface defects and flaws:

- Efflorescence – this is the highly alkaline white powdery substance that results when block & mortar joints are exposed to moisture or water infiltration over time.
- Mold & mildew – also caused by moisture. This must be removed prior to applying a repaint coating.

DSD 0 – ideal surface, a color or gloss change may be preferred
DSD 1 – slightly deteriorated coating on concrete masonry units
DSD 2 – moderately deteriorated coating on concrete masonry units
DSD 3 – severely deteriorated coating on concrete masonry units
DSD 4 – substrate damage to the concrete masonry units

COATING PRODUCTS & SYSTEMS

Considerations for choosing a coating:

- Location
- Type of block used
- Breathability of the existing coating and the new repaint system

Block Profile – smooth, split-faced, fluted, etc.
Density & Porosity – low solids coatings cannot fill the voids in the surface of porous concrete block so a block filler product is almost always required. This is also true in a DSD 3 situation when previous block filler has been removed in the surface preparation.

When choosing a repaint system, the permeability of the existing coating must be considered.

Block fillers - are available in latex and epoxy formulas. Latex block fillers offer alkali resistance and epoxy block fillers offer excellent water & chemical resistance, particularly if an epoxy topcoat is specified.

Exterior Systems

- Elastomerics - when low density concrete blocks are used, high build latex or elastomeric coatings are often recommended. In a repaint situation, multiple coats of elastomerics are likely to reduce the permeance and breathability of the overall system to the point that interior moisture vapor can't escape, causing blistering and peeling paint failures.

- Latex Systems – provide good protection, good color retention and easy maintenance. If the surface of the CMU is a more porous lightweight block a high build latex system may have been used initially. A high build system may or may not be specified in a repaint situation.

- Epoxy systems – are very good for aggressive environments. A polyurethane coating may be used as a top-coat to assure color fastness and gloss retention.

- Clear Water Repellents – available in both non-paintable and paintable versions. These systems can only be applied over a surface previously coated with a similar product.

Interior Systems

Most interior CMU's are smooth-faced block but a block filler is still necessary to fill the pores and provide a uniform finish on unpainted blocks or blocks where the surface has been prepped back to bare block.

Commonly used interior systems include: latex, epoxy (aggressive environments) and multi-color. An alkali resistant primer may be necessary if the DSD Level is 3 and the earlier primer has been removed during the surface preparation.

SURFACE PREPARATION

If the current coating is intact overall then the surface preparation protocols are similar to those for concrete. The goal is to:

- Clean the surface of contaminants and weakened surface layers
- Fix surface defects
- Provide surface roughness (profile) for good adhesion
- Final cleaning to remove surface dust.

The specifics for the different types of CMUs include:

- In scored block if the grooves are bridged or filled in they must be cleaned out by grinding with hand or power tools and the edges brushed with a coat of primer (if needed).
- With split face, scored and fluted CMU, hand tooling during preparation may be necessary due to the unevenness of the blocks.

In general, when preparing the surface of CMUs it is advisable to do a test section first to ensure that the method is appropriate and will not harm the underlying CMU (causing further problems) and to perfect the method of surface preparation.

Choosing the method of surface preparation is dependent upon the contaminant or defect and of course the DSD Level.

A masonry or general contractor is responsible for repairing all cracks, holes, broken-off corners and loose mortar joints on both interior and exterior CMUs. All patches should be made flush and blend with the texture and appearance of the adjoining surfaces, and must be dry and fully cured before the coating work may begin. Most repairs must cure for 28 days prior to coating application.

Removing surface contaminants:

- Oils and grease can be removed by detergent or solvent cleaning followed by a thorough rinsing with clear water.
- All loose and flaking paint must be removed by hand or power tool cleaning or by pressure washing.
- Blisters must be removed from the surface and the edges feathered.
- Large amounts of efflorescence can be removed by mechanical means (abrasive sweep blasting or power tool grinding) followed by the application of an acid-etching solution and scrubbed with a brush after it has had time to "bubble" and work. It is then rinsed with copious amounts of water or a solution of ammonia and water to remove or neutralize any of the residual acid (particularly found in surface cavities). The surface must then be allowed to dry completely.
- Mold or mildew must be treated with a bleach solution that is scrubbed into the surface, allowed to sit for 30 minutes and then thoroughly rinsed with water. (This solution is explained in MPI RSP-9)
- Stains that have penetrated the surface should be removed by chemical cleaning or power tools.
- Rust stains can be removed with an oxalic solution that is worked into the surface with a brush and left on until the stain is no longer visible. The area must then be rinsed thoroughly and allowed to dry. Note that only qualified tradesmen should carry out this work.

Final surface prep includes:

- Dull glossy surfaces by sanding, sweep blasting or a TSP treatment to create an anchor pattern and promote adhesion of the new coating.
- Ensure that the surface is dry. Check the moisture readings – substrate moisture should not exceed 12%.
- Check the pH of the surface as some of the surface prep methods may have left the surface either too acidic or alkaline.
- All bare areas should be surface primed.

COATING APPLICATION AND INSPECTION

Application:

- Block filler or primers should only be used on areas of block that have been prepped to a bare condition and in specific circumstances.
- Back rolling or brushing helps to create a "pinhole-free" surface and helps to fill the irregular surfaces to provide an even appearance. Back rolling/brushing also helps to prevent "bridging" on scored block.
- Remember that too thick a film and the addition of multiple coatings may reduce the permeance of the system which can lead to blistering failures.
- Make sure that the batches and colors of the paint to be used are the same.

Quality Control Checklist:

- Check the pH of the surface (pH of 7.0 to 8.5 is acceptable).
- Measure for moisture – a suitable instrument should be used and the moisture should not exceed 12%.
- Check for film integrity – visually and by low magnification. Other methods may also be used if the surface appears questionable.