

A Masonry Design Service of Oberfield's Inc.

Topic: Smooth Face Architectural Concrete Masonry

“Smooth Face Architectural Concrete Masonry” is the designation used when a manufacturer produces a regular concrete block in a colored mix design. The only visual difference between Smooth Face Architectural Concrete Masonry and regular block...is the color.

For architects to achieve their design objective, it is important to understand the limitations of Smooth Face Architectural Concrete Masonry. This purpose of this MDS is to provide insight on the production process and field handling which collectively influence the finish and appearance of these block walls.

At the Block Plant

Texture

Smooth Face Architectural Concrete Block is produced using the same molds and production process as a regular block. The texture and aris of Smooth Face Architectural Block are very similar to a regular concrete block. Smooth Face Architectural Block produced from white aggregate tend to have even rougher edges and irregular texture due to the physical characteristics of most white aggregates.

Color Consistency

Concrete products use synthetic iron oxides to achieve color. The colored iron oxides are batched into the concrete mix where they are bound into the cement paste. The pigmented cement paste then acts as a binding agent for the aggregates in the concrete product.

When concrete block are produced, this pigmented concrete mix is compacted in the mold under high pressure. This pressure forces the cement paste to the surface of the block. When you look at a Smooth Face Architectural Block, the color you see is predominately the cement paste. The concentration of cement paste that is forced to the surface varies block per block causing the overall color of the Smooth Face Block to change.

This is not true with Split Face, Ground Face or Sandblasted units. Split Face Block are molded together and split apart after they are removed from the kiln. The concentration of cement paste forms on the opposite side of the finished surface. The cement paste on the surface of Sandblasted and Ground Face Block is either blasted or ground off during the manufacturing process. Both Sandblasted and Ground Face rely on the exposed aggregate matrix of the concrete to achieve their appearance.

To illustrate this point, view the Split, Sandblasted or Ground Face of an Architectural Concrete Masonry wall during construction. Next, look at the opposite side of that very same wall. The surface that removes the cement paste and exposes the aggregate matrix (split, sandblasted or ground) will show only a slight range of color. The surface with the cement paste remaining (smooth face) will show a wide noticeable color range.

Concrete block are cured in large kilns in a block plant. The goal of curing is hydration of the cement and is typically accomplished by elevating the temperature and moisture in the kiln. Temperature and moisture significantly affect the color of cement paste. Because the temperature and moisture vary within the kiln, the color of the cement paste will vary throughout the block in the kiln. Split Face, Ground Face or Sandblasted, whose finished surface do not rely on the surface cement paste are not affected. Smooth Face Block is significantly affected.

Handling At The Jobsite

Chipping

ASTM C-90 Standard Specification for "Load Bearing Concrete Masonry Units" recognizes that all concrete block projects experience chipping of the units from delivery and handling at the jobsite. "Minor cracks incidental to the usual method of manufacturing or minor chipping resulting from customary methods of handling in shipment and delivery are not grounds for rejection." The rough texture of Split Face and Sandblasted Block mask minor chips and allow the mason contractor to fill in a minor chip while the mortar joints are tooled. Small chips and rough edges are very difficult and often not possible to blend into the Smooth Face Block due to its lack of texture.

Scratching

The concentrated colored cement paste on the surface of a Smooth Face Block will scratch during customary methods of handling and delivery. One block rubbing against another removes the cement paste at the point of impact. This scratch appears as a white chalky line which cannot be removed by washing. Split Face are not as vulnerable to scratching as the aggregates of the exposed concrete matrix mask impact marks. Sandblasted Block are not affected as the entire surface has been etched by sand during the Sandblast process.

Suggested Design Considerations For Using Architectural Smooth Face Block

The wide color range and handling blemishes inherent in Smooth Face Architectural Concrete Block Walls can be minimized by limiting this style of block to small areas of the wall at higher elevations. An example is single course bands of Architectural Smooth Face Block within a field of Split Face.

Often Architectural Smooth Face Block are used for budget reasons after Split Face, Sandblasted or Ground Face Block have been eliminated due to their higher cost. One

option is to use regular concrete block and stain the wall afterward. Deep penetrating masonry stains maintain the natural texture of the block and have excellent durability. These colored stains mask jobsite blemishes and blend in the wide range of color visible in regular concrete block walls.

If you have questions on this Masonry Design Service, or are interested in learning more on deep penetrating masonry stains, please contact our office at 614.252.0955.

RE: Prebilling
Custom Concrete Masonry/Custom Mason Supplies

Dear

Materials which were custom produced and or custom ordered for your project are due for prebilling. Whenever we custom manufacture or custom order products, we dedicate these products for your specific project. We will not make that product available to anyone else. The products are tagged, identifying your account and the specific project they are allocated to.

Like many other industries, we invoice custom manufactured or custom order products within a reasonable time period of the products being produced, and inventories for use o your project. Our accounting department automatically invoices any of these custom products which have not been billed, 30 days after the products are inventories, waiting for your use.

Oberfield's assumes the responsibility to safely store Architectural Concrete Masonry Units, under cover where they will no stain, until our customer is ready to install the units.

Upon request, our insurance company, XXX, will issue a Certificate of Insurance for the value of the prebilled materials. In some instances when we invoice before shipment, an owner representative will come to our plant and inspect the custom products. On large municipal projects, we have led inspection tours on a monthly basis. This is a routine for us and we would be happy to accommodate an inspection at any time. Given our plant is centrally located, we are very accessible.

Our goal is not to pass the cash flow burden onto our customers. Our experience is that when products are manufactured for a specific project, are clearly labeled for that project and will not be used for any other project. Project owners will approve payment requisitions as long as the products are safely stored and adequately insured.

The Order/production/Invoicing Sequence was as follows:

We Received Your Order On
We Produced Your Order On
Your Order Was Available On
We invoiced the CMU not shipped on

Attached to invoice XXXXX, is a picking ticket dated, XXXX. In the comment section of the picking ticket is "custom block ordered and not taken per order confirmation."

As you order prebilled materials to be shipped, we issue a picking tickets for the materials on the truck. All picking tickets for materials, which are shipped after prebilling, state the following: "custom block prebilled per order confirmation."
*****warning-duplicate of picking ticket printed XXXXXX*****

If you have any questions, please call me.

Sincerely,

A Masonry Design Service of Oberfield's Inc.

Topic: Additions To Previously Produced Custom Concrete Masonry Buildings

Information for Building Owners

Custom Concrete Masonry Units are produced from natural quarried stones, sands, cements and pigments. These natural materials vary slightly in color, texture, and aggregate variegation. CCMU's are subject to these similar, slight variations.

Oberfield's does not stock CCMU's. Each project is custom manufactured on a per order basis, using aggregates drawn from the same location in the quarry...cement and pigments from the same lot. This process allows for a much tighter color, texture and range of aggregate variegations, than if CCMU's from different manufacturing lots were used in the same building.

The Custom Concrete Masonry Units you have ordered will be produced using the same materials, mix design and curing as the sample you may have selected your color from. However, due to this natural manufacturing lot variance, noticeable color, texture and aggregate differences may be detected between the sample you may have viewed and the actual production you will receive.

When producing CCMU's for a building Oberfield's produced in the past, you will always see a difference in color, texture and aggregate variegation, between the older production and the new. These differences are present, even when the new CCMU's are produced using the same materials, mix design and curing...as the original CCMU's.

Causes for these difference are:

Curing Time

The original production is completely cured out. CCMU's take up to 28 days to hydrate, color change occurs as this process takes place.

Aggregates

Within the same quarry, aggregates will vary in color. This is particularly prevalent when aggregates are drawn from different locations within the quarry...something unavoidable when production takes place over one year apart.

Weathering

Airborne pollutants and freeze thaw cycles, discolor masonry over time. Airbourne dust and dirt cling to the surface of masonry walls, slowly changing the appearance. This change can be gradually and often is unnoticed by building owners.

Chipping off a small piece of the original CCMU will expose the unweathered original color. Comparing the weathered surface to the surface that was buried, illustrates the effect weathering has had on the color of your building.

We make a sincere effort to match your original CCMU color as closely as possible, however, you will usually notice the greatest color difference in the early life of your new addition. In most instances, the new building cures and weathers to more closely match the original as the building completes a weathering cycle.