



Midwest Block & Brick Best Practices for Architectural Concrete Masonry Unit (ACMU) Single Wythe Wall Construction

Designing a water repellent masonry wall system requires proper design, proper material manufacturing and good workmanship. Each of these essential elements must also be coordinated with other work trades in order to ensure a weather tight building envelope that performs. These “Best Practices” have been developed based on our experiences over the past 70 years and are provided as our guideline to help reduce the chances for building performance issues.

WALL SYSTEM DESIGN

1. Proper design of the single wythe wall is critical to successful performance. National Concrete Masonry Association (NCMA) TEK notes should be used as the design standard for wall design. Particular attention should be paid to the following details:
 - a. Base of wall and at horizontal bond beams – Must include flashing and weep vents.
 - b. Block cores – Should allow for free drainage of moisture. Insulation materials used in the block cores should not retain moisture.
 - c. Window sills / heads and door heads should be properly flashed and contain necessary weep vents
 - d. Horizontal joint reinforcement and proper placement of control joints are needed to eliminate cracking due to shrinkage of concrete. Guidelines in NCMA TEK note #10-02C should be followed for determining proper placement.
 - e. Top of wall – Masonry coping should be flashed and joints raked, then caulked. Metal coping systems should extend over the block a minimum of 4”. Be sure to add additional thickness for nailers or other roofing materials in calculating the coping size.
 - f. Once walls are cleaned and properly caulked and weather tight, seal the walls with a RTV silicone type sealer such as Professional Water Sealant.

ACMU MANUFACTURING

At Block Plant

1. Midwest Products Group companies use quality, locally harvested materials for manufacturing of ACMU’s. All aggregate should conform to ASTM standard C-33 or C331.
2. Our curing process provides consistent moisture content to reduce unit shrinkage and maximize strength.
3. Utilize computer controlled batching systems to ensure batches are consistently balance moisture and color loading to ensure consistent material properties are being maintained..
4. Periodic plant quality control measures will be performed to ensure proper performance for integral water repellent admixture.



5. Independent testing is done on an annual basis by an independent testing lab to ensure compliance with ASTM standards. Internal testing is completed frequently to ensure materials for each project meet the project specifications.

At Jobsite:

6. Keep ACMU's **COVERED AT ALL TIMES** to prevent rain penetration that will cause efflorescence. Store units on level ground and out of mud to prevent chips and possible staining.
7. Erection of a Sample Panel (minimum 4'x4') is required by TMS 402/602 Masonry Code to establish acceptable standards for materials and workmanship to be expected throughout the project.

CONSTRUCTION:

1. Keep WALLS COVERED AT END OF EACH DAY AND/OR DURING RAIN to prevent efflorescence and color variation caused by moisture of the ACMU's.
2. Use mortar admixture, matched with the block admixture, should be used in all mortar to ensure the highest level of water repellency of ACMU masonry wall. Contractor should be able to document proper usage.
3. Properly install flashing to prevent moisture penetration. (Tip – Consider photographing flashing installation for project files)
4. Flashing must be located properly any time the vertical flow of moisture would be stopped. Base of wall, horizontal bond beams, windows and doors should receive flashing. If not detailed, communicate the issue with architect.
5. Weep holes must be located 16" on center.
6. All head joints must be full (at least thickness of block face shell) with no "bugholes".
7. Use only concave or (V) configuration for tooling mortar joints. **DO NOT USE A RAKE JOINT.**
 - a. It is generally recommended that joints be tooled when mortar reaches "thumbprint hardness". If a joint is tooled too soon, shrinkage cracks at the mortar/block interface are likely to occur and the color becomes very light. If the joint is tooled too late the color becomes very dark and the mortar will not be plastic enough to seal properly against the masonry units.
8. Use a DRY saw blade to cut special sizes of ACMU's. **DO NOT USE WATER.**
9. Extend roof drains away from the side of the building to keep water from running down ACMU. Apply straw or rock around base of wall to prevent mud stains on the ACMU.

CLEANING:

As work progresses, clean mortar droppings, mortar splatters with use of dry brush.

When installation of units is complete, clean the wall using **NMD80 Masonry Cleaner from EacoChem.**

- A. After mortar has cured for a period of 7 days, the cleaning process can begin.
 1. Beginning from the top of the wall, lightly pre-wet or pre-cool the wall;



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2. Begin applying cleaning material utilizing the Eaco Jet application wand from the top to bottom, using even, overlapping passes to ensure full coverage of chemical on the surface;
 - a. Apply cleaning material to the entire drop or section of wall that can be cleaned without allowing the chemical to dry on the surface.
3. After the first application of cleaning material, scrape the large chunks with a long handled scrapper from the first 8 feet of wall;
 - a. Use a scrapper in accordance to masonry manufacturers' requirements.
4. Check smears and tags to see if they crumble easily;
5. If needed, repeat application to melt remaining residue and extend dwell time;
6. After re-application, scraping can be done further down the wall;
7. Once smears and tags crumble easily, begin rinsing from top down. A thorough rinse is necessary to avoid leaving any cleaning material on the surface or in the masonry unit.
 - a. Use long even strokes that overlap each other.
 - b. Rinse pressure is determined by the masonry manufacturers' requirements. Color sensitive surfaces should always be rinsed with low pressure.

Efflorescence Staining - Prevention

- Keep all sprinklers from causing water to contact ACMU's. Continued moisture on the wall surface will cause staining and will not be the responsibility of Midwest Products Group.
- Staining below window sills, metal brackets, and vents that attach to the walls, etc., can be avoided by having projections carried out at least one inch from the face of the wall with a drip notch or groove on the underside in order to keep water from running back under sill and down the face of the wall and onto metal devices or other stain producing items attached to wall. These items should be insulated from the visible portion of the wall by non-staining durable gasket material having a drip to divert potential staining material away from the wall.

Water Repellency

Midwest Block & Brick recommends that all exterior walls be treated with a sealer to provide the highest level of water repellency.

- Block sealer shall not be applied until the wall has dried out a minimum of 72 hours without rain and there is no visible sign of efflorescence on the wall.
- Make sure to apply materials in accordance with manufacturer's printed instructions.
Note: Sealers can discolor ACMUs. Always apply on test panel and seek approval before applying sealer to building.
- All windows must be covered and all cars removed before spraying as glass and finished metal can be damaged. Sealers are extremely hard if not impossible to remove from glass.