

This is an 8 step introduction to repairing marble grave markers with Cathedral Stone's M120 marble Jahn product. It is a "do no harm" cemetery preservation technique used by a number of professional conservators. At this time Dale and Tina Utter are our only members with experience and knowledge of Cathedral Stone products. We hope to learn more about this product and technique from them in the near future. We thought that any do no harm preservation method is always worth mentioning and learning about. That is why we have created this pdf article.



MARBLE GRAVESTONE REPAIR - Mortar Only

By CCUS member Dale & Tina Utter of Cemetery Lovers

The current technique for marble repair, as instructed by AGS and contained in another CCUS standard, is to spot epoxy and then use a lime based mortar infill. We have learned and been using a different marble repair, with no failures, for the last four years. We learned this technique from an experienced conservator and former AGS workshop instructor. This alternative procedure uses mortar only and no epoxy.

Spot Epoxy with Infill Advantages:

- You use less of an expensive mortar
- Repair line is less conspicuous
- Disadvantages:
 - Must wait for epoxy to cure before doing the infill
 - We question the viability of using this type of mortar to infill small cracks and crevices as it does not follow the manufacturer's application instructions. We wonder if the infill will just pop out in time.

Mortar Only Advantages:

- No waiting for epoxy to cure to do infill
- The temperature range is 40-90 degrees so you can use it when it is too cold for epoxies
- If you question using epoxy under the "no harm" principle then you will like this technique since it does not use any epoxy

Some of the disadvantages are that you use more of an expensive mortar, and it creates a larger visible repair line



The product we are using is Cathedral Stone's M120 marble Jahn. I expect Lime Works' Lithomex would work just as well although we have not tried it yet. To purchase key products from Cathedral Stone you must be certified by taking their mortar repair training class.

Before using mortar for a project like this we strongly recommend you take the time to read the manufacturer's instruction and technical data sheets. Knowing the parameters of the product and the proper way to use it can help reduce failures.

For the purposes of this instruction we will be repairing a gravestone that is broken into two pieces with a horizontal break.

NOTE: It is extremely important you do not let the mortar dry out - spray (spritz) frequently. Avoid using this technique on hot or windy days. It is best to use early or late in the day, on overcast days or cool days.

STEP 1

- Reset the stone IAW CCUS standard, if necessary
- It is very important the stone is level

STEP 2

- Prep the stone
- Carefully remove any old mortar/epoxy/etc., if applicable
- If using a chisel go from the edge toward the middle of the stone and not toward the edge or you may break away part of the stone
- wire brush the broken part to remove any loose material -- at a minimum clean 3 inches around the break on both parts (see CCUS cleaning standard)
- do a dry fit to see how it sits, note any gaps or potential problems

STEP 3

- Have needed tools available
- spray bottle with water
- 1 inch natural bristle paint brush
- Plastic putty knife
- 4 clamps
- 4 pieces of wood
- Small bucket of water
- Sponge (Cathedral Stone sells ideal sponge otherwise use a high, quality natural one)
- Mortar -- mixing container and utensil

STEP 4

- Prepare and apply "peanut butter coat"
- saturate the edge of the breaks with water
- mix enough water to the Jahn to bring it to the consistency of wet paste
- Spray (spritz) both edges again
- using a brush or plastic putty knife apply 1/8 inch thick to both broken edges

NOTE: Marble is fairly absorbent so it is crucial to really wet the stone edge you will be applying the peanut butter coats to. If you skip the peanut butter coat the stone will suck all the moisture out of your mortar and greatly reduce the bond. This will probably result in a failure.

STEP 5

- Apply final coat
- mix enough water to the Jahn to bring it to the consistency of damp sand
- spritz the peanut butter coats
- apply the final coat to the set stone approximately 1/8 inch thick



STEP 6

- Place the top part of the stone on top of the reset part
- Wiggle the stone a little to ensure properly set
- ensure the front and sides are flush with each other
- clamp both sides using two clamps per side with wood between the stone and clamps
- spritz the mortar

ISSUE: Sometimes the stone can be warped. If you clamp too hard to get everything flush then when you remove the clamp to work the mortar the stone will revert back to its comfortable set position. This will create a crack all across the front or back and the sides and thereby reduce the bond between the mortar and the stone.

ISSUE: Ideally when you set the top on the stone the mortar will ooze out all around the stone. Often this is not the case. Just mix up some more final coat mortar and using a plastic putty knife fill the voids and cracks. Remove one clamp at a time to do this and then re-clamp.



Drying and Finishing

STEP 7

- give the mortar some time to dry but not too fast, spritz, especially if hot or windy
- Scrape the excess off with a cutting motion, if it smears it is not dry enough
- spritz again
- dampen a sponge and smooth out the mortar using a circular motion, wherever the clamps aren't/ don't sponge too much or you will leave a groove in the mortar/ rinse sponge frequently
- remove one clamp and scrape then spritz, dampen a sponge and smooth out mortar before putting the clamp back on
- remove the other clamp and scrape then spritz, dampen a sponge and smooth out mortar before putting the clamp back on

ISSUE: If you try to sponge with too much mortar on the stone you will just smear it into the stone and this creates what we call a halo. This can be permanent if it is not removed. Just use a damp sponge and keep sponging it off and it will disappear.



Bagging

STEP 8

- At least one set of clamps should remain on the stone during the final drying process
- Final spritz
- wet a couple of paper towels or a hand towel and place on top of the stone (not dripping wet)
- place a large plastic garbage bag over the stone
- put a bungee cord, rocks or wood to hold bag in place
- remove bag after 5 days

NOTE: The mortar is supposed to dry slowly. Placing the wet towel on the stone and bagging it helps raise the humidity level to slow the drying process.

MISC: - After the bag has been removed you can do a final cleaning to the entire stone if not previously done.

We do not color the mortar to try to match the stone, we are happy just to get the stone back up again.

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