

Adobe Alliance Restoration

Nov – Dec 2013

FIELD NOTES by Stevan de la Rosa, Project Manager

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1. Site assessment:

The site looks to be a bit abandoned and neglected. The buildings have suffered much wear to the point of needing not just plaster but full restoration. The vault containing the water tank fell and the top of its south kick wall got dislodged. The fifth vault that was the subject of the last workshops also had a section collapse, possibly the section that got made by enthusiast from Mississippi, which I was told from Jesusita used a lot of sand in their mortar.

From my history on this site I can tell that there has been no maintenance to any of these buildings since my last visit here in the spring of 2011, except for the experimental wall of the dome which got plastered for folks from Mississippi with cement/lime/clay/etc.

The outside courtyards and bottom of walls had amassed mounds of dirt debris from vault/wall erosion. The inside of the rooms have typical leaks, erosion and dry dirt drippings.

The kitchen vault is exhibiting cracks that are about 1/8" wide and extend for several feet. Jesusita said that this is the same behavior the water tank vault showed before it collapsed.

The power/utilities system of the compound were non-functioning at the time of my arrival and it took several days and a technician to be able to get most systems working (i.e. well pump, pressure tank, refrigerator, hot water)

2. Diaries:

Wednesday Nov. 13. Night arrival to 1 Casa Piedra Rd. Stevan de la Rosa and Ethan Prantera

Thursday Nov. 14. Overall cleaning of kitchen, sleeping quarters, common spaces, etc. Try to get systems running (power, water, etc.)

Friday Nov. 15. Start the cleaning of the job site. Scrape and haul rubble and erosion dirt from work areas. Move fallen adobes to be able to work in certain areas.

Saturday Nov. 16. Ethan started to build the much-needed buttress on the south side of the kitchen wall with Stevan giving parameters and aiding at the beginning. Walls and vault got swept from loose debris on them in order to have better adhesion of the subsequent layers. Stevan drove to Balmoray to acquire wheat straw necessary for all the repairs of the compound.

Sunday Nov. 17. Mostly a day off. Stevan entertained the visit of John Morrony and worked with the solar system technician to be able to use the system.

WEEK 1

We start the four week stint in which we will get as much of the repairs done with quality craftsmanship giving priority to the vaults and dome. The team comprises 5 workers, one of which is myself, the project manager. The first day, Monday, is worked by Narciso Levario aka "Chicho" (who is providing a lot of the heavy equipment/tools), Efren, Manuel Acosta, Ethan Prantera and Stevan de la Rosa. From Tuesday to Friday the only change was switching Efren for a new member, Eliar.

The goal of this week is to start working of the patching up of surfaces and rebuilding of fallen chunks of walls, corners, edges. Also, in this week I will asses the quality of team members and the potential flow of progress for the following three weeks.

Monday Nov. 18. We start patching work in west courtyard, the south side of Simone's bedroom vault and the north side of the living room vault. This involves, mixing in tarps a mix of clay-soil, sand and long straw (aka Cob) to a consistency that will withstand the depths of the gaps to be filled on the vault surfaces. This mix is a bit clay rich to mitigate potential erosion in the future in the event of untimely maintenance. These patch up layers are also used to start the re-sculpting of the vault shape, which has been distorted by the erosion of the past years. The mix is applied to the height of the vaults by using scaffolding and extension ladders.

Tuesday Nov. 19. We patched the north side of Simone's bedroom vault and the guest bedroom vault. Also, we were able to patch up most of the power shed (el changarro). Today we started with a new worker who replaced Efren. His name is Eliar Ruiz. I taught Eliar and Manuel the way and system of chopping straw. While the generator is on we also pump water up from the well.

Wednesday Nov. 20. We finished patching the solar shed and moved on to the east courtyard vaults (south side of guestroom and north side of kitchen). Since the kitchen vault's integrity is questionable we only patched as far as we could reach from the scaffolding/ladders. I will wait for this layer to dry and for the buttresses to be finished before we attempt anything further. Also, we started patching the south side of kitchen. Ethan finished the south buttress. We cleared the cement

bond beam of any adobes that were about to fall and we started chipping the exposed bond beam to adhere with concrete bonder and a slurry coat of cement and rough sand that will act as a mechanical bond for the layers of earth that will rebuild those sections.

I realized that the pumping of the well water starts fine but then diminishes to a trickle after about 10min. I will explore further.

Thursday Nov. 21. The chipping of the exposed cement bond beam was finished and the slurry coat of cement was applied. The cement used was the leftover from the Missouri people. The south side of the kitchen vault got finished patching. Mud droppings on the ground got cleared from around buildings. Walls got raked to dislodge loose chunks. The other kitchen buttress (on north side) got started. The crumbly earth under the exposed bond beam got removed and shelves/key-in point were carved out into the solid part of the wall to be able to key in the restoration earthen layer that will cover the cement bond beam. Some walls got patched up.

Friday Nov. 22. The mauve colored wall on the dome was left, but the cementitious plaster above it got removed; it came off really easy. More walls got patched up. The shelves and key points for the rest of the perimeter got finished. The layers that were first applied this week were dry enough and had cracked some by today, as expected. Most of the cracks got opened up so they can be refilled. The shelves and key points under cement bond beam started to get their layer to build out and up and cover the bond beam once again.

Today the weather turned blistering cold and continuous strong wind blew. We only worked 6hrs.

END OF WEEK NOTES:

I think this crew will be a good team to work with and we have a good chance to meet our goal of at least restoring and re-plastering and lime washing the vaults and dome on the compound.

The clay-soil we are using has a good amount of clay, which is drying nice and hard, which will help with weathering.

The purchase of materials has been minimum.

WEEK 2

Having started the repair and patch up last week, seeing the work flow and work load, the goal for this week is to finish the repairs and patches so we can start the actual plastering on week number three.

Saturday Nov. 23. Write weekly report for Simone. There is no water pressure at the house. These overcast days haven't replenished the batteries.

Sunday Nov. 24. OFF

Monday Nov. 25. This Monday the weather was bad and called the crew off. It was just myself and Ethan working for part of the day. Shape and sculpt the buttresses. Fill in the cracks that appeared from the initial patch up layer. Worked on the ledge detail working towards covering back the exposed sections of the cement bond beam. Built a plaster pit to store/soak/age plaster. Explored the water well in the arroyo because it has been producing only about 10-15min. of water at a time. It doesn't seem like the batteries will recharge enough to get the pressure tank working and we need water to be able to work. I discussed with Chicho the option of putting in a spigot at the bottom of the black tank to access the water in it.

Tuesday Nov. 26. The whole crew is back on site working. The buttresses got finished sculpting. The ledge detail took most of the day (mixing and applying in layers). Chicho and myself went down to the well with tools to clean it out. This involved me getting in and scooping out buckets of silt, which Chicho hauled up. We took out about 3 wheelbarrows worth of material out. The flow seemed to increase some.

At the end of the day I did a materials run to Harpers. We will install a spigot at the bottom of the black water tank.

Wednesday Nov. 27. Sculpted the catenary edge of the vault kickwalls. Kept working on the built up of ledge detail. Set up the barrel mixer Chicho brought and greased it. Chicho installed the spigot at bottom of black water tank, it works fine.

Thursday Nov. 28. Today, being Thanks giving, the crew consisted of only Ethan, Eliar and myself. We removed the cement on the top of the dome. The ledge detail is almost finished. Patch west wall of "changarro" (the solar shed). Checked the well for changes. The water level has risen about 10 inches more than before. Started to fill in and patch the top of the kitchen vault; this is the one that is compromised, with cracks on the inside. I discovered that, on the outside, there is a crack that runs the apex from the halfway point all the way to the east kickwall. It is visible to the eye and it is 1/8" in wide. Once I started cleaning it, to assess and repair, I found that just with the rub of a finger a lot of material came lose. The crack went in two inches and widened about 1.5 inches. At this point I have been on top of the vault with my weight. It doesn't seem to want to collapse; the buttresses and the side patch up reinforcement we have let dry I'm sure helped in stabilizing it.

Friday Nov. 29. Chicho will also not work today because of his family holiday. It will just be the remaining four at work. Patched up the dome. Finished all of the layering to build up the ledge detail and cover the exposed bond beam. Now we hope for an effective drying during the weekend. Affixed expanded metal lath to the rain gutter between "changarro" and water tank vault. Started to chip key-in holes on the patch of old lime that still covers the kitchen vault; this will aid in the application of the following layers. The lime patch is still holding on well after all these years. Started opening up cracks on the north side of living room vault. Some of these cracks go in about 3 inches. The substrate wants to crumble off.

Throughout the day we mixed plaster with the mixing machine and stored it in a tarp. We also chopped straw.

Saturday Nov. 30. Today we worked for half a day, just Ethan and myself. Finished chipping the key holes on the kitchen lime, finished opening up the cracks on the north side of living room vault. Mixed cob to fill them in. Filled shallow depressions that are left where the plaster will come down from the vault and wrap over onto the wall for about a foot. Started filling in the big crack on top of the kitchen vault.

END OF WEEK NOTES:

A lot of the surfaces we have restored have been weakened a lot by both termites and water saturation-and-drying cycles. In the most affected areas it has left the surface crumbly and rotten. We have to clear at least two inches (and more than double in some areas) to be able to reach far enough into the wall where the adobe is still intact and be able to key in our new mud securely. It has been a challenge to attach patches of new earth to some of these surfaces because of the above mentioned reasons.

The goal for the week was met successfully amidst holidays and not a full crew. We are ready to start the plastering this upcoming week.

All the malfunctioning with the house systems (electricity, pressure tank, batteries, well, water pump) have been taking extra time to deal with and it has slowed what would have been the normal pace of work. Nonetheless we are meeting our goals.

WEEK 3

Having completed the patching up, and building out last week, the goal for this week is to do the first coat of plaster (the scratch coat) on all the vaults and dome. We lost one worker this week, Eliar. He went down to Chihuahua to take care of personal matters over the weekend and didn't return for any of the week. It was only the remaining 4 of us left to work.

Sunday Dec. 1. Day off. Wrote weekly report and sent it to Simone

Monday Dec. 2. We started plastering. We plastered the "changarro" (power shed), and guest bedroom vault. The plaster mix is working well.

Tuesday Dec. 3. Plastered living room vault and the south side of Simone's bedroom vault. We had a better flow of work today. We were lacking the help of Eliar (who was supposed to show up), but pacing ourselves we managed to not strain work dynamics.

Wednesday Dec. 4. We plastered north side of Simone's bedroom and kitchen vault. We put a metal strap ring at the base (spring line) of the dome to hold together the force that is pushing out and making it crack. We put on the hood (hat) over the

dome oculus that had been missing for years. It is securely placed now. Straw got chopped and sand got screened in preparation for the final plaster layer.

Thursday Dec. 5. We plastered the dome, the two new kitchen buttresses. Straw got chopped. We started mixing and storing plaster for the final coat. We started putting on the roofing tiles on the ledge.

Friday Dec. 6. Today was cold. I wanted to plaster the finish coat on the “changarro” but postponed it for the following week because of the threat of frost this night. More ‘finish’ plaster got mixed and stored. The storing pit got filled. We continued putting on the roofing tiles on the ledge detail and mortaring them in with thick mud mix (aka Cob). It was planned to be a shorter day so we can have a shared meal to express gratitude to all the crewmembers for their hard work. We had pulled pork with BBQ sauce, greens and Shiner holiday beer.

Saturday Dec. 7. Ethan and I planned to work but the weather is too frigid. We will postpone for tomorrow Sunday.

END OF WEEK NOTES:

We were able to complete our goal even having a crewmember less. The main obstacle is going to be the freezing weather for the last week’s plastering. Another questionable item is the quality of the lime that was bought at Harpers. The brand is *Austin White Lime “90% calcium hydroxide”*. I will make further tests to assess.

WEEK 4

The decision was made to use up all the roofing tiles to cover as much of the ledge detail around the four main vaults, and protect the ledge from eroding again; the wall will also benefit greatly. The goal for this week is to finish placing the roofing tiles and mortaring them with cob, and putting on the finish plaster (of clay, straw, sand, and lime).

Sunday Dec. 8. Today the weather was warm enough to work. Ethan and myself continued placing the roofing tiles on the ledge. We mortar them in place using a cob-like mixture that uses chopped straw, this prevents most of the shrinkage/cracking and is drying solid. The only minor drawback of going ahead with this detail is that it’s taking up time that was contemplated for the finish plaster, etc.

Monday Dec. 9. Today the crew of 4 is all here. We finished placing all the roofing tiles and cobbing them in place. Toward the end of the day we had enough time to start plastering the “changarro” vault. This will be an opportunity to gage our flow in plastering with this new mix on the smallest vault. I talked with the crew to emphasize the success in this restoration thus far and to introduce this last stage of the finish plaster, my expectations and procedure for application.

We set to plaster the vault part of the “changarro” building. It went well and fast, so we continued plastering the ledge and wall. This night is the only one that has a threat of freezing (it is supposed to be just below freezing), so we’ll see how the plaster fairs.

Tuesday Dec. 10. The plaster on the “changarro” is still drying. The supposed freeze did not harm it. In the places where it dried faster small hairline cracks appeared. Today we plastered Simone’s bedroom vault and the guestroom vault in their entirety.

Wednesday Dec. 11. We plastered the kitchen vault and the living room vault in their entirety.

The inside cracks on the kitchen vault are still stable. The chalk marks I put at the end of each crack are still intact. I surmise the two buttresses have something to do with it and the fact that no more rain has gotten into the fabric of the vault.

Thursday Dec. 12. Today Ethan finished his work stint after half a day’s work. I offered this option to him because the remaining crew could easily finish the rest and because his mood was barely starting to affect group moral. He hit a limit within himself because of the living arrangement not having all the amenities necessary. I also went over with him how we could ameliorate the situation for the remaining couple of days, work aside.

We plastered the Dome by hand and the new kitchen buttresses. We have plenty of plaster mix left over, so I had some stiffer mix made to quickly patch up and sculpt out the edge of the kickwalls because they are the next in priority to be covered. At some areas, like the top edge, erosion has claimed the old plaster and about an inch of the adobe. These patches will be dry enough to receive a coat of plaster tomorrow. Today, we focused on the fifth, uncompleted vault that’s adjacent to the west courtyard. Some of the mortar joints had been eroded by an inch or more. We filled them in and applied a layer of the finish plaster (clay, straw, sand, lime) as a rough coat. We did this by hand so the plaster could follow the irregular contour and keep the thickness of $\frac{1}{4}$ ". If it were thicker it would crack.

Friday Dec. 13. Today is the last day of work. It was a half-day. We plastered all four kickwalls of the four main vaults, by hand, like yesterday’s fifth vault. It took us only two ours for Chicho and myself with the help of Mael to plaster them including set up, moving the scaffold for every wall, etc.

The rest of the half-day, about two more hours, we dedicated to cleaning up the site, the tools and putting them away for the season.

Saturday Dec. 14. There was still a very full wheelbarrow of finish plaster mix left that I applied to the walls flanking the north entrance to the Great Hall. I also finished cleaning up some of the worksite and pumping water from the well to the black water tank.

3. Plaster Recipes:

There are two plaster recipes and a cob recipe that mainly got used for the restoration of Swan House. The earthen mixes that were applied are not limited to these three. Different restoration methods require different mixes that are made to meet the need of the application, these lay within the spectrum of different consistencies/ratios of water, clay, sand, long straw and chopped straw. These are doctored application-by-application and are not logged as individual recipes.

The materials used were:

- Sand. Delivered by Gilberto in a previous occasion. Roughly 4-5 yards. It had a good amount of pea-sized gravel. We screened it thorough a 1/8" mesh only for the final plaster coat. All the previous applications we used the sand without screening.
- Clay soil. Local of a red/brown color delivered by Gilberto in a previous occasion. All of this got screened by 1/2" mesh.
- Straw. The majority of the straw came from Balmorehea. It was dried in the field, but cut green. It still had some leaf matter. This was the only straw available in the region. I also brought two ok straw bales form El paso (they were hard to find there as well). There was one bale on site covered in the rubble of the fallen vault, and I was gifted a bale of "sacate de agua" by a local. We used all of these, a total of 14 (two string) bales.

Cob mix:

- Clay soil (unscreened).....1part
- Sand (unscreened).....2parts
- Straw (long).....as needed
- Water.....to consistency

Base coat:

- Water.....4 parts.....12gal
- Sand (unscreened).....3 parts.....9gal
- Clay soil (screened 1/2").....5 parts.....15gal
- Straw (finely chopped).....5 parts.....15gal

We mixed these ingredients in the order listed in a 'cement mixer'. We made 29 mixes. Each mix filled about 1.5 wheelbarrows. The plaster got stored in plastic wrap for less than a week. We used it all up on the 4 main vaults, the dome, the "changarro" vault and one of its walls. This mix was applied by wooden float and scratched with a stucco comb. It went on approx. 1/2" thick.

Final coat:

- Water.....4 parts.....12gal
- Lime (in powder form).....1 parts.....3gal
- Sand (screened 1/8").....3 parts.....9gal
- Clay soil (screened 1/2").....5 parts.....15gal
- Straw (finely chopped).....5 parts.....15gal

We mixed these ingredients in the order listed in a 'cement mixer'. We made 20 mixes. Each mix filled about 1.5 wheelbarrows. The plaster got stored in plastic wrap for less than a week. This was enough to cover the areas plastered with the base coat and enough left over for: the four outside kickwalls, the fifth uncompleted vault, and the walls flanking the north entrance to hall. This mix was applied with Marshalltown pool trowels and floated with wooden floats. It went on approx. 1/4" thick.

4. Conclusions:

With regard to the monetary aspect of this project, one could affirm success. The original estimate for the labor only was \$15,200. The total cost of labor and materials was, \$14,129.

With regard to the work completed, one could declare success, also. We restored and re-plastered the four main vaults, the dome, plus gave one coat of plaster to the fifth vault and four kickwalls.

In the social regard we managed to expose three local people and one natural builder enthusiast to the realm of woodless roof construction/maintenance with natural materials. All workers left the four-week stint with positive affirmations such as, earth being a viable material for housing. Also, the local workers now have the knowledge to perform such repairs for future maintenance.

The only thing left to assess is the durability and maintenance schedule for the surfaces plastered, and that, is just a matter of time and observation. Two of these vaults suffered collapse, another had a close call, and the remaining had a similar foreboding if left as-is. My wish and hope is that that never happens again. Simple and timely maintenance, which should be fast and cheap, is going to be the best insurance for the longevity of these structures.

6. Contact information for Presidio workers:

- Narciso "Chicho" Levario, (432)294-2324
- Hector Manuel "Meño" Acosta, (432)202-1571