



THE CASBA JOURNAL

Newsletter of
the California Straw Building Association

CASBA: a non-profit project of The Tides Center

Volume XII, Number 4

February 13, Wednesday; 6pm
reception, lecture 6:30 - 8:30pm
"Rebuilding with Straw Bale in
Earthquake Affected Pakistan"
Pacific Energy Center, 851 Howard
Street, San Francisco
Speakers: Martin Hammer and
Surkhab Khan, PAKSBAB director
ADPSR Lecture Series
(www.adpsr.org)

February 21, Thursday; 7pm-
9pm "Rebuilding with Straw Bale in
Earthquake Affected Pakistan"
Ecology Center, 2530 San Pablo
Ave., Berkeley.
Speaker: Martin Hammer
Info: 510-548-2220 x233,
www.ecologycenter.org

**March 14th-16th: CASBA 2008
Spring Conference, Cambria
California.** Check out the
upcoming CASBA gathering at
Camp Ocean Pines in Cambria.
Details and registration on the
website. The accommodations
are in Ken Haggard and friends
designed straw-bale "huts"
which accommodate 10 or
camping. We have been there
before and enjoyed the tall pines
and ocean breezes. It will be a
complete program arranged by
our Spring 2008 Conference
Committee Leslie Christiana, Joy
Bennett, and Kathy Gregor.
Go to www.strawbuilding.org
and register today!!! Early
registration savings if you
register before Feb 15, 2008.

Straw Bale Building in Pakistan Martin Hammer and Darcey Donovan

2007 was a year of great progress by the organization Pakistan Straw Bale and Appropriate Building (PAKSBAB). Founded in 2006, PAKSBAB promotes and teaches straw bale construction and other sustainable building practices in Pakistan, especially in the northern region devastated by the October 2005 earthquake which caused the death of over 80,000 and left millions homeless. The organization facilitates knowledge transfer of straw bale construction tailored for Pakistan, with an emphasis on seismic detailing, simplicity, affordability and sustainability. We continue to refine our hand baling equipment, which in itself creates a potential cottage industry of manufacturing straw bales. PAKSBAB also advocates other appropriate technologies such as the use of local and natural materials, passive solar, and rainwater catchment.

In March PAKSBAB received preliminary endorsement for its straw bale construction method from ERRA and NESPAK, the Pakistani governing agency and consulting engineers overseeing earthquake reconstruction. They are supportive and excited about straw bale construction and see it as an ideal solution for Pakistan.

Also in March, our PAKSBAB Director Surkhab Khan, Logistics/Driver Zamurad Khan and Field Assistant Gul Khan, along with Program Advisor/Engineer Darcey Donovan and Vermont natural builder Sarah Machtey, continued construction of a residence in Hillkot which was started in October 2006. PAKSBAB then moved on to conduct a training course and construct a prototype residence in the village of Qalanderabad in partnership with TEAM/Salamat-e-Hazara, an international missionary organization assisting with earthquake reconstruction in Pakistan. The 24' x 24' house includes two rooms plus a kitchen and veranda. They were joined by Shannon Whitnack, a natural building designer from Nevada City, CA, who has become a prominent member of PAKSBAB, heading up our fundraising efforts.

With the success of the Qalanderabad project, Salamat-e-Hazara collaborated with PAKSBAB to construct 3 more residences near the city of Mansehra. Darcey returned in late summer to assist in the construction of these 3 houses, which are smaller (one room with a veranda) and utilize a simpler foundation and a site-built I-beam roof system, so as to decrease the construction time and cost.

In September PAKSBAB received a grant from the Earthquake Engineering Research Institute to engage in a seismic research project at the University of Nevada, Reno (UNR). The Network for Earthquake Engineering Simulation, a project of the National Science Foundation, is making this project possible by providing PAKSBAB use of their large-scale testing laboratory at UNR. The intention of this project is to understand the performance of the unique straw bale structural systems we are implementing in Pakistan, by testing individual straw bale wall assemblies as well as a shake table test of a 14'x14' straw bale building. The primary system we will be evaluating consists of a rubble trench foundation, gravel bag stemwalls, fishing net reinforcement and earthen plasters, with the options of polyprope tie downs and a concrete bond beam. These systems are applicable to developing countries in need of affordable seismic-resistant construction as well as to developed regions such as California.

In October Caroline Meyer White, a Danish natural builder, continued her ongoing

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CASBA

**THE CALIFORNIA
STRAW BUILDING
ASSOCIATION**

P.O. BOX 1293 ANGELS CAMP, CA 95222
(209) 785.7077 www.strawbuilding.org

CASBA is a non-profit organization whose members are architects, engineers, builders, and people interested in straw building. Our mission is to "...further the practice of straw building by exchanging current information and practical experience, promoting and conducting research and testing, and making that body of knowledge available to working professionals and the public at large."

NEWSLETTER: Daniel Silvernail M.Arch, Editor..

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Letters to the Editor

Letters to the CASBA Journal are welcomed and encouraged. We ask that *you limit your submission to 150 words or less. A letter published herein is entirely the opinion of it's author, and does not represent the opinion of CASBA, its Board, members, and/or your humble Editor.*

A host site has been found for the 2008 CASBA workshop, thanks to Jay Tulley. The dates have not been set yet but as usual will be in late June/early July for the bale raising and late August/early September for the plastering. Watch for more news and details to come soon in the newsletter and web site. The host is the Chartwell School in Seaside, Monterey County (<http://www.chartwell.org/>) "It is the first LEED Platinum school campus in the country. It's net neutral energy wise from PV panels, has a rain catchment system which is used to flush toilets and for irrigation, has waterless urinals, day-lighting, and has just about everything else green building-wise. They have great facilities: a soccer field and woods for camping, restrooms, and one shower."

Barring any problem with permits or city issues it sounds like a great location so we need an approved lead for the workshop. Jay may also need some assistance dealing with the building department and your assistance will be appreciated. Dates for the workshop have not been set as yet and will be once we have all the parties confirmed.

CJ Cavet,
Portland OR

As I reflect on my path in life I think of the saying,"a rolling stone gathers no moss". I connect with this saying and daily find my mind filled with and welcoming the exciting stories and information out there-many of which

Article continues page 8...



Editor's Note-

Daniel Silvernail - Santa Cruz

**Advisory Board Minutes
10/10/2007**

15 Board members are present.
CASBA has 173 members.
Prospective conference site Mammoth Lakes agreed: more south is better.
The DUC's anticipate completion in June.
We meet under a darkening sky
broken clouds occasional sun. Talk
of snow by afternoon
closure of mountain passes.
In the Bennett's cozy living room
thin glass thick bale walls facing south
11:30am – the wind is coming – air
moves, birch leaves fly into motion
birds adjust their erratic flights
prepare to hunker down.
Inside, someone says "the workshop
... should be incorporated
into the Procource".

Daniel Silvernail
15 January, 2008





NOTES FROM CASBA CENTRAL

Maurice Bennett

For starters, we want to thank each of you for supporting CASBA in 2007. We especially want to thank members of the Advisory Board for volunteering their time and energy toward the governance of this organization; to the Detail Update Committee for volunteering their time to update and revise our publication(s); to Dan Silvernail and his staff for their work on the newsletter; to Jim Reiland for his service as our workshop coordinator and to C J Cavet for volunteering to pick up that mantle and to those individuals who took their time and effort to represent CASBA at local events. Without the involvement of the members CASBA would not be able to be the great organization that it is.

Please note the upcoming Spring Conference to be held at Ocean Pines YMCA Camp outside Cambria, CA Mar 14-16, 2007. We seem to be trending toward a single annual conference rather than two conferences each year. The move to a single conference seems to be subtle but genuine. Your thoughts on this issue would be appreciated.

The Advisory Board met Nov 10-12, 2007 in Angels Camp. Additionally the DUC's held a meeting on Nov 9 preceding the Board meeting. Many issues were addressed, some resolved and some remain pending. The DUC's did agree to attempt to have a final draft of the new details in time for the Spring Conference and hopefully publish the new book (yet to be named) in early summer. A decision was made after the Board meeting to continue to make our original Detail Book available to those who request a copy. Although dated, much of that information is still pertinent. Details of the Board meeting and a DUC update will be addressed during the General Membership meeting at the conference. But if any of you have questions please do not hesitate to contact CASBA Central.

It look as though we will host an Intro to Straw Bale workshop on the Monterey Peninsula. CJ Cavet will keep everyone informed and post details on the web site.

Again a reminder for members to sign up for the CASBA ListServe – simply send an e-mail to Marcus Hardwick, our web master. E-mail for Marcus is marcus1@sonic.net.

Remember that membership dues run January 1 thru December 31 each year so for those of you whose membership expires December 31, 2007 it's time!!!! Membership dues structure is posted as an insert to this edition of the Journal.

CASBA Spring Conference Cambria: Registration Fee(s)

	Before Feb 15	After Feb 15	At the Door
ADULT FULL CONF Cottage	\$175	\$200	\$225
ADULT FULL CONF Camp	\$150	\$175	\$200
ADULT SAT ONLY	\$ 75	\$105	\$150
Children			
Age 1-5	FREE		
Age 6-12	1/2 Adult Fee		
Age 13-17	3/4 Adult Fee		
Student	Full Conf \$125 Sat Only \$ 50		
Scholarship	Determined on case basis		

SEE INSERT PAGE 1 OF THIS JOURNAL FOR CONFERENCE INFORMATION



Article continued from page 1...

assistance with PAKSBAB by facilitating the construction of a rocket stove /mass heater in Salim's home. Program Advisor/ Architect Martin Hammer rejoined the team in Pakistan to finish the Hillkot house, and to begin construction of a new residence in the village of Battal with and for one of PAKSBAB's trainees. Martin also designed and built a prototype low-tech solar water heater.

You can now visit PAKSBAB's newly created website at www.paksbab.org, thanks to volunteer and engineer Felise Canterini. It gives more detailed information about the organization's goals and work, and contains many photos. Donations are greatly appreciated and now easy via the website and PAKSBAB's 501(c)3 partner Builders Without Borders.

Photo credits for images associated with this article: Darcey Donovan and Martin Hammer

California Straw Bale Building Code Update (12/07)

Martin Hammer

The review process of proposed 'Appendix L-Strawbale Construction' for incorporation into the California Building Code, was suspended in summer of 2007 due to lack of consensus from the primary stakeholders. However, their general support for such a document remains strong, and the process will resume in early 2008.

A concerted effort was made to complete the review and gain adoption during the 2007 code cycle. Focus-group meetings were conducted in Sacramento, hosted by the sponsoring State agency, the California Department of Housing and Community Development (HCD). Representatives from major stakeholders attended the meetings, including the California Building Officials Association (CALBO), the Structural Engineers Association of California (SEAOC), the California Seismic Safety Commission (CSSC), and the State Fire Marshall (SFM).

Stakeholders were referred to or provided with supporting documentation, including CASBA member Bruce King's recent book "Design of Straw Bale Buildings", DVDs of EBNet's (Ecological Building Network, Sausalito: www.ecobuildnetwork.org) 2006 ASTM fire test and 2002 seismic tests, and full reports of other structural testing. The stakeholders reviewed the proposed Appendix and submitted detailed comments and questions.

CASBA members Bob Theis, Kevin Donahue, Dan Smith, and



Pakistan: Residence in Battal with hip-truss roof system, Nov. 2007

Mark Aschheim assisted with either their presence at meetings, providing responses to comments, or helping to adjust code language. Over 70% of the stakeholders' comments were in the realm of structure, with the balance concerned with issues of fire, moisture, quality of bales, and other miscellaneous concerns. It was a major education process for the stakeholders, most who had little experience with straw bale buildings. At one point, because structure was such a large area of concern, stakeholders proposed that the Appendix move forward with only non-structural application. As proponent and lead author, I strongly opposed this and pushed to maintain the legitimacy of straw bale construction as a complete building system, even if it would delay adoption of the appendix.

In July, as time was running out in the code adoption schedule, it was decided there was insufficient consensus to move the document forward to the Building Standards Commission (BSC). BSC has the authority to reject or adopt proposed code changes within the context of public hearings. They rarely go against the recommendations of major stakeholders, such as those reviewing the proposed Appendix L.

2008 will now be used to further develop consensus with stakeholders. This is a matter of addressing valid comments with adjustment of the code language, or remaining firm and educating the stakeholders with supporting documents and rationale for language believed correct. One such example is the allowance (or requirement) of no moisture barrier between plaster and straw. It continues to be a concept that those without experience in straw bale construction have difficulty accepting, but is critically important to the performance of the system in terms of structure and moisture control.

Because there is no code adoption cycle by the California BSC in 2008, the year will only be used to develop consensus. A revised Appendix L will then be submitted to BSC in 2009, and if adopted would become effective as part of the California Building Code in January 2010. In the meantime, Health and Safety Code section HS18944 – Guidelines for Straw-Bale Structures - will continue as the defacto “straw bale building code” in California. (See the home page of CASBA's website (www.strawbuilding.org) for the text of HS18944.)

Martin Hammer is lead author of the proposed 'Appendix L – Strawbale Construction'. He is a CASBA member and an architect in Berkeley, CA. E-mail inquiries to mfhammer@pacbell.net or contact by phone at 510-525-0525.

Experiment in Reaching Out Lesley Christiana

On November 28th an eager group gathered at the California Center for Sustainable Energy in San Diego to partake in the CCSE's first “Understanding How to Build Straw Bale Buildings” workshop. Formerly known as the San Diego Regional Energy Office, the new center hosts educational workshops on energy related matters 3 days a week, providing breakfast & lunch as well as speaker expenses. They also provide space free of charge to non profits wanting to organize their own workshops, and have a tool & book lending library as well. Their

mission statement is: “To foster public policies and provide programs, services, information and forums that facilitate the adoption of clean, reliable, renewable, sustainable, and efficient energy technologies and practices.”

Expert speakers for the day long venue came from CASBA. Bruce King, Martin Hammer and Dietmar Lorenz came down from the Bay Area to present. They were joined by local members Bob Bolles and Drew Hubbell, forming a truly impressive panel for those learning about the benefits and technicalities of building with straw for the first time.

Stressing passive solar design and insulation qualities as a nod to the energy center host, topics also included engineering, code, and local projects, with sidebars on Straw Bale in Europe and in Pakistan. Bob Bolles opened the event with an introduction to Straw and acted as moderator, while Bruce King wrapped the day up with “How we will build after Oil”.

It was hoped that this venue would serve as an opportunity not only to educate members of the professional community on the qualities of straw as a building material, but also to instill in them a profound respect for the medium, and for CASBA.

The intrigued audience was diverse; including representatives from large and small construction and engineering companies, realty finance, a home owners association, architects, designers, green consultants, Sea World, 10 members of the City of San Diego Development Services Dept, and 6 from the County. Three other local cities sent representatives as well.

Was the event a success? The CCSE considers a turnout of 50 or above large, expecting a 10% drop out rate balanced by 10% on the door. Pre-registration was 88, with 23 on the door, for a total of 111! This does not include organizer Lesley Christiana, or CCSE employees who sat in, such as former CASBA member Skip Fralich, a staff energy engineer. Suffice to say that CASBA was invited back before lunch!

If you would like to participate in future events like this please let CASBA know.

The Year of the House: Making Slip Jim Reiland

Slip is a magical, sticky clay goo essential to making plaster. It's a mixture of clay soil and water, that when combined with straw, sand (and several other optional ingredients like dry horse manure, eye of newt, wing of bat, etc.) make an earth plaster.

To make slip you need clay soil, and we don't have any. Our site soil is rocky and silty, so we put the word out among local earth moving contractors. After a few questioning looks we were lead to our source by a contractor who desperately needed a place to deposit some dirt. The clay soil, imported about fifteen miles from a basement excavation, is known locally as “Medford Mud.” We were told it was terrible to build on; we learned it

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was wonderful to plaster with!

The soil we found is at least 80% clay, but locked in a matrix with small stones and gravel that would need to be separated. I had high hopes the moment I stood beside the mother pile and watched sediments stratify in the test Mason jar that this was going to be great mud. Hanging around at CASBA conferences, and having worked at a few workshops, we had seen and worked with great clay soils, and we hoped for dirt as good. We knew more-or-less what to look for, but still, with such great variety among site dug and local soils, we were cautious. With twenty yards getting dumped on our driveway, we wanted to get it right!

And we did. In August we plastered a test wall four bales high and wide, and waited and watched for a week. Very little cracking. A few weeks later Joy accidentally snagged the test wall with the tractor's grader blade, dragging it ten feet...intact, with no cracks! Our confidence in "Medford Mud" grew, and we knew for certain we had good clay soil for slip.

Pulverizing and dry sifting the soil worked in the late summer when it was delivered, but fall rains and high humidity made even the covered soil too sticky to push through a screen. Then we

tried using our cement mixer, but the clumps combined to form super clumps that caused the mixer to rock dangerously back and forth, and rode the mixing paddles high in the drum before plunging into the glop below, splashing precious slip onto the ground and anyone standing nearby. That didn't work either.

The slip-making procedure d'jour, working well for nearly three months, has been to fill a five gallon pail about half-way with soil, top it off with a few inches of water, let it soak for an hour (overnight is better), then mix it with a plaster paddle chucked into a heavy-duty electric drill.

The slip making station is a work in progress, too. It's conveniently located adjacent to the clay soil pile. These days I like to place six or eight mud-filled pails on a pallet that raises them to a comfortable working height. I ease the paddle blade into the oozing mud and run the drill for about five minutes. It's tempting to mix a batch for under five minutes, and with some soils that would work, but our clay stubbornly clings to the gravel and goose-egg size stones in the mix. A large clock on the garage wall times my efforts, and keeps me honest.

The big drill has two handles. The plaster mixing paddle at the business end looks like it could propel a boat towing a water skier. I hold onto it with both hands as it jerks and splashes



Pakistan: Mansehra project with rubble trench/gravel bag foundation and I-beam roof system, Aug. 2007

around for the first few minutes because the clay and rocks really don't want to be separated. At first they seem to attack the paddle, trying to jam it. But with enough agitation the clay goes into suspension, the rocks fall to the bottom of the pail, the splashing stops, and I see a thick chocolate colored goo swirling in the five gallon bucket at my feet.

Because a lot of the slip would slop over the pail rim and be lost, we made a slotted lid out of plywood scraps. We screwed together back-to-back one square and one round 1" thick plates. The 12" square plate is easier to brace against my knees, and the round plate fits loosely inside the pail rim. A 1" wide slot leads from one side of the square to the center of the lid where the drill shaft disappears into the mud. Sighting through the slot I can see if the slip is too watery, or too thick, and make minor adjustments by adding a little more water or a shovel of soil. When I'm mixing for an hour or so—producing between 40 and 60 gallons—I don't fuss with each pail's consistency as it's all blended in a large trough. Thick slip, thin slip, mixed with a hoe, it all works out. Joy lets me know if what I'm making isn't just right.

After five minutes the cover comes off. As the paddle is lifted from the pail it leaves little "peaks" similar to what cooks see when they mix creams or frostings. The ideal slip is sometimes likened to a milkshake...we found that with our particular soil a thicker slip makes a better plaster.

I pour the contents of the pail through two screens stacked one on top of the other, laid across a trough. We made the screens from hardware cloth stapled to a wood frame. To reinforce the screens we sandwiched the edges of the hardware cloth between a 2 x 4 and a 2 x 2 frame, which are screwed together. The 1/2" screen catches the larger stones, and the 1/4" screen keeps the finer gravel out. We use an additional 1/16" screen when we're spraying slip with the wall texture gun or need a finer plaster. So far these screens have held up well. If they survive the entire plastering effort we'll retire them to sift garden compost.

For me, making slip is relaxing and even meditative, sort of like washing dishes, only less demanding. It's also one of the few times I can operate a power tool and let my eyes and mind wander without fear of losing a finger, or worse. With the drill running I turn to check the wall clock, decide when this bucket will be finished, and start looking around. Our building site straddles a ridge with views in all directions. Clouds flit across the hillsides to the east. Hawks soar at eye level. Geese, flying in formation, move up the valley. Flocks of bluebirds and waxwings alternate occupying the madrone above me. A rain squall roars in from the west. Greyback Mountain plays peek-a-boo with a coastal fog. The sun moves in the sky and the forest surrounding us shimmers from one green hue to another. Better than television.

Owner-builders Jim Reiland and Joy Rogalla are building in Jacksonville, Oregon. They have given themselves a year—The Year of the House—to build a post and beam straw bale house and workshop. They hired sub contractors for excavation, foundation, framing, roofing, electrical, plumbing, radiant floor, and drywall work. With the help of friends and neighbors they handled bale stacking and exterior plastering to date, and expect to complete exterior and interior plastering, tile, and finish work in 2008.

The Continued Chronicle of my Housebuilding

CJ Cavet

At the end of September and in preparation for winter, I held a plaster work party so we could apply a thick coat (1") of earth plaster on the whole exterior of the house. Numerous people came from various parts of the state including 2 from San Diego and 4 people from LA plus many locals. Over the course of the two days a total of 20 people came to help mix and apply the earth plaster. The team was great, worked hard, had fun, learned a little more about plastering and generally had a wonderful experience. Thank You again to all of you who came.

At the beginning of the summer, the house exterior had received the slip coat and an infill coat to even out the surfaces of the strawbales so that the specified meshes could be installed. In the weeks prior to the plastering weekend I finished all the waterproof papering and/or bituthene and I installed the meshes, both the plastic expanded lath over the wood framing and the cintoflex (deer fencing) over all the walls. It was completed and inspected prior to the weekend.

For the plaster I used Kathy Gregor's recipe but slightly adjusted for my clay. The mix was 5 gal slip, 1 #10 can sand (large can), 1 med can horse manure, mixed thoroughly and then about 5 gal chopped straw mixed into it.

In the weeks prior and with the assistance of Paul Sweeney, we prepared the ingredients for the plaster. We processed around 4 cubic yards of sifted clay from dirt leftover from my foundation sub soil. This clay was covered to keep oak leaves and acorns out of it since it was stored under an Oak tree. I had noticed a few dark spots in the some of the previously applied plasters and thought maybe the oak tannin might be causing it. I also had 10 large bags (55 gal bags) of coarsely chopped straw, saved from the notching of bales during the bale raising and I had the equivalent of about 2 large bags of sifted horse manure. Both of these quantities turned out to be short so we had to chop and sift more straw and manure before the end of the weekend.

The straw chopping turned into a discovery for a new and more effective method. Previously the rice straw had been run through a chipper/mulcher to chop it up. This required at least two passes, was extremely noisy and smelly plus generated a lot of dust. Since the set up was right next to our work area I decided to try chopping it in the garbage can with the weed eater. This too was less than efficient; too narrow an area to work in making it hard to maneuver the weed eater and the batch results were small. I had a plywood box (4'w x 3'd x 2'h) that had been used to capture the chopped straw from the mulcher so decided to try it in there. I threw a few flakes of straw into the box and went at it with the weed eater. This proved to be the best method. I could process 4 or 5 flakes at a time, the lower height allowed easier handling of the weed eater and I could move around the perimeter of the box to get at all the straw. The length of the chopped straw depended on how long I kept the weed eater on it. The dust generated was

come from our CASBA calls. Whether these stories are about a straw structure, a plastering job or a cob project, each has positive value. Each and every story has meaning and education.

As I go along life's path, I see there is more to life than strawbale structures. Plastering, earth-bag construction and cob are all a part of this whole. We are all working towards one thing: to use materials at hand and given to us by our precious earth. We all need to connect and continue to network with each other. That is part of growth. Each of us has something of value to share.

In many ways, we are like that rolling stone-gathering information and learning new things as we roll. May we all continue to roll and point others in a very positive direction.

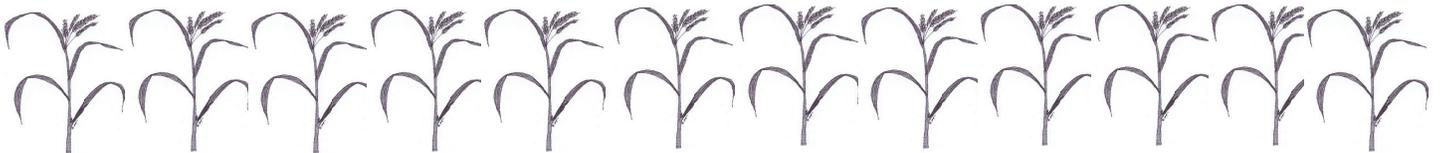
Joy Bennett,
Angels Camp

less than the other methods and the process went a lot faster. The manure was placed in a large garbage can and pulverized with a weed eater then sifted it through ¼" mesh. In a short time we had the needed material processed.

The rest of the preparation included having plenty of clean 5 gallon buckets (about 40) with metal handles, small tubs to mix plaster in and larger tubs to store pre-mixed plasters, various scaffolds and ladders, boxes of throw away vinyl gloves for applying the plaster and half a dozen heavy plastic gloves for mixing the plaster. I also had garden hoses at key locations to wet the existing plaster although a garden sprayer was found to provide a better and more controllable mist to wet the existing plaster.

We had some challenges with the meshes which altered how the plaster was applied. Forcing the plaster through the mesh was difficult so we first applied a thin soupier mixed onto the mesh then after working a large square but before moving applied the thicker coat to the area. This worked fine and later showed no cracking or separation of plasters.

During the plastering, the dynamics of the group shifted after a while. Most of the men gravitated to the plaster mixing while the women and a few men applied the plaster to the walls but lots of great conversations and new friendships evolved. All in all it was a wonderful weekend with great results.



A non-profit project of the Tides Center.

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