



Youth Training Program in Vernacular Earthen Architecture and Associated Cultural Traditions | 1996-31

Cornerstones Community Partnerships, Inc.



National Park Service
U.S. Department of the Interior

National Center for Preservation Technology and Training



NATIONAL PARK SERVICE
NCPTT

**YOUTH TRAINING PROGRAM
IN VERNACULAR EARTHEN ARCHITECTURE
AND ASSOCIATED CULTURAL TRADITIONS**

October 1, 1995 - September 30, 1996



CORNERSTONES *Community Partnerships*
227 Otero Street
Santa Fe, New Mexico 87501
(505)982-9521

**EVALUATION OF CORNERSTONES
YOUTH TRAINING PROGRAM
AT ZUNI PUEBLO AND MORA COUNTY**

**SUBMITTED TO:
BARBARA ZOOK
EXECUTIVE DIRECTOR
CORNERSTONES COMMUNITY PARTNERSHIPS
227 OTERO STREET
SANTA FE, NEW MEXICO 87501**

**SUBMITTED BY:
MICHAEL KRAMER
PROGRAM DEVELOPMENT, CONSULTING & TRAINING
P.O. BOX 4731
SANTA FE, NEW MEXICO 87502
(505) 982-7683**

TABLE OF CONTENTS

INTRODUCTION TO THE EVALUATION	1
PURPOSES	1
DESCRIPTION OF THE PROGRAM	1
HISTORY	1
GOALS	1
TARGET POPULATION/DESCRIPTION OF COMMUNITIES	2
ACTIVITIES	2
CURRENT STATUS	3
EVALUATION METHODS	4
ANALYSIS SUMMARY	5
SOCIAL FACTORS	5
IMPACT OF TRAINING ON PARTICIPANTS	5
SITE ISSUES	10
ADMINISTRATION	10
CHANGES PEOPLE WOULD LIKE TO MAKE	11
OTHER THINGS PEOPLE WANT THE ORGANIZATION TO KNOW	12
RECOMMENDATIONS	12
AREAS OF THE PROGRAM THAT ARE STRONG	12
AREAS OF THE PROGRAM THAT COULD BE IMPROVED	13
AREAS OF THE PROGRAM THAT DEFINITELY NEED TO BE IMPROVED	14
AREAS OF THE PROGRAM THAT NEED TO BE EXPLORED FURTHER	15
CONCLUSION	16
NEXT STEPS	17
APPENDIX: EVALUATION SURVEYS	

1. Introduction to the evaluation

A. Purposes

The main purpose of this evaluation is to determine whether the youth training programs at Zuni Pueblo and Mora are meeting community and youth needs. In eliciting the written and oral feedback of many participants, community members, and staff, the evaluation intends to distill key themes from their collective experience in the summer of 1996.

From the information collected, several program strengths and weaknesses shall emerge, which will be used by program and administrative staff to modify the program as it evolves. The evaluation also has the potential to be used as a promotional tool, not only for recruiting potential participants and community supporters, but also funders and new communities considering a partnership with Cornerstones.

In addition, the evaluation provides accountability to current funding sources, and informs them of progress related to the funded initiatives.

2. Description of the program

A. History

The youth training programs at Zuni Pueblo and Mora County emerged from many years of community church restoration statewide. Since 1986, over 150 communities have received technical assistance about how to repair and restore vernacular earthen buildings, and 40 communities have participated in Cornerstones-assisted hands-on building preservation projects.

It became apparent early on in the restoration initiative that one long-term factor which precipitated the dilapidated nature of many rural churches was the lack of youth involvement in church maintenance. As young people, particularly teenagers and young adults, pursue their education and employment opportunities, they tend to look outside of their communities for opportunities, and as such, tend not to become involved in supporting local institutions such as churches.

If New Mexico's rural churches are to be preserved, and saved from apparent extinction, it is vital that rapidly dying traditional and culturally-derived building skills be passed along to future generations. As the elders in a given community grow older, the risk is high that the knowledge they have grown up with will die along with them if it is not shared with youth. The youth training programs are therefore key components of a community's efforts to maintain and preserve important facilities, and the cultures and traditions these community symbols reflect.

B. Goals

Cornerstones' goals of the 1996 summer youth training program were to train

16 young adults from Zuni and Mora to learn and implement preservation activities on four historic adobe churches in the Mora Valley and significant historic structures at Zuni Pueblo. The approach is to involve local citizens, under the facilitation of Cornerstones staff, as mentors to the youth in teaching the traditional building and restoration skills for both adobe and stone. As such, the goals of the programs were to:

- (1) Develop a curriculum for earthen architecture preservation training including associated cultural traditions;
- (2) Test the curriculum, evaluate it, and modify it into a final curriculum;
- (3) Conduct a training program for 16 youth for 12 weeks

C. Target population/description of communities

By many statistical indicators, the communities of Zuni and Mora are economically disadvantaged. Poverty rates are high, and income levels are well below state and national averages. Locally-driven economic development is a stated goal, and there are signs of growth in this sector, but the demand for quality employment remains high, and often drives many young people looking to larger towns such as Gallup and Las Vegas for employment.

The consensus among citizens in the communities and Cornerstones staff is that keeping these youth home, by providing them economic opportunities which are culturally appropriate, will help to keep these rural communities alive and well, while also providing training in skills that have immediate application. The village of Mora and the surrounding area, as well as the middle village of Zuni, are both in desperate need of revitalization. Buildings that have either been poorly maintained or abandoned altogether are crumbling annually; and as these buildings crumble, the sense of community optimism also withers. It is hoped that by involving enthusiastic young people in a process of community revitalization, young people will see the benefits of contributing to the well-being of their communities, while local citizens will appreciate and support these youth for caring, and hopefully mentor them to embrace local cultural traditions.

D. Activities

At Zuni, the main activities of the program included the teaching of traditional and modern methods of stone quarrying, dressing, and laying. A central educational component of this process featured the elders' prayers, offerings, and stories associated with stone, quarrying, and its relevance to the Zuni people throughout history. Approximately 45 young people participated in the summer of 1996, a combination of Zuni youth, architecture students from the University of Pennsylvania and Iowa State University, and Hopi youth. In addition to the quarrying, participants visited and stabilized National Park Service historic ruins in the region, conducted assessments of various buildings in the village, and learned documentation, drafting, surveying, and planning using computers. A gardening component was also implemented in conjunction with the Zuni schools. A

greenhouse was constructed to grow seeds. Community elders taught traditional farming methods, while farming students from Iowa State University also shared their knowledge; these different approaches were implemented and connected to the school curricula.

All work at Zuni has been accomplished in direct and continual collaboration with the Zuni Tribal Council, which has prioritized needs, identified appropriate trainings sites, and allocated equipment and a stone yard for storage and training.

In Mora, the main activities of the program included the teaching of traditional methods of adobe restoration, including plastering, wall construction, roofing, wiring, and landscaping. The crew busily tackled four churches in the summer of 1996, with the assistance of several community members, and also identified new churches that need restoration work. While the work on two of the churches was completed, the work on two other churches (Chacon and Rainsville) still needs to be completed.

Trainees received most of their training through their work experience. In addition, they toured several historic sites in the region and in Santa Fe to understand the key issues surrounding adobe restoration.

The program is made possible through a partnership with Father Tim Martinez; Father Martinez prioritizes the need for projects, and assigns the crews, which are supervised by Cornerstones staff, accordingly. The University of New Mexico is another program partner, providing a history professor to discuss the history of the region with the trainees.

E. Current status

Due to the availability of funds, the Zuni program functions year-round for some of the trainees. This allows for a more formalized curriculum. While some currently continue their work, others are securing employment as professional subcontractors.

Cornerstones has entered into an agreement with Zuni to initiate a transition period, which will gradually allocate administrative control of the training program to Zuni over the next year or two. Cornerstones is currently employing an intern from Zuni to learn the administrative and fund raising skills necessary to ensure continuing program operations. The transition process is not clearly delineated, and is causing some confusion.

In terms of programming, a major planning effort is underway to assess and repair the Hapadina building; this project will integrate adobe restoration skills with a major agricultural project. Efforts are continuing to secure stipends for youth trainees, and to expand the pool to include more young people. Preliminary planning is also underway to design a \$10 million multi-year middle village housing restoration project.

The Mora program is currently only a summer training program. There is interest in expanding it, but current funding limitations prohibit program expansion. Planning is already underway for next summer's projects. All of the summer trainees are now in school, either at the high school or college level.

3. Evaluation Criteria and Methods

After reading the description of the program as included in funding proposals, the first major task was to identify key stakeholders in the evaluation. They include: participants, mentors, community members, and organizational staff and administrators. At that point, the following key evaluation criteria emerged:

1. To what extent, and in what areas, are youth learning and developing through this program?
 - a. What are some signs of youth development?
2. To what extent, and in what areas, are the communities of Zuni and Mora receiving meaningful service from the program?
 - a. What is the evidence that communities are benefiting?
3. How is Cornerstones as an organization benefiting from this youth training program?
 - a. In what ways does Cornerstones increase its capacity through carrying out this program?

Specific evaluation criteria to respond to these questions include a variety of personal and community attributes, including:

1. Improved community cohesiveness and cooperation
2. Positive changes in the communities' attitudes towards youth
3. Increased pride and interest in maintaining community facilities
4. Enhanced youth leadership development and changes in attitude
5. Increased interest in educational and career opportunities
6. Expanded job opportunities in the local community
7. Increased cultural understanding and pride

To measure these criteria, three methods were used to collect the data.

1. Evaluation forms were issued to and completed by 5 staff, 3 mentors, 11 participants, and 6 community members.
2. Interviews of participants, mentors, and community members were conducted by the evaluator in the communities.
3. Interviews of program and administrative staff were conducted by the evaluator at the Cornerstones office.

The collected data was analyzed in the following manner:

1. All questionnaire responses were tallied and categorized
2. All verbal comments were synthesized and summarized
3. Key themes emerged, elucidating areas of program strength and weakness, as well as administrative strengths and weaknesses.

4. Analysis Summary

A. Social Factors

Staff/participant relationships: Participants in Mora felt very comfortable with program staff. They felt respected, that staff was easy to work with and understand, and that activities seemed organized and on schedule.

At Zuni, participants felt that staff was helpful and easy to work with, and that activities did not always keep on schedule. They noted that while this was not usually the fault of Cornerstones staff, it did happen on occasion.

Participants from both communities liked the way they were taught the skills; they felt empowered to take on responsibility, were encouraged to participate in decision-making (although more so in Mora), and believed that the work they performed had relevance.

Community representatives from both communities expressed either that staff appeared to be relating well with trainees, or that they didn't know the nature of the relationship. They did mention keeping on schedule an issue upon which to improve.

Participants, staff, and community members noticed that they were not given written materials on job descriptions, personnel policies, and program objectives and activities. It is not evident that this fact caused any specific problems.

Group size and dynamic: Participants and community members expressed that the small size of the work groups facilitated an effective team dynamic and supported one-on-one instruction. Participants indicated that the groups were possibly too small, especially when one or more trainees was absent for some reason. In general, all parties observed and experienced generally positive peer interactions; in Mora, people spoke about developing new friendships and having fun while working. At Zuni, teamwork was usually evident, but sometimes trainees came to work under the obvious influence of alcohol, and this had a negative affect on everyone.

Community members at both locations observed that there could have been better coordination and communication between staff and the community; while the relationship was generally amicable, a general lack of communication, and in Zuni lack of consensus among Tribal Council members and staff, resulted in the communities' lack of high levels of participation in and decision-making about the program.

B. Impact of Training on Participants

Trainees in Mora learned site drainage, adobe building repair and plastering, wiring, wall construction, roofing, and landscaping. They believed that they were well instructed how to use traditional methods for these activities, and feel confident in their ability to engage in such activities now that the program has ended. They wished that staff would have provided feedback on how well they were

doing, but they still believe they have learned skills that they will be able to use in their life. Many have already begun to use them at home and in the community. Participants spoke about the pride they now have in the churches they have restored. They are reminded of this fact every time they drive by the buildings or go to church. Community members also observed the youth becoming more responsible in their daily lives, more interested in hard work, and more concerned about the community. Staff indicated that the youth worked hard, exhibited pride in their accomplishments, seemed to enjoy making a difference in the community.

When asked what they liked best about the program, Mora participants responded:

- "I enjoyed learning how to mud plaster";
- "The teamwork and closeness between co-workers; we had to help each other, so we all got along."
- "I felt good that I was improving the community."
- "The work wasn't hard."
- "The fact that it was the youth working to keep the churches in shape and together."

Zuni participants replied:

- "Working with the community, and other Indian villages."
- "Working with mud plastering the buildings."
- "Being able to set different goals and accomplishing them in different ways using different skills; plus, being able to be a good role model for the younger generations."
- "The kind of work that goes on every day at the work site."
- "Ruins stabilization throughout New Mexico."
- "How I contributed to this program, and how much positive feedback I received from it, from the community."
- "The collaboration between elders and youth."

Participants in Mora had the following comments about their development of leadership skills through the project:

- "I learned how to work well with others."
- "I learned that doing group work is better than doing it alone."
- "I improved on my people skills."
- "I learned how to communicate."
- "I learned to work better with others and how to speak up for what I believe."
- "I learned how to get everyone involved."
- "I learned to work on my own and also as a team, and to be in charge of what you have to get done."

Trainees at the Zuni site learned architectural history, cultural history, preservation philosophies, and technical preservation issues including stone quarrying, dressing, and laying, as well as gardening, drafting, surveying, computer design, planning, and documentation. They expressed satisfaction towards the

quality of the training, and believe that they have learned skills which they will use personally and professionally throughout their lives. They learned a great deal about the Zuni traditional of stone work, developed greater appreciation of the skills involved in the work, and seem ambitious about wanting to restore the entire community. In addition, the most advanced participants received advanced training in ruins stabilization at Wupatki and Aztec ruins over a 14-week period. Zuni participants had the following comments about their development of leadership skills through the project:

"(I learned) how to relay information to co-workers, and most importantly, how I developed the skills to be a good role model"

"I haven't had any skills on leadership, but I hope I will."

"The skills for new leadership were to keep setting new goals and succeeding in high potential ways."

"I have learned to deal with other community members, and to have patience."

"Documenting the experience, and supervising a crew."

"The ability to express my ideas and to take charge when necessary."

Staff and administrators also noticed that the youth exhibited enhanced self-esteem and self-confidence for having made a positive contribution using the skills they have learned in the program.

Attitudes towards culture

The program also had a significant impact on how the youth view their respective culture. When asked about how their attitudes have changed by participating in the program, Mora youth responded:

"I want to know more."

"I want to be involved more."

"I have a greater knowledge and respect for older buildings and our community's history."

"(The program) has opened my eyes because I have never been the type to like history but now I have a greater appreciation for it."

"I never really knew how hard my people had to work to keep up their homes; this program allowed me to feel a great appreciation and respect for my ancestors."

"I feel more deeply connected; I want to help keep us these structures so that they can be there in the years to come."

"My ancestors built these churches, and now we are improving them."

In Zuni, a similar strong impact was apparent by trainee comments:

"I developed awareness of how the community should work and progress together."

"I learned a lot about cultural happenings through the program."

"Helping it stay here for future youths."

"Participation in the program made me look at my culture in a different way. It made me realize that our culture needs to be

looked at more as having strengths; we need to teach our youngest more about the culture.”

“The new appreciation I have about my culture is not only to respect but to provide all my time and effort to make it a better community.”

“I have more respect and interest in preserving my culture.”

“It’s great that a program like Cornerstones brings back a sense of what it’s like to work as a community.”

“(The program) helped to reinforce the importance of maintaining traditional knowledge.”

Attitudes toward the community

Trainees at both locations indicated that while their participation in the Cornerstones program have improved their attitudes towards wanting to help the community, the community seems less interested in taking them as seriously as they had hoped. And the adults in those communities appear to agree with that assessment. It was nearly the consensus view that people involved in any way with this program don’t think the program has necessarily helped the community take more responsibility for its youth and/or its churches, despite the fact that the program showed obvious and persistent concern for the community. So while the community appears to be benefiting, citizens are not yet willing to modify their approaches towards dealing with youth and/or the churches. All involved, however, are confident that in time, they will be able to influence the community to the extent that these behaviors will change, and pride in youth and the traditional building methods will reemerge.

Economic opportunities

A central goal of the youth training program is to prepare trainees for future local economic opportunities. While the training never guaranteed participants employment upon completion of the program, Cornerstones staff and administrators nevertheless wanted to make these opportunities available; this would ensure proper program recruitment and provide credibility in the communities being served.

In Mora, participants believe that the training is preparing them for future work opportunities, though only one individual has been able to secure related employment since the training program ended. Trainees reflected, “I had no prior work experience, so it has helped me,” “It is a great reference for future employment,” “Because the training was physically tough at times, it made me more aware of how important it is to get a good education so that I won’t have to work so hard,” and “With the skills that I have learned, I know I have options for different jobs.”

Economic development questions from Mora include: How can they create opportunities to repair homes and business in the region? How can they teach other youth in other towns in the region? How can La Jicarita Enterprise Community, the state legislature, and the Department of Labor collaborate in a process that employs

trainees to revitalize Mora's dilapidated buildings as community and youth centers and businesses and implement affordable housing construction?

In Zuni, trainees are very optimistic about future work possibilities, partially because some have already been able to secure jobs with St. Anthony's Mission, the school district, and local contractors. One graduate is an administrative intern at Cornerstones, and she is being trained for the eventual management of the youth training program by the pueblo. One graduate is now a housing program supervisor. Many are also keenly aware that the National Park Service is about to retire many personnel who oversee area ruins preservation efforts, and they look forward to being able to fill such positions in the next few years.

While these opportunities appear to be based on the program's success, many community members and participants observed that an important dimension of the program is that it builds confidence and a positive and responsible work ethic, skills which will inevitably lead to employment opportunities.

Many community members seemed unaware of the job status of program graduates. Since the community is somewhat responsible for helping to provide such opportunities, clearly they need to be involved in this process.

Economic development questions from Zuni include: Why not sell quarried stone to meet the out of state demand? How can stones be used as veneer for new home construction in Zuni? How can the community come to consensus about the goals for the program in the community? Can trainees participate in fee-for-service work off the pueblo? How can these young people be paid to train youth in other Indian communities like Hopi?

General changes observed during program participation

Participants in both program sites observed positive changes in themselves throughout their participation, and developed a more positive view of their community as a result. In Mora, trainees commented, "I learned many valuable skills that are necessary for life;" "I learned to be more responsible and prepared for the real world, and to set goals for what I want to accomplish; and" "It made me think about fixing things at my house, how to do them, and what I need."

Participants and staff at Zuni noticed that the community seems more interested in renewing the tradition of utilizing local traditional building materials (as opposed to timber and cinder block). They also observed changes in themselves:

"It gave me more understanding of patience. At the beginning, we were working on the old trading post; I looked at it and thought that we had to demolish most of the building, but we worked on it, and through patience, it's coming along great."

"By giving me more knowledge about the different skills that I have accumulated."

"It made me realize that there are other ways of building homes other than the lumber or cinder block. There is nature that will help you do the work."

"I look at the village in a different way after learning what I could offer."

“My participation allowed me to develop many skills which I had yet to uncover. I am much more assertive, better able to communicate my ideas to both large and small audiences. I believe that as a person I am now more confident in life.”

C. Sites issues

All involved in the program thought the sites elected for training and work were well-selected; sites were clearly in need of services and were visible to the community to demonstrate maximum impact. Activities appear to have been properly scheduled, and for an appropriate number of hours each day.

Some concern was expressed about the availability of the necessary materials and equipment in Mora. Administrators mentioned the need for Cornerstones to own its own equipment outright, while participants said that basic tools like shovels were not always available.

In terms of work site safety, Mora participants seemed to feel that working conditions were safe, although community members expressed concern in this area. At Zuni, 60% of the participants thought that the site safety was an issue to deal with, although they did not specifically state their area of concern.

It should be noted that someone trained in first aid/CPR was not available at either site at all times.

D. Administration

The youth training program appears to have a diversified funding base from both private and public sources. Nevertheless, because the Mora project serves exclusively religious facilities, there is some staff and administrative concern about how to leverage support for youth training wages. The Zuni site does not face this issue.

Participants and community members in Mora indicated a desire to see the program extended to 10 or 12 weeks during the summer. However, it is not clear how to fund this expansion. Participants at both locations also indicated that their participation has spurred interest among other young people in the communities, and that if more positions were made available, they would be easily filled.

The program does not appear to have the staff to maintain records sufficient to track individual trainees from the time they are selected to the time they are placed into an employment opportunity or other activity.

The program does not have an evaluative system in place. Assessment criteria have not been developed until after the completion of the program, and this prevents a neutral party from observing the program during its operations and measuring any factors throughout the program's duration.

The citizens of Mora are not regularly consulted about the operations and impact of the program. An advisory group is not regularly utilized so that it can be effective. In Zuni, while the Tribal Council is regularly informed about the project's progress, the remainder of the community is not involved in providing feedback

on program effectiveness.

Staff in Mora did not have enough planning time to prepare adequate educational complements to the curriculum.

Personnel and operational policies are not provided to all participants, and performance standards and program objectives are not provided in writing to community members; this contributes to a lack of clarity about the programs, and a desire among community members to know more about what is going on.

Staffing: Participants, community members, and administrators believe that staff were well qualified to supervise the projects. The consensus was that the supervisors were knowledgeable in their fields, clear presenters of the information, and able to empower all trainees to assume responsibilities and test abilities.

One issue that participants observed was a general lack of communication between staff and trainees. Participants wanted more and regular feedback about their performance, and community members often were unaware of youth and program progress. In Mora, there was a discrepancy about whether participants thought there were meetings to discuss problems/issues in the program; for those who acknowledged that there were meetings, there was a diversity of thinking that they were effective. In Zuni, meetings were implemented at some point during the program, but their effectiveness in resolving problems/issues was also called into question.

E. Changes people would like to make

Community members from both sites suggested that they become more involved in planning, implementing, and monitoring the program. They expressed an interest in participating in advisory groups which met regularly to discuss the trainees, the program design, and the impact of the program of the community.

In Mora, participants and community members requested an increase in the length of the program, perhaps to 12 weeks or even to other seasons. In addition, due to the interest generated amongst other youth in the community, they suggested that more positions be made available, upwards of 20 at a time. They also thought it would be useful to get the community more involved in doing the actual work, and they indicated a desire to have greater access to materials.

At Zuni, participants hoped to have more interested people applying. They also hoped that employees would stick to the guidelines set forth by the program, and that young people would display a greater degree of workmanship. They also hoped to be given more opportunities to teach what they have learned to other youth in the community, perhaps at the schools, in order to encourage more youth to take the challenge and help their community. Finally, a suggestion was made to recruit more young women into the program.

Staff and administrators hoped to see more emphasis on what happens to the youth after they leave the program, a system of tracking them to future placements. Opportunities for advanced training for graduates of the regular program was also

suggested, as was academic advancement opportunities. The issue of more media exposure arose, although it was evident that the press is not always welcome at Zuni. At the curricular level, administrators hoped that youth documentation of elders' oral histories would be added to curriculum, so that the trainees would have greater perspective about why they are doing this service to the community.

F. Other things people want the organization to know

The following are comments elicited from participants from Mora:

"I would like to see the program come back next year."

"I really enjoyed taking part in this program. It's hard work, but fun. You make new friends and learn new skills."

"I take great pride when I pass the buildings that we worked on."

The following are comments elicited from participants from Zuni:

"My experience with Cornerstones was a helpful experience. I hope it will last in our community."

"All I want to say is thanks for Cornerstones for hiring for four years."

"If I still have the opportunity to join the program again, I wouldn't hesitate to apply and give my knowledge to the test."

"I hope that there are more restoration projects that we will be involved with; that's my goal."

"Cornerstones is a great program and offers wonderful opportunities to rural communities."

Zuni Bailiff Elkus Gasper: "I used to see a lot of these guys coming through the system. Once they began work on the memorial park with the mentors, I didn't see them in court anymore. They had somewhere to go, something meaningful to do."

5. Recommendations

A. Areas of the program that are strong

It is clear that the staff and administration go to great lengths to ensure that the program is effective for the youth and the communities. They work hard at creating a proper hands-on learning environment, and are careful to act as facilitators when bringing in community elders to teach traditional skills. In addition, they have a strong ability to be flexible about program design, which appears to be necessary when dealing with these particular communities. This responsiveness to community needs, as well as the latitude staff have to adapt to community circumstances, makes Cornerstones seem genuinely interested in the well-being of the communities.

Staff seem to be exceptional motivators. In addition to providing expertise in building techniques, they have created an atmosphere which empowers the trainees to take on responsibility; the result is that participants seem to have had great fun while doing this very laborious work, and they seem very self-confident about

having learned very significant skills. In other words, there is evidence that the training is teaching specific skills which are being retained by trainees.

The communities have the general perception that great things are happening through this training program, not only because youth are active doing positive things in the community, but because Cornerstones is able to leverage financial resources which the communities might not be able to bring in on their own.

In Mora, based on the excellent support from Father Tim Martinez and the *mayordomos*, the youth are being seen as a resource to the community. There is great anticipation that with increased training opportunities, youth will revitalize the entire valley, although there is still some adultism which stands in the way of total acceptance of these young people in the community. One of the churches had graffiti on one of the walls, but since the youth mud-plastered it, the entire church has remained graffiti-free.

In Zuni, there is a strong sense that the program is cultivating interest in cultural preservation, as these youth learn the traditional ways of building. The trainees speak of "rebuilding the middle village" - an enormous task, and yet they seem motivated and confident that it will be done. They are also optimistic about being able to create economic opportunities inside and surrounding the pueblo, mostly because of the strong level of interagency collaboration that has developed over the past six years. The fact that a key staff person has a regular presence in the community contributes to the effective development of the program, and it is paving the way for Zuni to eventually administer this program on its own. The Zuni people seem interested in maintaining the collaboration, but it is also clear that they believe they have the internal resources, or can at least develop them soon, to successfully manage the program in the near future. The fact that they want to administer the program indicates that the program has been successful, and that this success is evident to a broad segment of the population at Zuni.

To maintain program success, staff have been wise to develop opportunities for ongoing intertribal cultural exchange, particularly with Hopi. They have also been effective at intervening in what was becoming a serious alcohol abuse problem, by implementing and enforcing a zero-tolerance drug and alcohol policy for the program.

B. Areas of the program that could be improved

The items listed in this section are areas where there is partial success but clearly room for improvement if some attention is focused on them.

The main issue is the need for greater communication among all parties in the program. For example, staff and administrators must be more clear with the tribal council about how Cornerstones and the pueblo are benefiting from the collaboration; this may lead to the implementation of a clearly defined transition period for the program. A second example is staff providing regular performance feedback to youth, so that they are clear about how they are doing and the areas which require improvement. A third example is staff bringing in more community

members to support and celebrate the work being done; the more community participation, the more needed the program will be.

The following recommendations are based on the oral and written comments elicited from staff, administrators, participants, and community members. In terms of the overall program:

- Increase the size of crews and consider adding field staff assistants
- Improve safety at Zuni training sites
- Lengthen the Mora training program to 10 or 12 weeks
- Strengthen the cultural history component in Mora by connecting the youth more to community elders
- Cornerstones should own more equipment outright, particularly in Mora, so that staff do not have to use their own personal equipment; in particular, a work truck, mixers, and dozens of shovels and picks are needed

Staff need to consider the following recommendations:

- Recruit more young women into the program
- Focus some attention on the leadership skills being developed
- Train crew leaders in interpersonal skills and problem-solving, so that they can play a greater role in motivating trainees and managing the program
- Involve the Zuni trainees more in decision-making about the direction of the program
- Involve Mora community members in planning and guiding projects, particularly non-Church projects developed by community leaders for which Cornerstones trainees might be invited to support
- Elicit appropriate and frequent media coverage of program activities

C. Areas of the program that definitely need to be improved

The following issues were identified as requiring more immediate attention by staff and administrators of the youth training program. They include:

- In Mora, develop a clear working arrangement with Father Tim so that schedules, equipment, and responsibilities can be properly planned and implemented
- Develop a tracking system to place trainees into other programs or jobs after completing the program, and monitoring their success in such initiatives
- Give more attention to program evaluation, being sure to set up assessment criteria before training modules begin, monitoring program effectiveness during the modules, and measuring program outcomes once the modules are completed
- Write and distribute clear procedures which outline all relevant policies, program objectives, performance standards, and tasks

- and educational curriculum to be covered during that training to everyone interested in or associated with the program
- Facilitate regular staff/ participant meetings to bring up and resolve performance, behavioral, organizational, and other issues
- Conduct regular community meetings, or obtain the consistent input of a project advisory group, in order to promote, get support for, and provide information regarding program activities, and to encourage the community to take more responsibility for its youth and/or facilities
- Make available at all times someone trained in first aid/CPR

D. Areas of the program that need to be explored further

The following areas require staff or administrative research to see if they are appropriate to include as part of the program:

- Explore higher education partnerships with Luna Vocational Technical Institute or New Mexico Highlands University, or United World College, to support the Mora site and provide academic opportunities to youth who complete the program
- Secure funding for Mora youth stipends (through the Catholic Church?)
- Consult with Mora- area contractors and businesses to develop job opportunities for youth after they complete the program
- Develop a service-learning connection with the trainees that facilitates educational projects in the local schools which are connected to curricula
- Design a peer outreach program that would involve current or past trainees in trainings of youth in other rural communities
- Facilitate communication and gatherings between the people from the various training sites
- Provide advanced training opportunities for graduates of regular program
- Present nationwide academic opportunities in the field

6. Conclusion

This evaluation has elucidated answers to the following questions:

1. To what extent, and in what areas, are youth learning and developing through this program?

It is clear that the design of the program, the quality of staff instruction, the knowledge and methods of mentors, the support of the community, and the funds available to sponsor the program, all contribute to provide an environment in which young people can learn important personal, interpersonal, and work skills. These skills seem to be giving participants the confidence they need to stay out of trouble, pursue their education, and secure meaningful employment. Perhaps more importantly, participants feel more connected to their culture and to their community as a direct result of their participation. They genuinely care about fixing crumbling community facilities, and they seem determined to create an atmosphere in which youth take responsibility for improving their community. This ethic of service they are cultivating is based mostly on the fact that the program has convinced these young people that knowledge is power, and that they are in control of being able to create positive change in their own lives and in their communities.

2. To what extent, and in what areas, are the communities of Zuni and Mora receiving meaningful service from the program?

Representatives from both communities expressed genuine appreciation for the existence of the Cornerstones program. In both regions, where jobs for young people are scarce, the adults were pleased that these young people could remain in their communities and be paid to do important work for the community. And the fact is that the work is getting done. People can see very clearly the results of the work accomplished through the programs, and it then becomes obvious that these youth have been working hard and learning valuable traditional skills. The communities seem very pleased that traditional wisdom is being passed down to the next generation. Many are keenly aware that the current educational system does not seem to value such traditional wisdom, and as such, the opportunity to value community wisdom gives many elders hope that their culture will be preserved and that their buildings will be saved before they entirely crumble. The fact that the communities want to see the programs grow and expand, and the fact that Zuni wants to administer the program itself in the future, suggests that the program is very much needed by the communities. They seem to truly recognize that the youth are the future of their communities.

3. How is Cornerstones as an organization benefiting from this program?

Cornerstones is developing a reputation for administering high quality youth training programs statewide. The organization is one of a small handful that can

claim to be impacting diverse communities in such distinct regions of New Mexico. This track record is significant, as the organization attempts to expand its funding pool and consider expanding the training programs at current sites. The attention these programs create seems to attract new funders, as well as great respect from the historic preservation community. Considering that it is difficult to raise private and public institutional funds for church restoration, the organization has successfully shifted its focus to the easily-fundable realm of youth training in order to accomplish its mission.

7. Next steps

It will be important that staff and administrators use this evaluation to develop strategies for improving the youth training program. Planning meetings should be used to brainstorm all such strategies, and choose the strategies which seem most likely to succeed. The following questions can be used to make this determination:

- Can it be done?
- How much will it cost?
- Who would support the plan?
- How much work is involved?
- Does it fit into the overall program/organizational plan?
- What are its advantages and disadvantages?
- Who has made similar changes (programs, books)?

Once there is general agreement about which strategies to adopt, it will be necessary to decide what resources are needed to conduct these changes, and then a timetable for action will need to be designed. This timetable also needs to identify who is responsible for implementing which changes. Once this plan is drafted, it will be important to review it to determine again if it is realistic, if there are enough resources to complete it, and if the best strategies have been selected. Any modifications to the plan can then be made, and a final plan designed and implemented.

APPENDIX

Cornerstones Youth Training Program Evaluation Survey: Participants

The main purpose of this questionnaire is to determine the many ways in which people have experienced the youth training program. It may help to bring to the surface ideas and emotions which have not been raised before, and it will help all involved in this program to understand the common views and feelings, as well as their intensity, regarding the activities undertaken. If certain patterns or themes emerge from these questionnaires and other evaluative measures, it will be easier to identify the program's strengths and weaknesses, as well as shape a positive direction for the program. Thank you for taking the time to share your thoughts.

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
1. Do you feel proud of what you've accomplished?	1	2	3	4
2. Did you receive the kind of training you wanted from the program?	1	2	3	4
3. Were the staff/mentors helpful to you and easy to work with?	1	2	3	4
4. Did the program keep to its stated schedule of activities?	1	2	3	4
5. Were you involved in decision making about the direction of the program?	1	2	3	4
6. Do you think this program has helped your community?	1	2	3	4
7. Was the program too difficult in any way? If yes, please explain.	1	2	3	4
8. Do you feel the program showed concern for your community?	1	2	3	4
9. Do you think the project sites chosen were appropriate?				
10. Did you observe positive changes in yourself by participating in this program?	1	2	3	4
11. Did you feel free to share your ideas about the program and its policies?	1	2	3	4
12. Did you feel that the work sites were safe?	1	2	3	4
13. Do you think the adults supervised you well?	1	2	3	4

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.

	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
14. Did staff involve the community in this project to your satisfaction?	1	2	3	4
15. Do you want to be more active in your community because of this program?	1	2	3	4
16. Did you have the appropriate tools and equipment to do the program well?	1	2	3	4
17. Did staff and community supporters work well as a team?	1	2	3	4
18. Did you feel respected as a young person participating in this program?	1	2	3	4
19. Did you like coming to the program?				
20. Were you given written materials on job descriptions, personnel policies, and program philosophy and plans?	1	2	3	4
21. Did this program deepen your knowledge about your culture as a result of your involvement? Please comment.	1	2	3	4
22. Did you like the way in which you were taught the skills in the program?	1	2	3	4
23. Were staff clear about who was responsible for particular tasks?	1	2	3	4
24. Did you have meetings to talk about issues or problems in the program?	1	2	3	4
25. If so, were these meetings effective ways of dealing with these issues or problems?	1	2	3	4
26. Do you have a more positive view of the community because of this program?	1	2	3	4
27. Were there enough staff so that you could carry out activities successfully?	1	2	3	4
28. Do you think this program has helped your community?	1	2	3	4

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.

	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
29. Did staff provide you with regular feedback on how you were doing?	1	2	3	4
30. Do you believe you have developed skills that you will be able to use in your life?	1	2	3	4
31. Have you found a job in this or a related field since completing the program?	1	2	3	4
32. Do you think this program has helped the community take more responsibility for its youth and/or community facilities?	1	2	3	4
33. Would you recommend this program to your friends?	1	2	3	4
34. Overall, were you satisfied with this program?	1	2	3	4

Please answer the following questions. Use additional pages if needed.

What did you like best about this program?

What would you like to change or improve about the program?

What new and/or deeper appreciation do you have towards your culture as a result of your participation in this program?

What new leadership skills did you develop through this program?

In what ways has the training helped you to secure meaningful employment?

How has your involvement in this program affected other parts of your life?

What else would you like to say about your experience and/or the program?

(Optional)

Name:

Address:

Cornerstones Youth Training Program Evaluation Survey: Community

The main purpose of this questionnaire is to determine the many ways in which people have experienced the youth training program. It may help to bring to the surface ideas and emotions which have not been raised before, and it will help all involved in this program to understand the common views and feelings, as well as their intensity, regarding the activities undertaken. If certain patterns or themes emerge from these questionnaires and other evaluative measures, it will be easier to identify the program's strengths and weaknesses, as well as shape a positive direction for the program. Thank you for taking the time to share your thoughts.

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION:	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
1. Do you feel proud of what these youth have accomplished?	1	2	3	4
2. Do you think the participants received high quality training?	1	2	3	4
3. Were the staff helpful and easy to work with?	1	2	3	4
4. Did the program keep to its stated schedule of activities?	1	2	3	4
5. Were you involved in decision making about the direction of the program?	1	2	3	4
6. Do you feel the community has benefitted from this program?	1	2	3	4
7. Was the program too difficult in any way? If yes, please explain.	1	2	3	4
8. Do you feel the program showed concern for your community?	1	2	3	4
9. Do you think the project sites chosen were appropriate?	1	2	3	4
10. Did you observe positive changes in the youth participants during the program?	1	2	3	4
11. Did you feel free to share your ideas about the program and its policies?	1	2	3	4
12. Did you like observing/helping the program?	1	2	3	4
13. Did you feel that the work sites were safe?	1	2	3	4

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.

	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
14. Do you think the adults supervised the youth well?	1	2	3	4
15. Did staff involve the community in this project to your satisfaction?	1	2	3	4
16. Do you want to be more active in your community because of this program?	1	2	3	4
17. Did the program have the appropriate tools and equipment to do the program well?	1	2	3	4
18. Did staff and community supporters work well as a team?	1	2	3	4
19. Did you like coming to watch or help out at the program?	1	2	3	4
20. Were you given written materials on job descriptions, personnel policies, and program philosophy and plans?	1	2	3	4
21. Did this program deepen your knowledge about your culture as a result of your involvement? Please comment.	1	2	3	4
22. Did you like the way in which youth were taught the skills in the program?	1	2	3	4
23. Were staff clear about who was responsible for particular tasks?	1	2	3	4
24. Did you have meetings to talk about issues or problems in the program?	1	2	3	4
25. If so, were these meetings effective ways of dealing with these issues or problems?	1	2	3	4
26. Do you have a more positive view of the community because of this program?	1	2	3	4
27. Were there enough staff so that activities could be carried out successfully?	1	2	3	4

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.

	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
28. Do you think this program has helped your community?	1	2	3	4
29. Did community mentors and staff provide the youth with regular feedback on how they were doing?	1	2	3	4
30. Do you believe the youth who participated have developed skills that they will be able to use in their life?	1	2	3	4
31. Have these youth found a job in this or a related field since completing the program?	1	2	3	4
32. Do you think this program has helped the community take more responsibility for its youth and/or community facilities?	1	2	3	4
33. Would you recommend this program to other youth in your community?	1	2	3	4
34. Overall, were you satisfied with this program?	1	2	3	4

Please answer the following questions. Use additional pages if needed.

What did you like best about this program?

What would you like to change or improve about the program?

What new and/or deeper appreciation do you have towards your culture as a result of your participation in this program?

What changes did you notice in the youth who participated in this program?

In what ways has the training helped any of these youth to secure meaningful employment?

How has your involvement in this program affected other parts of your life?

What else would you like to say about your experience and/or the program?

(Optional)

Name:

Address:

Cornerstones Youth Training Program Evaluation Survey: Staff/Mentor

The main purpose of this questionnaire is to determine the many ways in which people have experienced the youth training program. It may help to bring to the surface ideas and emotions which have not been raised before, and it will help all involved in this program to understand the common views and feelings, as well as their intensity, regarding the activities undertaken. If certain patterns or themes emerge from these questionnaires and other evaluative measures, it will be easier to identify the program's strengths and weaknesses, as well as shape a positive direction for the program. Thank you for taking the time to share your thoughts.

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
1. Do you feel proud of what these youth have accomplished?	1	2	3	4
2. Do you think the participants received high quality training?	1	2	3	4
3. Was the community helpful and easy to work with?	1	2	3	4
4. Did the program keep to its stated schedule of activities?	1	2	3	4
5. Does the program appear to be meeting the needs of young people?	1	2	3	4
6. Do you feel the community has benefited from this program?	1	2	3	4
7. Was the program too difficult for youth in any way? If yes, please explain.	1	2	3	4
8. Do you feel the program showed concern for the community?	1	2	3	4
9. Do you think the project sites chosen were appropriate?	1	2	3	4
10. Did you observe positive changes in the youth participants during the program?	1	2	3	4
11. Did you feel that the work sites were safe?	1	2	3	4
12. Do you think staff adults supervised the youth well?	1	2	3	4

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.	<i>yes</i>	<i>could improve</i>	<i>no</i>	<i>I don't know</i>
13. Did staff involve the community in this project to your satisfaction?	1	2	3	4
14. Did you have the appropriate tools and equipment to do the program well?	1	2	3	4
15. Did staff and community supporters work well as a team?	1	2	3	4
16. Did you like going to work to do this project?	1	2	3	4
17. Did you given written materials on job descriptions, personnel policies, and program philosophy and plans to participants and others involved in the program?	1	2	3	4
18. Did this program deepen your knowledge about the issues facing the community? Please comment.	1	2	3	4
19. Do you like the way in which youth were taught the skills in the program?	1	2	3	4
20. Were staff clear about who was responsible for particular tasks?	1	2	3	4
21. Did you have meetings to talk about issues or problems in the program?	1	2	3	4
22. If so, were these meetings effective ways of dealing with these issues or problems?	1	2	3	4
23. Do you have a more positive view of the community because of this program?	1	2	3	4
24. Were there enough staff so that you could carry out activities successfully?	1	2	3	4
25. Do you feel the program successfully balances community needs with youth interests?	1	2	3	4
26. Did staff provide participants with regular feedback on how they were doing?	1	2	3	4

PLEASE CIRCLE ONE NUMBER FOR EACH QUESTION.

	yes	could improve	no	I don't know
27. Do you think this program has helped the community take more responsibility for its youth and/or community facilities?	1	2	3	4
28. Were there difficulties in dealing with the youth which warranted the need for staff training?	1	2	3	4
29. Are you satisfied with the personnel policies regarding the youth participants? If no, why?	1	2	3	4
30. Do you feel staff were responsive to the concerns/issues raised by the community during the program?	1	2	3	4
31. Do you feel that the youth selection process is adequate?	1	2	3	4
32. Did you have regular meetings with the community to discuss the project's progress?	1	2	3	4
33. Was there a staff member trained in first aid and CPR available at all times?	1	2	3	4
34. Are there other skills or trainings that would be important to add to this program? What are they?	1	2	3	4
35. Did you maintain individual youth records on attendance, accidents/injuries, work performance, and emergency address and phone numbers?	1	2	3	4
36. Did the program use the media effectively to notify the public about the program's activities? What could be done to improve this?	1	2	3	4
37. Did you work closely with a project advisory group? If so, how well did it function?	1	2	3	4
38. Are staff evaluated at least once a year?	1	2	3	4
39. Overall, were you satisfied with this program?	1	2	3	4

DRAFT CURRICULUM

1996 Curriculum

CCP/NCPTT

Mora, New Mexico

- I. Introduction (Classroom)
 - A. Cornerstones, Its History and Mission
 - B. The CCP Partnerships with NCPTT, U/Penn, Iowa
 - C. Goals and Objectives

- II. The Physical Setting (Classroom/field trips)
 - A. Geography and Topography of Mora Valley
 - B. Materials: morphology, geology, typology
 1. Materials dictate architecture
 2. locations of local materials resources

- III. The Cultural Setting (Classroom)
 - A. History of the area before the Spanish arrival
 - B. The advent of the Spanish

- IV. History and Traditions of Architecture in New Mexico (Classroom/field trips)
 - A. Pre-contact architecture in New Mexico and the Las Vegas area
 - B. The Style of the Spanish and its Moorish Origins

- V. The Preservation in New Mexico (Classroom)
 - A. The State Historic Preservation Office
 - B. NM State Monuments
 - C. Local Preservation Organizations
 - D. Private and Non-Profit Initiatives

- August 19 - 23. Documentation and ruins stabilization training at Chaco Culture National Monument. **Scott, Werito.**
- August 27: Workshop on materials compatability in architectural conservation projects. **Taylor.**
- September 16 -20: Documentation and ruins stabilization training at Aztec Ruins National Monument. **Morgart.**
- October 16 -20: Two trainees attend the National Trust Conference in Chicago. **Zook.**

National Center for Preservation Training and Technology

Schedule and Curriculum
March - December, 1996

Zuni, NM

BACKGROUND

The curriculum for the Zuni component of the NCPTT training program is centered upon buildings with secular, ceremonial and residential uses. The program is intended to underscore ongoing mentorship training that draws heavily upon federal- and state-funded assistance programs, among them the Job Training Partnership Act (JTPA), the Youth Conservation Corps (YCC) and Native AmeriCorps. The curriculum is balanced to the needs and abilities of the trainees, and centers around the acquisition of locally marketable skills with enough theory and academic background to project the skills into other markets.

MECHANICS

Because there are several components to the program which include different entry and exit dates for the various programs, differing entry level skills on the part of the trainees, and different goals for particular structures, the scheduling for the NCPTT coursework has followed several different tracks. All trainees have had the advantage of working with the Zuni mentors, but some have undertaken specialized training in particular skills. All have been exposed to the documentation training conducted by the University of Pennsylvania (U/Penn), but only 6 have received intensive tutelage. Most have the advantage of hearing the guest lecturers in a classroom setting. Six have been selected for field work in the various national monuments. The following schedule, then, reflects considerable fluidity in the presentation of facets of the program, but the themes are constant.

THEMES

- The conservation of Zuni's culture and its material manifestations is the pervue of the Zuni themselves.
- As much as possible of the training in architectural conservation in Zuni must come from Zuni mentors.
- Outside specialists are needed to round out the training, and to help the trainees develop skills that will be useful both within the local setting and outside of Zuni.

VENUES

Stone quarrying and cutting: Three quarry sites in the countryside surrounding the pueblo, and at the stoneyard located east of the village.

Stone masonry: Zuni Memorial Park (new construction), Wide Wall Kiva, (reconstruction), Rain Priests' meditation rooms (conservation).

Masonry re-pointing: Hapadina Building (trading post dating to 1880's)

Roofing. (standing seam shingle): Hapadina Building

Woodworking and restoration carpentry: Hapadina Building

Adobe repair and earthen finishes: Hapadina Building, Zuni Conservation Program seed house.

Glass and glazing: Hapadina Building

Architectural documentation: Middle Village residences, open spaces and ceremonial chambers

Conservation grantwriting: Zuni Home Improvement Program offices, Cornerstones offices in Santa Fe.

Administration workshops: Cornerstones offices in Santa Fe, A:shiwi A:wam Museum and Heritage Center, Zuni.

Preservation theory and law workshops: Various meeting spaces in Zuni.

Soils, dryland agriculture and their relationships to architecture: Various sites.

INSTRUCTORS

- Wapton Tshowna, Bennie Laate and Paul Neha, Zuni mentors
- Joseph Dishta, Director Zuni Heritage and Historic Preservation Office.
- Tony Atkin, faculty, U/Penn
- Lisa Miles, landscape architect, Pennsylvania
- Elga Jeffris, Bob Lazor, Joan Young; architectural interns, U/Penn
- Eileen Rojas, architectural intern, Cornerstones
- Bob Creasy, architectural intern, Yale University
- Terry Morgart, ruins stabilization specialist, National Park Service
- André Dumont, technical writing specialist, Santa Fe
- Michael Romero Taylor, New Mexico State Monuments
- Kelly Lally, National Trust for Historic Preservation
- Tom Kennedy, Executive Director, A:shiwi A:wan Museum and Heritage Center
- Jay Norton, Deborah Muenchrath, Jon Sandor: Iowa State University
- Barbara Zook: historical architect, executive director, Cornerstones
- Ed Crocker: technical director, Cornerstones
- Alfred Von Bachmayr, architect with Earthworks
- Dennis Playdon, landscape architect, faculty U/Penn
- Dabne Scott, ruins stabilization specialist, National Park Service.
- Cecil Werito, ruins stabilization technician, Chaco Culture National Monument.

SCHEDULE

- March 4, continuous: YCC and Native AmeriCorps trainees begin training in quarrying, cutting, dressing and laying of stone. **Tshowna and Laate.**
- March 8 - 17: First workshops in architectural documentation and design of appropriate housing. Workshops in landscape architecture with emphasis on the reflection of the environment in the built milieu, and the inseparability of architecture and agriculture in Zuni. **Atkin, Playdon and Miles.**
- March 10 - 11: Classroom and hands-on workshops on pressed earthen block building technologies, including characteristics of materials, particle size analysis, compressive strength and masonry technologies. Begin construction of model home using local human and natural resources with an emphasis on historic infill. **Von Bachmayr and Crocker.**

- April: Continuing work in quarry and model home. **Toshowna, Laate and Neha.**
- May 2 - 3: Presentations by trainees at statewide symposium on service learning. **Kennedy.**
- May 16 - 17: Second session on architectural documentation and presentation of models for appropriate housing. **Atkin and Miles.**
- May - June. Continuing training in stone and adobe technologies. **Toshowna and Laate.**
- June 10 - Aug. 2: JTPA Summer Youth Program. 14 trainees join the workforce. Three are assigned to work with soils analysis and dry-land runoff agricultural techniques through the Iowa State University Program. Others work in the quarry and the Hapadina Building. **Norton, Sandor, Muenchrath, Toshowna and Laate.**
- June 27 - July 23: Technical writing workshops centered around a CDBG application for funds for architectural stabilization in Middle Village. **Dumont.**
- July 8 - October 4. Ruins stabilization training at Wupatki, AZ. **Morgart.**
- July 10 - August 28: Architectural and open space documentation workshops. Tutelage in small groups led by **Miles, Lazor, Creasy, Young, Rojas and Jefferis.**
- July 15 - December 30. Ongoing work on Hapadina Building. **Zook, Crocker.**
- July 23: Workshop in adobe wall repair and earthen renders. **Crocker.**
- July 25: Workshop in glass and glazing, wood and steel sash rehabilitation. **Crocker.**
- August 2: JTPA program ends.
- August 3: Presentation by trainees at New Mexico Heritage Preservation Alliance meeting in Gallup. **Crocker.**
- August 12 - Nov. 30: Internship for one trainee in the Cornerstones offices in Santa Fe. Training in administration, organization, grantwriting, fundraising, recordkeeping, etc. **Zook.**
- August 14: Workshop in preservation theory and law. **Lally.**
- August 16: Section 106 Compliance and other issues pertaining to historic districts and National Register sites. **Dishta.**

VI. Technical Preservation Issues Applying to all Styles of Architecture (Classroom/field trips/laboratory/hands-on)

- A. Moisture related pathologies
- B. Compatibility of Materials

VII. Issues Pertaining to Specific Materials: Earth as a Building Material, its History and Tradition.

A. The Materials, their characteristics, applications and modifications. (Field, Classroom)

B. The Styles to Which Earthen Architecture Lends Itself (Classroom)

- a. residential
- b. commercial
- c. communal

C. Typologies of Earthen Architecture (Field and Classroom)

- a. adobe
- b. pressed block
- c. rammed earth
- d. cob
- e. cod
- f. etc.

D. Pathologies (Field, Classroom, Lab)

- a. moisture related
- b. materials related
- c. site related
- d. use related

E. Emergency Stabilization (Field)

- a. Safety issues
- b. Shoring

F. Assessments (Field, Classroom)

- a. Visual assessments
- b. Documentation
- c. Monitoring
- d. The role of architects, engineers and contractors in assessments
- e. Historic Structure Reports

G. Planning Interventions (Field and Classroom)

- a. Selection of sites
- b. Permitting: Section 107(f) of UBC, Section 106 in HUD.
- c. Historic sites as a venue for vocational training
- d. Should volunteerism play a role?
- e. Finding the technical assistance needed

H. Field Work Organizational Issues (Classroom and Field)

- a. Identifying the workforce and matching them to the work
- b. Organizing workdays

I. Specific Interventions (Field)

- a. Site Drainage
- b. Adobe repair
- c. Roofs
- d. Wood elements
- e. Plasters
- f. Ruins Stabilization with capping and amended mortars

VIII. The Pertinence of Preservation in the 21st Century
(Classroom and Field) *Ongoing*

- A. Why do we care?
- B. Why do we expect our children to care?
- C. The growing inventory of historic buildings and their potential as usable, affordable structures.
- D. Skill vs Labor in Preservation Projects

CURRICULUM

1996 Curriculum
CCP/NCPTT

Zuni, New Mexico

- I. Introduction (Classroom)
 - A. Cornerstones, Its History and Mission 3.4.96
 - B. The CCP Partnerships with NCPTT, U/Penn, Iowa 3.4, 3.11, 5.28.96
 - C. Goals and Objectives 3.4.96
Crocker, Norton, Kennedy

- II. The Physical Setting (Classroom/field trips)
 - A. Geography and Topography of the Zuni District 3.11.96
 - B. Materials: morphology, geology, typology 3.11.96
 - 1. Materials dictate architecture 3.8 - 3.16.96
 - 2. locations of local materials resources 3.4 - 9.20.96**Enote, Atkin, Tshowna, Laate**

- III. The Cultural Setting (Classroom)
 - A. Zuni history 3.9, 9.5.96
 - B. The advent of the Spanish 3.9.96
Seowtewa

- IV. History and Traditions of Architecture in New Mexico (Classroom/field trips)
 - A. Pre-contact architecture in the Zuni District 5.16.96
 - B. The Style of the Spanish and its Moorish Origins 3.17, 5.16.96
Neha, Penketewa, Atkin, Crocker

- V. The Preservation in New Mexico (Classroom)
 - A. The State Historic Preservation Office 8.16.96
 - B. NM State Monuments
 - C. Local Preservation Organizations 8.3.96
 - D. Private and Non-Profit Initiatives 8.2.96
Hardy, Taylor, Crocker

VI. Technical Preservation Issues Applying to all Styles of Architecture (Classroom/field trips/laboratory/hands-on)

- A. Moisture related pathologies
- B. Compatibility of Materials

Von Bachmayr, Playdon, Atkin

VII. Issues Pertaining to Specific Materials: Earth as a Building Material, its History and Tradition.

A. The Materials, their characteristics, applications and modifications. (Field, Classroom) **Toshowna, Laate, Neha 3.4 - 9.13.96**

B. The Styles to Which Earthen Architecture Lends Itself (Classroom) **7.23.96**

- a. residential
- b. commercial
- c. communal

Crocker

C. Typologies of Earthen Architecture (Field and Classroom) **5.16, 7.23.96**

- a. adobe
- b. pressed block
- c. rammed earth
- d. cob
- e. cod
- f. etc.

Tsethlikai, Crocker

D. Pathologies (Field, Classroom, Lab) **3.12, 5.16, 7.8 - 9.28.96**

- a. moisture related
- b. materials related
- c. site related
- d. use related

Morgart, Crocker, Taylor, Atkin

E. Emergency Stabilization (Field) **6.21.96**

- a. Safety issues
- b. Shoring

Neha, Crocker

- F. Assessments (field, classroom) 6.17 - 9.26.96
 - a. Visual assessments
 - b. Documentation
 - c. Monitoring
 - d. The role of architects, engineers and contractors in assessments
 - e. Historic Structure Reports
Dishta, Morgart, Werito, Anyon, Atkin, Crocker, Miles, Creasy, Lazor

- G. Planning Interventions (Field and Classroom)6.10 - 6.26.96
 - a. Selection of sites
 - b. Permitting: Section 107(f) of UBC, Section 106 in HUD.
 - c. Historic sites as a venue for vocational training
 - d. Should volunteerism play a role?
 - e. Finding the technical assistance needed
Dishta, Morgart, Dumont, Crocker, Hardy

- H. Field Work Organizational Issues Classroom and Field) 3.3 - 9.15.96
 - a. Identifying the workforce and matching them to the work
 - b. Organizing workdays
Toshowna, Laate, Neha, Morgart

- I. Specific Interventions (Field)
 - a. Site Drainage **Crocker** 3.3.96
 - b. Adobe repair **Toshowna, Crocker** 6.25.96
 - c. Roofs **Playdon, Atkin** 3.11 - 3.15.96
 - d. Plasters **Toshowna, Laate, Crocker** 6.25, 7.25, 8.12.96
 - e. Ruins Stabilization with capping and amended mortars **Morgart, Werito** 7.8 - 9.28.96

VIII. The Pertinence of Preservation in the 21st Century
(Classroom and Field) *Ongoing*

- A. Why do we care?
- B. Why do we expect our children to care?
- C. The growing inventory of historic buildings and their potential as usable, affordable structures.
- D. Skill vs Labor in Preservation Projects

Staff

INSTRUCTORS

- Wapton Tshowna, Bennie Laate and Paul Neha, Francis Tsethlikai, Zuni mentors
- Joseph Dishta, Director Zuni Heritage and Historic Preservation Office.
- Tony Atkin, faculty, U/Penn
- Ricky Penketewa, UNM Construction Trades instructor, Zuni
- Anita Hardy, State Historic Preservation Division
- Lisa Miles, landscape architect, Pennsylvania
- Elga Jefferis, Bob Lazor, Joan Young; architectural interns, U/Penn
- Bob Creasy, architectural intern, Yale University
- Terry Morgart, ruins stabilization specialist, National Park Service
- André Dumont, technical writing specialist, Santa Fe
- Michael Romero Taylor, New Mexico State Monuments
- Tom Kennedy, Executive Director, A:shiwi A:wan Museum and Heritage Center
- Jay Norton, Deborah Muenchrath, Jon Sandor: Iowa State University
- Barbara Zook: historical architect, executive director, Cornerstones
- Ed Crocker: technical director, Cornerstones
- Alfred Von Bachmayr, architect with Earthworks
- Dennis Playdon, landscape architect, faculty U/Penn
- Cecil Werito, ruins stabilization technician, Chaco Culture National Monument.

1996 Trainees CCP /NCPTT
Zuni

Trainees from Zuni:

Bradley, Brady
Hechilay, Roderick
Martinez, Marcus
Soseeah, Averil
Soseeah, Harland
Soseeah, Harley
Waikaniwa, Rodney
Waikaniwa, Clifford
Chimoni, Calvin
Dewa, Anthony
Deysee, Tammy
Lucio, David
Hooee, Wayne.
Vacit, Lawrence
Cheama, Albert
Tsipa, Noreen
Waatsa, Kristy
Bobelu, Lisa
Coonsis, Colin
Dewesee, Breon
Edaakie, Kinsey
Edaakie, Garriett
Gasper, Dilbert
Laate, Orlandy
Martza, Amanda
Martza, Terrence
Nastacio, Jay
Quam, Gerard
Yamutewa, Corwin
Galper, Shalie
Quandalacy, Preston
Pablito, Tim
Sweetwyne, Makossa

From Hopi

Harvey, Everett David
Koruh, Jr., Frederick
Malkewa, Donald
Mote, Bernadine
Namingha, Wilber
Nutumya, Maurice
Patterson, Shanna Marie
Stacey, Joseph
Talayumptewa, Raymond, J.

U/Penn

Creasy, Robert
Jefferis, Elga
Lazor, Peter
Miles, Lisa
Young, Joan

1996 Curriculum

CCP/NCPTT

Mora, New Mexico

- I. Introduction (Classroom) Week of 6/17/96
 - A. Cornerstones, Its History and Mission
 - B. Goals and Objectives
 - C. CCP Partnerships with NCPTT, National Park Service and Communities

- II. Preservation Philosophy Week of 6/17/96
 - A. Preservation program of Fort Union National Monument
 - B. Conservation methods - University of Pennsylvania
Conservation program of lime plasters

- III. Ruins Preservation Methods and Materials Week of 6/17/96
 - A. National Park Service - Fort Union Preservation Crew
Preservation of historic adobe walls at Fort Union
 - B. Methods for preserving historic adobe ruins at Fort Union

- IV. Mud Plaster on Historic Adobe Structures Week of 6/17/96
 - A. Selection of appropriate materials
 - B. Wall preparation
 - C. Specifications and mixing of mud plaster
 - D. Application of mud plaster

- V. Inspection, Evaluation and Documentation Week of 6/24/96
 - A. Adobe deterioration problems
 - B. Technical building inspection of three historic structures
 - C. Graphic documentation of historic structures

- VI. Cultural Significance of Adobe Mission Churches Week of 6/24/96
 - A. Cultural traditions of San Rafael Church, La Cueva
 - B. The Mayordomo System (lay church caretaking)

- VII. Site Grading Week of 7/1/96
 - A. Removing earth adjacent to walls
 - B. Removing vegetation adjacent to walls
 - C. Creating positive drainage away from walls

- VIII. Mud Plastering Historic Adobe Structures Week of 7/8/96
 - A. Removing cement plaster
 - B. Applications of scratch and finish coats of mud plaster

- IX. Phase I of Restoration of Historic Adobe Structures Weeks of 7/15/96, 7/22/96
 - A. Selective Demolition
 - B. Regrading

- X. Phase II of Restoration of Historic Adobe Structures Week of 7/29/96
 - A. Stone Foundations
 - B. Adobe Blocks - Selection, Repair Procedures
 - C. Viga (Round Wood Beams) Repairs

- XI. Phase III of Restoration of Historic Adobe Structures Week of 8/5/96
 - A. Rough Framing
 - B. Wood Windows and Doors
 - C. Final Exterior and Interior Finishes

CCP/NCPTT1996

Mora

TRAINEES

Patrick Gurule
Santiago Bustos
Danielle Medina
Rebecca Sanchez
Valerie Sanchez
Frances Lovato
Gerald Romero
Joaquin Casias
Paul Gallegos, Jr.
Janel Valdez
Marino Olivas
Benjie Sanchez
Bernadette Maestas
Wanda Martinez
Dominic Olivas
Manuel Martinez

INSTRUCTORS

Community Elders

Charlie Weber
Joe Weber
Randy Espinoza
Felix Vigil

National Park Service

Albert Dominguez, Preservation Crew Leader

Conservators

Ann Brackin

Cornerstones Community Partnerships

Antonio Martinez, Community Projects Manager
Francisco Unvina, Intern Architect
Sam Baca, Program Coordinator

TRAINING MATERIALS

Walking Tour of Middle Village

PHOTO ASSIGNMENTS

July 19, 1996

Respond to the following through photography. Then write a short note on why the picture responds to the question, in your own mind. There are no "right" and "wrong" answers. You can keep the cameras until tomorrow morning, so you have 24 hours for this assignment.

1. TAKE A PHOTOGRAPH OF THE TYPE OF WORK YOU HAVE ENJOYED MOST THIS SUMMER.

2. OF THE BUILDINGS HAVE WORKED ON THIS SUMMER, WHICH MEANT THE MOST TO YOU?

3. WHICH BUILDING IN ZUNI HAS CHANGED THE LEAST DURING YOUR LIFETIME?

4. WHICH BUILDING HAS CHANGED THE MOST?

5. WHAT HAS CHANGED FOR THE BETTER?

6. WHAT HAS CHANGED FOR THE WORSE?

7. OF THE NEW CONSTRUCTION YOU SEE IN ZUNI, WHICH DO YOU LIKE THE BEST?

8. WHICH DON'T YOU LIKE SO MUCH?

9. OF THE PEOPLE YOU HAVE BEEN INVOLVED WITH THIS SUMMER, WHO TAUGHT YOU THE MOST?

10. TAKE A PICTURE OF THE ONE THING YOU DID THIS SUMMER OF WHICH YOU ARE THE MOST PROUD.

11. TAKE A PICTURE OF THE SCENE YOU SEE AS YOU LEAVE YOUR HOUSE IN THE MORNING.

12, 13, 14. TAKE ONE PHOTOGRAPH OF (1). A PERSON(OR PEOPLE)
(2) A SCENE AND (3) A BUILDING THAT YOU WOULD WANT TO
CARRY WITH YOU IF YOU HAD TO LEAVE ZUNI FOR A LONG TIME.

USE THE REST OF THE FILM TO TAKE PICTURES OF ANYTHING YOU WANT.

Please answer the following questions. Use additional pages if needed.

What worked effectively about this program?

What were the biggest challenges to operating this program?

What changes would you like to make to the curriculum to improve it?

What changes did you notice in the youth who participated in this program?

In what ways has the training helped any of these youth to secure meaningful employment?

What else would you like to say about your experience and/or the program?

Name:

Address:

PHOTOS FOR COMPARISON

Cover of Book

Plates: CI, LIX, LVII, LXXXI, LXXXII

Figures: 98, 110

WALKING TOUR OF MIDDLE VILLAGE
AUGUST 9, 1996

PHOTOGRAPHIC ASSIGNMENTS

As part of this exercise, each trainee should take six photographs based on the following assignments, and six more that you consider important as a result of the tour and discussions.

You don't have to take the pictures in the order presented. Use your photo data sheet to indicate which photo goes with which idea.

* * *

Don't think about the first three assignments. Just let your intuition guide you:

- What scene *DEFINES* the character of Zuni in your mind. This scene might include a building, an open space, a landscape, a person, a garden, a combination, or something completely unexpected.
- Which scene best represents Zuni's past?
- Which scene best represents what you think Zuni should be like in the future?

Now Think:

- You are all learning a craft. Look for scenes that incorporate the craft of stone masonry. Take a picture of the scene that represents the best use of *SKILL* in this craft.
- Look closely at other types of craftsmanship. Take a detail shot of the best you find. Don't limit yourself to stone masonry here. Maybe the best craftsmanship you see will be an adobe wall, a roof, an oven, a doghouse or something else.
- Finally, pick a building, a wall, a window frame, or anything else that you wish you had had a chance to work on. On the photo data sheet, use as many lines as necessary to tell why you would have liked to work on it.

NATIONAL PARK SERVICE/CORNERSTONES
Wupatki/Walnut Canyon Masonry Stabilization Program

Photo Assignments

T. Morgart and E. Crocker
August 26, 1996

INTRODUCTION

The Hopi and Zuni Trainees have all spent enough time at Wupatki and Walnut Canyon to have come to some conclusions about the training program.

This assignment has two parts:

1. Respond to the following questions and statements with photographs.
2. After you have gotten the photos back, label them, and tell why you think they respond to the questions. We will do a workshop on this, both in Hopi and in Zuni.

There are no right and wrong answers. The purpose of this exercise is for you to look at the work you are doing from a different point of view. Let the camera speak for you.

ASSIGNMENT

FIRST, write your name on the cameras and on the question sheet.

SECOND, when you take a picture that responds to the question, write the number that appears on the camera next to the question on the sheet. If you don't want to respond to a question, leave it blank.

THIRD, by Sunday, September 1st, give the cameras and question sheets to David Lucio or Wilbur Namingha. The film will be developed and you will get one set of prints. We will keep the negatives, but will provide additional copies of any prints you want.

Pg. 2

1. Take a photograph of the Hopi/Zuni team at work.
2. Take a photograph of the work that you as a team have done at Wupatki.
3. Take a photograph of the best work that you, individually, have done at Wupatki or Walnut.
4. Take a photograph of the best work that was done before you came to either Wupatki or Walnut.
5. Take a photograph of the worst work done before you came to Wupatki or Walnut.
6. Take a photograph of something or someone you didn't agree with during the training.
7. Who taught you the most during the training program?
8. At home, in either Hopi or Zuni, take a photograph of a building that you might be able to restore using what you have learned.
9. At home, take a photograph of a building which has been restored recently.
10. At home, take a photograph of a building which doesn't fit in.
11. At home, take photograph of someone or something that you would want to remember if you had to leave for a long time.

Use the rest of the photos any way you like.

SOLAR ADOBE DESIGN

May 16, 1996

Paul Neha, Ricky Penketewa, Ed Crocker

I. Background: Where did adobe come from?

Around ten thousand years ago, human beings began building cities. The earliest cities are built of EARTH.

Before cities, people lived in smaller social units, sometimes not larger than an extended family. They also used the most readily available material to build with. EARTH.

The oldest city we know is Jerico, in the Middle East. The oldest dwellings there were round, with stone footings and mud brick walls. They are 10,000 years old.

From the Middle East, the use of mud bricks traveled to Egypt. Five thousand years ago, the Egyptians were building homes, temples and cities of sun dried bricks that they called "tob"

From Egypt, mud bricks travelled across northern Africa to Morocco. The pronunciation of the Egyptian word "tob" became "thob-e".

When the Moors invaded Spain, they carried with them the earthen technology which in Spanish came to be called "adobe".

When the Spanish (really a black African and a French Priest) made contact with the Zuni's, they found another type of earthen building - stone laid up in mud. When the later Spaniards decided to build a church here, between 1621 and 1629, they introduced adobe, a combination of red sand (clay), white sand and straw.

II. How Prevalent is the use of adobe on a world wide basis?

Of the roughly five billion people living on this planet today, very nearly one half (2,500,000,000), according to the best available census figures, live in homes built of unbaked earth.

Some statistics on unbaked earth:

Homes built today in Perú 60%

In India 72.2% (1971 figure)

(this translates to 67 million houses)

In the US in 1980 there were 176,000 homes recorded as built of unbaked earth. The actual number is now known to be far higher

In California, construction in adobe increases by 30% annually.

In New Mexico today, the commercial production of adobes exceeds 5,000,000 blocks. This does not include individuals building their own structures.

There are earthen houses in:

Upstate New York, Nebraska, Sydney Australia, Germany, the Netherlands, Panama, Finland, Vietnam, Russia, Brazil, England and practically everywhere else.

On every continent, save Antarctica.

In every climatic zone, including arctic

III. What are the different technologies of building with earth?

The most ancient is called *trogolyditic*. It is the simple process of occupying a natural or man-made cave or rock shelter. Often the walls of the cave were modified to accomodate living functions (cooking), storage, and decoration.

Direct Shaping is one of the oldest techniques for building in the open. It makes use of very plastic earth which is modeled into walls or blocks without the use of molds or forms. Many Puebloan structures were built of *coursed earth*, layers of mud stacked in coursed until a given height is reached.

Rammed earth or *Pisé*, is the process of using wooden forms and compacting the damp earth between them. The forms are moved up the wall to begin a new course. In the south of France, architects tried doing an inventory of *Pisé* buildings but gave up when the count reached 10,000 and they had only covered a small fraction of the geographic area.

The stacking of earthen balls and tamping them into place with hands or feed is called *Cob*.

Wattle and daub, technique uses a wooden or bamboo lattice or netting over which the mud is applied. Also called *Quincha*, this method is widespread in tropical countries.

Straw-clay is the binding of large amounts of straw with very wet clay to form various building

components such as blocks, insulating panels and floors.

Sod or *Terrone* construction uses blocks of soil bound together with large quantities of roots and organic material which are cut directly out of the earth.

Adobe is to us the most familiar method of building with earth. It uses sun dried blocks made either by hand or by machine.

Compressed earth blocks are manufactured in hand operated or engine driven presses. They have exceptionally high compressive strength, are inexpensive to produce and very easy to lay.

IV. How durable is earth as a building material?

Does moisture hurt earthen walls? No, if the wall has a protective footing and the plaster is permeable, the earth can get wet, even very very wet in practically infinite cycles. If the wall can dry out, it is safe to let it get wet.

-What is the function of:

Footings?

mortars?

plasters?

roofs?

-What do these elements protect?

There is an old adage "don't go out in the rain without boots and a hat" that is often applied to earthen buildings. If a structure is on a good footing and has a good roof, maintenance will be minimal and longevity maximized. It is not unusual to see a 15 year maintenance cycle for mud plasters on a well constructed building.

How do earthen buildings do in earthquakes?

-The ladder belts in Macedonia

-*Taq* and *Daajii-dwari* in Kashmir

-The Getty Seismic Adobe Project

V. Soil characterizations

What is Soil?

Soil is one stage in the long process of the deterioration of rocks.

It comes in an infinite variety, depending on the "parent" rock, and the climate.

How can we describe the "type" of Zuni soils?

Is there more than one type?

Does Zuni history and storytelling give any clues about how the soils were formed?

What kind of rock is producing them?

The white sands are sedimentary from Triassic and Jurassic sandstones

The red sands (clays) are eroded from granites in

the Zuni Mountains

Are Zuni Soils good for building?

How did your ancestors make the best use of the soils as a building material?

What types of structures did they build?

What are the characteristics of Zuni soils?

Color

Texture

Variety

Permeability (porosity)

Some of the other important characteristics are:

Grain size and distribution (granulometry)

Adhesion/cohesion (Why is this important in

building? Do you want the soil to stick together?)

Water Retention

Some simple field tests for soil characteristics

Grain size and distribution by "Shake Test"

What do the results tell about building characteristics?

Adhesion/cohesion:

- Make a roll of mud about 3/4 inch diameter
- With the roll in the palm of your hand, begin flattening it between your thumb and forefinger so that it forms a ribbon about 1/2 inch wide and as long as possible as it hangs out of your hand.

If the ribbon is long (10 to 12 inches, there is a high clay content.

If the ribbon is short (2 to 4 inches, there is a low clay content.

If you can't make a ribbon, there is a very low clay content, or no clay at all.

Plasticity

This is the ability of a mud to be deformed without cracking or crumbling. It is important that muds be plastic, or workable, during application. It is also a characteristic of muds that a plastic sample will be more durable than a non-plastic one. Plasticity is manipulated by the content of the two main ingredients of the mud; the aggregate (of white sand) and the clays/silts (the red sand).

Add enough water to the soil mix so that you can roll a ball of mud about 1 1/2" in diameter between your hands. Once the ball is smooth, squash it between your thumb and forefinger until the middle of the ball is about 1/2 inch thick.

The fewer the cracks and separations, the more plastic it is.

If chunks fall off, plasticity is low

If the ball holds together with only small cracks around the edge of the "wheel," plasticity is high.

Water Retention

- Make a ball of mud about an inch and a half in diameter. Moisten the ball with as much water as it takes to be workable and not sticky.
- Slightly flatten the ball and hold it in the palm of your hand. With your other hand at a right angle, begin striking the side of the hand that holds the ball. Strike it vigorously until water begins to run out.
- Press the ball between the thumb and forefinger

If five or six blows are enough to bring the water out, and when you press it the ball crumbles, you have very fine sands or coarse silts.

If it takes 20 to 30 blows to bring the water to the surface, and when pressed the ball does not crack or crumble, you have silty clay.

If you can't bring the water to the surface and when pressed the ball remains shiny, you have a very clayey soil.

The Nibble test:

Nibble the soil. Crush it lightly between the teeth. Enjoy the sensation. Describe it. Is the soil disagreeably sandy or delightfully smooth and floury? Can you determine good soils for building by nibbling on them?

Some tests of soil characteristics:

Grain size and distribution by "Shake Test"

What do the results tell about drainage and adhesive characteristics?

Adhesion/cohesion:

•Make a roll of mud about $\frac{3}{4}$ inch diameter •With the roll in the palm of your hand, begin flattening it between your thumb and forefinger so that it forms a ribbon about $\frac{1}{2}$ inch wide and as long as possible as it hangs out of your hand.

If the ribbon is long (10 to 12 inches, there is a high clay content.

If the ribbon is short (2 to 4 inches, there is a low clay content.

If you can't make a ribbon, there is a very low clay content, or no clay at all.

ZUNI MENTORSHIP PROGRAM
Cornerstones
National Center for Preservation Technology and Training

SCHEDULE OF ACTIVITIES FOR THE WEEK OF MARCH 11, 1996

Monday: 8:00 AM. Guest Speaker Alfred Von Bachmayr will discuss the economic and environmental advantages of earthen architecture. The workshop will be held at the stoneyard, at the site of the model home. Listen for such words and phrases as "embodied energy," "R-factor" and "N-factor". Be sure you understand their meanings.

After the introduction, we will use the adobe press to make blocks for the home.

Tuesday: Work in the quarry, stoneyard and park. BE SURE TO DO THE ASSIGNED READING FOR THE CLASSWORK TO BE HELD LATER IN THE WEEK.

Wednesday

Guest speakers Dennis Playdon and Tony Atkin of the University of Pennsylvania, 11:00, Room 3, Twin Buttes Building.

All trainees and instructors will be guests of the Cornerstones for lunch. The speakers will describe the role of the U/Penn in historic preservation projects in Zuni, as well as their potential role in new construction using local resources. They will introduce you to the concept of "Cultural Landscapes". After lunch we will do a walking tour of Zuni looking at various types of buildings and construction. Be thinking about what it is that makes Zuni special to you, individually, and to you generally as a member of the community.

The speakers will ask you to compare the Zuni of today with the Zuni of 100 years ago when "*A Study of Pueblo Architecture in Tusayan and Cibola*" was written. Try to identify photographs in the book which you can compare to the present day village. (Consider these photos for comparison: Cover of Book, Plates: CI, LIX, LVII, LXXXI, LXXXII, Figures: 98, 110)

You will also be introduced to methods of documenting, or recording historic buildings, including photographic documentation. Cornerstones will provide each trainee with a disposable camera, a photo data sheet, and a photo assignment sheet.

Thursday

Morning: Guest speaker Joe Dishta of the Zuni Heritage and Historic Preservation Office
8:30, Room 3, Twin Buttes Building.

Joe will explain the history and role of the "ZHHPO" and its relationship with the State Historic Preservation Division. Terms such as "Historic Zone" and "Contributing Building," will be explained using examples in Zuni. This segment of classwork will help you understand the philosophy of preservation and how you may want to apply it to your work in Zuni.

ZUNI MENTORSHIP PROGRAM

Cornerstones

National Center for Preservation Technology and Training

READING ASSIGNMENTS

The text for all trainees is Victor Mindeleff's *Study of Pueblo Architecture in Tusayan and Cibola*. *Tusayan* is the archaic, or old, name for the Hopi region, and *Cibola* is the archaic name for the villages in the Zuñi area.

This book was chosen because it contains the best descriptions of the buildings in both areas a hundred years ago. It also dedicates some time to recognizing the importance of Zuñi and Hopi religious beliefs in their choices of places to live and methods of construction. The book is especially appropriate for use by trainees in the Quarry Project because it acknowledges the historic friendship of the Zuñi and Hopi which is continuing today.

Assignment for week of June 10, 1996:

Familiarize yourselves with the book.

Spend some time looking over the table of contents on pages 5, 6 and 7. You will notice that Mindeleff dedicates more space to Tusayan than to Cibola. This is because he spent more time there, and because there were more inhabited villages to describe.

Look carefully at the illustrations throughout the text. Look for similarities and differences between what Mindeleff recorded and what you see today. Train your eye to recognize the different techniques used in building. Compare the drawings on Plate V and Plate XI. How are they alike and how do they differ? Do you see a style in Zuñi that is not recorded in the book, and must have come after Mindeleff visited during the 1800's?

Examine the plans of the villages. How does the plan of Zuñi on Plate LXXVI (14 pages after pg. 134) compare with what you see today? Locate the main plaza on the plan and note how many houses surrounded it in 1891. Do the same with Oraibi.

Begin to give some thought to how your work in the Quarry and on the Memorial Wall may make a difference in the appearance of Zuñi a hundred years from now.

Soil:
The Common Denominator in
Architecture and Agriculture

Twin Buttes HS
6.10.96

What is Soil?

Soil is one stage in the long process of the deterioration of rocks.

It comes in an infinite variety, depending on the "parent" rock, and the climate.

How can we describe the "type" of Zuni soils?

Is there more than one type?

What kind of rock is producing them?

Is there evidence that these rocks resulted from water deposits (as opposed to volcanos or glaciers)?

Does Zuni history and storytelling give any clues about how the soils were formed?

Are Zuni Soils good for Agriculture? For Building?

How did your ancestors make the best use of the soils?

Where did they farm?

What did their farms look like?

Does the appearance of a waffle garden give you any hints about soil and climatic conditions?

What were the characteristics of the soils?

Did they drain well, or did they retain water?

Where did the water come from?

Was it plentiful?

How did the waffle garden design help conserve water?

How does design (the ridges and certain-sized squares) relate to the soil characteristics?

Where did your ancestors build?

What are the similarities in their use of soil in building as compared to farming?

LAB

What *are* the characteristics of Zuni soils?

Describe Zuni soils:

Color

Texture

Variety

Permeability

Ability to sustain plant life

Some of the other important characteristics are:

- Grain size and distribution (granulometry)

- Adhesion/cohesion (Why is this important in horticulture? Do you want the soil to stick to the roots?)

- Water Retention

- Ph

Some tests of soil characteristics

Grain size and distribution by "Shake Test"

What do the results tell about drainage characteristics?

Adhesion/cohesion:

- Make a roll of mud about 3/4 inch diameter
- With the roll in the palm of your hand, begin flattening it between your thumb and forefinger so that it forms a ribbon about 1/2 inch wide and as long as possible as it hangs out of your hand.

If the ribbon is long (10 to 12 inches, there is a high clay content.

If the ribbon is short (2 to 4 inches, there is a low clay content.

If you cant make a ribbon, there is a very low clay content, or no clay at all.

SITE MAPPING

June 17, 1996

E. Crocker

There are many ways to map sites and buildings. Among the more common (and the most accurate) methods nowadays is the use of satellites. A surveyor using this method sends a signal to two geostatically orbiting stellites and by receiving the signal back can identify a point anywhere on the Earth's surface within a couple of inches. This method requires very expensive equipment.

There are two methods that require very little equipment which are good for mapping small areas.

TRIANGULATION uses two fixed points (equivalent to the satellites in space) from which other points can be measured. This "plotting" shows the relationship of the points to one another and is very accurate depending on the care of the mappers and the size of the project. The only tools required are a long measuring tape, architects' scale, paper and pencil.

ALIDADE AND PLANE TABLE mapping uses an optical instrument (the alidade) which is moved freely over a flat surface with a piece of paper attached (the plane table). Other tools needed are a long tape measure, sharp pencils, a stadia pole or plumb line, a pin, a chaining pin, and a plumbing fork.

The plane table represents the plane of the earth to be mapped. It is set up in such a way that the area to be mapped will fit on the space on the table.

On the plane table, the mapper inserts a pin which will be the datum. This point corresponds to a chaining pin in the ground directly underneath it (determined with the plumbing fork) from which measurements to different points are made.

By placing the edge of the alidade against the datum (pin) on the plane table, and sighting to a stadia pole or plumb line, the mapper can place points on the paper which correspond to points on the ground. This is done in two steps: one, the sightline between the plane table and the site is established and, two, the measurement from the pin in the ground to the point on the site is taken. This measurement is then "scaled down" using the architects' scale to fit on the paper. If you are mapping a rectangular room and you "shoot" the four corners and "scale" them in, you can connect the four dots on the plane table and have on paper an accurate representation of the real room.

The whole point of mapping is to create an accurate representation on paper of the real object. There are many possibilities for losing accuracy, among them; not holding the tape tightly, or letting it snake around bushes and rocks, jostling the plane table, moving the alidade after a shot has been taken, using the wrong scale to plot in certain points, and not keeping the base of the alidade against the pin when sighting.

Among the information that should always be printed on the map are:

- a north arrow
- the site name and location
- the mappers' names
- the date
- the scale used

Each "feature" which is mapped should be labeled. For example:

- "property corner"
- "bread oven"
- "arroyo" (indicated by a dash-dot line)
- "fence"

ZUNI MENTORSHIP PROGRAM
Cornerstones/NCPTT

READING ASSIGNMENT FOR WEEK OF JULY 15, 1996

Text: Victor Mindeleff's *Study of Pueblo Architecture in Tusayan and Cibola*.

Pgs. 100-104. Pay special attention to the last few sentences on page 101 which describe the use of mud mortar and irregularly shaped stones. This is how it was done in Oraibi where the lack of water resulted in a very thin mortar joint.

Page 137. This is probably the most interesting section of the book for those interested in why buildings were built the way they were. Read as much of the chapter Details of Tusayan and Cibola Construction as you find interesting. At the very least, read to the bottom of page 139 so that you will understand why adobe began to be used in Zuni. Note the comment in the middle of page 138 that "Zuni builders preferred to use stone."

Spend plenty of time looking at the illustrations of construction details.

NOTES ON ADOBE
CORNERSTONES/ZUNI

July 23, 1996

Ed Crocker

repeat of 5-18-96

I. Background: Where did adobe come from?

Before cities, people lived in small social units, sometimes not larger than an extended family. They used the most readily available material to build with. EARTH. Sometimes, their shelters were little more than modified caves.

Around ten thousand years ago, human beings began building cities. The earliest cities are built of EARTH.

The oldest city we know is Jerico, in the Middle East. The oldest dwellings there were round, with stone footings and mud brick walls. They are 10,000 years old.

From the Middle East, the use of mud bricks traveled to Egypt. Five thousand years ago, the Egyptians were building homes, temples and cities of sun dried bricks that they called "tob"

From Egypt, mud bricks travelled across northern Africa to Morocco. The pronunciation of the Egyptian word "tob" became "thob-e".

When the Moors invaded Spain, they carried with them the earthen technology which in Spanish came to be called "adobe".

When the Spanish (really a black African and a French Priest) made contact with the Zuni's, they found another type of earthen building - stone laid up in mud. When the later Spaniards decided to build a church here, between 1621 and 1629, they introduced adobe, a combination of red sand (clay), white sand and straw.

II. How Prevalent is the use of adobe on a world wide basis?

Of the roughly five billion people living on this planet today, very nearly one half (2,500,000,000), according to the best available census figures, live in homes built of unbaked earth.

Some statistics on unbaked earth:

Homes built today in Perú 60%

In India 72.2% (1971 figure)

(this translates to 67 million houses)

In the US in 1980 there were 176,000 homes recorded as built of unbaked earth. The actual number is now known to be far higher

In California, construction in adobe increases by by 30% annually.

In New Mexico today, the commercial production of adobes exceeds 5,000,000 blocks. This does not include individuals building their own structures.

There are earthen houses in:

Upstate New York, Nebraska, Sydney Australia, Germany, the Netherlands, Panama, Finland, Vietnam, Russia, Brazil, England and practically everywhere else.

On every continent, save Antarctica.

In every climatic zone, including arctic

III. What are the different technologies of building with earth?

The most ancient is called *trogolyditic*. It is the simple process of occupying a natural or man-made cave or rock shelter. Often the walls of the cave were modified to accommodate living functions (cooking), storage, and decoration.

Direct Shaping is one of the oldest techniques for building in the open. It makes use of very plastic earth which is modeled into walls or blocks without the use of molds or forms. Many Puebloan structures were built of *coursed earth*, layers of mud stacked in courses until a given height is reached.

Rammed earth or *Pisé*, is the process of using wooden forms and compacting the damp earth between them. The forms are moved up the wall to begin a new course. In the south of France, architects tried doing an inventory of *Pisé* buildings but gave up when the count reached 10,000 and they had only covered a small fraction of the geographic area.

The stacking of earthen balls and tamping them into place with hands or feet is called *Cob*.

Wattle and daub, technique uses a wooden or bamboo lattice or netting over which the mud is applied. Also called *Quincha*, this method is widespread in tropical countries.

Straw-clay is the binding of large amounts of straw with very wet clay to form various building

components such as blocks, insulating panels and floors.

Sod or *Terrone* construction uses blocks of soil bound together with large quantities of roots and organic material which are cut directly out of the earth.

Adobe is to us the most familiar method of building with earth. It uses sun dried blocks made either by hand or by machine.

Compressed earth blocks are manufactured in hand operated or engine driven presses. They have exceptionally high compressive strength, are inexpensive to produce and very easy to lay.

IV. How durable is earth as a building material?

Does moisture hurt earthen walls? No, if the wall has a protective footing and the plaster is permeable, the earth can get wet, even very very wet in practically infinite cycles. If the wall can dry out, it is safe to let it get wet.

-What is the function of:

Footings?

mortars?

plasters?

roofs?

-What do these elements protect?

There is an old adage "don't go out in the rain without boots and a hat" that is often applied to earthen buildings. If a structure is on a good footing and has a good roof, maintenance will be minimal and longevity maximized. It is not unusual to see a 15 year maintenance cycle for mud plasters on a well constructed building.

How do earthen buildings do in earthquakes?

-The ladder belts in Macedonia

-*Taq* and *Daajii-dwari* in Kashmir

-The Getty Seismic Adobe Project

V. Soil characterizations

What is Soil?

Soil is one stage in the long process of the deterioration of rocks.

It comes in an infinite variety, depending on the "parent" rock, and the climate.

How can we describe the "type" of Zuni soils?

Is there more than one type?

Does Zuni history and storytelling give any clues about how the soils were formed?

What kind of rock is producing them?

The white sands are sedimentary from Triassic and Jurassic sandstones

The red sands (clays) are eroded from granites in

the Zuni Mountains

Are Zuni Soils good for building?

How did your ancestors make the best use of the soils as a building material?

What types of structures did they build?

What are the characteristics of Zuni soils?

Color

Texture

Variety

Permeability (porosity)

Some of the other important characteristics are:

Grain size and distribution (granulometry)

Adhesion/cohesion (Why is this important in

building? Do you want the soil to stick together?)

Water Retention

Some simple field tests for soil characteristics

Grain size and distribution by "Shake Test"

What do the results tell about building characteristics?

Adhesion/cohesion:

- Make a roll of mud about 3/4 inch diameter
- With the roll in the palm of your hand, begin flattening it between your thumb and forefinger so that it forms a ribbon about 1/2 inch wide and as long as possible as it hangs out of your hand.

If the ribbon is long (10 to 12 inches, there is a high clay content.

If the ribbon is short (2 to 4 inches, there is a low clay content.

If you can't make a ribbon, there is a very low clay content, or no clay at all.

Plasticity

This is the ability of a mud to be deformed without cracking or crumbling. It is important that muds be plastic, or workable, during application. It is also a characteristic of muds that a plastic sample will be more durable than a non-plastic one. Plasticity is manipulated by the content of the two main ingredients of the mud; the aggregate (of white sand) and the clays/silts (the red sand).

Add enough water to the soil mix so that you can roll a ball of mud about 1 1/2" in diameter between your hands. Once the ball is smooth, squash it between your thumb and forefinger until the middle of the ball is about 1/2 inch thick.

The fewer the cracks and separations, the more plastic it is.

If chunks fall off, plasticity is low

If the ball holds together with only small cracks around the edge of the "wheel," plasticity is high.