K aibeto C reek C ommunity

design and master plan for a new independent senior living community in Kaibeto on the Navajo Nation

November 2010

Kaibeto Chapter Foundation for Senior Living Tuba City Regional Health Care Corporation



THE DRACHMAN INSTITUTE COLLEGE OF ARCHITECTURE AND LANDSCAPE ARCHITECTURE THE LINUS ARZONA TUCSON ARIZONA



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Kaibeto Creek Community Credits

The information in this report is intended as guidance for the Kaibeto Chapter, the Foundation for Senior Living, and the Tuba City Regional Health Care Corporation (the partnership constituting "Project Partners") in informing decisions related to this project. The research, evaluation, and recommendations were achieved to the best knowledge and judgement of the Drachman Institute staff, students, and faculty, and is subject to verification by the *Project Partners* or other parties prior to implementation of any action.

All photos, renderings, drawings, charts, or other content were taken or generated by Drachman Institute staff unless cited otherwise.

Drachman Institute

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November 2010

The Drachman Institute is the research-based outreach arm of the College of Architecture and Landscape Architecture (CALA) at The University of Arizona dedicated to environmentally-sensitive and resource-conscious planning and design with a focus on underserved and vulnerable communities. We engage students, staff, faculty, and citizens as an interdisciplinary collaborative striving to make our communities healthier, safer, more equitable, and more beautiful places to live. We embrace a service-learning model of education serving the needs of communities while providing an outreach experience for students as a fundamental educational goal consistent with the mission of CALA and The University of Arizona.



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Kaibeto Creek Community Project Introduction

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Project Introduction

Project Summary

After years of discussion and ideas, the Kaibeto Chapter of the Navajo Nation, the Tuba City Regional Health Care Corporation, and the Foundation for Senior Living (*Project Partners*) established the Kaibeto Creek Community, LLC in the summer of 2009 as a partnership to engage in the planning and establishment of an independent senior living community. The concept for the community included independent senior residences, a common house, and a health clinic.

In September 2009, the Arizona Department of Housing accepted an application from the *Project Partners* for a technical assistance grant to work with the Drachman Institute to develop a schematic master plan as well as architectural schematic design for the senior residences. In November 2009, the Drachman Institute developed a Scope of Work which established the design collaboration with the *Project Partners* on this project.

Based on site constraints, coordination with the *Project Partners*, and feedback from community members, the Drachman Institute developed a series of alternate site plans that included residences, a community senior center, a health center, on-site staff housing, outdoor ceremonial space, outdoor recreational space, parking, and loading space. Additionally, the Drachman Institute developed alternate architectural designs for the independent senior living residences and community senior center.

The site plans and architectural designs and principles were presented to the *Project Partners* and other community members through a series of public community meetings and charrettes. These meetings were held at the Kaibeto Chapter House and were typically held in conjunction with Chapter meetings or senior center meetings and activities. Their feedback resulted in a final recommended master site plan and architectural designs for the independent senior living residences and community senior center. The primary focus of the plan was to develop a prototype community that exemplifies the best of sustainability, culture, and community connectivity for the "Elderlies" in the Kaibeto region.

The goal of this project and document, which presents the designs and master plan developed through that process, is to provide the *Project Partners* and the community with the information, knowledge, and momentum to move this project forward in providing an independent senior living community that provides local seniors a sustainable, healthy, and beautiful place where they can remain with their family and age in the place they call home.

Project Introduction

Project Timeline

September 2009	The <i>Project Partners</i> applied with the Arizona Department of Housing (ADOH) for a technical assistance grant.
September 28, 2009	ADOH accepted the <i>Project Partner's</i> application, which initiated work with the Drachman Institute.
November 24, 2009	A Scope of Work was developed by the Drachman Institute outlining the project scope and setting a preliminary schedule.
February 26, 2010	An initial kick-off and planning meeting was held between the Drachman Institute, ADOH, and the <i>Project Partners</i> in Kaibeto, Arizona on the Navajo Nation.
May 3, 2010	The first community presentation was held at the Kaibeto Chapter House. A public participatory design charrette followed a presentation of the project history, site analysis, case studies, and initial concepts to the <i>Project Partners</i> and community members.
May 3, 2010	The <i>Project Partners</i> developed and administered a survey to potential residents and other community members during the first community presentation.
August 4, 2010	The second community presentation was held at the Kaibeto Chapter House. Based on previous feedback, four alternate site plans and four alternate senior residence designs were presented to the <i>Project Partners</i> and community members for review and feedback.
November 23, 2010	The third (final) community presentation was held at the Kaibeto Chapter House. Based on all feedback, a final master site plan and architectural designs of the senior residences and community senior center were presented to the <i>Project Partners</i> and community members for review and feedback.

Kaibeto Creek Community Presentation 1

In coordination with the monthly Kaibeto Chapter meeting on May 3, 2010 at the Kaibeto Chapter House, Drachman Institute staff made the first presentation to Chapter leaders, Tuba City Regional Health Care Corporation staff, Foundation for Senior Living representatives, and members of the Kaibeto community.

Information regarding the site selected by the *Project Partners*, a cultural study and review, examples and case studies of similar projects, and initial design concepts were presented for discussion and review. Following the slide presentation, Drachman Institute staff lead a community participatory design charrette. Participants were divided into three groups, and each table was provided with a laminated site plan, markers, and model pieces representing different programmatic elements (common house, health center, residences, etc.). Each group independently reviewed the design program and developed different ideas as to the layout and flow of the site. Three or four overall concepts were established by the participants. Additionally, the *Project Partners* administered a survey to help determine the needs and expectations of potential future residents and other community members.

The following pages include the information as presented. Also included are images of the design charrette, including photos of some of the design ideas that were generated through that process.

Kaibeto Chapter Foundation for Senior Living Tuba City Regional Health Care Corporation



Project History

 September 2009 – ADOH accepts application for technical assistance from Kaibeto Chapter, TCRHCC, & Foundation for Senior Living.

• November 2009 – Drachman Institute contacted "Project Partners" and developed a Scope of Work.

• December 2009 – Kaibeto Chapter designated 12-acre site for the senior living and health center project.

 February 2010 – Drachman Institute & ADOH staff met with "Project Partners" and members of the Kaibeto community to discuss the project scope and schedule and visit the proposed site.

• May 3, 2010 - Here we are...

Kaibeto

Location





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"The Drachman Institute ... is dedicated to environmentallysensitive and resource-conscious planning and design ... engaging students, staff, faculty, and citizens as an interdisciplinary collaborative striving to make our communities healthier, safer, more equitable, and more beautiful places to live."

Research + Outreach

- Students, Staff, and Faculty
- Planning
- Landscape Architecture
- Architecture

Today

Presentation

- 1. Site Analysis
- 2. Culture & Community
- 3. Case Studies and Examples
- 4. Initial Design Concepts

- Community Participation – Design Charrette

- 1. Presentation Feedback and Brainstorm Ideas
- 2. Design in Groups
- 3. Discuss Design Options



Chapter House









Culture

Earth & Sky Father Sky and Mother Earth Dwelling between the two



Culture

Emergence Concept Journey through 4 Worlds

First World – Black World Second World – Blue World Third World – Yellow World Fourth World – Glittering World



Culture

Concept of Time

Solar position/movement

- Ceremonies
- Stories

- Planting/harvesting
- hogan orientation
- daily renewal Four Times of Day



Richard Begay, 2001













33 modern structures and planning: Richard Begay, Senior Project 2001











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40



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Colorado Solar Hogan Demonstration College of Environmental Design, University of Colorado/Boulder, 1987-1990





modern structures and planning: The Solar Hogan Colorado Solar Hogan Demonstration College of Environmental Design, University of Colorado/Boulder, 1987-1990



modern structures and planning: The Solor Hogon Colorado Solar Hogan Demonstration College of Environmental Design, University of Colorado/Boulder, 1987-1990





Colorado Solar Hogan Der College of Environmental Design, U sign, Ur



Concept 'A' "Solstices" Initial Design Concepts site: organized along solar equinoxes and solstices Concept 'A' - "Solstices" linear "4 worlds" progression 0 2 separate entrances/ exits Concept 'B' - "4 Worlds" pedestrian connection and orientation along axis homes: • all individual entrances Concept 'C' - "Centered" face east hybrid hogan design 49 50 back porch









"Centered"

site: organized around a

- central "hogan" ramada in a radial pattern
- 1 main entrance/ exit with a formal covered drop-off & pick-up zone
- pedestrian connection along outside ring
- homes: not all individual entrances face east rather face the "street'
- modern design with adjacent parking
- focus on natural clerestory light







Today

- 3. Case Studies and Examples
- 4. Initial Design Concepts

- Community Participation – Design Charrette

- 1. Presentation Feedback and Brainstorm Ideas
- 2. Design in Groups
- 3. Discuss Design Options



Images from the Design Charrette.



Design Charrette - Table 2

Design Charrette - Table 3

Kaibeto Creek Community Presentation 2

In coordination with the Kaibeto Chapter planning meeting on August 4, 2010 at the Kaibeto Chapter House, Drachman Institute staff made a second presentation to Chapter leaders, the Kaibeto Chapter Land Use Planning Committee, Tuba City Regional Health Care Corporation staff, Foundation for Senior Living representatives, and members of the Kaibeto community.

Information regarding the site that was selected by the *Project Partners*, a cultural study and review, examples and case studies of similar projects, and initial design concepts were briefly reviewed. Results from the survey administered by the *Project Partners* at the previous presentation and the design charrette results were presented and discussed. Finally, the design program and goals as well as four concepts of the overall site design and of the individual residences were presented for review and feedback. Also, about 25 people completed a brief survey at the conclusion of the presentation regarding their responses to the design concepts presented.

The following pages include the information and design concepts presented.



Project History

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 September 2009 – ADOH accepts application for technical assistance from Kaibeto Chapter, TCRHCC, & Foundation for Senior Living.

• November 2009 – Drachman Institute contacted "Project Partners" and developed a Scope of Work.

• December 2009 – Kaibeto Chapter designated 12-acre site for the senior living and health center project.

 February 2010 – Drachman Institute & ADOH staff met with "Project Partners" and members of the Kaibeto community to discuss the project scope and schedule and visit the proposed site.

3

Today

- Review from last presentation
 - 1. Site Analysis
 - 2. Culture & Community
 - 3. Case Studies and Examples
 - 4. Initial Design Concepts
 - 5. Survey Results
 - 6. Charrette Results
- Presentation
 - 1. Design Program
 - 2. Design Priorities
 - 3. Updated Site Plan Design Concepts (four)
 - 4. Updated Residential Unit Design Concepts (four)
- Feedback
 - 1. Site Plan Selection: Choose one for Development
- 2. Unit Design Feedback



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Research + Outreach

- Students, Staff, and Faculty
- Planning
- Landscape Architecture
- Architecture

Project History (continued)

 May 3, 2010 – First community presentation and design charrette



Kaibeto

Location





Culture

Earth & Sky Father Sky and Mother Earth Dwelling between the two



Culture

Concept of Time

Solar position/movement

- Ceremonies
- Stories
- Planting/harvesting
- hogan orientation
- daily renewal Four Times of Day







Culture

Emergence Concept Journey through 4 Worlds

First World – Black World Second World – Blue World Third World – Yellow World Fourth World – Glittering World





traditional structures and materials



Community Design Charrette [5/3/2010] Community Design Charrette [5/3/2010] Design Concept, Table 1 Design Concept, Table 2 25 26 Community Design Charrette [5/3/2010] Community Design Charrette [5/3/2010] Design Concept, Table 2 Design Concept, Table 3 27 28 Community Design Charrette [5/3/2010] Community Survey, May 3, 2010 Design Concepts 20 Questions – 8 Survey Participants 30 29



Community Survey Responses [5/3/2010]

Question 7

"There will most likely be a lot of shared outdoor space on the property. Is it important to you that you also have private outdoor space adjacent to or near your home?"



Community Survey Responses [5/3/2010]

Question 8 [continued]

"Which activities/spaces would you prefer to see available at the new Kaibeto Creek Senior Living Community?"

"Yes" votes for:

- [5] Traditional Arts Studio
- [5] Library
- [4] Amphitheater
- [4] Gift Shop
- [4] Salon / Barber Shop
- [4] Classrooms
- [3] Covered Outdoor Space / Ramada
- [3] Computers / Internet Access
- [3] "Woodshop"

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Community Survey Responses [5/3/2010]

Question 10

"What is your preferred method of transportation?"



Community Survey Responses [5/3/2010]

Question 8

"Which activities/spaces would you prefer to see available at the new Kaibeto Creek Senior Living Community?"

"Yes" votes for:

- [7] Community Garden
- [7] Indoor Theater / TV Room
- [7] Visitor's Quarters for Guests
- [6] Exercise Room
- [6] Outdoor Cooking Space
- [5] Ceremonial Space
- [5] Nature Trails
- [5] Sauna / Hot Tub
- [5] Craft Area

Community Survey Responses [5/3/2010]

Question 9

38

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"What types of community events are important to you?"

Responses:

- "Ceremonial purposes of important values of traditional
- ways."
- "Traditional class"
- "Rodeo"
- "Community get together"
- "Song & dance"
- "Veterans"
- "Community resource events"

Community Survey Responses [5/3/2010]

Question 11

[&]quot;What types of building materials would you prefer homes and other buildings at the Senior Living Community be constructed of?"



42 No votes for "log or heavy timber" and "wood frame with siding"







"Solstices"

site:

- organized along solar equinoxes and solstices
- linear "4 worlds" progression
- 2 separate entrances/ exits
- pedestrian connection and orientation along axis
- 2 drop-off/pick-up/loading zones
- · integrated health center design
- parking near each unit and near common house and health center
- accessible and encourages walkability









"4 Worlds"

site:

Concept 'B'

- organized around the traditional Emergence Concept of the "4 worlds"
- · 2 connected entrances/ exits
- pedestrian connection and orientation along "worlds" journey
- continuous loop drive around common house with drop-off/ pick-up/loading zone at east entrance
- · separate health center design
- · centralized/ consolidated parking

"Centered"

site:

- organized around a central "hogan" in a radial pattern
- · 2 connected entrances/ exits
- pedestrian connection along cardinal directions leading to central "hogan"
- continuous loop drive around the perimeter with drop-off/ pick-up/loading zone at east entrance
- · separate health center design
- parking near each unit and near common house and health center


Unit Design Concept 2

- residential units: • all individual entrances face east
- hybrid hogan design
- fireplace in center or corner of "hogan" living room space
- 2-bedroom; small 1-bedroom



small 1-bedroom has kitchenette unit



Unit Design Concept 2



Unit Design Concept 3



Unit Design Concept 4

Unit Design Concept 4



residential units: • all individual entrances face east

- s an marriada entrances race eas
- back porch

hybrid hogan design

- 2-bedroom; 1-bedroom; small 1bedroom
- accessible design
- suspended fireplace in center of "hogan" living room
- small 1-bedroom has kitchenette unit



Next Steps

- Need feedback for selection of site design to develop
- Need feedback for selection of residential unit design to develop

Design Development:

- Common house design
- Materials
- Residential unit interior space design

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Designs

Site Concepts:



Kaibeto Creek Community Presentation 3

In coordination with the Kaibeto Chapter Senior Center annual Thanksgiving event on November 23, 2010 at the Kaibeto Chapter House, Drachman Institute staff made a final presentation to Chapter leaders, Tuba City Regional Health Care Corporation staff, Foundation for Senior Living representatives, and members of the Kaibeto community.

Information regarding the site that was selected by the *Project Partners*, a cultural study and review, examples and case studies of similar projects, and initial design concepts were briefly reviewed, as were survey results, design charrette results, and the design program and goals. Based on the feedback received by community members at previous presentations, through the surveys, and feedback from the *Project Partners* throughout the process, Drachman Institute staff presented final schematic designs for the overall site, the senior center and common house, and the individual residential units.

More than 70 people were in attendance. Comments from community members during the presentation indicated their support in moving the project forward.

The following pages include the information and schematic design concepts as presented.



Project History

 September 2009 – ADOH accepts application for technical assistance from Kaibeto Chapter, TCRHCC, & Foundation for Senior Living.

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• December 2009 – Kaibeto Chapter designated 12-acre site for the senior living and health center project.

 February 2010 – Drachman Institute & ADOH staff met with "Project Partners" and members of the Kaibeto community to discuss the project scope and schedule and visit the proposed site.

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Today

- Review from last presentation
 - 1. Site Analysis
 - 2. Culture & Community
 - 3. Case Studies and Examples
 - 4. Initial Design Concepts
 - 5. Survey Results
 - 6. Charrette Results
 - 7. Concept Selection Results

- Presentation

- 1. Final Site Plan Design Concept
- 2. Final Residential Unit Design Concepts (two)
- 3. Final Senior Center/ Common House Design Concept



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Research + Outreach

- · Students, Staff, and Faculty
- Planning
- Landscape Architecture
- Architecture

Project History (continued)

• May 3, 2010 - First community presentation and design charrette



August 4, 2010 – Second community presentation





Kaibeto

Location





Culture

Earth & Sky Father Sky and Mother Earth Dwelling between the two



Culture

Emergence Concept Journey through 4 Worlds

First World - Black World Second World - Blue World Third World - Yellow World Fourth World - Glittering World





Concept of Time

Solar position/movement

- Ceremonies
- Stories
- Planting/harvesting
- hogan orientation
- daily renewal Four Times of Day







traditional structures and materials







Presentation Two Feedback, August 4, 2010 25 Responses

1. "Please rank the four site plan concepts...":





Site Features

- Organized around a central "hogan" (senior center) in a radial pattern Two connected vehicle entrances/ exits
- Pedestrian connection along cardinal directions leading to central "hogan" (senior center)
 Continuous loop drive around the perimeter with drop-off/ pick-up/ loading zones at east entrance area
 Separate health center
- Parking near each unit and near senior center and health center
 Staff housing on site at north end
 Outdoor amphitheater/ ceremonial space at east end with seating, flag poles, and east-facing stage
 Community garden areas north and south of senior center
 26 residential units: (6) 1-bedroom
- units & (20) 2-bedroom units

Unit Design Concepts (August 4, 2010)



Presentation Two Feedback, August 4, 2010 25 Responses

2. "Please rank the four residential concepts...":







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- All units have individual hogan-style

front room - All individual entrances face east

- Covered front entrances

- Private back porch area

- Accessible design
 Full-size kitchen
 Suspended fireplace in center of
 hogan-style front room
- 2-bedroom, 1-bath; 840 square feet















Kaibeto Creek Community Final Design

The following pages outline the final schematic design that was developed based on feedback throughout this process. Included are design concepts for the overall site, individual residential units, and the senior center and common house. In addition to plans, elevations, and perspective images, a brief summary of possible building materials is also included.



Final Design Site Plan

Site Features:

- Organized around a central "hogan" (senior center) in a radial pattern
- Two connected vehicle entrances/ exits
- Pedestrian connection along cardinal directions leading to central "hogan" (senior center)
- Continuous loop drive around the perimeter with drop-off/ pick-up/ loading zones at east entrance area
- Separate health center
- Parking near each unit and near senior center and health center
- Staff housing on site at north end
- Outdoor amphitheater/ ceremonial space at east end with seating, flag poles, and east-facing stage
- Community garden areas north and south of senior center
- 26 residential units: (6) 1-bedroom units & (20) 2-bedroom units





Final Design

Residences

North/South Unit Features:

- All units have individual hogan-style front room
- All individual entrances face east
- Covered front entrances
- Accessible design
- Suspended fireplace in center of hogan-style front room (1-bedroom units); corner fireplace in 2-bedroom units
- Full-size kitchen in 2-bedroom units; kitchenette in 1-bedroom units
- North & south solar exposure with clerestory natural light in each unit
- 2-bedroom, 1-bath: 830 square feet; 1-bedroom, 1-bath: 590 square feet







Final Design

Residences

Duplex Unit Features:

- All units have individual hogan-style front room
- All individual entrances face east
- Covered front entrances
- Private back porch area
- Accessible design
- Full-size kitchen
- Suspended fireplace in center of hogan-style front room
- 2-bedroom, 1-bath: 840 square feet







Final Design Senior Center/ Common House

Features:

- Reception area: includes reception workspace, seating, tables, etc.
- Director's office: includes workstation/ desk and table with seating for private meetings with clients, etc.
- Staff offices: includes workstation/ desk for three staff and a lockable storage room
- Art studio and gallery: includes workspace/ table and chairs, cabinets/ shelving for storage, display space, and a gift shop
- "Hogan" lounge: includes 'hearth' or fireplace, chairs, couches, etc.
- Patio: includes space and furniture for outdoor eating and lounging
- Dining/ multi-purpose room: includes space for classes, games, dancing, dining, and other events; includes storage rooms
- Kitchen: includes commercial cooking equipment, refrigerator and freezer, pantry/ food storage, and meal preparation space/ tables
- Chapel: multi-denominational worship or contemplation space
- Media room: includes TV, computers, couches, and library
- Exercise room: includes spa, sauna, and exercise equipment
- Restrooms: includes restroom facilities plus showers and changing areas
- Laundry: includes laundry equipment for all residents, sink, and counter/table for folding







Final Design Possible Building Materials

Fly-ash Concrete

"Fly ash is a fine, glass-like powder recovered from gases created by coal-fired electric power generation. U.S. power plants produce millions of tons of fly ash annually, which is usually dumped in landfills. Fly ash is an inexpensive replacement for portland cement used in concrete, while it actually improves strength, segregation, and ease of pumping of the concrete. Fly ash is also used as an ingredient in brick, block, paving, and structural fills." http://www.toolbase.org/Technology-Inventory/Foundations/fly-ash-concrete. Accessed Dec. 8, 2010.

One local example of the use of this material in building construction is *Navajo FlexCrete Building Systems*, who produces blocks made from fly ash concrete. They are a subsidiary of the Navajo Housing Authority. For examples of the use of this product and for more information see their website:



http://woodburydb.files.wordpress.com/2010/01/flyash_concrete.gif. Accessed Nov. 22, 2010.

http://www.navajoflexcrete.biz.

Wood & Steel

Wood, or timber, is a traditional building material found throughout Navajo architecture. It creates a warm and traditional feel on the interior, and, if treated or protected properly, emphasizes the place and culture when used as an exterior feature or material.

Most structural steel manufactured today contains more than 80% recycled content. Along with its durability, this emphasizes steel's role as a sustainable building material. Additionally, when allowed to rust, or sealed in its rusted state, the steel adds to the natural and earthen aesthetic and blends with the colors of the land.



http://www.archidir.com/wp-content/uploads/2010/07/5-Sustainably-Caroline-house-interior-by-Design-Build-Bluff-in-Navajo-Nation-Southern-Utah.jpg. Accessed Nov. 22, 2010.



http://www.architecturelist.com/wp-content/uploads/Design-Build-Bluff-Keith-Carlsen-119.jpg. Accessed Nov. 22, 2010.





http://engeyedesignteam.files.wordpress.com/2010/09/rammedearth1.jpg. Accessed Nov. 22, 2010.

"Rammed earth is a structural wall system built of natural mineral soils compacted in thin layers within sturdy formwork. The strength and durability of the wall results from the densification of a clay, sand, and gravel matrix. The mass of the wall provides superior thermal and acoustic properties.

To build a rammed earth wall, moist soil is compacted layer at a time inside of a strong mold or form. The forms can be removed immediately and the fresh wall is capable of supporting loads. It continues to cure and gain strength slowly over time.

Although rammed earth can serve as simply a resourceconserving thermal flywheel, in other applications it is celebrated as functional art." http://rammedearthworks.com/ page/FAQs. Accessed Dec. 8, 2010.

Rammed earth technology has been used throughout traditional Navajo architecture. The use of this material http://www.treehugger.com/files/2007/04/nkmip_desert_cu.php. Accessed Nov. 22, 2010. in a modern application both celebrates the past and emphasizes the durability of culture moving forward.

