PR Number: 0020052138
Award Number: P14AC01548
Project Number: **UNM-109**
CFDA #: 15.945
Park/NPS Unit: Casa Grande Ruins National Monument (CAGR)
Title of Project: Archaeological Analysis, Documentation, and Development of Pilot Conservation Treatments for the Great House, Casa Grande Ruins National Monument

Administered through the: Colorado Plateau Cooperative Ecosystem Studies Unit Cooperative Agreement Number P14AC00921

CESU Partner: University of New Mexico (UNM)

PROJECT CONTACTS:
Principal Investigator: Angelyn Bass, Research Assistant Professor, Department of Anthropology, University of New Mexico, MSC04 2530, Albuquerque, NM 87131, 505-577-8603, angelynbass@gmail.com or angelyn@unm.edu

Partner Administrative Contact*:* Diana Sargent, Contract and Grant Administrator Pre-Awards, University of New Mexico PreAward Services, 1700 Lomas Blvd. NE, Ste 2200, MSC01 1247, Albuquerque, NM 87131-0001, (505)277-5793 dsargent@unm.edu

NPS Certified ATR: Derek Toms, Chief of Resources, Casa Grande Ruins National Monument, 1100 West Ruins Drive, Coolidge, AZ, (520) 723-3172 ext. 137, Fax: (520) 723-7209, derek_toms@nps.gov

NPS Technical Expert (if appropriate): Lauren Kingston, Archeologist, Casa Grande Ruins National Monument, 1100 West Ruins Drive, Coolidge, AZ, (520) 723-3172 ext. 139, Fax: (520) 723-7209, lauren_kingston@nps.gov

FUNDING INFORMATION:
Amount Funded: $248,195
NPS Account Numbers (amounts in parentheses): PH.P01783539A.00.1 ($65,000) and PH.P0190856A.00.1 ($183,195)
Fund Source (e.g., ONPS, FLREA, CRPP, CESU, etc.): ($65,000 Rec Fee Regional 20%) and ($183,195 Cultural Resources Funding Source/Vanishing Treasures)
☒NPS Funding
☐ Is this funded using a reimbursable account number? If yes, IMR contracting needs a copy of the Interagency Agreement.

PROJECT DATES:
Start Date: October 01, 2014

NOTE*: *This Task Agreement will become effective on the date of final signature or the effective date of the Award document, whichever is later.

End Date: January 31, 2017

NPS Administrative Contacts
Interim CESU Coordinator (May 18 – September 13, 2014): Todd Chaudhry, National Park Service/CPCESU, NAU P.O. Box 5765, Flagstaff, AZ 86011, 928-523-6638, Fax: 928-523-2014; todd_chaudhry@nps.gov

Intermountain Region Administrative Contact: Kelly Adams, Grants and Agreements Specialist, National Park Service, 12795 West Alameda Pkwy, Lakewood, CO 80228. Phone: 303-969-2303 Fax: 303-969-2992 Email: Kelly_adams@nps.gov

FEDERAL FINANCIAL REPORTS:

Federal Financial Reports (Check as required for project based on spending plan, period of performance, risk, cooperator history, etc.)

{ } Quarterly { } Semi-annually { } Annually {X} Final (required)

PROJECT SCHEDULE AND TECHNICAL REPORT DEADLINES:

List all technical reports and products in sequential order as required in the scope (more lines and milestones can be added as needed):

Project Start Date – October 1, 2014

Technical progress reports – { } Quarterly { } Semi-annually {X} Annually
(Check as needed from PI to monitor progress of specific project. Content should be addressed in the scope.)

Investigator's Annual Report (IAR) – January 31, 2017

Database, Collections/Specimens, Archives, and Maps provided to the NPS ATR or Technical Expert – January 31, 2017

Draft Final Report – August 31, 2016

Final Report – November 30, 2016

Project End Date – January 31, 2017 (project reports/deliverables are due)

Final SF425 FFR must be submitted within 90 days of project end date

PAYMENTS

2 CFR PART 215.22*:* Cash advance (drawdown) to recipient organization shall be limited to the minimum amounts needed and be timed to be in accordance with the actual immediate cash requirements of the recipient organization in carrying out the purpose of the approved program or project. The timing and amount of cash advances shall be as close as is administratively feasible to the actual disbursements by the recipient organization for direct program or project costs and the proportionate share of any allowable indirect costs.

2 CFR PART 215.25 (8)(e)(1): Incur pre-award costs 90 calendar days prior to award or more than 90 calendar days with the prior approval of the Federal awarding agency. All pre-award costs are incurred at the recipient's risk. (i.e. the Federal awarding agency is under no obligation to reimburse such costs if for any reason the recipient does not receive an award or if the award is less than anticipated and inadequate to cover such costs.)

CESU REQUIRED PRODUCTS (may be different from those products required by the ATR – See Statement of Work for Products required by the NPS unit):

The Principal Investigator will prepare a brief report abstract suitable for public distribution and an electronic version (in PDF file format) of the final report and mail all to Todd Chaudhry, National Park Service, CPCESU, NAU P.O. Box 5765, Flagstaff, AZ 86011. Please be sure to include the project number (e.g.; NAU-###, UMT-###, UAZDS-###) and the P number on the cover page of the final report.

PROJECT ABSTRACT:

Staff, students, institutional partners, and professional consultants from the University of New Mexico (UNM) will work with the National Park Service (NPS) to complete investigation necessary for treatment design, including treatment testing and selected pilot treatment of architectural finishes having a high priority for treatment of the Great House at Casa Grande Ruins National Monument.

SCOPE OF WORK:

The Department of Anthropology / UNM proposes to participate with their institutional and professional partners, and with staff from Casa Grande Ruins National Monument (CAGR) in the preservation of selected architectural finishes in the Great House. The project team recently completed an assessment of architectural finishes in the Great House to determine primary modes of deterioration and identify research needs for the development of conservation treatments. Recommendations for treatment design, treatment testing, and pilot treatment developed in the earlier project will be implemented under this new agreement.

Project Description:

The Department of Anthropology / UNM is titled "Condition Assessment and Treatment Planning For The Great House, Casa Grande Ruins National Monument" (P13AC00568 / UNM-88) which focused on the documentation and condition assessment of earthen plasters and other architectural finishes in the Great House that includes recommendations for treatment and long term preservation. The four-story pre-Columbian structure, occupied from ca. 1350-1450 C.E., was constructed of carbonate-rich soil (caliche) puddled in courses or layers. Many of the walls still have earthen plasters and remnants of architectural details such as viga sockets, ghosts of wooden lintels and possibly astronomical features.

Treatment options were developed based on balancing archaeological significance, management priorities, and treatment feasibility, and treatment strategies were proposed for areas having a high priority for treatment (areas can be said to have a high priority for treatment when the result of withholding treatment is likely to be loss of significant cultural material). The assessment resulted in recommendations for future research and monitoring as well, including instrumental studies and computer simulations intended to enhance current understanding of the behavior of the structure, and define more precisely the goals and likely outcomes of treatment.

Recommendations for treatment design, treatment testing, and pilot treatment to be implemented in this project may include: 1) structural evaluation of the ruin; 2) testing and pilot conservation treatment of the earthen architectural finishes; 3) characterization and testing of soils (including original construction materials and candidate soils for developing grouts and mortars for repair); 4) pest management design to address deterioration caused by animal pests that include roosting birds, bats, spiders, and bees; 5) continued archaeological investigation and synthesis of stack and plan graphics; 6) nondestructive testing to characterize internal fracture networks and other discontinuities; and 7) photodocumentation of the ruin, including photomosaic wall composites and high resolution repeat photography. Information produced in this phase of the work will provide basic performance values to be used in hygrothermal modeling of original wall materials and a raindrop simulation of the ruin and its shelter in a subsequent phase.

The scope of work includes:

1. Conducting a project called "**Archaeological Analysis, Documentation, and Development of Pilot Conservation Treatments for the Great House, Casa Grande Ruins National Monument**" for students, NPS staff, and institutional and professional partners, and focused on:
2. Developing and testing conservation treatments for the earthen architectural finishes to address: delamination of plasters and leveling coats; blistering, flaking and erosion of finishes due to persistent wet-dry cycling; cleaning of mud runnels and bird droppings; and undercutting of plasters along erosion channels and losses. Pilot testing and recommendations for treatment will take place as soon as possible after execution of the agreement to facilitate planning and implementation for the high priority for treatment areas.

3. Structural evaluation of the ruin, including a review of the existing literature pertaining to structural condition, static analysis of wall segments, and dynamic structural analysis using the discrete element method (DEM)
4. Systematic characterization of prehistoric wall materials to determine reasonable design values and modeling parameters, likely to include particle size distribution, description of the coarse fraction constituents, specific gravity, porosity[i], identification of clay minerals and soluble salts, shrink-swell index, description of precipitated secondary minerals and rinds or coatings using optical / SEM microscopy, and determination of Atterberg limits. In addition, soils for developing grouts and mortars for repair will be characterized to determine their suitability for use in repairs
5. Pest management design to address deterioration caused by animal pests that include roosting birds, bats, spiders, and bees resulting in site-specific approaches adapted to Great House conditions for each type of pest problem
6. Continued archaeological investigation and synthesis of stack and plan graphics, including additional contextual/comparative study of the Casa Grande Great House and contemporaneous structures in the Hohokam and adjacent cultural areas
7. Nondestructive testing to characterize internal fracture networks, likely to include pulse-velocity measurements and microwave radar techniques
8. Photodocumenting the ruin, including photomosaic wall composites and high resolution repeat photography
9. Preparing a project completion report that includes:
    a. Narrative description of the project goals and methodology
    b. Results of modeling and analysis
    c. Narrative description of pilot treatment methods and implemented treatments
    d. Recommendations for additional research and treatment
    e. Photodocumentation and other graphics produced for the project

Statement of Work:

The UNM will:

1. Undertake a project titled "**Archaeological Analysis, Documentation, and Development of Pilot Conservation Treatments for the Great House, Casa Grande Ruins National Monument**" as described in Attachment I and throughout this document in collaboration with NPS.
2. Appoint Angelyn Bass, Research Assistant Professor, Department of Anthropology, University of New Mexico, MSC04 2530, Albuquerque, NM 87131, 505-577-8603, angelynbass@gmail.com or angelyn@unm.edu as Principal Investigator
3. Hire student research assistants as needed to conduct the project.
4. The cooperator will perform the following tasks:
    a. Develop a work plan in collaboration with NPS experts.
    b. Provide oversight, supervision and guidance to consultants and students involved in the project.
    c. Work with park staff to complete archival research for site.
    d. Plan and conduct fieldwork to complete documentation and implement treatments.
    e. Produce a final report as described in Item 2.
    f. Provide qualified conservation trainees to work with the project team.
5. Correspond regularly by email with the NPS Technical Expert.
6. Fully acknowledge the NPS in any published or formally presented material (PowerPoint presentations, signs and film) developed or derived from this Task Agreement.
7. Participate, as appropriate, with the NPS in a 60-day wrap-up period following the due date of the last project product.

The NPS will:

1. Undertake a project titled "Archaeological Analysis, Documentation, and Development of Pilot Conservation Treatments for the Great House, Casa Grande Ruins National Monument" as described throughout this document in collaboration with UNM.

2. Appoint Derek Toms as NPS Certified ATR
3. The NPS will perform the following tasks:
    a. Develop a work plan in collaboration with UNM.
    b. Provide project oversight and guidance to cooperators involved in this project.
    c. Work with UNM to complete archival research for the sites.
    d. Provide scaffolding, lifts and fall protection for the project.
    e. Participate, as needed, in project planning and fieldwork to document the structure, assess current conditions, and develop treatment recommendations.
    f. Review final report as described in Item 7.
4. Fully acknowledge PI(s) in any published or formally presented material developed or derived from this Task Agreement.
5. Participate, as appropriate with PI(s) in a 60-day wrap-up period following the due date of the last project product.

COOPERATIVE AGREEMENTS OR TASK AGREEMENTS INVOLVING COOPERATORS WORKING ON-SITE

Background

In cooperative agreements or task agreements with universities where the university utilizes interns, student employees, research associates (RAs) or cooperators on-site (hereafter called "cooperator personnel"), these cooperator personnel sometimes work on government sites in close proximity to federal employees. It is illegal (without specific statutory authority) for federal employees to directly supervise the cooperator personnel or any university employees or for the students or other university employees to supervise federal employees. When cooperator personnel are working on an NPS site, it is important that there is a clear distinction between students and federal employees.

Office Environment and Vehicles

- The office space of the cooperator personnel and NPS personnel should be clearly labeled (Name and NPS or University affiliation on office or cubicle space).
- Cooperator personnel should be listed separately from NPS personnel in telephone lists, other identification or organizational rosters, and publication credits.
- Cooperator personnel should not receive "all-employee" e-mail or other communications intended for NPS personnel (unless it relates directly to the work the cooperator is doing for the NPS). When the e-mail does relate to the work being done, a copy of the same e-mail message should be sent to the University or cooperator's supervisor.
- Cooperator personnel may use NPS e-mail systems when the communication relates directly to the work the cooperator is doing for the NPS. The e-mail addresses of the cooperator personnel must include a label associated with their NPS e-mail address that identifies the cooperator's status (i.e., "Linda Webb, Cooperator" would be the label associated with the e-mail address, linda_webb@contractor.nps.gov). Doing so clearly identifies this individual each time they send an e-mail message using the NPS system, and it identifies their status as a research associate, student intern or student employee in the e-mail directory.
- Unless stipulated in the agreement, cooperator personnel should not drive government vehicles.
- Unless stipulated in the agreement, cooperator personnel should not ride as a passenger in a government vehicle. When this is planned as part of the agreement, an appropriate amount of liability insurance should be negotiated.
- Prior written approval by the Park Superintendent or Center Manager must be obtained in order for a task to allow cooperator personnel to drive or ride in government vehicles.

Supervision and Scheduling

- Each task must specify the university's/cooperator's supervisor for the cooperator personnel.
- Unless stipulated in the agreement, NPS staff should not set hours for cooperator personnel, specify where the work should be done, or conduct performance appraisals. National Park Service staff may give performance feedback to the cooperator personnel supervisor.
- Cooperator personnel should report leave, scheduling, and other related issues to the university or cooperator's supervisor, not to NPS employees. The supervisor of the cooperator personnel should then communicate with the NPS. National Park Service employees cannot directly supervise cooperator personnel on a day-to-day basis. Work should be given to the cooperator personnel (via the cooperator's supervisor) on a "task basis." Cooperators should work without NPS supervision to accomplish each task, although technical consultations and cooperation is permissible.
- The Cooperator will be responsible for any disciplinary action needed to correct student employee conduct or performance problems. The NPS agreements technical representative will inform the university/cooperator's supervisor of any conduct or performance problems.
- The Cooperator will remove student employees from their positions if they fail to improve performance or address conduct issues.
- The NPS will review and provide feedback to students or interns regarding work assignments.
- The NPS will inform the cooperator of conduct or performance problems with cooperator personnel so that the university can counsel employees and correct the performance problems.
- The NPS will recommend to the cooperator dismissal of cooperator personnel based on conduct or performance issues.
- The Cooperator will hire students, interns or RAs to work on NPS tasks identified in the agreement. Hiring will be conducted in consultation with the NPS Agreements Technical Representative (ATR).
- The Cooperator will: pay students, interns or RAs for hours they have worked in support of the agreement.

Representation and Communication

- Cooperator personnel cannot in any way represent themselves to the public as NPS employees.
- Cooperator personnel are required to wear visible identification at all times.

Other Issues

- Cooperator personnel should not list an NPS affiliation on publications, but rather should list the cooperative agreement under which the work was performed.
- Cooperator personnel should not be invited to official NPS "social" events.
- Cooperator personnel will follow the local policy of the facility when federal facilities are closed due to early release for holidays, snow days, etc.

PRODUCTS:

1) One digital copy of a Draft Project Completion Report for review by NPS.
2) An electronic copy (CD) of Final Report (.pdf format) including photo documentation and drawings.
3) In addition to the above, the Principal Investigator shall complete the NPS Investigator's Annual Report.

BUDGET: *(You may create your budget in a spreadsheet and attach it as a separate document when you submit your project coversheet and Justification for Use of Financial Assistance.)*

Item	Rate	Unit	No. of Units	Total
UNM SALARIES				
Faculty- University Investigator	percent effort	biannual	33%	$25,134
Student x 2	$12.00	hr.	939	$11,268
Project Lead Benefits	30% of total salary rate			$7,659
Student Benefits	1% of total temp salary + insurance			$2,666
UNM TRAVEL				
Air Travel (PI and students)	$500	roundtrip	12	$6,000.00
Local Travel (car rental, fuel for PI & students)	$100	day	30	$3,000
Housing/M&IE (for PI & students)	$150	day	60	$9,000
CONSULTANTS				
Architectural Conservator				
Fees	$80	hr	250	$20,000
Benefits	$0			$0
Air Travel	$500	ticket	3	$1,500
Housing/M&IE	$150	day	24	$3,600
Assistant Conservator				
Fees	$50	hr	260	$13,000
Benefits	$0			$0
Air Travel	$400	ticket	3	$1,200
Housing/M&IE	$150	day	20	$3,000
Structural Engineer- Investigation and Modeling				
Ercd				$12,800
Structural analysis and dynamic modeling				$18,400
Reporting				$2,400
Structural Engineer- Nondestructive Testing and Tomographic Imaging				
Fees	$200	hr	32	$6,400
Equipment				$550
Reporting	$200	hr	22	$4,400
Air Travel and Housing/M&IE				$2,725
Pest Management Specialist				
Fees	$185	hr	39	$7,215
Benefits	$0			$0
Air Travel and Housing/M&IE				$2,721
Photographer				
Fees	$60	hr	100	$6,000
Benefits	$0			$0.00
Air Travel and Housing/M&IE				$2,000
Archaeologist				
Fees	$50	hr	200	$10,000
Benefits	$0			$0.00
Air Travel and Housing/M&IE				$2,500
SERVICES				
Lab Fees-Performance Properties of Conservation Treatment Materials	1000	sample	10	$10,000
Soil Analysis-Building Materials Characterization	1000	sample	15	$15,000
SUPPLIES				
Printing of architectural photographs and copying of maps for field documentation				$1,091
Project Totals				

Total Direct Costs				$211,229
Total Indirect Costs (17.5%)				$36,965
GRAND TOTAL				$248,195

Budget narrative:

Project research will be conducted by UNM in consultation with specialists in architectural conservation, structural modeling, non-destructive analysis, pest management, photography, and archaeology.

The PI will provide project planning and oversight at every stage of the work and will supervise the project assistant(s)/students, consultants, analysis of all assessment and test results, and preparation of the final report. The PI's estimated involvement is 33% of full time over the course of the project.

Two graduate or undergraduate students (also called research assistants) will assist in all aspects of the work including fieldwork, analysis and reporting. They will work directly with both the PI and the specialists. The student portion of the budget includes provisions for salary, F & A, insurance, and travel.

The specialists are an essential part of the research and training aspects of this project. They not only provide expertise in various aspects of their professions/disciplines, they have agreed to work with the UNM students in a mentoring capacity and to involve the students in all aspects of their work, including analysis and reporting. This is a unique opportunity for the students to participate in the design and implementation of new conservation technologies and treatments. Consultant costs include fees and travel (air travel, ground transportation and M&IE). The consultants include:

An architectural conservator, Douglas Porter, will analyze past treatments, conduct pilot treatments, and document them in accordance with professional standards for conservation practice. He will also collaborate on the structural investigation and modeling, nondestructive analysis, and building materials characterization.

An assistant conservator, will assist in the PI in treatment design and testing, and will work closely with the project archaeologist and photographer to synthesize past photographic and lidar documentation and graphically merge it with current archaeological survey results, maps, and conservation treatment recording. They will also assist with project documentation, fieldwork and report preparation.

A structural engineer from Ochsendory DeJong and Block, will conduct static analysis of wall segments, and a dynamic structural analysis using the discrete element method (DEM). These analyses will provide a clear basis for decision-making about both the short-term and the long-term structural safety of the monument.

A structural engineer from Atkinson Noland will conduct nondestructive evaluation and testing that may include tomography, microwave radar, and flatjack testing. These techniques will be used to characterize internal fracture networks and better understand the building construction techniques and structural capacity.

A pest management specialist, Thomas Parker, will assess deterioration caused by animal pests that inhabit the Great House and design site-specific approaches adapted to conditions for each type of pest problem.

An archaeologist, Larry Nordby, who was involved in an earlier phase of archaeological analysis and documentation, will continue archaeological analysis and synthesis of stack and plan graphics, including additional contextual/comparative study of the Casa Grande Great House, which will form the archaeological basis for a preservation plan.

A photographer, Neil Dixon, will travel to the site to conduct repeat photography and semi-rectified photography of the open areas and multi-story rooms. These photographs will form the basis of the condition assessment graphics and a baseline for monitoring.

Funds for laboratory analysis and testing of building and treatment materials are included. An estimate of $1000 per sample is consistent with the type and range of investigations to be employed. Analysis will be conducted at UNM where possible, and physical tests will be conducted at specialty labs. Analysis and tests may involve particle size distribution, description of the coarse fraction constituents, specific gravity, porosity[1], identification of clay minerals and soluble salts, shrink-swell index, description of precipitated secondary minerals and rinds or coatings using optical / SEM microscopy, and determination of Atterberg limits.

Funding for supplies include incidental materials for documentation (batteries, scales, camera supplies, memory cards) reproduction of historic documents and reports, and large-scale printing of maps and other graphics.

Due to the exploratory nature of this project, costs are estimates. Some costs and time commitments may vary based on discoveries made during the course of the work.