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14. ABSTRACT
The NC State University College of Design Legacy

The College of Design has a substantial legacy of sponsored studios involving industry and community priorities. This long-time involvement is colorfully illustrated by the depiction of the helicopter and the geodesic dome on the Buckminster Fuller commemorative stamp, The event depicted on this stamp was a collaboration between students and faculty of the College of Design at NC

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## Report Title

Final Report: Sustainable Base Camp Advanced Structures Strategies

## ABSTRACT

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The format of this study follows this tradition. What follows is the fact finding, the interpretation of data and shared experiences, the iteration of ideas represented through a process of ideation and a strategy worthy of further exploration.

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## Enter List of papers submitted or published that acknowledge ARO support from the start of the project to the date of this printing. List the papers, including journal references, in the following categories:

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**Number of Papers published in non peer-reviewed journals:**

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### (c) Presentations

**Number of Presentations:** 0.00

## Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

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**TOTAL:**

**Number of Non Peer-Reviewed Conference Proceeding publications (other than abstracts):**

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**TOTAL:**

**Number of Peer-Reviewed Conference Proceeding publications (other than abstracts):**

## (d) Manuscripts

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**TOTAL:**

**Number of Manuscripts:**

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Received Book

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|---|---|

**TOTAL:**

## Patents Submitted

## Patents Awarded

## Awards

### Graduate Students

| NAME | PERCENT_SUPPORTED |
|---|---|

**FTE Equivalent:**
**Total Number:**

### Names of Post Doctorates

| NAME | PERCENT_SUPPORTED |
|---|---|

**FTE Equivalent:**
**Total Number:**

### Names of Faculty Supported

| NAME | PERCENT_SUPPORTED |
|---|---|

**FTE Equivalent:**
**Total Number:**

### Names of Under Graduate students supported

| NAME | PERCENT_SUPPORTED |
|---|---|

**FTE Equivalent:**
**Total Number:**

## Student Metrics

This section only applies to graduating undergraduates supported by this agreement in this reporting period

The number of undergraduates funded by this agreement who graduated during this period: ..... 0.00

The number of undergraduates funded by this agreement who graduated during this period with a degree in science, mathematics, engineering, or technology fields:..... 0.00

The number of undergraduates funded by your agreement who graduated during this period and will continue to pursue a graduate or Ph.D. degree in science, mathematics, engineering, or technology fields:..... 0.00

Number of graduating undergraduates who achieved a 3.5 GPA to 4.0 (4.0 max scale):..... 0.00

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The number of undergraduates funded by your agreement who graduated during this period and intend to work for the Department of Defense ..... 0.00

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## Names of Personnel receiving masters degrees

NAME

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NAME

**Total Number:**

## Names of other research staff

| NAME | PERCENT_SUPPORTED |
|---|---|

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## Sub Contractors (DD882)

## Inventions (DD882)

# Scientific Progress

Project Recommendations

These recommendations have been drawn directly from the body of this report. They were derived over the course of the project.

1. The resolution of the challenges related to this project must include the fundamental strategy of scalability. That is, the shelter must be capable of acting as a singular unit, in the form if multiple combinations, and finally as an element within a larger base camp. Expectations range from camp configurations of 25 to 500.

2. The project development must be guided by the standardization of component parts taking advantage of factory efficiencies.

3. Human factors must be taken into account for assembly minimizing the dependency upon independent contractors while recognizing the limitations of assembly priority and skills among a fighting force.

4. New technologies and materials must be further explored, and perhaps even developed, to take advantage of newly introduced materials such as composites and to further investigate the appropriateness of textile materials.

5. A zero foot print and comprehensive sustainable strategy must be developed for the manufacturing and deployment of the unit.

6. The unit must have the capability to be deployed andre deployed ten times.

7. The unit must have the capability to be deployed utilizing multimodal capabilities including air and land strategies in multiple theaters of operation.

8. Technology transfer and adoptive strategies must be employed to take advantage of new materials and processes including structurally insulated panels , panelized assembly , and factory assembly processes.

9. Cost factors must be taken into account should the unit design development process be undertaken. It is recommended that this process be guided by integrated project delivery model.

10. Rapid set-up and strike strategies are crucial to the success of any base deployment option.

11. The units must be interoperable among the armed services branches.

12. Site strategies and related infrastructure decisions require considerably more study especially regarding water and fuel security, communication options and sanitation issues.

13. Further consideration of site strategies must take into account the deployment of units and the formation of base camps in locations as diverse as rural and urban deployment zones.

14. Carry-in and carry-out technology to supplement base camp construction requires further exploration .

15. An economy of means, materials, component parts and processes must characterize any resolution of this project. This is particularly important in a rapid adaptability circumstance.

16. A greater investigation of fabric structures will assist environmental sheltering, assisting or restricting communication, camouflage and incoming fire deflection.

17. A continuing education plan for officers who would be responsible for base camp deployment should be developed (perhaps as an e-course) to provide information in the form of precedents and strategies as evolved from best practices and environmental factors. All of this with the perspective of those who have deployed base camps in combat zones.

## Technology Transfer