Air Force Architects Presentation
Dynamic Prototypes: 4-Airmen Dormitories

Conceptualization of Program by AFCEE

Implementation of Prototype + Benefits of BIM

Jacobs
Integration Architects
for AFCEE Dynamic Prototypes Program
Conceptualization of Program by AFCEE

AFCEE’s CHARGE

- More effective control over design standards
- Better incorporation of best practices, more efficient
- More consistency in processes and products
- Reduce facility acquisition time and costs
- Avoid re-inventing the wheel
Conceptualization of Program by AFCEE

Approaching Design

Performance Based
(program criteria)
- Aircraft Hangar
- Administration
- Flight Simulator

Kit of Parts
(modules)
- Dormitory
- Fitness Center
- Squad Ops

Prescriptive Based
(site adapt)
- Munitions Igloo
- Firing Range
- Dog Kennel

Dynamic Prototypes: 4-Airmen Dormitories
Conceptualization of Program by AFCEE

Three Dimensional Representation of Design Guide

Jumpstart Design
Incorporate Critical Functional + Technical Criteria
Balancing Flexibility + Standardization

Unaccompanied Housing Design Guide

UNITED STATES AIR FORCE

Developed by:
Headquarters United States Air Force
Office of the Civil Engineer
Housing Division AF/ILEH
(703) 601.0478

January 2006

Dynamic Prototypes: 4-Airmen Dormitories
Conceptualization of Program by AFCEE

Leveraging BIM Technology

“Dynamic” - Flexible, adaptable, and easy to change

“Prototype” - A model on which to build

Stair

Unit A

Unit B

Unit C

Commons Space
Implementation of Prototype + Benefits of BIM

Kit of Parts
Discipline Models - Arch, Struct, Mech, Elec, Plumb, + Fire
Unit A, B, + C
Implementation of Prototype + Benefits of BIM

Kit of Parts
Discipline Models - Arch, Struct, Mech, Elec, Plumb, + Fire
Unit A, B, + C

Unit A - Assembled Example
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Kit of Parts

Discipline Models - Arch, Struct, Mech, Elec, Plumb, + Fire
Unit A, B, + C

Dynamic Prototypes: 4-Airmen Dormitories
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Kit of Parts

Discipline Models - Arch, Struct, Mech, Elec, Plumb, + Fire
Unit A, B, + C

Unit B - Assembled Example

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Kit of Parts

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Unit A, B, + C

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Dynamic Prototypes: 4-Airmen Dormitories
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Prototype Test Runs

Dynamic Prototypes: 4-Airmen Dormitories
Implementation of Prototype + Benefits of BIM

Prototype Use

- Grouping
- Scheduling
- Coordination
Implementation of Prototype + Benefits of BIM

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Implementation of Prototype + Benefits of BIM

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Dynamic Prototypes: 4-Airmen Dormitories
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Dynamic Prototypes: 4-Airmen Dormitories
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Prototype Use
Grouping
Scheduling
Coordination
Implementation of Prototype + Benefits of BIM

Linked Specifications
Assembly Codes Linked to Spec Sections to Key Note Coordination

Dynamic Prototypes: 4-Airmen Dormitories
Implementation of Prototype + Benefits of BIM

Linked Specifications
Assembly Codes Linked to Spec Sections to Key Note Coordination
## Implementation of Prototype + Benefits of BIM

### LEED Checklist

#### Silver Baseline

### Dynamic Prototypes: 4-Airmen Dormitories

#### LEED 2009 for New Construction and Major Renovation

**Project Scorecard**

<table>
<thead>
<tr>
<th>Sustainable Sites</th>
<th>26 Points</th>
</tr>
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<tbody>
<tr>
<td><strong>Prereq 1</strong> Construction Activity Pollution Prevention</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 2</strong> Site Selection</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 3</strong> Water Efficiency</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 4</strong> Energy &amp; Atmosphere</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 5</strong> Materials &amp; Resources</td>
<td>Required</td>
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<tr>
<td><strong>Prereq 6</strong> Indoor Environmental Quality</td>
<td>Required</td>
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<tr>
<td><strong>Prereq 7</strong> Informed Environmental Quality</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 8</strong> Natural Priority</td>
<td>Required</td>
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<tr>
<td><strong>Prereq 9</strong> Regional Priority</td>
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<tr>
<td><strong>Prereq 1</strong> Major Innovation</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 2</strong> Alternative Transportation</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 3</strong> Alternative Transportation</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 4</strong> Low-Emitting Materials</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 5</strong> Low-Emitting Materials</td>
<td>Required</td>
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<tr>
<td><strong>Prereq 6</strong> Building Reuse</td>
<td>Required</td>
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<tr>
<td><strong>Prereq 7</strong> Construction Site Development</td>
<td>Required</td>
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<tr>
<td><strong>Prereq 8</strong> Construction Site Development</td>
<td>Required</td>
</tr>
<tr>
<td><strong>Prereq 9</strong> Construction Site Development</td>
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<td><strong>Prereq 2</strong> Site Selection</td>
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</tr>
<tr>
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<td><strong>Prereq 1</strong> Major Innovation</td>
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</table>
 Implementation of Prototype + Benefits of BIM

SOW for Dormitories, Attachment F (BIM Requirements), Harvesting Language & BIM Manual for Dormitories
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When to utilize the dynamic prototypes

1391
RD
RD2
CCD
RFP
60%
100%

PD
SD
DD
CD
CA

Architectural Model to Develop Program Validation
Architectural Model to Develop Design Solution + Engineering Models for Checks + Narrative Development
Engineering Models Developed + Fully Integrated with Linked Specs

Dynamic Prototypes: 4-Airmen Dormitories
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Customer Concept Document Process - Select a Unit Plan

Dynamic Prototypes: 4-Airmen Dormitories
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Customer Concept Document Process - With a plan comes a fully vetted program

Unaccompanied Housing for 4-Airmen Dormitories - Square Footage Comparison

<table>
<thead>
<tr>
<th>E1-E4 Module Areas (NLA)</th>
<th>Unit A (144)</th>
<th>Unit B (144)</th>
<th>Unit C (144)</th>
<th>UHDG (min.)</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>1 Bedroom 1</td>
<td>129</td>
<td>129</td>
<td>129</td>
<td>129</td>
<td>min. bedroom width 10'-0&quot; (p. 15) - required</td>
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<tr>
<td>2 Bedroom 2</td>
<td>129</td>
<td>129</td>
<td>129</td>
<td>129</td>
<td>min. bedroom width 10'-0&quot; (p. 15) - required</td>
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<td>3 Bedroom 3</td>
<td>129</td>
<td>129</td>
<td>129</td>
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<td>min. bedroom width 10'-0&quot; (p. 15) - required</td>
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<tr>
<td>4 Bedroom 4</td>
<td>129</td>
<td>129</td>
<td>129</td>
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<tr>
<td>5 Bathroom 1</td>
<td>35</td>
<td>35</td>
<td>35</td>
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<td>exclude from net living area (NLA) calculations (p. 15)</td>
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<td>6 Bathroom 2</td>
<td>35</td>
<td>35</td>
<td>35</td>
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<tr>
<td>7 Bathroom 3</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>exclude from net living area (NLA) calculations (p. 15)</td>
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<tr>
<td>8 Bathroom 4</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
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<tr>
<td>9 Closet 1</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>exclude from net living area (NLA) calculations (p. 15)</td>
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<tr>
<td>10 Closet 2</td>
<td>20</td>
<td>20</td>
<td>20</td>
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<td>exclude from net living area (NLA) calculations (p. 15)</td>
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<tr>
<td>11 Closet 3</td>
<td>20</td>
<td>20</td>
<td>20</td>
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<td>exclude from net living area (NLA) calculations (p. 15)</td>
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<tr>
<td>12 Closet 4</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>exclude from net living area (NLA) calculations (p. 15)</td>
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<tr>
<td>13 Laundry</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>included in living room (p.31)</td>
</tr>
<tr>
<td>14 HVAC</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>included in living room (p.31)</td>
</tr>
<tr>
<td>15 Kitchen/Dining</td>
<td>45</td>
<td>40</td>
<td>35</td>
<td></td>
<td>included in living room (p.31)</td>
</tr>
<tr>
<td>16 Living</td>
<td>166</td>
<td>190</td>
<td>175</td>
<td>123</td>
<td>min. room width 11'-0&quot; (p. 15) recommended</td>
</tr>
<tr>
<td><strong>NET TOTAL</strong></td>
<td><strong>967</strong></td>
<td><strong>986</strong></td>
<td><strong>966</strong></td>
<td><strong>639</strong></td>
<td>refer to page 15 for NLA calculation requirements</td>
</tr>
</tbody>
</table>

Common Support Areas (NLA)

| 17 Multi-Purpose         | 270          | 270          | 270          | 270         | min. net required (p.32) |
| 18 Supply Storage        | 100          | 100          | 100          | 100         | min. net required (p.32) |
| 19 Office                | 0            | 0            | 0            | 0           | recommended part of the multi-purpose room (78 sqft) |
| 20 Vending               | 25           | 25           | 25           | 25          | min. net required (p.32) |
| 21 Bathroom              | 100          | 100          | 100          | 100         | min. net required (p.32) |
| 22 Bulk Storage          | 1196         | 1196         | 1196         | 1196        | 70.6CF per airman |
| 23 Laundry               | 10           | 10           | 10           | 10          | included in living room (p.31) |
| 24 Utility               | 0            | 0            | 0            | 0           | included in living room (p.31) |
| **NET TOTAL**            | **1691**     | **1691**     | **1691**     | **1691**    | refer to page 18 for calculation requirements |

* Calculations are based on demonstration Assembled Plan Examples

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Customer Concept Document Process - Site Plan (in SketchUp)
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Other Advantages for the Future

4D - Time (animating construction & better understanding sequencing)
5D - Cost Estimating (BIM Take Offs)
6D - Operation (Maintenance + Performance)
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Implementation of Prototype + Benefits of BIM

http://www.wbdg.org/references/afbim_tools.php

Air Force Building Information Modeling for MILCON Transformation

Tools

Dynamic Prototypes – Authentication required. Contact Ralph "Rick" Sinkfield to obtain username and password. Please include explanation of need for access.

BIM Templates

Autodesk Revit BIM Template for USAF MILCON Projects ZIP 7.4 MB
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Dynamic Prototype Program

Welcome

It is our pleasure to introduce this website as the official location for the Dynamic Prototype Program. Dynamic Prototypes are 3D representations of the current standards for building types described in our current guidelines. The models have been developed to assist contractors in jump starting their design process while leveraging BIM to maximize A/E’s design expertise.

Here we will house all downloads including the prototype models, general documents like contracts, LEED checklist, harvesting language, BIM manuals, guidelines, and all other pertinent information. You can also find a place to provide feedback on the program. This is very important and we look forward to hearing what everyone has to say about this exciting new program.
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Dynamic Prototypes: 4-Airmen Dormitories
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FEEDBACK

It is important to hear your feedback on how these dynamic prototypes are being used, working, and how they might be improved. We are excited about this program and committed to improving these tools.
Please take the time to let us know what you think.

Click below on 'Feedback' to send us a message, or on 'See Feedback' to read posted messages including responses.

Feedback
See Feedback
Implementation of Prototype + Benefits of BIM

Program Dates
V2.0 is available (see AFCEE for website access)
- Includes Architectural, Structural, MEP, Fire Protection
  Linked Specifications, + LEED Checklist

Measuring Success
Acquisition time saved
Construction costs (initial & life-cycle)
Easy to maintain and sustainable
Adequate scope + functional

Continuous Improvement
Feedback
Dynamic Prototype Site

Question/Answer
Thank you!