Sustainability Criteria for Planning, Constructing, and Operating Contingency Bases

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Symposium and Exhibition
Background

- Contingency bases are temporary in nature, historically without consideration for sustainability in planning and design.
- Experience in Iraq and Afghanistan show that supply lines to an isolated base are its greatest vulnerability.
- Increasing a base’s self-sufficiency or *sustainability* increases its *security*.
- Fewer resources = fewer soldiers on the road.
Planning and Design

Contingency planners and designers do not have *relevant* sustainability criteria to consider

► US based criteria cannot be directly applied to a contingency environment or host nation cultural considerations

► Limited construction materials and equipment systems in theater of operation

► Most base designs consider individual components, not how they interact as a system

► Sustainability considerations typically not linked to force protection
Objectives

- Identify most relevant criteria from existing sustainability rating tools
- Develop prototype criteria for contingency bases to describe sustainability principles and practices
- Provide sustainability guidance to assist:
  - Contingency base camp planners and designers
  - Builders
  - Operators
Objectives

- The criteria will be focused on these objectives:
  - Improving base camp sustainability
    - Reducing external (shipped in) resources
    - Improving linkages to local cultural (and environmental) circumstances
    - Reducing resources for operating and maintaining camps
  - Enhance personnel health and quality of life
The project team first developed a framework that categorizes criteria by base camp components found in the Sandbook including:

- Life support
- Command facilities
- Power generation
- Water/waste water
- Transportation
- Force protection
- Maintenance operations
- Cultural resources
Rating Systems

This analysis will look at specific criteria of each of these tools to determine their suitability and applicability to contingency bases.
Rating Systems

- **LEED 2009 for New Construction and Major Renovations - (USGBC)**
  - For certifying the design and construction
    - commercial or institutional buildings
    - high-rise residential buildings of all sizes
    - both public and private.

- **Intent:**
  - To promote healthful, durable, affordable, and environmentally sound practices in building design and construction.
Rating Systems

- LEED for Neighborhood Development
  - Emphasis on the site selection, design, and construction elements that bring buildings and infrastructure together
  - Relate the neighborhood to its landscape as well as its local and regional context.
Rating Systems

- Sustainable Sites Initiative
  - American Society of Landscape Architects
  - Lady Bird Johnson Wildflower Center
- Transformation in land development and practices
- Aims to supplement existing green building initiatives
- Sustainability: Environmental, Economic and Social
Rating Systems

 Envision 2.0
  ► ASCE, Institute for Sustainable Infrastructure (ISI)
  ► Covers civil infrastructure that makes up the built environment:
    • Roads, bridges, pipelines, railways, airports, dams, levees, landfills, water treatment systems
  ► Does not include buildings or facilities

 Improvement in the performance and resiliency of physical infrastructure across the full dimensions of sustainability
Examples of Sustainability Criteria

- LEED – New Construction and Major Renovation
  - Pollution Prevention – prevent loss of soil, sedimentation, air pollution
  - Water Use Reduction – use 20% less water
  - Storage and Collection of Recyclables – easily accessible dedicated area for collection
  - Minimum Energy Performance - 10% improvement
  - On-site Renewable Energy - solar, wind, geothermal, etc
## LEED 2009 for Neighborhood Development

### SMART LOCATION & LINKAGE

<table>
<thead>
<tr>
<th>PREREQ</th>
<th>Description</th>
<th>Phase</th>
<th>Base Camp Size</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smart Location</td>
<td>no</td>
<td>Planning</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>Imperiled Species and Ecological Communities</td>
<td>some</td>
<td>Planning</td>
<td>All</td>
</tr>
<tr>
<td>3</td>
<td>Wetland and Water Body Conservation</td>
<td>yes</td>
<td>Planning</td>
<td>All</td>
</tr>
<tr>
<td>4</td>
<td>Agricultural Land Conservation</td>
<td>some</td>
<td>Planning</td>
<td>Small</td>
</tr>
<tr>
<td>5</td>
<td>Floodplain Avoidance</td>
<td>yes</td>
<td>Planning</td>
<td>All</td>
</tr>
<tr>
<td>CREDIT 1</td>
<td>Preferred Locations</td>
<td>yes</td>
<td>Planning</td>
<td>All</td>
</tr>
<tr>
<td>CREDIT 2</td>
<td>Brownfield Redevelopment</td>
<td>no</td>
<td>Planning</td>
<td>N/A</td>
</tr>
<tr>
<td>CREDIT 3</td>
<td>Locations w/ Reduced Automobile Dependence</td>
<td>n/a</td>
<td>Planning</td>
<td>N/A</td>
</tr>
<tr>
<td>CREDIT 4</td>
<td>Bicycle Network and Storage</td>
<td>n/a</td>
<td>Planning</td>
<td>N/A</td>
</tr>
<tr>
<td>CREDIT 5</td>
<td>Housing and Jobs Proximity</td>
<td>n/a</td>
<td>Planning</td>
<td>N/A</td>
</tr>
<tr>
<td>CREDIT 6</td>
<td>Steep Slope Protection</td>
<td>yes</td>
<td>Planning, Design, Construction</td>
<td>All</td>
</tr>
<tr>
<td>CREDIT 7</td>
<td>Site Design for Habitat / Wetland &amp; Water Body Conservation</td>
<td>yes</td>
<td>Planning, Design, Construction</td>
<td>All</td>
</tr>
<tr>
<td>CREDIT 8</td>
<td>Restoration of Habitat/Wetlands and Water Bodies</td>
<td>no</td>
<td>Planning</td>
<td>N/A</td>
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<tr>
<td>CREDIT 9</td>
<td>Long-Term Cnsrvn. Mgmt. of Habitat / Wetlands &amp; Water Bodies</td>
<td>some</td>
<td>Planning, Design, Construction, O&amp;M, T</td>
<td>Small</td>
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</table>

### NEIGHBORHOOD PATTERN & DESIGN

<table>
<thead>
<tr>
<th>PREREQ</th>
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<th>Base Camp Size</th>
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<tr>
<td>1</td>
<td>Walkable Streets</td>
<td>yes</td>
<td>Planning, Design, Construction, O&amp;M</td>
<td>Medium</td>
</tr>
<tr>
<td>2</td>
<td>Compact Development</td>
<td>some</td>
<td>Planning, Design, Construction</td>
<td>Medium</td>
</tr>
<tr>
<td>3</td>
<td>Connected and Open Community</td>
<td>some</td>
<td>Planning, Design, Construction</td>
<td>Extra Small</td>
</tr>
</tbody>
</table>
Analysis Matrix: Life Cycle
Analysis Matrix: Size

Extra Small
Small
Medium
Large
Analysis Matrix: Duration

- Expeditionary (6 months or less)
- Temporary (up to 2 years)
- Semi-permanent (up to 10 years)
- Enduring (more than 10 years)
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<tr>
<td>PREREQ 2</td>
<td>Imperiled Species and Ecological Communities</td>
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<td>Planning</td>
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<td>PREREQ 3</td>
<td>Wetland and Water Body Conservation</td>
<td>yes</td>
<td>Planning</td>
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<td>N/A</td>
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<td>Long-Term Csrvt. Mgmt. of Habitat / Wetlands &amp; Water Bodies</td>
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<td></td>
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**SMART LOCATION & LINKAGE**

- **PREREQ 1:** Smart Location
  - Phase: no
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Mission determines location.

- **PREREQ 2:** Imperiled Species and Ecological Communities
  - Phase: some
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Avoid those areas if possible. Be aware of cultural resources too.

- **PREREQ 3:** Wetland and Water Body Conservation
  - Phase: yes
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Avoid those areas if possible.

- **PREREQ 4:** Agricultural Land Conservation
  - Phase: some
  - Planning: Planning
  - Base Camp Size: Small
  - Comments: Mission determines location.

- **PREREQ 5:** Floodplain Avoidance
  - Phase: yes
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Look at suitability of existing infrastructure, e.g. ports and airfields.

- **CREDIT 1:** Preferred Locations
  - Phase: yes
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Don't want to clean up a site to use it. Too risky, takes too long.

- **CREDIT 2:** Brownfield Redevelopment
  - Phase: no
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Base camp site location is chosen based on mission criteria, not public transportation.

- **CREDIT 3:** Locations w/ Reduced Automobile Dependence
  - Phase: n/a
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Base camp site location is chosen based on mission criteria, not access to existing bicycle networks.

- **CREDIT 4:** Bicycle Network and Storage
  - Phase: n/a
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Mission determines location.

- **CREDIT 5:** Housing and Jobs Proximity
  - Phase: n/a
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Avoid disturbing steep slopes.

- **CREDIT 6:** Steep Slope Protection
  - Phase: yes
  - Planning: Planning, Design, Construction
  - Base Camp Size: N/A
  - Comments: Avoid disturbing habitats, wetlands, water bodies and neighbors who care about them. The US does not want to incur liability for wetland restoration at the end of the mission.

- **CREDIT 7:** Site Design for Habitat / Wetland & Water Body Conservation
  - Phase: yes
  - Planning, Design, Construction
  - Base Camp Size: N/A
  - Comments: This isn't a contingency base issue.

- **CREDIT 8:** Restoration of Habitat/Wetlands and Water Bodies
  - Phase: no
  - Planning: Planning
  - Base Camp Size: N/A
  - Comments: Conserve and manage habitat/wetlands & water bodies if they are in your footprint - but only for the duration of the camp.

- **CREDIT 9:** Long-Term Csrvt. Mgmt. of Habitat / Wetlands & Water Bodies
  - Phase: some
  - Planning, Design, Construction, O&M, T
  - Base Camp Size: Small
  - Comments: Want major roads to have sidewalks, and provide safe walking paths for base camp occupants. Won't apply the specific LEED-HD criteria. Pay special attention to roads that connect LSA (life support areas) to common use areas.

- **NEIGHBORHOOD PATTERN & DESIGN**

| PREREQ 1        | Walkable Streets                     | yes               | Planning, Design, Construction, O&M | Medium                  |
| PREREQ 2        | Compact Development                  | some              | Planning       | Medium                     |
| PREREQ 3        | Connected and Open Community         | some              | Planning       | Extra Small                |

**NEIGHBORHOOD PATTERN & DESIGN**

- **PREREQ 1:** Walkable Streets
  - Phase: yes
  - Planning, Design, Construction, O&M
  - Base Camp Size: Medium
  - Comments: Plan carefully to accommodate similar functions in the same area to make development compact. Concept makes sense, same metrics won't.

- **PREREQ 2:** Compact Development
  - Phase: some
  - Planning: Planning
  - Base Camp Size: Medium
  - Comments: Specific metrics won't apply, but concept does apply. Note exemption for military bases connectivity to outside communities. Consider connectivity and shared capabilities between bases in a base cluster.
Applicability of Criteria

LEED ND - Walkable Streets

- Intent:
  - To promote transportation efficiency.
  - To promote walking by providing:
    - Safe
    - Appealing
    - Comfortable street environments.
Applicability of Criteria
LEED ND - Walkable Streets

- Requirements:
  - [...]functional entry on the front façade faces a public space, such as a street, square, park, paseo, or plaza [..]/
  - Continuous sidewalks or equivalent all-weather provisions for walking are provided along both sides of 90% of streets [..]
Walkable Streets

Why does this concept apply to Contingency Bases?
Walkable Streets

- Specific LEED-ND criteria does not apply
- Want major roads to have sidewalks
- Provide safe walking paths for base camp occupants
- Pay special attention to roads that connect LSA to common use areas
Applicability of Criteria
LEED NC – Regional Materials

- Intent:
  - To increase demand of materials/products from the region
  - Support the use of indigenous resources
  - Reduce environmental impacts from transportation
Applicability of Criteria
LEED NC – Regional Materials

- Requirements:
  - Products extracted, harvested or recovered within 500 miles
  - Minimum percentages:
    - 10% 1 pt
    - 20% 2 pts
Applicability of Criteria
Envision 2.0—Regional Materials

- Intent:
  - Minimize transportation costs and impacts and retain regional benefits through specifying local sources.

- Requirements:

<table>
<thead>
<tr>
<th>Material</th>
<th>Distance Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils and mulches</td>
<td>50 miles</td>
</tr>
<tr>
<td>Aggregates, Sands</td>
<td>50 miles</td>
</tr>
<tr>
<td>Concrete</td>
<td>100 miles</td>
</tr>
<tr>
<td>Plants</td>
<td>250 miles</td>
</tr>
<tr>
<td>Other materials (excluding equipment)</td>
<td>500 miles</td>
</tr>
</tbody>
</table>
Use of Regional Materials

Criteria on LEED NC and Envision 2.0 both applicable

VS.
Applicability of Criteria

 LEED ND—Historic Resource
Preservation and Adaptive Reuse

- Intent:
  - Preservation and adaptive use of *historic buildings and cultural landscapes*
  - Preservation of historic materials and character defining features.

- Requirements:
  - Do not demolish any historic buildings or alter any cultural landscapes as part of the project.
Applicability of Criteria
Envision 2.0—Preserve Historic and Cultural Resources

- **Intent:**
  - Preserve or restore significant historical and cultural sites and related resources to preserve and enhance community cultural resources.

- **Requirements:**
  - Increase efforts to understand community needs
  - From preservation and conservation to restoration and enhancement of cultural and heritage sites
Historic and Cultural Resources
Next Steps

- Finish assessment process
- Identify most important criteria from each rating tool
- Organize sustainability criteria into usable guidance
- Provide explanations for users to understand how to apply these principles
- Stakeholders review draft guidance
Conclusions

- Contingency base camp community could reduce resources and improve quality of life by using these criteria
  - Not intended to be prescriptive
  - Helpful considerations and references
- Planners should use judgment and experience when applying these sustainability criteria
Contact Information

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