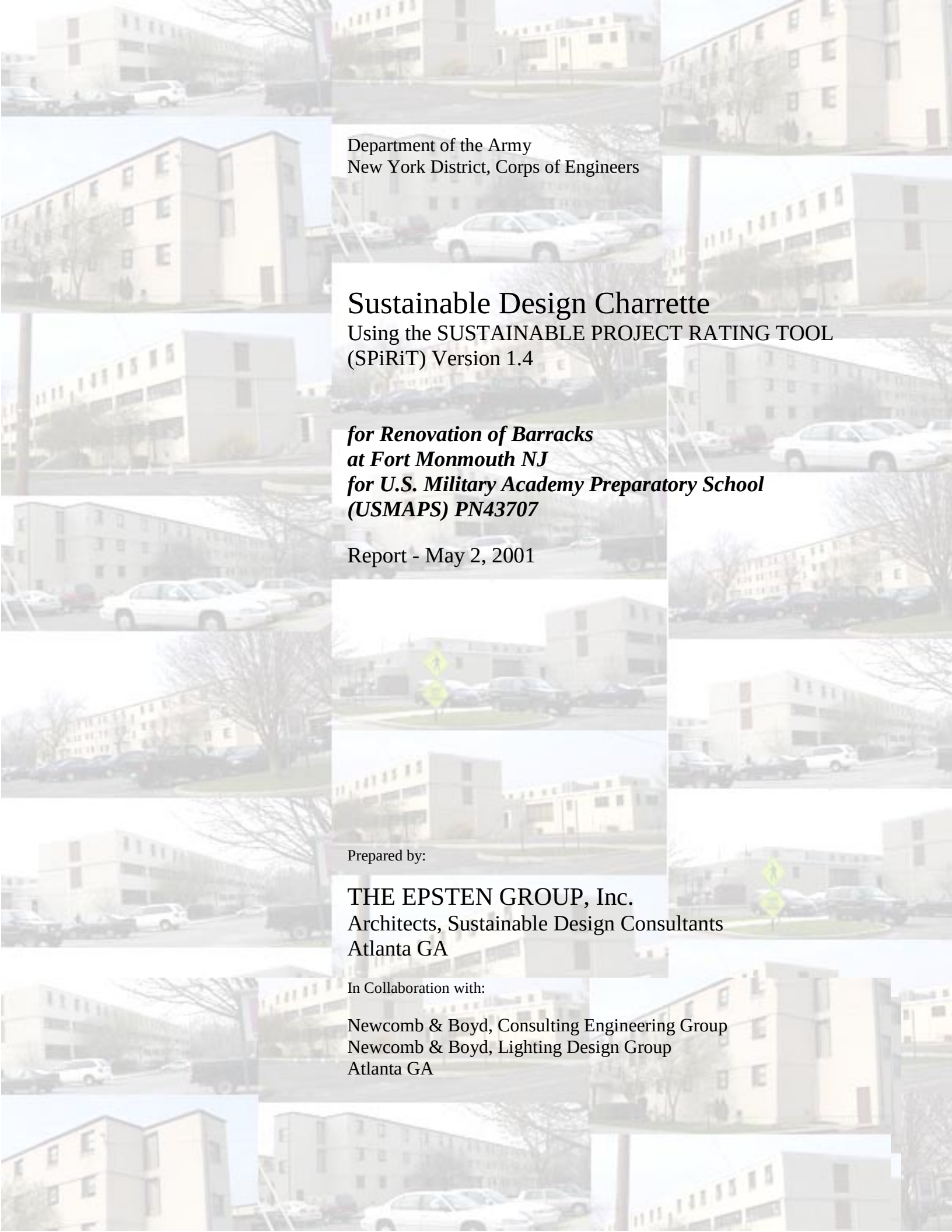

Department of the Army
New York District, Corps of Engineers

Sustainable Design Charrette

Using the SUSTAINABLE PROJECT RATING TOOL (SPiRiT) Version 1.4

for Renovation of Barracks
at Fort Monmouth NJ
for U.S. Military Academy Preparatory School (USMAPS) PN43707

Report - May 2, 2001

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Table of Contents

Table of Contents

Introduction

The project consists of the renovation of two buildings for the U.S. Military Academy Preparatory School at Ft. Monmouth, New Jersey, using sustainable design principles.

The Army Corps of Engineers contacted Dagmar B. Epsten of The Epsten Group, Inc., Atlanta, to lead a charrette discussion of the project under the guidelines of the sustainability rating tool SPiRiT.

In August 2000, the project was informally reviewed by Ned Shepherd, AMXIS-C, under the SPiRiT draft version 1.2.

SPiRiT

SPiRiT (Sustainable Project Rating Tool) is a new tool for rating the sustainability of a construction project, with sustainability defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The SPiRiT tool was developed by the Engineer Research and Development Center of the U.S. Army Corps of Engineers (USACE) in response to a May 2000 memo from the Army Chief of Staff for Installation Management (ACSIM) declaring the adoption of sustainable design principles for future facilities and activities. This established the Department of the Army's Sustainable Design and Development (SDD) policy. The current version, SPiRiT version 1.4, dated April 2001, is the first version to be released as a standard for the Department of Defense.

The SPiRiT rating tool is derived from Leadership in Energy and Environmental Design (LEED), a rating system developed by the U.S. Green Building Council, an interdisciplinary construction industry organization. The current version is LEED 2.0.

Points can be scored in the major categories of Sustainable Site, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Facility Delivery Process, Current Mission, and Future Mission. A project receives a rating when a certain number of credit points are demonstrated within this point system. The rating categories, in ascending order, are bronze, silver, gold and platinum.

Charrette Ground Rules

As introduced by Dagmar Epsten:

1. A charrette is a collaborative process
2. All ideas are valid
3. Respond with "Yes and …" instead of "No, but …"
4. Be aware of time; do not fall behind schedule

Participants

The Epsten Group, Inc., Atlanta, GA, was invited by the Army Corps of Engineers, New York district, to chair a sustainable design charrette for the Renovation of Barracks project in Ft. Monmouth on two days, April 11 and 12, 2001. Dagmar Epsten of The Epsten Group asked mechanical engineer Richard Jones and lighting designer T. Morgan Gabler, both from Newcomb & Boyd, Atlanta, to assist her in chairing the charrette.

Participants in the charrette included representatives of the U. S. Army Corps of Engineers including from Ft. Monmouth and the New York District; the Directorate of Public Works (DPW) at Ft. Monmouth, of Staunton Chow Engineers, and the U.S Army Materiel Command (AMXIS-C). The participants were involved with the project as designers, administrators, and base personnel.

Charrette Process

The charrette was held on location, in Ft, Monmouth, New Jersey, and followed a basic agenda, typed and distributed beforehand.

It appeared most practical to split the participants into three interdisciplinary workgroups for more detailed discussions. By forming smaller groups working simultaneously, the charrette actually stayed ahead of the previously defined schedule. Each workgroup, chaired by one of the charrette leaders, focused on two main SPiRiT categories in two separate sessions, as follows:

	Session I	Session II
Working Group A (Epsten)	Sustainable Sites	Materials and Resources
Working Group B (Jones)	Energy and Atmosphere	Facility Delivery Process Current Mission Future Missions
Working Group C (Gabler)	Water Efficiency	Indoor Environmental Quality

The agenda was geared toward evaluating the project using SPiRiT version 1.4, and using SPiRiT as a guide in reviewing the project. The agenda essentially was as follows:

1. Introduction; goals and project review
2. Presentation on SPiRiT v. 1.4 and initial project assessment
3. Working meetings in three simultaneous smaller workgroups for the SPiRiT categories, interspersed with reviews and issue discussions by the whole group
4. Discussion of responsibilities and processes

There was also time for a short presentation on lighting design as it may relate to the project, by Morgan Gabler of Newcomb & Boyd.

Charrette Results

While the team originally hoped for a platinum rating under LEED, the more realistic assessment as developed in the two days of this charrette points towards a likely silver rating. The implications of a silver vs. platinum rating were discussed. It was agreed that striving for a platinum rating was not practical for the existing buildings.

The most significant issues for the long-term performance of the buildings are

- the need for commissioning to ensure that systems perform as designed – there have typically been problems in the past.

- occupant education in reducing abuse of the building, as current military training in “toughness” extends that attitude to buildings. This requires selection of extra durable materials and extra maintenance and replacement.

The charrette also showed that the SPiRiT process needs to be further refined. As SPiRiT does not list how a proposed certification should be documented through backup information (“Submittals”), its is tempting for a team to assume that a point is met without further investigation into the detailed aspects of a point. Unless documentation becomes an essential part of SPiRiT certification, the rating system will likely be diluted in its value and lose its function as a standard.

Project Images






Photographs: Fernando Bautista

Project Description

The project consists of the renovation of two three-story buildings with a combined area of approximately 160,000 sq. ft., serving the training functions of the U.S. Military Academy Preparatory School. Students will live in the facilities while in training, and will have access to indoor athletic facilities, dining, and an outdoor athletic field, which will double as the location of new geothermal loops. Each of the two buildings is U-shaped, currently with dormitories, offices, and athletic facilities in the two wings of each building, and common areas, including dining, in the middle section. All areas will be renovated, except for the dining facilities, an auditorium, and other common areas in the middle sections. However, the basement of these areas is included in the renovation.

The new functions are essentially unchanged. Interior gypsum walls will be demolished and replaced with newly arranged gypsum walls. The renovation includes the following elements:

1. New stairs
2. Reduced glass
3. Classrooms to remain
4. New ADA compliance
    a. 1 elevator/ classroom 1 wing
    b. ramps
    c. 2/3 of sleeping quarters not ADA
5. Central kitchen/ dining/ auditorium not included in renovation
6. Use is same
    a. Offices
    b. Sleeping quarters
    c. Athletic
7. Some CMU (cinder blocks) to remain
8. HVAC
    a. Equipment to be relocated inside
    b. Low ceiling
        i. 8'-4" to beam + 18" beam
        ii. Exposed ducts/ pipes
9. Shut down central steam plant during operations/ construction
10. Geothermal
    a. Test well
    b. OA/ heat recovery
    c. Manholes [in] athletic field
    d. Size/ depth/ diameter of pipe
    e. Balancing
    f. Geothermal domestic water?

Project Issues
as seen by Charrette Participants

The issues below were addressed in the charrette, documented in section IV of this report in the discussion of SPiRiT points and the issues listed at the beginning of each SPiRiT category:

- Improve design, create award-winning design, achieve platinum rating
- Familiarization with project and energy savings
- Daylighting
- IEQ; improve air quality
- Geothermal and site impact evaluation
- Energy conservation
- Review of systems
- Information on and understanding of sustainable design
- Implementation of sustainable design ideas
- Coordination/ collaboration
- Process/ decisions
- Evaluation of progress
- Intent and economics
- Quality assurance; quality standards of Ft. Monmouth
- Functionality: least operating cost; ease of maintenance and operation
- Overall cost

Project Schedule and Phasing

At the time of this charrette, the project was at the 35% point, somewhat into Design Development.

Phasing of the project was discussed in some length. While the project team is enthusiastic about the opportunity of receiving a SPiRiT rating, the long-phased construction will make it impossible for the project to be the first project completed under SPiRiT. To speed up the process, the renovation of the two barracks could perhaps be divided into two separate projects. However, there are major arguments against this split, including economy of the construction and the need for occupants to shift from one building to the other for temporary accommodations. Therefore, the renovation will occur one wing rather than one building at a time. One wing of the first building will be the first phase and the second wing of the same building the last phase. At times, occupants will have to live in trailers. A phasing plan should be established as the basis for this process and for further discussion.

Phasing of the project includes the following milestones:

1. 35% now
2. 60% July 2001
3. Final Construction Documents September 2001
4. 5 months to procure, to March 2002
5. Occupancy March 2004

Budget Considerations

While the charrette evaluates feasibility in a more general approach, detailed budget issues should be part of a continuous sustainable design process. Currently the estimated construction cost is approximately $18 million, without interiors. Of this sum, approximately $8 million is allocated to HVAC and geothermal systems. The project size is approximately 160,000 sq. ft., and the construction budget approximately $112.50/ sq. ft. A value engineering study is scheduled for the week following this charrette. Life-cycle costs are important.

In-depth professional services for obtaining a SPiRiT rating would likely require additional professional fees, such as perhaps for energy modeling.

The sustainable design aspects of the project were considered to be a great learning tool, even if the life-cycle cost analysis shows that the project would only break even.

This Report

In report section IV, each major category is introduced by issues that emerged in the discussion that could not easily be identified with any one credit point. Following this is a discussion of each credit point. Each requirement is listed at the top of a page, exactly as written in SPiRiT version 1.4. Where SPiRiT differs from LEED 2.0, italics show new language, and struck-out text shows deleted language. The number of credit points attainable for meeting the requirements is also listed. Below the heading "Ft. Monmouth" on each page is a discussion of what is needed for the Ft. Monmouth project to meet the specific requirement. The points likely to be obtained are indicated.

SPiRiT does not include a procedure for documenting compliance with the requirements. Therefore we have suggested submittals for documentation. These are taken directly from the LEED reference guide where the SPiRiT requirements match those of LEED in their essence; and noted as "Submittal (LEED)". Where SPiRiT has modified or added requirements that make other documentation prudent, The Epsten Group has developed a suggested format; these are noted as "Submittal (TEG)".

A Facilities Point Summary at the beginning of section IV shows how the project may fare within the rating system if current objectives are maintained as the design and construction process continues.

Additional Sustainable Aspects of the Project

It was discussed whether the approach to the building project has some additional environmental significance that might improve the rating or simply be noteworthy.

- The building, constructed in 1952, is now almost 50 years old, and the renovation is a considerable commitment to existing building substance; however, there are no extra credits available for this aspect.
- The buildings have a 7 day / 24 hour use, thus optimizing their space and cost of operations.
- Another option would be to build the facilities at another base - West Point - but the function is better provided at Ft. Monmouth, and construction will be easier at Ft. Monmouth as well (the West Point site has rocks that would make construction difficult).

Responsibilities

The charrette participants agreed on most points that should be pursued for a SPiRiT rating. The evaluation in the following section of the report is the result of two rounds of discussion. Material was reviewed after the first round and revised as needed in a second round by the whole group, focusing on responsibilities. Some of the points "crumbled" as responsibilities and processes were discussed further.

The charrette leader, Dagmar Epsten, emphasized that the project team should define how the points deemed attainable would in fact be complied with. She recommended the following questions for a review of the feasibility of each point:

Who? - What? - Where? - When? - Why? - How?

Thus, the attached spreadsheet assigning responsibilities and action items was developed in the charrette (see next 2 pages).

Various strategies were discussed on how to accomplish the sustainable design goals throughout the process of design and construction. They included:

- Use outside consultant
- Prepare report to document each credit
- Design team to make available plans and specs to consultant
- Design team vs. consultant for documentation – consultants should pull information together; project team needs to provide all background information.
- Command post should be involved
- Balance cost/ schedule/ quality
- Document all points
- Technical issues should be reviewed and addressed in more depth
- Scope of work of a consultant should be defined

It was decided that The Epsten Group should assemble and submit a list of responsibilities to technical manager Perry Pang, COE NY, with requested submittals. The Epsten Group should finalize a charrette report within approximately 2 weeks.

Table of Responsibilities and Immediate Submittals

Bolded items needed as soon as possible

	Description	What	Who
1.0	***Sustainable Sites (S)***		
1.R1	Erosion, Sedimentation and Water Quality Control	**Erosion control plan**	**Laurie, Ft. Monmouth (DPW)**
1.C1	Site Selection	(Statement)	The Epsten Group
1.C2	Installation/Base Urban Redevelopment	**Master Plan**	**Robert (DPW)**
1.C3	Brownfield Redevelopment	N/A	
1.C4	Alternative Transportation	**Mass transit plan (in master plan)**	**Robert (DPW)**
		Show bike racks in site plan	**Isabel (COE, Architect)**
		Pre- and post-con-struction parking plans	**Tom (DPW, Civil)**
1.C5	Reduced Site Disturbance	N/A	
1.C6	Stormwater Management	N/A	
1.C7	Landscape & Exterior Design to Reduce Heat Islands	**Site Plan**	**Tom (DPW, Civil)**
		Roof detail of existing roof	**Robert (DPW)**
1.C8	Light Pollution Reduction	**Exterior lighting plan**	**Andy (Electrical)**
1.C9	Optimize Site Features	N/A	
1.C10	Facility Impact	Master plan	Robert (DPW)
1.C11	Site Ecology	N/A	
2.0	***Water Efficiency (W)***		
2.C1	Water Efficient Landscaping	Irrigate athletic fields?	Robert (DPW)
2.C2	Innovative Wastewater Technologies	Check on greywater issues	Robert (DPW)
2.C3	Water Use Reduction	**Fixtures (specs)**	**Vinny (COE)**
		Check on greywater issues	Robert (DPW)
3.0	***Energy and Atmosphere (EA)***		
3.R1	Fundamental Building Systems Commissioning	Typical scope	Newcomb & Boyd
		TBD in specs	Robert (DPW)
3.R2	Minimum Energy Performance	TBD	Vinny (COE)
3.R3	CFC Reduction in HVAC&R Equipment	TBD	Vinny (COE) or COE
3.C1	Optimize Energy Performance	TBD	Vinny (COE)
3.C2	Renewable Energy	N/A	
3.C3	Additional Commissioning	see 3.R1	see 3.R1
3.C4	Measurement and Verification	TBD	Boris (SCE)
3.C5	Green Power	TBD	later date for evaluation
3.C6	Distributed Generation	TBD	later date for evaluation

4.0	***Materials and Resources (M)***		
4.R1	Storage & Collection of Recyclables	**Plan showing location and path**	**Isabel (COE, Architect)**
		Info	Laurie, Ft. Monmouth (DPW)
4.C1	Building Reuse	**Elevations (pre- and post-construction)**	**Isabel (COE, Architect)**
4.C2	Construction Waste Management	Specs, goals	Isabel (COE, Architect)
4.C3	Resource Reuse	N/A	
4.C4	Recycled Content	Gyp. Bd. Alternatives	Isabel (COE, Architect)
4.C5	Local/Regional Materials	Specs	Isabel (COE, Architect)
4.C6	Rapidly Renewable Materials	N/A	
4.C7	Certified Wood	N/A	
5.0	***Indoor Environmental Quality (Q)***		
5.R1	Minimum IAQ Performance	TBD	Vinny (COE)
5.R2	Environmental Tobacco Smoke (ETS) Control	**Copy regulation**	**Robert (DPW)**
5.C1	IAQ Monitoring	TBD	Boris (SCE)
5.C2	Increase Ventilation Effectiveness	TBD	Boris (SCE)
5.C3	Construction IAQ Management Plan	TBD	Perry
5.C4	Low-Emitting Materials	TBD	Isabel (COE, Architect)
5.C5	Indoor Chemical and Pollutant Source Control	N/A	
5.C6	Controllability of Systems	TBD	Andy (Electrical) / Boris (SCE)
5.C7	Thermal Comfort	N/A	
5.C8	Daylight and Views	TBD	Isabel (COE, Architect)
5.C9	Acoustic Environment/ Noise Control	TBD	Isabel (COE, Architect)
5.C10	Facility In-Use IAQ Management Plan	N/A	
6.0	***Facility Delivery Process (P)***		
6.C1	Holistic Delivery of Facility	TBD	Perry
7.0	***Current Mission***		
7.C1	Operation and Maintenance	TBD	Kevin (DPW)
7.C2	Design for Soldier and Workforce Productivity and Retention	TBD	Laurie, Ft. Monmouth (DPW)
8.0	***Future Missions***		
8.C1	Assess Lifespan of Designed Use and Supporting Systems	TBD	Isabel (COE, Architect) / Alan
8.C2	Design for Adaptation, Renewal and Future Uses	TBD	Laurie, Ft. Monmouth (DPW)

	Facility Points Summary		Maximum Points
1.0	**Sustainable Sites (S)**	**Score 10**	**Max 20**
1.R1	❑ Erosion, Sedimentation and Water Quality Control	[Required]	[Required]
1.C1	❑ Site Selection	2	2
1.C2	❑ Installation/Base Redevelopment	2	2
1.C3	❑ Brownfield Redevelopment	0	1
1.C4	❑ Alternative Transportation	3	4
1.C5	❑ Reduced Site Disturbance	0	2
1.C6	❑ Stormwater Management	0	2
1.C7	❑ Landscape and Exterior Design to Reduce Heat Islands	1	2
1.C8	❑ Light Pollution Reduction	1	1
1.C9	❑ Optimize Site Features	0	1
1.C10	❑ Facility Impact	1	2
1.C11	❑ Site Ecology	0	1
2.0	**Water Efficiency (W)**	**Score 2**	**Max 5**
2.C1	❑ Water Efficient Landscaping	1	2
2.C2	❑ Innovative Wastewater Technologies	0	1
2.C3	❑ Water Use Reduction	1	2
3.0	**Energy and Atmosphere (E)**	**Score 5**	**Max 28**
3.R1	❑ Fundamental Building Systems Commissioning	[Required]	[Required]
3.R2	❑ Minimum Energy Performance	[Required]	[Required]
3.R3	❑ CFC Reduction in HVAC&R Equipment	[Required]	[Required]
3.C1	❑ Optimize Energy Performance	4	20
3.C2	❑ Renewable Energy	0	4
3.C3	❑ Additional Commissioning	0	1
3.C4	❑ <<Deleted>>	-	-
3.C5	❑ Measurement and Verification	1	1
3.C6	❑ Green Power	0	1
3.C7	❑ Distributed Generation	0	1
4.0	**Materials and Resources (M)**	**Score 5**	**Max 13**
4.R1	❑ Storage & Collection of Recyclables	[Required]	[Required]
4.C1	❑ Building Reuse	2	3
4.C2	❑ Construction Waste Management	1	2
4.C3	❑ Resource Reuse	0	2
4.C4	❑ Recycled Content	0	2
4.C5	❑ Local/Regional Materials	2	2
4.C6	❑ Rapidly Renewable Materials	0	1
4.C7	❑ Certified Wood	0	1

	Facility Points Summary (Continued)		Maximum Points
5.0	**Indoor Environmental Quality (IEQ) [Q]**	**Score 12**	**Max 17**
5.R1	❑ Minimum IAQ Performance	[Required	[Required]
5.R2	❑ Environmental Tobacco Smoke (ETS) Control	[Required	[Required]
5.C1	❑ IAQ Monitoring	1	1
5.C2	❑ Increase Ventilation Effectiveness	1	1
5.C3	❑ Construction IAQ Management Plan	2	2
5.C4	❑ Low-Emitting Materials	4	4
5.C5	❑ Indoor Chemical and Pollutant Source Control	0	1
5.C6	❑ Controllability of Systems	2	2
5.C7	❑ Thermal Comfort	0	2
5.C8	❑ Daylight and Views	1	2
5.C9	❑ Acoustic Environment /Noise Control	1	1
5.C10	❑ Facility In-Use IAQ Management Plan	0	1
6.0	**Facility Delivery Process (P)**	**Score 6**	**Max 7**
6.C1	❑ Holistic Delivery of Facility	6	7
7.0	**Current Mission**	**Score 5**	**Max 6**
7.C1	❑ Operation and Maintenance	3	3
7.C2	❑ Soldier and Workforce Productivity and Retention	2	3
8.0	**Future Missions**	**Score 4**	**Max 4**
8.C1	❑ Functional Life of Facility and Supporting Systems	2	2
8.C2	❑ Adaptation, Renewal and Future Uses	2	2
		Total Score 49	**Max 100**

25 - 34	SPiRiT BRONZE
35 - 49	SPiRiT SILVER
50 - 74	SPiRiT GOLD
75 - 100	SPiRiT PLATINUM

1.0 Sustainable Sites

The following issues were encountered in the discussion of site issues:

Site size

The site shall be defined as the area to be disturbed by construction activities. This includes some lawn areas surrounding the two buildings. Further, as the new geothermal heat pump loops serving the project will be located below the athletic field, the athletic field shall be included in the site area.

Landscaping

Natural force protection (protection from blasts) determines the landscape design: placement of drives and trees discourages vehicles from carrying explosives to the buildings; there can be no shrubbery near the buildings as there cannot be any hiding places for explosives. Therefore, landscaping in essence will remain as it is, as lawn with some pin oaks, black oaks and white oaks.

1.R1 * **Erosion, ~~and~~ Sedimentation, *and Water Quality* Control** **Reqd.**

Intent: Control erosion *and pollutants* to reduce negative impacts on water and air quality.

Requirement: ❑ Design a site sediment and erosion control plan *and a pollution prevention plan* that conforms to best management practices in the EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-833-R-92-001, Chapter 3, OR local Erosion and Sedimentation Control standards and codes, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.
- *Prevent hazardous material discharge into storm water systems.*
- *Prevent petroleum oils and lubricants (POL) discharge into storm water systems.*

Technologies /Strategies: The EPA standard lists numerous measures such as silt fencing, sediment traps, oil grit separators, construction phasing, stabilization of steep slopes, maintaining vegetated ground cover and providing ground cover that will meet this prerequisite.

FT. MONTMOUTH **Goal**

Contact Laurie, Ft. Monmouth (DPW)

Discussion **Reqd.**

- Soil Sedimentation Plan submitted to the county contains the first two requirements.
- Measures include inlet protection, silt fences, stabilization of construction traffic.
- No hazardous materials on site.
- Measures are stated in the specifications of the contract documents.
- Soil Erosion Control plan is needed as documentation - use Ft. Monmouth Template.

Action Needed Erosion control plan

Suggested Certification Submittals

Submittal 1 (LEED)	Declare whether the project follows local erosion and sedimentation control standards or the referenced EPA standards and provide a brief listing of the measures implemented. If local standards and codes are followed, describe how they meet or exceed the EPA best management practices.
Submittal 2 (LEED)	Provide the erosion control plan (or drawings and specifications) with the sediment and erosion control measures highlighted
Submittal 3 (TEG)	To meet additional SPiRiT requirement, provide a pollution prevention plan demonstrating measures that prevent discharge of hazardous substances, oils and lubricants into the stormwater system during and after construction.

1.C1 * **Site Selection**

Intent: Avoid development of inappropriate sites and reduce the environmental impact from the location of a building on a site. *Select site based on functional adjacencies/relationships and land use compatibility.*

Requirement:

- ❑ Do not develop buildings on portions of sites that meet any one of the following criteria: **1**
  - ~~Prime agricultural land as defined by the Farmland Trust~~
  - *Prime training or maneuver land.*
  - Land whose elevation is lower than 5 ft. above the 100-year flood elevation as defined by FEMA.
  - Land that provides habitat for any species on the Federal or State threatened or endangered list.
  - Within 100 feet of any wetland as defined by 40 CFR, Parts 230-233 and Part 22, OR as defined by local or state rule or law, whichever is more stringent.
  - ~~Land which prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public land owner. (Park Authority projects are exempt.)~~
- ❑ *Select site based on functional adjacencies/relationships and land use compatibility.* **1**
  - *Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure.*
  - *Select site in area of high density.*
  - *Site facilities based on the strength of their relationships to other facilities/land-uses to limit travel distances. The stronger the relationship/functional interaction, the closer the distance between two facilities.*
  - *Select for distance to installation/base transit systems and access to pedestrian ways and bike paths.*
  - *Select for development previously used or developed suitable and available sites.*

Technologies /Strategies: Screen potential building sites for these criteria ~~prior to purchasing the land,~~ and/or ensure that these criteria are addressed by the designer during the conceptual design phase. Utilize landscape architects, ecologists, environmental engineers, civil engineers, and similar professionals for the screening process. New wetlands constructed as part of stormwater mitigation or other site restoration efforts are not affected by the restrictions of this prerequisite.

FT. MONMOUTH **Goal**

Contact The Epsten Group

Discussion

- ❑ *Sites not to meet criteria*: Project site does not encroach into any of the prohibited criteria. **1**
- ❑ *Functional adjacencies:* Site meets all requirements: close to mass transit, within a high density area, self-contained facility, existing facility. **1**

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Action Needed Statement

Suggested Certification Submittals

Submittal 1 (LEED)	*Sites not to meet criteria:* Declare that the project site does not meet any of the prohibited criteria.
Submittal 2 (TEG)	*Functional adjacencies:* Describe how each SPiRiT requirement is being met, stating distances to facilities, transit systems, and densities as applicable. Distances shall be less than ½ mile (walking distance).

1.C2 * ***Installation/Base*** ~~**Urban**~~ **Redevelopment**

Intent: Channel development to *installation/base cantonment* ~~urban~~ areas with existing infrastructure, protecting greenfields and preserving habitat and natural resources.

Requirement:

- ❑ Increase localized density to conform to existing or desired density goals by utilizing sites that are located within ~~an~~ *existing cantonment areas of high* ~~minimum~~ development density ~~of 60,000 square feet per acre (2 story downtown development)~~. **1**
- ❑ *Select sites close to existing roads and utilities or use an existing structure to minimize the need for new infrastructure.* **1**

Technologies /Strategies: During the site selection process give preference to previously developed sites with ~~urban~~ *installation/base cantonment* redevelopment potential *such as facility reduction program cleared sites.*

FT. MONMOUTH **Goal**

Contact Robert (DPW)

Discussion

- ❑ *Increase localized density:* 60,000 sq.ft./ acre LEED requirement is struck in SPiRiT. It should therefore be sufficient to show in master plan that the renovated buildings are surrounded by an existing base and that the project results in a slight increase in density (as some additions are made to the existing buildings). Also, the existing base density is higher than the average density of military facilities. **1**
- ❑ *Close to roads and utilities/ existing structure:* Project uses an existing structure **1**

Action Needed Master Plan

Suggested Certification Submittals

~~Submittal 1 (LEED)~~	~~Provide an area plan with the project location highlighted and the calculated development density for both the project and the surrounding area.~~
Submittal 1 (TEG)	*Increase localized density:* Statement of desired development density for site with applicable copy of master plan for site; area plan showing project density to be minimum 75% of desired development density.
Submittal 2 (TEG)	*Close to roads and utilities/ existing structure:* Statement that project uses an existing structure (alternative, not applicable for this project: statement that distances to existing roads and utilities are less than 200').

1.C3 * **Brownfield Redevelopment**

Intent: Rehabilitate damaged sites where development is complicated by real or perceived environmental contamination, reducing pressure on undeveloped land.

Requirement: ❑ Develop on a site classified as a brownfield and provide remediation as required by EPA's Brownfield Redevelopment program requirements *OR Develop a brownfield site (a site that has been contaminated by previous uses).* **1**

Technologies /Strategies: *Screen potential damaged sites for these criteria prior to selection for rehabilitation.*

~~Participate in EPA's Brownfield Redevelopment program.~~ Utilize EPA OSWER Directive 9610.17 and ASTM Standard Practice E1739 for site remediation where required.

~~Gain community support by highlighting the social and urban benefits of brownfield redevelopment. Negotiate with local municipalities and landowners for below-market purchase price for brownfield real estate. Obtain tax incentives be meeting geographic requirements for EPA's Brownfield tax credits.~~

	FT. MONMOUTH	**Goal**
Contact	Not applicable	
Discussion	No brownfield on the site; therefore, credit not available.	**0**
Action Needed	None	
Suggested Certification Submittals	Submittal 1 (LEED): Provide a letter from the local regulatory agency or regional EPA office confirming that the site is classified as an EPA Brownfield site.	
	Submittal 2 (LEED): Provide documentation demonstrating that remediation efforts have been performed on the site to clean up or stabilize contaminants.	

1.C4 * **Alternative Transportation**

Intent: Reduce pollution and land development impacts from automobile use.

Requirement:

- ❑ Locate building within ½ mile of ~~a commuter rail, light rail or subway station or ¼ mile of 2 or more bus lines~~ *installation/base transit systems.* **1**
- ❑ Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants. **1**
- ❑ *Locate building within 2 miles of* ~~Install~~ alternative-fuel refueling station(s) ~~for 3% of the total vehicle parking capacity of the site. Liquid or gaseous fueling facilities must be separately ventilated or located outdoors~~. **1**
- ❑ Size parking capacity not to exceed minimum ~~local zoning~~ *installation/base cantonment* requirements AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants, OR, add no new parking for rehabilitation projects AND provide preferred parking for carpools or van pools capable of serving 5% of the building occupants. **1**

Technologies /Strategies: Select sites near public *installation/base* transit served by safe, convenient pedestrian pathways.

FT. MONMOUTH **Goal**

Contact

Locate Near Public Transportation: Robert (DPW)
Bicycle Storage & Changing Rooms: Isabel (COE, Architect)
Minimum or No New Parking: Tom (DPW, Civil)

Discussion

- ❑ *Locate Near Public Transportation:* Meet this requirement. Will provide map showing mass transit close to site. **1**
- ❑ *Bicycle Storage & Changing Rooms:* Bike rack and shower facilities provided in the design. **1**
- ❑ *Alternative Fuel Refueling Stations:* No alternative-fuel refueling station within 2 miles. **0**
- ❑ *Minimum or No New Parking:* Project reduces parking spaces by four spaces due to the fire escape tower. Bus shuttle provided by the base -.vanpool preferred parking not required. **1**

Action Needed

Locate Near Public Transportation: Mass transit plan (in master plan)
Bicycle Storage & Changing Rooms: Show bike racks in site plan
Minimum or No New Parking: Pre- and post-construction parking plans

Suggested Certification Submittals

Submittal 1 (LEED)	*Locate Near Public Transportation:* Provide an area drawing highlighting the building location, the fixed rail stations and bus lines, and indicate the distances between them. Include a scale bar for distance measurement.
Submittal 2 (LEED)	*Bicycle Storage & Changing Rooms:* Provide drawings and specifications highlighting bicycle securing apparatus and changing/ shower facilities.
Submittal 3 (LEED)	*Alternative Fuel Refueling Stations:* Provide drawings and specifications highlighting alternative-fuel refueling stations. Include information on venting if applicable.
Submittal 4 (LEED)	*Alternative Fuel Refueling Stations:* Provide calculations demonstrating that these facilities accommodate 3% or more of the total vehicle parking capacity.
Submittal 5 (LEED)	*Minimum or No New Parking:* Provide a design narrative, parking plan, and company literature demonstrating that carpool and van pool programs serve 5% of the building occupants.
Submittal 6 (LEED)	*Minimum or No New Parking:* For new projects, provide a copy of the local zoning requirements highlighting the criteria for minimum parking capacity. Provide a parking plan highlighting the total parking capacity. OR For rehabilitation projects, provide a pre-rehabilitation parking plan and a post-rehabilitation parking plan demonstrating that no new parking capacity was added.

1.C5 * **Reduced Site Disturbance**

Intent: Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Requirement:

- ❑ On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond pervious paving areas that require additional staging areas in order to limit compaction in the paved area; OR, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation. **1**

- ❑ Reduce the development footprint (including building, access roads and parking) to exceed the installation/base's/base's master plan local zoning's open space requirement for the site by 25% *or in accordance with installation/base policy on open space set asides, whichever is greater.* **1**

Technologies /Strategies: Note requirements on plans and in specifications. Establish contractual penalties for destruction of trees and site areas noted for protection. Reduce footprints by tightening program needs and stacking floor plans. Establish clearly marked construction and disturbance boundaries. Delineate laydown, recycling, and disposal areas. Use areas to be paved as staging areas. Work with local horticultural extension services, ~~or~~ native plant societies*, or installation/base agronomy staff* to select indigenous plant species for site restoration and landscaping.

FT. MONMOUTH **Goal**

Contact Not applicable

Discussion

- ❑ *Greenfield sites*: The project does not meet this requirement. Landscape options are limited to requirement for natural forces protection. **0**

- ❑ *Reduce Footprint:* Initial assessment is that the project does not meet this requirement. However, base policy on this issue should be further explored. **0**

Action Needed None

Suggested Certification Submittals

Submittal 1 (LEED)	*Greenfield sites*: provide site drawings and specifications highlighting limits of construction disturbance. OR On previously developed sites, provide a narrative describing restoration of degraded habitat areas. Include highlighted site drawings with area calculations demonstrating that 50% of degraded habitat areas have been restored.
Submittal 2 (LEED)	*Reduce Footprint:* Provide a copy of the local zoning requirements highlighting the criteria for open space.
Submittal 3 (LEED)	*Reduce Footprint:* Provide highlighted site drawings with area calculations demonstrating that the building footprint exceeds the local zoning open space requirement for the site by 25%.
Submittal 4 (LEED)	*Reduce Footprint:* For areas with no local zoning requirements (e.g., university campuses, military bases), designate open space area adjacent to the building that is equal to the building footprint. Provide a letter from the property owner stating that the open space will be conserved for the life of the building.

1.C6 * **Stormwater Management**

Intent: Limit disruption of natural water flows by minimizing storm water runoff, increasing on-site infiltration and reducing contaminants.

Requirement: Implement a stormwater management plan that results in:

- ❑ No net increase in the rate or quantity of stormwater runoff from *undeveloped* ~~existing~~ to developed conditions; OR, if existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff. **1**

- ❑ Treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% of the average annual post development total phosphorous (TP), by implementing Best Management Practices (BMPs) outlined in EPA's Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA-840-B-92-002 1/93). **1**

Technologies /Strategies: Significantly reduce impervious surfaces, maximize on-site stormwater infiltration, and retain pervious and vegetated areas. Capture rainwater from impervious areas of the building for groundwater recharge or reuse within building. Use green/vegetated roofs. Utilize biologically-based and innovative stormwater management features for pollutant load reduction such as constructed wetlands, stormwater filtering systems, bioswales, bio-retention basins, and vegetated filter strips. *Use open vegetated swales to reduce drainage velocity and erosion, reduce system maintenance, increase vegetative variety and support wildlife habitat where space permits.*

FT. MONMOUTH **Goal**

Contact Not applicable

Discussion

- ❑ *No Net Increase or 25% Decrease:* The project does not meet this requirement. **0**

- ❑ *Treatment Systems:* The project does not meet this requirement. **0**

Action Needed None

Suggested Certification Submittals

Submittal 1 (LEED): *No Net Increase or 25% Decrease:* For sites with less than 50% net imperviousness, provide pre-construction and post-construction site drawings. Include area calculations demonstrating no increase in net imperviousness of the site. OR

For sites with greater than 50% net imperviousness, provide a copy of the stormwater management plan. Include calculations describing how the measures of the plan decrease net imperviousness of the site by 25% over existing conditions.

Submittal 2 (LEED): *Treatment Systems:* Provide drawings and specifications describing EPA Best Management Practices implemented for removal of TSS and TP.

Submittal 3 (LEED): *Treatment Systems:* Provide calculations to demonstrate that the BMPs meet or exceed the minimum treatment requirements of the credit.

1.C7 **Landscape and Exterior Design to Reduce Heat Islands**

Intent: Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirement:

- ❑ Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, including parking lots, walkways, plazas, etc., OR, use light-colored/ high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, OR place a minimum of 50% of parking space under-ground OR use open-grid pavement system (net impervious area of LESS than 50%) for a minimum of 50% of the parking lot area.

- ❑ Use ENERGY STAR Roof compliant, high-reflectance AND low emissivity roofing (initial reflectance of at least .65 and three-year-aged reflectance of at least .5 when tested in accordance with ASTM E408) for a minimum of 75% of the roof surface; OR, install a "green" (vegetated) roof for at least 50% of the roof area.

Technologies /Strategies: Employ design strategies, materials, and landscaping designs that reduce heat absorption of exterior materials. Note albedo/reflectance requirements in the drawings and specifications. Provide shade (calculated on June 21, noon solar time) using native or climate tolerant trees and large shrubs, vegetated trellises, or other exterior structures supporting vegetation. Substitute vegetated surfaces for hard surfaces. Explore elimination of blacktop and the use of new coatings and integral colorants for asphalt to achieve light colored surfaces.

FT. MONMOUTH **Goal**

Contact

Site Surfaces: Tom (DPW, Civil)
Roof Surfaces: Robert (DPW)

Discussion

Site Surfaces: Concrete walkways are high-albedo concrete. However, concrete walkways make up less than 30% of non-roof impervious surfaces (walkways and asphalt parking). Therefore, the project does not meet this requirement. **0**

Roof Surfaces: All roof surfaces are existing EPDM with existing light-colored stone ballast, thus exceeding the 75% light-color roof area requirement. **1**

Action Needed

Site Surfaces: Site Plan
Roof Surfaces: Roof detail of existing roof

Suggested Certification Submittals

Submittal 1 (LEED)

Site Surfaces: Provide drawings highlighting all non-roof impervious surfaces and portions of these surfaces that will be shaded within five years. Include calculations demonstrating that a minimum of 30% of non-roof impervious surfaces areas will be shaded within five years. OR

Provide specifications and cut sheets for high-albedo materials applied to non-roof impervious surfaces highlighting the reflectance of the installed materials.

Submittal 2 (LEED)

Site Surfaces: Provide drawings and calculations demonstrating that these materials are furnished and installed on 30% of non-roof impervious surfaces. OR

Provide a parking plan demonstrating that a minimum of 50% of site parking spaces are located underground. OR

Provide drawings and cut sheets for a pervious paving system with a minimum perviousness of 50%. Include calculations demonstrating that this paving system covers a minimum of 50% of the total parking area.

Submittal 3 (LEED)	*Roof Surfaces:* Provide specifications and cut sheets highlighting roofing materials that are Energy Star labeled, with a minimum initial reflectance of 0.65, and a minimum three-year-aged reflectance of 9/5, and a minimum emissivity of 0.9. Include area calculations demonstrating that the roofing material covers a minimum of 75% of the total roof area. OR Provide specifications and cut sheets highlighting a green vegetated roof system. Include area calculations demonstrating that the roof system covers a minimum of 50% of the total roof area.	

1.C8 * **Light Pollution Reduction**

Intent: Eliminate light trespass from the building site, improve night sky access, and reduce development impact on nocturnal environments.

Requirement: ❑ Do not exceed Illuminating Engineering Society of North America (IESNA) footcandle level requirements as stated in the Recommended Practice Manual: Lighting for Exterior Environments, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site. **1**

Technologies /Strategies: Consult IESNA Recommended Practice Manual: Lighting for Exterior Environments for Commission Internationel de I'Eclairage (CIE) zone and pre and post curfew hour descriptions and associated ambient lighting level requirements. Ambient lighting for pre-curfew hours for CIE zones range between .01 footcandles for areas with dark landscapes such as parks, rural, and residential areas, and 1.5 footcandles for areas with high ambient brightness such as *installation/base* ~~urban~~ areas with high levels of nighttime activity. Design site lighting and select lighting styles and technologies to have a minimal impact off-site and minimal contribution to sky glow. Minimize lighting of architectural and landscape features. *Exterior lighting should be consistent with security lighting requirements.*

	FT. MONMOUTH		**Goal**
Contact	Andy (Electrical)		
Discussion	Installation design complies with the IESNA requirements.		**1**
Action Needed	Exterior lighting plan		
Suggested Certification Submittals	Submittal 1 (LEED)	Provide a brief exterior lighting design narrative and exterior lighting design plan demonstrating the lighting objectives and measures that prevent any direct-beam illumination from leaving the building site.	
	Submittal 2 (LEED)	Provide an exterior lighting design plan that illustrates the location of all lighting fixtures and the features they are to light.	
	Submittal 3 (LEED)	Demonstrate that the design will use diffuse or muted light, will meet the IESNA Illuminance values measured at eye height, and not create glare or direct lighting onto neighboring property, streets or the night sky.	

1.C9 ** ***Optimize Site Features***

Intent: *Optimize utilization of the site's existing natural features and placement of man-made features on the site.*

Requirement: ❑ *Perform both of the following:* **1**

- *Maximize the use of free site energy.*
- *Plan facility, parking and roadways to "fit" existing site contours and limit cut and fill.*

Technologies /Strategies: *Evaluate site resources to ascertain how each can enhance the proposed project and visa versa. Work to maximum advantage of the site's solar and wind attributes. Use landscaping to optimize solar and wind conditions and to contribute to energy efficiency; Locate and orient the facility on the site to optimize solar and wind conditions.*

	FT. MONMOUTH		**Goal**
Contact	Not applicable		
Discussion	Base has an integrated natural resources management plan; however, it doesn't seem applicable for this credit. Also, buildings face east-west, and no shade trees are added.		**0**
Action Needed	None		
Suggested Certification Submittals	Submittal 1 (TEG)	Site Plan showing prevailing winds, sun path diagram, long building axis within 15% of east-west, vegetation deflecting winds, vegetation providing shading, and balanced cut and fill.	

1.C10 ** ***Facility Impact***

Intent: *Minimize negative impacts on the site and on neighboring properties and structures; avoid or mitigate excessive noise, shading on green spaces, additional traffic, obscuring significant views, etc.*

Requirement:

- ❑ *Cluster facilities to reduce impact, access distance to utilities and sufficient occupant density to support mass transit.* **1**
- ❑ *Collaborate with installation/base and community planners to identify and mitigate potential impacts of the project beyond site boundaries, and transportation planners to insure efficient public transport.* **1**

Technologies /Strategies: *Involve local/regional planners and community members in installation/base master planning processes. Recognize the context and the impact of a project beyond site boundaries, and integrate it with the larger installation/base/community context/land use.*

FT. MONMOUTH **Goal**

Contact Robert (DPW)

Discussion

- ❑ *Cluster facilities:* The project does not meet this requirement. **0**
- ❑ *Mitigate potential impacts:* Noise is mitigated by replacing HVAC window units and central HVAC with geothermal system. This includes the mitigation of noise from the large chillers and of their view. Further, a step is made toward mitigating the need for the central steam plant. **1**

Action Needed Master plan

Suggested Certification Submittals

Submittal 1 (TEG)	*Cluster facilities:* Provide site plan and calculations showing density on site to be minimum 60,000 sq. ft. per acre.
Submittal 1 (TEG)	*Mitigate potential impacts:* Provide statement how the project makes a significant contribution toward mitigating potential or existing impacts beyond site boundaries.

1.C11 ** ***Site Ecology***

Intent: *Identify and mitigate all existing site problems including contamination of soil, water, and air, as well as any negative impacts caused by noise, eyesores, or lack of vegetation, enhancing or creating new site habitat.*

Requirement: ❑ *Develop site environmental management and mitigation plan.* **1**

Technologies /Strategies: *Understand site and surrounding ecosystem interdependence and interconnectivity. Plan landscaping scheme to incorporate biodiversity. Preserve/enhance existing trees, hydrological features, ecosystems, habitats, and cultural resources. Increase the existence of healthy habitat for native species. Reintroduce native plants and trees where they have been destroyed by previous development.*

	FT. MONMOUTH	**Goal**
Contact	Not applicable	
Discussion	The project does not meet the requirement.	**0**
Action Needed	None	
Suggested Certification Submittals	Submittal 1 (TEG) Provide a written site environmental management and mitigation plan for the project.	

2.0 Water Efficiency

The following issue was encountered in the discussion of water issues:

Stormwater/ Greywater/ issues

Various issues need to be addressed if stormwater and/or greywater are to be used for water needs in the project. The main issues are:

- Cost of extra pipes
- Cost of storage tanks
- Cost of maintenance of systems
- Water savings
- Code issues / regulations for the base

2.C1 **Water Efficient Landscaping**

Intent: Limit or eliminate the use of potable water for landscape irrigation.

Requirement:

- ❑ Use high efficiency irrigation technology, OR, use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means. **1**
- ❑ Use only captured rain or recycled site water for an additional 50% reduction (100% total reduction) of potable water for site irrigation needs, OR, do not install permanent landscape irrigation systems. **1**

Technologies /Strategies: Develop a landscaping water use baseline according to the methodology outlined in the LEED Reference Guide. Specify water-efficient, native or adapted, climate tolerant plantings. High efficiency irrigation technologies include micro irrigation, moisture sensors, or weather data based controllers. Feed irrigation systems with captured rainwater, gray water, or on-site treated wastewater.

FT. MONMOUTH **Goal**

Contact Robert (DPW)

Discussion If the athletic field is irrigated, then high efficiency irrigation technology or captured rain water/ greywater will be used **1**

1. Rainwater and greywater collection
2. Use to irrigate ground and football field from beneath.
3. Xeriscaping to lessen need
4. Separate grey from black

Benefits

1. Recharge aquifers
2. Irrigate field - subsurface

Or, as an alternative, to be determined, the athletic field will not be irrigated at all **0**

Action Needed Investigate alternate irrigation methods, provide drawings and cut sheets for selected method.

Suggested Certification Submittals

Submittal 1 (LEED): *Reduce by 50%:* Provide cut sheets for high-efficiency irrigation equipment. Include calculations demonstrating that potable water consumption for irrigation is reduced by 50%. OR

Provide drawings and a narrative describing the captured

Submittal 2 (LEED): *Reduce Additional 50% or No Irrigation:* Provide drawings and a narrative describing the captured rain system or recycled site water system with the capacity of the system highlighted. Include calculations demonstrating potable water consumption for irrigation is reduced by 100%. OR

Provide a design narrative of the landscape design and describe why a permanent landscape irrigation system is not required.

2.C2 **Innovative Wastewater Technologies**

Intent: Reduce generation of wastewater and potable water demand, while increasing local aquifer recharge.

Requirement: ❑ Reduce the use of municipally provided potable water for building sewage conveyance by a minimum of 50%, OR, treat 100% of wastewater on site to tertiary standards. **1**

Technologies /Strategies: Develop a wastewater baseline according to the methodology outlined in the LEED Reference Guide. Implement decentralized on-site wastewater treatment and reuse systems. Decrease the use of potable water for sewage conveyance by utilizing gray and/or black water systems. Non-potable reuse opportunities include, toilet flushing, landscape irrigation, etc. Provide advanced wastewater treatment after use by employing innovative, ecological, on-site technologies including constructed wetlands, a mechanical recirculating sand filter, or aerobic treatment systems.

FT. MONMOUTH **Goal**

Contact Robert (DPW)

Discussion Reduce potable water sewage conveyance by 50% **0**

1. Greywater in toilets
2. Greywater retrieval from showers/ hand washing/ laundry
3. 48,000 sq. ft. roof area with relatively clean area
4. Waterless urinals
5. Flushometers on toilets.
6. Use greywater to irrigate adjacent football field.
7. Provide urinal instead of 2nd toilet in men's facilities.

Questions for discussion and further investigation:

- Will cadets using the toilets at same time cause a potential pressure problem? 200-250 cadet candidates. 4 cadets going through day at same time. Toilets flushed at the same time
- 1 toilet per 4 cadets. 2nd toilet? Urinal?
- Will flushometers be a maintenance problem? 160 tanks

Action Needed Check on greywater issues: codes, cost and implication of greywater storage tanks. Provide drawings, specs and narrative, and letter from health department.

Suggested Certification Submittals

Submittal 1 (LEED)

Provide a narrative of measures implemented to reduce potable water sewage conveyance. Include calculations demonstrating that potable water sewage conveyance volumes are reduced by 50% over baseline conditions. OR

Provide drawings, specifications and a narrative demonstrating that 100% or building wastewater volumes is directed to an on-site wastewater treatment system that provides treatment to tertiary levels. Include a letter from the local health department documenting compliance with local codes.

2.C3 * **Water Use Reduction**

Intent: Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Requirement:

- ❑ Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act *(EPACT)* of 1992 fixture performance requirements. **1**
- ❑ Exceed the potable water use reduction by an additional 10% (30% total efficiency increase). **1**

Technologies /Strategies: Develop a water use baseline including all water consuming fixtures, equipment, and seasonal conditions according to methodology guidance outlined in the LEED Reference Guide. Specify water conserving plumbing fixtures that exceed Energy Policy Act *(EPACT)* of 1992 fixture requirements in combination with ultra high efficiency or dry fixture and control technologies. Specify high water efficiency equipment (dishwashers, laundry, cooling towers, etc.). Use alternatives to potable water for sewage transport water. Use recycled or storm water for HVAC/process make up water. *Install cooling tower systems designed to minimize water consumption from drift, evaporation and blowdown.*

FT. MONMOUTH **Goal**

Contact
Vinny (COE)
Robert (DPW)

Discussion

Reduce overall potable water usage by 20%: **1**

1. See above tactics in 2.C1 and 2.C2.
2. Use select water reducing fixtures
   a. Waterless urinals
   b. Infrared sensors on sinks with temperature control. Hand washing
   c. Reduced water usage appliances in commercial and cadet laundry facilities (1/3 – ½ standard of washing machine.)
   d. Equipment towel washers etc.
   e. Infrared flush valves for toilets
   f. Do not use water saving showerheads and sink faucets.

Benefit: Water bill reduction 30% - 50%?

Reduce overall potable water usage by 30%: **0**

Is probably not met unless greywater can be used in above mentioned areas. Is greywater allowed?
Dependent on approval of the military and if meets local health codes
Water reuse is great
Reject heat into city water - heat recovery coil (energy category)

Action Needed
Plumbing Fixtures (specs) - Vinny
Check on greywater issues - Robert

Suggested Certification Submittals

Submittal 1 (LEED)	Provide cut sheets for all water consuming fixtures necessary for the occupancy use of the building, with water conservation specifications highlighted. Demonstrate that plumbing fixtures meet or exceed fixture performance requirements of the Energy Policy Act of 1992.
Submittal 2 (LEED)	Provide a water budget calculation demonstrating that occupancy based potable water consumption is reduced by 20% over baseline conditions.

3.0 Energy and Atmosphere

The following issues were encountered in the discussion of energy issues:

Commissioning

As Fundamental Building Commissioning is a SPiRiT prerequisite, and as this credit point is difficult for the project, this item should be given major attention. If the project does not meet the prerequisite of Fundamental Building Commissioning, the project will not qualify for any rating under the SPiRiT system.

Hot water

Hot water for showers and lavatories creates a significant energy demand in the building. Measures that reduce hot water needs may reduce both energy and water consumption of the building and will likely create an important economic benefit. Low-flow options that provide good performance should be researched. Motion sensors may be useful for the faucets. Possibly, heat exchangers could exchange heat from waste water to the water supply.

Heat recovery

Various opportunities exist in the project for heat recovery. A desiccant wheel would provide recovery of sensible heat (temperature) and latent heat (humidity).

Overall energy

The project received relatively few points in the energy and atmosphere category. Perhaps the project should be more aggressive in this category.

3.R1 * **Fundamental Building Systems Commissioning** **Reqd.**

Intent: Verify and ensure that fundamental building elements and systems are designed, installed and calibrated to operate as intended.

Requirement: ❑ Implement all of the following fundamental best practice commissioning procedures.

- Engage a commissioning authority.
- Develop design intent and basis of design documentation.
- Include commissioning requirements in the construction documents.
- Develop and utilize a commissioning plan.
- Verify installation, functional performance, training and documentation.
- Complete a commissioning report.

Technologies /Strategies: Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. *Perform additional commissioning in accordance with the DOE Building Commissioning Guide, Version 2.2.* Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional commissioning guides. *Specify pre-occupancy baseline IAQ testing at time of commissioning. Test for indoor air concentrations of CO, CO2, total VOCs and particulates. Test to assure that adequate ventilation rates have been achieved prior to initial occupancy.*

FT. MONMOUTH **Goal**

Contact Robert
Richard (Newcomb & Boyd)

Discussion Provide basic commissioning by base facility operations group; this will meet the requirement **Reqd.**

Action Needed Typical scope
TBD in specs

Suggested Certification Submittals

Submittal 1 (LEED)	Provide a copy of the commissioning plan highlighting the six fundamental commissioning procedures as listed in the credit requirements.
Submittal 2 (LEED)	Provide a signed letter of certification by the commissioning authority confirming that the commissioning plan has been successfully executed and the design intent of the building has been achieved.

3.R2 * **Minimum Energy Performance** **Reqd.**

Intent: Establish the minimum level of energy efficiency for the base building and systems.

Requirement: ❑ Design to meet building energy efficiency and performance as required by *TI 800-01 (Design Criteria)* ~~ASHRAE/IESNA 90.1-1999 or the local energy code, which ever is the more stringent. Analyze expected baseline building performance using the System/ Component Method~~.

Technologies /Strategies: Use building modeling and analysis techniques to establish and document compliance. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Refer to the LEED Reference Guide for a wide variety of energy efficiency strategy resources.

Use a professionally recognized and proven computer program or programs that integrate architectural features with air-conditioning, heating, lighting, and other energy producing or consuming systems. These programs will be capable of simulating the features, systems, and thermal loads used in the design. Using established weather data files, the program will perform 8760 hourly calculations. BLAST, DOE-2 or EnergyPlus are acceptable programs for these purposes.

FT. MONMOUTH **Goal**

Contact Vinny (COE)

Discussion Cost of modeling is an issue. **Reqd.**
TRACE, an energy analysis program produced by TRANE, could be used in modeling of the building; less expensive than DOE2 modeling.
Show that building meets the state energy performance as shown In T1-800-01, for building type and location.

Action Needed Model the building using an energy simulation tool.

Suggested Certification Submittals Submittal 1 (TEG) Provide computer energy model output that shows energy performance in compliance with T1-800-01, for building type and location.

3.R3 **CFC Reduction in HVAC&R Equipment** **Reqd.**

Intent: Reduce ozone depletion.

Requirement: ❑ Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phaseout conversion.

Technologies /Strategies: Specify only non-CFC-based refrigerants in all base building HVAC&R systems.

	FT. MONMOUTH	Goal
Contact	Vinny (COE) or COE	
Discussion	The building does not make use of CFC-bases refrigerants in its HVAC&R systems.	**Reqd.**
Action Needed	Specifications	
Suggested Certification Submittals	Submittal 1 (LEED)	For new buildings, provide equipment schedules and cut sheets highlighting refrigerant information for all HVAC&R components. OR For existing buildings, provide a listing of all existing HVAC& R components and state whether each components uses CFCs. For those components that use CFCs, provide a copy of the phase-out plan describing how these components will be converted or removed and replaced with CFC-free components before construction is complete.

3.C1 * **Optimize Energy Performance**

Intent: Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

Requirement: ❑ Reduce design energy *usage (DEU)* ~~cost~~ compared to the energy *use* ~~cost~~ budget *(EUB) in joules per square meter per year* for regulated energy components *as* described in the requirements of *Chapter 11 of the TI 800-01 (Design Criteria)* ~~ASHRAE/IESNA Standard 90.1-1999~~, as demonstrated by a whole building simulation ~~using the Energy Cost Budget Method described in Section 11~~. **20**

- *1 Point will be awarded for every reduction in design energy use of 2.5% for both new and existing facilities for a maximum score of 20 points.*

~~Reduction Beyond Minimum~~
~~New Bldgs. 20%30%40%50%60% Existing Bldgs. 10%20%30%40%50%~~

Regulated energy components include HVAC systems, building envelope, service hot water systems, lighting and other regulated systems as defined by ASHRAE.

Technologies /Strategies: Develop and use building modeling and analysis techniques to establish a base case that meets the minimum prerequisite standard. ASHRAE/IESNA 90.1-1999 provides guidance for establishing building base case development and analysis. Perform interactive energy use analysis for selected design elements that affect energy performance and document compliance.

Unit of measure for performance shall be annual energy *usage in joules per square meter* ~~cost expressed in dollars~~. *Life-Cycle* ~~Annual~~ energy costs shall be determined using rates for purchased energy, such as electricity, gas, oil, propane, steam, and chilled water and approved by the adopting authority ~~OR using the default purchased energy costs set forth in the Reference Guide~~. Refer to the LEED Reference Guide *or Whole Building Design Guide* for a wide variety of energy efficiency resources and strategies including conservation measures, electromechanical energy efficiency technologies *(for example ground-source heat pumps),* passive heating and cooling strategies, *solar hot water*, and daylighting.

Life-Cycle costing will be done in accordance with 10 CFR 436.

Consider installation of an Energy Management and Control System (EMCS), which is compatible with exiting installation systems to optimize performance. Use sensors to control loads based on occupancy, schedule and/or the availability of natural resources use (day light or natural ventilation).

FT. MONMOUTH **Goal**

Contact Vinny (COE)

Discussion Overall the systems chosen for the project are very efficient. The opportunities for additional energy savings through daylighting and renewables are not available for this project because of cost and the nature of the renovation. Efficient layout of the systems is essential to capture the energy performance potential of them. **4**

1. Geothermal
2. Heat recovery for outside air
3. High performance reflector (lighting)
4. Maximum lighting power densities
5. VFD's variable frequency drive for pumps
6. CO2 sensors in classroom
7. Use the energy model to indicate by how much the renovated building will beat the EUB (Energy Use Budget)
8. Occupancy sensors for classrooms and offices
9. High performance windows
10. Entrance vestibules
11. High efficiency appliances
12. Minimize pump energy by providing efficient pipe layout to minimize pump head
13. Solar hot water heating

Action Needed Develop energy model of building and compare its energy performance with the Energy Use Budget.

Suggested Certification Submittals

Submittal 1 (LEED)	Provide a narrative highlighting energy-saving measures incorporated in the building design, including an isometric of the building showing the basic floor plate shape and external projections.

Submittal 2 (TEG)	Demonstrate the design energy usage compared to the energy use budget by providing computer model output and an analysis statement of the comparison.

3.C2 * **Renewable Energy**

Intent: Encourage and recognize increasing levels of self-supply through renewable technologies to reduce environmental impacts associated with fossil fuel energy use.

Requirement: ❑ Supply a net fraction of the building's total energy use ~~(as expressed as a fraction of annual energy cost)~~ through the use of on-site renewable energy systems.

% of Total *Annual* Energy ~~Cost~~ *Usage* in Renewables	
5%	**1**
10%	**2**
15%	**3**
20%	**4**

Technologies /Strategies: Employ the use of on-site non-polluting-source renewable technologies contributing to the total energy requirements of the project. Consider and use high temperature solar and/or geothermal, photovoltaics, wind, biomass (other than unsustainably harvested wood), and bio-gas. Passive solar, solar hot water heating, ground-source heat pumps, and daylighting do not qualify for points under this credit. Credit for these strategies is given in Energy & Atmosphere Credit 1: Optimizing Energy Performance.

FT. MONMOUTH **Goal**

Contact Not applicable

Discussion Project does not meet this requirement. **0**

Action Needed None

Suggested Certification Submittals

Submittal 1 (LEED)	Provide drawings, cut sheets, and specifications highlighting on-site renewable energy systems installed in the building.
Submittal 2 (LEED)	Provide calculations demonstrating that 5% of total energy costs are supplies by on-site renewable energy systems.

3.C3 **Additional Commissioning**

Intent: Verify and ensure that the entire building is designed, constructed, and calibrated to operate as intended.

Requirement: ❑ In addition to the Fundamental Building Commissioning prerequisite, implement the following additional commissioning tasks: **1**

1. Conduct a focused review of the design prior to the construction documents phase.
2. Conduct a focused review of the construction documents when close to completion.
3. Conduct a selective review of contractor submittals of commissioned equipment.
4. Develop a system and energy management manual.
5. Have a contract in place for a near-warranty end or post occupancy review.

Items 1, 2, and 3 must be performed by someone other than the designer.

Technologies /Strategies: Introduce standards and strategies into the design process early, and then carry through selected measures by clearly stating target requirements in the construction documents. Tie contractor final payments to documented system performance. Refer to the LEED Reference Guide for detailed descriptions of required elements and references to additional guidelines.

FT. MONMOUTH **Goal**

Contact Robert
Richard (Newcomb & Boyd)

Discussion This is an additional cost as a third party agency will be needed to provide the commissioning. Provide if budget allows. **0**

Action Needed Typical scope.
TBD in specs

Suggested Certification Submittals

Submittal 1 (LEED)	Provide an excerpt from the commissioning plan highlighting the five additional commissioning tasks as listed in the credit requirements.
Submittal 2 (LEED)	Provide a signed letter of certification by an independent commissioning authority confirming that Tasks 1, 2, and 3 of the credit requirements have been successfully executed.
Submittal 3 (LEED)	Provide a signed letter of certification by an independent commissioning authority or designer confirming that Tasks 4 and 5 of the credit requirements have been successfully executed.

3.C4 **Elimination of HCFC's and Halons**

Intent: Reduce ozone depletion and support early compliance with the Montreal Protocol.

Requirement: ❑ Install base building level HVAC and refrigeration equipment and fire suppression systems that do not contain HCFC's or Halon. **1**

Technologies /Strategies: Utilize base building HVAC and refrigeration systems that use non ozone damaging liquids for the refrigeration cycle. Refer to the LEED Reference Guide for qualifying alternatives.

3.C5 * **Measurement and Verification**

Intent: Provide for the ongoing accountability and optimization of building energy and water consumption performance over time.

Requirement: ❑ Comply with the installed equipment requirements for continuous metering as stated in *selected Measurement and Verification Methods -* Option B: *Retrofit Isolation* ~~Methods by Technology~~ of the US DOE's International Performance Measurement and Verification Protocol (IPMVP) for the following: **1**

- Lighting systems and controls.
- Constant and variable motor loads.
- Variable frequency drive (VFD) operation.
- Chiller efficiency at variable loads (kW/ton).
- Cooling load.
- Air and water economizer and heat recovery cycles.
- Air distribution static pressures and ventilation air volumes.
- Boiler efficiencies.
- Building specific process energy efficiency systems and equipment.
- Indoor water risers and outdoor irrigation systems.

Technologies /Strategies: Design and specify equipment to be installed in base building systems to allow for comparison, management, and optimization of actual vs. estimated energy and water performance. Employ building automation systems to perform M&V functions where applicable. Tie contractor final payments to documented M&V system performance and include in the commissioning report. Provide for ongoing M&V system maintenance and operating plan in building operations and maintenance manuals. *Consider installation/base of an Energy Management and Control System (EMCS), which is compatible with exiting installation/base systems to optimize performance.* ~~Refer to the LEED Reference Guide for a synopsis of IPMVP options.~~

FT. MONMOUTH **Goal**

Contact Boris

Discussion Metering. **1**
This will be met by having a Direct Digital Control (DDC) building control system record data. Make sure DDC system provides the points (as in data points) necessary to record the data listed in the requirement. This may be cost-prohibitive as extra points may be needed over the base DDC system.

Action Needed Add additional metering points (data points) as long as they are cost prohibitive.

Suggested Certification Submittals

Submittal 1 (LEED)	Provide a copy of the Measurement & Verification Plan.
Submittal 2 (LEED)	Include a summary schedule of the instrumentation and controls for the ten required monitoring categories, highlighting the I/O data points to be collected.
Submittal 3 (LEED)	Include cut sheets of sensors and the date collection system used to provide continuous metering per IPMVP standards.

3.C6 * **Green Power**

Intent: Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

Requirement: ❑ Engage in a two year contract to purchase *the amount of power equal to projected building consumption* ~~power~~ generated from renewable sources that meet the Center for Resource Solutions (CRS) Green-E requirements. **1**

Technologies /Strategies: Purchase power from a provider that guarantees a fraction of its delivered electric power is from net nonpolluting renewable technologies. Begin by contacting local utility companies. If the project is in an open market state, investigate Green Power and Power Marketers licensed to provide power in that state. Grid power that qualifies for this credit originates from solar, wind, geothermal, biomass, or low-impact hydro sources. Low-impact hydro shall comply with the Low Impact Hydropower Certification Program.

FT. MONMOUTH **Goal**

Contact Not applicable for the time being.

Discussion Currently not possible. **0**
Possible in 2004 because of deregulation.
If deregulation provides for power companies to sell green power, and if Ft. Monmouth purchases green power, this point is possible.

Action Needed Later date for evaluation

Suggested Certification Submittals

Submittal 1 (LEED)	Provide a copy of the two-year electric utility purchase contract for power generated from renewable sources.
Submittal 2 (LEED)	Provide documentation demonstrating that the supplied renewable power meets the referenced Green-E requirements.

3.C7 ** ***Distributed Generation***

Intent: *Encourage the development and use of distributed generation technologies, which are less polluting than grid-source energy.*

Requirement: ❑ *Reduce total energy usage and emissions by considering source energy implications and local cogeneration and direct energy conversion. Generate at least 50% of the building's projected annual consumption by on-site distributed generation sources.* **1**

Technologies /Strategies: *Investigate the use of integrated generation and delivery systems, such as co-generation, fuel cells, micro-turbines and off-peak thermal storage.*

	FT. MONMOUTH		**Goal**
Contact	Not applicable		
Discussion	Project does not meet this requirement.		**0**
Action Needed	None		
Suggested Certification Submittals	Submittal 1 (TEG)	Provide statement and calculations demonstrating that 50% of the building design energy usage is met by sources other than grid sources.	

4.0 Materials and Resources

The following issues were encountered in the discussion of material issues:

Major New Materials

As this is a renovation project, major new materials are limited to:

- Connecting corridor
- Elevator tower
- Stairs and handrails
- Gypsum board (100% demolished/ new)
- Ceiling tile (60% demolished/ new)
- Resilient flooring
- Quarry tile

Resilient Flooring

Currently specified is vinyl tile: As vinyl has negative effects on the environment in its manufacture, alternatives should be considered. Discussed were:

- Linoleum. The manufacturer will probably be able to dispel concerns that this material may be a maintenance problem, such as by chipping at its seams.
- "Colorquartz aggregate" for seamless flooring – this has shown great performance in other buildings of the base. Long-term durability and potential recycled content could be environmental assets.

Gypsum board

Required high impact resistance due to abuse by occupants leads to specification of Fiberrock. Though the architect was told by the manufacturer that only the paper facing, not the board core, is recycled (resulting in an 8% overall recycled content), The Epsten Group, Inc, has been given information by the manufacturer that the material has an overall 85% recycled content.

4.R1 * **Storage & Collection of Recyclables** **Reqd.**

Intent: Facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills.

Requirement:
- ❑ Provide an easily accessible area that serves the entire building that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, and metals.

Technologies /Strategies: *Establish a waste management plan which meets requirements of the installation/base environmental and/or solid waste management plans in cooperation with users to encourage recycling.* Reserve space for recycling functions early in the building occupancy programming process and show areas dedicated to collection of recycled materials on space utilization plans. Broader recycling support space considerations should allow for collection and storage of the required elements and newspaper, organic waste (food and soiled paper), and dry waste. When collection bins are used, bin(s) should be able to accommodate a 75% diversion rate and be easily accessible to custodial staff and recycling collection workers. Consider bin designs that allow for easy cleaning to avoid health issues.

FT. MONMOUTH **Goal**

Contact Isabel (COE, Architect)
Laurie, Ft. Monmouth (DPW)

Discussion Project meets the requirement. **Reqd.**

Action Needed Plan showing location and path.
Information on recycling material volumes.

Suggested Certification Submittals

Submittal 1 (LEED)	Provide drawings highlighting locations for collection and storage of materials separated for recycling. Indicate the path from recycling locations to the building loading dock and demonstrate that the recycling area can handle the recycling material volumes generated by building occupants.

4.C1 * **Building Reuse**

Intent: Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste, and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.

Requirement: Reuse large portions of existing structures during renovation or redevelopment projects.

- ❑ Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window assemblies). **1**
- ❑ Maintain an additional 25% (100% total) of existing building structure and shell (exterior skin and framing excluding window assemblies). **1**
- ❑ (walls, floor coverings, and ceiling systems). **1**

Technologies /Strategies: Evaluate retention of existing structure. Consider facade preservation, particularly in *installation/base* ~~urban~~ areas. During programming and space planning, consider adjusting needs and occupant use patterns to fit within existing building structure and interior partition configurations. Identify and effectively address energy, structural, and indoor environmental (lead & asbestos) issues in building reuse planning and deconstruction documents. Percentage of reused non-shell building portions will be calculated as the total area (s.f.) of reused walls, floor covering, and ceiling systems, divided by the existing total area (s.f.) of walls, floor covering, and ceiling systems.

FT. MONMOUTH **Goal**

Contact Isabel (COE, Architect)

Discussion

- ❑ *Maintain 75%:* The project meets this requirement. Refer to elevations. **1**
- ❑ *Maintain 100%:* The project meets this requirement. Window replacement uses the existing openings. **1**
- ❑ *Maintain 100% + 50% non-shell:* Reused interior walls 70%, reused ceilings (in classrooms) 30%, reused floor coverings 30%. **0**

Action Needed Elevations (pre- and post-construction)

Suggested Certification Submittals

Submittal 1 (LEED)	*Maintain 75% (100%):* Provide pre-construction and post-construction plan and elevation drawings highlighting reused structure and shell elements. Include calculations demonstrating that 75% (100%) of the structure and shell was reused.
Submittal 2 (LEED)	*Maintain 100% + 50% non-shell:* Provide pre-construction and post-construction drawings highlighting reused interior walls, floor coverings and ceilings. Include calculations demonstrating that 50% of the non-shell components were reused.

4.C2 * **Construction Waste Management**

Intent: Divert construction, demolition, and land clearing debris from landfill disposal. Redirect recyclable material back to the manufacturing process.

Requirement: Develop and implement a waste management plan, quantifying material diversion by weight:

- ❑ Recycle and/or salvage at least 50% (by weight) of construction, demolition, and land clearing waste. **1**
- ❑ Recycle and/or salvage an additional 25% (75% total by weight) of the construction, demolition, and land clearing debris. **1**

Technologies /Strategies: Develop and specify a waste management plan *which meets requirements of the installation/base environmental and/or solid waste management plans* that identifies licensed haulers and processors of recyclables; identifies markets for salvaged materials; employs deconstruction, salvage, and recycling strategies and processes, includes waste auditing; and documents the cost for recycling, salvaging, and reusing materials. Source reduction on the job site should be an integral part of the plan.

The plan should address recycling of corrugated cardboard, metals, concrete brick, asphalt, land clearing debris (if applicable), beverage containers, clean dimensional wood, plastic, glass, gypsum board, and carpet; ~~and~~ evaluate~~s~~ the cost-effectiveness of recycling rigid insulation, engineered wood products and other materials; *hazardous materials storage and management; and participation in manufacturers' "take-back" programs to the maximum extent possible*. Refer to the LEED Reference Guide for guidelines and references that provide waste management plan development and implementation support including model bid specifications.

FT. MONMOUTH **Goal**

Contact Isabel (COE, Architect)

Discussion

- ❑ *Construction Waste Management, Salvage or Recycle 50%:* The project meets this requirement. Active recycling program in the facility. Will be in contract specs. **1**
- ❑ *Construction Waste Management, Salvage or Recycle 75%:* The project does not meet this requirement. **0**

Action Needed Specs, goals

Suggested Certification Submittals

Submittal 1 (LEED)	Provide a copy of the Waste Management Plan for the project highlighting recycling and salvage requirements.
Submittal 2 (LEED)	Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% (75%) of construction wastes were recycled or salvaged.

4.C3 **Resource Reuse**

Intent: Extend the life cycle of targeted building materials, reducing environmental impacts related to materials manufacturing and transport.

Requirement:
- ❑ Specify salvaged or refurbished materials for 5% of building materials. **1**
- ❑ Specify salvaged or refurbished materials for 10% of building materials. **1**

Technologies /Strategies: Commonly salvaged building materials include wood flooring/ paneling/cabinets, doors and frames, mantels, iron work and decorative lighting fixtures, brick, masonry and heavy timbers. See the LEED Reference Guide for calculation tools and guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars* (see exclusions) of the salvaged or refurbished material.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: In total dollar calculations, exclude; labor costs; all mechanical and electrical material and labor costs; and project overhead and fees. *If the cost of the salvaged or refurbished material is below market value, use replacement cost to estimate the material value, otherwise use actual cost to the project.

FT. MONMOUTH **Goal**

Contact Not applicable

Discussion
- ❑ *Resource Reuse, Specify 5%:* The project does not meet this requirement. **0**
- ❑ *Resource Reuse, Specify 10%:* The project does not meet this requirement. **0**

Action Needed None

Suggested Certification Submittals

Submittal 1 (LEED)	Provide specifications and contractor submittals highlighting salvaged and refurbished materials to use on the project.
Submittal 2 (LEED)	Provide calculations demonstrating that 5% (10%) of building materials were salvaged. Include the origin and cost for salvaged materials and the total cost for building materials.

4.C4 * **Recycled Content**

Intent: Increase demand for building products that have incorporated recycled content material, reducing the impacts resulting from extraction of new material.

Requirement:

- ❑ Specify a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post-consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material. **1**

- ❑ Specify an additional 25% (50% total*)* of building materials that contain in aggregate, a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material. **1**

Technologies /Strategies: Specify building materials containing recycled content for a fraction of total building materials. *Select products and materials with supporting information from the AIA Resource Guide or the EPA Environmentally Preferable Purchasing (EPP) Program.* ~~Start with the materials listed in the EPA's Comprehensive Procurement Guidelines (CPG).~~ Common building materials and products with recycled content include; wall, partition, and ceiling materials and systems; insulation; tiles and carpets; cement, concrete, and reinforcing metals; structural and framing steel. *For products/materials not listed, selection should be made on the basis of EPP criterion and/or:*

- *Toxicity;*
- *Embodied energy;*
- *Production use of water, energy and ozone depleting substances (ODSs);*
- *Production limits on toxic emissions and effluents;*
- *Minimal, reusable or recycled/recyclable packaging;*
- *Impact on indoor environmental quality (IEQ);*
- *Installation that limits generation of waste;*
- *Materials that limit waste generation over their life;*
- *EPA guideline compliance; and*
- *Harvested on a sustainable yield basis.*

See the LEED Reference Guide for a summary of the EPA guidelines and calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of the material that contain recycled content.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees)

FT. MONMOUTH **Goal**

Contact Isabel (COE, Architect)

Discussion *Recycled content, specify 25%* Initial assessment is that the project does not meet this requirement. However, gypsum board needs further research. **0**

Recycled content, specify 50%: The project does not meet this requirement. **0**

Action Needed Gypsum Board Research

Suggested Certification Submittals

Submittal 1 (LEED)	Provide specifications and contractor submittals highlighting recycled content materials.
Submittal 2 (LEED)	Provide a spreadsheet of all materials used on the project highlighting recycled content materials. Include the percentage of post-consumer and post-industrial recycled content for all recycled content materials, the costs of all materials for the project, and calculations demonstrating that 25% of building materials have the required recycled content.

4.C5 **Local/Regional Materials**

Intent: Increase demand for building products that are manufactured locally, reducing the environmental impacts resulting from transportation, and supporting the local economy.

Requirement:

- ❑ Specify a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles. **1**
- ❑ Of these regionally manufactured materials, specify a minimum of 50% that are extracted, harvested, or recovered within 500 miles. **1**

Technologies /Strategies: Specify and install regionally extracted, harvested, and manufactured building materials. Contact the state and local waste management boards for information about regional building materials. See the LEED Reference Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of material that is locally or regionally manufactured.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees.

FT. MONMOUTH **Goal**

Contact Isabel (COE, Architect)

Discussion

- ❑ *20% Manufactured Locally:* The project meets this requirement. There are many building manufacturers within a 500 mile radius of the project as the region is highly industrialized. **1**
- ❑ *Of 20% Above 50% Harvested Locally:* The project meets this requirement as well. **1**

Action Needed Specifications

Suggested Certification Submittals

Submittal 1 (LEED)	*20% Manufactured Locally:* Provide specifications and contractor submittals highlighting local material installed.
Submittal 2 (LEED)	*20% Manufactured Locally:* Provide a spreadsheet of all materials used on the project highlighting locally manufactured materials. Include the location of the material manufacturer, the distance from the manufacturer to the project site, the costs of all materials for the project, and calculations demonstrating that 20% of building materials are manufactured within 500 miles of the project.
Submittal 3 (LEED)	*Of 20% Above 50% Harvested Locally:* Provide specifications and contractor submittals highlighting local material installed.
Submittal 4 (LEED)	*Of 20% Above 50% Harvested Locally:* Provide a spreadsheet of all materials used on the project highlighting locally manufactured materials. Include the location of the material manufacturer, the distance from the manufacturer to the project site, the costs of all materials for the project, and calculations demonstrating that 20% of building materials are manufactured within 500 miles of the project.
Submittal 5 (LEED)	*Of 20% Above 50% Harvested Locally:* Provide manufacturer information on locally manufactured materials demonstrating that 50% of these materials were extracted, harvested, or recovered within 500 miles of the project.

4.C6 **Rapidly Renewable Materials**

Intent: Reduce the use and depletion of finite raw and long cycle renewable materials by replacing them with rapidly renewable materials.

Requirement: ❑ Specify rapidly renewable building materials for 5% of total building materials. **1**

Technologies /Strategies: Rapidly renewable resources are those materials that substantially replenish them-selves faster than traditional extraction demand (e.g. planted and harvested in less than a 10 year cycle) and do not result in significant biodiversity loss, increase erosion, air quality impacts, and that are sustainably managed. See the LEED Reference Guide for calculation methodology guidelines. Determine percentages in terms of dollar value using the following steps:

1. Calculate total dollars (see exclusions) of materials that are considered to be rapidly renewable.
2. Calculate total dollars (see exclusions) of all building materials.
3. Divide Step 1 by Step 2 to determine the percentage.

Exclusions: Labor costs; all mechanical and electrical material and labor costs; project overhead and fees.

FT. MONMOUTH **Goal**

Contact Not applicable

Discussion The project does not meet this requirement. **0**

Action Needed None

Suggested Certification Submittals

Submittal 1 (LEED)	Provide written documentation from the manufacturer, declaring the rapidly renewable materials contained in the candidate products.
Submittal 2 (LEED)	Provide specification and contractor submittals highlighting rapidly renewable materials installed.
Submittal 3 (LEED)	Provide a spreadsheet of all materials used on the project highlighting rapidly renewable materials. Include manufacturer information, the cost of all materials for the project, and calculations demonstrating that 5% of building materials are rapidly renewable.

4.C7 **Certified Wood**

Intent: Encourage environmentally responsible forest management.

Requirement: ❑ Use a minimum of 50% of wood-based materials certified in accordance with the Forest Stewardship Council guidelines for wood building components including but not limited to framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work and pedestrian barriers. **1**

Technologies /Strategies: Refer to the Forest Stewardship Council guidelines for wood building components that qualify for compliance to the requirements and incorporate into material selection for the project.

FT. MONMOUTH **Goal**

Contact Not applicable

Discussion The project does not meet this requirement. However, replacement of particleboard with low-emitting plywood will result in a credit in the category of indoor environmental quality. **0**

Action Needed None

Suggested Certification Submittals

Submittal 1 (LEED)	Provide wood certification documentation from the manufacturer declaring conformance with Forest Stewardship Council Guidelines for certified wood building components.
Submittal 2 (LEED)	Provide specifications and contractor submittals highlighting certified wood-based materials installed.
Submittal 3 (LEED)	Provide a spreadsheet of all wood-based materials used on the project highlighting certified wood-based materials. Include calculations demonstrating that 50% of wood-based materials are certified wood.

5.0 Indoor Environmental Quality (IEQ)

The following issues was encountered in the discussion of indoor environmental quality issues:

Monitoring vs. Control

It makes most sense to monitor those data that may lead to some kind of action. While CO_2 monitoring will not feed directly into a system control, it may lead to the discovery of a need for system balancing, replacement of filters, or discovery of air leaks. Monitoring of humidity is of limited use as humidity will not be controlled in the system.

5.R1 * **Minimum IAQ Performance** **Reqd.**

Intent: Establish minimum IAQ performance to prevent the development of indoor air quality problems in buildings, maintaining the health and well being of the occupants.

Requirement: ❑ Meet the minimum requirements of voluntary consensus standard ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality and approved Addenda.

Technologies /Strategies: Include proactive design details that will eliminate some of the common causes of indoor air quality problems in buildings. Introduce standards into the design process early. Incorporate references to targets in plans and specifications. Ensure ventilation system outdoor air capacity can meet standards in all modes of operation. Locate building outdoor air intakes *(including operable windows) away from potential pollutants/contaminant sources such as sporulating plants (allergens),* loading areas, building exhaust fans, cooling towers, *sanitary vents, dumpsters, vehicular exhaust,* and other sources ~~of contamination~~. Include operational testing in the building commissioning report. Design cooling coil drain pans to ensure complete draining. *Include measures to control and mitigate radon buildup in areas where it is prevalent. Limit humidity to a range that minimizes mold growth and promotes respiratory health.*

FT. MONMOUTH **Goal**

Contact Vinny (COE)

Discussion Provide letter from mechanical engineer re. compliance with ASHRAE 62.1999 **Reqd.**

Action Needed See above.

Suggested Certification Submittals

Submittal 1 (LEED)	Provide a letter from the mechanical engineer stating compliance with ASHRAE 62-1999.
Submittal 2 (LEED)	Declare the ASHRAE 62-199 procedure employed in the IAQ analysis (Ventilation Rate Procedure or Indoor Air Quality Procedure) and include design criteria and assumptions.

5.R2 **Environmental Tobacco Smoke (ETS) Control** **Reqd.**

Intent: Prevent exposure of building occupants and systems to Environmental Tobacco Smoke (ETS).

Requirement:

- ❑ Zero exposure of nonsmokers to ETS by prohibition of smoking in the building, OR, by providing a designated smoking room designed to effectively contain, capture and remove ETS from the building. At a minimum, the smoking room shall be directly exhausted to the outdoors with no recirculation of ETS-containing air to the non-smoking area of the building, enclosed with impermeable structural deck-to-deck partitions and operated at a negative pressure compared with the surrounding spaces of at least 7 Pa (0.03 inches of water gauge). Performance of smoking rooms shall be verified using tracer gas testing methods as described in ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in the ASHRAE Standard 129-1997 is required in the contract documents and critical smoking facility systems testing results must be included in the building commissioning plan and report or as a separate document.

Technologies /Strategies: Prohibit smoking in the building and/or provide designated smoking areas outside the building in locations where ETS cannot reenter the building or ventilation system and away from high building occupant or pedestrian traffic.

FT. MONMOUTH **Goal**

Contact Robert (DPW)

Discussion Letter from building owner: no smoking **Reqd.**

Action Needed Monitoring to be provided in all major spaces with centrally located equipment.

Suggested Certification Submittals

Submittal 1 (LEED)	Provide a letter from the building owner verifying the building policy prohibiting smoking. Include site drawings highlighting designated outdoor smoking areas if applicable, OR Provide drawings and a narrative demonstrating that designated smoking rooms have ventilation systems independent of non-smoking building areas.
Submittal 2 (LEED)	Provide a letter from the testing engineer stating compliance with ASHRAE 129-1997 for smoking areas. Include a narrative describing the sequence of operation and control of building ventilation systems and initial operation set point parameters.

5.C1 * ***IAQ*** ~~**Carbon Dioxide (CO_2)**~~ **Monitoring**

Intent: Provide capacity for indoor air quality (IAQ) monitoring to sustain long term occupant health and comfort.

Requirement: ❑ Install a permanent carbon dioxide (CO_2) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments, AND specify initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time. **1**

Technologies /Strategies: Install an independent system or make CO_2 monitoring a function of the building automation system. Situate monitoring locations in areas of the building with high occupant densities and at the ends of the longest runs of the distribution ductwork. Specify that system operation manuals require calibration of all of the sensors per manufacturer recommendations but not less than one year. Include sensor and system operational testing and initial set point adjustment in the commissioning plan and report. *Also consider periodic monitoring of carbon monoxide (CO), total volatile organic compounds (TVOCs), and particulates (including PM10).*

	FT. MONMOUTH		**Goal**
Contact	Boris (SCE)		
Discussion	Provide drawings, cutsheets and narrative re. dining, auditorium, classrooms		**1**
Action Needed	Monitoring to be provided in all major spaces with centrally located equipment.		
Suggested Certification Submittals	Submittal 1 (LEED)	Provide drawings, specifications and cut sheets highlighting the installed carbon dioxide monitoring system. Include a narrative describing the sequence of operation and control of building ventilation systems and initial operation set point parameters.	

5.C2 **Increase Ventilation Effectiveness**

Intent: Provide for the effective delivery and mixing of fresh air to building occupants to support their health, safety, and comfort.

Requirement: ❑ For mechanically ventilated buildings, design ventilation systems that result in an air change effectiveness (E) greater than or equal to 0.9 as determined by ASHRAE 129-1997. For naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy. **1**

Technologies /Strategies: Employ architectural and HVAC design strategies to increase ventilation effectiveness and prevent short-circuiting of airflow delivery. Techniques available include use of displacement ventilation, low velocity, and laminar flow ventilation (under floor or near floor delivery) and natural ventilation. Operable windows with an architectural strategy for natural ventilation, cross ventilation, or stack effect can be appropriate options with study of inlet areas and locations. See the LEED Reference Guide for compliance methodology guidelines.

FT. MONMOUTH **Goal**

Contact Boris (SCE)

Discussion Provide reports that air change is in compliance with ASHRAE 129-1997 **1**

Action Needed See above.

Suggested Certification Submittals

Submittal 1 (LEED): For mechanically ventilated buildings, provide a report summarizing test results and calculations demonstrating that the designed building has an air-change effectiveness value of 0.9 or greater as determined by ASHRAE 129-1997, Appendix B. If E is less than 0.9, provide documentation indicating the corrected design ventilation rate (CDVR) used in the system design, OR

For mechanically ventilated buildings, provide a design narrative that describes compliance with the recommended design approaches in ASHRAE Fundamentals chapter 31, Space Air Diffusion design for as described in the calculation details of this credit.

Submittal 2 (LEED): For naturally ventilated spaces, provide airflow simulation results including location of inlets, outlets, and flow patterns. Provide a narrative describing the sequence of the ventilation system and demonstrate that distribution and flow patterns in all naturally ventilated spaces involve at least 90% of the room or zone area in the direction of airflow for at least 95% of hours of occupancy.

5.C3 **Construction IAQ Management Plan**

Intent: Prevent indoor air quality problems resulting from the construction/renovation process, to sustain long term installer and occupant health and comfort.

Requirement: Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:

- ❑ During construction meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, AND protect stored on-site or installed absorptive materials from moisture damage, AND replace all filtration media immediately prior to occupancy (Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999). **1**

- ❑ Conduct a minimum two-week building flushout with new filtration media at 100% outside air after construction ends and prior to occupancy, OR, conduct a baseline indoor air quality testing procedure consistent with current EPA protocol for Environmental Requirements, Baseline IAQ and Materials, for the Research Triangle Park Campus, Section 01445. **1**

Technologies /Strategies: Specify containment control strategies including protecting the HVAC system, controlling pollutant sources, interrupting pathways for contamination, enforcing proper housekeeping and coordinating schedules to minimize disruption. Specify the construction sequencing to install absorptive materials after the prescribed dry or cure time of wet finishes to minimize adverse impacts on indoor air quality. Materials directly exposed to moisture through precipitation, plumbing leaks, or condensation from the HVAC system are susceptible to microbial contamination. Absorptive materials to protect and sequence installation include; insulation, carpeting, ceiling tiles, and gypsum products. Appoint an IEQ Manager with owner's authority to inspect IEQ problems and require mitigation as necessary.

FT. MONMOUTH **Goal**

Contact Perry

Discussion

- ❑ *During Construction:* **1**
  1. Seal duct work
  2. Special insulation
  3. Require contractor to follow SMACNA IAQ guidelines.

- ❑ *After Construction:* **1**
  2 week flush-out

Action Needed TBD

Suggested Certification Submittals

Submittal 1 (LEED)	*During Construction:* Provide a copy of the Construction IAQ Management Plan highlighting the six requirements of SMACNA IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3.
Submittal 2 (LEED)	*During Construction:* Provide photographs of construction IAQ management measures such as protection of ducts and on-site stored or installed absorptive materials.
Submittal 3 (LEED)	*During Construction:* Provide cut sheets of filtration media used during construction and installed immediately prior to occupancy with MERV values highlighted.
Submittal 4 (LEED)	*After Construction:* Provide a letter from the architect or engineer describing building flushout procedures including actual dates of building flushout. OR Provide specifications and documentation demonstrating conformance with IAQ testing procedures and requirements as described in the referenced standard.

5.C4 **Low-Emitting Materials**

Intent: Reduce the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort.

Requirement: Meet or exceed VOC limits for adhesives, sealants, paints, composite wood products, and carpet systems as follows:

- ❑ Adhesives must meet or exceed the VOC limits of South Coast Air Quality Management District Rule #1168 by, AND all sealants used as a filler must meet or exceed Bay Area Air Resources Board Reg. 8, Rule 51. **1**
- ❑ Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements. **1**
- ❑ Carpet systems must meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Program. **1**
- ❑ Composite wood or agrifiber products must contain no added urea-formaldehyde resins. **1**

Technologies /Strategies: Evaluate and preferentially specify materials that are low emitting, non-irritating, nontoxic and chemically inert. Request and evaluate emissions test data from manufacturers for comparative products. Ensure that VOC limits are clearly stated in specifications, in General Conditions, or in each section where adhesives, sealants, coatings, carpets, and composite woods are addressed.

FT. MONMOUTH **Goal**

Contact Isabel (COE, Architect)

Discussion

- ❑ *Adhesives*: Include in specs; provide cutsheets **1**
- ❑ *Paints*: Include in specs; provide cutsheets **1**
- ❑ *Carpet:* Include in specs; provide cutsheets **1**
- ❑ *Composite Wood*: No particle board or plastic laminate in cabinets and closets. Use plywood. **1**

Action Needed Specifications to outline low-emitting materials to be used on job.

Suggested Certification Submittals

Submittal 1 (LEED)	*Adhesives:* Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each adhesive used in the building highlighting VOC limits.
Submittal 2 (LEED)	*Paints*: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each paint or coating used in the building highlighting VOC limits and chemical component limits.
Submittal 3 (LEED)	*Carpet*: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each carpet product used in the building highlighting VOC limits.
Submittal 4 (LEED)	*Composite Wood*: Provide a cut sheet and a Material Safety Data Sheet (MSDS) for each composite wood or agrifiber product used in the building highlighting urea-formaldehyde resin limits

5.C5 * **Indoor Chemical and Pollutant Source Control**

Intent: Avoid exposure of building occupants to potentially hazardous chemicals that adversely impact air quality.

Requirement: ❑ Design to minimize cross-contamination of regularly occupied areas by chemical pollutants: **1**

- Employ permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

Technologies /Strategies: Design to physically isolate activities associated with chemical contaminants from other locations in the building, providing dedicated systems to contain and remove chemical pollutants from source emitters at source locations. Applicable measures include eliminating or isolating high hazard areas; designing all housekeeping chemical storage and mixing areas (central storage facilities and janitors closets) to allow for secure product storage; designing copy/fax/printer/printing rooms with structural deck to deck partitions and dedicated exhaust ventilation systems; and including permanent architectural entryway system(s) to catch and hold particles to keep them from entering and contaminating the building interior.

Consider utilization of EPA registered anti-microbial treatments in carpet, textile or vinyl wall coverings, ceiling tiles or paints where microbial contamination is a concern. Utilize "breathable" wall finishes where circumstances require, to reduce moisture build-up and prevent microbial contamination. Minimize selection of fibrous materials, e.g. insulation, carpet and padding and flexible fabrics, whose exposed surfaces when exposed to the air stream or occupied space can contribute significant emissions and absorb and re-emit other contaminants over time.

FT. MONMOUTH **Goal**

Contact Not applicable.

Discussion Project does not meet this requirement. **0**

Action Needed None.

Suggested Certification Submittals

Submittal 1 (LEED)	Provide drawings and cut sheets highlighting entryway systems, including locations of entryways in the building.
Submittal 2 (LEED)	Provide a narrative and drawings highlighting the deck-to-deck physical separation and independent ventilation system of chemical use areas and copy rooms.
Submittal 3 (LEED)	Provide a narrative and drawings highlighting the plumbing system employed in chemical mixing areas.

5.C6 **Controllability of Systems**

Intent: Provide a high level of individual occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort conditions.

Requirement:

- ❑ Provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied areas within 15 feet of the perimeter wall. **1**
- ❑ Provide controls for each individual for airflow, temperature, and lighting for 50% of the non perimeter, regularly occupied areas. **1**

Technologies /Strategies: Provide individual or integrated controls systems that control lighting, airflow, and temperature in individual rooms and/or work areas. Consider combinations of ambient and task lighting control and operable windows for perimeter and VAV systems for non perimeter with a 1:1: 2 terminal box to controller to occupant ratio.

FT. MONMOUTH **Goal**

Contact Andy (Electrical)
Boris (SCE)

Discussion

- ❑ *Operable Window:* Project meets this requirement. **1**
- ❑ *Individual Controls:* Project meets this requirement. **1**

Action Needed Plans indicating temperature and lighting controls.

Suggested Certification Submittals

Submittal 1 (LEED)	*Operable Window:* For perimeter regularly occupied areas, provide drawings and cut sheets highlighting operable windows and lighting controls for perimeter areas of the building. Include calculations summarizing the total perimeter occupied area and number of operable windows and lighting controls.
Submittal 2 (LEED)	*Individual Controls:* For non-perimeter regularly occupied areas, provide drawings and cut sheets highlighting airflow, temperature, and lighting controls. Include calculations summarizing the total non-perimeter occupied area, number of occupants, and number of airflow, temperature and lighting controls

5.C7 **Thermal Comfort**

Intent: Provide for a thermally comfortable environment that supports the productive and healthy performance of the building occupants.

Requirement:

- ❑ Comply with ASHRAE Standard 55-1992, Addenda 1995 for thermal comfort standards including humidity control within established ranges per climate zone. **1**
- ❑ Install a permanent temperature and humidity monitoring system configured to provide operators control over thermal comfort performance and effectiveness of humidification and/or dehumidification systems in the building. **1**

Technologies /Strategies: Integrated envelope and HVAC system design strategies that achieve thermal comfort conditions based on mean radiant temperature, local air velocity, relative humidity, and air temperature. Install and maintain a temperature and humidity monitoring system for key areas of the building (i.e., at the perimeter, and spaces provided with humidity control). This function can be satisfied by the building automation system. Specify in system operation manuals that all sensors require quarterly calibration. Include criteria verification and system operation in commissioning plan and report.

FT. MONMOUTH **Goal**

Contact Not applicable.

Discussion

- ❑ *Comply with ASHRAE 55-1992:* The project does not meet this requirement. **0**
- ❑ *Permanent Monitoring System:* The project does not meet this requirement. **0**

Action Needed None.

Suggested Certification Submittals

Submittal 1 (LEED)	*Comply with ASHRAE 55-1992:* Provide a letter from the mechanical engineer confirming that the project complies with ASHRAE Standard 55-1992, Addenda 1995. Include design criteria and assumptions for thermal comfort including temperature, humidity, and air movement ranges.
Submittal 2 (LEED)	*Permanent Monitoring System:* Provide drawings, specifications and cut sheets highlighting the installed permanent temperature und humidity monitoring system. Include a narrative describing measurement points and operator interface.

5.C8 **Daylight and Views**

Intent: Provide a connection between indoor spaces and the outdoor environment through the introduction of sunlight and views into the occupied areas of the building.

Requirement:

- ❑ Achieve a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. Exceptions include those spaces where tasks would be hindered by the use of daylight or where accomplishing the specific tasks within a space would be enhanced by the direct penetration of sunlight. **1**

- ❑ Direct line of sight to vision glazing from 90% of all regularly occupied spaces, not including copy rooms, storage areas, mechanical, laundry, and other low occupancy support areas. **1**

Technologies /Strategies: Implement design strategies to provide access to daylight and views to the outdoors in a glare-free way using exterior sun shading, interior light shelves, and /or window treatments. Orient buildings to maximize daylighting options. Consider shallow or narrow building footprints. Employ courtyards, atriums, clerestory windows, skylights, and light shelves to achieve daylight penetration (from other than direct effect or direct rays from the sun) deep into regularly occupied areas of the building.

FT. MONMOUTH **Goal**

Contact Isabel (COE, Architect)

Discussion

- ❑ *Diffuse Sunlight to 75%:* The project does not meet this requirement. **0**

- ❑ *Direct Line of Sight to 90%:* Project meets this requirement. **1**

Action Needed Provide architectural plans with window locations.

Suggested Certification Submittals

Submittal 1 (LEED)	*Diffuse Sunlight to 75%:* Provide drawings with a narrative highlighting critical visual task areas and typical rooms sections highlighting shading devices for direct sun control.
Submittal 2 (LEED)	*Diffuse Sunlight to 75%:* Include area calculations defining the daylight zone and daylight prediction calculations demonstrating a minimum Daylight Factor of 2% in these areas, OR Include area calculations defining the daylight simulation results demonstrating a minimum Daylight Factor of 2% in these areas.
Submittal 3 (LEED)	*Direct Line of Sight to 90%:* Provide drawings and a narrative highlighting direct line of sight zone. Include calculations demonstrating that 90% of these zones have direct lines of sight to perimeter glazing.

5.C9 ** ***Acoustic Environment /Noise Control***

Intent: *Provide appropriate acoustic conditions for user privacy and comfort.*

Requirement: ❑ *Minimize environmental noise through appropriate use of insulation, sound-absorbing materials and noise source isolation.* **1**

Technologies /Strategies: *Evaluate each occupied environment and determine the appropriate layout, materials and furnishings design.*

	FT. MONMOUTH	**Goal**
Contact	Isabel (COE, Architect)	
Discussion	Acceptable acoustic environment. Different levels for different areas. Lay-in ceiling. Break rooms to structure. STC 45 between dorm rooms.	**1**
Action Needed	All areas to be designed with acceptable noise levels for the purpose of that area.	
Suggested Certification Submittals	Submittal 1 (TEG) Floor plan, specifications, and cut sheets showing locations and product data for sound insulation, sound-absorbing materials, and noise source isolation measures.	

5.C10 * ***Facility In-Use IAQ Management Plan***

Intent: *Insure the effective management of facility air quality during its life.*

Requirement: ❑ *Perform all of the following:* **1**

- *Develop an air quality action plan to include scheduled HVAC system cleaning.*
- *Develop an air quality action plan to include education of occupants and facility managers on indoor pollutants and their roles in preventing them.*
- *Develop an air quality action plan to include permanent monitoring of supply and return air, and ambient air at the fresh air intake, for carbon monoxide (CO), carbon dioxide (CO 2), total volatile organic compounds (TVOCs), and particulates (including PM10).*

Technologies /Strategies: *Provide action plan for periodic system maintenance, monitoring, occupant/manager training.*

FT. MONMOUTH **Goal**

Contact Not applicable.

Discussion Project does not meet the requirements, as no permanent monitoring will be provided for CO, CO_2, TOVCs and particulates. **0**

Action Needed None.

Suggested Certification Submittals Submittal 1 (TEG) Provide written air quality action plan, including schedules, occupant education dates, and a description of permanent monitoring installations and procedures.

6.0 Facility Delivery Process

The following issue was encountered in the discussion of facility delivery process issues:

Consultant involvement

While the involvement of a consultant will be beneficial in collecting SPiRiT documentation leading to a certification, assistance with various information is required by members of the project team. Successive charrettes may be useful.

6.C1 ** ***Holistic Delivery of Facility***

Intent: *Encourage a facility delivery process that actively engages all stakeholders in the design process to deliver a facility that meets all functional requirements while effectively optimizing tradeoffs among sustainability, first costs, life cycle costs and mission requirements.*

Requirement:

❑ *Choose team leaders that are experienced in holistic delivery of facilities.*	**1**
❑ *Train the entire team in the holistic delivery process. The team must include all stakeholders in the facility delivery, including the users, the contracting staff, the construction representatives, project manager, and design/engineering team members.*	**1**
❑ *Identify project goals and metrics.*	**1**
❑ *Plan and execute charrettes with team members at critical phases of the facility delivery.*	**1**
❑ *Identify and resolve tradeoffs among sustainability, first costs, life cycle costs and mission requirements through charrettes and other collaborative processes.*	**2**
❑ *Document required results for each phase of project deliverables that achieve the project goals and are measurable throughout the facility life span.*	**1**

Technologies /Strategies:

Develop performance specifications or choose competitive range of products that meet environmental criteria.

Use automated modeling and analysis tools to assess site and facility design alternatives.

Conduct life-cycle cost analysis (LCCA) in the design process according to the Federal Facilities Council Technical Report, Sustainable Federal Facilities: A Guide To Integrating Value Engineering, Life Cycle Costing, and Sustainable Development, FFC # 142, 2000.

Conduct a full ecological assessment to include soil quality, water resources and flows, vegetation and trees, wildlife habitats and corridors, wetlands, and ecologically sensitive areas to identify the least sensitive site areas for development. Evaluate space utilization/functions to reduce overall space requirements, considering networking, flextime, flexi-place, dual-use, and other strategies to reduce space requirements/optimize facility size.

FT. MONMOUTH **Goal**

Contact Perry

Discussion

❑ *Experienced team leaders:* Does not apply.	**0**
❑ *Train the entire team*: Charrette will meet requirement.	**1**
❑ *Identify project goals and metrics:* Charrette will meet requirement.	**1**
❑ *Charrettes with team members at critical phases:* First charrette will partially meet requirement; charrettes at later critical phases would be needed to fulfill requirement.	**1**
❑ *Identify and resolve tradeoffs:* This is a goal. Value engineering session will be held soon.	**2**
❑ *Document required results:* Document required results. Someone should be designated to document process.	**1**

Action Needed To be determined

Suggested Certification Submittals

Submittal 1 (TEG)	*Experienced team leaders:* Description of project leader's experience with minimum of one previous project certified by SPiRiT.
Submittal 2 (TEG)	*Train the entire team*: Sign-in sheet showing attendance of representatives of project team at either a SPiRiT charrette or SPiRiT training workshop.
Submittal 3 (TEG)	*Identify project goals and metrics:* Written statement of project goals and metrics, dated no later than 100% Schematic Design (early implementers: 50% Design Development).
Submittal 4 (TEG)	*Charrettes with team members at critical phases:* Summary page of a minimum of 2 Charrette reports.
Submittal 5 (TEG)	*Identify and resolve tradeoffs:* Points summary page of charrette report establishing which credit points have been agreed upon as feasible.
Submittal 6 (TEG)	*Identify and resolve tradeoffs:* Summary of life-cycle cost analysis (LCCA) according to the Federal Facilities Council Technical Report, Sustainable Federal Facilities: A Guide To Integrating Value Engineering, Life Cycle Costing, and Sustainable Development, FFC # 142, 2000.
Submittal 7 (TEG)	*Document required results:* Summary of report with Draft Submittals for SPiRiT, Summary of report with Final Submittals for SPiRiT.

Innovation Credit

Intent: To provide design teams and projects the opportunity to be awarded points for exceptional performance above requirements set by the LEED Green Buildings System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

Requirement: ❑ In writing, using the LEED Credit Equivalence process, identify the INTENT of the proposed innovation credit, the proposed REQUIREMENT for compliance, the proposed DOCUMENTATION to demonstrate compliance, and the TECHNOLOGIES/STRATEGIES used to meet the required elements.

Suggestion:
- Responses to regional sustainability issues.
- Unique project types and locations.
- Emerging sustainable design topics and innovations.

Accredited Professional

Intent: To support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process.

Requirement: ❑ At least one principal participant of the project team that has successfully completed the LEED Accredited Professional exam.

Technologies /Strategies: Attend a LEED Accredited Professional training workshop in preparation to take and pass the LEED Accredited Professional exam.

7.0 Current Mission

The following issue was encountered in the discussion of current mission issues:

Facility Abuse by Occupants

This is a major concern for the life-cycle of all elements of the building. Occupants are trained in “toughness”, often translating into toughness towards the building as well. An education curriculum that would emphasize respect toward the building, in spite of an overall need for toughness, would improve the lifecycle of the building and its elements.

7.C1 ** ***Operation and Maintenance***

Intent: *Encourage the development of a facility delivery process that enhances efficient operation and maintenance of the facility.*

Requirement:

- ❑ *Develop a facility operations and maintenance program to include:* **2**
  - *Commissioning instructions for all facility systems.*
  - *Comprehensive facility operations and maintenance instructions for system operation, performance verification procedures and results, an equipment inventory, warrantee information, and recommended maintenance schedule. The instructions should include a comprehensive, preventive maintenance program to keep all facility systems functioning as designed.*
  - *A periodic training program for occupants, facilities managers, and maintenance staff in all facility operations and maintenance activities.*
  - *Instructions on sustainable cleaning and pest control practices.*
  - *Develop a comprehensive site/facility recycling/waste management plan.*
- ❑ *Provide surfaces, furnishings, and equipment that are appropriately durable, according to life cycle cost analysis.* **1**

Technologies /Strategies:

Maintain facility elements, systems and subsystems on a routine maintenance schedule to ensure integrity and longevity.

Perform scheduled cleaning and maintenance activities with nontoxic environmentally preferable cleaning products and procedures. Keep air ducts clean and free of microorganisms through a structured program of preventive maintenance. Clean lighting systems following a regular maintenance schedule to ensure optimum light output and energy efficiency.

Use pesticides and herbicides sparingly and only when necessary with preference to natural methods and materials over poisons and toxic agents.

Use automated monitors and controls for energy, water, waste, temperature, moisture, and ventilation monitors and controls. Turn off the lights, computers, computer monitors, and equipment when not in use. Enable power-down features on office equipment.

FT. MONMOUTH **Goal**

Contact

Facility operations and maintenance program: Kevin (DPW)
Durable surfaces, furnishings, and equipment:: Isabel (COE, Architect)

Discussion

- ❑ *Facility operations and maintenance program*: Instructions for facility operations are part of the typical procedures on the base. **2**
- ❑ *Durable surfaces, furnishings, and equipment:* Products have been and will be selected to withstand abuse. **1**

.

Action Needed

TBD

Suggested Certification Submittals

Submittal 1 (TEG)	*Facility operations and maintenance program:* Submit written facility operations and maintenance program and training schedule with training participants.
Submittal 2 (TEG)	*Durable surfaces, furnishings, and equipment:* Provide life cycle cost statements or for interior surfaces. Provide written purchasing guidelines for furnishings and office equipment.

7.C2 ** ***Soldier and Workforce Productivity and Retention***

Intent: *Provide a high-quality, functional, healthy and safe work environment to promote soldier and workforce productivity and retention.*

Requirement:	❑ *Provide a high quality indoor environment to enhance user/occupant quality of life (QOL).*	**1**
	❑ *Provide a highly functional work environment to promote user/occupant work productivity.*	**1**
	❑ *Provide a healthy and safe work environment to sustain QOL and productivity.*	**1**

Technologies /Strategies: *Use a registered/certified interior designer to provide stimulating interior environments with pleasant colors, surface treatments, room proportions and ceiling heights, external views, natural lighting, and quality detailing for interior furnishings, equipment, materials and finishes. Use IES standards to provide light to occupied space with variations in level, comfortable contrasts, natural color rendition, natural/man-made, and adequate controls to optimize light aesthetic qualities. Provide occupant control of individual work areas configuration, and lighting, thermal and ventilation systems.*

Collaborate with end users to identify functional and technical requirements and to perform adjacency studies. Configure occupied space to address the specific workers/occupants functions and activities that will be carried out there. Meet TI 800-01 Design Guide requirements. Design and configure occupied space, and select furniture and equipment using human ergonomics. Identify existing user amenities, such as dining, recreation, socialization, shopping and child care facilities. Identify what amenities should be incorporated into the project or provided in the future, nearby facility. Provide ventilation air in sufficient volume free from natural and man made contaminants.

	FT. MONMOUTH	**Goal**
Contact	Laurie, Ft. Monmouth (DPW)	
Discussion	❑ *High quality indoor environment:* Lighting meets this requirement	**1**
	❑ *Highly functional work environment:* Project does not meet this requirement	**0**
	❑ *Healthy and safe work environment:* Dining, athletic field are amenities that meet the requirement.	**1**
Action Needed	TBD	

Suggested Certification Submittals

Submittal 1 (TEG)	*High quality indoor environment;* Statement of lighting designers that IES standards are met OR statement of architect or interior designer describing interior design intent with color copy of interior finish sample board
Submittal 2 (TEG)	*Highly functional work environment:* Statement of interior designer or architect describing how design and layout of furnishings exceed typical standards by addressing ergonomic needs
Submittal 3 (TEG)	*Healthy and safe work environment:* Statement listing a minimum of two amenities with their capacities and schedule, and describing who has access to these facilities and how the occupants of the project have access to those amenities.

8.0 Future Missions

The following issue was encountered in the discussion of current mission issues:

Plumbing Needs of Current/Future Facility

With the current design, the number of toilets and showers in the dormitory portions of the project are at a minimum. More toilets would help as one toilet is shared by four soldiers, and use will likely occur during the same times as schedules, including short breaks, coincide. However, future use of the facility may result in half of the occupancy in the dormitories or perhaps even an administrative use. Therefore, more plumbing fixtures in the dormitory groupings might result in a long term over-design of plumbing fixtures. A good solution would be hall bathrooms that could serve as overflow for the immediately anticipated use, and could later be re-assigned, adapted or demolished to serve another function.

8.C1 * ***Functional Life of Facility and Supporting Systems***

Intent: *Assess the functional life of a facility and its supporting systems to optimize the infrastructure investment.*

Requirement:
- ❑ *Identify how long the designed function is likely to occupy the current facility.* **1**
- ❑ *Identify how long the envelope, structure, HVAC, plumbing, communications, electrical, and other systems are likely to last before requiring replacement or upgrade. Consider economic, functional and physical obsolescence.* **1**

Technologies /Strategies: *Assess the typical or likely lifespan of the function(s) to be accommodated to forecast eventual adaptation to a different use(s). Assess the life spans of the various building systems/components to forecast their revision/replacement during the facility lifespan and design in a manner that facilitates revision/replacement.*

Consider the life span of the weapon systems, doctrines, or other programs supported by the facility.

Use life cycle data and other sources to identify the life span of the embodied systems.

FT. MONMOUTH **Goal**

Contact

Function in current facility: Isabel (COE, Architect)
Envelope and systems lifespan: Alan

Discussion

- ❑ *Function in current facility* **1**
  Buildings were built in 1952, with first renovation 1979 (after 27 years), and second renovation in 2002 (after 23 years). Therefore, 25 years is average design life.
- ❑ *Envelope and systems lifespan* **1**
  While durable materials have been selected, student orientation emphasizing need to respect building would greatly help.

.

Action Needed

TBD

Suggested Certification Submittals

Submittal 1 (TEG)	*Function in current facility:* Provide statement showing expected life-span of designed use, and describing how life-span has been determined.
Submittal 2 (TEG)	*Envelope and systems lifespan:* Describe how the design has addressed the life-span of the facility through the selection of the envelope and major systems, to minimize revisions and replacement within the life-span of the designed use unless future environmental benefits are anticipated by their revision and replacement.

8.C2 ** ***Adaptation, Renewal and Future Uses***

Intent: *Encourage facility design that is responsive to change over time to maximize accommodation of future uses without creating waste and insuring maximum useful life of products.*

Requirement:

- ❑ *Identify possible future uses for the facility; consider alternatives that expand the list of possible future uses. AND Design the building to accommodate as wide a range of future uses, as practical. AND Design the installation of building systems to accommodate foreseeable change with a minimum amount of disruption, cost, and additional materials.* **1**
- ❑ *Build the smallest facility necessary to meet current mission functional requirements, using the most efficient shape and form, while taking into consideration expansion capabilities and potential future mission requirements. AND Design the facility for recycling of materials and systems.* **1**

Technologies /Strategies: *Create durable, long-lasting and adaptable facility shell and structural system. Create an adaptable, flexible facility design using open planning, service corridors, interstitial space, access floors, demountable walls/partitions, modular furniture and other adaptable space configuration/utilization strategies.*

Select materials that are recyclable, avoiding composite materials, such as reinforced plastics and carpet fibers and backing. Consider selecting materials and labeling construction materials with identification information to facilitate recycling. Use pre-cut/pre-fabricated materials and use standard lengths and sizes (dimensional modularity) in design. Design facility systems and subsystems for reconfiguration and/or disassembly/recycling using reversible/reusable connectors.

FT. MONMOUTH **Goal**

Contact

Possible future uses: Isabel (COE, Architect)
Smallest facility and design for recycling: Laurie, Ft. Monmouth (DPW)

Discussion

- ❑ *Possible future uses:* After 25 years, potential uses are: dorm, offices, athletic facilities, or classrooms. Instead of two occupants per dorm room, there might be only one occupant per room, still sharing one bath. Future function is likely to be part of the U.S. Military Academy Preparatory School **1**
- ❑ *Smallest facility and design for recycling:* The project went through a rigorous programming phase that maximized the functions within the existing structures. **1**

Action Needed

Suggested Certification Submittals

Submittal 1 (TEG)	*Possible future uses:* Provide statement listing three possible future uses for the facility; and describe how the project design facilitates design adaptations for each future use.
Submittal 2 (TEG)	*Smallest facility and design for recycling:* Provide a list of programmed spaces, including circulation areas, accounting for the total net building area without contingency. Describe how future expansion needs might be handled.
Submittal 3 (TEG)	*Smallest facility and design for recycling:* Provide a statement and calculations showing how a minimum of 10% of building materials will allow disassembly and reuse, not counting windows.

A Proposed Sustainable Project Rating Tool (SPiRiT)

by Stephen N. Flanders, Richard L. Schneider, Donald Fournier, and Annette Stumpf

Background

In a 1 May 2000 memo, the Army Chief of Staff for Installation Management (ACSIM) recently decreed that all future facilities will be designed and built according to sustainable principles. Sustainable Design and Development is the systematic consideration of current and future impacts of an activity, product, or decision on the environment, energy use, natural resources, economy, and quality of life. It is Army policy that the concept and principles of Sustainable Design and Development shall be incorporated into installation planning and infrastructure projects.

ACSIM has asked the U.S. Army Corps of Engineers (USACE) to provide technical guidance to support this initiative. The guidance will ensure that Sustainable Design and Development is considered in Army installation planning decisions and infrastructure projects to the fullest extent possible, balanced with funding constraints and customer requirements.

In working with an ACSIM/USACE Technology Coordinating Panel, the Engineer Research and Development Center has developed a rating tool that will help ACSIM, USACE, and their clients to identify and measure what are sustainable principles in each project that they develop. We call the resulting product, SPiRiT, for the "Sustainable Project Rating Tool." USACE intends to field SPiRiT with a requirement that all Corps designers strive to achieve a 'Bronze' rating for all future projects (see below). The Army is also considering requiring sustainable development on 1391s starting year 02. It is our expectation that SPiRiT may become the standard for the Department of Defense (DOD).

Quest For A Rating Tool

While there have been a number of rating tools put into practice, most of them did not reflect the reality of military installation planning, design, and construction. We investigated a wide variety of sources on the measurement and rating of sustainable qualities during the planning, design, and construction phases of building and infrastructure projects. Upon analyzing "the best of the best," we decided to adapt the Green Building Council's Leadership in Energy and Environmental Design Green Building Rating System 2.0 (LEED 2.0)™.

LEED 2.0 ™ is divided into five categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. To these categories, SPiRiT adds three more: facility delivery process, current missions, and future missions. Each of these is synopsized below. We also adapted LEED 2.0 ™'s format of describing the intent of a measure, defining a measurable and quantifiable requirement, and offering a strategy to meet the requirement. We used applicable, equivalent military standards and regulations, where applicable.

SPiRiT Basics

The following is a synopsis of SPiRiT. LEED 2.0™ has been supplemented in many areas, and energy conservation has been emphasized more strongly.

Sustainable Sites (Score 20) – SPiRiT minimizes the impact of placing a building on a site, with an eye to land use compatibility and biodiversity. It channels development to installation areas with existing infrastructure, rehabilitates damaged sites, and reduces impacts from automobile use. SPiRiT optimizes microclimate and minimizes effects on neighboring sites of noise, light, runoff, pollution, etc.

Water Efficiency (Score 5) – SPiRiT minimizes the use of potable water for landscape irrigation and within the building.

Energy and Atmosphere (Score 28) – SPiRiT ensures that buildings work as intended. It establishes energy efficiency and optimization for the base building and systems and encourages use of renewable and distributed energy systems. It reduces ozone depletion and supports early compliance with the Montreal Protocol.

Materials and Resources (Score 13) – SPiRiT reduces waste from construction and building occupants and redirects recyclable material back to the manufacturing process. It extends the life cycle of existing building stock, in part by extending the life cycle of targeted building materials. It increases use of building products with recycled content material and of locally manufactured building products. It reduces depletion of finite raw materials and encourages environmentally responsible forest management.

Indoor Environmental Quality (IEQ) (Score 17) – SPiRiT promotes indoor air quality (IAQ) and prevents exposure to Environmental Tobacco Smoke (ETS). It provides a high level of individual occupant control of thermal, ventilation, and lighting systems. SPiRiT provides a connection between indoor spaces and the outdoor environment through the introduction of sunlight and views into the occupied areas of the building. SPiRiT provides appropriate acoustic conditions for user privacy and comfort.

The following areas are not found in LEED 2.0™. They are designed to ensure that the delivery process is optimized to meet the needs of the present without compromising the needs of the future.

Facility Delivery Process (Score 7) – SPiRiT delivers a facility that optimizes tradeoffs among sustainability, first costs, life cycle costs and mission requirements. It assures that the delivery process assures efficient operation and maintenance of the facility.

Current Mission (Score 6) – SPiRiT assures that the delivery process establishes efficient operation and maintenance of the facility. It provides a high-quality, functional, healthy, and safe work environment to promote soldier and workforce productivity and retention.

Future Missions (Score 4) – SPiRiT requires an understanding of: (1) The typical or likely lifespan of the function to be accommodated by the facility in order to recognize how soon the facility should be expected to adapt to a different use; and (2) The life spans of the building systems to understand when they will need to be updated during the lifespan of the facility and to

design the facility in a manner that facilitates the updating of each system. It requires design of the facility to maximize accommodation of future uses. The greater the future flexibility, the less likely it is that the facility will become a source for waste materials, or that it will require additional materials.

SPiRiT Certification Levels

SPiRiT Bronze -- 25 to 34 Points
SPiRiT Silver -- 35 to 49 Points
SPiRiT Gold -- 50 to 74 Points
SPiRiT Platinum -- 75+ Points

The SPiRiT Product

SPiRiT is designed to be an easy-to-understand EXCEL worksheet that will allow self-scoring by building delivery teams and their members, either during the charrette process or by an independent panel.

Points of Contact:

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Dagmar B. Epsten, AIA, CCS
Architect, LEED Accredited Professional

Education and Licensure

LEED Accredited Professional, U.S. Green Building Council, 2001
Certified Construction Specifier (CCS), Construction Specifications Institute, 1992
Registered Architect, NCARB Certificate, Georgia, 1989, Maryland, 1998
Energy Engineer, Newcomb & Boyd, Consulting Engineers, Atlanta, 1984-1985
Master of Architecture, Georgia Institute of Technology, World Student Fund Scholarship, Honorary Fraternity, 1984
Diplom-Ingenieur, Karlsruhe University, Germany, Honors Degree, 1984

Experience Summary

Ms. Epsten has 16 years of architectural experience in Atlanta, ten of those as firm principal of The Epsten Group, Inc. She has designed and managed over 50 projects, providing services in all phases, from programming to construction contract administration and post-occupancy evaluation.

The Epsten Group's focus on comprehensive sustainable design solutions derives from Ms. Epsten's background in energy engineering, daylighting, indoor air quality, construction specifications, planning, architecture, interiors, and landscape design.

She has served as sustainable design consultant on large-scale projects, and multiple environmental awards have honored her expertise.
Ms. Epsten is on the Leadership Committee of the U.S Green Building Council's Atlanta Chapter, has been a Steering Group member of the AIA's national Committee On The Environment, and founded Georgia's Sustainable Design Awards Program and the Georgia and Atlanta environmental committees of the AIA. For 10 years, she served on the Georgia Power/GA AIA Energy Design Awards Committee.

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Richard M. Jones, Mechanical Engineer

Education

Bachelor of Science, Architectural Engineering, 1997, University of Colorado at Boulder, Boulder, Colorado

Licensure

Licensed Engineer-In-Training (EIT) in Colorado

Professional Affiliations

American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
U.S. Green Building Council (USGBC)

Experience Summary

Mr. Jones joined Newcomb & Boyd in 1997. His experience since then has focused on mechanical design for a wide variety of projects, including religious, educational, military, telecommunications, health care, and performing arts facilities.

T. Morgan Gabler, IES, Lighting Designer

Education

Bachelor of Arts, Drama and Literature, 1994, Bennington College, Bennington, Vermont

Professional Affiliations

Illuminating Engineering Society of North America (IESNA)
Secretary, Georgia Section of the Illuminating Engineering Society
International Association of Lighting Designers (IALD)
International Interior Design Association, (IIDA)

Experience Summary

While completing her BA in Drama, specializing in lighting design, Ms. Gabler served as a technical intern with the Baltimore Theatre Project, in Baltimore, Maryland, and also worked as Assistant to the Technical Director of the Theatre for the New City in New York.

After graduating, Ms. Gabler has worked as both lead electrician for the Alley Theatre, and as a lighting designer with Linda Cummings/Lighting Consultants, both located in Houston, Texas. Since joining Newcomb & Boyd, Ms. Gabler's work has included design responsibilities for lighting on a variety of projects, including educational, office, and performing arts facilities, as well as parking structures and tenant space.

From the Sign-in Sheet

Ron	Ackerman	COE NY	732 532 5358
John	Alexoudis	DPW	732 532 6368
Fernando	Bautista	COE NY	212 264 9064
Vinny	Castro	COE	212 264 9073
Andrew	Chan	COE	212 264 9070
Felix	Chevere	USACE, Ft. Monmouth	732 532 5358
Tom	Dannemann	USACE	212 264 4474
Thomas	Dessa	COE	212 264 9070
Kevin	Dooney	DPW, Ft. Monmouth	732 532 6360
Dagmar	Epsten	The Epsten Group	404 577 0370
Morgan	Gabler	Newcomb & Boyd	404 352 6815
Andrew	Grant	SCE	201 792 3900
Isabelita	Huerto	COE	212 264 6074 / 9070
Richard	Jones	Newcomb & Boyd	404 352 6653
Laurie	Martinez	DPW	732 532 6357
Robert	Melascaglia	DPW	731 532 6355
Perry	Pang	COE	212 264 9095
Ned	Shepherd	AMXIS-C	309 782 8368
Boris	Sholomyansky	SCE	201 792 3900
Alan	Williams	COE, PM	212 264 5904

COE	Corps of Engineers
DPW	Director of Public Works
USACE	U. S. Army Corps of Engineers
SCE	Staunton Chow Engineers
AMXIS	U.S. Army Materiel Command
COE, PM	Corps of Engineers, Project Manager

Things That Worked

AE (Dagmar and team): good task master keeping group on track; overall, time was effectively used by all.

This is a very helpful process for design.

Learned something about better discussion mentality.

Some issues were addressed early in the process before moving on too far.

Overall presentation outstanding.

Liked the presentation and approach to condition

Small groups worked well.

I liked everything in this charrette.

I liked the application of SDD to a unique project. Ideas generated could benefit the project and the installation.

Charrette was very well organized.

Facilities were good.

Discussion was lively.

Coffee service was excellent.

I liked the ideas of group involvement.

Every aspect of the SDD was covered.

Suggestions

Overall: need to have continuity of SDD throughout development phase, not just a one-time charrette

Charrette and contact with AE: need one day project familiarization with AE SDD support team to preclude taking up entire team time

SDD leader: more direction of meeting conduct instead of total egalitarian approach

Dept. of Army: arrange for plaque for building

Need SPiRiT information push approach to users, e.g. list server; problem is keeping current

Sustainability of the design decisions remains to be seen.

More user participation/ input is necessary.

Not all topics were discussed according to the design disciplines.

Dividing groups into responsibilities and functions would save time.

Shall be carried out at the beginning and the end of the project.

Do the means justify the end? Is it worth the effort? I doubt the economics.

Facilitators should visit site before charrette.

More attention should be paid to the project budget.

Charrette was a little uncoordinated; it needs a tougher approach, since there is so much to do.

Too much small group discussion outside of main topic. Very distracting.

Charrette didn't end early enough.

A better introduction of SDD would be helpful.

SDD should provide a planned evaluation form.

Recommendations by T. Morgan Gabler, Newcomb & Boyd

Exterior Nighttime Environment

Use full cut-off luminaries, meaning no dropped lenses, minimize up-lighting. All lighting levels for parking lots, roadways and pedestrian walkways should meet the IESNA guidelines as outlined in the IESNA Lighting Handbook, Chapters 21 and 22, Exterior Lighting and Roadway Lighting. Refer to the Dark Sky Organization as a reference tool for responsible nighttime illumination. Minimize over-illumination, creates light pollution and decreases the security of the site.

Interior Lighting and Controls

Use ASHRAE/IESNA 90.1-1999 as a guideline for electrical and lighting design. Tandem wiring for all (3) lamp fluorescent fixtures, provide in board/out board switching for maximum lighting control. Use durable light fixtures that will last and long life lamps. Evaluate use of high Kelvin temperature lamps 5500K – 6000K, confirm the Kelvin temperature will be a standard in order to avoid mixing color temperatures in the same building. Use IES standards for interior illumination, do not exceed maximum lighting levels. Provide visual interest, sconces. Minimize the number of lamps use for ease of maintenance.

Sustainable Project Rating Tool (SPiRiT), Version 1.4
U.S. Army Corps of Engineers, U.S. Army Assistant Chief of Staff for Installation Management, Washington D.C., April 2001

Leadership in Energy and Environmental Design (LEED™) Green Building Rating System, Version 2.0
U.S. Green Building Council, Washington D.C. March 2000

Environmental Design Charrette Workbook
Watson, Donald, AIA Committee on the Environment, Washington D.C., 1996

Fifth Annual Federal Government Summit
U.S. Green Building Council, Washington D.C., April 10, 2001

The IESNA Lighting Handbook
The Illuminating Engineering Society of North America, New York, New York, Ninth Edition, 2000

Lighting for Exterior Environments, IESNA RP-33-99
The Illuminating Engineering Society of North America, New York, New York, 1999

90.1 User's Manual, ASHRAE/IESNA Standard 90.1-1999 Energy Standard for Buildings Except Low-Rise Residential Buildings
American Society of Heating Refrigerating and Air-Conditioning Engineers, Inc., Atlanta, Georgia, 2000.

www.cecer.army.mil/SustDesign

www.usgbc.org

www.e-architect.com/pia/cote/AIA-COTE

www.darksky.org

