Attachments

Attachment 1 – Input 1

(The Meaning of Sustainability and the Built Environment)

Think-Pair-Share Exercise – Day 1:
The Meaning of Sustainability and the Built Environment

In this exercise, participants were requested to use a think-pair-share technique to identify terms and concepts that define what sustainability means with respect to the built environment. Participants were given approximately 90 seconds to brainstorm ideas on their own, then two minutes to pair with the person next to them and determine the top three most important concepts. The results shared with the group are listed below, with multiple votes for the same item indicated by a number in parentheses following the item.

- Long term economic benefits (2)
- Maintainability – economic (2)
- Operating costs
- Life cycle cost savings
- Maintain continued, beneficial growth
- Material durability (5)
- Effective planning
- Full circle recycling
- Recycled materials within reason (3)
- Less landfill use
- Environmental quality
- Prevent global warming
- Water pollution
- Chemical contamination
- Minimal environmental impact, all of which is mitigatable (4)
- No dinosaur designs – no future liabilities
- Future generations in mind – modular design (4)
- Environmentally conscious systems
- Maximum functionality
- Politics
- Being realistic
- Education/awareness, particularly for users and the masses
- Healthy
- Biodegradable (2)
- Environmentally friendly (3)
- Low resource use (4)
- Energy effectiveness/efficiency for long term cost savings (5)

Attachment 2 – Input 2 (Individual Comments)

(Reactions to, Benefits of, and Risks of Implementing Sustainability)

Group/Individual Exercise – Day 1:
Reactions to, Benefits of, and Risks of Implementing Sustainability

In the final session of Day 1, participants were asked to individually brainstorm and then discuss in groups their individual reactions to the concepts presented throughout the day. Additionally, participants were instructed to list three possible benefits, three possible risks, two barriers to, and two associated barrier breakers for implementing sustainability. The following bullet lists and tables presents a direct transcription of the inputs provided by participants on their input sheets.

Please state briefly your **individual reaction to sustainability** as presented in the previous sessions and within the specific context of Robins Air Force Base:

- This sounds like an overall good idea with a desirable goal.
- The concern I have is over the extra time and effort required to research sustainable companies and prices and products. We have a very heavy workload with a difficult time meeting our design goals.
- This is most relevant to small scale private sector.
- It is difficult to design in current configuration with this team.
- Who is moderator of what goes and what does not?
- I have attended no other classes or requirements before this class. The challenge is like TQM/Value Engineering/ISO 14000 to implement.
- Very good course and intelligent presentation. Waiting for implementation and requirements.
- Too complex at the individual level – time, cost, quality.
- Payoff is too low now. Not measured now.
- There is no "legitimate" sense of urgency.
- The risk is much higher than the benefits.
- There is some awareness now.
- I favor this concept of sustainability and can see why it is an important concept in planning and design of facilities.
- I am interested in taking measures to make a good place for future generations: to use natural resources wisely and to preserve our ecosystem.
- As a taxpayer, I am also interested in saving life cycle costs of government – built facilities and systems, fuel costs.
- Vague and idealistic, but the more tangible aspects (Energy Star, LEED, etc.) can be implemented.
- Sustainability is a good goal, but it will be difficult to implement with too many organizations involved with related concepts handled by different departments.
- It is difficult to identify cost savings. Decisions are cost driven.
- Great concept, but must have top-level support to happen.
- Lots of idealism. Discrete portions are tangible.
- Good theory. It has been previously attempted. End result is economics-driven.

- Excellent concept. Will be like other government programs – all talk with no actual results (e.g., EEO, workplace violence, and sexual harassment).
- Full scope exceeds areas under RAFB control (utility companies, etc.).
- Air Force policy mandates consideration of sustainability.
- May reduce material and energy consumption.
- May reduce waste and pollution – recycles.
- May be economical and good quality, longer life cycle.
- May help extend protection of natural resources for future generations.
- The discussion certainly prompted what the built environment's challenges are for future generations. It becomes the responsibility of every one of us to start looking at making and bringing changes in a sustainable way.
- Team work is essential.
- Green products should be used wherever possible.
- I think we have to do this in order to leave the world for the next generations.
- The Air Force as a large industrial complex has to move to sustainability to preserve the environment.
- A very warm apple pie concept with no specific vision or goal.
- No means of determining if the objective has been achieved.
- A very subjective ideal that is subject to the whims of individuals.
- Good for the environment.
- Will only work if everybody will use it.
- Specify certain products be used now.
- Good engineering tactics.
- Right thing to do.
- Problematic due to sole sourcing.
- Not cost effective.
- Advances with technology.
- Principles needed to follow and specifics to follow.
- People do not think beyond what their job is.
- Net value = payoff; is it a sensible base-wide concept?
- The need to save energy and resources.
- Preserve resources for the future.
- Teamwork is essential to accomplish sustainability.
- Realizing that there are many possibilities and sources to give green results to the design of projects and facilities.
- How will the directives come down – heavy-handed or encouraging?
- More relevant to small-scale commercial than military.
- Nothing new here. Will be taken care of if it is a good design.
- This will slow down the design process.
- Too complex for the individual designer.
- Not a big payback.
- Benefits are not readily apparent to the designer personally.
- Whether a product is green or not is kind of fuzzy.
- Many green requirements are now being driven by the latest codes.

- It is needed.

Please list the potential **benefits of implementing sustainability** within the specific context of Robins Air Force Base:

- Generates good publicity.
- Can create some cost savings in some areas.
- Reduce maintenance.
- More responsible use of resources.
- Better environment for us to live in.
- Will clean up our environment.
- Better designer morale – ethical satisfaction.
- Get better design guides.
- Reduce pollution and exploitation of earth's resources.
- Improve quality of life.
- Better living environment.
- Longer lasting structures.
- Better environment.
- Cost effectiveness.
- Decrease waste.
- Reduction of life cycle costs.
- Less resource depletion.
- Use local resources for the area you are in.
- Better end products.
- Communications/communicating.
- Planning.
- Executing.
- Upgrade and update our technology.
- Get out of "business as usual" mode.
- Cheaper and smarter.
- Start now to get results later.
- Leaving vegetation.
- Recycle for better environment.
- Cost effective.
- Decrease waste products.
- Possibly reducing pollution.
- Reduction of exploitation of earth's resources (as a greater good).
- Quality of life just from thinking about it.
- Will be very innovative but risky.
- Economical due to recycling and efficient use of materials, operation, and management.
- Environmentally, will reduce pollution.
- Conservation of resources (initial and maintained costs, natural resources, manpower, environment).
- Reduced manpower (maintenance).
- Less waste.

- Possible energy savings, resulting in less power generation.
- Less pollution.
- More efficient systems in buildings, such as HVAC.
- Less concrete that causes stormwater runoff.
- Better use of energy resources.
- Long term environmental improvement -> Humans survive/live better in progeny.
- Some potential for reduced costs now and in long term.
- Ethical satisfaction increased.
- More responsible use of materials.
- Lower cost in the future.
- Better human environment.
- Clean up environment.
- Challenges the paradigm – make a concentrated effort.
- Put positive spin on our environment.
- Good publicity.
- Cost savings.
- Reduced maintenance requirements.

Please list the potential **risks of implementing sustainability** within the specific context of Robins Air Force Base:

- Unintended consequences will result – some will be positive, but some will be negative.
- Commanders have a short term mentality and will not support if greater first cost.
- Suppliers will jack up prices.
- Reduction in effective design – stumble and fall before walking.
- Not guaranteed to succeed.
- Built-in obsolescence – life cycle waste.
- Unknowns.
- Jump without looking – health impacts.
- Impact other industries, i.e., food production – world will starve without fertilizers and pesticides.
- Not enough?
- Poor quality and errors – low information level and unknowns.
- Higher costs now.
- Higher future costs forced.
- Reduced safety.
- Negative results.
- Pendulum swings in the opposite direction.
- Lip service and fraud.
- Might not work in this setting.
- Costs might be prohibitive.
- Too time consuming.
- Higher maintenance costs/unmaintainable with current resources.

- Higher A/E/C costs.
- Lack of full team participation.
- Cost and time lead to failure of projects.
- Lack of availability of materials, familiarity with materials, and maintenance of new systems.
- Functionally may not guarantee the success of existing.
- Financially may become a liability.
- Timely process – to go back and redo design, construction.
- Cost – immediate economic impacts.
- Question of biodegradable products in the race of implementing sustainability.
- Adverse sustainable impacts.
- Changes to management.
- Lack of technical skills to accomplish objectives.
- No definite metrics to measure.
- Process failure.
- Higher cost.
- No guaranteed results.
- Innovation may cause failure and loss of life or increased costs.
- Losing projects due to increased costs.
- Doing nothing – fear of unknown.
- Not as cost effective.
- Loss in productivity when implementing.
- End products not available.
- Loss of mission statement.
- Challenges to management, i.e., high management may see green thinking as an obstacle to implementing their projects.
- Lack of technical skills.
- No definite measurements or metrics.
- Resistance to long term management.
- Need career redevelopment assignments.
- Overruns in time and funds.
- Jump without looking.
- Negative health consequences.
- If not done, pollute us out of business.
- Not guaranteed success.
- New technology can prove to be outdated.
- Cost will increase initially.
- Proprietary claims.
- Not enough time to design – lose projects.
- New technology could create errors.
- Poor choices due to unfamiliarity.
- Backlash to program when mistakes occur.
- Commanders can have a short term mentality.
- Long term unknown consequences of new products.

- Rework costs if new products do not work.
- Customers won’t accept.

Please list the potential **barriers to implementing sustainability** in the context of Robins Air Force Base, along with a **barrier breaker** for each of the identified barriers:

BARRIER	BARRIER BREAKER
Lack of clear requirements	
Lack of organizations	
Government regulations	
Retraining maintenance people in new technologies	
No management support	
Directions are too fuzzy to implement	
Lack of resources internally	
Difficult to educate oneself	
Lack of proven technology	
Too complex with low payoff	
Heavy-handed, top down direction	
Environmental restrictions	Work around restrictions, relocate project, replenish land use.
Cost, i.e., Congressional limits	Do more with less; Implement green design procedures to reduce cost, e.g., super energy saving windows and better insulation and better building operation, THEREBY causing the HVAC system to be smaller, duct size smaller, less building height, and less construction materials
Siting and planning constraints	
Supplier support	
Management support	
Lack of proven products	
Management and workers	Vision definition
Workers	Open minded, out of box thinking
Money limitations	Education
Timely performance	Mandated by government
Local support	More money
Lack of supplier support causing project delays	Use tried and proven products
Management's lack of vision	Vision definition
Stagnation of management	
Convincing and educating decision makers in the hierarchy – utopian to pragmatic	Education at grass-roots level
Time it would take to educate oneself and getting up to speed in an already busy work schedule	Ready availability of material

BARRIER	BARRIER BREAKER
Implementation will be difficult unless standardized by the Air Force	
Difficult until proven	
Spurious management objectives (another useless metric)	
Cost/time – A/E won't know how to design and contractor won't know how to build	
Management wants what they want (e.g., dark bronze roof regardless of energy)	
A/E firms won't design it and the contractors won't know how to build it	
Management resistance and attitude	Management's attitude can be more receptive when direction comes from top down
Cost	Life cycle cost can be reduced by using sustainability. Some people think only short term benefits.
Too much individual responsibility vs. resources – backlash; this is a complex, low payoff, difficult to measure, low urgency at implementation level, high risk concept	Better measures (real, unfaked); High-level canned specs with example drawings and details
From a group standpoint, education of maintenance folks, poor information flow, regulation, lack of top management support, lack of resources, and lack of available time	Provide rewards at low levels, then up (measure); reduce individual risk and reward trying: 1. measure 2. verify/report 3. reward
No requirement – "I will not"	Start from the top and do not burn the bottom by pressure and effort without reward or resources
Lack of organized information or standard	
Government regulations with respect to buying American or proprietary products	Sell to higher-ups: Educate, educate, educate
Retrain maintenance	
Lack of resources internally	
Lack of commander support	

Attachment 3 – Input 3

(Ideas for Improving the Sustainability of the Classroom Building)

Brainstorm Exercise – Day 2:
Ideas for Improving the Sustainability of the Classroom Building

As part of Day 2's discussion of decision making processes and metrics for comparing alternatives, participants were asked to generate ideas for improving the sustainability of the building in which the workshop was being held. Ideas were drawn from sustainability strategies covered in the previous day's workshop. The class identified six strategies for improving the building, each listed and described below along with the costs and benefits associated with each.

- **Carpet** – since the carpet in the facility will eventually need to be replaced due to normal wear and tear, the class suggested using recycled content carpet or leasing carpet tiles to replace the existing product, along with finding a destination to recycle the carpet that is removed from the facility. Benefits of this option include reduced solid waste, savings in use of virgin materials, and economic support of environmentally friendly manufacturing industries. Barriers include the challenges of potentially higher costs and changes in cash flows due to leasing.
- **Daylighting** – particularly in the warehouse areas where there are no dropped ceilings, participants thought that daylighting via skylights or solar tubes could reduce the quantity of energy presently used for electrical lighting of these areas, as well as possibly increasing the productivity of employees who work in these areas. Barriers include the need to enhance lighting control systems to take maximum advantage of daylighting, and disruption of existing operations during the retrofit.
- **More Efficient HVAC Equipment** – due to recent malfunctions in the building's HVAC equipment, participants were particularly aware of the need to consider proper sizing and the eventual need to replace existing equipment. Saving energy (and thus operating costs) was the primary benefit of this option. Barriers include the risks associated with innovative equipment and the need to educate maintenance staff on the operational requirements of the equipment.
- **Roof Color** – participants suggested changing the color of the roof to a lighter color to reduce heat gain, lower cooling requirements, save energy, and reduce operating costs. Specific means of changing the roof color were not discussed, but alternatives include placing a coating over the existing roof to extend its service life, or replacing the roof at the end of its life cycle with a lighter color roof. Barriers to this option stemmed primarily from the architectural requirements imposed by command, although it was observed that using light colored roofing materials on low slope roofs would prove to be virtually invisible from the ground, and therefore might be acceptable in terms of architectural requirements.
- **Insulation** – another option to improve the energy efficiency of the facility is to increase the insulation value of the building shell. Options include insulating the roof area, exterior walls, or interior walls that separate office areas from warehouse areas that have significant heat transfer due to open doors. Benefits of this option include reduced space conditioning requirements, increased energy savings, and reduced operating costs. Barriers include the challenge of insulating elements of a facility that

are already built out, particularly if structural enhancements need to be made to support additional weight or if fire safety could be affected.

- **Lowering the Ceilings** – this option would result in a smaller volume of space that requires mechanical conditioning, therefore reducing the costs associated with this task. Barriers include possibly negative changes to the spatial comfort of the facility that could negatively influence the performance of employees. Some participants also questioned the feasibility of this option from the standpoint of systems needing to be significantly redesigned in order for the change to have its desired effect.

Attachment 4 – Input 4 (Class Ranking Tally)

(Think, Pair, Share: LEED Rating System)

Think, Pair, Share Exercise – Day 2
LEED Rating System - Class Ranking Tally

Following a two-hour introduction to the U.S. Green Building Council's LEED Rating System for Green Buildings, participants were asked to use a think-pair-share exercise to identify the top three specific LEED points they believed would be most easy to implement in the kinds of projects with which they are typically involved. The list below identifies the number of votes (each pair voted for their top three points in each category) for each LEED point. Specific points that were selected for further investigation in the subsequent exercise are indicated by underlines.

Sustainable Sites

Pre-requisite: Erosion and Sedimentation Control

8 **Credit 1**: Site selection
1 **Credit 2:** Urban redevelopment
3 **Credit 3**: Brownfield redevelopment
Credit 4: Alternative transportation
1 Near transit
4 Cyclist amenities
4 Alternative fueling stations
3 Minimum parking (or no new parking)
Credit 5: Reduced site disturbance
6 Limit disturbance
3 Exceed open space requirements
Credit 6: Stormwater management
4 Reduce run-off
2 Treatment system
Credit 7: Reduce Heat Island Effect
0 Shade
5 High reflectance roof
0 Green roof
1 **Credit 8**: Reduce light pollution

Water Efficiency

Credit 1: Water efficient landscaping
12 High efficiency irrigation
11 Capture and use rain water for irrigation
9 **Credit 2**: Innovative wastewater technologies
17 **Credit 3**: Water use reduction

Energy and Atmosphere

Pre-requisite 1: Fundamental commissioning
Pre-requisite 2: Minimum energy performance
Pre-requisite 3: CFC reductions

13 **Credit 1**: Optimize energy performance
2 **Credit 2**: Renewable energy
8 **Credit 3**: Best practice commissioning
9 **Credit 4**: Eliminate HCFCs and halons
11 **Credit 5**: Measurement and verification
2 **Credit 6**: Green power

Materials and Resources

Pre-requisite: Reduce waste to landfills

Credit 1: Building reuse
11 Maintain at least 75% of existing shell
Credit 2: Construction waste
5 Recycle at least 50%
Credit 3: Resource reuse
9 Specify at least 5% salvaged materials
Credit 4: Recycled content
4 Specify at least 25% of materials contain it
Credit 5: Local/regional materials
11 At least 20% within 500 mile radius
1 **Credit 6**: Rapidly renewable materials
4 **Credit 7**: Certified wood

Indoor Environmental Quality

Pre-requisite 1: Meet ASHRAE 62-1989
Pre-requisite 2: Prevent exposure to tobacco smoke

6 **Credit 1**: Carbon dioxide monitoring
8 **Credit 2**: Increase ventilation effectiveness
1 **Credit 3**: Construction IAQ plan
Credit 4: Low-emitting materials
2 Adhesives
8 Paints and coatings
2 Carpets
1 Composite woods
1 **Credit 5**: Indoor chemical pollutant source
Credit 6: Controllability of systems
2 Windows and lighting
2 Air flow, temperature and lighting
Credit 7: Thermal comfort
1 ASHRAE 55-1992
9 Temperature and humidity monitoring systems
Credit 8: Daylight and views
2 Diffuse sunlight
0 Direct line of sight

Attachment 5 – Input 5

(LEED Barriers, Benefits and Next Steps)

LEED Input: Barriers, Benefits and Next Steps

After voting on the LEED points with the highest likelihood of success for RAFB projects, the class was divided into five groups, each of which was commissioned to investigate the LEED points corresponding to their group in more detail. Each group was responsible for approximately three LEED points, for which they were asked to identify barriers to implementation, benefits if the point could be successfully obtained, and next steps that should be taken to incorporate the point requirements in current or future projects. The sections below list each of the points investigated by the groups along with barriers, benefits, and next steps identified for each. Points are listed in order of most votes within each category.

Sustainable Sites

Credit 1: Site selection

Barriers

- Existing street layout
- Lack of available land
- Lack of infrastructure or infrastructure conflicts
- Existing polluted sites
- Wetland
- Can't afford parking garages

Benefits

- Better community aesthetics
- Better orientation for solar control
- Less traffic congestion and air pollution
- Lower costs to extend utilities

Next Steps

- Continue planning and keep area plans up to date
- Maintain existing GIS data and enhance
- Look at enhancing public transport
- Look at alternate parking materials

Credit 5a: Limit Disturbance

Barriers

- Working around obstructions may increase costs
- Users drive disturbance of area
- Lack of funding to enhance site
- Cheaper to build one story than multistory

Benefits

- Reduced landscaping costs
- Limited sediment run-off, doesn't clog drainage ditches, pipes, wetlands
- Maintain green space for occupants. Site greener with mature vegetation
- Reduce costs

Next Steps
- Educate ourselves and change standards
- Educate our customers
- Program extra fund needed

Credit 7b: High reflectance Roof

Barriers
- Architectural color plan (metal roofs)
- Single ply roofs give poor performance
- Discoloration of light roofs on residential roofs

Benefits
- Lower ambient air temperature
- Lower energy use
- Better employee comfort

Next Steps
- Investigate costs/benefits to sell management
- Look into costs of white rocks vs. crushed granite
- Low slope roofs use white where roof not visible

Water Efficiency

Credit 3: Water Use Reduction

Barriers
- Cost of low-flow fixtures
- Measurement of reduced flow by metering
- Training/ownership for active water reduction measures

Benefits
- Reduction in potable water consumption. $ and green.
- Enhanced compliance with Energy Policy Act in new construction (power)
- Enhanced savings from reduced use of heated water (faucets, showerheads)
- Once new fixtures installed, provides passive approach

Next Steps
- Develop installation-wide water management plan

- Install low-flow fixtures
- Install meters
- Awareness training for xeriscaping, reduced irrigation, etc.

Credit 1b: Capture and Use Rainwater for Irrigation

Barriers

- Rainfall dependent system
- Piping identification
- Co-location
- Pollutants: natural evaporation, filtration, testing and monitoring *[stated that EM would likely require testing and monitoring of such a system]*

Benefits

- Limit or eliminate the use of potable water for landscape irrigation
- Limit or eliminate (help manage) storm water runoff

Next Steps:

- Make it a base utility system for broad-spread use
- Study process
- Select facilities that apply

Credit 1a: High Efficiency Irrigation

Barriers

- First cost is high
- Management approval

Benefits

- Provide adequate water for drinking and indoor use in case a drought may occur
- Water reduction through reduced consumption
- Energy consumption
- Life cycle cost savings
- Green
- Reduce impact on wetlands – water sources

Next Steps

- Plan for UG water distribution piping system
- Design and implementation

Energy and Atmosphere

Pre-requisite 1 (Fundamental Commissioning) and Credit 3: Additional Commissioning

Barriers

- Manpower
- Cost
- Technical expertise

Benefits
- Efficiency
- Better air quality
- Lower life cycle costs

Next Steps
- Independent testing
- Increase manning
- Training

Pre-requisite 2: Minimum Energy Performance

Barriers
- Low-bid mentality *[and requirements]*
- Apathy
- Incentive

Benefits
- Energy/$ savings
- Conservation of resources
- Reduce global warming

Next Steps
- Procedures to meet ASHRAE 90.1
- Measurement
- Decrease energy requirements

Credit 1: Optimize Energy Performance

Barriers
- Initial cost
- Unproven technologies
- Standard operating procedure

Benefits
- Energy savings
- Conserve resources
- Reduce global warming

Next Steps
- Educate/train

- Management commitment
- Financial support
- Mandatory R&D *[A discussion ensued regarding AFCESA's mission to send out notices regarding proven, environmentally superior technologies to encourage AF personnel to use them. However, attendees responded that they do not often see this type of information from AFCESA regarding building technologies. One attendee shared an example from a personal past experience in which he spoke with AFCESA about participating in a pilot project. Disappointment resulted because the attendee was asked to submit a great deal of paperwork, but would receive no funding or other assistance he deemed to be helpful. Comments suggested the appearance that incentives are considered to be weak or lacking.]*

Credit 4: Eliminate HCFCs and Halons

Barriers

- User acceptance alternatives
- Lack of acceptable alternatives
- Lack of $ and contractor

Benefits

- Reduce global warming
- Cheaper

Next Steps (not addressed, likely as the result of insufficient time to complete the exercise)

Materials and Resources

Credit 1: Building Reuse - Maintain at Least 75% of Existing Shell

Barriers

- Existing shell
- Appropriate in size
- Practicality/layout
- Location
- Existing environment *[Comments were made regarding the incompatibility of older buildings with a newer commander's preferences for building type/style]*
- Structural integrity
- Historic/cultural requirements
  [Comments were made regarding military construction goals to reduce square footage on the installation. This is often accomplished by demolishing older buildings and replacing them with smaller ones, or combining activities into a single building or a fewer number of buildings. This can serve as a disincentive to renovate an existing structure.]

Benefits

- Historic/cultural savings
- Cost
- Conservation of resource
- Reduce waste

Next Steps
- Research availability
- Research need

Credit 3: Resource Reuse

Barriers
- Availability of materials
- Perceived or real quality
- Knowledge of materials
- Technology and availability

Benefits
- Reduced landfill
- Reduced cost
- Reduced use of natural resources
- Reduced acquisition time
- Sentimental value

Next Steps
- Research availability
- Verify quality
- Research technical use

Credit 5: Local/Regional Materials

Barriers
- No barriers noted
- *[NAFTA added during group discussion]*

Benefits
- Boost local economy
- Cost effective
- Faster delivery
- Reduced transportation
- Reduced cost
- Reduced pollution

Next Steps:

- Implement policy and broad knowledge of local materials

Indoor Environmental Quality

Credit 2: Increase Ventilation Effectiveness

Barriers

- Economic cost factor

Benefits

- No sick buildings

Next Steps

- Evaluation of technologies and implementation

Credit 4: Paints and Coatings

Barriers

- Approving authority
- Lead from surface *[illegible word]*
- Cost effectiveness

Benefits

- Reduce litigation
- Quicker occupancy
- Reduce PPE requirement

Next Steps

- Implementation
- Revise specification (base standards)

Credit 7: Temperature and Humidity Monitoring Systems

Barriers

- Scope determination *[once participants looked at the applicable ASHRAE standard, they realized that it addresses more than temperature and humidity. They would need to further investigate the scope of this LEED point]*
- Cost and man power
- Unreliable technology
- False alarms

Benefits

- No sick building
- Possible energy maintenance efficiency
- Reduce litigation and liability

Next Steps

- Determine state-of-the-art
- Establish maintenance requirement
- Demonstrate and validate to upper management

Attachment 6 – Input 6

(Organizational Action Items)

Individual/Group Exercise – Day 2:
Organizational Action Items for Sustainability

In the final session of Day 2, participants were asked to individually brainstorm and then discuss in groups specific action items that Robins AFB needs to take to implement sustainability. For each identified action, participants were asked to identify the strategic importance, required resources, organizational commitments, individual commitments, and target completion dates. The following table presents a direct transcription of the inputs provided by participants on their input sheets.

ORGANIZATIONAL ACTION ITEM	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	ORGANIZATIONAL COMMITMENT	INDIVIDUAL COMMITMENT	TARGET DATE
Educate all personnel			Include a person from each organization on the S.A.B. and learn about projects that have been done		
Include procedures in all project language (Statements of Work, etc.)		AFCEE Connection			
Acquire or develop the human resources necessary to sustain sustainability	Better cost effectiveness, environment	Management support and empowerment		Positive attitude - actions, not words	FY 2001
Design prototype green project	Better cost effectiveness, environment; clean-up - value by prototype	Managmenet support and empowerment	Visible prototype	Positive attitude - actions, not words	FY2001
Model a baseline project	Provides a baseline for evaluating feasibility and success	Management support and empowerment		Positive attitude - actions, not words	FY2001

ORGANIZATIONAL ACTION ITEM	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	ORGANIZATIONAL COMMITMENT	INDIVIDUAL COMMITMENT	TARGET DATE
Provide cross-feed forums on successes	Shares knowledge and ensures that successes are spread	Time	Schedule crossfeed meeting or computer site for this purpose		
Devise training and continuing education effort	Help				
Provide support					
Starting with site plan, seek a LEED score for projects		Reward for achieving LEED score; informal management buy-in	Management needs to request a report	Seek continuous improvement by dealing with one issue at a time	
Report AFRC early wins			Teams should prepare journal articles		
Implement an initiative to educate programmers about sustainability	It will initiate a sustainable atmosphere				
Survey reports required and reduce number by at least 25% to only the most essential; share with others in the organization	Allows for more time to do actual work; permits us to put more energy and efforts into what is sustainable	Manpower, energy, and cooperation from management	Remove the waste of unnecessary reports based on issues no longer required or used.	Volunteer to help with the screening process	Sep-00
Incorporate LEED scores for all major projects (>$200K)	Good, solid design to give better built facilities	None			
Assemble a panel of leaders to promote sustainability training and materials					

ORGANIZATIONAL ACTION ITEM	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	ORGANIZATIONAL COMMITMENT	INDIVIDUAL COMMITMENT	TARGET DATE
Dedicate resources to implement sustainability	Better environment, better cost, save environmental clean-up costs, and give proof of value	Management support and empowerment		Positive attitude	2001
Program and design a prototype green project	Better environment, better cost, save environmental clean-up costs, and give proof of value	Management support and empowerment	Commitment to the visibility of the prototype	Positive attitude	2001
Human resources to implement sustainability	Better environment, cost-effectiveness, and savings in clean-up cost	Management support and empowerment		Positive attitude - actions, not words	2001
(Prototype) design of a green type project	Proof of the value [of the approach]	Management support and empowerment	Proactive commitment to the visibility of the prototype project	Positive attitude - actions, not words	2001
Develop an information base to be used basewide to share information about facilities and plans to entire teams	Allow unified strategies to various parties and discourage duplicated efforts	Development time, equipment, and manpower	Providing development time, equipment, and manpower	Active participation in the development of this information base	
Adopt the state-of-the-art design procedures, tools, construction methods, and specifications on a continuous basis, e.g., immediate adoption of metric system	Easy inter-communication with other branches of government and private industry	Usage	Organization has started	I have started	

ORGANIZATIONAL ACTION ITEM	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	ORGANIZATIONAL COMMITMENT	INDIVIDUAL COMMITMENT	TARGET DATE
Sustainable design process, via consciousness of evolutionary processes (resources); knowledge and awareness bring evolution to sustainable design; better use of material = smart design	Possibly improving productivity of primary mission and improving quality of life	Education (and willingness to bring about change)	Analysis and synthesis	Bring resources	Immediately
Have contractors recycle construction waste	Save resources	Money, time to sort and recycle	Time and money	Support the change	2004
Management support and commitment		Education and training	Stop wasting natural resources		
Team to initiate sustainability	Conservation of energy, eventual cost savings, and improvement of the environment	Time, materials, manpower, technical skills, and funding	Life-cycle cost	Consider sustainability on the front end of my projects, and encourage all involved to do the same	5 years
Teamwork to initiate sustainability	Conservation of energy and eventual cost savings	Manpower, money, and material	Set a goal [based on] life cycle cost	Consider sustainability in all design practices	5 years
Assign a team with skills to initiate sustainability and accomplish in mission; [provide] rewards and training	Conservation of energy, cost savings, better environment, money, and materials	Money, materials, time, manpower, technical skills	[Set a] goal, life cycle cost analysis	Life cycle cost analysis and sustainability	5 years

ORGANIZATIONAL ACTION ITEM	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	ORGANIZATIONAL COMMITMENT	INDIVIDUAL COMMITMENT	TARGET DATE
Identify areas where sustainability is obtainable/achievable now	Our current resources and ways of doing things are not infinite. Resources are deleted and the methods and materials of building are changing	Manpower, access to product information, management buy-in	Process implementation by management	Change from business as usual	
Identify areas where sustainability is achievable now	Ensure that Robins is on the bandwagon and fills the square	Manpower, access to products	Process implementation by management	Teach or share with others	30 February 200?
Identify areas where sustainability is achievable now	To ensure continued mission capability	Management buy-in, time, and personnel	Process implementation by management		31 February 2001

Attachment 7 – Input 7
(Personal Commitment Input Sheet)

Individual Exercise – Day 2:
Personal Commitments for Implementing Sustainability

In the final session of Day 2, participants were asked to individually brainstorm specific action items they were personally willing to commit to implement sustainability. For each identified action, participants were asked to identify the strategic importance, required resources, and target completion dates. The following table presents a direct transcription of the inputs provided by participants on their input sheets.

PERSONAL COMMITMENT	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	TARGET DATE
To carry out what management tells me to do	Management needs to be trained first	More rules to make the design include sustainability	10 years
Obtain information of successful projects from private sector	Teamwork; management approval	Money	5 years
Work toward mission	Work for better quality of life	Project implementation of green project	Program project design and execution
Research on the web			
Open-mindedness	Everyone needs to be objective in their views of looking at better ways of doing things	Management support, time, personnel	
I am willing to incorporate recyclable building materials, increase building material waste promotion efforts, and educate and convince users of the need for sustainability efforts	To make R.A.F.B. a role model for DOD bases and local industry	Increased funding from users for their projects	1-Jan-02
Push for recycling			
Willingness to educate myself and bring awareness through my design development	The process starts with one	Time	Within three months
Proactive team player		Details of a sustainable action team	FY2001

PERSONAL COMMITMENT	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	TARGET DATE
Start using LRFD method in steel design immediately	May save in steel and thus save in waste and thus natural resources	Start using [LRFD]	
Assist and/or management portions of project	Makes common/consistent information available for design/build	Time, training	
Be a proactive team player	Project will not be successful without commitment	Details of a Sustainability Action Team	2000
I personally commit to try to implement a small prototype project that is green, and also to read an article about sustainability			2000
Suppress my pessimism about the feasibility of implementing sustainability; support others' efforts			
Writing one design-delivery order that incorporates a target LEED score of 30.	Will demonstrate the costs and benefits of typical design	None	In process
To speak up with I believe someone is wasting my time and resources; to invalue my team members in the sustainability process	Reduction of waste and with involvement of others, to make ourselves more efficient and effective	My own energy and time, critical thinking, the encouragement of others to do the same	Sep-00
Develop a briefing for AFRC base civil engineers explaining my understanding of sustainable design; to give a brief history of lessons learned in the process of developing and designing a sustainable facility			
Continuous improvement; support of change agent, and look at specs & BFS when doing projects			
Support Nancy M. - all; Talk to Nancy about a computer or study group or what?			30 days

PERSONAL COMMITMENT	STRATEGIC IMPORTANCE	REQUIRED RESOURCES	TARGET DATE
I will make every effort to ask the questions to the planners and engineers, "How can I change the design to use less energy?"	It will reduce energy consumption	Resources	Ongoing
Create a file on the file server by division to record sustainable products used on our projects			
[Be a] proactive team player; continue support of "sustainability"; talk support and read relevant material	For success of the mission; for the U.S.A. freedom maintainability forever	People; details to sustainability action team; temporary reassignment	FY2001
Will have training briefing for sustainable architecture board put together; read information; develop a list of people and organizations to brief			1-Sep-00
LEED accreditation - how do you get it?			