

FORM FOR SCORING OF TRAINING RESOURCE TO FULFILL FEDERAL BUILDING PERSONNEL TRAINING ACT (FBPTA) CORE COMPETENCIES

The FBPTA requires Federal building personnel to demonstrate compliance with a set of Core Competencies. The General Services Administration (GSA) accepts submissions for courses, certificates, certifications, accreditations, registrations, licenses, and other qualifications that demonstrate alignment with the FBPTA Core Competencies. GSA will post resources that sufficiently map to FBPTA Core Competency requirements on the FMI webpage (www.fmi.gov) and may incorporate them into the Core Competency Web Tool. The Web Tool allows Federal buildings personnel to immediately claim credit for competencies met by completing approved training. FMI and the Core Competency Web Tool help Federal employees identify appropriate training, and allow Federal agencies to share information on training sources. To qualify for consideration, submitters complete this form describing how a specific training resource, certification / accreditation, license or other resource aligns with FBPTA core competencies through AskFMI@gsa.gov.

Initial Review Conducted By: Maria Fara

Initial Review Submission Completion Date: August 30, 2013

Technical Review Conducted By: Angela Lewis

Technical Review Submission Completion Date: January 3, 2014

Alignment of Competency with Functional Roles

- Often Aligned with Facility Management roles (24/43 Core Competencies)
- Often Aligned with Building Operations Professional roles (6/43 Core Competencies)
- Often Aligned with Energy Management Role (7/43 Core Competencies)
- Often Aligned with more than one role (6/43 Core Competencies)

1. Please complete the following for each training course submitted for consideration:

Training provider: BOMI International

Provider address information (primary physical location, including address, city, state, zip code): One Park Place Suite 475, Annapolis, MD 21401

Provider's primary point of contact for this learning resource (name, primary physical location (if different from provider address information), phone, and email): Ron Bishop, (410) 974-1410 x1259, rbishop@bomi.org

Title of this training resource: The Design, Operation, and Maintenance of Building Systems, Part I

Type of training course: Property and Facilities Management

Does this course provide CEUs (Continuing Education Units) and if so, how many and for what occupation or field? Yes, 30 GBCI CE hours for LEED Credential Maintenance Program plus 2 ACE semester hours

Learning objective(s) associated with this training course: Maintain building systems efficiently and cost-effectively, Effectively use and maintain structural components and building materials in the design and construction of facilities, Describe best practices for the design, operation, and maintenance of HVAC and plumbing systems, Demonstrate a working knowledge of how a structure functions.

Delivery method and learning methods (delivery methods may include online instruction, classroom instruction, or other means, and learning methods could include lecture, group work, essay work, quizzes, or other learning activities): Instructor Led Online, Self-Study, Live Classroom/Accelerated Review. Learning Methods, lecture, group work, quizzes, practice exam, 3rd Party proctored final exam.

Length of training (in hours): 30 Hours

URL link to information about the training course, content, and/or syllabus: <http://www.bomi.org/Courses/The-Design,-Operation,-and-Maintenance-of-Building-Systems-Part-I/>

2. Review the course objective(s) that have been submitted as being aligned with required FBPTA performance criteria. Review the learning methods in the course that will support that learning objective(s).

FBPTA Core Competency Area	FBPTA Core Competency	Required FBPTA performance criteria	Based on technical review of learning objectives and skills, does this resource map to the performance criteria?	Initial Review: Are all submission requirements included?	Initial Review: Are descriptions clear and logical?	Initial Review: Are all materials referenced included with the submission?	Technical Review: Learning Objectives Reviewed	Technical Review: Skills Reviewed	Technical Review: Are there any clarifications requested?	If clarification requested, note here	Clarification Response From Provider	Technical Review: Identify other materials submitted	Technical Review: Other Materials Reviewed
		1.1.1.Demonstrate familiarity with Building Systems.	Partial. This course received credit because demonstrate familiarity with Building Systems such as: HVAC, building envelop, structural and roofing systems. Although, it does not cover fire protection system, lighting systems, electrical systems and vertical transportation, topics covered in Design Operation and Maintenance Part II.	Yes	Yes	Yes	Yes	Yes	Yes	From review of Part 1 of this course, it is clear that information about HVAC, building envelope, structural and roofing systems are addressed in Part 1 and fire protection, lighting systems, electrical systems and vertical transportation systems are addressed in Part 2. However, it is not clear that Part 2 includes information about generators within the electrical systems portion of the course.	Generators and motors, and their functions and roles in a facility, are detailed in Chapter 4 of The Design, Operation, and Maintenance of Building Systems, Part II.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		1.1.2.Demonstrate ability to work with Facilities Team to assess a facility's need for building systems.	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate an ability to work with facilities teams to assess building systems needs of a facility.	Yes	Yes	Yes	Yes	Yes	No			Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.

1. Management of Facilities O&M	1.1 Management of Building Systems	1.1.3.Demonstrate ability to oversee the acquisition, installation, and operation of building systems.	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate an ability to oversee the acquisition, installation, and operation of building systems.	Yes	Yes	Yes	Yes	Yes	Yes	Comparing the requirements of performance criteria 1.1.3, the learning objectives and information provided about the skills taught seem incomplete. The performance criteria requests information about the acquisition, installation and operation of building systems. The information provided for performance criteria 1.1.3 appears to only focus on operation. From review of the information provided for performance criteria 1.1.2, it appears the course may cover acquisition and installation. Please provide additional information, beyond what is included in performance criteria 1.1.2, to support further review.	For each system addressed throughout these two courses, facility needs relative to size and function, evaluating costs of acquisition and use relative to refurbishing (for example, elevators), and recovery of costs through energy savings, submetering, lease escalations, and other means, are included.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.	
		1.1.6.Demonstrate ability to monitor and evaluate how well building systems perform.	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate an ability to monitor and evaluate how well building systems perform.	Yes	Yes	Yes	Yes	Yes	No			Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.	
		1.1.7.Demonstrate ability to manage corrective, preventive and predictive maintenance.	Partial. Based on the review of the learning objectives, the skills/materials covered, and the clarification response from the provider, the course covers the ability to manage corrective, and preventive maintenance. The course likely covers predictive maintenance in this course at a high level. More detail on predictive maintenance is provided in the Building Design Maintenance Course and the individual systems courses.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Although the information provided about the learning objectives and skills/materials covered provide details about various maintenance activities, it is not clear that the course describes the specific maintenance strategies listed: corrective, preventive and predictive. Please specifically state how the course addresses the three maintenance strategies.	In the BOMI course The Design, Operation, and Maintenance of Building Systems, Part I, predictive maintenance such as diagnostic testing and comparing performance to benchmarks is considered a key part of comprehensive preventive maintenance.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	1.2 Management of Building Interior	1.2.1.Demonstrate knowledge of how to evaluate building structures and permanent interiors.	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate knowledge of how to evaluate building structures and permanent interiors.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It is not clear from the learning objectives and skills/materials covered that the course specifically discusses how to evaluate building structures and permanent interiors. The information provided about Chapter 3: Basic Construction Materials information does not seem directly relevant to performance criteria 1.2.1. From review of the information provided for performance criteria 1.1.1, Chapters 5: The Building Envelope and 6: Roofing Systems, it is possible content within one of these chapters may be better aligned with performance criteria 1.2.1. Please review the course content again, specifically focusing on this question: What material will allow learners to evaluate the condition of different types of structures and permanent building interiors? When looking for information to answer the question, evaluating means having the ability to assess, and is more than knowing facts about different types of components and materials.	For specific topics such as the building envelope, roofing systems, and structural systems, maintenance procedures are provided, including evaluation. As an example from Chapter 12: "During the life of any building, preventing deterioration is always preferred to repair. If prevention has been unsuccessful, the structure must be repaired, replaced, or abandoned. Typically, it is repaired. The execution of such repair involves five basic steps: 1. locating the deterioration 2. determining the cause and its neutralization or elimination 3. evaluating the strength of the existing structure 4. evaluating the need for repair 5. selecting and implementing a repair procedure. Preventing the deterioration of and building component or subsystem starts with a maintenance programs to prevent major problems." This section then goes on to detail specifics for each step. Similar content is provided for most standard building systems.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		1.2.3.Demonstrate ability to evaluate furniture and equipment performance.	No, based on review of the learning objectives and the skills/materials covered, this course does not include the ability to evaluate furniture and equipment performance within the definition of this performance criteria. Within the context of this performance criteria, furniture and equipment is in reference to interior systems, such as copiers and kitchen equipment, not HVAC systems.	Yes	Yes	Yes	Yes	Yes	No		Based on clarification that systems refer to items such as copiers and kitchen equipment, we concur with this assessment			
		1.2.4.Demonstrate ability to manage the maintenance and cleaning of furniture and equipment.	No, based on review of the learning objectives and the skills/materials covered, this course does not include the ability to manage furniture and equipment cleaning within the definition of this performance criteria. Within the context of this performance criteria, furniture and equipment is in reference to interior systems, such as copiers and kitchen equipment, not HVAC systems.	Yes	Yes	Yes	Yes	Yes	No		Based on clarification that systems refer to items such as copiers and kitchen equipment, we concur with this assessment			

1.3 Management of Building Exterior	1.3.1.Demonstrate familiarity with managing grounds and exteriors, parking structures, site utilities, landscaping and grounds, exterior envelope (roof, brick, masonry, etc.).	Partial. This course received credit because demonstrate familiarity with managing exterior envelope. Although, it does not cover managing grounds and exteriors, parking structures, site utilities, landscaping and grounds.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	From review of the learning objectives and skills/materials covered submitted for performance criteria 1.3.1 for parts 1 and 2 of this course, it is clear that part 1 of the course includes information about roofing, one part of the building exterior. Part 2 of the course includes information about grounds and exteriors, parking structures, landscaping and grounds. To receive full credit for this performance criteria, please provide further explanation about how part 1 of the course addresses other parts of the building envelop, such as exterior walls made of brick or masonry.	Chapter 3, Basic Construction Materials, includes a section on masonry. Topics covered include: cement, concrete, mortar, brick, concrete block, stone, plaster, stucco.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	1.3.2.Demonstrate ability to assess the effect of climate and extreme environmental conditions	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include the ability to assess the effective of climate and extreme environmental conditions.	Yes	Yes	Yes	Yes	Yes	No					
	1.3.4.Demonstrate ability to assess the need for alterations in grounds and exterior elements.	Partial. This course received credit because demonstrate familiarity with assessing the need for alteration in exterior envelope. Although, it does not cover assessing the need for alteration in grounds.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	From review of the learning objectives and skills/materials submitted to review performance criteria 1.3.4, it is not clear that the course includes information about assessing needs for grounds or exterior element alternations. The information provided to review performance criteria 1.3.4 is very broad; providing a brief description of retrofit projects. This description does not describe how grounds are addressed within the course. Although the material provided lists several types of exterior element retrofits, such as window replacement, it is not clear if the course includes information to determine when the retrofits are needed. Please provide additional information by responding specifically to this performance criteria. As a starting point, please review the information provided for performance criteria 1.3.5.	For the components of a building addressed in this course, including building materials, structural systems, the building envelope, roofing, and interior systems, the course provides potential problems to watch for and prevent, how to mitigate those problems when they occur, and information on retrofits.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	1.3.5.Demonstrate ability to manage the maintenance and custodial needs of grounds and exterior elements.	Partial. This course received credit because demonstrates ability to manage the maintenance and custodial needs of exterior elements such as Building facades, roof systems, and rooftop equipment. Although, it does not cover ability to manage the maintenance and custodial for Landscaping, parking structures, and windows and ground which are included in the Design Operations and Maintenance part II.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	From review of the learning objectives and skills/materials submitted for Part 2, it appears that the course will allow learners to demonstrate knowledge of grounds maintenance. However, it is not clear how the course custodial needs of grounds. From review of the information submitted for performance criteria 1.3.5, it is also not clear how the course specifically addresses maintenance of exterior elements. From review of information submitted for other performance criteria, it seems likely that the course includes information about maintenance of exterior elements. Please provide a response specific to this performance criteria. When providing response, please respond how parts 1 and 2 of this course meet performance criteria 1.3.5.	In The Design, Operation, and Maintenance of Building Systems, Part I and Part II, custodial needs are included in grounds maintenance. Building facades, roof systems, and rooftop equipment are addressed in Part I. Cleaning and other maintenance are taught across both courses. Landscaping, parking structures, and windows are addressed in Part II.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	2.1.2.Demonstrate ability to adjust System Parameters as required.	Partial. Based on the review of the learning objectives and the skills/materials covered, the course should include an overview of system parameters. However, since this performance criteria is intended for a building operator, it does not go to the detail for the ability to adjust system paramaters required for a building operator.	Yes	Yes	Yes	Yes	Yes	No			Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.	

2.1. Operating and Maintaining HVAC Systems	2.1.3. Demonstrate understanding of indoor air quality and how to test and adjust it.	Partial. Based on the review of the learning objectives and the skills/materials covered, the course should cover demonstrating a general understanding of indoor air quality. However since this performance criteria is intended for a building operator, it does not cover how to test and adjust to the detail required for a building operator.	Yes	Yes	Yes	Yes	Yes	Yes	The learning objectives and skills/materials submitted to review performance criteria 2.1.3 do not provide sufficient information about how learning objective 9.6 is met within the course. Please provide additional information about how the course describes "good IAQ." Specifically, how does the course address air sampling, carbon dioxide (CO2) measurement, mold control strategies and system balancing. It is acknowledged that carbon dioxide is described as a contaminant, but it is not clear if the course discusses carbon dioxide measurement. Please also define the acronyms SBS and BRI in the context of this course.	SBS and BRI refer to sick building syndrome and building related illness. SBS is defined as "general discomfort, adverse reactions, or nonspecific sicknesses that appear to be linked to the time people spend in a particular building. Symptoms may include headaches, rashes, burning, teary eyes, or other irritations." BRI is defined as "specific, diagnosable illness whose symptoms can be identified and whose cause is directly attributed to airborne building pollutants (e.g., Legionnaires' disease, hypersensitivity pneumonitis)." Good IAQ components include acceptable temperature and RH controlled airborne contaminants adequate distribution of ventilation air. For CO2 metering, monitoring of HVAC system meter is included as part of maintaining good indoor air quality. Air balancing involves setting the regulator or quadrant on each volume damper to provide the required flow of conditioned air to the terminal devices downstream of the volume damper.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	2.1.4. Demonstrate ability to analyze HVAC system performance.	Partial. This course received credit for demonstrating the ability to analyze HVAC system performance to include the following: Clean, change and perform preventative maintenance, Collect trends of operational parameters, Compare trends and data, and Report findings. The course does not cover the ability to conduct performance tests and collect data.	Yes	Yes	Yes	Yes	Yes	No			Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	2.1.6. Demonstrate knowledge and ability to maintain all HVAC Systems.	Partial. This course received credit because the course provides general knowledge of how to maintain HVAC systems. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain the HVAC system.	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/materials covered, the course appears to demonstrate knowledge of how to maintain HVAC systems. However, it is unclear how the ability to maintain HVAC systems is gained by learners. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing this course, would the student leave with the ability to physically maintain HVAC systems? If so, please provide more information or course material.	Simulations, such as building envelope or HVAC system simulations, are tools used by facilities managers. The application of building simulation can be used in the property manager decision-making process with the following: building heating / cooling load calculation (peak energy demand and its profile), building systems alternative system selection, building energy performance analysis, building energy management and control system design, building regulations / codes / standards compliance checking, life cycle cost analysis, quality assurance (commissioning). Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	2.1.8. Demonstrate knowledge and ability to optimize HVAC controls.	Partial. This course received credit because the course provides general knowledge of how to optimize HVAC controls. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically optimize HVAC controls.	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/materials covered, the course appears to demonstrate knowledge of benefits of optimized HVAC control and examples of optimized control strategies. However, the information provided does not demonstrate how learners will gain the ability to optimize HVAC controls. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing this course, would the student leave with the ability to physically optimize HVAC controls? If so, please provide more information or course material.	Simulations, such as building envelope or HVAC system simulations, are tools used by facilities managers. The application of building simulation can be used in the property manager decision-making process with the following: building heating / cooling load calculation (peak energy demand and its profile), building systems alternative system selection, building energy performance analysis, building energy management and control system design, building regulations / codes / standards compliance checking, life cycle cost analysis, quality assurance (commissioning). Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.

2. Performance of Facilities O&M	2.2. Operating and Maintaining Electrical and Mechanical Systems	2.2.4. Demonstrate knowledge and ability to maintain plumbing fixtures, sewage injectors, and water heaters.	Partial. This course received credit because the course provides general knowledge of how to maintain plumbing fixtures, sewage injectors, and water heaters. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain plumbing fixtures, sewage injectors, and water heaters..	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/materials covered, the course includes information about sewage ejectors and maintenance of water systems. However, the information provided does not specifically define or state how the course defines water systems. Please specifically state how the course provides knowledge of plumbing fixtures, such as toilets, urinals and sinks, and water heaters. Please also describe how the course provides learners with the opportunity to gain the ability to perform maintenance of plumbing fixtures, sewage ejectors and water heaters. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing the course, would the student leave with the ability to physically maintain plumbing fixtures, sewage ejectors and water heaters? If so, please provide more information or course material.	Water systems include domestic cold and hot water, fixtures such as sinks and toilets, hot- water generators, equipment such as kitchen dishwashers, and the interconnecting piping, valves, and other accessories on both the water supply and waste drainage systems. Fire standpipes and automatic sprinkler fire protection systems are also included in plumbing systems. Pneumatic and electric sewage ejectors are described, including their purpose, where they are used, and maintenance guidance. Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		2.2.6. Demonstrate knowledge and ability to all drains and backflow preventers.	Partial. This course received credit because the course provides general knowledge of how to maintain all drains and backflow preventers. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain all drains and backflow preventers.	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/material covered, the course provides learners knowledge about various types of drainage systems. However, it is not clear if the course specifically discusses backflow preventers. Please also describe how the course provides learners with the opportunity to gain the ability to perform maintenance of drains and backflow preventers. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing the course, would the student leave with the ability to physically maintain drains and backflow preventers? If so, please provide more information or course material.	Backflow preventers are shown in the context of sewage ejectors in The Design, Operation, and Maintenance of Building Systems, Part I. They are shown in relation to other systems, including fire protection, in Part II. The discussion includes the purpose, function, and importance, along with noted municipal requirements for annual testing. Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		2.2.7. Demonstrate knowledge and ability to maintain pressure-reducing valves.	Partial. This course received credit because the course provides general knowledge of how to maintain pressure-reducing valves. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain pressure-reducing valves.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/material covered, the course provides learners knowledge about types of pressure reducing valves. However, it is not clear if the information provided describes maintenance of these devices. Please provide additional information about how maintenance of pressure reducing valves is included within the course. Please also describe how the course provides learners with the opportunity to gain the ability to perform maintenance of pressure reducing valves. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing this course, would the student leave with the ability to maintain pressure reducing valves? If so, please provide more information or course material.	Keeping pressure reducing valves through regular cleaning and periodic replacement of strainers is addressed. Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.

		2.4.2.Demonstrate knowledge and ability to maintain roof systems.	Partial. This course received credit because the course provides general knowledge of how to maintain roof systems. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain roof systems.	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/materials covered, the course provides knowledge about the maintenance of roof systems. However, it is not clear if the course provides learners with the opportunity to gain the ability to maintain roof systems. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing the course, would the student leave with the ability to physically maintain roofing systems? If so, please provide more information or course material. Please note that for performance criteria that require an ability to perform a maintenance task it is necessary for learners to successfully physically perform the task.	Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		2.4.3.Demonstrate knowledge and ability to maintain ceiling tiles.	Partial. This course received credit because the course provides general knowledge of how to maintain ceiling tiles. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain ceiling tiles.	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/materials covered, the course provides knowledge about the maintenance of ceiling tiles. However, it is not clear if the course provides learners with the opportunity to gain the ability to maintain ceiling tiles. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing the course, would the student leave with the ability to physically maintain ceiling tiles? If so, please provide more information or course material.	Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		2.4.4.Demonstrate knowledge and ability to maintain flooring systems.	Partial. This course received credit because the course provides general knowledge of how to maintain flooring systems. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain flooring systems.	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/materials covered, the course provides knowledge about the maintenance of flooring systems. However, it is not clear if the course provides learners with the opportunity to gain the ability to maintain flooring systems. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing the course, would the student leave with the ability to physically maintain flooring systems? If so, please provide more information or course material.	Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		2.4.5.Demonstrate knowledge and ability to maintain window systems.	Partial. This course received credit because the course provides general knowledge of how to maintain window systems. However, as the performance criteria is intended primarily for building operators, it does not sufficiently provide information about the ability to physically maintain window systems.	Yes	Yes	Yes	Yes	Yes	Yes	Based on the learning objectives and skills/materials covered, the course provides knowledge about the maintenance of window systems. However, it is not clear if the course provides learners with the opportunity to gain the ability to maintain window systems. The learning methods provided state that simulation and other resources are used. Is simulation used to demonstrate ability? After finishing the course, would the student be able to leave with the ability to physically maintain window systems? If so, please provide more information or course material.	Regarding course delivery, simulations are at the discretion of the instructor and client.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	2.4. General Building Maintenance												
		4.1.1.Demonstrate knowledge of building systems and how they affect energy use	Partial. This course received credit because it demonstrates knowledge of the following building systems and how they affect energy use: HVAC System and Building Envelope. The course does not cover Electrical Systems, Motors and drives, Lighting Systems, and Fuel Systems, which are covered in Design operation and Maintenance Part II.	Yes	Yes	Yes	Yes	Yes	Yes	Although Part 1 of the course appears to include information about heat transfer characteristics of construction materials, it is not clear if this information is discussed within the context of building system energy use. Please provide more information about how building envelope and/or HVAC systems are discussed within the context of heat transfer characteristics. Please also clarify what systems the "control features" and "utility options" are specific to. It is apparent through the examples provided, such as economizer switchover, HVAC systems are addressed. However, it is not clear that part 1 of course provides information to demonstrate knowledge of how electrical systems, motors and drives, lighting systems and fuel systems affect energy use. Part 2 of the course provides information about lighting systems.	Part I covers HVAC systems and the building envelope. Part II covers electrical systems, motors and drives, lighting systems, and fuel systems and selection.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.

4. Energy Management	4.1. Systems and Demand Reduction	4.1.3. Demonstrate knowledge of Renewable Energy Systems – Solar (Thermal and Photovoltaic), Wind, Biomass, and Hydropower.	Partial. This course received credit because demonstrate knowledge of Renewable Energy System such as Solar. Although the course does not cover Wind, Biomass and Hydropower.	Yes	Yes	Yes	Yes	Yes	Yes	From review of the learning objectives and skills/materials submitted to review performance criteria 4.1.3, it is clear that the course includes information about solar systems. However, it is not clear if the course includes any information about wind, biomass or hydropower.	The course addresses hydronic heat recovery, but not hydroelectric power. Hydro, wind, and biomass will be addressed in BOMI's High Performance Sustainable Buildings courses	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.	
		4.1.7. Demonstrate knowledge of Energy Management Systems (EMS) and Energy Information Systems (EIS).	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate knowledge of energy management systems and energy information systems.	Yes	Yes	Yes	Yes	Yes	No			Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.	
		4.1.8. Demonstrate knowledge of re-programming current systems and expanding network of sensors and control devices to optimize HVAC, lighting, and other automated systems.	No, based on review of the learning objectives and the skills/materials covered, this course does not include the knowledge of re-programming current systems and expanding network of sensors and control devices to optimize HVAC, lighting, and other automated systems.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	It is not clear that knowledge of reprogramming current systems and adding additional sensors and control devices to support optimized HVAC, lighting and other control systems is addressed from the information submitted to review this performance criteria. The information provided demonstrates that controls are a topic discussed within the course, but does not clearly describe how reprogramming or the addition of control devices is included within the course.	Reprogramming of systems is addressed at a high level in this course. For more thorough coverage, refer to BOMI's course Energy Management and Controls.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	4.3. Commissioning and Energy Savings Performance Contracts (ESPC)	4.3.1. Demonstrate knowledge of all types of Commissioning, the differences between them, and commissioning requirements in laws and Executive Orders.	Partial. This course received credit for knowledge of all types of commissioning and the differences between them. The course does not cover commissioning requirements in laws and Executive Orders.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Although it is clear that the course includes information on various types of commissioning. It is not clear that the course includes information about the differences in commissioning requirements in laws and executive orders. Also, please check the course definitions for commissioning. For example, other industry definitions for continuous or on-going commissioning, such as provided in the ASHRAE Wiki (http://wiki.ashrae.org/index.php/Ongoing_commissioning_process) define ongoing commissioning as a continuation of the commissioning process, not a hybrid of retro- and re-commissioning.	Course further defines ongoing commissioning as continuously monitoring performance after modifications are made. We have revised this in the Identify Skills... column.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
		4.3.3. Demonstrate knowledge of the Energy Savings Performance Contracting (ESPC) procedures and requirements. (http://www1.eere.energy.gov/femp/financing/mechanisms.html).	Partial. This course received credit because the course provides general knowledge of Energy Savings Performance Contracts. However, as the performance criteria is intended primarily for energy managers, it does not sufficiently provide the detail required for an energy manager.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Although it is clear that the course includes information about energy savings performance contracting, the level of detail is unclear. Please provide further explanation about how the course discusses energy savings companies (ESCOs), regulations pertaining to ESPCS, utility financing, demand side management, risk assessment, and loans, stocks and bonds. It is understood that speculative or performance development may be related to some of the topics further information has been requested. However, this phrase alone is insufficient to evaluate the performance criteria.	Performance contracting, demand-side management, regulations, M&V, and related topics are taught at an awareness level. All topics listed for this performance criteria will be fully taught in BOMI's High Performance Sustainability courses.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	5. Safety	5.2. Infrastructure	5.2.2. Demonstrate knowledge of proper water treatment to prevent Legionnaire's Disease.	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate knowledge of proper water treatment to prevent Legionnaire's Disease.	Yes	Yes	Yes	Yes	Yes	Yes	It is not clear that the course contains information about preventing Legionnaire's disease beyond the single example of keeping pans clean. Please provide additional information about how the course demonstrates knowledge of proper water treatment to prevent Legionnaire's disease. When providing a response, please focus specifically on water treatment methods.	Chemical treatment, regulatory compliance, and relevant techniques of water treatment to control bacterial growth and other contaminants are addressed, along with the importance of these practices including disease prevention.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
5.2.3. Demonstrate knowledge of ventilation systems and prevention of contaminant introduction and cross contamination.			Partial. Based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate knowledge of ventilation systems and prevention of contaminant introduction. It does not appear to cover cross contamination.	Yes	Yes	Yes	Yes	Yes	No			Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.	

6. Design	6.1. Planning	6.1.5.Demonstrate knowledge of certification systems used by the Federal Government and industry (e.g., Leadership Energy Environmental Design (LEED), Green Globes).	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include knowledge of certification systems used by the Federal Government and industry (e.g., Leadership Energy Environmental Design (LEED), Green Globes).	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Although it is clear that trends popularized by LEED, such as roles and relationships to sustainable design, are included within the course, it is not clear that the course provides information a out rating the rating system. Please clarify if the course discusses what is included within LEED and if the course discusses what is included in any other certification systems, such as Green Globes.	Examples of the employment of certification systems are currently limited to LEED and Energy Star.	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
	6.2. Infrastructure Systems	6.2.1.Demonstrate knowledge and understanding of the design basis of all applicable Architectural and Engineering Systems.	Partial. This course received credit for demonstrating knowledge and understanding of the design basis of the following Architectural and Engineering Systems: HVAC, building envelope, structural and roofing systems, BAS, plumbing systems, interior design, occupant needs and requirements/controls resource flows. The course does not cover window systems, electrical systems, fire protection systems and landscape architecture systems and lighting systems.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Although it is clear that part 1 of the course includes information about roofing, building envelope, window and HVAC systems, and part 2 of the course includes information about window systems, electrical systems, fire protection systems and landscape architecture systems, it is not clear that the course includes information about telecommunication systems, lighting systems, BAS, IT systems, interior design or plumbing systems. It is also not clear how the course addresses occupant needs and requirements/controls as well as resource flows. Please provide information about how each item listed is addressed within the course. When providing a response, please clearly state if the topic is covered by part 1 or 2 of the course.	Part 1 includes: BAS plumbing systems interior design occupant needs and requirements/controls resource flows Part 2 includes: lighting systems	Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.
9. Project Management	9.1. Initiate	9.1.2.Demonstrate knowledge and ability to follow Project Management processes and procedures per your organization's preferred methodology. http://www.wbdg.org/project/pm.php#mr	Yes, based on the review of the learning objectives and the skills/materials covered, the topics listed should include demonstrate knowledge and ability to follow Project Management processes and procedures per your organization's preferred methodology. http://www.wbdg.org/project/pm.php#mr	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Link to course description on website.	Learning Objectives, Skills, and learning methods listed in re-submittal.