ECBC Compliance Tools

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CEPT University, Ahmedabad
Implementation of Energy Conservation Building Code
Chandigarh, Dec 3-4, 2012

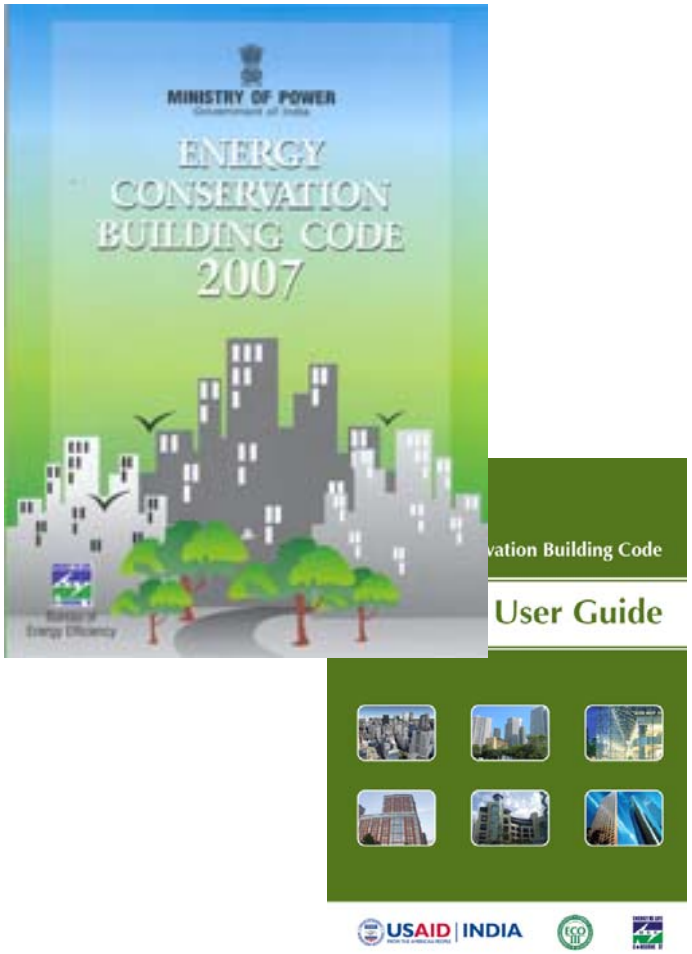
Keys to ECBC Compliance

- **Implementation**
  - Expertise amongst architects, engineers and contractors
  - Equipment with prescribed efficiency levels
  - Third party objective testing facilities that measure product efficiency with standard test procedures.

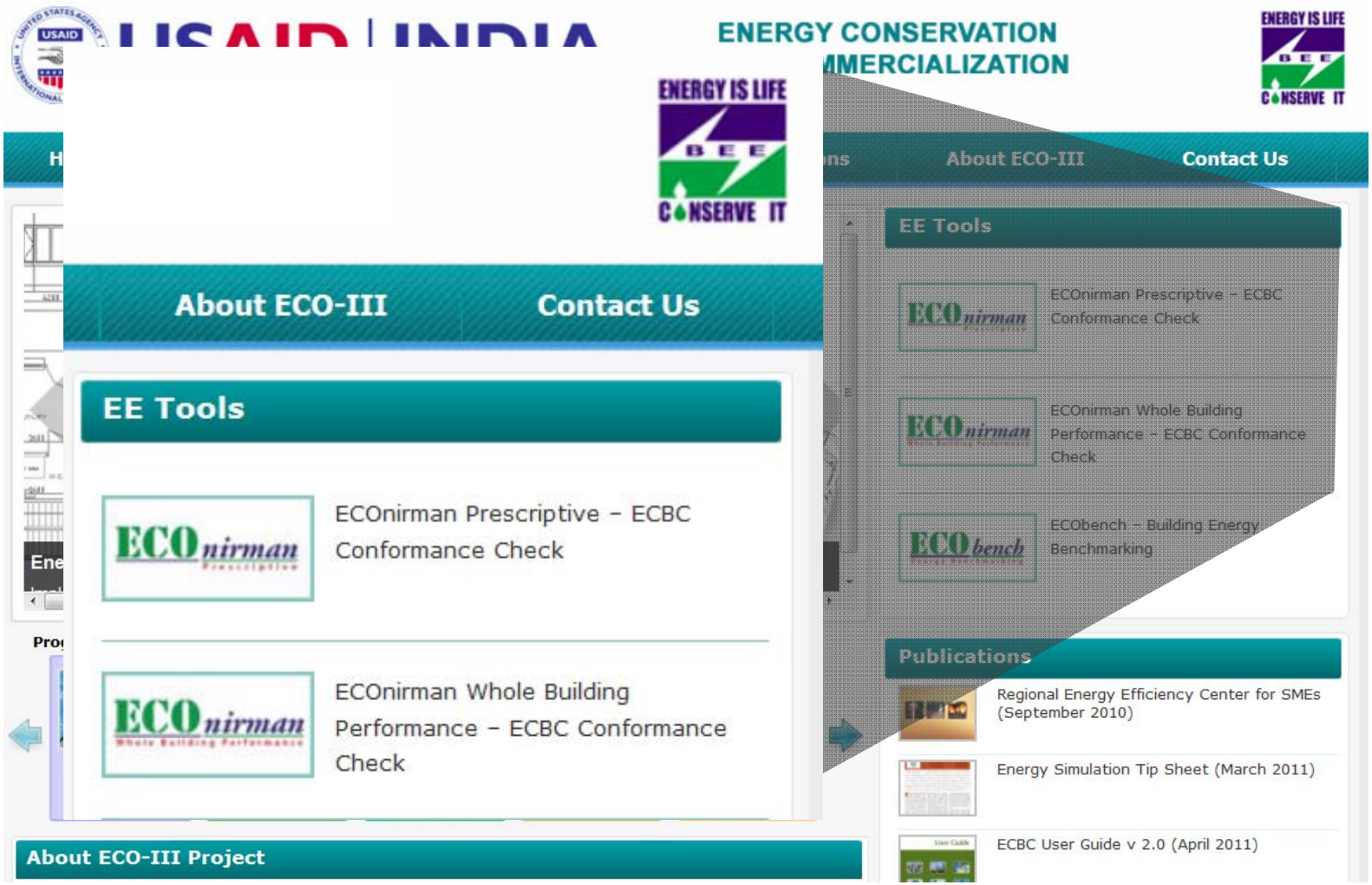
- **Enforcement**
  - Enforcement teeth at urban local bodies
  - Expertise of people to do checking
  - Permitting process takes in to account ECBC requirements

Why Have ECBC Compliance Tools

- Remove the need to pore through pages of the code book and the user manual that contain rules, tables, numbers and formulae
- Provide unambiguous interpretation of the code for the designer and the reviewer
- Make the process easier and faster
- Improve compliance rates



ECBC Compliance Tools in India



ECBC Compliance Tools in India

ENERGY CONSERVATION BUILDING CODE (ECBC)

ECOnirman
Whole Building Performance

Conformance Check Report
Whole Building Performance Method

1.0 Building Summary

Project Information		
Project ID	42f3bcd2-e9e4-4649-ac77-87f0f62802ac	Date: 12/8/2011
Project Name	All defaults	
Project Address		
Organization Name	TWG	
Building		
Building Type	Office	
Building Occupancy	Daytime Use	
Total Conditioned Area (m^2)	6,525	
Total Unconditioned Area (m^2)	975	
Total Interior Floor Area (m^2)	7,500	
Number of Floors	1	
Floor to Floor Height (m)	4	
Location		
State/UT	Maharashtra	
City	Akalkot	
General		
Climate Zone	HotAndDry	
Weather File	IND_Sholapur_431170_ISHRAE	
Simulation Program	DOE2.1	

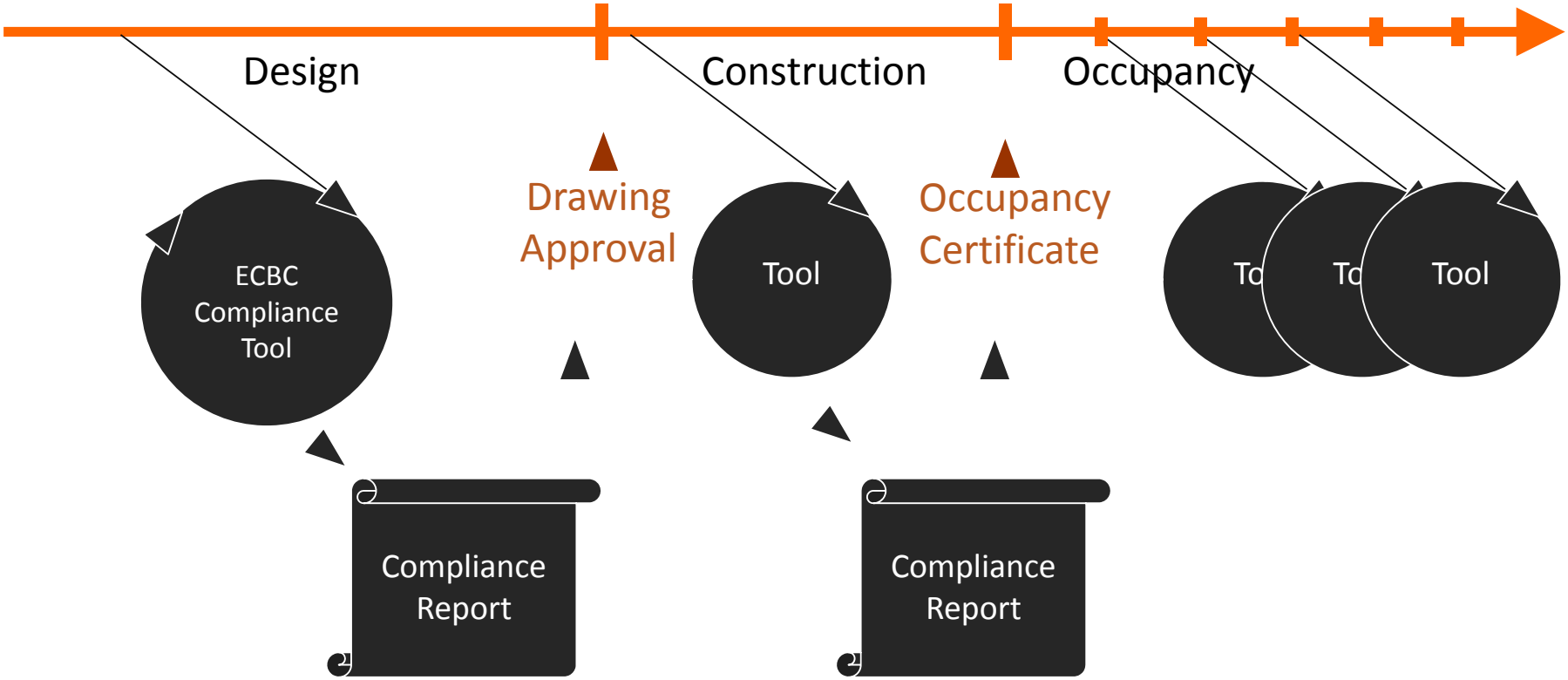
Building Conformance Summary		
Proposed Design Electricity Use per year (kWh/year)	**Standard Design Electricity Use per year (kWh/year)**	**Percent Savings: Electricity Use per year**
28,22,751	21,07,982	-33.9%
Proposed Design EPI ($kWh/m^2/year$)	**Standard Design EPI ($kWh/m^2/year$)**	**Percent Savings: EPI**
376	281	-33.9%
10.3.2(e) of ECBC Satisfied (Y/N)?		N
Mandatory Requirements Met (Y/N)?		Y

Building Conformance as per the ECBC	**NON-CONFORMING**

Why these are First in the World

- Tools ready before ECBC was adopted mandatorily at the state levels
- Web application through a standard Internet browser.
- Users do not need simulation software or any other special software installed on their computers.
- Users do not need to manage upgrades to the software
- Allows design teams to collaborate remotely.
- Collect user inputs into a central database.

Application of ECBC Compliance Tools in the Building Construction and Permitting Process



ECBC Compliance Experience

1. Enter from EETOOLS.IN
2. Log in, begin new project
3. Inputs
   a. Building use and site information
   b. Define building envelope
   c. Define lighting and other loads
   d. Define HVAC systems and hot water system
   e. Answer Mandatory Requirements queries
4. Check for compliance
5. Print report
6. Revisions
   a. Edit information
   b. Check compliance and print report

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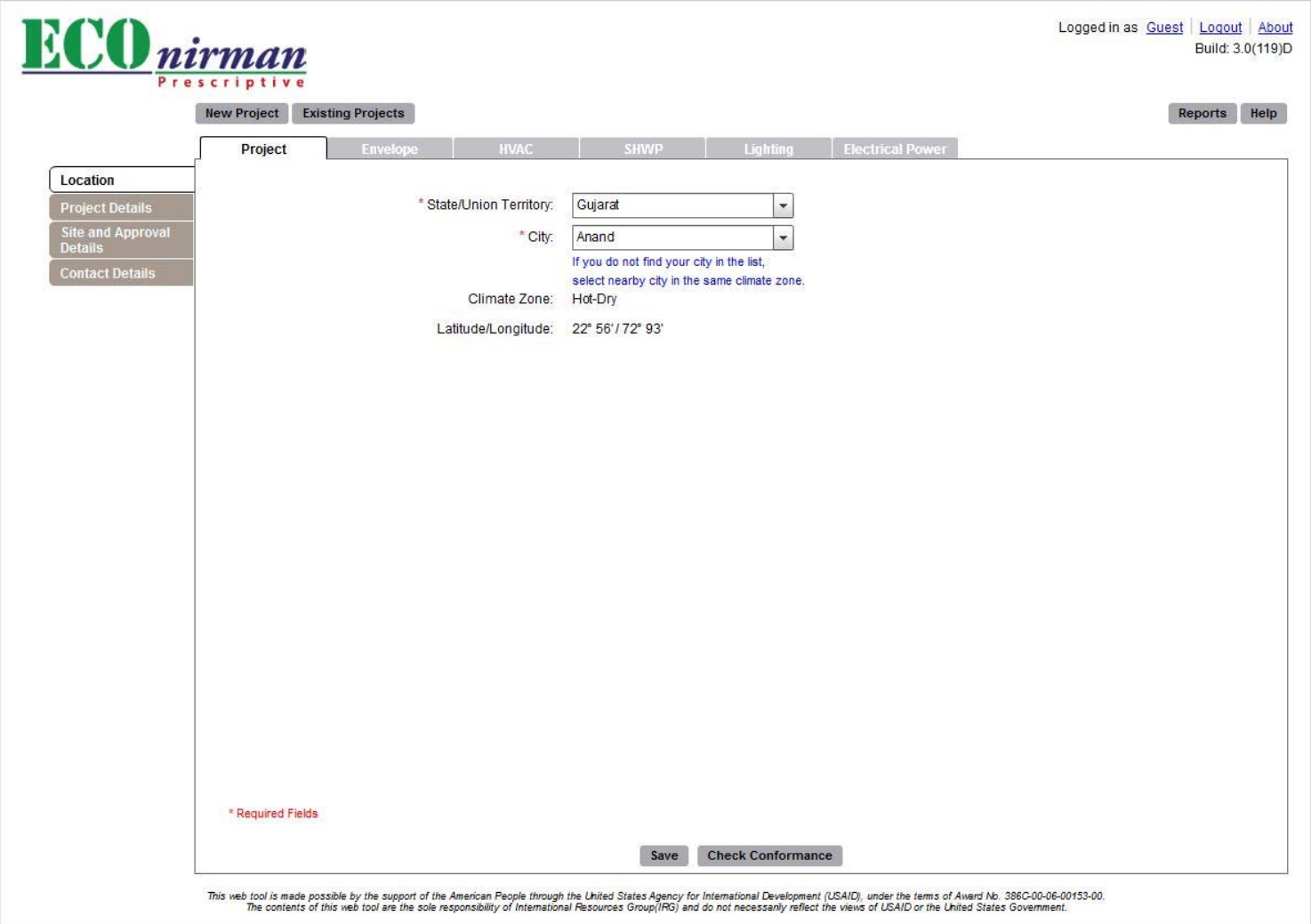
Prescriptive Compliance Tool

ECOnirman


ECO nirman
Prescriptive
Logged in as Guest | Logout | About
Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
Location
Project Details
Site and Approval Details
Contact Details
* State/Union Territory: Gujarat
* City: Anand
If you do not find your city in the list, select nearby city in the same climate zone.
Climate Zone: Hot-Dry
Latitude/Longitude: 22° 56' / 72° 93'
* Required Fields
Save
Check Conformance
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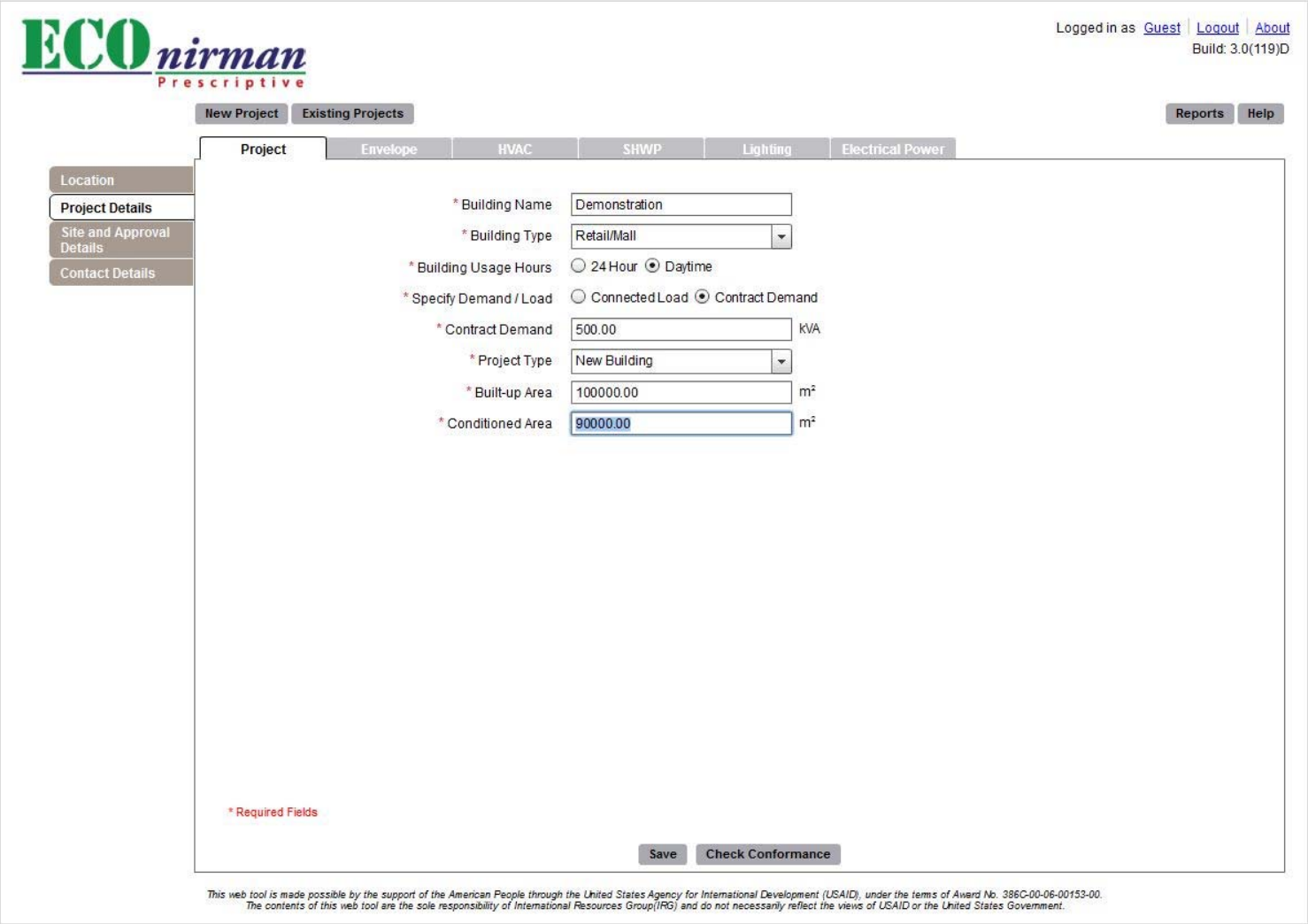
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Prescriptive
Logged in as Guest | Logout | About
Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
Location
Project Details
Site and Approval Details
Contact Details
* Building Name
Demonstration
* Building Type
Retail/Mall
* Building Usage Hours
24 Hour
Daytime
* Specify Demand / Load
Connected Load
Contract Demand
* Contract Demand
500.00
kVA
* Project Type
New Building
* Built-up Area
100000.00
m²
* Conditioned Area
90000.00
m²
* Required Fields
Save
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New Project | Existing Projects | Reports | Help

Project | Envelope | HVAC | SHWP | Lighting | Electrical Power

- Location
- Project Details
- Site and Approval Details
- Contact Details

Site Details

Description

* Address: ABC Street

* City: Anand

* Pincode: 543210

Approval Details

* Approving Authority: ABC

Approval Number

Approval Date

* Required Fields

Save | Check Conformance

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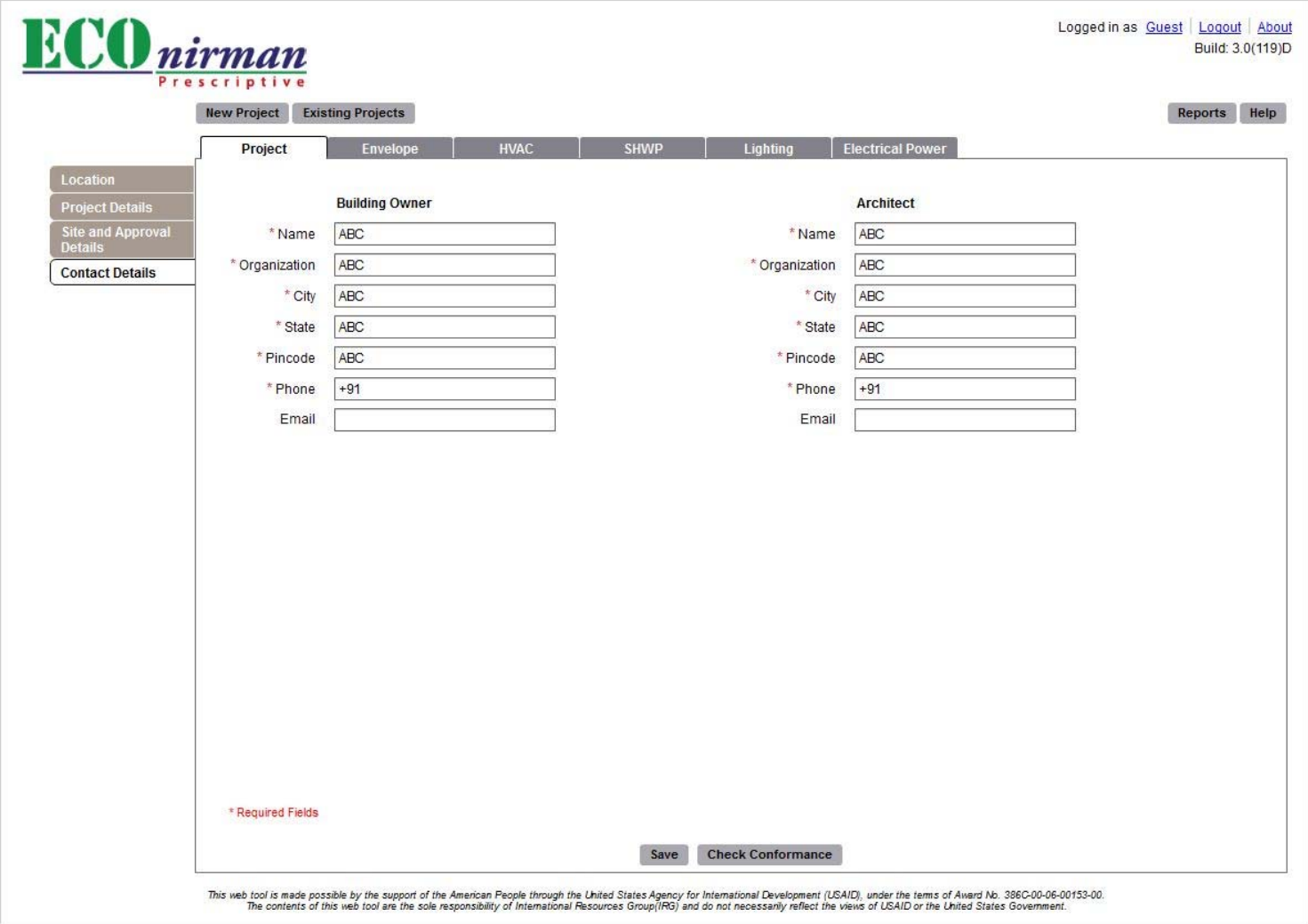
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Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
Location
Project Details
Site and Approval Details
Contact Details
Building Owner
Architect
* Name
* Organization
* City
* State
* Pincode
* Phone
Email
ABC
+91
* Required Fields
Save
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New Project | Existing Projects | Reports | Help

Project | Envelope | HVAC | SHWP | Lighting | Electrical Power

MANDATORY
- Fenestration
- Opaque Construction
- Building Envelope Sealing

PRESCRIPTIVE
- Roofs
- Walls
- Vertical Fenestration
- Skylights

Fenestration - U-Factor

Is the U-factor for overall fenestration (including the sash and frame) determined in accordance with ISO-15099, as specified in Appendix C §11 of ECBC, by an accredited independent laboratory, and labeled and certified by the manufacturer or other responsible party? ○ Yes ○ No ◉ NA

Enter description for NA

Is the U-factor for sloped glazing and skylights determined at a slope of 20 degrees above the horizontal? ◉ Yes ○ No ○ NA

Is the default table in Appendix C §11 used for determining the fenestration properties of unrated products? ◉ Yes ○ No ○ NA

Fenestration - SHGC

Is the SHGC determined for the overall fenestration product (including the sash and frame) in accordance with ISO-15099, as specified in Appendix C §11, by an accredited independent laboratory, and labeled and certified by the manufacturer or other responsible party? ◉ Yes ○ No ○ NA

Fenestration - Air Leakage

Is Air Leakage for glazed swinging entrance doors and revolving doors less than 5.0 l/sm²? ◉ Yes ○ No ○ NA

Is Air Leakage for fenestration and doors, other than glazed swinging entrance doors and revolving doors, less than 2.0 l/sm²? ◉ Yes ○ No ○ NA

Save | Check Conformance

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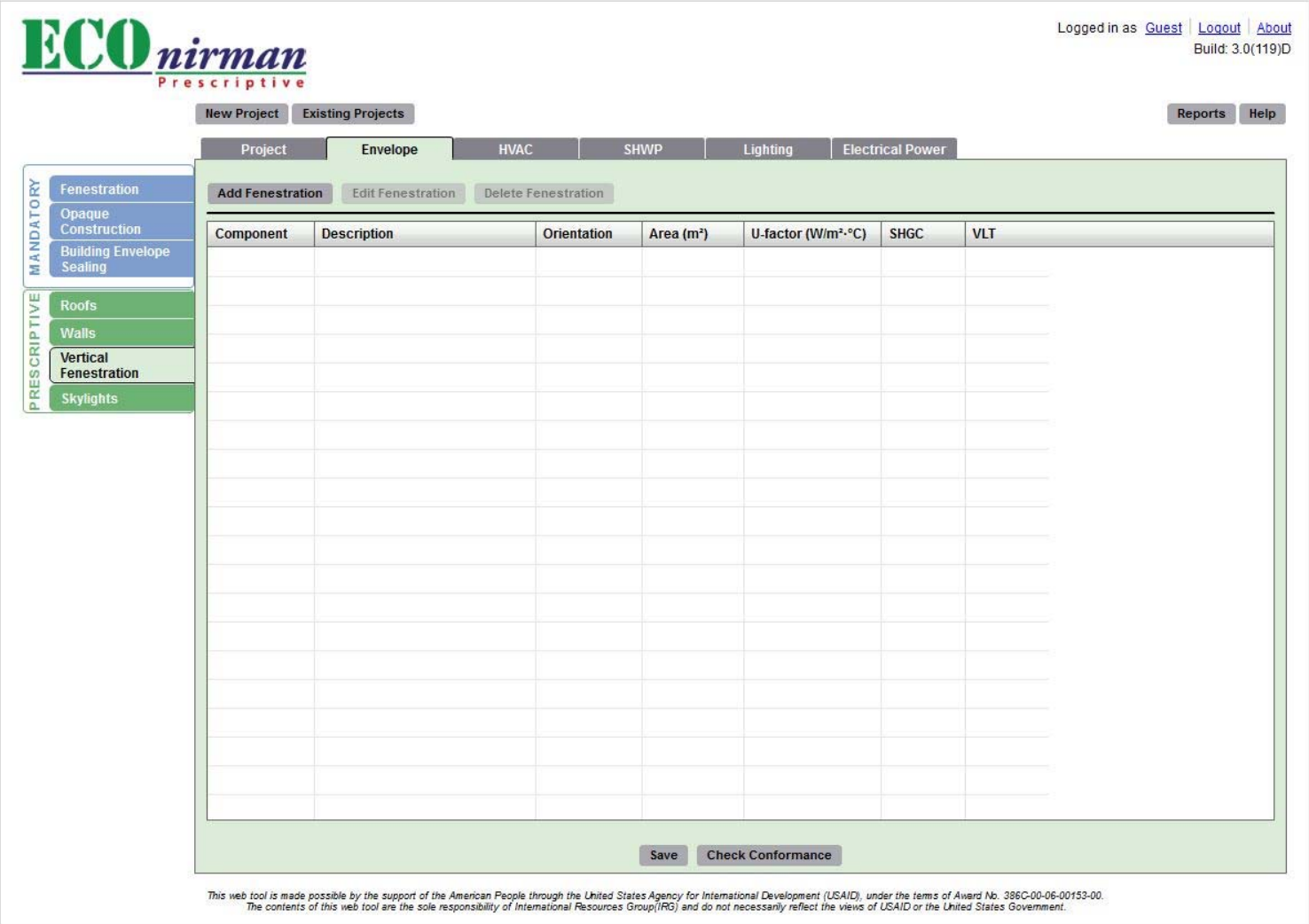
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Prescriptive
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Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
MANDATORY
Fenestration
Opaque Construction
Building Envelope Sealing
PRESCRIPTIVE
Roofs
Walls
Vertical Fenestration
Skylights
Add Fenestration
Edit Fenestration
Delete Fenestration
Component
Description
Orientation
Area (m²)
U-factor (W/m²·°C)
SHGC
VLT
Save
Check Conformance
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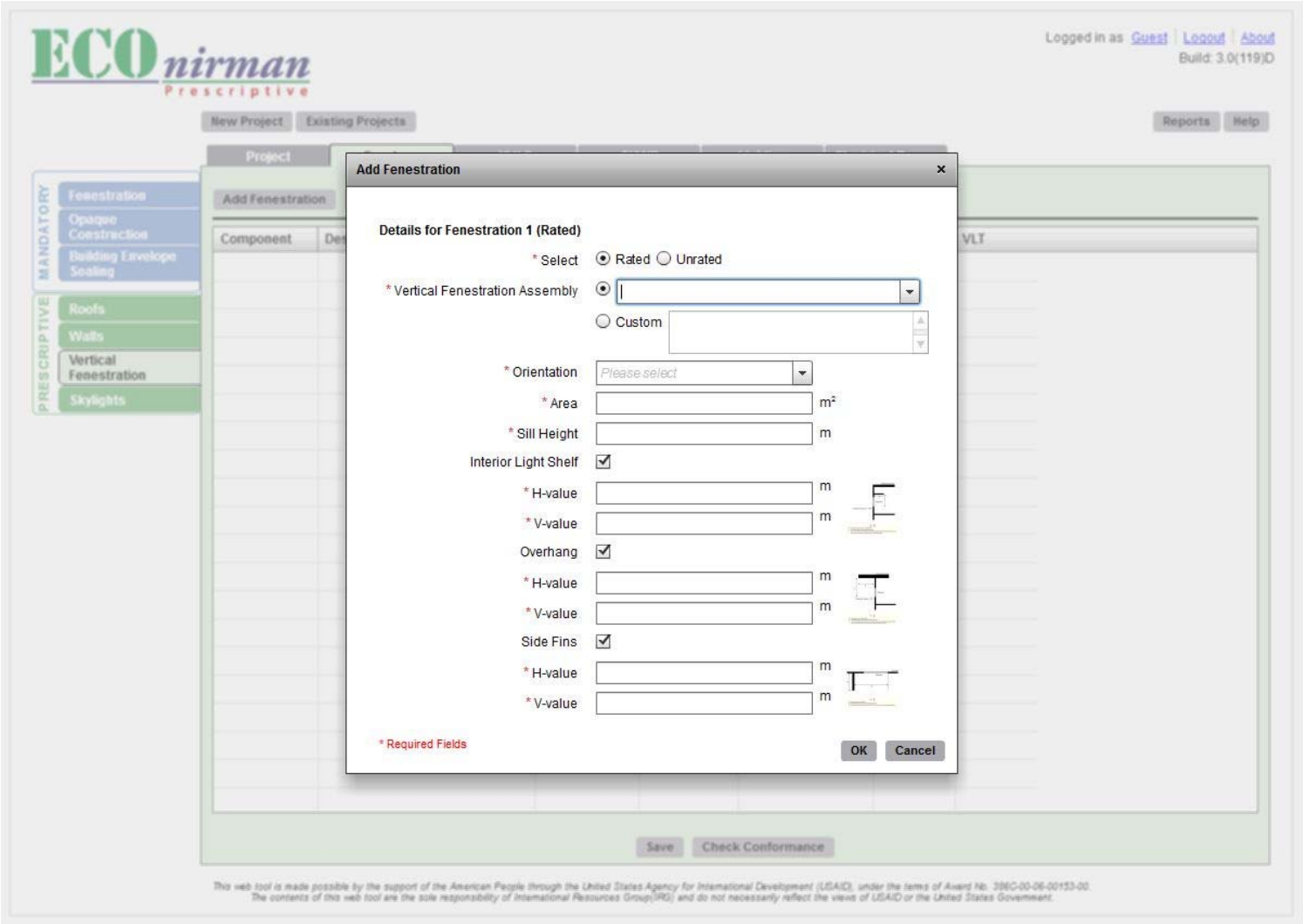
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Prescriptive
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Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
MANDATORY
Fenestration
Opaque Construction
Building Envelope Sealing
PRESCRIPTIVE
Roofs
Walls
Vertical Fenestration
Skylights
Add Fenestration
Component
VLT
Add Fenestration
Details for Fenestration 1 (Rated)
* Select
Rated
Unrated
* Vertical Fenestration Assembly
Custom
* Orientation
Please select
* Area
m²
* Sill Height
m
Interior Light Shelf
* H-value
* V-value
Overhang
Side Fins
* Required Fields
OK
Cancel
Save
Check Conformance

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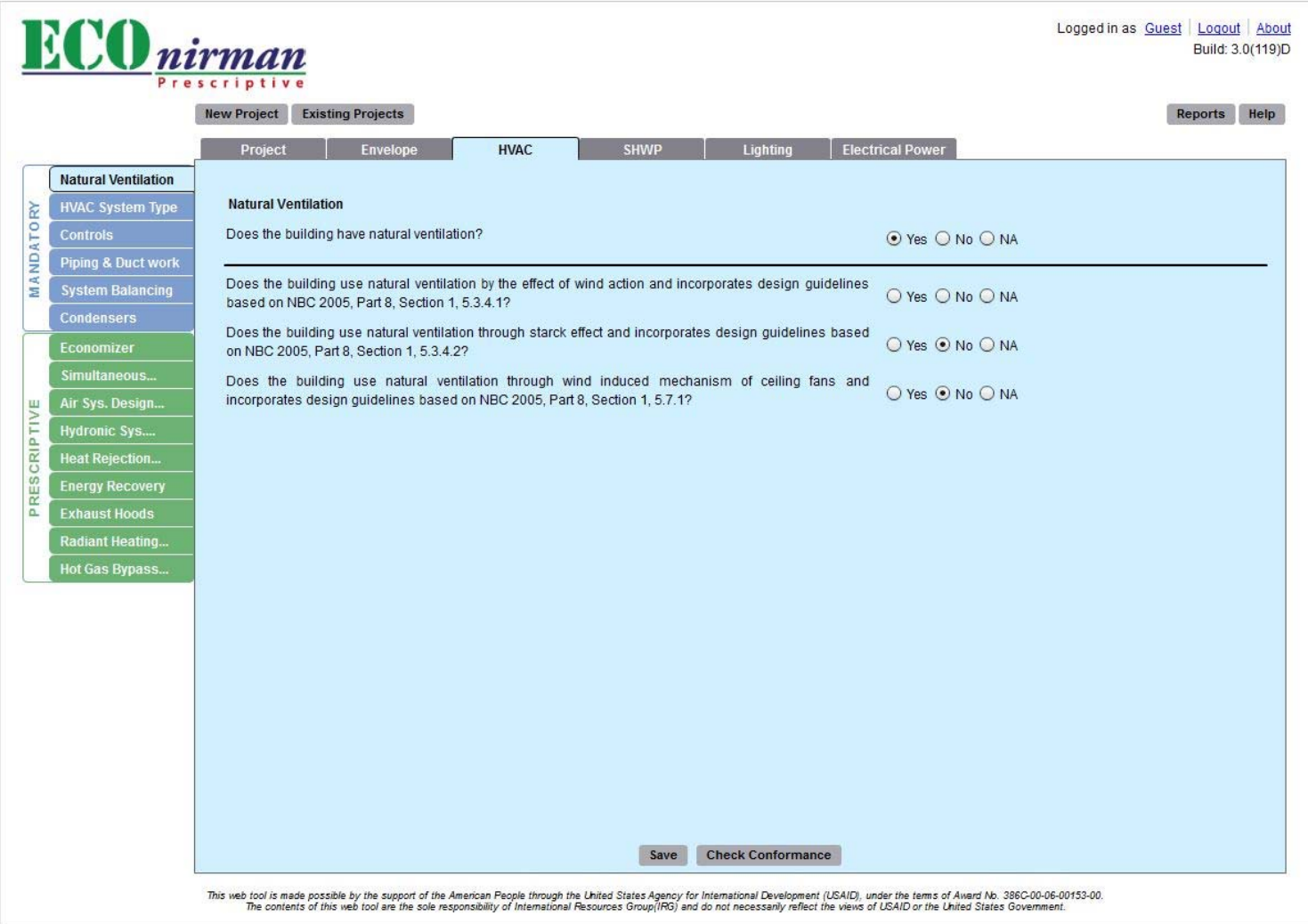
ECOnirman
Prescriptive
Logged in as Guest | Logout | About
Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
MANDATORY
Natural Ventilation
HVAC System Type
Controls
Piping & Duct work
System Balancing
Condensers
PRESCRIPTIVE
Economizer
Simultaneous...
Air Sys. Design...
Hydronic Sys....
Heat Rejection...
Energy Recovery
Exhaust Hoods
Radiant Heating...
Hot Gas Bypass...
Natural Ventilation
Does the building have natural ventilation?
Yes No NA
Does the building use natural ventilation by the effect of wind action and incorporates design guidelines based on NBC 2005, Part 8, Section 1, 5.3.4.1?
Yes No NA
Does the building use natural ventilation through starck effect and incorporates design guidelines based on NBC 2005, Part 8, Section 1, 5.3.4.2?
Yes No NA
Does the building use natural ventilation through wind induced mechanism of ceiling fans and incorporates design guidelines based on NBC 2005, Part 8, Section 1, 5.7.1?
Yes No NA
Save
Check Conformance
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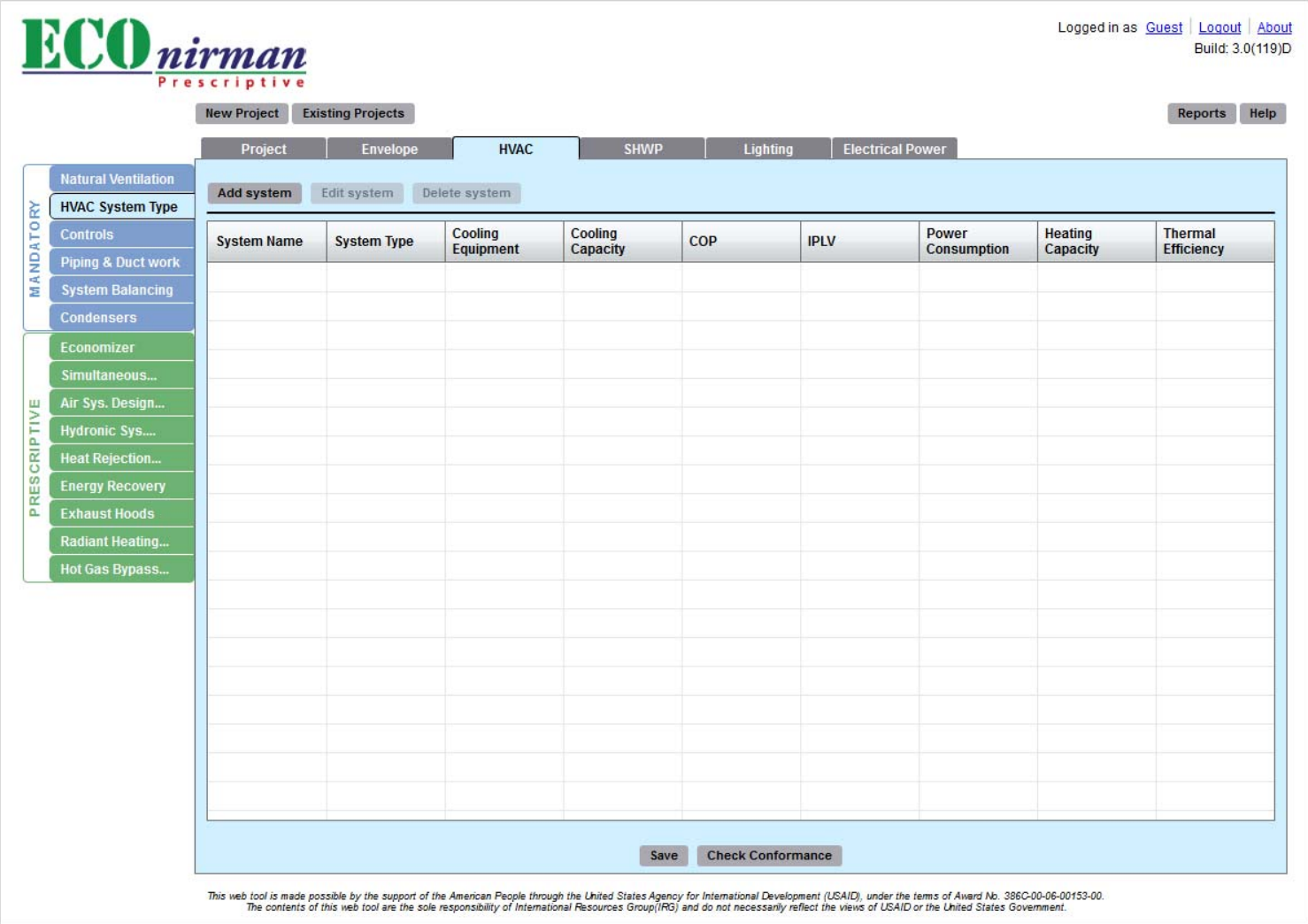
ECOnirman
Prescriptive
Logged in as Guest | Logout | About
Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
MANDATORY
Natural Ventilation
HVAC System Type
Controls
Piping & Duct work
System Balancing
Condensers
PRESCRIPTIVE
Economizer
Simultaneous...
Air Sys. Design...
Hydronic Sys....
Heat Rejection...
Energy Recovery
Exhaust Hoods
Radiant Heating...
Hot Gas Bypass...
Add system
Edit system
Delete system
System Name
System Type
Cooling Equipment
Cooling Capacity
COP
IPLV
Power Consumption
Heating Capacity
Thermal Efficiency
Save
Check Conformance
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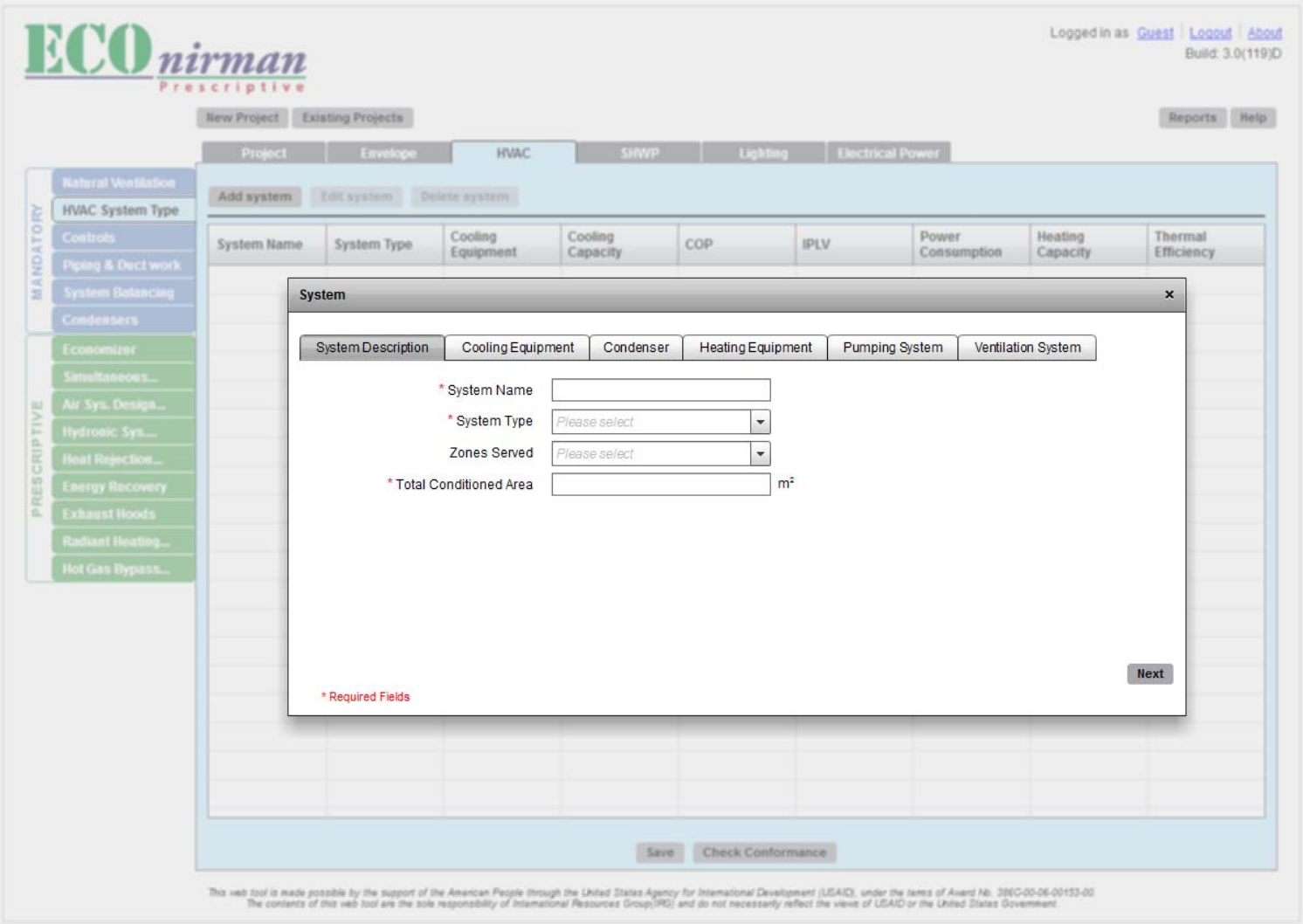
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Prescriptive
Logged in as Guest | Logout | About
Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
MANDATORY
Natural Ventilation
HVAC System Type
Controls
Piping & Duct work
System Balancing
Condensers
PRESCRIPTIVE
Economizer
Simultaneous...
Air Sys. Design...
Hydronic Sys...
Heat Rejection...
Energy Recovery
Exhaust Hoods
Radiant Heating...
Hot Gas Bypass...
Add system
Edit system
Delete system
System Name
System Type
Cooling Equipment
Cooling Capacity
COP
IPLV
Power Consumption
Heating Capacity
Thermal Efficiency
System
System Description
Cooling Equipment
Condenser
Heating Equipment
Pumping System
Ventilation System
* System Name
* System Type
Please select
Zones Served
Please select
* Total Conditioned Area
m²
Next
* Required Fields
Save
Check Conformance

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Logged in as Guest | Logout | About
Build: 3.0(119)D

New Project | Existing Projects | Reports | Help

Project | Envelope | HVAC | SHWP | Lighting | Electrical Power

MANDATORY
- Natural Ventilation
- HVAC System Type
- Controls
- Piping & Duct work
- System Balancing
- Condensers

PRESCRIPTIVE
- Economizer
- Simultaneous...
- Air Sys. Design...
- Hydronic Sys....
- Heat Rejection...
- Energy Recovery
- Exhaust Hoods
- Radiant Heating...
- Hot Gas Bypass...

Economizer

Does the cooling system not have a fan?	Yes No NA
Is the system an individual fan coil unit with a supply capacity less than minimum listed in ASHRAE 90.1. 2004 Table 6.5.1?	Yes No NA
Does the system include gas phase air cleaning in order to meet 6.1.2 of ASHRAE 62?	Yes No NA
Does the system have more than 25% of the air designed to be supplied by the system is to spaces that are designed to be humidified above 35 °F dew point temperature to satisfy process needs?	Yes No NA
Does the system include a condenser heat recovery system required by ASHRAE 90.1 2004 Table 6.5.6.2?	Yes No NA
Does the system serve residential spaces where the system capacity is less than five times the requirement listed in ASHRAE 90.1 2004 Table 6.5.1?	Yes No NA
Does the system serve spaces whose sensible cooling load at design conditions, excluding transmission and infiltration loads, is less than or equal to transmission and infilitration losses at an outdoor temperature of 60 °F?	Yes No NA
Is the system expected to operate less than 20 hours per week?	Yes No NA
Does the system if uses outdoor air will affect super market open referigerated casework systems?	Yes No NA
Does the system's cooling efficiency meet or exceed the efficiency requirements in ASHRAE 90.1 2004 Table 6.3.2?	Yes No NA
Does the system serve multiple zones?	Yes No NA
Is the cooling provided by a central plant?	Yes No NA
Is the heating provided by a central plant?	Yes No NA
Is the outside air quantity more than 1,400 l/s (3000 cfm) and less than 70% of supply air at design	

Save | Check Conformance

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Prescriptive
Logged in as Guest | Logout | About
Build: 3.0(119)D
New Project
Existing Projects
Reports
Help
Project
Envelope
HVAC
SHWP
Lighting
Electrical Power
MANDATORY
Solar Water Heating
Equipment Efficiency
Supplementary Water Heating
Piping Insulation
Heat Traps
Swimming Pools
Compliance Documentation
Is the building a hotel or a hospital with a centralized water heating system?
Yes No
Specify the design heating capacity of the centralized water heating system
kL/day
Does the heating system have a heat recovery system that provides water heating?
Yes No
Save
Check Conformance
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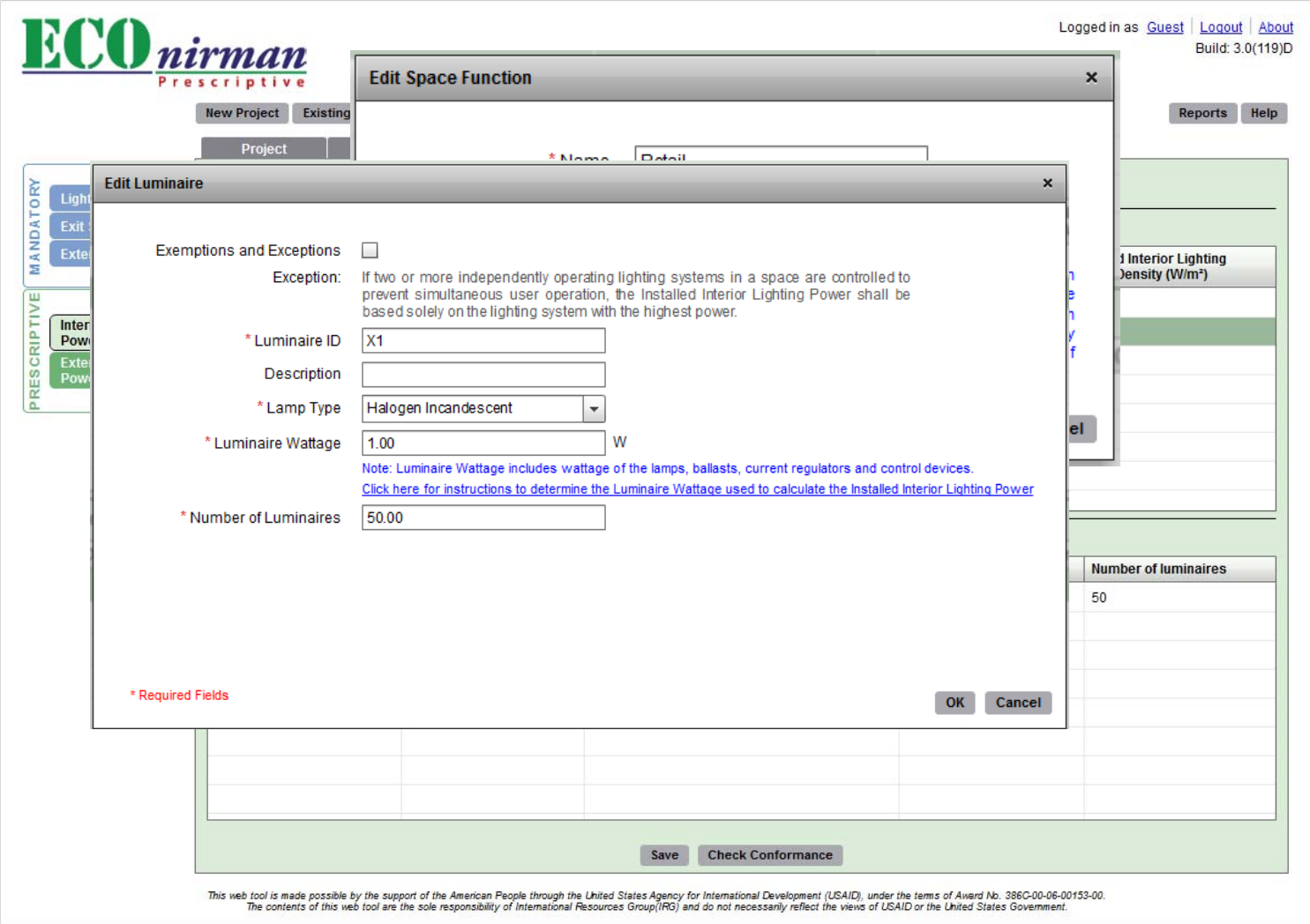
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Prescriptive
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Build: 3.0(119)D
New Project
Existing
Reports
Help
Project
MANDATORY
PRESCRIPTIVE
Edit Space Function
Edit Luminaire
Exemptions and Exceptions
Exception: If two or more independently operating lighting systems in a space are controlled to prevent simultaneous user operation, the Installed Interior Lighting Power shall be based solely on the lighting system with the highest power.
* Luminaire ID X1
Description
* Lamp Type Halogen Incandescent
* Luminaire Wattage 1.00 W
Note: Luminaire Wattage includes wattage of the lamps, ballasts, current regulators and control devices.
Click here for instructions to determine the Luminaire Wattage used to calculate the Installed Interior Lighting Power
* Number of Luminaires 50.00
* Required Fields
OK
Cancel
Number of luminaires
50
Save
Check Conformance
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Build: 3.0(119)D

New Project | Existing Projects | Reports | Help

Project | Envelope | HVAC | SHWP | Lighting | Electrical Power

MANDATORY
- Lighting Control
- Exit Signs
- Exterior Lighting

PRESCRIPTIVE
- Interior Lighting Power
- Exterior Lighting Power

Select a method for determination of Interior Lighting Power Allowance : ○ Building Area Method ◉ Space Function Method

Zones — Add | Edit | Delete

Name	Space Function Type	Lighted Floor Area (m²)	Installed Interior Lighting Power (W)	Installed Interior Lighting Power Density (W/m²)
Retail	Retail - Sales Area	90000.00	50.00	0.00

Add Luminaires to Retail — Add | Edit | Delete

Luminaire ID	Description	Lamp Type	Luminaire Wattage (W)	Number of luminaires
X1		Halogen Incandescent	1	50

Save | Check Conformance

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Action at the State level ECOnirman Prescriptive Tool

- Require or reward use of tools for Compliance
- Train architects and engineers to use tools
- Customise the compliance report outputs for the state
- Develop dynamic checklists for projects
- Track projects in central database for impact assessment

ECOnirman Prescriptive Future Development

- For Architects, Engineers, Developers

1. User libraries that can be shared
2. Compliance assistance features

- For ULBs, State Agencies and Central Government

1. Checking and enforcement assistance
2. Impact assessment and policy analysis tool
3. Generate back end EPIs for Prescriptive Method

ECOnirman

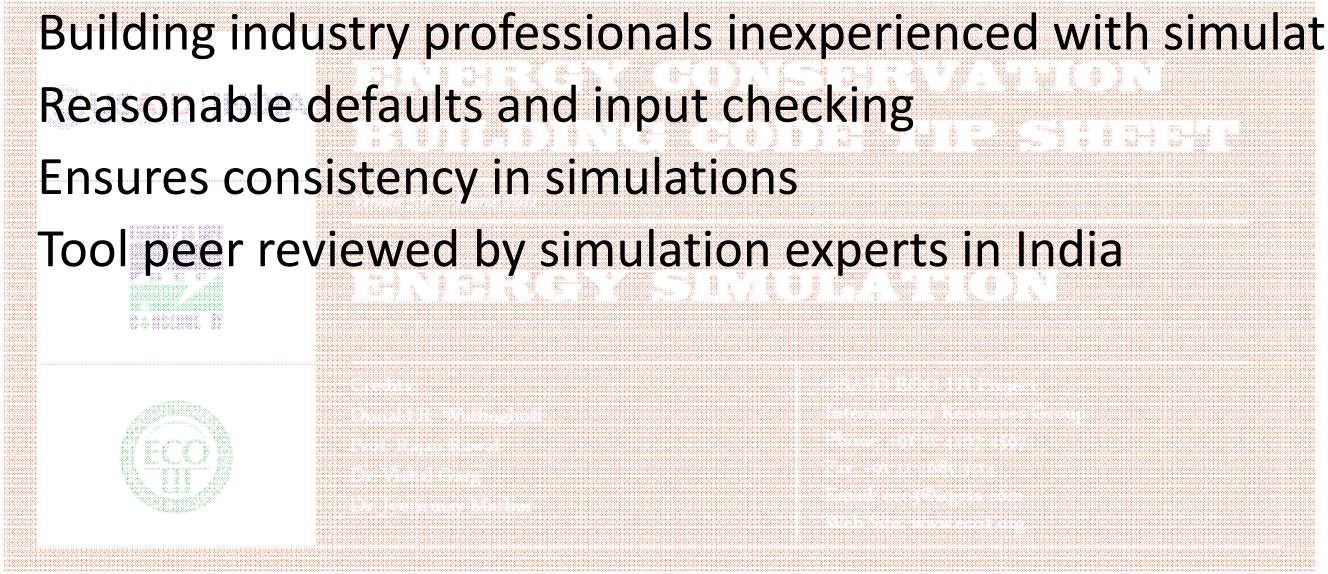
Whole Building Performance

Why a Whole Building Performance Tool

- EC Act of 2001 required energy consumption standards for buildings to be expressed as EPI
- Enables trade-off between building systems
- Promotes innovation in design and technologies
- Makes simulation more accessible and reliable

Why a Whole Building Performance Tool

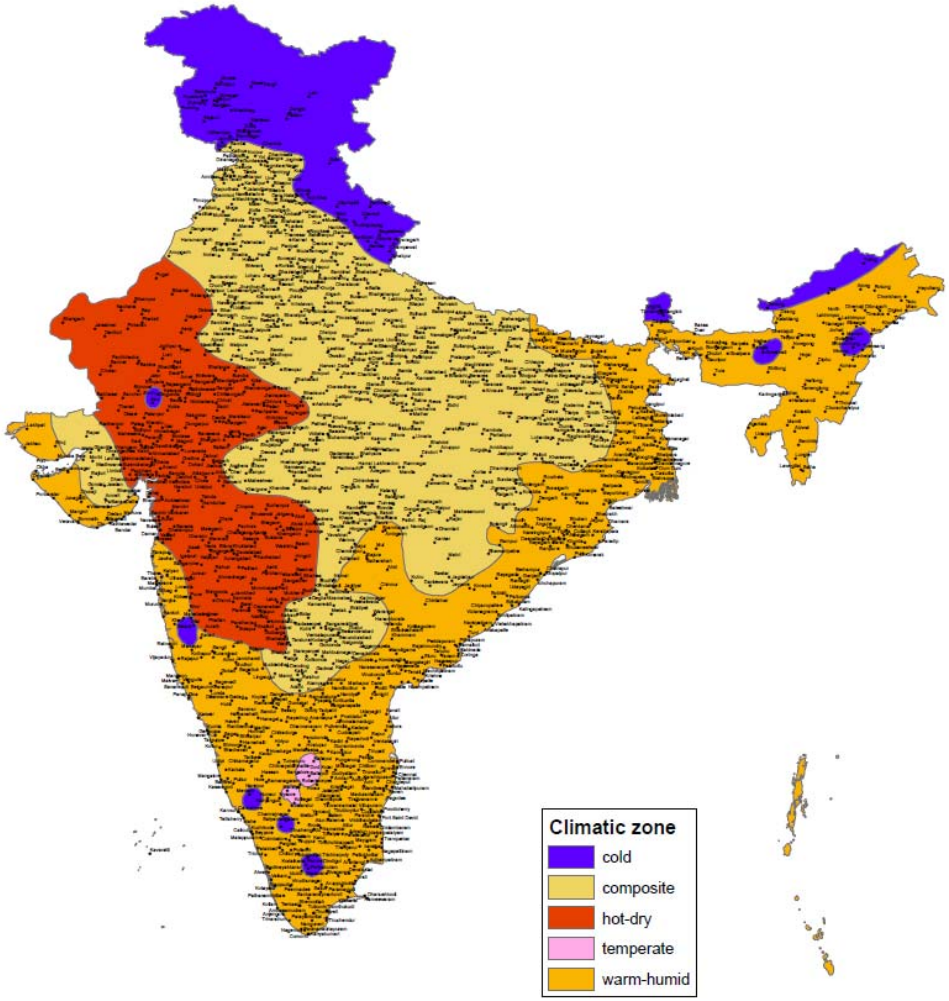
- Building industry professionals inexperienced with simulation
- Reasonable defaults and input checking
- Ensures consistency in simulations
- Tool peer reviewed by simulation experts in India



Energy simulation is a computer-based analytical process that helps building owners and designers to evaluate the energy performance of a building and make it more energy efficient by making necessary modifications in the design before the building is constructed. Use of energy simulation software is necessary to show compliance with Indian Energy Conservation Building Code (ECBC) via "Whole Building Performance Method." This Tip Sheet helps in understanding the basic concepts and processes involved in carrying out building energy simulation.

Current Version

- A total of 1,294 city locations in India are represented
- Office building type
- 4 basic HVAC systems



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Currently logged in as: (Not logged in)
About
Help
ECO nirman
Whole Building Performance
Version 1.0.0.55
Project Guidance
USAID/India
Archana Walia
Bureau of Energy Efficiency
Ajay Mathur, Sanjay Seth, Shabnam Bassi, Girja Shankar, Brijesh Manan
Development Team
International Resources Group, USAID ECO-III Project
Satish Kumar, Aalok Deshmukh, Sanyogita Manu, Bibhash Das
The Weidt Group, Inc. - Software Design
Prasad Vaidya, John Melchert, Vinay Ghatti
Supporting Partners
Technical Consultants
Vikas Arora, Shruti Narayan
For queries and information, please contact: eco3@irgssa.com
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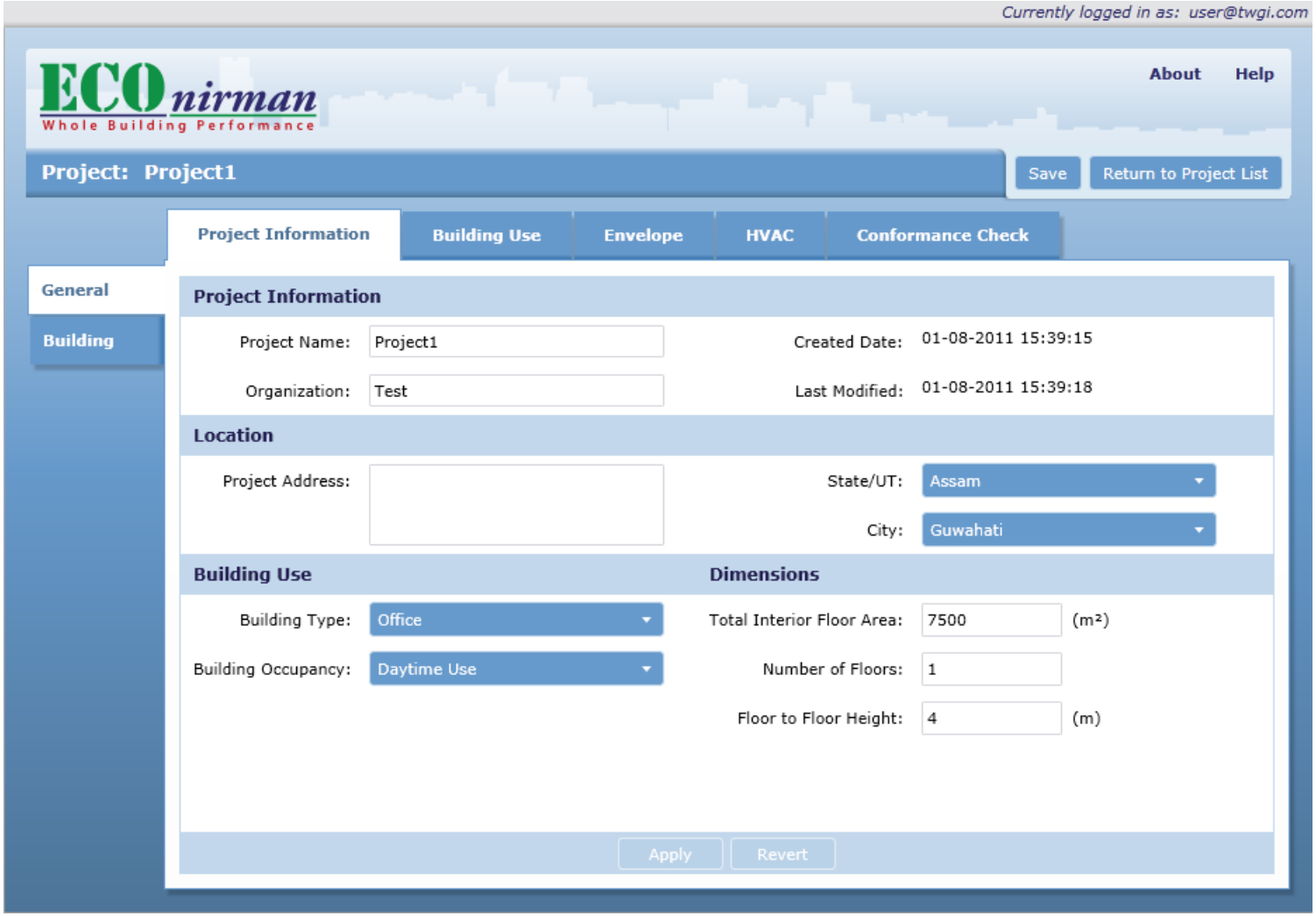
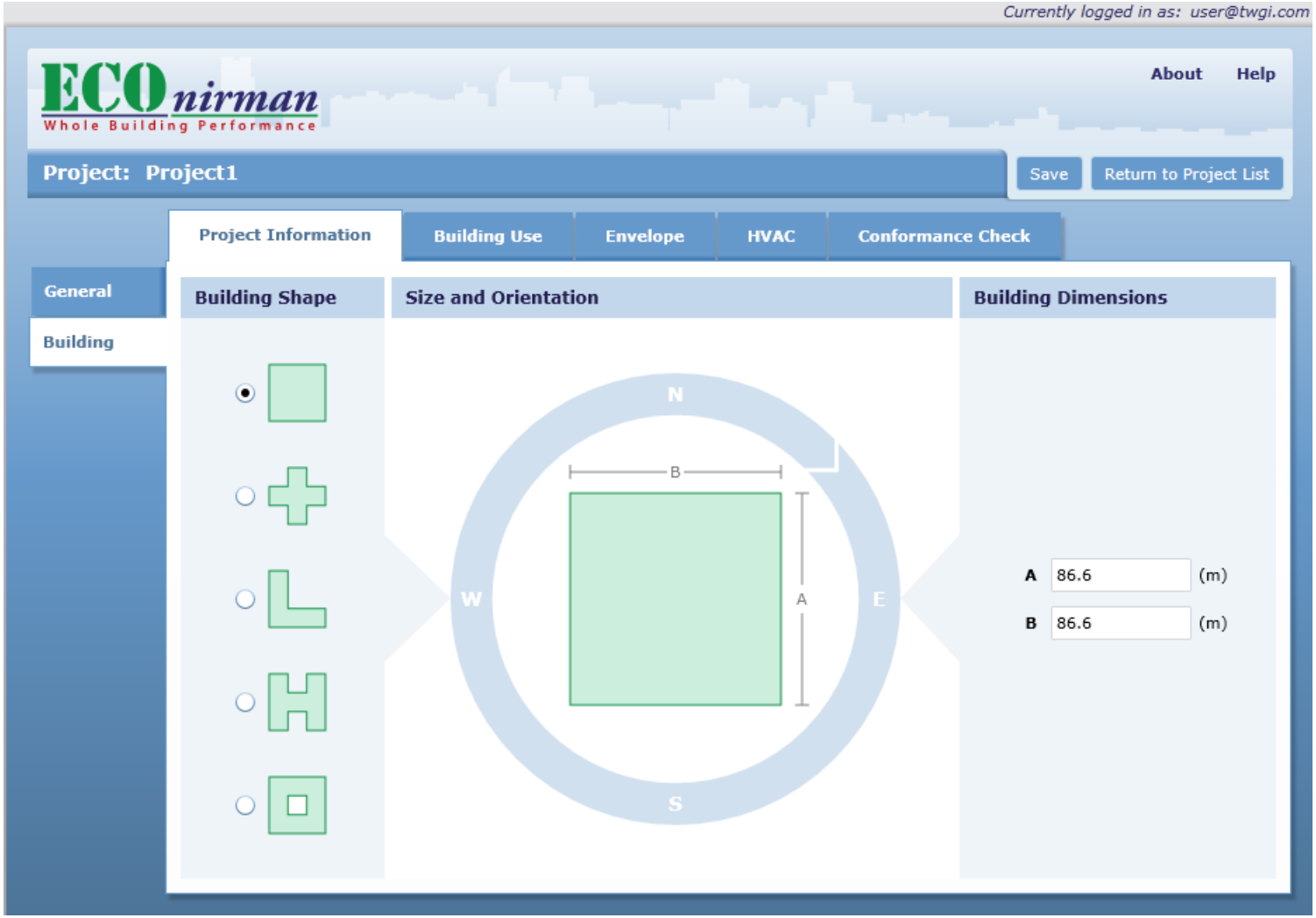

Currently logged in as: user@twgi.com
ECOnirman
Whole Building Performance
About
Help
Project: Project1
Save
Return to Project List
Project Information
Building Use
Envelope
HVAC
Conformance Check
General
Building
Project Information
Project Name: Project1
Created Date: 01-08-2011 15:39:15
Organization: Test
Last Modified: 01-08-2011 15:39:18
Location
Project Address:
State/UT: Assam
City: Guwahati
Building Use
Building Type: Office
Building Occupancy: Daytime Use
Dimensions
Total Interior Floor Area: 7500 (m²)
Number of Floors: 1
Floor to Floor Height: 4 (m)
Apply
Revert

ECOnirman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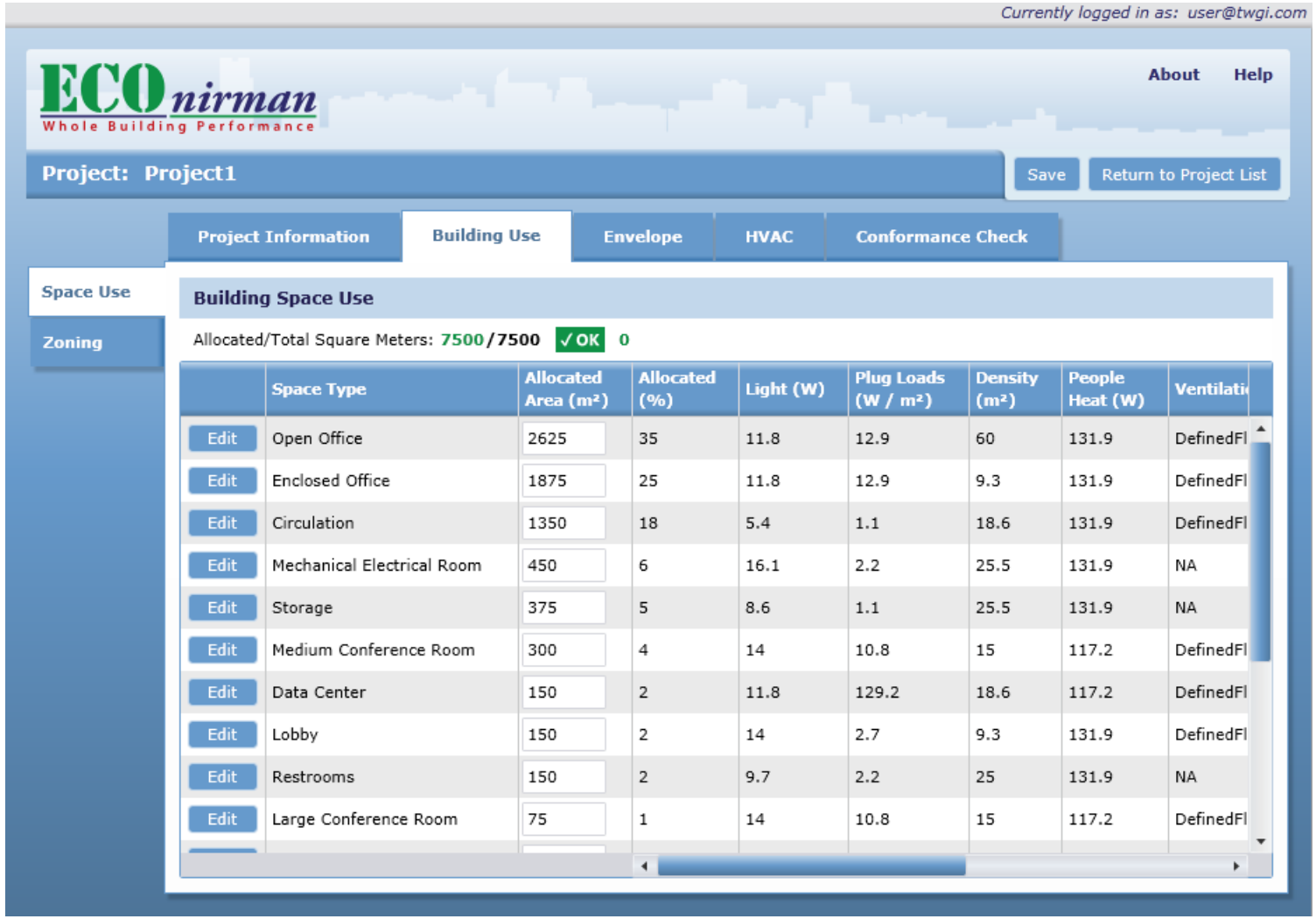
ECOnirman
Whole Building Performance
About
Help
Project: Project1
Save
Return to Project List
Project Information
Building Use
Envelope
HVAC
Conformance Check
General
Building
Building Shape
Size and Orientation
Building Dimensions
N
W
E
S
B
A
A 86.6 (m)
B 86.6 (m)

ECOnirman



	Space Type	Allocated Area (m²)	Allocated (%)	Light (W)	Plug Loads (W / m²)	Density (m²)	People Heat (W)	Ventilati
Edit	Open Office	2625	35	11.8	12.9	60	131.9	DefinedFl
Edit	Enclosed Office	1875	25	11.8	12.9	9.3	131.9	DefinedFl
Edit	Circulation	1350	18	5.4	1.1	18.6	131.9	DefinedFl
Edit	Mechanical Electrical Room	450	6	16.1	2.2	25.5	131.9	NA
Edit	Storage	375	5	8.6	1.1	25.5	131.9	NA
Edit	Medium Conference Room	300	4	14	10.8	15	117.2	DefinedFl
Edit	Data Center	150	2	11.8	129.2	18.6	117.2	DefinedFl
Edit	Lobby	150	2	14	2.7	9.3	131.9	DefinedFl
Edit	Restrooms	150	2	9.7	2.2	25	131.9	NA
Edit	Large Conference Room	75	1	14	10.8	15	117.2	DefinedFl

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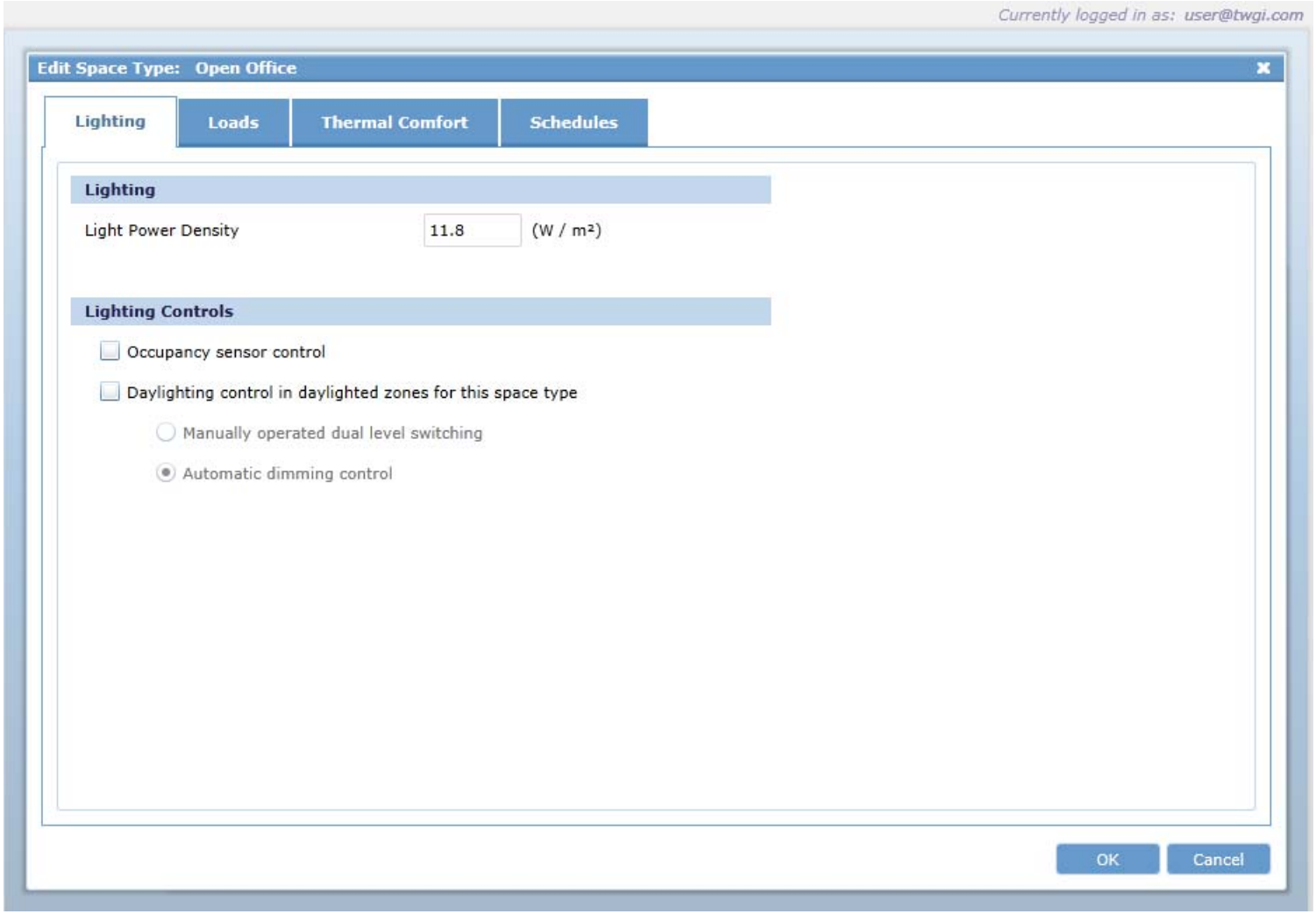
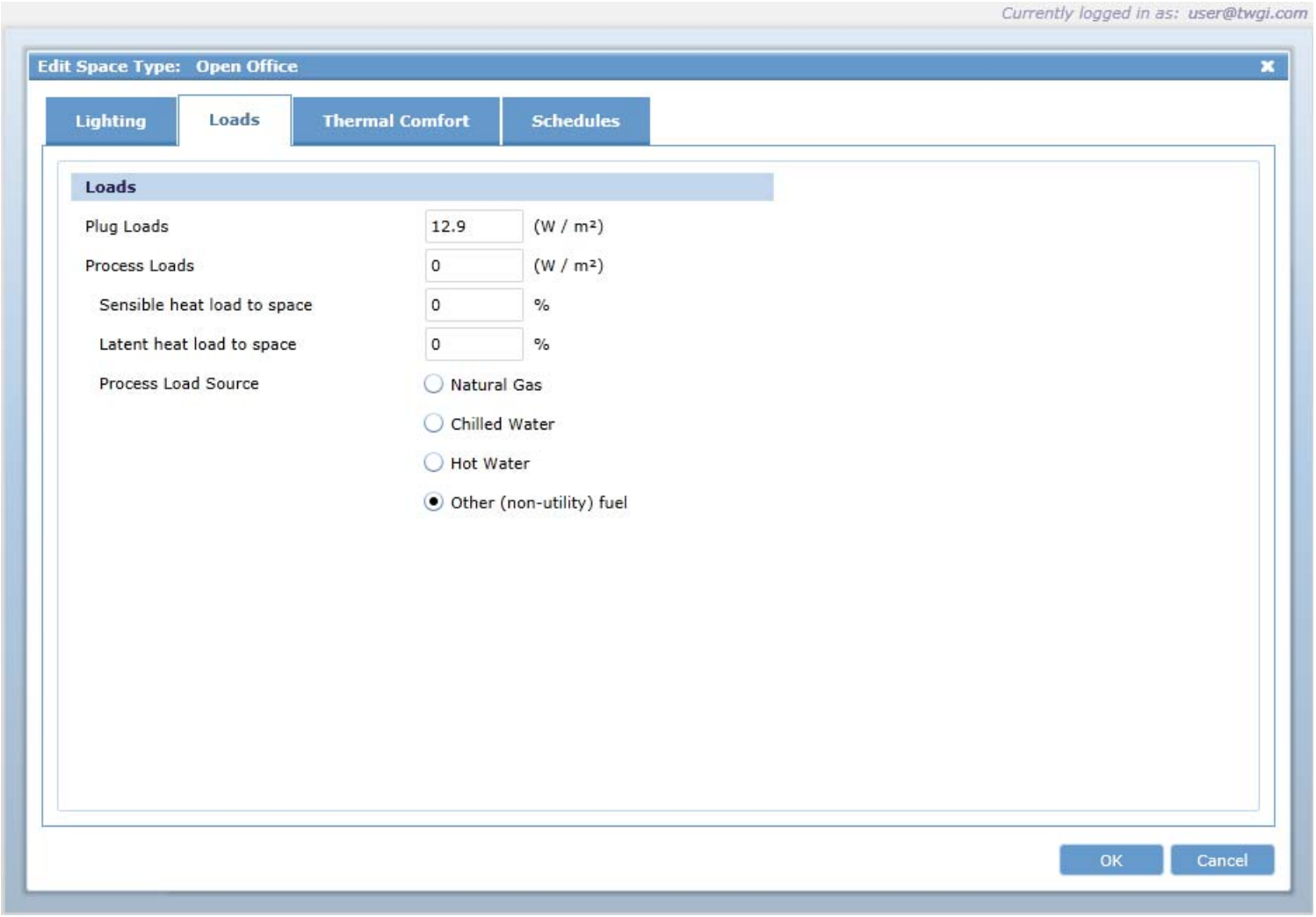

Currently logged in as: user@twgi.com
Edit Space Type: Open Office
Lighting
Loads
Thermal Comfort
Schedules
Lighting
Light Power Density
11.8
(W / m²)
Lighting Controls
Occupancy sensor control
Daylighting control in daylighted zones for this space type
Manually operated dual level switching
Automatic dimming control
OK
Cancel

ECOnirman


Currently logged in as: user@twgi.com
Edit Space Type: Open Office
Lighting
Loads
Thermal Comfort
Schedules
Loads
Plug Loads
12.9
(W / m²)
Process Loads
0
(W / m²)
Sensible heat load to space
0
%
Latent heat load to space
0
%
Process Load Source
Natural Gas
Chilled Water
Hot Water
Other (non-utility) fuel
OK
Cancel

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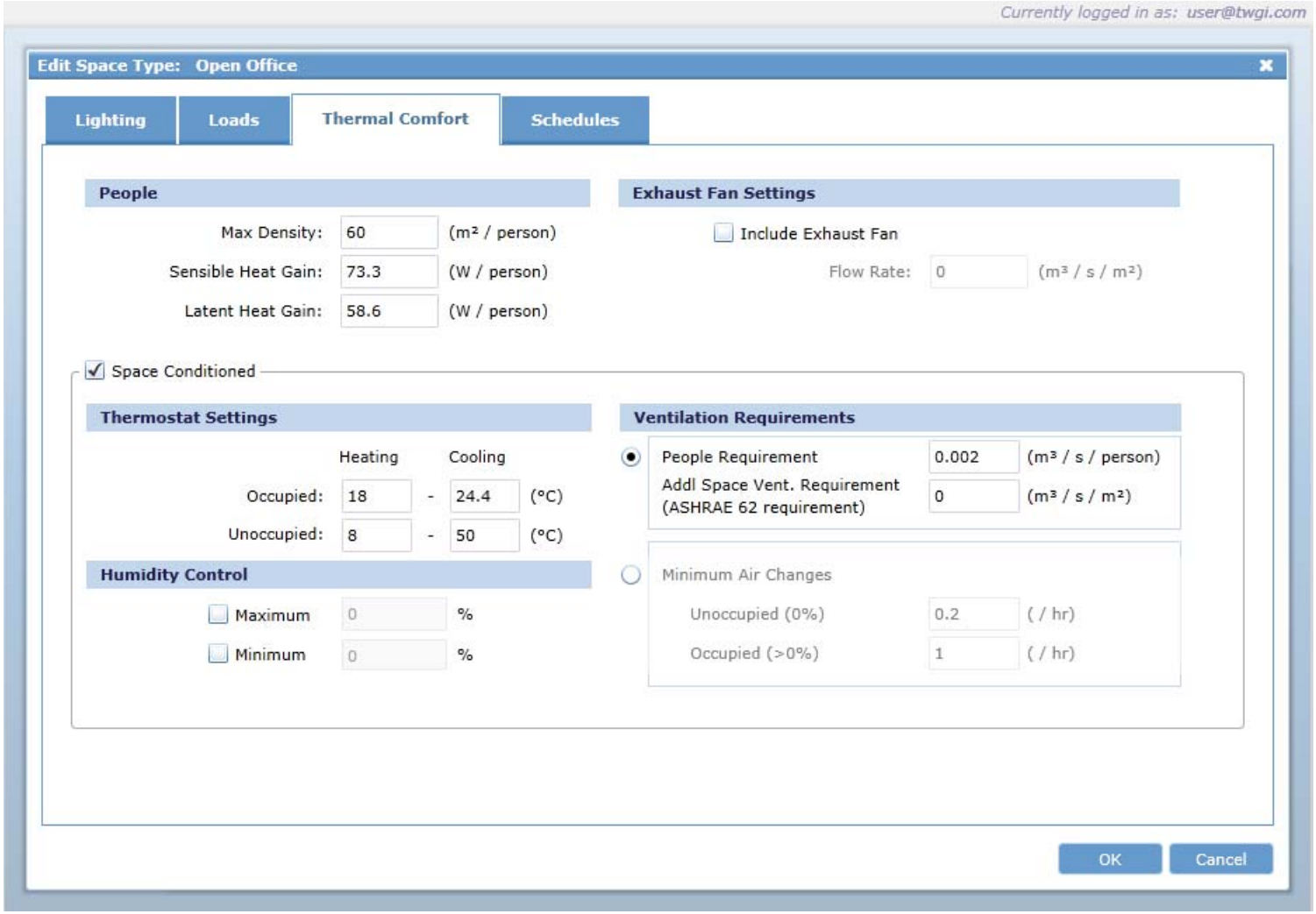
Currently logged in as: user@twgi.com
Edit Space Type: Open Office
Lighting
Loads
Thermal Comfort
Schedules
People
Max Density: 60 (m² / person)
Sensible Heat Gain: 73.3 (W / person)
Latent Heat Gain: 58.6 (W / person)
Exhaust Fan Settings
Include Exhaust Fan
Flow Rate: 0 (m³ / s / m²)
Space Conditioned
Thermostat Settings
Heating Cooling
Occupied: 18 - 24.4 (°C)
Unoccupied: 8 - 50 (°C)
Humidity Control
Maximum 0 %
Minimum 0 %
Ventilation Requirements
People Requirement 0.002 (m³ / s / person)
Addl Space Vent. Requirement (ASHRAE 62 requirement) 0 (m³ / s / m²)
Minimum Air Changes
Unoccupied (0%) 0.2 (/ hr)
Occupied (>0%) 1 (/ hr)
OK
Cancel

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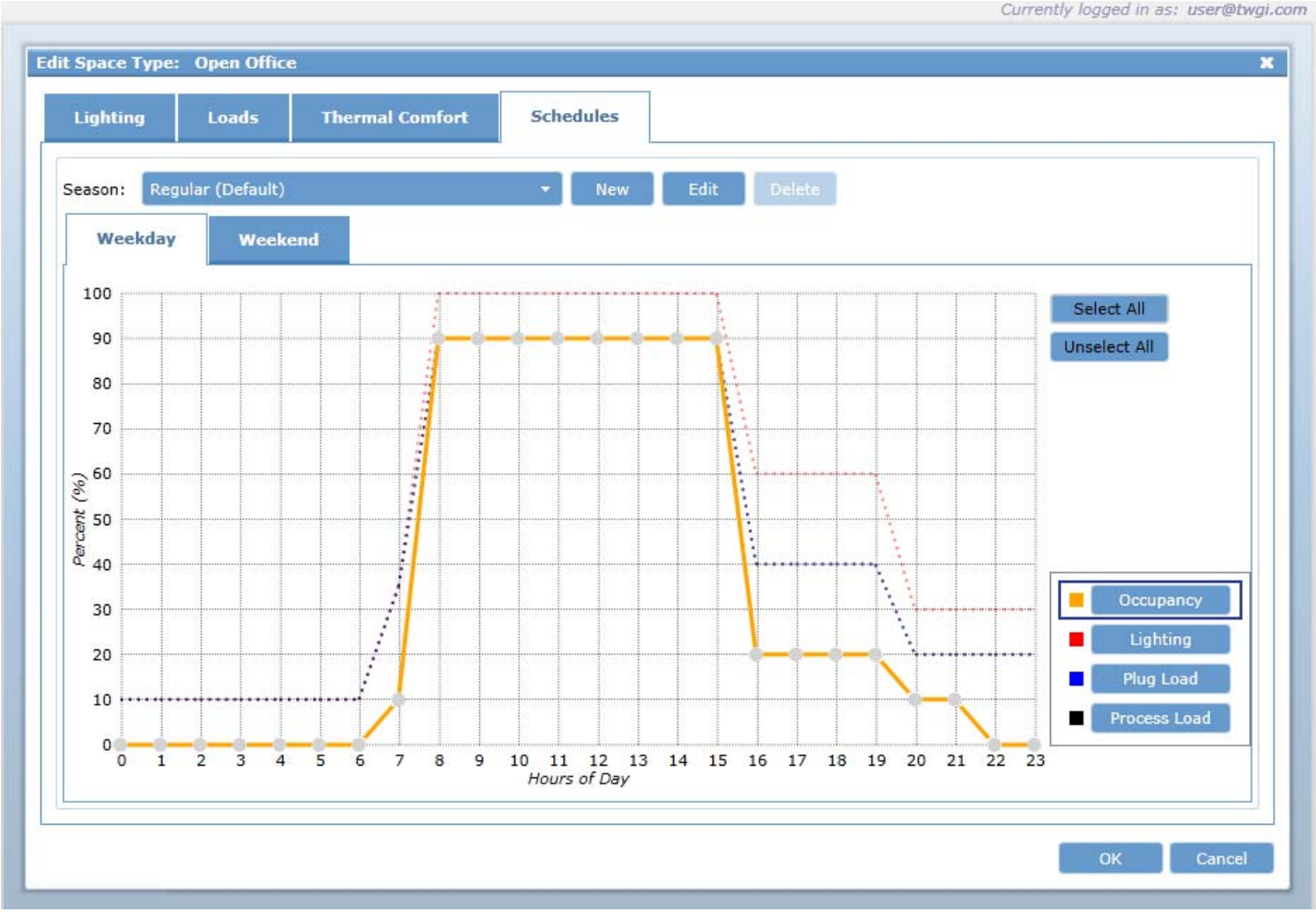
Currently logged in as: user@twgi.com
Edit Space Type: Open Office
Lighting
Loads
Thermal Comfort
Schedules
Season:
Regular (Default)
New
Edit
Delete
Weekday
Weekend
Percent (%)
Hours of Day
Select All
Unselect All
Occupancy
Lighting
Plug Load
Process Load
OK
Cancel

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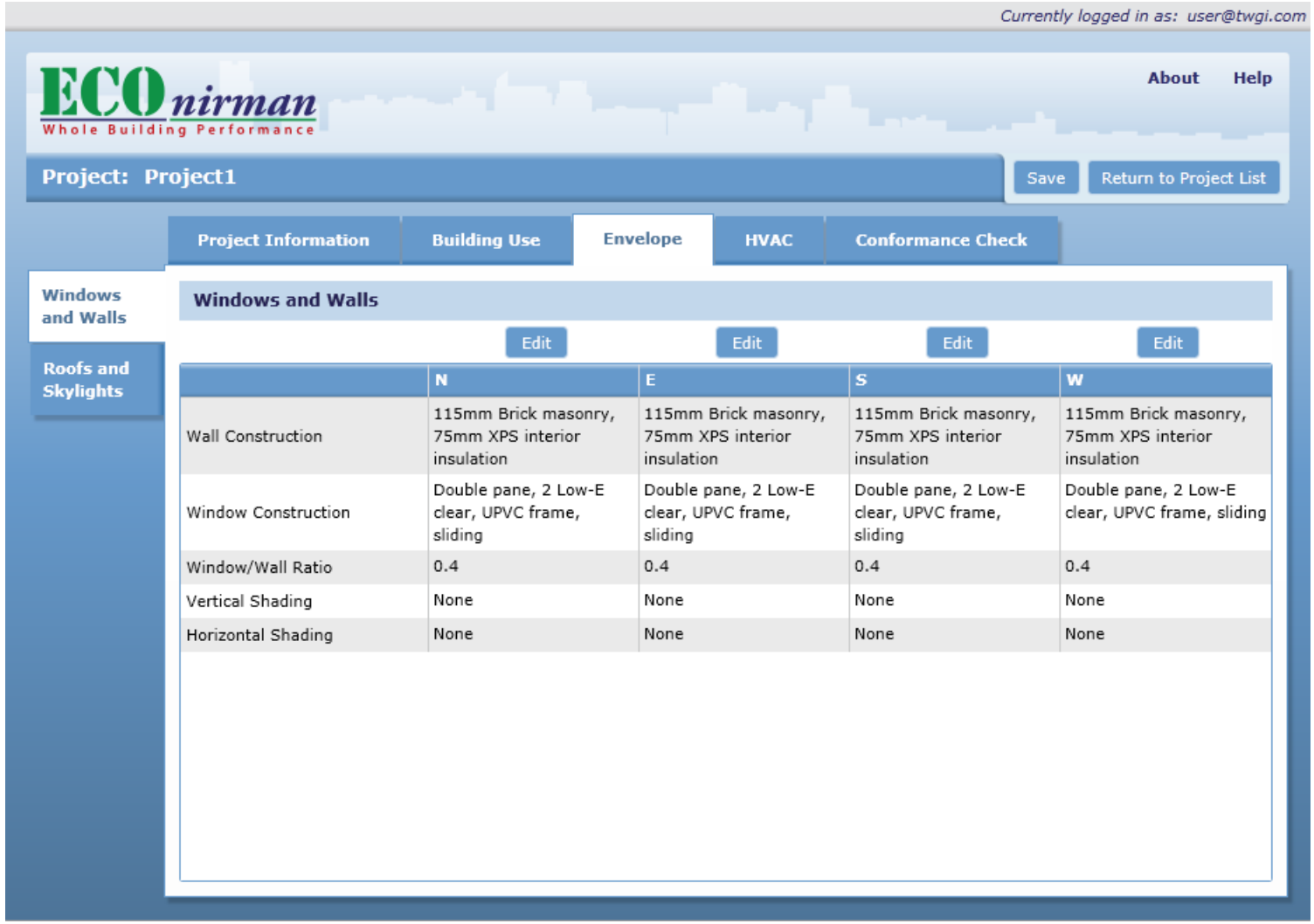

	N	E	S	W
Wall Construction	115mm Brick masonry, 75mm XPS interior insulation	115mm Brick masonry, 75mm XPS interior insulation	115mm Brick masonry, 75mm XPS interior insulation	115mm Brick masonry, 75mm XPS interior insulation
Window Construction	Double pane, 2 Low-E clear, UPVC frame, sliding	Double pane, 2 Low-E clear, UPVC frame, sliding	Double pane, 2 Low-E clear, UPVC frame, sliding	Double pane, 2 Low-E clear, UPVC frame, sliding
Window/Wall Ratio	0.4	0.4	0.4	0.4
Vertical Shading	None	None	None	None
Horizontal Shading	None	None	None	None

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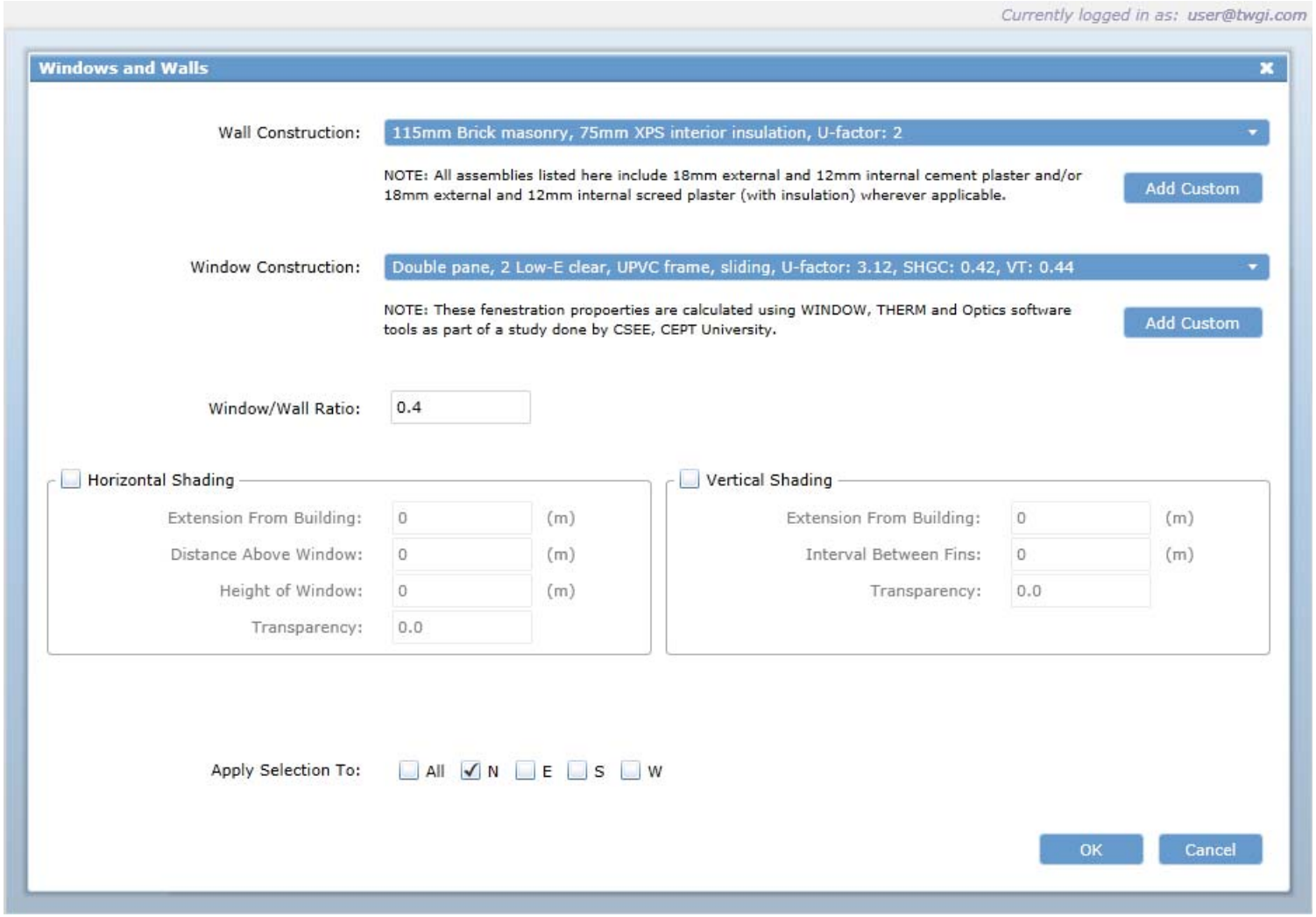
Currently logged in as: user@twgi.com
Windows and Walls
Wall Construction:
115mm Brick masonry, 75mm XPS interior insulation, U-factor: 2
NOTE: All assemblies listed here include 18mm external and 12mm internal cement plaster and/or 18mm external and 12mm internal screed plaster (with insulation) wherever applicable.
Add Custom
Window Construction:
Double pane, 2 Low-E clear, UPVC frame, sliding, U-factor: 3.12, SHGC: 0.42, VT: 0.44
NOTE: These fenestration propoerties are calculated using WINDOW, THERM and Optics software tools as part of a study done by CSEE, CEPT University.
Add Custom
Window/Wall Ratio:
0.4
Horizontal Shading
Extension From Building:
0
(m)
Distance Above Window:
0
(m)
Height of Window:
0
(m)
Transparency:
0.0
Vertical Shading
Extension From Building:
0
(m)
Interval Between Fins:
0
(m)
Transparency:
0.0
Apply Selection To:
All
N
E
S
W
OK
Cancel

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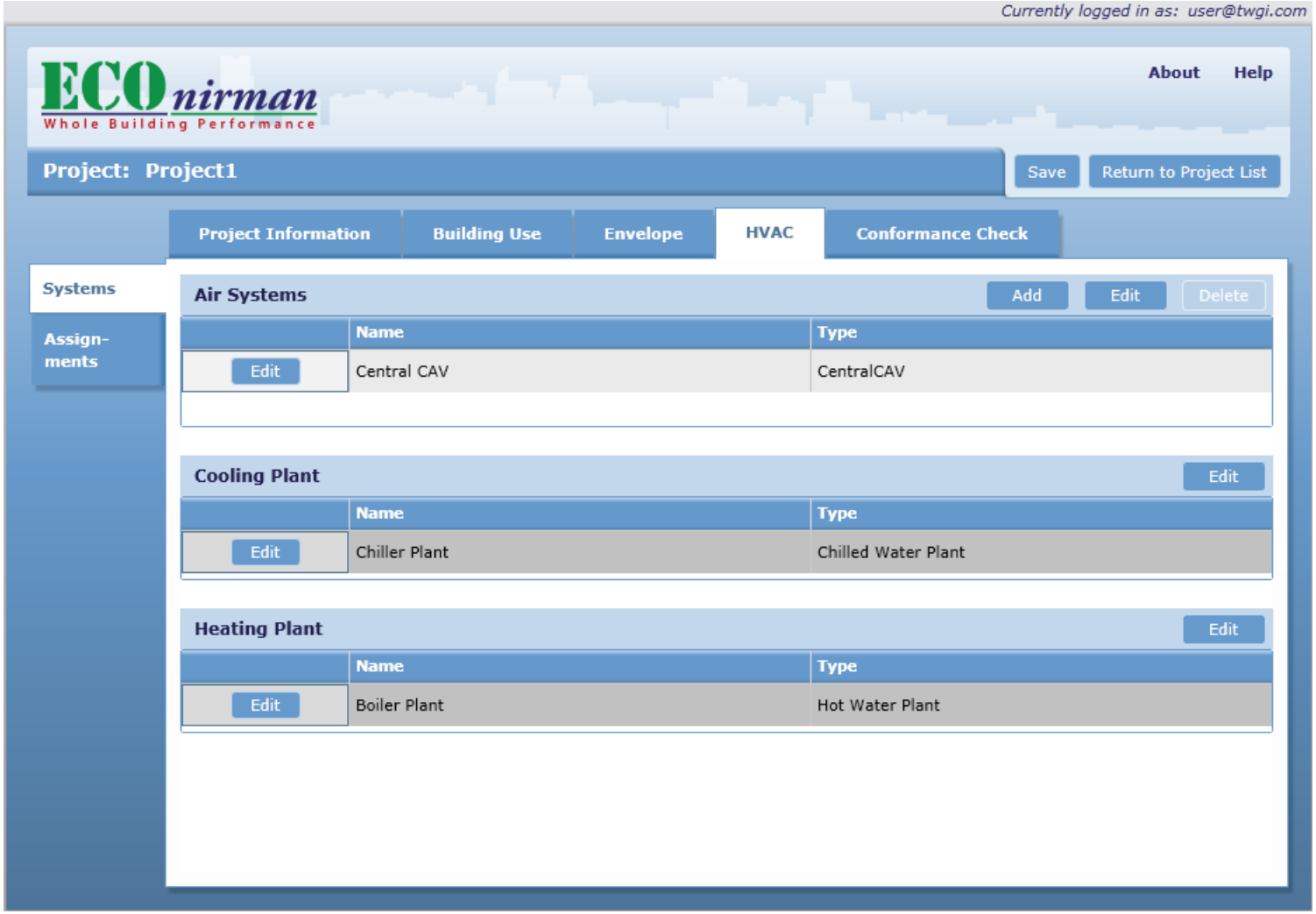
Currently logged in as: user@twgi.com
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Whole Building Performance
About
Help
Project: Project1
Save
Return to Project List
Project Information
Building Use
Envelope
HVAC
Conformance Check
Systems
Assign-ments
Air Systems
Add
Edit
Delete
Name
Type
Edit
Central CAV
CentralCAV
Cooling Plant
Edit
Name
Type
Edit
Chiller Plant
Chilled Water Plant
Heating Plant
Edit
Name
Type
Edit
Boiler Plant
Hot Water Plant

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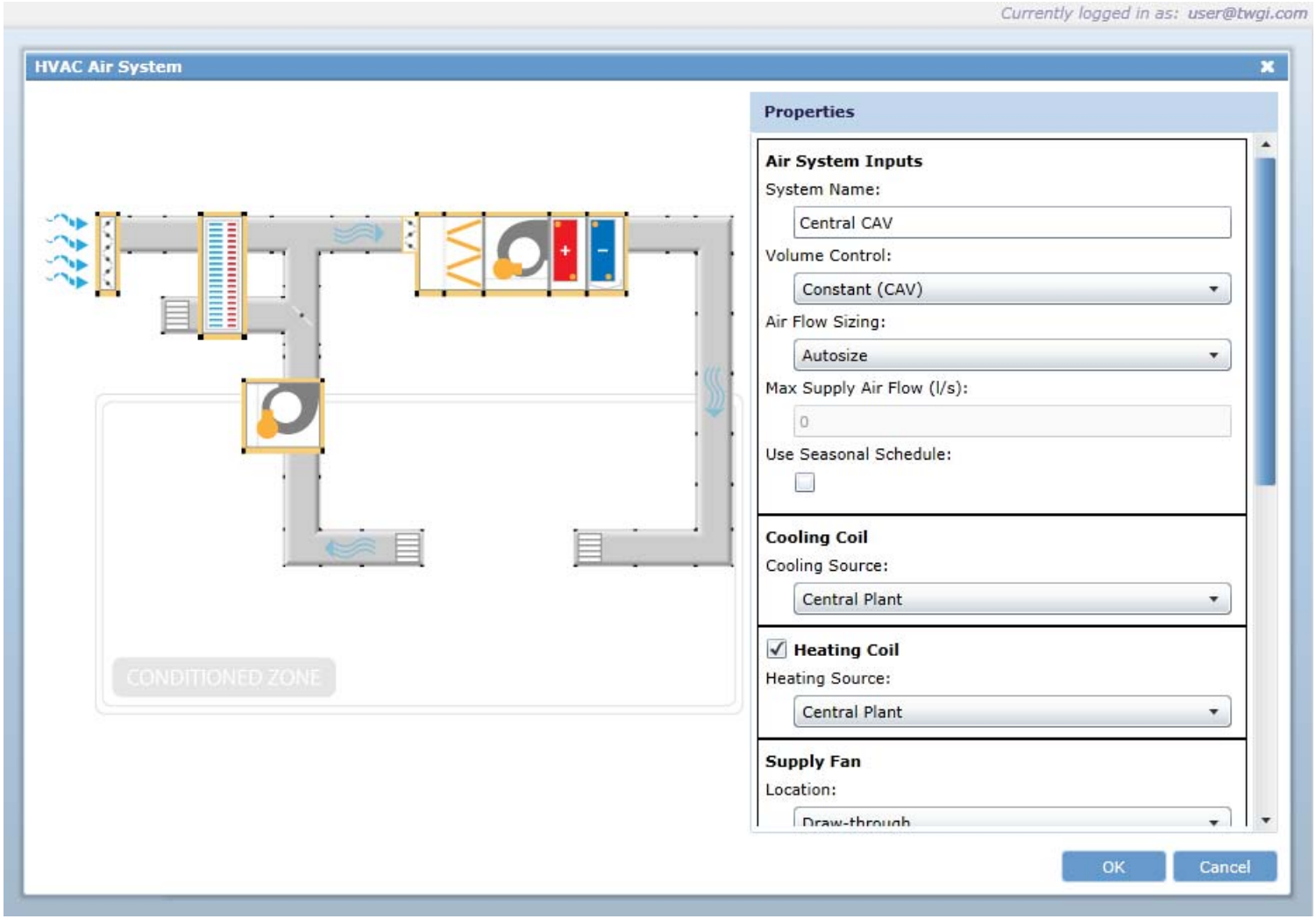
Currently logged in as: user@twgi.com
HVAC Air System
Properties
Air System Inputs
System Name:
Central CAV
Volume Control:
Constant (CAV)
Air Flow Sizing:
Autosize
Max Supply Air Flow (l/s):
0
Use Seasonal Schedule:
Cooling Coil
Cooling Source:
Central Plant
Heating Coil
Heating Source:
Central Plant
Supply Fan
Location:
Draw-through
CONDITIONED ZONE
OK
Cancel

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Whole Building Performance

About Help

Project: Project1

Save | Return to Project List

Project Information | Building Use | Envelope | HVAC | Conformance Check

Mandatory Requireme
Simulation
Results

Mandatory Requirements 0 of 104

Question	Answer
Envelope	
Fenestration	
U-Factor	
Is the U-factor for overall fenestration (including the sash and frame) determined in accordance with ISO- 15099, as specified in Appendix C §11, by an accredited independent laboratory, and labeled and certified by the manufacturer or other responsible party?	Yes No NA
Is the U-factor for sloped glazing and skylights determined at a slope of 20 degrees above the horizontal?	Yes No NA
Is the default table in Appendix C §11 used for determining the fenestration properties of unrated products?	Yes No NA
SHGC	
Is the SHGC determined for the overall fenestration product (including the sash and frame) in accordance with ISO-15099, as specified in Appendix C §11, by an accredited independent laboratory, and labeled and certified by the manufacturer or other responsible party?	Yes No NA
Air Leakage	
Is Air Leakage for glazed swinging entrance doors and revolving doors less than 5.0 l/sm2?	Yes No NA
Is Air Leakage for fenestration and doors, other than glazed swinging entrance doors and	

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Whole Building Performance

About Help

Project: All defaults

Save | Return to Project List

Project Information | Building Use | Envelope | HVAC | Conformance Check

Mandatory Reqs.
Simulation
Results

Conformance Results

	Proposed Design	Standard Design	Difference
Number of hours any zone outside of throttling range	0	140	-140
Number of hours any plant load not satisfied	0	0	0
10.3.2(e) of ECBC Satisfied?	No		
Annual Energy Use (kWh/yr)	2,822,751	2,107,982.25	+714,768.75
EPI (kWh/yr/m²)	376.37	281.06	+95.3
Mandatory Requirements have been satisfied?	Yes		
Proposed EPI is less than or same as Standard?	No		
Building is in Conformance with the ECBC?	No		

Report | Download

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ENERGY CONSERVATION BUILDING CODE (ECBC)

ECOnirman
Whole Building Performance

Conformance Check Report
Whole Building Performance Method

1.0 Building Summary

Project Information		
Project ID	74f5ca1a-ac20-4194-bc89-df5602e21008	Date: 12/8/2011
Project Name	Demo	
Project Address		
Organization Name	TWG	
Building		
Building Type	Office	
Building Occupancy	Daytime Use	
Total Conditioned Area (m²)	6,525	
Total Unconditioned Area (m²)	975	
Total Interior Floor Area (m²)	7,500	
Number of Floors	1	
Floor to Floor Height (m)	4	

Building Conformance Summary

Proposed Design Electricity Use per year (kWh/year)	Standard Design Electricity Use per year (kWh/year)	Percent Savings: Electricity Use per year
21,46,120	21,41,058	-0.2%
Proposed Design EPI (kWh/m²/year)	**Standard Design EPI (kWh/m²/year)**	**Percent Savings: EPI**
286	285	-0.2%
10.3.2(e) of ECBC Satisfied (Y/N)?		Y
Mandatory Requirements Met (Y/N)?		Y

Building Conformance as per the ECBC	**NON-CONFORMING**

Building Conformance as per the ECBC	**NON-CONFORMING**

Action at the State level
ECOnirman Whole Building Performance Tool

- Require use of tools for Compliance
- Train architects and engineers
- Develop dynamic checklists for projects
- Track projects in central database for impact assessment

ECOnirman WBP Future Development

- For Architects, Engineers, Developers

1. More building types, HVAC systems
2. Building materials layer builder
3. Building geometry input improvements
4. User libraries that can be shared
5. Compliance assistance features

- For ULBs, State Agencies and Central Government

1. Checking and enforcement assistance
2. Impact assessment and policy analysis tool
3. EPI tracking during building occupancy

Contact Information

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rajanrawal@cept.ac.in