

BUILDER EMS Version 3 User Manual

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Welcome

Welcome to the EMS Enterprise Framework



The EMS Enterprise Framework for BUILDER Version 3.0 is the newest product in the family of Engineered Management Systems (EMS) under development by the U.S. Army Corps of Engineers at its Engineering Research and Development Center-Construction Engineering Research Laboratory (ERDC-CERL) in Champaign, IL. The new framework provides web-based access to the latest version of BUILDER, an automated tool to support engineering and facility management decisions regarding when, where, and how best to maintain buildings and their key components.

In keeping with the EMS design philosophy, BUILDER uses as its primary condition measure a condition index (CI) rating on a 0-to-100 point scale. The condition index for each component-section is computed from inspection data that records the type, severity, and density of each distress found. Deterioration curves developed from experience over time show the optimal point at which work should be done to avoid more costly rehabilitation projects later.

New to the EMS Enterprise Framework is the functionality index (FI). The FI is the primary functionality measure and uses a 0-to-100 point scale to keep with the EMS design philosophy. The functionality index is computed from assessment data that records the functionality issues present in the building and the severity and density of those issues. Based on the assessment data, building modernization requirements can be identified.

With the assistance of the IMPACT simulation engine included with the EMS Enterprise Framework, managers can develop long-range work plans based on a sound investment strategy. By providing an objective description of condition and an automated means of exploring various options under different budget scenarios, BUILDER and IMPACT together make multi-year work plans easier to formulate and funding requests easier to justify. The goal is optimal facility performance for the dollars invested.

While the EMS Enterprise Framework is being developed for military installations, it is applicable for any organization with facility management responsibilities. The [University of Illinois](#) has several Cooperative Research and Development Agreements with ERDC-CERL to transfer EMS technology to the public works community.



Developed by U.S. Army ERDC-CERL

10/16/2007

What's New in Builder 3.0

There are a variety of new features and program improvements in the upgrade from BUILDER 2.2 to 3.0. These enhancements have been addressed to improve user interface and advance the science of building asset management. A list of the most significant enhancements is provided below.

- **Web-Based Access.** Starting with version 3.0, BUILDER will be a web-based program instead of a locally installed desktop software program. The main advantage of the web-based program is that it allows everyone in your work group with a valid username and password access to your database from anywhere with an active internet connection. This allows for multiple employees with the appropriate permissions at different locations the ability to access your facility-related data.
- **Knowledge-Based Inspection Scheduling.** [Knowledge-Based Inspection Scheduling](#) is an automated tool designed to select from the vast array of asset inventory a subset of component-sections that should be considered for inclusion in the next round of inspections. The selection algorithm is based on life-cycle attribute knowledge associated with each component section that is compared with user-defined parameters to schedule condition assessments. Incorporates US Patent # 7,058,544.
- **Functionality Assessments.** [Functionality Assessments](#) measure the building's inherent capability to meet user requirements efficiently within limits of code and compliance. The assessments are performed using a three-tiered, top-down approach to narrow the focus and provide greater assessment detail to the identified problem issues. The three tiers are the building as a whole, functional area, and component-section. In BUILDER 3.0, functionality assessments can be performed at the first and second tiers, or building and functional area levels. Later versions will include the third tier, or component-section level, functionality assessments. Incorporates US Patent App # 11,194,655.
- **Functionality Index (FI).** After a functionality assessment has been performed, a FI will be computed based on the results. If the assessment is performed at the building-level, the [Building Functionality Index \(BFI\)](#) will be computed. If the assessment is performed at the functional area level, the Functional Area Functionality Index (FAFI) will be computed. The scale of the FI is conceptually similar to the existing CI for condition, and provides an objective measure of suitability for a given mission. Incorporates US Patent App # 11/194,655.
- **Building Functional Areas.** Before the second tier of functionality assessments can be performed, functional areas must be created in buildings. Functional areas describe the use and classification of different building spaces. BUILDER version 3.0 allows for the [creation of functional areas](#) and the ability to [assign existing inventory in the building to the functional areas](#). This allows the building to be partitioned into different functional uses which may be managed individually.
- **Building Performance Index (BPI).** The [BPI](#) is building-level metric that measures the overall performance of buildings. It is weighted combination of the Building Condition Index (BCI) and the BFI. The BPI can be rolled up to the complex, site, and group level using the average BPI's, weighted by

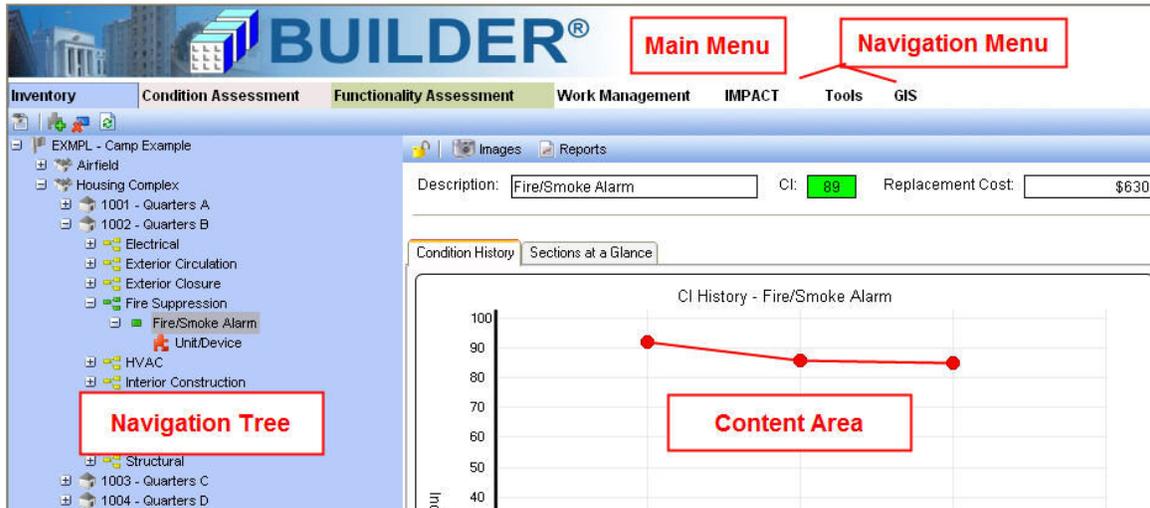
replacement cost, to obtain the Complex, Site, or Group performance index (PI).

- **Work Item Cost Analysis.** To determine the most cost-effective work activity for work items in BUILDER 3.0, the [Work Item Cost Analysis](#) tool can be used. The automated tool determines the return and return-on-investment (ROI) for each work activity type (do nothing, stop gap repair, repair, and replace). Different work activities in different work years can be explored, and the most cost-effective options can be selected. Incorporates US Patent App # 11/223,251.
- **Integration of IMPACT into BUILDER.** In previous versions, the [IMPACT application](#) was a separate, stand-alone program from the BUILDER program. In version 3.0, IMPACT is integrated into the web-based version of BUILDER. The inclusion of IMPACT with the BUILDER application improves ease of use and increases efficiency in exploring long range work plans.
- **Scenario Analysis.** To compare the results of multiple IMPACT scenarios, the [scenario analysis](#) tool has been added to version 3.0. Specifically, the condition trends and the expensed & backlogged reports of multiple IMPACT scenarios can be compared side-by-side. From these comparisons, the goal of optimal facility condition for the dollars invested can be met.
- **Component Importance Index.** The Component Importance Index (CII) is a measure that conveys the relative importance of a building component asset on a 0 to 1 scale. It allows users to view condition, schedule inspections, and prioritize work for their most critical building assets.

Getting Started

Navigating BUILDER 3.0

After opening the BUILDER website and logging into BUILDER 3.0, a screen similar to the one shown below will appear:



The BUILDER user interface has four (4) main areas, each of which is described in greater detail below:

- Main Menu
- Navigation Menu
- Navigation Tree
- Content Area

Main Menu

The Main Menu has two (2) options:

- **Logout.** This option allows the current user to logout, or sign-off, of BUILDER. Once logging out of BUILDER, you will no longer be able to view or edit data until logging back in.
- **Help.** This option launches a context-sensitive help file pertaining to the current BUILDER screen.

Navigation Menu

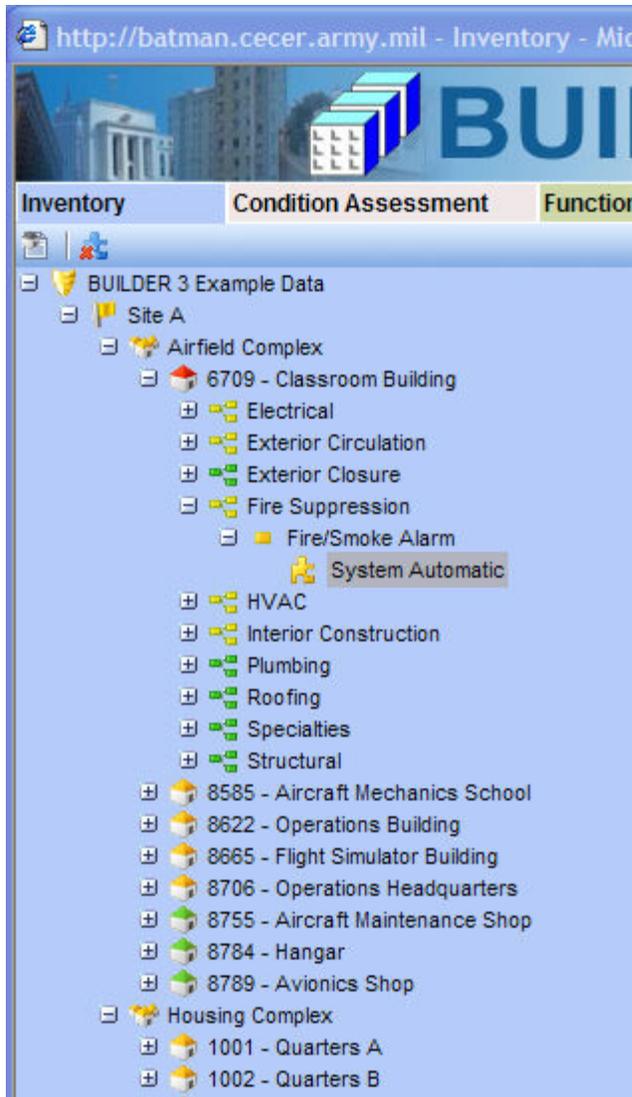
The Navigation Menu has six (6) options:

- **Inventory.** Clicking on the Inventory option will bring up in the inventory tree in the navigation tree. After an inventory level is chosen in the tree, placing the mouse over the Inventory option will cause a sub-menu to drop-down providing you with additional inventory options for the selected level. See the [Inventory Overview](#) for more information.

- **Condition Assessment.** Clicking on the Condition Assessment option will bring up in the condition assessment tree in the navigation tree. After a condition assessment level is chosen in the tree, placing the mouse over the Condition Assessment option will cause a sub-menu to drop-down providing you with additional condition assessment options for the selected level. See the [Condition Assessment Overview](#) for more information.
- **Functionality Assessment.** Clicking on the Functionality Assessment option will bring up in the functionality assessment tree in the navigation tree. After a functionality assessment level is chosen in the tree, placing the mouse over the Functionality Assessment option will cause a sub-menu to drop-down providing you with additional functionality assessment options for the selected level. See the [Functionality Assessment Overview](#) for more information.
- **Work Management.** Clicking on the Work Management option will cause a sub-menu to drop down providing you with the work management options for [Standards & Policies](#), [Funding](#), [Prioritization](#), and the [Work Plan](#).
- **Scenarios.** Clicking on the Scenario option will bring up the Scenarios Management Window, where users can create, [Manage](#) and [Analyze](#) different scenarios.
- **Tools.** Clicking on the Tools option will cause a sub-menu to drop down providing you with tools for importing data (from [BRED](#), [NFADB](#), and [other systems](#)), administration ([User Preferences](#), [Application Settings](#), [Security](#), and [Manual Condition Roll-Up](#)), libraries ([Cost](#), [Inflation](#), and [Service Life](#)), [Reports](#), and [GIS](#).

Navigation Tree

The Navigation Tree allows you to select the different levels of the tree and to view data related to the level in the context area. Shown below is an example of the inventory tree.



Here, the tree can be expanded by clicking on the "+" next to an inventory level or collapsed by clicking on the "-" next to an inventory level. To select a particular inventory level, left or right-click on it. The information pertaining to that inventory level will be displayed in the content area. While the example described above is for the inventory tree, the condition assessment and functionality assessment trees are navigated in the same manner.

Content Area

The content area displays the specific information pertaining to the current item selected in the navigation tree. Shown below is an example of what would appear in the content area if a component-section was selected in the inventory navigation tree. If you wish to view information pertaining to a different item, navigate the tree to the item and select it by clicking on it.

The screenshot shows the BUILDER EMS software interface. At the top, there is a blue header bar with the word "Explorer" on the left and the BUILDER logo (a stylized 'R' with three vertical bars to its left) in the center. Below the header, there is a menu bar with the following items: "nt", "Work Management", "IMPACT", "Tools", and "GIS". Underneath the menu bar is a toolbar with icons for "Save", "Images", "Comment", and "Reports". Below the toolbar, there are two rows of form fields. The first row contains "Section Name: N/A" (with a dropdown arrow) and "Equipment Category: System" (with a dropdown arrow). The second row contains "Component Subtype: Automatic" (with a dropdown arrow). Below these fields is a tabbed interface with four tabs: "General Information", "Section Details", "Condition Trend", and "Inspection History". The "General Information" tab is selected. Inside this tab, there are several input fields: "Quantity: 1 EA", "Year Install/Renewed: 1990" (with an "Estimated" checkbox), "Age: 17", and "RSL: 10". There are also two inspection summary boxes. The first box is titled "Latest Inspection 11/25/2003" and contains "CSCI: 88" (with a green background). The second box is titled "Current Estimated Condition" and contains "CSCI: 78" (with a yellow background).

Recognizing the Common Icons

Listed below are the common command, toolbar, and menu buttons, along with their definitions, you will encounter when using BUILDER. It is a good idea to become familiar with these icons before using the program.

-  - CLOSE. Click this button to close an open window.
-  - SAVE. Click this button to permanently save and store changes to the data.
-  - CANCEL. Click this button to cancel changes that have been made to the data since the last save. Changes made to data on the screen are not stored in the database until the SAVE button is clicked. Clicking CANCEL will cause recent changes to the data on the screen to be overwritten by data from the database.
-  - NEW/ADD. Click this button to create a new record. The type of record to be created is determined by where the NEW button is located. For example, if the button is next to a dropdown list, clicking the NEW button will create a new entry in that list. If the button is above a grid, clicking the NEW button will create a new line in the grid, i.e. a new record of whatever is being displayed in the grid. If the NEW button is in the window toolbar, clicking it will create a new item of the type being displayed in the window.
-  - DELETE. Click this button to delete a selected record. The record to be deleted is determined by where the DELETE button is located. For example, if

the button is next to a dropdown list, clicking the DELETE button will delete the record identified by the current selection in the list. If the button is above a grid, clicking the DELETE button will delete the current selected record in the grid (designated by an arrow in the left most column). If the DELETE button is in the window toolbar, clicking it will delete the item being viewed in the window and generally close the window since no data will then be available for display.

-  - COPY. Click this button to copy a selected item.
-  - COMMENT. Click this button if you wish to record a comment. The scope of the comment is determined by the location of the button. A COMMENT button in the window toolbar is used for comments regarding the item displayed in the window. A COMMENT button next to a dropdown list allows you to add comments about the current item selected in the list.
-  - IMAGES. Click this button if you wish to add a image. The scope of the image is determined by the location of the button. A IMAGE button in the window toolbar is used for images of the item displayed in the window.
-  - REPORTS. Click this button to select and view standard reports. The types and scope of the reports are determined by where the REPORTS button is located. A REPORTS button in the window toolbar is used for reports of the item displayed in the window.
-  - LOCKED RECORD. This indicates whether the selected record is locked or not. If it is locked, the record cannot be edited. This may be the case either because the record is checked out or the user does not have permission.

Establishing Selection Criteria

Several features of BUILDER, including [GIS themes](#) and [funding sources](#), require that you specify a criteria that will be used in deciding whether or not a building, component-section, or work item belongs to a particular group. Each instance where you must establish a selection criteria presents you with a grid similar to the one shown below:

Defining Property
Selection Criteria

Refine the record selection process by adding and deleting criteria.
 Add
Edit
Delete

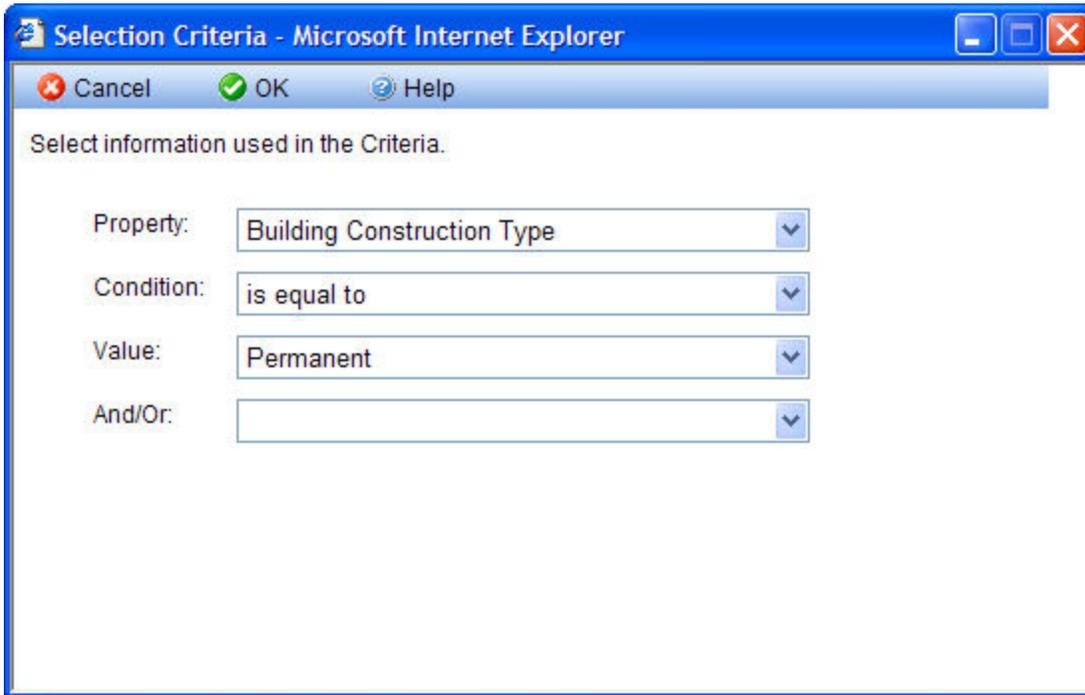
Property	Condition	Value	And/Or
Building Construction Type	is equal to	Permanent	

A selection criteria constructed in this grid has been designed to be easily read. If you are familiar with SQL selection statements used with database management systems, the structure and wording of the criteria in the grid should look familiar.

Each row of the grid represents one full statement in the criteria. Each statement is connected to the others by "And" or "Or". The association of statements is from the left, i.e. "A and B or C" is actually "(A and B) or C."

Creating a New Selection Criteria

To create a new selection criteria, click the ADD button in the top right corner of the Selection Criteria tab. The Selection Criteria Info window will appear:



Select the property to be used in the criteria from the Property dropdown list. Once the property is selected, the Condition dropdown list will populate with appropriate condition statements. Select a condition from the list. Depending on the property, the Value may be either entered or selected from a dropdown list of available choices. Finally, if more than one selection criteria will be used, Select the proper connector ("And" or "Or") statement. Click the OK button to save the selection criteria. If you do not wish to create the selection criteria, click the CANCEL button.

Important Points:

1. It is possible to create selection criteria containing contrary statements. BUILDER has no way of determining this but will simply return no items satisfying it.
2. Condition Index (CI) properties of all inventory items use -1 as the value of the CI when the CI is unknown. If you use a statement such as "CI is less than X," then you should also add a statement "CI is greater than or equal to 0" so as not to include all of the items of unknown CI.

Editing an Existing Selection Criteria

If you wish to edit an existing selection criteria, click the selection criteria in the grid and click the EDIT button in the top right corner of the tab. Again, the Selection Criteria Info window will open and the property, condition, value, and connector statement can be edited.

Deleting an Existing Selection Criteria

If you wish to delete an existing selection criteria, click the selection criteria in the grid and click the DELETE button in the top right corner of the tab.

Inventory

Inventory Overview

Your BUILDER inventory serves as the foundation for all that you will do with the BUILDER application. The first step in using BUILDER is to construct a database that describes the physical inventory you manage. That process of putting the data into BUILDER will probably be your single most intensive effort in working with the program, but it is a one-time effort that can be aided by features that may allow you to [import data from other systems](#), [copy buildings](#), use [building templates](#) when multiple buildings have a single design, or to use [embedded models](#) to estimate building composition.

Begin by grouping your buildings into logical management units, typically by their geographic regions, which are represented by [site records](#) in the BUILDER database. The site provides a natural way to group buildings and to apply properties that are regional in nature, such as the cost of operations and maintenance (O&M) work and the heating, ventilation and cooling (HVAC) climate.

Next, you [create building records](#) for the buildings at one of your sites. A building record includes critical information such as how the building is used, its size, age, and number of floors. You will find that BUILDER also allows you to store, at your option, a variety of other information about a building, such as applicable [family housing data](#). You will also be able to establish a [mission dependency index](#) to measure quantitatively how critical the building is to the mission for which it is used.

After you have created a building record in the BUILDER inventory, you will be able to add records that describe the various physical items that are part of the building: the doors, walls, windows, plumbing fixtures, heating units, etc. At the elemental level, these items are called component-sections, or simply sections. Component-sections are the management unit in BUILDER. You inspect them and plan work for them, and BUILDER applies its condition assessment algorithms to them in calculating their condition index. BUILDER uses embedded data and automated processes to determine a wealth of information about each component-section: its expected service life, its likely subcomponents and how their condition affects the section as a whole, and the cost of replacing, painting, repairing, and removing it. As you might imagine, for an automated system to be able to do all of this, there are some strict rules about how you define component-sections. Creating the component-section records is the most difficult and time-consuming aspect of creating the BUILDER inventory.

You begin by working down to the component-sections hierarchically, starting with the major systems of a building. In BUILDER, there are two building decompositions available:

- The traditional BUILDER system/component structure with 12 systems
- The ASTM UNIFORMAT II Classification for Building Elements with 17 systems (Level 2).

Regardless of which decomposition you choose, you will create the systems by selecting each applicable system from a pick list. Each system is further decomposed

into components (Level 3 elements when using UNIFORMAT). Again, you will create the component records by selecting from a pick list of components applicable to a given system. See [BUILDER Systems and Components](#) for a list of each decomposition's systems and their typical components.

Once you have created records for a system and for a component of that system, you are ready to create component-section records that actually represent the physical items in your building belonging to particular systems and components. For example, a system might be of type Exterior Closure and one of its components might be Doors. The component-section records represent the physical exterior doors in your building. Some of the doors may be glass personnel doors, some may be metal overhead doors. A component-section consists of items in the building that all belong to the same component and, moreover, are all of the same type and material/equipment category. In this example, you will have to create at least two records to represent the exterior doors; one for the glass personnel doors and one for the metal overhead doors. You will have considerable flexibility in how you group similar items together to form a component-section.

Once a component-section has been identified by component, type, and material/equipment category, BUILDER will have sufficient information to establish a clear link between the section and the embedded data and computations that it brings to the process in order to help you with your management tasks. Details, examples, and some suggestions about how to make the process of completing your BUILDER inventory are contained in the topic [Identifying Systems, Components and Sections](#).

Groups

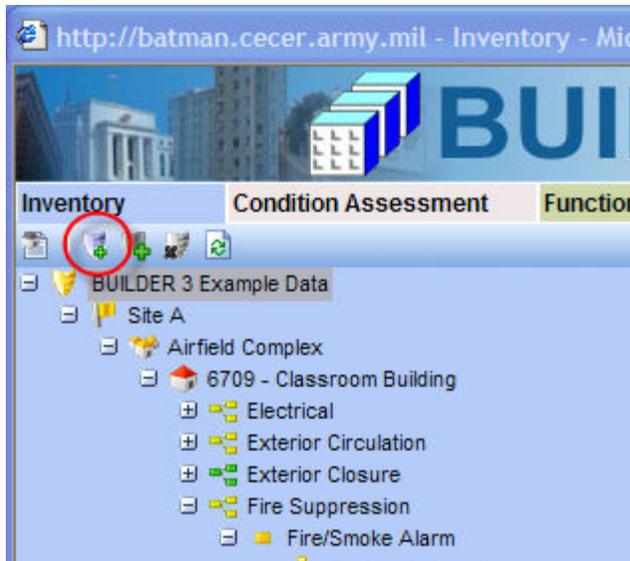
Adding, Editing, and Deleting an Organizational Group

BUILDER 3.0 is an enterprise level program. As such, its inventory can contain buildings at a number of different sites. It is possible that multiple sites are managed together, as in a region, and therefore should be arranged together. If this is the case, BUILDER allows for multiple sites to be arranged together in an organizational group.

Adding an Organization

To add a sub organizational group under a main group, select the main group to add this subgroup to, and click the *Add Organization* button on the navigation menu.

Alternatively, you can create a parent organization group by selecting a site, a choosing *Add Parent Organization*.



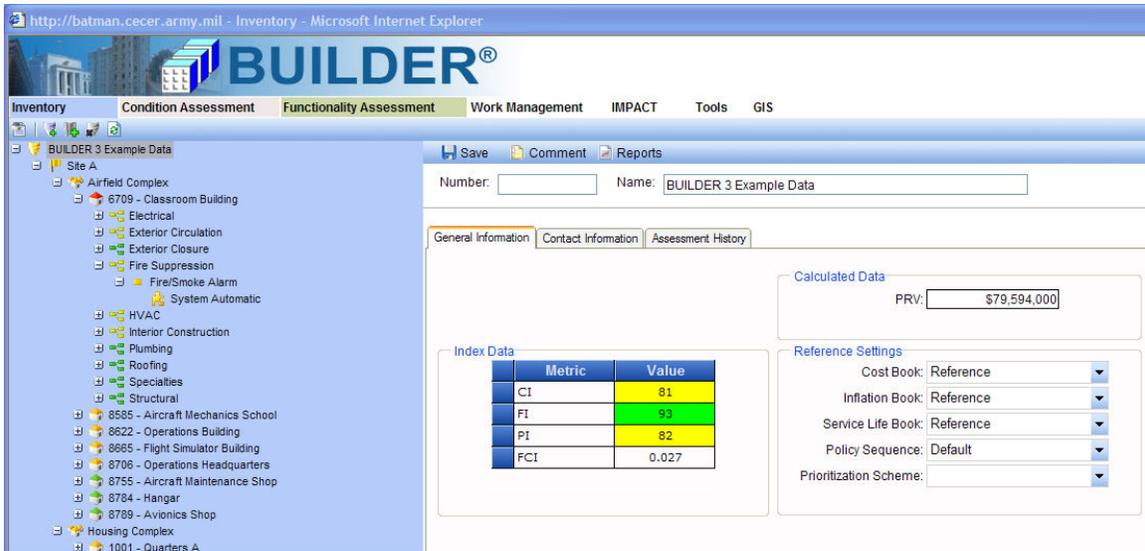
After this, the following data is required for the organization:

- **Organization Number.** Enter the identifying number for the group, limited to 12 alphanumeric characters. You may leave this blank if you wish to supply only a name. You must enter at least a organization name or organization number and the combination of the two must be unique among the organizations in your database.
- **Organization Name.** Enter the identifying name for this organization, limited to 50 alphanumeric characters. You may leave this blank if you wish to supply only a number. You must enter at least a organization name or organization number and the combination of the two must be unique among the organization in your database.
- **Relation.** Specify the relation of the group being created to the selected organization or site on the inventory tree. There are three options for the relation:
 - Child - The organization will be placed under the selected organization. Note that child organization can only be created when an organization is selected in the inventory tree.
 - Parent - The organization will be placed above the selected organization or site.
 - Sibling - The organization will be placed at the same level as the selected organization or site. Note that the top level organization may not have a sibling organization.

Once the required data are entered, click the ADD button to create the organization. To close the window without creating the organization, click the CANCEL button.

Editing Organization Data

To edit data for a specific organization, select the organization in the inventory tree.



Toolbar

- **CLOSE.** Use this button to close the organization record.
- **SAVE.** Use this button to save the changes you have made to the organization data.
- **COMMENT.** Use this button allows you to add, edit, and view comments about the organization.
- **REPORTS.** Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to organization inventory. See [Using the Report Viewer](#).

General Information

Initially after an organization is selected in the inventory tree, the general information tab is shown and the following information can be edited:

- **Organization Number and Name.** You may edit the Organization Number and Name as you wish. Organization Number is allowed to contain 12 characters; Organization Name is allowed 50 characters.
- **Index Data (Read-Only).**
 - **Organization Condition Index (CI).** The organization CI displays the average CI of the buildings in the organization, weighted by replacement cost. This metric provides an overall sense of the condition of the group as a whole.
 - **Organization Functionality Index (FI).** The organization FI displays the average FI of the buildings in the organization, weighted by replacement cost. This metric provides an overall sense of the functionality of the organization as a whole.
 - **Organization Performance Index (PI).** The organization PI displays the average PI of the buildings in the organization, weighted by replacement cost. This metric provides an overall sense of the performance of the organization as a whole.
- **Calculated Data (Read-Only).**

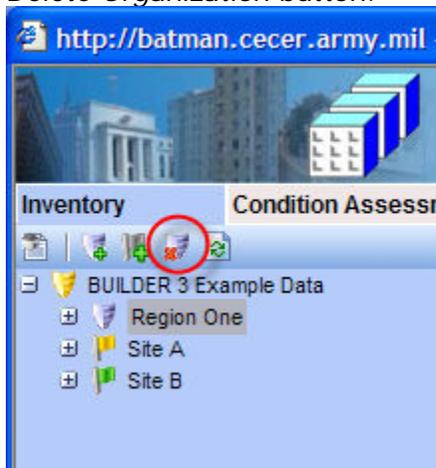
- **PRV.** The calculated data includes the aggregate present replacement value (PRV) of the buildings in the group.
- **Reference Settings.**
 - **Cost Book.** Select the [cost book](#) from the dropdown list you wish to use for the entire inventory of the organization. The cost book selected will provide inventory replacement costs for inventory.
 - **Service Life Book.** Select the [service life book](#) from the dropdown list you wish to use for the entire inventory of the organization. The service life book selected will estimate the remaining service life of component-sections in the inventory on the basis of its life expectancy and condition. Also, the service life is used in estimating a rate of deterioration in the condition index of a component-section when no more than one inspection has been recorded.
 - **Policy Sequence.** Select the [policy sequence](#) from the dropdown list you wish to use for the entire inventory of the organization. The policy sequence selected will establish the order of precedence for applying policies so that only one standard is chosen for the inventory in the building.
 - **Prioritization Scheme.** Select the [prioritization scheme](#) from the dropdown list you wish to use for the entire inventory of the organization. The prioritization scheme selected will prioritize and rank your work plan in a quick, objective, repeatable, and representative method with the touch of a button.

It is important to note that reference data can be set at the organization and site level. If this data is set at both levels, the reference settings at the site level will overwrite the reference settings at the organization level.

In addition to the general information for the organization described above, more information can be added and viewed on the [contact information and condition trends tab](#).

Deleting an Organization

To delete an organization, select the organization in the inventory tree, and click the *Delete Organization* button.



It is important to note that if you delete an organization, you also delete all inventory (sites, complexes, buildings, systems, components, and sections) in that organization. This is a significant step to take and should only be done when you are certain that you wish to clear the entire inventory of the group you have selected. Making frequent backups of your inventory database will protect you from significant data losses if mistakes in deleting are made.

Additional Organizational Data

Additional Organizational data is displayed and can be edited on the contact information and condition trends tabs when a group is selected in the inventory tree.

Contact Information Tab

The contact information for the organization can be viewed and edited by selecting the CONTACT INFORMATION tab.

The screenshot shows a software interface with a blue header bar containing 'Save', 'Comment', and 'Reports' buttons. Below the header, there are two input fields: 'Number:' (empty) and 'Name:' (containing 'BUILDER 3 Example Data'). A horizontal line separates this from a tabbed interface with three tabs: 'General Information', 'Contact Information' (which is selected and highlighted with a red border), and 'Assessment History'. Under the 'Contact Information' tab, there are several input fields: 'Name:' (containing 'Michael N Grussing'), 'Address:' (containing '2902 Newmark Dr'), 'City:' (containing 'Champaign'), 'State:' (containing 'IL'), 'Zip Code:' (containing '61822'), 'Phone #:', 'Fax #:', 'Email:', and 'WWW:' (all empty).

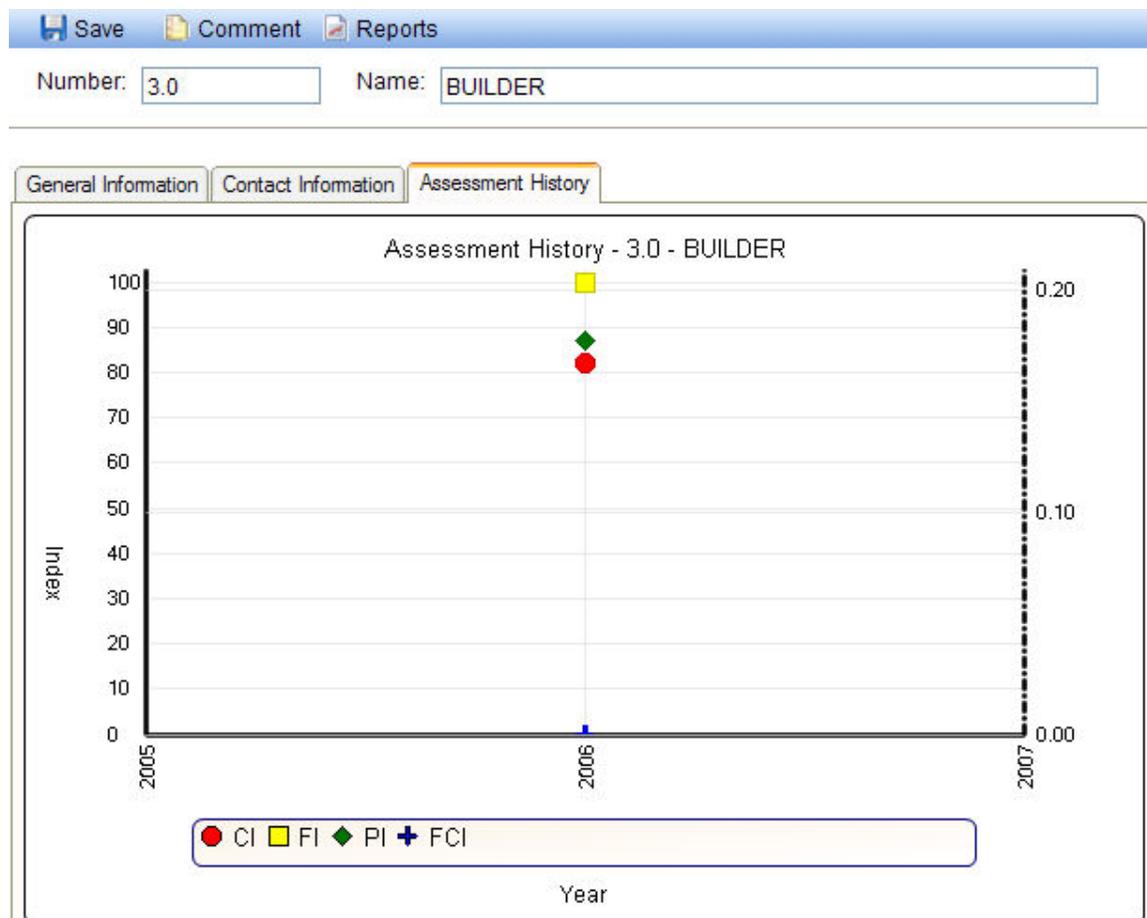
All of the additional organizational information is optional. It includes data regarding the official point of contact (POC) for the organization:

- **POC Name.** Enter the name of the organization point of contact, limited to 30 alphanumeric characters.
- **Address.** Enter the official street address of the organization, limited to 30 alphanumeric characters).

- **City.** Enter the city of the organization, limited to 15 alphanumeric characters.
- **State.** Enter the state of the organization, limited to 2 alphanumeric characters.
- **Zip Code.** Enter the zip code of the organization, limited to 10 alphanumeric characters.
- **Phone Number.** Enter the phone number of the organization POC, limited to 20 alphanumeric characters.
- **FAX Number.** Enter the FAX number of the organization POC, limited to 20 alphanumeric characters.
- **Email Address.** Enter the email address of the organization POC, limited to 75 alphanumeric characters.
- **WWW.** Enter the World Wide Web (WWW) URL address for the organization, limited to 75 alphanumeric characters.

Assessment History Tab

The Assessment History tab provides a graph of the condition, functionality, performance, and FCI history of the organization, displaying the organization CI, organization FI, organization PI, and organization FCI over time.



Sites

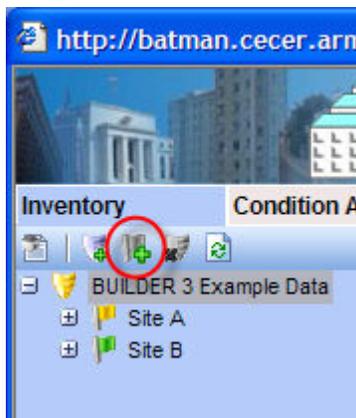
Adding, Editing, and Deleting a Site

A BUILDER inventory can contain buildings at a number of different geographic locations. Several properties of buildings and their components are determined or affected by the building's geographic location, most critically the area cost factor, a multiplier which adjusts national average labor/material/equipment costs to local costs. Additional location data includes the HVAC zone and seismic zone of the site.

Knowing the geographic location of a building is extremely important, therefore BUILDER requires you to create a site record for each geographic location before you can add buildings to the database.

Adding a Site

To add a new site select click the *Add Site* button from the navigation menu.



On this screen, enter the following required data for the site:

- **Number.** Enter the identifying number for the site, limited to 12 alphanumeric characters. You may leave this blank if you wish to supply only a name. You must enter at least a site name or site number and the combination of the two must be unique among the groups in your database.
- **Name.** Enter the identifying name for this site, limited to 50 alphanumeric characters. You may leave this blank if you wish to supply only a number. You must enter at least a site name or site number and the combination of the two must be unique among the groups in your database.

Additionally, you have the option of using factors (area cost factor, seismic zone, and HVAC zone) from existing locations in the BUILDER system by marking the **USE FACTORS FROM FOLLOWING LOCATION** checkbox and choosing a location from the dropdown lists. Choosing this data is optional and can be input later using the [SELECT button](#) if desired.

Once the required data are entered, click the **ADD** button to create the site. To close the window without creating the site, click the **CANCEL** button.

Editing Site Data

To edit the data for a specific site, select the site in the inventory tree.

The screenshot shows the BUILDER web application interface. The browser address bar displays "http://batman.cecer.army.mil - Inventory - Microsoft Internet Explorer". The application title is "BUILDER®". The main menu includes "Inventory", "Condition Assessment", "Functionality Assessment", "Work Management", "IMPACT", "Tools", and "GIS". The left sidebar shows a tree view with "BUILDER 3 Example Data", "Site A", and "Site B". The main content area has a toolbar with "Save", "Comment", "Images", "Reports", and "Select". Below the toolbar, there are input fields for "Number:" and "Name: Site A". The "General Information" tab is active, showing "Location Factors" (Area Cost Factor: 1, Seismic Zone: 2, HVAC Zone: 6) and "Calculated Data" (Number of Facilities: 34, PRV: \$78,141,000). A table titled "Index Data" is displayed:

Metric	Value
CI	81
FI	93
PI	82
FCI	0.028

Reference Settings are also visible, including Cost Book, Service Life Book, Inflation Book, Policy Sequence, and Prioritization Scheme, all set to Reference or Default.

Toolbar

- **SAVE.** Use this button to save the changes you have made to the site data.
- **COMMENT.** Use this button allows you to add, edit, and view comments about the site.
- **IMAGES.** Use this button to add and remove images of the site.
- **REPORTS.** Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to site inventory. See [Using the Report Viewer](#).
- **SELECT.** Use this button to launch the site selection window.

The screenshot shows the TRACES Lookup dialog box in Microsoft Internet Explorer. The title bar reads "TRACES Lookup - Microsoft Internet Explorer". The dialog has a toolbar with "Cancel", "Select", and "Help" buttons. The "State:" dropdown is set to "Alabama" and the "Location:" dropdown is set to "81st RSC Birmingham". Below these, a section titled "Data for this location" contains three input fields: "Area Cost Factor: 0.82", "Seismic Zone: 1", and "HVAC Zone: 3".

Select the state and then the location within that state of your site. The location list includes Department of Defense installations and most major cities in the United States. After the state and location are selected, click the SELECT

button to automatically fill in the required data fields on the location screen. If you click the CANCEL button, you will return to the Location screen without making changes. If your particular site is not listed, choose a location close to your site and edit the name afterward.

General Site Information

Initially after a site is selected in the inventory tree, the general information tab is shown with the following information:

- **Site Number and Name.** You may edit the Site Number and Name as you wish. Site Number is allowed to contain 12 characters; Site Name is allowed 50 characters.
- **Location Factors**
 - **Area Cost Factor.** The area cost factor is a multiplier used to adjust national average cost for labor/materials/equipment to local costs. It is generally a number between 0.8 and 1.2 for continental U.S. locations, but it can be even greater than 2.0 in high-cost geographic locations.
 - **Seismic Zone.** The seismic zone is an integer from 1 to 7 following the Federal Emergency Management Agency's (FEMA) U.S. seismic zoning. Determine your site's seismic zone by using the SELECT button on the toolbar or by consulting the seismic map of the U.S. seismic zones, which can be accessed by clicking the MAP button next to the Seismic Zone text box.
 - **HVAC Zone.** The HVAC zone is an integer from 1 to 11. Determine your site's HVAC zone by using the SELECT button on the toolbar or by consulting the map of the U.S. HVAC zones, which can be accessed by clicking the MAP button next to the HVAC Zone text box.
- **Index Data (Read-Only).**
 - **Site Condition Index (CI).** The site CI displays the average CI of the buildings in the site, weighted by replacement cost. This metric provides an overall sense of the condition of the site as a whole.
 - **Site Functionality Index (FI).** The site FI displays the average FI of the buildings in the site, weighted by replacement cost. This metric provides an overall sense of the functionality of the site as a whole.
 - **Site Performance Index (PI).** The site PI displays the average PI of the buildings in the site, weighted by replacement cost. This metric provides an overall sense of the performance of the site as a whole.
 - **Site Facility Condition Index (FCI).** The site FCI represents the total maintenance and repair costs for the site, normalized by the total site PRV. This metric provides an overall sense of deferred repair work.
- **Calculated Data (Read-Only).**
 - **# of Facilities.** Displays the number of buildings included in the site inventory.
 - **PRV.** Displays the total present replacement value of the buildings at the site computed by adding the individual building replacement costs.
- **Reference Settings.**
 - **Cost Book.** Select the [cost book](#) from the dropdown list you wish to use for the entire inventory of the group. The cost book selected will provide inventory replacement costs for inventory.

- **Service Life Book.** Select the [service life book](#) from the dropdown list you wish to use for the entire inventory of the group. The service life book selected will estimate the remaining service life of component-sections in the inventory on the basis of its life expectancy and condition. Also, the service life is used in estimating a rate of deterioration in the condition index of a component-section when no more than one inspection has been recorded.
- **Policy Sequence.** Select the [policy sequence](#) from the dropdown list you wish to use for the entire inventory of the group. The policy sequence selected will establish the order of precedence for applying policies so that only one standard is chosen for the inventory in the building.
- **Prioritization Scheme.** Select the [prioritization scheme](#) from the dropdown list you wish to use for the entire inventory of the group. The prioritization scheme selected will prioritize and rank your work plan in a quick, objective, repeatable, and representative method with the touch of a button.
- **Inflation Set.** Select the [inflation set](#) from the dropdown list you wish to use for the entire inventory at that site. This will apply inflation cost factors to estimate repair costs for multi-year IMPACT scenarios.

It is important to note that reference data can be set at the group and site level. If this data is set at both levels, the reference settings at the site level will overwrite the reference settings at the group level.

In addition to the general information for the site described above, more information can be added and viewed on the [other tabs](#) at the top of the screen.

Deleting a Site

To delete a site, select the site in the inventory tree and click the *Delete Site* option.

It is important to note that deleting a site deletes all inventory (complexes, buildings, systems, components, and sections) in that site. This is a significant step to take and should only be done when you are certain that you wish to clear the entire inventory of the site you have selected. Making frequent backups of your inventory database will protect you from significant data losses if mistakes in deleting are made.

Additional Site Data

Additional site data is displayed and can be edited on the contact information, building information, condition trends, and GIS tabs when a site is selected in the inventory tree.

Contact Information Tab

The Contact Information for the site may be viewed and edited by selecting the CONTACT INFORMATION tab.

The screenshot shows a web-based form interface for BUILDER EMS. At the top, there is a navigation bar with icons for Save, Comment, Images, Reports, and Select. Below this, there are two input fields: 'Number: EXMPL' and 'Name: Camp Example'. The main content area has five tabs: 'General Information', 'Contact Information' (which is selected and highlighted), 'Building Information', 'Assessment History', and 'GIS'. Under the 'Contact Information' tab, there are several input fields with the following data: Name: Mike Grussing, MSCE; Address: P.O. Box 9005; City: Champaign; State: IL; Zip Code: 61826; Phone #: 555-555-5555; Fax #: 555-555-0000; Email: michael.n.grussing@email.com; WWW: www.cecer.army.mil.

All of the additional site information is optional. It includes data regarding the official point of contact (POC) for the location:

- **POC Name.** Enter the name of the site point of contact, limited to 30 alphanumeric characters.
- **Address.** Enter the official street address of the site, limited to 30 alphanumeric characters).
- **City.** Enter the city of the site, limited to 15 alphanumeric characters.
- **State.** Enter the state of the site, limited to 2 alphanumeric characters.
- **Zip Code.** Enter the zip code of the site, limited to 10 alphanumeric characters.
- **Phone Number.** Enter the phone number of the site POC, limited to 20 alphanumeric characters.
- **FAX Number.** Enter the FAX number of the site POC, limited to 20 alphanumeric characters.
- **Email Address.** Enter the email address of the site POC, limited to 75 alphanumeric characters.
- **WWW.** Enter the World Wide Web (WWW) URL address for the site, limited to 75 alphanumeric characters.

Building Information Tab

Basic information regarding the buildings at the site is available under the BUILDING INFORMATION tab. All of the data shown on this tab is read-only.

Save Comment Images Reports Select

Number: EXMPL Name: Camp Example

General Information Contact Information **Building Information** Assessment History GIS

Site CI: 82 Site FI: 100 Site PI: 87

Facility	Area	PRV	BCI	BFI	BPI	FCI
1102 - Legal Office	20,094	\$4,025,000	74	100	82	0.000
1109 - Communications Center	8,570	\$1,717,000	82	100	87	0.000
1112 - Credit Union Building	14,070	\$2,819,000	83	100	88	0.000
1131 - Administration Building	9,330	\$1,869,000	78	100	85	0.000
1328 - Personnel Office	26,750	\$5,359,000	85	100	89	0.000
1397 - Community Building	12,500	\$2,504,000	84	100	88	0.000
1617 - Security Office	9,700	\$1,943,000	83	100	88	0.000
1621 - Fire Station	16,950	\$3,396,000	80	100	86	0.000
4000 - Fitness Center	28,150	\$5,639,000	84	100	89	0.000
4571 - Dining Hall	16,540	\$3,314,000	81	100	87	0.000
4572 - NCO Barracks	24,875	\$4,983,000	91	100	94	0.000
4577 - Senior NCO Barracks	27,950	\$5,599,000	82	100	87	0.000
4911 - Consolidated Club	33,207	\$6,652,000	85	100	89	0.000

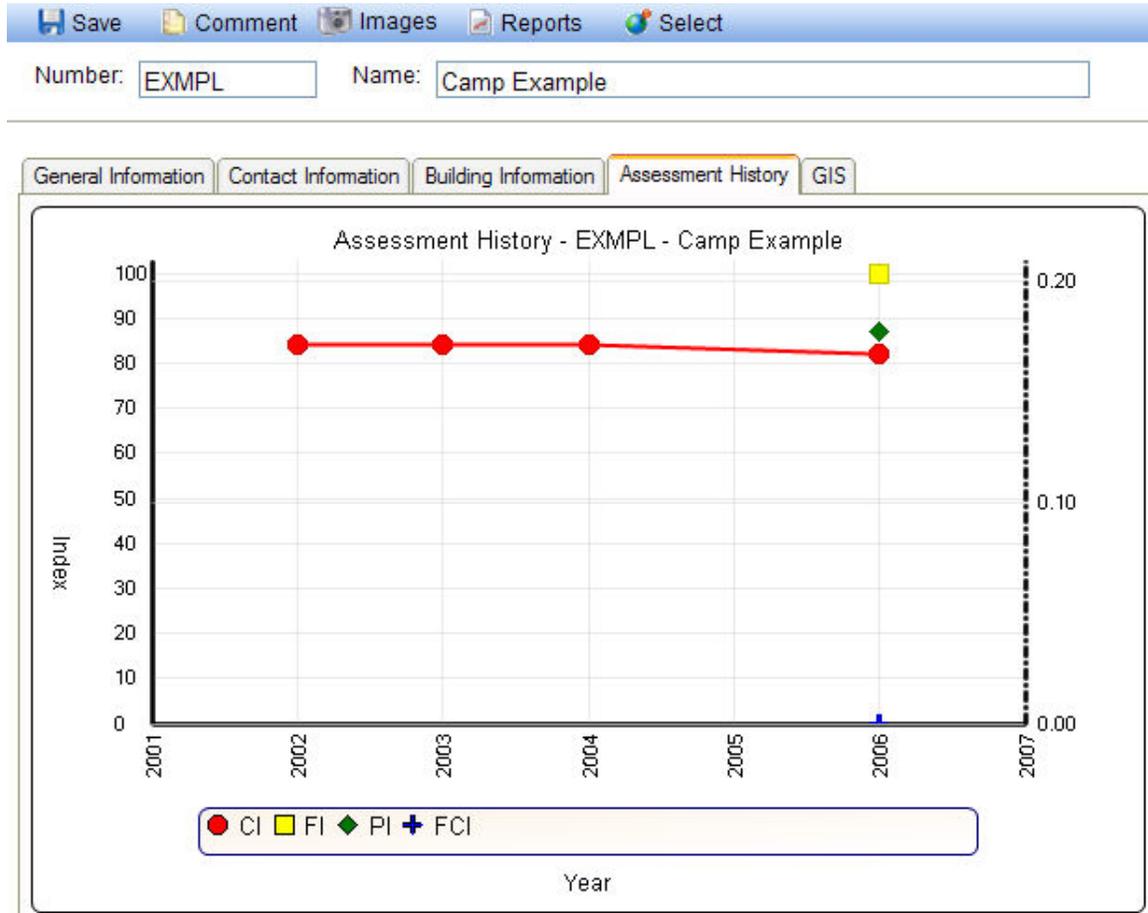
Export to Excel...

- **Facility.** Displays the building number and name of each building at the site.
- **Area.** Displays the square footage of each building at the site.
- **Present Replacement Value PRV.** Displays the total present replacement value (PRV) of each building at the site.
- **Building Condition Index (BCI).** Displays the current BCI of each building at the site.
- **Building Functionality Index (BFI).** Displays the current BFI of each building at the site.
- **Building Performance Index (BPI).** Displays the current BPI of each building at the site.
- **Building Facility Condition Index (FCI).** Displays the current FCI of each building at the site.

Additionally, the site CI, site FI, site PI and site FCI are shown at the top of the tab, which are the average of each index of the buildings at the site weighted by replacement cost. Finally, all the information on this tab can be exported to a Microsoft Excel spreadsheet by clicking the EXPORT TO EXCEL button at the bottom of the screen.

Assessment History Tab

The Assessment History tab provides a graph of the condition, functionality, and performance history of the site, displaying the site CI, site FI site PI, and site FCI over time.



GIS Tab

This tab can be used to add a GIS layer(s) for your site and link it to the inventory at your site. For more information, see [Setting Up GIS](#).

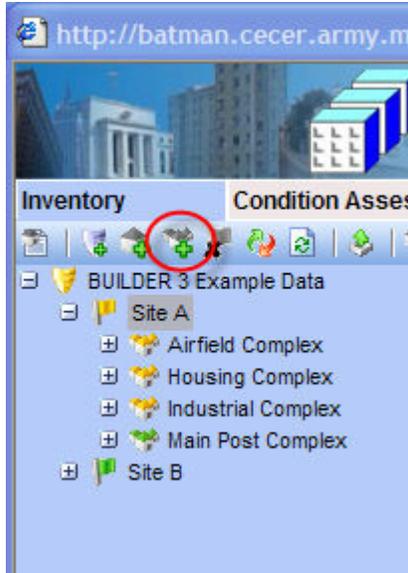
Complexes

Adding, Editing, and Deleting a Complex

BUILDER allows you to subdivide a site into regions called complexes. This is especially useful if your inventory has a large number of buildings at a single location. Each building may belong to at most one complex. You may choose not to use complexes at all, in which case buildings will be listed directly under their site in the inventory tree. If you do create complexes, you may also have buildings at your site that are not assigned to any complex. In this case, you may choose either to list unassigned buildings directly under their site or to have a complex named "Unassigned" which will have all such buildings listed under it in the inventory tree.

Adding a Complex

To add a new complex to a site select the site on the inventory tree and click the *Add Complex* button from the navigation menu.



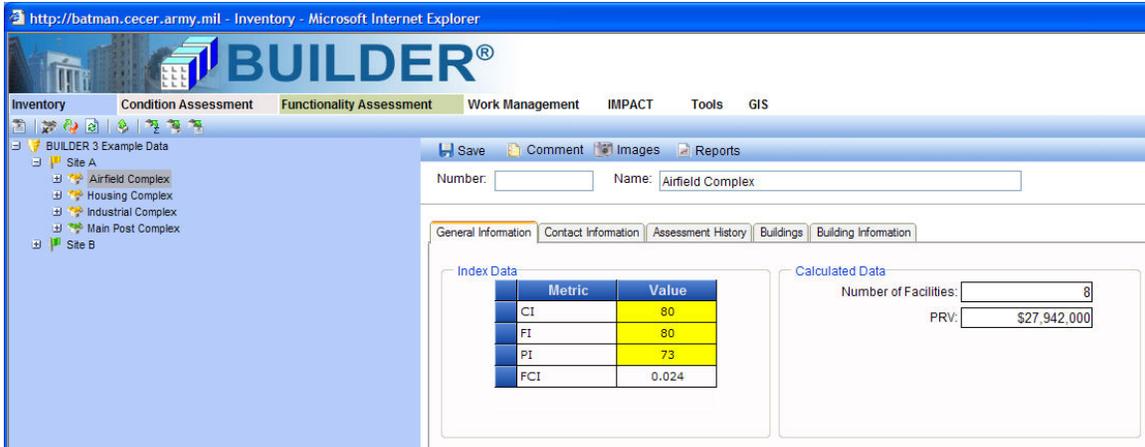
On this screen, enter the following required data for the complex:

- **Number.** Enter the identifying number for the complex, limited to 12 alphanumeric characters. You may leave this blank if you wish to supply only a name. You must enter at least a complex name or complex number and the combination of the two must be unique among the groups in your database.
- **Name.** Enter the identifying name for the complex, limited to 12 alphanumeric characters. You may leave this blank if you wish to supply only a number. You must enter at least a complex name or complex number and the combination of the two must be unique among the groups in your database.

Once the required data are entered, click the ADD button to create the complex. To close the window without creating the complex, click the CANCEL button.

Editing Complex Data

To edit the data for a specific complex, select the complex in the inventory tree.



Toolbar

- **SAVE.** Use this button to save the changes you have made to the complex data.
- **COMMENT.** Use this button allows you to add, edit, and view comments about the complex.
- **IMAGES.** Use this button to add, view, and remove images of the complex.
- **REPORTS.** use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to complex inventory. See [Using the Report Viewer](#).

General Complex Information

Initially after a complex is selected in the inventory tree, the general information tab is shown with the following information:

- **Complex Number and Name.** You may edit the Complex Number and Name as you wish. Complex Number is allowed to contain 12 characters; Complex Name is allowed 50 characters.
- **Index Data (Read-Only).**
 - **Complex Condition Index (CI).** The complex CI displays the average CI of the buildings in the complex, weighted by replacement cost. This metric provides an overall sense of the condition of the complex as a whole.
 - **Complex Functionality Index (FI).** The complex FI displays the average FI of the buildings in the complex, weighted by replacement cost. This metric provides an overall sense of the functionality of the complex as a whole.
 - **Complex Performance Index (PI).** The complex PI displays the average PI of the buildings in the complex, weighted by replacement cost. This metric provides an overall sense of the performance of the complex as a whole.
 - **Complex Facility Condition Index (FCI).** The complex FCI represents the total maintenance and repair costs for the complex, normalized by the total complex PRV. This metric provides an overall sense of deferred repair work.

- **Calculated Data** (Read-Only).
 - **# of Facilities**. Displays the number of buildings included in the complex inventory.
 - **PRV**. Displays the total present replacement value of the buildings at the complex computed by adding the individual building replacement costs.

Deleting a Complex

To delete a complex, select the complex in the inventory tree and click the *Delete* button.

It is important to note that deleting a complex deletes all inventory (buildings, systems, components, and sections) in the complex. This is a significant step to take and should only be done when you are certain that you wish to clear the entire inventory of the complex you have selected. Making frequent backups of your inventory database will protect you from significant data losses if mistakes in deleting are made.

Additional Complex Data

Additional complex data is displayed and can be edited on the contact information, building information, condition trends, and buildings tabs when a complex is selected in the inventory tree.

Contact Information Tab

The contact information for the complex may be viewed and edited by selecting the CONTACT INFORMATION tab.

Save Comment Images Reports

Number: Name:

General Information **Contact Information** Assessment History Buildings Building Information

Name:

Address:

City:

State:

Zip Code:

Phone #:

Fax #:

Email:

WWW:

All of the additional complex information is optional. It includes data regarding the official point of contact (POC) for the location:

- **POC Name.** Enter the name of the complex point of contact, limited to 30 alphanumeric characters.
- **Address.** Enter the official street address of the complex, limited to 30 alphanumeric characters.
- **City.** Enter the city of the complex, limited to 15 alphanumeric characters.
- **State.** Enter the state of the complex, limited to 2 alphanumeric characters.
- **Zip Code.** Enter the zip code of the complex, limited to 10 alphanumeric characters.
- **Phone Number.** Enter the phone number of the complex POC, limited to 20 alphanumeric characters.
- **FAX Number.** Enter the FAX number of the complex POC, limited to 20 alphanumeric characters.
- **Email Address.** Enter the email address of the complex POC, limited to 75 alphanumeric characters.
- **WWW.** Enter the World Wide Web (WWW) URL address for this complex, limited to 75 alphanumeric characters.

Building Information Tab

Basic information regarding the buildings in the complex can be viewed by selecting the BUILDING INFORMATION tab. All of the data shown on this tab is read-only.

Save Comment Images Reports

Number: Name:

General Information Contact Information Assessment History Buildings **Building Information**

Complex CI: **83** Complex FI: **96** Complex PI: **87**

Facility	Area	PRV	BCI	BFI	BPI	FCI
5709 - Classroom Building	10,667	\$2,224,000	78	76	76	0.000
8585 - Aircraft Mechanics School	24,746	\$4,957,000	82	100	87	0.000
8622 - Operations Building	8,600	\$1,723,000	83	100	88	0.000
8665 - Flight Simulator Building	10,200	\$2,044,000	68	100	77	0.000
8706 - Operations Headquarters	23,600	\$4,728,000	80	100	86	0.000
8755 - Aircraft Maintenance Shop	30,600	\$6,130,000	84	100	89	0.000
8784 - Hangar	26,400	\$5,289,000	88	100	92	0.000
8789 - Avionics Shop	17,341	\$3,474,000	86	100	90	0.000

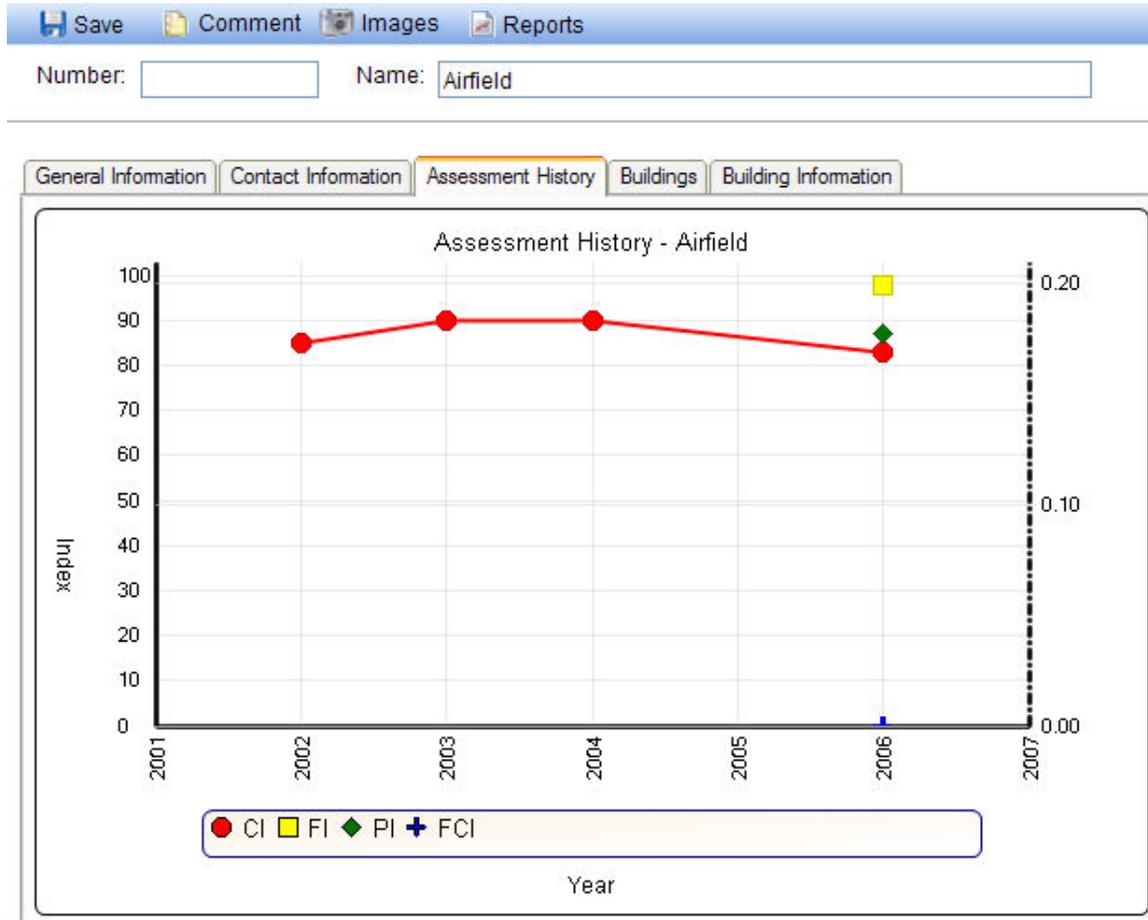
Export to Excel...

- **Facility.** Displays the building number and name of each building in the complex.
- **Area.** Displays the square footage of each building in the complex.
- **Present Replacement Value PRV.** Displays the PRV of each building in the complex.
- **Building Condition Index (BCI).** Displays the current BCI of each building in the complex.
- **Building Functionality Index (BFI).** Displays the current BFI of each building in the complex.
- **Building Performance Index (BPI).** Displays the current BPI of each building in the complex.
- **Building Facility Condition Index (FCI).** Displays the current FCI of each building in the complex.

Additionally, the complex CI, complex FI, complex PI and complex FCI are shown at the top of the tab, which are the average of each index of the buildings in the complex weighted by replacement cost. Finally, all the information on this tab can be exported to a Microsoft Excel spreadsheet by clicking the EXPORT TO EXCEL button at the bottom of the screen.

Assessment History Tab

The Assessment History tab provides a graph of the condition, functionality, performance and FCI history of the complex, displaying the complex CI, complex FI, complex PI and complex FCI over time.



Buildings Tab

The Buildings tab lists the buildings currently assigned to the complex. Buildings can be assigned or removed from the complex on this tab. The buildings are broken into two columns on this tab:

- **Unassigned Buildings.** Lists the buildings at the site that are not assigned to a complex.
- **Assigned Buildings.** Lists the buildings assigned to the current complex.

Save Comment Images Reports

Number: Name:

General Information Contact Information Assessment History **Buildings** Building Information

Unassigned Buildings

01 - Operations
02 - RD
03 - House
04 - Test
JDA - Test

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Assigned Buildings

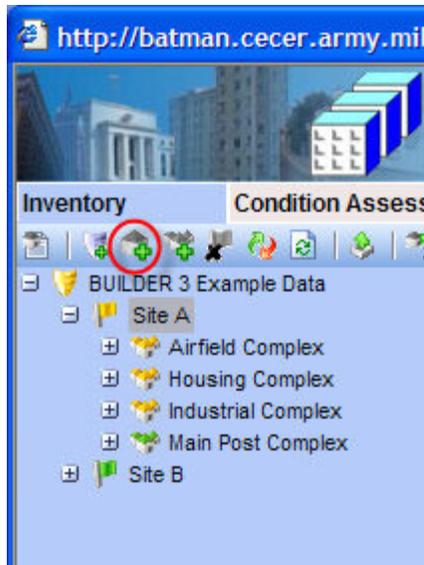
6709 - Classroom Building
8585 - Aircraft Mechanics School
8622 - Operations Building
8665 - Flight Simulator Building
8706 - Operations Headquarters
8755 - Aircraft Maintenance Shop
8784 - Hangar
8789 - Avionics Shop

Select the desired building and use the arrow keys to move unassigned buildings onto the assigned list or to remove buildings from the assigned list to the unassigned list. Only buildings that are not assigned to a complex will appear in the list on the left. If you wish to move a building from one complex to another, you must remove it from the first complex before you can add it to the second.

Buildings

Adding a Building

After a [site has been created](#), you can add the actual buildings to your inventory. To add a building, select the site you wish to add the building to in the inventory tree and click the *Add Building* button from the navigation menu.



the data required to be supplied when adding a building includes:

- **Building Number.** Enter the identifying number for the building, limited to 12 alphanumeric characters. Note that because the Building Number is alphanumeric instead of numeric, the alphabetic ordering of buildings in a list will follow character order rather than number order; for example, building number 10 will be listed before building number 2. You may avoid this situation by using leading zeros in your numbering system, e.g. use 02 or 002 or 0002 instead of 2, depending on the maximum number of digits you use in numbering buildings.
- **Building Name.** Enter the identifying number for the building, limited to 12 alphanumeric characters. The use of single quotes, double quotes, and ampersands is discouraged as these characters occasionally interfere with query formation. The Building Number and Building Name you enter will be concatenated into a string that must be a unique display identifier for the building at its location. If you intend to incorporate GIS mapping, it is important at this point to follow standard naming conventions at your site. Linking buildings in your BUILDER inventory with objects on your GIS map will be much simpler if the same building identifiers are used in both places.
- **Building Use.** Select the building use from the dropdown list that most closely matches the buildings use. If you are a Department of Defense activity, BUILDER should display familiar category codes for your service.
- **Construction Type.** Select the construction type from the dropdown list that matches the building. Construction type options include:
 - Permanent
 - Semi-Permanent
 - Temporary
 - Leased
- **Status.** Select the appropriate status of the building from the dropdown list. See [Using the Building Status Property](#) for more information. Status type options include:
 - Active
 - Vacant

- To be transferred
- To be demolished
- To be acquired
- To be built
- Transferred
- Demolished

The default status is "Active." The last four of these values indicate that the designated building is not currently part of the inventory, and two others indicate that the building will be removed from the inventory in the future. In essence, the [building status property](#) allows you to enter future buildings into the inventory and to plan for their maintenance in IMPACT even though they are not presently owned. In addition, the building status property allows you to keep records for buildings that are no longer in the physical inventory. Such records are ignored in processes that should only consider current buildings, such as condition roll-ups and work planning.

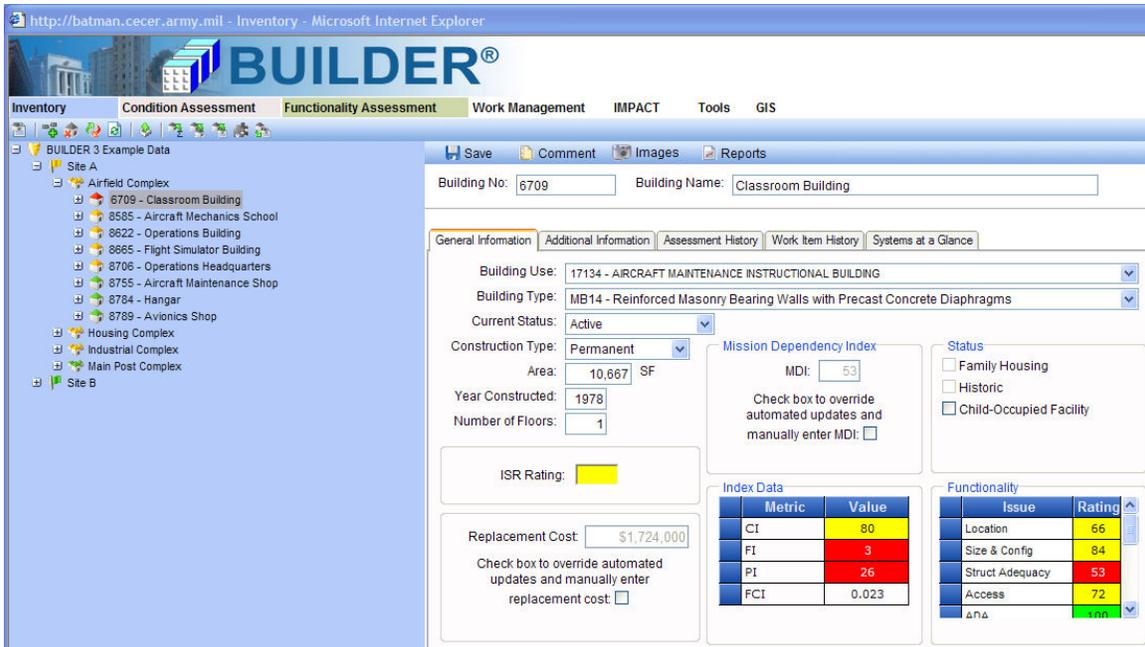
- **Year Built.** Enter the year that construction of the building was completed. This data element determines the age of the building, which is a critical factor in BUILDER's decision-making processes.
- **Number of Floors.** Enter the number of floors of the building. This data element is used to estimate the size of the building's footprint by dividing the area by the number of floors.
- **Area.** Enter the gross area of the building.

This data is required because BUILDER's internal algorithms generally have parameters determined by the building's use, size, age, number of floors, status, and construction type, so it is essential that the information be provided as a part of creating the building record.

When you have entered the required data, click the ADD button to create the building. The Building Summary window will open to allow you to immediately [edit the building data](#). To close the window without creating the new building, click the CANCEL button.

Editing Building Inventory Data

To view and edit building inventory data, select the building in the Inventory Tree.



Toolbar

- **SAVE.** Use this button to save the changes you have made to the building data.
- **COMMENT.** Use this button allows you to add, edit, and view comments about the building.
- **IMAGES.** Use this button to add, view, and remove images of the building.
- **REPORTS.** Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to building inventory. See [Using the Report Viewer](#).

General Information

Initially after a building is selected in the inventory tree, the general information tab is shown with the following information, all of which is required:

- **Building Number.** Enter the identifying number for the building, limited to 12 alphanumeric characters. Note that because the Building Number is alphanumeric instead of numeric, the alphabetic ordering of buildings in a list will follow character order rather than number order; for example, building number 10 will be listed before building number 2. You may avoid this situation by using leading zeros in your numbering system, e.g. use 02 or 002 or 0002 instead of 2, depending on the maximum number of digits you use in numbering buildings.
- **Building Name.** Enter the identifying number for the building, limited to 12 alphanumeric characters. The use of single quotes, double quotes, and ampersands is discouraged as these characters occasionally interfere with query formation. The Building Number and Building Name you enter will be concatenated into a string that must be a unique display identifier for the building at its location. If you intend to incorporate GIS mapping, it is important at this point to follow standard naming conventions at your site.

- Linking buildings in your BUILDER inventory with objects on your GIS map will be much simpler if the same building identifiers are used in both places.
- **Building Use.** Select the building use from the dropdown list that most closely matches the buildings use. If you are a Department of Defense activity, BUILDER should display familiar category codes for your service.
 - **Current Status.** Select the appropriate status of the building from the dropdown list. See [Using the Building Status Property](#) for more information.

Status type options include:

- Active
- Vacant
- To be transferred
- To be demolished
- To be acquired
- To be built
- Transferred
- Demolished

The default status is "Active." The last four of these values indicate that the designated building is not currently part of the inventory, and two others indicate that the building will be removed from the inventory in the future. In essence, the [building status property](#) allows you to enter future buildings into the inventory and to plan for their maintenance in IMPACT even though they are not presently owned. In addition, the building status property allows you to keep records for buildings that are no longer in the physical inventory. Such records are ignored in processes that should only consider current buildings, such as condition roll-ups and work planning.

- **Effective Year of Status.** When you choose a building status other than the default "Active" status, you must also provide a year in which the permanent status will take effect. For vacant, demolished, and transferred buildings, the effective year is the year the action occurred. For future "To be" statuses, the effective year is the year the future event will occur, i.e. the year the building is actually built, acquired, transferred, or demolished.
- **Construction Type.** Select the construction type from the dropdown list that matches the building. Construction type options include:
 - Permanent
 - Semi-Permanent
 - Temporary
 - Leased
- **Year Built.** Enter the year that construction of the building was completed. This data element determines the age of the building, which is a critical factor in BUILDER's decision-making processes.
- **Number of Floors.** Enter the number of floors of the building. This data element is used to estimate the size of the building's footprint by dividing the area by the number of floors.
- **Area.** Enter the gross area of the building.

In addition to the general information data described above, this tab displays some data calculated by BUILDER including:

- **ISR Rating** (Read-Only). This is a U.S. Army-specific data field. If you are managing an Army site for which [Installation Status Report data has been](#)

- [imported into BUILDER](#), this color rating will correspond to the building's primary use ISR rating.
- **Replacement Cost.** This data element contains the current replacement cost for a building of the current building's use and size under current construction standards. BUILDER provides a cost module to estimate the replacement cost. If you do not check the manual override checkbox, the cost module will update the replacement cost using the default [cost book](#), adjusted for [inflation](#) and [geographic location](#), when costs are updated. If you check the manual override checkbox, the cost module will not affect this building's replacement cost, and you will have to periodically update its replacement cost manually to account for inflation.
 - **Mission Dependency Index.** The availability of the Mission Dependency Index (MDI) is the result of on-going U.S. Navy research to develop a process for computing a 0-100 index that measures how critical the facility is to the overall mission of its owner. This measure is one of several being developed to allow user input to shape an automated planning process that uses metrics and rules for their application to identify and prioritize budget allocations and work plans. See [Mission Dependency Index Overview](#) for more information.
 - **Index Data (Read-Only).** All of the indices below are updated every time a [CI roll-up](#) is performed.
 - **Building Condition Index (BCI).** The BCI measures the condition of the building as a whole. It is computed by averaging the condition indices of the building's systems, weighted by the replacement costs of the systems.
 - **Building Functionality Index (BFI).** The BFI measures the functionality of the building as a whole. It is computed from the results of a [functionality assessment](#) of the building as a whole.
 - **Building Performance Index (BPI).** The BPI measures the overall performance of the building as a whole. It is computed using a weighted combination of the BCI and BFI.
 - **Facility Condition Index (FCI).** The (FCI) is the industry standard index calculated by dividing the total cost of necessary repairs in the building divided by the replacement cost of the building. In BUILDER, the total cost of necessary repairs is estimated by summing the individual section repair costs.
 - **Status**
 - **Family Housing (Read-Only).** This checkbox indicated whether or not the building is family housing. It is automatically marked if the building use type is residential. If checkbox is marked, you can save more data about each dwelling unit by clicking the  button. See [Family Housing Data](#) for information on the data that can be entered.
 - **Historic Building (Read-Only).** This checkbox indicates whether or not the building is historic. It is automatically marked if a functional assessment has been performed in the building and it has been determined that the building is historic or has cultural resources in the building.
 - **Child-Occupied Facility.** This checkbox indicates whether or not the facility is child-occupied. You can mark or un-mark this box as appropriate.
 - **Functionality (Read-Only).** Displayed in this grid is a list of the functionality issues with deficiencies in the building. Only functionality issues with a FI below the threshold set in the functionality standard will be shown here.

In addition to all of data described above, the other tabs at the top of the screen allow for [additional information](#) regarding the building to be added, viewed, and edited.

Additional Building Data

Additional building data is displayed and can be edited on the additional information, condition trends, work item history, and systems at a glance tabs when a building is selected in the inventory tree.

Additional Information Tab

The additional building information is accessed from the general building inventory screen by selecting the ADDITIONAL INFORMATION tab.

Save Comment Images Reports

Building No: Building Name:

General Information **Additional Information** Assessment History Work Item History Systems at a Glance

POC Name:
 Phone:
 E-Mail:

Street:
 City:
 State: Zip:

Architect:
 Contractor:
 Documents:

Perimeter: LF

Description	Length	Width

NOTE: Length and width are measured in linear feet

v

All of the additional building information is optional and includes:

Point of Contact

- **POC Name.** The name of the point of contact for the building, limited to 30 characters.
- **Phone.** The building POC's phone number, limited to 20 characters.
- **Email.** The building POC's Email address, limited to 75 characters.

Address

- **Street.** The building's street address, limited to 30 characters.
- **City.** The city portion of the building's address, limited to 15 characters.
- **State.** The state portion of the building's address, limited to 2 characters.
- **Zip.** The zip code of the building's address, limited to 10 characters.

Building Design

- **Architect.** Lists the architects of the building. Add and delete names by using the adjacent buttons. Each architect's name is limited to 30 characters.
- **Contractor.** Lists the contractors of the building. Add and delete names by using the adjacent buttons. Each contractor's name is limited to 30 characters.
- **Documents.** Lists the documents related to the building. Add and delete document names by using the adjacent buttons. Each document's name is limited to 24 characters.

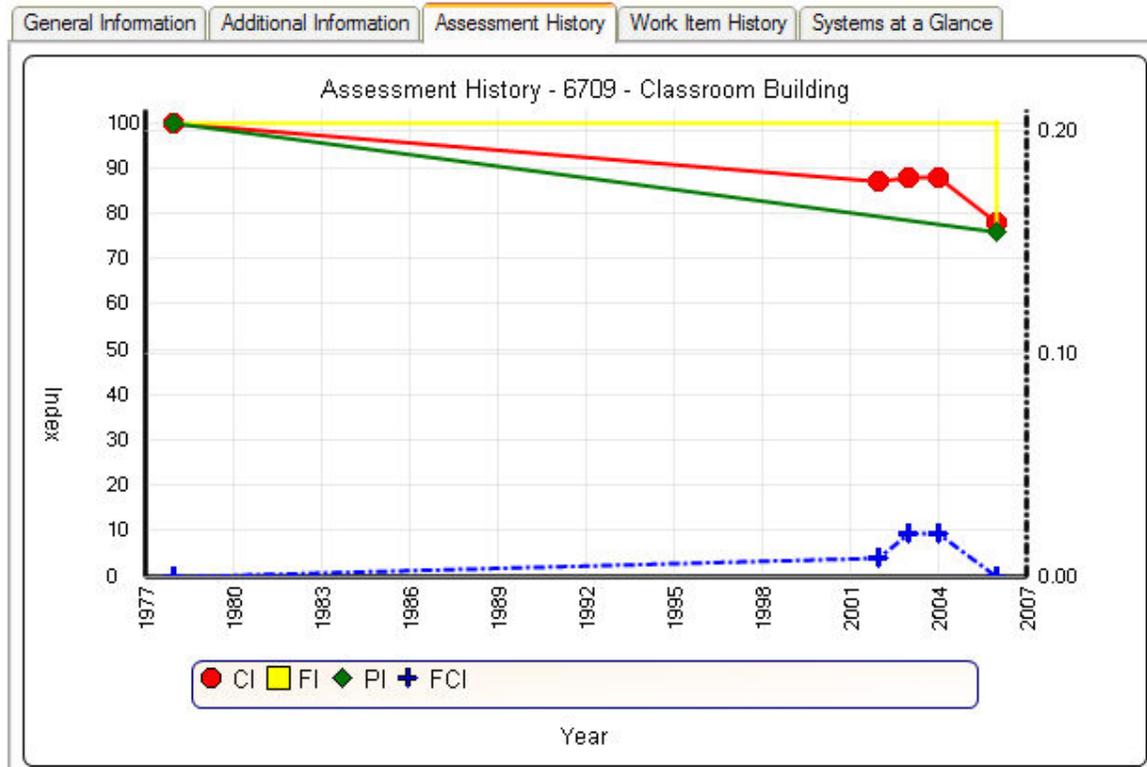
Dimensions

- **Perimeter.** Enter the linear measure of the perimeter of the building.
- **Description.** Enter a description of the distinct areas of the building you wish to add dimensions for. For example, you may list "East Wing/West Wing", or "Offices/Library/Warehouse", or "Public Areas/Secure Areas." Each description is limited to 50 characters. Use the ADD DIMENSION and DELETE DIMENSION buttons to add and delete items from the list.
- **Length.** Enter the length of the area identified in the description.
- **Width.** Enter the width of the area identified in the description.

Assessment History Tab

The Assessment History Trends tab displays two graphs showing how different metrics in the building have changed over time. The graph on the left displays the condition, functionality, performance and FCI history of the building (by displaying the BCI, BFI, BPI, and FCI) from the year the building was constructed to the current fiscal year.

Building No:
 Building Name:



Work Items History

The Work Item History tab shows a list of the work items that have been performed and/or are scheduled to be performed in the building. The work items can be filtered by FY, status, system, component, or section using the dropdown lists on the screen. For more information on work items, see the [Work Planning Overview](#).

BUILDER EMS Version 3 User Manual

Save Comment Images Reports

Building No: 6709 Building Name: Classroom Building

General Information Additional Information Assessment History Work Item History Systems at a Glance

FY: <All> System: <All>
 Status: <All> Component:
 Section:

Description	FY	Activity	Est. Cost	Status	Return	ROI
Replace Lighting Fixtures Incandescent Exterior	2006	Replace	\$250	Awaiting Funds	\$245	1.07
Repair Exterior Ramp Concrete	2006	Repair	\$250	Awaiting Funds	\$6,900	27.60
Repair Exterior Window Metal Casement	2006	Repair	\$250	Awaiting Funds	\$1,100	4.40
Replace Air Handling Unit Modular <3 Tons	2006	Replace	\$860	Awaiting Funds	\$1,200	1.00
Repair Air Handling Unit Central Station 12000-14000 CFM	2006	Repair	\$250	Awaiting Funds	\$5,200	20.80
Repair Fuel Storage Fuel Oil 1000-2000 GAL	2006	Repair	\$250	Awaiting Funds	\$910	3.64
Replace Cooling Unit/Plant Unknown Unknown	2006	Replace	\$90,000	Awaiting Funds	\$95,000	1.32
Replace Cooling Unit/Plant Heat Pump Residential 4-5 Tons	2006	Replace	\$6,300	Awaiting Funds	\$6,300	1.00
Replace Interior Floor Finish/Covering Wood	2006	Replace	\$960	Awaiting Funds	\$1,050	0.78
Replace Interior Floor Finish/Covering Carpet	2006	Replace	\$44,000	Awaiting Funds	\$45,500	-0.31
Replace Cooling Unit/Plant Air Conditioner Thru-Wall <25000 BTUH	2006	Replace	\$2,700	Awaiting Funds	\$3,000	1.16

Export To Excel

Systems at a Glance Tab

Basic information regarding the systems in the building can be viewed by selecting the SYSTEMS AT A GLANCE tab. The systems at a Glance tab shows the systems inventoried in the building, each system's condition index (SCI), and the replacement cost of each system. All of the data shown on this tab is read-only.

Save Comment Images Reports

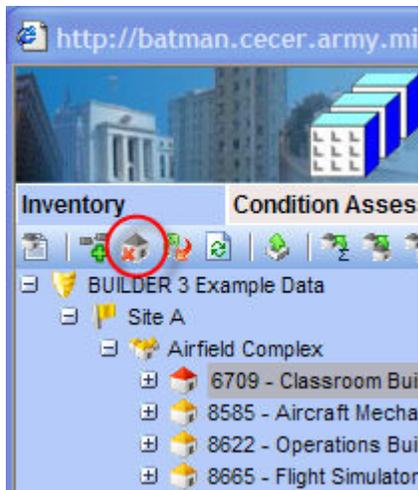
Building No: 6709 Building Name: Classroom Building

General Information Additional Information Assessment History Work Item History Systems at a Glance

Description	SCI	Replacement Cost
Electrical	86	\$28,775
Exterior Circulation	66	\$38,400
Exterior Closure	98	\$231,475
Fire Suppression	81	\$7,500
HVAC	48	\$141,816
Interior Construction	63	\$122,080
Plumbing	90	\$15,750
Roofing	90	\$55,510
Specialties	88	\$7,400
Structural	91	\$53,600

Deleting a Building

To delete a building select the building in the Inventory tree and click the *Delete Building* button.



It is important to note that deleting a building deletes all the inventory (systems, components, and sections) in the building. This is a significant step to take and should only be done when you are certain that you wish to clear the entire inventory of the building you have selected. Making frequent backups of your inventory database will protect you from significant data losses if mistakes in deleting are made.

Instead of deleting a building, you can use the [Building Status](#) property to mark buildings that have been demolished or transferred to another owner. With this method, the building's records remain in the database, but the building is ignored in processes that should only consider current buildings. See [Using Building Status to Track Non-Current Buildings](#).

Using the Building Status Property

The Building Status property allows you to maintain database records for buildings not currently in your physical inventory, whether for historical purposes or future planning. A building's current status is used in the decision processes of both BUILDER and IMPACT, and it is the basis for a number of useful capabilities, including allowing you to:

- Define [policies](#) so that buildings scheduled for demolition are maintained at a lower standards than might generally apply. Simply use the Building Status as one of the attributes used to define a policy and assign standards as appropriate to each status type.
- Define work [prioritization schemes](#) that consider future changes in building status in prioritizing work items. This can be done by using the Building Status as an initial split in your prioritization scheme and assigning weights appropriate for each status type (probably using 0.0 weight for non-current status types).
- Plan for the maintenance load of buildings to be added to your inventory in the future by [analyzing an IMPACT scenario](#).
- Change the status of a building dynamically during an IMPACT simulation to study the effects of a changing inventory on the budget and the work load.

The Building Status property is set on the [Building Summary](#) screen and has one of the following values:

- **Active.** This is the default building status. Use this status for buildings that are currently in use. This status is the end status for buildings with status "To be built" or "To be acquired."
- **Vacant.** This status replaces the Vacant checkbox property used in earlier versions of BUILDER. Use this status for buildings that are currently in your physical inventory but not in use.
- **To be transferred.** Use this status for buildings that will be transferred to another owner in the future. The effective year of this status is the year in which the transfer will take place. No BUILDER or IMPACT cost is associated with such a transfer. However, maintenance policies may be associated with this status that yield different standards than would ordinarily be in effect.
- **To be demolished.** Use this status for buildings that will be demolished in the future. The effective year of this status is the year in which the building is to be demolished. In an IMPACT simulation, a building-level work item to demolish the building will be generated, including a cost estimate for the work. In addition, maintenance policies may be associated with this status that lower the standards usually required for this type of building.
- **To be acquired.** Use this status to enter inventory records for an existing building prior to its acquisition. The effective year of this status is the year in which the building is expected to be acquired. You will be able to edit the building and inspection data for this type of building, and BUILDER's condition and remaining service life predictions will be applied based on the inspection data entered. In this way, you will be able to estimate the maintenance requirements of such a building prior to its acquisition. In an IMPACT simulation, this feature allows you to acquire buildings as the simulation progresses.
- **To be built.** Use this status to enter inventory records for a new building prior to its commissioning for occupancy. The effective year of this status is the year in which the building is expected to be recognized as part of your physical inventory. In BUILDER, you will be able to edit the building data on the Building Summary screen but will not be able to add inspection records until the status changes to "Active." In an IMPACT simulation, this feature allows you to add new buildings dynamically as the simulation progresses.
- **Transferred.** Use this status to force BUILDER's automated processes for condition/service life assessment and work planning to skip the building but leave the inventory and inspection records intact. The effective year for this status is the year in which the transfer takes place. This status is the end status of the "To be transferred" status.
- **Demolished.** Use this status to remove a building from BUILDER's automated processes for condition/service life assessment and work planning but leave the inventory and inspection records intact. The effective year for this status is the year in which the building is demolished. This status is the end status of the "To be demolished" status.

The last four of these values indicate that the designated building is not currently part of the inventory, and two others (to be transferred and to be demolished) indicate that the building will be removed from the inventory in the future. In essence, the building status property allows you to enter future buildings into the inventory and to plan for their maintenance in IMPACT even though they are not presently owned. In addition, the building status property allows you to keep records for buildings that are no longer in the physical inventory. Such records are ignored in processes that should only consider current buildings, such as condition roll-ups and work planning.

When you [delete a building](#) from BUILDER, you actually remove all database records associated with that building. If you wish to keep the records, whether for historical purposes, analysis, or possible transfer to another BUILDER database (perhaps the building is being transferred from one property book to another), you should simply set the building status property to an appropriate value.

Using Building Status to Track Non-Current Buildings

The Building Status property allows you to have records in your BUILDER database for buildings that are not currently in your physical inventory. This is useful for buildings at both ends of the life-cycle. You may keep records for buildings that have been demolished or transferred, and you may add buildings planned for future construction or acquisition.

Adding Buildings To Be Built or Acquired in the Future

Using the Building Status property, it is possible to enter buildings into the database before they are actually in the physical inventory. This includes buildings under construction (designated with status "To be built") and existing buildings being considered for acquisition from another owner (designated with status "To be acquired"). With the building status property, you will be able to assess short-term work requirements for newly acquired existing buildings and to plan long-term maintenance requirements for future buildings using an IMPACT scenario.

If you enter records for a building with status "To be acquired", you may record inspection results prior to acquisition. The BUILDER processes that determine remaining service life and condition prediction will track the condition of the building after it is first entered and prior to acquisition. With this information, BUILDER will be able to generate a work plan for the building to upgrade it to the standards established by an appropriate policy sequence. Such information could be invaluable in planning for the load such a building will place on both short and long term budgets.

If you enter a building with status "To be built", you may not record new inspections until the status changes to "Active". The BUILDER processes that determine remaining service life and condition prediction will skip such a building, under the assumption that quality assurance during the construction process will force all systems to a CI of 100 prior to commissioning. The advantage of entering the building before it is built is that you may include it in IMPACT scenarios to measure its long-term effects on work plans and budgets. That is, the IMPACT scenario can change the status of a new building to "Active" at a scheduled time and begin treating it as a normal building with predictable deterioration rates and work requirements.

Keeping Records for Buildings That Have Been Demolished or Transferred

In earlier versions of the BUILDER application, the only way to eliminate a building from the automated assessment and planning processes used by BUILDER and IMPACT was to delete the building. With this approach, all records related to the building were actually deleted from the database. The Building Status property gives you another option.

If you have records in the BUILDER database for a building which is to be demolished or transferred to another owner, you can keep the inventory, inspection, and work history records in the BUILDER database but make the building invisible to BUILDER's automated processes simply by changing the building's status to "Demolished" or "Transferred".

Here is a summary of the Builder/IMPACT approach to a building with status "Demolished" or "Transferred":

- Inventory records are locked. You will be unable to change the building's data properties or its composition.
- Condition and Functionality Assessment records are locked. You will be unable to change existing records or to add new records.
- Work Planning records are locked. You will be unable to change existing records or to add new records.
- The building's cost data will not be affected by annual cost updates at the beginning of the calendar year.
- The CI and RSL values for the building and its systems/components/sections will not be updated.
- The building will not be considered during automatic work generation.
- If the building will not appear in IMPACT simulations.
- If the building's status is changed to "Demolished" or "Transferred" during an IMPACT simulation, it will have records for the years prior to its status change and then will be treated as it is in BUILDER. That is, there will be no further updates of data, no new inspections, no changes in condition or service life, etc.

Systems, Components, and Sections

Identifying Systems, Components and Sections

After you have [created a building](#) and entered its required data elements, you should identify the systems, components and sections in the building. Your decomposition of a building into its systems, and the decomposition of those systems into components will be very straight-forward. The formation of sections, however, will require some thought on your part. BUILDER manages buildings at the section level, and you will inspect sections and plan work for sections. BUILDER's representation of building sections has been designed to be very flexible. With flexibility comes choices, choices that add complexity to the process. Pay particular attention to the "Defining Sections" section below. In addition to adding the systems, components, and sections manually, BUILDER provides several mechanisms to speed the inventory process including [Copying a Building](#), [Building Templates](#), and using the [Embedded Building Models](#).

Defining Systems

BUILDER offers you the option of using one of two [building system representations](#):

1. BUILDER's traditional building decomposition into 12 systems
2. ASTM UNIFORMAT II Classification for Building Elements with 17 systems

The traditional BUILDER systems were chosen to be more closely aligned to the maintenance and repair activities of buildings, while the UNIFORMAT systems align more closely with building construction.

Systems are used solely to help you organize the records for the actual physical items in your building, so choose the system decomposition that best suits your needs. Once you have chosen one of the two system representations, you may begin creating system records for each building. You may create only one system of each system type for any given building. In creating a new system for a building, the list of choices for the new system will only include those systems not already created for the building. See [Adding, Viewing, and Deleting a System](#) for details.

Defining Components

Like systems, components are used to help organize the records of the actual physical items in the building. The components that can be added to a system will depend on the building system representation you have chosen. You may create only one component of each type for each system. In creating a new component, the list of choices will only include those components of the appropriate system that have not already been created. See [Adding and Viewing a Component](#) for details.

If you have a component that is not in the list of available component types, please contact one of the [Support Centers](#). BUILDER does not have a feature for user-defined components. Each component has a number of data elements associated with it (varieties of types and materials, costs, service lives, standard units of measure, inspectable subcomponents, etc.) which must be researched before the component can be added.

Defining Sections

Building sections are the key structures in a BUILDER inventory. The System and Component structures are organizational in nature, serving to categorize what is in a building into manageable groups. Building sections actually represent the physical items of a building, belong to a particular component, and have the following properties:

- Component Type
- Material/Equipment Type
- Quantity
- Age
- Whether or not it is painted, and, if so, when it was last painted and paint type

BUILDER has been designed to be flexible in allowing you to represent your building's sections in a number of ways to support how you intend to manage them. Some examples may be helpful:

1. Building A has 5 exterior doors (System: Exterior Closure, Component: Exterior Door). Four of the doors are metal personnel doors and the fifth is a metal overhead door. Because there are two different types of doors (personnel, overhead), you will have to create at least two sections. In this

- situation, you should create a section for the metal overhead door and enter the appropriate data about it. You do not need to create a section name for this door since there is only one. For the four metal personnel doors, if you intend to manage them as a unit, create one more section and enter the appropriate data about the doors. Again, you do not need to enter a section name because you are only creating one section of this material and type.
2. Building A has 5 exterior doors (System: Exterior Closure, Component: Exterior Door). You lease Building A to two tenants X and Y. Two metal personnel doors and a metal overhead door are in the tenant X area, and the other two metal personnel doors are in the tenant Y area. Because you plan to inspect and maintain the doors by tenant, you create three sections:
 1. Tenant X Metal Personnel with quantity 2
 2. Tenant X Metal Overhead with quantity 1
 3. Tenant Y Metal Personnel with quantity 2.

When you create each section for Tenant X, you use "Tenant X" as the name of the section. Do the same for Tenant Y. In fact, you may want to name every section (especially Interior Construction sections) in the Tenant X area "Tenant X". When you inspect the building, you can use the section name to distinguish sections belonging to each of the tenants.

3. Building A has 2 reciprocating 20-ton chillers (System: HVAC, Component: Cooling Unit/Plant). If they are the same age and you plan to manage them as a unit, then create one section with quantity 2. However, if you want to manage them individually or if they were installed at different times and may therefore have different maintenance requirements, then create two sections of quantity 1 each. Since both sections have the same equipment type (Reciprocating 20-30 Ton) and component type (Chillers), you will have to have distinct Section Names for the two sections. You may use their barcode IDs as the section names if you wish.
4. Building B has 50 interior wood personnel doors, all alike and all installed when the building was built. You originally create one section with quantity 50 for these doors. You may have several years of inspection data regarding the doors, which have deteriorated uniformly over time. With the current inspection, however, two of the doors are found to be severely damaged and will have to be replaced. If the two doors remain in their original section, inspection samples for these two doors will have to be marked as "non-representative". When the condition index is calculated, the condition of the two doors, which are only 4% of the section, will have only a small impact on the overall section CI. Since you will be replacing the two doors, perhaps with a different quality of door since they may be subject to higher user abuse, you should use component sectioning to isolate the two doors. To do this, reduce the original section quantity to 48. Then create a new section for the two damaged doors and enter the current inspection data for this new section, which will then have a low CI.

From these examples you can see that some thought will have to be given to how you decompose a building into sections. Hopefully, you can also see that BUILDER is flexible enough to allow you to manage at the level of detail that you choose. See [Adding and Editing a Section](#) for details.

Inventory Suggestions

It is not necessary to do a complete inventory initially. Implementation funds and/or time may be limited so it is possible and permissible to begin with only some of the component-sections and expand the inventory on an as-needed basis. If the desire is to begin with a limited set, the following suggestions are made:

- Focus on the components that are most critical to building function
- Focus on the components that traditionally dominate M&R needs.

When sectioning, a few rules of thumb are offered:

- To avoid a data burden, use the smallest number of sections possible to meet managerial needs. For example, it is usually not necessary to individually section every room, each exterior wall, etc.
- Since material differences (e.g. wood vs. masonry) are criteria for sectioning, only create sections for material differences when the quantity is significant enough to warrant individual management attention. For example, an exterior wall may be made of wood, but a few square feet of wall is made of masonry, essentially for decoration. The wood wall is clearly a section, but what about the masonry? Should it be its own section? If the masonry quantity is a mere fraction of the wood and work would be accomplished on the masonry at the same time as the wood (in other words, the entire wall is being managed as a unit), then there is no need to create a section just for the masonry. However, if the quantities of both the wood and masonry are significant, then create sections for both.
- Equipment sectioning should be thought out carefully when multiple units of the same equipment are present. For example, there may be three air handling units of the same type, age, etc. In this case, there could be one section with the quantity of three, or three sections with the quantity of one. Which approach should be taken? If the desire is to manage them as essentially one unit as far as planning repair and replacement, then one section will suffice. However, if it is expected that over time, they will be replaced individually, etc, then each should be its own section.
- Obtaining accurate an accurate quantity can be difficult, and often times there are many sources for obtaining quantity. These include drawings, actual measurement or count, or other records. It must be understood that the more detailed or accurate the count or measurement, the more costly it is to collect the data. Extracting information from records, including drawings, and doing a field validation is the most costly. Reasonable estimates within reasonable error are very acceptable as it will result in reasonable error in BUILDER's analyses. For example, the wall finish may truly be 10,634 SF. An estimate of 11,000 SF will suffice for planning purposes especially if the cost to get the true value is twice that for an estimate. Component-sections that cover an area (SF or SM) are the most difficult to obtain with precision whereas those that are "each" are the easiest. Generally, field count the "each" component-sections and estimate the others. The estimates can be refined in the future when projects are developed for M&R work.
- Care should be taken when establishing Year Built/Renewed. Error here will result in erroneous remaining service lives and add error to the projected year when M&R should be performed. Experience has shown, however, that sometimes the year in which component-sections were replaced, rehabilitated, or initially installed/constructed is truly unknown as the records are no longer available. In those cases, make a reasonable estimate and

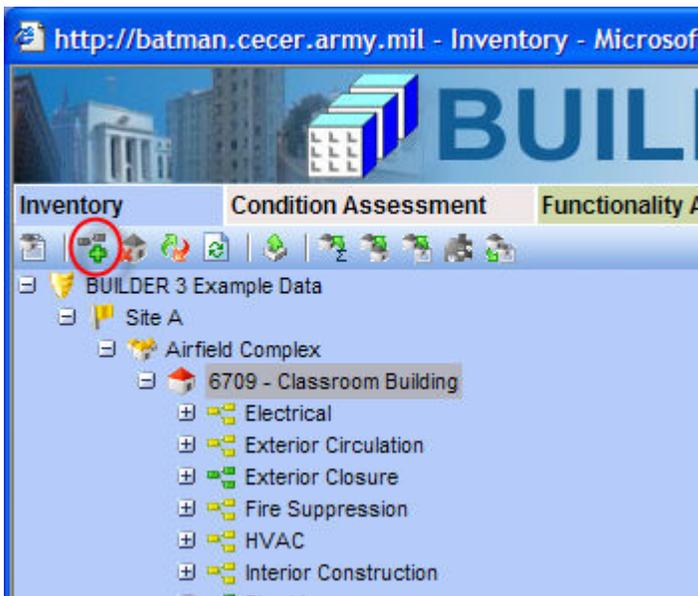
mark the estimated checkbox. Often, there are people who will remember when that work was done, at least in a generalized way (e.g. early 1990's). Fortunately, through subsequent inspections and condition assessments, the Year Installed/Built becomes less important, as BUILDER's prediction models will use the condition assessment information to adjust the remaining service life and to predict when M&R will be required in the future.

Adding, Viewing, and Deleting a System

Please be sure to read the topic [Identifying Systems, Components and Sections](#) before proceeding with this topic.

Adding a System

A new system can be added to an existing building by selecting the building in the inventory tree and clicking the *Add System* button.



The context area of the BUILDER screen will appear as shown below.



Select the system you wish to add to the building from the dropdown list and click ADD to add the system. If you do not wish to add a system to the building, click the CANCEL button.

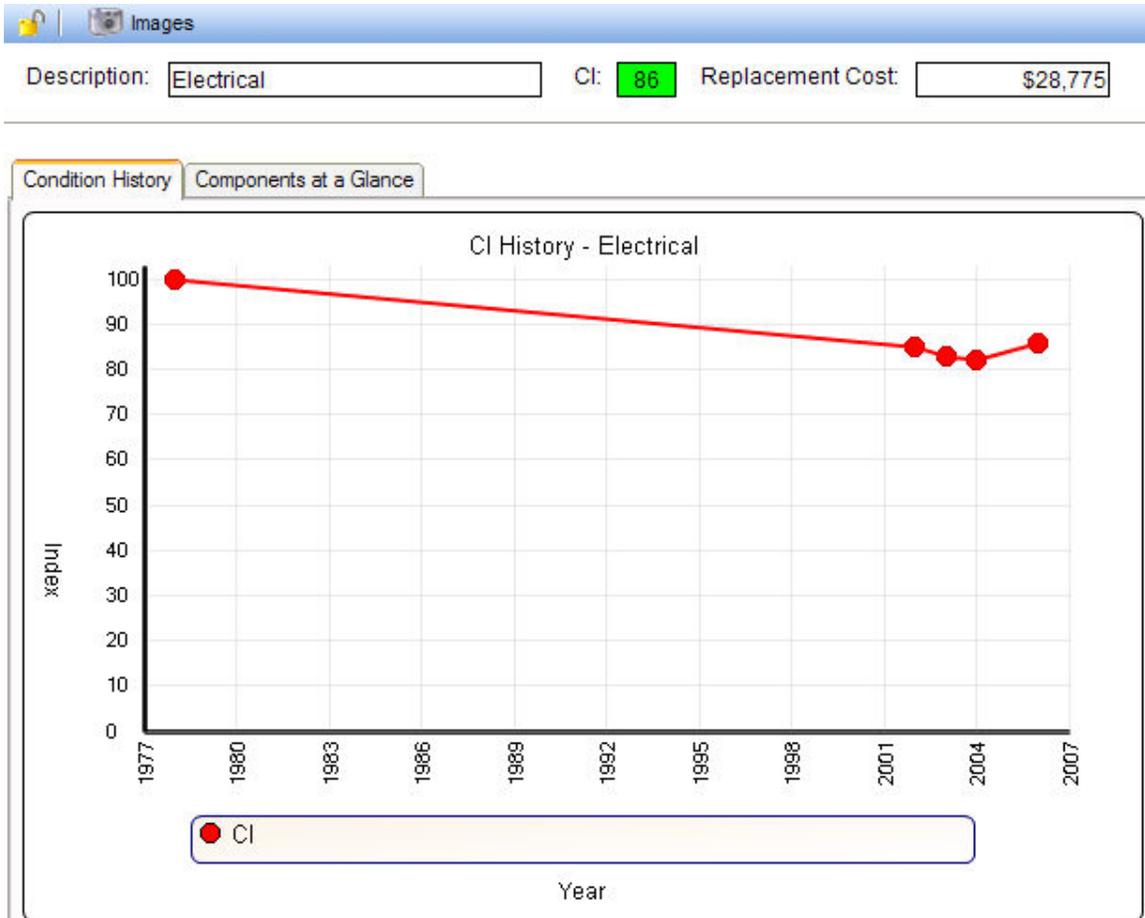
Note that each building can contain only one system of each type. The dropdown list for adding a system will display only the system types that do not already exist in the building.

Viewing an Existing System

Data for an existing system can be viewed by selecting the system in the inventory tree. At the top of the context area, the system description, system condition index (SCI), and system replacement cost are shown. Additional information regarding the system is found in the different tabs and is described below.

Condition History Tab

The Condition History tab displays a graph of the CI history of the system over time.



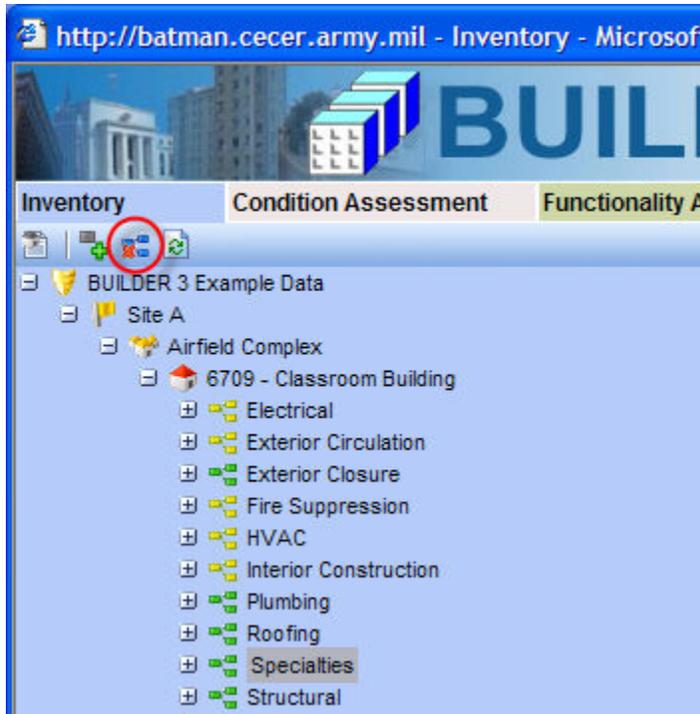
Components at a Glance Tab

Basic information regarding the components in the system can be viewed by selecting the COMPONENTS AT A GLANCE tab. The components at a Glance tab shows the components inventoried in the system, each building component's condition index (BCCI), and the replacement cost of each component. All of the data shown on this tab is read-only.

Description	BCCI	Replacement Cost
Distribution	70	\$11,000
Lighting Fixtures	98	\$14,825
Panels	90	\$2,950

Deleting an Existing System

To delete a system from a building, select the system in the Inventory Tree and click the *Delete System* button on the menu toolbar.



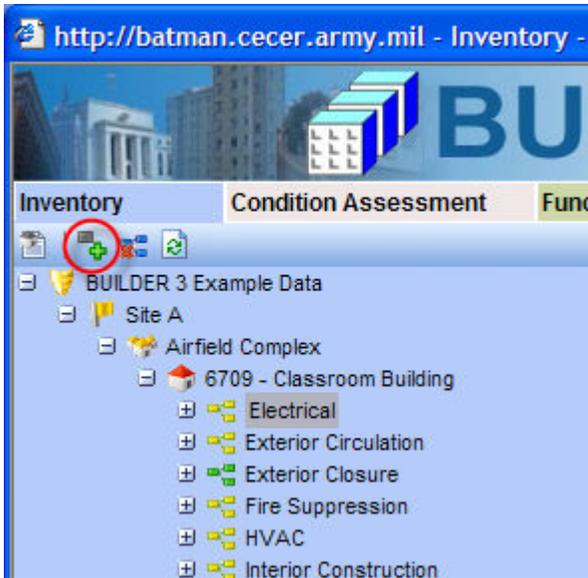
It is important to note that deleting a system will delete all inventory (components and sections) in the system. This is a significant step to take and should only be done when you are certain that you wish to clear the entire inventory of the system you have selected. Making frequent backups of your inventory database will protect you from significant data losses if mistakes in deleting are made.

Adding and Viewing a Component

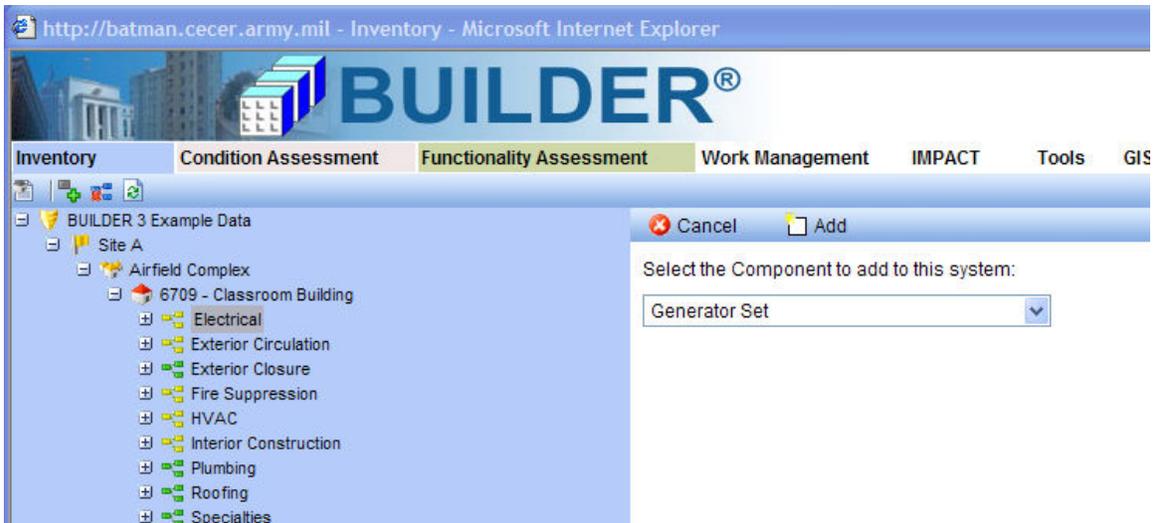
Please be sure to read the topic [Identifying Systems, Components and Sections](#) before proceeding with this topic.

Adding a Component

A new component can be added to an existing system by selecting the system in the inventory tree and clicking the *Add Component* button.



The context area of the BUILDER screen will appear as shown below.



Select the component you wish to add from the dropdown list and click ADD to add the component. If you do not wish to add a component to the system, click the CANCEL button.

Note that each system can contain at most one component of each type. The dropdown list for adding a component will display only the component types that do not already exist for the system.

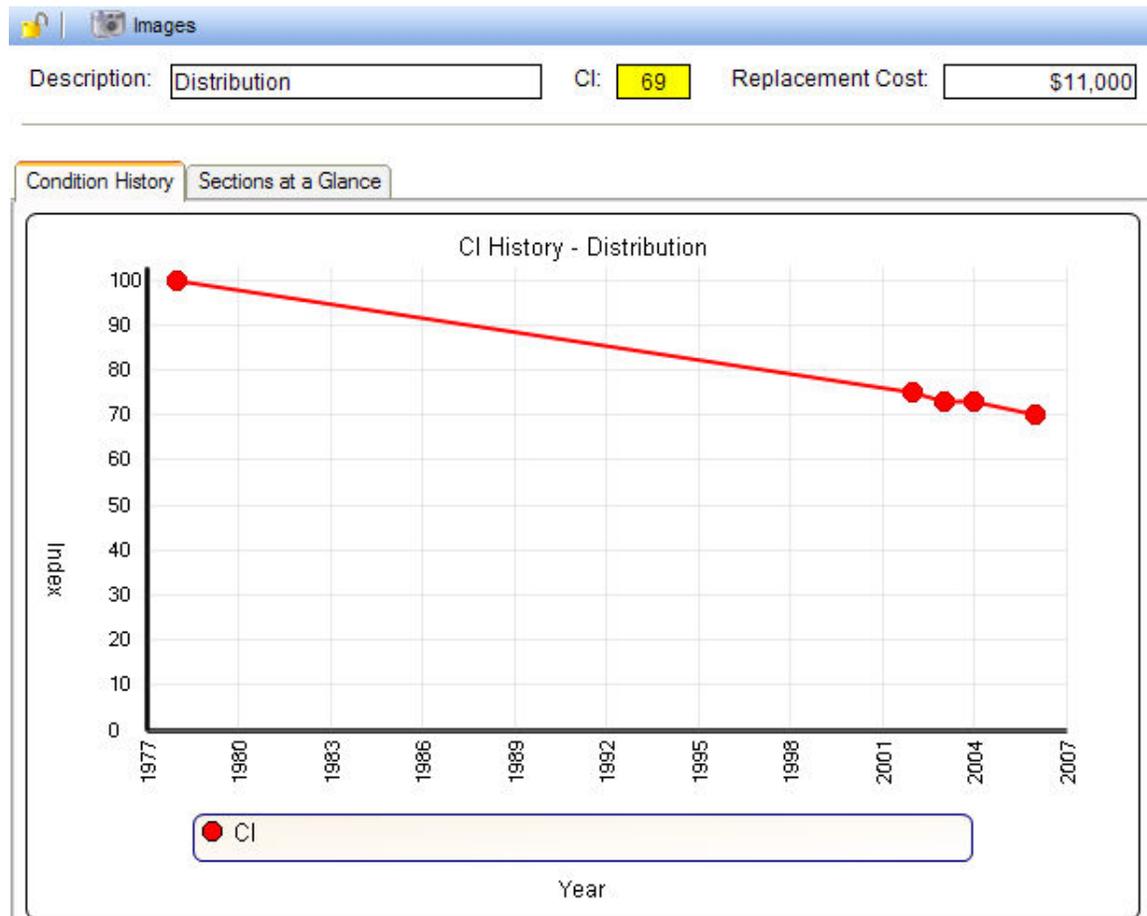
Viewing an Existing Component

Data for an existing components can be viewed by selecting the component in the inventory tree. At the top of the context area, the component description, building component condition index (BCCI), and component replacement cost are shown.

Additional information regarding the component is found in the different tabs and is described below.

Condition History Tab

The Condition History tab displays a graph of the CI history of the component over time.



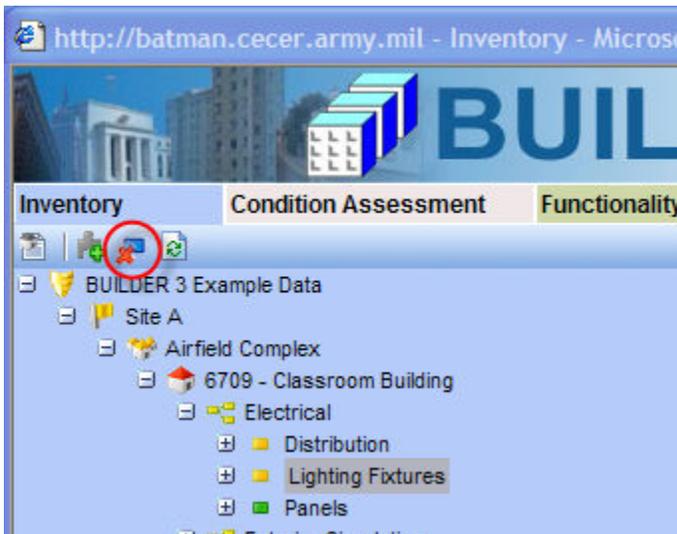
Sections at a Glance Tab

The Sections at a Glance tab shows the inventoried sections in the system, each section's CSCI, and each section's replacement cost. The replacement cost is computed from BUILDER's cost models based on section type and section quantity, and the CSCI is computed based on condition assessment data for the section.



Deleting an Existing Component

To delete a system component, select the component in the Inventory Tree, right-click it, and select *Delete*.



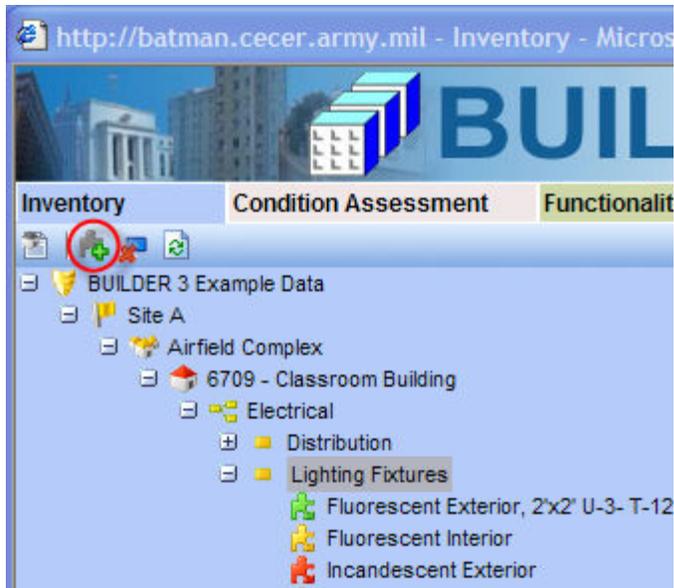
It is important to note that deleting a component will all sections in the component. Be sure that you wish to take this action. This is a significant step to take and should only be done when you are certain that you wish to clear the entire inventory of the system you have selected. Making frequent backups of your inventory database will protect you from significant data losses if mistakes in deleting are made.

Adding and Editing a Section

Please be sure to read the topic [Identifying Systems, Components and Sections](#) before proceeding with this topic.

Adding a Section

A new section can be added to an existing component by selecting the component in the inventory tree and clicking the *Add Section* button.



The context area of the BUILDER screen will appear as shown below.

Section Name:

Material Category:

Component Subtype:

Quantity: EA

Year Built/Renewed: Estimated

Painted/Coated:

Year Painted/Coated:

Paint/Coating Type:

Before adding the section, the following data must be recorded:

- Section Name.** Enter the name of the section. A section is described by its name, its material/equipment category, and its component subtype. You may have multiple sections of the same material/equipment category and component subtype, but each such section must have a unique name. A given section name may be used, however, for the sections of different systems and components, which allows the section name to be used in organizing your inventory and condition assessment procedures. For example, you may use the section name "Room 101" for the floor, walls, doors, plumbing, HVAC etc. sections in Room 101. When inspecting Room

101, all of the building sections with the name "Room 101" can be easily selected. To simplify the process of creating multiple types of sections with the same section name, the Section Name property includes a dropdown list of current section names for the building. You may either type in a new section name or choose a name from the dropdown list.

- **Material/Equipment Category.** Select the material/equipment category of the section from the dropdown list. Each component has a set of distinct material/equipment categories. For example, a "Door" component has material categories "Wood", "Metal", "Glass", etc.
- **Component Subtype.** Select the component subtype of the section from the dropdown list. Each component type and material/equipment category has a set of distinct component subtypes. For example, a "Door" component with material category "Wood" has component subtypes of "Personnel", "Overhead", etc.
- **Quantity.** Enter the quantity of the section.
- **Year Built/Renewed.** Enter the four-digit year the section was built (or installed if equipment) or renewed. If you have no record of the year the section was last replaced, you can enter an estimated year and check the Estimated checkbox. Initially, BUILDER algorithms estimate the year the section was last replaced. The default value is the building's year of construction if the age of the building is less than 1.5 times the expected service life of the section. If the estimating algorithm is used or you are unsure of when the section was built/renewed, make sure you mark the Estimated checkbox.
- **Painted/Coated.** Mark this checkbox if section is painted or has a surface coating.
- **Year Painted/Coated.** If the section is marked as painted/coated, enter the four-digit year the section was last painted. If you have no record of the year the section was last painted/coated, you can enter an estimated year and check the Estimated checkbox. Initially, BUILDER algorithms estimate the year in which the section was last painted/coated. The default value is the building's year of construction if the age of the building is less than 1.5 times the expected paint life of the section. If the estimating algorithm is used or you are unsure of when the section was last painted/coated, make sure you mark the Estimated checkbox.
- **Paint/Coating Type.** If the section is marked as painted/coated, select the paint/coating type from the dropdown list.

After adding the section data, click the ADD button to add the section to your inventory. If you do not wish to add the section, click the CANCEL button to close the form.

Editing Section Data

Data for a given section can be viewed and edited by selecting the section in the inventory tree.

The screenshot shows the BUILDER software interface. The top navigation bar includes 'Inventory', 'Condition Assessment', 'Functionality Assessment', 'Work Management', 'IMPACT', 'Tools', and 'GIS'. The left sidebar shows a tree view of the inventory structure, with 'Fluorescent Exterior, 2x2' U-3- T-12' selected. The main content area displays the 'General Information' tab for this section. The 'Section Name' is 'N/A', 'Equipment Category' is 'Fluorescent', and 'Component Subtype' is 'Exterior, 2x2' U-3- T-12'. The 'Quantity' is 1 EA, and 'Year Install/Renewed' is 1978 with the 'Estimated' checkbox checked. The 'Age' is 2007 and 'RSL' is 12. The 'Latest Inspection' CSCI is empty, and the 'Current Estimated Condition' CSCI is 97.

Toolbar

- **SAVE.** Use this button to save the changes you have made.
- **COMMENT.** Use this button allows you to add, edit, and view comments about the section.
- **IMAGES.** Use this button to add and remove images of the section.
- **REPORTS.** Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to section inventory. See [Using the Report Viewer](#).

General Information Tab

After a section is selected in the inventory navigation tree the General Information tab is shown, and all of the section data described above can be edited.

The screenshot shows the BUILDER software interface with the 'General Information' tab selected. The 'Section Name' is 'N/A', 'Equipment Category' is 'Central Station', and 'Component Subtype' is '12000-14000 CFM'. The 'Quantity' is 2 EA, and 'Year Install/Renewed' is 1985 with the 'Estimated' checkbox unchecked. The 'Age' is 21 and 'RSL' is 4. The 'Latest Inspection' is dated 09/20/2001 and the CSCI is 94. The 'Current Estimated Condition' CSCI is 65.

Additional data on this tab includes:

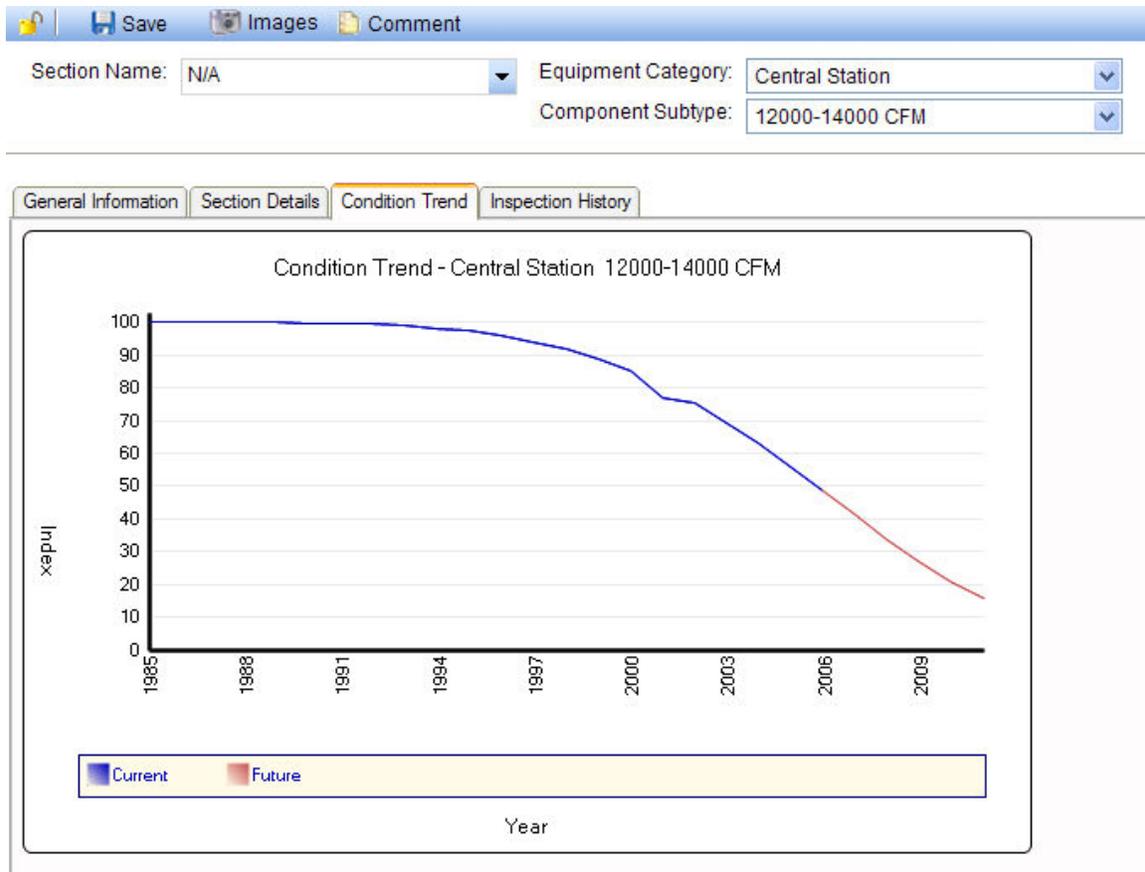
- **Age** (Read-Only). Displays the age of the section calculated from the Year Installed/Built.
- **RSL** (Read-Only). Displays the remaining [service life](#), in years, of the section. The remaining service life is calculated during the [CI roll-up process](#) using age, section service life, and section condition index trend.
- **Last Inspection** (Read-Only). Displays the date that the last condition assessment was performed on the section. Also displayed is the component-section condition index (CSCI) computed on the inspection date based on the assessment results. If the section is painted, the Coating Condition Index (CCI) computed at the last inspection date will also be shown.
- **Current Estimated Condition** (Read-Only). Displays the estimated CSCI based on service life and condition index trend. The estimated CSCI is computed during the [CI roll-up process](#), a process that should be performed on a regular basis. If the section is painted, the CCI computed at the last inspection date will also be shown. If the section is painted, the current estimated CCI will also be shown.

Section Details Tab

In addition to the General Information tab, you can store additional data about the section in the [Section Details](#).

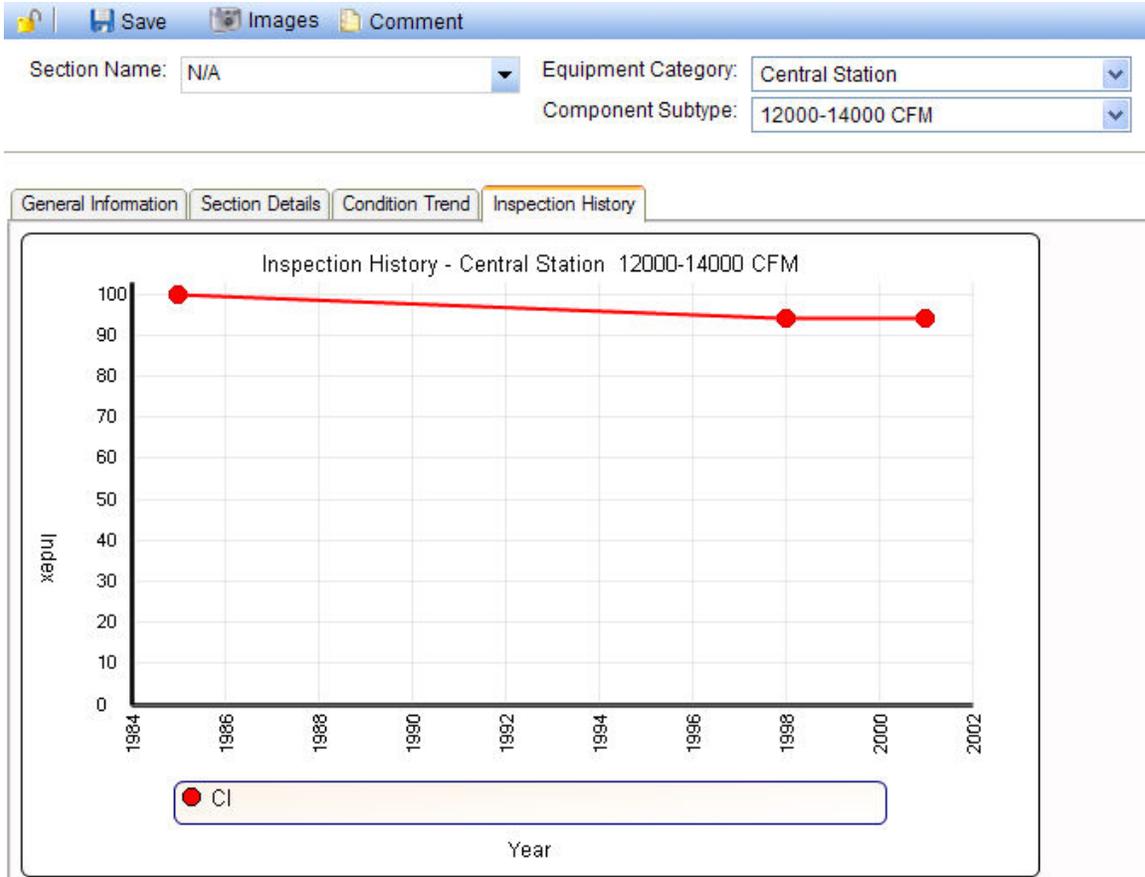
Condition Trend Tab

The Condition Trend tab shows the trend of the CSCI based on inspection information, as well as the projected CSCI trend into the future based on observed deterioration rates and expected service life.



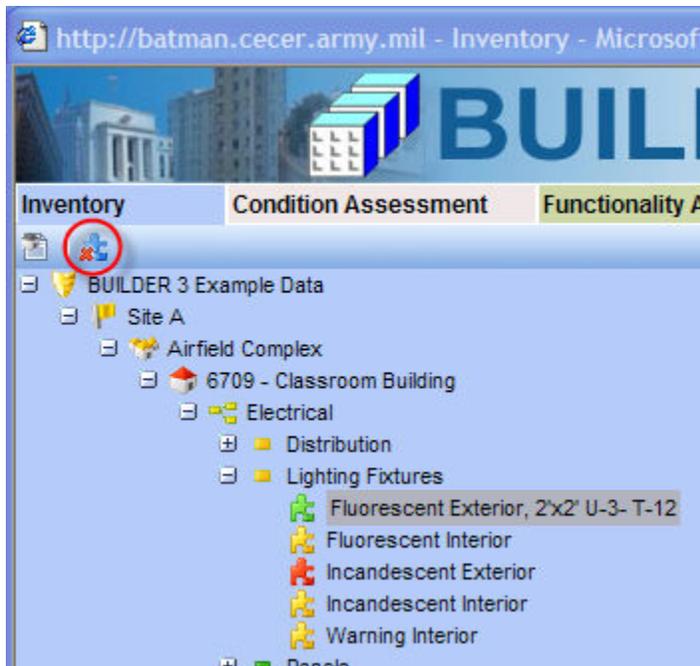
Inspection History Tab

The Inspection History tab displays a graph of the CSCI history of the section over time, based on inspection information.



Deleting a Section

To delete a section, select the section in the Inventory Tree, right-click it, and select *Delete*.



This is a significant step to take and should only be done when you are certain that you wish to clear the section you have selected from the inventory in the building. Making frequent backups of your inventory database will protect you from significant data losses if mistakes in deleting are made.

Section Details

Section details include critical information regarding warranties, model number, manufacturer, equipment serial numbers and property identifiers, and location. After defining a section, you may add details regarding individual items of equipment or constructed elements on the Section Details tab, as shown below. Use the ADD DETAIL and DELETE DETAIL buttons at the bottom of the screen to add and delete details for the section.

Section Name: N/A Equipment Category: Central Station Component Subtype: 12000-14000 CFM

ID Number	Equipment Type	Equipment Make	Model	Serial Number	Capacity	Manuf
AHU010	Central Station	Dual	320-345-342	324kjakl34332	12500 CFM	Trane

Add Detail Delete Detail

Toolbar

- **SAVE.** Use this button to save the changes you have made to the section detail.
- **COMMENT.** Use this button to add, edit, and view comments about the section details.
- **IMAGES.** Use this button to add and remove images of the section.

Section Detail Data

Because section detail data can be recorded for equipment and non-equipment section types, some of the data elements may not apply to a particular component-section. Simply fill in the applicable data fields and leave the non-applicable fields blank. Section detail data that can be entered includes:

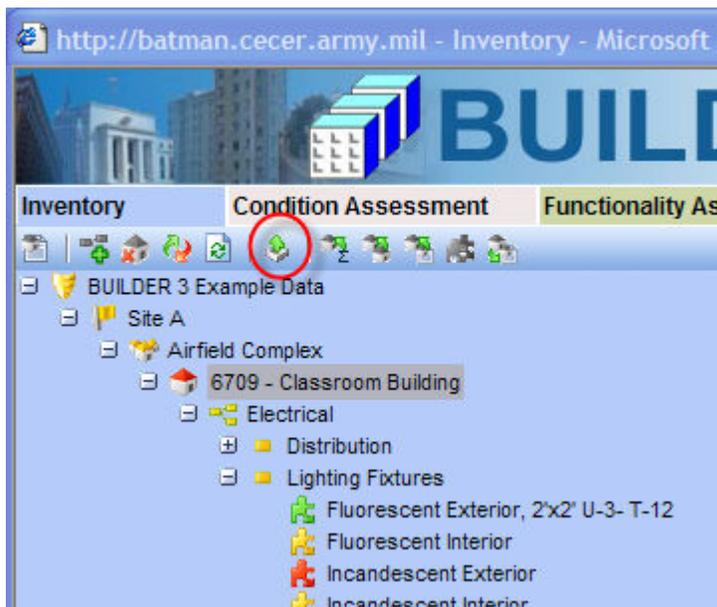
- **ID Number** (Required for individual items of equipment; not used for non-equipment section types). Enter the identifier for the individual equipment, limited to 20 alphanumeric characters.
- **Equipment Type.** Enter the equipment type of the section, limited to 50 alphanumeric characters.
- **Equipment Make.** Enter the equipment make of the section, limited to 30 alphanumeric characters.
- **Serial Number.** Enter the serial number of the section, limited to 30 alphanumeric characters.
- **Model.** Enter the section model, limited to 20 alphanumeric characters.
- **Capacity.** Enter the capacity of the section, limited to 70 alphanumeric characters.
- **Manufacturer.** Enter the manufacturer of the section, limited to 40 alphanumeric characters.
- **Warranty Company.** If the section has a warranty, enter each warranty company, which is limited to 50 alphanumeric characters each. For each section, two warranty companies may be listed.

- **Warranty Date.** If the section has a warranty, select each warranty date using the dropdown calendar. For each section, two warranty dates may be listed, numbered to match the warranty company.
- **Location.** Enter the section location, limited to 40 alphanumeric characters.
- **Date Manufactured.** Select the date the section was manufactured using the dropdown calendar.
- **Control Type/Make.** Enter the section control type or make, limited to 50 alphanumeric characters.
- **Year Installed.** Enter the 4-digit year the section was installed.
- **Comment.** Enter comments about the section.

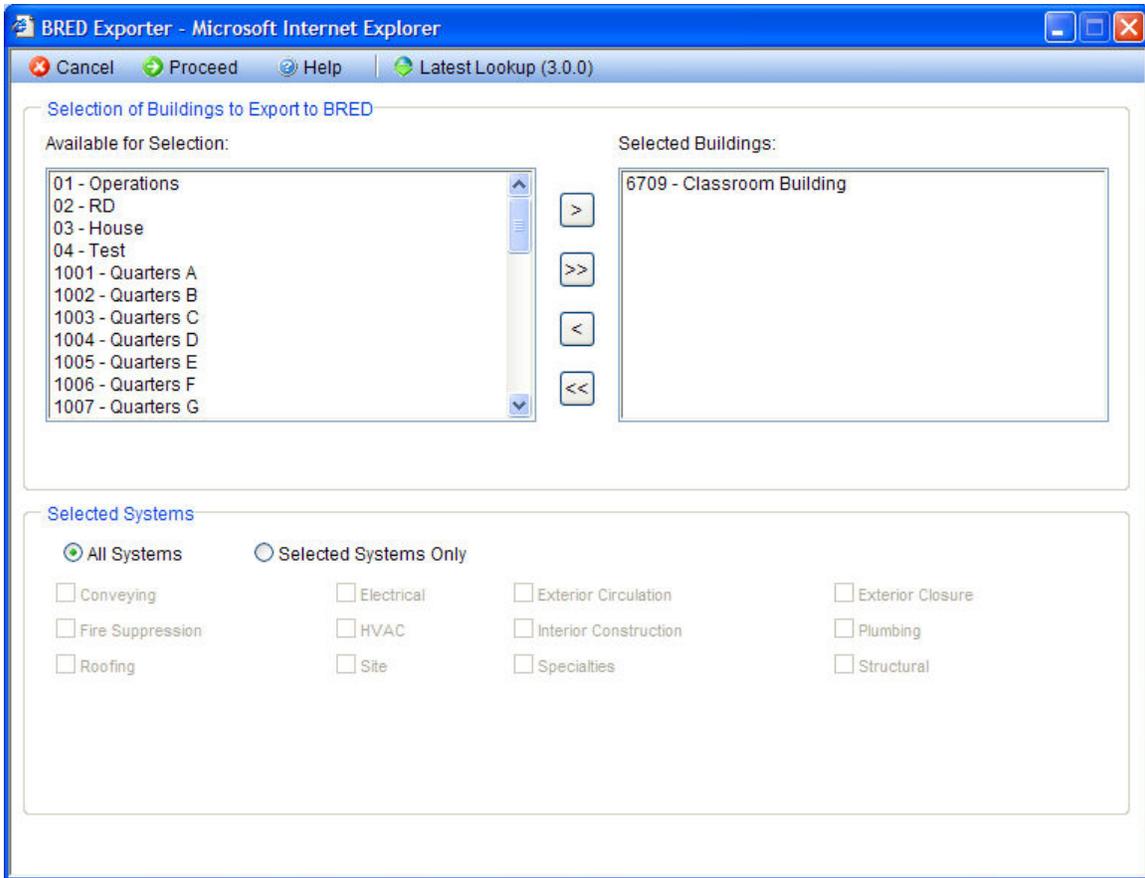
Exporting Data to BRED

The BUILDER Remote Entry Database (BRED) software program allows you to electronically collect inventory and condition assessment data using a handheld pen-based computer as you walk through the building. BRED was developed by the U.S. Army Corps of Engineers at ERDC-CERL and is intended to be used with conjunction with the EMS Enterprise Framework. Using BRED to collect data instead of pen and paper techniques provide many advantages, most notably savings in time and costs, and should be used whenever possible.

Before BRED can be used to collect data for existing buildings in your inventory, a database that can be uploaded into BRED must be exported from BUILDER. To export a database to upload into BRED, select the smallest organizational item in the inventory tree that contains all of the buildings with data that will be exported and click the *Export to BRED* button from the navigation menu, or right click on an item in the tree and choose *Export to BRED*



The BRED Exporter window will appear.



In this window input the required data, including:

- **Selected Buildings.** Select the buildings that data will be exported for. To add a building to the Selected Buildings list, select it in the Available for Selection list and use the arrow buttons to move it to the Selected Buildings list.
- **Selected Systems.** Select the systems that data will be exported for the selected buildings. The default option is All Systems, but you may choose to export any number and combination of buildings systems. If you choose to export only some of the systems, click the Selected Systems Only button and check the systems you wish to export individually.

After entering the necessary data, click the PROCEED button to initiate the export process. Clicking the CANCEL button at any time will cancel any pending activity and close the window.

By clicking the PROCEED button, the following tasks area accomplished:

- A Microsoft Access database is created, which is identified by path and name you chose after the export has completed. The database will contain the inventory and condition assessment data for the selected systems in the buildings in the Selected Buildings list. This database is accessible to a computer with the BRED software, where inventory and/or condition

assessment data can be recorded. Once complete, this file can be [imported into BUILDER](#) to add the new data is added to the database.

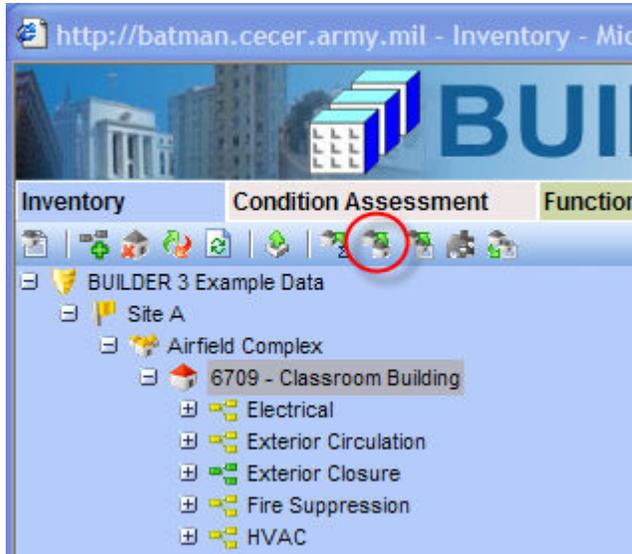
- The building inventory records of the selected systems that were exported are locked so changes cannot be made to them in BUILDER while being edited with BRED. The records are unlocked when the BRED data is imported back into the database.
- The *Latest Lookup (3.x.x)* button allows users to download the latest version of the lookup database that contains BUILDER's inventory lists, so that BRED lists are always current and in sync with BUILDER.

Rapid Inventory Methods

Copying a Building

BUILDER has been designed to help you quickly establish an inventory database for your buildings. One of the most time-consuming aspects is the decomposition of a building into its systems, components, and sections. One method that eases the data input process is copying a building's inventory from one building to another. This feature is very useful if you have a number of buildings in your inventory that were all built at the same time using the same plans and specifications.

Before you can copy a building's inventory from one building to another, you must first [create the building](#) and complete its inventory as fully as possible, including all of the related building data. Once the building has been created, select it in the inventory tree and click the *Copy Inventory to Another Building* button.



The Copy Building window will appear, and the building whose inventory you wish to copy should appear in the Select Building to Copy dropdown list.

In the Copy Target section of the window, select whether you want to copy that building's inventory to a New Building or into an Existing Building. If you select a New Building, you must supply Building Number and Building Name. If you select an Existing Building, a list of buildings currently in the inventory will be shown and you can select the building you wish to copy the inventory to.

In the Record Categories to be Included section of the window, check all of the categories you wish to have copied to the new/existing building. The following record categories can be copied to the new/existing building:

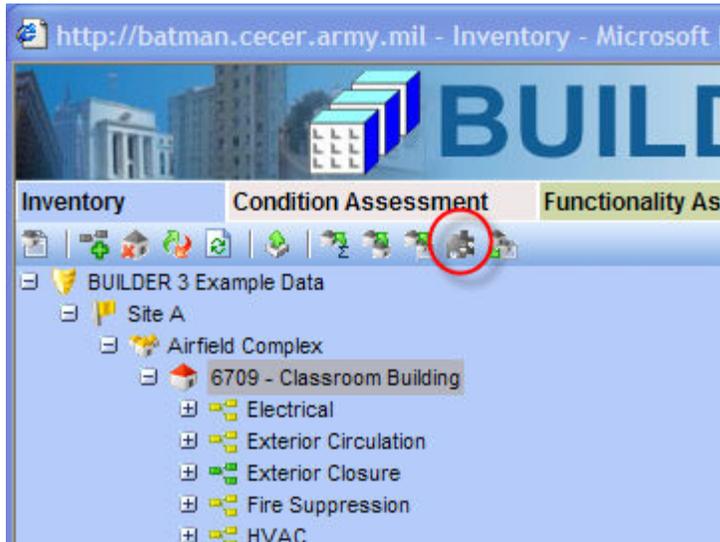
- **System/Component Structure.** Marking this checkbox will copy all of the systems, components, and sections to the new/existing building.
- **Copy Section Date as "Estimated".** Marking this checkbox will mark all of the section install dates in the new/existing building as estimated. This checkbox can only be marked if the System/Component Structure checkbox is marked.
- **Last Inspection Rating.** Marking this checkbox will copy the last condition assessment rating for each section to the new/existing building. This checkbox can only be marked if the System/Component Structure checkbox is marked.
- **Architect/Contractor Information.** Marking this checkbox will copy all of the [architect and contractor information](#) to the new/existing building.
- **Applicable Housing Information.** Marking this checkbox will copy all of the [housing information](#) from the family housing screen to the new/existing building.
- **Building Dimension Data.** Marking this checkbox will copy all of the [dimension data](#) to the new/existing building.

Click the PROCEED button to start the copy process. After the copy process is complete, you can edit all of the copied building's records if adjustments are necessary. If you do not wish to copy the building, click the CLOSE button.

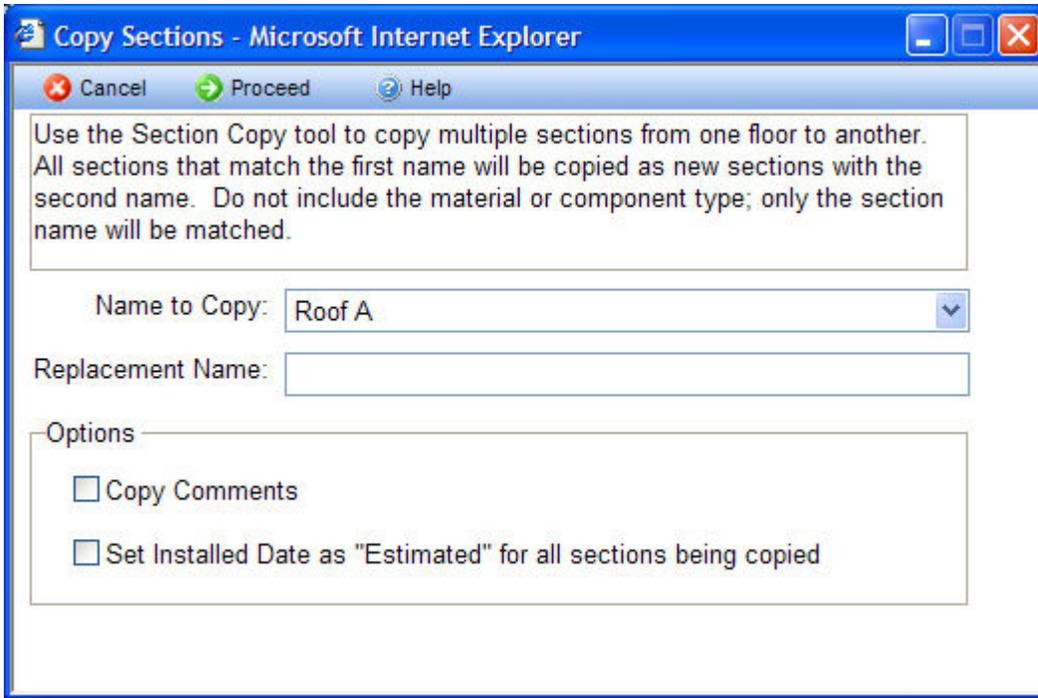
Copy Sections

BUILDER has been designed to help you quickly establish an inventory database for your buildings. One of the most time-consuming aspects is the decomposition of a building into its systems, components, and sections. One method that eases the data input process is the Copy Sections tool, which allows you to copy pre-existing sections from one area of a building to another area of the same building. An example of when to use this tool is in a multistory building with similar or identical inventory on multiple floors. The first floor can be inventoried and then copied to other floors, saving time and reducing inventory costs.

To use the copy sections tool, select the building you wish to copy the sections in from the inventory tree and click the *Copy Sections* button.



The Copy Sections window will appear.



In the copy sections window, enter the following data:

- **Name to Copy** (Required). Choose the existing section name to copy from the dropdown list. All sections that match the selected name will be copied as new sections.
- **Replacement Name** (Required). Enter the replacement name for the copied sections. The replacement name will appear as the section name for the copied sections.
- **Copy Comment** (Optional). Mark the Copy Comments checkbox if you wish to copy the comments associated with the copied sections and associate them with the replacement sections also.
- **Set Installed Date as "Estimated" for all sections being copied** (Optional). Mark this checkbox if you want all of the replacement sections' year installed to be marked as estimated.

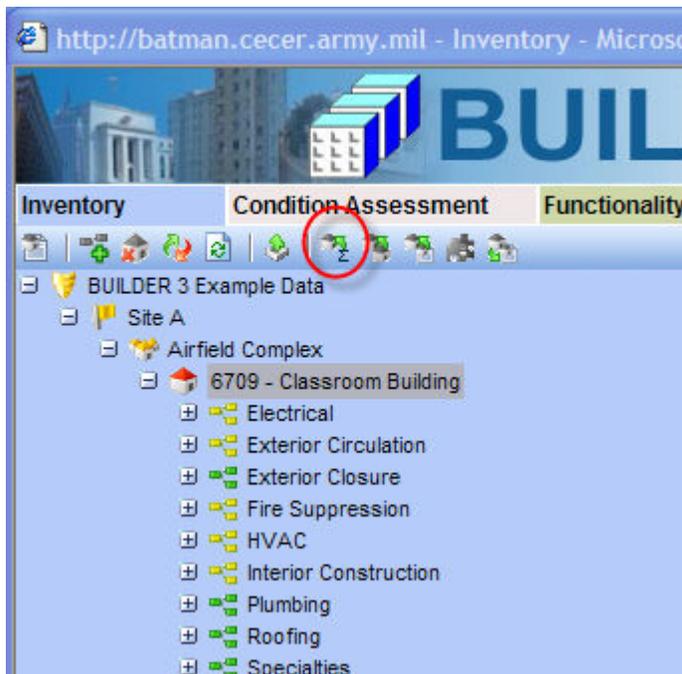
After all of the data has been entered, click the PROCEED button in the toolbar to copy the sections. The copied sections will be added to the database and appear on the inventory tree. If you do not wish to copy the sections, click the CANCEL button.

Using the Embedded Building Models

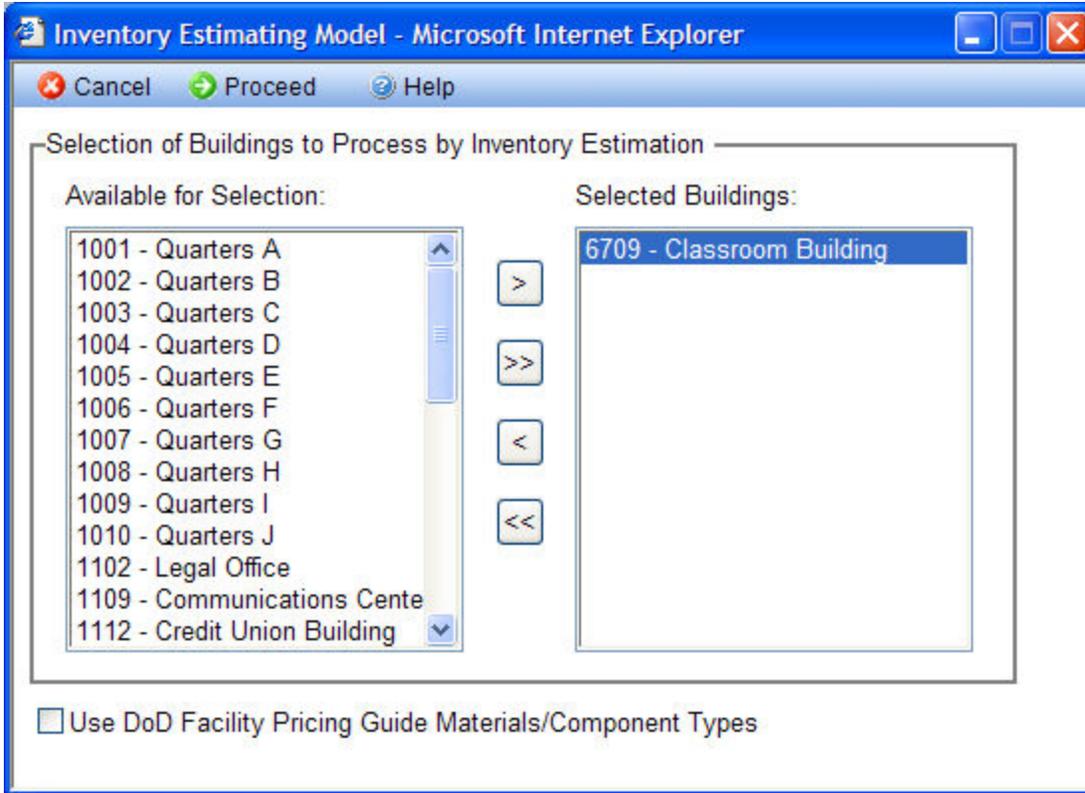
BUILDER has been designed to help you quickly establish an inventory database for your buildings. One of the most time-consuming aspects is the decomposition of a building into its systems, components, and sections. To help with this building decomposition, BUILDER has a set of embedded building models that construct an initial breakdown of systems, components, and sections in buildings based on the building use type, size, age, and number of floors. The building models were established by the Department of Defense under the Unified Facilities Criteria (UFC) system and published in the [DoD Facilities Pricing Guide](#).

BUILDER provides two options when using the embedded models for estimating building composition. The default model identifies likely components but creates sections of unknown material/equipment type and unknown component type. The DoD model identifies a specific material/equipment type and component type for each section. For example, the generic model may create a section of 10 doors of material type "Unknown" and component type "Unknown", while the DoD model may create a section of 10 doors of material type "Metal" and component type "Personnel". After applying either model, you will be able to edit the data for each building to increase accuracy. This refinement of the data can be done gradually over time as your needs require and as more accurate data becomes available.

Before the embedded models can be used, the buildings you wish to use the models on must [be created](#) and the general building information must be entered. Once the buildings are created, select the smallest organizational item in the inventory tree that contains all of the buildings that are to be expanded using the embedded models click the *Rapid Inventory Estimation* button.



The Inventory Estimating Model window will appear.



Select the buildings you wish to estimate the inventory for using the embedded models on the Available for Selection list and use the directional buttons to move them to the Selected Buildings list. If you wish to use the DoD model for this process, check the box at the bottom of the window, otherwise the generic model will be used.

Click the PROCEED button to start the estimation process. When the process is complete, you will be able to review and edit the systems, components, and sections created during the estimation. If you do not wish to estimate the inventory of the building(s), click the CANCEL button.

Building Templates

Using Building Templates

BUILDER has been designed to help you quickly establish an inventory database for your buildings. One of the most time-consuming aspects is the decomposition of a building into its systems, components, and sections. The Building Template feature is designed to ease the inventory development process in BUILDER. If your physical inventory contains a number of buildings that are essentially of the same design and composition, you can establish a template for that design to use as a "cookie cutter" and then apply an automated process with the template to create the matching buildings in your BUILDER inventory with little additional effort.

A building template looks very much like a building in BUILDER. Every data element belonging to a template or one of its substructures has a corresponding data element

in a building. A template has general building data such as use, size, and number of floors as well as a decomposition into systems, components, sections (including section details). If the template is designated as family housing, then you may specify data about each dwelling unit regarding number of rooms and types and makes of appliances. A template does not have data that is only known for each specific building, such as its year of construction, its condition ratings, its costs, its location, etc.

The template feature is designed to be used as an initial step in the construction of your inventory database. However, in order to achieve the greatest benefit from using templates, you must be very familiar with BUILDER's approach to inventorying a building. See [Adding a Building](#) and [Identifying Systems, Components and Sections](#) for important information regarding how buildings and their template counterparts are structured in the database.

BUILDER offers several methods for creating a template:

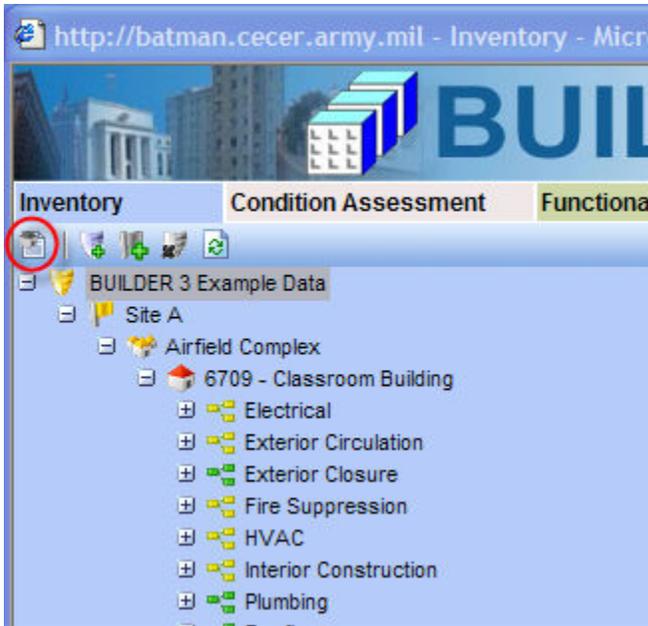
1. You can create a template by inputting each data element in much the same way that you create a building. See [Managing the Template Library](#) for instructions regarding this method.
2. Since each building in your inventory database has all of the comparable data elements of a template, you may create a template quickly by [copying an existing building's data into a template](#).
3. You can [import templates](#) from another user's template library for use in your own library. This import capability is especially useful for military installations, which may have many buildings constructed from a few standard service-wide designs.

Once a template is established, a building with the same design can be created in an automated fashion by copying the template data into the appropriate building data elements. This process can save hours of manual input if you have multiple buildings for which the template applies. See [Creating Building Inventory Using Templates](#) to learn how to use a template to create or expand the data for one building at a time and for multiple buildings at the same time.

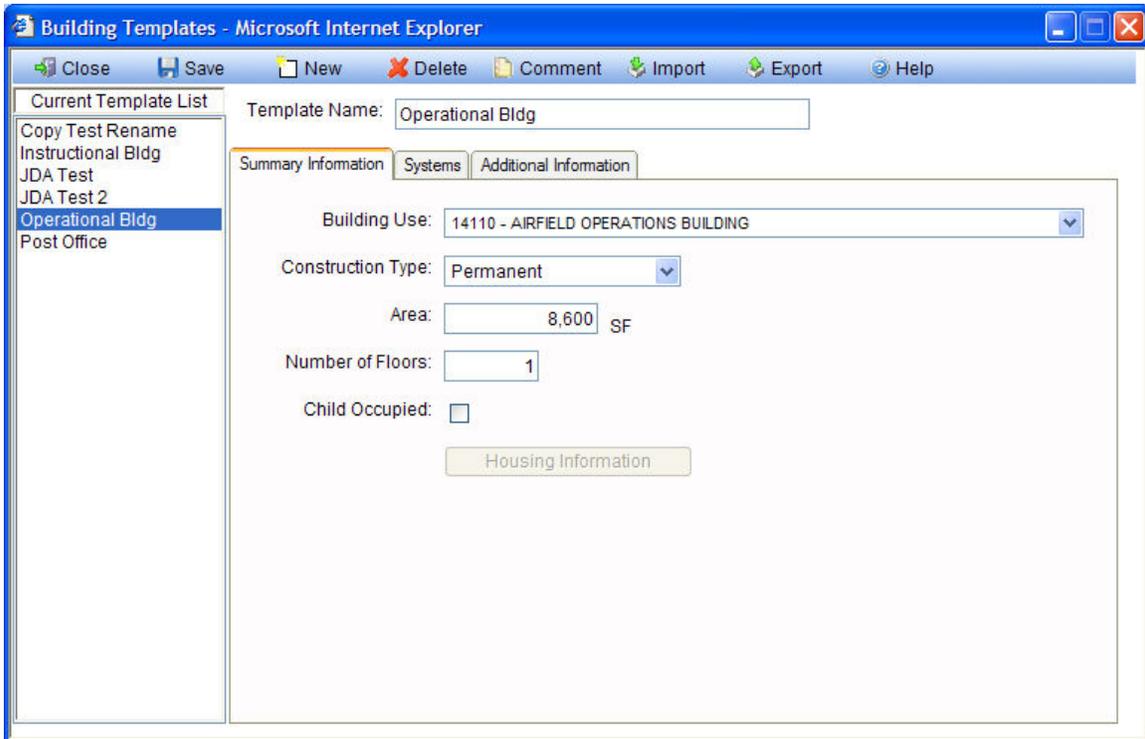
Managing the Template Library

Building templates provide a convenient method for rapidly creating your building inventory when you have multiple buildings with the same design and composition. A template stores the basic data about a generic building and can be used to create many buildings at one time using an automated process that copies the structure of the template to each desired building. For more information about templates, see [Using Building Templates](#).

BUILDER stores all of the templates in your database in a template library. From the template library you are able to manually add, edit, and delete templates in your database. To manage the template library, click the *Building Templates* button from the navigation menu.



The Building Template window will appear.



The Building Templates window lists the current templates in the library on the left side and the data for the selected template on the right side. The data on the different tabs are described below.

Toolbar

- CLOSE. Use this button to close the Building Template window.
- SAVE. Use this button to save the changes you have made to the building templates.
- NEW. Use this button to create a new template.
- DELETE. Use this button to delete the template currently selected.
- COMMENT. Use this button to add, edit, and view comments for the template.
- IMPORT. Use this button to [import templates](#) from other sources.
- EXPORT. Use this button to [export templates](#) to other sources.

Summary Information Tab

The following data appears on the Summary Information tab and can be edited.

- **Name** (Required). Enter the name that will appear in the template list and must be unique among the templates in your library. If you expect to create a large template library, especially if you anticipate sharing your library with others or importing other user's templates, then the name you choose here should be sufficiently descriptive of the building type to allow it to be safely and efficiently selected for use. Consider using a combination of its Building Use type with a specific model or style description. The use of single quotes, double quotes, and ampersands is discouraged as these characters occasionally interfere with query formation.
- **Building Use**. Select the building use from the dropdown list that most closely matches the buildings use.
- **Construction Type**. Select the construction type from the dropdown list that matches the building. Construction type options include:
 - Permanent
 - Semi-Permanent
 - Temporary
 - Leased
- **Area** (Required). Enter here the gross area of the building.
- **Number of Floors** (Required). Enter the number of floors in the building.
- **Child-Occupied**. Mark this checkbox if the facility is child-occupied.
- **Housing Information**. If the template is residential in nature (single family dwelling, multi-family dwelling, apartment building), then you can save more information about each dwelling unit, including the number of rooms by type and available appliances. This follows the pattern of [Family Housing Data](#) for a building, except that data regarding house numbers, dates and warranties is omitted.

Systems Tabs

The Systems tab gives you access to the data regarding the decomposition of the building into systems, components, and sections.

Note that this tab is arranged hierarchically, with systems containing components which contain sections. Use the buttons to the right of each respective dropdown list to add or delete inventory to the template. Once a system is added, you may define components for that system. Once a component is added you may define sections for that component. This follows the same pattern used for buildings, except that building-specific data (e.g. condition, age, year installed or built, year painted, and warranty dates and companies) is not used for templates. See [Identifying Systems, Components and Sections](#) for a description of how buildings are decomposed by system.

Each section has two data elements for input:

- **Quantity.** Enter the quantity of the section.
- **Painted/Coated.** Mark this checkbox if section is painted or has a surface coating.

Additional data for the section can be added by clicking the DETAILS button, which will launch the [section details](#) window. The data element displayed for each component, Number of Sections, is a rollup value from the section-level and is read-only.

Additional Information Tab

The Additional Information tab provides a location to store additional building data.

Summary Information Systems **Additional Information**

Dimensions

Perimeter: LF

Description	Length	Width
Wing A	50	40

NOTE: Length and width are measured in linear feet.

Building Design

Architect:

Contractor:

The data that can be recorded on this tab includes:

Dimensions

- **Perimeter.** Enter the linear measure of the perimeter of the building.
- **Description.** Enter a description of the distinct areas of the building you wish to add dimensions for. For example, you may list "East Wing/West Wing", or "Offices/Library/Warehouse", or "Public Areas/Secure Areas." Each description is limited to 50 characters. Use the ADD DIMENSION and DELETE DIMENSION buttons to add and delete items from the list.
- **Length.** Enter the length of the area identified in the description.
- **Width.** Enter the width of the area identified in the description.

Building Design

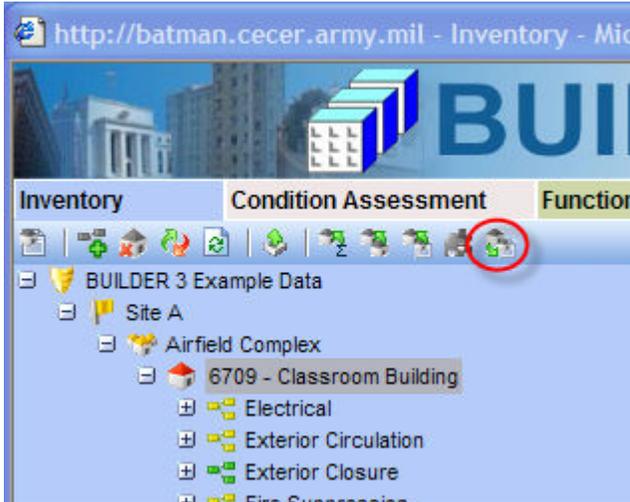
- **Architect.** Lists the architects of the building. Add and delete names by using the adjacent buttons. Each architect's name is limited to 30 characters.
- **Contractor.** Lists the contractors of the building. Add and delete names by using the adjacent buttons. Each contractor's name is limited to 30 characters.

Copying Building Inventory to a Template

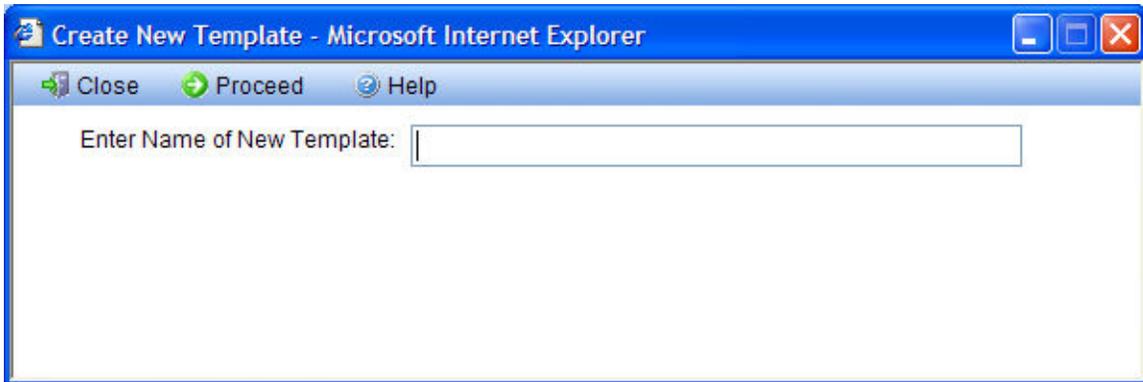
Building templates provide a convenient method for rapidly creating your building inventory when you have multiple buildings with the same design and composition. A template stores the basic data about a generic building and can be used to create

many buildings at one time using an automated process that copies the structure of the template to each desired building. For more information about templates, see [Using Building Templates](#).

To create a template by copying a building in your inventory, select the building in the inventory tree and click the *Copy Inventory to New Template* button.



The Copy Building to Template window will appear.



Enter the name of new template, which must be unique among the templates in your library, and click the PROCEED button to create the template. Click CLOSE if you do not wish to create the template.

Note that if you expect to create a large template library, especially if you anticipate sharing your library with others or importing other user's templates, then the name you choose here should be sufficiently descriptive of the building type to allow it to be safely and efficiently selected for use. The template name is allowed to be an alphanumeric string of 50 characters or less and the use of single quotes, double quotes, and ampersands is discouraged as these characters occasionally interfere with query formation.

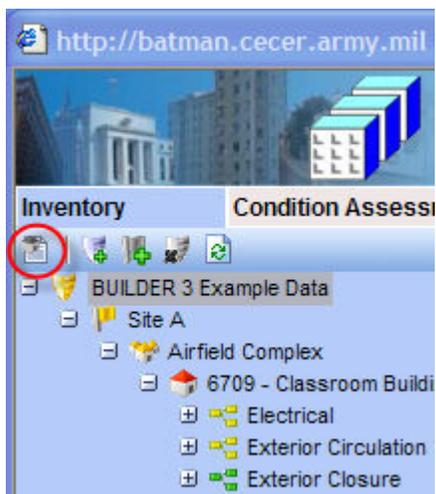
Importing and Exporting Building Templates

Building templates provide a convenient method for rapidly creating your building inventory when you have multiple buildings with the same design and composition. A template stores the basic data about a generic building and can be used to create many buildings at one time using an automated process that copies the structure of the template to each desired building. For more information about templates, see [Using Building Templates](#).

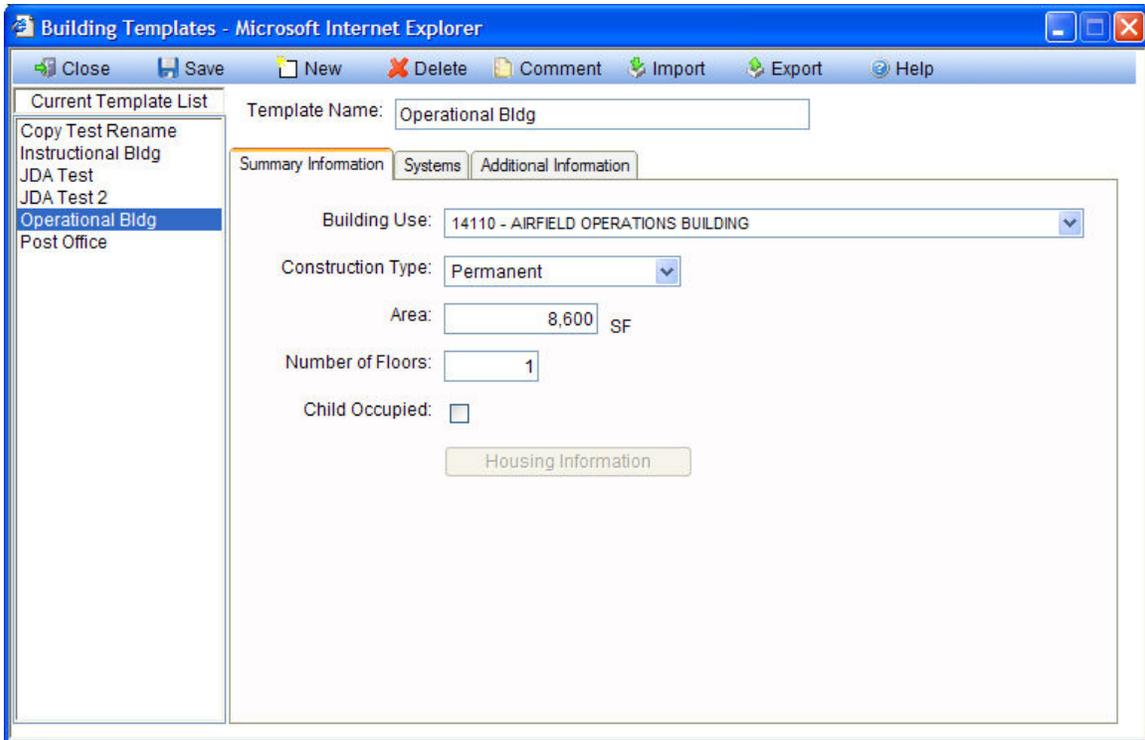
BUILDER allows for different users to share building templates by importing and exporting individual templates. This capability is especially useful for military installations, which may have many buildings constructed from a few standard service-wide designs.

Importing Building Templates

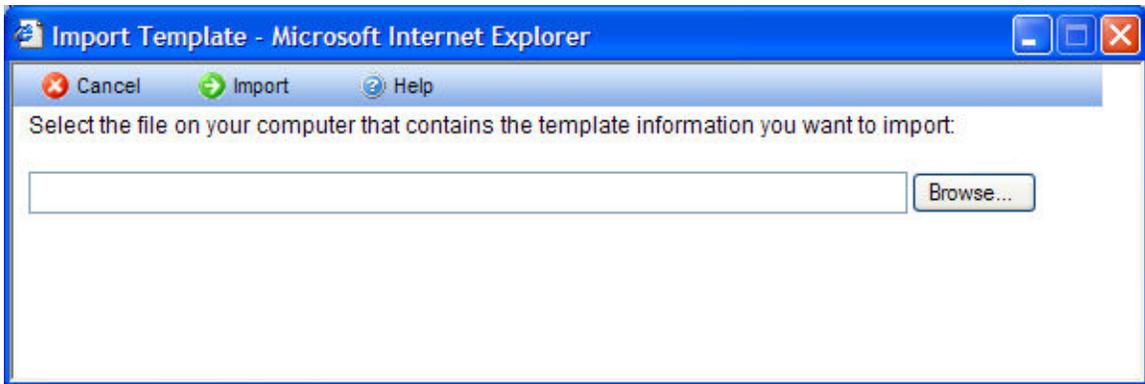
To import a template, open the template library by clicking the *Building Templates* button from the navigation menu.



The Building Template window will appear.



Select IMPORT from the toolbar, and the Import Template window will appear.



Use the BROWSE button to locate the template you wish to import into your template library, and click PROCEED. If you do not want to import a template, click the CANCEL button.

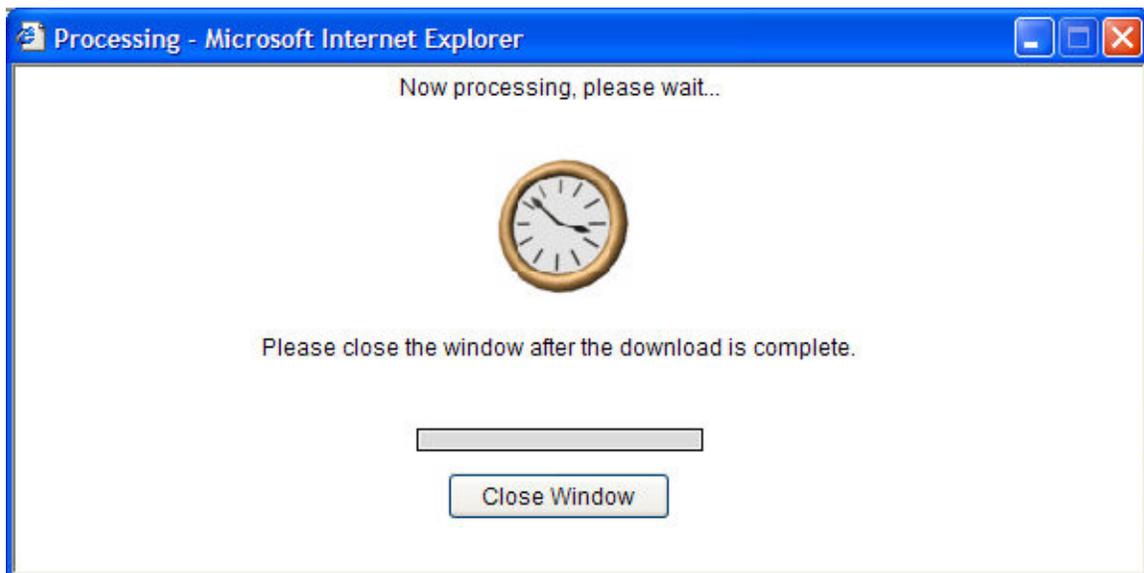
Before BUILDER imports your selections, checks of unique identifiers (internal data hidden from view) and template names are performed to avoid conflicts between your current template library and the templates being imported. If duplicate identifiers are found, the selected template will not be imported since it already exists in your library. If you are attempting to import a template with the same name but a different unique identifier as an existing template in your library, then the importing process will stop with an error message indicating the problem templates. If you still wish to import the problem templates, change the names of the corresponding templates in your library so that they are distinct from the

templates you wish to import. See [Managing the Template Library](#) for instructions regarding changing the name of a template in your library.

Note that the Building Use property of a template is dependent on the user category (Army, Navy, Air Force, Civilian, etc.). If you are managing an installation from one user category but importing building templates from a different user category, then the template Building Use properties will not match any of the building uses in your list. When you view each imported template, the Building Use property will be blank. You will have to select an appropriate Building Use property from your list of uses for each imported template. The template name can be used help choose an appropriate use.

Exporting Building Templates

To export a template, highlight it on the left side of the Building Template window and select EXPORT from the toolbar. The export process will begin, and the Processing screen shown below will appear.



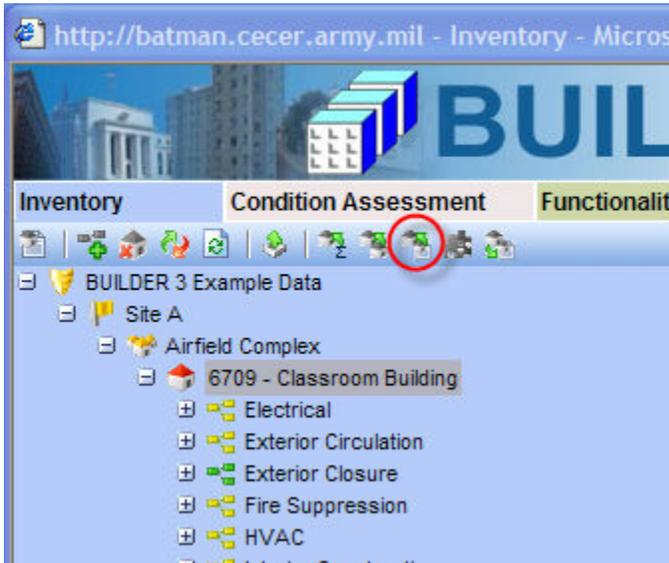
After the template has been successfully exported, you will be asked if you want to save or open the exported template. If you choose to save the template, you will be prompted for a path and file name for the exported template. The saved exported template can then be sent to other BUILDER users to be utilized in their template libraries. If you choose to open the exported template after the export is complete, the template will be open as a XML document.

Creating Building Inventory Using Templates

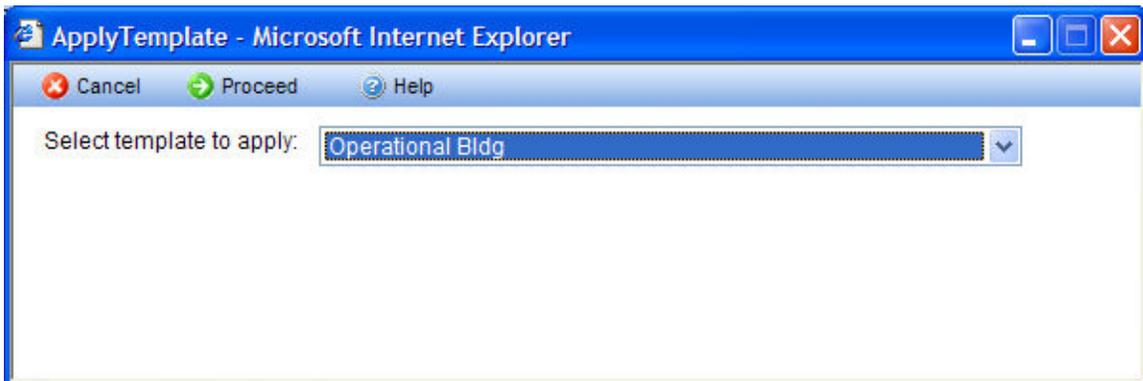
Building templates provide a convenient method for rapidly creating your building inventory when you have multiple buildings with the same design and composition. A template stores the basic data about a generic building and can be used to create many buildings at one time using an automated process that copies the structure of the template to each desired building. For more information about templates, see [Using Building Templates](#).

Creating Building Inventory for a Single Existing Building Using Templates

Once you have created a template, you can use it to create building inventory. If you have a single existing building and wish to expand its inventory using the template, select the building in the inventory tree. Take a look at the general information for the building to make sure that the data for important properties such as building use, area, and number of floors is correct. If you still wish to expand its inventory using the template, click the *Create Inventory Using Template* button.



This Apply Template window will appear.



Select the template you wish to apply to the building from the dropdown list and click PROCEED. If no systems have been created for the building prior to this point, the template's systems, components, sections, and section details will be copied to the building. However, if the building already had systems, the template's systems structure will not be copied to it.

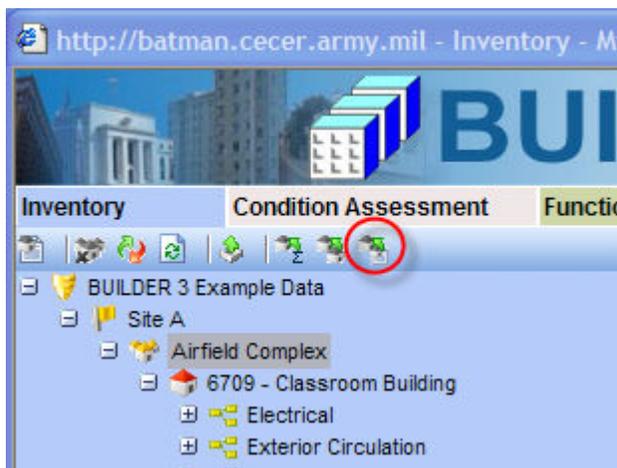
When the template process is complete, you will be able to select each of the newly created systems, components, and sections in the inventory tree and to edit the new data if adjustments need to be made. This same pattern applies to building dimensions, architects, contractors, and family housing records. That is, each of

these template lists will be copied to the building if and only if the building's corresponding list is empty. Otherwise, the building's existing list will be left unedited.

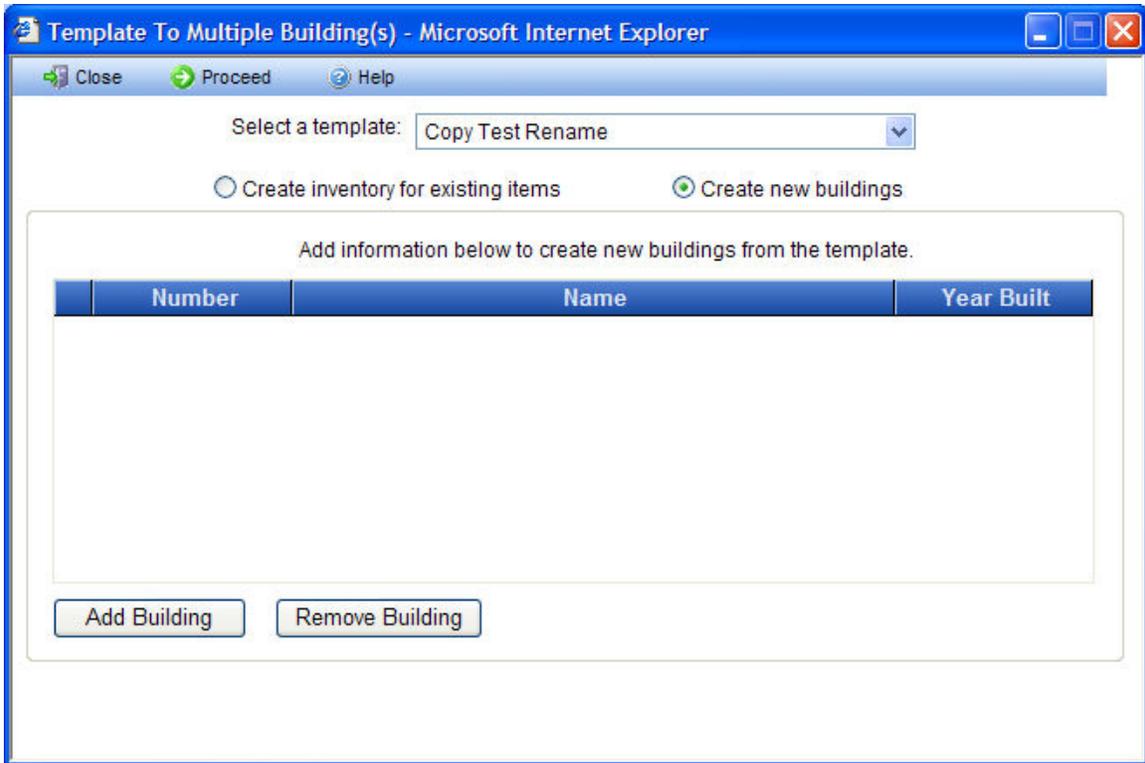
If you do not wish to apply the template to the building, click the CANCEL button.

Creating Building Inventory for Multiple Buildings Using Templates

The most efficient way to use templates is to create the inventory for multiple buildings at a time. To create inventory for multiple buildings using a template, select the smallest organizational item in the inventory tree that contains all of the buildings that will have inventory created using the template, click the *Create Inventory for Multiple Buildings Using Templates* button.



The Apply Template to Multiple Building window will appear:



When applying a template to multiple buildings, you have the option of either creating new buildings with the template or applying the template to multiple existing buildings. Each option is described below.

Create New Buildings Option

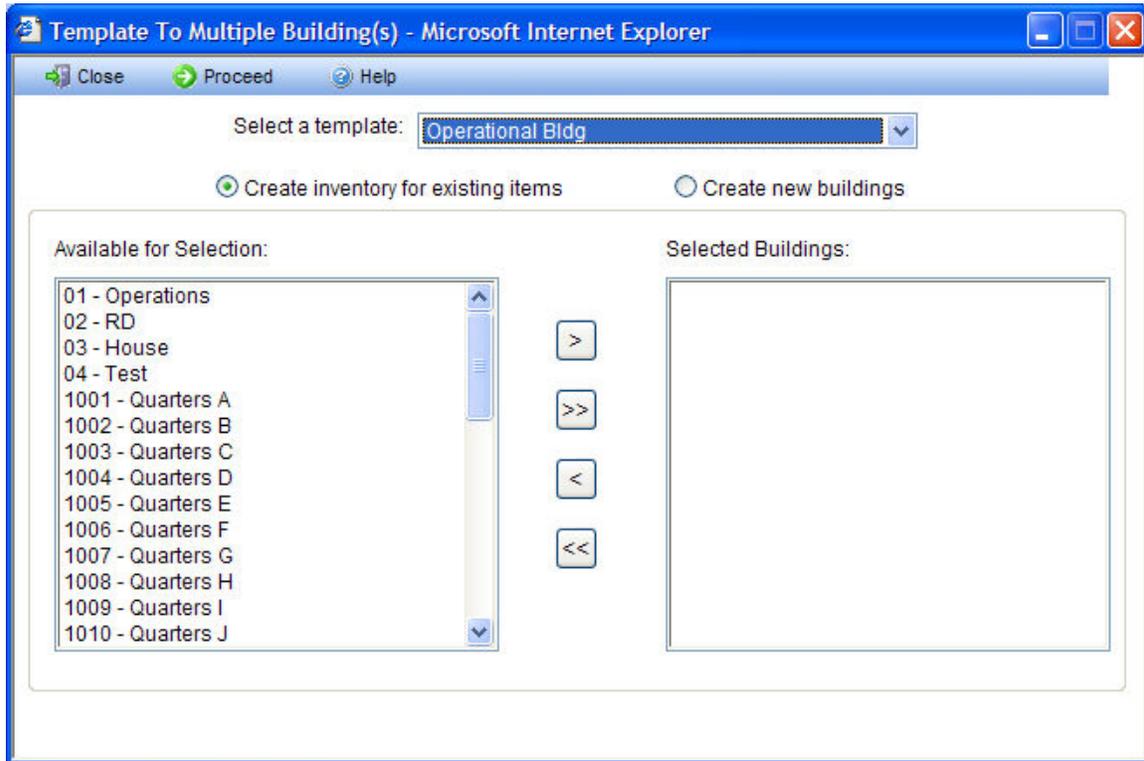
The window shown above illustrates when the Create new buildings option is chosen. For this option, use the ADD BUILDING button to add a new building to the grid. For each new building a number and/or name must be entered. If you wish to delete any of the buildings from the list, highlight the row in the grid and click the REMOVE BUILDING button.

When you listed all of the new buildings you wish to create using the template in the grid, click the PROCEED button to start the process that will create each building and copy the template data to it. This process may take a minute or so for each building, depending upon the complexity of the template's data structure.

When the process is complete, the new buildings will be available for editing. In particular, critical information that applies to each specific building should be added immediately, especially the year of construction and dates associated with sections since these data elements are used extensively in BUILDER's algorithms. Finally, when you have completed your inventory input, you should use the [cost estimating tool](#) to establish current costs for all buildings and their substructures.

Create Inventory for Existing Items Option

If you choose to create inventory for existing items, then the Apply Template to Multiple Buildings will appear as shown below:



In this window, the complete list of buildings Available for Selection at the selected inventory level will be displayed on the left. Select the buildings you wish to expand using the selected template and use the arrow buttons to move the buildings to the Selected Buildings list. When the Selected Buildings list is complete, click the PROCEED button.

When you do this, existing general information for each building will be replaced with the template data. If no systems have been created for a building, the template's systems, components, sections, and section details will be copied to it. However, if a building already has systems, the template's systems structure will not be copied to it. This same pattern applies to building dimensions, architects, contractors, and family housing record. That is, each of these template lists will be copied to a building if and only if the building's corresponding list is empty. Otherwise, the building's existing list will be left untouched.

When the process is complete, edit each building to add or verify critical data elements such as the year of construction, dates associated with sections, and all quantities since these data elements are used extensively in BUILDER's algorithms. Finally, when you have completed your inventory input, you should use the [cost estimating tool](#) to establish current costs for all buildings and their substructures.

Condition Assessment

Condition Assessment Overview

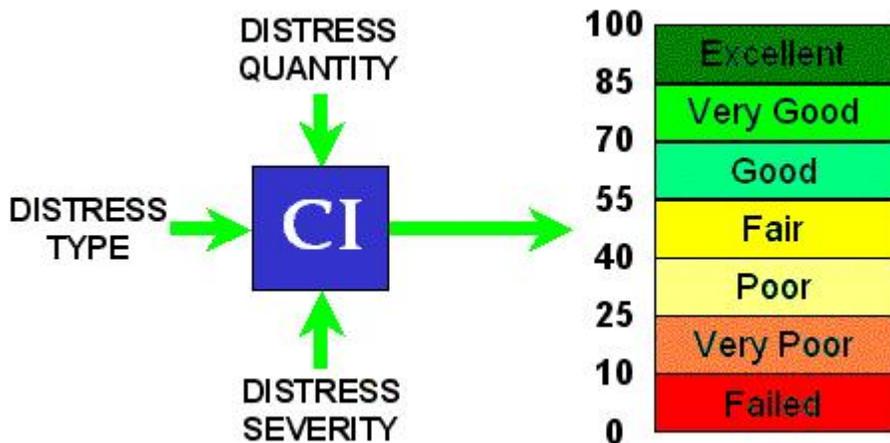
BUILDER offers two condition assessment types, [distress surveys](#) and [direct ratings](#), and allows for [sampling](#) for both. Neither type yields a detailed engineering assessment, but both types are designed to satisfy facility management data requirements regarding inventory condition and expected work requirements. In keeping with other aspects of BUILDER's design, every effort has been made to speed the process and ease the burden of [performing condition assessments](#).

Included in the BUILDER EMS family is a stand-alone application, [BUILDER Remote Entry Database \(BRED\)](#), which is designed to run on a pen-based electronic clipboard carried by inspectors at the inspection site. Condition assessment data may be entered quickly and easily at the inspection site in BRED and [imported to BUILDER](#) after the assessments. Additionally, BUILDER has a [rapid inspection tool](#) for quick and easy input of direct condition ratings.

If you have not already done so, you should familiarize yourself with the contents of the [Knowledge-Based Condition Assessment Manual for Building Component-Sections](#). This manual contains descriptions of both types of condition assessment, distress definitions, inspector qualifications, instructions for sampling, and general information about BRED.

Distress Survey Overview

When performing a distress survey, inspectors record information about a component-section by recording the distresses on each subcomponent of the component-section. Each distress is given a severity rating (low, medium, or high) and density range (quantity) based on established criteria. BUILDER uses this inspection information to calculate the Component-Section Condition Index (CSCI), which is then tied to Maintenance and Rehabilitation (M&R) costs to form the basis for M&R planning and budgeting. This process is illustrated by the diagram shown below.



Direct Rating Overview

When performing a direct condition rating, the inspector enters a color rating describing the section's condition according to the diagram shown below.

RATING	DETERIORATION	M&R NEEDS
Green + Green Green –	Minor Deterioration	Routine Maintenance or Minor Repair
Amber + Amber Amber –	Moderate Deterioration	Necessary Repair or Replacement
Red + Red Red-	Significant Deterioration	Major Rehabilitation or Replacement

The rating for the component section is determined by first choosing one of the three color bands (green, amber, or red) that corresponds to the amount of deterioration observed and the M&R needs of the component-section. Then within that color band, one of three ratings is chosen according to whether the observed condition falls at the top, middle, or bottom of the color band. Each color rating is specifically defined in [Appendix E](#) of the [Condition Assessment Manual](#). The color rating chosen produces a CSCI, which is calibrated to match the ratings that would result if a distress survey had been done.

Overview of Choosing a Condition Assessment Method

The BUILDER condition assessment process is designed to require the minimal data needed to make good managerial decisions about where attention and resources need to be focused. When a building is new or when inspecting a relatively new component-section with a long expected service life, using a direct condition rating will probably be sufficient. As a component-section begins to deteriorate, more data can be gathered during the inspection using a distress survey. When the inspection data or condition index trend indicates a problem requiring some type of work effort, an off-line development of project specifications can carry the burden of collecting more detailed data. The goal is to inspect more often and concentrate project development efforts on the M&R work for which you are most likely to allocate resources. More detail is provided in the [Condition Assessment Manual](#).

New to BUILDER 3.0 is the [Knowledge-Based Inspection Scheduling](#) tool. The tool is designed to select from your entire inventory a subset of component-sections that should be considered for inclusion in the next round of condition assessments.

Additionally, the feature is able to determine the condition assessments method to perform.

Overview of CSCI Computation

For both condition assessment types, the CSCI is computed by first calculating a deduct value from the assessment data and subtracting the deduct value from 100. The deduct value computation differs for each condition assessment method and is described below.

Distress Survey CSCI Computation

For distress surveys, the combination of distress type, severity level, and density of the subcomponents of the section are used to determine the deduct value for the individual subcomponents. The deduct values for each combination of distress, severity, and density were determined during ERDC-CERL's research effort using rating values from a team of experts.

It should be noted that if more than one distress exists, the sum of the deduct values for the distresses present must be corrected. This is because as additional distress types and/or severity levels occur on the subcomponent, the impact of a given distress on the condition rating becomes less. This correction correlates the expert panel's ratings and the computed indexes. The correction factor is a function of the summed total of the individual deduct values, a minimum individual deduct value, and the number of different distress types and severity level combinations found. The correction factor values were developed from the rating panel data and are applied directly to the deduct value to produce a corrected deduct value.

After all the subcomponent condition indexes are determined for a component-section, the CSCI (or sample unit condition index SUCI if sampling is used) is computed based on the individual subcomponent CI's and their weight factors. If sampling is used, the sample unit indexes for each component-section are aggregated into a CSCI by computing the average of the representative samples weighted by size. All calculations are made at the time an inspection is entered.

Direct Rating CSCI Computation

For direct ratings, the color rating chosen directly corresponds to a deduct value for the component-section. Using this deduct value, the CSCI can be easily computed.

If sampling is used for the component section, a sample unit condition index will be computed at each sample location and aggregated into a CSCI by computing the average of the representative samples weighted by size.

Condition Index Roll-Ups

The preceding sections described how a condition index is computed for a component-section after an inspection. The inspection CI's form the basis for computing a current CI for all inventory items in the hierarchy. CSCI's are [rolled-up](#) hierarchically to condition indexes for each component (BCCI), system (SCI), the building as a whole (BCI), the site, and the group. Collectively, trends can be monitored, and M&R can be scheduled accordingly.

- **Component CI (BCCI)**. For each component, the BCCI is computed by taking the average of its section CI's weighted by replacement cost.
- **System CI (SCI)**. For each system, the SCI is computed by taking the average of its component CI's weighted by replacement cost.

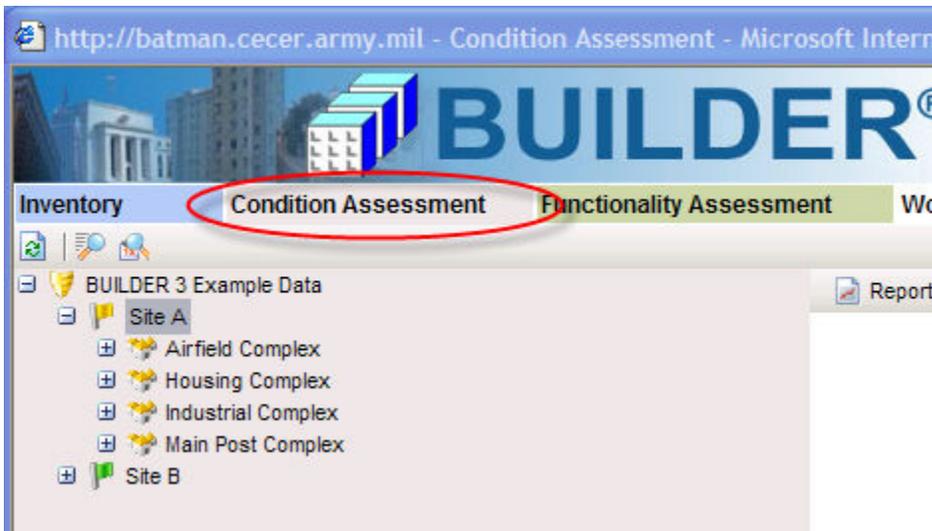
- **Building CI (BCI)**. For each building, the BCI is computed by taking the average of its system CI's weighted by replacement cost.
- **Complex CI**. The complex CI is computed by taking the average of the BCI's of each building in the complex weighted by replacement cost.
- **Site CI**. The site CI is computed by taking the average of the BCI's of each building at the site weighted by replacement cost.
- **Group CI**. The group CI is computed by taking the weighted average of the BCI's of each building in the group weighted by replacement cost.

Performing Condition Assessments

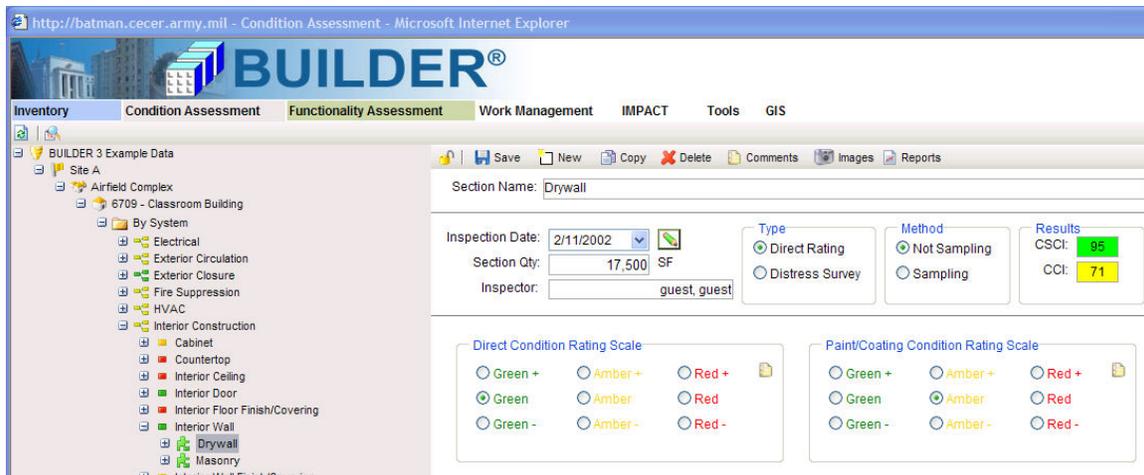
Condition assessments are associated with building component-sections. If you have not already constructed the necessary [inventory records](#), you will be unable to enter condition assessment data. Additionally, you should be familiar with the concepts and procedures described in the [Condition Assessment Manual](#), which contains crucial information regarding distress survey and direct condition rating procedures, condition assessment frequencies, inspector qualifications, distress definitions, and sampling.

It is important to note that with the addition of the [Building Status](#) property in Version 3.0 of BUILDER, it is possible to have condition assessment records for non-current buildings. Performing assessments on component-sections in non-current buildings are performed in the same manner as current buildings.

When you are ready to add or edit condition assessment data for a building, select the navigation menu option *Condition Assessment*.



The condition assessment navigation tree will appear. [Navigate the tree](#) to the section you wish to perform the condition assessment on. Sections can be selected by system or by sample location on the condition assessment tree. In the example below, the section is selected by system.



Toolbar

- **SAVE.** Use this button to save the changes that have been made to the condition assessment data.
- **NEW.** Use this button to create a new condition assessment.
- **COPY INSPECTION.** Use this button to copy a previous condition assessment. All previous condition assessment data will be copied to a condition assessment for the current date.
- **DELETE.** Use this button to delete the current condition assessment.
- **COMMENT.** Use this button to add, edit, and view comments about the condition assessment.
- **IMAGES.** Use this button to add, view, and delete images of the condition assessment.
- **REPORTS.** Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to the condition assessment of the section. See [Using the Report Viewer](#) for more information.

Condition Assessment Data

Once a component-section is selected, all condition assessments that have been previously recorded for it will be accessible using the dropdown Date field. To view past condition assessment data, choose the date of the assessment from the dropdown list. To create a new inspection click the NEW button in the main toolbar, and enter the required condition assessment data, including:

- **Date.** This field is initially set to the current date. However it can be changed by opening the dropdown field and using the calendar with scroll arrows to select the date from the calendar for the new inspection.
- **Type.** Select the type of condition assessment, either a [Distress Survey](#) or a [Direct Rating](#).
- **Method.** Select the condition assessment method, either Not Sampling or [Sampling](#).
- **Inspector** (Read-Only). Displays the name of the current inspector of the section. This field is automatically set to the user logged in to BUILDER.
- **Section Qty** (Read-Only). Displays the actual section quantity as entered in the inventory record.

- **CI** (Read-Only). Displays the condition index of the section based on condition assessment data for the selected date.
- **Painted**. Mark this checkbox if the component-section you are performing the condition assessment on is painted. This checkbox only appears if the section is inventoried as painted.
- **Condition Assessment Type Specific Data**. This data represents the actually condition assessment data that is used to [compute the CI's in BUILDER](#). See [Distress Survey Data](#) and [Direct Rating Data](#) for more description of the data required for each method.

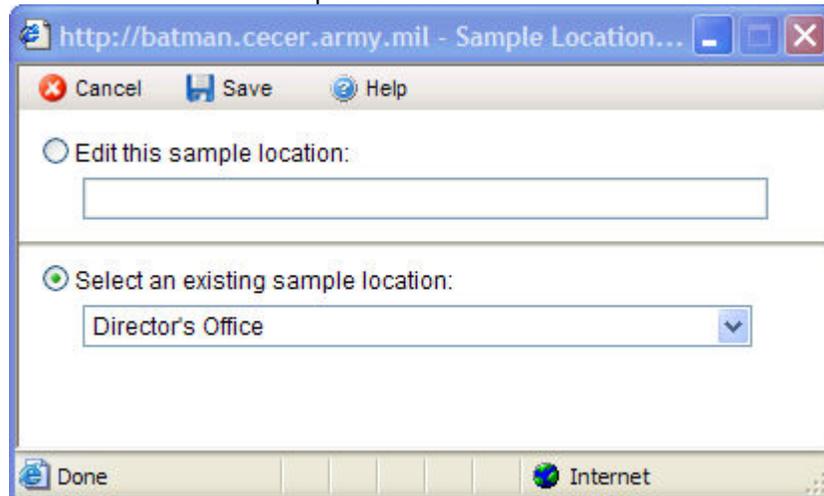
Using Sampling in Condition Assessments

Performing a condition survey inspection by sampling should be done when the component-section is large, complex, and/or discontinuous. In a practical sense, this means that the entire component-section is not readily viewable. The decision to sample or not will be a judgment call made by the inspector based on building size and component-section amount. Sampling rates, above the minimum addressed below, are up to the discretion of the inspector and/or organizational policy. Both sampling and non-sampling approaches can be used in the same building for different component-sections.

Additional Data Required for Condition Assessments Using Sampling

In addition to the data described in [Performing Condition Assessments](#), the following data is also required for condition assessments that are performed using sampling:

- **Sample Qty**. Enter the quantity of the section inspected at the current sample location.
- **% Inspected** (Read-Only). Displays the total percentage of the section that has been inspected for the current inspection date. This value is calculated by summing the sample quantities of all sample locations and dividing by the section quantity.
- **Sample**. Displays the location name of the sample. The buttons adjacent to this field allows you to:
 - Create a new sample location.



You can create the new location from existing sample locations or create a new sample location.

-  Edit the current sample location name.
 -  Delete the current sample name.
 -  Add comments regarding the current sample.
- **Non-Representative.** Mark this checkbox if the condition of the current sample is not representative of the component-section as a whole. Representative samples are those that are in a “typical” condition for the component-section as a whole. This does not mean that they are exactly in the same condition. Some variation is expected. Non-representative samples are those that are not in typical condition for the component-section as a whole. This can be either significantly better or worse condition. Non-representative samples are considered isolated and thus have less of an influence on the condition index than representative samples.

Representative Sample Creation and Selection

- A general walk through of the building is recommended prior to selecting samples to ensure that they are representative.
- Use discreet building discontinuities (e.g. entire rooms, wall corners) to help delineate sample boundaries especially when the quantity has a unit of measure of square feet (square meters) or linear feet (meters).
- When part of the building (i.e. specific room) is selected for sampling, it is recommended, but not required, that all of the component-sections present at that location be inspected as part of the sample (e.g. all component-sections for all systems found in a room).
- Specific component-sections with a unit-of-measure of “each” should most often be sampled individually, (e.g. sample five of 25 interior doors as five separate samples).
- Sample sizes for component-sections with a unit-of-measure of “each” need not be restricted to one.
- Sample sizes are often situation specific. Try to have them of approximate equal size, but be practical. There will be situations when this is not possible or practical.
- Ensure that all samples are properly identified as to location, including room number or name, if applicable, (think of the next person – can he/she easily find this location?).
- When sampling is used for a given condition survey inspection cycle, either the distress survey or the direct condition rating approach may be used for a given component-section. However, do not combine the methods for a given component-section (i.e. distress survey for one sample and direct condition rating for another sample).

Minimum Representative Sample Quantities

- The numbers of representative (as to condition) samples to be taken of a specific component-section with the unit-of-measure of “each” are:
 - One (1) sample when the component-section quantity is 1-4.
 - Two (2) samples when the component-section quantity is 5-9.

- At least three (3) samples when the component-section quantity is 10 or more.
 - AND a minimum of 10% of the component-section quantity.
- The number of representative (as to condition) samples to be taken of a specific component-section with the unit-of-measure of square feet (square meters) or linear feet (meters) are:
 - One (1) sample when the number of potential samples is 1-4.
 - Two (2) samples when the number of potential samples is 5-9.
 - At least three (3) samples when the number of potential samples is 10 or more.
 - AND a minimum of 10% of the component-section quantity.

Sampling Suggestions

- Specific rooms inside of a building (e.g. "Room 110"), where all of the various component-sections in that room would be sampled (e.g. ceiling, walls, wall finish, floor, floor covering, light fixtures, etc.).
- Exterior wall locations (e.g. "North Wall," etc.), where all component-sections included in that wall would be sampled (e.g. wall surface, doors, windows, awnings, lights, etc.).
- A component-section consisting of ten roof ventilating fans (all ten are the same), samples could be "Fan 1", "Fan 2", etc.
- Interior doors denoted by room number (e.g. a hallway has many doors leading to rooms, so select the requisite number of doors with each door being a sample).
- Specific structural columns, beams, frames, trusses.
- A specific component-section (e.g. fireplace) with a quantity greater than one, but still a small number (e.g. two or three) and they are geographically separated such that they cannot be inspected together. Inspect each one as a sample with a specific location. All need to be inspected to be in conformance with the minimum sample quantity addressed above.
- If an entire component-section happens to be co-located at a defined sample location where other component-sections were sampled (e.g. a fireplace in a room selected for sampling of walls, ceiling, flooring, etc.), that component-section can either be included in the sample location or simply inspected without sampling.
- In general, do what makes sense, but ensure that the rules are followed.

Using the Rapid Inspection Method

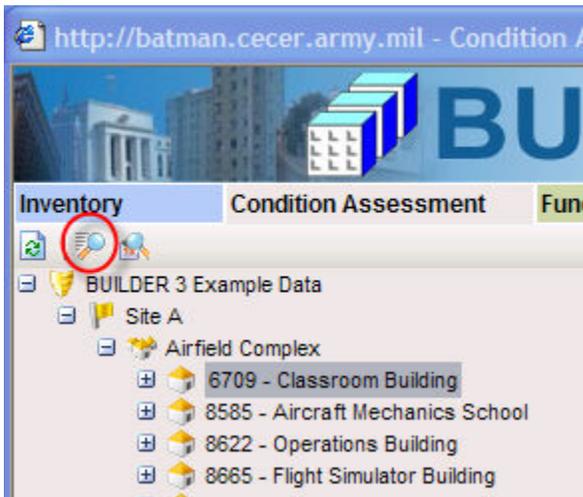
In an effort to speed the data input process, BUILDER offers a rapid inspection method feature for rapidly creating direct condition assessment records. Here are some examples of situations in which the feature might be used:

1. You have just renovated a family housing complex, and multiple systems have been completely replaced in every house. You need to record these new conditions in your BUILDER database.
2. You have just completed your BUILDER inventory, have very limited resources for a physical inventory but have staff members who are intimately knowledgeable of conditions in most of your buildings.
3. You structured your BUILDER inventory so that every door, window, room wall/floor/ceiling, etc. is identified as a component-section (see the inventory

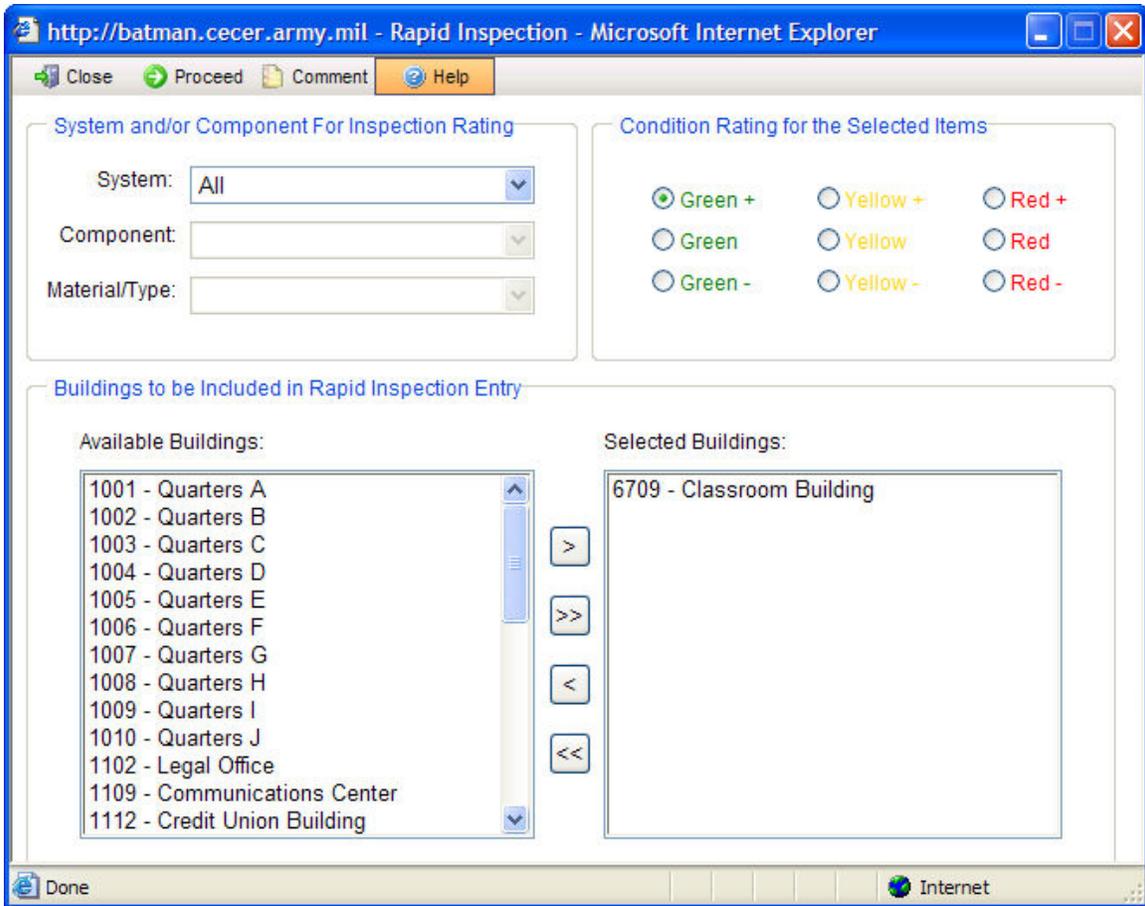
for 1131 Administration Building in the Example database as an illustration of this). Now that you have to perform an assessment, you find that every door, window, room wall/floor/ceiling, etc. must have its own inspection record but you want to do a quick walk through of the building and record component ratings for everything.

In all of these situations, you want to input condition ratings for systems or components for which you already know the rating. This is when Rapid Inspection can be very handy.

To launch the Rapid Inspection window, select the smallest organizational item in the condition assessment tree that contains all of the buildings that the rapid inspection will be used in, click the *Rapid Inspection* button from the inspection toolbar menu.



The Rapid Inspection window will appear:



The following data are required before the rapid inspection process can proceed:

- **System and/or Component for Inspection Rating.** Select the system for which inspections are to be created from the dropdown list. If you do not specify a component, then every component-section belonging to that kind of system in a selected building(s) will have an assessment created for it. However, if you specify a component but not a Material/Type, then every component-section belonging only to that kind of component in a selected building(s) will have an assessment created for it. Finally, if you specify a Material/Type, then every component-section of that material and type in a selected building(s) will have an assessment created for it.
- **Condition Rating for the Selected Items.** Select a Condition Rating for all of the inspections to be created.
- **Buildings to be Included in Rapid Inspection Entry.** Select the buildings for which condition assessments are to be created by using the arrow keys to build the list of Selected Buildings from the Available Building list.

You may also enter a comment to be recorded with every inspection created by clicking the COMMENT button in the toolbar . When all data has been entered, clicking the PROCEED button will initiate the rapid inspection process. If you do not wish to perform the rapid inspection, click the CLOSE button in the toolbar.

For the examples discussed above, here is how this feature may have been used:

1. You know that all of the roofs were rebuilt in the family housing complex. Select all of the houses, select Roofing as the system, and select G+ as the rating. Clicking PROCEED will create an inspection record with condition rating G+ for every component-section in the roofing system of every selected house.
2. Have each staff member sit down sequentially with BUILDER to do the following process: Select sets of buildings within his/her expertise that all have the same known condition for certain systems or components. Use the Rapid Inspection feature to create inspections as appropriate. If two staff members happen to input records for the same component-section, the later rating will overwrite the earlier rating if the ratings are done on the same day. (BUILDER allows only one inspection record per day per component-section.)
3. You have scanned the interior doors in your walk-through of the building, and they are all in good condition (rating G). Your inventory has 50 interior door component-sections, each door identified with the room it is in. Use rapid inspection by selecting the building, selecting Interior Construction/Interior Doors, and selecting condition rating G. Clicking PROCEED will automatically create 50 inspection records, one for each interior door component-section.

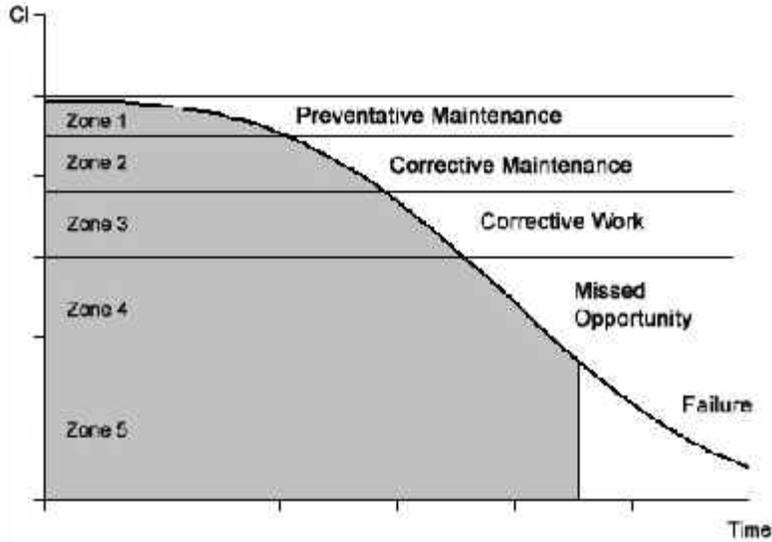
Knowledge-Based Inspection Scheduling

The Knowledge-Based Inspection (KBI) feature in BUILDER 3.0 is designed to select from your entire inventory a subset of component-sections that should be considered for inclusion in the next round of condition assessments. Additionally, the feature is able to determine the type of condition assessments to perform. The selection algorithm is based on pieces of data (knowledge) associated with the component section that are compared with user-defined parameters.

Note: Please refer to the [Condition Assessment Manual](#) for an explanation of the Knowledge-Based Inspection Principles.

Determining When to Perform a Condition Assessment

As stated above, the KBI feature needs to compare knowledge about the component-section with user-defined parameters to determine when condition assessment are to be performed. These parameters are input when [creating a standard](#) and must be input for each of the five condition zones shown in the figure below. See the [Condition Assessment Manual](#) for explanation of each condition zone.



The user-defined parameters for the KBI feature and include:

- **CI Lower Bound.** The lower bound of the CI range of the condition zone. Providing the lower bound for each zone breaks the condition curve as shown above.
- **Maximum Inspection Interval.** The maximum amount of time, in years, between condition assessments in each condition zone.
- **Number of Inspections in Zone.** The maximum number of condition assessments that should be performed in each condition zone.
- **Degradation Factor.** The ratio of the maximum relative rate of deterioration to the expected rate of deterioration when a condition assessment is triggered. That is, if the deterioration rate were set to 2, any measured deterioration rate greater than twice the expected rate would trigger another inspection.

Based on the projected CI of the component-section, the KBI feature determines which range the component-section is in, and how many inspections to perform in that range. It then calculates the time between inspections to accomplish this. This interval is compared to the maximum inspection interval, and the lesser of the two becomes the allowable inspection interval.

When the time since the last inspection becomes greater than the allowable interval between condition assessments, the component-section is flagged for inclusion into the next round of assessments. In addition, if the rate of deterioration of the CI seen by the last condition assessment is greater than the allowable rate of deterioration determined by the deterioration factor discussed above, the component-section will also be flagged for inclusion into the next round of assessments.

Determining the Type of Condition Assessment to Perform

Once the KBI program selects the subset of recommended component-sections for inclusion into the next round of assessments, it must determine the method that will

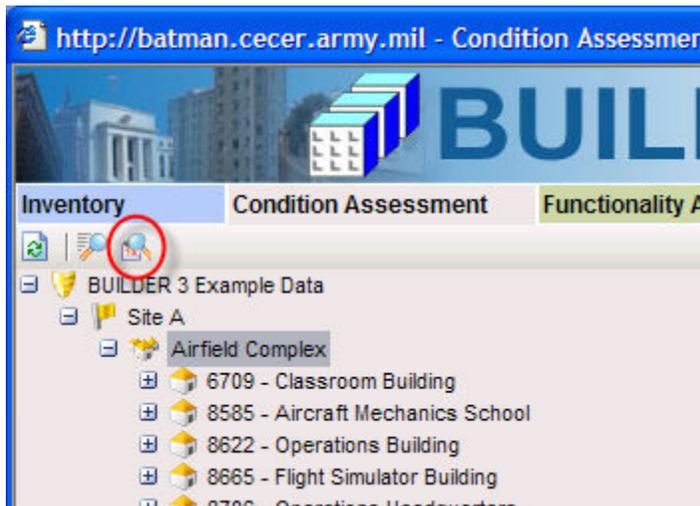
be used for each condition assessment. Based on the CI range that the component is projected to be in, the general guidelines below apply.

Range	Procedure
1	Direct
2	Distress
3	Distress
4	Direct
5	Direct

In some instances, a more detailed level of condition assessment may be warranted regardless of the guidelines recommended above. If a more detailed assessment was performed previously, the same method will be recommended again for zones 1 - 3. This means, for example, if the component-section is still in range 1 and the previous condition assessment method was a distress survey, the KBI program would recommend a distress survey be performed.

Using the KBI Feature in BUILDER 3.0

To use the KBI feature in BUILDER, click the *Inspection Scheduling* button from the inspection navigation toolbar.



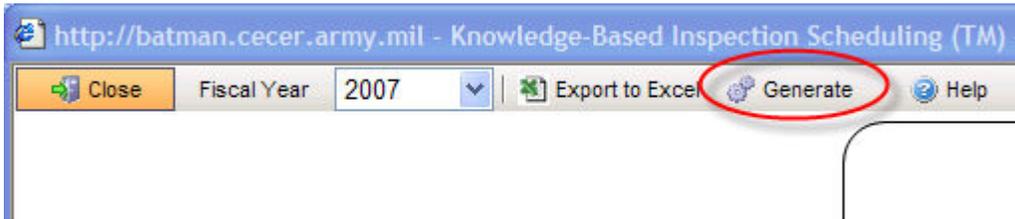
The Knowledge-Based Inspection Scheduling window will appear.

Toolbar

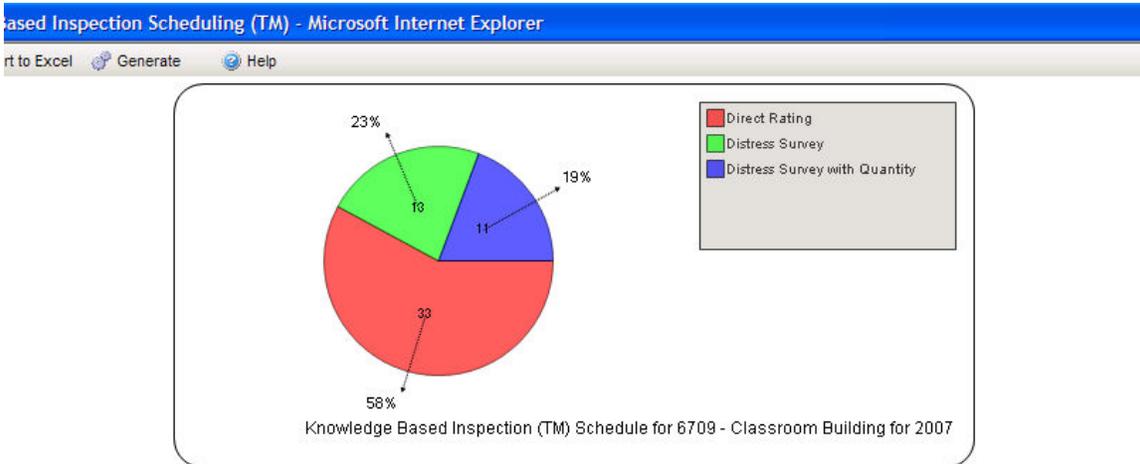
- CLOSE. Use this button to close the Knowledge-Based Inspection Scheduling window.
- EXPORT TO EXCEL. Use this button to export the current inspection schedule to a Microsoft Excel spreadsheet.
- GENERATE ITEMS. Use this button to generate a new inspection schedule.

Creating an Inspection Schedule

To create a Knowledge-Based Inspection Schedule click the GENERATE button in the toolbar.



The Generate Inspection Schedule window will appear. Using the [policy sequence](#) defined in the [site data](#), the KBI Schedule will be generated and shown in the window. The schedule can then be exported to a Microsoft Excel spreadsheet by clicking the EXPORT TO EXCEL button in the toolbar. It is important to note that generating a new inspection schedule will delete the current inspection schedule.



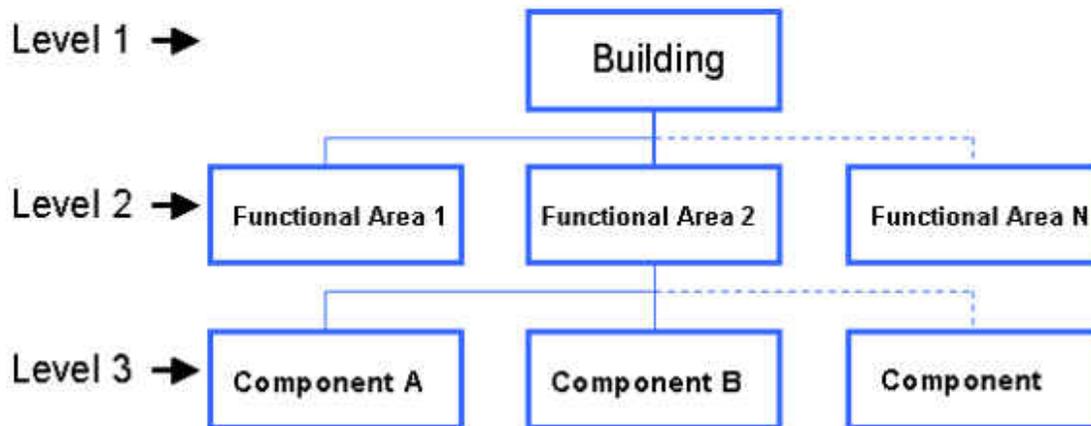
System	Component	Section	Inspection Type
Electrical	Distribution	Electrical Category 8	Direct Rating
Electrical	Lighting Fixtures	Fluorescent Exterior, 2'x2' U-3- T-12	Direct Rating
Electrical	Lighting Fixtures	Fluorescent Interior	Distress Survey with Quantity
Electrical	Lighting Fixtures	Incandescent Interior	Distress Survey with Quantity
Electrical	Lighting Fixtures	Warning Interior	Distress Survey with Quantity
Electrical	Panels	Panelboard 100-200 AMP	Distress Survey
Exterior Circulation	Exterior Ramp	Concrete	Direct Rating
Exterior Circulation	Exterior Stair/Step	Concrete Steps	Direct Rating
Exterior Circulation	Walkway	Concrete Non-Elevated	Direct Rating
Exterior Closure	Exterior Ceiling	Concrete	Distress Survey
Exterior Closure	Exterior Door	Glass Personnel	Direct Rating
Exterior Closure	Exterior Door	Metal Personnel	Direct Rating
Exterior Closure	Exterior Wall	Masonry	Direct Rating
Exterior Closure	Exterior Window	Metal Casement	Direct Rating
Exterior Closure	Exterior Window	Metal Fixed	Distress Survey
Fire Suppression	Fire/Smoke Alarm	System Automatic	Distress Survey
HVAC	Air Handling Unit	Central Station 12000-14000 CFM	Distress Survey with Quantity
HVAC	Air Handling Unit	Modular <3 Tons	Distress Survey with Quantity
HVAC	Cooling Unit/Plant	Air Conditioner Thru-Wall <25000 BTUH	Distress Survey with Quantity
HVAC	Cooling Unit/Plant	Compression, Reciprocating 25 TN, air cooled	Distress Survey with Quantity
HVAC	Cooling Unit/Plant	Heat Pump Residential 4-5 Tons	Distress Survey with Quantity

Functionality Assessment

Functionality Assessment Overview

A new feature included in BUILDER 3.0 is the ability to perform functional assessments on buildings to measure the "functionality" state. The functionality state relates to the building's suitability to function as intended and required for mission. The functionality state is distinct from, and determined independently from, the physical condition state. Although the functionality assessment is not a detailed engineering assessment, it does satisfy the requirements necessary for routine building facility management activities including long range budgeting and modernization planning. It also helps to quickly identify problem areas that will require detailed assessments. There may be times when detailed engineering assessments may be required to diagnose specific problems.

Functional assessments are structured into a three-tiered, top-down approach to narrow the focus and provide greater assessment detail to the identified problem issues. This approach saves effort, reduces cost, and focuses attention where needed. It also allows the identification and development of modernization requirements to efficiently flow from a broad strategic planning phase to a detailed execution phase. The assessment approach encompasses the three levels shown below.



In BUILDER 3.0, functionality assessments can be performed at the first and second tiers, or building and functional area levels. Later versions will include the third tier, or component-section level, of functionality assessments.

Overview of the First Tier of Assessment

The first tier of the functionality assessment is a fast, scoping building level assessment. Using a limited set of questions (see [First Tier Functionality Issues and Sub-Issues](#)) that address general functionality issues throughout the building, the first tier provides a quick and accurate way to rule out non-problem areas from further assessment, identify problem areas within the building that will require further assessment, and compute the Building Functionality Index (BFI). This level of assessment should be performed when an overall indication of the functionality of

the building is desired and when areas that will require further assessment need to be identified.

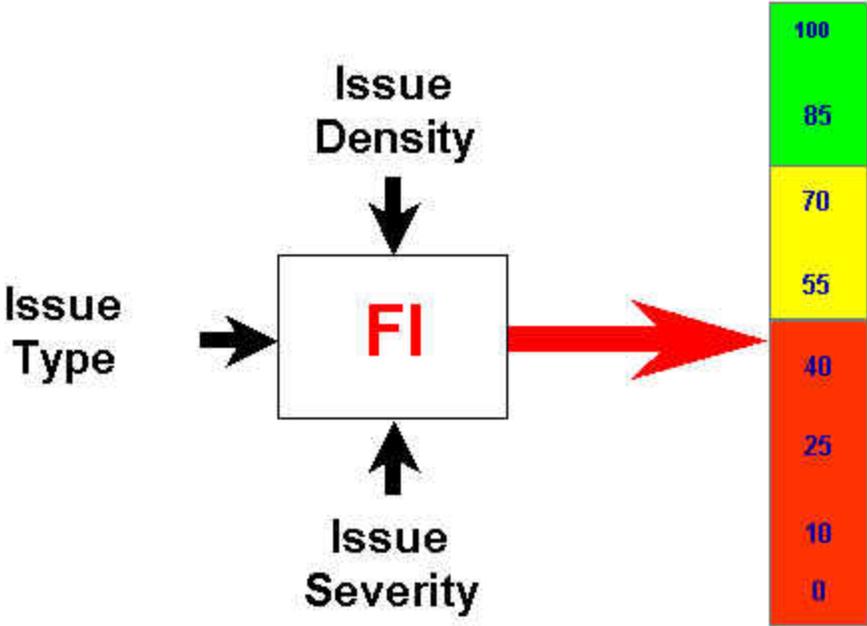
Overview of the Second Tier of Assessment

The second tier of the functionality assessment is a methodical building functional area assessment. This level of assessment produces more accurate results than the first tier, but it is also more time consuming and expensive to perform. In the second tier, a complete list of functionality questions (see [Second Tier Functionality Issues and Sub-Issues](#)) is used to identify the specific functionality deficiencies in each functional area, compute the Functional Area Functionality Index (FAFI), and refine the BFI. This level of assessment should be used when the functionality deficiencies within functional areas need to be identified and when the results of the first tier need to be refined.

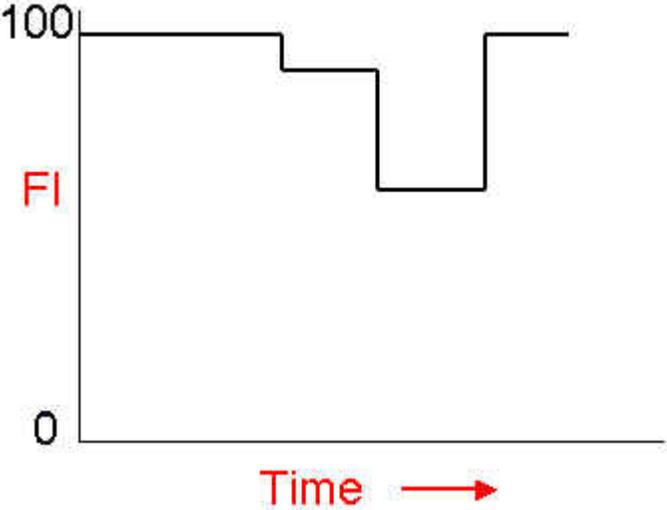
Functionality Index Computation Overview

Functionality assessments directly support the computation of a functionality index (FI) for the building, as a whole, and the functional areas within the building. These indices are known as Building Functionality Index (BFI) and the Functional Area Functionality Index (FAFI), and were developed for use in assessing building functionality. Both the BFI and FAFI are a general obsolescence metrics that addresses the issues related to user requirements, technical obsolescence, and regulatory/code compliance at the building level and functional area level, respectively.

All FI metrics are based on a scale of 0-100, which matches the scale used for the Condition Indices (BCI). BUILDER contains the model algorithms that compute the FI's automatically once the functionality assessment data are entered. The algorithms use the data entered regarding the functionality issues present in the building, the severity of the issues, and the density of the issue to calculate the BFI. This process is illustrated by the figure below.



It is important to note that the FI metrics are step functions over time, unlike the smooth, continuous functions seen in the condition indices. This is because functionality, unlike condition, is not an ongoing process. The functionality of a building (and/or functional area) depends on user needs, technical obsolescence, and compliance with code or regulations. These factors do not change gradually, but rather at discrete points in time. These discrete changes are reflected in the “steps” in the FI over time. The figure below shows an example FI over time.



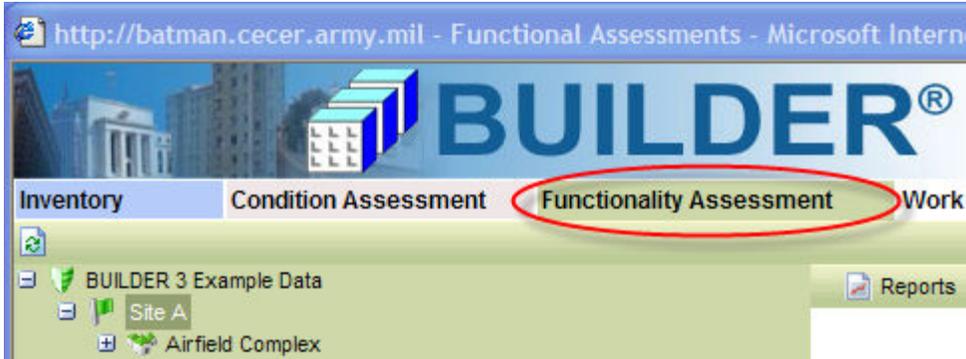
Performing First Tier Functionality Assessments

First tier functionality assessments are associated with the building as a whole. If you have not [created the building](#) in your inventory with the proper data, you will be unable to enter functionality assessment data for it. Additionally, you should be familiar with the concepts in the [Functionality Assessment Overview](#) and the [First](#)

[Tier Functionality Issues and Sub-Issues](#) before performing a functionality assessment.

It is important to note that with the addition of the [Building Status](#) property in Version 3.0 of BUILDER, it is possible to have functionality assessment records for non-current buildings. Performing assessments on non-current buildings are performed in the same manner as current buildings.

When you are ready to add or edit functionality assessment data for a building, select the navigation menu option *Functionality Assessment*.



The functionality assessment navigation tree will appear. [Navigate the tree](#) to the building you wish to perform the functionality assessment on. The window shown below will appear.

Save New Copy Delete Reports

Building No: 6709 Building Name: Classroom Building Current BFI: 100

Functionality Assessment Functionality Trend

Effective Assessment: 01/01/1978 Assessment BFI: 100

Assessment Description: Initial functionality assessment

Building Use Type: 61050 - ADMINISTRATIVE BUILDING, GENERAL PURPO

Status: Active

Issue	Issue FI	Last Assessment
Location	100	01/01/1978
Building Size and Configuration	100	01/01/1978
Structural Adequacy	100	01/01/1978
Access	100	01/01/1978
ADA	100	01/01/1978
ATFP	100	01/01/1978
Building Services	100	01/01/1978
Comfort	100	01/01/1978
Efficiency and Obsolescence	100	01/01/1978
Environmental/Health	100	01/01/1978
Missing or Improper Components	100	01/01/1978
Aesthetics	100	01/01/1978
Maintainability	100	01/01/1978
Cultural Resources		01/01/1978

Toolbar

- **SAVE.** Use this button to save the changes that have been made to the functionality assessment.

- **NEW.** Use this button to create a new functionality assessment.
- **COPY INSPECTION.** Use this button to copy a previous functionality assessment. All previous functionality assessment data for the date selected will be copied to a functionality assessment for the current date.
- **DELETE.** Use this button to delete the current functionality assessment.
- **REPORTS.** Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to the functionality assessment of the building. See [Using the Report Viewer](#).

Functionality Assessment Data

After a building is selected, general data about the building will be shown at the top of the screen. This data includes the building number, building name, and the current building functionality index (BFI). Below this data are additional data that is associated with functional assessments of the building:

- **Effective Assessment** (Required). Select the date of the functionality assessment you wish to see data for from the dropdown list. All functionality assessments that have been previously recorded will be accessible from this list. If you have created a new functionality assessment, the current date will be shown in this field.
- **Assessment BFI** (Read-Only). Displays the BFI computed based on the data recorded for the assessment currently selected.
- **Assessment Description** (Optional). Enter a brief description on the functionality assessment.
- **Building Use Type** (Required). Select the building use type from the dropdown list that most closely matches the building. If you are a Department of Defense activity, BUILDER should display familiar category codes for your service. This field is helpful when a building is being assessed against many use types to determine its optimal use type.
- **Status** (Required). Select the status of the current assessment from the dropdown list. The status options available for a functionality assessment in BUILDER 3.0 are:
 - **Active.** Sets the current functional assessment to active and is used to compute the current BFI.
 - **Past.** Sets the current functional assessment to a past assessment. This assessment data is not used when computing the current BFI.
 - **To Take Effect.** Sets the current functional assessment to a future year when user requirements, codes, or obsolescence are expected to change and affect the functionality of the building. These assessments are particularly useful to use when running [IMPACT scenarios](#).
- **Effective Year of Status.** Enter the year the status of the assessment will become active, or effective in the building. This field will only appear if the status is set to "To Take Effect."

The actual assessment data is displayed and recorded in the grid in the lower portion of the screen and includes:

- **Issue** (Read-Only). Displays the [14 first tier functionality issues](#) included in BUILDER 3.0. Expand the issues to show its sub-issues by using the "+" next to the issue. If the sub-issues are expanded, they can be collapsed by clicking the "-" next to the issue.

- **Rating** (Read-Only). Displays the FI rating for the issue computed from the ratings of its sub-issues.
- **Last Assessment** (Read-Only). Displays the date of the last functionality assessment for the issue.
- **Sub-Issue** (Read-Only). If the issues have been expanded, its [sub-issues](#) will be shown in this column on the grid.
- **Sub-Issue Rating**. Enter the applicable rating data for the functionality sub-issues in the building. The rating for each sub-issue consists of a severity color rating, along with a density range for some sub-issues. The hyperlinked text for each sub-issue provides a link to the definition and rating guidelines of the sub-issue.

Save New Copy Delete Reports

Building No: 6709 Building Name: Classroom Building Current BFI: 100

Functionality Assessment Functionality Trend

Effective Assessment: 06/23/2006 Assessment BFI: 77

Assessment Description: Modernization Evaluation

Building Use Type: 17136 - AUTOMATION-AIDED INSTRUCTIONAL BUILDING

Status: Active

Issue	Issue FI	Last Assessment
Location	77	06/23/2006
Building Size and Configuration	N/A	
Subissue	Rating	Comments
Does the building encourage an appropriate level of occupant interaction?	G+ A R N/A 1-10%	Reset Comments...
Is the building overcrowded?	G+ A R N/A 10-25%	Reset Comments...
Is the building configuration adequate?	G+ A R N/A 1-10%	Reset Comments...
Structural Adequacy	N/A	
Access	N/A	
ADA	N/A	
ATFP	N/A	
Building Services	N/A	
Comfort	N/A	
Efficiency and Obsolescence	N/A	
Environmental/Health	N/A	
Missing or Improper Components	N/A	
Aesthetics	N/A	
Maintainability	N/A	
Cultural Resources	N/A	

Rating Sub-Issues with Wizards

For some sub-issues, a wizard is provided to help you perform the rating for that sub-issue. To launch the wizard, click the WIZARD link included in the sub-issue row. The wizard for that sub-issue will appear in a new window. Follow the instructions in the wizard to complete the rating. Note that you are not able to directly enter the severity rating or density from the sub-issue grid for the sub-issues that use a wizard.

Sub-Issue Comments

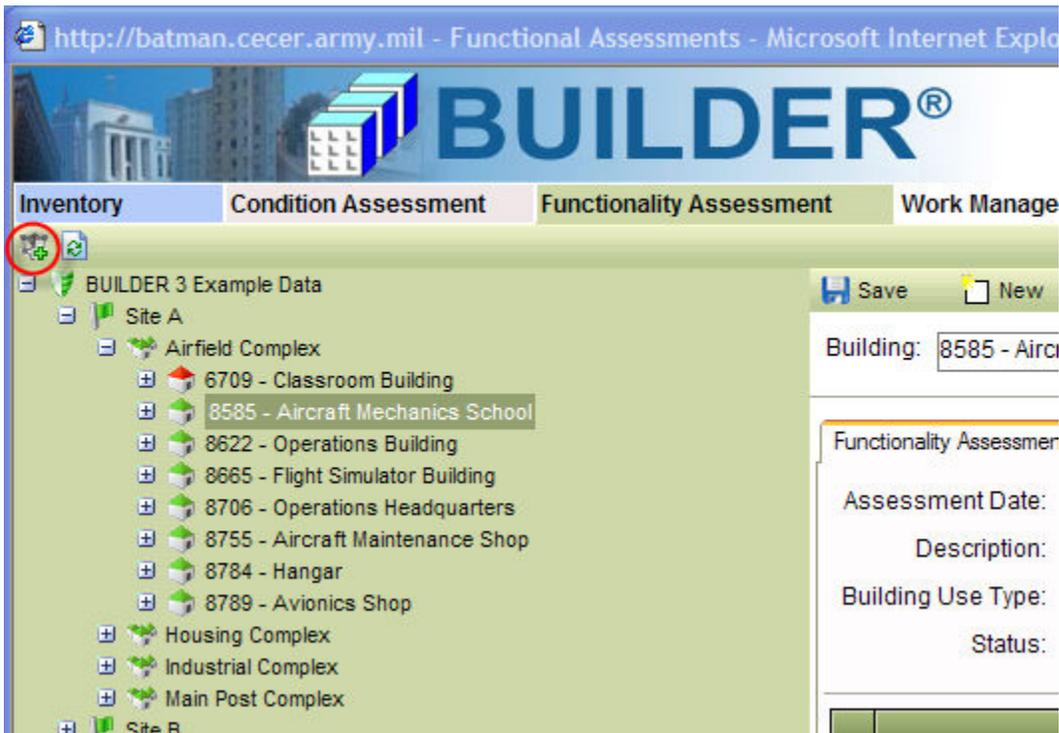
Additionally, comments can be added for each sub-issue by clicking the COMMENTS button in the sub-issue row. The comments window will appear in a new window.

Enter any comments about the rating of the sub-issue and click CLOSE to close the window and save the changes.

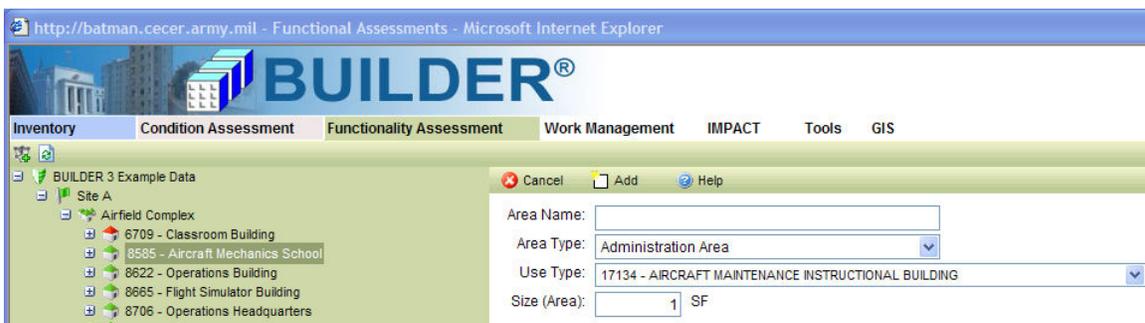
Adding Functional Areas to a Building

New to BUILDER 3.0 is the ability to separate the building into functional areas, which must be done before the [second tier functionality assessments](#) can be performed, functional areas must be created in buildings. Functional areas describe the use and classification of different building spaces.

To add a functional area to a building, select the building in the functionality assessment navigation tree, then click the *Add Functional Area* button.



The context area of the BUILDER screen will appear as shown below.



On this screen, enter the required data for the functional area:

- **Area Name.** Enter the name of the functional area.
- **Area Type.** Select the functional area type from the dropdown list provided. BUILDER allows you to choose from 26 different functional area types.
- **Use Type.** Select the use type of the functional area from the dropdown list. This dropdown list contains the same use types as the [Building Use](#).
- **Size (Area).** Enter the size or area of the functional area.

After entering the information described above, click the ADD button on the toolbar. The functional area will be created in the building, and the context area of the BUILDER screen will appear as shown below. If you do not wish to create the functional area, click the CANCEL button on the toolbar.

The screenshot shows a software window with a menu bar (Save, New, Copy, Delete, Reports) and a form for creating a functional area. The form fields are: Name: Admin; Functional Use: Administration Area; Size (Area): 1,000 SF; Current Use Type: 17134 - AIRCRAFT MAINTENANCE INSTRUCTK; Current FAFI: 100; Current CI: (empty). Below the form are three tabs: Sections, Functionality Assessment, and Assessment Trends. The Sections tab is active, showing two columns: Available Sections (with a tree view containing Conveying, Electrical, Exterior Circulation, and Exterior Closure) and Selected Sections (which is currently empty).

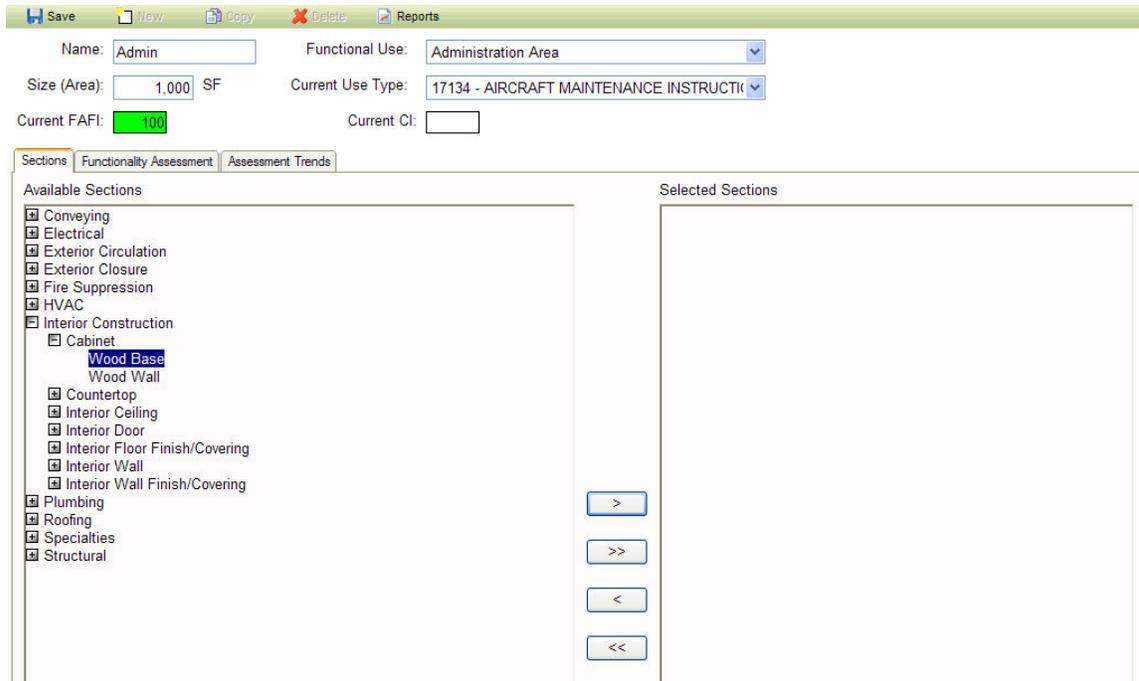
From this screen, all of the data described above can be edited, along with some additional data:

- **Current FAFI (Read-Only).** Displays the current FAFI of the selected functional area. The current FAFI is computed using the results of the active functionality assessment for the functional area.
- **Current CI (Read-Only).** Displays the current CI of the functional area. The current CI is computed using an average of the section CI's in the functional area, weighted by replacement cost.
- **Sections Tab.** This tab allows you to add sections in the building's inventory to the functional area. See [Adding Inventory to Functional Areas](#) for a complete description.
- **Functionality Assessment Tab.** This tab allows you to perform [second tier functionality assessment](#) on the functional area.
- **Trends Tab.** This tab displays the CI, FI, and PI trends of the functional area from the date the building was built to the current date.

Adding Inventory to Functional Areas

Entire systems, individual components, or individual sections can be added to the inventory of a functional area from the Sections tab on the Functional Area screen.

To add a particular system, component, or section to a functional area select the desired inventory item from the *Available Sections* tree and use the arrow keys to move it to the *Selected Sections* tree. Similarly, inventory items can be removed from the *Selected Sections* tree by selecting the desired inventory item from the *Selected Sections* tree and using the arrow keys to move it back to the *Available Sections* tree.



It is important to note that once a particular section is assigned to a functional area's inventory, it cannot be assigned to another functional area's inventory. After the section has been assigned to a functional area, it will not appear in the *Available Sections* tree any more. Similarly, once all of the sections for a particular component (and all of the components for a system) have been assigned to a functional area's inventory, the component (and system) cannot be assigned to another functional area's inventory and will not appear on the *Available Section* tree.

Performing Second Tier Functionality Assessments

Second tier functionality assessments are performed on the individual functional areas in the building. If you have not [created functional areas in the building](#) with the proper data, you will be unable to enter functionality assessment data for it.

Additionally, you should be familiar with the concepts in the [Functionality Assessment Overview](#) and the [Second Tier Functionality Issues and Sub-Issues](#) before performing a second tier functionality assessment.

When you are ready to add or edit functionality assessment data for a functional area, select the navigation menu option *Functionality Assessment*. The functionality assessment navigation tree will appear. [Navigate the tree](#) to the functional area you wish to perform the functionality assessment on and select the Functionality Assessment tab. The window shown below will appear.

Issue	Issue FI	Last Assessment
* Functional Area Size and Configuration	100	
* Structural Adequacy	100	
* Access	100	
* ADA	100	
* ATPF	100	
* Functional Area Services	100	
* Comfort	100	
* Efficiency and Obsolescence	100	

Toolbar

- **SAVE.** Use this button to save the changes that have been made to the functionality assessment.
- **NEW.** Use this button to create a new functionality assessment.
- **COPY INSPECTION.** Use this button to copy a previous functionality assessment. All previous functionality assessment data for the date selected will be copied to a functionality assessment for the current date.
- **DELETE.** Use this button to delete the current functionality assessment.
- **REPORTS.** Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to the functionality assessment of the building. See [Using the Report Viewer](#).

Functionality Assessment Data

After a functional area is selected, the general data that was input when [creating the functional area](#) will be shown at the top of the screen. This data includes the name, functional use, size, and current use type, along with the current functional area functionality index (FAFI) and current functional area CI. Below this data are additional data that is associated with functional assessments of the functional area:

- **Assessment** (Required). Select the date of the functionality assessment you wish to see data for from the dropdown list. All functionality assessments that have been previously recorded will be accessible from this list. If you have created a new functionality assessment, the current date will be shown in this field.
- **Description** (Optional). Enter a brief description on the functionality assessment.
- **Use Type** (Required). Select the use type from the dropdown list that most closely matches the functional area. If you are a Department of Defense activity, BUILDER should display familiar category codes for your service. This field is helpful when a functional area is being assessed against many use types to determine its optimal use type.

- **Assessment FAFI** (Read-Only). Displays the FAFI computed based on the data recorded for the assessment currently selected.
- **Functional Use** (Required). Select the functional use from the dropdown list that most closely matches the functional area. BUILDER allows you to choose from 26 different functional area types. This field is helpful when a functional area is being assessed against many functional uses to determine its optimal functional use.
- **Status** (Required). Select the status of the current assessment from the dropdown list. The status options available for a functionality assessment in BUILDER 3.0 are:
 - Active. Sets the current functional assessment to active and is used to compute the current FAFI.
 - Past. Sets the current functional assessment to a past assessment. This assessment data is not used when computing the current FAFI.
 - To Take Effect. Sets the current functional assessment to a future year when user requirements, codes, or obsolescence are expected to change and affect the functionality of the area. These assessments are particularly useful to use when running [IMPACT scenarios](#).
- **Effective Year of Status**. Enter the year the status of the assessment will become active, or effective in the functional area. This field will only appear if the status is set to "To Take Effect."

The actual assessment data is displayed and recorded in the grid in the lower portion of the screen and includes:

- **Issue** (Read-Only). Displays the [13 second tier functionality issues](#) included in the assessment. Expand the issues to show its sub-issues by using the "+" next to the issue. If the sub-issues are expanded, they can be collapsed by clicking the "-" next to the issue.
- **Rating** (Read-Only). Displays the FI rating for the issue computed from the ratings of its sub-issues.
- **Last Assessment** (Read-Only). Displays the date of the last functionality assessment for the issue.
- **Sub-Issue** (Read-Only). If the issues have been expanded, its [sub-issues](#) will be shown in this column on the grid.
- **Sub-Issue Rating**. Enter the applicable rating data for the functionality sub-issues in the building. The rating for each sub-issue consists of a severity color rating, along with a density range for some sub-issues. The hyperlinked text for each sub-issue provides a link to the definition and rating guidelines of the sub-issue.

Save New Copy Delete Reports

Name: Functional Use:

Size (Area): SF Current Use Type:

Current FAFI: Current CI:

Sections: **Functionality Assessment** Assessment Trends

Effective Assessment: Description:

Use Type: Assessment FAFI:

Functional Use:

Status: Effective Year of Status:

Issue	Issue FI	Last Assessment						
[-] Functional Area Size and Configuration	100							
[-] Structural Adequacy	100							
<table border="1"> <thead> <tr> <th>SubIssue</th> <th>Rating</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>Is the functional area structurally adequate for all loading conditions?</td> <td> <input type="radio"/> G+ <input type="radio"/> A <input type="radio"/> R <input type="radio"/> N/A <input type="text" value="1-10%"/> <input type="button" value="Reset"/> </td> <td><input type="button" value="Comments..."/></td> </tr> </tbody> </table>	SubIssue	Rating	Comments	Is the functional area structurally adequate for all loading conditions?	<input type="radio"/> G+ <input type="radio"/> A <input type="radio"/> R <input type="radio"/> N/A <input type="text" value="1-10%"/> <input type="button" value="Reset"/>	<input type="button" value="Comments..."/>		
SubIssue	Rating	Comments						
Is the functional area structurally adequate for all loading conditions?	<input type="radio"/> G+ <input type="radio"/> A <input type="radio"/> R <input type="radio"/> N/A <input type="text" value="1-10%"/> <input type="button" value="Reset"/>	<input type="button" value="Comments..."/>						
[-] Access	100							
[-] ADA	100							

Rating Sub-Issues with Wizards

For some sub-issues, a wizard is provided to help you perform the rating for that sub-issue. To launch the wizard, click the WIZARD link included in the sub-issue row. The wizard for that sub-issue will appear in a new window. Follow the instructions in the wizard to complete the rating. Note that you are not able to directly enter the severity color rating and density from the sub-issue grid for the sub-issues that use a wizard.

Sub-Issue Comments

Additionally, comments can be added for each sub-issue by clicking the COMMENTS button in the sub-issue row. The comments window will appear in a new window. Enter any comments about the rating of the sub-issue and click CLOSE to close the window and save the changes.

Work Management

Work Planning Overview

With your building inventory, condition assessment, and functionality data in place, you can begin to truly manage the work in your building using BUILDER's powerful tools. Condition assessment data is used to plan maintenance and repair work at the component-section level, and functionality assessment data is used to plan modernization work at the building or functional area level.

Regardless of the type of work planned, a work item record is generated for each work activity that stores basic information about what work is planned, including the type of work, description, estimated cost, funding year, and quantity. As a group, work items can be [viewed in several useful ways](#), such as a list of all past, present, and future work in the building or in a list filtered by year, status, system, component, and/or component-section.

For section-level, condition-related maintenance and repair work, there are three ways to create work items. Each method is briefly described below. Click on the hyperlink of each method for a detailed description.

- [Manually entering records](#)
- [Using the automatic work generator](#)
- [Copying work items from an IMPACT scenario](#)

Functionality related modernization work at the building or functional area level can be entered manually or created by the automatic work generator. Modernization work is not generated in IMPACT scenarios because FI's are step functions over time, unlike the smooth, continuous functions seen in the condition indices. Because the FI's are not smooth, continuous functions, future FI's cannot be predicted and modernization work cannot be planned. The only way to determine when and by how much the functionality changes and the associated modernization work is to physically perform functionality assessments in the building.

Manually Entering Work Items

This method of entering work items is especially useful for recording past work efforts. It gives you an opportunity to capture institutional memory regarding what work you have done and when it was accomplished. Aside from basic details such as when the work was completed, its actual cost, and its funding source, the work item description allows you to add multiple notes about that particular work effort.

You might also choose to enter work items manually as a basic business practice. Your procedure might follow these steps:

1. Review [BUILDER reports](#) or [create specific GIS themes](#) regarding remaining service life, condition index (CI) trends, functionality index (FI) trends, and performance index (PI) trends to identify possible work requirements.
2. Verify possible work requirements by re-inspecting, especially if you have recorded no recent condition/functionality assessment data for the items. At

- the same time, collect the more detailed data needed for the work item specifications (exact quantities, manufacturer, scheduling restrictions, etc.).
3. Compile a list for approval by your chain of command.
 4. Enter each work item as it clears the process.

Using the Automatic Work Generator

BUILDER offers you an [automated process](#) of creating work items for your inventory.

This requires you to specifying [condition and functionality standards and policies, along with a policy sequence](#) that describe your decision process in identifying possible work items in your building. Standards set threshold values for key work indicators; CI and remaining service life for condition, and FI and PI for functionality.

Policies link different standards to the various component-sections (for condition) and functional areas and buildings (for functionality). The policy sequence pulls the standards and policies together in a way that an automated process can link each component-section, functional area, and building with its respective standard. By comparing the component-section's, functional area's and building's properties with their threshold values in its standard, BUILDER is able to create work items for every component-section, functional area, and building not meeting its standard.

Copying Work Items from an IMPACT Scenario

BUILDER 3.0 offers the use of an [IMPACT scenario](#), or a simulation model integrated with BUILDER's business rules and databases, to create condition-related work items for your inventory. IMPACT uses your inventory database and a set of initial scenario parameters to simulate how your inventory will evolve over the next 5 to 10 years. The simulation works by stepping through each future year generating work items using the standards and policies, [prioritizing the work items](#) based on your [prioritization scheme](#), and funding work items by priority ranking until all [funding levels](#) have been exhausted. When the scenario is complete, the scenario database contains a record of annual work plans constrained by budget. These work plans can be used as the foundation for your out-year plans.

As discussed above, IMPACT does not simulate or forecast modernization work at the building or functional area level.

Standards, Policies, and Policy Sequences

Standards, Policies, and Policy Sequences Overview

With your building inventory, condition assessment, and functionality data in place, you can begin to truly manage the work in your building using BUILDER's powerful tools. Condition assessment data is used to plan maintenance and repair work at the component-section level, and functionality assessment data is used to plan modernization work at the building and functional area level. Before the assessment data can be used in an [automated process](#) to determine the work requirements in your inventory, both condition and functionality standards, policies, and policy sequences must be created.

Condition Standards, Policies, and Policy Sequences

The condition index (CI) and remaining service life (RSL) properties of a component-section are excellent metrics to consider when planning maintenance, repair, and replacement projects. This section presents concepts for using the CI and RSL measures to help automate the process of identifying which component-sections in your inventory need attention.

Intuitively, when the CI value is high, no work action needs to be taken. When the CI value is low, repair or replacement is necessary. Somewhere between the high and low values of the CI range is a value of the CI that is a threshold, or a point at which your decision would change from no activity to initiating a work item. This threshold value might be the same for all component-sections or it might vary depending upon how critical a particular section is to the overall building. For example a CI of 80 might be the threshold for an air handling unit, while a CI of 65 might be the threshold for an interior door.

Additionally, these thresholds may vary from building to building. A headquarters building might have a threshold CI of 85 for interior doors, while a warehouse might have a threshold CI of 65 for interior doors. Similarly, there is a threshold value for determining whether to repair or replace a section. This threshold value is a ratio of the repair cost to the replacement cost (in BUILDER it is assumed that the cost of repair is variable, increasing as the CI decreases). When the ratio is below the threshold the section will be repaired, and when the ratio is above the threshold the section will be replaced.

When you establish a set of threshold values like those described above, an automated process can use these thresholds to search the entire inventory and identify sections whose metrics indicate where work should be initiated. With this BUILDER-generated list, you can anticipate the location of condition deficiencies and plan to correct them before failure occurs. If condition assessments are completed regularly, the CI trend analysis can estimate when the threshold CI will be reached, several years before it actually happens. This is valuable information for preparing outyear budgets. In addition, because the search of your inventory is exhaustive, no potential problems "fall through the cracks." All of this supports a very proactive management strategy.

The concepts presented in the preceding paragraphs can be implemented using BUILDER's [standards](#), [policies](#), and [policy sequences](#). Essentially, condition standards are sets of threshold values that determine whether or not work is needed when applied to a particular component-section. Condition policies are rules that define by property which component-sections will use which condition standards. When a single component-section is covered by more than one condition policy, a policy sequence establishes the order of precedence for applying policies so that only one condition standard is chosen for each component-section.

Here is a simple example of how condition standards, condition policies, and policy sequences are used to assign thresholds to every component-section:

- Suppose that you have decided that your inventory contains certain sections that you want to maintain at a CI of 80 or above, or that repair is required when the CI falls below 80. Also, you have decided that if the cost of repairing such a section is more than 70% of its replacement cost, then you will replace it rather than repair it. These decisions are represented in a condition

- standard - a set of threshold values. You [create that condition standard](#) and call it "High." Your inventory also contains some sections for which 60 is to be the threshold CI. You create that condition standard and call it "Low."
- To apply these condition standards, you must [create condition policies](#) that link them to specific component-sections. You may want administrative buildings to be maintained under the "High" condition standard and warehouses to be maintained under the "Low" condition standard. You would create a condition policy that links the respective standard with the appropriate buildings. You might also want all of the sections of an HVAC system in any building to be maintained under the "High" condition standard. You would create another condition policy that links the "High" condition standard with HVAC systems. Note that a policy may not specify standards for every category, such as in the example of the HVAC condition policy which does nothing to determine condition standards for the other systems in a building.
 - If you want to apply only these two condition policies, several problems arise. You must [create a policy sequence](#) to take care of the problems. First, the two policies mention nothing about the condition standards for training facilities other than the HVAC system. The overall process must be able to determine a condition standard for every component-section. To address this problem, a policy sequence has a default condition standard that is used if none of the selected condition policies apply. The default condition standard is one of the standards you have created, and you designate it as the default.

Second, both condition policies apply to HVAC systems in warehouses. The first sets the condition standard at "Low" and the second sets it at "High." The overall process must be able to select one and only one condition standard for each component-section. To address this problem, the policy sequence lists, in the order of their application, all of the condition policies that are to be used. If the HVAC policy is listed after the warehouse policy, then the HVAC policy prevails and the condition standard will be "High." If the warehouse policy is listed after the HVAC policy, then the warehouse policy prevails and the condition standard will be "Low." That is, the last policy in the list governs the applicable component-sections.

Functionality Standards, Policies, and Policy Sequences

The functionality index (FI) of buildings (BFI), functional areas (FAFI) and of the individual functionality issues are excellent metrics to consider when planning modernization projects. Additionally, the Building Performance Index (BPI) property is an excellent metric to consider when planning for building reconstruction. This section presents concepts for using the FI measures to identify which buildings and functional areas in your inventory need modernization and concepts for using the BPI measure to identify which buildings in your inventory need to be reconstructed.

Intuitively, when the FI's and BPI values are high, no modernization or reconstruction is necessary. When any of these values are low, modernization or reconstruction is necessary. Somewhere between the high and low values of each measure is a value that is a threshold, or a point at which your decision would change from no activity to initiating a work item. This threshold value might be the same for the FI's and BPI, or it could be different for each. For example, 70 might be the threshold value for the BFI and FAFI, but 50 might be the threshold value for the

individual functionality issues and the BPI in the same building. Additionally, these thresholds may vary from building to building. A headquarters building might have a threshold BFI of 80, while a warehouse might have a threshold BFI of 60.

When you establish a set of threshold values like those described above, an [automated process](#) can use these thresholds to search the entire inventory and identify buildings and functional areas whose metrics indicate where modernization or entire building reconstruction should be initiated. With this BUILDER-generated list, you can pinpoint the location of functionality and performance deficiencies and plan to correct them. In addition, because the search of your inventory is exhaustive, no potential problems "fall through the cracks." All of this supports a very proactive management strategy.

The concepts presented in the preceding paragraphs can be implemented using BUILDER's [standards](#), [policies](#), and [policy sequences](#). Essentially, functionality standards are sets of threshold values that determine whether or not work is needed when applied to a particular building and/or functional area. Functionality policies are rules that define by property which buildings and functional areas will use which functionality standards. When a single building or functional area is covered by more than one functionality policy, a policy sequence establishes the order of precedence for applying policies so that only one functionality standard is chosen for each building.

Here is a simple example of how functionality standards, functionality policies, and policy sequences are used to assign thresholds to every building:

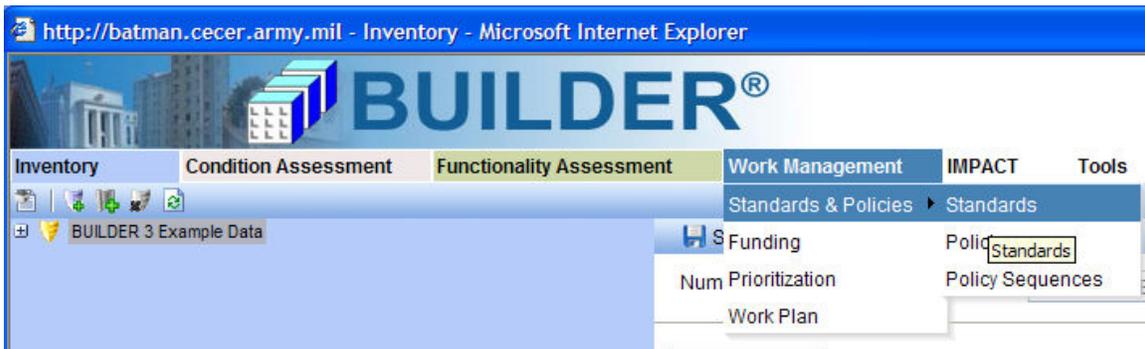
- Suppose that you have decided that your inventory contains certain buildings (with functional areas) that you want to maintain at a BFI, FAFI, and issue FI's of 80 or above, or that modernization is required when any of the FI's fall below 80. Also, you have decided that if the BPI falls below 70, then reconstruction of the building will be required. These decisions are represented in a functionality standard - a set of threshold values. You [create that functionality standard](#) and call it "High". Your inventory also contains some buildings for which 60 is to be the threshold for all the FI's and the BPI. You create that functionality standard and call it "Low".
- To apply these functionality standards, you must [create functionality policies](#) that link them to specific buildings and/or functional areas. You may want administrative buildings (and all functional areas in those buildings) to be maintained under the "High" functionality standard and housing buildings (and all functional areas in those buildings) to be maintained under the "Low" functionality standard. You would create a functionality policy that links the respective standard with the appropriate buildings. You might also want all the display functional areas (in all buildings) to be maintained under the "High" functionality standard. You would create another functionality policy that links the "High" functionality standard with display functional areas. Note that a policy may not specify standards for every category, such as in the example of the display area policy which does nothing to determine functionality standards for the functional areas other than display areas in all buildings.
- If you want to apply only these two functionality policies, several problems arise. You must [create a policy sequence](#) to take care of the problems. First, the two policies mention nothing about the functionality standards for non-

display functional areas in buildings that are not administration or housing. The overall process must be able to determine a functionality standard for every functional area in every building. To address this problem, a policy sequence has a default functionality standard that is used if none of the selected functionality policies apply. The default functionality standard is one of the standards you have created, and you designate it as the default.

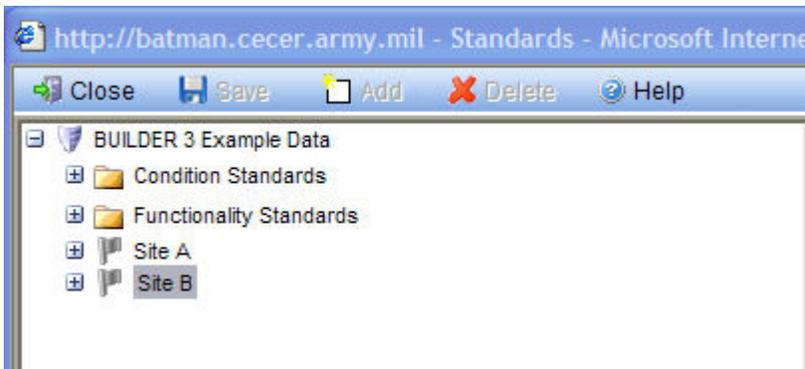
Second, both functionality policies apply to display areas in administration and housing buildings. The first sets the functionality standard at "Low" and the second sets it at "High" for housing buildings. The overall process must be able to select one and only one functionality standard for each building. To address this problem, the policy sequence lists, in the order of their application, all of the functionality policies that are to be used. If the housing policy is listed after the display area policy, then the housing policy prevails and the functionality standard will be "Low." If the display area policy is listed after the housing policy, then the display area policy prevails and the functionality standard will be "High." That is, the last policy in the list governs the applicable functional areas and/or buildings.

Adding and Editing Standards

To add or edit condition or functionality standards, select *Work Planning* -> *Standards and Policies* -> *Standards* from the navigation menu.



The Standards window will appear.



By expanding the tree at the site (or group) level, folders for condition and functionality standards will appear. From these folders, new condition or

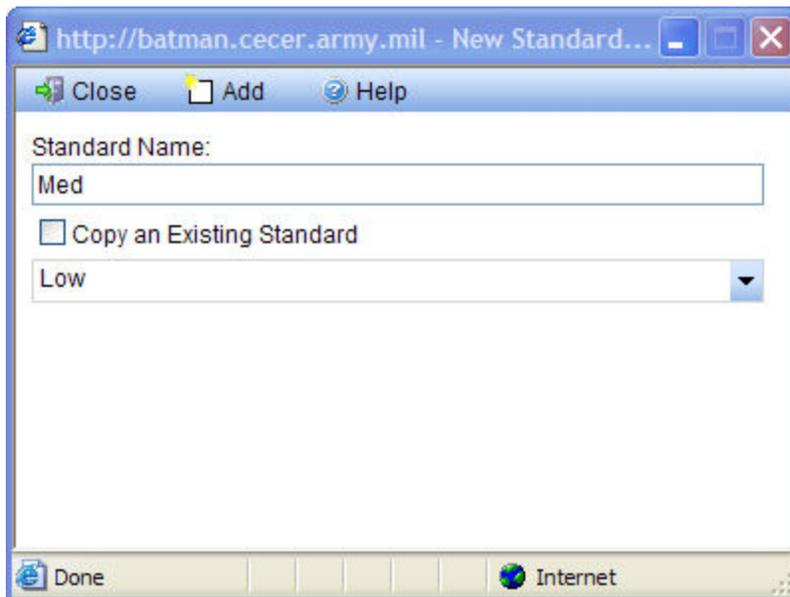
functionality standards can be added and the existing standards can be viewed and edited.

Toolbar

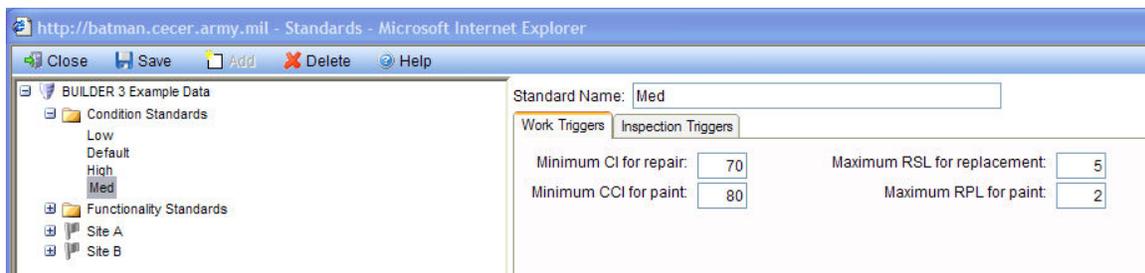
- CLOSE. Use this button to close the Standards window.
- SAVE. Use this button to save changes made to the standards.
- ADD. Use this button to add a new standard.
- DELETE. Use this button to delete the selected standard.
- HELP. Use this button to launch the help topic associated with standards.

Adding Condition Standards

To add a condition standard, select the condition standards folder on the tree and click the ADD button in the toolbar. Note that the level on the tree where condition standards are selected and added denotes the level in the inventory where those standards can be applied. The New Standard window will appear.



Enter the new standard's name, mark the COPY AN EXISTING STANDARD button and select an existing standard to copy if you want to copy data from an existing standard to the new one, and click the ADD button in the toolbar. The standards window will open as shown below and data can be input for the standard on the work triggers and inspections scheduling tabs (described below).



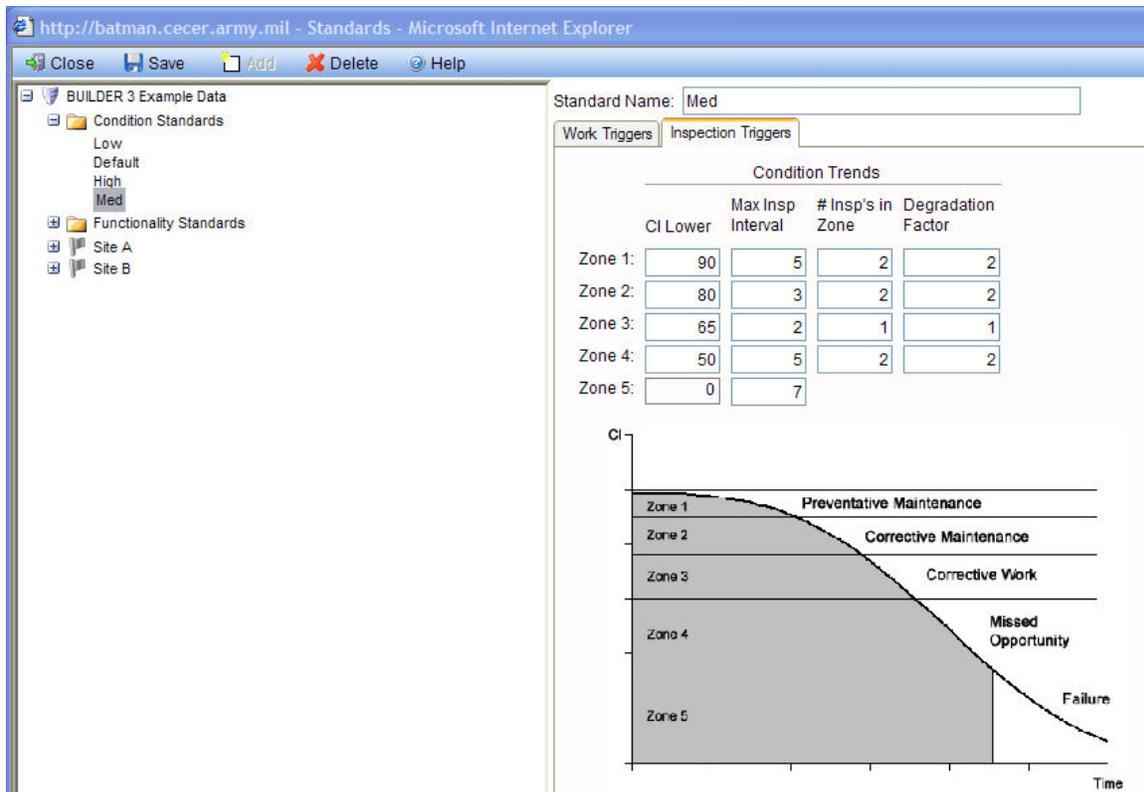
Work Triggers Tab

When creating a condition standard, you must enter a set of work triggers, or thresholds, to initiate work items for the inventory of your building.

- **Name.** Enter the condition standard's name, which must be unique and is limited to 50 alphanumeric characters.
- **Minimum CI for repair:** Enter the threshold value for condition index. For sections with a CI above this value, no work item is triggered. For sections with a CI below this value, a work item is triggered.
- **Maximum RSL for replacement:** Enter the threshold value for remaining service life. For sections with a RSL above this value, replacement would not be considered as an option unless it is more cost effective to replace than to repair.
- **Minimum CCI for paint:** Enter the threshold value for the coating condition index. For painted sections with a CCI above this value, no paint work item is triggered. For painted sections with a CCI below this value, a paint work item is triggered.
- **Maximum RPL for paint:** Enter the threshold value for remaining paint life. For painted sections with a RPL greater than this value, no paint work item is triggered. For painted sections with a CCI less than this value, a paint work item is triggered.

Inspection Scheduling Tab

On the Inspection Scheduling tab, additional data can be input to determine when condition assessments should be performed and the type of condition assessment to perform by using the [Knowledge-Based Inspection Scheduling](#) tool.



The data on this tab should be input for each of the condition zones (see the [Condition Assessment Manual](#) for explanation of each condition zone) and includes:

- **CI Lower.** Enter the lower bound of the CI range of the condition zone. Providing the lower bound for each zone breaks the condition curve as shown in the screen above.
- **Maximum Inspection Interval.** Enter the maximum amount of time, in years, between condition assessments in each condition zone.
- **Number of Inspections in Zone.** Enter the maximum number of condition assessments that should be performed in each condition zone.
- **Degradation Factor.** The ratio of the maximum relative rate of deterioration to the expected rate of deterioration when a condition assessment is triggered. That is, if the deterioration rate were set to 2, any measured deterioration rate greater than twice the expected rate would trigger another inspection.

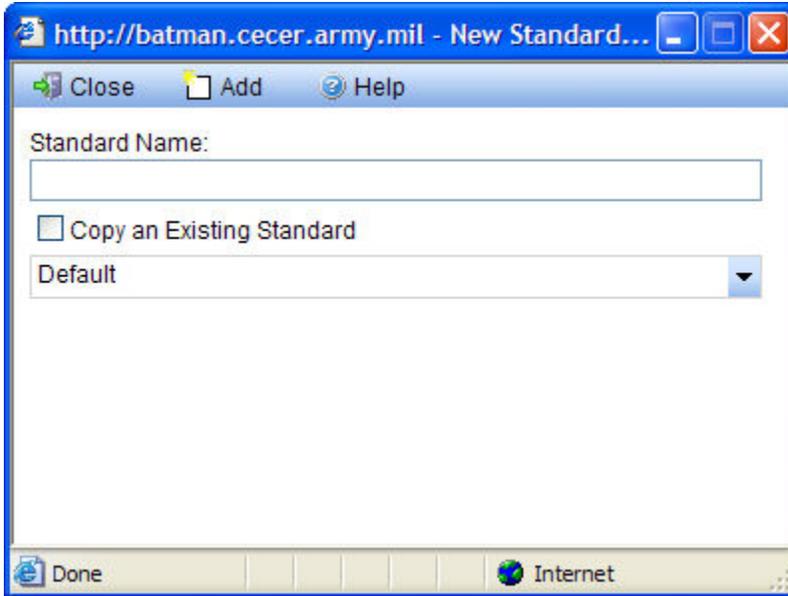
After adding data for a condition standard, make sure to click the SAVE button in the toolbar to save the changes to the condition standard.

Editing a Condition Standard

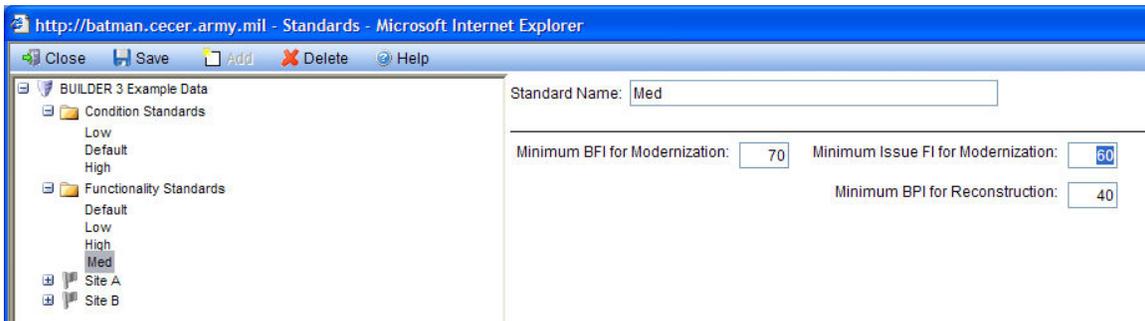
After a condition standard has been added, its data on the work triggers or inspection scheduling tabs can be edited by selecting the standard on the tree. Make sure to click the SAVE button in the toolbar to save any changes made to the condition standard.

Adding Functionality Standards

To add a functionality standard, select the functionality standards folder on the tree and click the ADD button in the toolbar. The New Standard window will appear.



Enter the standard's name, mark the COPY AN EXISTING STANDARD button and select an existing standard to copy if you want to copy data from an existing standard to the new one, and click the ADD button in the toolbar. The standards window will appear as shown below and data can be input for the standard (described below).



Required Data

For each functionality standard, you must enter a set of work triggers, or thresholds, to initiate modernization work in your building.

- **Name.** Enter the functionality standard's name, which must be unique and is limited to 50 alphanumeric characters.

- **Minimum BFI for Modernization.** Enter the threshold value for the BFI.
For buildings with a BFI above this value, no modernization work is triggered. For buildings with a BFI below this value, modernization work is triggered.
- **Minimum Issue FI for Modernization.** Enter the threshold value for the FI's for each individual functionality issue. For issues in the building with an FI above this value, no modernization work is triggered to correct the issue. For issues in the building with an FI below this value, modernization work is triggered.
- **Minimum BPI for Reconstruction.** Enter the threshold value for the BPI.
For buildings with a BPI above this value, no work is triggered. For buildings with a BPI below this value, the building will be scheduled for demolition and reconstruction.

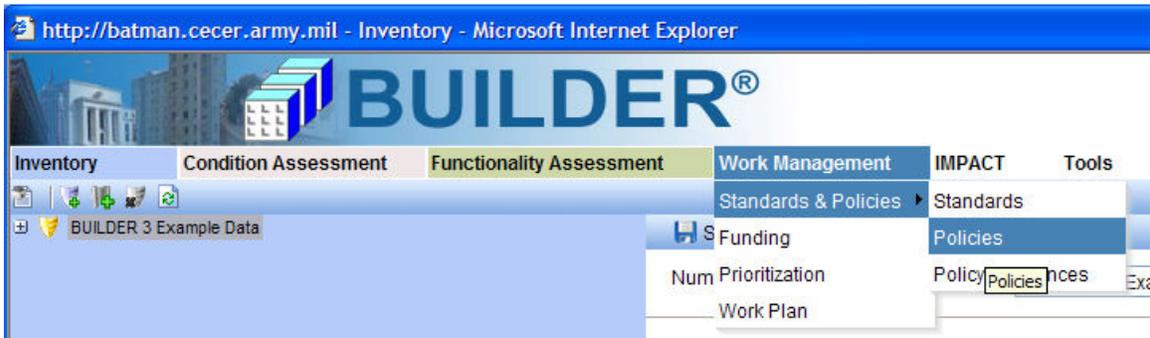
After adding or editing data for a functionality standard, click the SAVE button in the toolbar to save the changes to the functionality standard.

Editing a Functionality Standard

After a functionality standard has been added, its data can be edited by selecting the standard on the tree. Make sure to click the SAVE button in the toolbar to save changes made to the functionality standard.

Adding and Editing Policies

To add or edit policies, select *Work Management -> Standards and Policies -> Policies* from the navigation menu.



The Policies window will appear.



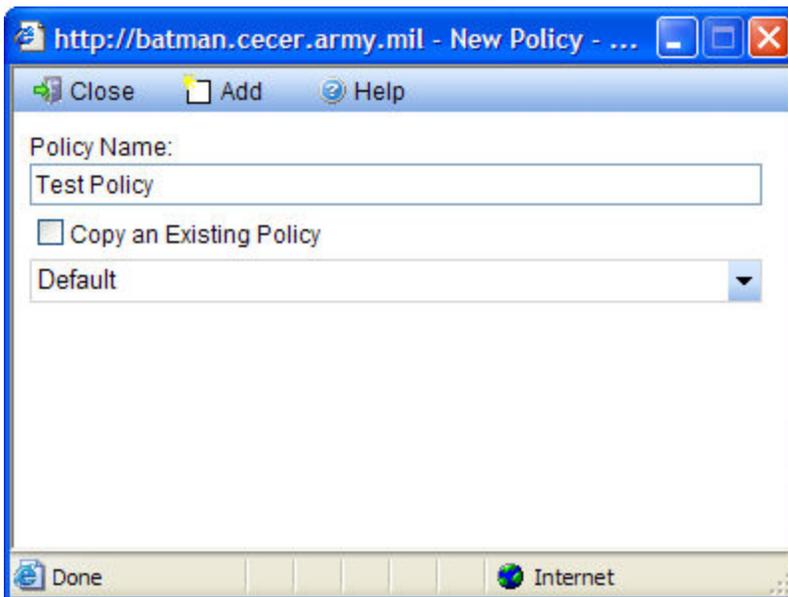
By expanding the tree at the site (or group) level, folders for condition and functionality policies will appear. From these folders, new condition or functionality policies can be added and the existing standards can be viewed and edited.

Toolbar

- CLOSE. Use this button to close the Policies window.
- SAVE. Use this button to save changes you have made to the policies.
- NEW. Use this button to add a new policy.
- DELETE. Use this button to delete the selected policy.
- HELP. Use this button to launch the help topic associated with policies.

Adding Condition Policies

To add a condition policy, select the condition policies folder on the tree and click the ADD button in the toolbar. Note that the level selected when adding a policy denotes the level at which that policy can be applied. The New Policy window will appear.



Enter the policy's name, mark the COPY AN EXISTING POLICY button and select an existing policy to copy if you want to copy data from an existing policy to the new one, and click the ADD button in the toolbar. The policy window will open as shown below and data can be input for the policy (described below).

Attributes Used to Define Policy

Policy Name:

Select Standards for all attribute combinations that apply to this policy.

First Attribute: Third Attribute:

Second Attribute: Fourth Attribute:

System	Standard
Conveying	
Electrical	High ()
Exterior Circulation	Low ()
Exterior Closure	
Fire Suppression	
HVAC	High ()
Interior Construction	Low ()
Plumbing	
Roofing	High ()
Site	Low ()
Specialties	
Structural	

Required Data

When you add a new condition policy, you must enter the following data:

- **Name.** Enter the policy's name, which must be unique and is limited to 50 alphanumeric characters.
- **Attributes Used to Define the Policy.** Select between one and four attributes of component-sections to define the condition policy. These are selected consecutively as First, Second, Third, and Fourth Attribute. These attributes are simply field properties in the location/complex/building/system/component/section hierarchy. The grid shown at the bottom of the window will not be visible until the attribute(s) have been selected.
- **Select Standards for all attribute combinations that apply to this policy.** Assign condition standards to the various combinations of values of these field properties, so that when a section's hierarchy has field properties matching a given combination of values, it will use the condition standard for that combination. The grid at the bottom of the window will show all combinations of the attributes selected. You do not need to select a condition standard for every combination. The combinations that do not have a selected condition standard are simply not covered by the condition policy.

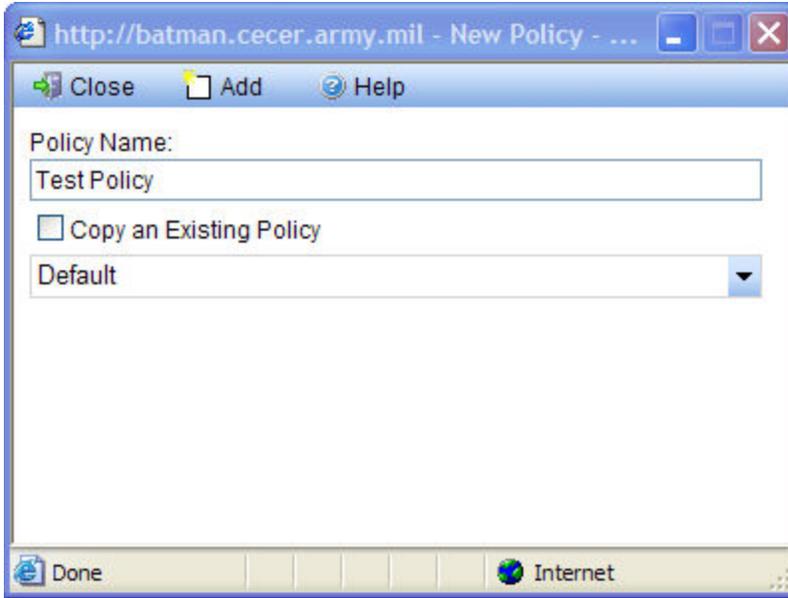
After adding a condition policy, make sure to click the SAVE button in the toolbar to save the changes to the condition policy.

Editing a Condition Policy

After a condition policy has been added, its data can be edited by selecting the policy on the tree. Make sure to click the SAVE button in the toolbar to save changes made to the condition policy.

Adding a Functionality Policy

To add a functionality policy, select the functionality policies folder on the tree and click the ADD button in the toolbar. The New Policy window will appear.



Enter the policy's name, mark the COPY AN EXISTING POLICY button and select an existing policy to copy if you want to copy data from an existing policy to the new one, and click the ADD button in the toolbar. The policy window will open as shown below and data can be input for the policy (described below).

Attributes Used to Define Policy

First Attribute: System Third Attribute:

Second Attribute: Fourth Attribute:

Policy Name:

Select Standards for all attribute combinations that apply to this policy.

	System	Standard
Conveying		
Electrical		High ()
Exterior Circulation		Low ()
Exterior Closure		
Fire Suppression		
HVAC		High ()
Interior Construction		Low ()
Plumbing		
Roofing		High ()
Site		Low ()
Specialties		
Structural		

Required Data

When you add a new functionality policy, you must enter the following data:

- **Name.** Enter the policy's name, which must be unique and is limited to 50 alphanumeric characters.
- **Attributes Used to Define the Policy.** Select between one and four attributes of component-sections to define the functionality policy. These are selected consecutively as First, Second, Third, and Fourth Attribute. These attributes are simply building and functional area field properties. The grid shown at the bottom of the window will not be visible until the attribute(s) have been selected.
- **Select Standards for all attribute combinations that apply to this policy.** Assign functionality standards to the various combinations of values of these field properties, so that when a building or functional area has field

properties matching a given combination of values, it will use the functionality standard for that combination. The grid at the bottom of the window will show all combinations of the attributes selected. You do not need to select a functionality standard for every combination. The combinations that do not have a selected functionality standard are simply not covered by the functionality policy.

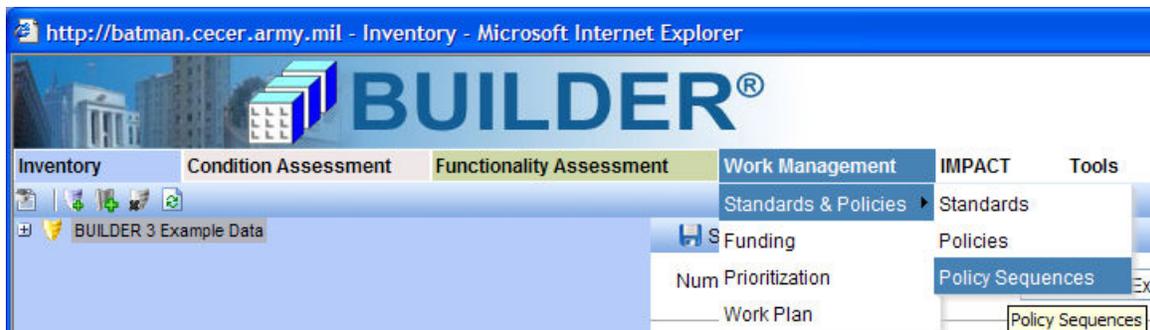
After adding a functionality policy, make sure to click the SAVE button in the toolbar to save the changes to the functionality policy.

Editing a Functionality Policy

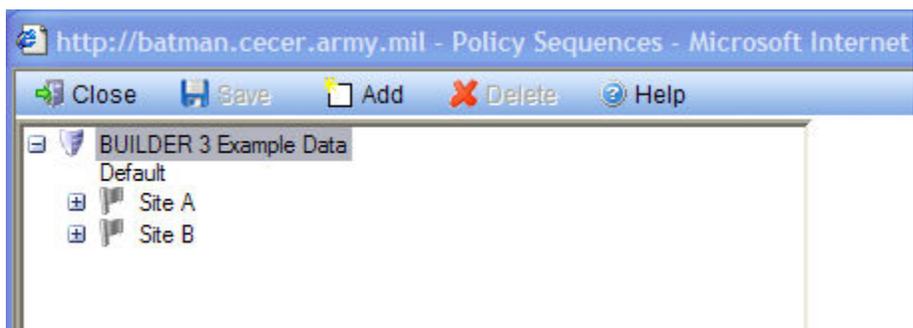
After a functionality policy has been added, its data can be edited by selecting the policy on the tree. Make sure to click the SAVE button in the toolbar to save changes made to the functionality policy.

Adding and Editing Policy Sequences

To add or edit policy sequences, select *Work Planning -> Standards and Policies -> Policy Sequences* from the navigation menu.



The Policy Sequence window will appear.



To create a new policy sequence, click the ADD button in the toolbar. If you wish to edit a current policy sequence, select the policy sequence you wish to edit from the tree on the left side of the screen.

Toolbar

- **CLOSE.** Use this button to close the Policy Sequences window.
- **SAVE.** Use this button to save changes you have made to the policy sequences.
- **NEW.** Use this button to add a new policy sequence.
- **DELETE.** Use this button to delete the policy selected sequence.
- **HELP.** Use this button to launch the help file associated with policy sequences.

Policy Sequence Name:

Default Condition Standard:

Default Functionality Standard:

Available Policies		Selected Policies	
Org Code	Name	Org Code	Name
		BUILDER 3 Example Data	Default
		BUILDER 3 Example Data	Default

Required Information

When you add a new policy sequence or edit an existing policy sequence, you must enter the following data:

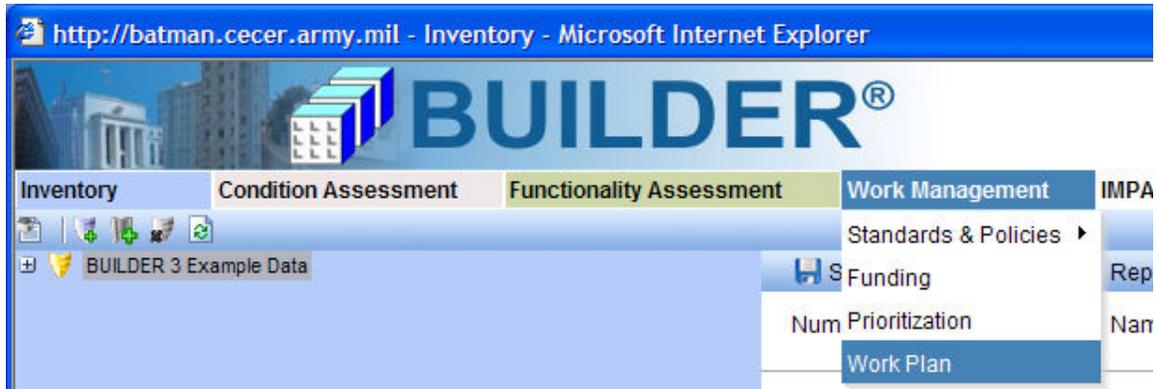
- **Name.** Enter the policy sequence's name, which must be unique and is limited to 50 alphanumeric characters.
- **Default Condition Standard.** Select a condition standard from among the standards you have previously created to be the default. The application of the policy sequence must be able to determine a standard for every component-section in your inventory. If none of the policies in this policy sequence apply to a given section, then the default standard is used.
- **Default Functionality Standard.** Select a functionality standard from among the standards you have previously created to be the default. The application of the policy sequence must be able to determine a standard for every building and functional area in your inventory. If none of the policies in this policy sequence apply to a given section, then the default standard is used.
- **Selected Policies.** Select the policies in the Available Policies list you wish to add to the policy sequence and use the arrow buttons to move them to the Selected Policies list. To change the order of application of a policy in the Selected Policies list, select the policy and use the up and down arrow buttons to move it in the list. Arrange the list so that each succeeding policy in the list overwrites earlier policies in the list. That is, the last policy in the Selected Policy list governs the applicable component-sections, functional areas, and buildings. You may choose to have no selected policies at all, in which case all inventory will use the default standard.

Note that you may create multiple policy sequences. The application of a specific policy sequence could potentially result in a work plan that differs from another policy sequence because each may assign different standards for the component-sections, functional areas, and buildings in your inventory.

Work Items

Viewing Work Items

The individual work item records, when grouped by fiscal year, become an annual work plan that can be viewed in the Work Items window. To view work plan, select *Work Planning* -> *Work Plan* from the navigation menu.



The Work Items window will appear.

Name	Description	Cost	Status	Score	Date
1004 - Quarters D	Repair Foundation Wall/Grade Wall Concrete	\$430	Budgeted	75.00	
4911 - Consolidated Club	Replace Roof Surface Roof A Metal Standing-Beam	\$146,000	Budgeted	73.00	
4874 - Dining Hall	Repair Heating Unit/Plant Boiler (Steel) Gas/Oil (Steam) 388	\$26,000	Budgeted	73.00	
4572 - Senior NCO Barracks	Repair Air Handling Unit Fan Coil (dual) <1 Ton	\$18,000	Budgeted	73.00	
1621 - Fire Station	Repair Heating Unit/Plant Boiler (Steel) Gas/Oil (Hot Water)	\$11,500	Budgeted	73.00	
1812 - Security Office	Repair Generator Set Fuel Oil	\$10,900	Budgeted	72.00	

Toolbar

- CLOSE. Use this button to close the Work Item screen.
- REPORTS. Use this button to launch the Report Selection tool, which gives you access to a list of standard reports relevant to the work items. See [Using the Report Viewer](#).
- GENERATE ITEMS. Use this button to [automatically generate work items](#).
- PRIORITIZE. Use this button to [prioritize the work items](#) for a work plan.
- FUND ITEMS. Use this button to [allocate funding to the work items](#) in a work plan.
- RANKINGS. Use this button to [view the rankings of the work items](#) for a work plan.
- COPY SCENARIO. Use this button to [copy the results of an IMPACT scenario](#) to the current work plan.

Changing the Work Items View

Initially, the work plan for the current fiscal year for the entire inventory is shown in the Work Items window. To view the work plan for a particular inventory level, [navigate the tree](#) on the left side of the window to the desired level. The work plan for the selected inventory level will be shown for the current fiscal year. To view the work plan for past or future fiscal years, select the desired fiscal year from the dropdown list at the top of the window.

Once the desired work plan is shown, you are able to sort it using the column headings. Click on the column you wish to sort by once to sort in alphabetically/ascending numerical order. Click on the column a second time if you wish to sort in reverse-alphabetic order/descending numerical order. Initially, the work plan is sorted by name in ascending numerical order.

Viewing Individual Work Item Details

To view the individual work item details, click on the Facility hyperlink associated with a given work item.

Name	Description	Cost	Status	Score	Date Completed
1004 - Quarters D	Repair Foundation Wall/Grade Wall Concrete	\$430	Budgeted	75.00	
4911 - Consolidated Club	Replace Roof Surface Roof A Metal Standing-Seam	\$146,000	Budgeted	73.00	
4571 - Dining Hall	Repair Heating Unit/Plant Boiler (Steel) Gas/Oil (Steam) 388	\$26,000	Budgeted	73.00	
4577 - Senior NCO Barracks	Repair Air Handling Unit Fan Coil (dual) <1 Ton	\$18,000	Budgeted	73.00	
1621 - Fire Station	Repair Heating Unit/Plant Boiler (Steel) Gas/Oil (Hot Water)	\$11,500	Budgeted	73.00	
1617 - Security Office	Repair Generator Set Fuel Oil	\$10,500	Budgeted	73.00	
4000 - Fitness Center	Repair Distribution Electrical Category 6	\$10,500	Budgeted	73.00	
4571 - Dining Hall	Repair Roof Surface Roof A Metal Standing-Seam	\$9,900	Budgeted	73.00	

If the work item is a section-level work item, you will see the [Section-Level Work Item Details](#). If the work item is a building-level work item, you will see the [Building-Level Work Item Details](#). If the work item is a project, you will see the [Project Details](#) for that project.

Adding and Deleting Work Items

To add a work item to the current work plan, click the ADD ITEM button. Work items can be added at the [section-level](#), [building-level](#), or as a [project](#). Additionally, work items can be added using [BUILDER's automatic work generator](#) or [copying the results of an IMPACT scenario](#). To delete a work item from the current work plan, select the work item on the grid and click the DELETE ITEM button.

Exporting the Work Plan to Excel

The current work plan can be exported to an Microsoft Excel spreadsheet using the EXPORT TO EXCEL button. After clicking this button, you must choose to either open or save the Excel spreadsheet. If you choose to save, you must specify the location and name to save the exported spreadsheet.

Creating and Editing a Section-Level Work Item

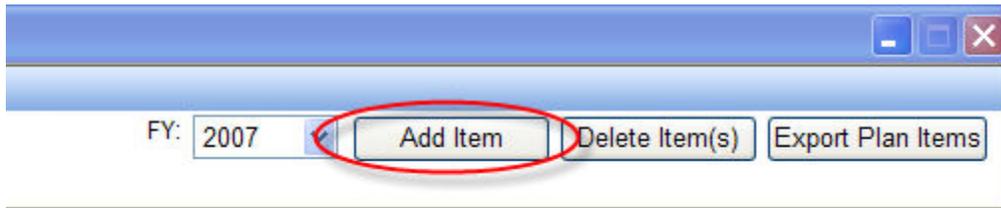
A section-level work item is an individual record of maintenance, repair, or revitalization work on a component-section in your inventory. The information stored with the work item is what was or is to be done, when it was or is to be done, its cost, its funding source, and its importance relative to the other work items vying for the same resources at the same time.

In BUILDER, section-level work items can be created three ways, each of which is discussed in detail further below.

- **Manual Input** - Allows you to create individual work items manually from the Work Items window.
- **BUILDER Generated Work Items** - Allows you to use the automated work generation feature in BUILDER to create an entire work plan if you have defined [standards, policies, and policy sequences](#).
- **IMPACT Scenario Generated Work Items**- Allows you to [copy the results of IMPACT scenario](#) and create a multi-year work plan.

Creating a Work Item Manually

To create a section-level work item manually, click the ADD ITEM button on the Work Item screen.



The New Work Item window will appear.

 A screenshot of a web browser window titled 'http://batman.cecer.army.mil - Add Wo...'. The browser has 'Close', 'Proceed', and 'Help' buttons. The main content area has two sections:

- Select the type of Work Item to create:** with three radio buttons: 'Project', 'Building Work Item', and 'Section Work Item' (which is selected).
- Select the Section to create the work item for:** with four dropdown menus:
 - Building: 1001 - Quarters A
 - System: Electrical
 - Component: Lighting Fixtures
 - Section: Incandescent Exterior

 The browser status bar at the bottom shows 'Done' and 'Internet'.

Select the Section Work Item option, along with the building, system, component, and section for the work item, and click the PROCEED button. The Component Section Work Item window will appear.

Component-Section Work Item - Microsoft Internet Explorer

Close Save Help

Section Description: Interior Wall Finish/Covering - Wood Paneling Quantity: 2,210 SF

Details Cost Analysis

Calculate

*Projected CI: 63 *Projected RSL: 4

Current Type: Wood Paneling

Description: Repair Interior Wall Finish/Covering Wood Paneling

Work Request ID: Status: Awaiting Funds

Funding FY: 2007 Must complete as planned

Work FY: 2007 Fund Source:

Score: 56.000 Estimated Cost: \$2,750 Override automatic cost estimate

Work Code: Sustainment Modernization Year:

Activity: Repair Actual Cost: \$2,750

Quantity: 2,210 SF CostBook: Reference

ROI Information

Return: \$2,800 ROI: 102%

* Projected values are estimated based on the Work FY.

On this screen, the following data for the section-level work item is displayed and can be edited:

- **Section Description** (Read-Only). Displays the description component-section of the work item.
- **Quantity** (Read-Only). Displays the actual inventory quantity for this component-section.
- **Projected CI** (Read-Only). Displays the projected Condition Index (CI) for the section in the funding FY. If the funding FY changes, BUILDER will recalculate the projected CI for the new funding FY.
- **Projected RSL** (Read-Only). Displays the projected Remaining Service Life (RSL) for the section in the funding FY. If the funding FY changes, BUILDER will recalculate the projected RSL for the new funding FY.
- **Current Type** (Read-Only). Displays the material/equipment type and component subtype of the section.
- **New Type**. If the work item activity is Replace, then you will have the option of replacing the current component-section type with another. The default is to replace in kind. Select a different type and material/equipment type from the dropdown list of available options if you wish to change the type. If the work item activity is not Replace, this item is not visible.
- **Description of Work Item**. Enter a description of the work item, limited to 255 alphanumeric characters.
- **Work Request ID**. Enter your agency's work request number, limited to 50 alphanumeric characters. This item of data is not used by BUILDER in any analyses.

- **Status.** Select the current status of the work item from the dropdown list of choices. The status will change over time as the work item moves from planning to completion. The values of status are:
 - Awaiting Contract Award
 - Awaiting Funds
 - Awaiting Funds (Special Project)
 - Budgeted
 - Canceled
 - Completed
 - Deferred
 - Funded
 - Funded (Service Call)
 - Funded (Special Project)
 - In Design
 - In Progress
 - On hold

- **Funding FY.** Enter the four-digit fiscal year that the work item was or will be funded.
- **Must Complete as Planned.** Check this box if the work item falls into the "must do" category. Marking this checkbox will force the work item to be funded before all other competing work items that are not marked as "must do" in IMPACT scenarios.
- **Completion FY.** Enter the four-digit fiscal year that the work item was or will be completed.
- **Fund Source.** Select the [funding source](#) to be used for this work item from the created fund sources.
- **Date Completed.** Enter the date the work item was completed.
- **Estimated Cost.** Enter the estimated cost of the work item. BUILDER provides a means of estimating the initial cost once you have entered the Fund FY, Activity, Cost Book, and Quantity using the ESTIMATE button. Note that the cost module is unable to estimate the cost of activities to Add/Install and Alter, so the ESTIMATE button is grayed out for those work activities.
- **Score (Read Only).** If you have [prioritized the work items](#), then this work item's score will be displayed here. The default value is 0.000, indicating that the work items have not been prioritized.
- **Override Automatic Cost Estimate.** Mark this checkbox if you wish to override the cost estimated using the ESTIMATE button and enter your own estimated cost of the work item.
- **Work Code.** Select the work code of the work item. The available work codes are:
 - Sustainment
 - Modernization
 - Demolition
 - New Footprint
- **Activity.** Select the work activity associated with this work item from the dropdown list. The work activities are:
 - Add/Install
 - Alter
 - Paint
 - Remove
 - Repair
 - Replace

- **Actual Cost.** Enter the actual cost of the work item after completion.
- **Quantity.** Enter the quantity of section involved with the work item. The Quantity listed at the top of the window is the actual component-section quantity, but the quantity of the work item may be different. For example, you may replace only 5 of the 10 doors in a component-section.
- **Cost Book.** Select the [cost book](#) to be used from the dropdown list.
- **ROI Information (Read-Only).** Displays the return and return on investment for the work item calculated on the [Cost Analysis tab](#).

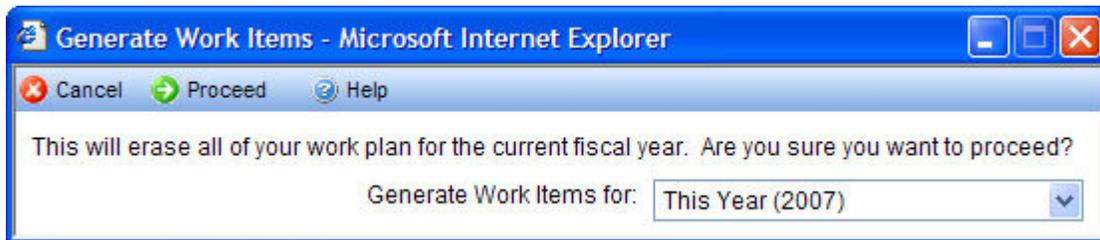
After entering the data for the work item, click the SAVE button in the toolbar to save the changes to the work item. If you do not wish to save the changes made to the work item, click the CANCEL button on the toolbar.

Generating Work Items in BUILDER Automatically

If you have created [condition and functionality standards and policies, along with a policy sequence](#), you may use the GENERATE WORK ITEMS button to create a work plan for the current year.



After clicking the GENERATE WORK ITEM button, the Generate Work Items window will appear.



Click PROCEED to generate the work items. It is important to note that by clicking the PROCEED button, all of the work items in the work plan for the current fiscal year will be deleted. Using the [policy sequence](#) defined in the [site data](#), each component-section's, functional area's, and building's properties with its standard's threshold values to determine where and what type of work should be done. Additionally, the estimated cost of each work item is computed using the [default cost book](#). When the process is complete, the work plan will appear in the Work Items window, displaying all of the newly generated work items. All of the newly generated work items will have the status "Awaiting Funds." You may then refine the work item list as you wish.

Note that BUILDER's work generation algorithms are still primitive in the sense that they are unable to detect work conflicts and precedences. For example, they may generate a need to repair a roof deck without a concurrent effort to repair the roof

surface. Your own manual processing of the work item list must address such problems.

Creating Work Items Using an IMPACT Scenario

If you have run an [IMPACT scenario](#), you may use the COPY SCENARIO button to use the results of the scenario to create a work plan for the current and future years.

(Screen Shot)

See [Creating a Work Plan from a Scenario](#) for more information on using this tool.

Editing Section-Level Work Items

To edit a section-level work item, click on the DETAILS button next to desired section-level work item on the Work Items screen.

Name	Description	Cost	Status	Score	Date Completed
1004 - Quarters D	Repair Foundation Wall/Grade Wall Concrete	\$430	Budgeted	75.00	
4911 - Consolidated Club	Replace Roof Surface Roof A Metal Standing-Seam	\$146,000	Budgeted	73.00	
4571 - Dining Hall	Repair Heating Unit/Plant Boiler (Steel) Gas/Oil (Steam) 388	\$26,000	Budgeted	73.00	
4577 - Senior NCO Barracks	Repair Air Handling Unit Fan Coil (dual) <1 Ton	\$18,000	Budgeted	73.00	
1621 - Fire Station	Repair Heating Unit/Plant Boiler (Steel) Gas/Oil (Hot Water)	\$11,500	Budgeted	73.00	
1617 - Security Office	Repair Generator Set Fuel Oil	\$10,500	Budgeted	73.00	

The Component Section Work Item screen will appear and all of the [data described above](#) can be edited as desired.

Creating and Editing a Building-Level Work Item

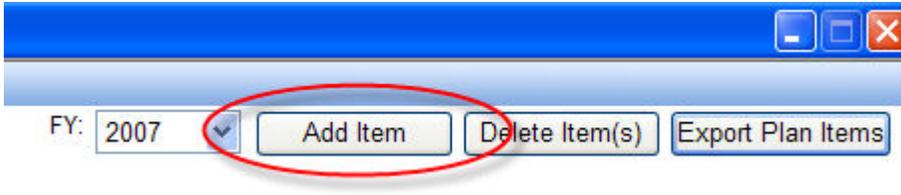
BUILDER 3.0 provides a feature to create work items at both the building-level and section-level. The building-level work items are currently limited to one work activity: demolish the building. The building-level work item allows you to schedule and track demolition in your work plan and to account for its cost in your overall budget. Since you will be entering, updating, and tracking such work manually, the new type of work item will be relatively trouble-free in BUILDER. The automated processes in IMPACT, however, will require some help from you to model funding and completion of this type of work item.

A work item to demolish a building affects all sections of the building, but the effect is counter to the logic associated with prioritizing M&R work, which focuses on valuing work that protects and preserves the various sections of a building. For that reason, the [prioritization schemes](#) in BUILDER/IMPACT do not compute a priority score for building-level work items (the score will be 0.00). In order for such a work item to be funded for completion, there must be a funding source for which it qualifies and sufficient funds in that source to meet the cost of the work item and all other qualified work items. Here are two examples of ways to handle this:

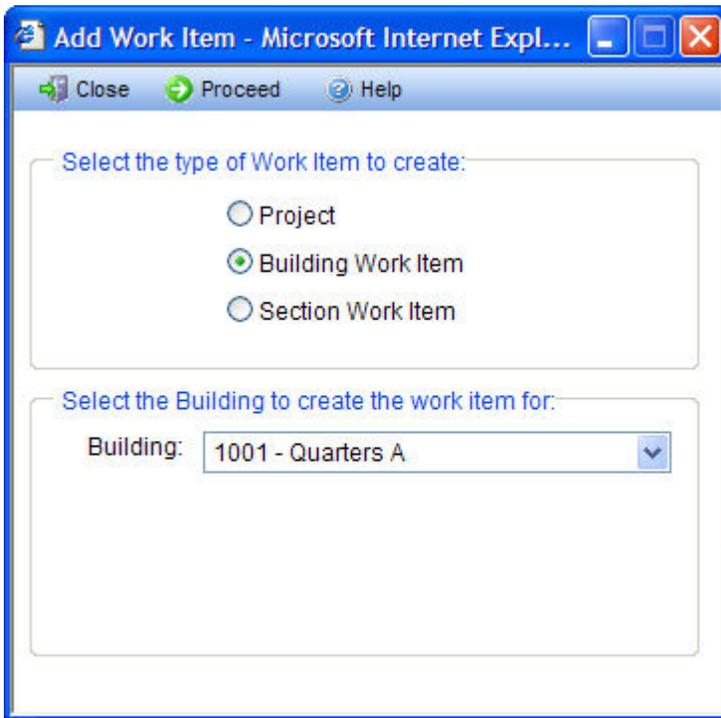
- Create a specific funding source with a criteria that it must be used only for the building that is to be demolished. Set aside sufficient funds in that source for the fiscal year of the work item to cover the cost of the demolition.
- Check the "Must do as planned" property of the work item. That will force the demolition work to be funded before all other competing work items that are not marked as "Must do."

Creating a Building-Level Work Item

To create a building-level work item, click the ADD ITEM button on the Work Item screen.



The New Work Item window will appear.



Select the Building Work Item option, select the building of the work item, and click the PROCEED button. The Building Work Item window will appear:

The screenshot shows a web browser window with the title 'Work Item for 1001 - Quarters A - Microsoft Internet Explorer'. The browser's address bar and navigation buttons (Close, Save) are visible. The main content area contains a form with the following fields:

- Description:** A text input field containing 'Modernize 1001 - Quarters A'.
- Work Request ID:** An empty text input field.
- Status:** A dropdown menu currently set to 'Awaiting Funds'.
- Funding FY:** A text input field containing '2007'.
- Work FY:** A text input field containing '2007'.
- Must complete as planned:** An unchecked checkbox.
- Fund Source:** A dropdown menu.
- Score:** A text input field containing '0.000'.
- Estimated Cost:** A text input field containing '\$0' and an 'Estimate' button.
- Override automatic cost estimate:** An unchecked checkbox.
- Work Code:** A dropdown menu set to 'Modernization'.
- Activity:** A dropdown menu set to 'Modernize'.
- Actual Cost:** A text input field containing '\$0'.
- CostBook:** A dropdown menu set to 'Reference'.

On this screen, the following data for the building-level work item can be recorded:

- **Description of Work Item.** Enter a description of the work item, limited to 255 alphanumeric characters.
- **Work Request ID.** Enter your agency's work request number for this work item, limited to 50 alphanumeric characters. This item of data is not used by BUILDER in any analyses.
- **Status.** Select the current status of the work item from the dropdown list of choices. The status will change over time as the work item moves from planning to completion. The values of status are:
 - Awaiting Contract Award
 - Awaiting Funds
 - Budgeted
 - Canceled
 - Completed
 - Deferred
 - Funded
 - In Design
 - In Progress
 - On hold
- **Funding FY.** Enter the four-digit fiscal year that the work item was or will be funded.
- **Must Complete as Planned.** Check this box if the work item falls into the "must do" category. As discussed above, using this checkbox is one of the ways to ensure the work items is funded and completed.
- **Completion FY.** Enter the four-digit fiscal year that the work item was or will be completed.
- **Fund Source.** Select the [funding source](#) to be used for this work item.
- **Date Completed.** Enter the date the work item was completed.
- **Estimated Cost.** Enter the estimated cost of the work item. BUILDER provides a means of estimating the initial cost once you have chosen the Cost Book using the ESTIMATE button next to this field.

- **Score.** Work items to demolish buildings are not scored by prioritization schemes in BUILDER, so the score is defaulted to 0.000. Special steps to ensure the work item is completed are discussed above.
- **Override Automatic Cost Estimate.** Check this box if you wish to override the cost estimated using the ESTIMATE button and enter your own estimated cost of the work item.
- **Work Code.** Select the work code of the work item. The available work codes are:
 - Sustainment
 - Modernization
 - Demolition
 - New Footprint
- **Activity.** Select the activity of the work item from the dropdown list. Currently, the only available work activity at the building level is "Demolish."
- **Actual Cost.** Enter the actual cost of the work item after completion.
- **Cost Book.** Select the [cost book](#) from the dropdown list to be used in estimating the cost of the work item.
- **ROI Information.** Displays information from the cost analysis tab. For more information see [Work Item Cost Analysis](#).

After entering the data for the work item, click the SAVE button in the toolbar to save the changes to the work item. If you do not wish to save the changes made to the work item, click the CANCEL button on the toolbar.

Editing a Building-Level Work Item

To edit a building-level work item, click on the DETAILS button next to the building-level work item on the Work Items screen.

Name	Description ^	Cost	Status	Score	Date Completed
1001 - Quarters A	Demolish 1001 - Quarters A	\$36,000	Awaiting Funds	0.00	
1131 - Administration Building	Paint Awning/Canopy Metal Cantilever	\$65	Awaiting Funds	38.00	
7770 - DPW Shops	Paint Awning/Canopy Metal Cantilever	\$680	Awaiting Funds	35.00	
1328 - Personnel Office	Paint Awning/Canopy Metal Supported	\$195	Awaiting Funds	38.00	
1397 - Community Building	Paint Awning/Canopy North Metal Supported	\$220	Awaiting Funds	47.00	
7918 - Public Works Center Admin	Paint Awning/Canopy Unknown Wood Cantilever	\$65	Awaiting Funds	35.00	

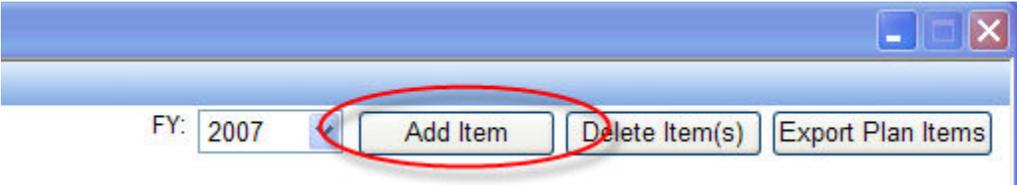
The Building Work Item window will appear and the data described above can be edited as desired.

Creating and Editing a Project

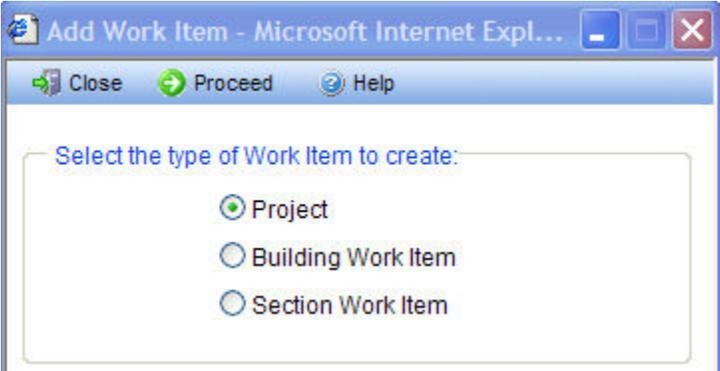
The concept of a M&R work project was added to BUILDER with the release of version 2.2. Projects allow you to group work items together to manage them as a single work effort that is prioritized and funded as a whole. The work items in a project may span different systems in a single building, as in a renovation effort. They may also span multiple buildings, as when roofing is replaced on several buildings under one contract. In general, a project is a collection of any work items grouped together in an "all or nothing" work unit with a single funding source and a single work year.

Creating a Project

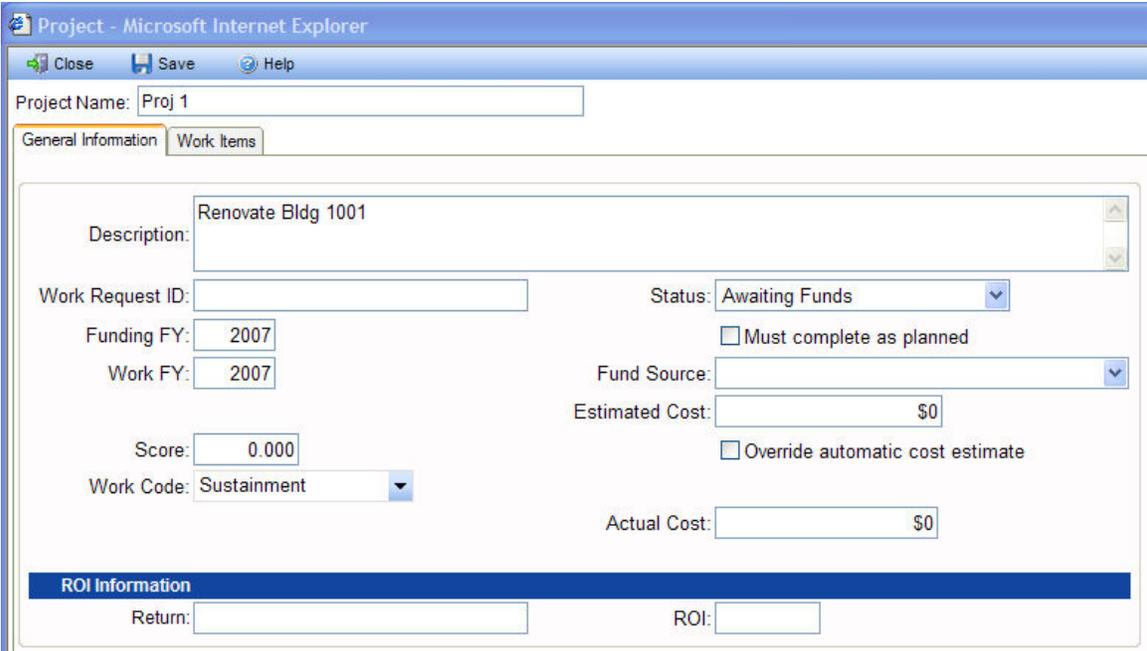
To create a project, click the ADD ITEM button on the Work Item screen.



The New Work Item window will appear.



Select the Project option and click the PROCEED button. The Projects window will appear opened to the General Information tab.



General Information Tab

On the general information tab, the following general data for the project can be recorded:

- **Project Name.** Enter the name of the project, limited to 30 alphanumeric characters. The project name will be used for selecting, tracking and reporting.
- **Description of Work Item.** Enter a description of the work item, limited to 255 alphanumeric characters.
- **Work Request ID.** Enter your agency's work request number for the project, limited to 50 alphanumeric characters. This item of data is not used by BUILDER in any analyses.
- **Status.** Select the current status of the project from the dropdown list of choices. The status will change over time as the project moves from planning to completion. The values of status are:
 - Awaiting Contract Award
 - Awaiting Funds
 - Budgeted
 - Canceled
 - Completed
 - Deferred
 - Funded
 - In Design
 - In Progress
 - On hold

- **Funding FY.** Enter the four-digit fiscal year that the project was or will be funded.
- **Must Complete as Planned.** Mark this box if the project falls into the "must do" category. Marking this checkbox will force the work items in the project to be funded before all other competing work items that are not marked as "Must do" in IMPACT scenarios.
- **Completion FY.** Enter the four-digit fiscal year that the project was or will be completed.
- **Fund Source.** Select the [funding source](#) to be used for the project.
- **Date Completed.** Enter the date the project was completed.
- **Estimated Cost.** Enter the estimated cost of the project. BUILDER provides a means of estimating the initial cost using the ESTIMATE button next to this field once you have chosen the work items in the project under the Work Items Tab.
- **Score.** If you have [prioritized the work items](#), then this project's score will be displayed here. The score for a project is computed as the average of its work items' scores weighted by their estimated cost. The default value is 0.000, indicating that the work items in the project have not been prioritized.
- **Override Automatic Cost Estimate.** Mark this box if you wish to override the cost estimated using the ESTIMATE button and enter your own estimated cost of the project.
- **Work Code.** Select the work code of the work item. The available work codes are:
 - Sustainment
 - Modernization
 - Demolition
 - New Footprint
- **Actual Cost.** Enter the actual cost of the project after completion.
- **ROI Information.** Displays information from [Work Item Cost Analysis](#) for the work items in the project.

Work Items Tab

The Work Items tab is used to build the list of work items for a project. The top grid on this tab displays the list of work items in the project and the bottom grid lists the work items not currently assigned to a project that can be added to the project. Note that work items from all fiscal years are available for selection to the project. If a work item from a different fiscal year is chosen, its fiscal year will be changed to the project's fiscal year before the project is saved.

To add a work item to the project, select it on the bottom grid and use the UP arrow to move the selected work item to the project list. To remove a work item from the project, select it on the top grid and use the DOWN arrow to remove it from the project list.

Project Name: Proj 1

General Information | **Work Items**

Work Items In Project:

Facility	Description	Actual Cost	Status	FY	Return	ROI
1001 - Quarters A	Repair Ductwork Non-Insulated (Aluminum) Residential (\$1,450	Budgeted	2007	\$3,600	248%
1001 - Quarters A	Repair Roof Surface Fiberglass Shingles	\$495	Budgeted	2007	\$900	182%
1001 - Quarters A	Repair Cooling Unit/Plant Heat Pump Air-to-Air <2.5 Tons	\$470	Budgeted	2007	\$1,100	234%
1001 - Quarters A	Replace Lighting Fixtures Incandescent Interior	\$5,500	Awaiting Funds	2007	\$5,500	100%
1001 - Quarters A	Repair Plumbing Fixtures Toilet Ceramic	\$500	Awaiting Funds	2007	\$520	104%
1001 - Quarters A	Repair Other Plumbing Equipment Water Heater Resident	\$210	Awaiting Funds	2007	\$425	202%
1001 - Quarters A	Replace Interior Stair/Step Wood Full-Set	\$2,350	Awaiting Funds	2007	\$2,350	100%
1001 - Quarters A	Repair Flashing (LF) Coated Metal Base Flashing	\$970	Awaiting Funds	2007	\$1,300	134%
1001 - Quarters A	Repair Lighting Fixtures Incandescent Exterior	\$700	Awaiting Funds	2007	\$840	120%
1001 - Quarters A	Repair Exterior Wall Finish/Covering Wood Clapboard	\$1,150	Awaiting Funds	2007	\$1,350	117%

Work Items not currently assigned to any Project:

Facility	Description	Actual Cost	Status	FY	Return	ROI
1001 - Quarters A	Repair Interior Floor Finish/Covering Linoleum	\$1,650	Awaiting Funds	2007	\$2,050	124%
1001 - Quarters A	Repair Exterior Door Metal Dutch	\$1,100	Awaiting Funds	2007	\$1,200	109%
1001 - Quarters A	Repair Countertop Laminated Plastic	\$120	Awaiting Funds	2007	\$280	233%
1001 - Quarters A	Repair Interior Floor Finish/Covering Carpet	\$470	Awaiting Funds	2007	\$3,800	809%
1001 - Quarters A	Repair Roof Drainage Metal Exterior	\$1,100	Awaiting Funds	2007	\$1,400	127%
1001 - Quarters A	Replace Roof Deck Wood	\$14,000	Budgeted	2007	\$14,000	100%
1001 - Quarters A	Replace Soffit Wood	\$1,400	Awaiting Funds	2007	\$1,400	100%
1001 - Quarters A	Repair Heating Unit/Plant Furnace Gas <45 MBH	\$450	Awaiting Funds	2007	\$550	122%

After entering the data for the project on the General Information and Work Items tabs, click the SAVE button in the toolbar to save the changes to the project. If you do not wish to save the changes made to the project, click the CANCEL button on the toolbar.

Editing a Project

To edit a project, click on the DETAILS button next to the project on the Work Items screen.

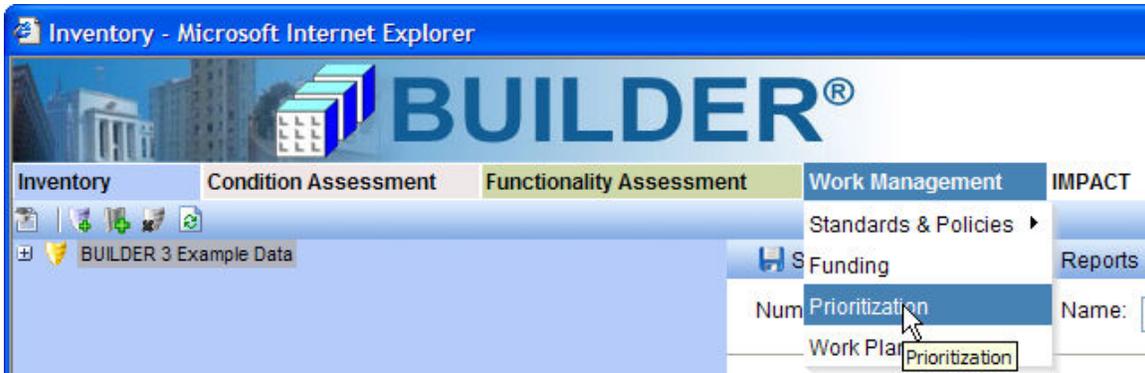
Name	Description ^	Cost	Status	Score	Date Completed
Project 1	Bldg 1001 Renovation	\$58,607	Awaiting Funds	58.06	
1001 - Quarters A	Demolish 1001 - Quarters A	\$36,000	Awaiting Funds	0.00	
1131 - Administration Building	Paint Awning/Canopy Metal Cantilever	\$65	Awaiting Funds	38.00	
7770 - DPW Shops	Paint Awning/Canopy Metal Cantilever	\$680	Awaiting Funds	35.00	
1328 - Personnel Office	Paint Awning/Canopy Metal Supported	\$195	Awaiting Funds	38.00	
1397 - Community Building	Paint Awning/Canopy North Metal Supported	\$220	Awaiting Funds	47.00	
7918 - Public Works Center Admin	Paint Awning/Canopy Unknown Wood Cantilever	\$65	Awaiting Funds	35.00	

The Projects window will appear and the data on the General Information and Work Items tabs can be edited as desired.

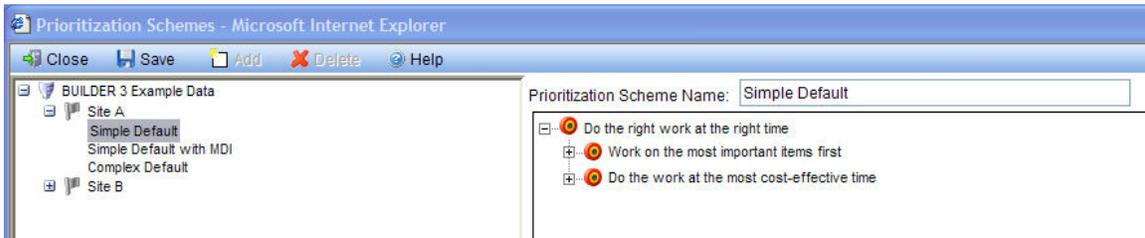
Creating a Work Prioritization Scheme

If you have constructed a [work plan](#) for a given year, you will need to prioritize it so that your planning efforts and funding allocations can be directed to the most important items. BUILDER allows you to do this using a work prioritization scheme. The BUILDER work prioritization method uses a simple additive utility function to calculate a score for each work item and to rank the work items from highest score (most important) to lowest (least important). It does this by allowing you to outline and weight your objectives and to identify specific properties of the work item that can be used as measures of how well a work item meets a particular objective. With a work prioritization scheme that you have tested and calibrated, you will be able to [prioritize](#) and [rank](#) your work plan in a quick, objective, repeatable, and representative method with the touch of a button.

To create or edit a prioritization scheme, select *Work Planning -> Work Prioritization* from the navigation menu.



The Prioritization Schemes window will appear.



For a description of the prioritization scheme shown above, see the [Prioritization Example](#). The prioritization example also includes an example scoring of a work item using the example shown.

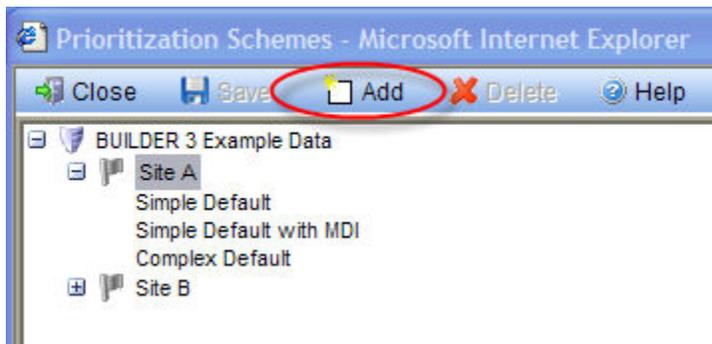
Toolbar

- CLOSE. Use this button to close the Prioritization Scheme window.
- SAVE. Use this button to save changes you have made to the prioritization schemes.
- ADD. Use this button to add a new prioritization scheme.
- DELETE. Use this button to delete the selected prioritization scheme.

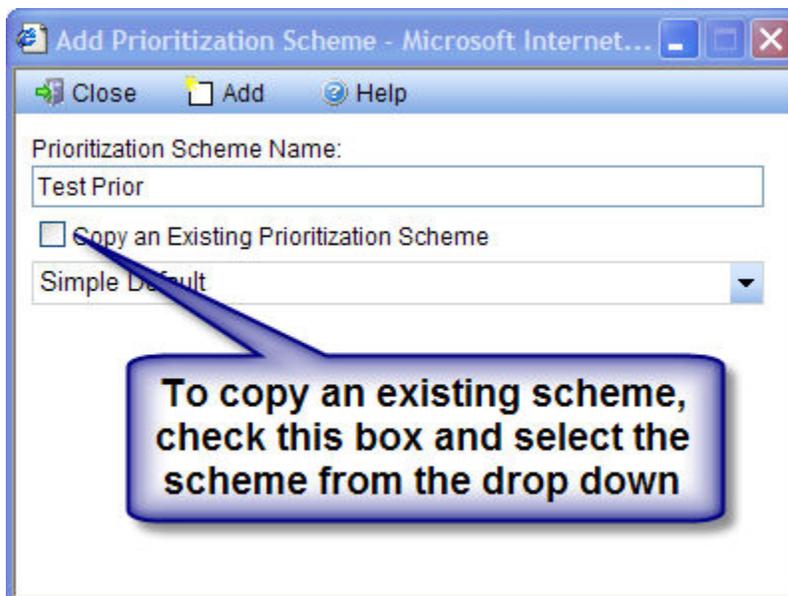
Creating a Prioritization Scheme

You can create as many prioritization schemes as you like. When you are ready to prioritize a work plan, you will simply choose the scheme you wish to use in the [site data](#). You may, in fact, wish to use several different schemes and then compare the resulting prioritized lists.

To create a new prioritization scheme, click the ADD button in the window toolbar.



The New Prioritization Scheme window will appear.



Enter a unique name for the new scheme, which is limited to 50 alphanumeric characters, and click the ADD button in the toolbar. Initially after creating a

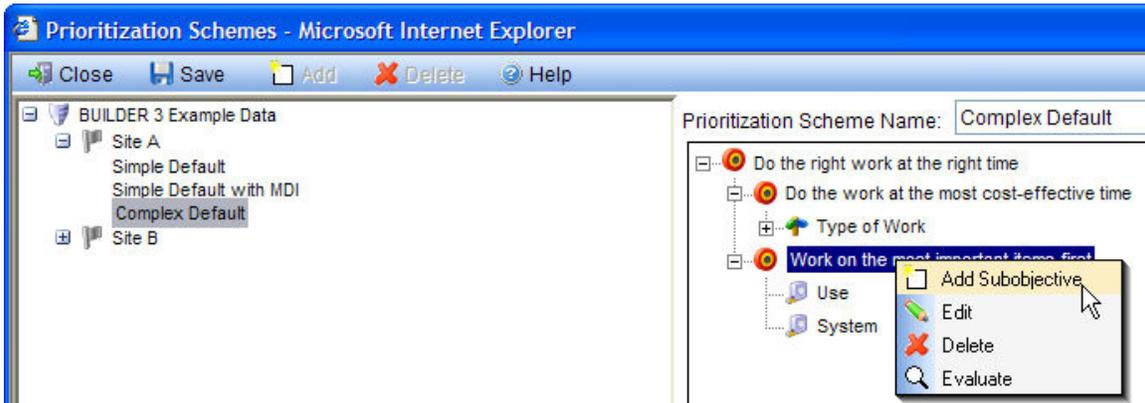
prioritization scheme, only the main objective will appear in the scheme. The main objective can be reworded (see **Editing an Objective** below) and subobjectives can be added to it (See **Adding a Subobjective** below).

Note that when you are creating a new prioritization scheme you are able to copy an existing scheme. If you have a prioritization scheme that you have fine tuned and accept as the standard scheme to use, then the ability to copy it can be very useful. If you want to experiment with recalibration of the weights and measures, you can do so with a copy and not destroy your original values. To copy an existing scheme, mark the Copy an Existing Prioritization Scheme checkbox, select the scheme to copy from the dropdown list, and click ADD button in the toolbar.

Additionally, there is no way to cancel changes for prioritization schemes. Changes are saved to the database when they are made, and the changes overwrite previous data. A safe way to experiment with a particular prioritization scheme is to copy it by creating an entirely new scheme and then edit with the copy and leave the original alone.

Adding an Subobjective

To add a subobjective to an objective on the tree, select the objective, right-click it, and select *Add Subobjective*.



The New Objective window will appear.

The screenshot shows a web browser window titled "Objective - Microsoft Internet Explorer". The browser's address bar and navigation buttons (Cancel, Proceed, Help) are visible at the top. The main content area contains a form with the following elements:

- Node Name:** A text input field.
- Measure Type:** A group box containing three radio buttons:
 - Fundamental Objective
 - Measure
 - Category Split
- Available split categories:** A dropdown menu currently showing "Building".
- Available Measures:** A dropdown menu currently showing "Building Type".
- Description:** A large text area for entering details.

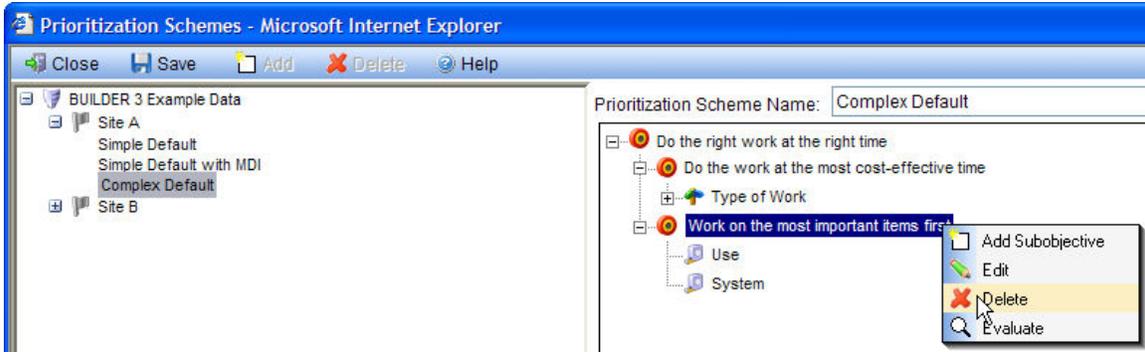
To create the subobjective, the following data must be recorded:

- **Node name.** Enter the name of the objective that will appear in the tree.
- **Measure Type.** Choose the type of objective is to be created from the three available types:
 - **Fundamental Objective.** This is a statement of one of the things you are trying to accomplish with the work plan. It is primarily used to help you outline your thoughts so that you eventually are able to identify properties (measures) in your inventory that you will consider when prioritizing the individual work items.
 - **Measure.** A measure is a property of the work item or of the inventory hierarchy of the work item's component-section. A work item's overall score in the prioritization scheme is fundamentally determined by the values of the work item's properties that are used as measures in the scheme, the point values assigned to those particular values, and the relative weights of the objectives.
 - **Category Split.** See **Using Category Splits** below for a further description of category splits.
- **Measure/Split Category.** If you select Measure or Split as the type of objective, select the category to associate with the measure or split, either Building or General. If a fundamental objective is chosen as the measure type, this field will not appear.
- **Available Measures.** If you select Measure or Split as the type for this objective, then you will also have to choose the measure to associate the measure or split. The available measures in the dropdown list depends on the Measure/Split category chosen. If a fundamental objective is chosen as the measure type, this field will not appear.

In addition to this required data, you have the option to add a Description of the new objective, which is limited to 255 alphanumeric characters. When all of the information has been entered, click the PROCEED button to create the objective. If you do not wish to create the objective, click the CANCEL button.

Deleting an Object from the Tree

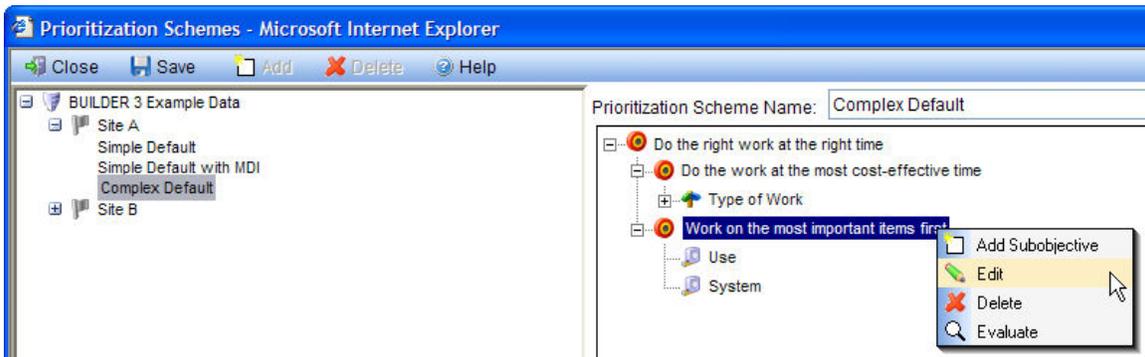
If you want to delete an objective from the tree, select it on the tree, right-click it, and select *Delete*.



It is important to note that if you delete an objective, the entire subtree under the objective will be deleted as well.

Editing an Objective

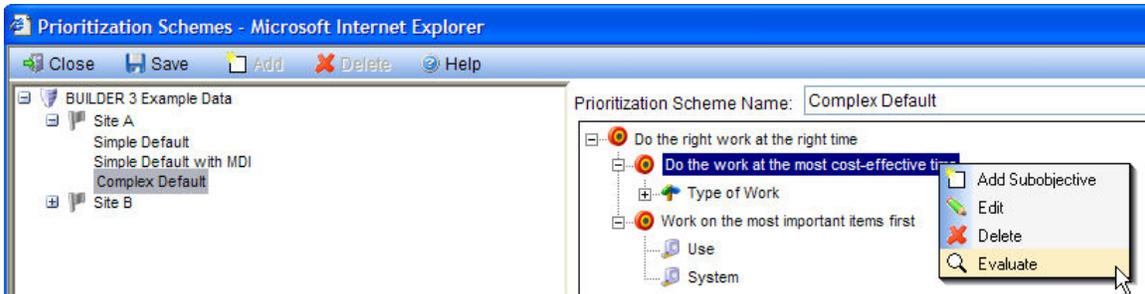
If you want to edit the name or description of an objective, select it on the tree, right-click it, and select *Edit*.



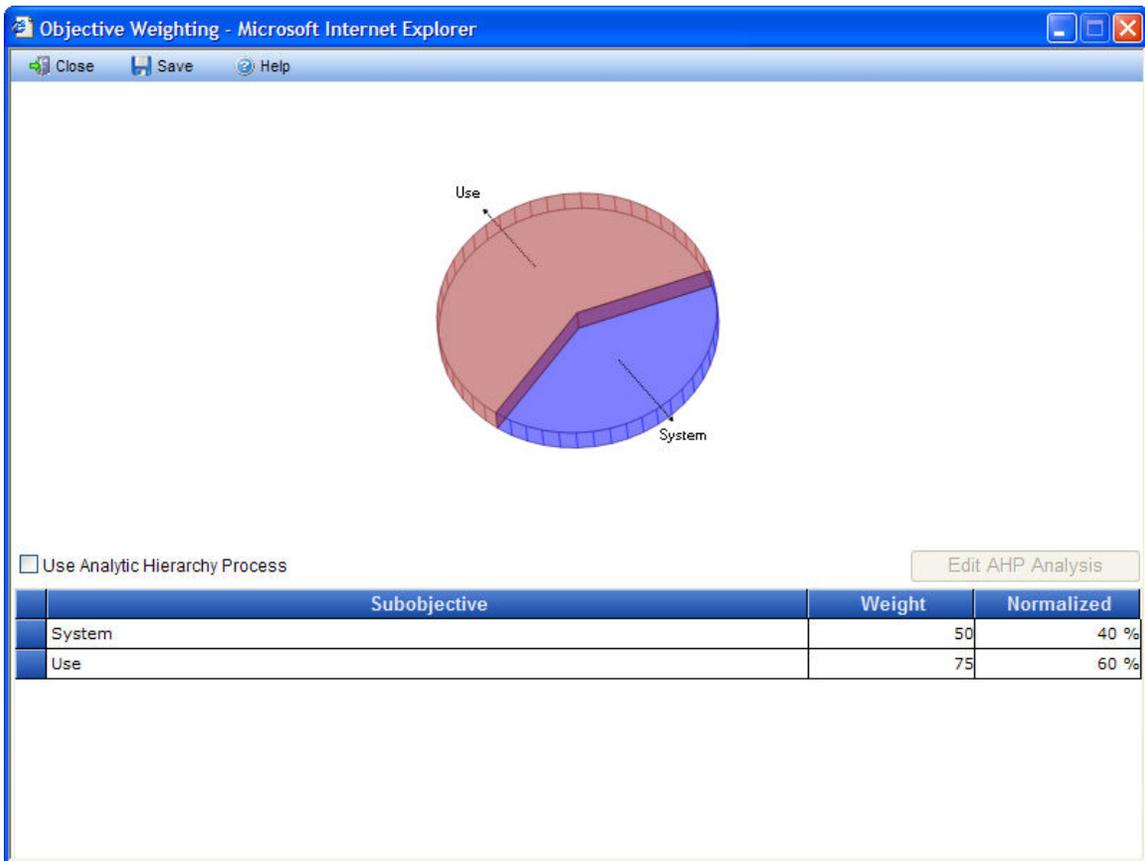
It is important to note that once an objective is created, you may not change the measure type, category, or measure itself, but you can change the node name.

Evaluating a Fundamental Objective

To record the relative weights of the children of an fundamental objective, select the fundamental objective, right click it, and select the *Evaluate* option.



The Objective window will appear:



The children of the fundamental objective will be listed in a grid along with their weight. The default setting for the Weight is 100 for all children. That is, all children are equally important to the parent. You may adjust the weights by either:

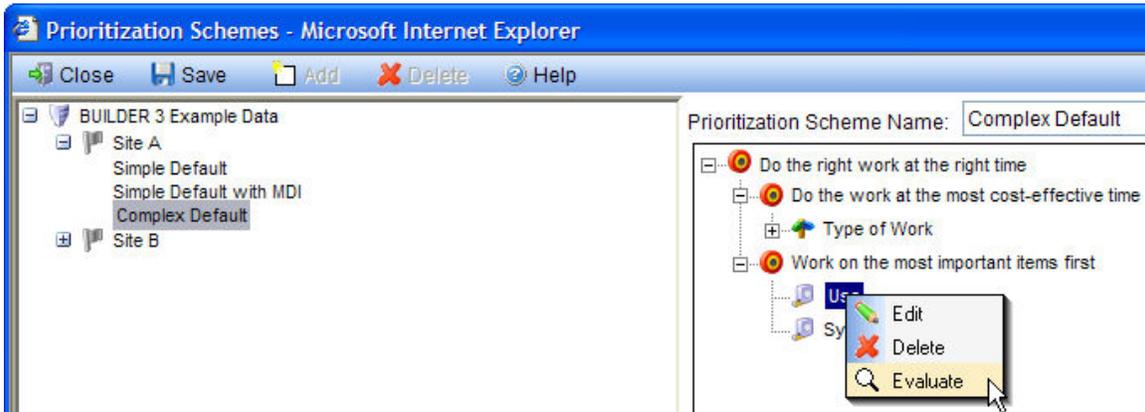
- Entering a number between 0 and 100 in the Weight column.
- Marking the Use [Analytic Hierarchy Process](#) checkbox and clicking the EDIT AHP ANALYSIS button. The AHP process allows you to establish the weights by doing a binary comparison of the field values. See Using the Analytic Hierarchy Process for a description of this method.

Note that each of these methods results in a normalized weight (which cannot be edited) that is calculated so that the sum of the weights is 100%. This is done by

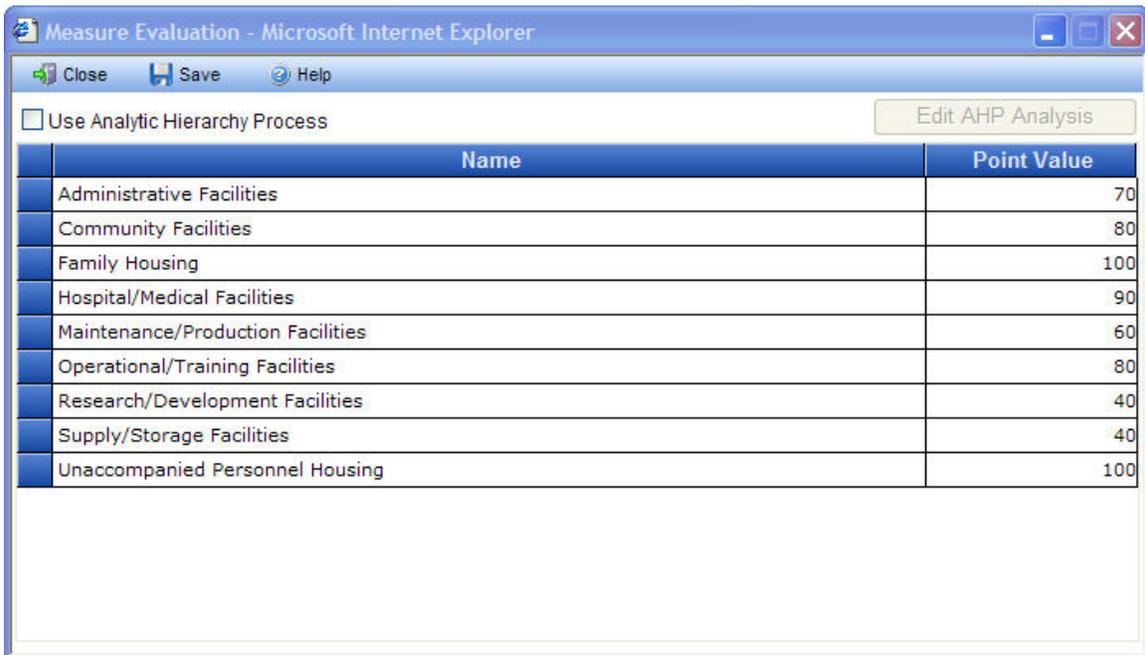
dividing each of the individual weights by the sum of all of the weights. Click the SAVE button to save changes.

Evaluating a Measure

To assign points to the various values of a measure, select the measure, right-click it, and select the *Evaluate* option.



The Measure Evaluation window will appear:



The possible field values for the measure will be listed in a grid, along with their assigned Point Value. The default point value is 100 for all field values. That is, they are equally important initially. You can edit the point value by either:

- Entering a number between 0 and 100 in the Point Value column.
- If the number of field values is less than 25, marking the Use [Analytic Hierarchy Process](#) checkbox and clicking the EDIT AHP ANALYSIS button. The

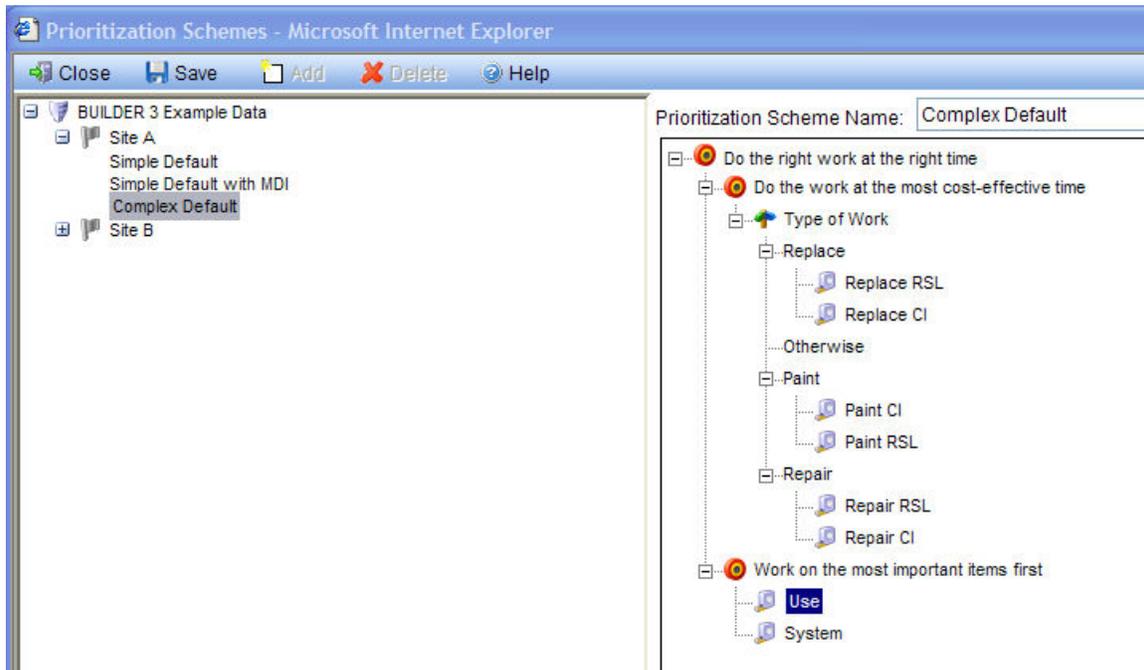
AHP process allows you to establish the points by doing a binary comparison of the field values.

Use the SAVE button to save changes or the CANCEL button to return to the previously saved weights.

Using Category Splits

A category split, denoted by the  icon in the Objectives Tree, is associated with a field property in the work item hierarchy and is used when you want to vary how the priority score is computed based on the work item's value for this field property. The subobjectives of a split can only be the various values of the field property.

The subobjectives of a split are called categories. The categories identify which subtree will be used based on the associated field's property value. In the algorithm that calculates the score comes to a split, only the single branch of the tree under the split corresponding to the work item's property value as a category will be used. The screen below shows an example of a split in a prioritization scheme:

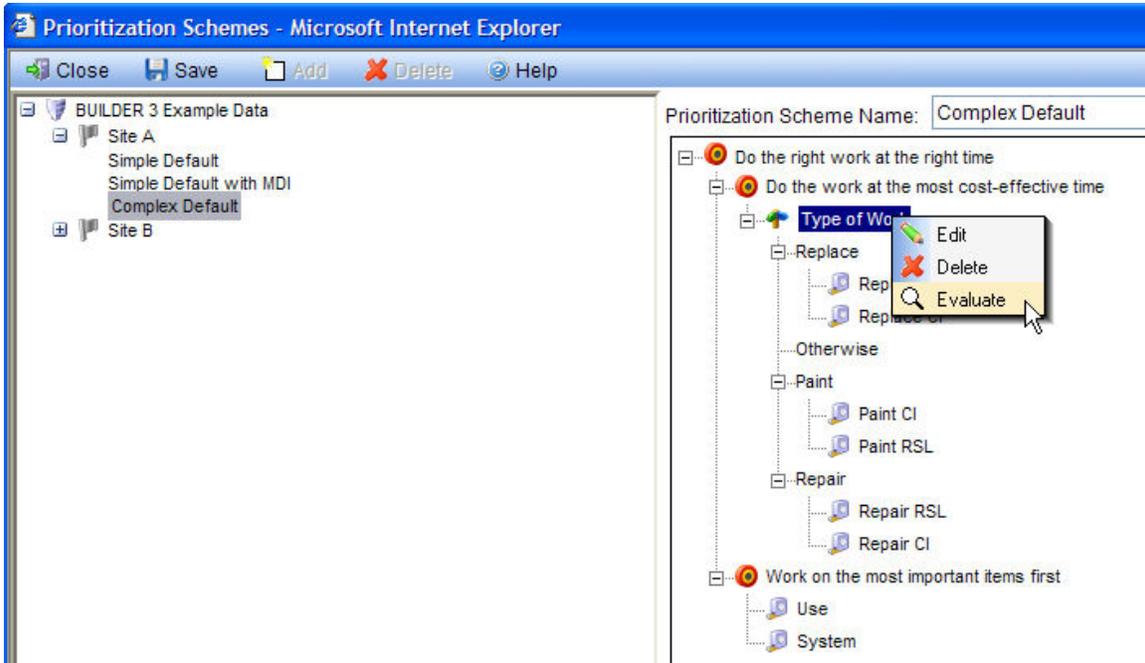


The category split in this example is Type of Work. The associated field is work activity, which has 6 possible values: Repair, Replace, Paint, Remove, Add/Install, and Alter. A category split generally has an added category named Otherwise, which is the branch of the tree used if the value of the field differs from all of the other listed values. In this case, Remove, Add/Install, and Alter will use the Otherwise category. When you first create a split, all of the possible values of the field are listed as categories under it. If you delete a category, then items with that field property value will use the Otherwise category.

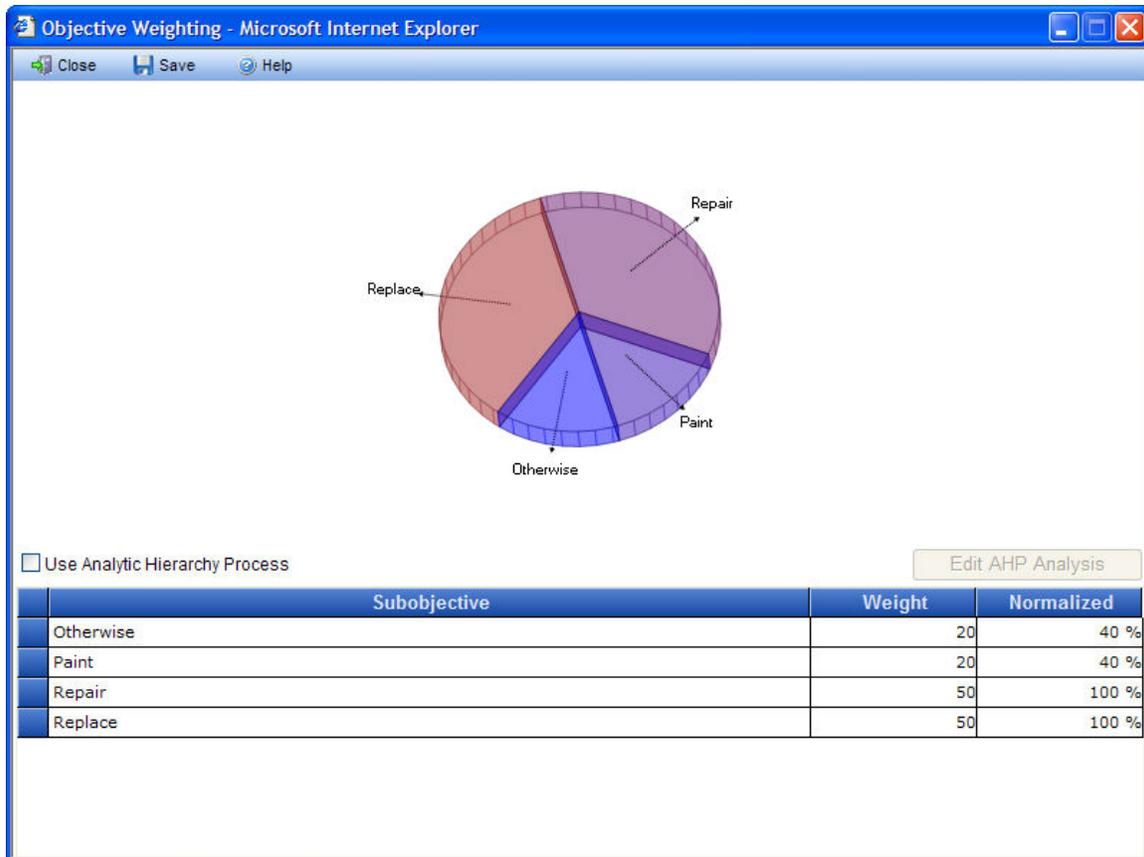
In the example above, the work item's CI and RSL are used as the measures for both Repair and Replace. However, the point values assigned to the fields varies by type

of work. To replace a component-section, the most cost-effective time would be indicated by a very low CI and little or no remaining service life. To repair a component-section, the most cost-effective time would be indicated by a mid-range CI and a long remaining service life. The Type of Work split allows the computation of the score to proceed selectively. Since only one of the categories will be used, the relative weights of the categories under a split are calculated differently from other types of objectives.

To assign points to the various values of a split select the split on the tree, right-click it, and select the *Evaluate* option.



The Objective window will appear:



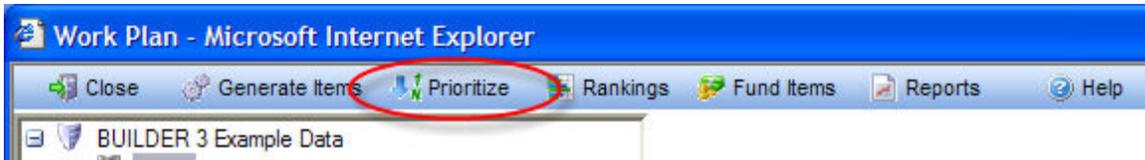
The possible field values for the measure will be listed in a grid, along with their assigned Point Value. The default point value is 50 for all field values. That is, they are equally important initially. You can edit the point value by either:

- Entering a number between 0 and 100 in the Point Value column.
- If the number of field values is less than 25, marking the Use [Analytic Hierarchy Process](#) check box and clicking the EDIT AHP ANALYSIS button. The AHP process allows you to establish the points by doing a binary comparison of the field values.

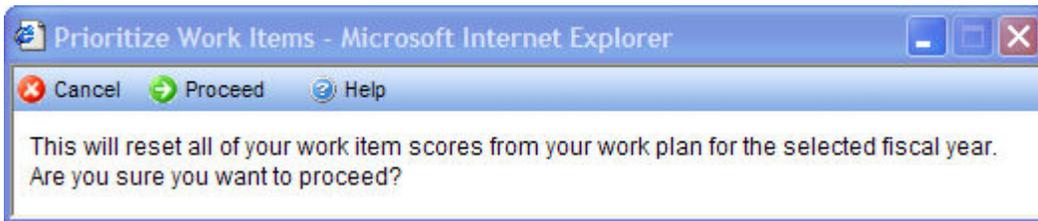
For the Normalized Weight of a category, its Weight is divided by the maximum Weight of the categories in the split. When first created, all of the categories of a split have the same weight and all have normalized weight of 100%. Note that the normalized weight is read-only.

Prioritizing Work Items

If you have created a [Prioritization Scheme](#), you may prioritize your work plan using the PRIORITIZE button on the Work Items window. Click the PRIORITIZE button on the toolbar to initiate the process.



A warning stating that all current work item scores from your work plan for the selected fiscal year will be reset if you continue will appear.



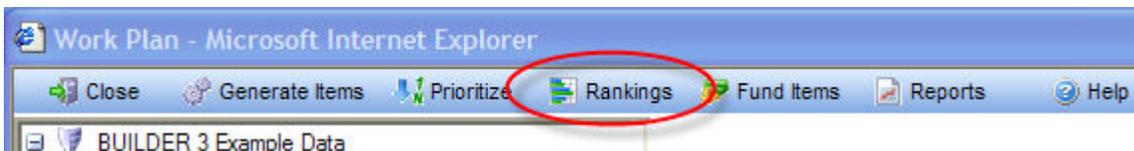
Click the PROCEED button if still wish to delete the current scores for the for section-level work items and recompute new prioritization scores using the prioritization scheme selected in the [site information](#). After a priority score has been computed for each work item, all work items will be shown in the work plan ranked from highest score to lowest. Project priority scores are computed by averaging the priority scores of the work items in the project, weighted by cost. Click the CANCEL button on the warning screen if you do not wish to perform these actions and return to the work plan.

You can prioritize the work plan as often as you wish. If you add new work items, you should re-prioritize to include the new items. You may also want to use a work plan to calibrate the weights and points you have assigned in a particular prioritization scheme. By considering the order in which work items are ranked and viewing their scores, you may identify measures that should carry more relative weight or measure values that warrant higher points so that the order of the work items is acceptable. The goal of a prioritization scheme is to rank work items by algorithmic calculation into the same order that expert facility managers at your agency would rank them by following sound engineering principles.

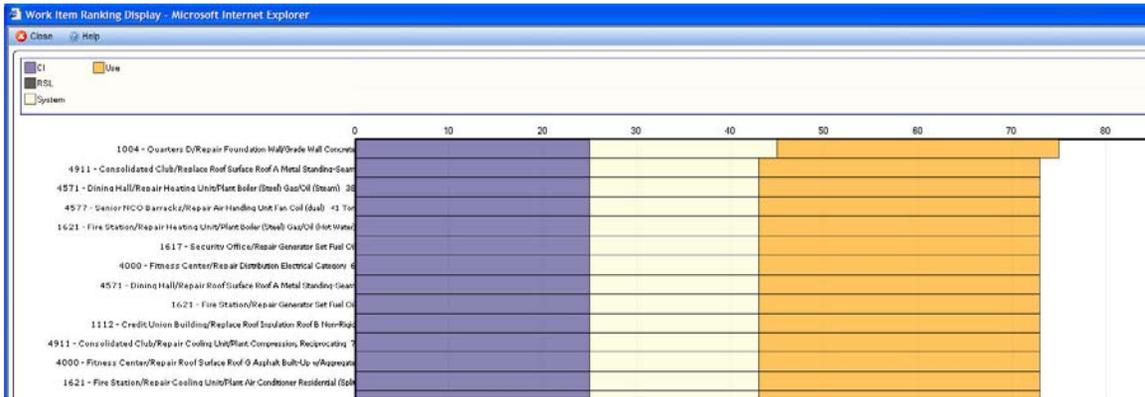
Note that [building-level work items](#) are not scored in the prioritization scheme. The score for a building-level work items will be 0.000. In order to have this type of work item completed in IMPACT, mark the work item as "Must do as planned" and provide a fund source with a criteria the work item can satisfy.

Ranking Work Items

If you have created a [prioritized your work plan](#), you may view the rankings of the work items in your work plan using the RANKINGS button on the Work Items window. Click the RANKINGS button on the toolbar to initiate the process.



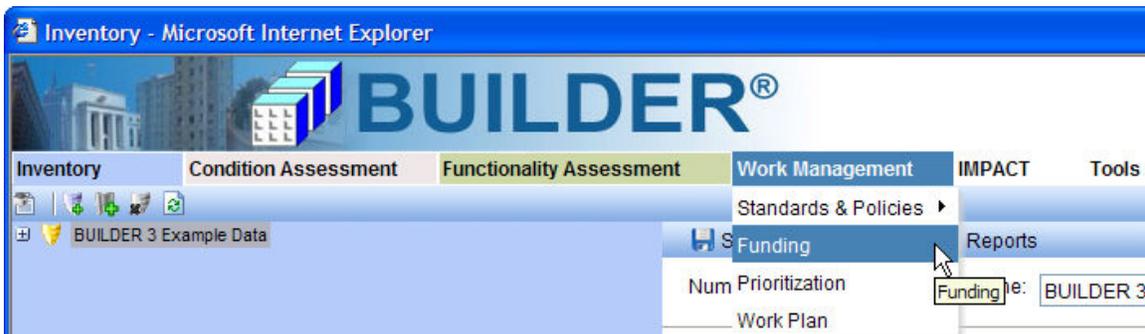
The Rankings window will appear.



The rankings of each section-level work item will be shown from highest priority score to lowest. The score for each work item will be broken down into the constituent scores for each measure used in the prioritization scheme. A legend appears at the top of the window correlating the colors to their respective measures.

Entering Anticipated Funding Levels

To add, enter, or edit funding levels, select *Work Management -> Funding* from the navigation menu.



The Funding window will appear.

The screenshot shows the 'Funding - Microsoft Internet Explorer' window. On the left, there is a tree view showing 'BUILDER 3 Example Data' with sub-items 'Site A' and 'Site B'. On the right, there are three tabs: 'Expected Funds', 'Funding Restrictions', and 'Funding Precedence'. The 'Expected Funds' tab is active, displaying a table with the following data:

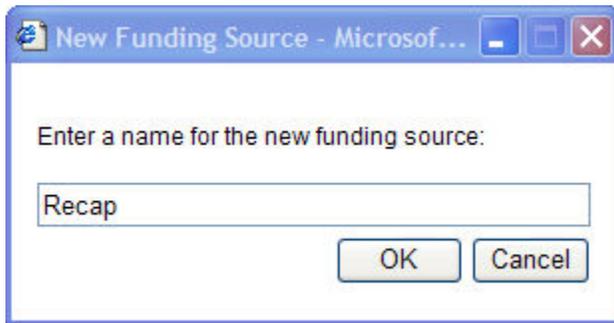
Fund	2007	2008	2009	2010
O&M	\$ 750,000	\$ 700,000	\$ 650,000	\$ 600,000

Navigate the tree on the left of the screen to the site you wish to edit the funding options for. Once a site has been chosen in the tree, the funding levels, funding restrictions, and funding precedence can be set from the different tabs. Further descriptions of each tab is provided below. It is important to note that the anticipated funding levels only need to be input if you are planning to use the IMPACT feature for multi-year work planning constrained by budget. The funding

sources and amounts you enter here will be used as the initial defaults for each scenario you create. You may, of course, edit the amounts in the scenario itself, but you will not be able to add new funding sources, change their restrictions, or change their precedence order in a scenario. For more information see [Scenario Management](#).

Toolbar

- CLOSE. Use this button to close the Funding window.
- SAVE. Use this button to save the changes you have made the funding levels, restrictions, or precedence.
- NEW. Use this button to Create a new funding source. After clicking this button, the New Funding Source window will appear.

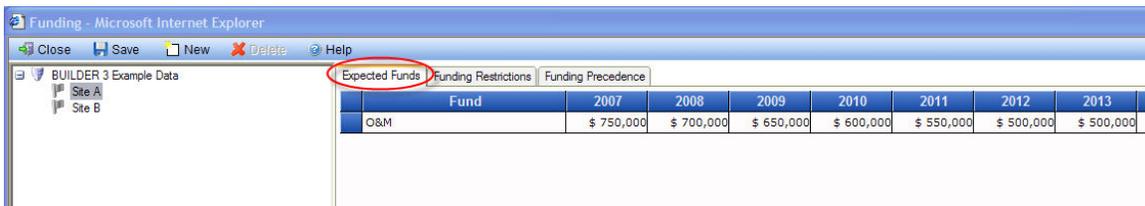


Enter the name of the funding source you wish to add. The name is limited to 50 alphanumeric characters and must be unique.

- DELETE. Use this button to delete the selected funding source. Note that a funding source can only be deleted from the Expected Funds tab. The selected funding source is identified in this tab by the arrow in the left column of the grid.
- HELP. Use this button to launch the help topic associated with funding.

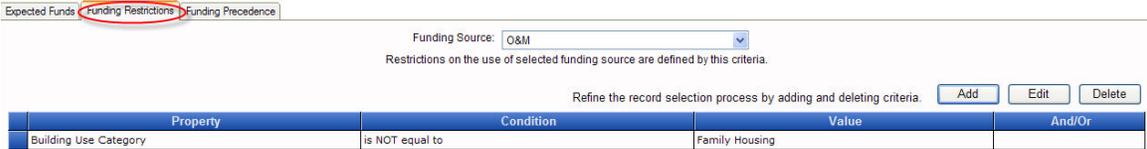
Expected Funds Tab

The Expected Funds tab provides an editable list of funding sources and amounts for the next ten years. To edit a funding source level for a particular year, click on the desired cell in the grid and enter the expected funds for that year. Remember that you must move from a cell or strike the Enter key to register the change.



Funding Restrictions Tab

The Funding Restrictions tab provides a means of establishing [selection criteria](#) that determines whether or not a particular funding source can be used for a particular work item. This tab allows you to identify properties that a work item must have in order to use the selected funding source. To add a funding restriction, select the funding source from the dropdown list, click the ADD button, and then enter the data regarding the restriction (selection criteria) in the grid.



Funding Precedence Tab

The IMPACT scenario needs to allocate funds algorithmically when it is processing a prioritized list of work items. After the funding sources, the amounts, and the criteria for using sources are set, the only further requirement is to specify how the automated process will determine which funding source to use if a work item satisfies the restrictions (selection criteria) of more than one funding source. The Funding Precedence tab provides a means of establishing an order of precedence among the funding sources for a work item. To change the order of the funding sources, select a source and use the up and down arrows to move it in the list. When funds are allocated, the first funding source listed will be checked first, then the second, and so on until funding is found or the list is exhausted.



IMPACT Scenarios

IMPACT Scenario Overview

IMPACT is a simulation tool that uses BUILDER's databases and coded processes to project maintenance, repair, and replacement (MR&R) work requirements for up to ten years into the future. The purpose of this overview is to explain how IMPACT does this and how you can benefit from using its projections to improve your facility management practices.

The data required to construct a BUILDER database and its embedded knowledge and methods regarding condition assessment, component life expectancy, and costs combine to provide a complete model of your facilities and business processes includes:

- Where your facilities are and the effect of location on costs
- Records of each building's use, age, size, construction type, etc.
- Decomposition of each building into its component-sections, specified as to type, material, quantity, age, etc.
- History of past condition assessments of each component-section, with a dated condition index rating for each
- History of MR&R work performed
- Cost estimating capability for various work activities related to building components
- Expected service life and paint life of each component by material category and type
- Models for projecting condition and remaining service life on the basis of past condition assessment results
- Standards, policies and policy sequences for determining when work is required
- Prioritization schemes for ranking a given set of work items by their importance to you
- Funding sources with their future expected levels of funding, their restrictions, and their order of allocation.

IMPACT uses all of this information as the basis for predicting how your inventory will change over time. BUILDER shows you the past and present for your inventory. IMPACT shows you the future. It is able to show you the future in very much the same way that BUILDER is able to show you the past and present. That is, IMPACT shows you the future by adding and changing records in your database at each step in simulated time the same way that you add or change records with the passing of real time. The difference is that, for example, when you add a new condition assessment record, it is based on a physical observation, whereas when IMPACT adds a new condition assessment, it has calculated the expected condition based on prior condition, deterioration rates, and work activity records. As another example, a work item in BUILDER may be subject to a good deal of off-line planning and debate before it is finally funded and complete, while in IMPACT the prioritization scheme and funding algorithms methodically calculate whether or not a particular work item can be completed.

Outline of IMPACT Scenario

Here is a brief description of how IMPACT simulates changes in your inventory over a 10-year period, starting at the date the scenario is run:

1. With the current inventory, update all time-sensitive data elements (CI, RSL, Cost) for every component-section as of the current date.
2. Use the selected [policy sequence](#) to determine the appropriate standard for each component-section.
3. Cycle through all of the component-sections in the inventory and use each component-section's standard to identify and generate necessary work items.
4. [Prioritize the work items](#) for the current year using the selected [prioritization scheme](#).
5. Allocate [funding sources](#) to the work items in [rank order](#) following the funding amounts, precedence rules, and restrictions established for each funding source.
6. Schedule completion of funded work items for later in the current year.
7. Set current date to the date scheduled for work item completion and register the effect of the work. That is, create a condition assessment for the current date with appropriate findings, change component-section record if replaced or painted, and mark work item as completed.
8. Set current date to the end of the current year and calculate CI's for all component-sections, taking into account the appropriate prior CI, deterioration rate, and any work completed.
9. The previous 8 steps have completed one year; advance current date to the start of next year and go back to 1 until 10 years have been simulated.

This very simple outline of what IMPACT does shows that you will have to specify several key elements of the process before it is able to move through these steps. They include the policy sequence, the prioritization scheme, and the funding levels. You will do this when [managing a scenario](#). The particular policy sequence you choose will affect what work is identified. The particular prioritization scheme you choose will affect which work items rank highest in a year's work plan. The particular funding levels you choose will affect the amount of work that can be accomplished in any given year. As you might imagine, scenarios in which different policy sequences, prioritization schemes, and/or funding levels are used will yield very different outcomes and can be [compared and analyzed](#) to determine the optimal work plan for your inventory.

Advantages of Using an IMPACT Scenario

The ability to run the simulation with different scenario settings makes IMPACT a valuable tool in creating a credible long-term MR&R budget. For a manager of a large number of buildings, establishing and defending a budget for the next 5 to 10 years is a very difficult problem. Often, managers use industry-standard planning factors to prepare a budget. Figures such as 2% - 4% of building replacement cost per year are often used. The DOD Facility Cost Handbook publishes a cost per square foot for MR&R by building use (category code), a planning tool similar to several commercial tools which also use a per-square-foot factor for building sustainment. One problem with these methods of forecasting costs is that they are each based on the assumption of a continuing investment that allows the manager to repair what needs to be repaired when it needs to be repaired, which assumes no backlog of MR&R. Very few managers have ever had sufficient funds to meet that assumption. Another problem with these methods is that they are averages that could miss the mark in

any given year for any given building by a factor of 2, 3, or much more. The manager of a thousand buildings could be faced with a very large shortfall. Still another problem, budgets prepared with planning factors are difficult to defend. If cuts are to be made, the manager is hard pressed to identify what will suffer. Without the ability to identify consequences, erosion of funds is inevitable.

IMPACT gives you the opportunity to prepare a long-term MR&R budget based on your actual inventory in its current condition. When IMPACT has finished a scenario run, it has produced records that tell the story about what is forecasted to happen under the scenario parameters. Each component-section in the inventory is tracked during the simulation. Dated condition assessments track expected deterioration. Dated work items show when work was done and how much it costs. When grouped by year, the work items provide an annual work plan constrained by expected funding levels. Annual work plans can be summarized by cost of completed and incomplete work, allowing you know what the backlog was each year and you know which work went unfunded. With roll-up CI values, you can determine how well buildings or even locations did over the simulated period.

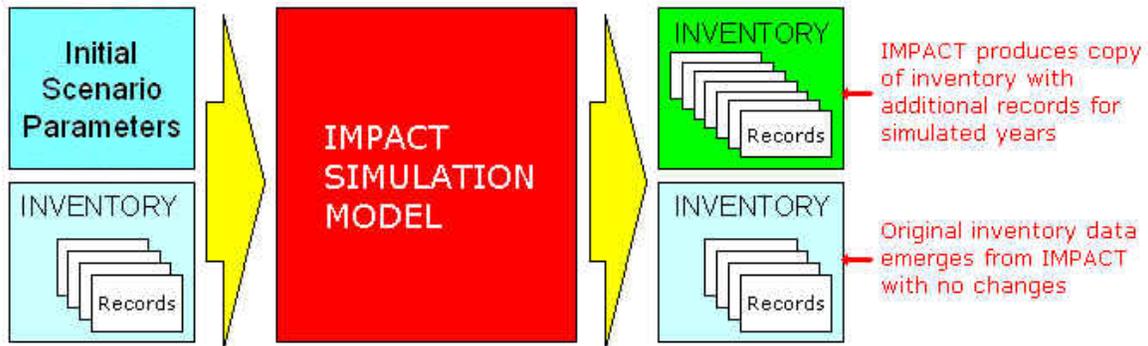
IMPACT allows you to run a scenario either constrained or unconstrained by budget. With an unconstrained budget, all work items are completed when they are first recognized. Analysis of this type of scenario will provide estimates of your total annual requirement. With a constrained budget, work items are funded in rank order until funds are exhausted. Work items not completed in one year will be generated the following year at a higher cost due to inflation and, for repair work types, to the cost for additional deterioration. Analysis of a constrained scenario will give you insight into what parts of your inventory will suffer at a given funding level.

Integration of IMPACT into the BUILDER 3.0

New to BUILDER 3.0 is the integration of the IMPACT application into the BUILDER application. That is, an IMPACT scenario can be run directly from the BUILDER user interface. The inclusion of IMPACT with the BUILDER application improves ease of use and increases efficiency in exploring long range work plans.

Scenario Management

A simplified outline of the IMPACT simulation steps was described in the [IMPACT Overview](#). You should review that topic before proceeding. Shown below is a conceptual illustration of the process:

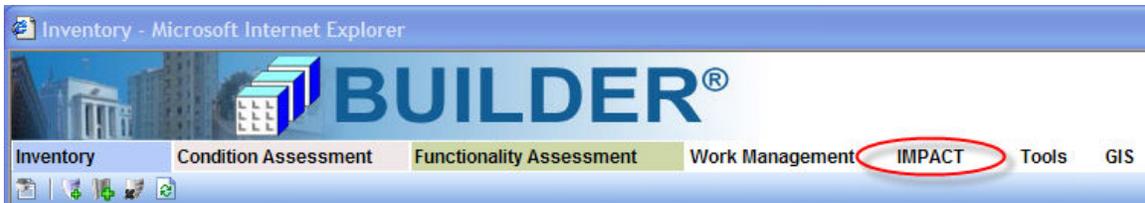


In IMPACT, a scenario is a set of data to be presented to the IMPACT simulation model consisting of particular inventory data and a set of initial parameters. The result of running the scenario is expressed as a copy of inventory records in which the "current date" is sometime in the future, typically 5 to 10 years, and in which the time-stamped records beyond the run date are generated by the IMPACT Simulation Model.

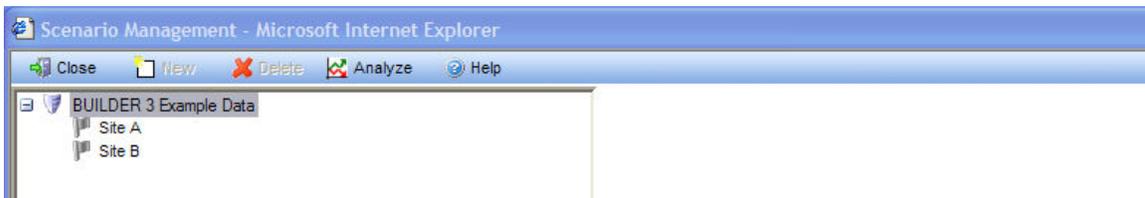
The first step in using IMPACT is to create a scenario and establish the set of initial parameters. The initial parameters are a set of values for key elements of the simulation decision process, such as the length of time to simulate, the [policy sequence](#) to use for generating work, the [prioritization scheme](#) to use for prioritizing work, and the [funding levels](#) to use for determining whether or not work can be completed. Additional parameters include specifications for future [building status](#) changes, the addition of new inventory, and the addition of new functionality assessments for buildings and functional areas. After the initial parameters are set, you are ready to run the simulation.

Creating a Scenario and Setting Initial Parameters

To create or edit an IMPACT scenario, select *IMPACT* from the navigation menu.



The Scenario Analysis window will appear.



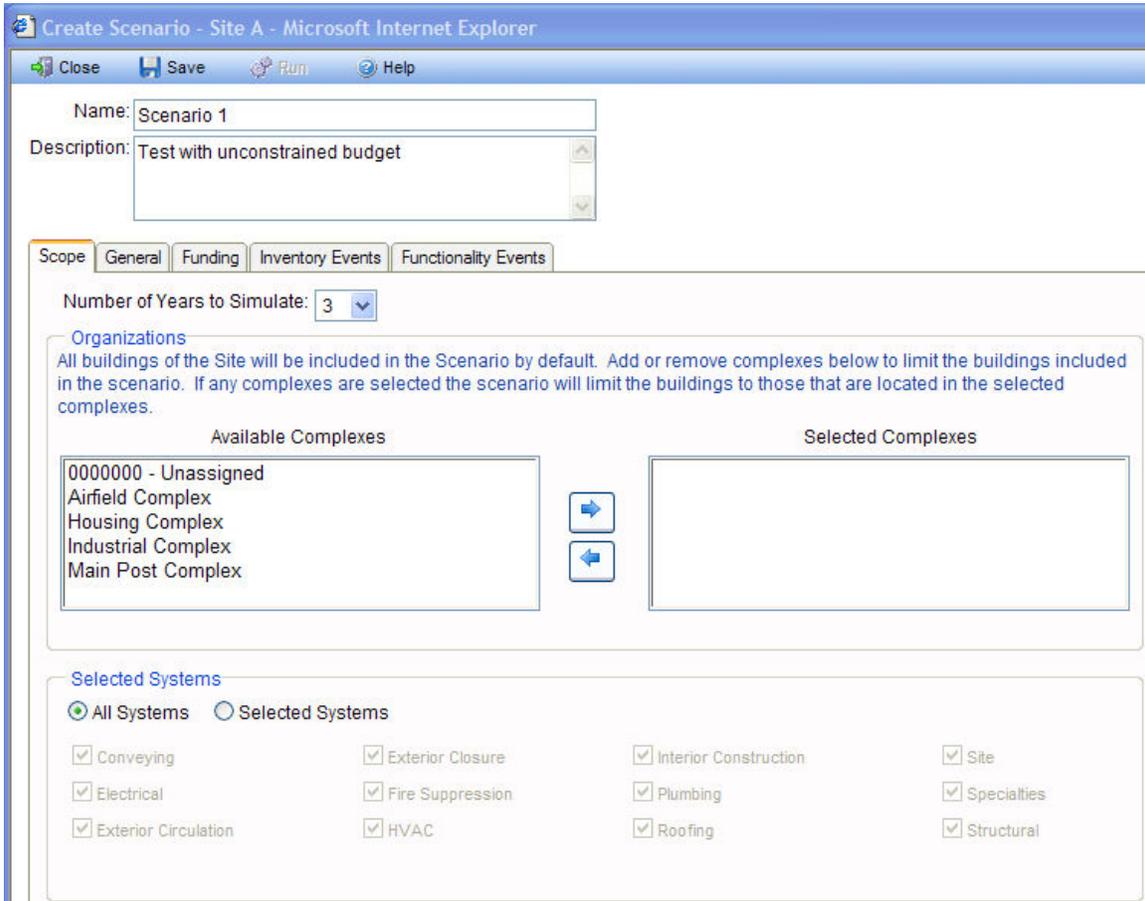
After navigating the tree on the left of the screen, the scenarios for that site will be listed in the grid on the right. Also shown in the grid is the total run time and owner, or the creator, of each scenario.

Toolbar

- **CLOSE.** Use this button to close the Scenario Management window.
- **NEW.** Use this button to create a new scenario.
- **DELETE.** Use this button to delete the selected scenario.
- **COMPARE.** Use this button to compare different scenario results. See [Scenario Analysis](#) for a description of this tool.
- **HELP.** Use this button to launch the help topic associated with scenarios.

Creating or Editing a Scenario

A new scenario can be created by clicking the NEW button in the toolbar or an existing scenario can be edited by clicking its name in the grid. In either case, the Create Scenario window will appear.



At the top of this screen, you can enter or edit the scenario name and also enter a description of the scenario. Additional information for the scenario is input in the six different tabs, which are described below.

Scope Tab

The Scope tab, which is shown above, specifies the planning horizon and the specific buildings to be included in the simulation. The data entered on this tab includes:

- **Number of Years to Simulate.** Select the number of years the simulation will run (1-10) from the dropdown list.
- **Organizations.** Select the organizations that are to be included in the simulation. The Available Groups list contains all of the groups, sites, and complexes currently in the inventory. Use the arrow keys between the two lists to create a list of inventory that is to be included in the simulation. The scenario will only include buildings that are in at least one of the Selected Groups. It is OK if the selected inventory overlap, i.e. if the same building is in more than one of the groups in the Selected Groups list.

- **Selected Systems.** Select the systems that are to be included in the simulation for the selected buildings. This is especially useful if you are simply developing a long-term repair and replacement plan for a single building system.

General Tab

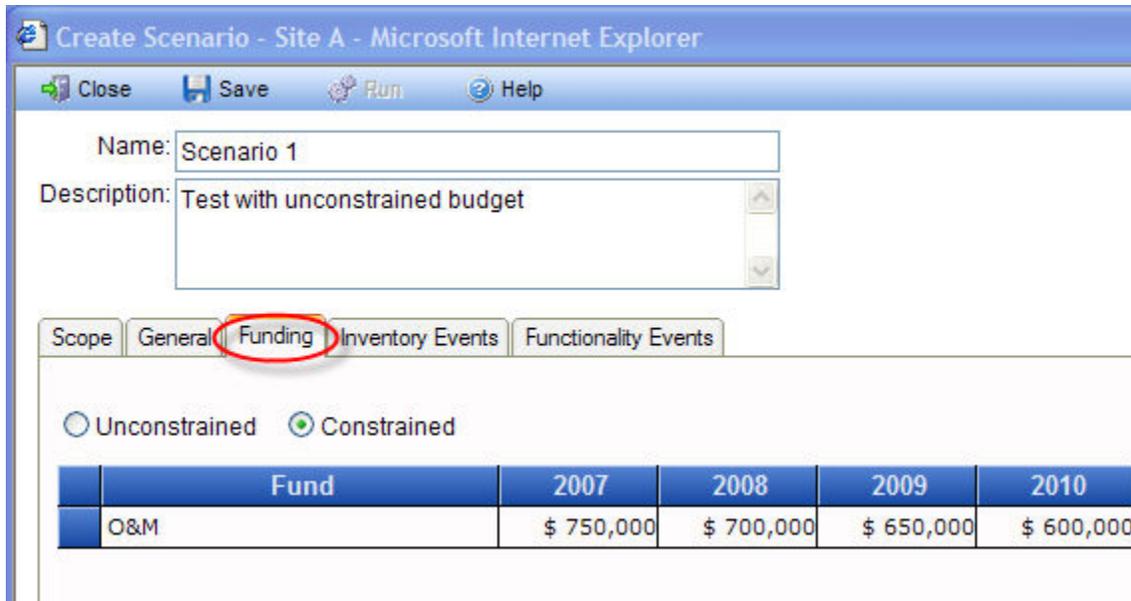
The general tab allows you to set the policy sequence, prioritization scheme, cost book, and service life book to use for the scenario. Each option is described in greater detail below.

- **Policy Sequence.** Choose the policy sequence you wish to use for the scenario from the dropdown list. A policy sequence is defined so that when it is applied to the inventory it will determine a standard for every component-section by using its default standard and then by successively applying the applicable policies. See [Standards, Policies, and Policy Sequence Overview](#) for general information or [Adding and Editing Policy Sequences](#) for information on how to add and edit policy sequences.
- **Prioritization Sequence.** Choose the prioritization you wish to use for the scenario from the dropdown list. A prioritization scheme is defined so that a priority score can be calculated for each section-level work item based on the measures, point values, and weights you have assigned. See [Creating a Work Prioritization Scheme](#) for more information. The Prioritization Scheme will be used only when funding is constrained, but you must select a scheme here even if the funding is unconstrained.
- **Cost Book.** Choose the cost book you wish to use for the scenario from the dropdown list. A cost book is defined so the cost of each work item can be computed. See [Viewing and Editing Cost Data](#) for more information.

- **Service Life Cost Book.** Choose the service life cost book you wish to use from the dropdown list. A service life book is defined so that the service life of all component-section in the inventory can be estimated.

Funding Tab

On the Funding tab, which is shown below, the funding levels for the different funding sources defined in BUILDER are set and the option of running the simulation with no funding constraints is provided. Each is described in greater detail below.

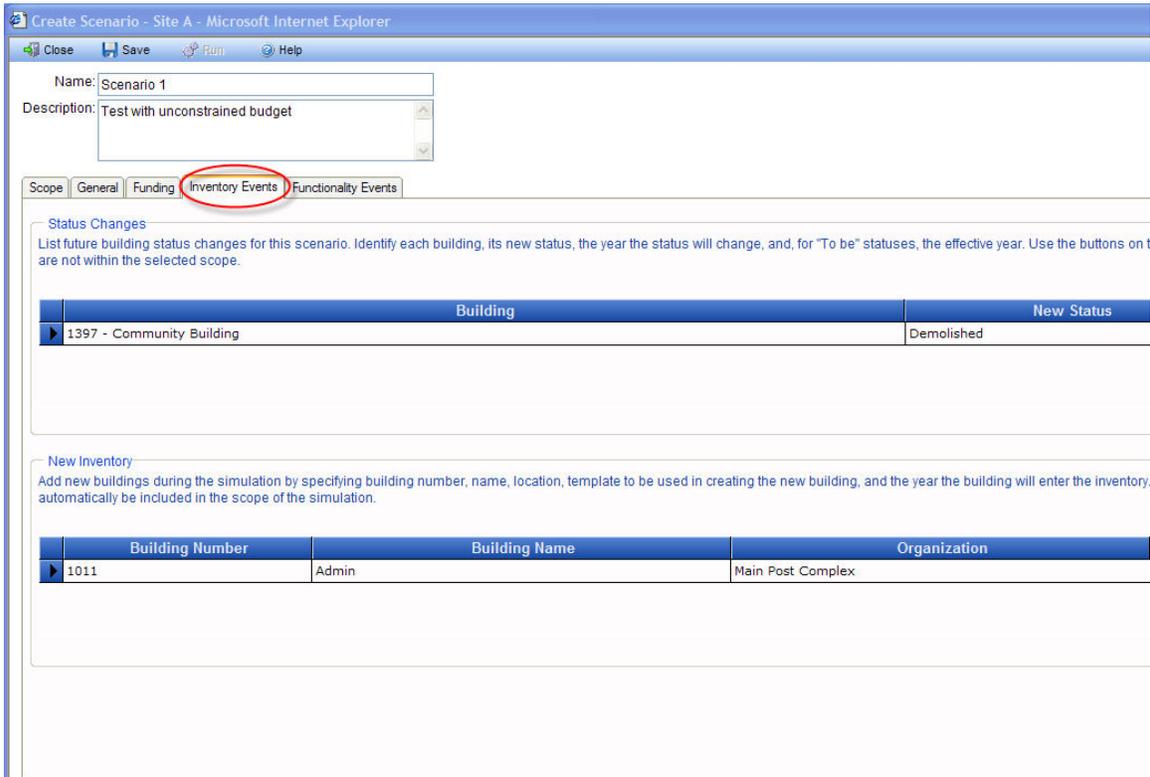


- **Unconstrained/Constrained Option.** Choose whether the scenario is to be constrained by funding or unconstrained by funding. If unconstrained, all simulated work items will be completed in the year they are generated. If constrained, you must specify the annual funding levels for all funding sources previously identified in BUILDER. In a constrained scenario, work items and projects are ranked by priority and funded for completion in order of rank until funds are exhausted. Work items and projects that are not funded cannot be completed. Projects and user-created work items that are not completed as planned will be carried over to the next year.
- **Funding Sources and Amounts Grid.** If you have chosen the Constrained option, the grid with funding sources and amounts will appear. Initially, the funding sources and amounts are set to data entered in the [Anticipated Funding Levels](#). You may not delete funding sources here, but you may set their amounts to \$0. Remember that if you change an amount, you must move to another cell or strike the Enter key for the grid to recognize that a change has been made.

Inventory Events Tab

On the Inventory Events tab, which is shown below, a future "whole building" events can be triggered at particular points in the simulation and completely new buildings

can be dynamically added to the inventory during the simulation. Each is described in greater detail below.



- **Status Changes.** Buildings in the BUILDER inventory that have a "To be" type of status will have the implied effects of those status changes represented during the scenario. For example, if a building has a status of "To be demolished" in year X, the IMPACT simulation will include the occurrence of the demolition in year X. In addition, you can schedule building status changes in the scenario parameters. This capability allows you to do the following:
 - Add new buildings to the inventory dynamically as the scenario progresses. To do this, add the buildings to the BUILDER inventory with status "To be built" or "To be acquired," with an effective year equal to the year the status is to change to "Active." When the scenario time reaches that year, the status will be changed. At that point, the building will be considered in the automated processes of condition assessment and work planning. If you wish to override the effective year of the status change in BUILDER, you can enter a status change for the building in the scenario for the new year.
 - Plan to demolish or transfer a building as the simulation progresses. You may do this in several ways:
 - Enter a building status of "To be demolished"/"To be transferred" in the BUILDER inventory, with an effective year set to the year the building is to be removed.
 - Enter a scenario status change to "Demolished"/"Transferred" in the appropriate change year.

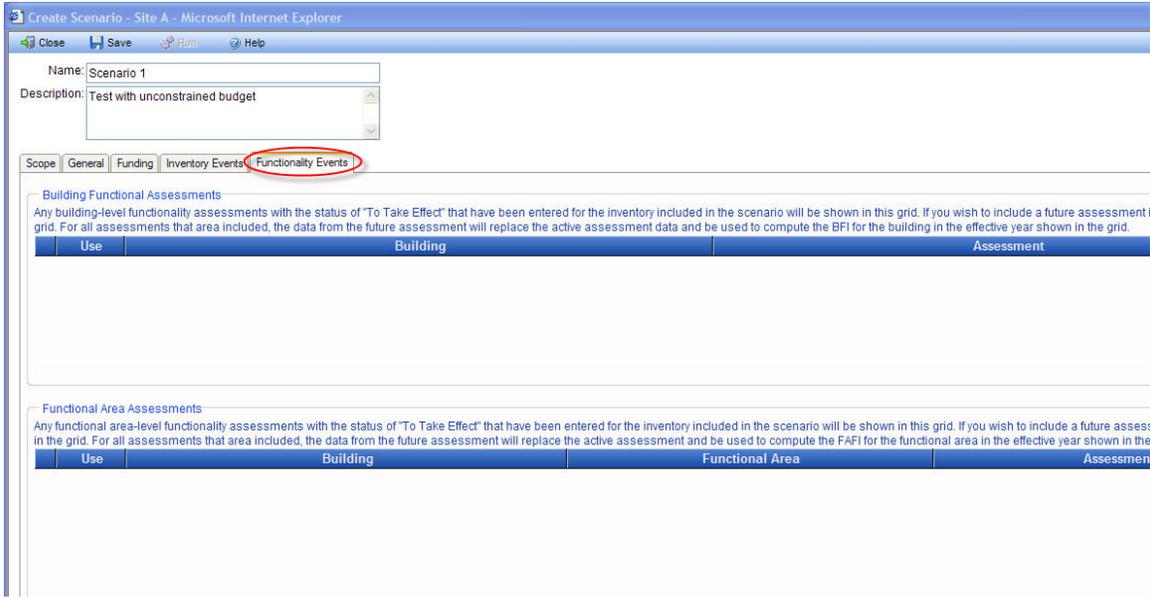
- Enter a scenario status change to "To be demolished"/"To be transferred" in a chosen year. Note that this allows you to model the progression of an active building to one that is to be demolished (with perhaps reduced maintenance standards) to a demolished building that is removed from work planning considerations.

To initiate a status change in the simulation, click the new button in the Status Change portion of the screen and enter the following data elements:

- **Building.** Select the building for which the change in status applies.
- **New Status.** Select the new status of the building using the dropdown list.
- **Change Year.** Enter the year in which the building's status is to change to the new status.
- **Effective Year.** Enter the effective year of the new status.
- **New Inventory.** BUILDER allows to add completely new buildings during a scenario, by clicking the NEW button in the New Inventory portion of the screen and entering the following data:
 - **Building Number.** Enter the number identifier for the new building.
 - **Building Name.** Enter the name identifier for the new building.
 - **Organization.** Select the organization to add the new building to.
 - **Template.** Select the [template](#) to use to estimate the new building's inventory.
 - **Effective Year.** Enter the year the new building will be added to the inventory.

Functionality Events Tab

On the Functionality Events tab, which is shown below, a future building and/or functional area functionality assessments can be triggered at particular points in the simulation. Further description of this process is provided below.



- Building Functional Assessments.** Any building-level functionality assessments with the status of "To Take Effect" that have been entered for the inventory included in the scenario will be shown in this grid. If you wish to include a future assessment in the scenario, mark the checkbox in the USE column next to it in the grid. For all assessments that area included, the data from the future assessment will replace the active assessment data and be used to compute the BFI for the building in the effective year shown in the grid.
- Functional Area Assessments.** Any functional area-level functionality assessments with the status of "To Take Effect" that have been entered for the inventory included in the scenario will be shown in this grid. If you wish to include a future assessment in the scenario, mark the checkbox in the USE column next to it in the grid. For all assessments that area included, the data from the future assessment will replace the active assessment and be used to compute the FAFI for the functional area in the effective year shown in the grid.

Running the Simulation

After all of the initial scenario parameters are set, the simulation can be run by clicking the RUN button in toolbar.



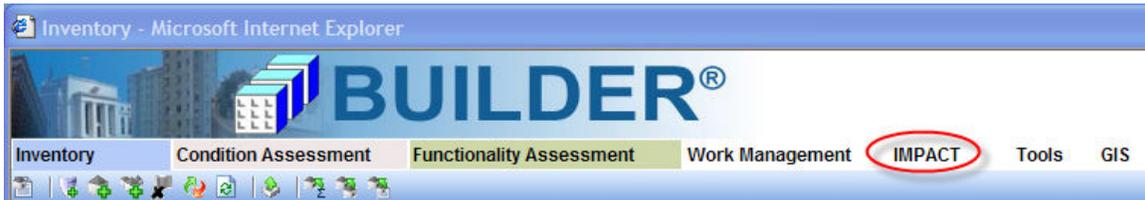
A progress report will scroll along the bottom of the window, entering a new line each time a new activity begins. Each line of the progress report begins with the system time on your computer so that you may judge how long each step takes. After the initial setup, the activity stream will repeat from year to year for the number of years in the simulation. By calculating how long it takes to simulate one year you can estimate how long the simulation will be running.

The simulation is a computationally intensive process, and many new records will have to be created in a single run. The simulation run time is very dependent on your computer system's speed and the size of the inventory in the simulation. The simulation could take from a few minutes up to several hours to finish. It does not allow for any interaction after you have clicked the RUN button, other than allowing you to CANCEL the run at any time. If you click the CANCEL button, the simulation will probably not stop immediately; it will complete the activity currently in progress before stopping.

When the scenario run is finished, the results can be [compared with the results of other scenarios](#) or used to [create a work plan for BUILDER](#).

Scenario Analysis

After a [scenario has been run](#), the results of the scenario can be analyzed and compared with the results of other scenarios. To analyze and compare the results of scenarios select *IMPACT* from the navigation menu.



The Scenario Analysis window will appear.



After navigating the tree on the left of the screen, the scenarios for that site will be listed in the grid on the right. Also shown in the grid is the total run time and owner, or the creator, of each scenario.

To view the results of a scenario, or to compare the results of multiple scenarios, click the *Analyze* button.



The scenario analysis window comes up. The user can choose to view or compare scenarios for an entire site, or drill down to a lower level to see analysis results. For example, if the user wanted to see how an individual component section would perform under two different scenarios, the user could select that component section from the tree, then select the scenarios to compare from the drop down boxes. The user then chooses from a number of reports to run to display scenario results.



These results include the following report options:

- **CI Performance.** Displays the year by year trend of the Condition index for each scenario.
- **FCI Performance.** Displays the year by year trend of the Facility Condition Index for each scenario. Only available at the building level or above.
- **FI Performance.** Displays the year by year trend of the Functionality index for each scenario. Only available at the building level or above.
- **Location Budget - Expensed and Backlog Cumulative.** Displays the cumulative amount of work expensed, and the total backlog at the end of each scenario horizon.
- **Location Budget - Expensed and Backlog Yearly.** Displays the yearly amount of work expensed and backlogged for each scenario in a given year.
- **PI Performance.** Displays the year by year trend of the Performance index for each scenario. Only available at the building level or above.
- **Work Plan Completions.** Displays a graph of work completed funds accomplished for each scenario in a given year.
- **Work Plan Detail By Years.** Displays the details of a work plan, including all work items for each year. Note that results for only one scenario can be viewed at a time for this report.
- **Work Plan for Export to MS Excel.** Generates the details of a work plan that can be exported to MS Excel. Note that results for only one scenario can be viewed at a time for this report.

After choosing these settings, the user clicks the *View Report* button on the toolbar and the resultant information is displayed.

Copying a Work Plan from a Scenario

After a [scenario has been run](#), the expected work items for all of the years in the scenario can be copied into BUILDER as the annual work plans. If the scenario was constrained by funding levels, then only the future work items with "Completed" status will form annual work plans constrained by budget. To create a work plan using the results of a scenario, click the COPY SCENARIO button on the Work Items screen.

Select the scenario to copy the work items from, and the following steps will be taken by BUILDER:

- If your work plan contained work items for the years prior to the scope of the scenario, those work items receive preferential treatment so that no conflicting work efforts will be generated during the scenario and the original work items will move along in the process with the simulated work items. The original work items will have to compete for resources if the scenario has funding constraints, so that original work items may not be "Completed" and therefore not re-imported back into your production database during the Copy Scenario process. One way to insure that the manually created future work items already in your production database do not get lost in the IMPACT scenario is to mark them as "Must Complete as Planned." This will essentially require that they be completed as planned in the IMPACT scenario.
- All current year and future work items for buildings in the scope of your scenario will be deleted.
- All "Completed" current year and future work items in the selected scenario will be imported into annual work plans with a status of "Awaiting Funds," a rank of "1/1", and a score of "0.000."

These steps are rather drastic in their manipulation of work item records, and it is possible for work items to be deleted and/or lost in the shuffle. It would be wise to make a copy of the database and work with the copy to ensure nothing is lost.

By using the IMPACT scenario tool, you can refine a work plan. If you start with no future work plan, then running an IMPACT scenario should give you a first cut at constructing future work plans. Use the Copy Scenario button to import the budget-constrained, completed work items from the scenario into your production database. You can then refine the work items from the [Work Plan screen](#), moving work items from year to year, changing work item properties, perhaps marking those that will definitely be completed as planned so that the next run of the scenario will insure that each one is completed. You may even re-inspect sections identified as needing work, especially if they have not been inspected for some time. Improvements in the accuracy of your data will improve simulation results as well.

You can then run another IMPACT scenario with your new data and the same scenario parameters and use the Copy Scenario button to import the work plan from the new scenario database. Each cycle should improve the work plan generated and the overall scenario results. This is important because the work plan generated will begin to represent your future work plans more realistically, and the scenario results will give you a more realistic view of the next 5 to 10 years and improve your insights into the consequences of a given funding level.

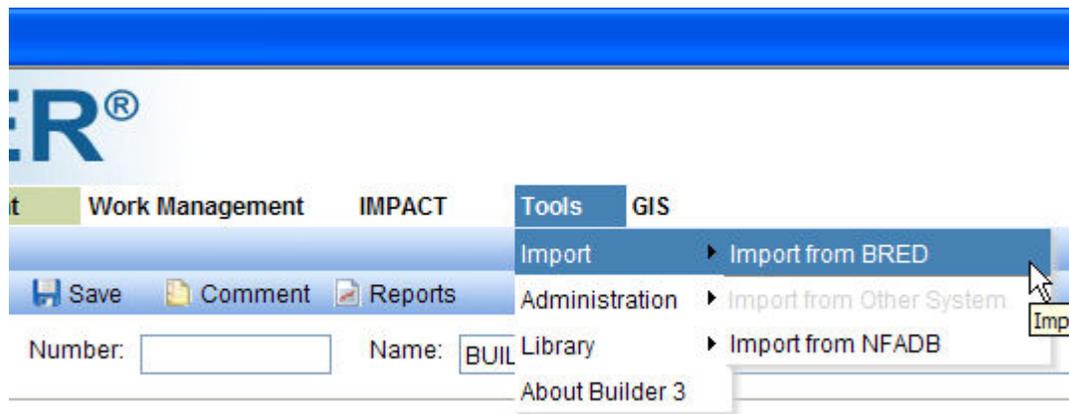
Tools

Import

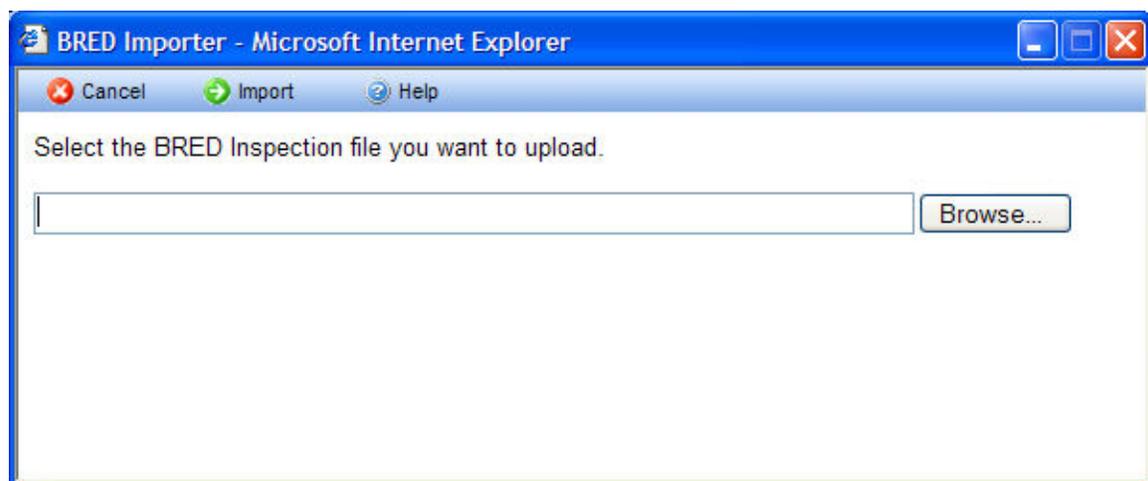
Importing Data from BRED

The BUILDER Remote Entry Database (BRED) allows you to collect inventory and inspection data using a free-standing pen-based handheld computer as you walk through the building you are inspecting. To load the data that you have collected on a BRED machine into the BUILDER database, you will need to import the database from BRED into BUILDER. It is important to note that the database file containing your new data must be loaded so that the BUILDER program has access to its path and can complete the importing process.

To import data from BRED, select *Tools -> Import -> Import from BRED* from the navigation menu.



The BRED Importer window will appear.



Use the BROWSE button select the BRED database you wish to import or simply enter the full path and filename in the textbox and click the PROCEED button in the toolbar.

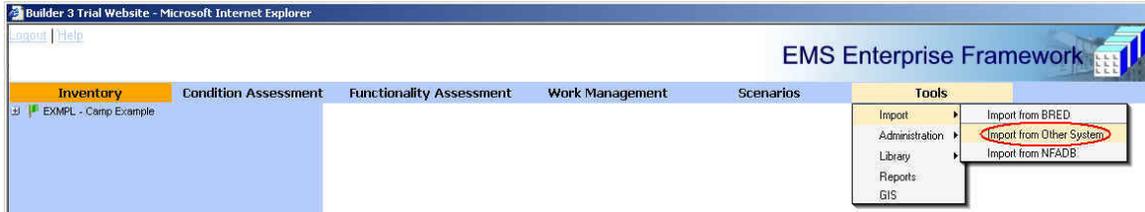
When the data was exported from BUILDER originally, the inventory records for the exported buildings were locked so that no changes could be made in the BUILDER database while inventory and condition assessment data was entered through BRED. This is done to avoid possible conflicts in the independent editing processes that might take place in BUILDER and BRED. Once the import is complete, the inventory records for the buildings will be unlocked and can be edited again.

Importing Data from Other Systems

BUILDER provides an importing feature that allows users to establish or enhance their databases by importing from existing standard data systems. These include:

- [U.S. Army Integrated Facilities System \(IFS\)](#)
- [U.S. Army Installation Status Report \(ISR\)](#)
- [Roofer EMS](#)

To import data from another system, select *Tools -> Import -> Import from Other System* from the navigation menu.



The Import from Other System window will appear:

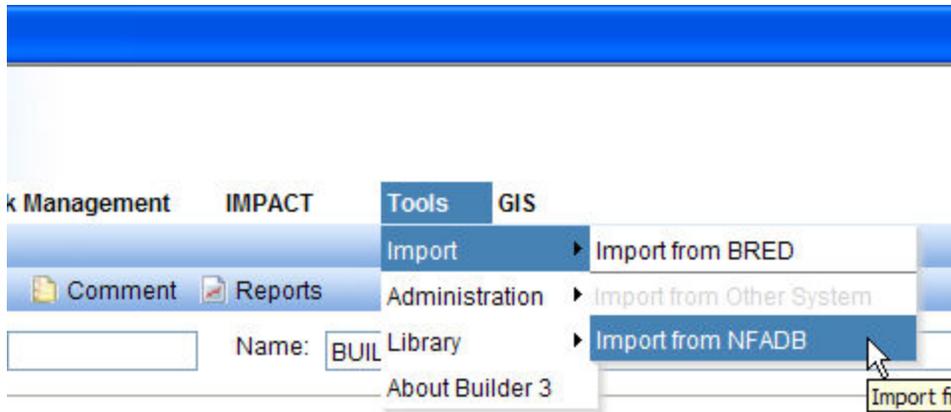
(Screen Shot)

From this window, data can be imported into BUILDER from any of the systems listed above. Click the specific system above for a description of the import process for that system.

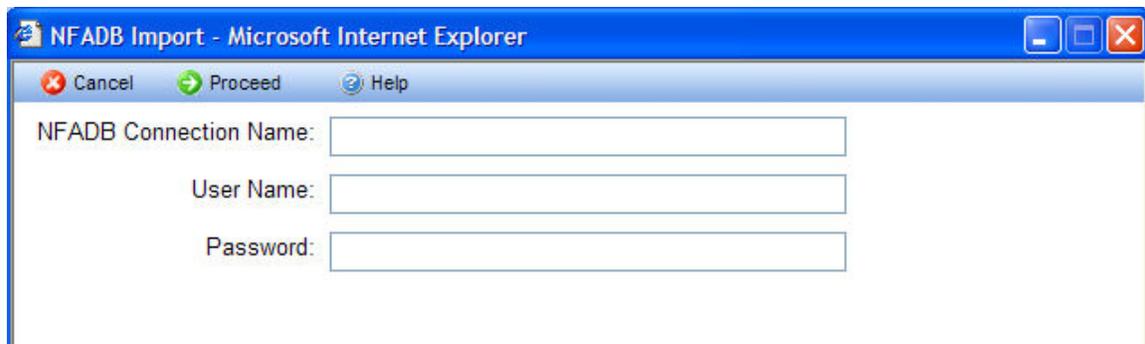
Importing Data from the Navy Facility Asset Database (NFADB)

This feature is designed to allow BUILDER's U.S. Navy users to rapidly construct an initial inventory database from the data contained in the Navy Facility Assets Database (NFADB). This feature reads the NFADB data, including the hidden facility ID field used by other Navy automated systems to track a facility, and creates a BUILDER inventory database.

To import data from NFADB, select *Tools -> Import -> Import from NFADB* from the navigation menu.



The NFADB Import window will appear:

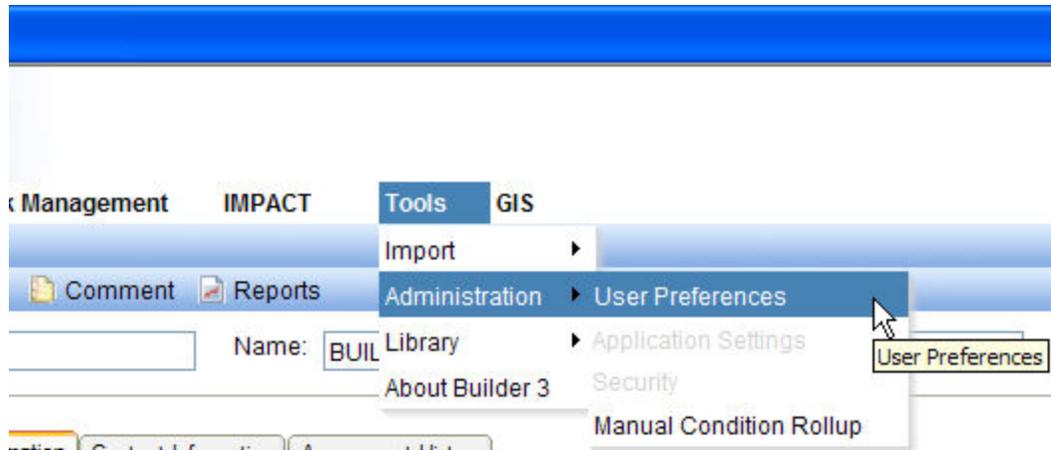


On this screen, you must enter the NFADB connection name, user name, and password to access the database you wish to import. Once you have entered this data, click the PROCEED button. Often times, special assistance is required to use this feature since the information for some of the fields are not generally available to Navy sites. If you wish to build a Navy BUILDER inventory, contact the [Support Center](#) for assistance.

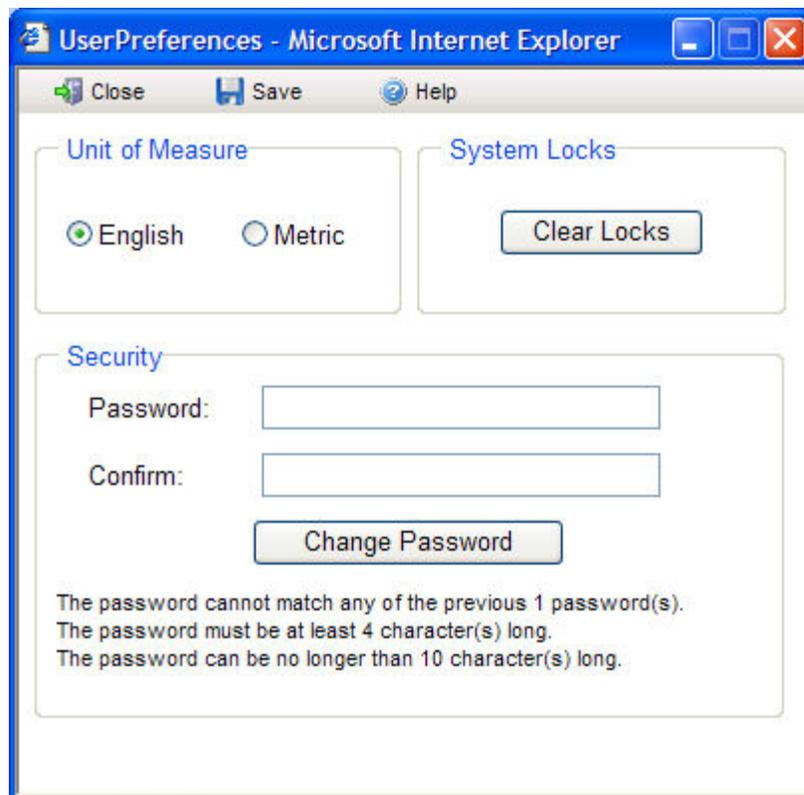
Administration

User Preferences

The User preferences window allows you to change the unit of measure, to clear all the locks on the database records, and change the password to your database. To edit the user preferences, select *Tools -> Administration -> User Preferences* from the navigation menu.



The User Preferences window will appear:



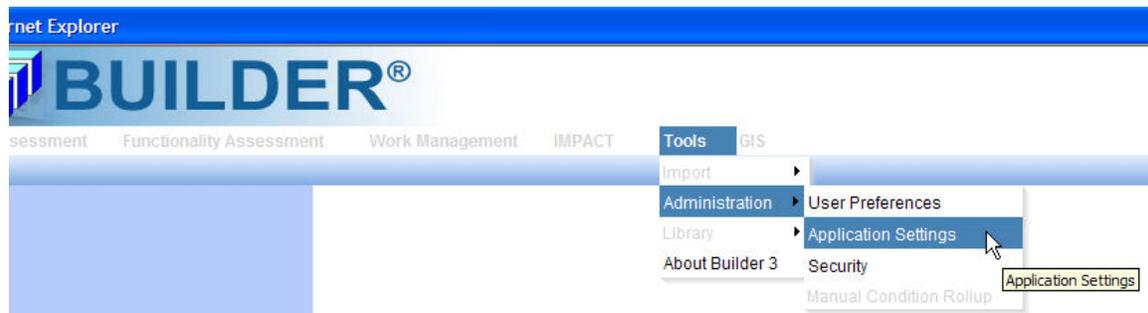
From this window, the following data can be edited:

- **Unit of Measure.** Select the unit of measure, English or Metric, to be used for the database.
- **Clear Locks.** Click the CLEAR LOCKS button to clear all the user locks and allow for all data to be edited.
- **Security.** If you wish to change your login password, enter the new password, retype it to confirm, and click the CHANGE PASSWORD button.

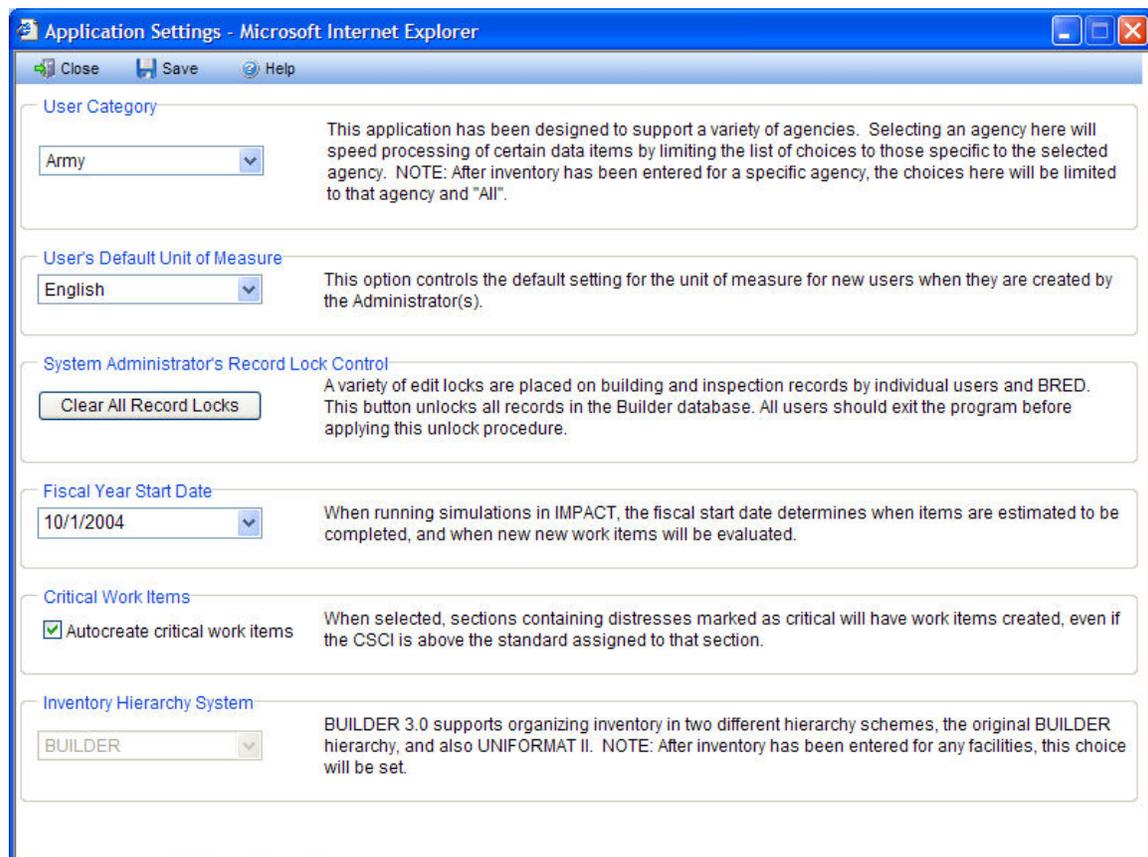
After editing any of the data, click the SAVE button to save the changes to the database and close the User Preferences window. Click the CANCEL button to disregard the changes and close the User Preferences window.

Application Settings

When you create a new inventory database, you should set the preferences in the Application Settings window before proceeding with any additions to inventory. To edit the application settings, select *Tools -> Administration -> Application Settings* from the navigation menu. Note that only a user with administrator privileges can change these settings.



The Application Settings window will appear.



From this window, the following preferences for your database can be edited:

- **User Category.** Select the user category for use when adding buildings to your inventory. By using this option, BUILDER presents an agency-specific list of building use types when adding inventory. The available categories are:
 - Army
 - Navy
 - Air Force
 - Civilian
 - Department of Energy
 - All

Choosing the All category allows you to enter building use types across multiple categories. It is important to note that once your inventory contains buildings from more than one category, the only choice here is All.

- **User Default Unit of Measure.** Select the default unit of measure for the inventory for all users. This unit of measure will initially be shown for all users initially, but each user can change their display units of measure at any time by using the [User Preferences](#) tool when they are logged into BUILDER.
- **Clear User Records Locks.** Click this button to clear all the locks placed on building and inspection records by individual users and BRED. It is important to note that the CLEAR locks button in the [User Preferences](#) window only clears locks on records locked by the current user, while the CLEAR ALL RECORD LOCKS button on this screen unlocks all locked records, regardless of how they were locked.

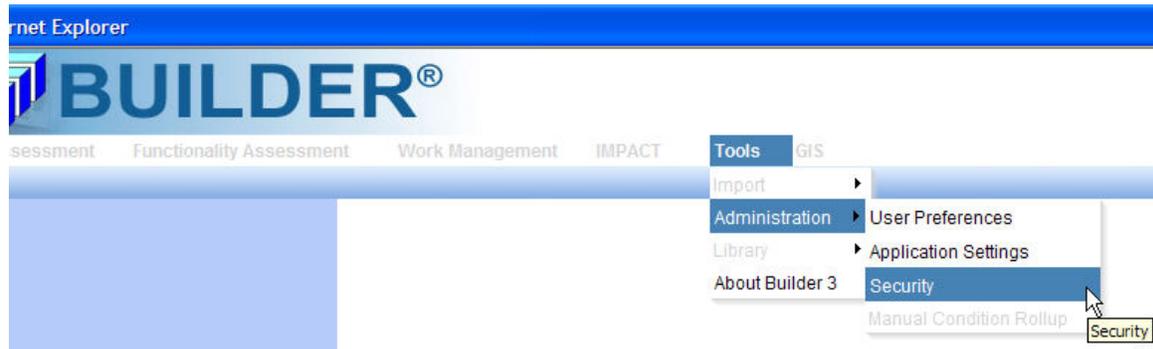
The locking of records is used to protect the data from inadvertent overwrites by multiple users. BUILDER also locks records when buildings are exported to BRED to prevent data changes from the BUILDER program while inspection is in progress. To protect data accuracy, all users should exit from the BUILDER program and all BRED files should be imported before the record locks are cleared.

- **Fiscal Year Start Date.** Enter the fiscal year start date. When running simulations in IMPACT, the fiscal start date determines when items are estimated to be completed, and when new work items will be evaluated.
- **Autocreate Critical Work Items.** Mark this checkbox if you want any section with a current distress marked as critical to automatically generate a work item for it. That is, sections containing distresses marked as critical will have work items created for them, even if the CSCI is above the standard assigned to that section.
- **Inventory Hierarchy System.** Choose the hierarchy system to use when inventorying your database. BUILDER 3.0 supports organizing inventory in two different hierarchy schemes, the original BUILDER hierarchy, and also UNIFORMAT II. It is important to note that after inventory has been entered for any facilities, this choice will be locked.

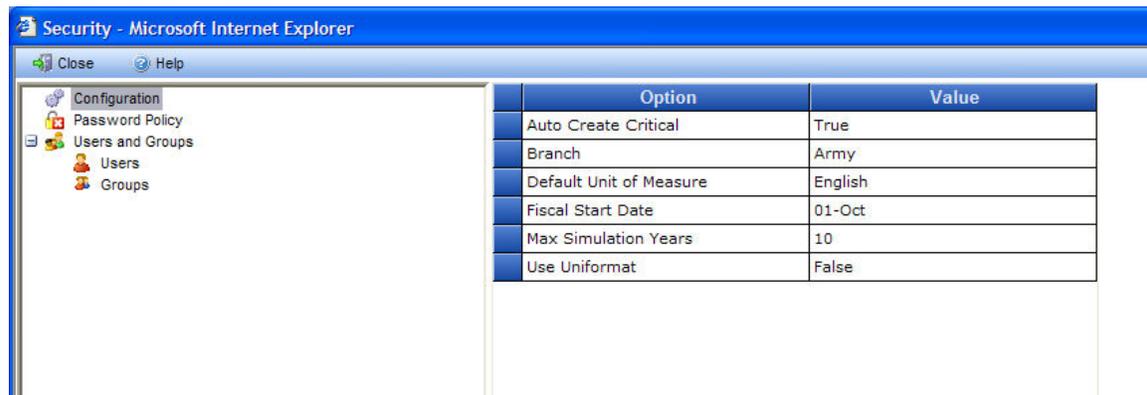
Security

The Security window allows the administrator to view configuration settings, set password parameters, and administer users and groups. The user must be logged in as an administrator to access this screen.

To edit the security features for BUILDER, select *Tools -> Administration -> Security* from the navigation menu.



The Security window will appear as seen below. The Configuration option lists the chosen BUILDER settings, setup in the [Application Settings](#). The Password Policy option allows the administrator to set password parameters for users.



Administering Users

Under Users and Groups, the Users option lists the available users set up for login into the system. This allows each system user to log into their own account, which has rights and privileges associated based on the group they are assigned to. The user screen is shown below:



The administrator can delete a user or edit user properties by selecting the name from the list, and choosing delete or edit from the toolbar. To add a new user, choose Add from the toolbar and the New User screen comes up. The administrator completes the information for name, user name, initial password, and click Save from the toolbar.

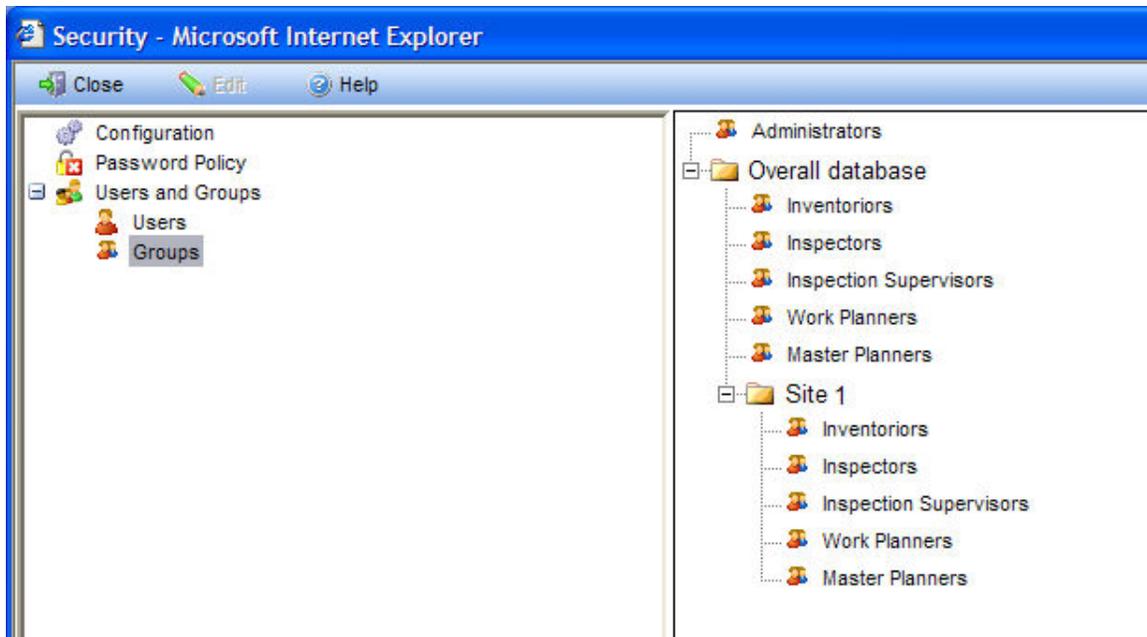
The screenshot shows a web browser window titled "New User - Microsoft Internet Explorer". The browser's address bar and toolbar are visible at the top, showing "Close", "Save", and "Help" buttons. The main content area is a form for creating a new user, organized into several sections:

- Personal:** Contains three text input fields: "First Name" (filled with "John"), "Last Name" (filled with "Smith"), and "User Name" (filled with "jsmith").
- Unit of Measure:** Contains two radio buttons: "English" (selected) and "Metric".
- Account Status:** Contains two radio buttons: "Enabled" (selected) and "Disabled".
- Security:** Contains two password input fields: "Password:" and "Confirm:". Below these fields is a message: "The password cannot match any of the previous 1 password(s). The password must be at least 4 character(s) long. The password can be no longer than 10 character(s) long."
- Roles:** Contains a table with two columns: "Site" and "Role". The table is currently empty.

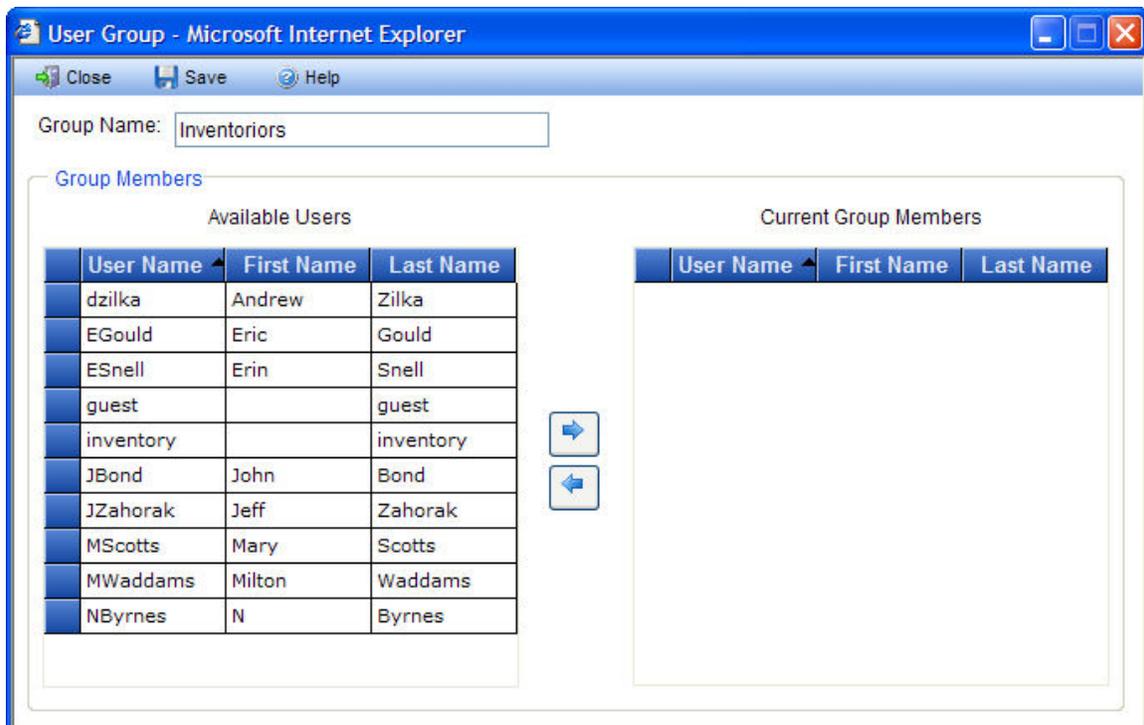
Creating groups

Once users have been created, they can be assigned to groups, which are allowed varying degrees of program access rights under the system. The different groups in BUILDER include:

- **Administrators** - can administer users, assign users to groups, and change BUILDER configuration settings.
- **Inventoriers** - can input/edit inventory information from the inventory screen
- **Inspectors** - has all the rights of Inventoriers, and can input/edit inspection information from the Condition Assessment screen
- **Inspection Supervisors** - has all the rights of Inspectors, and can also import/export data to BUILDER RED and create inspection schedules
- **Work Planners** - has all the rights of inspection supervisor, and can also create/edit work plans, standards, policies, prioritization schemes, and RSL and cost books.
- **Master Planners** - has all the rights of work planners, and can also generate multi-year work plan scenarios, and edit any and all data saved by other users of the program. The Master Planner is assigned the highest level of user privileges.



Since BUILDER can be configured for multiple sites and organizations, each user can have their group privileges assigned and restricted to that level. Therefore, a user can be assigned as a work planner only to one site or organization, or to the entire database globally. The screen below shows the group association. To assign users to a given group and level, select the node from the tree, and click the Edit button on the toolbar. The following screen will come up:



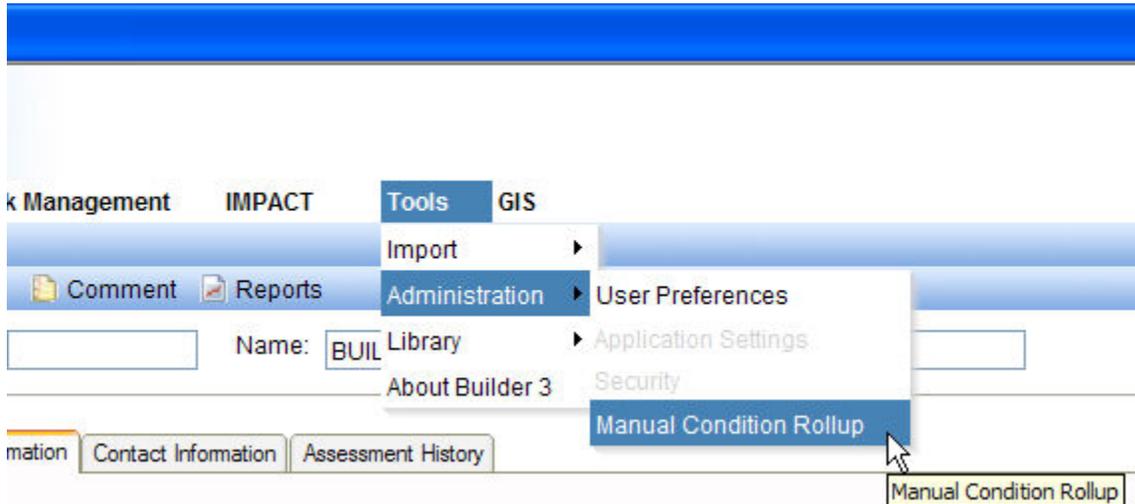
To assign users to the group, simply select the user from the Available Users list, and move them over to the Current Group Members

Manual Condition Rollup

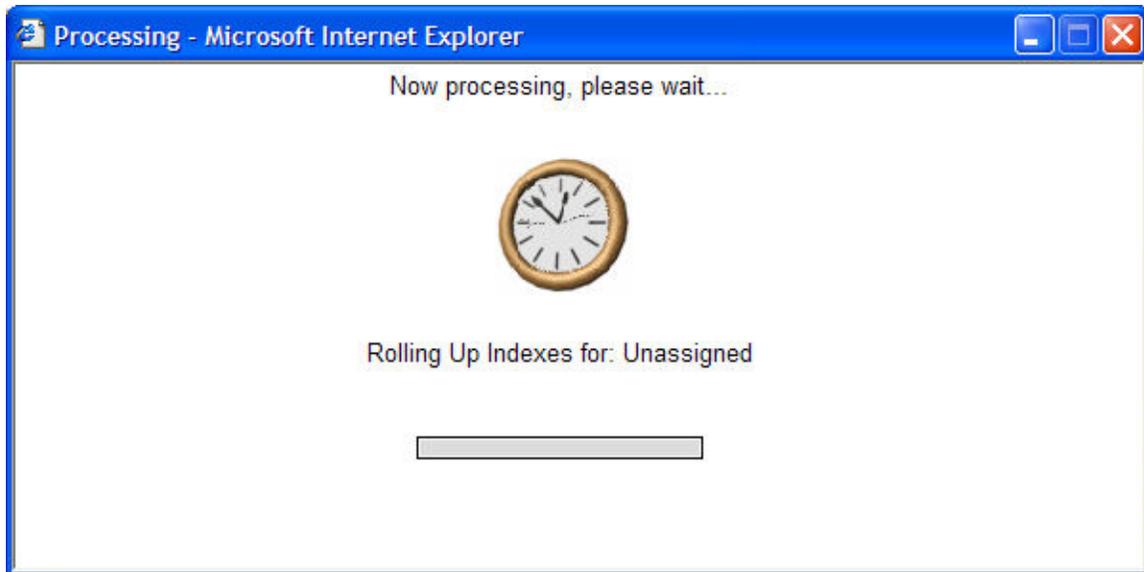
The [Condition Assessment Overview](#) contains a description of BUILDER's process for calculating current CI values for all levels of its inventory. The process "rolls up" the CI values from one level of the inventory hierarchy to the next in a methodical manner, beginning with component-sections and ending with the site (or parent group if one is included in the inventory). BUILDER is designed to perform the rollup recalculation on your command. You should perform this rollup calculation frequently, but especially:

- If you have not performed the rollup within the last 6 months
- If you have entered a large number of new condition assessments
- If you need the most current CI measures to develop a new work plan.

To initiate the manual rollup process, select *Tools -> Administration -> Manual Condition Rollup* from the navigation menu.



The rollup process will begin for all inventory in the database and the Progress window will appear.



The following processes will occur during the rollup:

- Retrieve the latest condition assessment records and estimate a current component-section CI for all component-sections.
- Estimate the current remaining service life (RSL) for all component-sections. The RSL is adjusted by rate of deterioration in CI's.
- Estimate the current CI for all components by calculating the average of their component-sections' CI's weighted by replacement cost.
- Estimate the current CI for all systems by calculating the average of their components' CI's weighted by replacement cost.
- Estimate the current CI for all buildings by calculating the average of their systems' CI's weighted by replacement cost.
- Estimate the current CI for all complexes, sites, and groups by calculating the average of their buildings' CI's weighted by replacement cost.
- Retrieve the latest functionality assessment records and determine the building and functional area FI based on the results of the assessments.
- Estimate the current FI for all complexes, sites, and groups by calculating the average of their buildings' FI's weighted by replacement cost.
- Estimate the current PI for all buildings using a weighted combination of the current building CI and FI.
- Estimate the current PI for all complexes, sites, and groups by calculating the average of their buildings' PI's weighted by replacement cost.
- Estimate the Facility Condition Index (FCI) for all buildings by calculating the total cost of needed repairs in the buildings divided by the present replacement value of the building.
- Estimate the current Facility Condition Index (FCI) for all complexes, sites, and groups by calculating the total cost of needed repairs in their buildings divided by the present replacement value of the complex, site, or group.

After the rollup process completes, the Progress window will close and you will be returned to the main BUILDER screen. Building inventory windows will display recalculated current CI's for all elements.

Library

Viewing and Editing Cost Data

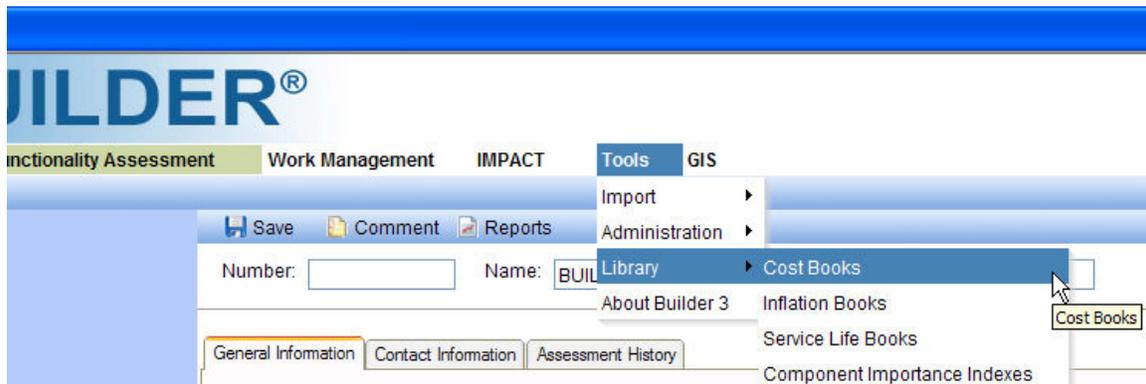
BUILDER has an embedded cost module that is used in two critical areas: work planning and condition assessment. The cost module provides inventory replacement costs for all levels of the building hierarchy. Additionally, replacement costs are used as weighting factors in rolling up CI's in the inventory hierarchy. For work planning, the cost module provides initial programming cost estimates for proposed maintenance, repair, and rehabilitation projects.

The data used in the cost module is derived from the Department of Defense's Tri-Service Automated Cost Engineering System (TRACES), from R.S. Means, and from your own cost data that you may add and use for the cost calculations. While TRACES and R.S. Means both provide electronic systems for cost estimating, BUILDER has its own coded methodology and only uses the cost data from those two sources. There are two primary reasons for this:

- Minimization of detail - Early in BUILDER's design, field input indicated that most users have very limited resources for creating and managing large, detailed databases of their facility assets. The BUILDER inventory and assessment data structures were designed to require as little data input as possible. The BUILDER cost module estimates costs from this minimal information; i.e. it can estimate the cost of a metal personnel door without knowing dimensions, hardware type, and other specifications normally required for most cost estimating systems.
- Flexibility of data - You can input your own cost data into the BUILDER cost module and it will work automatically with your inventory; proprietary cost estimating tools are much more difficult and numerous to integrate.

Managing Cost Data

To manage the cost data, select *Tools -> Library -> Cost Books* from the navigation menu.



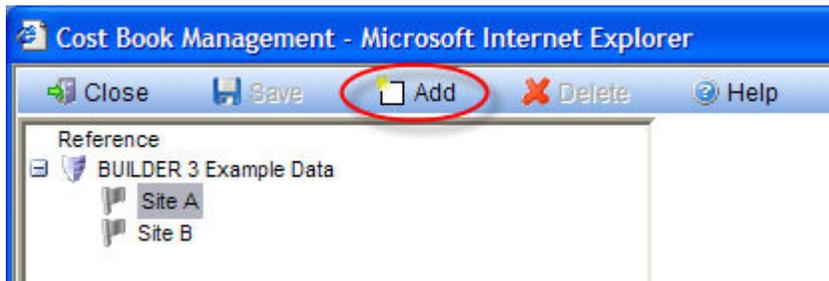
The Cost Management window will open.

Component	Material or Equipment Type	Component Type
Accessibility Lifts	Chair Lift	N/A
Accessibility Lifts	Porch Lift	N/A
Accessibility Lifts	Stair Lift	N/A
Accessibility Lifts	Unknown	Unknown
Chute	N/A	Linen/Refuse
Chute	N/A	Personnel
Chute	Unknown	Unknown
Dumbwaiter	Automatic	2 Stops
Dumbwaiter	Automatic	3 Stops
Dumbwaiter	Automatic	4 Stops
Dumbwaiter	Automatic	5 Stops
Dumbwaiter	Automatic	6-10 Stops
Dumbwaiter	Automatic	>10 Stops

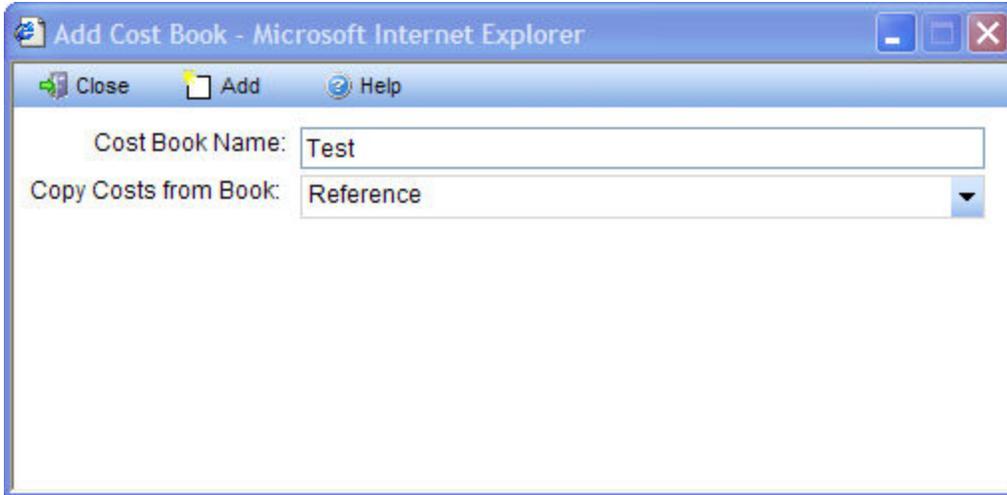
Expand the tree in the left portion of the window to show the available cost books in the database. Initially, only one cost book, Reference, is available. The Reference cost book cannot be deleted or edited; it is actually the built-in data derived from TRACES and R.S. Means. The Reference cost book is the foundation of all other cost books you create. You are free to use the Reference cost book if you like and not add any data of your own.

Adding and Editing Cost Data

If you would like to edit the cost data, you must add your own cost book first. To do so, select the organization or site where the cost book is applicable and click the ADD button in the toolbar.



The New Cost Book window will appear:



Enter the name of the new cost book, select the cost book to copy costs from, and click ADD. You may then edit the costs in the new cost book item by item on the Unit Costs tab using the dropdown lists to filter the grid at the bottom by inventory level, activity, and system (system only appears for section-level inventory items).

Additionally, you can edit the minimum paint cost and minimum cost for a work item from this tab. To edit different cost books in your inventory, select them in the tree and their data will appear in the grid.

Cost Book:

Minimum Cost: Minimum Paint Cost:

Level:

Activity: System:

Unit Costs | General Multipliers | Specific Multipliers

Unit Costs should reflect basic costs prior to Location-Specific (Area Cost Factor) factors being applied.

Component	Material or Equipment Type	Component Type	Unit	Current Cost
Accessibility Lifts	Chair Lift	N/A	EA	\$7,936.98
Accessibility Lifts	Porch Lift	N/A	EA	\$13,651.55
Accessibility Lifts	Stair Lift	N/A	EA	\$19,366.11
Accessibility Lifts	Unknown	Unknown	EA	\$18,923.90
Chute	N/A	Linen/Refuse	LF	\$122.15
Chute	N/A	Personnel	LF	\$356.40
Chute	Unknown	Unknown	LF	\$239.27
Dumbwaiter	Automatic	2 Stops	EA	\$20,354.58
Dumbwaiter	Automatic	3 Stops	EA	\$24,848.19
Dumbwaiter	Automatic	4 Stops	EA	\$29,341.81
Dumbwaiter	Automatic	5 Stops	EA	\$33,835.42
Dumbwaiter	Automatic	6-10 Stops	EA	\$47,316.26
Dumbwaiter	Automatic	>10 Stops	EA	\$65,290.72
Dumbwaiter	Manual	2 Stops	EA	\$5,872.26
Dumbwaiter	Manual	3 Stops	EA	\$7,829.68
Dumbwaiter	Manual	4 Stops	EA	\$9,787.11

General Multipliers Tab

The General Multipliers tab displays the multiplier that will be used in all cost computations for the items filtered using the dropdown lists at the top of the tab.

The general multiplier for the filtered items can be edited from this tab.

Cost Book:

Minimum Cost: Minimum Paint Cost:

Level:

Activity: System:

Unit Costs: **General Multipliers** Specific Multipliers

General multiplier to apply to all costs:

Specific Multipliers Tab

The Specific Multipliers tab displays the factors used as multipliers for the filtered items. There are three types of specific multipliers: Historic, Housing, and Per Floor. Each multiplier can be edited from this tab by choosing the multiplier from the dropdown list. It is important to note that building level items do not have specific multipliers.

Cost Book:

Minimum Cost: Minimum Paint Cost:

Level:

Activity: System:

Unit Costs: General Multipliers **Specific Multipliers**

Select Specific Multiplier:

Description: The base cost to replace this component/section will be increased by this percent for each floor of the building.

Component	Material or Equipment Type	Component Type	PerFloor
Accessibility Lifts	Chair Lift	N/A	0.000
Accessibility Lifts	Porch Lift	N/A	0.000
Accessibility Lifts	Stair Lift	N/A	0.000
Accessibility Lifts	Unknown	Unknown	0.000
Chute	N/A	Linen/Refuse	0.000
Chute	N/A	Personnel	0.000
Chute	Unknown	Unknown	0.000
Dumbwaiter	Automatic	2 Stops	0.000
Dumbwaiter	Automatic	3 Stops	0.000
Dumbwaiter	Automatic	4 Stops	0.000

Assigning Cost Books

You can create multiple cost books, and assign separate ones to each organization or site. This is done in the Inventory mode by selecting the organization or site to assign the cost book to, and selecting the cost book from the drop down menu in the Reference Settings.

Save Comment Images Reports Select

Number: Name:

General Information | Contact Information | Building Information | Assessment History | GIS

Location Factors

Area Cost Factor:

Seismic Zone:

HVAC Zone:

Calculated Data

Number of Facilities:

PRV:

Index Data

	Metric	Value
	CI	81
	FI	98
	PI	85
	FCI	0.028

Reference Settings

Cost Book: Reference

Service Life Book: Reference

Inflation Book: Reference

Policy Sequence: Default

Prioritization Scheme: Simple Default

How Costs Are Calculated

Only two levels of costs are editable, the costs for buildings and for components-sections. A component cost is determined by totaling the costs of the components-sections belonging to it. Similarly, a system cost is determined by totaling the costs of the components belonging to it. Generally, the cost to replace, remove, or paint a component-section is determined by the formula:

$$\text{Total Cost} = \text{Quantity} * \text{Unit Cost} * \text{Area Cost Factor} * \text{General Multiplier} * \text{Aggregate Specific Multiplier} * \text{Inflation Factor}$$

where the Aggregate Specific Multiplier is the product of the applicable individual specific multipliers and the area cost factor is taken from the [site data](#). The cost to demolish a building uses the same formula, with the Aggregate Specific Multiplier = 1.0.

BUILDER uses building replacement cost data from the Tri-Service Military Construction Program in the Reference cost book, and the method described above is essentially the same as the method described in *Technical Manual 5-800-4, Programming Cost Estimates for Military Construction*, to estimate the replacement cost of each building. See <http://www.usace.army.mil/inet/usace-docs/armytm/> for the text of this technical manual.

Costs relative to a specific geographic location are determined by applying a multiplier called the area cost factor to a base construction cost. The BUILDER database of area cost factors is the same database used in the Tri-Service Automated Cost Engineering System (TRACES) and is set in the [site data](#).

The area cost factor (ACF) accounts for the following geographic differences in costs:

- local costs of construction labor, equipment, and materials
- weather, climate, and seismic requirements
- labor availability
- labor productivity

The inflation factor is computed based on the base year of the cost data and the inflation rates given in the default [inflation set](#). If the cost data corresponds to the data in the Reference cost book, then the cost module uses a fixed year for the base year. If you add your own cost book and enter a unit cost different from the Reference set, then the cost module saves the year in which you input that data as the base year for inflation computations.

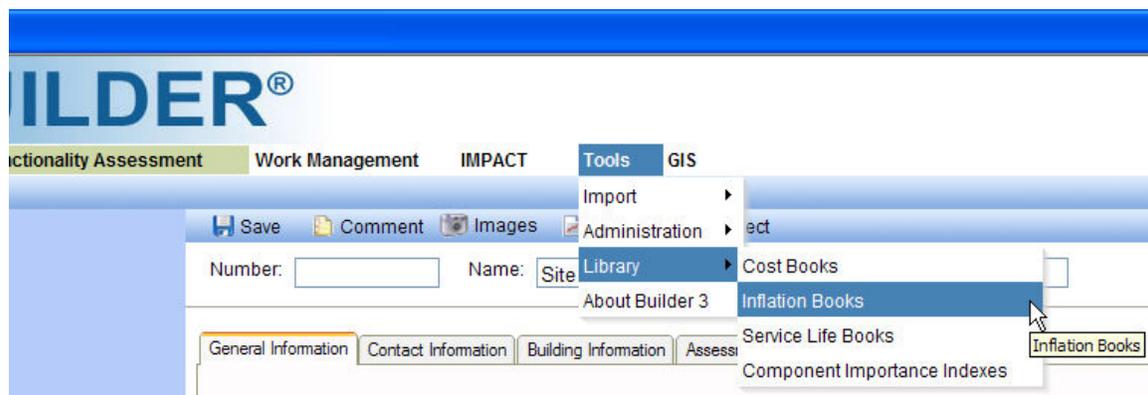
Repair costs are handled differently. The cost module calculates repair costs for component-sections as a function of current condition index and the replacement cost computed as above using an algorithm derived through ERDC-CERL's research.

Viewing and Editing Inflation Rates

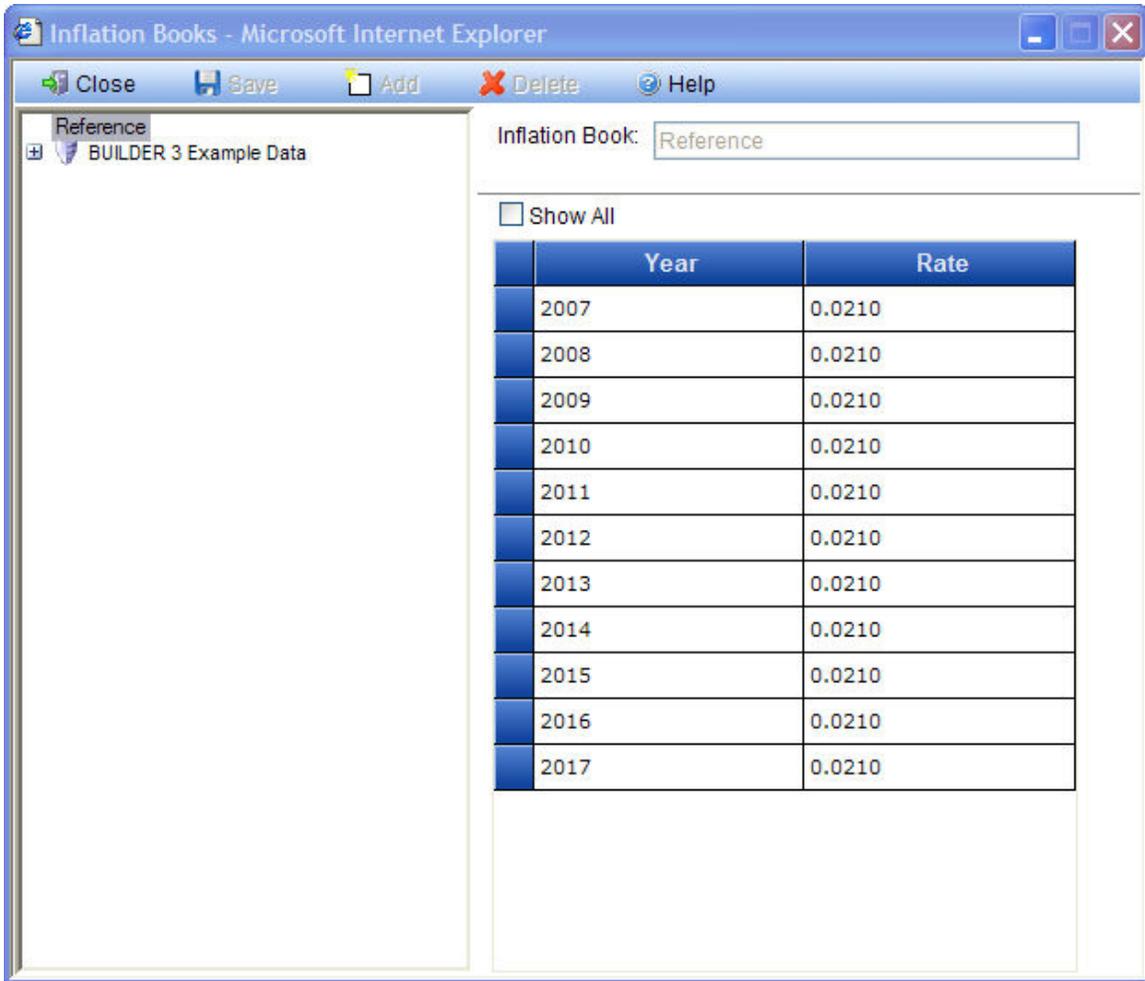
When costs are computed by the [cost module](#), an adjustment is made to account for inflation. The BUILDER cost module initially contains one Inflation Set, the Reference set, which is not editable. The data in the Reference set matches the inflation rates used by the Department of Defense for operations and maintenance costs. As time goes on and the economy's ups and downs yield different forecasts of inflation, you should create new inflation sets to more accurately predict outyear costs.

Managing Inflation Rates

To manage the inflation rates, select *Tools -> Library -> Inflation Set* from the navigation menu.



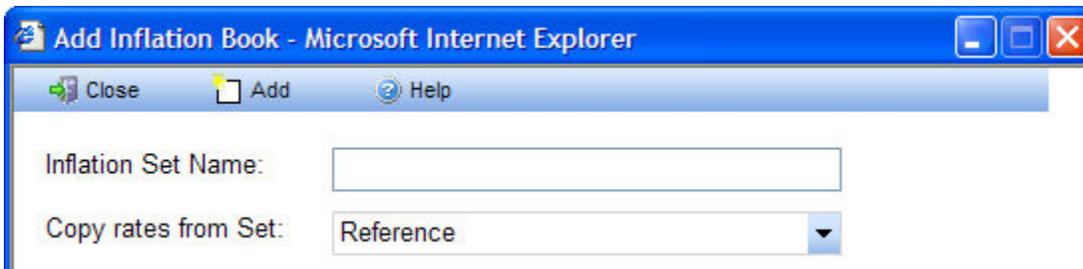
The Inflation Set Management window will appear.



Expand the tree in the left portion of the window to show the available inflation sets in the database. As stated above, only the References inflation set is available initially. The Reference inflation set cannot be deleted or edited and serves as the foundation for all other inflation sets you create. You are free to use the Reference inflation set if you like and not add any data of your own.

Adding and Editing Inflation Rates

If you would like to edit the inflation rates, you must add your own data set first. To do so, choose the organization or site where it applies from the tree, then click the ADD button on the toolbar. The New Inflation Set window will appear:



Enter the name of the new inflation set, choose the set to copy inflation rates from, and click ADD. You will be returned to the Inflation Set Management window, the name of the new book will appear in the Inflation Set dropdown list, and you will see the data corresponding to the book you copied from. You may know edit the inflation rates on a year-by-year basis for the new set in the grid. To edit different inflation sets in your inventory, select them in the tree and their data will appear in the grid.

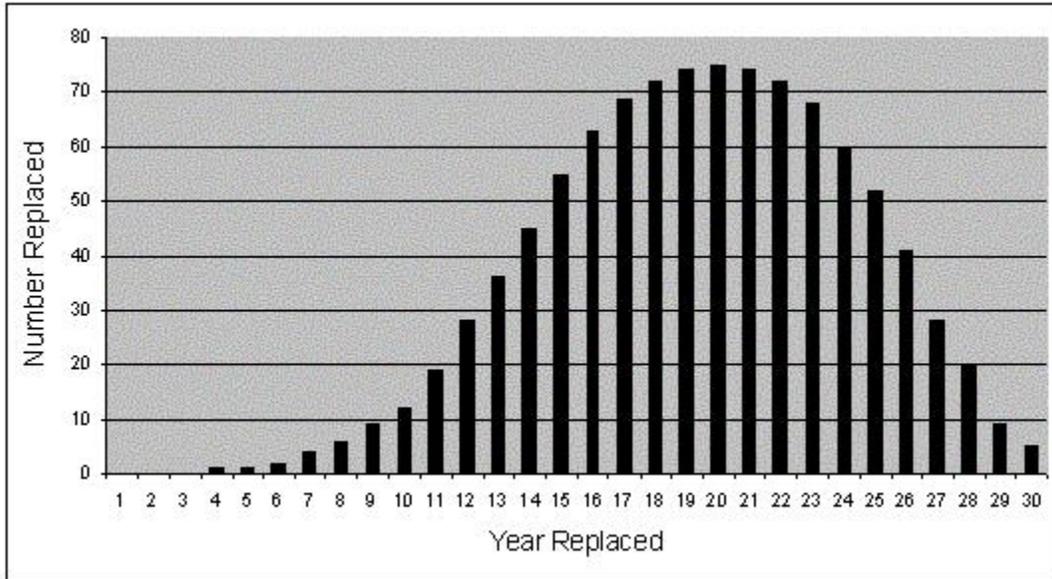
Choosing the Default Inflation Rate Data Set

Once the inflation set is created, it is available from the inventory screen to use for a given site, region, or organization.

Viewing and Editing Service Life Data

BUILDER comes with its own data regarding the service life expectancy, in years, of all types of building component-sections. It uses the expected service life data in several ways. First and foremost, BUILDER estimates the remaining service life of a component-section on the basis of its life expectancy and condition. Second, the expected service life is used in estimating a rate of deterioration in the condition index of a component-section when no more than one inspection has been recorded.

An example of how service life data is gathered and used may be helpful. Suppose the BUILDER service life data indicates that a heavy grade carpet under moderate traffic levels has a life expectancy of 20 years. The 20 years is obviously an average of some sort, and you should know that the average is determined more by the experiences and judgment of multiple facility managers than by statistically accurate field data. Gathering statistically valid data is virtually impossible, even for the manufacturer of a specific carpet type, but especially for the BUILDER database which must match service life with a very generic component-section type. If you installed a heavy grade carpet into 1000 buildings where the traffic level would be classified as moderate and you tracked how many years each carpet remained in the building before it was replaced, the graph of your data might look something like shown below (keep in mind that this is simply a conceptual picture and does not represent actual data.).



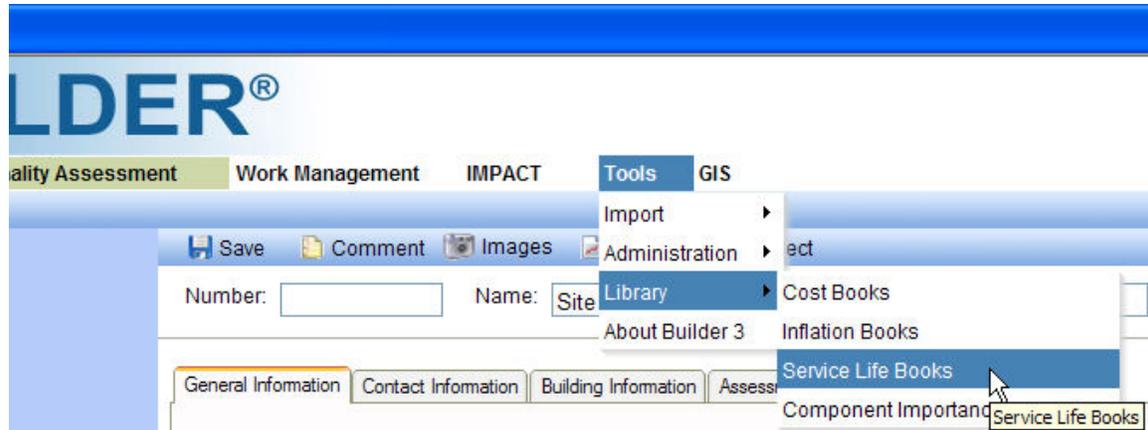
You can see from this simple graph that by year 20, the majority of the carpet in the 1000 buildings has been replaced. You can also see that all along the way, some of the carpet is being replaced sooner than 20 years and some later than 20 years. What makes the difference? Many factors may affect how long a particular carpet may be in use: level of daily and periodic cleaning, climate, actual quality of the carpet and of its installation, mission requirements of the tenant, etc. For those factors which affect the condition of the carpet, BUILDER attempts to relate an estimated remaining service life for a specific carpet component-section with the condition index of that section. The CI of the carpet at any given age gives a good indication of whether the carpet will last less than or more than the average life span. When you perform the process of [rolling up CI's](#) for your inventory, one of the computations in the series is to recompute the remaining service life of the component-section based on its current CI, its rate of deterioration during the time between its last two condition assessments, and the expected service life of the item.

As you can see, the expected service life is a key component in determining two important measures of how well a particular component-section is doing. The two are its current condition index and its remaining service life. Service life is used to determine an expected deterioration rate in estimating current condition in the absence of sequential condition assessment data. It is also used in the models that compute remaining service life on the basis of current CI and rate of deterioration.

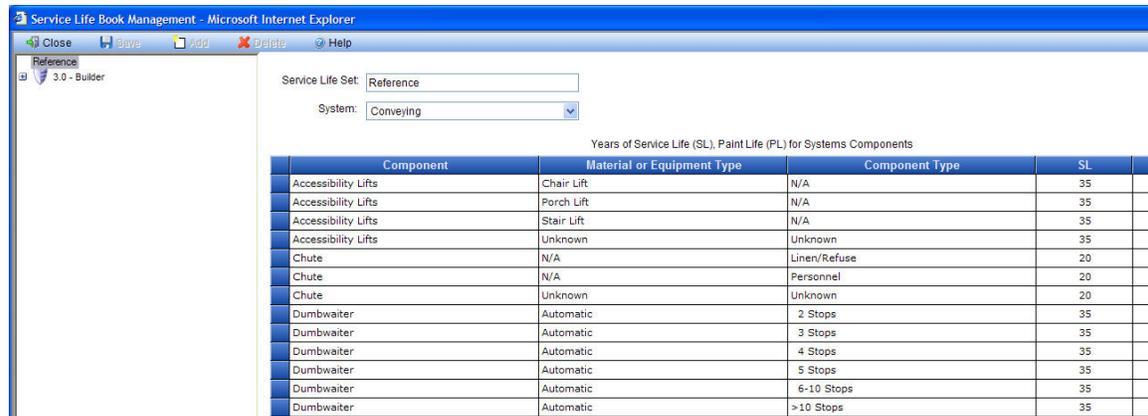
The service life data in BUILDER's Reference set was derived from data collected during many years of research at ERDC-CERL, both during the BUILDER project and by an earlier study that resulted in the Maintenance Resource Prediction Model (MRPM), which has served as the foundation for a number of facility maintenance models. Your experience, however, may be different in terms of how long items last in your buildings. For example, your buildings may be in a very wet, windy climate and the roof surfaces may need to be replaced more often, paint may need to be applied more often, wood windows may need to be replaced sooner than the data indicates. BUILDER allows you to edit the service life data to reflect your knowledge and experience with the various building components you manage.

Creating and Editing Service Life Data

To manage the service life data, select *Tools -> Library -> Service Life Data* from the navigation menu.



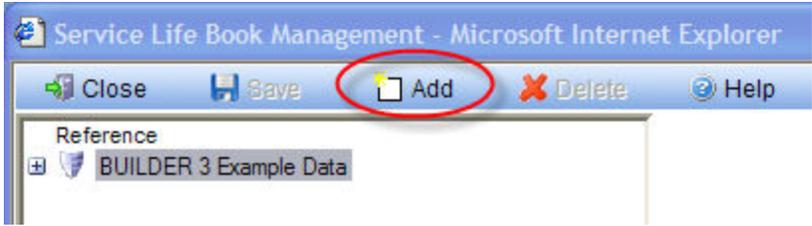
The Service Life Management window will appear.



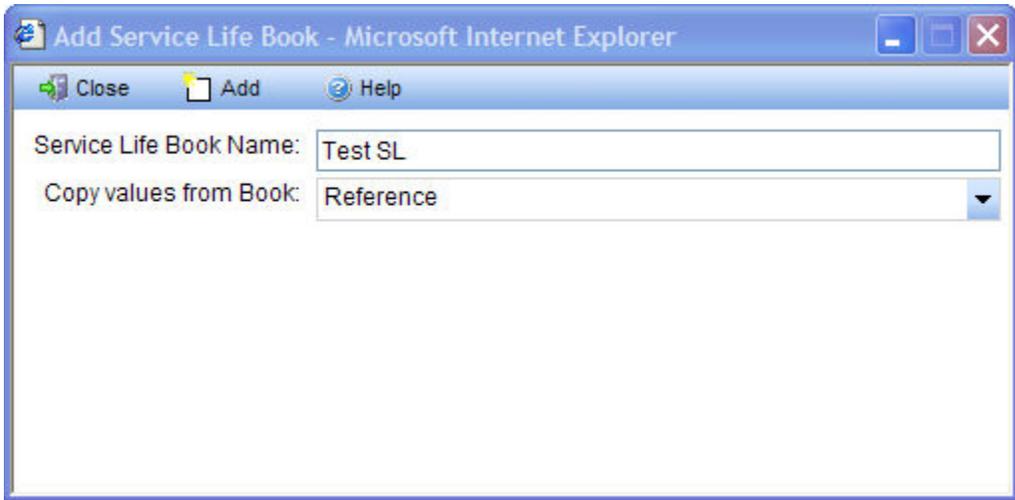
Expand the tree in the left portion of the window to show the available service life data sets. Initially, only one service life data set, Reference, is available. The Reference data set cannot be deleted or edited, and serves as the foundation of all other service life data sets you create. You are free to use the Reference service life data set if you like and not add any data of your own.

Editing Service Life Data

If you would like to edit the service life data, you must create your own data set first. To do so, click the ADD button on the toolbar.



The Service Life Management window will appear.



Enter the name of the new service life book, choose the book to copy service life data from, and click ADD. You will be returned to the Service Life Management window, the name of the new book will appear in the Service Life Set field, and you will see the data corresponding to the book you copied from. You may now edit the service life (SL) and paint life (PL) for the sections in the grid, which is filtered by system. To edit different service life sets in your inventory, select them in the tree and their data will appear in the grid.

Service Life Book:
 System:

Years of Service Life (SL), Paint Life (PL) for Systems Components

Component	Material or Equipment Type	Component Type	SL	PL
Accessibility Lifts	Chair Lift	N/A	35	
Accessibility Lifts	Porch Lift	N/A	35	
Accessibility Lifts	Stair Lift	N/A	35	
Accessibility Lifts	Unknown	Unknown	35	
Chute	N/A	Linen/Refuse	20	
Chute	N/A	Personnel	20	
Chute	Unknown	Unknown	20	
Dumbwaiter	Automatic	2 Stops	35	
Dumbwaiter	Automatic	3 Stops	35	
Dumbwaiter	Automatic	4 Stops	35	
Dumbwaiter	Automatic	5 Stops	35	
Dumbwaiter	Automatic	6-10 Stops	35	
Dumbwaiter	Automatic	>10 Stops	35	
Dumbwaiter	Manual	2 Stops	35	
Dumbwaiter	Manual	3 Stops	35	
Dumbwaiter	Manual	4 Stops	35	
Dumbwaiter	Manual	5 Stops	35	
Dumbwaiter	Manual	6-10 Stops	35	
Dumbwaiter	Manual	>10 Stops	35	
Dumbwaiter	Unknown	Unknown	35	

Assigning Service Life Books

You can create multiple Service Life books, and assign separate ones to each organization or site. This is done in the Inventory mode by selecting the organization or site to assign the Service Life book to, and selecting the Service Life book from the drop down menu in the Reference Settings.

Number: Name:

General Information | Contact Information | Building Information | Assessment History | GIS

Location Factors

Area Cost Factor:

Seismic Zone:

HVAC Zone:

Calculated Data

Number of Facilities:

PRV:

Index Data

	Metric	Value
	CI	81
	FI	98
	PI	85
	FCI	0.028

Reference Settings

Cost Book: Reference

Service Life Book: Reference

Inflation Book: Reference

Policy Sequence: Default

Prioritization Scheme: Simple Default

Reports

Selecting a Report

BUILDER offers a number of standard reports, each formatted in the commercial tool Data Dynamics Active Reports. These reports can be viewed, printed, or exported to electronic files of several formats. Reports can be viewed by clicking the REPORTS button  in the local toolbar. The Reports Selector window will appear.

Report Selector - Microsoft Internet Explorer

Close | View Report | Help

Select a Report:

To view a report, select it from the dropdown list and click the VIEW REPORTS button. The selected report will launch in the [Report Viewer](#) window. The method used to open the Reports Selector window determines the type and scope of the reports available to be viewed.

When you select the REPORTS button on a toolbar at a particular inventory level, the dropdown list includes only reports applicable to that level. Additionally, the report will only show data for the current model you are in. For example, if the REPORTS button is clicked while in inspection mode, or inspection related reports will be displayed.

Using the Report Viewer

The Report Viewer provided with BUILDER is a commercial report generator supplied by Data Dynamics Active Reports. The report viewer offers a number of powerful capabilities for working with BUILDER's standard reports. It allows you to view reports in a variety of formats, to print the reports, and to export the reports to an electronic file of a variety of formats. Shown below is the general appearance of the report viewer:

Complex	Building	BCI	BFI	BPI	FCI	MDI
USPS						
	Warehouse 1	94	100	96	0.000	
Main Post						
	1102 Legal Office	75	100	82	0.026	38
	1109 Communications Center	82	100	87	0.031	92
	1112 Credit Union Building	83	100	88	0.031	57
	1131 Administration Building	78	100	85	0.022	38
	1328 Personnel Office	85	100	89	0.015	57
	1397 Community Building	84	100	89	0.027	38
	1617 Security Office	83	100	88	0.020	85
	1621 Fire Station	80	100	86	0.024	86
	4000 Fitness Center	84	100	89	0.013	71
	4571 Dining Hall	81	100	87	0.020	69
	4572 NCO Barracks	91	100	94	0.005	78
	4577 Senior NCO Barracks	82	100	87	0.013	78
	4911 Consolidated Club	85	100	89	0.051	71
Airfield						
	6709 Classroom Building	85	76	80	0.023	54
	8585 Aircraft Mechanics School	82	100	87	0.012	85

Toolbar

- CLOSE. Use this button to close the window.
- VIEW TYPE. Select the view type of the report from the dropdown list. The reports you can be viewed in Adobe Acrobat (PDF), HTML, or ActiveX.

Note that one report, "Work Plan for Export to MS Excel," was designed specifically to be used with Microsoft Excel and not to be viewed and printed as it appears in the Report Viewer. By choosing to export this report the Excel,

you can format, sort, eliminate columns, add your own columns, etc. as you wish to build your own work plan reports.

- EXPORT REPORT. Use this button to export the report.
- HELP. Use this button to launch the help topic associated with viewing reports.

Exporting a Report

New to BUILDER 3.0 is the ability to export reports to hardcopies. A report can be exported in 4 formats:

- Adobe Acrobat (PDF)
- Microsoft Excel
- Microsoft Word (RTF)
- HTML

To export the current report, select the format type using the dropdown list and click the EXPORT REPORT button in the toolbar.



The export process will begin, and you will be asked if you wish to open the exported report or save it to file. If you wish to save the report to file, you must specify a file path and name.

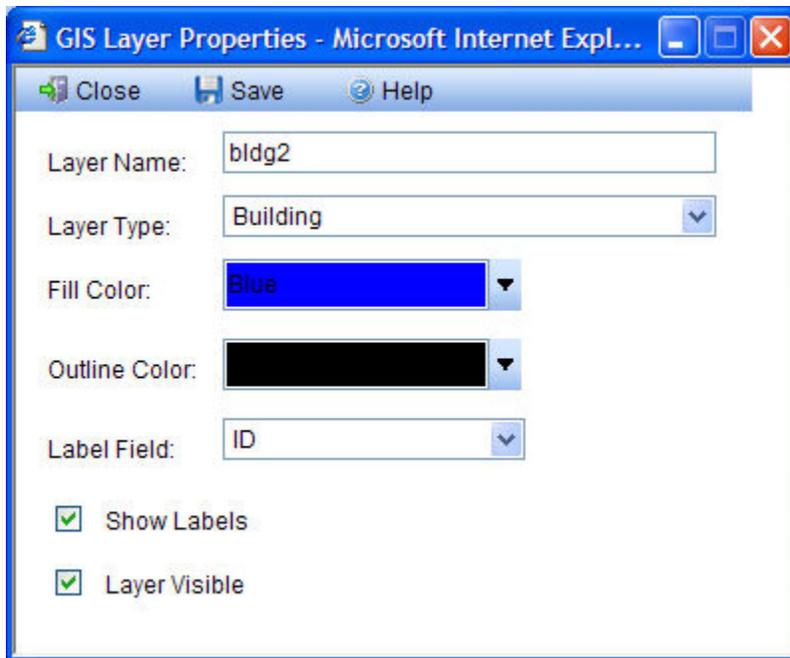
GIS

Setting Up GIS

If you have a GIS map and wish to associate with a site in your inventory, it can be done from the GIS tab on the [site information screen](#).



Each row in the grid shows the data for a GIS layer that has been added for the site. To edit the data in a particular row, click the PROPERTIES button in the column on the left. The GIS Layer Properties window will appear.



Properties that can be edited in this window include:

- **Layer Name.** Enter the name the layer will be identified by.
- **Fill Color.** Select the fill color for the layer from the dropdown list.
- **Outline Color.** Select the outline color for the layer from the dropdown list.
- **Label Field.** Select the label describing the layer to be shown in the [GIS Viewer](#) from the dropdown list.
- **Show Labels.** Mark this checkbox if you want the layer labels to be visible in the [GIS Viewer](#).
- **Layer Visible.** Mark this checkbox if you want the layer to be visible in the [GIS Viewer](#).
- **Layer Searchable.** Mark this layer if you want the layer to be searchable. That is, mark the checkbox if you want the linked building identifiers to be shown when a particular data element is selected in the GIS Viewer.

After editing the data for a layer, click the SAVE button in the toolbar to save the changes to the layer. Click the CANCEL button if you do not wish to save the changes to the layer.

Adding a Layer

To add a layer that can be shown in the [GIS Viewer](#), click the NEW button. The GIS Upload window will appear.

GIS Upload - Microsoft Internet Explorer

Cancel Import Help

Select the files for the GIS layer that you want to display.

The three GIS files will contain the file extensions DBF, SHP, and SHX. All three of these files must have the same name.

Browse...

Browse...

Browse...

Select layer type: Building

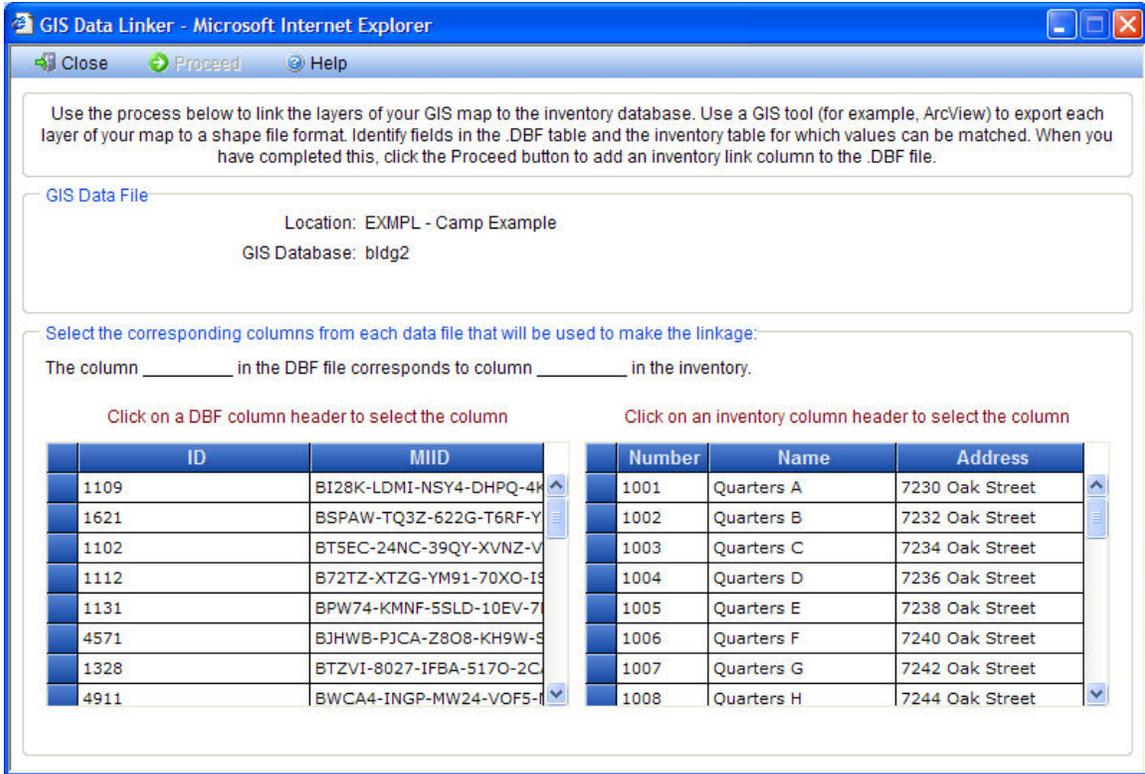
Select the three GIS files you would like to upload using the BROWSE buttons next to the three fields. The GIS files you need to upload will contain the file extensions DBF, SHP, and SHX, and all three must have the same name. After the three GIS files have been selected, click the PROCEED button to initiate the upload. After the upload process is complete, the new layer will appear as a new row on the grid. If you do not wish to upload the files, click the CANCEL button.

Deleting a Layer

If you would like to delete a layer from the grid, select the layer and click the DELETE button. Note that deleting a layer may prevent a [theme from being viewed](#) in the [GIS Viewer](#) correctly (or at all).

Linking a GIS Layer to the BUILDER Inventory

By linking the GIS layers to the BUILDER inventory, the building identifiers are shown when a particular data element is selected in the GIS Viewer. To link a GIS layer that has already been added, select the layer you wish to link in the grid and click the LINK  button. The Map Linker window will appear.



In the Map Linker, select the column in the left grid corresponding to the building identifier in the .dbf file that matches either building number, name, or address. Select the column in the right grid corresponding to the selected building identifier in the BUILDER inventory. For DOD agencies, this will generally be building number. Click the PROCEED button to begin the automated linkage process. This process will create a new column in the .dbf file that will contain the BUILDER unique ID for each building the process is able to match.

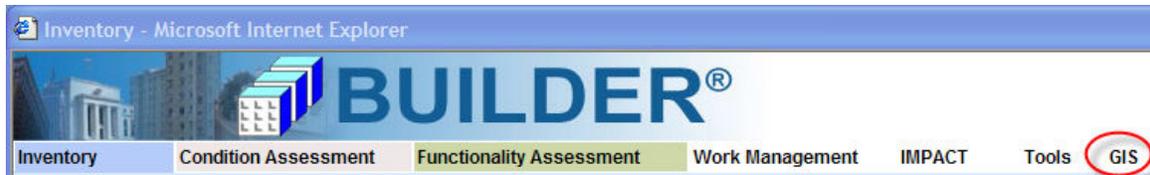
Moving a Layer

If multiple layers are added for a particular site, then the order in which they appear in the grid on the GIS tab will dictate how they appear in GIS viewer and in [themes you create](#). The GIS viewer is configured to show the layer at the top of the grid over all other layers on the grid. That is, if the top layer in the grid and the bottom layer on the grid both have overlapping element on the map, the element associated with the top layer will be shown and the element associated with the bottom layer will not be. If there is no overlap between layers, all layers will be shown in their entirety.

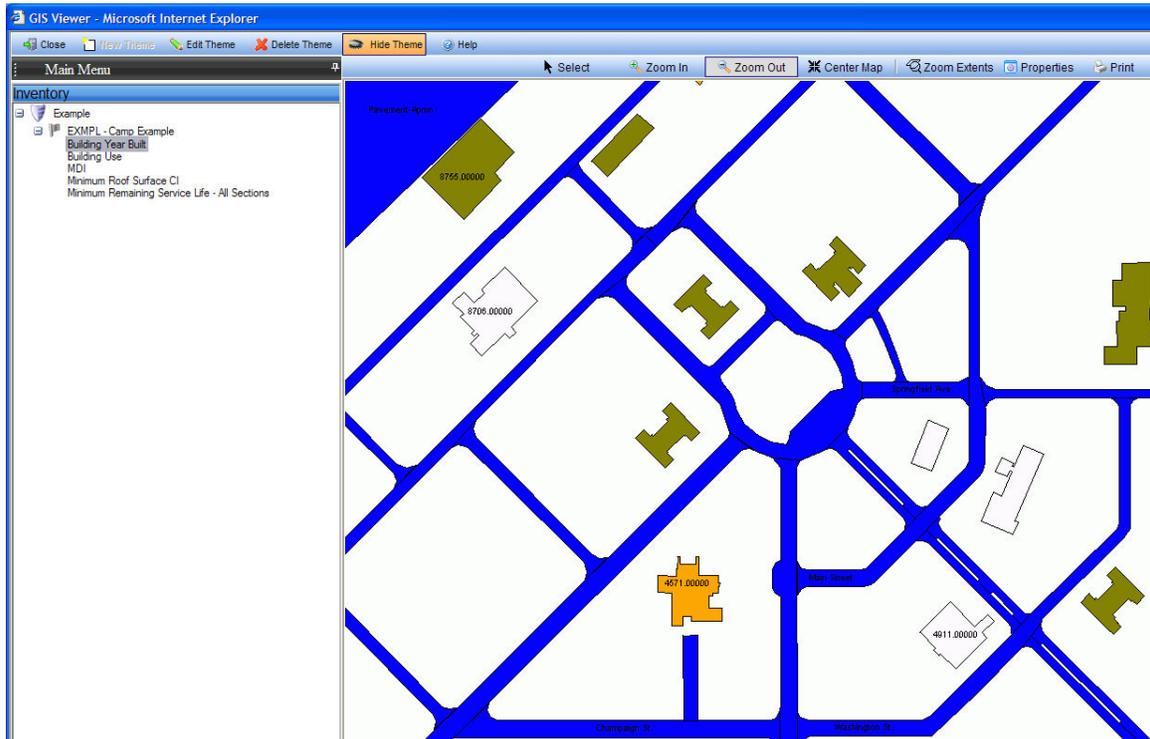
To move a layer in the GIS grid, select the layer and use the UP and DOWN arrows. The different layers in the grid should be moved to ensure the correct elements are shown the GIS viewer and in the themes you create.

GIS Viewer

After you have [setup GIS layers for your BUILDER Inventory](#), the associated GIS map can be viewed by selecting *GIS* from the navigation menu.



The GIS Viewer window will appear.



When the GIS Viewer appears, the GIS layers associated with the site will be shown. Additionally, the tree on the left side of the window can be expanded to show all of the themes that have been created for the site and a legend appears on the right side of the screen. The tree and legend can be hidden and shown again using the arrow buttons marked on the screen shot shown above.

Toolbar

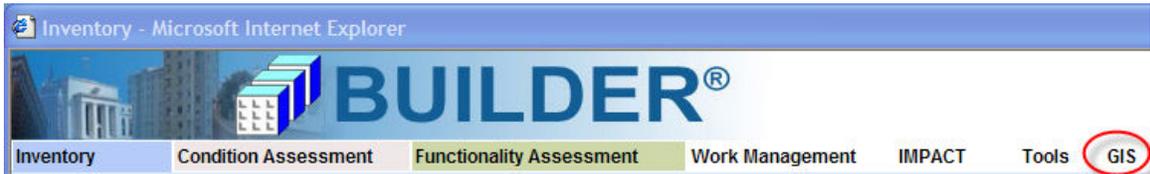
- CLOSE. Use this button to close the GIS Viewer.
- CREATE THEME. Use this button to [create a new theme](#).
- EDIT THEME. Use this button to edit the selected theme.
- DELETE SELECTED THEME. Use this button to delete the selected theme.
- VIEW/HIDE THEME. Use this button to [view the selected theme](#) or hide the currently shown theme.
- SELECT. Use this button to select a particular element on the map. After clicking this button, clicking on a linked data element will display information about it. See [Setting Up GIS](#) for information on how to link data elements.
- ZOOM IN. Use this button to zoom in on the map. After clicking this button, click once on the map where you wish to zoom in.

- ZOOM OUT. Use this button to zoom out from the map. After clicking this button, click once on the map where you wish to zoom out.
- CENTER MAP. Use this button to center the map. After clicking this button, click once on the map where you wish to center the map.
- ZOOM EXTENTS. Use this button show the entire map.
- PRINT. Use this button to print the map.
- HELP. Use this button to launch the help topic associated with the GIS Viewer.

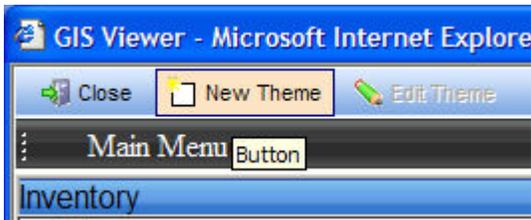
Creating Themes

A helpful tool included in BUILDER is the ability to create and show themes based on properties of the inventory (BCI, BFI, BPI, estimated work cost, etc). Creating and viewing these themes allows for an overall indication of the site's properties to be viewed and compared from a single location.

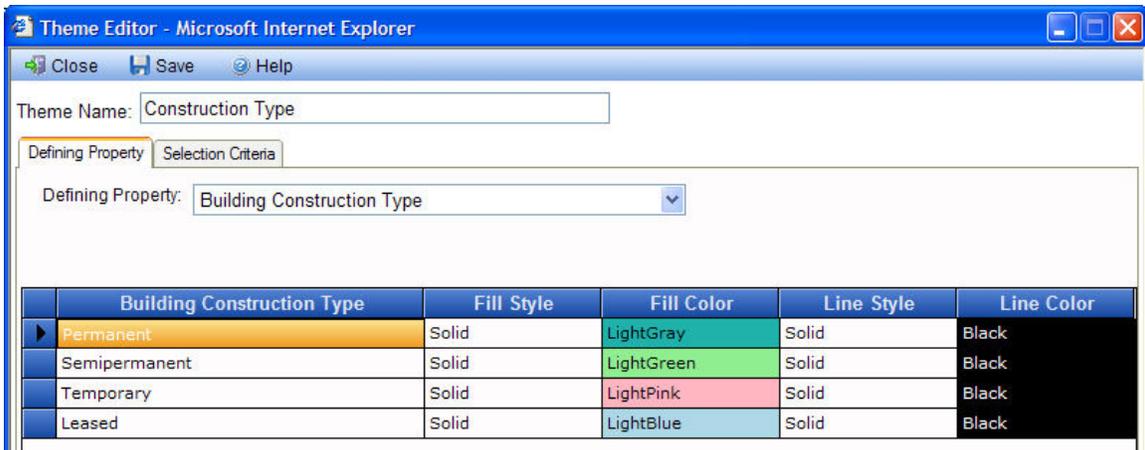
To create a theme, open the GIS Viewer window by selecting *GIS* from the navigation menu.



From the GIS Viewer, click the CREATE NEW THEME button on the toolbar.



The Add Theme window will appear.



Initially, the Add Theme window will be open to the Defining Property tab. On this tab, the following data should be input:

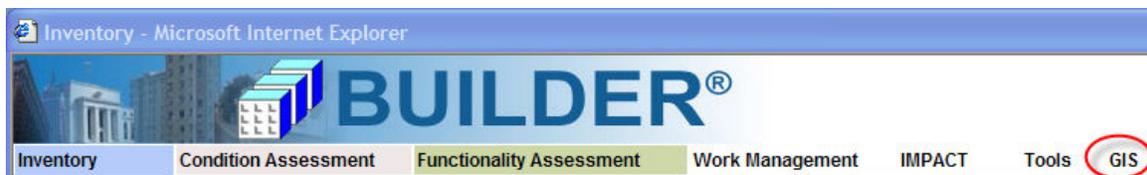
- **Theme Name.** Enter the name of the theme being created, which should be unique.
- **Defining Property.** Select the defining property of the theme from the dropdown list. Depending on the Defining Property chosen, the grid in the bottom of the screen will populate with different values in the first column.
- **Fill Style.** Select the fill style from the dropdown list for the selected row. Each inventory item that has the property in the first column of the selected row will have the selected fill style when the theme is viewed.
- **Fill Color.** Select the fill color from the dropdown list for the selected row. Each inventory item that has the property in the first column of the selected row will have the selected fill color when the theme is viewed.
- **Line Style.** Select the line style from the dropdown list for the selected row. Each inventory item that has the property in the first column of the selected row will have the selected line style when the theme is viewed.
- **Line Color.** Select the line color from the dropdown list for the selected row. Each inventory item that has the property in the first column of the selected row will have the selected line color when the theme is viewed.

In addition to the data described above, additional data can be entered for the theme on the [Selection Criteria](#) tab. Adding selection criteria to a theme can limit the inventory the theme is shown for. After all of the data for the theme has been entered, click the SAVE button in the toolbar to create the theme. Click the CANCEL button in the toolbar if you do not wish to create the theme.

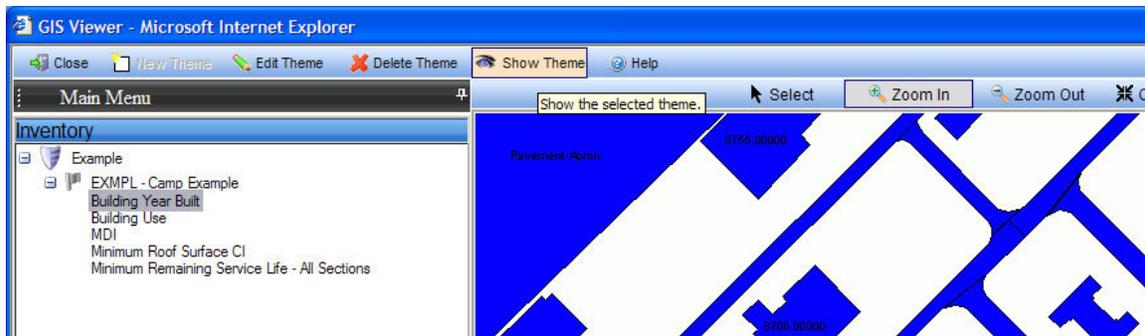
Viewing Themes

A helpful tool included in BUILDER is the ability to create and show themes based on properties of the inventory (BCI, BFI, BPI, estimated work cost, etc). Creating and viewing these themes allows for an overall indication of the site's properties to be viewed and compared from a single location.

After a [GIS theme has been created](#), it can be viewed in the GIS viewer. To open the GIS viewer, select *GIS* from the navigation menu.



To view a theme, select it in the tree and click the SHOW THEME button in the toolbar.



The theme, using the fills and lines you defined when creating the theme, will be shown in the GIS viewer. The different element appearances allows for data regarding the inventory to be easily identified and compared with one and other. From this information, areas of concern and areas of non-concern can be easily identified.

When viewing a theme, the legend corresponding to the defining property is show in the right portion of the screen. Additionally, the toolbar buttons ([see GIS Viewer](#)) allow for the GIS map to be zoomed in, zoomed out, etc.

Mission Dependency Index

Mission Dependency Index Overview

Securing and defending funding for building maintenance, repair, and revitalization (MR&R) is difficult at best. MR&R funding is almost always less than required since the preference of resource managers is to spend the available funds in areas that directly affect the primary mission. Buildings generally serve in a support role and usually do not directly affect the accomplishment of their owner's mission. Some examples:

- For a military agency, the primary mission is in some way related to the warfighting capability. Recruitment and retention of soldiers, modernization of weapons, and training all directly affect the primary mission; the existence of or condition of most buildings will probably not directly affect the warfighting capability.
- For a manufacturer, the primary mission is the production and sale of the company's products. The machinery in the assembly line and the abilities of the sales force directly affect the company's mission; the building containing the assembly line may have little effect on the company's mission.
- For a school, the primary mission is the education of its students. The quality of the teachers and the curriculum are key to the school's mission; the classroom building only secondary.

It is very difficult to measure how buildings and their states of repair affect the mission performance of their owners. Such a measure would be invaluable when seeking funding because a clear cause-and-effect relationship could be shown. This is the desired product of the Mission-Focused Infrastructure Investments program.

While not available today, ongoing research is striving to develop such a metric.

BUILDER offers the Mission Dependency Index (MDI), which is currently under development by the U.S. Navy Naval Engineering and Service Center (Port Hueneme, CA) in a cooperative research effort with ERDC-CERL. The MDI is based on the mission owner's assessment of the importance of each building to the accomplishment of his/her mission. The goal, as in the second view of the story, is to identify in an objective, quantitative manner how critical each facility is to the overall performance of the mission. Each building has an MDI score in the 0-100 range, where 100 is most critical and 0 is least critical. With such a score available, the most critical buildings can be easily identified, especially by the automated computer decision processes used by BUILDER.

The MDI score for a building is based primarily on the answer given by the owner/user to two questions:

1. How long could the functions provided by this facility be unavailable before adverse impact to your mission?

- (N) Must be maintained continuously (24/7)
- (B) Brief (a matter of hours)
- (S) Short (a matter of days)
- (P) Prolonged (a matter of weeks)

2. If this facility was not functional, could you continue performing your mission by using another facility or by setting up temporary facilities?

- (I) No, it's impossible
- (D) Yes, but with great difficulty
- (P) Yes, with little or no difficulty

Each selected mission answers these two questions about each building it owns or uses. Additional scoring data is gathered when each other mission at the same location answers the following two questions about the selected mission:

1. How long could the functions provided by the selected mission be unavailable without adverse impact to your mission?

- (N) Must be maintained continuously (24/7)
- (B) Brief (a matter of hours)
- (S) Short (a matter of days)
- (P) Prolonged (a matter of weeks)

2. If the selected mission's infrastructure were not available, could you continue performing your mission by using other facilities or by setting up temporary facilities?

- (I) No, it's impossible
- (D) Yes, but with great difficulty
- (P) Yes, with little or no difficulty

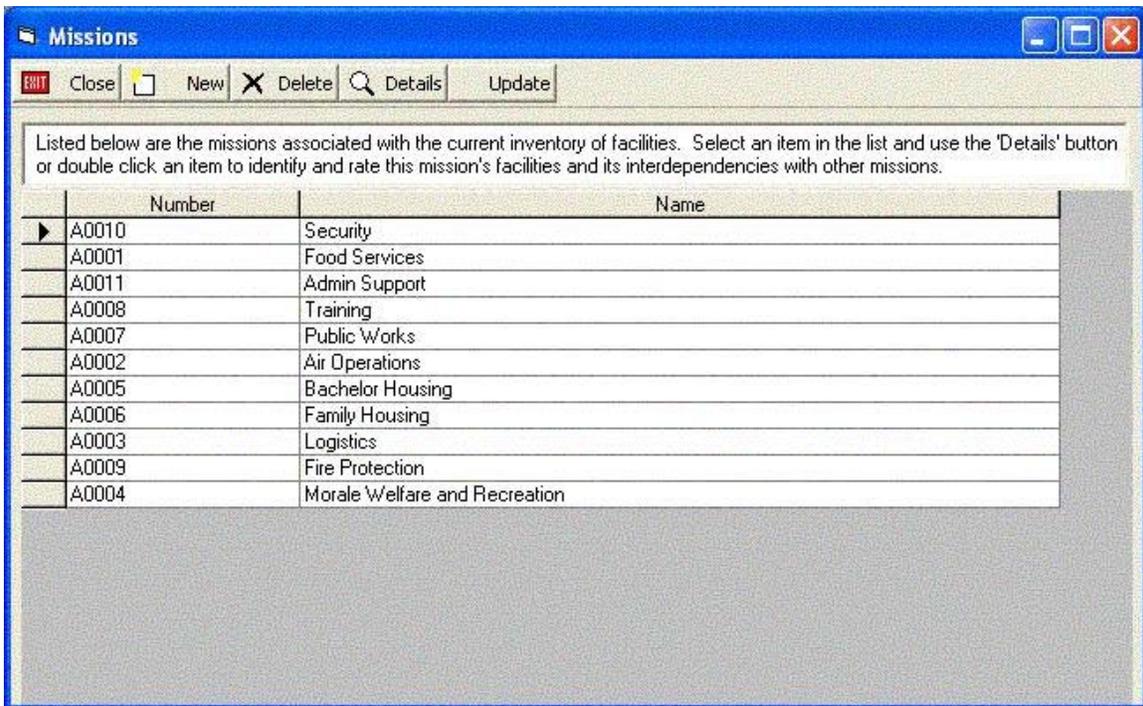
This second set of questions yields a mission interdependency score that adjusts a building score upward for each other mission dependent on its owner.

In its current implementation, the algorithm for computing the MDI score for a building combines the points associated with these questions to achieve an overall score. See [Determining the Mission Dependency Index](#) for instructions regarding the data required for computing a MDI score for each building in your inventory and for using the MDI in user-defined groups, themes, and prioritization.

Determining the Mission Dependency Index

The Mission Dependency Index (MDI) is a measure of the relative importance of a building on a 0-100 scale. The value of the measure is determined by mission owner of the building and by other missions dependent on the building or the building's primary mission. In a military setting, various missions may include: air operations, port operations, payroll, supply, security, public works, training, etc. For a city, the missions may be city administration, fire protection, police protection, library services, public housing, public works, etc. An industrial complex may have missions of production, administration, payroll, human services, maintenance, etc.

To establish building MDI scores for your inventory, select *Data/Mission Evaluation* on the menu bar and follow the instructions below:



The first step is to establish the various missions that are accomplished in the buildings in your inventory. To do this, take special care to identify all of the missions. This may involve holding discussions with key people and/or reviewing organization charts and/or other pertinent material.

Manage your list of missions by clicking the NEW button on the window above to create a mission and by clicking the DELETE button to delete the mission selected in the grid that lists existing missions. When adding a mission or editing an existing mission's details as seen in the window below, **Number** is limited to 20

alphanumeric characters and **Name** is limited to 75 alphanumeric characters. Access the details for each mission by selecting a mission in the grid and clicking the DETAILS button or by double-clicking the mission in the grid.

The screenshot shows a window titled "Mission Details" with a blue header and standard Windows window controls. Below the header is a toolbar with "Close" and "Save" buttons. The main content area is divided into three tabs: "POC Information" (which is selected and highlighted with a dashed border), "Mission Facilities", and "Mission Interdependencies". Under the "POC Information" tab, there are several text input fields: "Number" (A0008), "Mission Name" (Training), "First Name" (Betty), "Last Name" (Spitfire), "Organization" (Training Department), "Position" (Training Coordinator), "Email Address" (bspitfire@abc.mil), and "Phone" (703-234-6518).

The mission details screen has three tabs of information:

POC Information.

First Name/Last Name. This should be a spokesperson for the mission who will serve as the primary person for answering the mission questions later. First Name and Last Name are each limited to 50 alphanumeric characters.

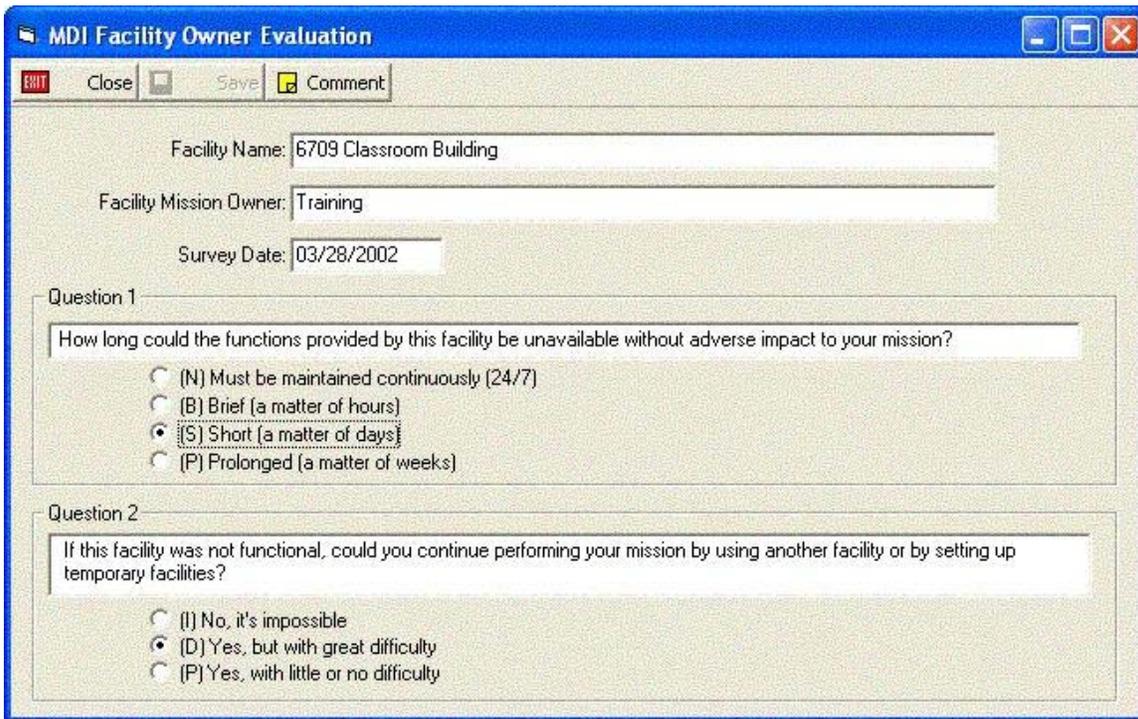
For the POC named above, provide **Organization** (limited to 20 alphanumeric characters), **Position** (limited to 50 alphanumeric characters), **Email Address** (limited to 150 alphanumeric characters), and **Phone** number (limited to 20 alphanumeric characters).

Mission Facilities.



On the Mission Facilities tab, use the arrow keys to build a list of the facilities owned/occupied by the current mission. Each building will serve at least one mission. For example, a fire station serves the mission of fire protection. It is possible that a building will serve more than one mission. For example, a single building may serve both as a fire station and as a police station.

The next step involves answering two questions about each mission facility. While on the Mission Facilities Tab, double click, in turn, each building in the Mission Facilities list. This will display a Facility Owner Evaluation screen. The mission POC should select the answer to each of the two questions and provide the current date. A comment may be added by clicking the COMMENT button on the toolbar. Use the SAVE button to save changes and the CLOSE button to return to the previous screen.



Mission Interdependencies.

POC Information		Mission Facilities		Mission Interdependencies	
Mission Interdependency Evaluations (Double Click to Evaluate)					
Number	Name	Q3	Q4		
▶ A0010	Security	N	P		
A0001	Food Services	B	P		
A0011	Admin Support	B	D		
A0007	Public Works	B	D		
A0002	Air Operations	B	D		
A0005	Bachelor Housing	B	P		
A0006	Family Housing	S	P		
A0003	Logistics	S	D		
A0009	Fire Protection	N	I		
A0004	Morale Welfare and Recreation	B	I		

With Mission Interdependencies, the POC of the current mission (Training in the examples here) double clicks each other listed mission and answers two questions on the MDI Mission Interdependency Evaluation screen regarding how the POC's mission is dependent upon the selected mission. The POC also provides the date on which the evaluation was determined.

MDI Mission Interdependency Evaluation

Close Save Comment

Evaluate the dependency of your mission (Training) on the selected mission listed below.

Selected Mission: Security

Survey Date: 03/29/2002

Question 3

How long could the functions provided by the selected mission be unavailable without adverse impact to your mission?

- (N) Must be maintained continuously (24/7)
- (B) Brief (a matter of hours)
- (S) Short (a matter of days)
- (P) Prolonged (a matter of weeks)

Question 4

If the selected mission's infrastructure were not available, could you continue performing your mission by using other facilities or by setting up temporary facilities?

- (I) No, it's impossible
- (D) Yes, but with great difficulty
- (P) Yes, with little or no difficulty

When all mission buildings and mission interdependencies have been evaluated, you will return to the Missions window illustrated at the top of this topic. If you have entered new data or changed existing data, you should click the UPDATE button on

the toolbar to force the MDI scoring to be recalculated for the buildings in your inventory.

See [Using the Mission Dependency Index](#) for suggestions regarding how the MDI scores may be used for forming groups, displaying themes, and prioritizing work items.

Using the Mission Dependency Index

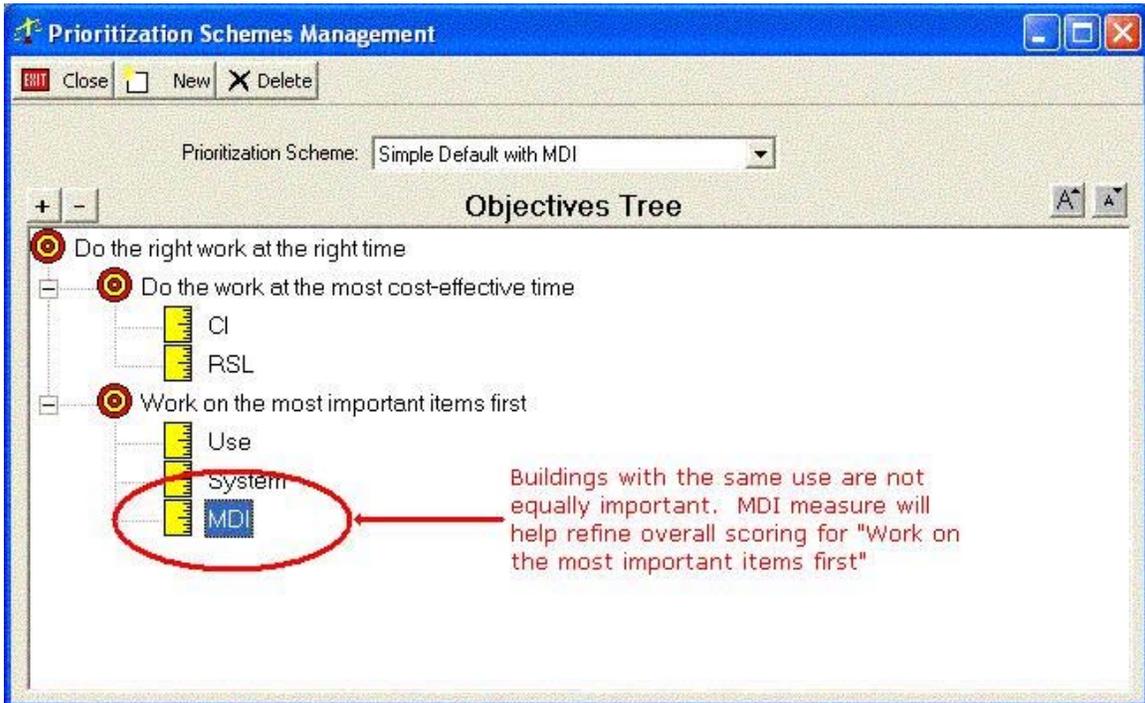
The Mission Dependency Index (MDI) serves as a measure of the relative importance of your buildings to the missions associated with your inventory. On a scale of 0 to 100, the higher the MDI score for a building the more important it is. The mission owners themselves establish the MDI scores; see the [Mission Dependency Index](#) topic for details regarding how the value of the MDI is determined for each building. The examples in this topic illustrate various ways to use the MDI.

GIS Themes

Using the property "Facility Mission Dependency Index (MDI)" as the defining property for a GIS theme would allow you to display your inventory color-coded by importance.

Prioritization Schemes

Perhaps the most valuable use of the MDI is in the area of prioritization. With limited resources for maintaining an inventory of buildings, the MDI is a good measure for insuring that work items in mission critical buildings rank high and are more likely to be funded.



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Support Centers



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If Builder 3.0 software was obtained from the University of Illinois, contact the following for software support:

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